GILLESPIE COUNTY AIRPORT

AIRPORT MASTER PLAN

GILLESPIE COUNTY AIRPORT

Fredericksburg, Texas

AIRPORT MASTER PLAN

FINAL

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FINAL

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Chapter One

INVENTORY

Chapter One

INVENTORY

The initial step in the preparation of the airport master plan for Gillespie County Airport is the collection of information pertaining to the airport and the area it serves. The information collected in this chapter will be used as a baseline for subsequent analyses in this study. The inventory of existing conditions at Gillespie County Airport provides an overview of the airport facilities, area airspace, and air traffic control. Background information for the regional area is also collected and presented. This includes the airport's role in the regional, state, and national aviation systems, regional surface transportation modes, and the regional socioeconomic profile.

The information was obtained from several sources, including on-site inspections, airport records, reviews of other planning studies, the Federal Aviation Administration (FAA), the Texas Department of Transportation (TxDOT) - Aviation Division, various local government agencies, internet sites, and interviews with airport staff, planning associations, and airport tenants. As with any airport planning study, an attempt has been made to utilize existing data, or information provided in existing planning documents, to the maximum extent possible.

AIRPORT SETTING

As depicted on **Exhibit 1A**, Gillespie County Airport is located in the central portion of Gillespie County, approximately three miles southwest of the central business district (CBD) of the City of Fredericksburg. Located approximately 70 miles northwest of San Antonio, Fredericksburg can be accessed via Interstate 10 to U.S. Highway 87 North. Access from Austin,

located 78 miles east is via U.S. Highway 290. Access from Kerrville and Llano, located 24 miles southwest and 39 miles north, respectively, is via State Highway (SH) 16.

Fredericksburg and Gillespie County are in the heart of what is called the Texas Hill Country. Gillespie County boundaries include approximately 1,055 square miles and 675,200 acres. Elevations range from 1,100 to 2,250 feet above mean sea level (MSL).

The County is primarily plateaus and hills covered with cedar, oak and other timber with the landscape broken by the spring-fed Pedernales River. There are 57 types of soils ranging from shallow soil to deep sand with 573,000 acres used for agriculture and 82 percent of that dedicated to rangeland.

The airport is located on approximately 216 acres at the southern edge of the incorporated limits of Fredericksburg. On-airport access is provided by Fair Drive, Crosswind Lane, and Airport Road. The airport is directly linked to the central business district (CBD) by State Highway 16.

CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while predominant wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions such as fog or haze.

Fredericksburg's climate can be described as subtropical, with mild winters and hot summers. The area is primarily affected by weather patterns from the Gulf of Mexico. Warm moist air from the Gulf dominates the weather from spring to fall, while cool air from the central plains dominates the weather in the winter. Average high temperatures range from 61 degrees Fahrenheit (F) in January to 93 degrees (F) in August. The area averages 32 inches of precipitation per year, with the majority of rainfall occurring from April through June. **Table 1A** summarizes climatic data for Fredericksburg, Texas.

Prevailing winds are southerly, with relatively little smog. Gillespie County receives about 62 percent of the total possible sunshine annually. The freeze-free growing season is 219 days, with the first freeze normally November 6 and the last freeze April 1.

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on many levels: local, state, and national. Each level has a different emphasis and purpose. An airport master plan is the primary local airport planning document.

At the national level, Gillespie County Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). This plan identifies 3,364 existing

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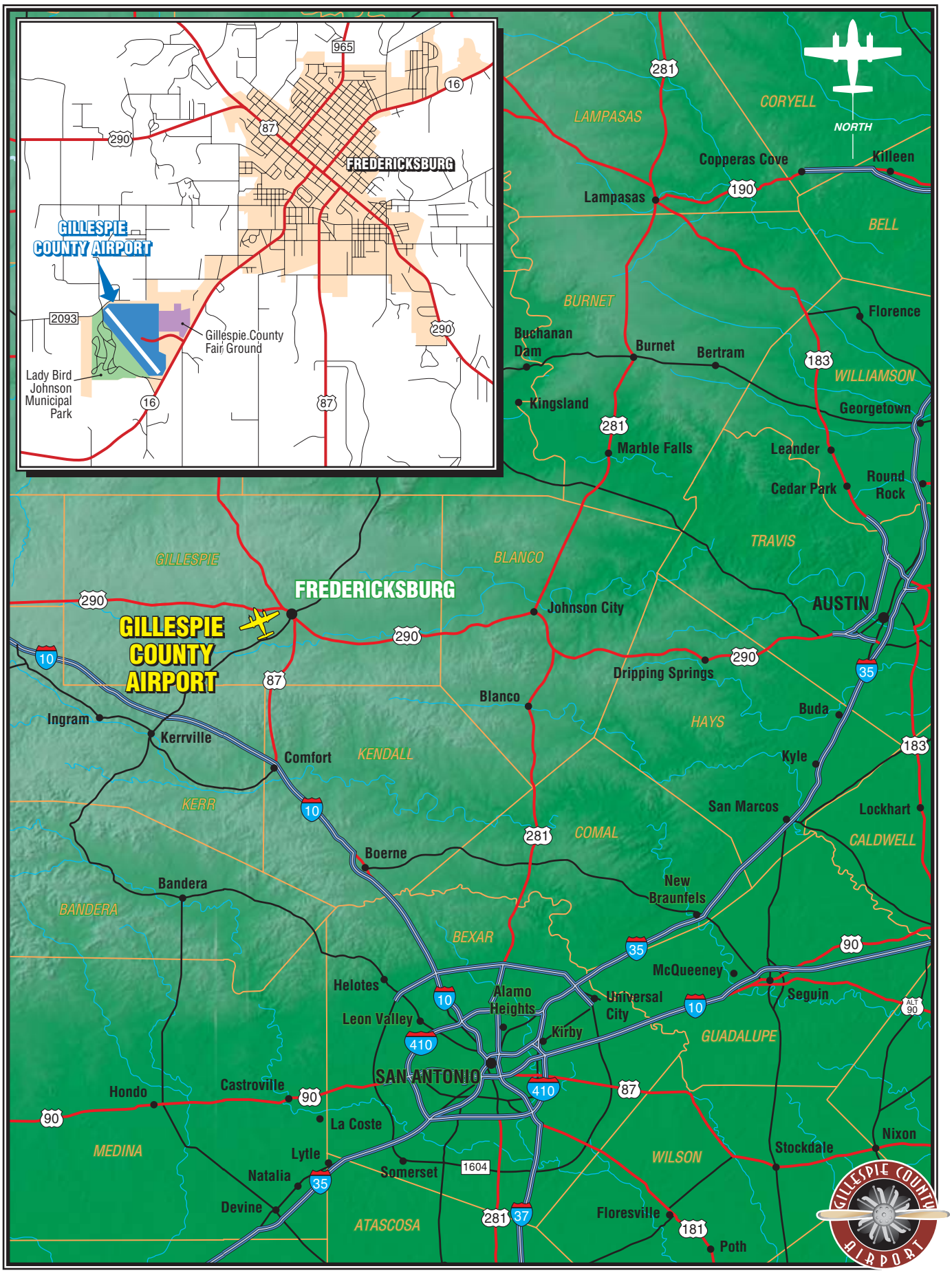

Exhibit 1A
VICINITY/LOCATION MAP

airports which are significant to national air transportation. The NPIAS plan is used by the Federal Aviation Administration (FAA) in administering the Airport Improvement Program (AIP). The NPIAS supports the FAA's strategic goals for safety, system efficiency and environmental compatibility by identifying specific airport improvements. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP program.

TABLE 1A
Climate Summary
Fredericksburg, Texas

	Monthly Averages		Precipitation
Month	**Maximum (F)**	**Minimum (F)**	**Mean (inches)**
January	61	36	1.36
February	66	39	1.91
March	73	47	1.86
April	79	54	2.40
May	84	62	4.29
June	90	68	3.97
July	93	70	2.00
August	93	69	2.74
September	88	64	3.07
October	80	56	3.72
November	69	45	2.19
December	62	38	2.14

Source: The Weather Channel (www.weather.com)

The 2005-2009 NPIAS identified $39.5 billion for airport development. Of that approximately 17 percent is identified for general aviation (GA) airports. Gillespie County Airport is classified as a GA airport in the NPIAS and thus is eligible for federal funding. The NPIAS includes $799,000 in development costs for the airport.

Communities that do not receive scheduled commercial service may be included in the NPIAS as sites for GA airports if they account for enough activity (usually at least 10 locally owned aircraft) and are at least 20 miles from the nearest NPIAS airport. The activity criterion may be relaxed for remote locations or other mitigating circumstances.

The 2,472 GA airports in the NPIAS tend to be distributed on a one-per-county basis in rural areas and are more often located near the county seat. These airports, with an average of 29 based aircraft, account for 37 percent of the nation's general aviation fleet. These airports are the most convenient source of air transportation for about 19 percent of the population and are particularly important to rural areas. Gillespie County Airport has 55 based aircraft and an estimated average of 43 operations per day thus being further eligible for AIP funding.

At the state level, TxDOT – Aviation Division provides statewide planning to airports through its *Texas Aviation System Plan* (TASP) and *Policies and Standards.* The purpose of the TASP is to ensure that the state has an adequate and efficient system of airports to serve its aviation needs well into the future. The TASP defines the specific role of each airport in the state's aviation system, identifies capital improvements, and provides a guide for programming federal and state development funds.

AIRPORT HISTORY

Gillespie County Airport opened in 1948, after a 1945 bond election was held to raise $95,000 to purchase the property and construct a runway. Hans Hannemann, the airport's first manager, campaigned for the required signatures to put the airport issue on the ballot, and for providing the vision of an airport in Gillespie County. Nearly 1,300 voters cast ballots with a margin of victory of only 19 votes.

Hannemann and others relocated an old decommissioned beacon and its tower from a hill near San Marcos to its present location at the airport. In the 1950's, an emergency occurred so Hannemann and some of the local townspeople lined up their cars along the runway to light the way for a pilot in distress. After this event, Arthur Godfrey donated the original runway lights to airport. Hannemann installed the lights himself. For years, his phone number was posted at the telephone by the gas pump (which in those days was not self-serve), and when called, he would come out to the airport to pump gas for pilots. In memory of his great contribution to the Airport, a plaque has been placed in his honor on the new terminal building.

DEVELOPMENT HISTORY

Throughout the years, many airport improvements have been made; most recently, runway and hangar improvements. In 1995, the airport had one rundown wooden hangar, one paint hangar, an automotive style fuel pump, and three T-hangars. A ten-unit T-hangar was constructed and the wooden hangar was removed. In 1997, the paint hangar was leased to an avionics shop. Over the next three years, three more hangars were constructed, and by 2002 a new terminal, self-serve avgas and Jet-A fuel sites were constructed. In 2002, a new ten-unit T-hangar, the Airport Diner, and Hangar Hotel were opened. Also at this time, rental cars were made available, a Jet-A fuel truck was put into service, and a lease was signed for another ten unit T-hangar. Finally, a 400-foot extension was added to Runway 14-32. The taxiway was extended 3,000 feet.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities which are needed for the safe and efficient movement of aircraft such as runways, taxiways, lighting and navigational aids. The landside category includes those facilities necessary to provide a

safe transition from surface to air transportation including aircraft servicing, storage, maintenance, and safety, and apron.

AIRSIDE FACILITIES

Airside facilities are identified on **Exhibit 1B**. **Table 1B** summarizes airside facility data for Gillespie County Airport.

Runway

Gillespie County Airport is served by a single asphalt runway (Runway 14-32). This runway is 5,002 feet long by 75 feet wide and is in good condition. Oriented in a northwest-southeast manner, Runway 14-32 has a load-bearing strength of 30,000 pounds single wheel loading (SWL), which refers to the design of certain aircraft landing gears having a single wheel on each main landing gear.

Taxiways

The existing taxiway system at Gillespie County Airport is shown on **Exhibit 1B**. Runway 14-32 is served by a full-length parallel taxiway. Both ends of the runway are connected to the parallel taxiway and two additional taxiways are provided. One of these access taxiways crosses the parallel taxiway and connects to the apron area. All of the taxiways are marked with lighted identification signs.

Pavement Markings

The non-precision markings on Runway 14-32 identify the runway, runway centerline, touchdown point, and aircraft holding positions. Taxiway and apron centerline markings are provided to assist aircraft using these airport surfaces. Taxiway centerline markings assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxi-lane edges. Pavement edge markings also identify aircraft parking and aircraft holding positions.

Airfield Lighting

Pavement edge lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas. Gillespie County Airport has medium intensity runway lighting (MIRL), and all taxiways are equipped with blue edge and green centerline reflectors.

All airfield lighting systems can be controlled through a pilot-controlled lighting system (PCL). This allows pilots to increase the intensity of the airfield lighting systems from the aircraft with the use of the aircraft's radio transmitter.

TABLE 1B
Airside Facility Data
Gillespie County Airport

	Runway 14-32
Runway Length (feet)	5,002
Runway Width (feet)	75
Runway Surface	Asphalt
Surface Treatment	None
Condition	Good
Runway Load-bearing Strength (pounds)	
Single Wheel Loading (SWL)	30,000
Runway Lighting	Medium Intensity (MIRL)
Approach Aids	Rotating Beacon PAPI-2
Instrument Approach Aids	VOR/DME OR GPS-A
Weather or Navigational Aids	AWOS Segmented Circle Lighted Wind Cones
Pavement Markings	
Runway	Non-precision Instrument
Taxiway, Taxi-lanes, Aprons	Edge Reflectors, Centerline Reflectors, Tie-down

PAPI - Precision Approach Path Indicator
GPS - Global Positioning System
AWOS - Automated Weather Observation System
VOR/DME - Very high frequency Omnidirectional Range/Distance Measuring Equipment

Source: Airport Facility Directory; South Central (April 2004).

Approach Aids

A two-unit precision approach path indicator (PAPI-2L) is available on both ends of Runway 14-32. A PAPI consists of a system of lights, located at various distances from the runway threshold. These lights give the pilot an indication of being above, below, or on the designed descent path to the runway.

A lighted wind-cone is located within the segmented circle near the northwest end of the runway. A second wind-cone, which is unlighted, is located west of the southeast end of the runway. These are used to provide the pilot with a visual indication of the wind speed and direction, and other basic information about the airport's traffic pattern.

The location of the airport at night is universally indicated by a rotating beacon, displaying flashes of green and white light. The rotating beacon at Gillespie County Airport is located east of the runway, behind the terminal building.

Airfield Signs

Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Lighted signs are installed on all taxiway and runway intersections. Hold lines are also included at taxiway and runway intersections.

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LEGEND
Airport Property Line
Easement Line

OFF-TRACK HORSE RACING FACILITY
COTTON GIN B&B
GILLESPIE COUNTY FAIRGROUNDS
GILLESPIE COUNTY BUSINESS PARK
FAIR DRIVE
HIGHWAY 16
T-HANGARS
TERMINAL
HANGAR HOTEL
AIRPORT ROAD
EXECUTIVE HANGAR
FUEL FARM
DINER
OFFICE
EXECUTIVE HANGARS
CHUCKWAGON INN B&B
EXECUTIVE HANGARS
APRON
MAINTENANCE
APRON
PARALLEL TAXIWAY
A
PAPI-2L
B
C
D
RUNWAY 14-32 (5,002' x 75')
PAPI-2L
WINDCONE
SEGMENTED CIRCLE/ LIGHTED WINDCONE
LADY BIRD DR.
LADY BIRD JOHNSON MUNICIPAL PARK AND GOLF COURSE
LIVE OAK CREEK
RR 2093/TIVYDALE RD.
NORTH
0
600
1200
SCALE IN FEET

Exhibit 1B
EXISTING AIRFIELD FACILITIES

Weather Aids

Gillespie County Airport is equipped with an Automated Weather Observation System III (AWOS-III). An AWOS-III is equipped to automatically record weather conditions such as cloud height, visibility, wind speed and direction, temperature, dew point, and precipitation. This information is then transmitted at regular intervals. Aircraft in the vicinity can receive this information if they have their radio tuned to the correct frequency. The information collected by the AWOS-III is also transmitted to the FAA. Flight Service Stations, the National Weather Service, and many other weather outlets. Pilots and individuals can also call a published telephone number and receive the information via automated voice recording. The AWOS-III radio frequency is 120.00 Mhz.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the terminal building, aircraft storage/ maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, roadway access, and aircraft rescue and firefighting. Landside facilities are identified on **Exhibit 1C**.

Terminal Building

A new passenger terminal building was dedicated on April 10, 2002, and provides a comfortable environment for those waiting for arriving flights, passengers, and crew members. The building is located east of the aircraft parking apron and includes flight planning facilities, a pilot's lounge, a conference room and a public area. It is the only county-owned building at the airport. Gillespie County funded half of the building's total cost with the Texas Department of Transportation-Aviation Division providing matching grants.

Aircraft Parking Apron

Gillespie County Airport has two aircraft parking aprons. The main apron is adjacent to the new terminal building, Airport Diner, and Hangar Hotel. The apron is served by self-serve fuel pumps. The main apron totals approximately 29,300 square yards, with approximately 36 aircraft tie-down positions. The second apron is on the northeast side of the runway. This apron is used for maintenance operations and provides access to the hangars in the area. This apron is approximately 13,300 square yards with 17 aircraft tie-down positions.

Airport Services

Gillespie County Airport offers many services to incoming passengers. The Airport Diner was modeled after the soda fountains of the 1950's. The Hangar Hotel boasts fifty upscale guest rooms and an Officers Club, all trimmed with stately mahogany and leather accents. These facilities are located immediately south of the terminal building.

Three fixed-base operators (FBOs) are available at the airport; Snowden Aviation, Fritz Aviation, and Fredericksburg FBO. Two FBOs (Fritz and Snowden) are located at the northeast end of the runway, while Fredericksburg FBO is located adjacent to the terminal building.. Combined, these FBO's provide aircraft sales, flight instruction, fuel, oxygen service, aircraft parking (ramp or tie-down), hangars, aircraft maintenance and modifications, as well as aircraft cleaning and detailing.

Aircraft Hangar Facilities

Hangar facilities at Gillespie County Airport are comprised of conventional hangars, executive hangars, and T-hangars. T-hangars provide for separate hangar facilities within a larger contiguous facility. Several T-hangars are available for aircraft storage at the airport. Conventional hangars provide a large open space, free from roof support structures, and have the capability to accommodate several aircraft simultaneously. Conventional hangars are typically 10,000 square feet or greater.

Executive hangars provide the same type of aircraft storage as conventional hangars, but are normally less than 10,000 square feet. There are three box hangars, which can also be classified as executive hangars at the airport. The hangar facilities are identified on **Exhibit 1C**.

Airport Roads

The primary public access road to Gillespie County Airport is Fair Drive, which connects U.S. Highway 16 to Airport Road. A service entrance connects Airport Road to Tivydale Road.

Automobile Parking

There are several parking lots available for automobile parking at Gillespie County Airport. The airport terminal parking area totals approximately 11,520 square feet and provides approximately 30 spaces. It is located adjacent to the terminal building. Several additional parking areas are located next to the various facilities on the airfield. The Hangar Hotel has approximately 130 additional parking spaces. There are approximately 10 more spaces adjacent to the hangar facilities at the north end of the airport. To the east of Airport Road is a long-term parking lot with a capacity of 27 vehicles.

Fuel Facilities

The airport's fuel storage facilities include three aboveground storage tanks. Two are located adjacent to the terminal. These are both 12,000-gallon tanks (one is Jet-A and the other is 100LL) and the other 4,000-gallon tank (100LL) is located next to the

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Exhibit 1C
EXISTING LANDSIDE FACILITIES

maintenance building on the north end of the field. Fredericksburg FBO is a branded AirBP retailer, while Fritz Aviation is a branded AVFuel retailer.

Aircraft Rescue and Firefighting (ARFF)

There are no ARFF facilities permanently based at Gillespie County Airport. The City of Fredericksburg Volunteer Fire Department consists of the Director of Emergency Services, three paid shift officers, a fire marshal, and 36 volunteers. A firehouse located at 124 W. Main Street is approximately three miles from the airport. The City maintains four pumpers, one aerial platform, one rescue truck, two tankers, four brush trucks, one utility vehicle, and a mobile cascade/MCI Trailer.

Utilities

Water and sewer services at the airport are provided by the City of Fredericksburg. Electrical service is furnished by Central Texas Electric Cooperative. Verizon provides landline telephone service.

Airport Business Park

Gillespie County Business Park is a 24-acre multi-use business park that is owned and operated by the County. The park is located at the northeast corner of the airport. As airport activity increased, the business park was conceived as an opportunity to promote economic diversification and business growth within the county.

The Business Park features a single extra-wide curbed street that terminates in a cul-de-sac. It has two different tract depths; 250 or 300 feet. The water and sewer connections have been installed. The overall sizes of each tract are negotiable and can be tailored to any business need.

The location of the Business Park is unique because it provides the opportunity for both non-aviation and aviation related use. Depending on the needs of the business, drive up service and taxi-up service will be available.

To date there has been no construction in the business park but it is anticipated that future aviation growth will be a catalyst for growth in the business park as well.

AREA AIRSPACE

The Federal Aviation Administration (FAA) Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations and

procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for categories of airspace and identifies them as Classes A, B, C, D, E, and G. **Exhibit 1D** generally illustrates each airspace type in three-dimensional form.

Class A airspace is high level controlled airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high activity commercial service airports (i.e., DFW International Airport). Class C airspace is controlled airspace surrounding lower activity commercial service and some military airports. Class D airspace is controlled airspace surrounding low activity commercial service and general aviation airports with an airport traffic control tower (ATCT).

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for that particular airspace sector. Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. Class G airspace is uncontrolled airspace.

Exhibit 1E further identifies the local airspace area, restricted areas, Victor airways, military training routes, obstructions within a 30-mile radius and the Class E airspace in which Gillespie County Airport falls.

NAVIGATIONAL AIDS

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Gillespie County Airport include a non-directional beacon (NDB), very high frequency omni directional range (VOR) facility and global positioning system (GPS).

The NDB transmits radio signals to which pilots of properly equipped aircraft can determine the bearing to or from the NDB facility and then "home in on," or track to or from the station. Shein NDB is located approximately 20 nautical miles southwest of Gillespie County Airport and Horseshoe Bay Resort NDB is located approximately 33 nautical miles northeast of the airport. The location of the Shein NDB and the Horseshoe Bay NDB are depicted on **Exhibit 1E.**

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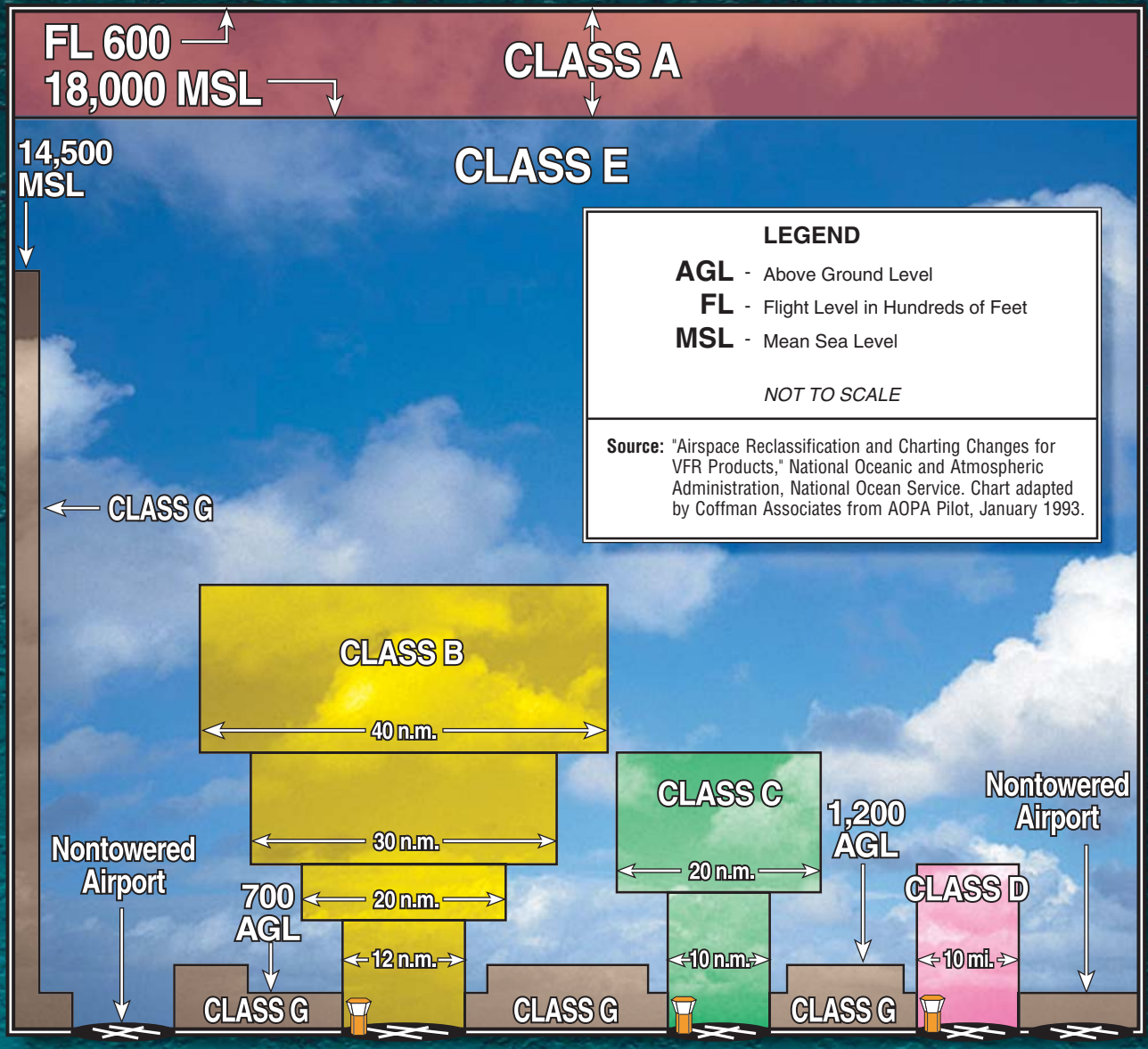

CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600 .
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Exhibit 1D
AIRSPACE CLASSIFICATION

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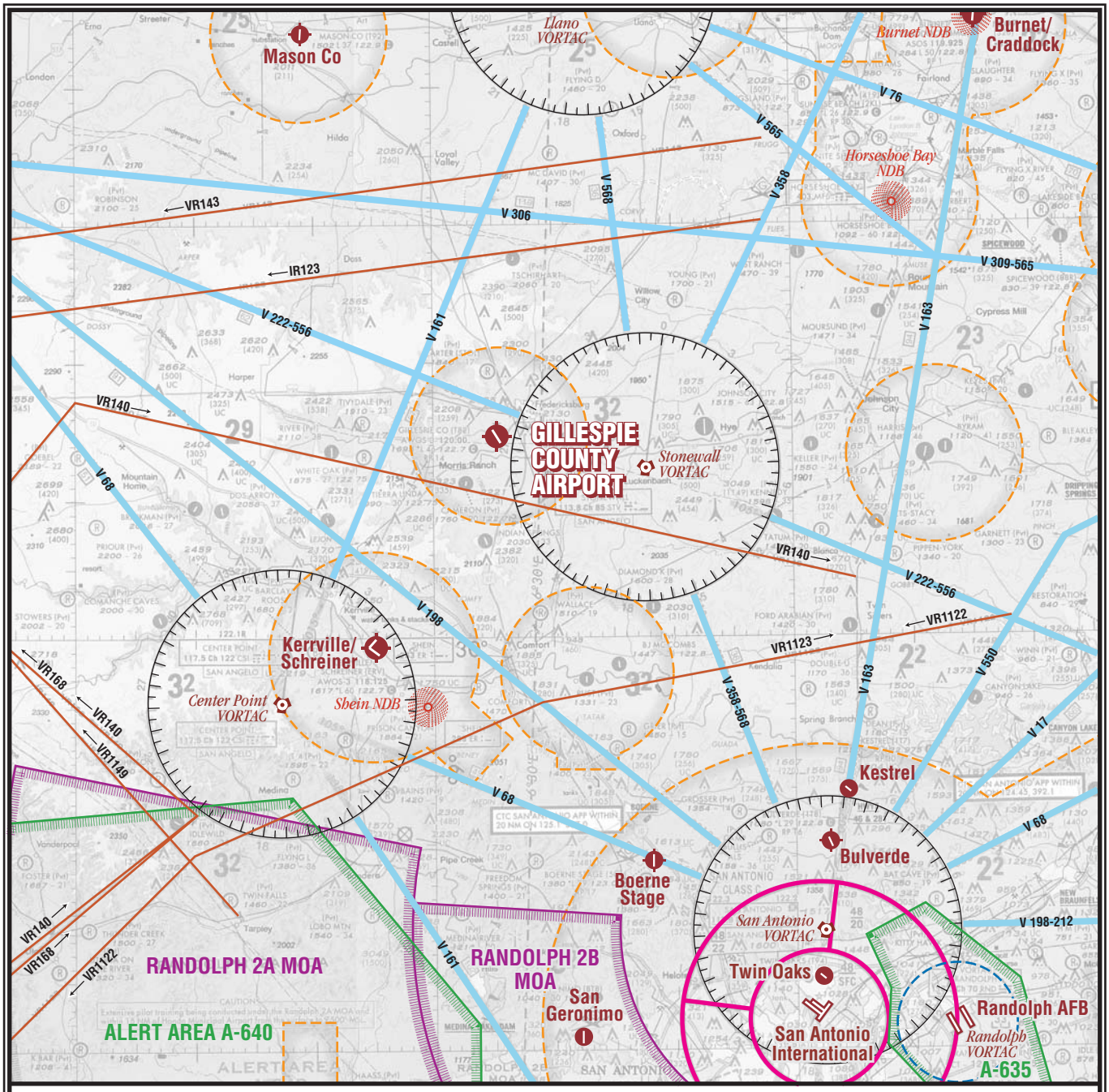


LEGEND

- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Military Operations Area (MOA)
- Prohibited, Restricted, Warning and Alert Areas
- Military Training Routes
- Victor Airways
- Class C Airspace
- Class D Airspace
- Class E Airspace with floor 700' above surface

NORTH

NOT TO SCALE

Source: San Antonio Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration, October 30, 2003

Exhibit 1E
REGIONAL AIRSPACE MAP

While no VOR facilities are located on the field at Gillespie County Airport, there are three VOR facilities located in the region which can be utilized by pilots flying to or from Gillespie County Airport. Stonewall VORTAC is located approximately 10 nautical miles (nm) east of the airport, Center Point VORTAC is located approximately 25 nm southwest of the airport, and Llano VORTAC is located approximately 34 nm north of the airport. These facilities are identified on **Exhibit 1E**.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, GPS has been utilized more in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next 20 years. The FAA phaseout schedule for traditional navigational aids includes: NDB's by 2005 and VOR's by 2010.

INSTRUMENT APPROACH PROCEDURES

Instrument approach procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. Both runway ends have approved published RNAV (GPS) approach procedures. The airport also has special take-off minimums. When departing Runway 14, aircraft must climb to 2,000 feet prior to turning on course. For aircraft departing Runway 32, aircraft must climb to 2,400 feet prior to turning on course. These procedures are designed for obstacle clearance.

The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see in order to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for the pilot to complete the approach. If the observed visibility or cloud ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach. The minimum requirements for visibility and cloud ceilings are varied, dependent on the approach speed of the aircraft. **Table 1C** provides details of the published instrument approaches currently available at Gillespie County Airport.

LOCAL OPERATING PROCEDURES

Gillespie County Airport is situated at 1,695 feet above mean sea level (MSL). A nonstandard right-hand traffic pattern has been established for all aircraft on Runway 14, and a left-hand pattern on Runway 32. In this manner, aircraft approach the desired runway

end, following a series of either right or left-hand turns. The procedure was established to keep aircraft traffic patterns on the western side of the airport because the eastern side has numerous public use facilities and there is a residential neighborhood to the northeast as well. Runway 14 has been designated as the calm wind runway.

TABLE 1C
Instrument Approach Data
Gillespie County Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE					
	Category A		Category B		Category C	
	CH	VIS	CH	VIS	CH	VIS
RNAV (GPS) Runway 14						
Straight-in	685	1	685	1	685	2
Circling	685	1	685	1	785	2.25
RNAV (GPS) Runway 32						
Straight-in	698	1	698	1	698	2
Circling	685	1	685	1	785	2.25
VOR/DME OR GPS-A						
Circling	766	1	826	1.25	826	2.5
International Altimeter Setting	926	1.25	966	1.5	966	3

Aircraft Categories are established based on 1.3 times the stall speed in landing configuration as follows:
- Category A/B 0-120 knots
- Category C 112-140 knots

CH - Cloud Height (in feet above ground level)
VIS - visibility minimums (in miles)

Source: Airport/Facility Directory; South Central U.S., (April, 2004)

Traffic Pattern Altitude

The traffic pattern altitude for fixed wing light aircraft is 2,500 feet MSL (805 feet AGL); turboprop and jet aircraft, 2,700 feet MSL (1,005 AGL); and helicopters, 2,200 feet MSL (505 feet AGL).

Air Traffic Control

Gillespie County Airport does not have an airport traffic control tower (ATCT). Therefore, no formal terminal air services are available. Aircraft operating in the vicinity of the airport are not required to file any type of flight plan or contact any air traffic control facility unless they are entering airspace where contact is mandatory (e.g., Class B).

Air traffic advisories and certain weather information can be obtained using the common traffic advisory frequency (CTAF) channel 122.7 MHz, also know as UNICOM. Enroute air traffic control services are provided by the Houston Air Route Traffic Control Center (ARTCC). The San Angelo Flight Service Station (FSS) provides additional traffic service to pilots operating in the vicinity of the airport.

This FSS provides pilots with weather information, airport advisory service, flight planning processing, and communication with other air traffic control facilities.

REGIONAL AIRPORTS

Kerrville Municipal Airport (ERV) is the only public airport within a 30 nautical mile (nm) radius of Gillespie County Airport, as is depicted on **Exhibit 1E**. Kerrville Municipal Airport is approximately 18 nautical miles southwest of Gillespie County Airport. The airport is five miles southeast of the city of Kerrville, and it has two runways. Runway 12-30 is 6,000 feet long and Runway 3-21 is 4,047 feet long. Both are constructed of asphalt and are in good condition. The airport reports 115 based aircraft. Services on the field include: aviation fuel, oxygen service, aircraft parking (ramp or tie-down), hangars, passenger terminal and lounge, flight school, flight training, and aircraft rental. There are currently 40 private airports within a 30nm radius of Gillespie County Airport. A majority of these airports are ranch airports with turf or gavel runways.

AREA LAND USE

Land use is important to the existing and potential needs of the airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future. The City of Fredericksburg and Gillespie County are settled in Texas Hill Country, with a large number and wide variety of trees, scenic hills, flowing rivers, and grazing pasture land. Land use in Gillespie County is primarily agriculture, with some light manufacturing and oil-related industry.

Existing Land Use

To the northeast of the airport sits the Gillespie County Fairgrounds. The Gillespie County Fair and Festivals Association (GCFFA) produces the oldest continuously running county fair in Texas. The 117th annual fair will be held in August 2005. The GCFFA hosts a number of other events throughout the year. The Gillespie County Fairgrounds also sponsors live pari-mutuel horse racing during the summer, as well as simulcasting races from Texas and out-of-state tracks. To the north of the runway is a fairly new residential community. Currently, there are 21 single-family homes, with a few lots still available. Adjacent to the residential community is the Chuckwagon Inn Bed & Breakfast, which is a historic home built in 1854. Another bed & breakfast is located to the southeast on Highway 16.

As previously mentioned, the Gillespie County Business Park is located adjacent to the airport to the northeast. This is a 24-acre tract of land that was set aside for economic development purposes in 2003. An access road with a cul-de-sac was constructed and all utilities are readily available for potential tenants ready to build.

To the southwest of the runway is the Lady Bird Johnson Municipal Park. This recreational space boasts baseball fields, tennis courts, an RV park and an 18-hole championship golf course. The park is laid out on the banks of Live Oak Creek. To the southeast is primarily agricultural land.

Exhibit 1F shows the current land uses surrounding the airport.

Planned Land Use

The *City of Fredericksburg Comprehensive Plan* was completed in 1996. The plan is designed to establish policies toward growth and development and to make recommendations and define strategies for actions to achieve the goals established in the plan. **Exhibit 1G** is the future land use classification for the City of Fredericksburg and the adjacent county land. By Texas law cities are allowed to consider land outside of their immediate jurisdiction for planning purposes.

The study proposes a long-term surface transportation improvement that would have a significant impact on the airport. Currently, traffic traveling toward Fredericksburg converges in the downtown historic district. To alleviate the resulting congestion and pollution, the development of a relief route plan was proposed. The relief route plan would essentially create a connecting loop around the city. The proposed relief route connects U.S. Highway 290 east of the city to U.S. Highway 87 south of the city to State Highway 290 west of the city to U.S. Highway 87 north of the city. Due to the complexity of the overall project, an interim plan which considers using the Friendship Lane right-of-way to connect between U.S. 290 and State Highway 16 on the south side of the city has been proposed. **Exhibit 1H** is reproduced from the comprehensive plan and illustrates the proposed relief route plan.

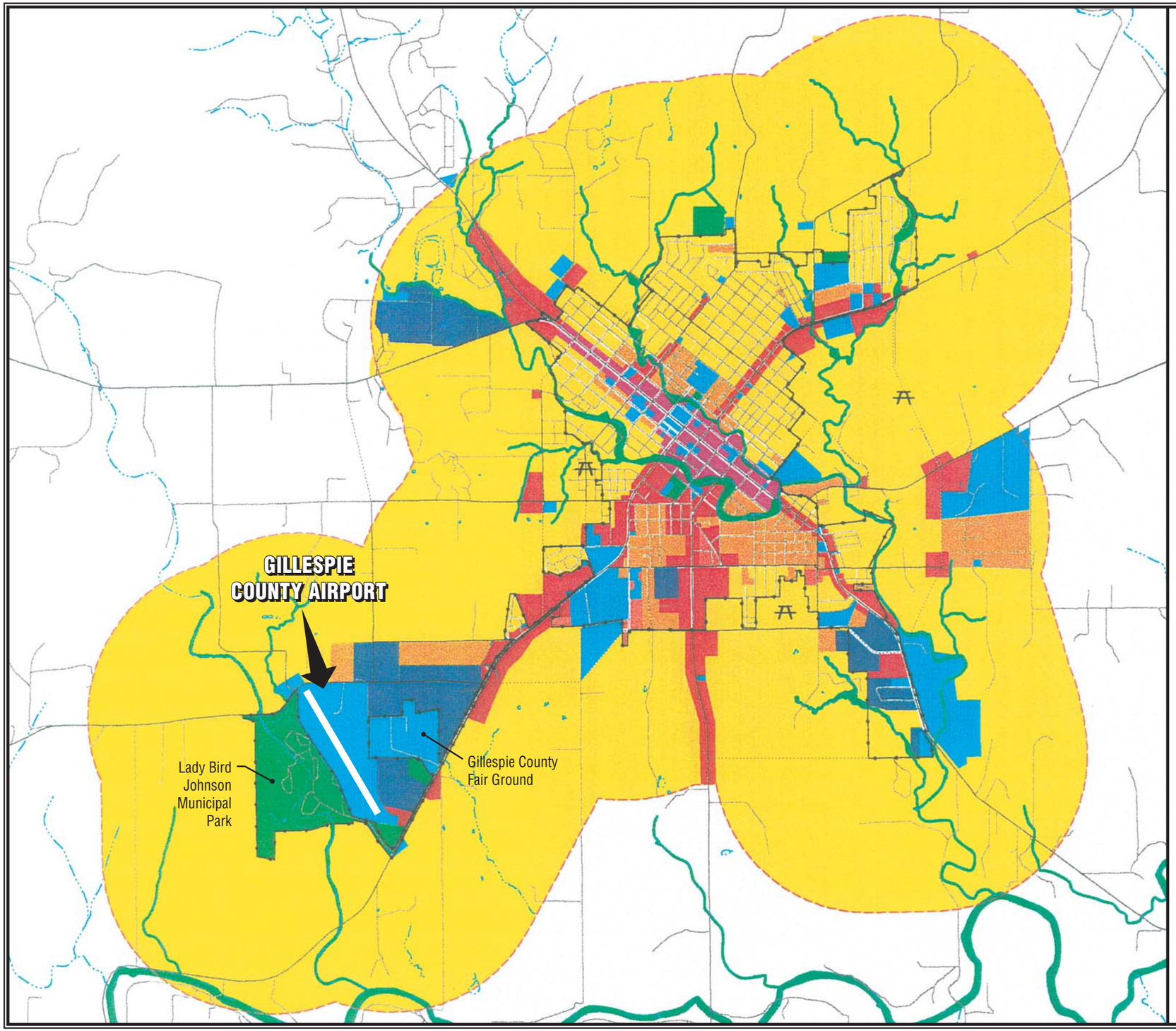
In 2003, the City of Fredericksburg completed the Texas Hill Country University Master Plan. This plan proposes the construction of a regional higher education facility to be located to the southeast of the city on US 290. The project is designed to support up to 4,000 full-time students. There has been some discussion on including an aviation education program. If this is the case then Gillespie County Airport should expect significant demand on their services.

Boot Ranch is an upscale private golf club and residential community currently under construction in Gillespie County. Touring professional, Hal Sutton, is a principal in the project. Phase I of the development will include about 800 acres. The entire project is expected to encompass about 1,900 acres. The project includes an 18-hole championship golf course, an elaborate clubhouse and 62 home sites. The home sites are single family residences on lots ranging from four to 12 acres. A corporate retreat village called “Sunday House” is also included in the project. The “Sunday House” village will be comprised of about 25 structures that will be offered to corporations. The corporate owners can then designate up to five individuals with entitlement to use the facility. Total membership is limited to 300. A facility such as Boot Ranch will have a significant impact on demand at the local airport.

04MP04-1F-5/24/05

Exhibit 1F
EXISTING LAND USE

04MP04-1G-7/7/04



LEGEND

- Creeks and Streams
- Fredericksburg City Limit
- Extra-Territorial Jurisdiction
- Future Park (Not Site Specific)

THOROUGHFARE SYSTEM

- Primary Routes
- Secondary Routes
- Proposed Thoroughfares

FUTURE LAND USE

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Central Business District
- Public Facilities/Institutional
- Park/Open Space
- Agricultural

Source: City of Fredericksburg Comprehensive Plan, July 1996
Hankamer Consulting

NORTH

0 5000

SCALE IN FEET

Exhibit 1G
COMPREHENSIVE PLAN

04MP04-1H-12/3/04

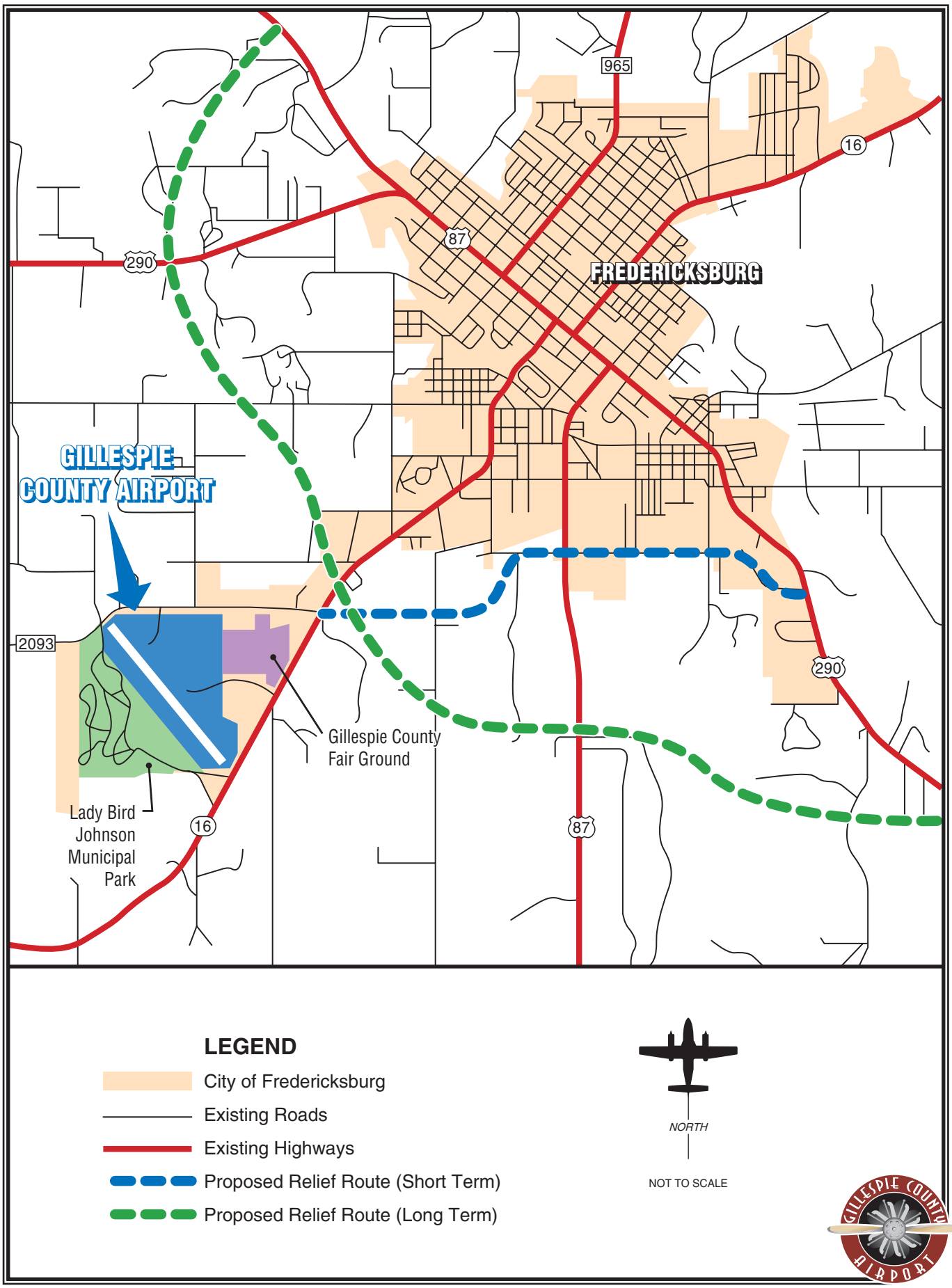


Exhibit 1H
THOROUGHFARE PROPOSAL

Community Profile

In 1846, German settlers founded Fredericksburg. During the ensuing years, Gillespie County has evolved into a key agricultural area with a strong reputation for historic preservation. In May 2000, The National Trust for Historic Preservation honored Fredericksburg as one of 12 distinctive destinations in the United States. The criteria for this prestigious honor included: well-managed growth, dynamic downtown, commitment to historic preservation, locally-owned businesses and walk-ability for residents and visitors.

The city is known for their German Heritage and Texan hospitality. Tourism is a major economic factor today. Activities and points of interest include museums, historic district tours, a wildflower farm, vineyards, peach orchards, Enchanted Rock State Natural Area, and LBJ State and National Historic parks. There are more than 250 Bed and Breakfasts in the county.

Residential

The City of Fredericksburg has a residential pattern typical of agricultural communities that surround a central business district(CBD). The city is laid out on a grid pattern, with many single-family residences emanating from the CBD. As the city has grown a suburban fringe has developed. This is evidenced by the community to the north of the runway. The comprehensive plan of 1996 designates all buffering land as potentially residential, including land around the airport. This is illustrated in yellow on **Exhibit 1G**. Further residential development toward the airport should be anticipated.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data has been collected for use in various elements of this master plan. This information provides essential background for use in determining aviation service level requirements. Aviation forecasts are related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time.

POPULATION

Population is one of the most important elements to consider when planning for future needs of the airport. Historical population data for the City of Fredericksburg and Gillespie County, as well as adjacent counties is shown in **Table 1D**.

As shown in the table, Gillespie County's population has been growing at a brisk 2.29 percent average annual rate. Between 1970 and 2000 the population nearly doubled, adding 10,261 people. Fredericksburg also experienced an increase in population during the same period. Since the airport draws business from adjacent counties, the significant population increases there should be noted.

TABLE 1D
Historical Population Statistics

County Populations	1970	1980	1990	2000	Avg. Annual Growth Rate (1970-2000)
Gillespie County	10,553	13,532	17,204	20,814	2.29%
Blanco County	3,567	4,681	5,972	8,418	2.90%
Kendal County	6,964	10,635	14,589	23,748	4.17%
Kerr County	19,454	28,780	36,304	43,653	2.73%
City Population					
Fredericksburg	5,326	6,412	6,934	8,911	1.73%
State Population					
Texas	11,198,655	14,225,513	16,986,510	20,851,790	2.09%

Source: Texas Water Development Board - 2006 Regional Water Plan

It is forecast that the strong growth in population for Gillespie County and the surrounding region will continue for the foreseeable future. **Table 1E** shows the population forecasts as aggregated from Texas Water Development Board data. All cities and counties listed are expected to grow through 2030. Gillespie County is projected to add more than 8,000 people by 2030 bringing its total population to over 28, 800.

TABLE 1E
Forecast Population

County Populations	2000	2010	2015	2025	Avg. Annual Growth Rate (2000-2025)
Gillespie County	20,814	24,089	25,743	28,169	1.01%
Blanco County	8,418	9,946	10,813	12,592	1.35%
Kendal County	23,743	35,720	42,381	57,500	2.99%
Kerr County	43,653	49,250	51,991	56,210	0.85%
City Populations					
Fredericksburg	8,911	10,313	11,021	12,060	1.01%
State Population					
Texas	20,851,790	24,909,072	26,926,804	31,011,727	1.33%

Source: Texas Water Development Board - 2006 Regional Water Plan

EMPLOYMENT

Analysis of a community's employment base can be valuable in determining the overall well-being of that community. In most cases, the community make-up and health are significantly impacted by the availability of jobs, variety of employment opportunities, and types of wages provided by local employers. **Table 1F** provides historical employment characteristics in Gillespie County from 1990 to the present.

TABLE 1F
Employment Characteristics
Gillespie County

	1990	1992	1994	1996	1998	2000	2002	2004*
Civilian Labor Force	8,041	9,086	9,670	9,922	10,379	10,299	10,704	10,763
Total Employment	7,910	8,860	9,480	9,760	10,195	9,999	10,458	10,662
Unemployment	131	226	190	162	184	300	246	201
Unemployment Rate	1.6%	2.5%	2.0%	1.6%	1.8%	2.9%	2.3%	1.9%

*Source: Texas Workforce Commission. *2004 Totals are Year-To-Date Averages (Jan-May)*

The unemployment rate has always been low in Gillespie County compared to the national unemployment numbers (4.92 percent compared to 1.83 percent from 1990 to 2004). This shows that Gillespie County is able to sustain solid employment over time. The most recent numbers for 2004 also show a trend to even lower unemployment.

Employment by economic sector is presented in **Table 1G**. Historical and forecast data were obtained from the Complete Economic and Demographic Data Source (CEDDS) 2004, which is published by Woods & Poole Economics, Inc. and compiled from data published by the U.S. Department of Commerce.

TABLE 1G
Employment by Sector
Gillespie County

Economic Sector	2000	% of Total Employment (2000)	2025	% of Total Employment (2025)	Avg. Annual Growth Rate (2000-2025)
Mining	115	1.06%	112	0.62%	-0.11%
Construction	1,201	11.09%	2,199	12.19%	2.45%
Manufacturing	684	6.32%	718	3.98%	0.19%
Transport., Comm., & Utilities	302	2.79%	609	3.37%	2.85%
Wholesale Trade	364	3.36%	545	3.02%	1.63%
Retail Trade	2,449	22.61%	3,858	21.38%	1.83%
Finance, Ins., & Real Estate	990	9.14%	1,855	10.28%	2.54%
Services	3,657	33.76%	6,630	36.74%	2.41%
Federal Civilian Government	74	0.68%	85	0.47%	0.56%
Federal Military Government	54	0.50%	56	0.31%	0.15%
State and Local Government	941	8.69%	1,378	7.64%	1.54%
Total Employment	**10,831**	**100.00%**	**18,045**	**100.00%**	**2.06%**

Source: CEDDS, Woods and Poole (2004)

As indicated in the table, the employment base of Gillespie County is in large part dependant upon the services industry, which accounted for approximately 34 percent of total employment in 2000. This is due, in large part, to the many tourist attractions in Gillespie County. Retail trade accounted for the next largest percent of total employment in 2000, with nearly 23 percent. The two combined for over 56 percent of the

county employment base, giving strong indications that tourism is the most significant economic factor for Gillespie County.

The forecasts for 2025 indicate an overall average annual growth rate of 2.06 percent. The economic base is still expected to be dominated by services and retail trade accounting for 58.12 percent. By 2025, nearly 8,800 people are projected to be added to the Gillespie County employment base. This represents a 60 percent increase in the number of employed persons over 25 years. Only the mining sector, which represented about one percent of the economic base in 2000, will show a negative growth rate accounting for only 0.62 percent of the economic base in 2025.

INCOME

Table 1H compares the per capita personal income (PCPI), adjusted to 1996 dollars for Gillespie County, the State of Texas, and the United States between 1990 and 2025. As indicated on the table, the PCPI for the State of Texas has slightly trailed that of the United States. Gillespie County PCPI trails the State of Texas by nearly eight percent and the U.S. PCPI by nearly 18 percent. By 2025, Gillespie County PCPI is expected to make up some of that ground by having a significantly stronger average annual growth rate. By 2025, Gillespie County is forecast to trail the State of Texas by only 0.6 percent and the U.S. by only seven percent.

TABLE 1H
Per Capita Personal Income (1996$)

	HISTORICAL		FORECAST			
Area	1990	2000	2010	2015	2025	Avg. Annual Growth Rate (2000-2025)
Gillespie County	$18,757	$23,547	$26,785	$28,955	$33,876	1.47%
State of Texas	$20,374	$26,066	$28,691	$30,361	$34,080	1.08%
United States	$22,856	$27,712	$30,680	$32,470	$36,510	1.11%

Source: CEDDS, Woods and Poole (2004)

SUMMARY

The information discussed in this inventory chapter provides a foundation upon which the remaining elements of the planning process will be constructed. Information on current airport facilities and utilization will serve as a basis, with additional analysis and data collection, for the development of forecasts of aviation activity and facility requirement determinations.

DOCUMENT SOURCES

As mentioned earlier, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with

staff and tenants contributed to the inventory effort.

Airport/Facility Directory, South Central U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, June 10, 2004 Edition.

San Antonio Sectional Aeronautical Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, 71st edition, February 19, 2004.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 2001-2005.

U.S. Terminal Procedures, South Central, U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, June 10, 2004 Edition.

A number of internet Web sites were also used to collect information for the inventory chapter. These include the following:

FAA 5010 Data:
http://www.airnav.com

Fredericksburg Chamber of Commerce:
http://www.fredericksburg-texas.com

Texas Water Development Board:
http://www.twdb.state.tx.us/home/index.asp

Texas Workforce Commission:
http://www.twc.state.tx.us

U.S. Census Bureau:
http://www.census.gov

U.S. Department of Labor - Bureau of Labor Statistics:
http://www.bls.gov/cps/prev_yrs.htm

City of Fredericksburg Official Web site
http://www.fbgtx.org/

Gillespie County Fair & Festivals Association, Inc.
http://www.gillespiefair.com

Chapter Two

AVIATION DEMAND FORECASTS

Chapter Two

AVIATION DEMAND FORECASTS

Facility planning must begin with a definition of the demand that may reasonably be expected to occur at the facility over a specific period of time. For the Gillespie County Airport, this involves forecasts of aviation activity indicators through the year 2025. In this master plan, forecasts of based aircraft, based aircraft fleet mix, annual aircraft operations, and operational peak periods will serve as the basis for facility development planning.

It is virtually impossible to predict with certainty year-to-year fluctuations of activity when looking 20 years into the future. Aviation activity can be affected by many influences at the local, regional, and national level. Therefore, it is important to remember that forecasts are to serve only as guidelines and planning must remain flexible enough to respond to unforeseen facility needs.

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

GENERAL AVIATION

General aviation is defined as the portion of civil aviation which encompasses all facets of aviation except commercial and military operations. To determine the types and

sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. These indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- Local and Itinerant Operations
- Peak Activity
- Annual Instrument Approaches

NATIONAL AVIATION TRENDS

Each year, the Federal Aviation Administration (FAA) publishes its national forecast. Included in this publication are forecasts for large air carriers, regional air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was FAA *Aerospace Forecasts-Fiscal Years, 2004-2015*. The forecast uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

In the seven years prior to the events of 9/11, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and aviation industry from the events of 9/11 were immediate and significant. However, the economic climate and aviation industry have been recovering in the past year. The FAA expects the U.S. economy to recover rapidly over the next two years, growing moderately thereafter. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming there will not be any new successful terrorists' incidents against either U.S. or world aviation).

Airline passengers are expected to recover to pre-9/11 levels by 2005, and then grow at 4.2 percent annually through 2015. Large air carriers will grow at 3.8 percent annually, while the regional/commuter airlines are expected to grow at an astonishing pace of 6.4 percent annually. Air cargo revenue-ton-miles (RTMs) are projected to grow at 3.5 percent annually. The number of active general aviation aircraft is expected to grow at 1.3 percent annually.

GENERAL AVIATION TRENDS

Following more than a decade of decline, the general aviation industry was revitalized with the passage of the *General Aviation Revitalization Act* in 1994 (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufacture). This legislation sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry. The

high cost of product liability insurance was a major factor in the decision by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

However, this continued growth in the general aviation industry slowed considerably in 2001 and 2002, having been negatively impacted by the events of September 11. Thousands of general aviation aircraft were grounded for weeks, due to "no-fly zone" restrictions imposed on operations of aircraft in security-sensitive areas. This, in addition to the economic recession already taking place in 2001-02, has had a profoundly negative impact on the general aviation industry. Weak traffic demand, coupled with the failure of full-fare business travelers to return in any significant numbers, forced carriers to resort to discounting to fill empty seats. This had a devastating impact on both passenger yields and profits.

General aviation activity is expected to continue to experience slow growth in 2004 and return to more normal growth patterns beginning in 2005, as the U.S. economy reaches the peak of its recovery. The forecast assumes that the regulatory environment affecting general aviation will not change dramatically. The forecast also assumes that the fractional ownership market will continue to expand and bring new operators and shareholders into business aviation.

The active general aviation aircraft fleet is expected to increase at an average annual rate of 1.2 percent over the 13-year forecast period, increasing from 211,244 in 2002 to 246,415 in 2015. This growth includes the addition of a new aircraft category; light sport aircraft, which is expected to enter the active fleet in 2004 and account for 20,915 aircraft in 2015. Excluding these light sport aircraft, growth averages only 0.5 percent over the 13-year forecast period.

Exhibit 2A depicts the FAA forecast for active general aviation aircraft in the United States. The number of single-engine piston aircraft is projected to reach 148,450 in 2015, which represents an average annual growth rate of 0.3 percent. During this same time, the number of active multi-engine piston aircraft fleet is expected to decline by 0.5 percent. The number of turboprop aircraft is expected to increase at an average annual rate of 1.3 percent over the 13-year forecast period, while turbojet aircraft are forecast to increase on average by 4.9 percent annually. The rotorcraft fleet is forecast to grow only 0.6 percent annually through 2015 and the number of experimental aircraft is projected to increase at an average annual rate of 0.4 percent. Gliders and lighter-than-air aircraft are forecast to increase approximately 0.3 percent annually over the 13-year forecast period.

The declines in the aircraft utilization rates experienced in 2000 (down 3.2 percent) and 2001 (down 7.2 percent) were due, in part, to higher fuel prices and the 2001 U.S. economic recession. However, the restrictions placed on general aviation in the aftermath of the September 11 events contributed

heavily to the decline in utilization in 2001. A strong recovery in the U.S. economy in 2004 and 2005 should lead to increased utilization rates for most categories of general aviation aircraft.

The total pilot population is projected to increase from an estimated 625,011 in 2003 to 777,730 by 2015, which represents an average annual growth rate of 1.6 percent. This includes the certification of 16,100 new sport pilots. The student pilot population increased 1.5 percent in 2003 and is forecast to increase at an annual rate of 1.9 percent (almost 1,800 students annually) over the 12-year forecast period, reaching a total of 108,430 in 2015. Growth rates for the other pilot categories over the forecast period are as follows: airline transport pilots, up 1.6 percent; recreational pilots, up 0.8 percent; rotorcraft only, up 1.0 percent; and glider only, up 0.2 percent.

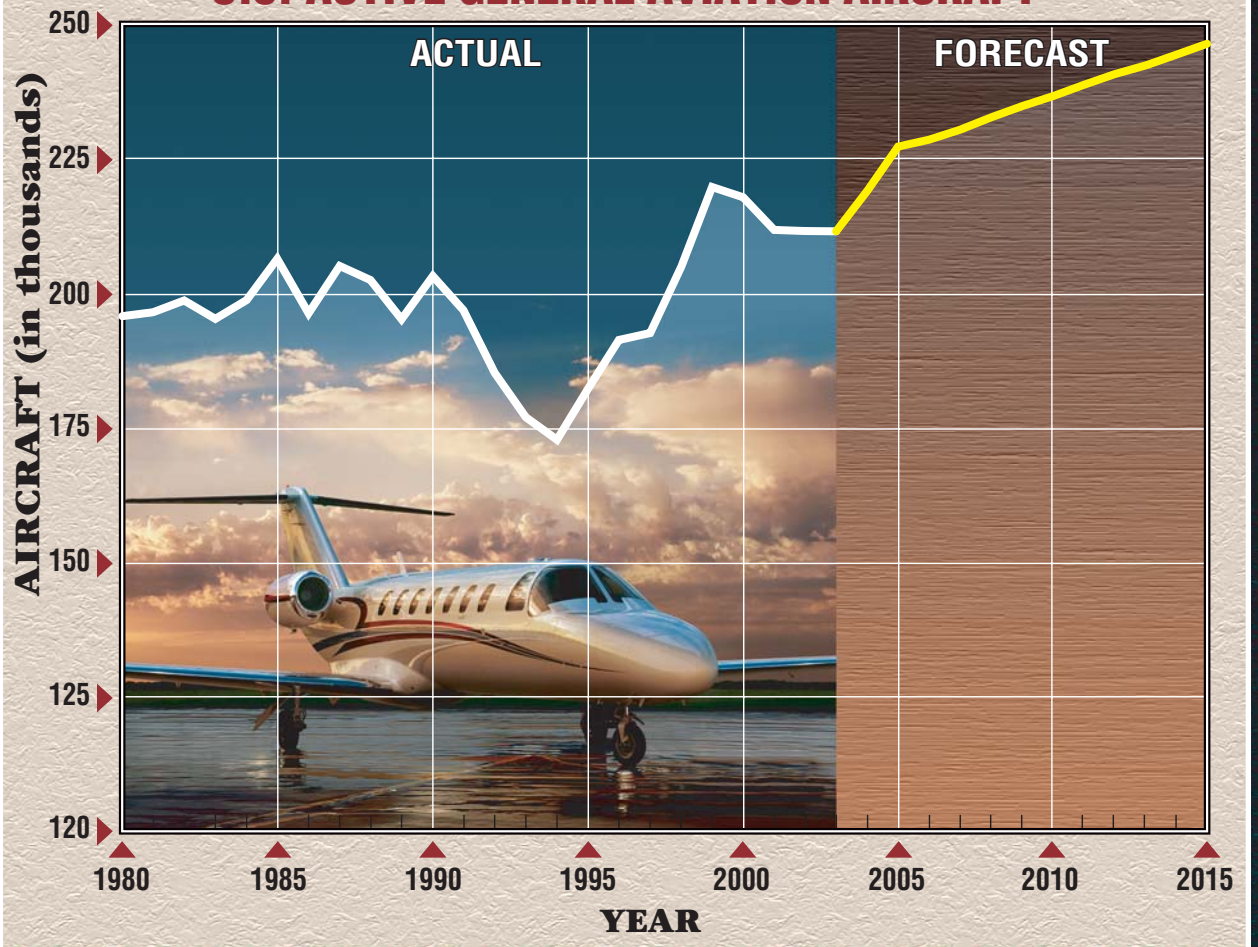
Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. "No Plane, No Gain" is an advocacy program created in 1992 by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA) to promote acceptance and increased use of general aviation as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot", sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The "Be a Pilot" program is jointly sponsored and supported by more than 100 industry organizations. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community, and career opportunities available to them in business aviation. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

GENERAL AVIATION USER SURVEYS AND SERVICE AREA

The initial step in determining the general aviation demand for an airport is to define its generalized service area for the various segments of aviation the airport can accommodate. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities and services, and their relative attraction and convenience. Also, to aid in identifying the generalized service area for Gillespie County Airport, a general aviation user/pilot survey was conducted. It should be noted that aviation demand often crosses geographical and political boundaries.

The airport service area is a geographical area where there is a potential market for airport services. Factors such as the availability of surface transportation networks,

U.S. ACTIVE GENERAL AVIATION AIRCRAFT



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

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

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

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

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

proximity of other airports, and the quality of aviation facilities will help determine the airport service area. Typically, the service area for a general aviation airport extends up to 30 miles.

The proximity of other airports is largely the defining factor when describing an airport service area. A description of nearby airports was previously completed in Chapter One. The only public airport within 30 nautical miles of Gillespie County Airport is Kerrville Municipal (ERV).

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

In determining the aviation demand for an airport, it is necessary to identify the role of that airport. The primary role of Gillespie County Airport is to serve the needs of general aviation in the area. General aviation is a term used to describe a diverse range of aviation activities which includes all segments of the aviation industry, with the exception of commercial air carriers and military. This includes recreational flying in single engine aircraft, up to corporate business jets.

The primary service area for Gillespie County Airport certainly includes the whole of Gillespie County, although it should be noted that the southwest portion of the county is actually closer to Kerrville Municipal Airport than Gillespie County Airport. Due to a lack of other regional airports, a secondary service area will include portions of Kendall, Blanco, and Kerr Counties. For purposes of this Master Plan, Gillespie, Blanco, Kendall and Kerr Counties will be further analyzed and defined as the four-county region.

To further define the service area, analysis of the user/pilot survey is presented. **Exhibit 2B** depicts the location by zip code of the 16 respondents who have aircraft based at Gillespie County Airport. As indicated on the exhibit, two based aircraft owners (having a total of six aircraft) live in Kerr County. The majority of the respondents live in Gillespie County.

GENERAL AVIATION USER SURVEY

In order to obtain a profile of local general aviation users and their preferences, a general aviation user survey was conducted. The survey was sent to all registered aircraft owners living within a 30 mile radius of the airport. This included all of Gillespie County and portions of Kerr, Kendall, and Blanco counties. A total of 244 surveys were sent out and 60 responses were received (24.6 percent response-rate). Sixteen indicated that they base at least one aircraft at

Gillespie County Airport as presented in **Table 2A**.

Six of these respondents indicated that they were contemplating the acquisition of at least one additional aircraft within the next five years. Responses indicated that each user conducts an average of three operations per month, with local training operations averaging 12 percent of those operations. The respondents indicated that they use their aircraft for pleasure 65 percent of the time and business 35 percent of the time.

The remaining questions on the survey were related to owner preferences. **Table 2A** presents the priority categories and respondent rankings. The priority scale utilized number "1" as the highest priority and the number "7" as the lowest priority. Also, several respondents simply checked a category or did not prioritize at all. Checked categories were given the priority of "1", while unchecked categories were weighted with a "7".

The majority of respondents indicated several preferences which led them to base at the airport or has kept them at the airport. As indicated in the table, by far the highest priority for basing at the airport was convenience (lived or worked closer to the airport). The next two highest priorities were the airport's aircraft hangar facilities (3.4) and runway length (5.5). The lowest ranked category was navigational aids, which had a response average of 6.6.

Using the same priority ranking with "1" as the highest, the questionnaire asked those surveyed what improvements were necessary at Gillespie County Airport. The responses indicated no unanimous needs. The need for improved navigational aids was the most common response. Several respondents also indicated the need for improved airport FBO services, as well as the need for hangar improvements.

The respondents were also asked to provide general comments. Of those which based at the airport, the most common response was for improved approaches and the need for more/better maintenance services at the airport. The most common response from non-based respondents was a desire for a crosswind runway and improved approaches.

SOCIOECONOMIC PROJECTIONS

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

For this study, socioeconomic variables for Gillespie County, Blanco County, Kendall County, and Kerr County have been considered. Information specific to the individual county was gathered from *The Complete Economic and Demographic Data Source* (CEDDS) by Woods and Poole (2004).

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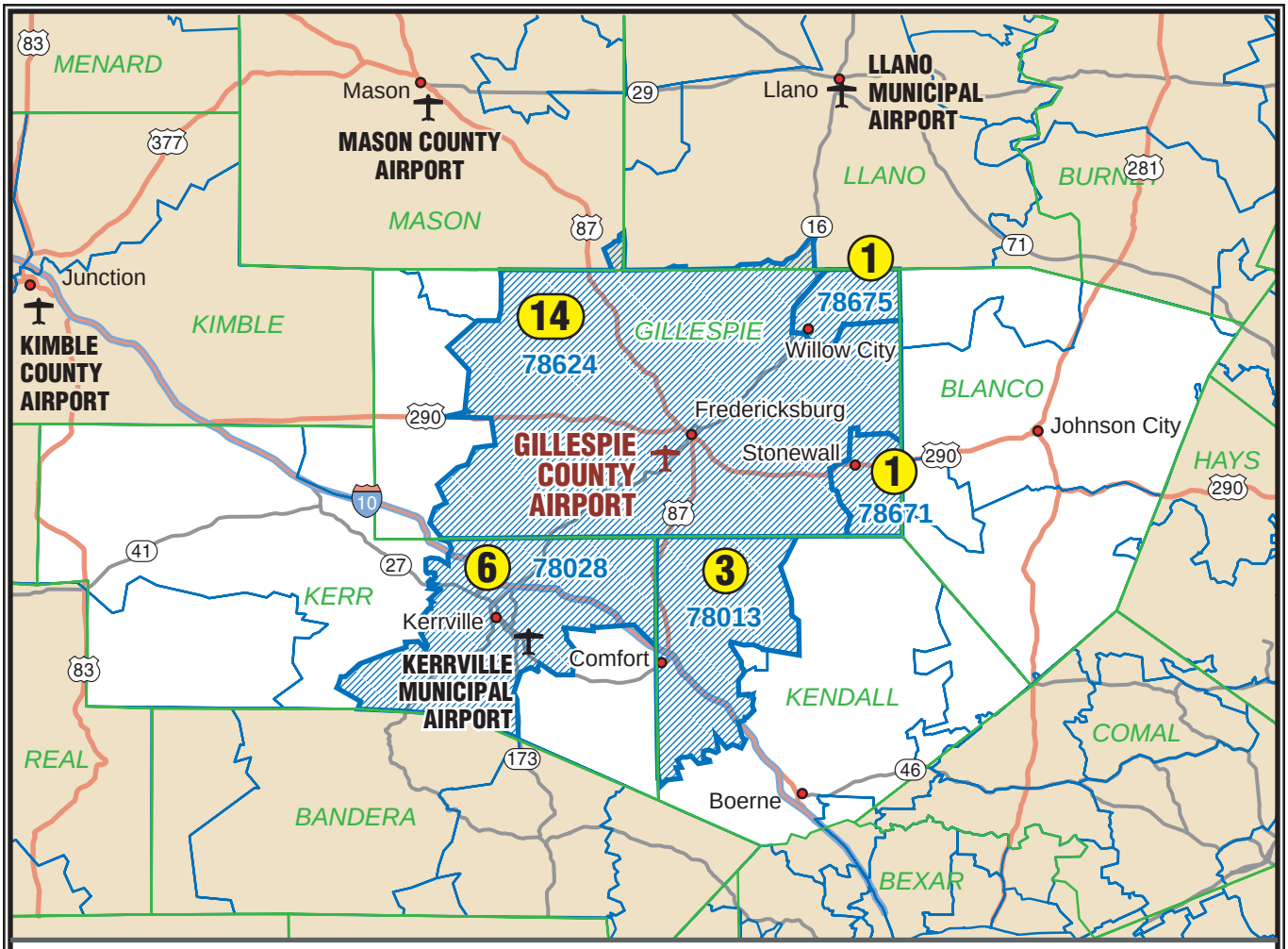

LEGEND

- County Line
- Zip Code Boundary
- Zip Code with Based Aircraft
- 6 — Number of Based Aircraft within Zip Code

NORTH

NOT TO SCALE

ASSOCIATED CITY OF REGISTERED AIRCRAFT

Fredericksburg	14
Kerrville	6
Comfort	3
Stonewall	1
Willow City	1

Exhibit 2B
AIRPORT SERVICE AREA

TABLE 2A

Pilot Survey Results

Total Surveys Sent - 244

Total Survey Responses - 60

Response Rate = 24.6%

Respondents Based at Gillespie County Airport - 16

Total Based Aircraft of these Respondents - 25

Respondents Considering Upgrade or Purchase of Another Aircraft in Next 5 Years - 6

Primary Use of Aircraft and Operation Estimates

Business	Pleasure	Flight Instruction	Other
34.80%	65.20%	0.00%	0.00%

Monthly Operations at Gillespie County Airport by These Aircraft = 782

Average Operations for Each Aircraft per Month = 3

Percentage Touch-and-Go Operations per Aircraft per Month = 12%

Primary Reasons for Basing at Gillespie County Airport (Priority with 1 being the highest)

Convenience	Aircraft Hangar Facilities	FBO/Terminal Services	Lower Aircraft Storage Costs	Runway Length	Navigational Aids
2	3.4	6.4	6	5.5	6.6

Current Aircraft Storage Use

Tie-down	T-hangar	Individual Hangar	Multi-aircraft Hangar
0	7	6	2

Preferred Aircraft Storage

Tie-down	T-hangar	Individual Hangar	Multi-aircraft Hangar
0	5	5	0

Improvements Necessary at Gillespie County Airport (Priority with 1 being the highest)

Runway/Taxiway	Airport/FBO Services	Aircraft Apron	Hangars	Terminal Building	Navigational Aids
6.3	4.6	6.5	5	6.6	3.2

Source: Surveys

POPULATION

Table 2B summarizes historical and forecast population estimates for the four county region. Analysis of historical population information for Gillespie County indicates a moderate average annual growth rate of 1.92 percent between 1990 and 2000. Kendall County had the highest

average annual growth rate at 4.99 percent over the period.

Future population data for Gillespie County and the surrounding counties is also presented. The population for Gillespie County is forecast to reach 28,169 by 2025. This projection equates to an average annual growth rate of 1.22 percent between 2000 and 2025. Kendall County is expected to continue to have the highest growth rate over the forecast years.

TABLE 2B
Socioeconomic Forecasts for Airport Service Area

	HISTORICAL		FORECAST			Average Annual Growth Rate	
	1990	**2000**	**2010**	**2015**	**2025**	**1990-2000**	**2000-2025**
Gillespie County							
Population	17,204	20,814	24,089	25,743	28,169	**1.92%**	**1.22%**
Employment	7,580	10,820	14,150	15,110	18,050	**3.62%**	**2.07%**
PCPI	$18,757	$23,851	$26,785	$28,955	$33,876	**2.43%**	**1.41%**
Blanco County							
Population	5,972	8,418	9,946	10,813	12,592	**3.49%**	**1.62%**
Employment	2,600	4,860	6,080	6,910	8,620	**6.46%**	**2.32%**
PCPI	$19,793	$21,633	$26,261	$28,116	$32,324	**0.89%**	**1.62%**
Kendall County							
Population	14,589	23,743	35,720	42,381	57,500	**4.99%**	**3.60%**
Employment	6,220	11,660	15,160	16,780	20,000	**6.49%**	**2.18%**
PCPI	$23,321	$25,724	$27,168	$29,125	$33,429	**0.99%**	**1.05%**
Kerr County							
Population	36,304	43,653	49,250	51,991	56,210	**1.86%**	**1.02%**
Employment	17,060	22,900	26,880	28,600	32,690	**2.99%**	**1.43%**
PCPI	$21,424	$25,059	$29,221	$31,557	$36,753	**1.58%**	**1.54%**

Source: Employment and PCPI from Woods and Poole, CEDDS 2004; Population from Texas Water Development Board-2006 Regional Water Plan

EMPLOYMENT

Historical and forecast employment data for Gillespie, Blanco, Kendall, and Kerr Counties is also presented in **Table 2B**. All counties are expected to show increasing employment through the forecast year of 2025 although not at the high rates of the 1990s. Over the forecast period, employment in Gillespie County is expected to increase by 2.07 percent annually, compared to a population increase of 1.22 percent. Kerr County employment is expected to increase the least, while Blanco the most among the four-county region.

PER CAPITA PERSONAL INCOME (PCPI)

Table 2B compares per capita personal income (adjusted to 1996 dollars) for the four counties. The region's average adjusted PCPI for 2000 is $24,067. Kendall County represented the region with the highest PCPI of $25,724 while Blanco had the lowest with $21,633.

Gillespie County's PCPI increased at 2.43 percent annually, and is forecasted to slow to a growth rate of 1.41 percent which would yield a PCPI of $33,876 by 2025. This forecast is lower than the projected 1.62 percent growth rate for Blanco County and the projected 1.54 percent growth rate for Kerr County. These forecasts would yield a PCPI of $32,324 for Blanco County and $36,753 for Kerr County, by 2025.

FORECASTING APPROACH

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

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

The analysis begins with an assessment of historical trends, as data is collected and sorted on a variety of aviation indicators at the local, regional, and national level. Data on aviation related factors such as based and registered aircraft, aircraft fleet mix, and aircraft operations was collected. Similarly, socioeconomic factors such as population, income, and employment are also considered for their effect on aviation activity. The identification and comparison of the relationships between these various indicators provides the initial step in the development of realistic forecasts of aviation demand.

Trend line projection is probably the simplest and most familiar of the forecasting techniques. By fitting classical growth curves to historical demand data, then extending them into the future, a basic trend line projection is produced. Because the dependent variable (time) grows at a constant rate, a basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections. It is also important to remember that this methodology is time-sensitive and only as accurate as the data entered into the formula.

Regression analysis measures the statistical relationship between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.95, it indicates good predictive reliability. A value below 0.95 may be used with the understanding that the predictive reliability is lower.

Another method commonly utilized in forecasting aviation elements is a

market share analysis. This method involves a historical review of the airport activity as a percentage, or share, of the larger regional, state, or national aviation market. A historical market share trend is determined providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as regression analysis tools, but can provide a useful check on the validity of other forecasting techniques.

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

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a ten-year preview, since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

The primary objective of a forecasting effort is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict, with certainty, year-to-year fluctuations in activity when looking twenty years into the future. However, a trend can be established which delineates long-term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. The point to remember about forecasts is that they serve only as guidelines, and planning must remain flexible to respond to unforeseen facility needs. This is because aviation activity is affected by many external influences, as well as by the types of aircraft used and the nature of available facilities.

Recognizing this, the intent is to develop a master plan for Gillespie County Airport that will be demand-based rather than time-based. As a result, the reasonable levels of activity potential that are derived from this forecasting effort will be related to the planning horizon levels rather than dates in time. These planning horizons will be established as levels of activity that will dictate consideration of the next step in the master plan program.

AVIATION ACTIVITY FORECASTS

To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. Indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- General Aviation Operations
- Peaking Operations
- Annual Instrument Approaches

The remainder of this chapter will examine historical trends with regard to these areas of general aviation, and project future demand for these segments of general aviation activity at the airport.

BASED AIRCRAFT FORECASTS

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

One method of forecasting based aircraft at an airport is to examine local aircraft ownership, or aircraft registrations in the airport's service area. The primary service area for aircraft basing at Gillespie County Airport is Gillespie County. An examination of registered aircraft for neighboring Blanco, Kendall, and Kerr Counties has also been completed. These counties were chosen after careful consideration of many factors including population centers near the airport, responses to the airport user survey, transportation access to the airport, etc. Historical records of registered aircraft in the four-county region are presented in **Table 2C.**

Registered Aircraft Forecasts

Historical records of aircraft ownership in Gillespie County, Blanco County, Kendall County, and Kerr County (four-county) were obtained and evaluated in preparing the forecast of registered aircraft. Historically, Gillespie County Airport has drawn primarily from the County, however, some aircraft that are registered in neighboring counties are based at Gillespie County Airport. This was shown on **Exhibit 2B**.

The first registered aircraft forecast for the region was developed by comparing the aircraft registered in the four-county region with the United States active fleet of general aviation aircraft. **Table 2D** provides historical and forecasted aircraft registrations since 1995.

As depicted in the table, the four-county region's registrations have increased at a moderate pace since 1995. Between 1995 and 2004, 131 registered aircraft were added, with forty of those in Gillespie County. During that time, the four-county region's registered aircraft increased from 0.1313 percent of U.S. active aircraft in 1995, to 0.1725 percent of U.S. active aircraft in 2004.

TABLE 2C
Historical Aircraft Registrations for Airport Service Area

	County				
Year	**Gillespie**	**Blanco**	**Kendall**	**Kerr**	**Total**
1990	23	20	61	75	179
1991	29	27	59	69	184
1992	29	29	52	78	188
1993	30	26	55	85	196
1994	33	31	58	91	213
1995	39	36	55	117	247
1996	41	42	57	133	273
1997	38	42	62	142	284
1998	44	54	68	150	316
1999	42	63	77	143	325
2000	52	64	76	150	342
2001	65	52	82	130	329
2002	65	52	82	130	329
2003	74	45	93	144	356
2004	79	47	97	155	378

Source: FAA Aircraft Registry Database (2004); Census of U.S. Civil Aircraft (1990-1994); Aircraft and Airmen Database from Avantext, Inc. (2001-2003); Aviation Goldmine CD from Software Innovations (1995-2000)

TABLE 2D
Four-County Registered Aircraft Forecasts as a Percent of Total U.S. Active Aircraft

Year	**U.S. Active Aircraft**	**Four County Registered Aircraft**	**% of U.S. Aircraft**
1995	188,089	247	0.1313%
1996	191,129	273	0.1428%
1997	192,414	284	0.1476%
1998	204,711	316	0.1544%
1999	219,464	325	0.1481%
2000	217,533	342	0.1572%
2001	211,447	329	0.1556%
2002	211,244	329	0.1557%
2003	211,190	356	0.1686%
2004	219,100	378	0.1725%
Constant Share Forecast			
2010	236,900	409	0.1725%
2015	246,400	426	0.1725%
2025	266,600	460	0.1725%
Increasing Share Forecast			
2010	236,900	458	0.1931%
2015	246,400	527	0.2137%
2025	266,600	680	0.2549%

Source: FAA Aerospace Forecast Data, U.S. Census of Civil Aircraft

Two forecasts were developed considering the four-county region's share of U.S. active aircraft. First, a forecast maintaining a constant 0.1725 percent of U.S. active aircraft was developed. This forecast yields 460 aircraft by 2025. Next, an increasing share forecast following historical trends was developed. As presented in the table, the increasing share forecast yields 680 aircraft by 2025.

A second method of forecasting county aircraft registrations considers the number of aircraft per 1,000 residents in the four-county region. **Table 2E** presents historical and forecast registered aircraft per 1,000 residents.

TABLE 2E
Four-County Registered Aircraft Forecasts Per 1,000 Resident Population Projections

Year	Four County Registered Aircraft	Four County Population	Aircraft Per 1,000 Residents
1995	247	86,880	2.84
1996	273	89,180	3.06
1997	284	91,280	3.11
1998	316	93,360	3.38
1999	325	94,960	3.42
2000	342	97,210	3.52
2001	329	98,790	3.33
2002	329	100,730	3.27
2003	356	102,560	3.47
2004	378	104,320	3.62
Constant Ratio Projection			
2010	431	119,005	3.62
2015	474	130,928	3.62
2025	560	154,471	3.62
Increasing Ratio Projection			
2010	479	119,005	4.02
2015	579	130,928	4.42
2025	776	154,471	5.02

Sources: FAA Aerospace Forecast Data, CEDDS 2004 from Woods and Poole.

Two forecasts were developed considering aircraft registrations per 1,000 residents. First, a constant share of 3.62 aircraft per 1,000 residents yielded 560 registered aircraft in the four-county region by 2025. Next, an increasing share projection reaching 3.90 aircraft per 1,000 residents yielded 603 aircraft registered in the four-county region by 2025. The increasing share projection closely follows the growth rate experienced over the last ten years.

A trend line projection was also considered for forecasting registered aircraft in the four-county region yielding an "r^2" value of 0.95. This projection yields 473 registered aircraft for 2010, 549 aircraft registrations for 2015, and 701 registrations for 2025.

Regression analysis was also conducted comparing the four-county population to registered aircraft.

An "r^2" value of 0.91 resulted. For 2010 this regression forecast yields 468 region-wide registrations. In 2015, the projection is 545, and for 2025 the projection is 698. **Table 2F** summarizes the four forecasts and shows the selected forecast numbers for registered aircraft in the four-county region.

TABLE 2F
Four-County Region Registered Aircraft Projections

PROJECTION	2010	2015	2025
Regression Analysis			
Trend Line (r^2=0.95)	473	549	701
vs. Population (r^2=0.90)	468	545	698
Market Share of U.S. Active Aircraft			
Constant Share	409	426	460
Increasing Share	458	527	680
Market Share of Registered Aircraft per 1,000 Pop in Four-County Region			
Constant Share	431	474	560
Increasing Share	479	579	776
Selected Forecast	***470***	***550***	***700***

The forecasts developed for the four-county region's registered aircraft are also depicted on **Exhibit 2C.** As shown, the forecasts are defined by the low-line (constant share of U.S. active aircraft projection) and the high projection (regression analysis compared to population growth for the region). For purposes of this study, the trend-line analysis is considered the most reasonable. Several factors allow this conclusion including historical trend, expected growth in regional and county populations, new local upscale golf course development and other socioeconomic factors.

Based Aircraft Forecasts

There are a number of methods for identifying the number of aircraft based at an airport. One common method is to use the FAA form 5010 numbers. A second method is to use airport records if they have been maintained. It is preferable to use local records. Gillespie County Airport staff provided a list of based aircraft dating back to 1995. These numbers are used in the following based aircraft forecasts.

Once registered aircraft for the service area has been forecast, based aircraft at Gillespie County Airport can be examined in comparison to historical regional registered aircraft. **Table 2G** presents based aircraft at Gillespie County Airport as a share of the four-county region's registered aircraft. As presented in the table, aircraft based at Gillespie County Airport as a share of the four-county region's registered aircraft has generally increased since 1995.

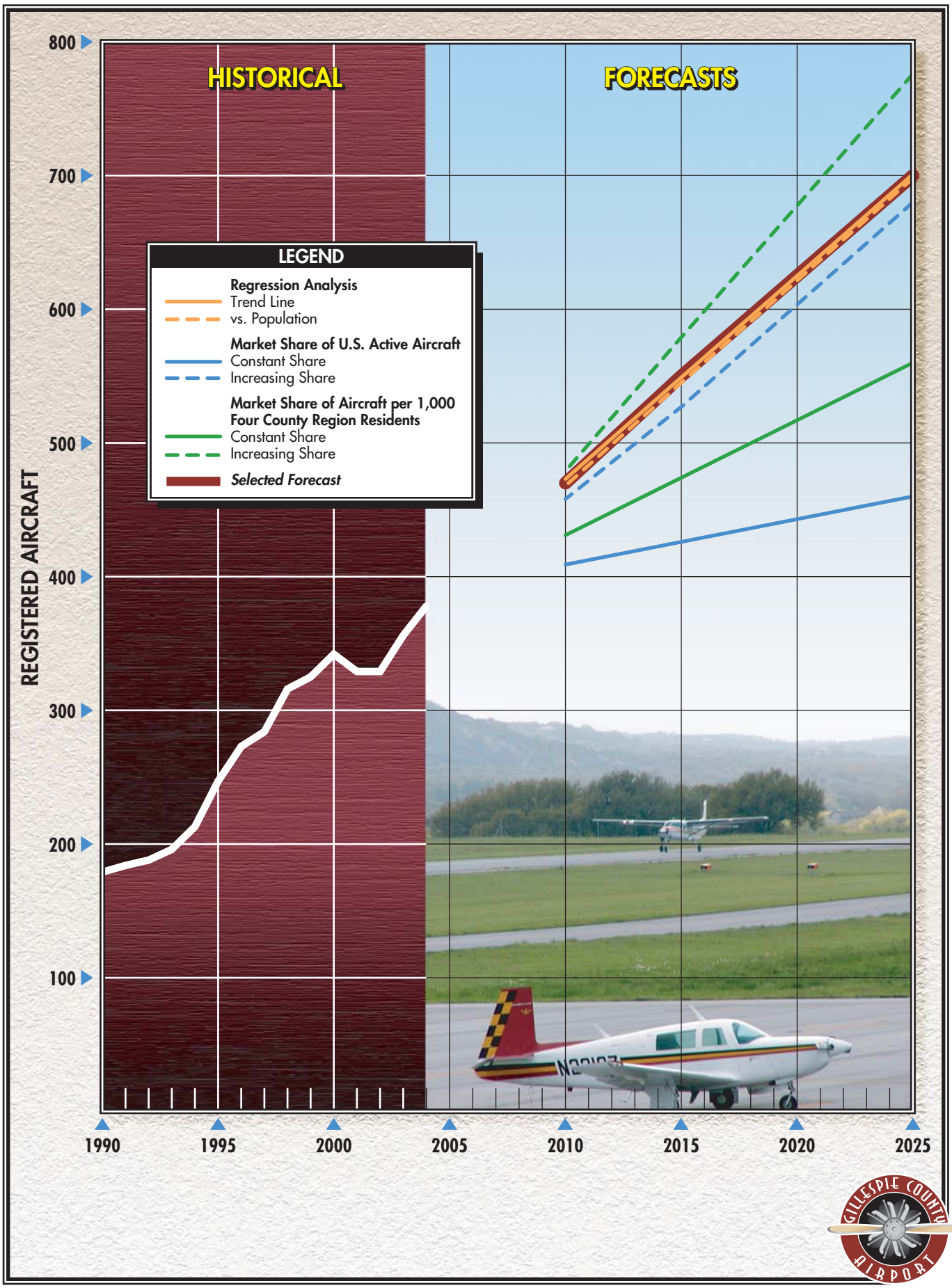

Exhibit 2C
FOUR-COUNTY REGISTERED
AIRCRAFT FORECASTS

TABLE 2G
Gillespie County Based Aircraft vs. Four-County Registered Aircraft

Year	Gillespie County Based Aircraft	Four-County Registered Aircraft	% of Registered Aircraft in Gillespie County
1995	20	247	8.10%
1996	30	273	10.99%
1997	35	284	12.32%
1998	35	316	11.08%
1999	37	325	11.38%
2000	43	342	12.57%
2001	43	329	13.07%
2002	43	329	13.07%
2003	53	356	14.89%
2004	55	378	14.55%
Constant Market Share Projection			
2010	68	470	14.55%
2015	80	550	14.55%
2025	102	700	14.55%
Increasing Market Share Projection			
2010	83	470	17.75%
2015	115	550	20.95%
2025	192	700	27.40%

Sources: Airport Records, FAA Aerospace Forecast Data

Future based aircraft at Gillespie County Airport will depend on several factors, including the economy and available airport facilities. Forecasts assume a reasonably stable economy and reasonable development of airport facilities necessary to accommodate aviation demand. **Table 2G** presents both a constant market share projection and an increasing market share projection as a percentage of the four-county region's registered aircraft. It is believed that Gillespie County Airport will continue to be capable of accommodating increased demand over the planning period.

As presented in the table, the first based aircraft forecast considers that the airport would maintain a constant market share (14.55 percent) of the four-county's registered aircraft. This projection would yield 68 aircraft based at the airport in 2010, 80 aircraft in 2015, and 102 aircraft in 2025. The second forecast considers an increasing market share. This projection would yield 83 aircraft based at the airport in 2010, 115 aircraft in 2015, and 192 aircraft in 2025.

Another forecast method compares the airport's based aircraft with local resident population trends. **Table 2H** presents historical and forecast based aircraft per 1,000 residents in Gillespie County.

TABLE 2H
Based Aircraft vs. Population Projections

Year	Based Aircraft	Gillespie County Population	Aircraft per 1,000 Residents
1995	20	19,250	1.04
1996	30	19,520	1.54
1997	35	19,840	1.76
1998	35	20,080	1.74
1999	37	20,460	1.81
2000	43	20,930	2.05
2001	43	21,150	2.03
2002	43	21,610	1.99
2003	53	22,030	2.41
2004	55	22,430	2.45
Constant Market Share Projection			
2010	62	24,910	2.45
2015	67	27,040	2.45
2025	78	31,450	2.45
Increasing Ratio Projection			
2010	63	24,910	2.50
2015	69	27,040	2.55
2025	84	31,450	2.65

Sources: Airport Records, U.S. Census Bureau.

Using a constant market share projection yields 62 based aircraft in 2010, 67 in 2015 and 78 in 2025. With an increasing ratio projection, the airport could expect 63 based aircraft in 2010, 69 in 2015 and 84 in 2025.

In addition to the two above mentioned forecasting methods, regression analysis was also conducted. A time - series or trendline analysis revealed a strong correlation and a positive growth trend. Based aircraft growth over the last ten years yields an r^2 value of 0.93. The resultant projections are presented on **Table 2J**. When performing regression analysis between based aircraft and projected population growth, an r^2 value of 0.92 resulted. **Exhibit 2D** graphically illustrates the forecast for based aircraft at Gillespie County Airport. **Table 2J** summarizes all projections for based aircraft at Gillespie County Airport.

Gillespie County Airport has undergone significant improvements in recent years. The construction of a new on site hotel/conference center, as well as a new diner all add to the attractiveness of the facilities. Gillespie County itself is expected to continue to develop into a destination tourist area. Finally, the construction of a new upscale golfing facility, Boot Ranch, in the region will be expected to attract new based aircraft, if only seasonally. As a result the selected forecast of based aircraft is projected to increase at a greater rate than just the average of the forecasting methods. Growth is expected toincrease at a higher rate in the first ten years to accommodate both general growth and the growth expected with the new golf community.

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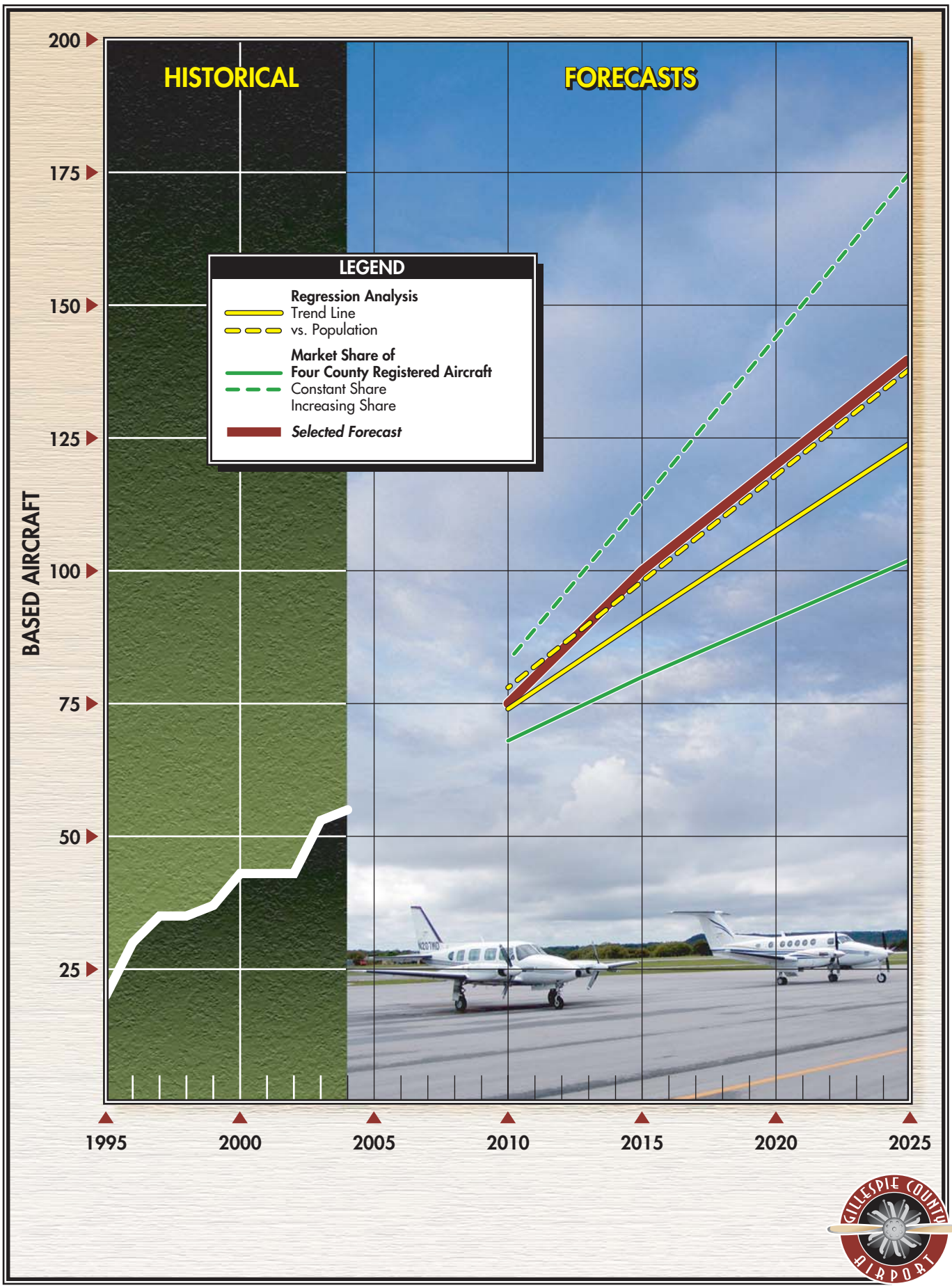


Exhibit 2D
BASED AIRCRAFT FORECASTS

TABLE 2J Gillespie County Airport Based Aircraft Projections			
PROJECTION	**2010**	**2015**	**2025**
Regression Analysis			
Trend Line (r^2=0.93)	74	91	124
vs. Population (r^2=0.92)	78	98	138
Market Share of Four-County Registered Aircraft			
Constant Share	68	80	102
Increasing Share	83	113	175
Selected Forecast	***75***	***100***	***140***

Cost-effective, safe, efficient, and orderly development of an airport should rely more upon actual demand at an airport than a time-based forecast figure. Thus, in order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones have been established that take into consideration the reasonable range of based aircraft projections.

The milestones were developed considering the potential of attracting additional based aircraft, not only providing timely goals. In actuality, the milestones may be higher than the median forecast range. By planning for a slightly higher level of aircraft, the plan can accommodate unexpected shifts, or changes, in the area's aviation demand. This will allow county officials to respond to unexpected changes in a timely manner. As a result, these milestones provide flexibility, while potentially extending this plan's useful life if aviation trends slow over the period.

The most important reason for utilizing milestones is that they allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to actual demand at any given time over the planning period. The resultant plan provides county officials with a financially responsible and need-based program. The planning horizons for based aircraft that will be utilized for the remainder of this master plan are as follows:

- Short Term - 75
- Intermediate Term - 100
- Long Term - 140

BASED AIRCRAFT FLEET MIX PROJECTION

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing based aircraft fleet mix is comprised of 49 single-engine and five multi-engine piston-powered aircraft as well as one helicopter.

As detailed previously, the national trend is toward a larger percentage of sophisticated turboprop, jet aircraft, and helicopters in the national fleet. Growth within each based aircraft

category at the airport has been determined by comparison with national projections (which reflect current aircraft production) and consideration of local economic conditions.

The projected trend of based aircraft at Gillespie County Airport includes a growing number of single and multi-engine aircraft and turboprop aircraft. Growth in turbojet aircraft is also expected to be as strong, even though there are currently none based at the airport because of the Boot Ranch development. The based aircraft fleet mix projection for Gillespie County Airport is summarized in **Table 2K**.

TABLE 2K
Based Aircraft Fleet Mix Projections Gillespie County Airport

	EXISTING		FORECAST					
Aircraft Type	**2004**	**%**	**Short Term**	**%**	**Inter. Term**	**%**	**Long Term**	**%**
Single Engine	49	89.09%	64	85.33%	83	83.00%	115	82.14%
Multi-Engine	5	9.09%	6	8.00%	7	7.00%	8	5.71%
Turboprop	0	0.00%	2	2.67%	4	4.00%	8	5.71%
Jet	0	0.00%	2	2.67%	5	5.00%	8	5.71%
Helicopters	1	1.82%	1	1.33%	1	1.00%	1	0.71%
Totals	55	100.00%	75	100.00%	100	100.00%	140	100.00%

Source: Airport Records

Currently, single-engine aircraft compose the largest segment of aircraft at Gillespie County Airport, making up 89 percent of total based aircraft. The future based aircraft mix will continue to be dominated by single-engine aircraft but turboprop and turbojet aircraft have been forecast to increase following national trends. Although there are currently no based turbo-props or jets, with the changing socioeconomic conditions in the county over the next 20 years it is reasonable to expect a growth in those aircraft.

ANNUAL OPERATIONS

There are two types of operations at an airport: local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are takeoffs or landings performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use as business aircraft are used primarily to carry people from one location to another.

Due to the absence of an airport traffic control tower**,** actual annualized operational counts are not available for Gillespie County Airport. For a historical reference, only general estimates of aircraft operations for the airport are available. Historical aircraft operations for the airport have been recorded by the FAA Form 5010-1.

Projections of annual operations have been developed by examining the number of operations per based aircraft. In attempts to quantify more reliably than simply estimating airport operations, the Texas Department of Transportation - Aviation Division (TxDOT) has established an ongoing operations monitoring system. The goal of this program is to ultimately establish a model that will provide more accurate counts.

TxDOT's model indicates that for airports similar to Gillespie County Airport, annual operations typically equate to approximately 300 operations (200 local + 100 itinerant) per based aircraft. Airports with higher training operations (local operations) will have a higher operation per based aircraft ratio, whereas airports with a higher percentage of transient aircraft operations typically will have a lower ratio. Airports in major metropolitan areas with high numbers of based aircraft, flight schools, and several fixed based operators typically will run upwards of 500 operations per based aircraft. An airport such as Gillespie County would also reasonably see about a 40/60 percent split between itinerant and local operations. **Table 2L** presents historical and forecast operations for Gillespie County Airport.

TABLE 2L
General Aviation Operations per Based Aircraft Projections
Gillespie County Airport

Period	Based Aircraft	Itinerant Operations	Local Operations	Annual Operations	Operations per Based
2004	55	6,270	9,405	15,675	285
Constant Ratio Projection					
Short Term	75	9,000	13,500	22,500	300
Intermediate Term	100	12,000	18,000	30,000	300
Long Term	140	16,800	25,200	42,000	300

Source: FAA Terminal Area Forecast (TAF), TxDOT Operations Model.

PEAKING CHARACTERISTICS

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

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

Without an airport traffic control tower, adequate operational information is not available to directly determine peak general aviation operational activity at the airport. Therefore, peak period forecasts have been determined according to trends experienced at similar airports.

Typically, the peak month for activity at general aviation airports approximates 10 to 15 percent of the airport's annual operations. For planning purposes, peak month operations have been estimated as 12 percent of annual operations at Gillespie County Airport. Based on peaking characteristics from similar airports, the typical busy day was determined by multiplying the design day by 20 percent of weekly operations during the peak month, or 1.4. Design hour operations were determined using an industry standard of 17.5 percent of the design day operations. The general aviation peaking characteristics are summarized in **Table M**.

TABLE 2M
Peak Operations Forecasts
Gillespie County Airport

	Current	Short Term	Intermediate Term	Long Term
Annual Operations	15,675	22,500	30,000	42,000
Peak Month (12%)	1,881	2,700	3,600	5,040
Busy Day	88	126	168	235
Design Day	63	90	120	168
Design Hour (17.5%)	11	16	21	29

ANNUAL INSTRUMENT APPROACHES (AIAs)

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

Table 2N summarizes historical and forecast AIAs for the planning period. Overall, AIAs at Gillespie County Airport have fluctuated between 1995 and 2000.

TABLE 2N
Annual Instrument Approach (AIAs) Projections
Gillespie County Airport

Year	AIAs	Itinerant Operations	Ratio
1995	40	3,580	1.12%
1997	28	3,550	0.79%
1999	19	3,550	0.54%
2001	43	3,550	1.21%
2003	21	6,270	0.33%
FORECASTS			
Short Term	180	9,000	2.00%
Intermediate Term	240	12,000	2.00%
Long Term	336	16,800	2.00%

Source: FAA Form 5010 - Approach Operations

In the future, Gillespie County Airport will be increasingly utilized by larger and more sophisticated aircraft. Also, the increased availability of low-cost navigational equipment could allow for smaller and less sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of instrument approaches given the greater availability of approaches at airports with GPS and the availability of more cost-effective equipment.

Typically, AIAs for airports with available instrument approaches utilized by advanced aircraft will average between one and two percent of itinerant operations. For Gillespie County Airport, that ratio has been historically lower. For forecasting, a ratio of two percent of itinerant operations has been applied to project the short, intermediate and long term AIAs. Two percent has been an accepted industry standard for general aviation airports that currently are expected to support corporate jet aircraft which is projected for Gillespie County Airport over the planning period.

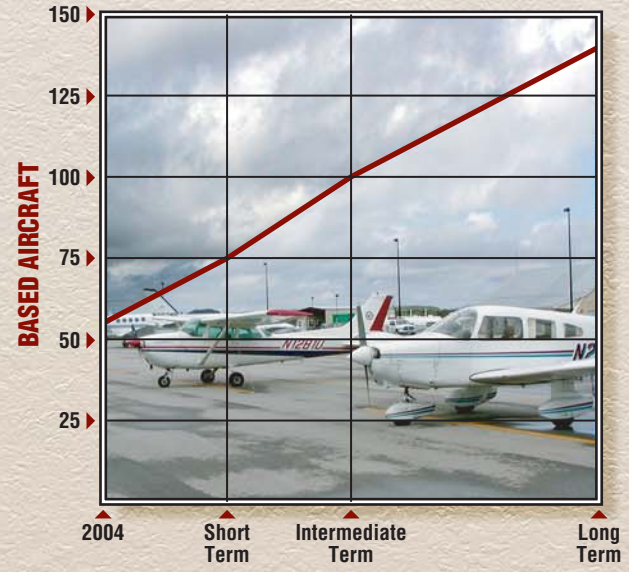
SUMMARY

This chapter has provided demand-based forecasts of aviation activity at Gillespie County Airport over the next 20 years. An attempt has been made to define the projections in terms of short, intermediate and long term expectations. Elements such as the local socioeconomic indicators, anticipated regional development and historical aviation data as well as national aviation trends were all considered when determining future conditions.

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

	2004	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT FORECASTS				
Single Engine	49	64	83	115
Multi-engine	5	6	7	8
Turboprop	0	2	4	8
Jet	0	2	5	8
Helicopter	1	1	1	1
Total Based Aircraft	***55***	***75***	***100***	***140***
OPERATIONS FORECASTS				
Itinerant	6,270	9,000	12,000	16,800
Local	9,405	13,500	18,000	25,200
Annual Operations	***15,675***	***22,500***	***30,000***	***42,000***
Peak Operations Forecasts				
Peak Month	1,881	2,700	3,600	5,040
Busy Day	88	126	168	235
Design Day	63	90	120	168
Design Hour	11	16	21	29
AIA's	***71***	***180***	***240***	***336***

BASED AIRCRAFT FORECASTS



OPERATIONS FORECASTS

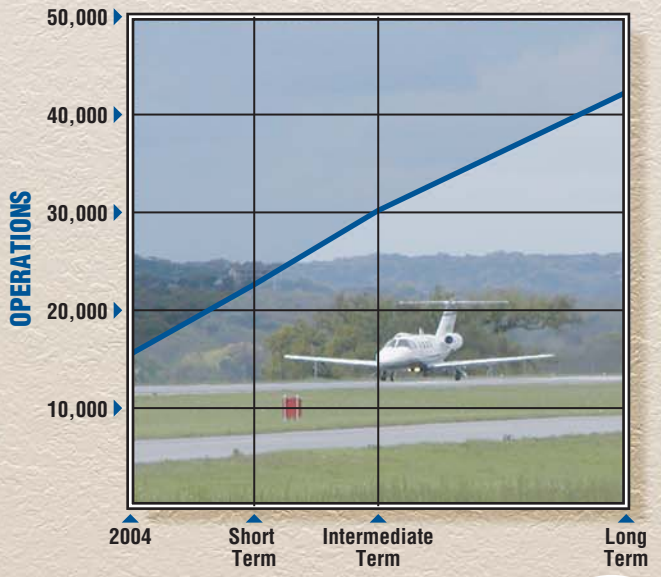


Exhibit 2E
FORECAST SUMMARY

Chapter Three

AIRPORT FACILITY REQUIREMENTS

Chapter Three

AIRPORT FACILITY REQUIREMENTS

To properly plan for the future of Gillespie County Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, aircraft parking apron, and automobile parking) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and when these may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing these facilities will be evaluated in Chapter Four, to determine the most cost-effective and efficient means for implementation.

PLANNING HORIZONS

The cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport than a time-based forecast figure. In order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones has been established for Gillespie County Airport, that take into consideration the reasonable range of aviation demand projections prepared in Chapter Two.

It is important to consider that the actual activity at the airport may be higher or lower than projected activity

levels. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts, or changes, in the area's aviation demand. It is important that the plan accommodate these changes so that the airport sponsor can respond to unexpected changes in a timely fashion. These milestones provide flexibility, while potentially extending this plan's useful life if aviation trends slow over time.

The most important reason for utilizing milestones is that they allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to actual demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and need-based program. **Table 3A** presents the planning horizon milestones for each aircraft activity category. The planning milestones essentially correlate to the five, ten, and twenty-year periods used in the previous chapter.

TABLE 3A
Planning Horizons

	Short Term	Intermediate Term	Long Term
OPERATIONS			
Itinerant	9,000	12,000	16,800
Local	13,500	18,000	25,200
TOTAL OPERATIONS	22,500	30,000	42,000
Annual Instrument Approaches	180	240	336
Total Based Aircraft	75	100	140

In this chapter, existing components of the airport are evaluated so that the capacities of the overall system are identified. Once identified, the existing capacity is compared to the planning horizon milestones to determine where deficiencies currently exist or may be expected to materialize in the future. Once deficiencies in a component are identified, a more specific determination of the approximate sizing and timing of the new facilities can be made.

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. The adequacy of existing airfield facilities at Gillespie County Airport has been analyzed from a number of perspectives including airfield capacity, runway length, runway pavement strength, airfield lighting, navigational aids, and pavement markings. The components include:

- Airfield Capacity
- Runways
- Taxiways
- Navigational Approach Aids
- Airfield Lighting, Marking, and Signage

AIRFIELD DESIGN STANDARDS

The selection of appropriate Federal Aviation Administration (FAA) and Texas Department of Transportation (TxDOT) - Aviation Division design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use, the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These standards must be determined now since the relocation of these facilities will likely be extremely expensive at a later date.

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This code, the airport reference code (ARC), has two components: the first component, depicted by a letter, is the aircraft approach speed (operational characteristic); the second component, depicted by a Roman numeral, is the airplane design group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities. **Exhibit 3A** depicts typical aircraft within each ARC.

According to FAA Advisory Circular (AC) 150/5300-13, Change 8, *Airport Design*, an aircraft's ***approach category*** is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

Category A: Speed less than 91 knots.
Category B: Speed 91 knots or more, but less than 121 knots.
Category C: Speed 121 knots or more, but less than 141 knots.
Category D: Speed 141 knots or more, but less than 166 knots.
Category E: Speed greater than 166 knots.

The ***airplane design group (ADG)*** is based upon the aircraft's wingspan. The six ADGs used in airport planning are as follows:

Group I: Up to but not including 49 feet.
Group II: 49 feet up to but not including 79 feet.
Group III: 79 feet up to but not including 118 feet.
Group IV: 118 feet up to but not including 171 feet.
Group V: 171 feet up to but not including 214 feet.
Group VI: 214 feet or greater.

CRITICAL AIRCRAFT

Gillespie County Airport is currently designated as a Stage II-General Utility airport in the Texas Aviation System Plan (TASP). This design standard corresponds to an ARC B-II airport. Future design standards will correspond with the ultimate critical aircraft.

In order to determine facility requirements, an ARC should first be determined, then appropriate airport design criteria can be applied. This begins with a review of the type of aircraft using and expected to use Gillespie County Airport.

The FAA recommends designing airport functional elements to meet the requirements of the most demanding ARC for that airport. The majority of aircraft currently operating at the airport are small single engine aircraft weighing less than 12,500 pounds. The airport is used on an infrequent basis by corporate aircraft ranging up to 30,000 pounds. These aircraft include most business jets and larger general aviation propeller aircraft.

As indicated in Chapter Two, Gillespie County Airport is presently utilized primarily by small (less than 12,500 pounds) general aviation aircraft. Defining the actual critical aircraft can sometimes be a difficult task. Typically, the design aircraft is based upon the most demanding aircraft actually based at the airport. Many times, more than one aircraft can compose the critical aircraft.

For airports similar to Gillespie County Airport, the critical aircraft can often be defined by a group of similar aircraft which operate at the airport on a regular basis. In some cases, one aircraft could be the most critical for approach speed (e.g., ARC C-I), while another for wingspan (e.g., ARC B-III). Considering all aircraft types at the airport is important to ensure all facilities at the airport are properly planned.

A review of based aircraft at the airport indicates that the most critical aircraft is the multi-engine piston aircraft category such as the Cessna 402. These aircraft range from ARC A-I to ARC B-I. Responses from the user survey indicated that the owners of these aircraft operate them regularly.

The airport is also used on an infrequent basis by larger and faster business jet aircraft. Discussions with airport officials indicate that the airport is utilized on an infrequent basis by a range of business jets including Cessna Citations and Learjets. The most common business jets (in number) are the Cessna Citation and Learjet families, which are produced in several different model types, with ARCs ranging from ARC B-I to B-II to C/D-I.

Table 3B presents corporate jet operations at Gillespie County Airport from June 30, 2003 to July 1, 2004 (12-month operational count). The data presented in the table includes only operations conducted by privately owned and operated business jets. As

A-I

- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Piper Archer
- Piper Seneca

B-I less than 12,500 lbs.

- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I

B-II less than 12,500 lbs.

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

B-I, II over 12,500 lbs.

- Super King Air 300
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation** II, **III**, IV, V
- Saab 340
- Embraer 120

A-III, B-III

- DHC Dash 7
- **DHC Dash 8**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP

C-I, D-I

- **Lear** 25, **35**, 55
- Israeli Westwind
- HS 125

C-II, D-II

- **Gulfstream** II, III, **IV**
- Canadair 600
- Canadair Regional Jet
- Lockheed JetStar
- Super King Air 350

C-III, D-III

- Boeing Business Jet
- B 727-200
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

C-IV, D-IV

- **B-757**
- B-767
- DC-8-70
- DC-10
- MD-11
- L1011

D-V

- **B-747** Series
- B-777

Note: Aircraft pictured is identified in bold type.

presented in the table, Gillespie County Airport has experienced a total of 152 privately-owned corporate jet operations over the last year.

TABLE 3B
Private Jet Operations
Gillespie County Airport

		Most Demanding Representative Users	
Aircraft Type	**Operations**	**Name**	**Origin/Destination**
Beech 400	6	J P Morgan Leasing	Houston
Cessna 501	2	B & B Morgan, LLC	Dallas
Cessna 525	4	Ludwig Law Firm	Little Rock, AR
Cessna 550	10	Nevada N53FT, LLC	Carson City, NV
Cessna 560	20	CHC LLC	Memphis, TN
Cessna 650	6	Seafood Holding Supply	Houston
Cessna 750	2	Burlington Oil & Gas	Midland/Houston
Challenger 600	6	SLW Aviation	Houston
Falcon 10	36	Falcon Flight Group	Denver area/Addison
Falcon 200	30	Hal Sutton	Shreveport, LA
Falcon 50	4	Southern Cross Rach	Atlanta/Salt Lake City
Hawer 800XP	10	Depuy Orthopaedics	Warsaw, IN/Houston
Lear 25	4	Private Jets LLC	Oklahoma City
Lear 31	6	Global Select Capital	Clovis/San Antonio
Lear 35	4	Addison Express	Austin/Lubbock
Lear 45	2	Aerometro LLC	Houston
Total	152		

Source: Airportiq.com utilizing FAA data. June 30, 2003 - July 1, 2004.

It is important to note that these operations present the absolute minimum number of private business jet operations at Gillespie County Airport. Operations are only "logged" if aircraft executes (either opens or closes) an IFR flight plan on the ground at Gillespie County Airport. Many aircraft operators, however, elect to file their flight plan in the air after departure, or close their flight plan in the air prior to landing at the airport. In either situation, the operations are not credited to the airport and would not be reflected in the table above.

Based on this information, it is reasonable to assume that the actual number of private business jet operations at Gillespie County Airport is somewhat higher than presented in the table. Moreover, the airport is served by only one instrument approach procedure, thus, it is likely that many flight plans were closed prior to landing at the airport. The frequency and type of jet aircraft operations provided in the table, however, indicate a desire by private corporate operators to use Gillespie County Airport on a regular basis.

The table also presents the specific aircraft types operated at the airport. The most commonly used business jets were the Falcon 10 and 200 models. It should be noted that the majority of operations by the Falcon 200 were conducted by Hal Sutton as preparations were made for the Boot Ranch Golf Resort. Cessna Citation and Learjet aircraft models were also well represented in the annual operational count.

As presented in the table, the airport was utilized by a wide variety of corporate users with varying originations and destinations. It should be noted that the business and originations/destinations listed are not the only ones for each aircraft, however, they represent the most demanding operations (e.g., longest haul lengths). Most of the private operators over the last year originated from or were destined to an intrastate location. A portion of the traffic, however, originated from or departed to points beyond the State of Texas including Denver; Shreveport (Hal Sutton); Atlanta; Salt Lake City; Warsaw; Indiana; and Little Rock, Arkansas.

Another segment of corporate aircraft users operates under F.A.R. Part 135 (air taxi) rules for hire and through fractional ownership programs. Air taxi operators are governed by FAA rules which are more stringent than those required for private aircraft owners and are generally considered charter operators. Fractional ownership operators are actual aircraft owners who acquire a portion of an aircraft with the ability to use any aircraft in the program's fleet. These programs have become quite popular over the last several years, especially since 9-11. Some of the most notable fractional ownership programs include Executive Jet, Bombardier Business Jet Solutions, Citation Shares, Flight Options, etc. **Table 3C** presents air taxi and fractional ownership aircraft operations at Gillespie County Airport over the last year.

It is evident from the information in the table that Gillespie County Airport is frequented by the largest fractional ownership programs in the country. The primary downside of this information is determining the person(s)/business(es) using the aircraft. The information does, however, provide a better understanding of the value of the airport and the potential for increased usage, especially now that the runway measures 5,000 feet.

Unlike **Table 3B**, **Table 3C** does not provide a listing of originations or destinations. For clarity and brevity purposes, this information was not included in the table. The most common airport for air taxi and fractional ownership operations was Dallas Love Field with 33 arrivals from and 35 departures to, equating to 68 total operations at Gillespie County Airport. The next six highest ranking originations/destinations were all intrastate locations including Addison (35 operations), Amarillo (19 operations), San Antonio (17 operations), Abilene (15 operations), Houston Hobby (12 operations), and Sugar Land (11 operations). Other locations of note include Burbank, Fort Lauderdale, Santa Fe, Orange County,

Kansas City, Palm Beach, Las Vegas, Minneapolis, and Scottsdale. Obviously, the airport is desired for use by those in locales on the west coast, Florida, and the upper Midwest.

TABLE 3C
Air Taxi/Fractional Owner Business Jet Operations
Gillespie County Airport

Operator Name	Aircraft Type	Operations
Air Transport	Lear 35	2
Bombardier Business Jet Solutions	Lear 31	16
	Lear 45	4
Citation Shares	Cessna 525	4
	Cessna 550	42
	Cessna 560	20
Executive Jet Aviation	Cessna 560	6
	Cessna 750	2
Flight Options	Beech 400	84
	Cessna 525	18
	Cessna 550	6
	Cessna 560	2
	Cessna 650	6
	Falcon 50	2
	Hawker 600	2
	Hawker 800	4
Hop-A-Jet	Lear 55	2
Unknown Operator	Lear 35	2
Total		224

Source: Airportiq.com utilizing FAA data. June 30, 2003 - July 1, 2004.

Considering the last year's operations by private and air taxi/fractional ownership operations, the airport's current critical aircraft should consider the full range of Cessna Citation models. These were the most commonly used of all the aircraft type. These aircraft range up to ARC B-II. Thus, considering the existing based aircraft and operations by business jets over the last year, the airport's current critical aircraft is ARC B-II.

Future aircraft mix can expect to include a larger percentage of corporate aircraft. Review of the active business jet aircraft fleet indicates approximately half range up to ARC B-II, while the other half are Category C and D, Groups I, II, and III. Increased corporate aircraft utilization is typical at general aviation airports surrounded by growing or established population and employment centers. Once utilized only by large conglomerate-type

corporations, corporate aircraft (especially jets) have been increasingly utilized by a wider variety of companies. FAA trends indicate that businesses are increasingly utilizing corporate aircraft to conduct their business. This is also evident by the substantial growth of fractional ownership programs. The fractional ownership programs have recently announced large numbers of aircraft owners to meet this growing demand.

Many factors indicate that future use of the airport will include more business jet operations. The previous year business jet usage of the airport shows a strong trend, especially given the runway was not the full 5,000 feet for a portion of the tracking period. Also, the area is a popular destination having many attractions which will continue to draw additional operations. Moreover, the development of Boot Ranch will spur more of these operations since it will cater to individuals and corporations with access to corporate aircraft. Discussions with those close to the development indicate that the full range of business jets will desire to operate at Gillespie County Airport once Boot Ranch is completed.

It is highly likely that Gillespie County Airport will be frequented by larger corporate aircraft on the order of 250 or more operations per year, within the planning period, as factors presented above influence potential demand. Utilization of corporate aircraft has become a cost-effective manner in which to transport executives and other personnel. The cost benefit can be attributed to the newer, fuel-efficient jet aircraft which can close the expense gap between the seat on the corporate jet versus the seat on the commercial carrier.

As previously discussed, the most visible trend in general aviation today is the shift of corporate operators to fractional ownership programs. Planning for fractional ownership aircraft is difficult as it is an on-demand service, however, planning must consider meeting the needs of the majority of highly-utilized fractional ownership aircraft. These aircraft range up to ARC D-III. Thus, future facility planning should include the potential for the airport to be utilized by the majority of business jets on the market.

In order to identify the critical aircraft which will make at least 250 annual operations, it is necessary to analyze what type of aircraft corporate operator might base at and/or utilize Gillespie County Airport on a regular basis. It can be expected that the majority of corporate aircraft utilizing the airport in the future will be turboprop aircraft and small business jet aircraft (e.g., Cessna Citation). It can also be expected that business jet usage will increase well above the 250 annual operational level which is used to identify the critical aircraft.

The previous chapter indicated that eight business jets are forecast to be based at the airport in the long range planning period. Thus, the combination of operations by based business jet aircraft, along with transient corporate jet operations, will determine the critical aircraft for the airport. In fact,

transient business jet operations may be even more critical due to the destination nature of the City of Fredericksburg as well as operations supporting Boot Ranch.

As previously mentioned, half of all active business jets fall within ARC B-II. The remainder range up to ARC D-III. It is unlikely that the airport will base or be used on a frequent basis (250 times annually) by ARC D-III business jets, however, the airport will be increasingly utilized by ARC C/D-I such as the Learjet, Hawkers, and Westwinds. Moreover, it is very likely that aircraft in ARC C-II and D-II such as the Gulfstream III, IV, Challenger 600 or Sabre 65 will increasingly utilize the airport over the planning period.

Given all of these considerations, the current planning should conform to ARC B-II to accommodate existing based aircraft and business jet use. Ultimate planning, however, should conform to at least ARC D-II, with consideration given to the potential for providing for ARC D-III standards, to meet the needs of business aircraft up to and including the G-V and Global Express. It should be noted that aircraft in ARC D-III require substantially more design criteria. For this reason, airfield design may not be capable of fully accommodating these aircraft. Analysis presented below will consider the airfield requirements, including runway lengths required by both C-II and D-II aircraft. ARC C/D-III requirements will be presented for informational purposes.

The airfield facility requirements outlined in this chapter correspond to the design standards described in the FAA's Advisory Circular 150/5300-13, Change 8, *Airport Design*. The following airfield facilities are outlined to describe the scope of facilities that would be necessary to accommodate the airport's role throughout the planning period.

AIRFIELD CAPACITY

A demand/capacity analysis measures the capacity of the airfield facilities (i.e., runways and taxiways) in order to identify and plan for additional development needs. The capacity of the airport's single-runway system can provide up to 230,000 annual operations. FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS*), indicates that improvements should be considered when operations reach 60 percent of the airfield's annual service volume (ASV). If the projected long range planning horizon level of operations comes to fruition, the airfield's ASV will not exceed the 60 percent level after the long term planning horizon. Thus, additional airfield capacity enhancements are not mandated.

RUNWAYS

The adequacy of the existing runway system at Gillespie County Airport has been analyzed from a number of perspectives, including runway orientation, runway length, pavement strength, width, and safety standards. From this information, requirements for

runway improvements were determined for the airport.

Runway Orientation

Runway 14-32 is orientated in a northwest-southeast manner. Ideally, the primary runway should be orientated as close as practical in the direction of the predominant wind to maximize the runway's usage. This minimizes the percent of time that a crosswind could make the preferred runway inoperable.

FAA Advisory Circular 150/5300-13, Change 8, *Airport Design*, recommends that a crosswind runway should be made available when the primary runway orientation provides for less than 95 percent wind coverage for any aircraft forecast to use the airport on a regular basis. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for Airport Reference Codes (ARC) A-I and B-I; 13 knots (15 mph) for ARC A-II and B-II; 16 knots (18 mph) for ARC C-I through D-II; and 20 knots for ARC A-IV through D-VI.

Wind data specific to the airport was not available, however, data for San Antonio International Airport (1988-1997) provides adequate information for use in this study. This data is graphically depicted on the wind rose in **Exhibit 3B**.

As depicted on the exhibit, primary Runway 14-32 provides 96.60 percent coverage for 10.5 knot crosswinds, 98.53 percent at 13 knots, and 99.83 percent at 16 knots. The analysis indicates that the existing runway system provides adequate crosswind coverage for all aircraft. It should be noted, however, due to geographical differences, this data could be somewhat different than what is actually experienced in Fredericksburg. Without more applicable information, however, a site specific determination cannot be made. Thus, based on the analysis using the best available information, future plans for an additional crosswind runway do not need to be considered.

Runway Length

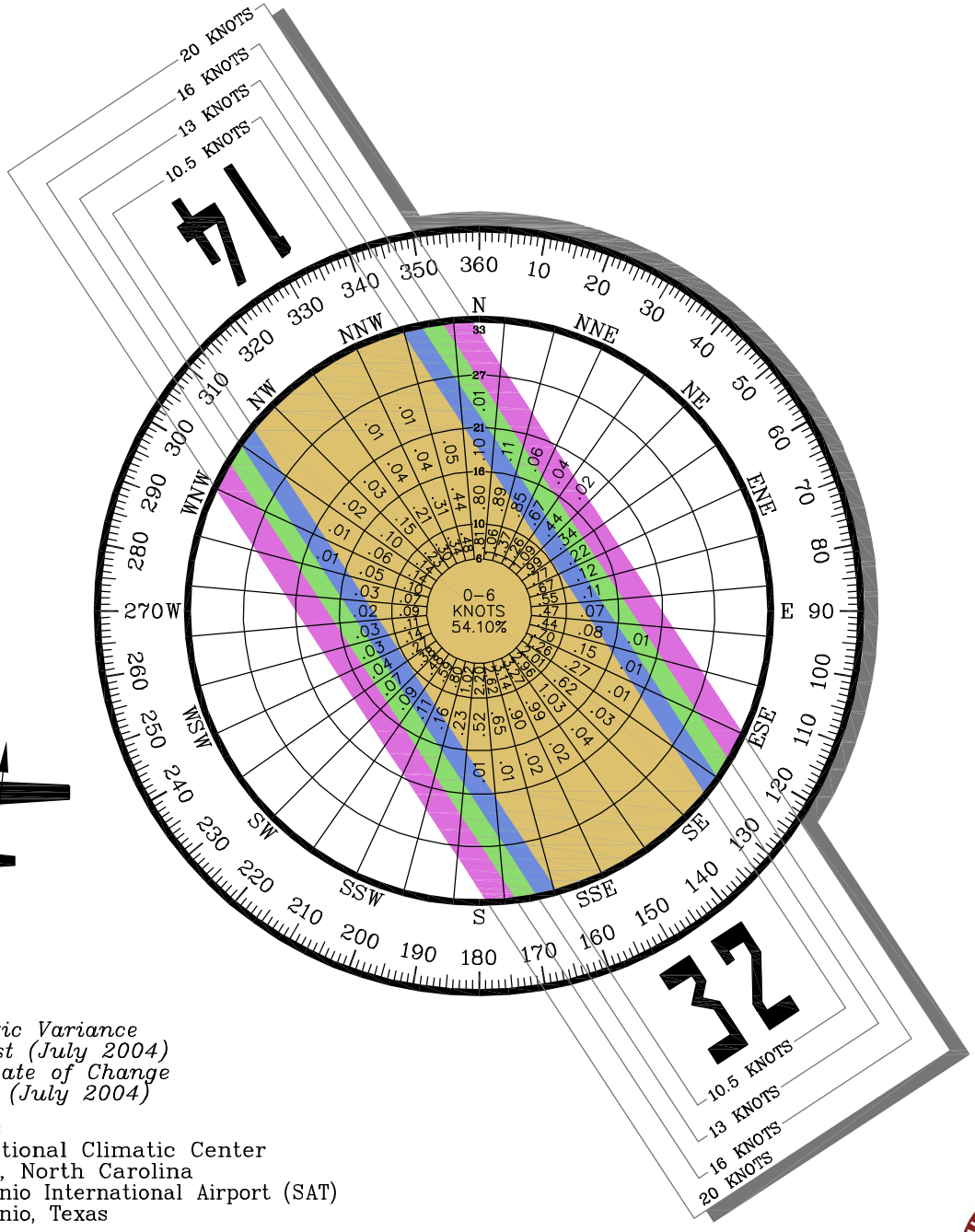
The determination of runway length requirements for the airport is based on five primary factors:

- Critical aircraft type expected to use the airport.
- Stage length of the longest nonstop trip destination.
- Mean maximum daily temperature of the hottest month.
- Runway gradient.
- Airport elevation.

An analysis of the existing and future fleet mix indicates that large business jets will be the most demanding aircraft on runway length at Gillespie County Airport. Currently, there are no business jets based at the airport. The typical itinerant business aircraft range from the Cessna Citation family, to Lear Jets, to Falcons as presented in **Tables 3B** and **3C**.

ALL WEATHER WIND COVERAGE

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 14-32	*96.60%*	*98.53%*	*99.83%*	*99.98%*



NORTH

Magnetic Variance
6° 8' East (July 2004)
Annual Rate of Change
5' West (July 2004)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
San Antonio International Airport (SAT)
San Antonio, Texas

OBSERVATIONS:
84,310 All Weather Observations
1988-1997

GILLESPIE COUNTY AIRPORT

Exhibit 3B
WINDROSE

Aircraft operating characteristics are affected by three primary factors: the mean maximum daily temperature of the hottest month, the airport's elevation, and the gradient of the runway. An increase in the maximum difference in runway centerline elevation increases the runway requirement in large aircraft weighing less than 60,000 pounds, while an increase in haul length of airplanes weighing more than 60,000 pounds will also increase runway lengths for these aircraft.

The mean maximum daily temperature of the hottest month for Gillespie County Airport is 95 degrees Fahrenheit. The airport elevation is 1,695 feet MSL. Due to falling terrain at the south end of the runway, the greatest difference in runway elevation is 17.2 feet.

Table 3D outlines the runway length requirements for various classifications of aircraft that utilize Gillespie County Airport. These standards were derived from the **FAA Airport Design Computer Program** for recommended runway lengths. As with other design criteria, runway length requirements are based upon the critical aircraft grouping with at least 250 annual operations.

Based upon the forecast of aircraft fleet mix through the long range planning period, Gillespie County Airport should be designed to accommodate those aircraft corresponding to ARC C and D-II standards. By designing the runway to meet C/D-II standards, most if not all business jets can be accommodated, at least at a 60 percent useful load.

According to the FAA design program, to fully accommodate 75 percent of these aircraft at 60 percent useful load, the runway length should be at least 5,200 feet. To accommodate 100 percent of business jets at 60 percent useful load (generally correlating to ARC D-II), the runway should be 6,400 feet long. Currently Runway 14-32 is 5,002 feet, which falls short of the requirements of ARC C-I through D-II business jet aircraft.

The program also provides an estimation of runway lengths for general aviation aircraft weighing more than 60,000 pounds. This group includes the Gulfstream family of aircraft and some new long-range corporate jets. The estimate of runway length requirements for the large corporate aircraft over 60,000 pounds considers all airfield data, but also considers the typical haul distance for up to 1,000 miles. As indicated in **Table 3D**, aircraft weighing more than 60,000 pounds, with haul lengths of 1,000 miles, require at least a 6,700-foot long runway.

TABLE 3D
Runway Length Requirements
Gillespie County Airport

AIRPORT AND RUNWAY DATA	
Airport elevation	1,695 feet
Mean daily maximum temperature of the hottest month	95 F
Maximum difference in runway centerline elevation	17.2 feet
Length of haul for airplanes of more than 60,000 pounds	1,000 miles
Dry runways	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	3,100 feet
95 percent of these small airplanes	3,800 feet
100 percent of these small airplanes	4,400 feet
Small airplanes with 10 or more passengers seats	4,700 feet
Large airplanes of 60,000 pounds or less	
75 percent of business jets at 60 percent useful load	**5,200 feet**
100 percent of business jets at 60 percent useful load	**6,400 feet**
Airplanes of more than 60,000 pounds	**6,700 feet**

REFERENCE: FAA's airport design computer software utilizing Chapter Two of AC 150/5325-4A, *Runway Length Requirements for Airport Design*, no changes included.

It is important, then, to examine the runway length requirements of specific aircraft currently utilizing or planned to utilize Gillespie County Airport in the future. **Table 3E** presents the runway length needs (both take-offs and landings on a contaminated runway, e.g., very heavy rain, ice, or snow) for a wide variety of business jets. Figures in the table consider maximum take-off and landing weights. It should be noted that landings during contaminated runway conditions increase significantly for aircraft with single landing gear configurations due to hydroplaning.

In general, the data specific to each airplane presented in **Table 3E** is similar to the generalized output by the FAA software program (presented in **Table 3D**). Obviously, airport planning cannot always conform to the worst case scenario. Planning should at least conform to providing a runway length capable of accommodating the majority of aircraft, the majority of the year. In other words, the runway should be capable of handling business jets with typical weight loading during moderate heat conditions.

TABLE 3E
Business Jet Runway Length Requirements
Gillespie County Airport

	Runway Length Required for (in feet)		
Aircraft Type	**Take-off @ 95° F**	**Landings on Dry Runway**	**Landings on Contaminated Runway**
Beechjet 400	5,900	4,500	6,000
Canadair Challenger CL600	6,500	5,500	7,000
Cessna 550	5,500	2,900	6,000
Cessna 650	6,000	5,300	6,100
G-IV	7,000	5,400	6,200
Hawker 125-700/800	7,000	4,000	6,000
Hawker 1000	6,500	5,000	5,600
Isreal Aircraft Industries			
- Astra SPX	7,000	5,000	5,000
- Westwind	6,500	3,500	7,000
Lear			
- 35	6,000	3,400	7,000
- 55	7,100	3,200	6,400

Source: Aircraft operating manuals

Given the need to accommodate the majority of business aircraft, consideration should be given to providing a runway length of at least 6,400 feet. This length would better suit many business jet operators during hot periods, allowing them greater operational flexibility. This also holds true for the attraction of fractional ownership aircraft operators. Available runway length is a primary issue in landing site selection by corporate pilots.

Analysis in the next chapter will examine potential runway extensions that could be achieved. The analysis will factor constraints which could hinder runway extension including roads, environmental considerations, and costs. It is important to note that TxDOT and the FAA will require specific justification for the runway to be extended to this distance. The type of aircraft, its specific runway requirements and frequency of operation will need to be provided for funding assistance. Therefore, current record keeping of business jet operators should be enhanced to include company names, aircraft types, and frequency of operation at the airport. Also, airport administration should request that corporate aircraft operating at the airport provide, in writing, their established runway length requirements.

Runway Width

Runway 14-32 is currently 75 feet wide. FAA design criterion calls for a runway width of 75 feet to serve aircraft up to ARC B-II, as long as the instrument approach minimums are greater than three-quarters of a mile. For lower approach minimums and for aircraft in approach categories C-I through D-II, the runway should be 100 feet wide. Also, TxDOT criterion calls for a 100-foot-wide runway for transport category airports. Thus, the current width will be adequate for the short term. Ultimate planning, however, should consider the widening of Runway 14-32 to 100 feet to meet business jet needs and the potential for lower approach minimums in the future.

Runway Strength

As previously mentioned, the pavement for Runway 14-32 is currently 30,000 pounds single wheel loading (SWL). This strength will adequately handle current and short term aircraft operations. Future planning should consider providing a runway strength of up to 60,000 pounds SWL to meet the future-planned critical aircraft requirements of larger business jet aircraft.

Runway Safety Areas

Consideration of runway length requirements must also factor FAA design criteria regarding runway object free area (OFA), runway safety area (RSA), and height clearances.

The runway OFA is defined in FAA Advisory Circular 150/5300-13, Change 8, *Airport Design*, as an area centered on the runway extending out in accordance to the critical aircraft design category utilizing the runway. The OFA must provide clearance of all ground-based objects protruding above the runway safety area (RSA) edge elevation, unless the object is fixed by function serving air or ground navigation.

The RSA is also centered on the runway, reaching out in accordance to the approach speed of the critical aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

Currently, Runway 14-32 is designed for ARC B-II aircraft with approach minimums of not lower than one mile. The FAA calls for the RSA to be 150 feet wide and extend 300 feet beyond the runway end. Analysis in the previous section indicated that Runway 14-32 should be planned to accommodate aircraft up to and including ARC D-II.

In order to meet design criteria for the future critical aircraft, the cleared and graded RSA would need to be 500 feet wide (centered on the runway) and extend 1,000 feet beyond each runway end. The OFA would require a cleared area 400 feet on each side of the runway centerline, extending 1,000 feet beyond each runway end. Currently, the runways conform to RSA and OFA

standards for current critical aircraft design. Runway 14-32 does not readily conform to ARC C/D-II RSA and OFA standards. **Table 3F** presents airfield design standards for Gillespie County Airport. The first column considers ultimate planning standards which conform to ARC D-II design, while the second column applies ARC D-III design standards for comparative purposes.

Runway Protection Zones

Another consideration is the FAA requirement for cleared approaches. The runway protection zone (RPZ) is a trapezoidal area centered on the runway and typically beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses in order to enhance the protection of approaching aircraft, as well as people and property on the ground. The dimensions of the RPZ vary according to the visibility minimums serving the runway, and in some instances, the type of aircraft operating on the runway.

The FAA does not necessarily require the fee simple acquisition (outright property purchase) of the RPZ area, but recommends that airports maintain positive control over development within the RPZ. It is preferred that the airport own the property through fee simple acquisition, however, avigational easements (acquiring control of designated airspace within the RPZ) can be pursued if fee simple purchase is not possible. It should be noted, however, that navigation easements can cost nearly as much as the underlying land value and may not fully prohibit incompatible land uses from the RPZ. Also, the area encompassed by the RPZ envelops the required RSA, OFA, and areas needed for installation of approach lighting systems, all of which would be required for purchase.

Currently, the airport owns and maintains positive control over all existing RPZs through fee simple acquisition or easement. It should be noted, however, the RPZ for ARC C/D aircraft would be larger than the current RPZ and would extend into areas outside of the existing airport property line. The dimensions for RPZs considering ARC C/D aircraft and no lower than one mile and three-quarter mile visibility approaches are detailed in **Table 3F**. Future plans should consider acquiring any property not contained inside the exiting or planned RPZs.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases at an airport, to provide safe and efficient use of the airfield.

As detailed in Chapter One, the taxiway system at Gillespie County Airport consists of a parallel taxiway and four entrance/exit taxiways serving Runway 14-32. All taxiways are 40 feet wide.

TABLE 3F
Airfield Planning Design Standards (Ultimate)
Gillespie County Airport

	Runway 14-32	**Runway 14-32**
DESIGN STANDARDS		
Airport Reference Code (ARC)	***Up to D-II***	***Up to ARC C/D-III***
Runway		
Length (ft.)	6,400	7,000
Width (ft.)	100	100
Pavement Strength (lbs.)	60,000 SWL	100,000 DWL
Shoulder Width (ft.)	10	20
Runway Safety Area		
Width (feet)	500	500
Length Beyond Runway End (ft.)	1,000	1,000
Object Free Area		
Width (ft.)	800	800
Length Beyond Runway End (ft.)	1,000	1,000
Obstacle Free Zone		
Width (ft.)	400	400
Length Beyond Runway End (ft.)	200	200
Primary Surface		
Width (ft.)	500	1,000
Length Beyond Runway End (ft.)	200	200
Taxiways		
Width (ft.)	40	50
OFA (ft.)	131	186
Centerline to Fixed or Movable Object (ft.)	66	93
Runway Centerline to:		
Parallel Taxiway Centerline (ft.)	300/400	400
Aircraft Parking Area (ft.)	500	500
Building Restriction Line (ft.)		
20 ft. Height Clearance	390	640
35 ft. Height Clearance	495	745
Runway Protection Zones	<u>One-mile Vis.</u>	<u>3/4-mile Vis.</u>
Inner Width (ft.)	500	1,000
Outer Width (ft.)	1,010	1,510
Length (ft.)	1,700	1,700
Approach Slope	20:1	34:1

The FAA's criterion calls for the parallel taxiway serving a runway designed for lower than one-mile approach minimum or ARC C-I through D-II, to be separated (centerline to centerline) from the runway by at least 300 feet. In some cases, the minimum separation is 400 feet (lower than three-quarters mile approach minimums). Currently, the parallel taxiway is located only 240 feet east of Runway 14-32. Obviously, this distance falls short of FAA criteria for ARC C/D-II aircraft. Future planning should consider the potential to relocate this taxiway further east to be at least 300 feet from the runway. If the airplane design group (ADG) is to be considered, a separation distance of 400 feet is required.

Consideration should be given to the addition of taxiways, as needed, to improve airfield circulation and capacity. The current taxiway layout appears efficient, however, if Runway 14-32 were to be extended, another exit taxiway should be added. An additional exit taxiway would significantly improve airfield efficiencies and would increase the runway's capacity.

Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. As mentioned previously, the current and future critical aircraft for the airport falls within ADG II. FAA criteria call for a 40-foot width for taxiways serving aircraft within Design Group II. All taxiways at the airport currently meet this requirement. If ADG III is to be considered, the taxiways serving these aircraft should be 50 feet wide.

NAVIGATIONAL AIDS AND LIGHTING

Airport and runway navigational aids are based on FAA recommendations, as defined in DOT/FAA Handbook 7031.2B, *Airway Planning Standard Number One***,** FAA Advisory Circular 150/5300-2D, *Airport Design Standards, Site Requirements for Terminal Navigation Facilities*, and TxDOT's *Policies and Standards***.**

Navigational aids provide two primary services to airport operations: precision guidance to specific runway and/or non-precision guidance to a runway or the airport itself. The basic difference between a precision and nonprecision navigational aid is that the former provides electronic descent, alignment (course), and position guidance, while the nonprecision navigational aid provides only alignment and position location information. The necessity of such equipment is usually determined by design standards predicated on safety considerations and operational needs. The type, purpose, and volume of aviation activity expected at the airport are factors in the determination of the airport's eligibility for navigational aids.

Global Positioning System

The advancement of technology has been one of the most important factors in the growth of the aviation industry in the twentieth century. Much of the civil aviation and aerospace technology has been derived and enhanced from the

initial development of technological improvements for military purposes. The use of orbiting satellites to confirm an aircraft's location is the latest military development to be made available to the civil aviation community.

Global positioning systems (GPS) use two or more satellites to derive an aircraft's location by a triangulation method. The accuracy of these systems has been remarkable, with initial degrees of error of only a few meters. As the technology improves, it is anticipated that GPS may be able to provide accurate enough position information to allow category II and III precision approaches, independent of any existing ground-based navigational facilities. In addition to the navigational benefits, it has been estimated that GPS equipment will be much less costly than existing precision approach landing systems.

Currently, Gillespie County Airport is served by three instrument approach procedures: RNAV (GPS) Runway 14, RNAV (GPS) Runway 32, and the VOR/DME or GPS-A approaches. These approaches allow the airport to remain operational with reported cloud ceilings of at least 685 feet above ground level (AGL) and as low as one-mile visibility for approach category A and B aircraft. The minimums increase for category C aircraft (as presented on **Table 1C**). It should be noted that the current approach procedure excludes aircraft in approach category D. With the evolution of GPS, however, it is likely that Gillespie County Airport will have the opportunity to be served by additional GPS instrument approaches in the future.

Future planning is considering the increased use of the airport by corporate aircraft. These aircraft users are often dependent upon instrument approaches. In fact, some flight departments are excluded from using airports without instrument approaches. Considering these aircraft, future planning must also consider improved instrument approach procedures.

Analysis of wind data presented on **Exhibit 3B** indicates that the prevailing winds for the region are from the south. Therefore, Runway 14, at a minimum should be planned for a nonprecision type approach, with capabilities of serving aircraft up to approach category D. Consideration should also be given to an improved instrument approach capability for Runway 32. Weather conditions in the area are conducive to periods of low visibility, with considerable cloud cover. Ultimate planning will consider the implementation of approach minimums down to not lower than three-quarters mile, utilizing GPS technologies. The possibility of implementing this type of approach will be studied in the next chapter.

Airport Visual Approach Aids

Visual glide scope indicators are a system of lights located at the side of the runway which provide visual descent guidance information during an

approach to the runway. These systems can consist of either a two- or four-box unit. Four-box systems are recommended for use by business jet aircraft. TxDOT's *Policies and Standards* indicate that four-box systems should be installed on the primary runway at reliever airports which are more commonly utilized by corporate aircraft.

Currently, both ends of Runway 14-32 are served by two-box visual approach slope indicators (PAPI-2). If the airport is increasingly utilized by corporate aircraft as projected, consideration should be given to upgrading these units to PAPI-4 systems.

Airfield Lighting and Marking

Runway identification lighting provides the pilot with a rapid and positive identification of the runway end. The most basic system involves runway end identifier lights (REILs). The FAA and TxDOT indicate that REILs should be considered for all lighted runways at airports not planned for a more sophisticated approach lighting system (ALS).

Currently, REILs are not installed on either end of the runway. In order to comply with TxDOT *Policies and Standards*, REILs need to be considered for all runway ends until/unless more sophisticated ALS is installed.

As previously mentioned, Runway 14 is being planned for an improved instrument approach procedure. The FAA requires an approach lighting system to achieve lower than one mile visibility minimums. Consideration should be given to an abbreviated approach lighting system for Runway 14. Examples of these systems include an omni-directional approach lighting system (ODALS) or lead-in lighting system (LDIN).

Runway 14-32 is currently marked with nonprecision marking. These markings will be adequate for the planning period.

Currently, the taxiway system at Gillespie County Airport is not equipped with taxiway lighting, however, lighted signage is provided. TxDOT *Policies and Standards* indicate that airports having more than 100 based aircraft should be served with these lights, as well as taxiway guidance signs. Thus, planning should consider the installation of medium intensity taxiway lighting (MITL) at the airport by the intermediate term of the planning period.

The airport currently has lighted wind cones and a segmented circle which provide pilots with information about wind conditions and traffic patterns. In addition, an airport beacon assists in identifying the airport at night. Each of these facilities should be maintained in the future.

HEIGHT CLEARANCE CRITERIA

Use of existing properties and planned uses of land near the Gillespie County Airport include height and obstruction considerations. Vernon's Revised Statutes for the State of Texas regarding the use of state funds for

airport improvement require establishment of an Airport Hazard Zoning Ordinance. This ordinance is established to regulate and restrict the heights of structures and objects of natural growth around the airport to enhance safety of aircraft in flight and objects on the ground. The Joint Airport Zoning board of the County of Gillespie established the *Gillespie County Airport Zoning Order* on February 23, 1979.

The Order is based Federal Aviation Regulation (F.A.R.) Part 77, *Objects Affecting Navigable Airspace.* F.A.R. Part 77 assigns three-dimensional imaginary surfaces or zones which extend out from the runway centerline, in accordance with the type of aircraft and approach minimums being served. The Gillespie County zoning map reflects the boundaries of the zones.

In 1979, the runway at Gillespie County Airport was 3,800 feet long. The runway is currently 5,002 feet long. Because the imaginary surfaces begin at or beyond the runway threshold and extend outward, the area of coverage will change when a change occurs in runway length. In addition, the Order is based upon a definition for the airport as an *other-than-utility* airport. Gillespie County Airport is projected to transition to a *transport* category airport, as defined by TxDOT, within the planning period of this study. With this change comes differences to the imaginary surfaces. It is suggested that the City of Fredericksburg, in conjunction with Gillespie County, update the zoning ordinance to reflect the changes to the airport.

LANDSIDE REQUIREMENTS

Landside facilities provide the essential interface between the air and ground transportation modes. The capabilities of the various components of each area were examined in relation to projected demand to identify future landside facility needs.

This includes components for general aviation needs such as:

- Aircraft Hangars
- Aircraft Parking Aprons
- General Aviation Terminal
- Auto Parking and Access
- Airport Support Facilities

HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is toward more sophisticated aircraft (and, consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions.

While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft will still tie-down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities should not be planned for each based aircraft. At Gillespie County Airport, approximately 91 percent (49 aircraft) of the based aircraft are currently stored in enclosed hangar facilities. It is estimated that the percentage of based aircraft stored in hangars will increase to 95 percent through the planning period. The increase reflects a desire for more hangar positions. It should be noted that the airport maintains a waiting list of 15 aircraft owners which desire hangar space.

Approximately 90 percent of the hangared aircraft at the airport are currently stored in T-hangars. The majority of aircraft currently stored in these hangars are single-engine. A planning standard of 1,200 square feet per based single-engine aircraft has been used to determine future requirements.

The remaining 10 percent of hangared aircraft are stored in executive/ conventional hangars, which are designed for multiple aircraft storage. As the trend toward more sophisticated aircraft continues throughout the planning period, it is important to determine the need for more conventional/executive hangars. For executive/conventional hangars, a planning standard of 1,200 square feet was used for single-engine aircraft, while a planning standard of 2,500 square feet was used for multi-engine, jet, and helicopters. These planning standards recognize that some of the larger business jets require a greater amount of space.

Since portions of executive/conventional hangars are also used for aircraft maintenance and servicing, requirements for maintenance/service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs.

Future hangar requirements for the airport are summarized in **Table 3G**. As shown in the table, additional hangar area will be required in the short term. Chapter Four, Airport Development Alternatives, will examine the options available for hangar development at the airport and determine the best location for each type of hangar facility.

TABLE 3G
Aircraft Storage Hangar Requirements
Gillespie County Airport

		Future Requirements		
	Currently Available	**Short Term**	**Intermediate Term**	**Long Term**
Aircraft to be Hangared	49	70	94	134
T-Hangar Positions	44	52	67	95
Executive/Conventional Hangar Positions	5	18	27	39
Hangar Area Requirements				
T-Hangar Area (s.f.)	46,650	62,400	80,400	114,000
Executive/Conventional Hangar Storage Area	28,000	33,300	51,900	76,700
Total Maintenance Area	8,000	14,400	19,800	28,600
Total Hangar Area (s.f.)	**82,650**	**110,100**	**152,100**	**219,300**

AIRCRAFT PARKING APRON

A parking apron should provide for the number of locally-based aircraft that are not stored in hangars, and for those aircraft used for air taxi and training activity. Parking should be provided for itinerant aircraft as well. As mentioned in the previous section, approximately 91 percent (49 aircraft) of based aircraft at Gillespie County Airport are currently stored in hangars. It is estimated that the percentage of based aircraft stored in hangars will increase to 95 percent through the end of the planning period.

Local aircraft, which utilize apron space as tie-downs, are typically smaller single-engine aircraft. A planning standard of 650 square yards per aircraft was used to determine the apron requirements for local aircraft. Apron space needed for transient piston aircraft uses a standard of 800 square yards. Transient business jet apron requirements are calculated using a standard of 1,600 square yards.

Total aircraft parking apron requirements for general aviation are presented in **Table 3H**. Currently, apron area at the airport totals approximately 20,000 square yards, with approximately 53 total tie-down positions. As indicated in the table, additional apron area is not required through the planning period.

TABLE 3H
General Aviation Aircraft Parking Apron Requirements
Gillespie County Airport

	Currently Available	Short Term	Intermediate Term	Long Term
Single, Multi-Engine Transient				
Aircraft Positions		9	13	20
Apron Area (s.y.)		7,200	10,400	16,000
Transient Jet Aircraft Positions		4	5	8
Apron Area (s.y.)		6,400	8,000	12,800
Locally-Based Aircraft Positions		10	11	11
Apron Area (s.y.)		6,500	7,200	7,200
Total Positions	**53**	**23**	**29**	**39**
Total Apron Area (s.y.)	**44,800**	**19,600**	**26,100**	**36,500**

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal facilities have several functions. Space is required for passengers waiting, pilots' lounge and flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but also includes the space offered by fixed base operators for these functions and services. Currently, the airport offers a terminal building which provides approximately 2,088 square feet of space.

Gillespie County Airport has some unique features that affect the recommendations for terminal building

space. Although the existing terminal is 2,088 square feet, the two aviation businesses as well as the Hangar Hotel and the Airport Diner offer more space that can be utilized by the airport users.

The methodology used in estimating general aviation terminal facility needs was based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were then based upon providing 90 square feet per design hour itinerant passenger. **Table 3J** outlines the general aviation space requirements for general aviation services at Gillespie County Airport.

TABLE 3J
General Aviation Terminal Facilities
Gillespie County Airport

	Currently Available	Short Term	Intermediate Term	Long Term
General Aviation Design Hour Itinerant Passengers		12	17	26
General Aviation Building Spaces (s.f.)	900	1,000	1,500	2,300

It should be noted that the space requirements do not necessarily indicate a need for a larger terminal building. Some additional spaces could be provided by a fixed base operator (FBO) or other aviation business on the airport. For example, Fredericksburg FBO will provide additional terminal spaces once facilities are constructed.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation areas have also been identified. These other areas provide certain functions related to the overall operation of the airport, and include: automobile parking, fuel storage, and aircraft rescue and firefighting facilities.

AUTOMOBILE PARKING

General aviation vehicular parking demands have been determined for Gillespie County Airport. Space determinations were based upon an evaluation of existing airport use, as well as industry standards. Terminal automobile parking spaces required to meet general aviation itinerant and FBO operator demands were calculated by multiplying design hour itinerant passengers by the industry standard of 1.9 in the short term, increasing to 2.5 in the long term, as corporate operations increase.

The parking requirements of aircraft owners should also be considered. Although some owners prefer to park their vehicles in their hangars, safety can be compromised when automobile and aircraft movements are intermixed.

For this reason, separate parking requirements, which consider one-half of based aircraft at the airport, were applied to general aviation automobile parking space requirements. Parking requirements for the airport are summarized in **Table 3K**.

Automobile parking at Gillespie County Airport is currently provided directly to the east and north of the terminal building. A public parking lot provides for approximately 30 parking spaces, while Fredericksburg FBO will provide 73 additional spaces once completed. There are also approximately 10 additional parking spaces adjacent to the northern area hangar facilities.

Directly to the south of the terminal area is the Hangar Hotel. This facility has approximately 130 parking spaces and is 41,300 square feet. Since the Hangar Hotel parking lot is quasi-public and is designed primarily to serve the hotel's clientele and not the aviation community, the available parking there will not be included in the vehicle parking projections. In addition, the location of the parking at the hotel does not provide for parking in other areas of the airport such as the north-end hangar areas.

TABLE 3K
Vehicle Parking Requirements
Gillespie County Airport

		Future Requirements		
	Currently Available	**Short Term**	**Intermediate Term**	**Long Term**
Design Hour Passengers		12	15	21
Terminal Vehicle Space		22	32	52
Parking Area (s.f.)		8,800	12,800	20,800
General Aviation Spaces		38	50	70
Parking Area (s.f.)		15,200	20,000	28,000
Total Parking Spaces	**30**	**60**	**82**	**122**
Total Parking Area (s.f.)	**1,700**	**24,000**	**32,800**	**48,800**

FUEL STORAGE

Fuel storage facilities at Gillespie County Airport include two above ground storage tanks located north of the terminal building. Both storage tanks have a 12,000-gallon storage capacity; one tank is utilized to store Jet A fuel, while the other tank provides storage for 100LL, or Avgas fuel. Fuel services are provided by an onsite FBO utilizing a refueling vehicle. In addition there is a 4,000-gallon storage tank operated by an aviation business in the northern hangar area.

Fuel storage requirements are typically based upon maintaining a two-week supply of fuel during an average month. However, more frequent deliveries can reduce the fuel storage capacity requirement. Generally, fuel tanks should be of adequate capacity to accept a full refueling tanker, which is approximately 8,000 gallons, while maintaining a reasonable level of fuel in

the storage tank. Given the projected increase in business jet traffic, it is recommended that the storage capacity of Jet A fuel be doubled to 24,000 gallons in the short to intermediate term. Actual demand will dictate the need for additional fuel storage capacity.

AIRCRAFT RESCUE AND FIREFIGHTING

Gillespie County Airport is not currently served by a dedicated aircraft rescue and firefighting facility (ARFF). The airport is provided with rescue and fire assistance from the City of Fredericksburg, as needed.

ARFF services do not necessarily have to be located on the airport. Only certified airports providing scheduled passenger service with greater than nine passenger seats are required to provide ARFF services. Many corporate flight departments, however, are requesting ARFF services at the airports they utilize. ARFF facilities and personnel costs are substantial, thus, many times not feasible for smaller communities. If services are requested, consideration should be given to meeting "Index A" standards, which includes aircraft less than 90 feet in length and requires on-vehicle carrying of at least one of the following:

- 500 pounds of sodium-based dry chemical or halon 1211; or
- 450 pounds of potassium-based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF foam application.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Gillespie County Airport for the planning horizon. A summary of the airfield and general aviation facility requirements is presented on **Exhibits 3C** and **3D**.

Following the facility requirements determination, the next step is to develop a direction of development which best meets these projected needs. The remainder of the master plan will be devoted to outlining this direction, its schedule, and its cost.

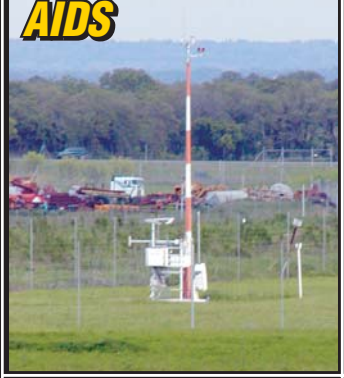
	AVAILABLE	SHORT TERM	LONG TERM
RUNWAY 	**Runway 14-32** 5,002' x 75' 30,000# SWL ARC B-II Design	**Runway 14-32** Same	**Runway 14-32** 6,400' x 100' 60,000# SWL ARC D-II Design
TAXIWAYS 	**Runway 14-32** Full Length Parallel Taxiway (240' runway/taxiway separation) 4 Exits All Taxiways 40' Wide	**Runway 14-32** Same	**Runway 14-32** Relocate Parallel Taxiway (at least 300' separation - consider 400' separation) Add Exit Taxiway
NAVIGATIONAL AIDS 	AWOS Segmented Circle Lighted Windcones **Runway 14-32** VOR/DME GPS A PAPI-2	AWOS Segmented Circle Lighted Windcones **Runway 14-32** Add GPS for Approach Category D Aircraft	AWOS Segmented Circle Lighted Windcones **Runway 14-32** Consider GPS with Lower than One Mile Visibility Minimums Add PAPI-4
LIGHTING & MARKING 	Rotating Beacon **Runway 14-32** MIRL Taxiway Reflectors Non-Precision Marking	Rotating Beacon **Runway 14-32** Same	Rotating Beacon **Runway 14-32** Add MITL

Exhibit 3C
AIRFIELD FACILITY REQUIREMENTS

AIRCRAFT STORAGE HANGARS

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
T-hangar Positions	44	52	67	95
Executive/Conventional Hangar Positions	5	18	27	39
T-Hangar Area (s.f.)	46,650	62,400	80,400	114,000
Executive/Conventional Hangar Area (s.f.)	28,000	33,300	51,900	76,700
Maintenance Area (s.f.)	8,000	14,400	19,800	28,600
Total Hangar Area (s.f.)	82,650	110,100	152,100	219,300

APRON AREA

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Transient Positions	N/A	13	18	28
Locally-Based Aircraft Positions	N/A	10	11	11
Total Positions	53	23	29	39
Total Apron Area (s.y.)	44,800	19,600	26,100	36,500

TERMINAL SERVICES AND VEHICLE PARKING

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Terminal Building Space (s.f.)	900	1,000	1,500	2,300
Total Parking Spaces	30	60	82	122
Total Parking Area (s.f.)	1,700	24,000	32,800	48,800

Exhibit 3D
LANDSIDE FACILITY REQUIREMENTS

Chapter Four

ALTERNATIVES

Chapter Four
Alternatives

In the previous chapter, airside and landside facilities required to satisfy the demand for the long range planning period were identified. The next step in the planning process is to evaluate reasonable ways these facilities can be provided. In some cases, there can be countless combinations of options, but the alternatives presented are those with the greatest potential for implementation.

Any development proposed for a master plan is evolved from an analysis of projected needs for a set period of time. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands for the next twenty years. However, no plan of action should be developed which may be inconsistent with the future goals and objectives of Gillespie County and its citizens who have a vested interest in the development and operation of the airport.

The development alternatives for Gillespie County Airport can be categorized into two functional areas: The **airside** (airfield) and **landside** (general aviation hangars, apron, and terminal area). Within each of these areas, specific facilities are required or desired. In addition, the utilization of the remaining airport property to provide revenue support for the airport and to benefit the economic development and well-being of the Gillespie County area must be considered.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined both individually, then coordinated as a whole to ensure the

final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to determine if the investment in Gillespie County Airport will meet the needs of the citizens of the community, both during and beyond the planning period.

When analyzing alternatives for development, consideration must also be given to a “do-nothing” or “no build” alternative, as well as the possibility of removing aviation services altogether. As these alternatives are not without major impacts and costs to the public, they are also addressed in this chapter.

The alternatives considered are compared using environmental, economic, and aviation factors to determine which of the alternatives will best fulfill the local aviation needs. With this information, as well as the input and direction from local government agencies and airport users, a final airport concept can evolve into a realistic development plan.

NON-DEVELOPMENT ALTERNATIVES

Non-development alternatives include the “no-action” or “do-nothing” alternative, transferring service to an existing airport, or developing an airport at a new location. These alternatives need to be examined first to determine whether future development of Gillespie County Airport is in the best interest of Gillespie County and the region as a whole.

DO-NOTHING ALTERNATIVE

The "do-nothing" alternative essentially considers keeping the airport in its present condition and not providing for any type of improvement to the existing facilities. The primary result of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area.

Gillespie County has experienced strong growth in all socioeconomic categories over the past several decades. Forecasts indicate this trend will likely continue throughout and beyond the long range planning horizon. Moreover, the City of Fredericksburg is a tourist destination, which typically requires a functional airport. These reasons, combined with favorable regional and national aviation forecasts, indicate a future need for improved facilities at Gillespie County Airport. Improvements recommended in the previous chapter include a longer runway, improvements to the taxiway system, improvement of navigational aids, and the construction of additional hangar facilities. Without these facilities, regular users of the airport, and potential future users of the airport will be constrained from taking maximum advantage of the airport's air transportation capabilities.

The unavoidable consequence of the “do-nothing” alternative would involve the airport’s inability to attract potential airport users. Corporate aviation plays a major role in the transportation of business leaders and key employees. Thus, an airport’s facilities are often the

first impression many corporate officials will have of the community. If the airport does not have the capability to meet hangar, apron, or airfield needs of potential users, the County's capabilities to attract the major sector businesses that rely on air transportation could be diminished.

The area already attracts corporate aircraft operators seeking local attractions and will soon be home to the Boot Ranch resort. Many who are currently attracted by local tourism and who will frequent the resort will require the support of a highly functional airport that is capable of accommodating business jet aircraft on a daily basis. In its present condition, the airport can accommodate most of these users on an infrequent basis, however, more improvements will be necessary to better meet the needs of these users in the future, as their operations become more common.

The long term consequences of the "do-nothing" alternative extend beyond the immediate Gillespie County area. Gillespie County Airport is part of a system of public airports that serve the aviation needs of the region. Without facilities such as Gillespie County Airport, commercial service airports like San Antonio International Airport would be at, or exceeding, capacity. General aviation airports not only provide convenience to general aviation users, but also help to avoid a major concentration of smaller general aviation aircraft and large commercial aircraft at a single airport.

Another key impact of this alternative will likely be the inability to attract certain businesses and industries seeking locations with adequate and convenient aviation facilities. Gillespie County Airport has much to offer in terms of airfield and landside facilities. Without regular maintenance and additional improvements, existing and potential users and businesses for Gillespie County Airport could be lost.

To propose no further development at Gillespie County Airport could adversely affect the long term viability of the airport, resulting in negative economic effects on the community. Therefore, the "no-development" alternative is not considered as prudent or feasible.

TRANSFER AVIATION SERVICES

The alternative of shifting aviation services to another existing airport was found an undesirable alternative due to the lack of available airports having the facilities or the potential that Gillespie County Airport provides. In 2004, Gillespie County Airport based 55 aircraft and experienced an estimated 15,675 total operations. There is only one public-use general aviation airport within twenty miles which could potentially serve the demand at Gillespie County Airport: Kerrville Municipal Airport.

Kerrville Municipal Airport provides a 6,000-foot long runway with 115 reported based aircraft. The airport is also home to the Mooney Aircraft manufacturing facility. If a shift of aviation services to Kerrville were pursued, current users of Gillespie

County Airport would be forced to travel to a more distant and less convenient airport. Furthermore, the continuing growth expected in the area demonstrates the need for a highly functional and convenient airport.

General aviation airports play a major role in the way companies conduct their business. Furthermore, these airports are becoming increasingly important in the post 9-11 aviation environment. Corporate aircraft use is becoming more affordable for individuals, not only businesses, to use. Gillespie County Airport is expected to accommodate business aircraft traffic for companies located or conducting business in Gillespie County and for those traveling to the Boot Ranch or other tourist attractions in the area. This role is not easily replaced by another existing airport in the system, without tremendous expense.

CONSTRUCTION OF A NEW AIRPORT SITE

The alternative of developing an entirely new airport facility in the area to meet projected aviation demands was also considered, but similarly found to be an unacceptable alternative primarily due to the economic and environmental considerations. Land acquisition, site preparation, and the construction of an entirely new airport near an urbanized area can be a very difficult and costly action. In addition, closing Gillespie County Airport would mean the loss of a substantial investment in a sizable transportation facility. In a situation where public funds are limited, the replacement of a functional and expandable airport facility would represent an unjustifiable loss of a significant public investment. Moreover, the relocation would result in the loss of substantial private investments such as those made in the Hangar Hotel complex and other airport business proprietors.

From social, political, and environmental standpoints, the commitment of a new large land area must also be considered. The public sentiment toward new airports in the last several years has been very negative, primarily because a new airport normally requires the acquisition of several large parcels of privately-owned property. Furthermore, the development of a new airport similar to Gillespie County Airport would likely take a minimum of seven years to become a reality. The potential exists for significant environmental impacts associated with disturbing a large land area when developing a new airport site. Moreover, given the rolling terrain in the locale, finding a new site to develop another airport could be a very difficult task.

The only condition at which evaluating a new airport site would be considered feasible is if the current site becomes constrained or incapable of accommodating aviation demand. This could become a necessity at some point in the distant future, as analysis in the following sections will detail; however, at this time, it appears that the current airport will be capable of

accommodating future demand for the planning period.

Overall, transferring service to an existing airport in the region or to an entirely new facility are unreasonable alternatives that should not be pursued at this time. Gillespie County Airport is fully capable of accommodating the long term aviation demands of the area and should be developed in response to those demands. The airport has the potential to continue to develop as a quality general aviation airport that could greatly enhance the economic development of the community.

The previous chapter identified facilities necessary to meet the forecast demand throughout the planning period. The purpose of the remainder of this chapter is to evaluate alternatives that meet the needs of the airport. The necessary facilities and design concerns are examined in the paragraphs to follow.

ALTERNATIVE ISSUES

A commitment to remain at the existing site and develop facilities sufficient to meet the long term aviation demands entails the following requirements:

- Provide sufficient airside and landside capacity to meet the long range planning horizon demand levels of the area.

- Develop the airport in accordance with the currently established Federal Aviation Administration (FAA) and Texas Department of Transportation (TxDOT) criteria.

The Facility Requirements Chapter outlined specific types and quantities of facilities necessary to meet projected aviation demands throughout the planning period. Expansion will be required to meet the long range planning horizon level of demand. The remainder of this chapter will describe various alternatives for the airfield and landside facilities. Before actual airfield and landside alternatives are presented, however, it is necessary to discuss items which are factored into the development of the various alternatives. **Exhibit 4A** outlines alternative issues to be considered in this analysis.

RUNWAY

Analysis in the previous chapter indicated that Runway 14-32 provides adequate length for most general aviation airplanes. The current runway length, however, falls short of the requirements for the full range of business aircraft which currently operate at the airport on an infrequent basis, but are projected to increase in the future. The analysis considered the trend of increased corporate aircraft operations at the airport.

Gillespie County Airport is currently utilized by a variety of aircraft ranging from small single engine piston airplanes to corporate jet aircraft. In order to accommodate corporate aircraft, FAA runway length design

criteria indicate a need for at least 5,200 feet of runway. This length would be suitable for aircraft within airport reference code (ARC) C-II with short or moderate trip lengths, most of the year. For these aircraft and larger aircraft in ARC D-II with longer haul lengths or during hot weather conditions, a longer runway length is necessary. Analysis of specific aircraft needs during hot weather conditions indicates that aircraft could require up to, and in some cases, more than 6,400 feet.

Airfield alternative analysis will consider providing at least 6,400 feet to meet the needs of the majority of business jets that could operate at the airport in the future. Moreover, if the runway is designed for ARC C/D-II, it should be planned to be widened to 100 feet to meet FAA requirements.

AIRFIELD DESIGN STANDARDS

Planning for the increased use of the airport by corporate aircraft will substantially change the airfield design criteria for Gillespie County Airport. Of primary concern are the runway safety areas (RSA) and runway object free areas (OFA), as well as other separation criteria discussed below.

The FAA defines the RSA as *"a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway."* The RSA is an integral part of the runway environment. RSA dimensions are established in Advisory Circular 150/5300-13, Change 8, *Airport Design*, and are based on the airport reference code. The RSA is intended to provide a measure of safety in the event of an aircraft's excursion from the runway by significantly reducing the extent of personal injury and aircraft damage during overruns, undershoots, and veer-offs. According to the Advisory Circular, the RSA must be:

1) cleared and graded and have no potentially hazardous ruts, bumps, depressions, or other surface variations;

2) drained by grading or storm sewers to prevent water accumulation;

3) capable, under dry conditions, of supporting, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and

4) free of objects, except for objects that need to be located in the safety area because of their function.

Furthermore, the FAA has placed a higher significance on maintaining adequate RSAs at all airports due to recent aircraft accidents. Under Order 5200.8, the FAA established a Runway Safety Area Program. The Order states, "The goal of the Runway Safety Area Program is that all RSAs at federally-obligated airports and all RSAs at airports certificated under 14 CFR part 139 shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practical." Under the Order, each regional airports division of the FAA is obligated to collect and maintain

AIRFIELD CONSIDERATIONS

- Consider FAA Design Criteria Upgrade to ARC C/D-II
- Consider Extending and Widening Runway 14-32 up to 6,400' x 100'
- Land Acquisition
- Analysis of Improved Instrument Approach Procedures
- Evaluate the Relocation of the Parallel Taxiway to be 300' from Runway Centerline

LANDSIDE CONSIDERATIONS

- Maximize Available Property for Facility Development
- Develop Conventional, Executive, and T-hangars
- Consider Additional Land Acquisition for Future Facility Development

GILLESPIE COUNTY AIRPORT

Exhibit 4A
ALTERNATIVE DEVELOPMENT ISSUES

data on the RSA for each runway at federally-obligated airports.

Currently, the airport's critical aircraft falls in ARC B-II. Thus, the required RSA for Runway 14-32 (ARC B-II design) is 150 feet wide, extending 300 feet beyond both runway ends. An upgrade to ARC C/D-II design standards significantly changes this requirement. The ARC C/D-II RSA extends 1,000 feet beyond the runway ends and is 500 feet wide. Alternative analysis must consider providing adequate RSA while also providing for additional runway length.

The existing RSA for Runway 14-32 is more than adequate considering ARC B-II aircraft design standards, as depicted on the top half of **Exhibit 4B**. If the runway is planned for ARC C/D-II aircraft, however, the RSA is limited to approximately 150 feet to the north due to the location of the golf course and Tivydale Road (RR2093), and 400 feet to the south due to the location of State Highway 16, as depicted on the lower half of **Exhibit 4B**.

The runway OFA is defined in FAA Advisory Circular 150/5300-13 Change 8, *Airport Design*, as an area centered on the runway extending laterally and beyond each runway end, in accordance to the critical aircraft design category utilizing the runway. The OFA must provide clearance of all ground-based objects protruding above the RSA edge elevation, unless the object is fixed by function serving air or ground navigation. For ARC B-II design, the OFA is 500 feet wide, extending 300 feet beyond the ends of the runway.

As with the RSA standards, the OFA increases significantly for ARC C/D-II aircraft. For ARC C/D-II aircraft design, the OFA should be 800 feet wide and extend 1,000 feet beyond the runway ends. It should be noted that in some cases, the terrain encompassing the OFA may fall significantly below the RSA elevation. In those cases, objects can be in the OFA as long as they do not rise above the elevation of the RSA at any given lateral position.

Currently, Runway 14-32 provides adequate OFA for ARC B-II design criteria with one exception. Northwest of Runway 14, the airport perimeter fencing penetrates the OFA. This area is significantly lower than the RSA due to falling terrain. The fence and tree, however, rise above the RSA elevation and are obstructions. If the tree were removed and fence relocated outside of the OFA, the airport would meet both RSA and OFA standards for ARC B-II design.

Obviously, upgrading to ARC C/D-II design criteria will place the OFA outside of airport property, as Tivydale Road and Highway 16 would be obstructions to the OFA. As previously mentioned, the northern OFA is obstructed by trees on the adjacent golf course, airport perimeter fencing, and Tivydale Road (including areas north of Tivydale). To the south, the OFA would be limited to 400 feet due to Highway 16. Also, as depicted on the exhibit, the OFA for ARC C/D-II would not allow the northern apron to be usable for aircraft parking. Alternatives evaluated later will outline necessary

improvements aimed at meeting ARC C/D-II deign criteria.

It should be noted that upgrading to the ARC C/D-II standards is not something that is decided upon by the airport or its ownership. It is simply a function of the type of aircraft that operate at the airport on a frequent basis (more than 250 times annually). The transition would occur only when actual operations and activity at the airport dictate. The aviation demand and facility requirement analysis, presented in the previous chapters, included the possibility that the airport will be increasingly utilized by these aircraft, however, the projected increase may never materialize.

It is important that the airport have a plan in place for if and/or when the airport transitions to ARC C/D-II aircraft design. Many airports across the country have failed to plan for such a transition and are now space limited. As a result, these airports do not meet FAA design criteria and face significant development constraints. For this reason, the analysis will consider the airport's potential need to transition to the higher design standard. Ultimately, however, as the alternatives presented in the following sections will depict, upgrading to the higher standard may not be feasible.

TAXIWAYS

The current layout of the taxiway system at Gillespie County Airport is adequate from a functional perspective. The parallel taxiway serving Runway 14-32 just meets the FAA standard, which calls for the taxiway to be at least 240 feet from runway centerline for ARC A and B-II aircraft with approach minimums of not lower than one mile.

Analysis in the previous section outlined the need to relocate the parallel taxiway to be 300 feet from the runway (centerline to centerline). The increase separation would allow the airport to be served by better instrument approach visibility minimums for aircraft in ARC C/D-II. The bottom half of **Exhibit 4B** depicts the relocation of the parallel taxiway to provide the 300-foot separation. As depicted, the relocated taxiway would significantly reduce the aircraft parking apron at the north end of the terminal area. In fact, the northernmost hangar may be rendered unusable due to the relocation.

The following section will present additional information regarding the potential for improved approach procedures. Given the negative results of relocating the parallel taxiway, implementing an approach with lower than one-mile visibility minimums may not be considered feasible. Thus, future plans for relocating the parallel taxiway may not be necessary.

INSTRUMENT APPROACH CONSIDERATIONS

The final airfield consideration is protecting the potential for flight obstructions. The FAA has established criteria aimed at protecting the airport

04MP04-4B-10/29/04

EXISTING ARC B-II STANDARDS

AIRPORT ROAD
FAIR DRIVE
HIGHWAY 16
RUNWAY 14-32 (5,002' x 75')
14
32
LADY BIRD DR.
RR 2093/IVYDALE RD.
LIVE OAK CREEK

LEGEND

- Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- RSA Deficiency
- Object Free Area (OFA)
- OFA Deficiency
- Runway Protection Zone (RPZ)
- RPZ Deficiency

UPGRADE TO ARC C/D-II STANDARDS

AIRPORT ROAD
FAIR DRIVE
HIGHWAY 16
300'
RUNWAY 14-32 (5,002' x 75')
14
32
LADY BIRD DR.
RR 2093/IVYDALE RD.
LIVE OAK CREEK

NORTH

0 600 1200
SCALE IN FEET

GILLESPIE COUNTY AIRPORT

Exhibit 4B
AIRPORT DESIGN CRITERIA

from these flight obstructions. First, the FAA criterion stipulates that obstructions not be placed too near the runway ends or parallel the runway. The obstruction clearance requirements are based on the ARC of the critical aircraft and also include the type of approaches at the airport. For visual approaches and/or not lower than one-mile visibility approaches for ARC B-II aircraft, minimum obstruction clearance is required. For ARC C/D-II aircraft, however, the obstruction criterion is more protective.

There are two considerations when discussing airport approaches and obstacle evaluations. The two resources for determining airspace obstructions are the FAA's Federal Air Regulations (F.A.R.) Part 77 and Terminal Instrument Procedures, or TERPS. Part 77 is more of a filter which identifies potential obstructions, whereas, TERPS is the critical tool in determining actual flight obstruction. In fact, TERPS analysis is used to evaluate and develop instrument approach procedures including visibility minimums and cloud heights associated with the approaches.

Analysis in the previous chapter indicated that the plan should consider improved instrument approach capabilities for Runway 14-32. The first step in identifying potential airspace obstructions is the evaluation of the appropriate threshold siting surfaces (TSS). TSS is a surface contained within TERPS which represents the most critical approach area nearest the runway end.

TSS is defined by the type of approach and aircraft using the approach. The airport currently provides a straight-in approach for both runways with minimums as low as one mile for approach category A and B aircraft, and two miles visibility minimums for aircraft in approach category C. It should be noted that the current approaches are not approved for use by aircraft in approach category D. **Exhibits 4C** and **4D** present analysis of the TSS associated with current and future approach procedures for Runways 14 and 32 respectively.

Exhibit 4C presents the airspace obstruction evaluation for Runway 14. The TSS depicted in red considers a straight-in approach for all aircraft with not lower than one-mile visibility, day and night. As depicted, the surface is 800 feet wide near the runway end. It appears that the TSS associated with the current approach procedure is obstructed by two groups of trees, one group located on the golf course and the other to the north near the Chuckwagon Inn Bed and Breakfast.

Exhibit 4D presents airspace obstruction analysis for the current Runway 32 end. For the straight-in approach for large aircraft, Lady Bird Drive and State Highway 16 pose obstructions to the TSS. It is important to note that the approaches require a "clear" 20 to 1 approach slope for the area contained in the TSS. Moreover, the FAA requires that the approach slope clear roads by 15 feet and highways by 17 feet. Due to this requirement, the roads would pose obstructions to the TSS as depicted.

Analysis also considered the implementation of approaches providing lower than one-mile visibility minimums. While these approaches would be beneficial for some aircraft operators, their implementation at Gillespie County Airport would be improbable. These surfaces require clearance utilizing a shallower approach slope of 34 to 1. The lower approach slope would be obstructed by several more objects, including the roads at either end of the runway. It appears that an approach with lower than one mile would require substantial obstruction removal, at a cost which would likely exceed the perceived benefit of providing for the lower minimums. Also, as previously discussed, these approaches would require the relocation of the parallel taxiway to be separated from the runway by 300 feet. For these reasons, the recommended plan will only consider improving the approach areas in order to achieve straight-in approaches with not lower than one-mile visibility minimums.

Another consideration is the runway protection zone (RPZ). The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. The dimensions of the RPZ vary according to the visibility minimums serving the runway and, in some instances, the type of aircraft operating on the runway. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses, in order to enhance the protection of approaching aircraft as well as people and property on the ground.

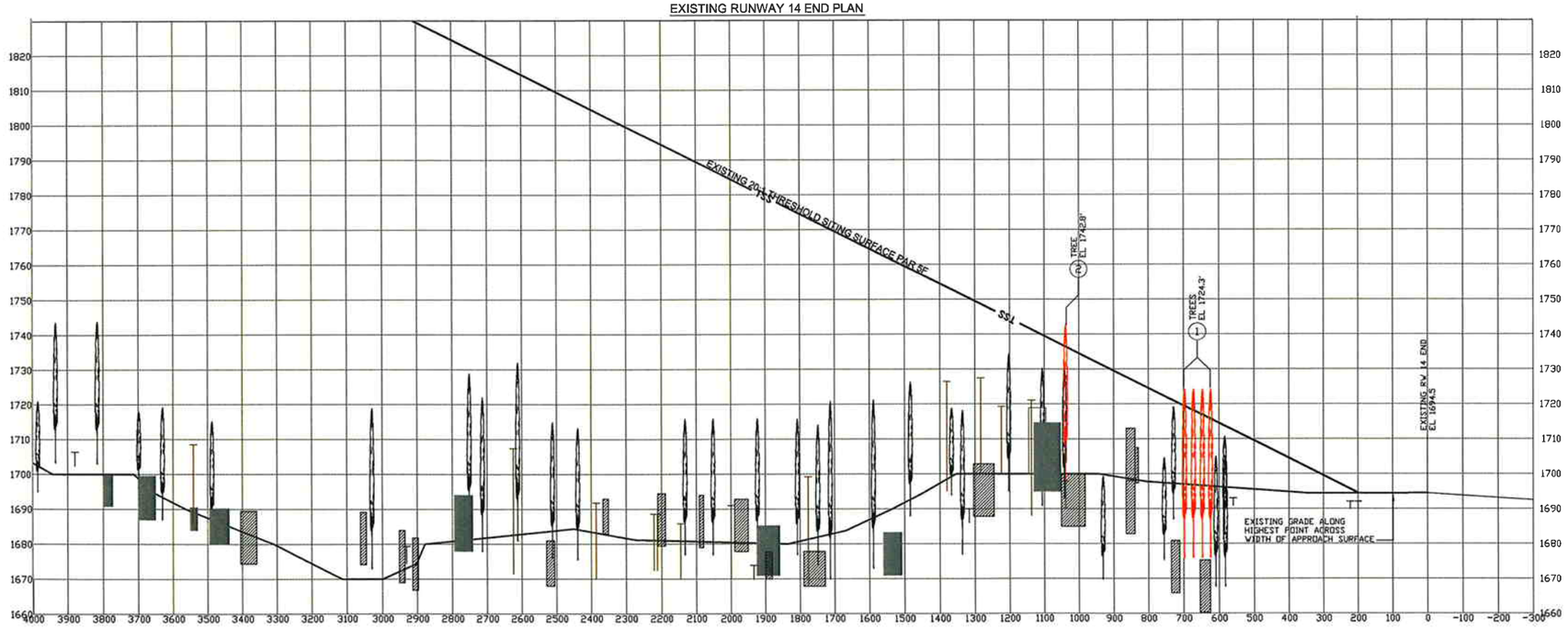
The FAA does not necessarily require the fee simple acquisition of the RPZ area, but highly recommends that the airport have positive control over development within the RPZ. It is preferred that the airport own the property through fee simple acquisition, however, avigational easements (providing control of airspace within the RPZ) can be pursued if fee simple purchase is not possible. It should be noted, however, avigation easements can often cost as much as 80 percent of the land value and may not fully prohibit incompatible land uses from the RPZ. For planning purposes, therefore, all alternatives will assume fee simple acquisition of the RPZ and land on either side of the runways not currently encompassed by the existing property line.

LANDSIDE CONSIDERATIONS

The orderly development of the airport terminal area can be the most critical, and probably the most difficult, development to control on the airport. A terminal area development approach of taking the path of least resistance can have a significant effect on the long term viability of an airport. Allowing development without regard to a functional plan could result in a haphazard array of buildings and small ramp areas, which will eventually preclude the most efficient use of the valuable space along the flight line.

Activity in the terminal area should be divided into three areas at an airport. The high activity area should be planned and developed as the area

EXISTING RUNWAY 14 END PLAN

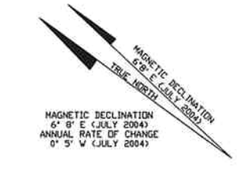


EXISTING RUNWAY 32 END PROFILE

RW 14 Threshold Siting Surface Obstructions

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	Par 5F Penetration
1	TREES	824.9.0	118.1 R	1724.3	11.4
2	TREE	1036.4	233 L	1742.8	23.7

* ELEVATIONS ADJUSTED UPWARD 10' FOR PRIVATE ROAD, 15' FOR PUBLIC ROADWAY.



GILLESPIE COUNTY AIRPORT

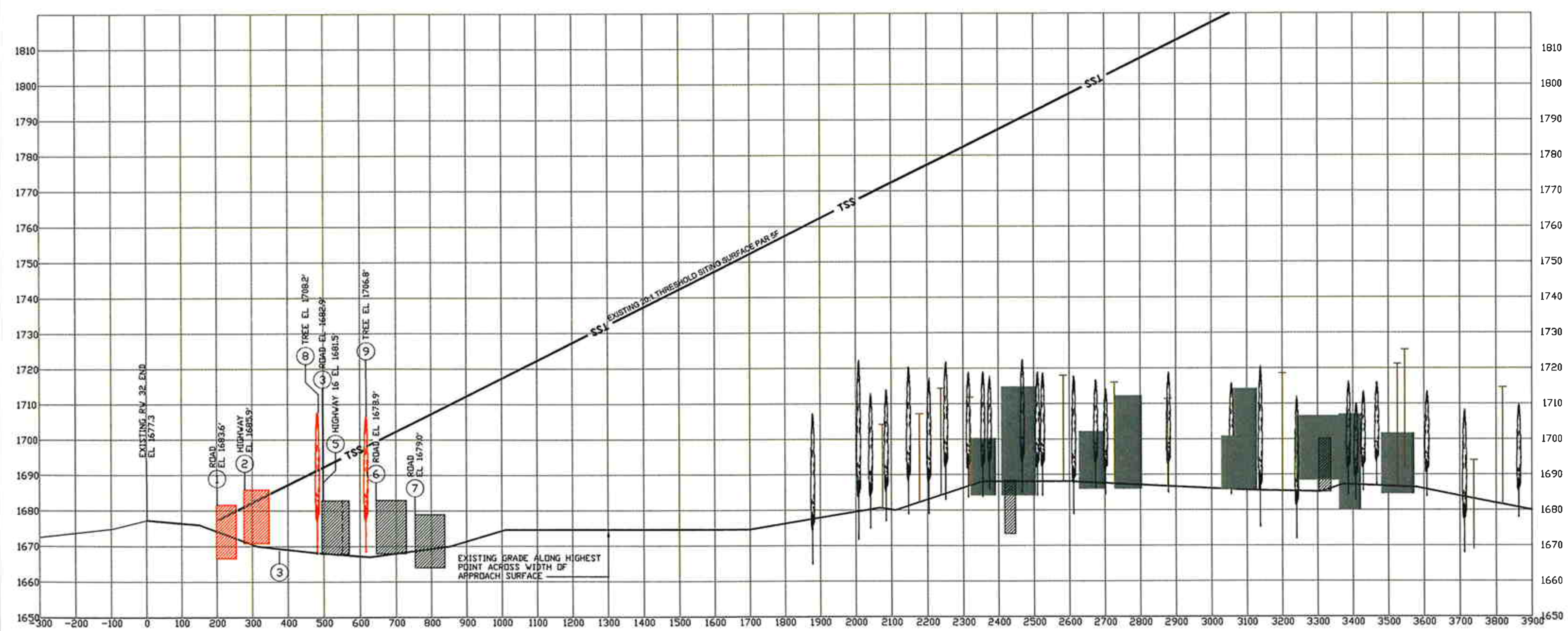
Exhibit 4C
OBSTRUCTIONS TO 14 APPROACH

Exhibit 4D
OBSTRUCTIONS TO 32 APPROACH

RW 32 Threshold Siting Surface Obstructions					
No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	Par 5F Penetration
1	ROAD	200.0	335.3 L	1683.6	6.3
2	ROAD	279.3	410.0 R	1685.9	6.3
8	TREE	483.6	337.6 R	1708.2	16.7
9	TREE	619.2	369.8 R	1706.8	8.5

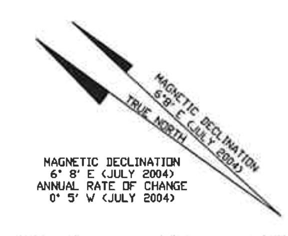
* ELEVATIONS ADJUSTED UPWARD 10' FOR PRIVATE ROAD, 15' FOR PUBLIC ROADWAY.

EXISTING RUNWAY 32 END PLAN



* ELEVATIONS ADJUSTED UPWARD 10' FOR PRIVATE ROAD, 15' FOR PUBLIC ROADWAY, 17' FOR INTERSTATE HIGHWAY, 23' FOR RAILROADS

EXISTING RUNWAY 32 END PROFILE



HORIZONTAL SCALE
1" = 400'

VERTICAL SCALE
1" = 40'

Coffman Associates

providing aviation services on the airport. An example of the high activity area is the aircraft parking apron which provides outside storage of aircraft and circulation of aircraft. In addition, large conventional hangars housing corporate aviation departments or storing a large number of aircraft would be considered a high activity use. A conventional hangar structure in the high activity area should be a minimum of 6,400 square feet (80-foot by 80-foot). The best location for high activity areas is along the flight line near midfield, for ease of access to all areas of the airfield.

The medium activity use category defines the next level of airport use and primarily includes smaller corporate aircraft that may desire their own conventional hangar storage on the airport. A conventional hangar structure in the medium activity use area should be at least 50 feet by 50 feet, or a minimum of 2,500 square feet. The best location for medium activity use is off the immediate flight line, but readily accessible. Parking and utilities such as water and sewer should also be provided in this area.

Low activity use category defines the area for storage of smaller single and twin-engine aircraft. Low activity users are personal or small business aircraft owners who prefer individual space in shade or T-hangars. Low activity areas should be located in less conspicuous areas. This use category will require electricity, but generally does not require water or sewer utilities.

In addition to the functional compatibility of the terminal area, the proposed development concept should provide a first-class appearance for Gillespie County Airport. Consideration to aesthetics should be given to the entryway, as well as public areas, when arranging the various activity areas.

The existing terminal area at Gillespie County Airport has been developed with mixed activity areas. These facilities, however, do not appear to be causing efficiency problems. In the future, consideration should be given to developing facilities with greater separation between activity levels.

Ideally, terminal area facilities at general aviation airports should follow a linear configuration parallel the primary runway. The linear configuration allows for maximizing available space for aircraft parking apron, while providing ease of access to terminal facilities from the airfield. Each landside alternative will address development issues. Separation of activity levels and efficiency of layout will be provided as well.

AIRFIELD ALTERNATIVES

The following section describes four airfield development alternatives. These alternatives consider upgrading Runway 14-32 to ARC C/D-II design criteria, extending the runway to 6,400 feet, and taxiway improvements. These alternatives can then be compared with the alternative of leaving the runway in its present state, as an ARC B-II runway.

AIRFIELD ALTERNATIVE A

Alternative A, depicted on **Exhibit 4E**, considers the baseline condition for evaluating the upgrade of Runway 14-32 to ARC C/D-II standards. This alternative is considered the baseline condition, as it simply applies ARC C/D-II standards to the existing runway conditions.

As previously mentioned, the northern RSA and OFA for ARC C/D-II is obstructed by the location of the golf course, as well as Tivydale Road (and points beyond). The location of these obstructions limits the available RSA/OFA to 150 feet. The southern RSA and OFA are obstructed by Highway 16 and Lady Bird Drive. These obstructions limit the southern RSA and OFA to only 240 feet. If these obstructions were to remain, as assumed in this alternative, the application of displaced thresholds and declared distances would be required.

Utilizing displaced thresholds and declared distances is the most undesirable of alternatives, however, it is the simplest and most cost-effective means to meet RSA and OFA deficiencies. Effectively, this alternative artificially limits the current runways take-off and landing distances by declaring less operational length than the pavement provides. Basically, the alternative would require that the location of the displaced thresholds be the limit for operational length calculations.

Declared distances are the effective runway distances that the airport operator declares are available for take-off run, take-off distance, accelerate-stop distance, and landing distance requirements. These are defined by the FAA as:

Take-off run available (TORA) - The length of the runway declared available and suitable to accelerate from brake release to lift-off, plus safety factors.

Take-off distance available (TODA) - The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA available to accelerate from brake release past lift-off to start of take-off climb, plus safety factors.

Accelerate-stop distance available (ASDA) - The length of the runway plus stopway declared available and suitable to accelerate from brake release to take-off decision speed, and then decelerate to a stop, plus safety factors.

Landing distance available (LDA) - The distance from threshold to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

The ASDA and LDA are the primary considerations in determining the runway length available for use by aircraft, as safety areas must be considered. The ASDA and LDA can be figured as the useable portions of the runway minus the area required to maintain adequate RSA and OFA beyond the end of the runway. In other words, for take-off, or ASDA calculations, only the RSA and OFA limitations at the far end of the runway need to be considered; whereas, for

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LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)

DECLARED DISTANCES		
	Runway 14	**Runway 32**
Accelerate-Stop Distance Available (ASDA)	5,242'	4,152'
Landing Distance Available (LDA)	3,392'	3,392'

NORTH

0 800 1600

SCALE IN FEET

Exhibit 4E
AIRFIELD ALTERNATIVE A
UPGRADE TO ARC C & D STANDARDS BASELINE CONDITION

landing operations, both end's RSA and OFA limitations need to be considered.

As presented, Airfield Alternative A, or the baseline condition, would provide 4,242 feet of ASDA for Runway 14 and 4,152 feet of ASDA for Runway 32. These calculations consider the loss of 760 feet for southerly take-offs and 850 feet for northerly departures. For landing, both limitations apply, thus, the LDA for both runway ends would be 3,392 feet (calculated at 5,002 feet minus 760 feet and 850 feet).

Exhibit 4E also depicts the RPZs for Runways 14 and 32. The RPZs are sized for instrument approaches with visibility minimums not lower than one mile for ARC C/D-II aircraft. The RPZs have a 500-foot inner width, 1,010-foot outer width, and are 1,700 feet long (beginning 200 feet beyond the threshold). As depicted, most of the land in the RPZs is owned by the airport. Some additional properties would need to be acquired.

It should be noted that while this alternative considers baseline conditions, one improvement is proposed. The alternative would require the relocation of Lady Bird Drive. Allowing Lady Bird Drive to remain would require further displacement of the southern end (approximately 1,800 feet as opposed to only 760 feet). This alternative would result in a runway length available that would not accommodate some small aircraft. Thus, as a baseline condition, Lady Bird Drive would need to be relocated if the upgrade to ARC C/D-II is considered remotely feasible.

Advantages: This alternative would provide adequate RSA and OFA to meet ARC C/D-II standards, without substantial improvements and associated costs.

Disadvantages: The primary disadvantage of this alternative is the overall loss of operational length. While ARC C/D-II design standards are met, the resultant operational length of the runway would be unsuitable for most business jets. Moreover, utilizing declared distances in this manner can cause confusion and may not be supported by TxDOT or the FAA.

AIRFIELD ALTERNATIVE B

Depicted on **Exhibit 4F**, Airfield Alternative B proposes the extension of Runway 14-32 1,400 feet north. As discussed earlier, the runway should be extended to provide up to 6,400 feet, in order to meet the needs of future business jet operators.

The goal of this alternative would be to improve the northern RSA and OFA along with the extension. The alternative would keep the southern end of the runway in its current position, without improving the RSA and OFA obstructions to the south. Thus, this alternative would propose the 760-foot displacement of the Runway 32 landing threshold. Obviously, the outcome would be to modify only one end, thus, reducing overall costs associated with the alternative.

The property acquisition required by this alternative would include approximately 28 acres north of Tivydale Road and two acres of the golf course. Acquisition of land to the north would also include the relocation of at least one business (the Chuckwagon Inn) and two other facilities. The golf course acquisition would be only the area which would obstruct the RSA and would require the redesign or relocation of two golf holes. These improvements would likely cost millions of dollars, depending upon land prices, costs of acquiring or relocating the business and golf course holes.

As depicted, the alternative considers rerouting Tivydale Road around the residential area to the northeast and the RSA and OFA, then reconnecting to the northwest. It is estimated that rerouting the road would cost approximately $1.5 million. Another option for Tivydale Road would be to tunnel under, or bridge the runway over the road. It is estimated that this concept would cost nearly the same as rerouting the road.

The end result of Alternative B would be a runway that measures 6,400 feet long, however, providing less operational length due to the southern RSA and OFA limitations. As detailed in the previous alternative, the method of displacing the runway end to achieve adequate RSA and OFA artificially limits the operational length of the runway through the use of declared distances. As noted on the exhibit, this alternative would provide 5,640 feet of ASDA (take-off length) for Runway 14 and 6,400 feet for Runway 32. The LDA (landing length) for both runways would be 5,640 feet.

It is estimated that this alternative would cost at least $5 million to implement. This cost includes the property acquisition, rerouting Tivydale Road, relocation of business(es), modification of the golf course, extension of the runway and taxiway to the north, and relocation of Lady Bird Drive. This figure could increase upwards of $8-$10 million, depending upon the variability potential of property costs, business relocation costs, and golf course improvements. It should also be noted that some of the improvements would be eligible for TxDOT grant funding. Some items, however, would not be eligible, or would be eligible for lesser funds. For example, TxDOT may only be able to provide 50 percent of the funds necessary to relocate Tivydale Road. TxDOT would not likely fund the golf course improvements.

Advantages: The runway extension and southerly displacement proposed by this alternative allows the runway to meet ARC C/D-II design criteria. The operational length available for northerly departures would meet most business jet operational requirements. The landing length should be adequate for all aircraft except for extreme rain conditions.

Disadvantages: The primary disadvantage of the runway is the limit of an increased operational length for southerly departures. Typically, southerly departures, more common during hot weather, will require the

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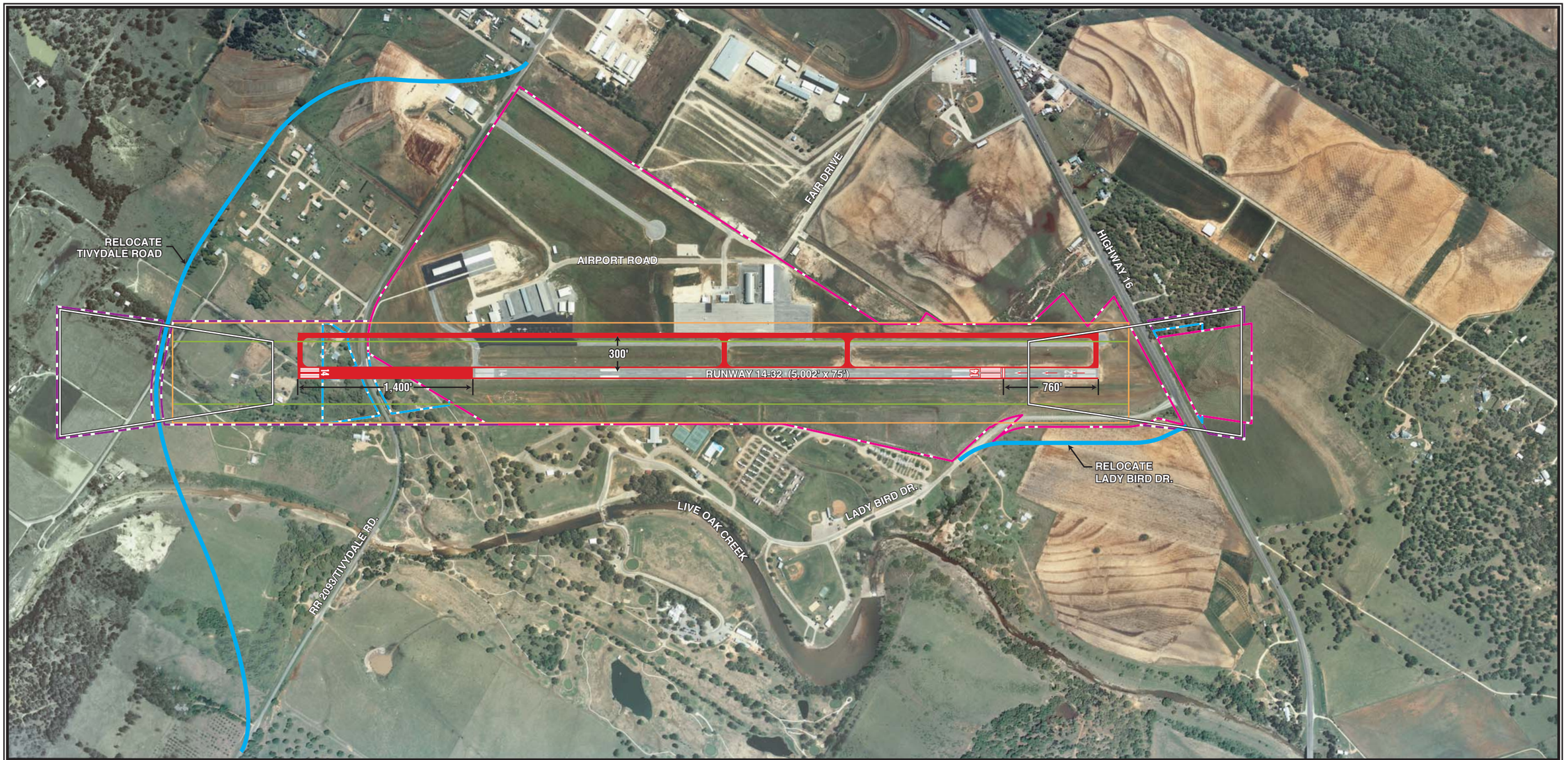

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)

DECLARED DISTANCES		
	Runway 14	Runway 32
Accelerate-Stop Distance Available (ASDA)	5,640'	6,400'
Landing Distance Available (LDA)	5,640'	5,640'

NORTH

0 800 1600

SCALE IN FEET

GILLESPIE COUNTY AIRPORT

Exhibit 4F
AIRFIELD ALTERNATIVE B
EXTEND RUNWAY 1,400' NORTH

longer operational lengths. The expenditures could outweigh the potential benefits.

AIRFIELD ALTERNATIVE C

Alternative C considers upgrading to ARC C/D-II standards while providing adequate runway length to accommodate these aircraft. Similar to Alternative B, this alternative proposes an extension in one direction only, however, this extension is to the south.

As depicted on **Exhibit 4G**, Alternative C considers extending Runway 14-32 1,400 feet south. To accomplish this plan, Highway 16 would need to be rerouted as depicted (or similar) on the exhibit. The rerouting would include the acquisition of land for, and the construction of, approximately 2.2 miles of new highway. The estimated cost for this relocation would be $3.2 million. In order to implement this extension, approximately 55 acres of land would need to be acquired. This would also include the acquisition of highway right-of-way and relocation of at least two homesteads. Property acquisition and homeowner relocation is estimated to cost at least $3 million under this alternative. Thus, the cost of rerouting the road and land acquisition to the south would be approximately $6.2 million. This figure would likely be similar if the highway were to be tunneled under the runway.

As with the previous alternatives, the implementation of declared distances would be necessary. In order to provide adequate RSA and OFA at the north end of the runway, the Runway 14 threshold would need to be displaced 850 feet. As a result, Runway 14 would provide 6,400 feet for ASDA, while Runway 32 would provide 5,550 feet of ASDA. The LDA for both runway ends would be 5,550 feet.

In total, including the runway extension (approximately $2.2 million), this alternative would cost approximately $8.4 million. Approximately $5 million would be eligible for grant-in-aid funding from TxDOT at the full 90/10 percentage split. The remainder would be at lower funding levels or ineligible for TxDOT aviation funding. Obviously, the highway relocation could be eligible for TxDOT highway funds.

A sub-alternative for Airfield Alternative C was also considered. Airfield Alternative C1 considers the same improvements at the south end of the runway, however, considers improving a portion of the northern RSA and OFA. This alternative considers providing as much OFA and RSA as feasible within the boundaries of Tivydale Road, as depicted on **Exhibit 4H**.

Alternative C1 considers acquiring and improving a portion of the golf course to be developed for RSA. As presented in Alternative B, this would require the modification of one hole and relocation of another.

This alternative would provide 700 feet of usable RSA and OFA to the north. Thus, only a 300-foot displacement of the Runway 14 landing threshold would be necessary. As a result, the ASDA for

Runway for Runway 14 would remain at 6,400 feet, while the ASDA for Runway 32 would improve to 6,100 feet. The LDA for both runway ends would improve to 6,100 feet. This sub-alternative would add approximately $1 million to the cost of Airfield Alternative C.

The added benefit of improving a portion of the northern RSA would be the increased operational length. It should be noted, however, with the 850-foot displacement proposed in Alternative C, the northernmost hangars could become obstructions. Sub-alternative C1 would remove these hangars as potential flight obstructions.

Advantages: This alternative would provide the needed runway length for the majority of ARC C/D-II aircraft the majority of the time. The operational length for southerly departures would be adequate for business jets during hot days. Sub-alternative C1 would remove the potential for the northern hangars to become flight obstructions, due to the 850-foot displacement proposed in Alternative C.

Disadvantages: This alternative would be very costly. While this alternative provides the needed requirements of ARC C/D-II aircraft, it would not be prudent to undertake without adequate justification.

AIRFIELD ALTERNATIVES SUMMARY

The analysis performed above considered several methods which attempt to provide additional runway length to meet increased demands by corporate aircraft. Alternative A, the baseline condition, should be rejected as it would provide adequate RSA and OFA, but would reduce operational length below the requirement of the aircraft it is intended to serve. The three remaining alternatives provide the only reasonable solutions.

Alternative B proposes a northerly extension to Runway 14-32. The extension would require rerouting Tivydale Road, acquisition of approximately 28 acres, relocation of at least one business, and the modification of the golf course. The alternative provides adequate take-off lengths to the north, however, southerly departures would be limited to 5,640 feet. Obviously, this is more than the current condition and would provide added length not available now. Southerly departures, however, typically require longer lengths, as southerly winds are predominant during hot weather conditions. Thus, the length could limit some business jet operations during hot days. This limitation devalues the alternative, especially when considering the potential costs of implementation.

Alternative C provides the best solution to upgrading the runway to ARC C/D-II standards, however, it would be costly. The alternative would require rerouting State Highway 16, substantial property acquisition and homeowner relocation, as well as the 1,400-foot runway/ taxiway extension. Imple-menting this alternative would be feasible, but, would take long term commitments and

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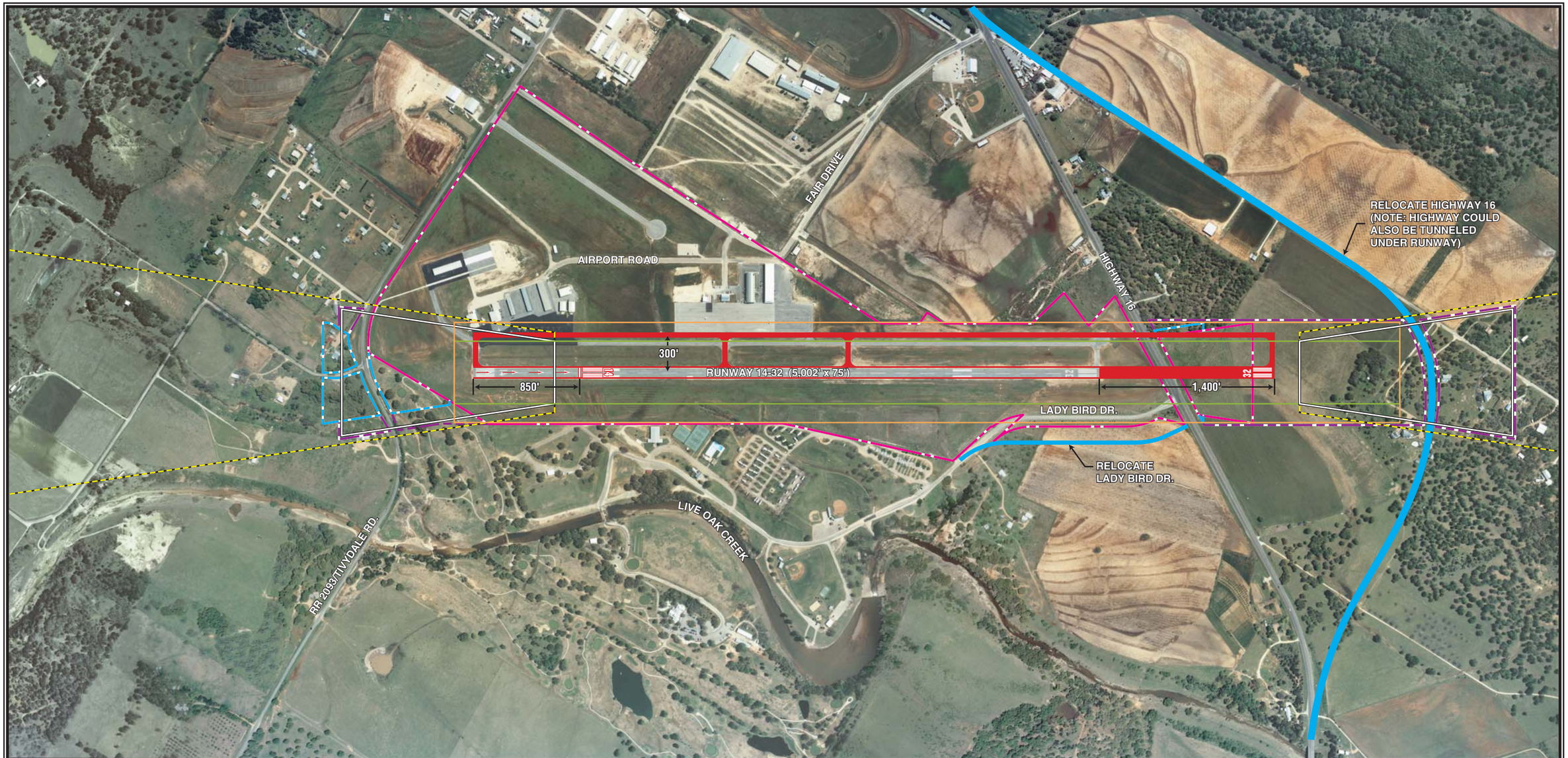

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Threshold Siting Surface

DECLARED DISTANCES		
	Runway 14	Runway 32
Accelerate-Stop Distance Available (ASDA)	6,400'	5,550'
Landing Distance Available (LDA)	5,550'	5,550'

NORTH

0 800 1600

SCALE IN FEET

Exhibit 4G
AIRFIELD ALTERNATIVE C
EXTEND RUNWAY 1,400' SOUTH/DISPLACE NORTH END 850'

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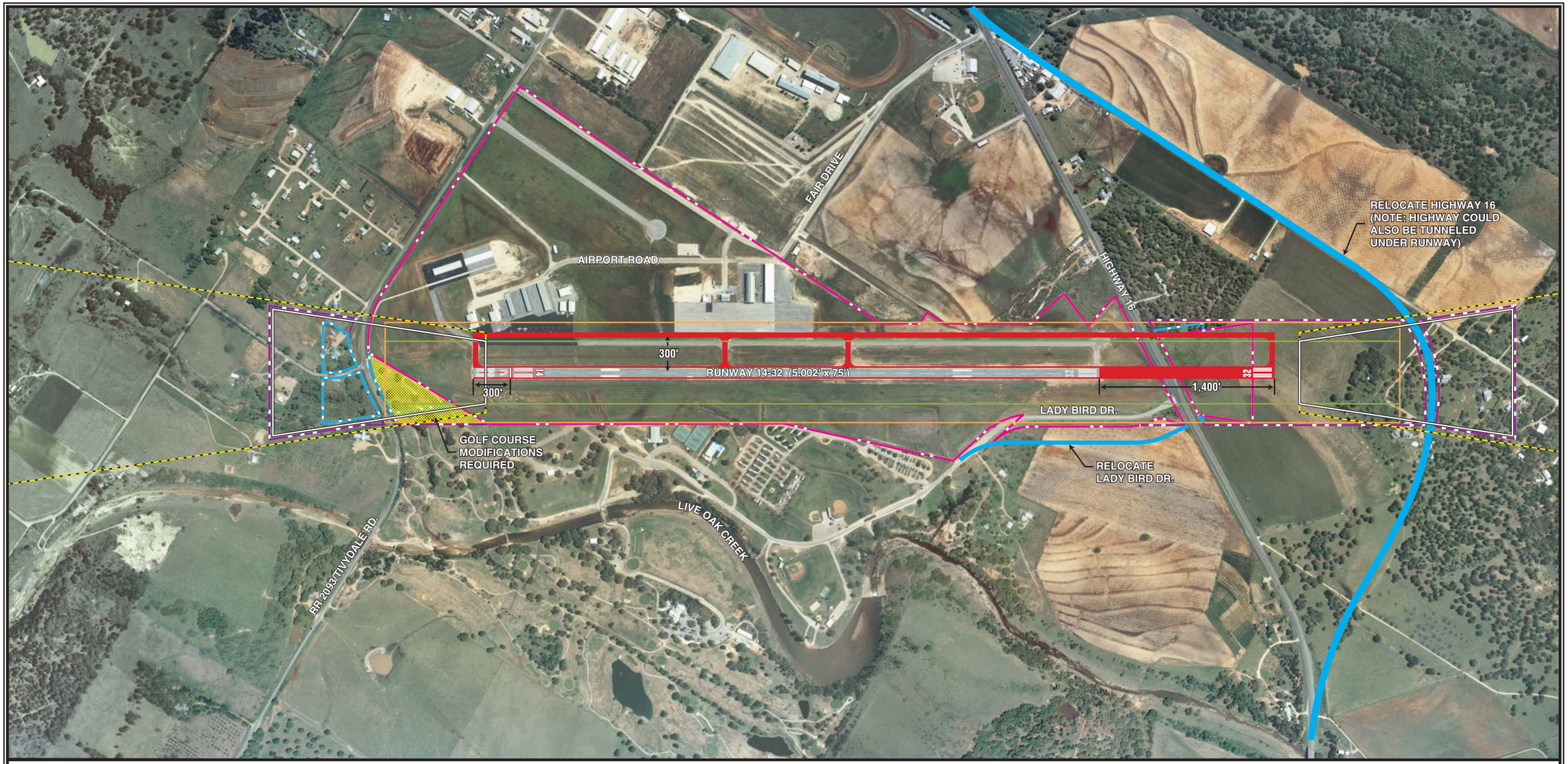

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Threshold Siting Surface

DECLARED DISTANCES		
	Runway 14	Runway 32
Accelerate-Stop Distance Available (ASDA)	6,400'	6,100'
Landing Distance Available (LDA)	6,100'	6,100'

NORTH

0 800 1600

SCALE IN FEET

GILLESPIE COUNTY AIRPORT

Exhibit 4H
AIRFIELD ALTERNATIVE C1
EXTEND RUNWAY 1,400' SOUTH/DISPLACE NORTH END 300'

federal, state, and political support. The resultant operational length would provide the best choice when factoring the longer southerly departure lengths. Sub-alternative C1 further improves operational length by providing more landing length and take-off length to the north. Moreover, Alternative C1 also removes the potential for the two northernmost hangars from becoming flight obstructions.

While these alternatives evaluate the potential to extend Runway 14-32 and improve the airfield to meet ARC C/D-II standards, they are very costly to implement. The cost of implementation should be carefully weighed versus the potential benefits achieved. Both Alternatives B and C (including C1) will provide runway lengths and safety factors which would directly benefit the business jet operators. However, without justification, these alternatives would likely face opposition from TxDOT and those who will be impacted.

The underlying assumption in the airfield alternatives evaluation is that the airport will transition to an ARC C/D-II airport in the future. If this is to happen, the County would need to consider implementing one of these alternatives to promote safety. If these alternatives prove to be unfeasible, the only options left for the County to consider would be to relocate the airport to another site or simply maintain ARC B-II standards. As mentioned previously, however, the option to relocate the airport would be undesirable, especially considering the significant investments made in the current facility.

The most prudent course of action that can be taken now by the County is to factor all of these alternatives while maintaining the current airport at ARC B-II design. The airport currently meets ARC B-II design with the exception of one tree (located on the adjacent golf course) and the northeastern perimeter fencing, which obstructs the current OFA.

Many airports across the country were developed originally to meet ARC B-II standards, which later, due to increases in operations, transitioned to ARC C/D-II design. A very good example of this is the Addison Airport, in the Dallas Metroplex. This airport is now extremely space limited and cannot fully conform to FAA standards. There are many other examples as well.

While the airport cannot ban aircraft from operating at the airport (due to FAA grant assurances), steps can be taken to advise aircraft operators of the airport limitations. For example, the airport could require that aircraft of a certain size request permission to operate at the airport. This is a common practice used by airports, for example, to advise aircraft operators of pavement strength limitations of their runway. As a result, the airport could advise larger aircraft operators that certain FAA standards for RSA or OFA are not provided, and that they would be operating at their own risk.

If the airport is to be increasingly utilized by corporate aircraft due to Boot Ranch or any other local attractant, the operators must decide whether to operate at the airport based

on current facilities. In some cases such as fractional ownership programs, these users could select smaller jets in ARC B-II. In other cases, these operators could accept the airport's limitations and choose to operate at the airport with ARC C/D-II aircraft. There is evidence that several operators utilizing C/D-II aircraft have operated at the airport on an infrequent basis in the recent past. In any event, the operator must choose to operate at the airport.

The County's options are clear. The airport could be maintained as an ARC B-II airport with limitations to ARC C/D-II design indicated in aviation publications. As a result, the operator of ARC C/D-II aircraft would need to decide if the airport is sufficient for their use. It should be noted that this option does not fully relieve the County from liability issues. A second option is for the County to upgrade the airport to ARC C/D-II standards at some point in the future, when demand dictates. Improving the airport to ARC C/D-II standards, once demand dictates, would remove any potential liability to the County, but would be costly. Finally, if the airport is utilized daily by ARC C/D-II aircraft and expansion of the facility to meet ARC C/D-II standards is not feasible, development of a new airport could be studied.

LANDSIDE ALTERNATIVES

The following section describes three landside development alternatives. These alternatives consider general aviation facility development providing separation of activity levels. The goal of this analysis is to indicate development potentials which would provide the County with a specific goal for future development. The resultant plan will aid the County in strategic marketing of available properties.

It should be noted that the three alternatives described below are not the only options for development. In some cases, a portion of one alternative could be intermixed with another. Also, some development concepts could be replaced with others. The final recommended plan only serves as a guide for the County. Many times, airport operators change their plan to meet the needs of specific users. The goal in analyzing landside development alternatives is to focus future development so that airport property can be maximized.

LANDSIDE ALTERNATIVE 1

Landside development proposed in this alternative utilized some previous terminal facility development planning as a reference. The development plan depicted on **Exhibit 4J** considers utilizing existing spaces available and acquiring additional property for future landside development.

Alternative 1 considers developing two conventional hangars (80-foot by 80-foot) facing south at the northeast corner of the main apron. This area would require the construction of an enlarged apron and could support three opposing executive hangar facilities (60-foot by 60-foot). To the north, seven additional T-hangars are proposed. These developments would be the only

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Exhibit 4J
LANDSIDE ALTERNATIVE 1

areas which could be readily developed without additional property acquisition.

This alternative plan does not include additional development in the vacant area north of the main ramp. This area has two significant development challenges. First, the area serves as a detention area for water run-off from areas to the east. Second, the area is significantly lower than the areas around it and would require substantial earthwork to bring the area up to grade. Thus, this alternative considers allowing this area to remain open for drainage purposes.

Once the available areas for development are used, additional development areas will be needed. The County is in the process of swapping land on the southwest with the City of Fredericksburg, for property immediately southeast of the Hangar Hotel Conference Center. This land swap would allow the City to develop additional park facilities (likely a soccer facility) in return for land which could be utilized by the airport for facility development. The only downfall with the land southeast of the Conference Center is that some of it is currently utilized for drainage purposes. Thus, if the area is to be developed for hangars, drainage improvements would be necessary.

The plan depicts additional hangar development south of the main ramp. The development would require the acquisition of three property parcels. First, the City-owned property previously discussed would be needed. Second, a portion of a large tract of land between the baseball fields and airport would need to be acquired. Lastly, the parcel which fronts Highway 16 needs to be acquired. This property is currently on the market for sale and the County should seriously consider acquiring it to protect for future development potential. If development of the southern properties is considered, additional drainage improvements would need to occur, as proposed on **Exhibit 4J**.

As depicted, Alternative 1 considers extending the main parking apron to the south. Four large conventional hangars could be developed along the extended ramp, as depicted. This development would require the construction of a new access road, also depicted. To the south of the main ramp, the alternative depicts two sets of corporate hangar developments. In total, the plan could provide for 16 executive hangars with apron and taxiway access. South of the corporate hangar facilities, T-hangars are proposed. The T-hangar area would be perpendicular to the runway (the most efficient layout) and could support up to 60 individual storage units.

The plan also considers future support facility improvements. Currently, the Automated Weather Observation System (AWOS) is located south of the main ramp. If improvements are made as proposed, the AWOS would need to be relocated. Alternative 1 considers relocating the AWOS to the northern portion of the terminal area. Also, the plan considers the installation of a bulk fuel storage location. The current facility could become undersized in the

future. As depicted on **Exhibit 4J**, the alternative proposes the placement of a bulk fuel storage facility southeast of the Conference Center, along Fair Drive. It is located on the land currently owned by the City and could be swapped to the County for land at the southwestern portion of the airport.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2 considers the other options for development of existing airport property and areas currently outside of airport property. **Exhibit 4K** depicts Landside Alternative 2.

Alternative 2 considers developing only corporate hangars in the area at the northern portion of the main ramp. As mentioned previously, this area, along with the undeveloped area near the recently constructed T-hangars, is the only area which is ready for development. This area could support the layout of seven executive hangars (60-foot by 60-foot) and supporting apron. The plan also includes the development of 17 similar executive hangars in the northern portion of the terminal area. This alternative proposal differs from Alternative 1, as it would forego additional T-hangar development in the northern terminal area.

Alternative 2 considers developing additional hangar facilities in the undeveloped drainage area to the north of the main ramp. As depicted, the alternative would allow for two large conventional hangars and associated ramp to be built in the northernmost portion of the area. In order to develop these facilities, significant earthwork/ fill would be required. The plan would also allow for the construction of a taxiway to traverse the area, providing access to the Airport Industrial Park.

To the south, the plan includes that another hangar facility, similar in size to the Hangar Hotel Conference Center, be placed opposite the existing facility. As depicted on **Exhibit 4K**, the alternative proposal includes extending the ramp south and around the planned facility, allowing for the development of two large conventional hangars which would be north-facing. Further south, a large apron supporting three conventional hangars is proposed.

Continuing south, Alternative 2 proposes the development of a corporate hangar complex supported by a single aircraft parking apron. This area could support 10 executive hangars. T-hangars, aligned parallel the runway, are proposed at the southernmost end of the proposed terminal area. The three facilities would provide 30 individual storage units.

As with the previous alternative, Alternative 2 proposes support facility improvements. The plan considers relocating the AWOS to the southwestern area of the airport. This area is located on the land considered to be swapped with the City. Bulk fuel storage is proposed for the northern portion of the terminal area.

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Exhibit 4K
LANDSIDE ALTERNATIVE 2

LANDSIDE ALTERNATIVE 3

Alternative 3, depicted on **Exhibit 4L**, would extend development to the north and south, including facilities in all activity levels. As with the previous alternatives, this plan first considers development at the northern portion of the airport and north of the main ramp. As depicted, the plan considers the development of a conventional hangar (100-foot by 100-foot) which would front the existing ramp. Behind and east of this hangar, three executive/ conventional hangars (80-foot by 80-foot) are proposed.

In the northern portion of the terminal area, the plan considers a mixed use of hangar facilities. As depicted on the exhibit, the plan would allow for four additional T-hangar facilities, providing 40 individual storage units. The plan also considers the development of 16 executive hangar facilities in this area.

The southern portion of the terminal area also considers mixed hangar facility development. The plan considers developing three executive hangars immediately south of the Hangar Hotel Conference Center facility. These hangars could be developed without additional land acquisition.

As with the previous alternatives, development of facilities on land to the south, not currently owned by the airport, would separate activity levels. First, a midfield terminal area could support three large conventional hangars and ramp. Further south of the proposed conventional hangars are six executive hangars and six T-hangar facilities.

Support facilities have also been considered. The AWOS in this plan could potentially remain at or near its current position. However, if required to be relocated by the FAA, the AWOS could be sited in the open area north of the main apron currently used for drainage detention. This alternative considers the location of a bulk fuel storage facility south of the overflow parking lot, between Fair Drive and Airport Road.

LANDSIDE SUMMARY

All three alternatives propose development which would exceed the demand levels proposed in this plan. Each does, however, give the County a future vision of what the airport could become. This vision is important as it shifts the focus from haphazard, build as-you-go development to a long-term, focused development process. As a result, the County will be capable of providing a first class airport which maximizes airport property.

It appears that all three development alternatives would sufficiently accommodate the long term development goals of the County. Actual demand levels will likely dictate facility development. For example, if the airport were required to house a large number of small aircraft, the decision to build (or allow private developers to build) T-hangars would be prudent. However, if corporate aircraft are more demanding, executive or

conventional hangar development would be necessary. The ultimate plan will provide the County the means to meet the future needs of these demands in an efficient manner.

SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long term requirements, as well as future growth potential. Current airport design standards were considered at every stage in the analysis. Safety, both air and ground, were given a high priority in the analysis of alternatives.

After review and input from the Planning Advisory Committee, County officials, and the public, a recommended concept will be developed by the consultant. The resultant plan will represent an airside facility that fulfills safety design standards, and a landside complex that can be developed as demand dictates. The development plan for Gillespie County Airport must represent a means by which the airport can evolve in a balanced manner, both on the airside and landside, to accommodate the forecast demand. In addition, the plan must provide for flexibility to meet activity growth beyond the long range planning horizon.

The following chapters will be dedicated to refining the basic concept into a final plan with recommendations to ensure proper implementation and timing for a demand-based program.

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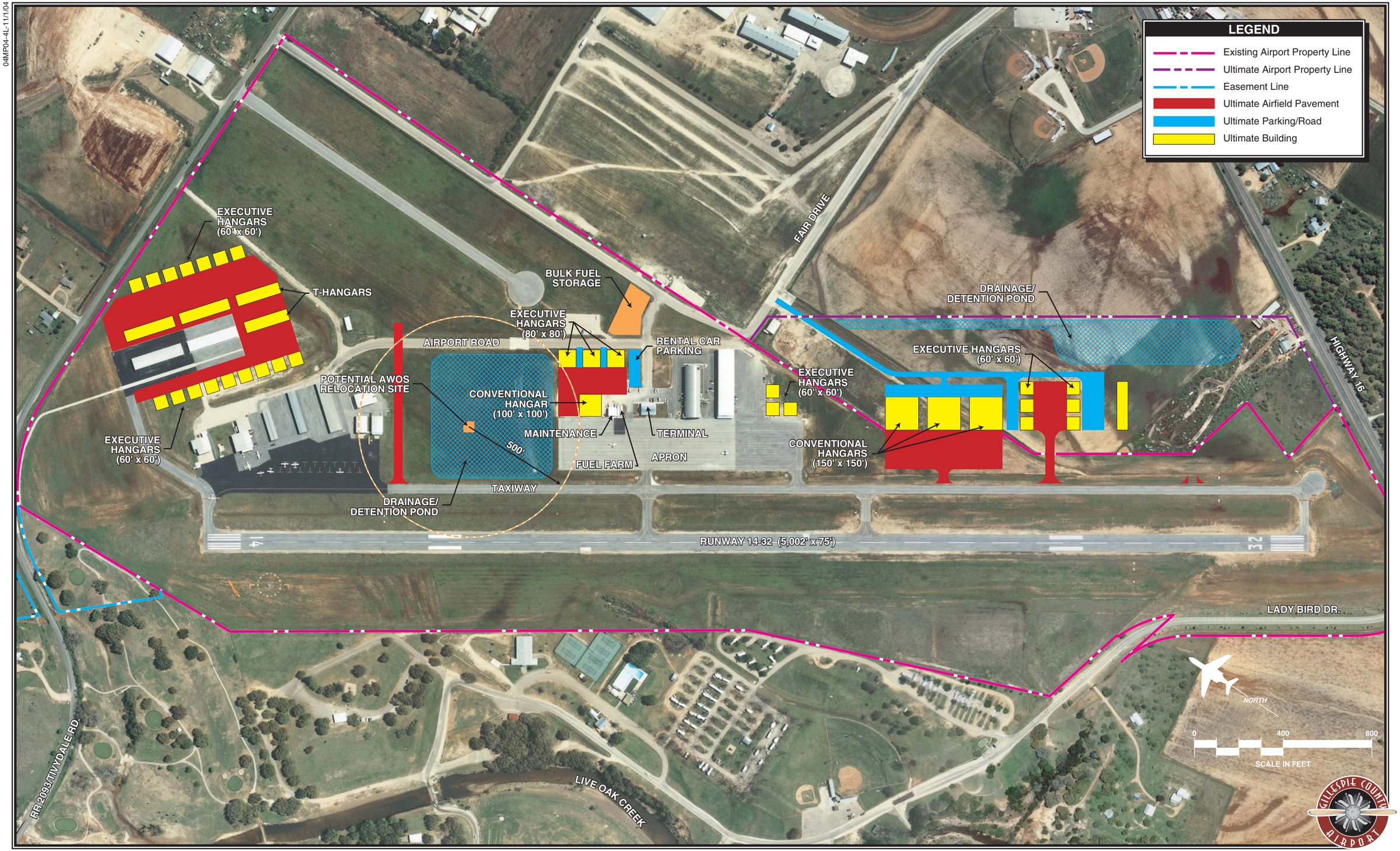

Exhibit 4L
LANDSIDE ALTERNATIVE 3

Chapter Five

AIRPORT PLANS

Chapter Five

AIRPORT PLANS

The airport master planning process has evolved through several analytic efforts in the previous chapters. These efforts intended to analyze future aviation demand, establish airside and landside needs, and evaluate options for the future development of the airport and its facilities.

In the previous chapter, several development alternatives were analyzed to explore different options for future growth and development of Gillespie County Airport. The development alternatives were refined into a single recommended concept for the master plan after receiving feedback from the Planning Advisory Committee (PAC) and the Airport Board. It is also possible that this concept could be further refined after the final review meeting with the PAC. This chapter describes, in narrative and graphic form, the recommended direction for the future use and development of Gillespie County Airport.

RECOMMENDED CONCEPT

Gillespie County Airport is currently served by a single runway oriented in a northwest/southeast manner. Runway 14-32 is 5,002 feet long by 75 feet wide. The airport's current critical aircraft, or the most demanding aircraft or grouping of aircraft operating at the airport more than 250 times annually, falls within airport reference code (ARC) B-II. This Federal Aviation Administration (FAA) design category includes all aircraft with approach speeds up to 120 knots and wingspans up to but not including 79 feet. Thus, the airport should be planned and designed, at a minimum, to meet ARC B-II design standards to meet the needs of the current design aircraft.

The previous chapter outlined several development alternative concepts which were aimed specifically at meeting FAA criteria for ARC C/D-II aircraft. This design standard applies to airports with a critical aircraft, or grouping of similar aircraft, with approach speeds ranging between 121 and 140 knots, with wingspans up to, but not including 79 feet. These aircraft typically represent the larger aircraft in the corporate fleet.

Analysis in Chapters Two and Three discussed the possibility of business jet aircraft operating at the airport with increased regularity in the future. A contributing factor to a projected increase in business jet activity is the Boot Ranch development. Boot Ranch will include a golf resort and upscale residential development. It is anticipated that this development will attract significant business jet activity to Gillespie County Airport. More importantly, however, the City of Fredericksburg is a tourist destination, and as such, serves as an attractant for business jet aircraft operations at the airport. As a result, the alternative development concepts were examined as an attempt to determine if the airport could be upgraded to ARC C/D-II standards. The alternative analysis, however, indicated significant obstacles to upgrading the airport.

The most significant change required when upgrading the airport design was a need for a longer runway and the associated increase to the runway safety area (RSA) and object free area (OFA) dimensions. Under the current ARC B-II design, the FAA requires that the airport provide a 150-foot wide RSA and 500-foot wide OFA, both extending 300 feet beyond the runway ends. For ARC C/D-II, the dimensions increase to a required width of 500 feet for RSA and 800 feet for OFA, both extending 1,000 feet beyond the runway ends. Coupling these upgraded safety area standards with the proposed runway length of 6,400 feet results in an alternative that would extend the airfield area requirements beyond the current property boundaries.

The airport is bound on the north by Tivydale Road and the Lady Bird Johnson Golf Course and to the south by Texas State Highway 16. These constraints effectively limit any runway or safety area extensions for Runway 14-32, without significant modifications. It should be noted that the current RSA at the north end of the runway does not meet FAA design standards. The golf course limits the available RSA at the north end to approximately 150 feet, half of the FAA requirement.

The alternative evaluations in the previous chapter considered both northerly and southerly extensions of the runway to meet future business jet runway length requirements. The analysis concluded that a southerly extension may be more feasible than a northerly extension. A northerly extension would require the acquisition and modification of a portion of the golf course, substantial earthwork to improve the topography north of the airport, re-routing of Tivydale Road (with associated impacts), and the acquisition and relocation of at least two businesses and a homestead. Moreover, if the northerly extension

were pursued, the southern end of the runway would not readily meet FAA design criteria for ARC C/D-II standards.

As presented in Airfield Alternative B in the previous chapter, a northerly extension coupled with an upgrade to ARC C/D-II standards would require the southernmost 760 feet of the runway to be used as RSA. Thus, northerly departures would be effectively limited to an operational length of 5,640 feet, even though the pavement would measure 6,400 feet. At Gillespie County Airport, southerly operational flow is more common, especially during hot conditions, due to predominant wind patterns. Jet aircraft require longer runway lengths during hot weather conditions. Therefore, the northerly extension alternative would not sufficiently accommodate these aircraft. As a result, the benefits associated with the northerly extension would be minimized, while the costs would be substantial. In fact, the alternative would not likely be supported by a benefit/cost analysis.

The southerly extension proposed by the master plan development concept depicted on **Exhibit 5A** will require substantial improvements. As depicted, the proposed 1,400-foot southerly extension would extend across State Highway 16. At this time, the recommended plan considers bridging the highway. It is important to note that this bridge will need to span the entire runway safety area (500 feet) and the parallel taxiway to the east. The estimated bridge span would be 650 feet. As a result, Highway 16 would route through a "tunnel" beneath the runway.

The alternative evaluation in the previous chapter considered re-routing the highway; however, re-routing the highway could pose a greater impact to land owners in the area. Also, re-routing the highway could be more costly and difficult to implement, as it would require substantial involvement from the local community and the Texas Department of Transportation (TxDOT).

Many airports in communities similar to Gillespie County are experiencing a shift in use. Corporate aircraft activity is the fastest growing trend in aviation at this time. For this reason, it is prudent to analyze the airport's future capabilities to meet the needs of these aircraft. Increased business jet use at Gillespie County Airport appears at this time to be a certainty. Once the demand dictates, the County will need to thoughtfully consider undertaking the recommended plan.

Given the significant physical, financial, and political constraints, the alternative to upgrading the airport to meet ARC C/D-II standards will not occur without substantial improvements undertaken through commitments and partnerships with Gillespie County, the City of Fredericksburg, TxDOT, and the FAA. As outlined in the previous chapter, however, the remaining alternatives are less appealing.

If ARC C/D-II aircraft become more frequent, the County must examine and

decide upon one of three choices. The most obvious choice is to do nothing, but not without risk. To do nothing could pose significant safety concerns and liability issues. The second option would be to build a new airport. This choice is less appealing as it would mean the loss of substantial improvements (both public and private) in the existing facility, as well as the additional costs of building a new airport. Building a new airport could cost nearly twice as much as the development proposed in this study. Finally, the County could choose to meet the needs of business jet operators by implementing the recommended plan (or a modification of the proposed plan). Given the negative potential economic and financial impacts of the first two options, the ultimate plan should, at a minimum, support continued airport improvement.

The finalized concept provides for both anticipated facility needs over the next twenty years, as well as for some facility needs beyond the planning period. The following sections summarize specific airside and landside recommendations included in the final concept. The recommended concept is shown on **Exhibit 5A**.

AIRFIELD DESIGN STANDARDS

The FAA and the TxDOT - Aviation Division have established design criteria to define the physical dimensions of runways and taxiways and the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, FAA and TxDOT design criteria primarily center around the airport's critical design aircraft. Factors included in airport design are an aircraft's wingspan, approach speed and, in some cases, the runway approach visibility minimums. The FAA has established the ARC to relate these factors to airfield design standards.

As previously discussed, Gillespie County Airport is presently used by a wide range of general aviation aircraft. The majority of these aircraft include single and multi-engine aircraft which fall into ARC A-I and B-I categories. In addition, larger business turboprop and turbojet aircraft that fall within approach categories B, C, and D and airplane design groups (ADGs) I and II use the airport on a less frequent basis.

Analysis conducted in Chapter Three, Facility Requirements, concluded that Gillespie County Airport's current critical design aircraft are those aircraft ranging up to ARC B-II. As previously discussed, the airport will likely be increasingly utilized by business jets in the future. For this reason, the airport design standards will be planned to conform to full ARC C/D-II standards.

The recommended concept, shown on **Exhibit 5A**, includes recommendations provided on Airfield Alternative C, as presented in the previous chapter. Of primary consideration, this alternative considers a 1,400-foot southerly

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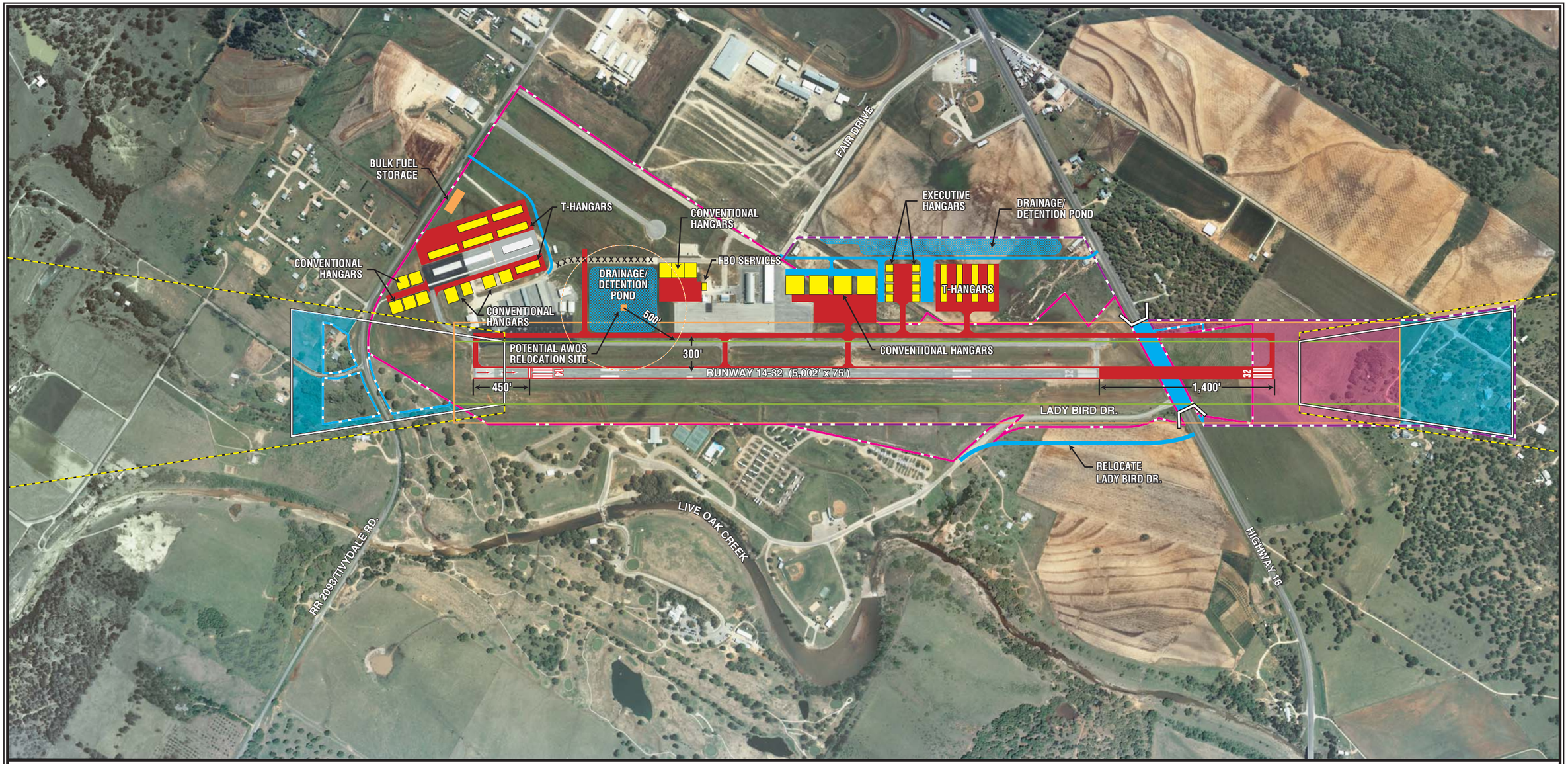

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Threshold Siting Surface
- Property Acquisition Required for Runway Extension (Fee Simple)
- Property Easement Required for RPZ (ARC C/D-II)
- Ultimate Airfield Pavement
- Ultimate Parking/Road
- Ultimate Building

DECLARED DISTANCES		
	Runway 14	**Runway 32**
Accelerate-Stop Distance Available (ASDA)	6,400'	5,550'
Landing Distance Available (LDA)	5,950'	5,550'

NORTH

0 800 1600

SCALE IN FEET

GILLESPIE COUNTY AIRPORT

Exhibit 5A
MASTER PLAN CONCEPT

extension to meet the needs of ARC C/D-II business jets during hot days. As a result, the plan includes an ultimate runway length of 6,400 feet. This extension will allow the runway to provide additional operational length for business aircraft with heavy loads.

The southerly extension will require substantial improvements. As previously mentioned, the extension would cross State Highway 16. The plan considers bridging the highway. The proposed bridge would need to extend at least 650 feet long to encompass the RSA and parallel taxiway. Moreover, the existing runway gradient would need to be modified.

As depicted on **Exhibit 5B**, the southern end of the runway generally slopes down to the last several hundred feet, where it slopes upward. The upward slope was necessary to maintain adequate obstruction clearances over Highway 16. The proposed plan includes reconstruction of the southernmost 1,500 feet of the runway in order to maintain a reasonable runway gradient. Without modification, the runway would have a large hump which could pose safety concerns. Moreover, the land south of Highway 16 is significantly lower than the existing runway end. The plan includes filling the area with approximately 430,000 cubic yards of dirt to maintain adequate runway gradient.

The proposed plan also includes modifying the northern runway end. As previously mentioned, the golf course northwest of the runway effectively limits the existing RSA to 150 feet north of the runway. For this reason, the Runway 14 threshold is planned to be displaced by 450 feet.

As detailed in the previous chapter, the FAA and TxDOT require adequate RSA both prior to and beyond the runway end. For landings, both RSAs are required, while only the area beyond the runway end is required for take-offs. It should be noted that the FAA has recently changed the RSA requirement for the required area prior to the landing threshold. Previously, the RSA for ARC C/D-II extended 1,000 feet both prior to and beyond the far end of the runway. The change requires only 600 feet of RSA prior to the landing threshold. Therefore, for Runway 14 landings, the proposed 450-foot displacement coupled with the existing 150 feet of available RSA provides the necessary 600 feet of RSA for Runway 14 landing operations. It should be noted that the FAA still requires the full 1,000 feet of RSA beyond the far end of the runway. Thus, only 5,550 feet of operational length will be available for Runway 32 for both take-off and landing.

Exhibit 5A presents the proposed declared distances for the recommended development concept. The accelerate stop distance available (ASDA) is the operational length available for takeoff with full RSA beyond the far end of the runway. The landing distance available (LDA) is the operational length available for landings with full RSA prior to and beyond the far end of the runway. For Runway 14, the ASDA

would be the entire length of the runway, while the LDA would be reduced by 450 feet, or 5,950 feet in length. For Runway 32, however, only 150 feet of RSA is available beyond the northern runway end. Thus, the LDA and ASDA for Runway 32 are reduced by 850 feet, for an operational length of 5,550 feet.

Upgrading to ARC C/D-II design will also require the widening of Runway 14-32. The plan considers first reconstructing the southernmost 1,500 feet of the runway while also widening the entirety of the runway to 100 feet. A 100-foot wide runway is required to meet ARC C/D-II design. Also, the plan considers upgrading the runway's pavement strength to 60,000 pounds single wheel gear loading (SWL) and 100,000 dual wheel gear loading (DWL). This strength would be more suitable to meet increasing business jet operations.

The recommended development concept includes several taxiway improvements. Runway 14-32 is currently served by a full-length parallel taxiway. The parallel taxiway is located 240 feet east of the runway (centerline to centerline). FAA and TxDOT design standards stipulate that the parallel taxiway be located no closer than 300 feet (centerline to centerline) for ARC C/D-II design. The ultimate plan considers the relocation of the taxiway to 300 feet from the runway centerline. Relocating the taxiway and upgrading to ARC C/D-II standards will require relocating the two executive hangars at the northern portion of the terminal area. Obviously, the ultimate plan considers extending the parallel taxiway to the proposed end of the runway. Also, the plan includes the installation of taxiway lighting.

The design of taxiway and apron areas must also consider the critical aircraft identified for Gillespie County Airport. Primary consideration is given to the wingspan of the most demanding aircraft to operate at the airport. The parallel and connecting taxiways, transient apron areas, and aircraft maintenance areas have all been designed to accommodate aircraft within ADG II, wherever appropriate. **Table 5A** summarizes airport design criteria for both the current and future critical aircraft.

As previously mentioned, analysis in prior chapters indicated that plans should be made to upgrade the instrument approach capabilities of the airport. Currently, Gillespie County Airport is served by straight-in RNAV (GPS) approaches to both runway ends. These approaches, however, preclude approach category D aircraft. The ultimate plan considers straight-in GPS approaches providing not lower than one mile visibility minimums for both runway ends for general aviation aircraft through ARC D-II. Implementing approaches to both runway ends would ensure that the airport would be capable of remaining open most of the time.

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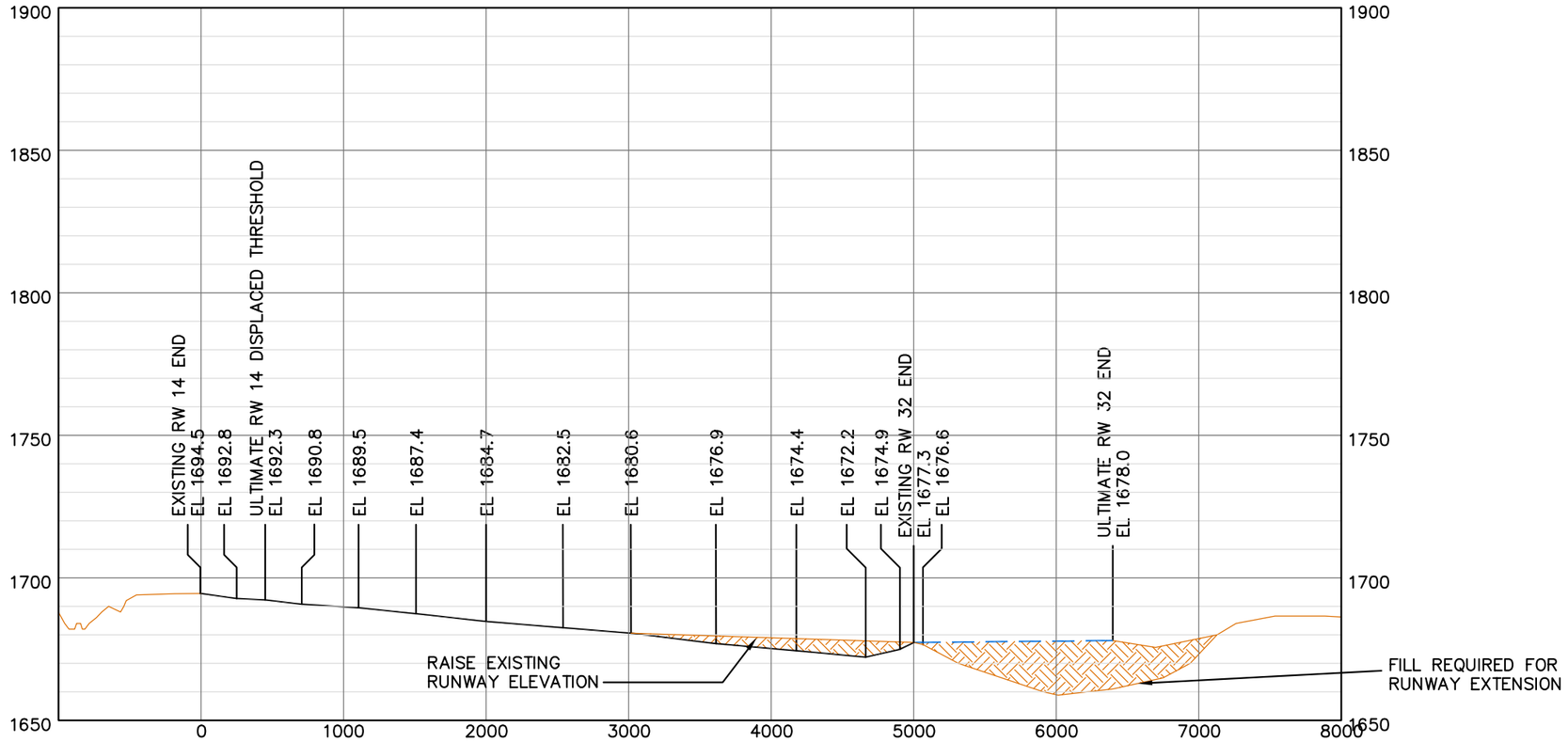

RUNWAY 14–32 PROFILE

HORIZONTAL SCALE
1" = 1000'

VERTICAL SCALE
1" = 50'

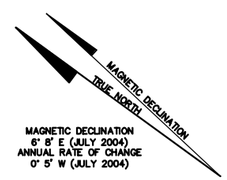

Exhibit 5B
RUNWAY 14-32 PROFILE

TABLE 5A
Airfield Planning Design Standards (Ultimate)
Gillespie County Airport

	Existing Runway 14-32	Ultimate Runway 14-32
DESIGN STANDARDS		
Airport Reference Code (ARC)	***B-II***	***C/D-II***
Runways		
Length (ft.)	5,000	6,400
Width (ft.)	75	100
Pavement Strength (lbs.)		
Single Wheel (SWL)	30,000	60,000
Dual Wheel (DWL)	n/a	100,000
Shoulder Width (ft.)	10	10
Runway Safety Area		
Width (ft.)	150	500
Length Beyond Runway End (ft.)	300	1,000
Object Free Area		
Width (ft.)	500	800
Length Beyond Runway End (ft.)	300	1,000
Obstacle Free Zone		
Width (ft.)	400	400
Length Beyond Runway End (ft.)	200	200
Taxiways		
Width (ft.)	35	35
OFA (ft.)	131	131
Centerline to Fixed or Movable Object (ft.)	66	66
Runway Centerline to:		
Parallel Taxiway Centerline (ft.)	240	300
Aircraft Parking Area (ft.)	400	400
Building Restriction Line (ft.)		
20 ft. Height Clearance	390	390
35 ft. Height Clearance	495	495
Runway Protection Zones		
Inner Width (ft.)	500	500
Outer Width (ft.)	700	1,010
Length (ft.)	1,000	1,700
Approach Slope (Threshold siting surface requirement)	20:1	20:1

Proposed Property Acquisition

Development proposed in the recommended concept would require some property acquisition while acquisition of other properties would be recommended. **Exhibit 5C** presents areas proposed to be acquired for future airside or landside development.

In the near future, Gillespie County and the City of Fredericksburg plan to swap some property in the airport environs. The airport owns a triangular piece of property at the southwestern corner of the airport, immediately adjacent the Lady Bird Johnson Park. The City of Fredericksburg owns a rectangular piece of property immediately south of the Hangar Hotel Conference Center. The plan includes the swap of these two property parcels. The swap will allow the City to develop additional park facilities such as soccer fields, while the airport would be allowed additional landside development areas. These areas are identified with yellow shading on **Exhibit 5C**.

The plan also includes additional property acquisition immediately south of the land being obtained from the City. The plan considers the acquisition of approximately 25 acres of land in the southeastern portion of the airport. This land should be acquired to protect for incompatible uses, but more importantly, to provide additional landside development opportunities.

The airside recommendations will require additional property acquisitions to the north and south of the runway. To the north, the current avigation easements would not be adequate to cover the planned runway protection zone (RPZ). The current RPZ and associated avigation easements consider an RPZ corresponding to an ARC B-II design. The RPZ would increase in size, as depicted in **Exhibit 5C**, for ARC C/D-II design. The FAA and standards for RPZs would require the County to obtain property rights, either in the form of an avigation easement or in fee simple. The FAA and TxDOT would prefer fee simple acquisition of properties in the RPZ, but avigation easements are acceptable. Avigation easements give the County the rights of certain airspace over a given property. The height is limited in such a manner that approaches and departures will not be obstructed by future development in the approach. In addition, development that would encourage a congregation of people in the RPZ would be prohibited. The County has implemented height and hazard zoning around the airport. It was completed in 1979 and was developed for other than utility aircraft and a 3,800-foot runway. Obviously, this needs to be updated.

The runway extension project would require a minimum property acquisition of approximately 25 acres, as depicted on **Exhibit 5C**. This area is needed for the runway/taxiway system as well as the associated RSA and OFA. Further south, the remaining approximately 20 acres could be obtained as avigation easement, although fee simple acquisition would be preferred. It should be noted that the southern proposed property acquisition is the minimum amount needed to implement the proposed runway extension. It is very likely that the acquisition area would be much larger. At least one

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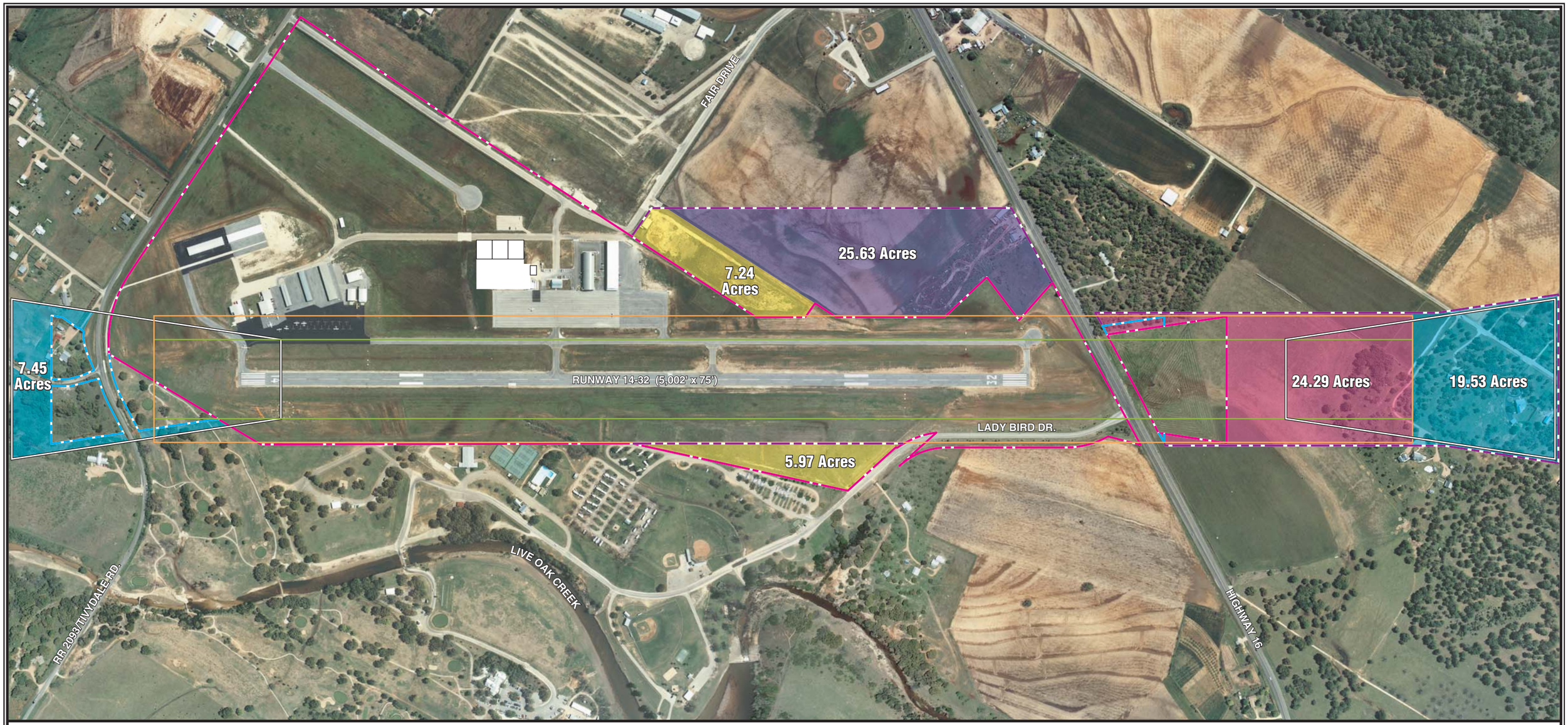


LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Minimum Property Acquisition Required for Runway Extension
- Property Easement Required for RPZ (ARC C/D-II)
- Property Acquisition for Future Landside Development
- Property Exchange with City

NORTH

0 600 1600

SCALE IN FEET

Exhibit 5C
PROPOSED PROPERTY ACQUISITIONS

home/business, which operates as a bed and breakfast, would need to be acquired. Much of this property falls outside the minimum property acquisition area. The acquisition could require obtaining the owner's entire property parcel, not simply the minimum area depicted on the exhibit.

LANDSIDE

Landside development included in this plan considers vacant area in the existing terminal areas north of the terminal building and new development to the south. The primary goal of landside facility planning is to provide adequate space while also maximizing operational efficiencies and land uses. Achieving this goal yields a development scheme which segregates aircraft users (large vs. small aircraft) while maximizing the airport's revenue potential.

Exhibit 5A depicts the recommended landside development plan for the airport. The development concept proposes the layout of an airport fixed base operator (FBO) adjacent the terminal building. This area could provide for FBO offices and four 100-foot by 100-foot hangars, as depicted. This development is currently under construction by the existing airport FBO. The FBO also plans to construct additional fueling facilities which could be located at the northern portion of the airport, as depicted in the exhibit.

Additional conventional hangars are planned south of the Hangar Hotel Convention Center facility. As proposed, the southern end of the existing ramp could support one 150-foot by 150-foot conventional hangar. The plan considers extending the ramp south to provide support for up to three additional conventional hangars. The conventional hangars would likely house additional airport businesses and/or corporate flight departments. This area would be served by a new airport road which connects directly to State Highway 16.

Further south, executive hangars are planned. The plan would require that the City deed this property to the airport. As depicted, the corporate hangar development area could house six 60-foot by 60-foot executive hangars and include the associated roads, automobile parking, and aircraft parking apron. It should be noted that prior to developing this area, additional drainage improvements would likely be required. Additional executive hangar construction is also planned in the northeastern corner of the airport. As depicted, the plan could support the construction of nine additional executive hangars in this area.

As depicted in **Exhibit 5A**, the plan considers the development of additional T-hangar facilities northeast of the existing T-hangars. The proposed T-hangar plan could support an additional five T-hangar facilities, providing at least 50 individual storage units. T-hangars are also proposed in the southern portion of the terminal area. This plan could support four T-hangar facilities, or 40 individual storage units. To support this development, utilities would need to be extended, taxilanes constructed, and the new airport road would need to be completed.

The plan also considers the development of a taxiway leading from the parallel taxiway, east to the Airport Industrial Park. This taxiway would support the needs of operators in the industrial park which desire airfield access. The proposal, however, would require the closure of the existing airport access road. As a result, the plan considers the development of a new airport access road providing access to the northern hangar facilities from Tivydale Road.

The landside development plan would require the relocation of the Automated Weather Observation System (AWOS). As depicted on **Exhibit 5A**, the recommended concept proposes the relocation of the AWOS to a drainage area north of the terminal building. This location is not ideal, as it could be obstructed by hangar facilities. In general, the FAA requires a cleared area around the AWOS of 500 feet. The antenna, however, may be elevated to accommodate the hangar locations. At this time, it appears that the infield area would be the most suitable location for the relocated AWOS.

The ultimate landside plan exceeds the needs of this 20-year planning effort. Consideration of facility development beyond the scope of this planning effort will, however, provide the County with a vision which will yield a first-class aviation facility capable of maintaining revenues which exceed operational costs. It should be noted that the development of all facilities should consider aesthetics a high priority. The airport is often the first and last impression a corporate decision-maker has of the community. Consideration should always be given to the development of facilities which meet aviation demand while presenting a positive image to all users.

AIRPORT LAYOUT PLAN SET

Per FAA and TxDOT requirements, an official Airport Layout Plan (ALP) has been developed for Gillespie County Airport and can be found at the end of this chapter. The ALP drawing graphically presents the existing and ultimate airport layout. The ALP is used by the FAA and TxDOT to determine funding eligibility for future development projects.

The ALP was prepared on a computer-aided drafting (CAD) system for future ease of use. The digital plan set provides detailed information of existing and future facility layout on multiple layers that permit the user to focus in on any section of the airport at a desired scale. The plan can be used as base information for design and can be easily updated in the future to reflect new development and more detail concerning existing conditions, as made available through design surveys.

A number of related drawings which depict the ultimate airspace and landside development will be included with the ALP once the draft master plan concept detailed in this chapter is finalized. The following provides a brief discussion of the additional drawings to be included with the ALP.

AIRPORT LAYOUT PLAN

The airport layout plan drawing depicts all proposed development on the airport. It is a digital copy of the recommended development concept depicted on **Exhibit 5A**. The plan can then be utilized by engineers to develop further engineering design documents.

OBSTRUCTION SURVEY DRAWING

The obstruction survey drawing (OSD) is a new requirement as a part of the ALP drawing set. It is a visual representation of the topography and obstructions within the runway end environment. The OSD is developed for any runway currently served or planned to be served by an instrument approach procedure.

The OSD includes the evaluation of three critical surfaces: the obstruction identification surface (OIS), the primary surface, and the threshold siting surface (TSS). As depicted on the drawings, the current and planned approaches consider non-precision type approaches with not lower than one mile visibility minimums. It appears that both runway ends have penetrations to the approach surfaces. The extension of Runway 32 should include the removal of all potential flight obstructions. For Runway 14, tree trimming may be necessary. Ultimately, upgrading to ARC C/D-II standards will require the relocation of the northern hangars, as they will become obstructions (numbers 61 and 62 on the drawing).

INNER PORTION OF THE APPROACH SURFACE PLANS

The Inner Portion of the Approach Surface Plan drawing is a scaled drawing of the RPZ, RSA, OFZ, and OFA for each runway end. A plan and profile view of each RPZ is provided to facilitate identification of obstructions that lie within these safety areas. Detailed obstruction and facility data is provided to identify planned improvements and the disposition of obstructions.

PROPERTY MAP

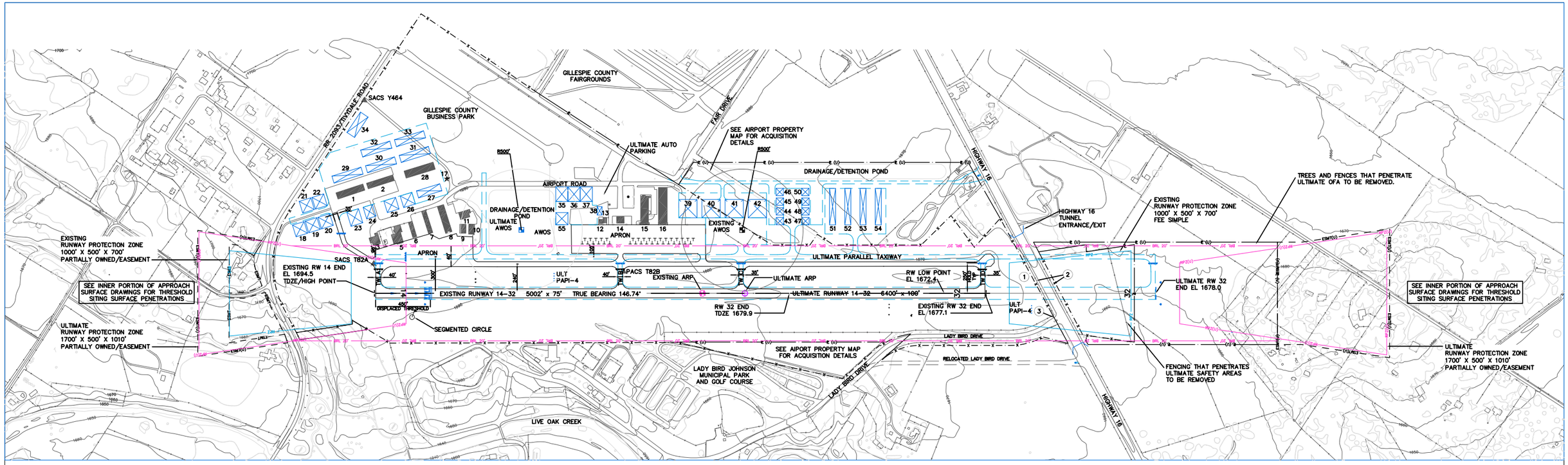
The Property Map provides information on the acquisition and identification of all land tracts under control of the airport.

SUMMARY

The recommended master plan concept has been developed in conjunction with the Planning Advisory Committee, Gillespie County, and the local citizens, and is designed to assist the County in making decisions on future development and growth of Gillespie County Airport. This plan provides the necessary development to accommodate and satisfy the anticipated growth over the next twenty years and beyond.

Flexibility will be very important to future development at the airport. Activity projected over the next twenty years may not occur as predicted. The

plan has attempted to consider demands that may be placed on the airport even beyond the twenty-year planning horizon, to ensure that the facility will be capable of handling a wide range of circumstances. The recommended plan provides the County with a general guide that, if followed, can maintain the airport's long term viability and allow the airport to continue to provide air transportation services to the region.



BUILDING TABLE

BLDG. #	DESCRIPTION EXISTING	DESCRIPTION ULTIMATE	TOP ELEVATION
1	T-HANGAR	NA	1708.6'
2	T-HANGAR	NA	1707.2
3	EXECUTIVE HANGAR	NA	1718.9'
4	SELF-SERVE FUEL ISLAND	NA	1702.7'
5	EXECUTIVE HANGAR	NA	1716.5'
6	T-HANGAR	NA	1705.6'
7	T-HANGAR	NA	1707.0'
8	T-HANGAR	NA	1708.9'
9	EXECUTIVE HANGAR	NA	1711.2'
10	EXECUTIVE HANGAR	NA	1710.6'
11	EXECUTIVE HANGAR	NA	1718.3'
12	MAINTENANCE	NA	1699.5'
13	FUEL FARM	NA	1691.7'
14	TERMINAL	NA	1708.5'
15	HANGAR HOTEL	NA	1718.5'
16	DINER	NA	1713.6'
17	ROTATING BEACON	NA	1740.4'
18	N/A	CONVENTIONAL HANGAR	1713.0'
19	N/A	CONVENTIONAL HANGAR	1713.0'
20	N/A	CONVENTIONAL HANGAR	1713.0'
21	N/A	CONVENTIONAL HANGAR	1713.0'
22	N/A	CONVENTIONAL HANGAR	1713.0'
23	N/A	CONVENTIONAL HANGAR	1713.0'
24	N/A	CONVENTIONAL HANGAR	1713.0'
25	N/A	CONVENTIONAL HANGAR	1712.5'
26	N/A	CONVENTIONAL HANGAR	1712.0'
27	N/A	CONVENTIONAL HANGAR	1711.5'
28	T-HANGAR	NA	1711.5'
29	N/A	T-HANGAR	1713.0'
30	N/A	T-HANGAR	1713.0'
31	N/A	T-HANGAR	1712.5'
32	N/A	T-HANGAR	1712.5'
33	N/A	T-HANGAR	1712.0'
34	N/A	BULK FUEL STORAGE	1712.5'
35	N/A	CONVENTIONAL HANGAR	1704.0'
36	N/A	CONVENTIONAL HANGAR	1704.0'
37	N/A	CONVENTIONAL HANGAR	1704.0'
38	N/A	CONVENTIONAL HANGAR	1704.0'
39	N/A	FBO	1704.9'
40	N/A	CONVENTIONAL HANGAR	1703.0'
41	N/A	CONVENTIONAL HANGAR	1701.5'
42	N/A	CONVENTIONAL HANGAR	1701.5'
43	N/A	CONVENTIONAL HANGAR	1701.5'
44	N/A	CONVENTIONAL HANGAR	1698.0'
45	N/A	CONVENTIONAL HANGAR	1698.0'
46	N/A	CONVENTIONAL HANGAR	1698.0'
47	N/A	CONVENTIONAL HANGAR	1698.0'
48	N/A	CONVENTIONAL HANGAR	1698.0'
49	N/A	CONVENTIONAL HANGAR	1698.0'
50	N/A	CONVENTIONAL HANGAR	1698.0'
51	N/A	T-HANGAR	1694.0'
52	N/A	T-HANGAR	1694.0'
53	N/A	T-HANGAR	1694.0'
54	N/A	T-HANGAR	1694.0'
55	N/A	CONVENTIONAL HANGAR	1704.5'

ULTIMATE ELEVATIONS WILL VARY DUE TO FINAL GRADING AND DRAINAGE PLAN

LEGEND

	EXISTING	ULTIMATE
RUNWAY/TAXIWAY OUTLINE		
BUILDINGS/FACILITIES		
AIRPORT PROPERTY LINE		
AWOS		
AIRPORT REFERENCE POINT (ARP)		
EASEMENT		
WIND CONE AND SEGMENTED CIRCLE		
THRESHOLD LIGHTS		
AIRPORT BEACON	★	N/A
FENCE LINE		N/A
FENCE LINE PROPERTY		N/A
TELEPHONE/POWER POLE LINE		N/A
RWY END IDENTIFIER LIGHT (REIL)	N/A	
BUILDING RESTRICTION LINE (BRL)	N/A	BRL 20'
GROUND CONTOURS	1670	N/A
TREES/BRUSH		N/A
HOLD POSITION AND SIGN		
SURVEY MARKERS		N/A

AIRPORT DATA TABLE

	RUNWAY 14-32 EXISTING	RUNWAY 14-32 ULTIMATE
AIRPORT ELEVATION (MSL)	1694.5'	1694.5
AIRPORT NAVIGATION AIDS	VOR/DME, GPS	VOR/DME, GPS
AIRPORT VISUAL AIDS	PAPI-2 ROTATING BEACON	PAPI-4 REILS ROTATING BEACON
MEAN MAX TEMP (Hottest Month °F)	95°	95°
AIRPORT REFERENCE CODE (ARC)	B-II	C-II
RUNWAY GRADIENT	0.26%	0.26%
TAXIWAY MARKING	STD W/℄ REF	STD W/℄ REF
TAXIWAY LIGHTING	NONE	MITL
WND COVERAGE (%)	98.53%	99.83%
AIRPORT REFERENCE POINT COORDINATES	30°14'35.67" 098°54'33.07"	30°14'29.89" 098°54'28.70"

ALL EXISTING COORDINATES AND ELEVATIONS SUPPLIED BY ASIS DATASHEET SYSTEM, http://avnwww.jccbi.gov/datasheet/.

ALL REFERENCE DATUM NAD 83 HORIZONTAL, NAVD 88 VERTICAL

RUNWAY DATA TABLE

	EXISTING 14-32	ULTIMATE 14-32
RUNWAY LENGTH & WIDTH (ft.)	5002' X 75'	6400' X 100'
PAVEMENT DESIGN STRENGTH (lbs.)	30,000 (SW)	60,000 (SW)
RUNWAY LIGHTING	MIRL	MIRL
RSA - LENGTH BEYOND RW END	300'	1000'
RSA - WIDTH	150'	500'
OFA - LENGTH BEYOND RW END	300'	1000'
OFA WIDTH	500'	800'
OFZ - LENGTH BEYOND RW END	200'	200'
OFZ WIDTH	250'	400'
RUNWAY END	**14 / 32**	**14 / 32**
RUNWAY MARKING	NPI / NPI	NPI / NPI
RUNWAY VISUAL AIDS	PAPI-2 ROTATING BEACON / PAPI-2 ROTATING BEACON	PAPI-4 REIL / PAPI-4 REIL
APPROACH VISIBILITY MINIMA	1 MILE / 1 MILE	1 MILE / 1 MILE
TOUCHDOWN ZONE ELEVATION	1694.5' / 1681.5'	1694.5' / 1679.0'
TAKE-OFF RUN AVAILABLE (TORA)	5002' / 5002'	6400' / 6400'
TAKE-OFF DISTANCE AVAILABLE (TODA)	5002' / 5002'	6400' / 6400'
APPROACH STOP DISTANCE AVAILABLE (ASDA)	5002' / 5002'	6400' / 5950'
LANDING DISTANCE AVAILABLE (LDA)	5002' / 5002'	5950' / 5950'

CAUTION ZONE LIGHTS ARE PRESENT AT GILLESPIE COUNTY AIRPORT

RUNWAY END COORDINATES AND ELEVATIONS

	LATITUDE	LONGITUDE	ELEVATION
EXISTING RWY 14 END	30°14'56.37"	98°54'48.71"	1694.5'
EXISTING RWY 32 END	30°14'14.97"	98°54'17.44"	1677.1'
ULTIMATE RWY 14 END	30°14'56.37"	98°54'48.71"	1694.5'
ULTIMATE RWY 14 DISPLACED THRESHOLD	30°14'52.65"	98°54'45.89"	1692.3'
ULTIMATE RWY 32 END	30°14'03.41"	98°54'08.70"	1678.0'

ALL EXISTING COORDINATES AND ELEVATIONS SUPPLIED BY ASIS DATASHEET SYSTEM, http://avnwww.jccbi.gov/datasheet/.

ALL REFERENCE DATUM NAD 83 HORIZONTAL, NAVD 88 VERTICAL

GENERAL NOTES

SURVEY MAPPING PERFORMED APRIL 26-27, 2004 BY GEODETIX, INC., SAN ANTONIO, TX.

THE EXISTING HEIGHT HAZARD ZONING ORDINANCE FOR THIS AIRPORT WAS ADOPTED ON 23 FEBRUARY 1979. ZONED 3800' x 75', OTHER THAN UTILITY, NPI.

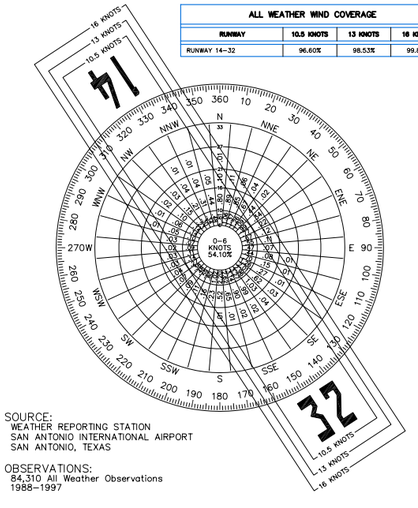
EXISTING AND ULTIMATE THRESHOLD SITING SURFACE PENETRATIONS SHOWN ON INNER PORTION OF APPROACH SURFACE DRAWINGS

ALL EXISTING COORDINATES AND ELEVATIONS SUPPLIED BY ASIS DATASHEET SYSTEM, http://avnwww.jccbi.gov/datasheet/.

ALL REFERENCE DATUM NAD 83 HORIZONTAL, NAVD 88 VERTICAL

OBSTACLE FREE ZONE PENETRATIONS TABLE

NO.	OBJECT	REMEDIATION
1	HIGHWAY 16	CONSTRUCT HIGHWAY TUNNEL
2	FENCE	TO BE REMOVED
3	LADY BIRD DRIVE	TO BE RELOCATED

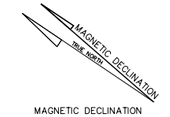


ALL WEATHER WIND COVERAGE

RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 14-32	96.60%	98.53%	99.83%

SOURCE:
WEATHER REPORTING STATION
SAN ANTONIO INTERNATIONAL AIRPORT
SAN ANTONIO, TEXAS

OBSERVATIONS:
84,310 All Weather Observations
1988-1997



MAGNETIC DECLINATION
5° 48' E (JUNE 2006)
ANNUAL RATE OF CHANGE
0° 7' W (MAR 2006)

0 400 800 1600
GRAPHIC SCALE

TEXAS DEPARTMENT OF TRANSPORTATION AVIATION DIVISION

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TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

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Coffman Associates
Airport Consultants
www.coffmanassociates.com

M. Dmyterko	June 2006	DESIGNED BY — DATE
D. Hopkins	June 2006	DRAWN BY — DATE
J. Harris	June 2006	CHECKED BY — DATE

AIRPORT LAYOUT DRAWING
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation Aviation Division

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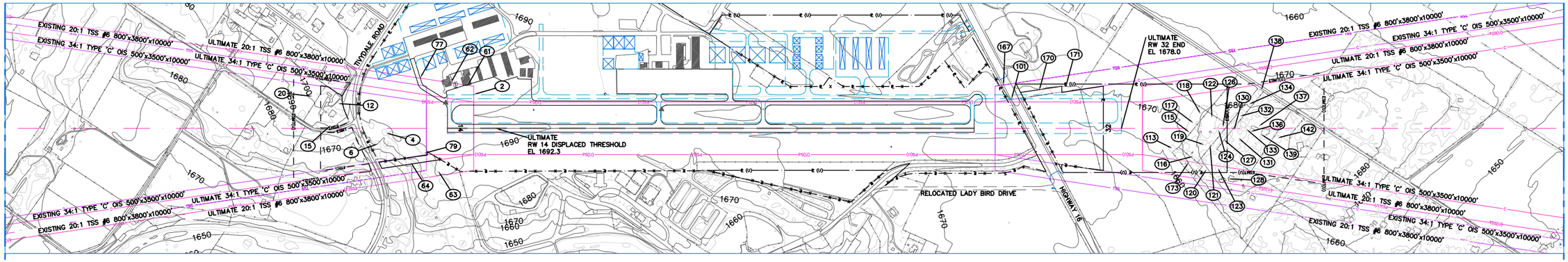
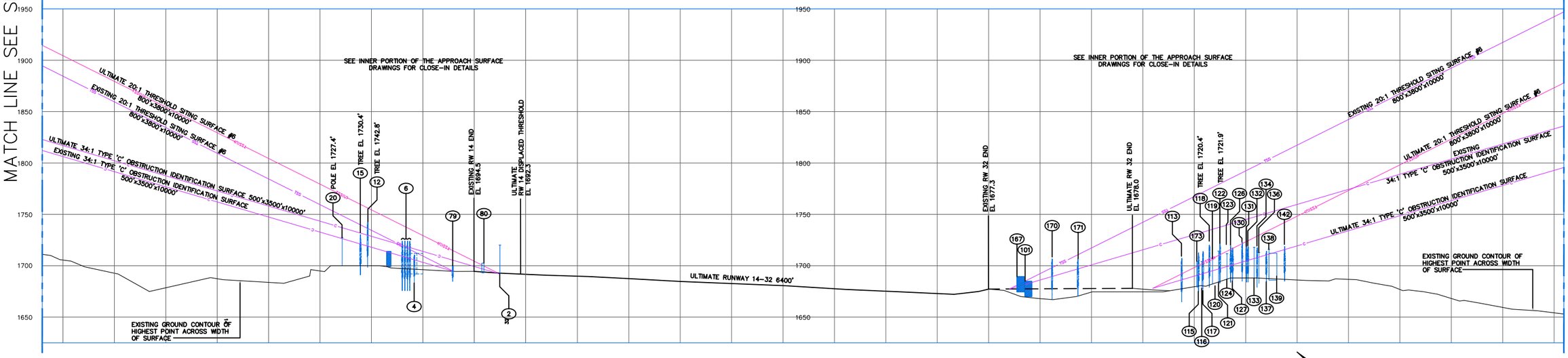


RUNWAY 14–32 PLAN



RUNWAY 14–32 PROFILE

MATCH LINE SEE SHEET 3

MATCH LINE SEE SHEET 4

OBSTRUCTION TABLE

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	Ex OIS Penetration	Ex 20:1 TSS Penetration	Ult OIS Penetration	Ult 20:1 TSS Penetration	Primary Surf Penetration
2	TAXIWAY	−250.0 E/200.0 U	231.4 L	1720.1	N/A	N/A	19.7	27.8	N/A
4	TREE	581.9 E/1031.9 U	47.4 R	1710.8	5.1	NONE	5.1	NONE	N/A
6	TREE	624.8 E/1074.8 U	161.2 R	1724.3	17.3	8.6	17.3	NONE	N/A
12	TREE	1036.3 E/1486.3 U	231.4 L	1742.8	23.7	6.5	23.7	NONE	N/A
15	TREE	1106.8 E/1556.8 U	21.5 L	1730.4	9.2	NONE	9.2	NONE	N/A
20	POLE	1283.7 E/1733.7 U	300.4 L	1727.4	1.0	NONE	1.0	NONE	N/A
61	BLDG	−198.1 E/252.7 U	408.0 L	1716.5	N/A	N/A	N/A	21.6	N/A
62	BLDG	−35.2 E/414.6 U	432.2 L	1718.9	N/A	N/A	N/A	15.9	N/A
63	TREE	83.7 E/533.6 U	414.5 R	1717.8	N/A	N/A	N/A	8.8	N/A
77	TAXIWAY	257.0 E/712.9 U	495.0 L	1719.9	N/A	N/A	N/A	2.0	N/A
89	TREE	209.7 E/659.7 U	231.1 R	1717.3	22.5	22.3	N/A	2.0	N/A
101	HIGHWAY 16	351.3 E/−1046.7 U	274.0 R	1685.0	3.2	0.1	N/A	N/A	N/A
103	HIGHWAY 16	493.9 E/−904.1 U	0.0	1681.5	NONE	NONE	N/A	N/A	13.5
104	TREE	483.6 E/−914.4 U	178.9 L	1681.0	22.8	16.9	N/A	N/A	NONE
108	FENCE	1100.0 E/−298.0 U	0.0	1664.3	NONE	NONE	N/A	N/A	4.8
113	TREE	1877.8 E/479.8 U	194.0 L	1707.3	NONE	NONE	21.1	15.3	N/A
115	TREE	2041.3 E/643.3 U	41.1 L	1712.8	NONE	NONE	21.8	12.6	N/A
116	POLE	2074.8 E/676.8 U	275.7 L	1704.2	NONE	NONE	12.2	2.4	N/A
117	TREE	2085.1 E/687.1 U	47.7 R	1714.0	NONE	NONE	21.7	11.6	N/A
118	TREE	2147.1 E/749.1 U	137.3 R	1720.4	NONE	NONE	26.3	14.9	N/A
119	POLE	2177.6 E/779.6 U	158.2 L	1707.2	NONE	NONE	12.2	0.2	N/A
120	TREE	2203.4 E/805.4 U	398.2 L	1716.9	NONE	NONE	21.1	8.6	N/A
121	POLE	2238.1 E/840.1 U	167.9 L	1714.3	NONE	NONE	17.5	4.3	N/A
122	TREE	2250.1 E/852.1 U	91.2 L	1721.9	NONE	NONE	24.7	11.3	N/A
124	POLE	2318.7 E/920.7 U	19.5 L	1711.8	NONE	NONE	12.6	NONE	N/A
126	TREE	2335.4 E/937.4 U	10.0 R	1719.1	NONE	NONE	19.4	4.2	N/A
127	TREE	2367.7 E/969.7 U	111.6 L	1717.5	NONE	NONE	16.9	1.0	N/A
130	TREE	2467.2 E/1069.2 U	19.8 L	1722.5	NONE	NONE	18.9	1.0	N/A
131	TREE	2509.9 E/1111.9 U	96.9	1718.9	NONE	NONE	14.1	NONE	N/A
132	TREE	2523.5 E/1125.5 U	111.3 R	1717.7	NONE	NONE	12.5	NONE	N/A
133	POLE	2583.0 E/1185.0 U	11.9 L	1717.9	NONE	NONE	10.9	NONE	N/A
134	TREE	2611.2 E/1213.2 U	221.4 R	1717.8	NONE	NONE	10.0	NONE	N/A

OBSTRUCTION TABLE

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	Ex OIS Penetration	Ex 20:1 TSS Penetration	Ult OIS Penetration	Ult 20:1 TSS Penetration	Primary Surf Penetration
136	POLE	2629.5 E/1231.5 U	33.4 L	1717.5	NONE	NONE	9.2	NONE	N/A
137	TREE	2702.0 E/1304.0 U	19.8 L	1722.5	NONE	NONE	3.7	NONE	N/A
138	POLE	2726.8 E/1328.8 U	357.3 R	1716.0	NONE	NONE	4.8	NONE	NONE
139	BLDG	2727.6 E/1329.6 U	64.3 L	1712.2	NONE	NONE	1.0	NONE	NONE
142	TREE	2879.0 E/1481.0 U	96.2 L	1718.9	NONE	NONE	3.2	NONE	NONE
163	HIGHWAY 16	376.0 E/−1022.0 U	228.2 R	1683.7	1.4	NONE	NONE	NONE	9.5
170	TREE	619.2 E/−778.8 U	228.2 R	1706.8	17.4	8.8	NONE	NONE	NONE
171	TREE	868 E/−530 U	364.3 R	1703.7	7.0	NONE	NONE	NONE	NONE
173	WINDMILL	2027.7 E/629.7 U	320.6 L	1704.3	NONE	NONE	13.7	4.8	NONE

ELEVATIONS ADJUSTED UPWARD 10' FOR PRIVATE ROADS; 15' FOR PUBLIC ROADWAYS.

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM AN APPROACHING AIRCRAFT.

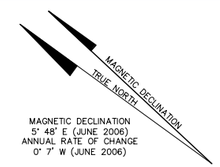
GENERAL NOTES:

1. AN 405 OBSTRUCTION SURVEY TYPE "D" WAS PERFORMED APRIL 26–27, 2004 BY GEODETIX, INC., SAN ANTONIO, TX.
2. THE EXISTING HEIGHT HAZARD ZONING ORDINANCE FOR THIS AIRPORT WAS ADOPTED ON 23 FEBRUARY 1979. RUNWAY 14–32 4600' x 75', ZONED 3800' OTHER THAN UTILITY, NPI.

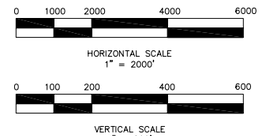
I hereby certify that the information provided herein has been compiled from field surveys conducted under my direct supervision and that said information complies with the areas, obstruction identification surfaces (OISs), obstruction selection criteria, and accuracy requirements of FAA No. 405, "Standards for Aeronautical Surveys and Related Products" (including Change 1, effective April 15, 1998) for the type of survey being performed.

Surveyor's Name: _____

Surveyor's License #: _____ Affix Seal:



MAGNETIC DECLINATION
5° 48' E (JUNE 2006)
ANNUAL RATE OF CHANGE
0° 7' W (JUNE 2006)



TEXAS DEPARTMENT OF TRANSPORTATION AVIATION DIVISION

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DIRECTOR, AVIATION DIVISION — DATE

AIRPORT SPONSOR

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TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

SIGNATURE — DATE

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(602) 993-6999, Fax (7196)

Coffman Associates
Airport Consultants
www.coffmanassociates.com

M. Dmyterko	June 2006
DESIGNED BY	DATE
D. Hopkins	June 2006
DRAWN BY	DATE
J. Harris	June 2006
CHECKED BY	DATE

SURVEY DRAWING: TYPE C SURVEY
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation Aviation Division

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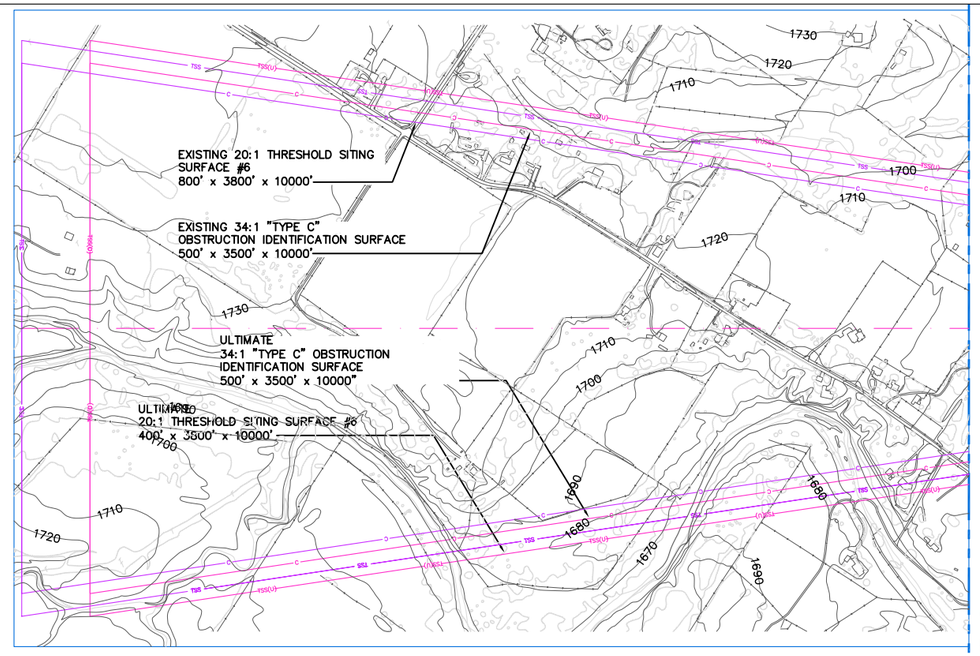
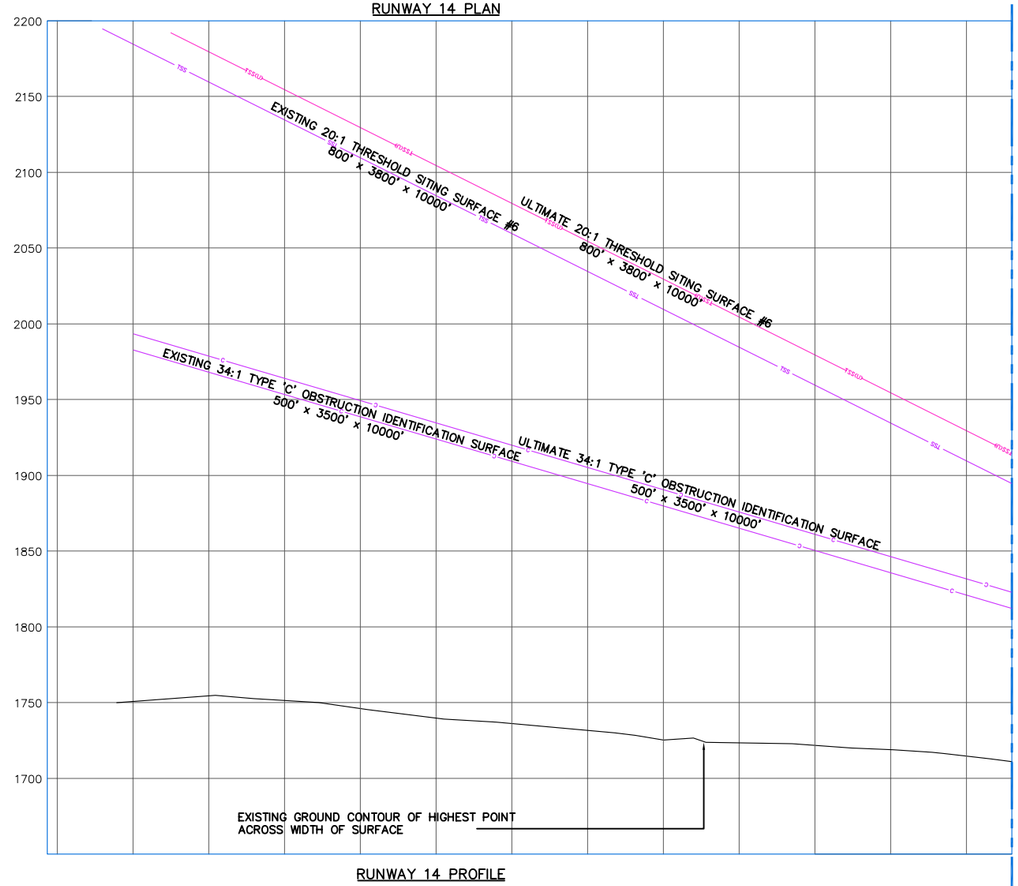


RUNWAY 14 PLAN



RUNWAY 14 PROFILE

MATCHLINE SEE SHEET 2

Obstruction Table

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	OIS Penetration	20:1 TSS Penetration	Primary Surf Penetration
	NONE						

GENERAL NOTES:

1. AN 405 OBSTRUCTION SURVEY TYPE "D" WAS PERFORMED APRIL 26-27, 2004 BY GEODETIX, INC., SAN ANTONIO, TX.
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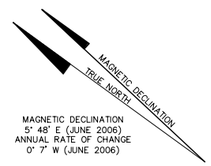

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5° 48' E (JUNE 2006)
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Surveyor's Name: _____

Surveyor's License #: _____ Affix Seal:

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M. Dmyterko	June 2006
DESIGNED BY	DATE
D. Hopkins	June 2006
DRAWN BY	DATE
J. Harris	June 2006
CHECKED BY	DATE

SURVEY DRAWING: TYPE C SURVEY
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation
Aviation Division

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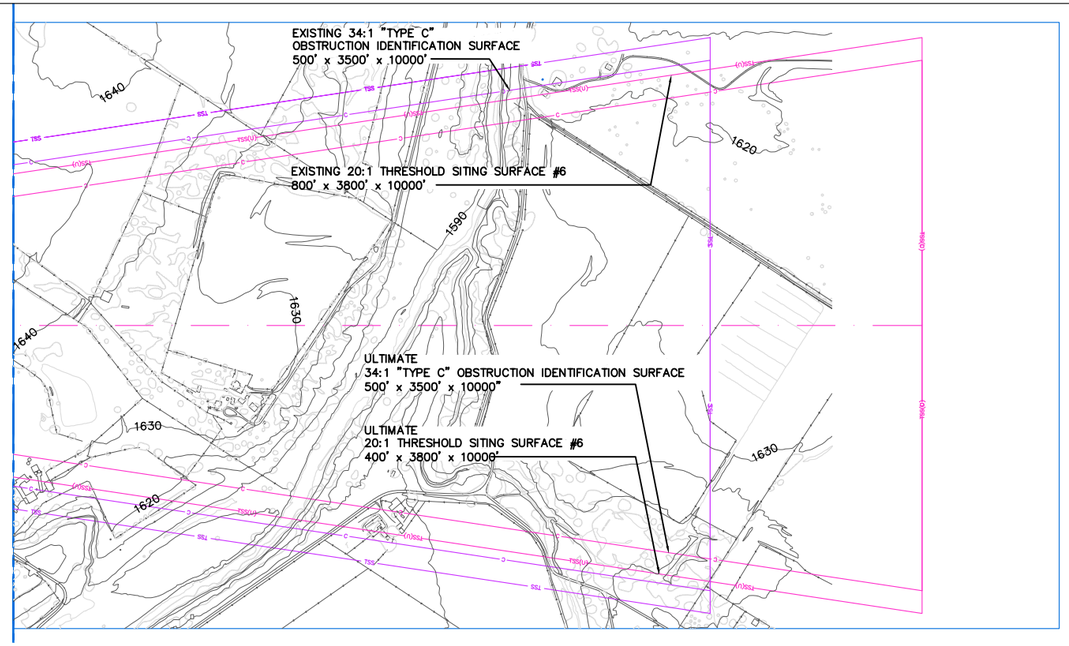
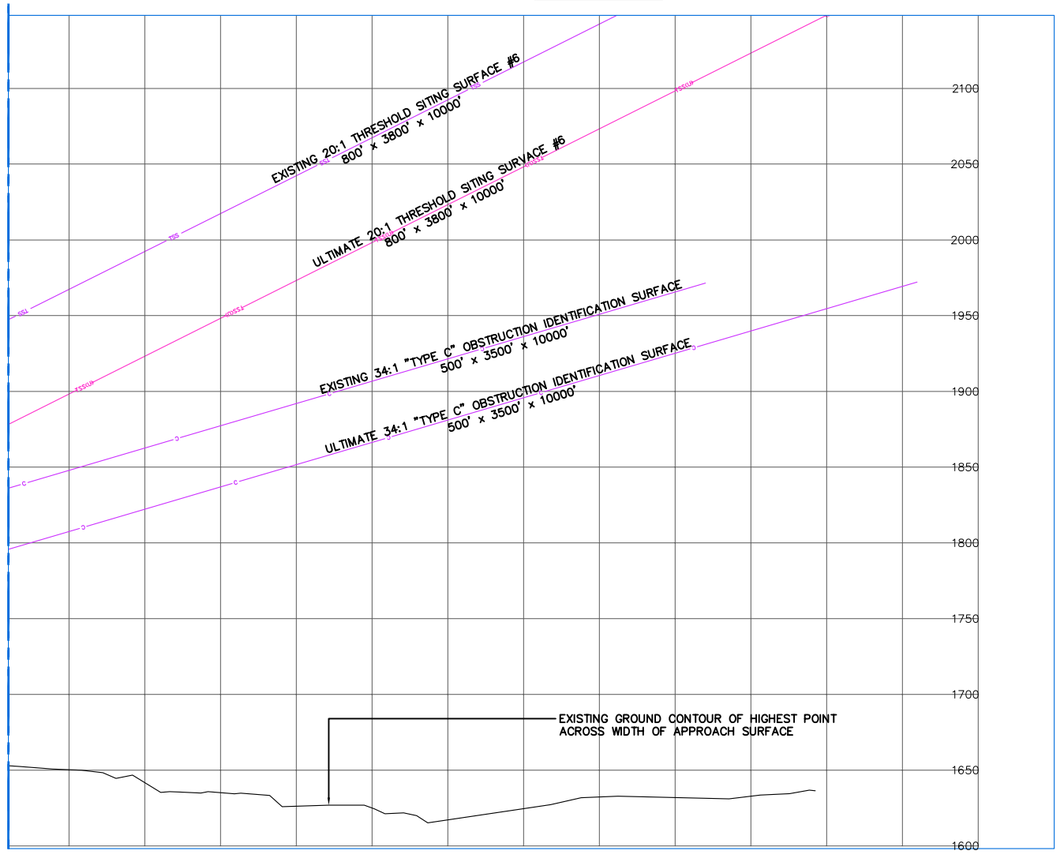


RUNWAY 32 PLAN

MATCHLINE SEE SHEET 2



RUNWAY 32 PROFILE

Obstruction Table

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	OIS Penetration	20:1 TSS Penetration	Primary Surf Penetration
	NONE						

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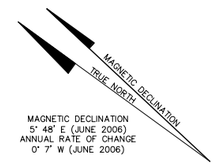
0 1000 2000 4000 6000

HORIZONTAL SCALE
1" = 2000'

0 100 200 400 600

VERTICAL SCALE
1" = 200'



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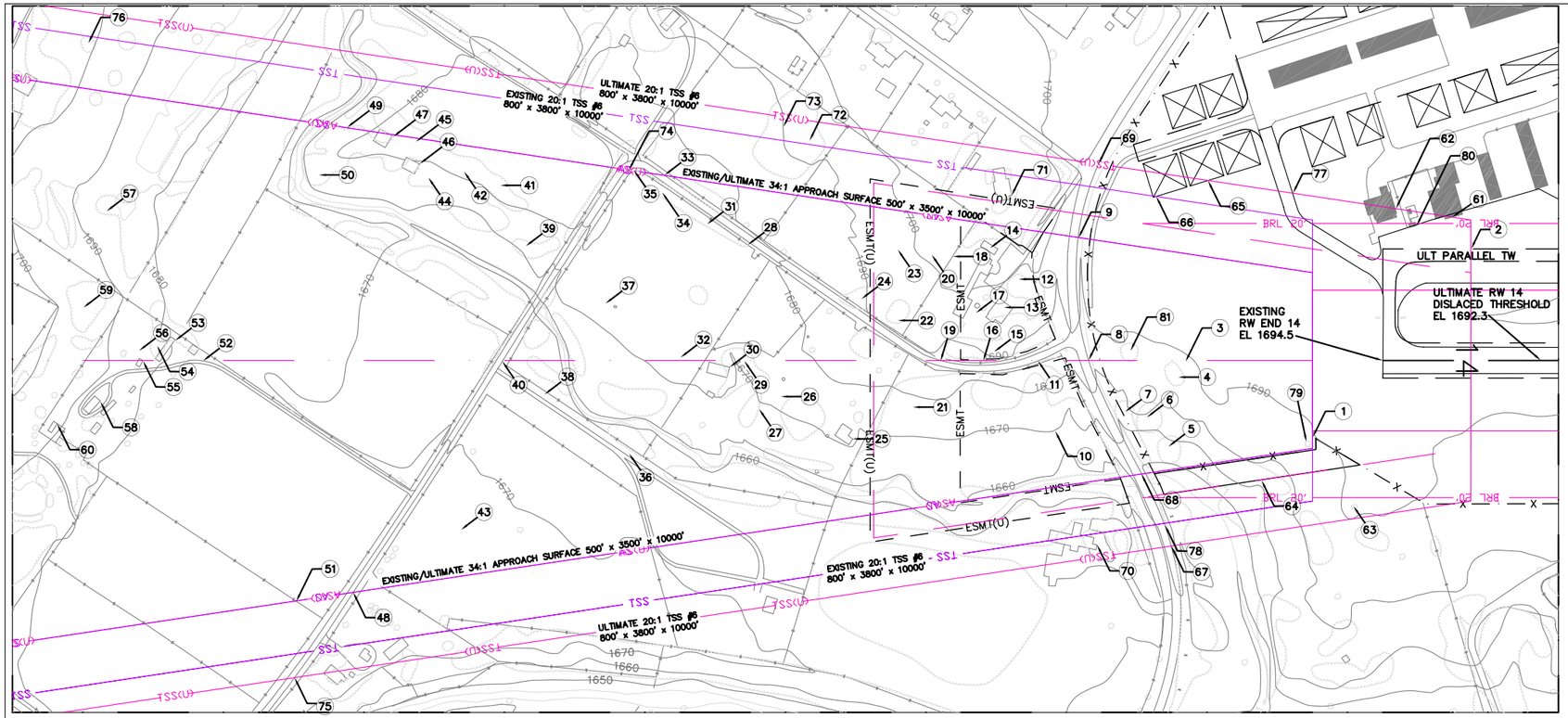
M. Dmyterko	June 2006	DESIGNED BY — DATE
D. Hopkins	June 2006	DRAWN BY — DATE
J. Harris	June 2006	CHECKED BY — DATE

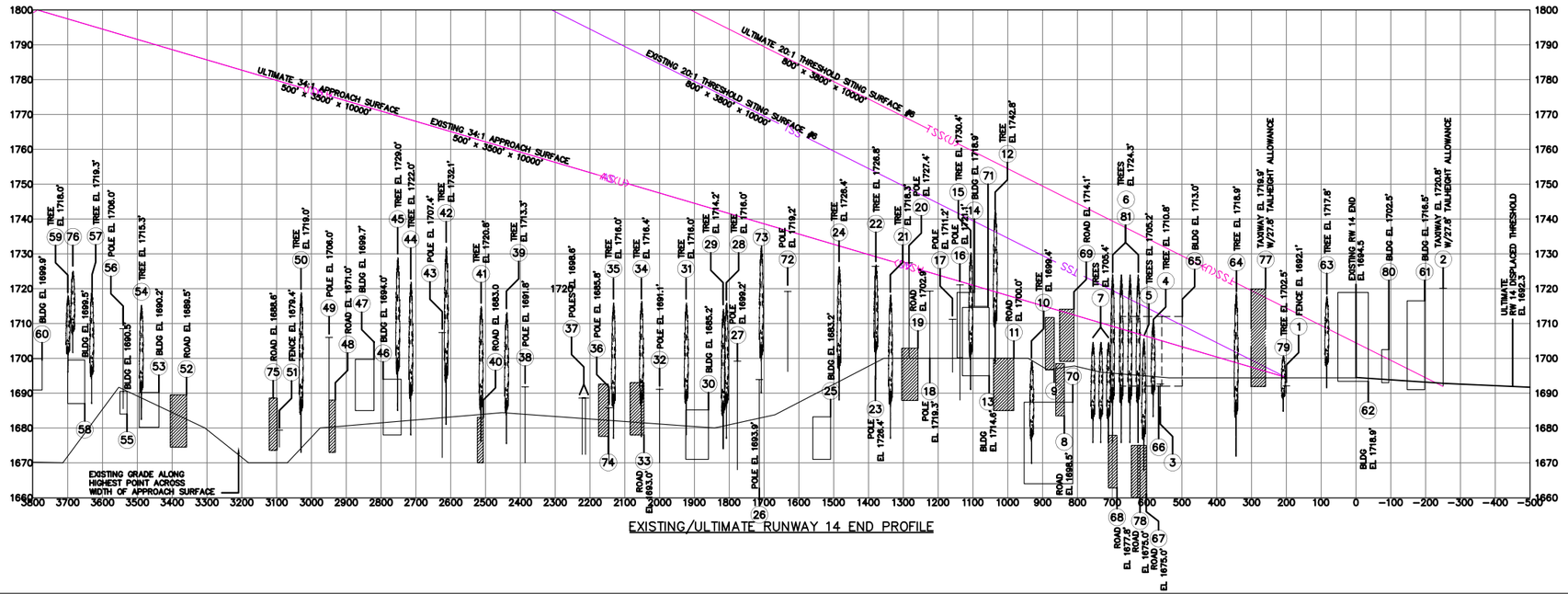
SURVEY DRAWING: TYPE C SURVEY
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation
Aviation Division

Coffman Associates R:\CAD\hopkinsD\MP\GILLESPIE\ALP\FREDERICKSBURG_SY10_05 Outer RW 32.dwg Printed Date: 6-21-06 02:23:50 PM DHopkins



EXISTING/ULTIMATE RUNWAY 14 END PLAN



EXISTING/ULTIMATE RUNWAY 14 END PROFILE

Ultimate Obstruction Table

No.	Object Description	Distance fm Ult RW End	Offset fm RW C/L	Top Elev (MSL)	34:1 App Penetration	20:1 TSS Penetration	Obstruction Remediation
2	PROPOSED TWY	−250	318.2 L	1720.1	N/A	27.8	ADD HOLD MARKING AND SIGN
4	TREE	581.9	47.4 R	1710.8	5.1	NONE	20:1 TSS CLEAR; NAR
6	TREE	624.8	161.2 R	1724.3	17.3	NONE	20:1 TSS CLEAR; NAR
12	TREE	1036.3	231.4 L	1742.8	23.7	NONE	20:1 TSS CLEAR; NAR
13	BLDG	1053.6	104.3 L	1714.6	NONE	NONE	NO ACTION REQUIRED
14	BLDG	1096.1	301.0 L	1718.9	NONE	NONE	NO ACTION REQUIRED
15	TREE	1106.8	21.5 L	1730.4	9.2	NONE	20:1 TSS CLEAR; NAR
20	POLE	1283.7	300.4L	1727.4	1.0	NONE	20:1 TSS CLEAR; NAR
61	BLDG	−198.1	408.0 L	1716.5	N/A	21.6	TO BE RELOCATED
62	BLDG	−35.2	432.2 L	1718.9	N/A	15.9	TO BE RELOCATED
63	TREE	83.7	414.5 R	1717.8	N/A	8.8	TRIM
77	TAXIWAY	257.0	495.0 L	1719.9	N/A	2.0	ADD HOLD MARKING AND SIGN
79	TREE	659.7	231.1 R	1717.3	N/A	2.0	TRIM
80	BLDG	355.7	381.2 L	1702.5	N/A	2.4	TRIM

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

ANY OBSTRUCTION REMEDIATION TIME TABLE IS CONTINGENT UPON DEVELOPMENT, ACCEPTANCE AND IMPLEMENTATION OF AN ENGINEERED DESIGN OF THE ULTIMATE PLAN AS PROPOSED BY THIS ALP. LAND ACQUISITIONS, EASEMENTS AND AGREEMENTS BETWEEN PROPERTY OWNERS AND AIRPORT SPONSOR MAY ALSO FACTOR INTO TIME TABLE FOR OBSTRUCTION REMEDIATION. THEREFORE, THE FOLLOWING SUGGESTED TIME FRAMES FOR REMEDIATION SHOULD BE UNDERSTOOD TO BE ESTIMATES ONLY:

TREES THAT PENETRATE THE ULTIMATE 20:1 THRESHOLD SITING SURFACE TO BE TRIMMED TO ACHIEVE ULTIMATE TSS CLEARANCE STANDARDS.

BUILDINGS THAT PENETRATE THRESHOLD SITING SURFACES TO BE RELOCATED TO AN AREA YET TO BE DETERMINED.

Existing Obstruction Table

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	34:1 App Penetration	20:1 TSS Penetration	Obstruction Remediation
4	TREE	581.9	47.4 R	1710.8	5.1	NONE	TRIM OR REMOVE
6	TREE	624.8	161.2 R	1724.3	17.3	8.6	TRIM OR REMOVE
12	TREE	1036.3	231.4 L	1742.8	23.7	6.5	TRIM OR REMOVE
15	TREE	1106.8	21.5 L	1730.4	9.2	NONE	TRIM OR REMOVE
20	POLE	1283.7	300.4 L	1727.4	1.0	NONE	20:1 CLEAR; NAR
64	TREE	345.1	340.9 R	1718.9	N/A	17.3	TRIM OR REMOVE
79	TREE	209.7	231.1 R	1717.3	22.5	22.3	TRIM OR REMOVE
81	TREE	726.9	20.7 L	1719.1	9.1	NONE	20:1 CLEAR; NAR

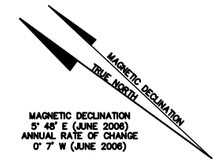
ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT

NO OTHER EXISTING APPROACH OR THRESHOLD SITING SURFACE PENETRATIONS

TREES WITHIN AIRPORT CONTROLLED PROPERTY TO BE TRIMMED OR REMOVED WHEN FEASIBLE.

GENERAL NOTES:

1. AN OBSTRUCTION SURVEY TYPE 'D' MEETING THE STANDARDS OF FAA #405 WAS PERFORMED ON APRIL 26–27, 2004 BY GEODETIX.
2. THE EXISTING HEIGHT HAZARD ZONING ORDINANCE FOR THIS AIRPORT WAS ADOPTED ON 23 FEBRUARY 1979. RUNWAY 14–32, 4600' x 75', ZONED 3800' OTHER THAN UTILITY, NPI.
3. ELEVATIONS ADJUSTED UPWARD 10' FOR PRIVATE ROAD, AND 15' FOR PUBLIC ROADWAYS.
4. NO ACTION REQUIRED (NAR)



MAGNETIC DECLINATION
5° 48' E (JUNE 2006)
ANNUAL RATE OF CHANGE
0° 7' W (JUNE 2006)

HORIZONTAL SCALE
1" = 400'

VERTICAL SCALE
1" = 40'

TEXAS DEPARTMENT OF TRANSPORTATION
AVIATION DIVISION

☐ ALP APPROVED ACCORDING TO FAA AC 150/5300-13 CH 9 PLUS THE REQUIREMENTS OF A FAVORABLE ENVIRONMENTAL FINDING PRIOR TO THE START OF ANY LAND ACQUISITION OR CONSTRUCTION AND AN FAA FORM 7460-1 SUBMITTED PRIOR TO ANY CONSTRUCTION ON AIRPORT PROPERTY

☐ ALP APPROVED ACCORDING TO FAA AC 150/5300-13 CH 9 PLUS THE CONDITIONS/COMMENTS IN LETTER DATED:

DIRECTOR, AVIATION DIVISION — DATE

AIRPORT SPONSOR

CURRENT AND FUTURE DEVELOPMENT DEPICTED ON THIS ALP IS APPROVED AND SUPPORTED BY AIRPORT SPONSOR

TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

SIGNATURE — DATE

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Airport Consultants
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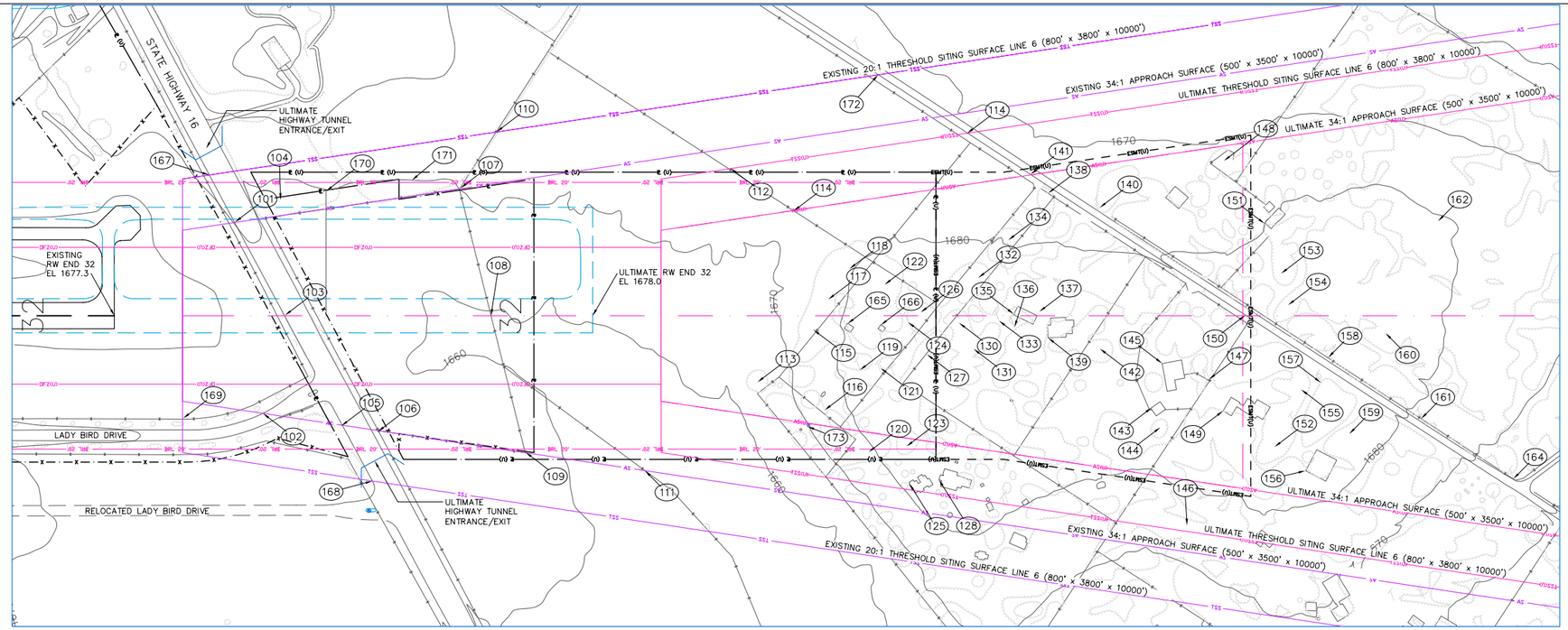
M. Dmyterko	June 2006	
DESIGNED BY	DATE	
D. Hopkins	June 2006	
DRAWN BY	DATE	
J. Harris	June 2006	
CHECKED BY	DATE	

ULTIMATE IPASD RUNWAY 14
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation Aviation Division



EXISTING/ULTIMATE RUNWAY 32 END PLAN

GENERAL NOTES:

1. A 405 OBSTRUCTION SURVEY TYPE "D" WAS PERFORMED APRIL 26–27, 2004 BY GEODETIX, INC., SAN ANTONIO, TX.
2. THE EXISTING HEIGHT HAZARD ZONING ORDINANCE FOR THIS AIRPORT WAS ADOPTED ON 23 FEBRUARY 1979. ZONED 4600' x 75', 3800' OTHER THAN UTILITY.
3. ELEVATIONS ADJUSTED UPWARD 10' FOR PRIVATE ROAD, 15' FOR PUBLIC ROADWAY PER PART 77 – OBJECTS AFFECTING NAVIGABLE AIRSPACE, SECTION 77.23B.

Ultimate Obstruction Table

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	34:1 App Penetration	20:1 TSS Penetration	Obstruction Remediation
101	HIGHWAY 16	N/A	274.0 R	1685.0	NONE	NONE	CONSTRUCT RUNWAY BRIDGE
102	ROAD	N/A	285.3 L	1677.9	NONE	NONE	TO BE RELOCATED*
103	HIGHWAY 16	N/A	0.0	1681.5	NONE	NONE	CONSTRUCT RUNWAY BRIDGE
104	TREE	−916.4	337.6 R	1708.2	N/A	N/A	TO BE REMOVED*
105	HIGHWAY 16	−735.3	178.9 L	1681.0	N/A	N/A	CONSTRUCT RUNWAY BRIDGE
106	FENCE	N/A	340.3 L	1667.9	NONE	NONE	TO BE REMOVED*
107	FENCE	N/A	1010.2 R	1674.8	NONE	NONE	TO BE REMOVED*
108	FENCE	N/A	0.0	1664.3	NONE	NONE	TO BE REMOVED*
109	FENCE	N/A	400.6 L	1666.4	NONE	NONE	TO BE REMOVED*
111	FENCE	N/A	452.7 L	1660.8	NONE	NONE	TO BE REMOVED*
113	TREE	477.8	194.0 L	1707.3	21.1	15.3	TO BE REMOVED*
114	FENCE	583.6	306.3 R	1679.9	NONE	NONE	TO BE REMOVED*
115	TREE	641.3	41.1	1712.8	21.8	12.6	TO BE REMOVED*
116	POLE	674.8	275.7 L	1704.2	12.2	2.4	TO BE REMOVED*
117	TREE	685.1	47.7 R	1714.0	21.7	11.6	TO BE REMOVED*
118	TREE	747.1	137.3 R	1720.4	26.3	14.9	TO BE REMOVED*
119	POLE	777.6	158.2 L	1702.2	12.2	0.2	TO BE REMOVED*
120	TREE	803.4	398.2 L	1716.9	21.1	8.6	TO BE REMOVED*
121	POLE	838.1	167.9 L	1714.3	17.5	4.3	TO BE REMOVED*
122	TREE	850.1	91.2 R	1721.9	24.7	11.3	TO BE REMOVED*
123	TREE	913.6	381.9 L	1719.0	20.0	5.2	TO BE REMOVED*
124	POLE	918.7	19.5 L	1711.8	12.6	NONE	TO BE REMOVED*
126	TREE	935.4	10.0 R	1719.1	19.4	4.2	TO BE REMOVED*
127	TREE	967.7	111.6 L	1717.5	16.9	1.0	TO BE REMOVED*
130	TREE	1067.2	19.8 L	1722.5	19.9	1.0	TRIM OR REMOVE
131	TREE	1109.9	96.9 L	1718.9	14.1	NONE	20:1 TSS CLEAR; NAR
132	TREE	1123.5	111.3 R	1717.7	12.5	NONE	20:1 TSS CLEAR; NAR
133	POLE	1183.0	11.9 L	1717.9	10.9	NONE	20:1 TSS CLEAR; NAR
134	TREE	1211.2	221.4 R	1717.8	10.0	NONE	20:1 TSS CLEAR; NAR
136	POLE	1229.5	33.4 L	1717.5	9.2	NONE	20:1 TSS CLEAR; NAR
137	TREE	1302.0	11.8 R	1714.2	3.7	NONE	20:1 TSS CLEAR; NAR
138	POLE	1326.8	357.3 R	1716.0	4.8	NONE	20:1 TSS CLEAR; NAR
139	BLDG	1327.6	64.3 L	1712.2	1.0	NONE	20:1 TSS CLEAR; NAR
142	TREE	1479.0	96.2 L	1718.9	3.2	NONE	20:1 TSS CLEAR; NAR
165	BLDG	732.9	21.7 L	1690.2	NONE	NONE	TO BE RELOCATED*
166	BLDG	830.6	25.9 L	1691.4	NONE	NONE	TO BE RELOCATED*
167	HIGHWAY 16	−1123.6	411.8 R	1688.0	N/A	N/A	CONSTRUCT RUNWAY BRIDGE
169	FENCE	−1200.0	305.1 L	1672.0	N/A	N/A	TO BE RELOCATED*
170	TREE	−780.8	369.8 R	1672.0	N/A	N/A	TO BE REMOVED*
171	TREE	−532.0	364.3 R	1706.8	N/A	N/A	TO BE REMOVED*
173	WINDMILL	629.7	320.6 L	1704.3	13.7	4.8	ADD OBSTRUCTION LIGHT

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

(NAR) NO ACTION REQUIRED

ANY OBSTRUCTION REMEDIATION TIME TABLE IS CONTINGENT UPON DEVELOPMENT, ACCEPTANCE AND IMPLEMENTATION OF AN ENGINEERED DESIGN OF THE ULTIMATE PLAN AS PROPOSED BY THIS ALP. LAND ACQUISITIONS, EASEMENTS AND AGREEMENTS BETWEEN PROPERTY OWNERS AND AIRPORT SPONSOR MAY ALSO FACTOR INTO TIME TABLE FOR OBSTRUCTION REMEDIATION. THEREFORE, THE FOLLOWING SUGGESTED TIME FRAMES FOR REMEDIATION SHOULD BE UNDERSTOOD TO BE ESTIMATES ONLY:

RUNWAY BRIDGE CONSTRUCTION OVER HIGHWAY 16 TO OCCUR AS A RESULT OF THE ULTIMATE RUNWAY 32 EXTENSION.

LADY BIRD DRIVE TO BE RELOCATED CONCURRENT WITH CONSTRUCTION OF RUNWAY BRIDGE OVER HIGHWAY 16.

*OBJECTS THAT ARE ULTIMATE OFA PENETRATIONS TO BE REMOVED/RELOCATED PER AC 150/5300-13 CHG 8, PAR 307.

Existing Obstruction Table

No.	Object Description	Distance fm RW End	Offset fm RW C/L	Top Elev (MSL)	34:1 App Penetration	20:1 TSS Penetration	Obstruction Remediation
101	HIGHWAY 16	351.3	274.0 R	1685.0	3.1	NONE	20:1 TSS CLEAR; NAR
104	TREE	483.6	337.6 R	1708.2	22.6	16.7	TRIM OR REMOVE
167	HIGHWAY 16	276.4	411.8 R	1689.4	8.5	6.9	ADD OBSTRUCTION LIGHT
170	TREE	619.2	369.8 R	1706.8	17.2	8.5	TRIM OR REMOVE
171	TREE	868.0	364.3 R	1703.7	6.8	NONE	20:1 TSS CLEAR; NAR

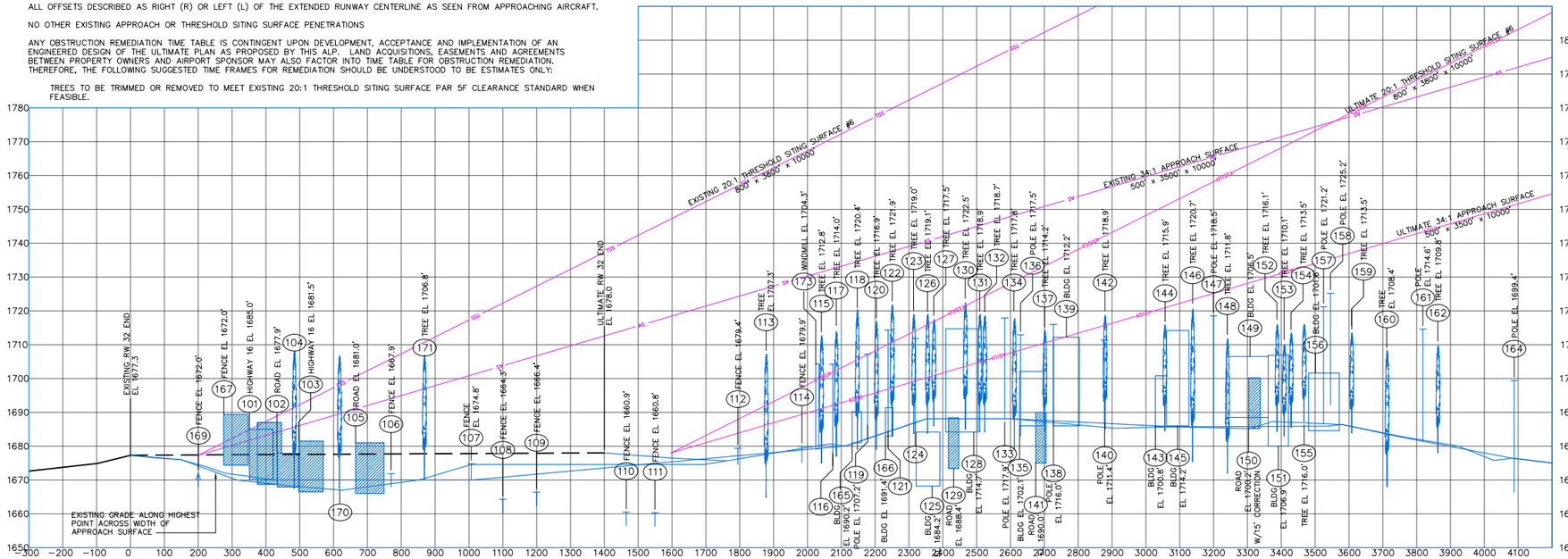
(NAR) NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

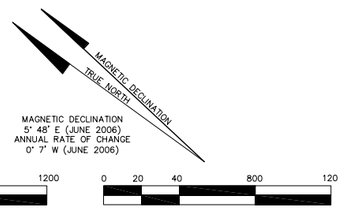
NO OTHER EXISTING APPROACH OR THRESHOLD SITING SURFACE PENETRATIONS

ANY OBSTRUCTION REMEDIATION TIME TABLE IS CONTINGENT UPON DEVELOPMENT, ACCEPTANCE AND IMPLEMENTATION OF AN ENGINEERED DESIGN OF THE ULTIMATE PLAN AS PROPOSED BY THIS ALP. LAND ACQUISITIONS, EASEMENTS AND AGREEMENTS BETWEEN PROPERTY OWNERS AND AIRPORT SPONSOR MAY ALSO FACTOR INTO TIME TABLE FOR OBSTRUCTION REMEDIATION. THEREFORE, THE FOLLOWING SUGGESTED TIME FRAMES FOR REMEDIATION SHOULD BE UNDERSTOOD TO BE ESTIMATES ONLY:

TREES TO BE TRIMMED OR REMOVED TO MEET EXISTING 20:1 THRESHOLD SITING SURFACE PAR 5F CLEARANCE STANDARD WHEN FEASIBLE.



EXISTING/ULTIMATE RUNWAY 32 END PROFILE



TEXAS DEPARTMENT OF TRANSPORTATION AVIATION DIVISION

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DIRECTOR, AVIATION DIVISION — DATE

AIRPORT SPONSOR

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TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

SIGNATURE — DATE

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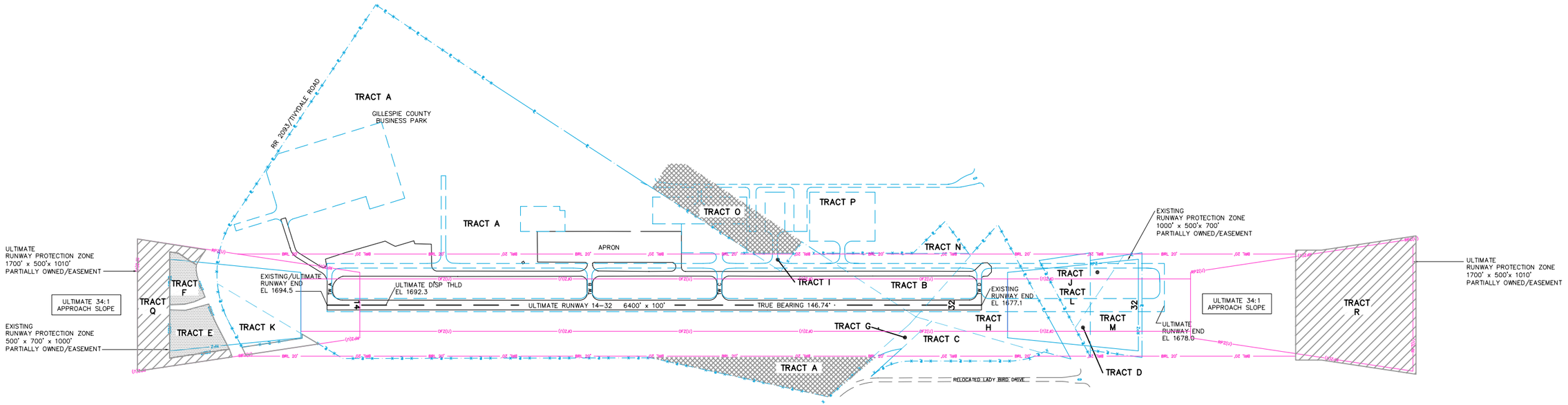
Airport Consultants
www.coffmanassociates.com

M. Dmyterko	June 2006
DESIGNED BY	DATE
D. Hopkins	June 2006
DRAWN BY	DATE
J. Harris	June 2006
CHECKED BY	DATE

IPASD RUNWAY 32
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation Aviation Division

Coffman Associates R:\CAD\Hopkins\D MPI\GILLESPIE\ALP\FREDERICKSBURG_IPASD_32_05.dwg,dwg Printed Date: 6-21-06 02:14:03 PM DHopkins



PROPERTY DATA

TRACT	ACRES	TITLE	GRANTOR	VOLUME/PAGE	DATE	FUNDING
A	181.30	WARRANTY DEED	EMIL F & MARY I TATSCH	60/360	3/13/46	FAAP9–41–023–701
			ALFRED A & ELLA AHRENS	61/494	10/30/46	
			EDWIN & HILDA GROBE	63/444	1/20/48	
B	6.55	WARRENTY DEED	ELMON PRIESS ESTATE	230/719	5/22/92	92–07–031
C	4.50	QUIT CLAIM DEED	CLIFFORD F & PATRICIA ERNST	230/731	5/22/92	
D	0.67	EASEMENT	BERNICE AND VERNON FLUITT	233/238	7/14/92	
E	3.07	EASEMENT	ANDREW FRITZ, ET. AL.	233/243	7/14/92	
F	1.81	EASEMENT	DARRELL R. & BETTY VANDERFORD	233/251	7/14/92	
G	0.78	FEE	CITY OF FREDERICKSBURG, TEXAS	233/581	7/21/92	
H	12.21	FEE	CITY OF FREDERICKSBURG, TEXAS	233/585	7/21/92	
I	0.49	FEE	CITY OF FREDERICKSBURG, TEXAS	233/589	7/21/92	
J	2.89	EASEMENT	AGNES L. HENNESSY, ET. AL.	237/899	10/20/92	
K	3.15	EASEMENT	CITY OF FREDERICKSBURG, TEXAS	244/631	3/23/93	
L	3.06	FEE	JUDY L. GOLD	244/631	3/23/93	0114FRBRG
M	6.76	FEE	BERNICE FLUITT, ET. AL.	456/059	4/11/02	
N	1.15	WARRENTY DEED	CHARLES ECKHARDT, ET. AL.	230/723	5/13/1992	92–16–031

NOTES:
(1) THESE THREE DEEDS SHOW A TOTAL OF 362.04 ACRES ORIGINALLY PURCHASED BY GILLESPIE COUNTY FOR USE AS A PUBLIC AIRPORT. THE COUNTY DEEDED PORTIONS OF THIS TOTAL TO THE CITY OF FREDERICKSBURG AS NOTED IN THE FOLLOWING VOLUMES/PAGES:

VOL. 90/PG. 594	10/14/66
VOL. 92/PG. 632	1/03/68
VOL. 103/PG. 93	6/23/72

WHAT IS SHOWN AS PARCEL "A" ON THE DRAWING ABOVE IS THE 181.30 ACRE REMAINDER.

FUTURE PROPERTY DATA

TRACT	ACRES	TITLE	GRANTOR	GRANTEE	DATE	FUNDING
A	5.81	WARRANTY DEED	GILLESPIE COUNTY AIRPORT	CITY OF FREDERICKSBURG		
O	7.05	FEE	CITY OF FREDERICKSBURG	GILLESPIE COUNTY AIRPORT		
P	7.28	FEE	CITY OF FREDERICKSBURG	GILLESPIE COUNTY AIRPORT		
Q	6.68	EASEMENT	CITY OF FREDERICKSBURG	GILLESPIE COUNTY AIRPORT		
R	19.53	EASEMENT	CITY OF FREDERICKSBURG	GILLESPIE COUNTY AIRPORT		

LEGEND

- EXISTING PROPERTY LINE
- EXISTING PROPERTY LINE WITH FENCE
- ULTIMATE PROPERTY LINE
- EXISTING PROPERTY TRACTS
- ULTIMATE RUNWAY PROTECTION ZONE
- ULTIMATE RUNWAY/TAXIWAY/APRON PAVEMENT
- SURVEY MONUMENTS
- ULTIMATE EASEMENT
- EXISTING EASEMENT
- ULTIMATE PROPERTY TRADE BETWEEN AIRPORT AND THE CITY OF FREDERICKSBURG

GENERAL NOTES

SURVEY MAPPING PERFORMED APRIL 26–27, 2004 BY GEODETIX, INC., SAN ANTONIO, TX.

ALL DATUM NAD 83 HORIZONTAL; NAVD 88 VERTICAL.

MAGNETIC DECLINATION
5° 48' E (JUNE 2006)
ANNUAL RATE OF CHANGE
0° 7' W (JUNE 2006)

0 200 400 800
GRAPHIC SCALE

TEXAS DEPARTMENT OF TRANSPORTATION AVIATION DIVISION

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DESIGNED BY	M. Dmyterko	June 2006
DRAWN BY	D. Hopkins	June 2006
CHECKED BY	J. Harris	June 2006

AIRPORT PROPERTY MAP
GILLESPIE COUNTY AIRPORT
FREDRICKSBURG, TEXAS

Texas Department of Transportation Aviation Division

Chapter Six

FINANCIAL PLAN

Chapter Six

FINANCIAL PLAN

The analyses completed in previous chapters evaluated development needs at the airport over the next twenty years and beyond, based on forecast activity and operational efficiency. The analyses contained in this chapter will include the application of basic economic, financial, and management rationale to each development item so that a fiscally feasible and responsible plan can be assured. The purpose of this chapter is to provide financial management information and tools which will help make the master plan achievable and successful.

The presentation of the financial plan and its feasibility has been organized into three sections. First, the airport development schedule is presented in narrative and graphic form. Secondly, capital improvement funding sources on the federal, state, and local levels are identified and discussed. Finally, the chapter presents an abbreviated cash flow analysis which analyzes current and projected airport revenues and expenditures. This analysis will provide insight to the overall financial feasibility of the recommended Capital Improvement Program (CIP).

AIRPORT DEVELOPMENT SCHEDULE S AND COST SUMMARIES

Once the specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule and associated costs for implementing the plan. This section will examine the overall cost of each item in the development plan and present a development schedule. The recommended improvements are grouped and divided by planning horizon: short term, intermediate term,

and long term. **Table 6A** summarizes the key milestones for each of the three planning horizons.

The short term planning horizon contains items of high priority and those that should be considered as the airport begins to approach the activity milestones identified for the short term. In some cases, the projects indicated in the short term are necessary regardless of demand levels, as they may be required for maintenance or to meet Federal Aviation Administration (FAA) and Texas Department of Transportation (TxDOT) - Aviation Division standards. Other projects will be required as activity increases as projected in the table below.

TABLE 6A
Planning Horizon Milestone Summary
Gillespie County Airport

	Current	Short Term	Intermediate Term	Long Term
Annual Operations				
Total Itinerant	6,270	9,000	12,000	16,800
Total Local	9,405	13,500	18,000	25,200
Total Operations	**15,675**	**22,500**	**30,000**	**42,000**
Based Aircraft				
Single-Engine	49	64	83	115
Multi-Engine	5	6	7	8
Turboprop	0	2	4	8
Jet	0	2	5	8
Helicopter	1	1	1	1
Total Based Aircraft	**55**	**75**	**100**	**140**
Total Annual Instrument Approaches	**71**	**180**	**240**	**336**

As short term horizon activity levels are reached, it will be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

As a master plan is a conceptual document, implementation of these capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. The cost estimates presented in this chapter have been inflated to also factor engineering and any other contingencies costs that may arise on the project. Capital costs presented here should be viewed only as estimates subject to further refinement during the engineering design process. Nevertheless, these estimates are considered sufficiently accurate for

performing the feasibility analyses in this chapter. Cost estimates for each of the development projects listed in the CIP are shown in current (2005) dollars. **Exhibit 6A** presents the proposed capital program for Gillespie County Airport.

The proposed CIP for Gillespie County Airport has been segregated into three segments: short, intermediate, and long term, which generally correlate with the first five years, the following five years, and the last ten years. TxDOT is the distribution source for federal and state aviation grant funding for Gillespie County Airport. Due to the large number of requests from airports across the state and limited funding available, TxDOT's grant process will generally only provide an airport with intermittent funding assistance. This is to say that TxDOT may provide funding for a project, or several projects in one fiscal year, but may not provide additional assistance for several years thereafter.

The proposed CIP projects have not been assigned specific years, as TxDOT's funding cycle typically allows for grants on an "as needed" basis as funds are available. Moreover, the plan should be flexible to account for demand changes. If actual activity exceeds the projections, some projects may need to be expedited. On the other hand, if the actual activity lags, the program could be slowed accordingly. It should be noted that TxDOT will assimilate the capital projects provided in this plan into their CIP planning. As funding for these projects is requested, there is potential for several of these projects to be funded in a single year's grant. Obviously, this would require that the County be ready to provide the local matching funds.

It is important to note that this CIP, and acceptance of such by the County and State, will not guarantee federal or state funding assistance. Also, the County will not be forced into any development project that it no longer desires. In short, the CIP is a method of cataloging a desire to proceed with additional airport improvement projects. It is the first step in the process of obtaining federal and state grants. Obviously, situations and demand may change. As a result, the CIP can also change. The Airport Board and County should closely examine its needs and work in conjunction with TxDOT on CIP issues annually. A close, timely, working relationship will ensure the best chance for obtaining funding assistance in a fluid environment.

SHORT TERM IMPROVEMENTS

The short term planning horizon CIP centers around the immediate needs of the airport. Of primary concern in the short term are improvements needed to accommodate additional landside facility development and pavement rehabilitation. Several of these rehabilitation projects are already programmed within TxDOT's five year CIP.

As with all airports, maintenance is a continual process. Understanding the vital importance of airport maintenance

projects, TxDOT has developed the routine airport maintenance program (RAMP). RAMP projects are eligible for 50/50 funding assistance up to $60,000 annually. Thus, over the short term, Gillespie County Airport could expect up to $150,000 in RAMP funds by matching these funds with $150,000 in local funds.

RAMP funds can be used for items not considered a high priority for grant funding, or are simply not eligible for grant assistance at all. Examples include pavement maintenance, roads, and parking lots, as well as ancillary projects such as hangar improvements (e.g., painting, drainage, etc.). The short term program includes the full allotment of $300,000 for RAMP projects. These projects can be completed on an as needed basis and must be scheduled annually with TxDOT.

Plans are in place for the development of fixed base operator (FBO) facilities adjacent to the terminal building. The FBO will initially construct a small terminal office facility and a conventional hangar. The first project considered in the short term program is the expansion of the terminal apron to serve the new FBO facilities. Ultimately, the FBO plans to construct up to three additional conventional hangars adjacent the proposed apron.

Runway 14-32 is served by visual approach lighting aids which provide the pilot with visual cues of being above, below, or on the correct approach path angle. These facilities are adequate and serve to promote operational safety. Neither runway end, however, is served by runway end identifier lights (REIL). REILs consist of two flashing lights located at each corner of the runway end, providing pilots with rapid visual cues to the location of the runway. In order to further enhance safety at Gillespie County Airport, REILs have been planned in the short term program.

As previously mentioned, pavement rehabilitation is included in the short term. Asphaltic pavements do not wear similar to concrete. In most cases, asphalt will need to be rejuvenated, crack-sealed, or overlaid within seven to ten years, and in some cases sooner. The plan considers the rehabilitation of the runway, parallel taxiway, and all terminal aprons.

The remaining projects focus on additional hangar development. Recently, a third T-hangar facility was added in the northeastern portion of the terminal area. The short term program considers adding a fourth T-hangar facility. In order to construct the T-hangar, additional taxilane access will need to be constructed as proposed. The T-hangar facility will be constructed by a private entity; however, the T-hangar taxilane is eligible for federal funding assistance, although it is considered a low priority. Also planned for this area are additional fuel storage facilities. Fuel farm construction is generally not a high priority item in the grant funding system. In fact, until recently, all revenue-generating facilities, such as fuel farms, were not eligible to receive federal funding assistance. Even though technically eligible for

	Project Cost	FAA/TxDOT Eligible	Local Share
SHORT TERM PROGRAM (0-5 YEARS)			
1. Install REIL's Runway 14-32	$47,000	$42,300	$4,700
2. Rehabilitate Runway 14-32 and Parallel Taxiway	645,000	580,500	64,500
3. Rehabilitate Terminal Apron (235' x 80')	75,000	67,500	7,500
4. Install Jet A Fuel Farm (12,000 gallons)	78,000	0	78,000
5. Acquire Southeast Property for Landside Development (18.63 ac.)	225,000	202,500	22,500
6. Construct New Airport Road - Phase I	125,000	62,500	62,500
7. Construct T-hangar Taxilanes for 10 T-hangars	275,000	247,500	27,500
8. Rehabilitate Aprons (52,888 s.y.)	195,000	175,500	19,500
9. Miscellaneous RAMP Projects	300,000	150,000	150,000
SHORT TERM PROGRAM (0-5 YEARS)	**$1,965,000**	**$1,528,300**	**$436,700**
INTERMEDIATE TERM PROGRAM			
1. Improve Airport Drainage (southeastern portion of airport)	$1,500,000	$1,350,000	$150,000
2. Construct Northeast Terminal Road	175,000	87,500	87,500
3. Construct Industrial Park Taxiway	385,000	346,500	38,500
4. Relocate AWOS-III	75,000	67,500	7,500
5. Construct New Airport Road - Phase II	320,000	160,000	160,000
6. Expand Apron South (5,000 s.y.)	350,000	315,000	35,000
7. Construct T-hangar Taxilanes for 20 T-hangars	525,000	472,500	52,500
8. Construct Corporate Parcel Taxiway and Apron - Phase I (4,000 sq. yds.)	490,000	441,000	49,000
9. Miscellaneous RAMP Projects	300,000	150,000	150,000
INTERMEDIATE TERM PROGRAM (6-10 YEARS)	**$4,120,000**	**$3,390,000**	**$730,000**
LONG TERM PROGRAM (10-20 YEARS)			
1. Widen Runway 14-32 to 100 Feet/Reconstruct Southern 1,500'	$3,920,000	$3,528,000	$392,000
2. Acquire Property to South for Runway Extension	3,000,000	2,700,000	300,000
3. Acquire Avigation Easements for North RPZ (7.45 ac.)	35,000	31,500	3,500
4. Relocate Parallel Taxiway to 300 Feet East of Runway	3,830,000	3,447,000	383,000
5. Relocate/Remove Two Northern Hangars and Fuel Farm	500,000	0	500,000
6. Extend Runway 14-32 1,400 Feet South	14,300,000	12,870,000	1,430,000
7. Construct T-hangar Taxilanes for 40 T-hangars (10,000 sq. yds.)	1,050,000	945,000	105,000
8. Expand Apron South (3,000 s.y.)	410,000	369,000	41,000
9. Miscellaneous RAMP Projects	600,000	300,000	300,000
LONG TERM PROGRAM (10-20 YEARS)	**$27,645,000**	**$24,190,500**	**$3,454,500**
TOTAL PROGRAM COSTS	***$33,730,000***	***$29,108,800***	***$4,621,200***

GILLESPIE COUNTY AIRPORT

Exhibit 6A
CAPITAL IMPROVEMENT PROGRAM

federal funds, the fuel farm construction is planned to be funded entirely by private sources.

The plan also considers the development of additional hangar facilities in the southern portion of the airport. The short term plan proposes the development of a new airport terminal road which will serve the southern terminal area. Ultimately, the road is planned to provide an additional access point, linking directly to Highway 16. The Phase I roadway development would provide support access for the development of a conventional hangar on the southern edge of the existing apron. This development can only take place after the planned land swap with the City of Fredericksburg.

It should be noted that no other development is proposed for the southern portion of the terminal area in the short term. Acquisition of approximately 25 acres of land east of the southern end of the runway, however, is proposed. Recently, the airport lost the opportunity to acquire approximately five acres of land immediately east of the southern end of the runway. An airport should own all land along the extended flight line or terminal area. If the airport were not to acquire the 25 acres of land as proposed, additional hangar development would be significantly limited in the future. Also, the airport should own the land to ensure compatible land uses adjacent the airport.

Short term projects presented on Exhibit 6A and graphically depicted on Exhibit 6B have been estimated at approximately $1.97 million total cost. Of that total, approximately $437,000 will be required to be provided by the County or other local sources.

INTERMEDIATE TERM IMPROVEMENTS

Intermediate term improvements focus on continued hangar needs. It is anticipated that the airport's hangar spaces will be limited by the intermediate term horizon. By this time, demand pressures could constrain airport facilities. Hangar development will be needed if these operators base at Gillespie County Airport versus chartering or utilizing fractional ownership programs for example. At this time, prudence suggests planning for additional hangar facilities of all varieties.

To meet the growing needs of small aircraft owners and operators, the intermediate term plan calls for the construction of an additional 20 T-hangar units which would be constructed by private entities. The proposed two ten-unit T-hangar facilities in the northeastern portion of the terminal area would require the construction of necessary taxilane access as planned in the CIP. The taxilanes would be grant eligible, while the T-hangar construction would require local funding sources.

As depicted on **Exhibit 6B**, the intermediate term plan considers extending the terminal apron south to accommodate the construction of two large conventional hangar facilities. The plan also includes the development of an executive hangar apron which could serve six 60-foot by 60-foot hangars. It is envisioned that these hangars would serve additional airport business operators or as bulk storage for small aircraft and corporate aircraft. In order to provide ample ingress/egress to the facilities, Phase II of the airport terminal roadway development is planned. The Phase II development would extend the proposed roadway south to Highway 16. At this time, relocation of the Automated Weather Observation System (AWOS) -III would be necessary. The AWOS-III is planned to be relocated to a drainage area north of the terminal building. The proposed AWOS-III relocation site appears to be the best choice given limited options.

The development of a taxiway leading from the airfield to the Airport Industrial Park is also planned in the intermediate term horizon. This project would provide airfield access to the western portion of the Airport Industrial Park. This improvement could aid in attracting industrial/ commercial businesses which desire airfield access but do not need to be on the flight-line. The taxiway construction would require the closure of the access road leading to the northern hangar facilities. For this reason, the plan includes the development of a new access road extending from Tivydale Road to the northern hangar facilities, as depicted on **Exhibit 6B**.

The intermediate term plan also considers the annual request for RAMP funds to accommodate pavement maintenance and development (including roads).

Projects included in the intermediate term have been estimated to cost $4.12 million with the local share estimated at $730,000 as presented on Exhibit 6A and depicted on Exhibit 6C.

LONG TERM IMPROVEMENTS

Nearly all projects contained in the long term are those associated with upgrading Runway 14-32 to airport reference code (ARC) C/D-II. The initial project is to widen the existing 5,000 feet of runway to 100 feet. Also, this project includes the reconstruction of the southernmost 1,500 feet of the runway. This portion of the runway would pose significant gradient issues if not modified prior to runway extension project. The current runway gradient generally slopes downward from the north. The southern end of the runway rises sharply. This rise, coupled with a relatively flat or slightly decreasing runway extension, would yield a large hump in the runway. Obviously, the hump would be problematic and could pose a safety risk.

The next project in the long term is the acquisition of land south of the runway.

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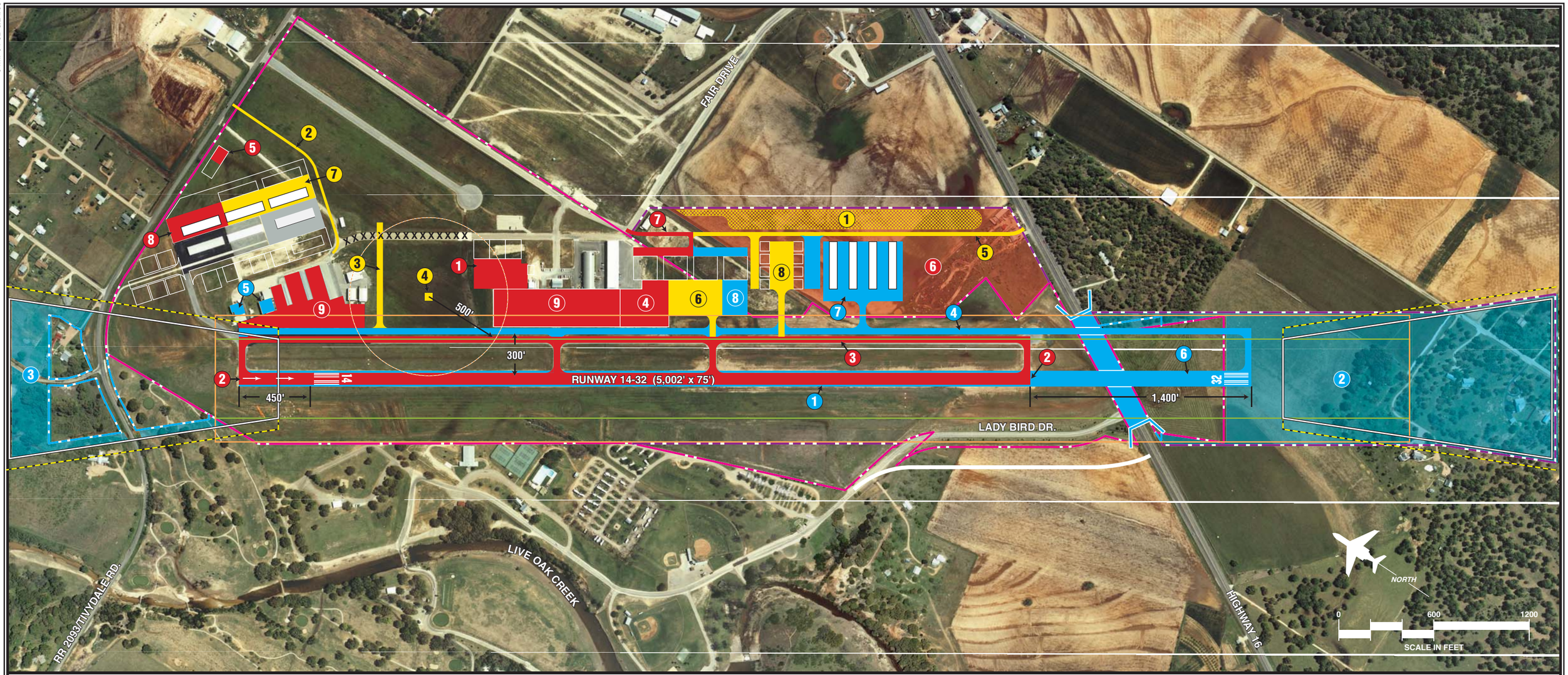


LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Threshold Siting Surface
- Short Term Improvements
- Intermediate Term Improvements
- Long Term Improvements

SHORT TERM IMPROVEMENTS

1. Expand Terminal Apron (5,000 s.y.)
2. Install REIL's Runway 14-32
3. Rehabilitate Runway 14-32 Parallel Taxiway
4. Rehabilitate Terminal Apron (235' x 80')
5. Install Jet A Fuel Farm (12,000 gallons)
6. Acquire Southeast Property for Landside Development (25.63 ac.)
7. Construct New Airport Road - Phase I
8. Construct T-hangar Taxilanes for 10 T-hangars
9. Rehabilitate Aprons (52,888 s.y.)
10. Miscellaneous Ramp Projects

INTERMEDIATE TERM IMPROVEMENTS

1. Improve Airport Drainage (southeastern portion of airport)
2. Construct Northeast Terminal Road
3. Construct Industrial Park Taxiway
4. Relocate AWOS-III
5. Construct New Airport Road - Phase II
6. Expand Apron South (5,000 s.y.)
7. Construct T-hangar Taxilanes for 20 T-hangars
8. Construct Corporate Parcel Taxiway and Apron - Phase I (4,000 sq. yds.)
9. Miscellaneous Ramp Projects

LONG TERM IMPROVEMENTS

1. Widen Runway 14-32 to 100 Feet/Reconstruct Southern 1,500'
2. Acquire Property to South for Runway Extension
3. Acquire Avigation Easements for North RPZ (7.45 ac.)
4. Relocate Parallel Taxiway to 300 Feet East of Runway
5. Relocate/Remove Two Northern Hangars and Fuel Farm
6. Extend Runway 14-32 1,400 Feet South
7. Construct T-hangar Taxilanes for 40 T-hangars (10,000 sq. yds.)
8. Expand Apron South (3,000 s.y.)
9. Miscellaneous Ramp Projects

GILLESPIE COUNTY AIRPORT

Exhibit 6B
DEVELOPMENT STAGING

The airport currently owns a section of land south of the runway to protect the runway protection zone (RPZ). An additional 44 acres would need to be acquired south of the existing property line in order to implement the proposed runway extension. As discussed, approximately 25 acres of this total would need to be acquired through fee simple acquisition in order to provide adequate runway safety area (RSA) and object free area (OFA). Approximately 20 acres of the 44 total acres, however, is planned to be acquired as avigation easement, or airspace ownership rights. Avigation easements ensure that the airport controls the land uses within the RPZ. The land encompassed in the future RPZ for Runway 14 is proposed for avigation easements as well.

It should be noted that the southern property acquisition could require the purchase of at least one bed and breakfast (or a portion of the landowner's property). The acquisition would be accomplished only after two (or in some cases three) appraisals establish market value. In some cases, the FAA will also pay for relocation costs or other burdens. These issues will be more thoroughly addressed during the environmental assessment (EA), which will be required prior to the FAA or TxDOT's involvement with the runway extension.

Next, the upgrade to ARC C/D-II standards will require that the parallel taxiway be relocated 60 feet east. As proposed, the relocation of the parallel taxiway will require the removal or relocation of the two northern executive hangars, as depicted on **Exhibit 6B**. These facilities would be within the taxiway object free area (OFA) and could pose obstructions to any future approach procedures. It should be noted that the taxiway relocation project includes the cost to install taxiway lighting on all the parallel and exit/entrance taxiways.

The 1,400-foot southerly extension of the runway will require substantial investments and partnerships. The extension is proposed to bridge State Highway 16. As proposed, the bridge would need to span at least 650 feet of Highway 16. Costs for bridging the highway are estimated at $7.2 million. In addition, an estimated 440,000 cubic yards of fill will be required to maintain desired runway gradient. Considering these factors, as well as paving and ancillary facility relocation/installation costs, extending the runway and parallel taxiway as proposed is estimated to cost $14.3 million.

The long term program also focuses on the need for additional hangar facilities. The program considers the development of four 10-unit T-hangars in the southeastern terminal area. The long term horizon continues the development of the general aviation terminal complex. As depicted on **Exhibit 6B**, the long term CIP includes the final proposed extension of the main terminal ramp to serve a fourth conventional hangar facility.

Similar to the intermediate term, the long term program includes annual pavement maintenance through the RAMP of $60,000, or $600,000 over the final ten years of the plan.

Total long term projects listed on Exhibit 6A and depicted on Exhibit 6C have been estimated at approximately $27.65 million, with $3.45 million in local share. The total CIP proposed for Gillespie County Airport has been estimated at $33.7 million, with a total local share of $4.62 million.

CAPITAL IMPROVEMENTS FUNDING

Financing capital improvements at the airport will not rely solely on the financial resources of the airport. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. The following discussion outlines key sources of funding for capital improvements at the Gillespie County Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public airports throughout the United States. The purpose of this system and its federally-based funding is to maintain national defense and promote interstate commerce. The most recent legislation was enacted in late 2003 and is entitled the *Century of Aviation Reauthorization Act*, or *Vision 100*.

The four-year bill covers FAA fiscal years 2004, 2005, 2006, and 2007. This bill presented similar funding levels to the previous bill - Air 21. Airport Improvement Program (AIP) funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This new bill provides the FAA and, ultimately, TxDOT the opportunity to plan for longer term projects versus simple one-year reauthorizations.

The source for *Vision 100* funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports based upon enplanement levels. If Congress appropriates the full amounts authorized by *Vision 100*, eligible general aviation airports could receive up to $150,000 of funding each year in Non-Primary Entitlement (NPE) funds (National Plan of Integrated Aiport Systems [NPIAS] inclusion required for general aviation entitlement funding).

Unfortunately, Gillespie County Airport did not qualify for NPE funds in the past, as the previous edition of the NPIAS did not include proposed capital improvements for the airport. The most recent edition of the NPIAS, however, does include capital improvements. Thus, the airport is now eligible for the

full $150,000 in NPE funds for fiscal year 2005.

The remaining AIP funds are distributed by the FAA based upon the priority of the project for which they have requested federal assistance through discretionary apportionments. A National Priority Ranking System is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding. It should be noted that the proposed runway extension projects will likely exceed the State's grant funding capabilities. The State's federal funding allotment must be distributed to many airports each year. As a result, TxDOT will typically limit the size of grants given to a single airport sponsor to ensure adequate funding for the State airport system as a whole. Thus, the substantial costs of implementing the runway extension will likely require the County to attract discretionary funding assistance.

STATE FUNDING PROGRAM

The State of Texas participates in the federal State Block Grant Program. Under the State Block Grant Program, the FAA annually distributes general aviation state apportionment and discretionary funds to TxDOT. The state then distributes grants to state airports. In compliance with TxDOT's legislative mandate that it "apply for, receive, and disburse" federal funds for general aviation airports, TxDOT acts as the agent of the local airport sponsor. Although these grants are distributed by TxDOT, they contain all federal obligations.

The State of Texas also distributes funding to general aviation airports from the Highway Trust Fund as the Texas Aviation Facilities Development Program. These funds are appropriated each year by the State Legislature. Once distributed, these grants contain state obligations only.

The establishment of a CIP for the state entails first identifying the need, then establishing a ranking, or priority system. Identifying all state airport project needs allows TxDOT to establish a biennial program and budget for development costs. The most recent TxDOT CIP, *Aviation Improvement Program 2005-2007*, assumed that approximately $22 million in annual federal AIP grants, $17 million in Non-Primary Entitlements, and $15 in million state funds would be available.

The TxDOT biennial program establishes a project priority system based upon the following objectives (in order of importance):

- enhance safety
- preserve existing facilities
- bring airport up to standards
- upgrade facilities to aid airport in providing for larger aircraft with longer stage lengths
- improve airport capacity
- new airport construction to provide new access to a previously unserved area
- new airports to provide capacity relief to existing airports

Each airport project for Gillespie County Airport must be identified and programmed into the state CIP and compete with other airport projects in the state for federal and state funds. In Texas, airport development projects that meet TxDOT's discretionary funds eligibility requirements receive 90 percent funding from the AIP State Block Grant Program. Eligible projects include airfield and apron facilities. Historically, revenue-generating improvements, such as fuel facilities, utilities, and hangars have not been eligible for AIP funding. *Vision 100*, however, provides the allowance for NPE funds to be utilized for hangar or fuel farm construction if all other airfield needs have been addressed.

TxDOT has also established a program to help airports maintain and, in some circumstances, fund new airport pavements and miscellaneous projects. As previously mentioned, RAMP is an annual funding source to airports. With RAMP, TxDOT will provide a 50 percent funding match for projects up to $60,000. The program was initially designed to help airports maintain airside and landside pavements, but has recently been expanded to include construction of new facilities. Examples of new facility construction projects fundable under RAMP include constructing airport access roads, paving the airport public parking lot, and hangar maintenance. These funds are available to general aviation airports on an annual basis.

Newer programs included in the TxDOT funding mechanism include terminal building and airport traffic control tower (ATCT) funding. TxDOT has funded terminal building construction on a 50-50 basis up to a $600,000 total project cost. It should be noted that TxDOT has recently considered upgrading the total cost allowance on a case-by-case basis. The airport is already served by a terminal building; however, this program could be used to expand the existing facility if additional space is needed.

TxDOT also funds the construction of up to two ATCTs statewide per year. TxDOT has recently changed the program so that ATCT funding could be provided on a 90-10 basis, similar to eligible grant projects. These grants provide up to $1.5 million for both structure and electronic facilities. The construction of an ATCT is not planned for Gillespie County Airport at this time.

FAA FACILITIES AND EQUIPMENT PROGRAM

The Airway Facilities Division of the FAA administers the national Facilities and Equipment (F&E) Program. This annual program provides funding for the installation and maintenance of various navigational aids and equipment for the national airspace system and airports. Under the F&E program, funding is provided for FAA airport traffic control towers, enroute navigational aids (such as a VOR), and on-airport navigational aids (such as REILs and approach lighting systems). As activity levels and other development warrant, the airport may be considered by the FAA Airways

Facilities Division for the installation and maintenance of navigational aids through the F&E program.

FINANCING OF DEVELOPMENT PROGRAM

Earlier in this chapter, programmed expenditures were presented in current (2005) dollars. Future expenditures were categorized according to assigned financing responsibilities, with the airport's responsible expenditures the primary focus. In this section, the base costs assumed to be the financing responsibility of the airport are adjusted to reflect available funding to determine the projected local share of these proposed capital expenditures in current dollars. Financing assumptions are then made, and the projected annual airport's cost of these planned expenditures is estimated for incorporation into the cash flow analysis.

At the outset, it must be emphasized that long term feasibility analyses such as these must be based on many assumptions. In practice, projects will be undertaken when demand actually warrants, thus changing underlying assumptions. Further, the actual financing of capital expenditures will be a function of airport circumstances at the time of project implementation (i.e., revenue bond financing would likely not be used unless the actual level of airport earnings and reserves, along with entitlement and discretionary grants available at a particular time, were insufficient to meet project costs). As a result, the assumptions and analyses prepared for the master plan must be viewed in the context of their primary purpose: to examine whether there is a reasonable expectation that recommended improvements will be financially feasible and implementable.

The balance of project costs, after consideration has been given to the various grants available, must be funded through airport resources. Usually, this is accomplished through the use of airport earnings and reserves, to the extent possible, with the remaining costs financed through obligation bonding mechanisms.

The airport is owned and operated by Gillespie County through the collection of various rates and charges from general aviation revenue sources. These revenues are generated specifically by airport operations. There are, however, restrictions on the use of revenues collected by the airport. All receipts, excluding bond proceeds or related grants and interest, are irrevocably pledged to the punctual payment of operating and maintenance expenses, payment of debt service for as long as bonds remain outstanding, or to additions or improvements to airport facilities. **Table 6B** presents historical and projected operating expenses and revenues for the Gillespie County Airport.

OPERATING REVENUES

Operating revenues at Gillespie County Airport include ground leases, apron leases, fuel flowage fees, office space leases, rental car parking leases, tie-

down fees, and other income. As shown on **Table 6B**, revenues generated in fiscal year 2004 totaled $38,448. Currently, operating revenues are far exceeded by operating expenses.

The largest revenue center for the airport is land leases. In fact, these leases total more than 86 percent of the airport's annual revenue stream. The land lease category includes the lease of land for hangar development as well as apron lease and aviation business charges. The current land lease rate is $0.132 per square foot per year. This rate is equitable with that charged by similar airports in the State of Texas. Apron leases are charged to FBOs and other airport businesses, also at a rate of $0.132 per square foot per year. For general tie-down storage space, individuals are charged $60 per month. Office space leases are two dollars per square foot, while rental car parking space leases are $15 per month.

TABLE 6B
Cash Flow Analysis
Gillespie County Airport

	2004	Short Term	Intermediate Term	Long Term
OPERATING REVENUES				
Land Leases	$33,276.22	$52,228	$77,555	$135,592
Hangar Rentals	$0.00	$19,933	$23,845	$28,501
Fuel Flowage	$4,294.75	$5,670	$8,635	$15,664
Other/Misc.	$876.91	$907	$958	$1,113
Operating Revenues	*$38,447.88*	*$78,738*	*$110,993*	*$180,870*
OPERATING EXPENSES				
Employee Salaries/Benefits	$52,669.24	$58,484	$68,781	$86,087
Office Supplies & Utilities	$14,447.26	$15,765	$18,054	$21,768
Maintenance and Equipment	$5,638.40	$6,047	$6,741	$7,830
Miscellaneous	$6,113.82	$5,942	$6,448	$7,215
Operating Expenses	*$78,868.72*	*$86,238*	*$100,024*	*$122,900*
AVERAGE ANNUAL INCOME/LOSS	***($40,420.84)***	***($7,500)***	***$10,969***	***$57,970***

The next highest revenue center is fuel flowage fees. The County allows private entities to sell fuel at the airport. For each gallon of fuel delivered, the retailer is charged $0.05. This rate is not uncommon for airports in the region; however, it might be slightly lower than the typical $0.06 to $0.09 per gallon.

OPERATING EXPENSES

Generalized operating expenses for the Gillespie County Airport include personnel costs, maintenance, supplies, and other services provide by the County. As indicated in **Table 6B**, airport operating expenditures were more than double operating revenues in 2004.

The largest operating expense is personnel costs. This cost center includes employee salaries as well as associated employee benefits. Some airports similar to Gillespie County Airport choose not to employ a full-time airport manager. Instead, the airport is operated on a day to day basis by the airport FBO through lease arrangement. This practice, although common, is not in the best interest of the County. Gillespie County Airport will likely experience dynamic growth over the next several years due to community development issues. In fact, the County may need to hire at least one additional employee to be better equipped to deal with future day to day operation issues.

The next highest cost center is office supplies and utilities. This category includes several items of which telephone, electricity, water, and janitorial expenses total more than 75 percent of the expenses. Other expenses in this cost center include general office supplies, subscriptions, and postal expenses.

The third largest expense category is miscellaneous expenses. Of these expenses, conference travel, professional services, and insurance comprise the largest costs. Maintenance costs are the next largest cost center for the airport. The majority of supply costs are for grounds maintenance equipment, as well as fuel and oil.

It is evident from the table that the airport operates in a negative income position at this time. The existing revenues are not adequate to meet operational costs. Airports similar to Gillespie County Airport do not typically maintain a positive operating income as operating expenses generally exceed operating revenues. The primary reason for the negative income position is the personnel costs. As previously mentioned, however, the airport requires an airport manager for simple grounds maintenance and to facilitate day-to-day operation of the airport. Without this position, the County would be required to dedicate other personnel to maintain the airport and/or oversee its development, or allow the airport to be operated by a private entity which would reduce operating revenues.

FUTURE CASH FLOW

Revenues

Review of current charges for airport tenants and businesses appears to be in line and reasonable as compared to those charged at other regional general aviation airports. Existing and future leases should always include provisions for the adjustment of the lease amount due to increases in the consumer price index (CPI) and property values. The typical review period ranges up to five years. Airport leases do have a CPI adjustment and it is recommended that all new and/or applicable leases include a review of CPI and property value every three years so that necessary adjustments to lease rates can be made.

It is anticipated that revenues will continue to increase with aviation activity. As more aircraft base at the

airport, additional revenues for hangar rent, tie-downs, and fuel sales will increase proportionately. Revenues will also be bolstered by transient aircraft activity with increased hangar, fuel, and tie-down fees.

It should be noted that fiscal year 2005 operating revenues could nearly double. The new FBO lease, industrial park lease, and reversion of a 10-unit T-hangar to County control will increase airport revenues by as much as $20,000. Currently, the County does not own or operate any hangar facilities. This year, a 10-unit T-hangar facility will be shifted to County ownership. For this reason, the cash flow projection considers hangar rental revenue. In the near future, more T-hangars will also revert to the County, bolstering revenues even more.

Future proposed hangar development includes the construction of T-hangars, executive, and conventional/corporate hangars. Also, it is likely that at least one additional FBO/specialty operator will operate at the airport. Thus, lease receipts could significantly increase, dependent upon the number of new businesses attracted to the airport. Finally, the airport provides land for commercial/industrial development. The Airport Industrial Park development could significantly improve airport revenues if fully developed.

Future revenue projections indicate that revenues will annually rise at a greater rate than expenses. Analysis presented in **Table 6B** indicates that the County will be capable of obtaining sufficient operating revenues to offset expenses by the intermediate term horizon. The analysis in the table considers average annual operating revenues for each planning horizon. As presented, airport revenues will near the break-even point over the next five years, then exceed expenses in the intermediate term.

Expenses

Future expenses will vary, depending upon the County's desire to hire additional personnel, as well as the associated costs of maintaining hangars and landside pavements (local share). The County could expect maintenance costs and administrative costs associated with operating hangar facilities. Moreover, the expenses consider the hiring of a part-time airport employee by the intermediate term.

It should be noted that proposed capital improvements will, at times (especially in the short term), exceed the County's ability to fund them from general funds. Thus, debt service obligations will likely continue through the long term planning horizon. Projects such as the runway extension, land acquisition, and utility/roadway improvements could require additional debt service. Each project will require critical examination to determine the feasibility and funding (local) availability. The County will need to determine at the time if general funding assistance is available for critical projects not capable of being funded by operational revenues.

SUMMARY

The best means of implementing the recommendations of this master plan is to first recognize that planning is a continuous process that does not end with completion of this document. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be provided and maintained. The issues upon which this master plan is based will remain valid for a number of years. As such, the primary goal is for the airport to evolve into a facility that will best serve the air transportation needs of the region and continue to operate as a self-supporting economic generator for Gillespie County.

In this master plan, focusing on the timing of airport improvements was necessary. However, the actual need for facilities is more appropriately established by airport activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed at the airport. In reality, however, the time frame in which these additional developments will be needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate the development on the north side of the airport. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be delayed or accelerated.

The real value of a usable master plan is that it keeps the issues and objectives in the mind of the user of the plan so that he or she is better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake recommended improvements in this master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for costly updates. Updating can be done by the user, improving the plan's effectiveness.

In summary, the planning process requires Gillespie County to consistently monitor the progress of the airport in terms of total aircraft operations, total based aircraft, and overall aviation activity. Analysis of aircraft demand is critical to the exact timing and need for new airport facilities. The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

Appendix A

GLOSSARY OF TERMS

Appendix A
GLOSSARY OF TERMS

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): see declared distances.

AIR CARRIER: an operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRPORT REFERENCE CODE (ARC): a coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT ELEVATION: The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRCRAFT APPROACH CATEGORY: a grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- *Category A:* Speed less than 91 knots.
- *Category B:* Speed 91 knots or more, but less than 121 knots.
- *Category C:* Speed 121 knots or more, but less than 141 knots.
- *Category D:* Speed 141 knots or more, but less than 166 knots.
- *Category E:* Speed greater than 166 knots.

AIRPLANE DESIGN GROUP (ADG): a grouping of aircraft based upon wingspan. The groups are as follows:

- *Group I:* Up to but not including 49 feet.
- *Group II:* 49 feet up to but not including 79 feet.
- *Group III:* 79 feet up to but not including 118 feet.
- *Group IV:* 118 feet up to but not including 171 feet.
- *Group V:* 171 feet up to but not including 214 feet.
- *Group VI:* 214 feet or greater.

AIR TAXI: An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): a central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): a facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

ALERT AREA: see special-use airspace.

ANNUAL INSTRUMENT APPROACH (AIA): an approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): an airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: the altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

AUTOMATIC DIRECTION FINDER (ADF): an aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dewpoint, etc...)

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): the continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BEARING: the horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: a barrier used to divert or dissipate jet blast or propeller wash.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

CIRCLING APPROACH: a maneuver initiated by the pilot to align the aircraft with the runway for landing when flying

a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE: see Controlled Airspace.

CLASS B AIRSPACE: see Controlled Airspace.

CLASS C AIRSPACE: see Controlled Airspace.

CLASS D AIRSPACE: see Controlled Airspace.

CLASS E AIRSPACE: see Controlled Airspace.

CLASS G AIRSPACE: see Controlled Airspace.

CLEAR ZONE: see Runway Protection Zone.

CROSSWIND: wind flow that is not parallel to the runway of the flight path of an aircraft.

COMPASS LOCATOR (LOM): a low power, low/medium frequency radiobeacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONTROLLED AIRSPACE: airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- *CLASS A:* generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- *CLASS B:* generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

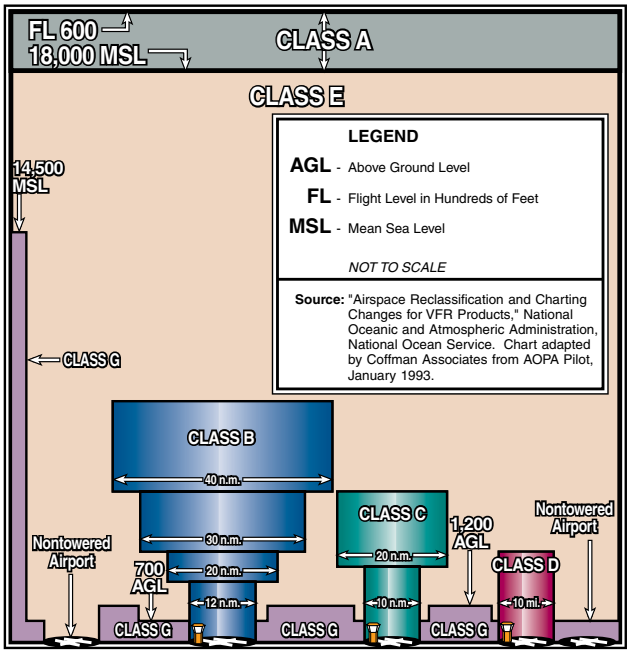
- *CLASS C:* generally, the airspace from the surface to 4,000 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- *CLASS D:* generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airport that have an operational control tower. Class D air space is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all

persons must establish two-way radio communication.

- *CLASS E:* generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- *CLASS G:* generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.



CONTROLLED FIRING AREA: see special-use airspace.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- *TAKEOFF RUNWAY AVAILABLE (TORA):* The runway length declared available and suitable for the ground run of an airplane taking off;

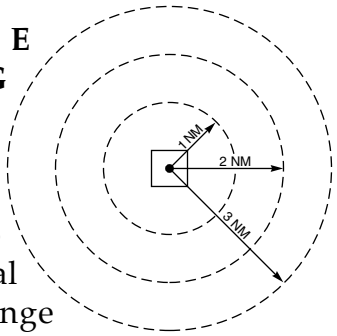
- *TAKEOFF DISTANCE AVAILABLE (TODA):* The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA;

- *ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):* The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff; and

- *LANDING DISTANCE AVAILABLE (LDA):* The runway length declared available and suitable for landing.

DISPLACED THRESHOLD: a threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range



distance of an aircraft from the DME navigational aid.

DNL: The 24-hour average sound level, in A-weighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ENPLANED PASSENGERS: the total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FRANGIBLE NAVAID: a navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION: that portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM: See "GPS."

GPS - GLOBAL POSITIONING SYSTEM: A system of 24 satellites

used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

HELIPAD: a designated area for the takeoff, landing, and parking of helicopters.

HIGH-SPEED EXIT TAXIWAY: a long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

INSTRUMENT APPROACH: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

LANDING DISTANCE AVAILABLE (LDA): see declared distances.

LOCAL TRAFFIC: aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): a facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LORAN: long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

MICROWAVE LANDING SYSTEM (MLS): an instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS AREA (MOA): see special-use airspace.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: the runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NAVAID: a term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc..)

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NONPRECISION APPROACH PROCEDURE: a standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

OBJECT FREE AREA (OFA): an area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION: a take-off or a landing.

OUTER MARKER (OM): an ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot, that he/she is passing over the facility and can begin final approach.

PRECISION APPROACH: a standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- *CATEGORY I (CAT I):* a precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- *CATEGORY II (CAT II):* a precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- *CATEGORY III (CAT III):* a precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION OBJECT FREE AREA (POFA): an area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PROHIBITED AREA: see special-use airspace.

REMOTE COMMUNICATIONS OUTLET (RCO): an unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering enroute clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): see remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: an airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: see special-use airspace.

RNAV: area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used enroute and for approaches to an airport.

RUNWAY: a defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY BLAST PAD: a surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: the average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY SAFETY AREA (RSA): a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISUAL RANGE (RVR): an instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ): an area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE: a system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: an area adjacent to the edge of paved runways, taxiways or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SPECIAL-USE AIRSPACE: airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- *ALERT AREA:* airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- *CONTROLLED FIRING AREA:* airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- *MILITARY OPERATIONS AREA (MOA):* designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- *PROHIBITED AREA:* designated airspace within which the flight of aircraft is prohibited.

- *RESTRICTED AREA:* airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- *WARNING AREA:* airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): a preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD TERMINAL ARRIVAL (STAR): a preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: a procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STRAIGHT-IN LANDING/APPROACH: a landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN): An ultra-high frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): see declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): see declared distances.

TAXILANE: the portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: a defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TETRAHEDRON: a device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: the beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

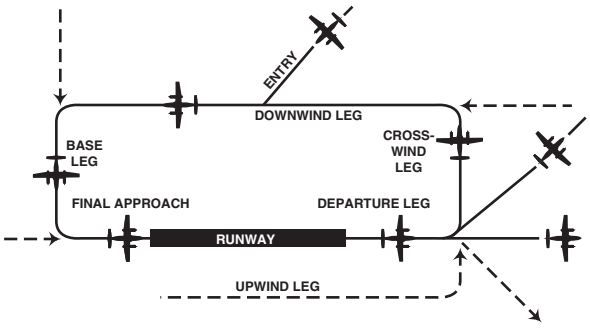
TOUCH-AND-GO: an operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.

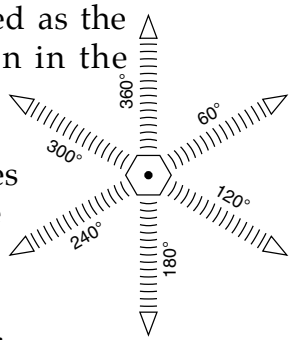


UNICOM: A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE STATION (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.



VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

WARNING AREA: see special-use airspace.

ABBREVIATIONS

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach light ing system with sequenced flashers (CAT II configuration)

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and firefighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100LL)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity for aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

MALSR: medium intensity approach lighting system with runway alignment indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076 .1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule-making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW: public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: Runway Safety Area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with sequenced flashers

SSALR: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

Appendix B

ENVIRONMENTAL EVALUATION

Appendix B
ENVIRONMENTAL EVALUATION

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The primary purpose of this Appendix is to review the proposed improvement program for Gillespie County Airport to determine whether the proposed actions could, individually or collectively, have the potential to significantly affect the quality of the environment. The information contained in this Appendix was obtained from various Internet websites and analysis by the consultant.

Construction of the improvements depicted on the Airport Layout Plan will require compliance with the *National Environmental Policy Act (NEPA) of 1969*, as amended to receive federal financial assistance. For projects not "categorically excluded" under FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). Instances in which significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. While this portion of the Master Plan is not designed to satisfy the NEPA requirements for a categorical exclusion, EA, or EIS, it is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the NEPA process. This evaluation considers all environmental categories required for the NEPA process as outlined in FAA Order 1050.1E and Order 5050.4A, *Airport Environmental Handbook*.

PROPOSED DEVELOPMENT

As a result of the Airport Master Plan analysis, a number of airport improvements have been recommended for implementation over the long-range planning horizon. Following is a discussion of planned major projects. A more detailed discussion of the proposed development plans can be found in Chapter Five.

ENVIRONMENTAL CONSEQUENCES – SPECIFIC IMPACTS

Several factors are considered in a formal environmental document, such as an EA or EIS, which are not included in an environmental evaluation. These factors include details regarding the project location, historical perspective, existing conditions at the airport, and the purpose and need for the project. This information is available within the Master Plan document. A formal environmental document also includes the resolution of issues/impacts identified as significant during the environmental review process. Consequently, this environmental evaluation only identifies potential environmental issues and *does not* address mitigation or the resolution of environmental impacts. Each of the specific impact categories outlined in FAA Order 1050.1E are addressed. The following table includes a discussion of each environmental category.

Review of Environmental Resources **Proposed Facility Improvements**	
Environmental Resource	**Resources Potentially Affected**
Air Quality. The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants, which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Particulate matter (PM10 and PM 2.5), and Lead (Pb). Various levels of review apply within both NEPA and permitting requirements. Potentially significant air quality impacts associated with an FAA project or action would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed.	• Gillespie County Airport is located within Gillespie County, which meets the requirements for all criteria pollutants. • Further analysis is required to determine the potential air quality impacts associated with the proposed development. • Construction-related air quality impacts are anticipated to be less-than-significant with the implementation of best management practices (BMPs).
Coastal Resources. Federal activities involving or affecting coastal resources are governed by the Coastal Barriers Resource Act (CBRA), the Coastal Zone Management Act (CZMA), and E.O. 13089, Coral Reef Protection.	• No impacts. The airport is not located within a Coastal Management Zone or Coastal Barrier Area.
Compatible Land Use. The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. Typically, significant impacts will occur over noise-sensitive areas within the 65 DNL noise contour.	• Land use surrounding the airport is primarily low-density residential and park land. • The existing DNL noise contours, shown in green on **Exhibit A**, remain entirely on airport property; therefore, no impacts are anticipated. • The projected long-term contours are illustrated in orange on **Exhibit A**. The 65 DNL noise contour extends beyond the airport property line to the south.
Construction Impacts. Construction impacts typically relate to the effects on specific impact categories, such as air and water quality or noise, during construction.	• Less-than-significant air and water quality impacts are anticipated with the use of BMPs during construction. • Noise impacts relating to construction could possibly impact the nearby residential properties. • All applicable permits and certificates must be obtained prior to construction.

Review of Environmental Resources (Continued) Proposed Facility Improvements	
Environmental Resource	**Resources Potentially Affected**
Department of Transportation Act, Section 4(f). A significant impact would occur when a proposed action involves more than a minimal physical use of a Section 4(f) property, (publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance) or is deemed a "constructive use" substantially impairing the 4(f) property where mitigation measures do not reduce or eliminate the impacts. Substantial impairment would occur when impacts to Section 4(f) lands are sufficiently serious that the value of the site in terms of its prior significance and enjoyment are substantially reduced or lost.	• A portion of the park south of the airport is located within the 65 DNL noise contour. Additional coordination with the City of Fredericksburg will be required to determine the extent of these impacts.
Farmlands. Under the *Farmland Protection Policy Act* (FPPA), federal agencies are directed to identify and take into account the adverse effects of federal programs on the preservation of farmland, to consider appropriate alternative actions which could lessen adverse effects, and to assure that such federal programs are, to the extent practicable, compatible with state or local government programs and policies to protect farmland. The FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture.	• According to the Natural Resources Conservation Service (NRCS), the lands required for the proposed runway extension and for the relocation of Lady Bird Drive are designated as prime farmland; however, this area is planned for low-density residential uses. Further coordination with the NRCS and the completion of a Farmland Conversion Impact Rating needs to be performed to determine potential impacts.
Fish, Wildlife, and Plants. The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) determines that a significant impact will result when the proposed action would likely jeopardize the continued existence of a species in question, or would result in the destruction or adverse modification of federally-designated critical habitats in the area. Lesser impacts, as outlined by agencies and organizations having jurisdiction, may result in a significant impact.	• Review of the U.S. Fish and Wildlife Service, Southwest Region, Endangered Species List indicates the potential presence of three listed endangered species in Gillespie County. The listed species are the black-capped Vireo, the golden-cheeked warbler, and the whooping crane. The habitats in which these species nest or roost include dense low thickets and oak scrub, deciduous woodlands, croplands and wetlands. A survey for protected species will likely be required during NEPA documentation or prior to construction. Additionally, the species list is constantly being updated and should be checked again prior to construction.

Review of Environmental Resources (Continued) Proposed Facility Improvements	
Environmental Resource	**Resources Potentially Affected**
Floodplains. Significant impacts to floodplains occur when a proposed action results in notable adverse impacts on natural and beneficial 100-year floodplain values.	• No impacts anticipated. Proposed airport improvements are not contained within a designated 100-year floodplain.
Hazardous Materials, Pollution Prevention, and Solid Waste. The airport must comply with applicable pollution control statutes and requirements. Impacts may occur when changes to the quantity or type of solid waste generated, or type of disposal, differ greatly from existing conditions.	• The airport will need to acquire and comply with a National Pollution Discharge Elimination System (NPDES) permit, which will ensure that pollution control measures are in place at the airport. • As a result of increased operations at the airport, solid waste will slightly increase; however, the solid waste disposal system will likely remain the same.
Historical, Architectural, Archaeological, and Cultural Resources. Impacts may occur when the proposed project causes an adverse effect on a property which has been identified (or is unearthed during construction) as having historical, architectural, archaeological, or cultural significance.	• According to the Texas Historic Sites Atlas, no known historic or cultural resources would be affected by the project. • A cultural resources survey would likely be required for those areas which have not been previously disturbed to eliminate potential impacts to unidentified resources.
Light Emissions and Visual Impacts. Impacts occur when lighting associated with an action will create an annoyance among people in the vicinity or interfere with their normal activities. Visual impacts relate to the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable.	• The proposed alternative will likely result in less-than-significant lighting or visual impacts to the area surrounding the airport. The installation of flashing runway lighting could possibly impact the residential properties southeast of the airport. The commercial and industrial land uses surrounding the airport will likely not be affected by any lighting changes at the airport. • Visual impacts will result from the construction of the bridge to support the runway extension, which will change the appearance of the area. Additional impacts will result from the transition of this area from farming to expanded airport use.
Natural Resources and Energy Supply. In instances of major proposed actions, power companies or other suppliers of energy will need to be contacted to determine if the proposed project demands can be met by existing or planned facilities.	• Any impacts at the airport would be a result of increased operations and upgraded facilities. • Construction impacts will result from increased use of fuel during the construction period. These impacts will be temporary.

Review of Environmental Resources (Continued) Proposed Facility Improvements	
Environmental Resource	**Resources Potentially Affected**
Noise. The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the FAA, EPA, and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.	• As depicted on **Exhibit A,** the existing noise exposure contours, depicted in green, remain entirely on airport property. No existing noise-sensitive institutions or development are impacted by noise in excess of 65 DNL. • The ultimate 65 DNL noise contour, depicted in orange, extends off airport property to the south, but does not impact any noise-sensitive land uses. • Construction noise impacts will be experienced during the construction period. Efforts should be taken to minimize these impacts by restricting construction activities to daylight hours.
Secondary (Induced) Impacts. These impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population growth, public service demands, and changes in business and economic activity to the extent influenced by airport development.	• Significant shifts in patterns of population movement or growth or public service demands are not anticipated as a result of the proposed development. It could be expected, however, that the proposed development would potentially induce positive socioeconomic impacts for the community over a period of years. • The extended runway will allow business jets to use the airport. This will enhance the area's ability to serve patrons of local amenities such as Boot Ranch Golf Course. • It is also expected to encourage tourism, industry, and trade, and to enhance the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development are anticipated to be primarily positive in nature.
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks. Impacts occur when disproportionately high and adverse human health or environmental effects occur to minority and low-income populations; disproportionate health and safety risks occur to children; and extensive relocation of residents, businesses, and disruptive traffic patterns are experienced.	• The proposed development includes acquisition of property adjacent to the airport. The areas identified for acquisition are outlined in purple on **Exhibit A**. • The proposed runway extension will require the acquisition of land at the end of Runway 33. This land will be acquired to gain control of the object free area (OFA). The FAA requires that the OFA be free of structures. There are no residences or businesses within the proposed OFA; therefore, no impacts are anticipated. • The FAA recommends that land within the runway protection zone (RPZ) be controlled by the airport.

Review of Environmental Resources (Continued) Proposed Facility Improvements	
Environmental Resource	**Resources Potentially Affected**
	• To gain full control of the RPZ the airport would need to acquire several residences, thereby displacing several residents. • Additional land north of the airport is to be acquired for landside development. Presently, there are no residences or businesses located on this property. Therefore, no impacts are anticipated. • The relocation of Lady Bird Drive will also require acquisition of land southwest of the airport. • The property acquisition process must comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*.
Water Quality. Water quality concerns associated with airport expansion most often relate to domestic sewage disposal, increased surface runoff and soil erosion, and the storage and handling of fuel, petroleum, solvents, etc.	• The airport will need to continue to acquire and comply with a NPDES operations permit. • With regard to construction activities, the airport and all applicable contractors will need to obtain and comply with the requirements and procedures of the construction-related NPDES General Permit, including the preparation of a *Notice of Intent* and a *Stormwater Pollution Prevention Plan*, prior to the initiation of product construction activities.
Wetlands. Wetlands are defined by Executive Order 11990, *Protection of Wetlands*, as those areas that are inundated by surface or groundwater with a frequency sufficient to support, and under normal circumstances, does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.	• A field survey would be required to determine the presence of wetlands or other waters of the U.S. Potential impacts cannot be determined at this time.
Wild and Scenic Rivers. Wild and scenic rivers (WSR) are designated by the Wild and Scenic Rivers Act. A National Rivers Inventory (NRI) is maintained to identify those river segments which are protected under this Act.	• No impacts. The airport is not located near any designated wild and scenic rivers.

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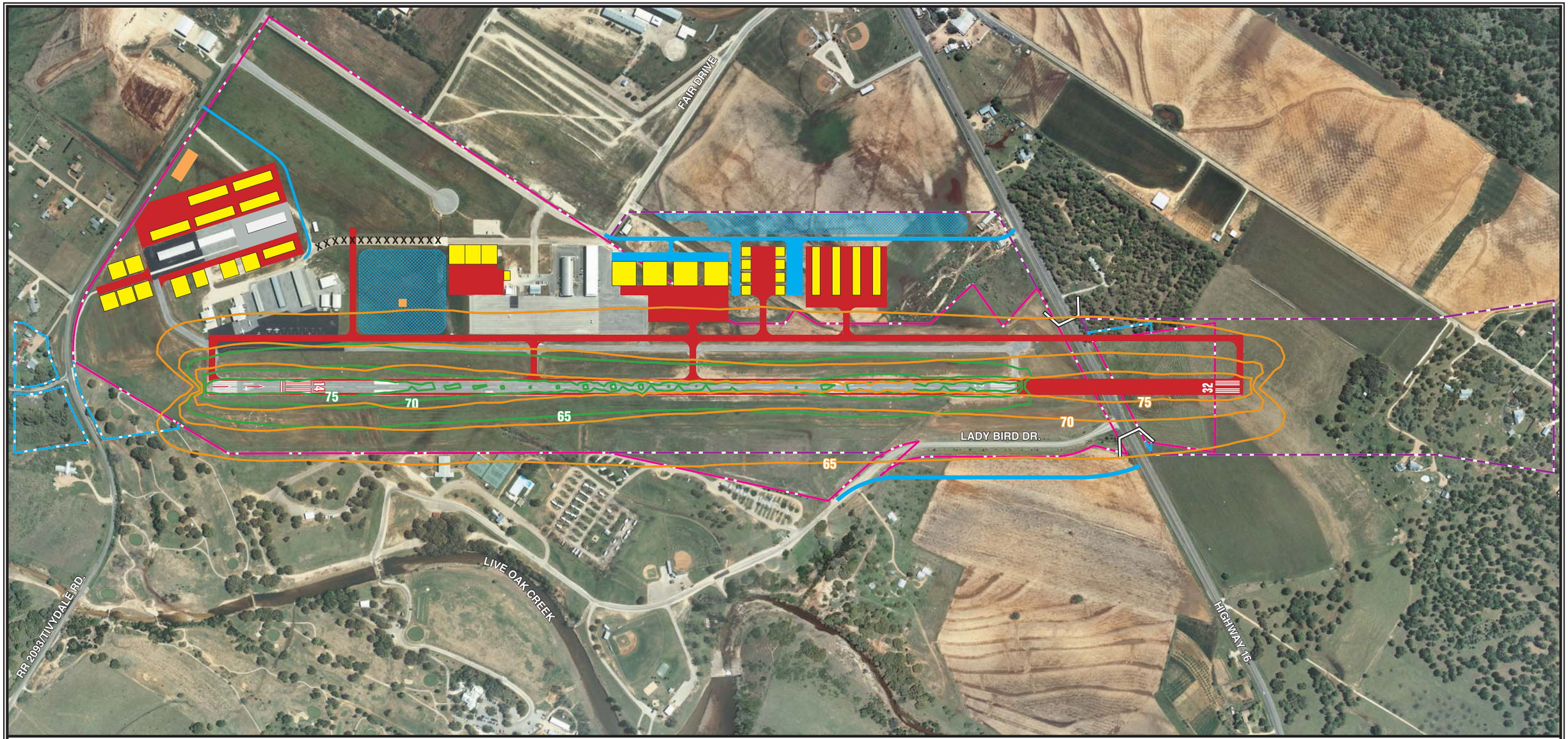

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Easement Line
- Ultimate Airfield Pavement
- Ultimate Parking/Road
- Ultimate Building
- Current DNL Noise Contours
- Ultimate DNL Noise Contours

NORTH

0 600 1600

SCALE IN FEET

GILLESPIE COUNTY AIRPORT

Exhibit A
CURRENT AND ULTIMATE
AIRCRAFT NOISE EXPOSURE

Appendix C

SAMPLE AIRPORT RULES AND REGULATIONS

Appendix C
SAMPLE AIRPORT RULES AND REGULATIONS

The following rules and regulations shall be observed in the use, operation, and conduct of Gillespie County Airport:

SECTION 1 - USE OF AIRPORT RESTRICTED

No person, firm, association, corporation, or entity, incorporated or otherwise, shall use the Airport as a home for any commercial aviation activity, or use the airport for any commercial activity, unless approved by a written lease with approval from the County Commissioners or in accordance with the rules and regulations.

SECTION 2 - GENERAL RULES AND REGULATIONS

RULE 1 - FEDERAL AIR TRAFFIC RULES

Federal Aviation Administration air traffic rules for aircraft operated anywhere in the United States, and presently or hereafter effective, are hereby referred to, adopted, and made a part hereof as though fully set forth and incorporated herein.

RULE 2 - SAFEGUARD OF PERSONS AND PROPERTY

The Airport Manager shall at all times have the authority to take such necessary and legal actions to safeguard any person, aircraft, equipment, or property at the Airport.

RULE 3 - HANGARS

T-hangars constructed and owned by the County may be rented to private individuals, companies or corporations on a monthly basis for the storage of aircraft and required aircraft support items. T-Hangars will be rented at rates approved by the County Commissioners as a part of the budget process, dependent upon age and location of the structure. Hangar rent will be paid by the first day of the month, the first month's rent paid in advance. Hangars will not be modified from their original state unless authorized by the Airport Manager. The Airport Manager will be authorized to enter into any leases or contracts substantially meeting the general terms and conditions of the attached contracts.

Commercial hangars constructed and owned by the County may be rented to companies or corporations on an annual basis for the purpose of conducting commercial, aviation related, activities. Commercial hangars will be rented at the greater of:

1) rates approved by the County Commissioners as a part of the budget process, or
2) the rental rate proposed by interested parties submitting proposals to lease the hangar.

Rentals will be paid by the first day of the month, the first month's rent paid in advance. Hangars will not be modified from their original state unless authorized by the Airport Manager. The Airport Manager will be authorized to enter into any leases or contracts substantially meeting the general terms and conditions of the attached contracts.

RULE 4 - LEASE OF UNIMPROVED AIRPORT PROPERTY

The County may lease property within the building area or other portions of the Airport for the private construction of hangars, buildings, lean-tos, aprons, taxiways, and auto parking lots in accordance with the approved Airport Master Plan/Airport Layout Plan.

RULE 5 - LEASE PROVISIONS AND RESTRICTIONS

The following provisions/restrictions shall apply to all leased Airport property:

a. The County may allow the lease of Airport property for a period not to exceed thirty (30) years in any one lease contract.

b. No leases will exceed periods of thirty (30) years.

c. The County may allow for the long-term lease of property on the Airport with the provision that at the end of a thirty (30) year period, title to all structures, buildings, or hangars erected on the leased property shall revert to the County.

d. Any private structure or hangar not in use for aviation purposes for a period in excess of three (3) months, or not available for rent or sublease for aviation purposes, unless so authorized by the County, must be removed after due notice is given in writing. If not removed, the County will consider such structures or hangars abandoned and possession and control will pass to the County.

e. Leased land from which any building, hangar, or structure is removed after due notice will be cleaned and returned to good condition by the owner of said building, hangar, or structure. Portable and temporary building will not be allowed on airport grounds, unless they are necessary for construction projects.

f. Leased property on the Airport may be subleased by the lessee only with approval by the Airport Manager, or the County Commissioners if appropriate.

g. No structures may be erected beyond the building restriction line (BRL) or in conflict with the approved Airport Master Plan/Airport Layout Plan.

h. All construction must be authorized by the County Commissioners and must be a compatible standard capable of withstanding winds of 70 mph, with doors open or closed.

i. All structures must comply with all Uniform Building Codes and Airport zoning and land-use ordinances.

j. All leased property and all buildings or structures erected on the leased property will be utilized for aviation related activity only, unless specifically otherwise approved by the Airport Manager.

k. Storage of non-aviation vehicles or equipment in a private hangar, or conducting non-aviation business in any structure is prohibited unless approved by the Airport Manager. In no circumstances, whether approved or not, will the County be liable for damage or destruction of any vehicles or equipment.

RULE 6 - LIEN FOR CHARGES

To enforce the payment of any charge made for repairs, improvements, storage, or care of any property, made or furnished by the Gillespie County or its agents, in connection with the operation of said Gillespie County Airport, the Gillespie County shall have a lien upon such personal property, which shall be enforceable as provided by law.

RULE 7 - LIEN POSSESSORY RIGHTS

To the extent provided by law, the Airport Manager may retain possession of any personal property located on the Airport until all reasonable, customary, and usual compensations shall have been paid in full.

RULE 8 - UNAUTHORIZED SIGNS AND STRUCTURES

No signs, equipment, portable buildings, house trailers, poles, or towers of any kind may be erected, installed, or relocated on the Airport property without specific authorization from the Airport Manager. All signs must comply with all other County ordinances and regulations, and if required, the proposed owner of the sign must have appropriate approval of other County departments or Boards and Commissions.

RULE 9 - SURREPTITIOUS ACTIVITIES

Any person observing suspicious, unauthorized, or criminal acts on the Airport property is encouraged to report such activities immediately to the Airport Manager.

RULE 10 - WRECKED/DISABLED AIRCRAFT

Every aircraft owner, pilot, or their agent(s), shall be responsible for notifying the FAA and for the prompt removal from the operational areas of the Airport of any disabled or wrecked aircraft. In the event the aircraft owner shall fail to arrange for the prompt removal of said aircraft, the County may, within its discretion, have the aircraft removed as it deems necessary on behalf of the aircraft owner and for the performance of the aircraft owner's obligations hereunder, and in such event, the cost of such removal shall be the payment obligation of the aircraft owner.

RULE 11 - REPAIRS TO AIRCRAFT

All aircraft repairs performed outside the confines of hangars shall be made at the place(s) designated by the Airport Manager for such purpose.

RULE 12 - AIRCRAFT WASHING

Aircraft may only be washed at the airport wash rack to comply with the Gillespie County Airport's Storm Water Pollution Prevention Plan (SWPPP). (If one becomes available).

RULE 13 - DAMAGE TO AIRPORT

Any person, corporate or individual, and the owner of any aircraft causing damage of any kind to the Gillespie County Airport, whether through violation of these rules or

through vandalism or any act of negligence, shall be liable to pay for the damages to the Gillespie County.

RULE 14 - INJURY TO PERSONS

Persons entering upon Airport grounds do so at their own risk and with no liability incurring to the Airport authority/sponsor for any injury or damage to personal property.

RULE 15 - LICENSED PILOTS

Only properly registered aircraft and persons holding current airman and medical certificates issued by the FAA shall be authorized to operate aircraft upon the Airport grounds. This limitation shall not apply to students in training under licensed instructors, nor to public aircraft of the Federal Government, or of a state, territory, or political subdivision thereof, nor to aircraft licensed by a foreign government with which the United States has a reciprocal agreement covering the operation of such licensed aircraft.

RULE 16 - INTOXICANTS, DRUGS, AND NARCOTICS

No person under the influence of any intoxicant, drug, or narcotic shall operate any aircraft, vehicle, or equipment on Gillespie County Airport; provided however, such prohibition shall not apply to a passenger when accompanied in an aircraft by a nurse or medical caretaker apart from the pilot.

RULE 17 - FOREIGN OBJECT DAMAGE

All persons are encouraged to pick-up and properly dispose of trash and objects, including bottles, cans, scrap, or any other object that could cause damage to an aircraft or injury to persons.

SECTION 3 - GROUND OPERATIONS

RULE 18 - GROUND TRAFFIC

All vehicular traffic shall be confined to avenues of passage designated and provided for that purpose by the Airport Manager and shall not be operated at a speed in excess of 10 miles per hour. Private vehicles shall not operate on the runway(s) or taxiway(s)

unless specifically authorized by the Airport Manager. Furthermore, private vehicle should make use of the service roads on the east side of the hangar buildings when proceeding to individual hangars or business locations on the Airport. The ramp area is restricted to aircraft, fuel trucks, and Airport maintenance vehicles only, except for tenants proceeding to assigned tie-downs occupied by their owned aircraft. Tenants and visitors conducting business with one of the established commercial operators of the Airport shall make use of parking lot areas that have been provided for this purpose.

RULE 19 - FUELING OF AIRCRAFT

The following shall apply to all fueling activity on the Airport property:

a. Aircraft shall not be fueled when an engine is running or while in a hangar or other enclosed place, except that helicopters on a fast-turn-around may be fueled with the aircraft engine idling, at the discretion of the Fixed Base Operator and the pilot. There cannot be any passengers inside the helicopter during "hot" refueling.

b. All aircraft shall be positively grounded when being serviced with fuel. Aircraft being serviced by a fuel truck shall be grounded to the fuel truck and the fuel truck shall be positively grounded.

c. To comply with local and state fire laws, aircraft must be completely outside and clear of hangars or other enclosed spaces when being refueled.

d. Aircraft fuel trucks shall be equipped, operated, and maintained in accordance with National Fire Protection Association, Inc., NFPA Manual 407, "Aircraft Fuel Servicing".

e. Persons and or aviation businesses wishing to supply and dispense aviation fuel for their own private use must first obtain authorization from the Airport Manager.

f. Fueling of aircraft or fuel trucks is prohibited during thunderstorm activity at or within five (5) to ten (10) statute miles of the airport.

g. Fuel trucks are prohibited from all grassy areas of the Airport.

h. Public sale of automobile gasoline for use in aircraft shall not be permitted on the Airport without approval by the Airport Manager. Aircraft authorized by the FAA to use auto gas may be privately fueled by their owner only after compliance with established rules adopted by the Airport Manager.

i. Aviation or automobile fuels shall not be stored within any hangar, except that which is contained in aircraft fuel tanks or other approved containers, in quantities established by the Fire Marshall.

RULE 20 - GROUND SAFETY

a. All fire lanes are to be kept clear.

b. All taxiways and taxilanes are to be kept clear.

c. The use of bicycles, motor scooters, and motorcycles on the ramp is restricted to licensed drivers only. These modes of transportation are NOT allowed past the west end of the hangar row with the exception of loading or unloading of aircraft.

d. Playing on ramp, taxiways, or runway is prohibited.

e. Double parking at hangars is prohibited.

RULE 21 - TIE-DOWN/PARKING OF AIRCRAFT

a. All aircraft not hangared shall be tied down and secured at night or during inclement weather.

b. All aircraft owners or their agent(s) are responsible for the tie-down ropes or chains and security of their aircraft at all times, particularly during inclement weather.

c. Transient aircraft must be tied-down at the Airport if parked for more than 4 hours or at anytime after sunset. Transient aircraft shall pay a posted rate per night for overnight parking on County tie-downs. Aircraft owner must furnish ropes/chains used for tiedowns.

d. Unoccupied aircraft shall NOT be parked or tied down within two hundred (200) feet of the centerline of a VFR runway, two hundred-fifty (250) feet of the centerline of a nonprecision runway, three hundred-fifty feet of the centerline of a precision runway. All aircraft not hangared shall be parked in the areas designated by the Airport Manager.

e. All aircraft shall be parked in such a manner as to not hinder the normal movement of other aircraft and vehicular traffic, unless otherwise specifically authorized by the Airport Manager.

f. It is the responsibility of the pilot, when leaving an aircraft unattended, to ensure that the brakes are set or that the aircraft is properly chocked and/or tied down.

RULE 22 - RUNNING AIRCRAFT ENGINES

a. If not equipped with adequate brakes, the aircraft's engine(s) shall not be started until and unless the wheels have been set with blocks attached to ropes or other suitable means for removing the blocks.

b. No aircraft engine shall be propped, started, or left running without a qualified person at the controls of the aircraft.

c. No mounted aircraft engine shall be started or run inside ANY hangar or building.

d. No aircraft engine shall be started, run, or warmed up until and unless the aircraft is positioned so that the propeller stream/jet blast will not cause damage to property or injury to persons.

RULE 23 - TAXIING AIRCRAFT

a. Persons taxiing aircraft shall ensure that there will be no danger of collision with any person or object.

b. Aircraft shall be taxied at a safe and prudent speed.

c. Aircraft not equipped with adequate brakes shall NOT be taxied near buildings or parked aircraft unless an attendant is at a wing of the aircraft to assist the pilot.

d. Aircraft taxiing from the ramp shall yield to other aircraft on the main taxiway area.

e. Taxiing aircraft into or out of hangars by engine power is prohibited.

f. Aircraft being taxied shall be operated by aircraft mechanics, licensed pilots, or students receiving instruction from a certified flight instructor.

RULE 24 - DAMAGE TO AIRPORT LIGHTING

Any person damaging any airport light or light fixture by operation of any aircraft or other manner shall immediately report such damage to the Airport Manager. Persons

causing damage to runway/taxiway lights, VASI, REIL, or other essential operating lighting apparatus, as a result of negligence or willful acts, shall be liable for replacement cost of the lights and/or fixtures.

RULE 25 - LOADING/UNLOADING AIRCRAFT

Pilots are encouraged to shut down engines(s) when loading/unloading aircraft or enplaning/deplaning an aircraft.

SECTION 4 - LANDING AND TAKE-OFF RULES

RULE 26 - AUTHORITY TO SUSPEND OPERATIONS

The Airport Manager may suspend or restrict any or all operations at the Gillespie County Airport without regard to weather conditions, whenever such action is deemed necessary in the interest of safety.

RULE 27 - RUNWAY USE

When prevailing winds are calm or at up to a ninety (90) degree cross wind, all take-offs and landings will be conducted on Runway 14.

RULE 28 - TAKE-OFFS FROM TAXIWAYS

No fixed-wing take-offs or landings shall be made on the apron, parking ramp, or taxiway except by special permission of the Airport Manager.

RULE 29 - TAKE-OFF CLIMB

A standard take-off pattern is used at Gillespie County Airport for Runway 32. On departure, all aircraft shall climb straight ahead, clear the Airport boundary and then execute a 90-degree left-hand turn into the traffic pattern. For Runway 14, a right-hand turn is to be executed into the traffic pattern, after a straight-out departure. To leave the pattern, the aircraft shall climb to 1,000 feet MSL before executing a 45-degree climbing turn out of the traffic pattern.

RULE 30 - VFR TRAFFIC FLOW

All aircraft landing on Runway 32 shall fly a standard left-hand traffic pattern at an altitude of 800 feet AGL. For Runway 14, all aircraft shall use a right-hand traffic pattern at 800 feet AGL. Pattern entry shall be made at an angle of 45 degrees to the active runway.

RULE 31 - NOISE ABATEMENT

Except when in the Airport traffic pattern, aircraft should be operated over noise sensitive areas at an altitude no less than 1,000 above the ground. Aircraft engines should not be accelerated or decelerated while over populated areas in such a manner as to disturb persons on the ground.

RULE 32 - STRAIGHT-IN APPROACHES

Straight-in approaches shall NOT be used unless authorized by the Airport Manager, or unless two-way radio contact with Airport UNICOM has been established prior to the aircraft reaching five (5) miles from the Airport.

RULE 33 - STOP AND GO APPROACHES

Stop and go maneuvers on the runways of Gillespie County Airport shall NOT be used unless intentions are broadcast in advance on Airport UNICOM.

RULE 34 - STUDENT TRAINING AND FAMILIARIZATION

a. Flight Instructors shall keep themselves informed of all rules and regulations in effect at the Airport and shall be responsible for informing their students of said rules and regulations.

b. By notice posted at the Airport Manager's office, the Airport Manager may designate limited areas of the Airport and local areas for practice flying and training of students.

RULE 35 - FLYING CLUBS

Flying clubs desiring to base their aircraft and operate on the airport must comply with the applicable provisions of the Minimum Standards and these rules and regulations.

They shall be exempt from the regular Fixed Base Operator and/or Commercial Operator requirements upon satisfactory fulfillment of the conditions contained herein.

a. The club shall be a nonprofit entity (corporation, association or partnership) organized for the express purpose of providing its members with aircraft for their personal use and enjoyment only. The ownership of the aircraft must be vested in the name of the flying club (or owned proportionately by all of its members).

b. Flying clubs may not offer or conduct charter, air taxi, or rentals of aircraft operations. They may not conduct aircraft flight instruction except for regular members, and only members of the flying club may act as pilot in command of the aircraft except when receiving dual instruction

c. All flying clubs and their members are prohibited from leasing or selling any goods or services whatsoever to any person or firm other than a member of such club at the airport except that said flying club may sell or exchange its capital equipment.

d. A flying club shall abide by and comply with all Federal, State and local laws, ordinances, regulations, and Rules and Regulations of the airport.

e. Flying clubs, with its permit request, shall furnish the Airport Manager with:

1) a copy of its charter and by-laws, articles of association, partnership agreement and other documentation supporting its existence;
2) a roster, or list of members, including names of officers and directors, and investment share held by each member to be revised on a semi-annual basis;
3) evidence of insurance in the form of a Certificate of Insurance as set out in the Minimum Standards under Exempt Flying Clubs;
4) number and type of aircraft;
5) evidence that ownership is vested in the club;
6) operating rules of the club.

f. The club's books shall be subject to audit by the Gillespie County and/or its auditors to ensure of the non-profitability of the club and to determine its compliance with other provisions of these Rules and Regulations.

Commercial flying clubs are described as those entities engaged in the ownership or lease of aircraft and providing flying services for its members and others but which do not meet the rigid requirements established for not-for-profit clubs. Commercial flying clubs shall have at least one tiedown or adequate hangar space leased from the airport owner or FBO for each owned or leased aircraft.

Proof of purchase of insurance coverage shall be furnished to the Gillespie County in the limits established in the Minimum Standards as detailed under Exempt Flying Clubs.

RULE 36 - SPECIAL PROCEDURES

The Airport Manager may, in the interest of safety, designate special traffic procedures for certain operations, such as air shows, agricultural operations, blimp operations, ultralights, etc.

SECTION 5 - FIRE REGULATIONS

RULE 37 - FIRE REGULATIONS

a. Every person using the Airport or its facilities, in any manner, shall exercise care and caution to prevent fire.

b. Smoking or any open flame within fifty (50) feet of any aircraft, fuel truck, or fuel storage tank is prohibited.

c. Compressed or inflammable gas shall NOT be kept or stored upon the Airport, except in places designated by the Airport Manager.

d. No flammable substances shall be used in cleaning motors or other parts of an aircraft inside a hangar or other building without adequate ventilation.

e. No person shall smoke, ignite a match or lighter in any building, except in offices, waiting rooms, or buildings where specifically designated.

f. Hangar entrances shall be kept clear at all times.

g. The floors in all buildings shall be kept clean and free from oil. Volatile, flammable substances shall NOT be used for cleaning floors.

h. Where aircraft fueling is performed by a fuel truck, an adequate number of suitable grounding connections shall be provided on the apron or servicing ramp.

i. At least two (2) 20 lb. portable fire extinguishers shall be available within fifty (50) feet of the fuel pumps where open hose discharge capacity of the pump is not more than 200 gallons per minute.

j. All aviation fuel nozzles will have "dead man" controls which will shut off the fuel flow when the nozzle hand control is released. Automatic fuel cut-off nozzles will MAY NOT be substituted for "dead man" controls for fueling.

k. At least one (1) fire extinguisher with a 2A, 10BC, rating shall be installed in each hangar to comply with the County Code of Ordinances. Extinguishers shall be mounted not less than five (5) inches from the floor of the hangar, and not more than five (5) feet from the hangar floor. Fire extinguishers should be inspected and tagged by an authorized agency yearly.

l. The County has the right to inspect all facilities with proper notice to ensure that fire extinguishers are properly mounted and that the hangar houses an airworthy aircraft.

SECTION 6 - KNOWLEDGE OF RULES IMPLIED

By publication of these rules and regulations, as required by law, all persons based at Gillespie County Airport will be deemed to have knowledge of its contents. The Airport Manager shall have copies of these rules and regulations available at all times in the Gillespie County offices or Airport Manager's office.

SECTION 7 - CONFLICT IN RULES

If and where there is conflict in these rules and procedures and the Federal Aviation Rules (FARs), the FARs will prevail.

SECTION 8 - PENALTY FOR VIOLATION

a. Any person operating or handling an aircraft in violation of any of these rules, or refusing to comply therewith, may, at once, be ejected from the Airport, or may, for any period of time not to exceed thirty (30) days, be denied use of the Airport by the Airport Manager and, upon public hearing by the County Commissioners, may be deprived of the further use of the Airport and its facilities for such period of time as may be deemed appropriate.

b. Any violation of these rules and regulations shall be a misdemeanor, punishable by fine in a sum not to exceed two hundred dollars ($200) and any such violation is subject to citation and punishment in County Court. This action is cumulative of all other penalties for violation of federal, state, and local laws, rules, regulations, and ordinances.

SECTION 9 - MAINTENANCE, UPDATE, AND DISTRIBUTION OF RULES AND REGULATION DOCUMENT

Maintenance and Update - The Airport Manager will ensure that the Rules and Regulations document is kept current and will submit proposed revisions to the County Commissioners as needed dependent upon the urgency of the subject matter to be revised.

Each time a revision is made to the Rules and Regulations, the date of the adoption of the revision will be reflected on a master copy of the document to be kept in the office of the Airport Manager.

Distribution - a copy of the most current publication of the Rules and Regulations will be provided to each new tenant upon the signing of the lease. Tenants renewing leases will also be provided a copy of the most current publication. A copy will also be posted on the bulletin board located in the airport terminal building. Copies will be provided to other interested parties, upon request at the County's rate for reproduction of printed material.

By the nature of the activity, the following parties will be provided with a copy of the revised document immediately after adoption and issuance of it.

Distribution list:
Manager of each fixed base operation (FBO)
Manager of each flight school
County Secretary, Gillespie County

SECTION 10 - SAVING CLAUSE

Should any part of these rules and regulations be held invalid, no other part shall necessarily be affected thereby.

READ, PASSED, AND ADOPTED, the _____ day of _____, 20___.

County Commissioners:
Gillespie County, Texas

County Secretary
APPROVED BEFORE ADOPTION:

County Attorney

Appendix D

SAMPLE MINIMUM STANDARDS FOR AIRPORT OPERATORS

Appendix D
SAMPLE
MINIMUM STANDARDS
FOR AIRPORT OPERATORS
at Gillespie County Airport

TABLE OF CONTENTS

SECTION 1 - POLICY STATEMENT

The County Commission of Gillespie, Texas being in a position of responsibility for the administration of the Gillespie County Airport, hereinafter called the "Airport", does hereby establish the following Minimum Standards policy:

The Minimum Standards are intended to be the threshold entry requirements for those wishing to provide aeronautical services to the public and to insure that those who have undertaken to provide commodities and services as approved are not exposed to unfair or irresponsible competition. These Minimum Standards were developed taking into consideration the aviation role of the Airport, facilities that currently exist at the Airport, services being offered at the Airport, the future development planned for the Airport and to promote fair competition at the Airport. The uniform application of these Minimum Standards, containing the minimum levels of service that must be offered by the prospective service provider, relates primarily to the public interest and discourages substandard entrepreneurs, thereby protecting both the established aeronautical activity and the Airport patrons.

Final decisions regarding application of these standards rests with the Gillespie County Commissioners, with recommendations provided by Gillespie County Airport Staff, Airport Board, and County staff.

SECTION 2 - DEFINITIONS

$ Aeronautical Activity - means any activity conducted at airports which involves, makes possible or is required for the operation of aircraft, or which contributes to or is required for the safety of such operations. These activities include, but are not limited to, air taxi and charter operations, pilot training, aircraft renting, sightseeing, aerial photography, aerial advertising, aerial surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products, repair and maintenance of aircraft and aircraft parts, sale of aircraft parts, and aircraft storage.

$ Aeronautical Service means any service which involves, makes possible or is required for the operation of aircraft, or which contributes to or is required for the safety of aircraft operations commonly conducted on the airport by a person who has a lease from the airport owner to provide such service.

$ Aircraft Lease (pertaining to the lease of aircraft by an aeronautical activity) means a long-term written agreement established on a minimum basis of six (6) months wherein the lessee shall have full control over the scheduling and use of aircraft and the aircraft is insured as required by these Minimum Standards for the use of the aircraft by Lessee. (Also referred to as aircraft lease-back.)

$ Airport means the Gillespie County Airport, and all of the property, buildings, facilities and improvements within the exterior boundaries of such airport as it now exists on the Airport Layout Plan or Exhibit A or as it may hereinafter be extended, enlarged or modified.

$ Airport Manager means the Airport Manager or his/her designee. If the airport does not have a hired, dedicated airport manager, this means the appointed member of the Gillespie County staff which is responsible for airport operations and development.

$ FAA means the Federal Aviation Administration.

$ FAR means Federal Aviation Regulation.

$ FBO stands for Fixed Base Operator means any aviation business duly licensed and authorized by written agreement with the airport owner to provide aeronautical activities at the airport under strict compliance with such agreement and pursuant to these regulations and standards.

$ Flying Club means a non-commercial organization established to promote flying, develop skills in aeronautics, including pilotage, navigation, and awareness and appreciation of aviation requirements and techniques. See the Airport Rules and Regulations for requirements.

$ Fuel - As defined in an operator's lease agreement.

$ Fueling Operations means the dispensing of aviation fuel into aircraft.

$ Fuel Vendor means an entity engaged in selling or dispensing aviation fuel to aircraft other than that owned or leased by the entity.

$ Fueling Operations Permit means a permit issued by the airport manager to a person or entity who dispenses aviation fuel at the Airport (see Airport Rules and Regulations for requirements and procedure). There are two types: (1) Fuel Vendor's Permit; and (2) Self-fueling Permit.

$ Independent Contractor in this context refers to persons whose place of business is located off the airport property, performing aeronautical services for individual airport tenants and/or operators of transient aircraft.

$ Landside means all buildings and surfaces on the airport used by surface vehicular and pedestrian traffic.

$ Large Aircraft is an aircraft of more than 12,500 pounds maximum certified takeoff weight or turboprop and turbojet aircraft.

$ Minimum Standards means the standards which are established by the airport owner as the minimum requirements to be met as a condition for the right to conduct an aeronautical activity on the airport.

$ NFPA means the National Fire Protection Association.

$ NOTAM means a Notice to Airmen published by the FAA.

$ Owner means the Gillespie County, Texas or other entity providing a combination of aeronautical services to or for aviation users at the Airport.

$ Person means an individual, corporation, government or governmental subdivision, partnership, association, or any other legal entity.

$ Ramp Privilege means the driving of an automobile or other vehicle upon an aircraft parking ramp on the airside of the airport to deliver persons, cargo or equipment to an aircraft as a matter of convenience or necessity. See Airport Rules and Regulations for requirements and procedure.

$ Self-fueling operator means a person who dispenses aviation fuel to aircraft owned by such person, or leased from others and operated by such person. See Airport Rules and Regulations for requirements and procedure.

$ Small Aircraft is an aircraft of 12,500 pounds or less maximum certified take-off weight.

$ TxDOT means Texas Department of Transportation - Aviation Division.

$ UNICOM means a non-governmental communication facility which provides airport advisory information.

SECTION 3 - APPLICATION AND QUALIFICATIONS

Demonstration of intent to conduct a business operation at the Airport shall be by application to the Airport Manager. The written application shall contain at the minimum:

1. The proposed nature of the business. A business plan may be used to express the proposed nature of the business. (See Appendix B, "Minimum Requirements for a Business Plan.")

2. The signatures of all parties whose names are being submitted as owning an interest in the business or will appear on leases or other documents as being a partner, director, or corporate officer, and those who will be managing the business.

3. A current financial statement prepared or certified by a Certified Public Accountant.

4. A listing of assets owned, or being purchased, or leased which will be used in the business on the Airport.

5. A current credit report for each party owning or having a financial interest in the business and a credit report on the business itself covering all geographical areas in which it has done business in the ten-year period immediately prior to such application.

6. An agreement to provide a suitable guarantee of adequate funds to the Airport Manager to be used to defray any expenses and fees normally paid by the Lessee between the estimated time the Lessee may default and a new lease is executed and another Lessee takes over.

7. A written authorization for the FAA, TxDOT, any aviation or aeronautics commissions, administrators, and departments of all states in which the applicant has engaged in aviation business to release information in their files relating to the applicant or its operation. The applicant will execute such forms, releases, or discharges as may be required by those agencies.

8. Preliminary plans, specifications and dates for any improvements which the applicant intends to make on the Airport as part of the activity for which approval is sought. Applicant must comply with appropriate Building Code and Airport Manager Plan Review Procedures and other applicable development code requirements.

9. Proof of liability coverage or insurance company letter of intent for the business operation, flight operations, itinerant aircraft and operators and premises insurance.

10. Such other information as the Airport Manager may require.

SECTION 4 - ACTION ON APPLICATION

All compliant applications will be reviewed and acted upon by the Airport Manager within 45 days from the receipt of the application.

Applications may be denied for one or more of the following reasons:

1. The applicant does not meet qualifications, standards and requirements established by these Minimum Standards.

2. The applicant's proposed operations or construction will create a safety hazard on the Airport.

3. The granting of the application will require the expenditure of local funds, labor or materials on the facilities described in or related to the application, or the operation will result in a financial loss to the Gillespie County.

4. There is no appropriate or adequate available space or building on the Airport to accommodate the entire activity of the applicant.

5. The proposed operation, Airport development or construction does not comply with the approved Airport Master Development Plan.

6. The development or use of the area requested will result in a congestion of aircraft or buildings, or will result in undue interference with the operations of any present fixed base operator on the Airport, such as problems in connection with aircraft traffic or service, or preventing free access and egress to the existing fixed base operator area, or will result in depriving, without the proper economic study, an existing fixed base operator of portions of its leased area in which it is operating.

7. Any party applying, or interested in the business, has supplied false information, or has misrepresented any material fact in the application or in supporting documents, or has failed to make full disclosure on the application.

8. Any party applying, or having an interest in the business, has a record of violating the Rules, or the Rules and Regulations of any other Airport, Civil Air Regulations, Federal Aviation Regulations, or any other Rules and Regulations applicable to this or any other Airport.

9. Any party applying, or having an interest in the business, has defaulted in the performance of any lease or other agreement with the Airport Manager or any lease or other agreement at any other airport.

10. Any party applying, or having an interest in the business, is not sufficiently credit worthy and responsible in the judgment of the Airport Manager to provide and maintain the business to which the application relates and to promptly pay amounts due under the FBO lease.

11. The applicant does not have the finances necessary to conduct the proposed operation for a minimum period of six months.

12. The applicant has committed any felony, or violated any local ordinance rule or regulation, which adversely reflects on its ability to conduct the FBO operation applied for.

SECTION 5 - MINIMUM STANDARDS FOR ALL FBOS

The following shall apply to all prospective aeronautical service providers wishing to become FBOs at the Airport:

1. Leases shall be for a term to be mutually agreed upon between the parties with due consideration for the financial investment and the need to amortize improvements to the leasehold.

2. A person shall have such business background and shall have demonstrated his business capability to the satisfaction of, and in such manner as to meet with the approval of the Airport Manager.

3. Any prospective FBO seeking to conduct aeronautical activity at the Airport should demonstrate that they have adequate resources to realize the business objectives agreed to by the Airport Manager and the applicant.

4. The prospective FBO shall lease from the Owner an area of not less than 5,000 square feet of ground space to provide for outside display and storage of aircraft. The prospective FBO shall also lease from the owner a sufficient area of land to erect a building with at least 5,000 square feet of floor space and to provide paved parking for the FBO's customers and employees. Space in the building shall be provided for aircraft storage, and, for properly lighted, heated, and air conditioned office and lounge space, with telephone and restrooms available to customers.

-- or --

The prospective FBO shall lease an existing building with no less than 5,000 square feet of floor space with properly lighted, heated, and air conditioned office and lounge space with public parking, telephone, and restroom facilities available for customer use.

5. All prospective FBOs shall demonstrate to the Airport Manager's satisfaction, evidence of its ability to acquire insurance coverage as stipulated for each particular type of operation. An FBO should make its own analysis to determine if more is needed. However, such policies of insurance shall be maintained in full force and effect during all terms of existing leases, agreements or business licenses or renewals or extensions thereof with a 30-calendar day notice of cancellation to the Airport Manager. Such policies shall not be for less than the amounts listed in the Airport=s Policies and Standards; however, in all cases, amounts of policies must meet the statutory requirements of applicable governmental agencies and be approved in writing by the Airport Manager.

6. Independent contractors, or, airport tenants and operators of transient aircraft performing aeronautical activities incidental to businesses located off the airport, shall not be considered to be FBOs for the purposes of Minimum Standard Requirements for Airport Aeronautical Services.

SECTION 6 - AIRCRAFT SALES

Statement of Concept

1. New Aircraft Sales: An aircraft sales FBO engages in the sale of new aircraft through franchises or licensed dealerships (if required by local, county or state authority) or distributorship (either on a retail or wholesale basis) of an aircraft manufacturer or used aircraft; and provides such repair, services, and parts as necessary to meet any guarantee or warranty on aircraft sold.

2. Used Aircraft Sales: Many companies engage in the purchasing and selling of used aircraft. This is accomplished through various methods including matching potential purchasers with an aircraft (brokering), assisting a customer in the purchase or sale of an aircraft, or purchasing used aircraft and marketing them to potential purchasers. In many cases these FBOs also provide such repair, services, and parts as necessary to support the operation of aircraft sold. Some of the requirements for the sale of new aircraft may not be appropriate to the sale of used aircraft because of each aircraft's unique operational purpose.

Minimum Standards:

1. The FBO shall provide necessary and satisfactory arrangements for repair and servicing of aircraft, but only for the duration of any sales guarantee or warranty period. The FBO who is engaged in the business of selling new aircraft shall have available a representative example of the product(s), as required by the manufacturer.

2. The FBO shall have in his employ, and on duty during the appropriate business hours, trained personnel in such numbers as are required. The FBO shall also maintain, during all business hours, a responsible person in charge to supervise the operations in the leased area with the authorization to represent and act for and on behalf of the FBO, and to provide appropriately rated pilots for aircraft demonstrations and make and model training in aircraft sold.

3. At least one aircraft storage space (tiedowns or hangars) shall be leased from the owner for each aircraft in inventory.

SECTION 7 - AIRFRAME, ENGINE, AND ACCESSORY MAINTENANCE AND REPAIR

Statement of Concept

An aircraft airframe, engine, and accessory maintenance and repair FBO provides one or a combination of airframe, engine and accessory overhauls and repair services on aircraft up to and may include business jet aircraft and helicopters. This category shall also include the sale of aircraft parts and accessories.

Minimum Standards:

1. The FBO shall provide sufficient equipment, supplies, manuals and availability of parts equivalent to that required for certification by the FAA.

2. The FBO shall have in his employ, and on duty during the appropriate business hours, trained personnel in such numbers as are required to meet the Minimum Standards set forth in this category of services in an efficient manner, but never less than one person currently certificated by the FAA with ratings appropriate to the work being performed and who holds an airframe, power plant or an aircraft inspector rating.

3. At least two aircraft storage spaces (tiedowns or hangars) shall be leased from the owner.

SECTION 8 - AIRCRAFT LEASE AND RENTAL

Statement of Concept

An aircraft lease or rental FBO engages in the rental or lease of aircraft to the public.

Minimum Standards:

1. The FBO shall have available for rental, either owned or under written lease to FBO, a certified and currently airworthy aircraft.

2. The FBO shall make available during business hours an appropriately rated and current FAA certified flight instructor for aircraft check flights as required.

3. At least one tiedown or adequate hangar space shall be leased from the owner for each owned or leased aircraft.

SECTION 9 - FLIGHT TRAINING

Statement of Concept

A flight training FBO engages in instructing pilots in fixed and/or rotary wing aircraft, and provides dual flight instruction and related ground school instruction as necessary preparatory to taking written examinations and flight tests appropriate to the pilot certificates and ratings sought by the applicant.

Minimum Standards:

1. The FBO shall have available for use in flight training, either owned or under written lease to FBO, a certified and currently airworthy aircraft, which must be a two place aircraft suitable for private pilot training.

2. The FBO shall employ at least one FAA certified flight instructor to provide the type of training offered.

3. At least one tie-down or adequate hangar space shall be leased from the owner for each owned or leased aircraft.

SECTION 10 - AIRCRAFT FUEL AND OIL SERVICE

Statement of Concept

An aircraft fuel and oil service FBO provides aviation fuels, lubricants and other services supporting itinerant aircraft operations and operations of aircraft based on the airport.

Minimum Standards:

Except as otherwise provided in any agreement between the FBO and the Authority, an FBO conducting aviation fuel and oil sales or service to the public on the Airport shall be required to provide the following services and equipment.

1. Appropriate grades of aviation fuel.
    a. 100 LL
    b. Jet A

2. An adequate inventory of generally accepted grades of aviation engine oil and lubricants.

3. Fuel dispensing equipment, meeting all applicable Federal, State, and Authority requirements for each type of fuel dispensed.

4. Proper equipment for aircraft towing, inflating aircraft tires, washing aircraft windscreens, and recharging aircraft batteries.

5. The safe storage and handling of fuel in conformance with all Federal, State, County requirements and fire codes pertaining to safe storage and handling of fuel.

6. The lawful and sanitary handling and timely disposal, away from the Airport, of all solid waste, regulated waste, and other materials including, but not limited to, used oil, solvents, and other regulated waste. The piling and storage of crates, boxes, barrels, and other containers will not be permitted within the leased premises.

7. Adequate grounding wires will be installed, continuously inspected and maintained on all fueling equipment, to reduce the hazards of static electricity.

8. An adequate supply of properly located fire extinguishers and other precautions and/or equipment required by applicable fire codes.

9. Unless provided by the airport owner, the FBO shall have a fixed fuel storage system which shall contain safety fixtures and filtration systems to ensure airline-type quality. The system shall be required to have at least 8,000 gallons of storage for each type of fuel the FBO is required to provide. The storage system must include adequate fuel spill prevention features and containment capabilities, together with an approved fuel Spill Prevention Countermeasures and Control Plan (SPCC), as applicable.

10. The prospective FBO shall have his premises open and services available at least 8 hours per day, 7 days a week, and shall make provision for an office

attendant to be on duty at all times during the required operating hours, unless otherwise negotiated with the Airport Manager.

11. A designated parking space for each fueling vehicle shall be leased from the owner.

SECTION 11 - AVIONICS, INSTRUMENTS OR PROPELLER REPAIR STATION

Statement of Concept

An avionics, instrument, or propeller repair station FBO engages in the business of and provides a shop for the repair of aircraft avionics, propellers, instruments, and accessories for general aviation aircraft. This category may include the sale of new or used aircraft avionics, propellers, instruments, and accessories. The FBO shall hold the appropriate repair station certificates issued by FAA for the types of equipment he plans to service and/or install.

Minimum Standards:

1. The FBO shall have in his employ and on duty during the appropriate business hours, trained personnel in such numbers as are required to meet the Minimum Standards set forth in this category in an efficient manner but never less than one person who is an FAA rated radio, instrument or propeller repairman.

2. At least one aircraft storage space (tie-downs or hangars) shall be leased from the owner.

SECTION 12 - AIRCRAFT CHARTER AND AIR TAXI

Statement of Concept

An unscheduled, or scheduled air charter or air taxi FBO engages in the business of providing air transportation (persons or property) to the general public for hire, on an unscheduled or scheduled basis under Code of Federal Regulations CFR 14 Part 135 of the Federal Aviation Regulations.

Minimum Standards:

1. The FBO shall provide, either owned or under written lease type, class, size and number of aircraft intended to be used by the FBO, not less than one single engine

four place aircraft which must meet the requirements of the commercial air taxi certificate held by the FBO.

2. The FBO shall have in his employ and on duty during the appropriate business hours trained personnel in such numbers as are required to meet the Minimum Standards in an efficient manner but never less than one person who is an FAA certified commercial pilot and otherwise appropriately rated to permit the flight activity offered by FBO.

3. At least one tie-down or adequate hangar space shall be leased from the owner for each owned or leased aircraft.

SECTION 13 - AIRCRAFT STORAGE

Statement of Concept

An aircraft storage FBO engages in the rental of conventional hangars or multiple T hangars.

Minimum Standards:

1. The conventional hangar FBO shall have his facilities available for the tenant's aircraft removal and storage on a continuous basis.

2. The FBO shall demonstrate that it can provide sufficient personnel trained to meet all requirements for the storage of aircraft with appropriate equipment.

SECTION 14 - SPECIALIZED COMMERCIAL FLYING SERVICES

Statement of Concept

Specialized commercial flying services FBO engages in air transportation for hire for the purpose of providing the use of aircraft for the following activities:

a. Non stop sightseeing flights that begin and end at the same airport.
b. Aerial advertising.
c. Aerial photography or survey.
d. Power line or pipe line patrol.
e. Fire fighting.
f. Any other operations specifically excluded from Part 135 of the Federal Aviation Regulations.

Minimum Standards:

1. All FBOs shall demonstrate that they have the availability of aircraft suitably equipped for the particular type of operation they intend to perform.

2. The FBO shall have in his employ, and on duty during appropriate business hours, trained personnel in such numbers as may be required to meet the Minimum Standards herein set forth in an efficient manner.

SECTION 15 - MULTIPLE SERVICES

Statement of Concept

A multiple services FBO engages in any two or more of the aeronautical services for which Minimum Standards have been herein provided.

Minimum Standards:

1. The FBO shall comply with the aircraft requirements, including the equipment thereon for each aeronautical service to be performed except that multiple uses can be made of all aircraft owned or under lease by FBO.

2. The FBO shall provide the facilities, equipment and services required to meet the Minimum Standards as herein provided for all aeronautical service the FBO is performing.

3. The FBO shall obtain, as a minimum, insurance coverage which is equal to the greater requirement for all individual aeronautical services being performed by FBO.

4. The FBO shall have in his employ, and on duty during the appropriate business hours, trained personnel in such numbers as are required to meet the Minimum Standards for each aeronautical service the FBO is performing as herein provided. Multiple responsibilities may be assigned to meet the personnel requirements for each aeronautical service being performed by the FBO.

5. The FBO providing 3 or more services, shall lease from owner a sufficient number of aircraft tie-down spaces to meet the combined needs of the operations proposed.

6. A flight planning/pilot lounge area with appropriate seating, work areas, and communication facilities necessary for complete flight planning separate from other public areas.

SECTION 16 - FLYING CLUBS

See requirements for Flying Clubs in Airport Rules and Regulations.

SECTION 17 - FBO SUBLEASING FROM ANOTHER FBO

Prior to finalizing an agreement, the lessee and sub-lessee shall obtain the written approval of the Airport Manager for the business proposed. Said sublease shall define the type of business and service to be offered by the sub-lessee FBO.

The sub-lessee FBO shall meet all of the Minimum Standards established by the Owner for the categories of services to be furnished by the FBO. The Minimum Standards may be met in combination between lessee and sub-lessee. The sublease agreement shall specifically define those services to be provided by the lessee to the sub-lessee that shall be used to meet the standards.

SECTION 18 - ENVIRONMENTAL

Any FBO, person, party, firm or corporation operating on this airport must comply with all federal, state and local environmental requirements.

APPENDIX A

Schedule of Minimum Insurance Requirements:

A. FIXED BASE OPERATOR

1. Commercial general aviation liability policy with coverages for premises, operations, and product liability ($1,000,000 CSL)

2. Hangar Keeper's Liability -Value of Aircraft in care, custody and control

B. AIRFRAME AND POWERPLANT REPAIR, AVIONICS, INSTRUMENTS, OR PROPELLER REPAIR

1. Commercial general aviation liability policy with coverages for premises, operations, and product liability ($1,000,000 CSL)

2. Hangar Keeper's Liability -Value of Aircraft in care, custody and control

C. AIR TAXI AND/OR AIRCRAFT CHARTER

1. Commercial general aviation liability policy with coverages for premises and operations ($1,000,000 CSL)

2. Aircraft liability with coverage for bodily injury and property damage, including passengers ($1,000,000 CSL)

D. AIRCRAFT RENTAL, FLIGHT TRAINING, COMMERCIAL FLYING CLUB

1. Commercial general aviation liability policy with coverages for premises and operations ($1,000,000 CSL)

2. Aircraft liability with coverage for bodily injury and property damage, including passengers ($1,000,000 CSL)

E. SPECIALIZED COMMERCIAL AERONAUTICAL ACTIVITIES, AIRCRAFT SALES

1. Commercial general aviation liability policy with coverages for premises and operations ($1,000,000 CSL)

2. Aircraft liability, if aircraft used in operation ($1,000,000 CSL)

F. EXEMPT FLYING CLUBS

1. Commercial general aviation liability policy with coverages for premises and operations ($1,000,000 CSL)

G. AIRCRAFT HANGAR OPERATOR

1. General Liability Policy ($1,000,000 CSL)

H. Hangar Keeper's Liability -Value of Aircraft in care, custody and control

SPECIAL INSTRUCTIONS

1. Any operator fueling aircraft shall have a minimum $1,000,000 CSL general liability policy with the coverage specified in the Gillespie County Airport Rules and Regulations.

2. Any Operator using service vehicles on the Airport premises in support of its operations shall maintain additional coverage of Motor Vehicle Liability in the amount of $500,000 CSL.

Note: CSL = Combined Single Limit

APPENDIX B

Minimum Requirements for a Business Plan:

1. All services that will be offered.

2. Amount of land desired to lease.

3. Building space that will be constructed or leased.

4. Number of aircraft that will be provided.

5. Equipment and special tooling to be provided.

6. Number of persons to be employed.

7. Short resume for each of the owners and financial backers.

8. Short resume of the manager of the business (if different from"7" above) including this person's experience and background in managing a business of this nature.

9. Periods (days and hours) of proposed operation.

10. Amounts and types of insurance coverage to be maintained.

11. Evidence of the projections for the first year and the succeeding 4 years.

12. Methods to be used to attract new business (advertising and incentives).

13. Amenities to be provided to attract business.

14. Plans for physical expansion, if business should warrant such expansion.

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