Final Report

Master Plan Update

prepared for

CITY OF TYLER

Tyler Pounds Regional Airport

Tyler Pounds Regional Airport

THE LPA GROUP

AVIATION CONSULTANTS

CITY OF TYLER

Tyler Pounds Regional Airport

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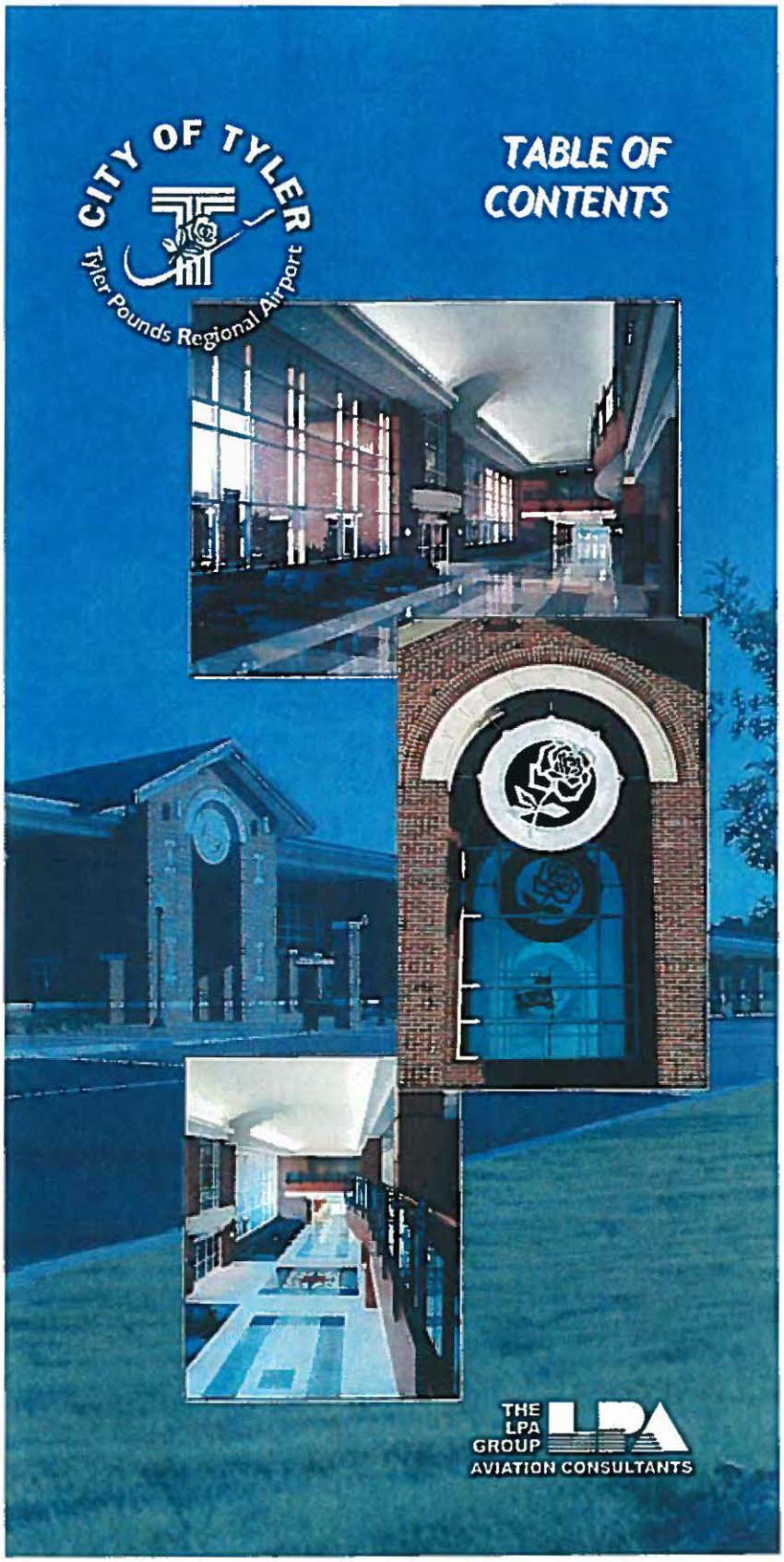

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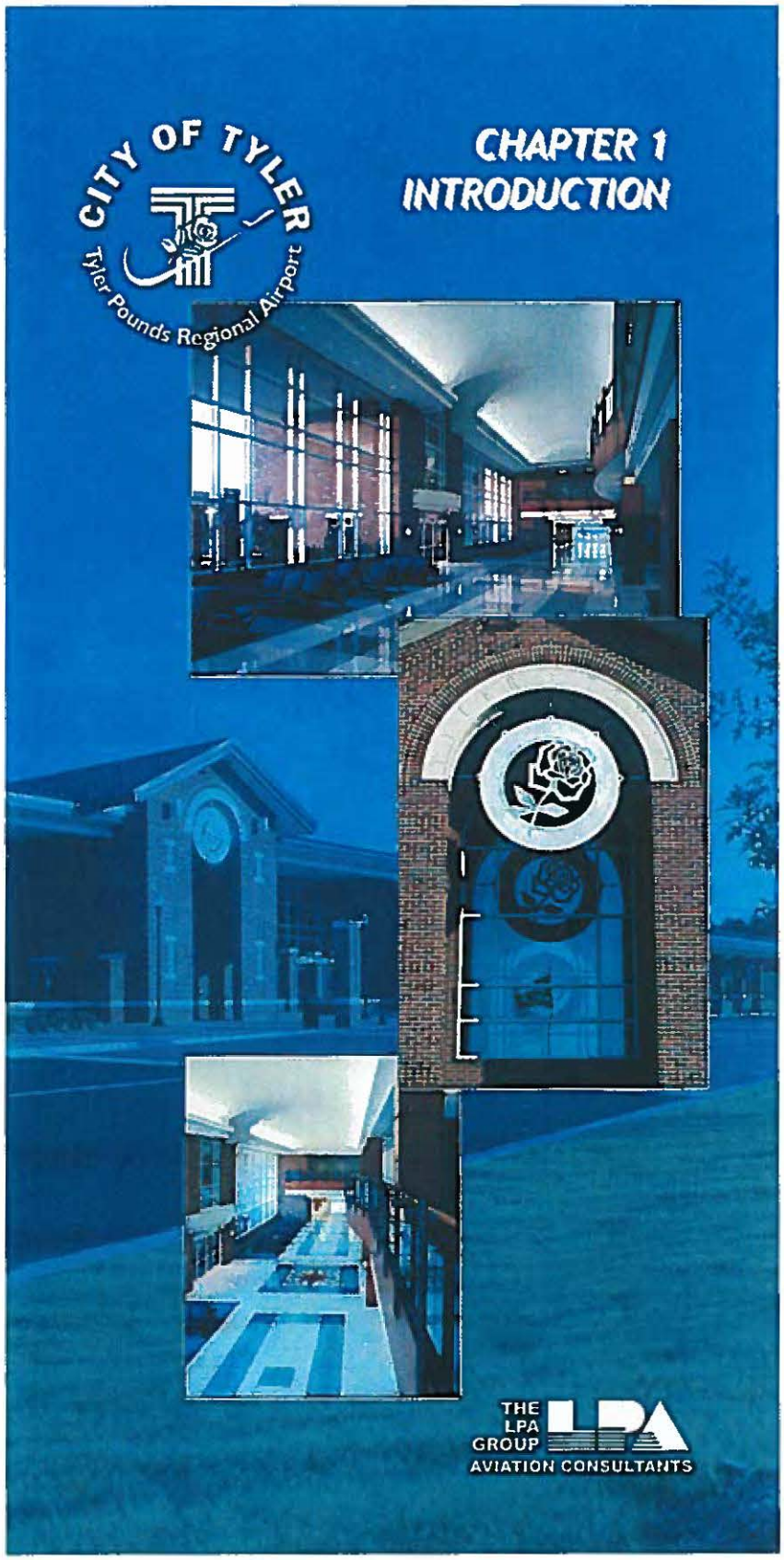
CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 1
INTRODUCTION



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CHAPTER ONE
INTRODUCTION

Due to a number of changes at both the Airport and within the industry as a whole, the City of Tyler undertook an update to the Tyler Pounds Regional Airport (TYR) Master Plan, which was previously updated in 1995. One of the primary reasons is based upon the Federal Aviation requirements associated with airports receiving development grants to conduct periodic updates to their airport development plans. In addition, in the wake of September 11, 2001, its impact on the aviation industry as a whole as well as changes within the Tyler Texas region, all have impacted the Airport in a number of ways.

The airport's master plan serves a variety of functions including projecting future aviation activity and development, being a tool for financial planning, and guiding on-airport and adjacent land uses. The primary objective of the master plan update was to create a 20-year development program that would maintain a safe, efficient, economical, and environmentally acceptable airport facility for the City of Tyler and Smith County. By achieving this objective, the document should provide guidance to satisfy the aviation demand in a financially feasible and responsible manner, while addressing the aviation, environmental and socioeconomic issues of the community. In support of this goal, the following objectives were considered:

- Identifying the needed airside, landside, and airspace improvements and recommend options to further optimize the economic aspects of the airport while enhancing the safety and operational capability;
- Establishing an implementation schedule for short-, intermediate-, and long-term improvements and insure that they are financially feasible;
- Identifying short-term requirements and recommend actions to optimize short-term funding opportunities;
- Insuring that short-term actions and recommendations do not preclude long-range planning options;
- Incorporating the interests of the public and government agencies into the planning process;
- Remaining sensitive to the overall environmental characteristics and needs of the area surrounding the airport; and
- Incorporating current comprehensive land use (both on- and off-airport property) and recommend developments that are compatible with existing and future land uses.

As suggested by the above listing, the airport does not exist in a static environment, but rather within the context of a larger community. As such, any future developments identified by this study consider potential community impacts. Multiple opportunities were available for community and governmental representatives to participate in this study, including through representatives serving on the study's technical advisory committee and through three public meetings. Additionally, the Airport Advisory Board was briefed regularly in an open public forum, allowing for public comments on the presented study information. It is important to note that the study results and the future developments presented in this report represent a plan to guide the Airport Advisory Board in meeting demands as they develop; therefore, no development should be undertaken until there is a clearly identified need for it.

KEY ISSUES

Overall, this master plan provides a comprehensive overview of the airport's needs over the next 20 years, including issues related to the timing of proposed development, costs for this development, methods of financing, management options, and a clear plan of action. Prior to the start of this master plan update, there were a number of key issues identified by Airport Management, requiring attention, including:

- Evaluating existing pavement conditions and considering the development of a pavement management plan that maximizes pavement life and funding over time.
- Evaluating airfield development options that address the primary runway length requirements, runway safety area standards, additional precision approach capability, and future airfield capacity.
- Evaluating long-term development options for general aviation, and maximizing airside access to general aviation facilities.
- Developing options to re-use existing facilities such as the old terminal area, and other vacant facilities.
- Developing options to locate and construct a new air traffic control tower.
- Considering options to improve airline service, including opportunities for enhanced service into major hub cities not presently served.
- Evaluating ground access to existing and future airport development areas with emphasis on minimizing existing impacts to the accessibility of existing airport uses, and future on-airport development areas.
- Compatible land use considerations adjacent to TYR.
- Identifying future aviation development areas within the current boundaries of the Airport.
- Potential industrial development opportunities associated with existing and potential industrial areas within the boundaries of TYR.
- Balancing airside development with a portion of the landside property that needs to be considered and ultimately reserved for other revenue generating purposes.
- Environmental Factors that may act to limit or guide the development of airport property.

This master plan update provides a systematic outline of the development actions required to maintain and further develop airfield and landside facilities. This process provides the officials responsible for scheduling, budgeting and ultimate funding of airport improvement projects with an advance notice of the future needs of the Airport. By phasing airport improvements, the development can be conducted in an orderly and timely fashion.

This master plan update for TYR was prepared in accordance with the requirements of the FAA, the Texas Department of Transportation (TxDOT), and the needs of the airport management and the City of Tyler. All portions of this document are based upon the criteria set forth in FAA Advisory Circulars (AC) 150/5070-6B, Airport Master Plans, and AC 150/5300-13, Change 9, Airport Design. To accomplish the objectives identified, the study included the following tasks:

- Conducting an inventory of existing documents related to the airport, the physical airport facilities, demographics of the airport service area, and airport environment;
- Collecting historical operational data, conducting tenant interviews, and forecasting aviation activity through the year 2023;
- Evaluating and comparing the airfield capacity to expected aviation activity;
- Determine the airport facilities required to meet forecast demand;
- Develop and evaluate alternative methods to meet airfield and landside facility requirements;
- Create a concise Airport Layout Plan (ALP) drawing set reflecting the proposed improvements through the year 2023; and

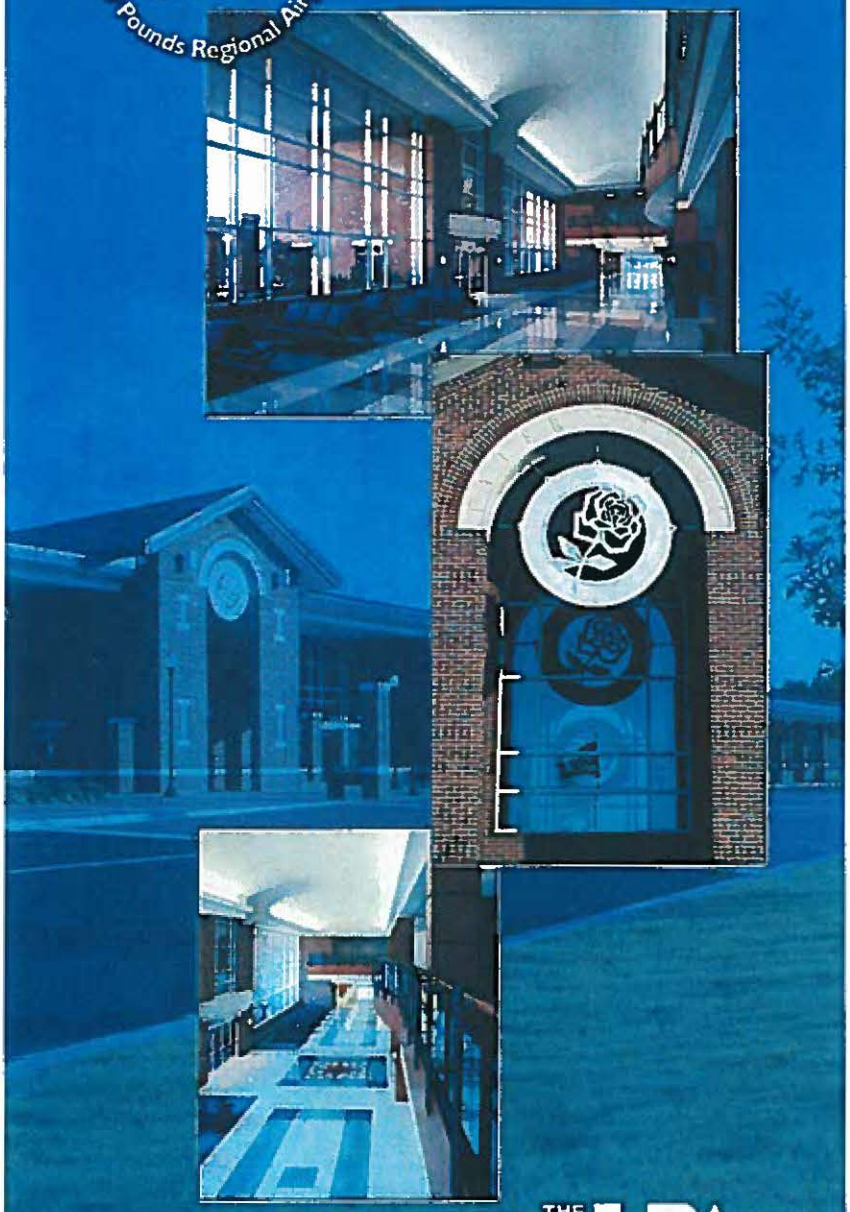
- Compiling a schedule of the proposed improvements, including cost estimates, phasing and financial feasibility of each proposed improvement.

Throughout this process, reviews of the master plan report were conducted at key points such as at the completion of the forecasts and during development of the alternatives. This ensured that input was received from key stakeholders, such as airport management, FAA and TxDOT. The individual report chapters provide a detailed explanation of these key steps. It should be noted that each step in the master plan process built upon information and decision made during the previous steps. Taken as a whole, the master plan process addressed key issues as identified above as well as illustrates how the study objectives were met.

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 2 INVENTORY OF EXISTING CONDITIONS



THE LPA GROUP

AVIATION CONSULTANTS

CHAPTER TWO
INVENTORY OF EXISTING CONDITIONS

INTRODUCTION AND BACKGROUND

The overall objective of the Master Plan Update is to provide guidelines for future development that will satisfy anticipated aviation demand. The Master Plan also addresses the need to be compatible with the environment, consistent with established community development plans, while complimenting alternative modes of transportation including other airports. The following objectives serve as a guide in the preparation of the study:

- To ensure the reliability and safety of airport operations;
- To provide effective graphic representation of the ultimate development of the Airport;
- To establish a schedule of priorities and phasing for the various improvements proposed on the ALP;
- To identify funding sources for development projects at the Airport;
- To graphically depict the various concepts and alternatives which were considered in the proposed plan;
- To provide a concise and descriptive report so that the impact and logic of its recommendations can be understood by those authorities and public agencies which are charged with the approval, promotion, and funding of the proposed improvements; and
- To ensure that the Airport compliments and supports the development of the surrounding communities.

The master plan update for Tyler Pounds Regional Airport (airport identifier TYR) requires the collection and evaluation of a variety of information related to both the Airport and the market which it serves. As such, information related to TYR was collected in order to help identify unique attributes that the Airport contributes to the community. Data gathered will provide an inventory of the following:

- Existing physical facilities: runways, taxiways, parking aprons, navigational aids, and facility areas associated with commercial, general aviation (GA), corporate and airport support.
- The Airport's role, including development history, location, and access relationship to other transportation modes.
- The community's population, socioeconomic and business trends within the Airport's service area, which will provide an indication of potential trends that may have direct bearing upon the level and type of services that the Airport should expand upon in the future.
- A review of the existing Airport, community, and regional plans and studies that contain information pertinent to the development and overall implementation of the overall master plan update recommendations.

An inventory addressing these and other issues requires data from a variety of sources in order to obtain an accurate depiction of TYR and its surrounding community, including:

- Interviews with TYR management and staff
- Interviews with TYR users and tenants
- Contacts with local, state and federal agencies
- Research and review of previous airport planning analyses and studies
- Review of aerial photography, mapping and airport and terminal plans
- Review of facility directories, approach plates, sectional charts, etc.

- Review of Federal Aviation Administration (FAA) Contract Tower (FCT) information related to air traffic activity and peaking characteristics, as well as airfield usage
- Reference materials, including: FAA publications, activity data sites, and planning guidelines; and
- Review of TYR, State of Texas and FAA statistical reports.

FAA CERTIFICATION AND CLASSIFICATION

The Airport is included within the National Plan of Integrated Airport System (NPIAS), which is published by the U.S. Department of Transportation. In the NPIAS, the Federal Aviation Administration (FAA) established the role of those public airports defined as essential to meet the needs of civil aviation and to support the Department of Defense and Postal Service. In the NPIAS, each airport is identified as one of five basic service levels. Based upon these criteria, TYR is designated as a primary commercial service airport.

Part 139 Certification

The FAA provides certification for airports with commercial operations under Federal Aviation Regulation (FAR) Part 139. Originally, this certification only applied to airports with scheduled air carrier service using 30 or more passenger seats. However, The FAA has recently issued a final rule that revises the Federal airport certification regulation [Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139] and establishes certification requirements for airports serving scheduled air carrier operations in aircraft designed for more than 9 passenger seats but less than 31 passenger seats. In addition, this final rule amends a section of an air carrier operation regulation (14 CFR Part 121) so it conforms with changes to airport certification requirements. As part of this certification process, the FAA is also reclassifying airports into four new classes, based on the type of air carrier operations served. Class I, II, and IV airports are those that currently hold Part 139 Airport Operating Certificates (AOCs), and Class III are those airports that will be newly certificated.

The **Table 2-1** indicates the types of air carrier operations that each Part 139 airport class can serve.

TABLE 2-1
TYPE OF AIR CARRIER OPERATION

	CLASS I	CLASS II	CLASS III	CLASS IV
Scheduled Large Air Carrier Aircraft (30+ seats)	X			
Unscheduled Large Air Carrier Aircraft (30+ seats)	X	X		X
Scheduled Small Air Carrier Aircraft (10-30 seats)	X	X	X	

Source: http://www.faa.gov/arp/certification/part139/class.cfm#class1

TYR is classified as a Class I Airport. Class I Airports are defined as Airports serving all types of scheduled operations of air carrier aircraft designed for at least 31 passenger seats (large air carrier aircraft) and any other type of air carrier operations are Class I airports. These airports currently hold an AOC and may serve any air carrier operations covered under Part 139. Accordingly, the operators of these airports must comply with all Part 139 requirements.

Table 2-2 compares previous Part 139 operational and safety requirements with those now required of Class I airports under the revised Part 139. These Part 139 operational requirements are in addition to modifications made to the airport certification process and other administrative changes.

TABLE 2-2
CLASS I PART 139 REQUIREMENTS

	Previous Part 139 Requirements	Revised Part 139 Requirements
1.	Personnel provisions (§139.303)	A recordkeeping system and new personnel training standards and clarification of use of a designee to comply with Part 139
2.	Paved and unpaved surfaces (§139.305 and .307)	Clarification of requirement to repair pavement cracks
3.	Safety areas (§139.309)	Clarification of safety area definition (see §139.3)
4.	Marking, lighting and signs (§139.311)	Clarification of requirement to mark pavement edges and new requirement for sign plan (see §139.203(b)(13))
5.	Snow and ice control plan (§139.313)	Clarification of requirement for determining need for plan and positioning of snow off movement areas
6.	ARFF (§139.315, .317 and .319)	New personnel training, fire extinguishing agent, and HAZMAT response standards; elimination of older ARFF vehicle exception; and clarification of Index criteria. Also, extends ARFF coverage to scheduled operations of small air carrier aircraft.
7.	HAZMAT handling/storage (§139.321)	Standards for air carrier fueling operations, and additional fuel fire safety and personnel training standards
8.	Traffic/wind indicators (§139.323)	New supplemental wind cone/segmented circle standards
9.	Airport emergency plan (§139.325)	New requirement to plan for fuel storage fires, HAZMAT and security incidents, alarm systems and water rescue situations
10.	Self-inspections (§139.327)	New training requirements for inspection personnel
11.	Ground vehicle operations (§139.329)	New training requirements for pedestrians and ground vehicles
12.	Obstructions (§139.331)	Unchanged
13.	NAVAIDS (§139.333)	Unchanged
14.	Public protection (§139.335)	Unchanged
15.	Wildlife hazard management (§139.337)	Clarification of wildlife hazards requiring action and new hazard assessment and management plan standards
16.	Airport condition reporting (§139.339)	New notification standard
17.	Construction/unserviceable areas (§139.341)	Unchanged

Source: Federal Aviation Administration, 14 CFR Part 139, 2004

At the time of the inventory, the Airport was in the process of updating the Airport Certification Manual and other procedures to meet the new requirements.

FAA Classification

For the purpose of planning, the FAA classifies aircraft by two key characteristics: Approach Speed and Wingspan. The Aircraft Approach Speed Category ranges from A to E. The letters represents the approach speed of the aircraft. The Aircraft Design Group ranges from I to VI. The number represents the aircraft's wingspan. A complete list of the Approach Speed Categories and Aircraft Design Groups is shown in **Table 2-3**. The FAA uses these two categories to determine the Airport Reference Code (ARC), which signifies the most demanding aircraft type expected at the facility. The ARC is used to determine the standards and dimensions of the critical surface and separations of the airfield facilities. The FAA Advisory Circular (AC) 150/5300-13 Change 8, *Airport Design*, contains the minimum standards for designing airport facilities based on the ARC associated with an airfield.

TABLE 2-3
FAA AIRCRAFT APPROACH CATEGORIES AND AIRCRAFT DESIGN STANDARD

Aircraft Approach Category	Approach Speed
A	Speed less than 91 knots
B	Speed 91 knots to less than 121 knots
C	Speed 121 knots to less than 141 knots
D	Speed 141 knots to less than 166 knots
E	Speed greater than 166 knots
Aircraft Design Group	**Wingspan**
I	49 feet and less
II	49 feet up to but not including 79 feet
III	79 feet up to but not including 118 feet
IV	118 feet up to but not including 171 feet
V	171 feet up to but not including 214 feet
VI	214 feet up to but not including 262 feet

Source: FAA AC 150/5300-13, Change 9, Airport Design

Within the last ten-year period from 1994 to 2004, TYR has averaged over 110,000 passengers per year. Based upon current aircraft operations, TYR is classified as a D-II airport.

Commercial service at TYR is provided through American Eagle and Continental Connection operators using Saab 340, Embrair 120 Brasilia, and Embrair RJ 140/145. In addition to commercial service operations, TYR is home to a significant amount of general aviation (GA) traffic, ranging in size from small single-engine piston aircraft like the Cessna 172 to larger turboprop and business jet aircraft such as the Cessna Citation II, Citation 10, Beach King Air and Dassault Falconjet. Other large business jets including the Grumman Gulfstream II also frequently use the Airport. Based upon aircraft records, there are currently 111 based aircraft on the field as of 2005. The existing based aircraft fleet mix at TYR is shown in **Table 2-4.**

TABLE 2-4 BASED AIRCRAFT MIX BY CLASSIFICATION*	
Aircraft Approach Category	
Utility Aircraft	
Category A	~70%
Category B	~23%
Transport Aircraft	
Category C	~6%
Category D	~1%
Category E	0%
Airplane Design Group	
Design Group I	~70%
Design Group II	~30%
Design Group III	~0%
Design Group IV	~0%
Design Group V	~0%
Design Group VI	~0%

** Per FAA Advisory Circular (A/C) 150/5300-13, Change 9*
Source: Tyler Pounds Regional Airport, 2003 and THE LPA GROUP, INC.

AIRPORT SETTING

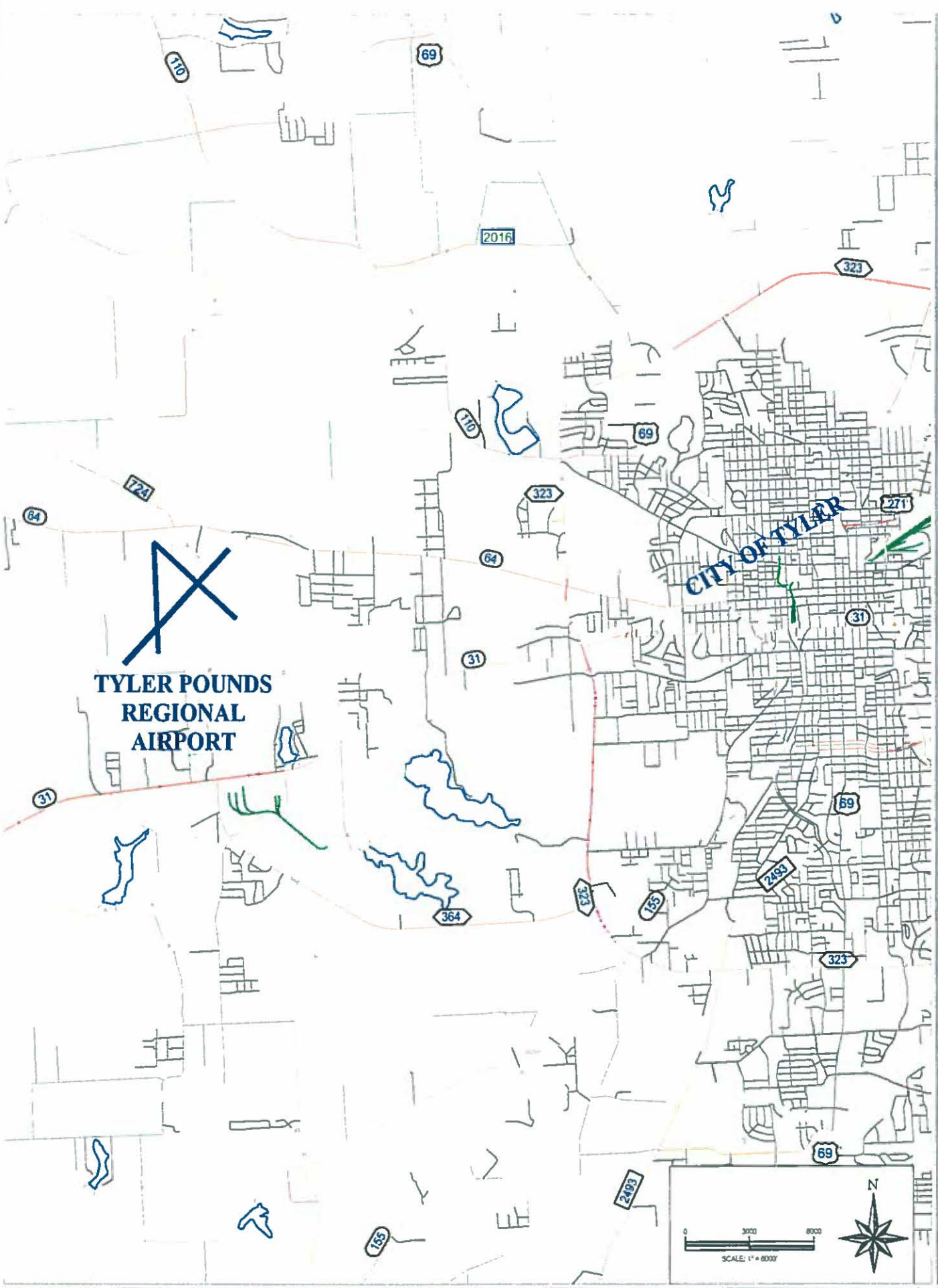
Tyler, Texas is located in east Texas approximately 90 miles southeast of Dallas via Interstate 20 (I-20) and approximately 100 miles northwest of Houston. TYR is located six miles west of the City of Tyler within Smith County. The Airport provides a gateway for East Texans to all major U.S. cities and destinations around the world primarily through Dallas/Fort Worth and Bush Intercontinental Airports. The Airport is only a short drive from Lindale, Whitehouse, Athens, Palestine, Jacksonville and other East Texas cities.

Locale

TYR is located on approximately 974 acres of land, as shown in **Figure 2-1,** at an elevation of 544 feet above sea level. The Airport is owned and operated by the City of Tyler.

There are several public use airports with commercial service within an 80 nautical mile radius of Tyler. The most significant of these are: Dallas Love Field, located approximately 79 nautical miles to the northwest, and Dallas/Fort Worth International Airport, located approximately 88 nautical miles to the northwest.

Additionally, there are also several public airports offering general aviation services located within an approximate 30-nautical mile radius of Tyler. These airports include: Athens Municipal Airport, Gladewater Municipal Airport, Rusk County Airport, Cherokee County Airport and Fox Stephens Field–Gilmer Municipal Airport. **Table 2-5 and Figure 2-2, respectively,** provide a brief overview of these surrounding airports.



VICINITY MAP

FIGURE 2-1

TABLE 2-5
PUBLIC GENERAL AVIATION AIRPORTS IN THE REGION

Airport	Distance from TYR (nm)	Runways	Published Instrument Approach Procedures
Athens Municipal Airport (F44)	24	17-35 (3,988' x 60')	NDB
Gladewater Municipal Airport (07F)	24	14-32 (3,301' x 75') 17-35 (2,301' x 60')	VOR/DME or GPS
Rusk County Airport (F12)	31	16-34 (4,004' x 75') 12-30 (3,002' x 75')	VOR/DME - GPS - NDB
Cherokee County Airport (JSO)	30	14-32 (5,011' x 75')	VOR/DME - GPS - NDB
Fox Stephens Field - Gilmer Municipal Airport (JXI)	31	18-36 (4,000' x 60')	VOR/DME

Source: Aimav.com

METEOROLOGICAL CONDITIONS

Since weather plays a significant role in the efficient and safe operation of aircraft, it must be considered in a number of different airfield design parameters. As such, information obtained regarding the Tyler area's climate and wind characteristics are presented in the following sections.

Climate

Tyler is located approximately 95 miles east of Dallas on I-20 midway between Dallas and Shreveport, LA. Nestled among sparkling lakes and woodlands, Tyler, Texas is known for its mild climate. East Texas has four distinct seasons - fall, winter, summer, and spring - with an average of 245 days of sunny weather annually. Summer months are warm due to moist southern air from the Gulf of Mexico. The average daily maximum temperature at TYR is 96 degrees Fahrenheit.

Tyler's winter is limited to January and February. Winter temperatures are mild with only two days a year when the daily high falls below freezing. Snowfall averages two inches per year but usually melts quickly. Even so, there are often warm days in February with daffodils dotting the landscape. Rainfall in this area occurs during all seasons; however, it is more abundant during the spring and summer months. Average rainfall in East Texas ranges between 32 to 48 inches per year.

Wind Coverage

Historical wind conditions were evaluated to determine the percentage of wind coverage at TYR. This element is important since aircraft takeoff and land into the wind. The FAA recommends that sufficient runways be provided to achieve 95 percent wind coverage. The 95 percent wind coverage is computed based on the crosswind not exceeding 10.5 knots (12 MPH) for the smallest aircraft with ARCs of A-I and B-I; 13-knots (15 MPH) for ARCs A-II and B-II; 16 knots (18 MPH) for ARCs A-III, B-III, C-I through D-III; and 20 knots (23 mph) for ARCs A-IV through D-VI. If 95 percent wind coverage is not provided at an airport for the maximum crosswind component of the critical aircraft, then the addition of a crosswind runway should be considered.

FAA Advisory Circular (AC) 150/5300-13, Change 9, *Airport Design*, expresses that a period of at least ten (10) consecutive years of onsite wind data should be examined when carrying out an airfield wind coverage evaluation. If onsite data is not available, it is recommended that composite data from two nearby airports be used for the wind

Figure 2-2
Airports in the Area
Source: National Plan of Integrated Airport Systems 2001-2005 (NPIAS)

analysis. Wind data is available through the National Oceanic and Atmosphere Administration's National Climatic Data Center (NCDC), located in Asheville, NC. Wind coverage percentages should also take into account the weather minimums associated with the approved approaches for each runway. Therefore, all weather, visual flight rules (VFR), instrument flight rule (IFR) and below minimum conditions should be analyzed.

Using **Airport Design, Version 4.2D**, an analysis of all weather, VFR and IFR wind coverage percentages was conducted. This information is presented in **Table 2-6 and Tables 2-3, All-Weather, and 2-4, IFR Coverage.** Wind coverage is only included for the crosswind speed that corresponds to the approach category and airplane design group that would utilize that runway. In the case of TYR, both a 10.5 knot and 13 knot crosswind component was analyzed. A review of prevailing winds, south and occasionally south-southeast, shows that for a 10.5-knot crosswind, no single runway provides the requisite 95 percent wind coverage under all-weather, VFR and IFR conditions. However, a combination of the primary runway 4-22 and either 13-31 or 17-35 provides the necessary wind coverage at the crosswind speed of 10.5 knots. All other wind coverage percentages exceed the 95 percent minimum.

TABLE 2-6
PERCENTAGE WIND COVERAGE

Airfield Configuration	Crosswind Component 10.5-Knots (12 mph)	13-Knots (15 mph)	16-Knots (18.4 mph)	20-Knots (23 mph)
All-Weather Conditions				
Runway 4/22	91.23%	95.85%	99.17%	99.84%
Runway 13/31	93.23%	97.09%	99.53%	99.92%
Runway 17/35	96.72%	98.54%	99.76%	99.94%
Total Combined	99.89%	99.97%	99.99%	99.99%
IFR Conditions (Ceiling between 250' and 1000'; Visibility between 0.75 and 3.0 statute miles)				
Runway 4/22		96.06%	Not Required	Not Required
Runway 13/31		97.23%	Not Required	Not Required
Runway 17/35		97.60%	Not Required	Not Required
Total Combined		99.95%	Not Required	Not Required

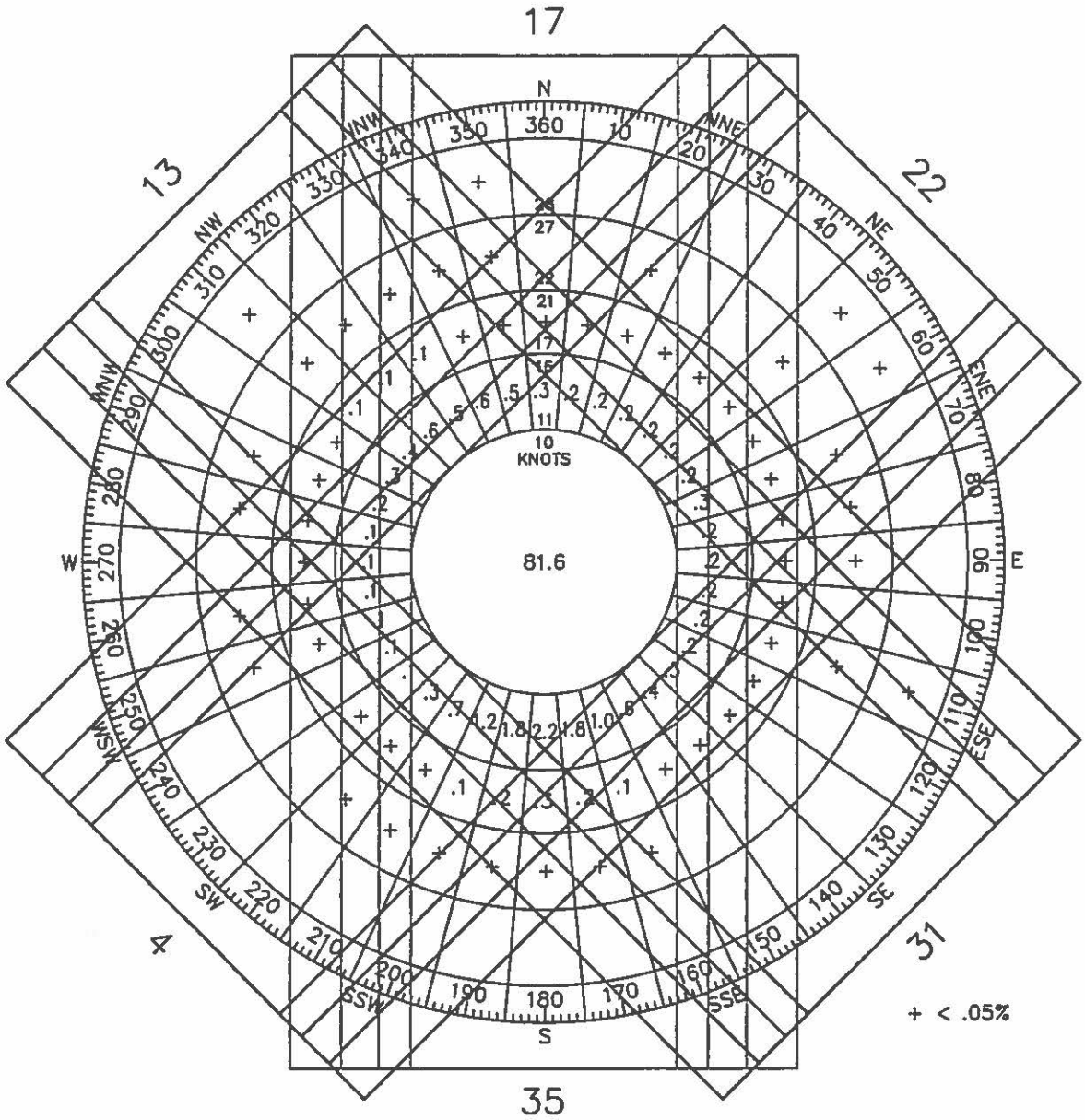
Source: National Climatic Data Center: TYR 1994-2004

HISTORIC DATA

A number of different sources were utilized to collect historical data related to activities at the Airport. This included reviewing the history of the Airport and previous studies conducted for the Airport, as well as FAA records for historic aircraft and operations.

Airport History

The Airport, originally named Rhodes Field after Chamber of Commerce Manager, Russell S. Rhodes, and established in June 1929 consisted of 93 acres of land purchased at a cost of $4,461.50. In June of 1930, the Airport was renamed to Tyler Municipal Airport. At that time, the Airport consisted of a sod runway, a hangar, a small apron and a refueling pit constructed on 240 Acres of sandy hillside. On January 8, 1943, the City Commission of the City of Tyler adopted a resolution to change the name of Tyler Municipal Airport to Pounds Field in honor of Lieutenant Jack Pounds, the first native son of Tyler and fallen WW II war hero. On August 18, 1991, the Tyler City Council adopted a resolution to change the name of Pounds Field to Tyler Pounds Field. This name was adopted following the renovation and expansion of the old terminal building.

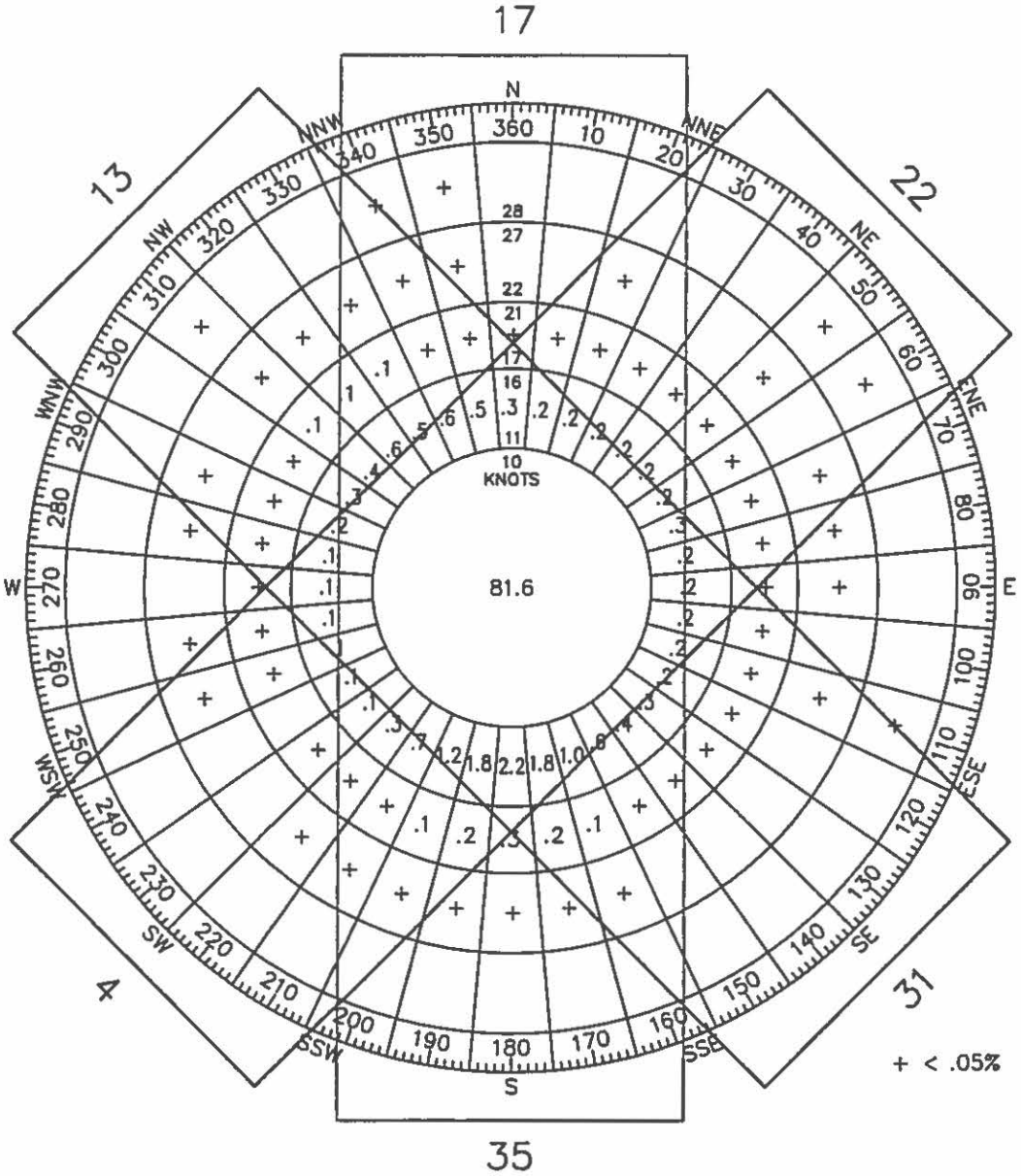


WIND COVERAGE	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 4/22	91.23%	95.85%	99.17%	99.84%
RUNWAY 13/31	93.23%	97.09%	99.53%	99.92%
RUNWAY 17/35	96.72%	98.54%	99.76%	99.94%
TOTAL COMBINED	99.89%	99.97.%	99.99%	99.99%

SOURCE: NATIONAL CLIMATIC DATA CENTER
ASHEVILLE, NC

67585 OBSERVATIONS MADE
OVER THE PERIOD 1994–2003
STATION 72244 TYLER–POUNDS AP, TX, US

All Weather Wind Rose



WIND COVERAGE	13 KNOTS
RUNWAY 4 *	83.09%
RUNWAY 22 *	70.61%
RUNWAY 13 *	78.81%
RUNWAY 31 *	69.92%
RUNWAY 17 *	73.65%
RUNWAY 35 *	71.79%

* BASED ON A 5 KNOT TAILWIND COMPONENT

WIND COVERAGE	13 KNOTS
RUNWAY 4/22	96.06%
RUNWAY 13/31	97.23%
RUNWAY 17/35	97.60%
TOTAL COMBINED	99.95%

SOURCE: NATIONAL CLIMATIC DATA CENTER
ASHEVILLE, NC

67585 OBSERVATIONS MADE
OVER THE PERIOD 1994–2003
STATION 72244 TYLER–POUNDS AP, TX, US

IFR Wind Rose

FIGURE 2-4

However on August 17, 2002, the Airport opened its new 38,000 square foot terminal facility, which initiated another name change. The Airport is now called the Tyler Pounds Regional Airport.

Previous Studies

It is important to review previous airport planning documents in order to understand and incorporate past planning efforts. The following planning documents were referenced in the development of this chapter.

- 1995 Airport Master Plan Update, Bucher, Willis and Ratliff
- 2002-2013 Aerospace Forecasts, Federal Aviation Administration
- 2004 Terminal Area Forecasts (TAF), Federal Aviation Administration, and
- 2001-2005 National Plan of Integrated Airport Systems, Federal Aviation Administration

These documents were reviewed strictly for their historical content and insight into potential long-range development at TYR.

HISTORICAL AVIATION ACTIVITY

In this section, previous activity at TYR was evaluated. This information is vital for developing the future aviation activity forecast and facility requirements.

Historical Aircraft and Activity Counts

The historical number of based aircraft, operations and enplanements at the Airport is essential in developing an accurate forecast for the future based aircraft and operations. This information along with industry trends and selected socio-economic factors will be evaluated for the planning period to develop the forecast. The main sources of the historical aircraft activity at TYR are the Airport itself, FAA Airport Master Records (Form 5010) and FAA Terminal Area Forecast (TAF). However, the most accurate source for based aircraft and aircraft operations was the Airport.

Based Aircraft

Historical based aircraft was obtained from the annual FAA 5010 forms, the FAA TAF and airport records. When evaluating the historical activity at an airport, data selected must represent the past ten years in order to provide an accurate understanding of airport usage. Since the Airport keeps outstanding records of based aircraft, data provided by TYR was selected as the most accurate representation of based aircraft. **Table 2-7** presents the summary of based aircraft information.

TABLE 2-7 HISTORICAL BASED AIRCRAFT	
Year	Total
1994	109
1995	107
1996	137
1997	111
1998	111
1999	107
2000	112
2001	117
2002	136
2003	111
2004	110
2005	111
Overall Growth Rate	1.82%
Average Annual Growth Rate	.164%

Source: Tyler Pounds Regional Airport, 2005 and FAA TAF, 2006

Aircraft Operations

An aircraft operation is counted as either a landing or takeoff. A touch-and-go operation is considered two operations, one landing and one takeoff. Operations are divided into two categories: local operations and itinerant operations. According to the FAA definition, local operations are those arrivals or departures performed by aircraft that remain in the airport traffic pattern or are within sight of the Airport. This generally covers an area within a 20-nautical mile radius of the airfield. Itinerant operations are arrivals or departures other than local performed by transient aircraft. Historical airport operations were obtained from Airport Management, which are outlined in **Table 2-8**.

TABLE 2-8 HISTORICAL AIRCRAFT OPERATIONS	
Year	Total
1994	101,346
1995	91,441
1996	87,391
1997	116,157
1998	114,991
1999	110,236
2000	103,820
2001	123,156
2002	135,984
2003	143,824
2004	63,441
2005	62,036
Overall Growth Rate	-38.79%
Average Annual Growth Rate	-4.36%

Source: Tyler Pounds Regional Airport, 2005

Air Carrier Passenger Enplanements

Commercial air carrier activity includes all regularly schedule airline activity performed by airlines certified under Federal Aviation Regulations (FAR) Parts 121 and 127. Commercial activity at TYR is provided by American Eagle and Continental Connection, which offer competitive airfares to a number of destinations around the country.

Passenger enplanements are defined as the number of revenue passengers boarding an aircraft, including stopover and transfer passengers. Passenger enplanements are primarily found between the Tyler/Dallas-Ft. Worth connection and Tyler/George Bush Intercontinental Airport connection. **Table 2-9** provides an overview of total passenger enplanements at TYR since 1994.

TABLE 2-9
HISTORICAL AIRCRAFT ENPLANEMENTS

Year	Total
1994	81,506
1995	77,252
1996	72,897
1997	73,415
1998	72,616
1999	77,795
2000	74,563
2001	63,834
2002	55,578
2003	60,284
2004	70,549
2005	86,183
Overall Growth Rate	8.19%
Average Annual Growth Rate	.72%

Source: Tyler Pounds Regional Airport, 2004

AIRPORT FACILITIES

Land Holdings

As stated, TYR is located on approximately 999 acres of land. According to airport records, approximately 974 acres is designated as Fee Simple ownership and 25 acres are designated as easements. Fee simple property represents the most complete ownership of land. A fee simple owner acquires ownership of the entire property, including both the land and buildings. The fee simple owner does not pay ground rent. The fee simple owner has the right to possess, use the land, and dispose of the land as he wishes to sell it, give it away, trade it for other things, lease it to others, or pass it to others upon death.

An easement, on the other hand, is the right of use over the real property of another. Easements may be considered public or private. A private easement is limited to a specific individual such as the owner of adjoining land. A public easement is one that grants the right to a large group of individuals or to the public in general, such as the easement on public streets and highways or of the right to navigate a river. Traditionally it was a right that could only attach to an adjacent land and was for the benefit of all, not a specific person. The right is often described as the right to use the land of another for a special purpose. In the case of the Airport, the existing easements consist of the runway protection zones associated with Runway 13-31. **Table 2-10** outlines the existing property information at the Airport as contained in airport records.

TABLE 2-10 EXISTING PROPERTY INFORMATION			
TRACT	ACREAGE	INTEREST	YEAR
1	829.168	Fee Simple	1942
2	41.697	Fee Simple	1958
3	5.20	Fee Simple	1964
4	.944	Fee Simple	1964
5	15.266	Fee Simple	1971
6	20.119	Fee Simple	1977
16	5.860	Fee Simple	1995
17	34.887	Fee Simple	1998
18	21.141	Fee Simple	1999
Total Fee Simple	**974.282**		
7	12.328	Easement	1977
8	7.997	Easement	1977
9	5.198	Easement	1977
Total Easement	**25.523**		

Source: Airport Records, 2005

Airfield Facilities

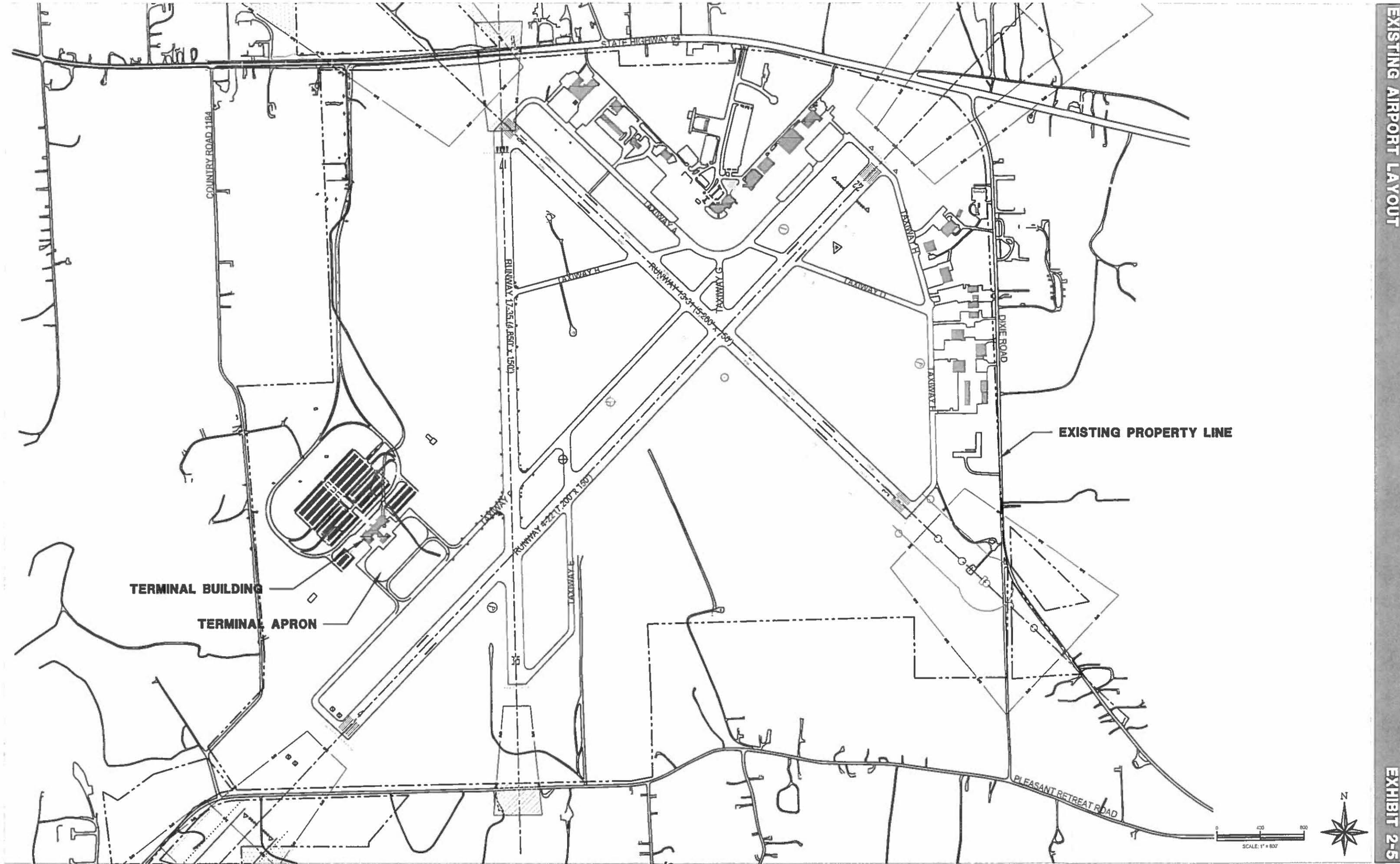
This section presents a description of the existing airside facilities at the airport. The description of the following facilities provides the basis for the airfield demand/capacity analysis and the determination of facility requirements to be presented in subsequent chapters. The airside facilities generally include those required to support the movement and operation of aircraft. While this most certainly involves the airport's runways and taxiways, it also includes the available instrument approaches; airfield lighting; pavement markings; takeoff and landing aids; and airfield signage. The current physical airside facilities at TYR are depicted in **Figure 2-5**, Existing Airport Facilities.

In addition to the physical characteristics of the runway, there are other safety-related criteria. These criteria are defined not only in FAA AC 150/5300-13, Change 9, but also by Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*. While there are various imaginary surfaces associated with each runway, the criteria for each will be discussed in later sections. Details pertaining to the requirements for a Runway Safety Area (RSA), Runway Object Free Area (ROFA), and Runway Protection Zone (RPZ) will be addressed as part of the facility requirements determination, while the FAR Part 77 surfaces will be included in the text associated with the Airport Layout Plan set.

Runway 13-31

Runway 13-31 is considered the primary instrument runway since commercial pilots frequently request this runway because it is equipped with a precision approach landing system on Runway 13. Runway 13-31 is 5,201 feet in length and 150 feet in width, as published in the Airport Facility Directory, dated September 2003. Runway 13-31 is designated to accommodate aircraft meeting ARC B-II design criteria. An RSA of 300 feet in width and an Object Free Area (OFA) of 800 feet in width are centered about the runway centerline. Both the RSA and OFA extend 600 feet beyond the runway threshold. There are no RSA issues associated with this runway.

The runway is of asphalt construction, and is reported to be in good condition. Pavement strength determines the maximum load bearing that the runway could sustain, and is dependant on the aircraft's undercarriage configuration. There are four types of undercarriage configurations: single wheel, dual wheel, tandem wheel and dual wheel tandem.



EXISTING AIRPORT LAYOUT

EXHIBIT 2-5

LPA

TYLER POUNDS
REGIONAL AIRPORT

MASTER PLAN UPDATE

Aircraft with all but dual tandem wheel configuration operate at the TYR. An additional evaluation of overall pavement strength based upon a pavement management assessment for the Airport is outlined in **Appendix C** (to be provided later in study). The Airport Facility Directory reports Runway 13-31 is currently rated to accommodate aircraft with single wheel bearing capacity of 40,000 pounds, dual wheel of 60,000 pounds and dual tandem wheel of 100,000 pounds.

Runway 4-22

Runway 4-22 is considered the primary runway based upon length, and has a published length of 7,199 feet in length and 150 feet in width. Runway 4-22 is often used during the summer and spring due to the southerly winds that prevail during those seasons. Runway 4-22 is designated in accordance with ARC D-II design criteria. According to AC 150/5300-13, Change 8, Airport Design, ARC D-II runway should have a RSA of 500 feet in width, an Object Free Area (OFA) of 800 feet in width, centered about the runway centerline and both the RSA and OFA should extend 1,000 feet beyond the runway threshold. The existing RSA and OFA for Runway 4-22 do not meet this criteria. Highway 64 and Dixie Drive impede the Runway 4 RSA, while Pleasant Retreat Road impedes the Runway 22 RSA. This issue will be addressed in the Facility Requirements chapter.

The runway is of asphalt construction, has grooved pavement and is reported to be in good condition. According to the most recent Airport Facility Directory, Runway 4-22 is rated to accommodate aircraft with single wheel bearing capacity of 40,000 pounds, dual wheel capacity of 60,000 pounds, and dual tandem wheel of 100,000 pounds.

Runway 17-35

Runway 17-35 is designated the crosswind runway, and provides the greatest wind coverage. See **Table 2-6**, Wind Coverage. Runway 17-35 has a relocated threshold and a published length of 4,850 feet in length and 150 feet in width. This runway primarily serves as the general aviation runway and is designated in accordance with ARC B-II design criteria. The Runway Safety Area (RSA) of 150 feet in width and an Object Free Area (OFA) of 500 feet in width is centered about the runway centerline. Both the RSA and OFA extend 300 feet beyond the runway threshold. There are no RSA issues for this runway.

Runway 17-35 is constructed of asphalt, but shows signs of cracking and spalling. According to the Airport Facility Directory, Runway 17-35 is rated to accommodate aircraft with single wheel bearing capacity of 40,000 pounds, dual wheel capacity of 60,000 pounds and dual tandem wheel of 100,000 pounds.

Table 2-11 provides a summary of existing runway data at the Airport.

TABLE 2-11
RUNWAY DATA

Description	Runway 13-31	Runway 4-22	Runway 17-35
Runway ARC	B-II	D-II	B-II
Length	5,201'	7,199'	4,850'
Width	150'	150'	150'
Single wheel load	40,000 lbs.	40,000 lbs.	40,000 lbs.
Dual wheel load	60,000 lbs.	60,000 lbs.	60,000 lbs.
Dual tandem load	100,000 lbs.	100,000 lbs.	100,000 lbs.
Marking	Precision	Non-precision	Visual
Lighting	HIRL	MIRL	MIRL

Source: THE LPA GROUP INCORPORATED, 2004

Taxiways

Taxiways are used to enable aircraft to move to and from the runway and other facilities on the Airport. TYR is currently equipped with eight parallel and connecting taxiways. All taxiways are 50 feet wide and have the same estimated weight bearing strength as their respective runways. The current condition of the taxiway pavement and reflective pavement markings, based upon visual inspection, are good. **Table 2-12** provides a summary of existing taxiway data at the Airport.

TABLE 2-12
RUNWAY DATA

Description	ARC	Weight Bearing Load	Location
Taxiway A	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway A is a partial parallel taxiway located along the northeast side of Runway 13-31. It provides access to the former terminal area.
Taxiway B	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway B runs from the former terminal apron, connecting to Taxiway A, Runway 13-31 and Runway 17-35.
Taxiway C	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway C begins at the Runway 22 threshold and connects with the former terminal apron.
Taxiway D	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway D connects Runway 4-22 and Taxiway H.
Taxiway E	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway E begins at Runway 35 threshold, and provides access to Runway 4-22 and Taxiway F.
Taxiway F	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway F begins at the Runway 4 threshold and connects Runway 17-35 and Runway 13-31. Taxiway F terminates at Taxiway G.
Taxiway G	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway G provides access from the former terminal apron to Taxiway F and the intersection of Runways 13-31 and 4-22.
Taxiway H	D-II	SW = 40,000 lbs DW = 60,000 lbs DTW = 100,000 lbs	Taxiway H provides access from the eastside general aviation facilities, the threshold of Runway 22, Taxiway D and the Threshold of Runway 31.

Source: THE LPA GROUP INCORPORATED, 2004

Figure 2-5 provides a graphical depiction of the existing airfield layout.

Airfield Lighting

Proper airfield lighting is required at all airports that are utilized for nighttime operations. Airfield lighting is necessary to allow pilots to identify the Airport from the air and to help them maneuver safely during operations on the ground. Airfield lighting electrical requirements are provided from the main electrical vault located northeast of Taxiway A, just west of the former terminal facilities. This section discusses the existing airfield lighting at TYR.

Identification Lighting

The airport-rotating beacon universally indicates the location and presence of an airport at night or during instrument meteorological conditions. The Airport beacon at TYR is located on top of the air traffic control

tower co-located at the old terminal building. The beacon is equipped with an optical rotating beacon system that projects two beams of light, one white and one green, 180 degrees apart. The existing rotating beacon is in good working condition; however, replacement parts are difficult to obtain.

Runway Lighting

Runway lights help pilots landing or maneuvering on the runway identify the runway centerline and runway edges. All the runways at TYR are equipped with runway edge lights. Runway 13-31 is equipped with High Intensity Runway Lights (HIRL), while Runway 4-22 and Runway 17-35 are equipped with Medium Intensity Runway Lights (MIRL) marking the runway edges. The Runway 17-35 lights were recently replaced with newer lights in cans and conduits. All the runway lights are in working condition.

As part of the runway lighting system, the identification of the runway end, or threshold, is of major importance to a pilot during landing and takeoff. Therefore, runway ends and thresholds are equipped with special lighting to aid in the approach to or identification of the runway end during takeoff. Each of the runway ends are equipped with threshold lights, and consist of four standard inboard threshold lights on each side of the runway centerline. These threshold lights have a two-color (red/green) lens, placed across the edge of the runway pavement. When landing, the green half of the lens faces the approaching aircraft, indicating the beginning of the usable runway. The red half of the lens faces the aircraft on takeoff, indicating the end of the usable runway.

Additional approach lighting systems consist of a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) on Runway 13, which is approved for a Category I Precision Approach. A MALSR provides a lighted path to the runway threshold which allows the pilot to visually transition the aircraft and perceive alignment, roll, height and position relative to the threshold.

Runway 31 is equipped with an Omnidirectional Approach Lighting System (ODALs), which are a series of flashing lights that provide an indication of runway approach alignment and threshold location. Runway 31 and Runway 22 are also both equipped with Visual Approach Slope Indicator-4 systems (VASI-4). VASIs provide visual descent information to the pilot as well as assist in determining whether the approach is high, on-line or low while descending toward the runway threshold.

Runway 4-22 is equipped with Runway End Identifier Lights (REIL) at both runway thresholds. The REIL is a flashing light offset from both ends of the runway. Runway 4 is also equipped with Precision Approach Path Indicator system (PAPIs), which consist of four individual units containing two lights each. A PAPI assists pilots in determining the appropriate approach path.

Taxiway and Apron Lighting

Taxiway centerline and edge lights serve to help pilots maneuvering on the taxiways identify the edge of pavement. All taxiways are equipped with Medium Intensity Taxiway Lights (MITL) except for Taxiway B and Taxiway E. The taxiway lights are in good working condition. The Airport is in the process evaluating the existing taxiway lights and replacing those that have met or are close to their life expectancy. New lighting is being placed in conduit and cans.

Apron lighting is used to illuminate the aprons and ramps. This is done both for safety and security reasons. Clusters of sodium arc lamps on light poles provide the lighting on the terminal apron. This area is well illuminated during the nighttime. On other parts of the Airport, lighting is provided by flood lamps and sodium arc lamps attached to hangars.

Pavement Markings

Pavement markings provide the standards for delineating operations on paved areas (runways, taxiways, and aprons) of the airfield, are vital in ensuring safe operations. These markings include: runway identification markings, runway and taxiway edge markings, hold bars, centerlines and so on.

The runways at TYR have the full runway pavement markings required for the various approaches available Runway 4-22 has non-precision runway markings, Runway 13-31 has precision markings and Runway 17-35 has visual markings. All runways are equipped with designation numbers, centerline striping, side stripes (Runway 13-31) and threshold markings. The designation markings identify the runways by their magnetic azimuth, while the threshold markings are located at the beginning of each runway's available landing area.

All taxiways at TYR have visible taxiway centerline stripes with hold short lines located at the required locations. These markings ensure that aircraft taxi along designated passageways for proper wingtip clearance and to warn of the areas protected for runway operations. Where appropriate, taxiway edge markings are used to delineate the width of the taxiways. Taxiway edge markings show where the taxiway edge does not correspond with the edge of the pavement.

The pavement markings at Tyler Pounds Regional Airport are in good condition and are regularly maintained as part of a continuous marking program. All markings conform to FAA AC 150/5340-1H, *Standards for Airport Markings*.

Airport Signage

As part of the airfield lighting system, the airport has a number of illuminated airfield signs. These signs are strategically placed to provide instruction and guidance information to the users of the airport. There are mandatory instruction signs, such as holding positions or no entry into an area; signs to indicate which runway or taxiway the user is on or crossing; direction signs; and destination signs.

The inventory of the Airport revealed that the Airport has adequate signage and at the appropriate locations. The airfield signage is illuminated and in working condition. The signage meets the requirements of FAA AC 150/5345-44F, *Specification for Taxiway and Runway Signs*.

Navigational Aids and Instrument Approaches

Navigational aids are instruments used to guide aircraft to or from the Airport. Some of these instruments also allow pilots to fly in cloud coverage and during periods of lower visibility.

Instrument Approaches

During times of inclement weather, instrument approaches allow pilots to safely land at an airport facility. There are a number of different types of instrument approaches that can be established at an airport, each with specific limitations. As the height of clouds and visibility deteriorate, the necessity for instrument approaches increases. When the cloud ceiling is greater than 1,000 feet above ground level (AGL) and the visibility is greater than three statute miles, the conditions are considered visual and pilots can operate under visual flight rules (VFR). In VFR conditions, no published approaches are required for an aircraft to safely land at an airport. However, once the cloud ceiling is less than 1,000 feet AGL and/or the visibility is less than three statute miles, pilots must operate under instrument flight rules (IFR). Additional air traffic control services are provided to pilots during IFR conditions. During the arrival phase, instrument approaches are what allow a pilot to safely navigate to and land on a runway. There are two basic categories for instrument approaches: precision and non-precision.

Both precision and non-precision instrument approaches provide course guidance to the runway centerline it is intended to serve. The precision of this course, or horizontal guidance, increases with the sophistication of the

instrument approach aid, which is reflected through the minimum operating parameters for each approach. The primary difference between a precision and non-precision approach is that the precision approach will also have vertical guidance for a specific runway end, which allows the aircraft to descend safely on a fixed glide slope signal, even when the runway environment is not yet in sight. All instrument approaches have heights published that dictate how far a pilot can descend towards the runway before having to abandon the approach and try again. For precision approaches, this is called the decision height and for non-precision approaches, it is referred to as the minimum descent altitude (MDA). Both heights are published in the number of feet above the intended runway's touchdown zone elevation. In addition, every instrument approach has minimum visibility requirements, measured in feet or miles, at which an instrument approach can be attempted. For either type of approach, if visual contact cannot be made before the decision height or MDA, then the aircraft must execute a missed approach and either try again or go to an alternate airport.

ILS Instrument Approaches

Currently, TYR only has Instrument Landing System (ILS) equipment installed for precision approaches to Runway 13. The purpose of an ILS is to provide a method of precision instrument navigation to a point just beyond the approach end of the runway. Since the system provides both course and glide slope information, much lower weather minimums are possible than the minimums provided by a non-precision instrument approach. Precision instrument approaches are runway specific and, therefore, each runway that is to have such an approach must have its own ILS system. An ILS generally consists of the following four basic components: localizer antenna, glide slope antenna, marker beacons, and runway approach lighting system; the localizer for Runway 13 is equipped with distance measuring equipment.

The ILS to Runway 13 provides Category I landing minimums that offer a decision height of 200 feet above runway touchdown zone elevation and 1/2 - statute mile visibility. Higher minimums are applied if aircraft only use the localizer portion of the ILS equipment or if they conduct a circling approach. These variations of the ILS approach are actually considered non-precision approaches because they do not utilize the vertical guidance portion of the approach provided by the glide slope antennae. The visibility minimums also vary for the non-precision approaches depending on the aircraft's Approach Category.

VOR/GPS Instrument Approaches

Non-precision instrument approaches can be provided at airports through a number of different navigational aids. As documented in the previous section, the localizer portion of an ILS system can be used for course guidance to the runway on which it is installed, hence providing non-precision approach capability to Runway 31 at TYR. In addition, two other navigational systems offer non-precision approaches at TYR: Global Positioning Satellite (GPS) and A Very High Frequency Omnidirectional Radio Range (VOR) approach.

The ends Runway 4-22 and Runway 13-31 are equipped with Global Positioning Satellite (GPS) approaches. GPS is a satellite based navigation system that consists of a network of satellites known as a constellation. This constellation provides a celestial reference for determining the position of any point on or above the Earth's surface. By analyzing the time delays of signals received from some of these satellites, air based receivers are able to determine latitude, longitude, and altitude.

As part of the Wide Area Augmentation System (WAAS), the FAA has committed to meeting a national goal of publishing 300 localizer performance with vertical-guidance (LPV) approaches by the end of fiscal year 2006 for runways without instrument-landing systems. A non-precision approach using this new technology would allow pilot's to land during instrument conditions with improved horizontal visibility minimums as low as ¾ of a mile and vertical minimums as low as 250 feet. The new LPV approaches rely solely on GPS satellite equipment and, therefore, remove the issue of allocating space for antenna arrays, critical areas and

also the costs associated with equipment purchases and associated environmental issues. Since the LPV is designated as a non-precision approach, it does not require an approach lighting system. Currently, LPV procedures are established for both Runways 4 and 22. All four of the GPS straight-in and circling non-precision approaches at each end offer better minimum descent altitudes and visibility requirements. However, the GPS approaches are only available to those aircraft that have approach speeds of 120 knots or less. The Runway 4 RNAV GPS associated with the LPV approach has an approach minimum visibility of 1 mile while Runway 22 has an approach minimum of 1-1/4 miles. An Omni-Directional Approach Lights System (ODALS) augments the Runway 31 GPS, while the Runway 13 GPS, which is augmented by the MALSR, has an approach minimum of ¾ mile. This decreases the approach minimum visibility to ¾ mile. All the GPS approaches have a decision height of not lower than 400 feet above the airfield elevation.

A VOR approach is utilized at TYR to provide signal course guidance in aircraft equipped with VOR receivers. A VOR is a ground-based electronic navigation aid transmitting signals, 360 degrees in azimuth, called radials. The airport's VOR is also equipped with Distance Measuring Equipment. This equipment allows pilots to determine their distances to or from the VOR as various radials are flown. The VOR facility at TYR is located approximately 1,800 feet from the approach end of Runway 17 and 600 feet left of Runway 17 centerline and 1,865 feet from the approach end of Runway 4 and 1000 feet left of the runway centerline.

Runway 4 and Runway 22 both have published Very High Frequency Omni Range Navigational System equipped with Distance Measuring Equipment (VOR/DME) approaches. The VOR radiates signals 360 degrees around, which are used as to provide navigational headings, while the DME measures the distance from the aircraft to the VOR. Runway 31 has a published VOR approach. **Table 2-13** provides a listing of all the published approaches at TYR.

TABLE 2-13
APPROACHES AND LANDING AIDS

	RWY 4	RWY 22	RWY 13	RWY 31	RWY 17	RWY 35
ILS			✓			
MALSR			✓			
ODALS				✓		
VOR				✓		
VOR/DME	✓	✓		✓		
RNAV GPS	✓	✓	✓	✓		
PAPI-4	✓					
VASI-4		✓		✓		

Source: THE LPA GROUP INCORPORATED, 2006

Automatic Service Observation System

Surface observations provide local weather conditions and other pertinent information. TYR is equipped with an Automatic Service Observation System (ASOS) which provides surface observations every minute via digitized voice broadcasts and printed reports. The ASOS system transmits on an assigned radio frequency (126.25 MHz), and pilots receive reports for wind, visibility, runway visual range (RVR), weather phenomenon, sky condition, temperature, dewpoint, and altimeter reading.

LANDSIDE FACILITIES

Landside facilities are defined as the facilities that are not part of the airport operating area (AOA). These consist of various facilities, both aviation and non-aviation related use, including: tenant facilities, apron area, the terminal building, fuel storage systems, and other existing infrastructure. There are three main areas of landside development on the Airport: the terminal area, located to the west of Runway 4-22; the former terminal area, located on the north side Airport at the intersection of Runway 4-22 and Runway 13-31 and the northeast development area located to the northeast side of the Airport, east of the Runway 13-13 and Runway 4-22 intersection. **Figure 2-3** is a graphical depiction of the existing airport layout.

FBO/General Aviation Facilities

Fixed Base Operations (FBO)

Johnson Aviation, one of two Fixed Based Operators (FBO) on the Airport, is located to the far west of this area. Johnson Aviation provides the following services including: Fuel, Parking, Hangars, Passenger Terminal & Lounge, Catering, Crew cars, and Pilot lounge/snooze room. Johnson Aviation uses the ramp between their hangar and the most western AVTEC Aviation facilities.

Jet Center of Tyler, the other FBO, owns the facilities to the north of the former terminal area. The first building to the north is the Jet Center of Tyler main facility, which houses the offices and maintenance hangar. The other buildings are storage hangars. Jet Center of Tyler provides the following services including: Fuel, Parking, Passenger Terminal & Lounge, Aircraft sales/leasing/brokerage, Pilot supplies, Courtesy Transportation, Public Telephone, Pilot lounge/snooze room, Restrooms, and Showers. In addition to the regular FBO services, Jet Center of Tyler provides the majority of jet fueling services at TYR, including the fueling of commuter airlines. Airside access to the development north of Runway 13 is provided by Taxiway A, while Taxiway C provides airside access to the development west Runway 22.

Table 2-14 outlines the Fixed Base Operator facilities at the Airport. This information was obtained from Airport surveys and interviews FBO management.

TABLE 2-14
FBO FACILITIES

	JET CENTER OF TYLER		JOHNSON AVIATION	
Facilities	**Area**	**Location**	**Area**	**Location**
Administration	N/A	N/A	750 SF	Adjacent
Office	8319 SF	Hangar 1	NA	
Instruction Rooms	N/A	N/A	225 SF	Hangar 1
Pilot Facilities	4 Offices	Hangar 1	975 SF	
Other	4000 SF Office	Hangar 2	225 SF	

Source: 2004 Airport Surveys, Tyler Pounds Regional Airport

General Aviation Facilities

Hangar Inventory

Storage facilities at TYR consist primarily of conventional and T-Hangar facilities as well as some limited tie-down facilities. The City does not own the existing hangar facilities, but leases ground areas to the FBOs who provide these facilities. **Table 2-15** outlines existing storage facilities at TYR.

TABLE 2-15
AIRCRAFT STORAGE FACILITIES

OWNER	CONVENTIONAL HANGARS	CONVENTIONAL HANGAR AREA (SF)	T-HANGARS	TIE-DOWNS
Ron Farish	1	8,000		Little apron
Johnson Aviation	5	41,350	0	15
Jet Center of Tyler	4			
Tyler Turbine	2	22,000	10	12
Civil Air Patrol	1	6,300	0	0
Mewbourne Hangar	1	13,500	0	0
Rodgers Hangar	1	10,000	0	0
J.C. Harder	1	7,200	0	0
Term Properties	3	44,000	14	0
AVTEC Aviation	1	10,000	6	0

Source: Tyler Pounds Regional Airport and The LPA GROUP INC., 2004

Northeast Development Area

This area houses a variety of different facilities. The Tyler Volunteer Fire Department is located to the north of this site. South of the Volunteer Fire department is the Mewbourne corporate hangar and apron. Southwest Business Jet is just south of the Mewbourne facility. Southwest Business Jet facilities are also a corporate hangar. Herd Producing Company owns the corporate hangar east of the Southwest facility. The facilities located further to the east are owned by J.C. Harder. The flight school aircraft are tied down on the apron directly in front of the facilities. The building next to the flight school is Texas Civil Air Patrol. Tyler Turbine owns the four facilities east of the Civil Air Patrol. The facility to the far west houses the HAMF Historic Aviation Museum. Taxiway F provides airside access to this development, while Dixie Drive provides landside access.

Flight Training

Tyler School of Aviation currently provides single-engine flight training at the Airport. Tyler School of Aviation is located off CR 1143 (Dixie Drive), and is designated as a Part 61 flight school. At Tyler Aviation Training, students can obtain their private pilot, commercial pilot, instrument and multi-engine training. Furthermore, Tyler School of Aviation provides Biennial Flight Review and Instrument Proficiency Checks.

Tyler School of Aviation also provides aircraft rentals and charter opportunities. Their current rental fleet consists of Cessna 152s, Cessna 172s, and the company will include a Beech Baron and a Piper Arrow in the future. Their business aircraft inventory includes jets, turboprops, and piston aircraft. On-site professionally trained technicians and inspectors maintain all aircraft.

Aircraft Parking Apron

The primary general aviation apron area at TYR is 26,130 SY in size and located at the north end of the Airport adjacent to the old terminal building. This apron provides approximately 65 tie-downs. Several aircraft parking apron areas located on the north side of the airport serve the parking needs for based and transient general aviation aircraft and Johnson Aviation and Jet Center of Tyler fixed base operations.

The northeast development area has approximately 7,000 square yards of apron, is constructed of asphalt and is in good condition. The primary users are Tyler School of Aviation, Civil Air Patrol, Tyler Turbine and three (3) corporate users. There are approximately 12 tie-down spaces on the east side apron used primarily for based and itinerant aircraft users. A breakdown of aircraft parking facilities is shown in **Table 2-16**.

TABLE 2-16
APRON PARKING FACILITIES

Owner	Apron Capacity (SY)	Tie-Downs (SY)	Location	Type of Surface
Jet Center of Tyler	~2040 SY	~2040 SY	Right of Hangar 2	Pavement
Tyler Turbine	17500 SY	750 SY	North Side	Asphalt
Johnson Aviation	2809 SY	None	North Side	Asphalt
	3500 SY	1500 SY	South Side	Asphalt
	3500 SY	480 SY	West Side	Turf
Mewbourne Aviation	1,000 SY			Pavement

Source: 2004 Airport Master Plan Surveys, Tyler Pounds Regional Airport

Terminal Facilities

There are three main areas of landside development on the Airport: the terminal area, located to the west of Runway 4-22; the former terminal area, located on the north side airport at the intersection of Runway 4-22 and Runway 13-31 and the northeast development area located to the northeast side of the Airport, east of the Runway 13-13 and Runway 4-22 intersection. **Figure 2-5** is a graphical depiction of the existing Airport layout.

New Terminal Area

The new terminal building opened for operations in August 2002. The terminal reflects Tyler's traditional East Texas hospitality, with reddish brick, gabled roofs, and a relaxing garden for passengers to wait for their flights. The entrance features a rose motif medallion welcoming visitors to the Rose Capital. The new terminal has over 38,000 square feet, which is more than twice the size of the old terminal. Most of the space is allocated to a larger holding room and wider walkways to provide more comfortable and efficient areas for passengers, as shown in **Table 2-17**.

The new terminal area is located on the Westside of the Airport property, close to the Runway 4-22 and Runway 17-35 intersection. The terminal apron is approximately 26,130 SY and constructed of concrete.

The apron area is currently used by the two commercial carriers, American Eagle and Continental Connection. Taxiway F provides airside access to this area, while Skyway Boulevard provides landside access to this area.

TABLE 2-17
TERMINAL BUILDING AREAS

AREA	APPROXIMATE AREA (SF)
Agent Positions	14 Stations
Ticket Counter Length	66 LF
Ticket Agent Area	790 SF
Ticket Lobby w/Circulation	2,436 SF
Airline Ticket Offices	2,023 SF
Baggage Make-Up	1,423 SF
Claim Devices	1 device
Conveyor Frontage	61 LF
Bag Claim Lobby w/Circulation	3,212 SF
Inbound Baggage Operations w/Storage	2,137 SF
Rental Car Areas	1,390 SF
Security Screening/Offices	973 SF
Passenger Holding	4,405 SF
Core Concessions	1,701 SF
Administration	1,900 SF
Miscellaneous (Support, Mechanical, Circulation, etc.)	23,510 SF
Total Gross Building	**45,900 SF**

Source: THE LPA GROUP, INC. 2004

Rental Car Facilities

TYR is home to four rental car companies, which are located within the new terminal facility: Avis, Hertz, Enterprise and National. Currently, each rental car operation pays the Airport 10 percent or a monthly minimum as bid in addition to $10.00 per parking space per month. 104 parking spaces are designated as rental car parking adjacent to the new terminal facilities. These parking areas are divided into four sets of 26 spots each for each rental car operation. During periodic negotiations, the top bidder obtains the closest set of parking spaces. At this time, all 104 spaces are rented.

Restaurant and Concession Facilities

At the time of this writing, the Edom Bakery and Grill was open for breakfast, lunch, and dinner within the terminal facility. The Airport offers free 90-minute parking for patrons of the restaurant located just as you enter the terminal.

Former Terminal Area

The former terminal area is located to the northwest of the Runway 4-22 and Runway 13-31 intersection. At the center of this area is the former terminal building, which is now empty. The former terminal apron is now seldom used and the pavement is starting to deteriorate. The rest of the development in this area parallels Runway 13 and Runway 22. With the exception of the Tower facilities, the majority of the old terminal stands empty. However, the Airport is currently working with potential tenants to occupy these facilities.

Space available is shown in **Table 2-18**, Former Terminal Facilities; however, based upon a recent site visit and information from Airport management, the building is in fair condition.

TABLE 2-18
FORMER TERMINAL BUILDING AREA

AREA	APPROXIMATE AREA (SF)
GROUND FLOOR/LEVEL 1	
Former Airline Areas	2,200 SF
Former Airline Ticket Counter	22 LF
Public Space/Circulation	5,000 SF
Small Conference Room	150 SF
Former Rental Car Area	500 SF
Former Airline Security (AMR Screening)	650 SF
Utilities and Maintenance	100 SF
Public Restrooms	300 SF
Former Baggage Claim	1000 SF
Former Restaurant/Concessions	1500 SF
Total Area Level 1	**11,300 SF**
SECOND FLOOR/LEVEL 2	
Office	1500 SF
Public Space/Circulation	350 SF
Public Restrooms	200 SF
Utilities and Maintenance	100 SF
Total Area Level 2	**2,150 SF**
Total Terminal Area Available	**13,450 SF**
LEVEL 3 AND 4/ATCT TOWER	**450 SF**

Source: Tyler Pounds Regional Airport 1995 Master Plan Update.

Airport Access

The primary transportation corridor to the Tyler/East Texas Region is U.S. Interstate 20. I-20 is a four-lane, limited access highway running east to west. I-20 connects with Interstate 10 near El Paso to the west and Interstate 59 to the east near Jackson, Mississippi. I-20 also provides access to the Dallas/Fort Worth area located approximately 90 miles west of Tyler. Local surface access to the airport is shown in **Figure 2-6**.

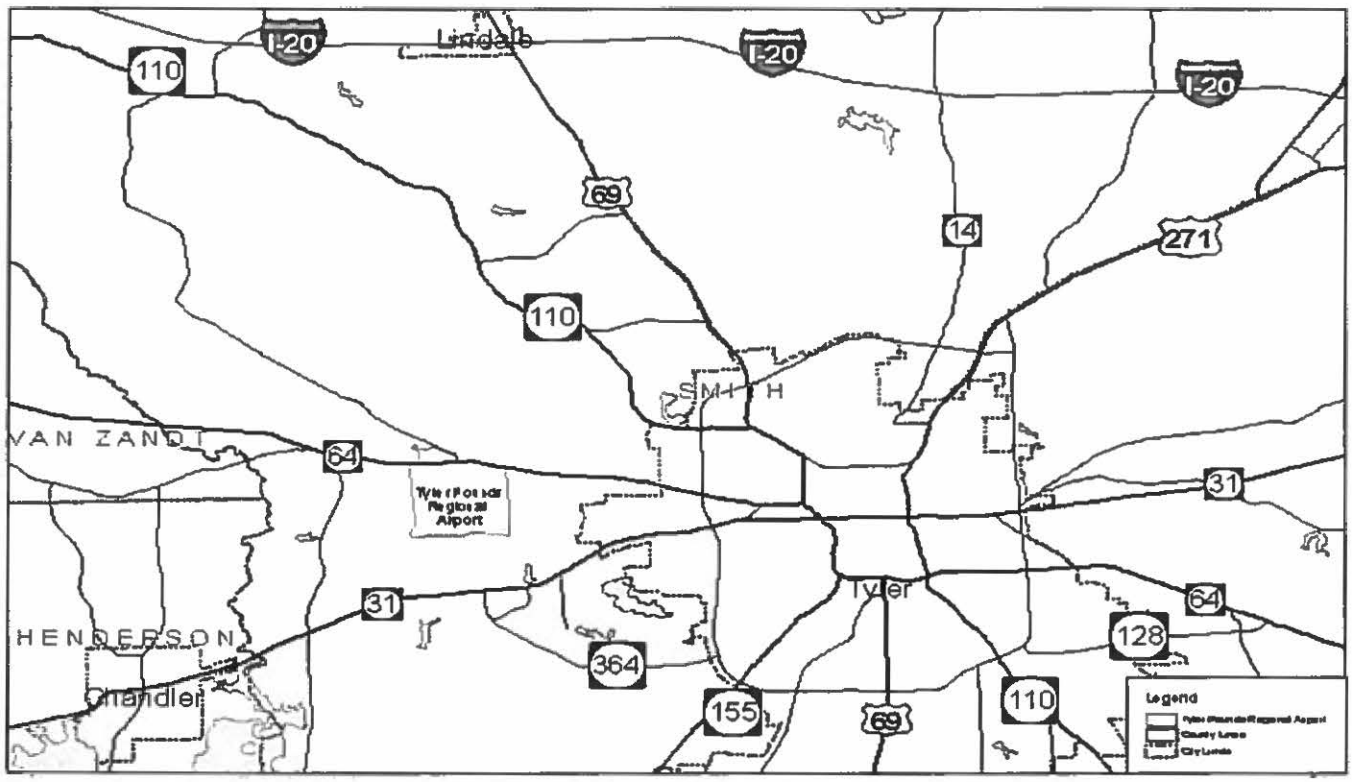


Figure 2-6
Airport Access

Eastbound access to the Tyler area is via U.S. 69 to I-20, and westbound access is provided via U.S. 271. Both of these U.S. Highways provide access to Loop 323, which connects with Highways 64, 31, 110 and 155. Highway 64 provides direct access to TYR.

Thus, using Highway 64 as the primary access road to the Airport, passengers use Skyway Boulevard and proceed south to the terminal building. A loop road provides a passenger drop-off and pick-up in front of the terminal facilities. Long-term parking and short-term rental car parking are accessed via Skyway Boulevard. The East Service Road provides access to the FBO facilities, employee parking and long-term rental car storage. There is also a gated access to the terminal apron at the west end of the employee parking lot.

Access to the Fixed Based operators, Jet Center of Tyler and Johnson Aviation, and related support facilities along the north side of the Airport is provided via Highway 64 and Airport Drive. Aviation Facilities currently located along the east side of the Airport, which includes flight training and aircraft storage, may be accessed from Highway 64 to F.M. 1143. F.M. 1143 is a two-lane asphalt road also referred to as Dixie Drive.

Automobile Parking

There are currently 104 short-term parking spaces located directly in front of the terminal facilities. Passenger long-term parking is located farther north of the existing building. Long-term parking is provided through a 24-hour access gate and includes 500 parking spaces.

Currently, there is a designated rental car parking area adjacent to the terminal building that has 104 spaces. This area is used solely by rental car companies located on-airport. The remaining parking area is designated for employee parking. There are approximately 51 parking spaces associated with this activity.

In addition to the public parking space, there is a considerable amount of private parking area on the Airport. FBO customers, flight training students, and businesses at the Airport primarily use these areas. The amount of private parking is difficult to define since it is loosely defined along the buildings. The parking information contained in **Table 2-19** was obtained from the surveys conducted as part of this master plan update.

TABLE 2-19
AUTOMOBILE PARKING FACILITIES

Owner	Capacity	Location	Type of Surface
Jet Center of Tyler	36	In Front of FBO	Asphalt
	150	Inside Gate	Asphalt
Johnson Aviation	35	In Front of Facility	Asphalt
Mewbourne Aviation	12	At Hangar	Concrete

Source: 2004 Airport Master Plan Surveys, Tyler Pounds Regional Airport

Support Facilities

Airport Administration

TYR is owned and operated by the City of Tyler and is under the direct supervision of the Airport Manager who is appointed by the City Manager. The Airport Manager at TYR is responsible for the daily operation of the Airport, handling emergency situations as well as overseeing the work schedules for eleven (11) full-time employees. The manager is responsible for communications with civic groups, news media and concerned citizens with regard to airport operations and development.

Airport Rescue and Fire Fighting (ARFF)

The Airport Rescue and Fire Fighting (ARFF) building is located between the AVTEC Aviation facilities. This ARFF building is in good condition. ARFF service is currently located 1,000 feet northwest of the old terminal facilities along Runway 13-31. The Airport is classified as an ARFF Index A airport currently serving regularly scheduled Index A air carrier aircraft as well as unscheduled air carrier aircraft. ARFF is provided on a 24-hour basis. ARFF data is shown in **Table 2-20.**

TABLE 2-20
AIRPORT FIREFIGHTING VEHICLES

VEHICLE TYPE	BRAND	CONDITION	RESPONSE TIME	WATER GALLONS	ARFF GALLONS	DRYCHEM LBS
ARFF	1991 Oshkosh	Excellent	3 min.	1585/750	205/1000	700/15
ARFF	1974 International	Good	3 min.	500/750	100/750	500/15
Structural	1992 E-One Pumper	Good	3 min.	500/1250		205/15

Source: Tyler Pounds Regional Airport, 2004

Fueling Facilities

Fuel services at the Airport are provided through the two fixed based operators, Johnson Aviation and Jet Center of Tyler. Johnson Aviation, a subsidiary of Best Aero, currently sells approximately 80,000 gallons of 100LL (Avgas) and 330,000 gallons of Jet A per year. Tyler Aero Center currently provides approximately 72,000 gallons of 100LL and 579,228 gallons of Jet A per year. A break down of existing fuel facilities at TYR is shown in **Table 2-21**.

TABLE 2-21
FUEL FACILITIES

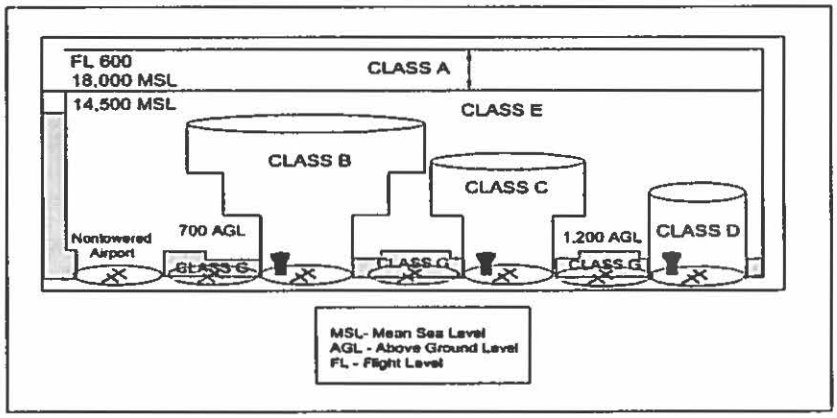
SERVICE PROVIDER	CONTENT	CAPACITY (GALLONS)	LOCATION	STORAGE TYPE
Johnson Aviation	Jet A	12,000	West Side	Underground
	100LL (Avgas)	12,000	West Side	Underground
	Jet A	3,000		Fuel Truck
	100LL (Avgas)	2,000		Fuel Truck
Jet Center of Tyler	Jet A	10,000	On-Airport	Above Ground
	Jet A	10,000	On-Airport	Above Ground
	Jet A	10,000	On-Airport	Above Ground
	100LL	10,000	On-Airport	Above Ground
	Jet A			Fuel Truck
	Jet A			Fuel Truck
	100LL			Fuel Truck

Source: 2004 Airport Surveys, Tyler Pounds Regional Airport

AIRSPACE AND AIR TRAFFIC CONTROL

As of 1993, the U.S. adopted a new airspace hierarchy that agreed with the International Civil Aviation Organization (ICAO) airspace classes. Within this hierarchy, controlled airspace is referred to as Class A, B, C, D or E and uncontrolled airspace is referred to as Class G. Class A airspace begins at 18,000 feet mean sea level (MSL) and continues up to and including 60,000 feet MSL. Class B includes the surface up to 10,000 feet MSL surrounding the nation's busiest airports. Class C airspace goes from the surface up to 4,000 feet MSL above the airport elevation for five miles surrounding the airports with an operational air traffic control tower service by a radar approach control. Class D airspace includes the surface up to 2,500 feet MSL above the airport's elevation surrounding those airports that have an operational control tower that are not in Class B or Class C airspace. The configuration of Class D airspace is individually tailored. Class E airspace is any other controlled airspace. Pilots are usually in radio contact with some portion of the FAA air traffic control (ATC) network. This ATC network consists of air route traffic control centers (ARTCC), terminal approach control facilities (TRACON), air traffic control towers (ATCT), and flight service stations (FSS). **Figure 2-7** provides a graphical presentation of controlled and uncontrolled airspace.

Figure 2-7
Airspace Classes



Air Traffic Control

Within East Texas, there are two major jurisdictional categories of airspace, Air Route Traffic Control Center Airspace (ARTCCA) and Air Traffic Control Tower (ATC) Airspace. These categories define a specific volume of airspace. All aircraft flying under Instrument Flight Rules (IFR) and not under control of military or terminal facilities are monitored by an air route traffic control center (ARTCC). Enroute aircraft to TYR area falls within the Fort Worth ARTCC area of responsibility.

TYR has a FAA Contract Tower (FCT), which is located on the north side of the Airport on top of the former terminal facilities, and operates between the hours of 6:30 a.m. to 9:30 p.m. local standard time. During the period that the FCT is in operation, the Airport is located within Class D controlled airspace. The Class D airspace is represented by a blue-colored dashed circular area having a radius of four nautical miles around the Airport on the Dallas/Fort Worth Sectional Aeronautical Chart, as shown in **Figure 2-8**, which depicts the airspace structure around TYR. TYR Class D airspace does not overlap with any other airports in the vicinity.

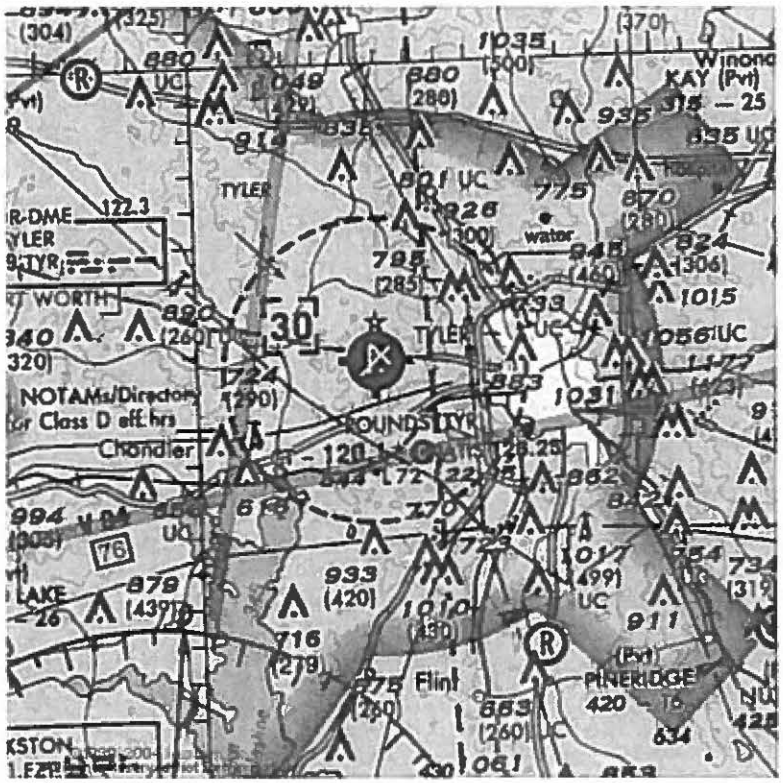


Figure 2-8
TYR Class D Airspace

The former terminal building and ATCT Tower are in fair condition. Existing ATCT equipment is approximately 10 years old but is still in good condition. Air Traffic handles approximately 1,700 IFR

operations and 4,300 VFR operations per month. **Table 2-22** provides a brief description of existing ATCT facilities at the Airport.

TABLE 2-22
AIR TRAFFIC CONTROL TOWER

DESIGNATED AREAS	TOTAL AREA (SF)
FORMER TERMINAL/LEVEL 3	
Break Room and Storage	225 SF
FORMER TERMINAL/LEVEL 4	
Tower Operations Center	225 SF
Total Tower Area	450 SF

Source: Tyler Pounds Regional Airport 1995 Master Plan Update

All aircraft must establish two-way radio communications with the FCT before entering Class D airspace. During the hours when the FCT is closed, the Class D airspace reverts to a Class G (uncontrolled) area. The magenta colored circular area surrounding the Airport designates Class E controlled airspace that begins at an elevation of 700 feet above the surface. Class E airspace also extends 8-miles outward beyond the magenta circular area, where it begins at an elevation of 1,200 feet above the surface. Basic VFR weather minimums for aircraft operating in this airspace near the Airport require a distance from clouds of 500 feet below, 1000 feet above, and 2000 feet horizontally, as well as a flight visibility of three statute miles.

Airport Imaginary Surfaces

Related to the physical layout of the airfield are the runway approach requirements and imaginary surfaces required by the FAA. Descriptions of these standards as they apply to TYR are explained in FAR Part 77. These represent the key components of the airspace at the Airport that impact airfield and landside facilities.

FAR Part 77 Imaginary Surfaces

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, defines standards for determining obstructions to navigable airspace. These imaginary surfaces are used to protect operations around airports from high structures that can pose a threat to aircraft landing or departing the airport facility. Obstructions are primarily determined by superimposing the Part 77 "imaginary surfaces" over the Airport and surrounding areas. An analysis is performed to determine the elevations of various objects (structures, terrain, towers, etc.). The object's elevation is then compared to the elevation of the associated Part 77 Surface. Objects that are found to be higher than the Part 77 surfaces are considered an obstruction. Within the ALP set developed in conjunction with this Master Plan Update, an airport airspace drawing will illustrate the various obstructions and objects located within the Part 77 areas.

Dimensions of the "imaginary surfaces" are derived from the type of approach and aircraft operating at the Airport. Federal regulations require that the Part 77 surfaces of the most demanding approach be applied to the entire runway. The configuration and dimensions of the Part 77 surfaces at TYR are illustrated in **Figure 2-9** and **Table 2-23**, respectively.

Figure 2-9
Typical Precision Instrument FAR Part 77 Imaginary Surfaces

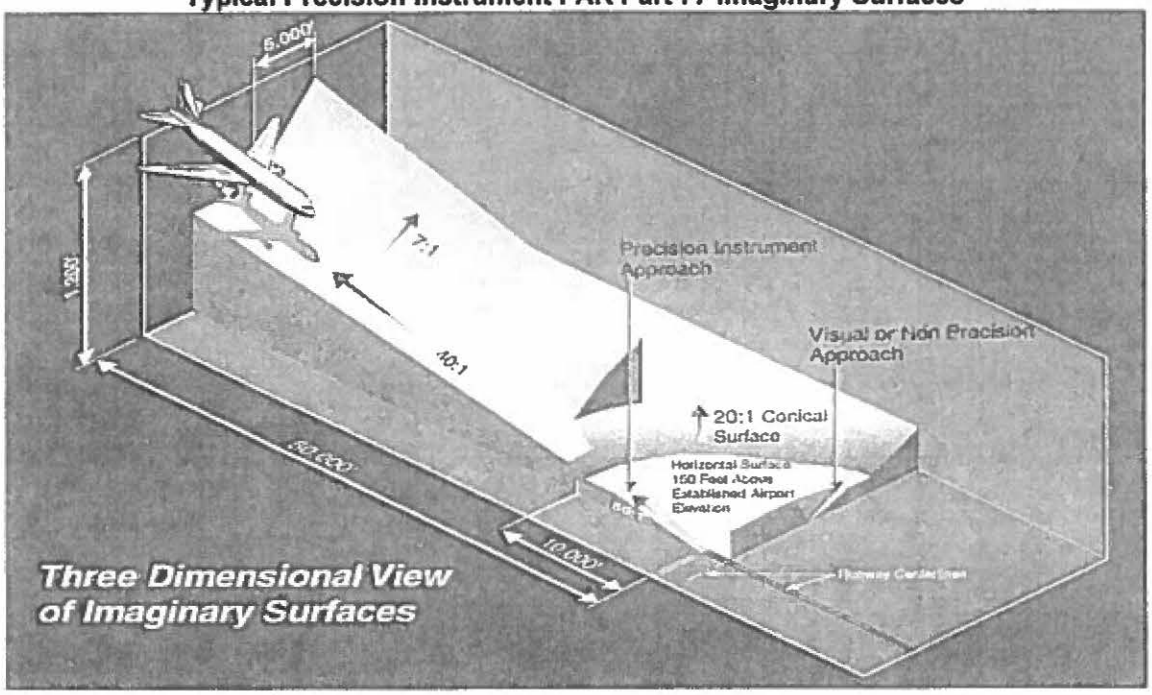


TABLE 2-23
PART 77 DIMENSIONAL STANDARDS

RUNWAY	ARC	APPROACH	INNER WIDTH	OUTER WIDTH	LENGTH	SLOPE	RADIUS OF HORIZONTAL SURFACE
13	B-II	Precision (<3/4 mile visibility)	1,000 feet 1,000 feet	16,000 feet	10,000 feet* 40,000 feet*	50:1 40:1	10,000 feet
31	B-II	Non-Precision (=3/4 mile visibility)	1000 feet	3,500 feet	10,000 feet*	34:1	10,000 feet
04	D-II	Non-Precision (>3/4 mile visibility)	500 feet	3,500 feet	10,000 feet	34:1	10,000 feet
22	D-II	Non-Precision (>3/4 mile visibility)	500 feet	3,500 feet	10,000 feet	34:1	10,000 feet
17	B-II (Utility)	Visual (>1 mile visibility)	250 feet	1,250 feet	5,000 feet	20:1	5,000 feet
35	B-II (Utility)	Visual (>1 mile visibility)	250 feet	1,250 feet	5,000 feet	20:1	5,000 feet

Source: Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace
(1) Additional 40,000 feet at a slope of 40:1

Approach and Runway Protection Zones

A Runway Protection Zone is a trapezoidal area representing the ground level at the innermost portion of runway approach. The type of aircraft and type of operations to be conducted on the runway defines the exact dimensions of this zone. The RPZ begins 200 feet beyond the runway threshold at the end of the area usable

for takeoff and landings, and is centered along the extended runway centerline. **Table 2-24** outlines the current RPZ dimensions at TYR.

TABLE 2-24
RUNWAY PROTECTION ZONE DIMENSIONS

RUNWAY	CRITICAL AIRCRAFT	APPROVED APPROACH	APPROACH SLOPE	RPZ LENGTH	INNER APPROACH ZONE	OUTER APPROACH ZONE
13	B-II	Precision	50:1	2500	1000	1750
31	B-II	Non-Precision	34:1	1700	1000	1425
04	D-II	Non-Precision	34:1	500*	500	1010
22	D-II	Non-Precision	34:1	500*	500	1010
17	B-II	Visual	20:1	1000	250	450
35	B-II	Visual	20:1	1000	250	450

*Note: *non-standard RPZ*
Source: FAA AC 150/5300-13, Change 8

The runway RPZs represents the innermost segment of the applicable approach surface, which is defined as a surface longitudinally centered on the extended runway centerline extending outward and upward from the runway pavement and approach available.

LAND USE

Land uses currently surrounding TYR including agricultural, industrial, residential and public use. While the Airport is city-owned and operated, it is not within the contiguous city limits. Smith County does not employ zoning; however, the Airport is within 3.5-mile extra-territorial limits of Tyler. Currently, there are no identified land use/airport related conflicts with regards to airport activities.

AIRPORT INFRASTRUCTURE

Most of the proposed development described in this study will be dependent upon the ability of the Airport to serve that improvement with necessary utilities, such as electric, sewer and water. The utility locations and sizes in this section were determined from past planning studies and information from local providers. This information focuses primarily on the main utility lines; therefore, prior to any development, detailed utility drawings should be obtained.

Existing Airport Water Supply and Distribution System

Water is supplied to the Airport by Tyler Water Utilities. Tyler Water Utilities receives water from Lake Tyler, Lake Palestine, Lake Tyler East and Lake Bellwood. Together these lakes provide over 30 billion gallons of water. Twelve deep-water wells are available to provide up 9 billion gallons of water. For future water requirements, up to 120 billion gallons of water can be diverted from Lake Palestine.

Existing Airport Wastewater Collection System

The wastewater collection system is also handled by Tyler Water Utilities. The wastewater pipe system consists of pipes with diameters ranging from 6 inches to 45 inches in diameter. There are four wastewater treatment plants in Tyler: Golden Road Water Treatment Plant which handles 16.5 million gallons per day, Lake Palestine Water Treatment Plant, Southside Wastewater Treatment Plant which handles 4 million gallons a day and Westside Treatment Plant which handles 7 million gallons per day.

Providers of additional utilities including electric power, telephone, fire protection, etc are listed in **Table 2-25**.

TABLE 2-25
AIRPORT UTILITIES

SERVICE	PROVIDER
Electricity	Texas Utilities Electric Company
Fire Protection (on airfield)	City of Tyler
Natural Gas	ENTEX
Sanitary Sewer	City of Tyler
Telephone	Southwestern Bell Telephone
Trash Removal	City of Tyler
Water	City of Tyler

Source: Tyler Pounds Regional Airport, 2004

SOCIOECONOMIC DATA

Several socioeconomic factors influence a community's need for airport services. Area population, per capita income, employment/unemployment, construction indicators, and taxable sales all affect the level of activity at an airport. The following sections provide an inventory of the historic and projected data for these socioeconomic factors. Overall growth rates and average annual growth rates, for Smith County and the State are based on 10 years of historic data obtained from a variety of sources, including: the Tyler Economic Development Council, the University of Texas at San Antonio, the U.S. Department of Commerce, and Texas A&M University. Likewise, the projections of this data are included as they provide an indication of future trends for the airport area.

Population

The population growth can be a good indication of the economic trend of a county and state. This can be used to help forecast the future growth of based aircraft and operations at the Airport. **Table 2-26** depicts the population data for the past ten years for both Smith County and the state of Texas. The state population increased by an average annual growth of 1.9 percent, while the County had an average annual growth of only 1.1 percent.

TABLE 2-26
HISTORICAL POPULATION

Year	Smith County	State of Texas
1993	159,652	18,031,484
1994	159,434	18,378,185
1995	161,437	18,723,991
1996	164,547	19,128,291
1997	165,705	19,439,337
1998	167,801	19,759,614
1999	168,744	20,044,141
2000	174,706	20,851,820
2001	178,119	21,325,018
2002	181,819	21,779,893
2003	178,644	21,828,569
Overall Growth Percentage	11.8%	21.0%
Average Annual Growth	1.1%	1.9%

Source: http://www.tedc.org/

Table 2-27 displays the projected population growth for both Smith County and the State of Texas. Using population projections provided by the University of Texas at San Antonio, the annual population growth for the state of Texas is projected to be 1.9 percent, while the population growth for Smith County is comparable at 1.8 percent annually.

TABLE 2-27
PROJECTED POPULATION

Year	Smith County	State of Texas
2008	196,409	24,417,278
2013	209,239	26,973,626
2018	231,407	29,764,506
2023	252,889	32,790,461
Projected Annual Growth	1.8%	1.9%

Sources: Projection by State of Texas, Office of the State Demographer
University of Texas at San Antonio: Institute for Demographic and Socioeconomic Research (ISDR), Office of the State Demographer, June 2004.
THE LPA GROUP INCORPORATED, 2004

Income

The most direct indicator of economic prosperity is the per capita personal income (PCPI) of the population. Just as the other demographics associated with the Tyler MSA have increased, PCPI has also gradually increased over the historical period selected for this study (1997-2002). In 2002, Texas had a total personal income of $631,208,404. This total personal income ranked 3rd in the United States. In 1992, the total personal income of Texas again ranked 3rd in the United States at $335,941,115. The 2002 total personal income reflected an increase of 2.2 percent from 2001. The 2001-2002 national change was 2.3 percent. The 1992-2002 average annual growth of total personal income was 6.5 percent. The average annual growth for the nation was 5.2 percent.

Even though there has been a continual increase in the Tyler MSA PCPI over the past eight years, it still lags behind the state PCPI and the nation. See **Table 2-28** the historical PCPI for the Tyler MSA, Texas, and the U.S.

TABLE 2-28
HISTORICAL PER CAPITA PERSONAL INCOME ($)

Year	Tyler (MSA)	Texas	United States
1997	$23,150	$23,616	$25,334
1998	$24,680	$25,186	$26,883
1999	$25,543	$26,250	$27,939
2000	$28,061	$28,313	$29,847
2001	$27,861	$28,943	$30,527
2002	$28,466	$29,039	$30,906
Overall Growth Percentage	22.9%	22.9%	21.9%
Average Annual Growth	4.22%	4.22%	4.06%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, 2004 (www.bea.doc.gov)

Table 2-29 displays the projected per capita income growth for Tyler MSA, the State of Texas and the United States. Per capita growth for the Nation is 4.06 percent and for the state of Texas and the Tyler MSA is 4.22 percent.

TABLE 2-29
PROJECTED PER CAPITA INCOME ($)

Year	Tyler MSA	State of Texas	United States
2008	$38,017.53	$38,782.80	$40,834.72
2013	$47,686.39	$49,825.16	$47,686.39
2018	$58,634.04	$60,794.99	$58,634.04
2023	$69,175.79	$71,285.80	$69,175.79
Projected Annual Growth	4.22%	4.22%	4.06%

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts, 2004 (www.bea.doc.gov), and THE LPA GROUP INCORPORATED, 2004

Employment/Unemployment

The employment and unemployment growth of a state and county can be great indicators of the economic growth and trends of the area. The historical employment data shown in **Table 2-30** was obtained from the Tyler Economic Development Council. This data revealed that average annual employment growth in the state of Texas is 1.5%, while the average annual employment growth for Smith County is 2.4%. Since the employment rate for Smith County is higher than that of the state of Texas, it can be derived that the labor market for Smith County is growing at a steady rate and it can be assumed that business is growing at a healthy rate.

TABLE 2-30
EMPLOYMENT DATA

Year	Smith County	State of Texas
1995	80,372	9,015,240
1996	81,274	9,168,805
1997	83,398	9,357,967
1998	85,293	9,649,447
1999	86,393	9,792,388
2000	88,219	9,960,436
2001	88,720	10,020,352
2002	90,091	10,009,395
2003	97,127	10,172,828
Overall Growth Percentage	20.8%	12.8%
Average Annual Growth	2.4%	1.5%

Source: http://www.tedc.org/

The forecast for the future employment data for the state of Texas and Smith County are depicted in **Table 2-31**. Since no projection data was available from the state of Texas, the data for the planning period is calculated by extrapolating the data from the historical employment data.

TABLE 2-31 PROJECTED EMPLOYMENT DATA		
Year	Smith County	State of Texas
2008	109,329	10,970,640
2013	123,065	11,831,021
2018	138,526	12,758,878
2023	155,929	13,759,502
Projected Annual Growth	2.4%	1.5%

Source: THE LPA GROUP INCORPORATED, 2004

Unemployment levels also give a great indication of the economic status of the state and county. The historical levels of unemployment are presented in **Table 2-32**. The state unemployment grows at an average annual growth of 4.3%, while the unemployment at Smith County grows at an average annual growth of .3%.

TABLE 2-32 UNEMPLOYMENT DATA		
Year	Smith County	State of Texas
1995	4,685	577,689
1996	5,547	546,720
1997	5,512	531,695
1998	4,588	487,779
1999	3,851	474,439
2000	3,589	441,121
2001	3,828	510,261
2002	4,346	676,771
2003	4,800	737,516
Overall Growth Percentage	2.4%	27.7%
Average Annual Growth	.3%	4.3%

Source: http://www.tedc.org/

Since there were no forecasted unemployment figures for unemployment data for Texas and Smith County available, the forecast is extrapolated using the historical growth rate. The results for the key years of the planning period are presented in **Table 2-33**.

TABLE 2-33 PROJECTED UNEMPLOYMENT DATA		
Year	Smith County	State of Texas
2008	4,873	913,342
2013	4,948	1,131,084
2018	5,023	1,400,738
2023	5,100	1,734,677
Projected Annual Growth	.3%	4.3%

Source: THE LPA GROUP INCORPORATED, 2004

Construction Indicators

The construction indicator is another great indicator of development and growth in the state and county. It is also a sign of prosperity and financial growth. The historical construction data for the state of Texas and Smith County is presented in **Table 2-34**.

TABLE 2-34
CONSTRUCTION DATA

Year	Smith County	State of Texas
1993	111,171,404	11,575,824,242
1994	108,154,153	12,502,113,567
1995	119,979,224	12,722,518,715
1996	146,060,697	15,299,223,028
1997	159,010,000	17,267,931,897
1998	197,515,000	21,282,687,737
1999	219,150,000	24,334,751,340
2000	224,280,000	27,585,583,575
2001	253,320,000	29,387,491,516
2002	258,260,000	31,268,085,747
2003	282,594,545	34,254,168,701
Overall Growth Percentage	154.1%	195.9%
Average Annual Growth	11.3%	13.1%

Source: Real Estate Rental at Texas A&M Univesity, 2002.

Since there were no forecasted construction data figures for unemployment data for Texas and Smith County available, the forecast is extrapolated using the historical average annual growth. The results for the key years of the planning period are presented in **Table 2-35**.

TABLE 2-35
PROJECTED CONSTRUCTION DATA

Year	Smith County	State of Texas
2008	482,725,068	63,613,770,973
2013	824,585,951	118,137,792,008
2018	1,408,549,163	219,394,915,393
2023	2,406,069,059	407,440,566,498
Projected Annual Growth	11.3%	13.1%

Source: THE LPA GROUP INCORPORATED, 2004.

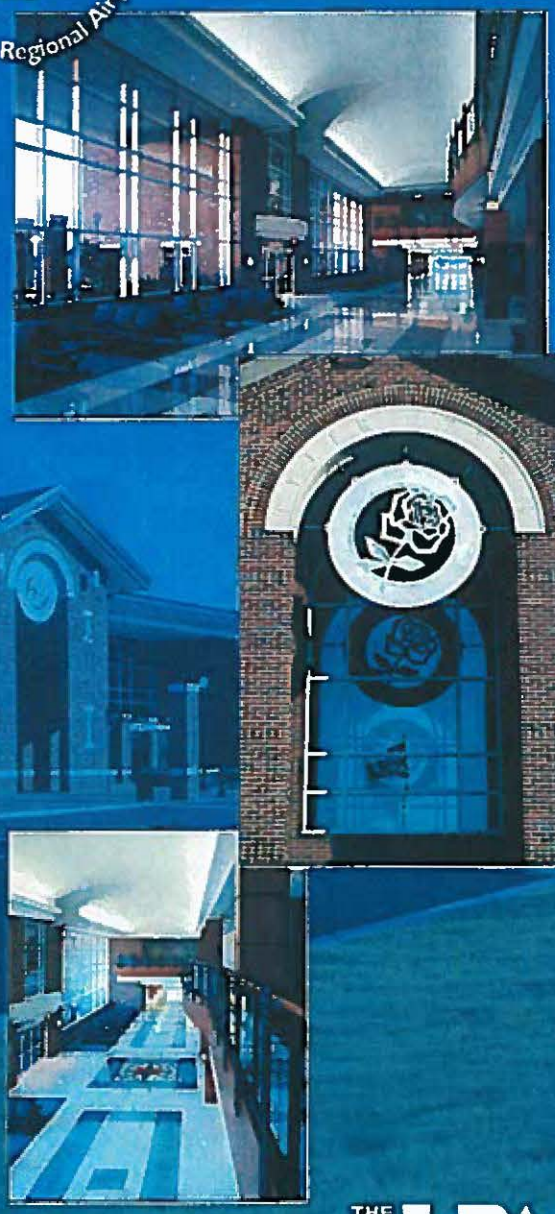
CONCLUSION

The inventory section provides the foundation upon which the remaining elements of the master plan process will be developed. The information contained in this section provides guidance to assess potential changes to facilities and procedures necessary to meet the goals of the airport planning process. The inventory section presents data to determine the needs of airport users and prepares the City of Tyler to meet those needs. Thus, the inventory of existing conditions is the first step in the complex process of developing the plan to meet projected aviation demands in the community. This information is based on activity in the 2003/2004 timeframe and facility observations in 2004/2005 timeframe.

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 3
AVIATION ACTIVITY FORECASTS



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AVIATION CONSULTANTS

CHAPTER THREE
AVIATION ACTIVITY FORECASTS

INTRODUCTION

This chapter presents projections of aviation activity that will be used as the basis for facility planning at Tyler Pounds Regional Airport (TYR). Most persons, including aviation planning and design professionals, refer to the terms "airport and aviation activity," as the safe and efficient movement of a mix of aircraft on and off the runway-taxiway system to various points on the airfield. The passenger terminal, the maintenance or fueling facility, the cargo area, overnight hangar or tie-down facilities, are among many designated-purpose points on the airfield at which operations are either initiated or concluded.

The forecasts are a general count of all the action items on the airport. The final numbers, be they passenger enplanements, size and make-up of the commercial and private (based aircraft) fleets, takeoffs and landings (operations) or several other sets of counts provide airport management with an understanding of demand and facility needs. The forecasts actually begin with people (enplanements), and are not as wholly mechanistic as a superficial glance might suggest. For it is the number of people who come to the airport now, and are expected to come in the future, that influence every detail of the design of the airport, its service facilities and physical airport layout, more than any other factor to be considered in a planning document.

The TYR Master Plan Update limits the element of surprise associated with facility demand while allowing the community and airport management to prepare sound strategies to accommodate growth in demand, mitigate environmental impacts, and ensure that local needs are met in the most safe, efficient and responsive manner.

FORECASTING NEED AND BENEFITS

Forecasts of future activity come at the very beginning of a master planning study since every subsequent decision related to the purpose, size, design and location of any structure or equipment relies on the estimated numbers of people who will use them. Under planning for the future can bring as many negative consequences as can over planning. Therefore, the forecast planning horizon term is twenty years, in order to encourage as broad a view as possible on the part of the operator, the traveling public and the surrounding community.

It is acknowledged that human vision generally does not reach 20 years into the future, and that significant modifications to the forecasts are likely in the out-years of the planning term. Nevertheless, experience in public policy proves it more cost-effective to modify an existing long-term vision that is based on sound planning principles, rather than to attempt to deal reflexively and inconsistently with inevitable change in the policy and physical environment. For this reason, most airport master plans are updated generally within 10 years of completion of the preceding plan. In some instances, unforeseeable changes in social, political or economic factors may require an even earlier update to the forecasts, with subsequent modifications to previously expected facility improvements as early as 5 years into the 20-year term.

A primary objective of forecasting is to provide information needed to determine whether existing airport facilities would adequately serve future needs. In most growth scenarios, the estimated levels of future demand may suggest the expansion, renewal, strengthening, or other improvements to airport structures or facilities. A primary criterion for airport improvements is safety. Safety considerations are the first concern of the FAA and the traveling public.

Safety concerns affect all stakeholders in the airport, including the community at large, the traveling public and the aircraft and airline operators. Once development decisions have been evaluated in light of safety considerations with regard to estimated future growth in demand, remaining development policy decisions are subject to more mundane criteria. These include efficiency of operations and the effectiveness of the airport as a whole in its roles as a link in the national transportation system, its economic contribution to the community, environmental concerns, responsiveness to the market, and financial feasibility.

Additionally, by projecting the most likely extents, high and low, of future numbers of passengers, aircraft, aircraft types, frequency of operations and types of operations, any constraints on existing infrastructure will be pinpointed. Comparing existing and future demand with existing facilities reveals potentially critical deficiencies before they become hazards, or are otherwise problematic.

Airport management uses activity forecasts to develop capital investment strategies to resolve potential future airfield and landside access problems. At the same time, placement and construction of any specialized facilities desirable to accomplish the airport's particular vision and mission in the community can either be programmed or modified to harmonize with changes in social and economic trends (also explored in this chapter).

The final benefit of developing a set of realistic forecasts is to help ensure that the airfield and passenger terminal areas, as well as technical facilities, remain in accord with FAA standards. In addition as aviation technology continues to evolve, existing facilities are kept in alignment with industry trends and the airport remains responsive to economic and market needs.

Forecasts of future demand not only reveal potential future facilities' needs, but also quantify them. Airport management is thereby supplied with sufficient information regarding the need and approximate timing of capital expenditures. The process helps ensure that the airport itself remains functionally and aesthetically a prized community asset, a generator of local economic activity, provides continuing effective and convenient service to the public, and continues to provide an important link in the national air transportation system. Ultimately, all of these benefits combine to bring people, products and services together to improve the productivity of the nation.

FORECASTING LIMITATIONS: ESTIMATES OF ACTIVITY LEVELS VS. "PREDICTIONS"

Forecasting future activity is a combination of science and art. Forecasts of future activity are not to be construed with predictions of the future but rather an educated guess of future activity based upon a variety of predictors, mathematical formulae, assumptions and subjective judgment.

Therefore, the forecasts developed in this section, should not be construed as predictions of the future. Rather, the subjective element consists of the collective experience of professional planners, as a group and individually. The combined planning wisdom and forecasting includes allowances for differing viewpoints, which depend in part on the employers, be they federal and state agency's of government, which exert a conservative influence (which includes the power to reject forecasts submitted on behalf of individual airports), private consultants who collect information in the field that may be unavailable to the government agencies, thereby influencing changes in the accepted wisdom at any specific place and time, and also by airport and aircraft operators, who tend to be optimistic and favor growth. Forecasts for a specific airport are an amalgamation of all of these viewpoints, tempered by years of observation and professional experience. In addition, to judgment and experience, science is one of the final arbiters in the development of aeronautical activity forecasts.

The science is brought to the forecasting desk in the form of statistical evaluation methods based upon patterns of past activity, in light of known and mathematically demonstrable relationships between activity and a variety of social and economic variables. Combined, these elements of objective and empirical evaluation, informed by the judgment of practicing professionals, re-evaluated annually in both macroeconomic terms informed by terms of local trends, produce generally reliable activity estimates for the near term.

The accuracy of the estimates declines as the planning term is extended, by unforeseen local or geo-political events, by unpredictable events involving natural disasters, or, more subtly, longer-term weather or climatological events. These caveats notwithstanding, the forecasts provided in this section utilize all of these methods, which together constitute best practices in the industry. Additionally, within the constraints of statistical analysis, the reliability parameters of the forecasts are published as a product of the statistical analysis.

Therefore, forecasts are not predictions, rather, more correctly developed **estimates.** Forecasts are the best estimates of a range of future activity levels that are most likely to occur, should a set of assumptions about the stability of the economic and political environment hold true for any stated planning horizon. Forecasting of aviation activity levels at an airport may also be viewed as contingency planning. Today's forecasting provides a variety of pathways that an airport can follow, based upon factors unique to the airport and on set planning scenarios, designed to provide airport management flexibility in response to differing degrees of demand for aviation services.

Acknowledging the limitations and caveats listed above, this chapter presents and analyzes recent and ongoing aviation industry trends, including the impacts of September 11, 2001, and the projections of aviation demand at TYR. Information was assembled to project the most likely future levels of demand for air carrier and air taxi activity at the Airport. General aviation activity (which includes all segments of the aviation industry except commercial air carriers and military) predominates at TYR. As a result, attention was given primarily to the factors that affect this sector of the market for aviation services.

Select Factors Influencing National and Local Aviation Services Markets

Nationally, the use of general aviation for business travel has increased in recent years. Much of this interest is due to the development of the fractional ownership instrument, combined with delays and other negative impacts of heightened security measures that have discouraged many travelers, including the airlines' highly valued business travelers, from using commercial air carriers.

Projecting future levels of interest and consequent demand for corporate general aviation operations at TYR is essential, if only for the fact that facility requirements for corporate aircraft usually exceed the requirements of recreational aircraft.

Corporate aviation activity is more likely to increase in the future as a result of economic recovery. The development of low-cost, light jet aircraft, such as the Eclipse 500 and Cessna Mustang, are further expected to increase corporate aircraft sales in the future.

In this chapter, the following elements are analyzed and subsequent projections prepared:

- Commercial Service Activity
  - Annual Passenger Enplanements
  - Passenger Service Operations
  - Air Carrier Fleet Mix
- General Aviation Activity
  - Based Aircraft

- Local Operations
- Itinerant Operations
- Fleet Mix

- Peak Activity
  - Peak Month Enplanements
    - Air Carrier/Regional
    - General Aviation
  - Average Day of Peak Month Enplanements
    - Air Carrier/Regional
    - General Aviation
  - Peak Hour Enplanements
    - Air Carrier/Regional
    - General Aviation
  - Peak Month Operations
    - Air Carrier/Regional
    - General Aviation
  - Average Day of Peak Month Operations
    - Air Carrier/Regional
    - General Aviation
  - Peak Hour Operations
    - Air Carrier/Regional
    - General Aviation

- Military Activity
  - Local Operations
  - Itinerant Operations
  - Peak Operations
    - Peak Month
    - Peak Day
    - Peak Hour

- Instrument Operations

Forecasts for TYR were generated on a year-by-year basis for the 20-year planning horizon (2004-2024), and were summarized in this report at 5, 10, 15 and 20-year increments of the planning period. The year 2004 was used as the base year for this analysis, and 2005 represents the first forecast year. Finally, the forecasts were also divided into planning intervals, named by historical convention as short (1-5 years), intermediate (6-10 years) and long-term (10-20 years).

EXISTING AIRPORT DATA

The following section summarizes available historical data from local sources and from FAA data banks, and from TYR local available records. The information includes historical data for the five- and ten-year periods immediately preceding the base year (2004) set for this master plan update. Before preparing the forecasts, data for historical levels of aviation activity were collected from various sources. The primary source of information describing past levels of airport passengers traffic originated from monthly enplanement reports filed by the airlines to the FAA with copies provided to airport management. Other historical data, including based aircraft, general aviation operations, commercial operations and military operations, were drawn from a variety of official records, including, airport

licensing records filed with state and federal aviation agencies, FBO records, Airport Management, and the TYR air traffic control tower.

Historical Passenger Enplanements and Annual Operations

Historical trends over the most recent five-year period show a marked and apparently accelerating decline in both enplanements and overall operations at TYR. However, recent figures for 2004 and early 2005 indicate that the accelerating decline in enplanements has diminished and that a recovery is in progress.

Analysis of the figures reveal that enplanements were in a downward slide averaging just under 8 percent annually by the end of 2003, and that considerable variation in overall operations also occurred, but with no discernable pattern, over this comparatively short-term period.

The effects of the dot com crash, recession, terrorist events of 9/11, ensuing war, uncertainty over the national economy and dramatic increases in fuel prices, among other factors, kept the public skittish about air travel during the two and one half years following the attacks. These events are tracked in the recent historical activity data shown in **Table 3-1**.

Therefore, much of the decline in the activity levels since 1999 can be explained in social and economic terms. The year 1999 marked the beginning of the crash in Internet marketing companies, the so-called "dot com bust." This crash impacted a large segment of the U.S. economy, which was followed by a general recession, lasting officially until the latter months of 2001, but whose negative effects on activity measures were still being felt in the price-sensitive aviation industry for most of the year 2002.

TABLE 3-1
HISTORICAL ANNUAL ENPLANEMENTS AND OPERATIONS

Year	Annual Enplanements	Annual Operations
1994	81,506	101,346
1995	77,252	91,441
1996	72,897	87,391
1997	73,415	116,157
1998	72,616	114,991
1999	77,795	110,236
2000	74,563	103,820
2001	63,834	123,156
2002	55,578	135,984
2003	60,284	143,824
2004	70,549	63,441

Source: Tyler Pounds Regional Airport, 2005

PREVIOUS AVIATION ACTIVITY FORECASTS

Master Plans

Three master plans preceded this 2004 study. Planning efforts began in 1973 with the first master plan covering the planning period from 1973 to 1994. The original plan commenced in 1973 as a consequence of the federal Airport

and Airway Development Act, which sought to codify the process of airport planning in the U.S. and provided funding to develop, maintain and improve the nation's stock of airport facilities. Among the criticisms of early airport planning efforts was that forecasts of aviation activity were often estimated too low. Among many other goals, the ADAP Act sought to achieve a more realistic means of estimating future air traffic levels, and the FAA issued guidelines on the subject. The overall goal objective of the Congress and the FAA as the designated implementation agency for this far-reaching Act, was to find a fair systematic means of issuing funding assistance to airport facility development projects where they were needed most urgently in light of current need and expected future demand.

The original TYR master plan was subsequently updated twice more in 1985 and 1995 for planning horizons of 20 years each, ending in 2005 and 2015, respectively. Approximately 10 years since completion of the most recent update, 1995, this update begins with 2004 as the base year and 2005 as the first forecast year. Much has changed in the industry and the economic and political landscape since 1995, and consideration of the forecasts from the previous plans is informative. Since forecasting is to a significant degree as subjective as it is scientific, the previous forecasts reveal clues about the airport's expected role in the local economy, and the amount of conservatism or optimism that prevailed by the local, regional and airport leadership of the time.

Accuracy of Earlier Forecasting Efforts

The previous Master Plan forecasts are reproduced in **Tables 3-2 and 3-3**, along with some clues to the temperament of the time in which they were produced. It is informative to note that where the early consultants of 1973 had forecasted a total of 60,000 enplanements in 1994, this calculation underestimated enplanements by more than 20,000.

TABLE 3-2
PREVIOUS MASTER PLAN
ANNUAL ENPLANEMENTS & OPERATIONS FORECAST

1973 Master Plan		
Year	**Annual Enplanements**	**Annual Operations**
1972	10,700	55,219
1978	16,700	84,600
1983	24,800	126,075
1988	36,400	182,600
1994	60,000	287,000
1985 Master Plan		
Year	**Annual Enplanements**	**Annual Operations**
1985	28,800	107,800
1990	35,600	132,200
1995	43,400	157,500
2000	52,300	186,200
2005	62,700	216,200

Source: Pounds Field Airport Master Plan, 1973; Tyler Pounds Field Airport Master Plan, 1985.

Airport records show that the actual level reached 81,506 paying passengers in that year. While the 1973 planners were far from conservative, the projected annual growth rate in enplanements, at more than 20 percent annually, would raise federal eyebrows in today's planning climate. Nonetheless, even this highly optimistic effort, underestimated actual performance by a factor of 26.4 percent. Among other implications, this figure shows how precarious the forecaster's craft may be.

Also optimistic by today's standards, the authors of the 1985 master plan reached calculated Year-2005 enplanements at a level of 62,700. This represents a 5.9 percent annual growth rate, with an overall 20-year increase of 117.7 percent over 1985 levels. While this is considered an optimistic forecast by federal, state and consulting professionals in 2005, this estimate is very close to actual levels, the airport having served 60,284 in 2003, while jumping another ten thousand to 70,549 enplanements tallied by the authorities in 2004.

Accuracy of Earlier Enplanements Estimates

At the time of this master plan update, Base-Year 2004, the year 2005 has yet to play out. However, enplanements had been steadily falling since 1999, at a rate of approximately 8.4 percent per year, from the all-time high of 81,506 in 1994 to a low of 60,284 in 2003.

The reasons for the drop are detailed in other sections of this report; however, a protracted downturn in the national economy, the threat of international terrorism, and a number of other issues raised the anxiety levels of potential air travelers keeping them away from the airport. However, from the airport's perspective, a decided change is under way, beginning with a 17 percent-plus increase in passenger traffic in 2004, when more than 70,500 passengers elected to return to the airways. This increase bodes well for the revenue side of the airport and the airlines, since positive changes in the social and economic fabric of the Tyler area are closely associated with business prosperity, future growth, and a reversal of the recent five-year downtrend in passengers at TYR.

Operations and Fleet Change

The operations forecasts produced by both sets of predecessor planners are also very high according to today's experience, but the passenger-carrying capacity of the fleet at the time of these earlier forecasts was small (below 30 seats in most of the aircraft used, and 19 or fewer on several even smaller models common to the regional carrier fleet at the time these earlier forecasts were produced. The 50-seat, 70-seat and even 90-seat regional jets were not envisioned in 1973, and only a topic for discussion, but not on the design drawing boards in 1985.

The preparers of the current set of forecasts in comparison, show overall growth of slightly more than 150 percent in enplanements, an average annual growth rate of approximately 7.5 to 7.7 percent annually for the 20 years to come. While this is comparatively high by the prevailing standard, it is noted that the FAA itself forecasts enplanement growth rates ranging from 9 percent annually in 2004 for the regional carrier industry, as the fleet moves to regional jets, to as much as 18 percent annual growth in 2005. In comparison, the forecasts shown in this document are conservative, at a minim of 1.25 to 2.5 percentage points below the FAA's prognostication.

Both the earlier master plans and this current update generally rely on the same set of standard forecast methods used to produce the aviation activity projections. Forecasting techniques applied included a variety of methods whose calculations and results are independent of each other in order to produce a range of results. Using a variety of techniques helps reduce bias that may be mathematically inherent in a given technique, or in a given set of aviation, social or economic forecasts.

Methods included, but were not limited to: analysis of time-series historical data, comparison with various FAA Aviation Forecast products, including the Terminal Area Forecasts, the National Aerospace Forecasts and the FAA Long-Term Forecasts (through 2020, 2025 and 2030). The National Plan of Integrated Airport Systems (NPIAS) is also consulted for short-term comparison. Various statistical techniques are also employed, including regression analysis on social and economic indicators, various averaging methods, as well as trendline analysis.

Table 3-3 depicts the enplanements and operations forecast derived during the most recent Master Plan Update completed in 1995. The annual enplanements growth rate for the planning period is 2.39 percent annually and the

annual operations growth rate over the planning period is 3.70 percent annually. For future comparison, these percentages were used to extrapolate the annual enplanements and operations for the year 2024.

TABLE 3-3
1995 MASTER PLAN UPDATE ENPLANEMENTS & OPERATIONS

Year	Annual Enplanements	Annual Operations
Base Year		
1993	76,000	87,580
Forecast		
2000	93,600	102,080
2005	104,900	116,890
2010	117,450	145,170
2015	130,000	189,610
Extrapolated by LPA		
2024	160,816	262,896

Source: Tyler Pounds Field Airport Master Plan Update, 1995; THE LPA GROUP INCORPORATED, 2005

FAA Terminal Forecast

The Terminal Area Forecast (TAF) is prepared by the FAA to provide an indication of the FAA forecasted traffic levels at the nation's airport facilities. Except for specific regional or state requests, the airports included in the FAA TAF report must meet at least one of the following criteria:

- Have an existing FAA tower
- Have an existing FAA Contract tower
- Candidate for an FAA tower
- Currently receiving or expected to receive scheduled air carrier or regional/commuter service
- Currently exceed 60,000 itinerant or 100,000 total operations
- Reported ten or more based aircraft on the latest available Airport Master Record (FAA 5010 form)

Table 3-4 depicts the TAF projections for annual enplanements and annual operations over the planning period. According to the TAF, annual enplanements over the planning period are projected to grow at rate of 2.00 percent annually, while annual operations will grow at a rate of 1.00 percent annually.

TABLE 3-4 TAF ENPLANEMENTS & OPERATIONS		
Year	**Annual Enplanements**	**Annual Operations**
Base Year		
2004	71,594	80,454
Forecast		
2009	82,543	60,953
2014	91,566	64,505
2019	101,575	68,273
2024	112,679	72,269

Source: FAA TAF, 2006

NPIAS Forecast

The National Plan of Integrated Airport Systems (NPIAS) for 2005 to 2009 identifies 3,344 existing airports that are significant to national transportation, and, therefore, eligible to receive grants under the FAA Airport Improvement Program (AIP). The NPIAS was used to express national trends among similarly classified airports for both operations and commercial enplanements. According to the NPIAS, TYR is designated as a primary commercial airport providing regional/commuter service. Based upon strong nationwide economic growth, the FAA forecasts that U.S. commercial enplanements will increase at an average rate of 4.2 percent annually. In addition, operations associated with airports catering to regional/commuter carriers in addition to GA operations are expected to increase at a rate of 2.9 percent annually. Applying these growth rates to operations and enplanements for the base year 2004 resulted in 160,637 annual enplanements and 101,956 total operations by the year 2024. The results of these calculations are shown in **Table 3-5**.

TABLE 3-5 NPIAS ENPLANEMENTS & OPERATIONS		
Year	**Annual Enplanements**	**Annual Operations**
Base Year		
2004	70,549	63,441
Forecast (Extrapolated by LPA)		
2009	86,662	71,418
2014	106,455	80,406
2019	130,770	88,547
2024	160,637	101,956

Source: NPIAS, 2005-2009

FAA Aerospace Forecast

The national forecast is a forecast created by the FAA to project aviation growth for the U.S. The FAA Aerospace Forecasts, Fiscal Years 2004-2015, was used to express national trends in both commercial operations and

enplanements in order to determine the correlation between national trends and activity at TYR. Based upon the National Growth rate for domestic aviation operations and enplanements as presented in the FAA Aerospace Forecast, resulted in a .92 percent average annual growth rate for aircraft operations and 4.35 percent average annual growth for enplanements through the twenty-year planning period. The results of these calculations are shown in **Table 3-6**.

TABLE 3-6
FAA AEROSPACE FORECAST
ENPLANEMENTS & OPERATIONS

Year	Enplanements	Annual Operations
Base Year		
2004	70,549	63,441
Forecast (Extrapolated by LPA)		
2009	89,186	66,389
2014	112,747	69,513
2019	136,515	72,761
2024	165,295	76,202

Source: The LPA Group Incorporated, 2005

RECENT POLITICAL AND ECONOMIC EVENTS AFFECTING AIR TRAVEL

1999-2001: MILLENIAL SCARES, RECESSION AND TERRORISM

In addition to these two interrelated events, came a generalized public scare concerning the millennial change on the calendar, and associated uncertainty over the reliability of computer-based navigation and communications systems. Following these events, at a time when the nation perceived some positive signs in the technology sectors of the economy, the terrorist attacks of 2001 occurred, quickly squashing these seeds of optimism.

Both commercial aviation and general aviation (GA) suffered a complete and generalized shutdown of the entire industry in the immediate wake of the attacks. In addition, due to security concerns related to the generally amorphous composition of the GA market, GA activity was especially affected for more than two months following the attacks and indirectly suppressing activity for months longer.

2002-2003: INTERNATIONAL CONFLICT AND BURDENSOME SECURITY MEASURES

In the interim, the nation was put on a war footing with the invasion of Afghanistan in the latter months of 2001, followed by war with Iraq in the following spring. The economy continued to wobble uncertainly in the face of these events, and continued uncertainty over the security of flying kept many former passengers from the airways. Furthermore, a series of far-reaching reforms in airline security pre-flight passenger and luggage searches were introduced, adding hours of non-productive time to any planned travel by air on commercial airlines.

SMALL-MARKET EFFECTS ON TYLER AREA AIR TRAFFIC

The effects particularly dampened air travel in the Tyler market, described locally as a secondary or "mid-market," which is characterized by its short haul nature to Dallas-Ft. Worth, and to Houston, approximate 100 and 130 air miles distant. Former air travelers rediscovered their autos for these short hauls, rather than put up with the "hassle-factor" that the new passenger and luggage security policies initiated. Having formed new travel habits, former air travelers were difficult to convince to return to the airways.

AIRLINE INDUSTRY TURMOIL AND NON-AVIATION CORPORATE MISBEHAVIOR

In addition, the airline industry was plagued with a sea of red ink that was exacerbated by the cumulative effects of economic uncertainty. Beset with labor union problems, several major carriers declared bankruptcies, while others teetered on the brink. Mass pay cuts, early retirements and layoffs in the air industry were also echoed by businesses in the general economy, including scandals at some of the largest corporations in the nation. The airlines themselves were targets for mergers, consolidations or annihilation, and many undercapitalized start-up carriers went bankrupt overnight. This added even more to the uncertainty of air travel with the predictable result of declining interest in air travel nationally, as well as the Tyler market.

2004-2005: TRANSFORMATION OF THE TYLER ECONOMY

Significant changes in the workforce, from blue collar manufacturing and oil administration to high-tech entrepreneurs and service professionals, have quietly transformed the economies of both the City of Tyler and the Smith County MSA. The effects of this change are detailed in the socio-economic review section of this report. In short, the transformation, abetted largely by efforts of the Tyler Economic Development Commission, have resulted in a need to import highly qualified and high-earning professionals to the local market, along with a steady growth economy at a moderately high but sustainable growth rate of approximately 2.4 percent per year.

This influx of professionals into the local economy resulted in a significant growth in enplanements (more than ten thousand passengers) representing an increase of more than 17 percent over the preceding years. This portends continued growth in demand at TYR, but an annual increase of 17 percent is not sustainable in the long-term. The FAA National Aerospace Forecasts for 2004 maintained that regional air carriers, including those in the Tyler area market, are expected to grow at a rate of 18 percent or greater in the short-term. Such significant change in levels of operations over the period can be associated with schedule adjustments by commercial carriers, the sudden entry and equally sudden exit of undercapitalized start-up carriers, and the effects of sharply reduced flight training activity at the Airport.

Impact of September 11th on Tyler Regional Market

The previous sections have discussed recent political and economic events that have affected air travel at TYR and across the US. As a result of the economic impacts that have been experienced by the airlines, (discussed previously) there has been a shift in the manner in which the airlines serve TYR. The most significant impact has been the increased utilization of regional commuter airlines across the industry and in particular those employing regional jets to serve demand in the market. Both American Airlines and Sky West Airlines are slowly transitioning from using turboprop aircraft to regional jet aircraft in the Tyler market.

TYR like all U.S domestic markets experienced a sharp drop in commercial passenger and operations volume in the months following 9/11. In 2001, passenger enplanements were down by 14.38 percent over the previous year. Commercial operations dropped by approximately 2,600 operations (or –28.3 percent) during the same period. This decline continued into 2002 as enplanements were 25.46 percent (18,985 passengers) below 2000 levels. Operational levels also fell in 2002 to approximately 8,536 annual commercial operations (a 38.5 percent decrease from 2000). However, in 2003, signs of recovery were evident as TYR experienced growth in passengers and operations over the previous year, 8.46 and 5.71 percent, respectively. This growth continued the following year as commercial operations at TYR increased to 10,143 operations (an 18.8 percent increase over 2002 levels), and passengers rose by 17.02 percent (10,265 operations).

It is apparent that there was an impact in the market stemming from 9/11, but TYR has bounced back strongly since the beginning of 2003 in terms of both passenger enplanements and commercial operations. The influence of the changes discussed in this section and others have been factored into the analysis. While 9/11 has affected the extent and complexion of activity at TYR, its overall impact on passenger levels and activity are well on the way to being

moderated and should not be a significant consideration in future activity levels. This belief is borne out by the recovery of activity and initiation of increased service in the TYR market.

WORKFORCE TRENDS

Table 3-7, *Recent Workforce Trends*, tracks changes in workforce characteristics (by standardized industrial sectors) as they have occurred during the most recent 5-year time period preceding this study. The data presented track significant recent (and continuing) changes in the composition of the active workforce in the Tyler, Texas, and regional economy. The regional economy includes population, active workforce, and income levels within the boundaries of the Metropolitan Statistical Area (MSA). The MSA includes the City of Tyler, Texas, and all of surrounding Smith County, Texas.

Some activity originates from adjacent and outlying areas (including extra-regional residents from elsewhere in the nation who may utilize available air services to visit). However, the local MSA is considered to be the primary basin from which local enplanements are drawn. In addition to local airline customers, the majority of based general aviation aircraft owners can be assumed to be residents of the region, as defined by the boundaries of the MSA. In other words, the regional market, as geographically defined by the MSA, is statistically representative of user demand for airport and aviation services. These assumptions do not in any way diminish the importance of extra-regional airport users; rather, they serve a practical purpose by allowing the preparers of this master plan to limit the airport user population to a representative sample of manageable size.

At the same time, the use of local (City of Tyler) and regional (MSA) information ensures that issues, characteristics and factors that are unique to the airport -- and therefore of most importance to the economic future of the region -- are revealed and addressed in this Airport Master Plan Update. Such issues include, but are not limited to, the continued availability and improvement of airport services and facilities, environmental concerns, public access, quality of life concerns, adequacy of services, fares, fees and taxes, among others. Additionally, the planning process also will identify new issues, concerns or developments requiring public considerations, so that they may be properly evaluated by all parties with an interest in the airport.

Finally, and often unremarked or overshadowed by shorter-term issues, the airport planning process will identify previously unrecognized benefits, positive effects or influences on the community, provided by the Airport. Often these developments are generated all or in part by the mere presence of the airport, and the quality of its management.

Among such benefits (other than the obvious direct benefit of access to the national air transportation system) is the value of the airport as a stimulus to new economic activity. The airport often works as a magnet for commercial and industrial development, plays a significant role in the creation of quality employment opportunities, and contributes to stimulating development of a skilled, high-earning workforce. Airports by their nature often attract high-technology economic development and help generate other similar, but indirect, synergistic economic influences. Such influences considerably boost the airport's asset value to the sponsoring community.

The degree to which a community may be aware of such beneficial influences, varies considerably, especially if specific studies have not brought them to light. This study focuses on the Airport and the quality of its component facilities in order to maintain, prepare and improve them based upon a best-possible estimate of the level and qualities of future demand for services. The workforce trends identified in this analysis are, therefore, limited in scope, number and type of variables selected for analysis. The community may wish to explore workforce trends, and related variables more thoroughly in separate and dedicated studies, if it is not already doing so. In addition to the research mentioned, it is recommended that a dedicated and separate economic impact study be conducted for the airport. Such a study can definitively quantify the airport's true asset value to the community. This effort is beyond the scope of the airport master plan, but is frequently accomplished in the wake of a master plan update as a means of providing

a better public understanding of the airport's economic role and contribution to the local and regional economy. Beyond the airport's value as a community asset, an economic impact study, in tandem with a master plan update, carries implications for future public policy decisions relating to the airport's role in the community, the need to protect it from encroachment by other development, and other related issues.

Shortage of Qualified Professionals; Greater Reliance on Airport Services

Among the beneficial regional developments revealed in this portion of the airport planning effort are a series of profound changes in the social and economic fabric of the region. The analysis primarily shows significant changes including a growing sophistication of the workforce. The changes are identified and quantified in individual detail in **Table 3-7**, *Recent Workforce Trends*, and summarized in **Table 3-8**. Their meaning is further explored in the trend analysis discussion. Changes, as revealed in the workforce and economic trend analysis, are generally positive in nature, involving improvements in regional employment and income, growing prosperity for the region, and portending a greater reliance on airport services and facilities throughout the 20-year planning period.

The trends show a shift toward a professional workforce from a historically blue-collar economy. Remaining blue-collar industries are statistically in decline, while mercantile, white-collar management, government and professional service jobs, among others, are increasing by significant percentages. Historically, it is this type of economy, characterized by a highly educated and comparatively well-compensated workforce that possesses the necessary wherewithal in both time and money to demand higher levels of both leisure and business-oriented aviation services, including travel, cargo, package delivery and aviation training sectors of the aviation service market.

Table 3-8, *Analysis of Changes in Workforce, Industry Type and Employment*, isolates and quantifies predictive factors from the Workforce Trends identified in the previously tabulated dataset. Thus quantified, the predictive factors can be applied to other aviation activity performance indicators to project estimated increases in demand for air travel and other aviation services. It is worthy to note that other social and economic trends, such as population employment and wages (as tracked by the Census Bureau) for the Tyler region have been decreasing over the same period. However, the Census figures reflect the surface reality, which unsurprisingly follows national recessionary trends during the period, as well as the economically dampening effects of wartime. The Census figures, however, do not show recovery trends in local economies, as can be seen in the Tyler, Texas region.

From information obtained from local economic sources, it can be noted that the Tyler area is an economy-in-transition. Barring the possibility of any more economic upheavals on a national scale, or unforeseen local events that could confound the trends as documented, Tyler and the neighboring region have already reached the bottom of the declining curve and are well into recovery.

Sociodynamics of the Tyler Area Workforce

Table 3-7 summarizes the story of recent and profound changes in the workforce and the regional economy, which are detailed in **Table 3-8.** The Workforce Ratio as described in **Table 3-8** outlines the number of new jobs created in excess of the existing workforce's capacity to fill them -- by a factor of 22 percent. This statistical analysis describes a job market in which 4.5 new jobs are unfilled for every 100 members of the full-time workforce who are already employed.

Table 3-7 shows a significant change from the old-line mining, agricultural and manufacturing economy, whose growth potential is shown to have peaked, then stagnated. While growth trends in the professional sector are rising at better than 3 percent on average, the predominance of old-line industries is receding at an annual average rate exceeding 2.5 percent.

TABLE 3-7
RECENT WORKFORCE TRENDS: CITY OF TYLER, TEXAS AND SMITH COUNTY MSA
PROFESSIONALIZATION OF THE WORKFORCE: EMPLOYMENT CHANGES BY INDUSTRY SECTOR

Track of Significant Target Variable	Numbers of Persons Employed (By Industry Sector)				Growth/Decline Factors		
					A	B	C
					TREND		
						% Change	
	Five-Year Trend	1999	2003	2004	Number of Jobs	Net Percentage	Total Equalized
Expanding Enterprise Sectors	Private Sector Employment (Overall)	70,300	73,600	74,700	4,400	6.30%	0.28%
	Producers of Services	66,200	72,300	73,800	7,600	11.50%	0.88%
	Construction	3,600	3,800	3,900	300	8.30%	0.02%
	Wholesale Trade	3,000	3,500	3,500	500	16.70%	0.08%
	Information	1,600	2,000	2,000	400	2.005%	0.10%
	Professional & Business Services	6,000	6,600	6,600	600	10.00%	0.06%
	Education & Health Services	13,800	17,100	17,600	3800	27.50%	1.05%
	Leisure & Hospitality	6,900	8,100	8,200	1300	18.80%	0.25%
	Other Services	3,100	3,500	3,500	400	12.90%	0.05%
	State Government	3,000	3,100	3,300	300	10.00%	0.03%
	Local Government	7,700	8,600	9,100	1400	18.20%	0.26%
Totals	*Total Jobs Created (City of Tyler, and Smith County, TX MSA):*	*185,200*	*202,200*	*206,200*	21,000	5-yr Net Growth *(Average):*	
						11.61%	3.06%
Total 5-yr Jobs Gain					21,000	*Avg Ann'l Growth:*	
Average Annual Gain			*5 yr rate*	*Jobs per year*	3,500	1.94%	
Enterprise Sectors in Transition or Decline	Producers of Goods	15,800	13,900	14,200	-1600	-10.10%	-0.16%
	Natural Resources & Mining	1,200	800	900	-300	-25.00%	-0.08%
	Manufacturing	11,000	9,300	9,400	-1600	-14.50%	-0.23%
	Retail Trade	13,700	13,100	13,000	-700	-5.10%	-0.04%
	Financial Activities	4,600	4,100	4,300	-300	-6.50%	-0.02%
	Transportation & Warehousing	1,800	1,700	1,800	0	0.00%	0.00%
	Federal Government	1,000	900	900	-100	-10.00%	-0.01%
Totals	Total Jobs Lost	*49,100*	*43,800*	*44,500*	*- 4 ,600*	5-yr Avg Net Chg:	*- 10.17%* *- 0.54%*
	Unadjusted 5-yr Change, Declining Sectors				*- 29.1%*		
	Net Gain/Loss (Growth-Decline, all Sectors)					*1.44%*	*2.52%*

Data Sources: Office of the State Demographer, Texas; and City of Tyler, Texas, December, 2004; Analysis by LPA Group, Incorporated, March, 2005

TABLE 3-8
ANALYSIS OF CHANGES IN WORKFORCE, INDUSTRY TYPE AND EMPLOYMENT
City of Tyler and Smith County MSA, Texas

1	*2*	*3*	*4*	*5*
Total Workforce	Total Unemployment	Total Gain in Jobs	Total 5-yr Gain in per Capita Income	Average Equalized % Change
99,643	**3,787** (~3.8% of Population)	**21,000**	**$2,923.00**	**3.06%**
6	*6 (a)*	Explanation of Analytic Results - Steps 6 & 6 (a)		
Jobs Gained to Available Workforce	Actual Jobs Created (but not filled) by existing Workforce	*The ratio means that 22 percent (100 ÷ 22) = 4.55, or approximately four and one half (unfilled) jobs, on average, are being created in the Tyler-Smith County region for every 100 fully employed workers in the existing workforce, as well as those moving into the City of Tyler – Smith County area.*		
Ratio = **0.22**	**4.55: 100**			

Source: THE LPA GROUP INCORPORATED, 2005

In its place, the workforce statistics reveal the emergence of a new professional workforce. The job surplus described displaces shrinking employment (4,600 jobs lost) in the blue-collar workforce. However, new jobs created significantly exceed those displaced, and at a rate that is apparently beyond the ability of the existing local workforce to replace and fill. The comparatively low level of local unemployment underscores the gap. At a level 3.8 percent of the workforce as shown in **Table 3-8**, the unemployment rate is significantly below national levels (which hover between 5 and 6 percent).

The fact that this trend dates back more than six years indicates that this is not a short-lived blip in the local economy. Rather this trend is based firmly in a regional business community, which is changing to benefit from an ex-urban economy. The comparative longevity of this work force trend is a good indicator of stability in the economic foundation, which is poised for continued growth. In keeping with the economic principle of supply and demand, per-capita income is also seen to be rising sharply in the region, providing new wealth once unavailable to workers in the previous economy. With a population growth rate of only about 1.8 percent, the shortage of workers to fill employment opportunities created in the new regional economy is becoming acute. It can be reasonably expected that the population growth rate will rise over the next decade as businesses expand and import new talent to fill a rapidly increasing gap in qualified workers.

The rates selected for tracking social and economic change fluctuate dramatically, but consistently upward, over the six-year period tracked. The trend rises more steeply as time advances, illustrating a widening gap between the creation of new jobs and lack of qualified professionals to fill them in the local workforce. This combination of increases in income mixed with a lagging rate of population growth by the end of 2004 will become self-correcting as regional businesses reach out nationally to attract workers and their families to fill these gaps. In fact, at the point in time where this analysis stops (end of calendar year 2004), the rate of job creation in the new economy outstrips the existing workforce's ability to fill employment vacancies by nearly 5.5 percent.

The equalized percent change statistic (**Table 3-8**, Column 5) illustrates growth sectors of the economy, which shows that the local economy in the Tyler area should continue to grow at a rate of approximately 3.06 percent annually. Industries that cannot find local employees within the existing workforce tend to import them from elsewhere, resulting in an in-migration of skilled professionals. This adds to a highly skilled, highly educated population, who tend to earn well above average salaries and who generate demand for business services, professional services and air transportation.

As shown in **Table 3-8**, column 4, a significant gain in per capita income has occurred for Tyler area residents, demonstrating a community of growing personal wealth. On a per capita basis, the statistics show that residents of the region are generating nearly $3,000 annually over previous income levels. Such gains are only realized with the success of the local business community. Successful business ventures stimulate demand for travel services, especially business-oriented air travel. Gains in personal wealth also generate demand for additional services and amenities, including discretionary air transportation for leisure purposes.

The **Equalized Percent Change** calculation (**Table 3-8**, Column 5) shows that even with the collected decline of various industry segments, this factor exerts a slowdown rate (or drag) of only one-half percentage point on an otherwise robust growth rate. The **2.52 percent annualized growth rate** as shown in **Table 3-7** shows a healthy community with a local economy in transition. Moreover, those industries in decline are not likely to impact the local economy over the long-term since these industries will tend to adapt to the new marketplace and conditions. Other industries that may lag due to national, geopolitical and other environmental conditions beyond their control, should recover, adapt or be transformed with continuing improvements in the national economy. However, those (few) businesses which may not or cannot adapt to this new economy, will likely give way to other more modern ventures that are attuned to the changing Tyler marketplace, and thereby not exert a lasting drag on municipal and regional growth.

Preliminary Conclusions

The statistic "Net Growth and Decline" is the straight summation of the advance or retreat of all existing and developing industry sectors. When added together, the sum shows that a straight tally of regional industries, subtracting those in decline, still leaves a net growth of 4.85 percent.

"Equalized Change...," compensates for the comparative sizes of subpopulations in the sample and balances changes in the workforce proportionately to the population. This calculation recognizes that a small industry sector's growth or decline has a lesser impact than does a large industry. When compensated for greater or lesser size in relation to the entire working population, **a net growth factor of 2.52 percent is calculated.** This figure most accurately describes the annual growth rate of the economy over the period examined. The 2.52 average annual growth percentage can, therefore, be used as an average factor in predicting immediate future growth in the Tyler-area economy. The total equalized change in the workforce was calculated by dividing the total number of jobs (Factor A. Five-Year Change: Number of Jobs) gained/lost in each named sector of the economy, by the total workforce (Analysis Table, Factor 1 (99,643 members of the Workforce), and multiplied by the percentage of change that took place in that sector over the 1999-2004 period (Factor B "Five-Year Percentage Change"). Applied as a constant, the numerical size of the workforce normalizes the impact of change across the entire affected population. See "Example," following:

> Example: the equalized significance of a 10 percent gain affecting 6,600 workers in the Professional Services sector is measured at .066 percent in terms of the total workforce. However, compared to an identical 10 percent gain in State Government jobs only, which, impacts a group of workers only half as large (3,300) results in an impact of only .03 percent in terms of the total workforce.

Based upon the information presented, an analysis of the regional economy for the period 1999-2004 (inclusive) shows that the overall economy is growing at an average rate of 2.52 percent per year. Planning for improvements in public infrastructure and services in the region should begin with this percentage growth rate in order to accommodate increased demand for the same. In addition, it should be noted that the make-up of the workforce is changing from a blue-collar based economy to a professional workforce.

Generally, the demand characteristics of this sector of the workforce places a greater emphasis on quality, variety, frequency or depth on public services and facilities rather than those of the more independent workforce currently being displaced.

Overall, the forces discussed above can be expected to stimulate, rather than reduce demand for regional air travel services. A secondary effect of growth in demand for air service can be expected to manifest itself by changes to the fleet mix. Aging turboprop aircraft currently in use are expected to be replaced by regional jet aircraft. Finally, since the smallest regional jets now in service seat a minimum of 50 passengers, additional capacity can be expected to meet growth in demand.

These conclusions are preliminary until supported by the remaining analysis in this chapter, where they will be tested in the form of assumptions for statistical analysis. The conclusions or assumptions, which withstand the rigor of statistical tests performed in the body of this chapter, will be used as assumptions from which projections of future aviation activity are extrapolated. Combined, the best series of assumptions will be selected to constitute the forecasts of commercial (scheduled airline) aviation activity for TYR.

The conclusions noted here, which withstand the rigor of statistical tests, will be used as assumptions from which projections of future aviation activity are extrapolated. Combined, the best series of assumptions will then constitute the selected forecasts of commercial (scheduled airline) aviation activity for TYR.

FORECASTING APPROACH

Two of the primary considerations that can influence activity forecasts at an airport include historical trends and industry trends. By tracing historical trends, it is possible to determine the impact that economic fluctuations, as well as changes in the market or in airline business practices have had on activity at an airport. Likewise, applying recent or anticipated industry trends can allow educated assumptions to be made as to how a market may be served or activity may be affected in the future. These considerations play a key role in the forecast of enplanements and operations presented in this chapter.

A key element in the forecast process is the identification of national and local trends that enhance the potential for new or expanded service by existing commercial operators, as well as the potential for the airport to secure new service and users. Several sources of data were utilized to identify both national and local trends. In addition to the historic data and previous studies conducted, national and local industry information was collected from the current FAA Aerospace Forecasts; the FAA Terminal Area Forecast; airline reports; and industry periodicals. Moreover, interviews and surveys were conducted with airport management, airline management, air traffic control, fixed base operators, and other airport tenants.

Using the information gathered, assumptions were made with respect to how aviation activity may change in the future based on trends emerging in the aviation industry. This included evaluating TYR's role in the nation's aviation transportation network. Along these lines, many different factors were considered which might influence the course in which activity at an airport develops. The primary goal of the analysis was to develop an approach that gives reasonable consideration to these factors while at the same time providing a rational basis on which to base the

forecast process. In addition to aviation trends, local demographics were also explored. In developing the various forecasts for TYR, the historic and projected demographics of the region were analyzed to identify potential factors that could impact the level or type of aviation activity at TYR. This data is primarily used to develop a series of linear and multiple regression analyses as appropriate for both the commercial and general aviation forecasting efforts.

FACTORS AFFECTING COMMERCIAL AIR SERVICE

Airline Industry Trends

The airline industry in the United States throughout 2004 and into 2005 remained turbulent -- characterized by mergers, bankruptcies, and fare wars. In addition, collective bargaining and labor problems among the legacy carriers, cuts in pay for airline employees, along with cuts in service, and consolidation forces within the industry seemed to portray a chaotic state of affairs for paying passengers and the lay public.

These recent developments, which appeared to reach a peak in 2004 among major airlines, were accompanied by a host of airline startup ventures, primarily in the discounted fares market segment of the industry in the wake of deregulation (the volatile impacts of which echoed throughout the industry into the mid 1990s), and 2005, the first forecast year for TYR. They include, first, the emergence of the regional jet (or RJ), a down-sized airliner, usually carrying between 50 and 70 passengers -- with a trend to carrying up to 90 passengers among regional jets (RJs) just entering manufacturing stage in 2004.

Regional Carriers vs. Legacy Carriers

The second important airline industry development is the maturation of the hub-and-spoke system, first designed as an efficiency measure by the major airlines (or "legacy carriers" still operating from pre-deregulation years). The hub-and-spoke system gave impetus to the development of the RJ and the regional carriers, to serve as feeder lines into major hubs served by the legacy carriers. As the hub-and-spoke system matured into the early years of the 21st century, it was accompanied by subsequent problems of air traffic congestion associated with the FAA's air traffic control system accompanied by inconvenience to air travelers funneled into ever-increasing crowds through endless walkways in massive airline terminals in the large hub cities.

As this system became more and more problematic for both the FAA and for the air traveling public, the period from approximately 1995 through 2005 became the stage where the regional airline industry, growing out of the air-taxi segment of the aviation market, began to seize market share in its own right. Some regional carriers returned to the point-to-point service that characterized air travel prior to deregulation, using small, efficient, and high-technology regional jets, providing service to secondary markets often shunned by the major carriers. Secondary markets are often known as "Regional Airports". Once shunned by air travelers, these airports are emerging as desirable destinations by these same travelers, due to their smaller scale, less crowding, and therefore, their ability to process airline passengers with relative efficiency.

Since many of the regional airports in the secondary market were located near, but not within the large cities, the increasing growth and efficiency of rental car providers contributed to the popularity of regional carriers by making the final leg of a trip to a large urban destination comparatively easy and cheap. The FAA continues to note an inverse relationship in air traffic within these segments of the airline industry. These are documented by the FAA in its annual National Aerospace Activity Forecast Conferences, where officials repeatedly noted during the initial years of the new century, that whenever operational, economic or political events cause a downturn in passenger statistics among the major carriers, an upturn-in-kind in traffic among the regional carriers can be observed in mandated traffic reports to the agency from air traffic control towers and airline operations and enplanements traffic reports.

CORRELATION BETWEEN HISTORIC AND FUTURE AIR SERVICE

Regression Analysis

Regression analysis is the strongest scientifically based method available to establish: first, the existence of a relationship between demand for aviation travel services and changes in the local economy that drive this demand; and, second, the overall strength of that relationship. That the relationship exists can be seen in the fact, for example, that as growth occurs in one or more of the social and economic variables selected (population, employment and income), growth also occurs in tandem with the demand for aviation services. In this study, we start with Enplanements, as the key variable, since the magnitude of growth in this variable prompts aircraft operators to consider the kind of services to offer. The services range from model and type of aircraft (jet or turboprop) to frequency of service, fare levels and many other considerations. Airline choices among the above, in turn, will place demand on the airport for certain types and sizes of facilities, depending on the aircraft model and size. These facilities range from terminal buildings and gates, to available aircraft ramp space, fueling, storage and maintenance facilities. If the airplanes needed to serve the market grow progressively larger in size, then the length, width, strength and turning radius available on runways, taxiways and aprons, also becomes a concern for airport management.

The following provides an overview of the correlation between key social and economic variables in relation to anticipated demand at TYR:

A strong statistical relationship was found between the demand for airport services and growth in the independently projected social and economic variables. As a result, a strong positive correlation between changes in social and economic indicators and the number of enplanements at TYR was determined.

- The strength of this correlation is technically expressed in the value of R^2 (coefficient of determination), one of the important statistical outputs of the regression analysis.
- At TYR, the R^2 value was calculated to equal 84.4 percent at the 90 percent confidence level.
- This means that in general, the variation in demand (which is seen in the peaks and valley points on graphs tracing the number of enplanements over time) for aviation travel services (Enplanements) is explained by variations occurring in the (1) changes (growth) size of the general population; (2) the number of persons within the general population who work full-time in the local economy (Employment); and (3) changes in the level of wages earned by members of the active workforce as measured when distributed over the entire population of the metropolitan statistical area (Per Capita Income).
- The interaction between these variables then generally drives the amount of demand. However, according to the regression analysis, some 15.6 percent of the demand for air travel service cannot be explained by changes in population, income or employment, and, therefore, has some other explanation. Often the part of the relationship left unexplained is subjective in nature, and cannot be easily pinpointed or quantified. However, the analyst in this instance can assume that the uncertainty in the economy, the acts of terrorism associated with 9/11, extensive and sometimes invasive airline passenger security protocols, along with a certain amount of psychological anxiety in the wake of the terror events, and other factors discussed in earlier sections of this report, are driving that portion of demand (or lack of demand, as applicable) not accounted for by the terms of the regression equation.

- It is also important to note that the "strong positive" statistical relationship described, means specifically that such a relationship exists and can be quantified. Interestingly, this relationship in the Tyler area begins as an inverse relationship, demonstrated by the downward trendline analysis shown in the preliminary regression equation. That is, the trendline, in and of itself, shows that over the years since 1999, interest in utilizing available air service at TYR actually declined even as jobs became available, wages increased and the population grew modestly.

- However, the inverse relationship is shown to have reversed itself in 2004, when more than 10,000 new enplanements were recorded.

This reversal indicates that fears or uncertainties, or the security "hassle factor," among other concerns seems to have reached a critical point as the U.S. economy in 2004 took a significant leap forward specifically in the level of change in the three key social and economic variables. In other words, the 2004 levels of population growth, employment growth and income growth, specifically as they relate to the transformation occurring in the Tyler-area economy, constituted the "critical mass" point at which that segment of the population, which previously shunned air travel, decided that the speed and benefits of air travel exceeded those of alternate forms of transportation. In 2004-05, this important subgroup of the general population decided to return to the airways, thus ending the downward trend of the previous five years.

Defining the Statistical Sample

The preceding section focused on identifying and quantifying demographic and workforce changes in the City of Tyler and within the Tyler-Smith County Metropolitan Statistical Area (MSA). It was determined, based on precedent, that the boundaries of the MSA also generally define TYR's essential Market Service Area for commercial air passenger traffic. In other words, the majority of the scheduled passenger flight users are from within the City of Tyler or the County itself.

Although some passengers travel to the airport from outside the immediate boundaries of the MSA, it is reasonable to assume that the number of passengers from outside the area represent such a small percentage as to be statistically meaningless in this analysis. This is largely due to the fact that the Tyler-Smith County MSA, has over recent years, developed into an ex-urban population center that is growing within an essentially rural area. Therefore, for estimating purposes, the Metropolitan Statistical Area contains, at present, the most and only significant air travel demand in that quadrant of the state of Texas.

Selecting and Testing Growth Factors

The preceding demographic and social analysis provided a number of useful statistical factors that can be used to develop reasonable projections of growth in demand for aviation services. The forecast model first tests these factors for statistical significance in their correlation with population, income and employment trends in the MSA. The factors that exhibit the most robust correlation with actual operations recorded at the airport will then be applied in the model to develop projections of future activity.

Forecast Range & Scenarios

Since most future events influencing airline bookings and other air travel services are unknowable, a range of scenarios will be developed. This will allow airport management to make critical decisions relative to expenditures for facility improvements, based on which of the scenarios most closely matches actual airline activity variables. Examples of such variables of particular concern to the operators include the number of aircraft passenger seat bookings, service improvements, schedule frequencies, fleet composition, and related information.

A range of forecasts generally defines the upper and lower limits of the market. Between these boundaries is a set of possible scenarios estimating the number of passengers likely to fly in any given year. Thus, forearmed with a set of reasonable possibilities, airline operators as well as airport management have the ability to plan flexibly, whether to ramp up or to hold the line on equipment and/or facility improvements based upon the range of passenger demand. Demand is often dependent on economic cycles that cannot be foreseen; therefore, the range of possibilities, each of which has an airport improvement project schedule linked to it, provides needed flexibility in the face of the unforeseeable.

The ultimate goal of forecasting, therefore, lies much less in predicting any precise level of activity, than to anticipate the greater or lesser order of magnitude in demand for service. First, this helps airport management and FAA prevent traffic bottlenecks, whether inside the terminal or in the airways leading to or from the airport. Second, it reduces the possibility of over-investment of public air transportation funding in facilities whose need did not materialize, and allows funding to be diverted to other projects which can be demonstrated to have a greater priority, either at the airport in question or airports elsewhere within the national system.

Any number of events can trigger an upward, downward or steady trend in passenger demand, whether it is a series of bad weather events, a suddenly surging economy – or the reverse – labor problems, fuel prices, and other concerns. The preceding is a short list among a host of other factors that influence the public's decisions to fly to any given destination, and the operators' decisions about which aircraft, flight schedules, fares, and other related factors that dictate service levels (aircraft type/seating capacity, scheduled frequency of service, and the many other variables that must be considered).

Related factors include the aircraft size, weight, and number of types in the future fleet, as well as the aircraft's physical dimensions and schedule frequency which all play a key role in airport development decisions. Forecasts almost always are based upon estimates of the size of the future market, and they make basic assumptions that airline operators will respond to the market. Airport management's role is to make the airport as safe, as efficient and as effective as it can, according to standards developed by the Federal Aviation Administration, in order to accommodate the public and the aircraft operators.

Therefore, airport management must anticipate passenger demand as far ahead as possible, in order to decide which airport improvements will be needed most urgently, to accommodate the aircraft on the runway/taxiway system and airside aircraft parking aprons, along with the number of passengers expected to pass through gates, security facilities, and many other fixtures on the airport. This also includes access roads, airport passenger vehicle parking, gate sizes, terminal concession space, rental car and public transportation access and facilities, among a host of interrelated development items.

Decisions regarding airport development and improvement begin largely with decisions made by aircraft operators. These involve the type aircraft, their respective passenger and cargo capacities, destinations (and length of flight), and finally schedules or flight frequency. These factors in turn directly influence the numbers of passengers boarding, amounts of cargo off-loaded, fuel pumped into aircraft tanks, cars in parking lots, access roads and terminal curb lengths. Therefore, the primary statistics needed to plan virtually every aviation service facility on the airport is the variable Enplanements, from which, once established, most other descriptors of airport activity can be derived.

The forecasts of aviation activity are critical to this decision-making process due to the often long lead times between the management's decision to seek funding for improvements, and actual construction. This is due to the fact that airport development grants must be sought – in frequently intense competition – from trust funding and other programs administered by the FAA and the state, which may require bureaucratic approvals, including public hearings, to obtain funding or approval from a host of federal, state and local agencies.

Many airport projects must be anticipated years ahead of time to allow the performance of often lengthy environmental reviews, before which time engineering or architectural design may be performed. In addition, for major facilities, such as runways or terminals, airport management must allow for the letting of contracts for needed infrastructure ahead of the planned project. This includes utilities, such as water, sewer and drainage, telephone and electronic communications lines, power and digital cable or fiber optics, along with a host of related matters, which must be in place prior to construction of the needed facility, whether terminal gates, aircraft apron, runway/taxiway systems, auto parking and many others.

SERVICE LEVEL AND MARKET SHARE

Existing Market Share

The market for aviation services should be considered in a minimum of two contexts, among a wide spectrum, each facet of which provides light by which to consider varying sets of possibilities for improvements to the benefit of the airport, the service providers and the public.

The market with the most immediate and far-reaching impacts is the existing and potential passenger market. This market exerts a strong impact since it directly drives management and policy decision relating to aircraft types and changes, improvements or the construction of new airport facilities to accommodate them.

Within this narrowed spectrum most relevant is the division of the passengers market between the two dominating air carriers. Second, not in comparative importance, but only hierarchically, is the share of the Tyler Pounds Regional Airport passenger market in terms of the national market. Although comparatively small by comparison with the nation, Tyler Pounds is a link in the National Plan of Integrated Airport Systems, where service, not size is the critical value.

The Passenger Market (Enplanements), Fleet Mix and Fleet Capacity

Certain key statistics in both of these contexts (local and national marketplace) follow, with implications for future airport growth and development, and its ability to effectively handle fluctuation in operations, aircraft types, and other considerations brought to bear based on the number of passengers that can be expected to pass through the airport gates annually, as evident from the forecasts of future aviation activity.

- In the five years preceding this master plan update (base year 2004), the local market for air travel service consisted of a per-year average of nearly 79,800 passengers annually.
- These passengers were transported on a variety of turboprop-driven regional aircraft with seating capacities varying from about 30 seats per aircraft to 48 revenue seats per aircraft.
- Aircraft types include generally the Saab-340, a twin-engine turboprop configured for approximately 30 passengers, with capacity for up to approximately 37 possible; the ATR-42, the largest aircraft in the local fleet through 2003, with a 48-seat capacity. Finally the airlines utilized the more modern Embraer 120, also with a seating capacity of approximately 30 seats per flight available.
- In total, these average 40,000 annual passengers were transported on aircraft flying frequently enough to bring a total 138,868 revenue seats per year into the air.
- Of the two carriers providing regular scheduled service from Tyler Pounds Regional Airport, American Eagle had the larger share of this market, carrying an average of 56,900 passengers per year during the multi-year

period preceding these forecasts or 71 percent of the local market. Following up is Sky West, which averaged approximately 22,800 passengers per year, or 28.7 percent of the local passenger market.

- While the two rival carriers have shared this market for many years, each surviving in its own niche with service to Dallas and Houston, some signs are emerging from the forecasts prepared for this report, that there may exist latent demand for additional service in areas that is not being served at the present time. This demand is approximately 27,000 potential passengers not served over the previous five years, or approximately 5,400 (historically approximately 4 percent to 6 percent of total passengers in any given operating year).

- In terms of load factors, the historical peak in the field-wide load factor (all carriers, all flights, annualized) reached approximately 64.8 percent in 2004 with about 61.6 percent load factor achieved by the larger carrier, American Eagle, and 58 percent to the slightly smaller Sky West. However, it is noted that these load factors were likely achieved with some service reductions, putting more passengers on fewer flights through changing of flight schedules.

- The preceding was the peak-year load factor, the multi-year average for both carriers was somewhat lower, measuring 57.2 percent for the combined carriers over five years, and American Eagle averaging about 60.15 percent; followed by Sky West with about 54.2 percent. It is estimated from industry-wide figures that the break-even point for regional carriers hovers around 52 percent; however, this can vary widely according to a host of cost variables unique to individual carriers.

    - It is emphasized that these figures are general estimates possessing rule-of-thumb validity, which may vary considerably by carrier and by operating procedures in any given year (which information was not available to this study). The information available to study was limited to a generalized level appropriate to general planning purposes. The available data do suggest a detailed air service analysis be made of the local market, especially as it grows and changes over the short term of the planning period, in order for the airport and operators to obtain a deeper insight into questions of service expansion possibilities at Tyler Pounds Regional Airport.

For the passengers, the above chain of statistics means that most flights could be perceived as comfortably uncrowded, given that the airlines put about three times the number of seats in the air, than were filled by passengers. This is partially due to economic uncertainty that marked the years 1999-2004, as detailed in the social and economic sections of this chapter.

For the airlines, this meant a field-wide load factor of about 57.2 percent for the total five-year period. This figure is approximated from only partial information available at the time of this compilation. The information, however is sufficient to surmise that the two dominating airlines were flying generally above the break-even point in their individual accounting systems, but that Tyler, during the period from 1999-2004, represented a comparatively steady market that paid for itself and provided a small profit margin.

However, as the market trendline in enplanements indicated, the airport and its two major airlines were going downward on an economic slide that would have left them with only about 9,000 enplanements at the end of the planning horizon for this study (from a previous high of 81,500 enplanements in 1994).

The reversal to this trend became apparent with a change in the composition of the local economy from industrial to professional services-based, that began to take hold in 2003, and solidified its foothold in 2004, which witnessed a jump in enplanements of more than 10,000 annually (17.1 percent over 2003).

In response to this new uptrend the airlines increased capacity by bringing one new 50-seat ERJ-145 into the previously all-turboprop fleet. On an annualized basis, this brought the fleet capacity by 23 percent, or 25,972 available revenue seats for the sponsoring air carrier, based on flight schedules as published in January, 2005 when the new jet service was put in place.

This action provides sufficient capacity to handle traffic increases as projected by the forecasts in this section, which run somewhat below burgeoning traffic expected by the FAA nationally, as presented in the FAA Aerospace Forecasts 2003-15, of March, 2004, and updated in March 2005[1].

Still, Tyler Pounds Regional Airport will be well positioned to handle even higher than forecast levels of traffic with planned or likely future additions to fleet capacity between 2004 base year and 2009 (the five-year short term of the planning period). Within this time frame, it is likely that the existing carriers, or possibly the existing carriers and a new entrant carrier will follow the national industry trend to gradually eliminate older-generation turboprop airliners from the fleet, and replace them with regional jets of varying capacity from 50 seats at the smallest to 70 seats for the newer models entering service recently, and 90-seat models expected to come in the near future. Preliminary estimates conducted for this report show that overall capacity of the airline fleet at Tyler Pounds Regional can be expected to increase by approximately 245 percent by 2009 to 2010, by fielding 341,280 total annual revenue seats (up from 138,868 in 2004).

Operations

During the multi-year historical period, scheduled airline operations averaged approximately 12,603 annually, or 11.6 percent of the total airport operations (averaging 108,218 per year over ten years). The remaining average 45.5 percent of the total operations were general aviation itinerants. Military flights were insignificant, amounting to only two tenths of a percentage point on average for the five-year period. Local (or training) flights made up the remaining 42.6 percent of the operating spectrum, averaged over five years.

National Market Share

The preceding describes a detailed and narrow look at the local market. Opportunities sometimes become more visible when stepping back from the close-in picture for a macro-scale overview. Although, as noted previously, Tyler Pounds Regional Airport is but one link in the much larger national picture, it can also be noted that every link is important to a chain or network. The loss of any link has economic reverberations throughout a much larger area, than that merely surrounding the local airport, with implications for local businesses, as well as businesses and clients tens to hundreds of miles distance, across one or more state lines.

The larger, national picture is described here from historical and forecast information published by the FAA in the National Aerospace Forecasts, updated annually, and relying on the edition released in March 2004 for this study.

- Changing the focus to a truly nationwide scale, it is noted that the entire passenger market in the U.S. was more than 627,236,000 in 2004. The 70,549 enplanements logged by Tyler air carriers in this year amount to approximately .011 (slightly more than one tenth of one percent of that national passenger market).

- The analysis of this information also made clear that the market served by airline operators at Tyler Pounds Regional Airport lags between approximately 4.2 percent and 6.8 percent behind the national trend, as forecast in the FAA Aerospace forecast for 2004.

[1] *For the sake of consistency, this master plan update utilizes the FAA forecasts of March 2004, since planning for this study proceeded approximately six months prior re-issue dates for annual updates to the FAA Aerospace forecasts. It is important to note that the "Aerospace Forecasts" are one of several forecasting products updated annually by FAA. In tables and other references in this report, they are termed the "National" forecasts for the sake of brevity.*

- (These FAA forecasts, released one year ahead of the event, turned out to be very accurate short-term estimates of demand, and have generally been among the more reliable sources for estimating future aviation activity over the decade proceeding the base year for this master plan update).

Possible Expansion of Existing Market/Possible Niche Market

The information gained from this analysis reveals that the Tyler demand for air travel services may be missing a market opportunity to fly an addition 5,000 to as many as approximately 7,900 passengers annually; increasing proportionately by year with the preferred forecast for this airport master plan update. These figures represent the passengers whose travel needs are not being met by the existing service and constitute latent demand.

The above suggests an opportunity for a niche market for a smaller carrier, such as a new entrant into the Tyler market, or an opportunity for increased service, either in frequency, more destinations, or both for the existing carriers. A more detailed local air service study is recommended to answer specific questions raised by these statistics for the national viewpoint.

It should be born in mind, however, that the Tyler market is already considered to be a niche market from the viewpoint of the major carriers. In practical terms, there is little to be gained from overly segmenting the market, since the principle of diminishing returns looms larger with each succeeding subdivision. The latent demand presented here, may well be served to the highest practical extent by existing air service-on-demand operators, such as private charters, air taxis or the emerging fractional business jet ownership programs.

In order to obtain a definitive answer to specific questions relating to the extent of possible air service expansions, as well as the feasibility, profitability and sustainability of such a potential expansion of commercial air service at Tyler Pounds Regional Airport, a more detailed local air service study is recommended.

Returning to the macro-scale, the total market for domestic air travel in 2004 is estimated by the FAA at 105 million. Of this market, American Eagle is the top regional air carrier in the nation, enplaning some 12,360,998 passengers annually, from information provided by FAA. Sky West is the second place regional carrier with 10.842 million enplanements annually.

- The Tyler air passenger market under this scenario, constitutes 0.31 percent of the entire national market, and is divided unevenly between the two carriers. American Eagle has a 0 .44 percent share of the enplanements captured overall, and Sky West has 0.16 percent share. System-wide, however, the two powerhouse regional carriers command 7 percent of the national market for passengers as a whole, and more than 20 percent of the passenger market served solely by regional air carriers.

- The strength of these two carriers has implications for equipment upgrades at Tyler and elsewhere in their extensive service networks; also for their stability and sustainability in the future, particularly with emphasis on their ability to resist or fight back in any "fare war" initiative. The latter is a favored technique by start-up carriers and discount carriers entering new markets.

- There is considerable debate on the efficacy of fare war initiatives: while the traveling public is helped by inexpensive fares and more choice in the short run, the stability of the airline market as a whole tends to be undermined. In addition, air travel ticket taxes collected by the FAA for saving and redistribution in the Airport Improvement Trust Fund become fewer and fewer. This leaves FAA with diminished capacity to assist airports in maintaining existing and developing new facilities to meet changes and growth in demand for services, and maintenance and safety expenditures for facilities in place.

Taken together, the above market share information shows areas of opportunity for service expansions, along with the existing and potential magnitude of the markets that can be served from Tyler Pounds Regional Airport.

OPERATORS, FLEET AND OPERATIONS CHANGES

Potential Changes among Airlines Serving Tyler

Low-Fare Carriers

It is possible that a new-entrant, low-fare carrier may see a market opportunity that is not being exploited by the two entrenched regional airlines serving the Tyler Pounds market area. If the entry strategy were to involve low fares in general, or drastically reduced initial fares, such a carrier may gain a toehold in the market. However, the new entrant would have to be extraordinarily well capitalized in order to win market share using a fare-wars strategy. The existing carriers hold, respectively, the Number 1 and 2 positions in the regional/commuter airline market, each carrier flying more than 10 million passengers annually on their respective route systems. They have also survived challenges before, and several small carriers that attempted to start service from Tyler during the five-year period preceding this study are no longer operating from TYR. Both carriers have the financial wherewithal to withstand any protracted siege on their territory. In addition, each has shown willingness to fly for extended periods at below break-even load factors. In essence, the existing entrenched carriers have demonstrated convincingly that they intend to retain a tenacious hold in the Tyler market, even if it costs profits to do so. Therefore, the likelihood of a third carrier obtaining appreciable market share in direct competition with the existing regional airlines is unlikely, at least on a sustained bases.

A new carrier may, however, force the entrenched Tyler air carriers to wake up if it discovered destinations not currently served by the regional carriers. It is important to note that the primary purpose of the regional carriers, under code sharing agreements with the major airlines, is to provide feeder services into large urban hubs operated by the major airlines.

Regional operators at TYR center their flight schedules on the main urban markets of Dallas-Ft. Worth and Houston. If the entrenched carriers have an Achilles heel in the Tyler market, the fixation on two short-haul destinations could possibly leave them vulnerable to a low-cost carrier that serves other attractive destinations at reasonable or discount fares. Such destinations could focus on popular vacation areas south of the U.S. border or potentially link with cruise lines at ports in Latin America or the Southeast U.S. Given their size and comparative inflexibility to their mission to feed the major airlines at hubs Houston or Dallas, a start-up air carrier with a leisure-time service business model may find roots in Tyler.

This scenario is more likely as white collar professionals continue to enter the Tyler area workforce, and higher salaries are earned by a new workforce that considers air travel to vacation destinations as one of many available choices, rather than as an extraordinary or rare pleasure. However, the leisure travel market is notoriously price sensitive, and any air carrier using this as a business model would likely not survive the next business cycle or other turmoil that runs quickly at intervals through the aviation industry. Each time this occurs, a number of new entrants, or even established single-mission and/or discount-fare airliners, quickly become casualties.

New Entrants

As noted above, any new entrant seeking to compete with the existing entrenched carriers would have to be well capitalized and capable of withstanding sustained fare wars. More likely candidate is a specialized

carrier or even charter service operator providing service to specific, popular resort areas not conveniently served by the existing carriers and their hub connections in large cities.

The leisure market (or vacation travelers), however, is considered to be thin, price sensitive and highly vulnerable to value fluctuations in currency, international tensions, and similar problems.

A new entrant that provides direct service to business destinations not conveniently or cost-effectively served by the existing airlines could also have a chance at success; however, with only 174,000 people in the Tyler-Smith County Metropolitan Statistical Area at present, any such start-up carrier would likely have a difficult time attracting sufficient passengers to operate beyond the break-even point.

Regional / Commuter Carriers

Over the most recent 10-year period, it would seem that any regional/commuter carriers (besides the entrenched pair) that would have seen a market opportunity not already exploited would have already joined the fleet and be operating. It is unlikely that they would survive in direct competition against the two top regional/commuter lines in the nation. Such an airline, again, would most likely have to offer competitive service to other hubs or destinations needed by the local market. However, with the socio-economic makeup of the region changing, population increasing and the importation of professionals from elsewhere in the nation to fill significant gaps in the qualified workforce, such opportunities may arise during the current planning term.

The airport should consider possible additions to the fleet mix, capacity questions and related facilities matters if such an event, which is most likely to happen in the midterm of the planning period, were to occur. The forecasts assume such an event would occur in approximately 2009-10 in order to judge the effects of this additional demand. This will enable airport management to prepare plans for accommodating such demand in advance of the event in order to secure any space needs and apply for funding assistance.

The FAA notes that the Regional/Commuter branch of the industry is growing at remarkable rates (between 9 percent annually to as much as 18 percent annually in 2005). The FAA further notes that, as time goes on, today's regional carriers may very well replace the major airlines. Thus restructured, the airline industry is open to a wide range of new service possibilities, which are now being suppressed by the overweening weight of the major metro hub and spoke system.

This could include offering a wide and attractive mix of service to secondary as well as major metro markets by utilizing the versatile and efficient regional jets. The latter are becoming larger, and may find a niche between standard and jumbo jets, while offering point to point service in areas that have been largely ignored in the hub-formation business model that came to dominate airline service in the years since airline deregulation of 1978.

Identify Potential (Operator) Changes Influencing Air Service Levels or Type (Fleet)

Operators

Operators are likely to become more entrepreneurial and flexible in contrast to the inflexibility of the top-heavy, bureaucracy laden corporate model. The large legacy carriers of the past have continuously demonstrated the difficulty they have in adapting to the deregulated atmosphere. They are likely to disappear or be broken apart to be bought by smaller, more adventurous companies in this new century.

Fleet

Large jets are most efficient on overseas or transcontinental routes. Regional jets can serve most airports more efficiently than most of the legacy carriers. New models of regional jets will show in the marketplace and existing models will continue to be refined for efficiency.

Turboprop Aircraft

Turboprop aircraft actually offer greater economy and efficiency, especially in short and super short-haul markets (less than 150 and 100 air miles, respectively). However, the public does not love them. Manufacturers are not considering production of new models for the passenger market, and so it is likely that they will disappear from the airline side of the terminal. Many existing turboprop regional transports will be sold to developing nations. However, they are likely to remain very much in use by small charter operators, especially cargo carriers and providers of air taxi services.

Emergence of Regional Jet Aircraft

The first regional jets emerged in about 1995. Instantly popular among airline customers, they retain their popularity 10 years after their first appearance. Regional jets continue to grow larger, to the size of what would generally be considered small airliners. 90-seat models are already being placed in the market place. Their full range of use has not been explored nor exploited by present day operators. RJ aircraft could very well dominate the domestic market over the next 50 years.

The following bulleted list details some of the advantages offered by this type aircraft, and provides a rationale for its continuing popularity.

Destinations

Just as close-in metropolitan airports gave the low-fare carriers instant popularity in the immediate aftermath of deregulation, so is the potential of regional aircraft to open the market to a new level. Most urban general aviation reliever airports have the basic facilities needed to service regional jets and their passengers. In addition, it is possible that airports that now serve general aviation almost exclusively could also become destinations for regional jets. In market terms, this is merely a business response to demand from the consumer for ever-increasing convenience. However, most GA airports do not have facilities in place such as terminal space, rental car facilities, maintenance crews, fueling facilities and other similar facilities or passenger amenities to serve such demand. Such airports might be well advised to consider development of this class of facilities in the event that the market turns their way. TYR is already well situated for this eventuality, but any improvements in passenger or aircraft service amenities would render the airport more competitive.

Effects on Airport facilities

While historical analysis of service schedules lies beyond the scope of this study, it is generally true that decreases in service levels concentrate more passengers in fewer flights. As a result, large numbers of airline passengers, who have been crowded together on a flight, can be expected to suddenly course through terminal areas in search of many secondary services. These include fuel, taxi/limo services, also bus service; food and beverage services; restroom facilities; reading, souvenir and candy counter items that are standard in the airport repertoire. However, they are generally not found at GA airports in sufficient concentration to serve sudden influxes of passengers, especially when de-planeing from several flights arriving close together on the time schedule.

Results:

- Passengers Disadvantaged:
  - Less passenger comfort (packed planes);
  - Less travel flexibility (less choice in departure times
- Airlines Gain:
  - Reductions in schedules result in overall cost savings
  - Maintenance crew, parts and downtime costs
  - Flight crew labor and support staff labor cost
  - Higher Load Factors per departure = gains in operating and costing efficiencies; greater fleet utilization; greater aircraft utilization
  - Higher operating profit margins
- Both Airlines & Passengers Gain, Initially:
  - Greater Operating efficiency means lower fares
  - Greater profit margins mean stability for both the airlines and its customers in a small market, i.e. in both the basic existence of local service in a secondary market, and survivability of the carrier overall within the volatile airline business, nationally
  - More predictable and therefore stable basic fares: customers gain since they can budget for air travel needs; airlines gain from this because it increases the steadiness of the customer base in a given market
- Potentially lower fares; at a minimum more intuitively reasonable fares for the customers; steadier, stable and predictable cash flow for the carriers

COMMERCIAL SERVICE ACTIVITY FORECASTS

Annual Enplanements

Expected annual enplanements are the key to all of the various forecasts presented in the planning study. The magnitude, density and timing of the number of people passing through the airport is the single most influential determinant in planning for efficient and effective facilities to process passengers, as well as the type aircraft airlines will choose to most efficiently and comfortably enplane them to carry to their destinations. The design and size characteristics of these aircraft selected by the airlines, in turn affect all of the airside facilities from the design considerations of safety (foremost), followed by efficiency and effectiveness.

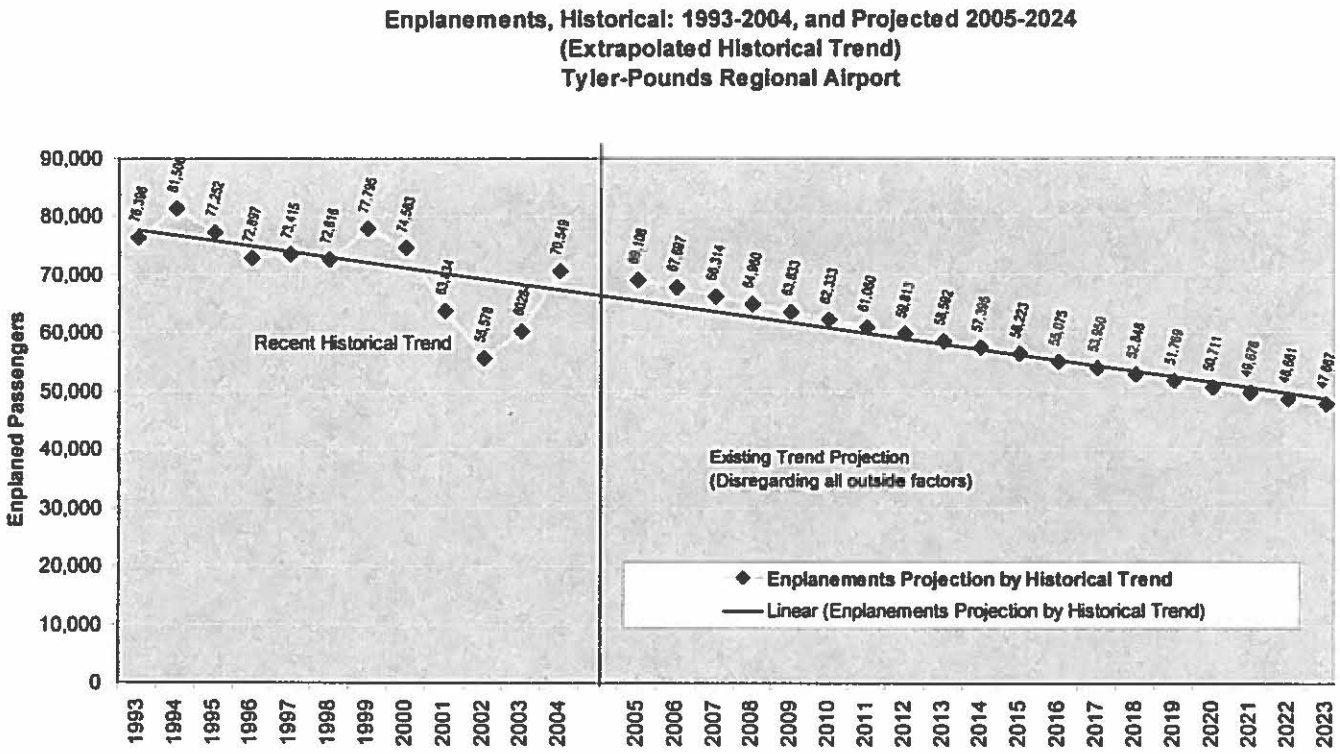


Figure 3-1

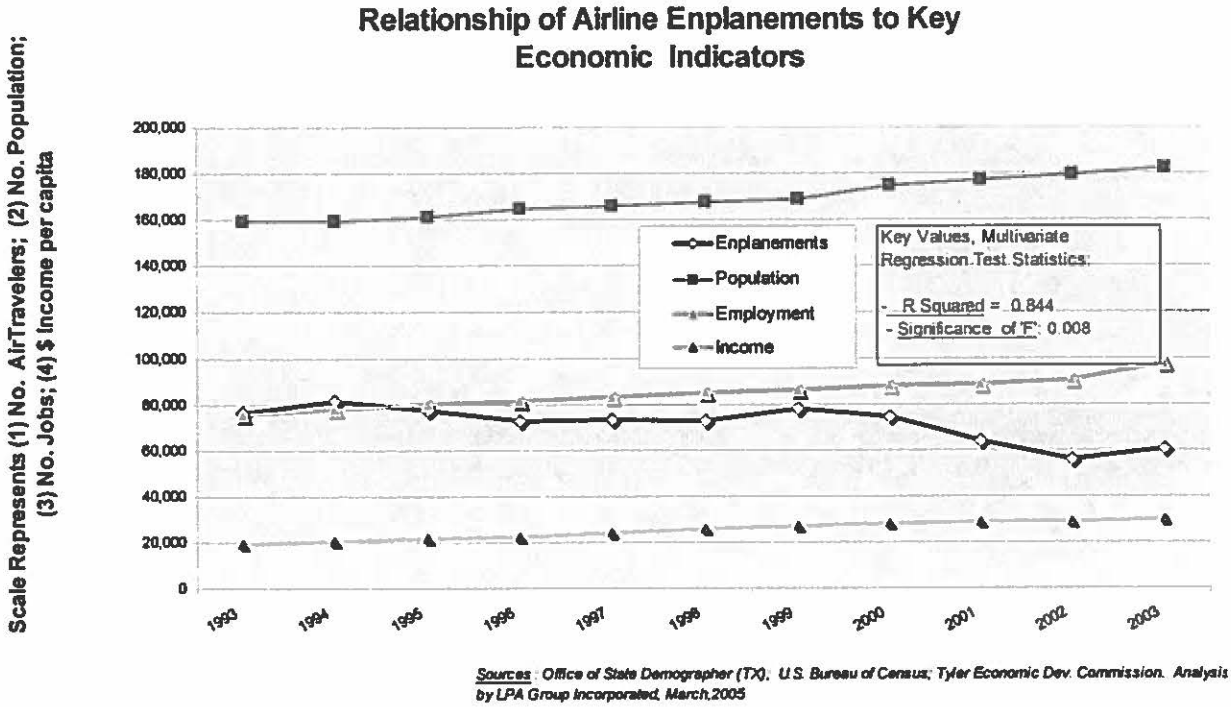


Figure 3-2

Six estimates of the potential number of passengers utilizing Tyler Pounds Regional are presented in these pages. Numerous estimates of future annual enplanements were prepared. The projections are shown in **Table 3-9**. The first three columns represent forecasts prepared by or for the FAA, from a national perspective. As such, they are "top-down" forecasts, and are prepared for the purpose of estimating future FAA air traffic control and other infrastructure costs to present annually in federal budget appropriations bills before Congress.

TABLE 3-9
PROJECTED COMMERCIAL ENPLANEMENTS

Year	National	TAF	NPIAS	Market Share	Conservative Growth	Preferred
				National Rate (FAA)	Economic Contingency Forecast	Business Growth Forecast
Base Year						
2004	70,549	71,594	70,549	70,549	70,549	70,549
Forecast						
2009	89,186	82,543	86,662	101,614	80,923	88,743
2014	112,747	91,566	106,455	124,515	92,823	114,310
2019	136,515	101,575	130,770	148,633	106,473	144,253
2024	165,295	112,679	160,637	170,560	122,130	179,320

Source: Tyler Pounds Regional Airport, 2005; FAA Terminal Area Forecasts; National Aerospace Forecast, 2003
THE LPA GROUP INCORPORATED, 2005

The latter three columns are locally focused forecasts that take into account local and regional social-economic trends, actual historical traffic counts and other local details that are of necessity not included in the federal perspective, looking downwards from the national-scale picture. The FAA is cognizant of the difference between the "top-down" and "bottom-up" (or local perspective) in forecasts of aviation activity. When the local forecasts are fully documented and justified, the FAA will generally accept these forecasts and adjust its own macro-scale forecasts accordingly.

This action assumes that the local forecasts withstand challenges from agency reviewers and that growth excursions significantly beyond the national trends as estimated by the FAA can be justified. The local forecasts are critical to Tyler Pounds Regional Airport, since, once accepted by the FAA, they help justify grant applications for federal assistance from the Aviation Trust Fund and other sources to help fund facility improvements.

The preferred forecast for Tyler Pounds Regional Airport is the "Business-Growth" forecast scenario, which estimates future activity based on the demonstrated growth of the local economy. The relationship between economic growth and growth in demand for airport and aviation services is documented in the earlier part of this chapter, which noted not just normal economic growth in the regional economy, but a transformation of the economy from an industrial to a professional services base. This profound change by its very nature tends to sharply increase the demand for airport and aviation services, since it involves the growing segment of the highly trained, highly qualified, and therefore well-compensated workforce, that depends on air travel for both business, professional, commercial reasons, as well as for leisure travel.

Also prepared from the local perspective is a conservative "Economic Contingency" forecast. This forecast, which estimates lower activity levels than the "Business Growth (preferred) forecast, takes into account that the economic recovery from the vicissitudes of recession, international terrorism, unpredictability of oil prices and other factors discussed earlier, could still injure the fragile recovery in progress.

The Tyler Market Share forecast is a hybrid of the top-down and the bottom-up approaches, in that it applies local historical trends in demand for aviation services to national estimates. In doing so, the Market share forecasts assumes aircraft enplanements will grow in proportion to the national trend. However, the number of enplanements, while estimated realistically according to current trends documented by airport counts, is estimated somewhat lower than the most optimistic of the federal forecasts, but also more optimistically than very conservative forecasts, which are dismissed due to not only the amount of activity that is already documented, but the well-established growth trend, also well documented by state and federal census, economic development agencies, local universities as well as the Texas Office of the State Demographer. Studies and data provided by all of these studies inform the preferred ("Business Growth" forecast). The preparers of these forecasts concern is that they could underestimate growth, when compared with the most optimistic of forecasts for regional airline activity prepared on a national scale. In such an instance, the forecasts should be revisited after a maximal five-year interval and be readjusted accordingly.

This fractionally lower ratio is based on the historical ratio relationship between Tyler and the national market. Therefore, local considerations play a significant influence on the Market Share Forecast as well. This is important in light of the fact that the FAA shows extreme optimism for the Regional/Commuter segment o f the air travel industry for the duration of this study's planning period, ending in 2024.

A comparison of the magnitude of expected growth over twenty years of each of the forecasts is presented below. A full comparison of all key forecast parameters in accord with federal standards for airport development is shown in the final two comparison tables of this forecast chapter.

Comparison of Federal and Local Forecasts
Tyler Pounds Regional Airport
Estimated 20-year growth potential: Six Federal and Local Projections

FAA National	FAA TAF	NPIAS	Market Share	Economic Contingency	Business Growth
134.30%	57.39%	127.70%	141.76%	73.11%	154.18%

Source: THE LPA GROUP INCORPORATED

Annual Operations

Numerous estimates of future annual operations were prepared. The projections are shown below, in **Table 3-10**. The first three columns represent forecasts prepared by or for the FAA from a national perspective. As such, they are "top-down" forecasts, and are prepared for the purpose of estimating future FAA air traffic control and other infrastructure costs to present annually in federal budget appropriations bills before Congress.

The latter three columns are locally focused forecasts that take into account local and regional social-economic trends, actual historical traffic counts and other local details that are of necessity not included in the federal perspective, looking downwards from the national-scale picture. The FAA is cognizant of the difference between the "top-down" and "bottom-up" (or local perspective) in forecasts of aviation activity. When the local forecasts are fully documented and justified, the FAA will generally accept these forecasts and adjust its own macro-scale forecasts accordingly.

This action assumes that the local forecasts withstand challenges from agency reviewers and that growth excursions significantly beyond the national trends as estimated by the FAA can be justified. The local forecasts are critical to Tyler Pounds Regional Airport, since, once accepted by the FAA, they help justify grant applications for federal assistance from the Aviation Trust Fund and other sources to help fund facility improvements.

The preferred forecast for Tyler Pounds Regional Airport is the "Conservative Growth" forecast scenario, which estimates future activity based on the demonstrated growth of the local economy. The preferred forecast shows the relationship between economic growth, as demonstrated by the transformation of the Tyler Regional economy from an industrial to a professional service base, and increased demand for aviation and airport services. This forecast also considers the potential impacts of the recession, international terrorism, oil prices and other factors, as discussed earlier, on the fragile economic recovery process.

The Business Growth forecast scenario also shows a growth in future activity based upon demonstrated local economy growth. This forecast estimates higher activity levels than the Conservative Growth forecast, since it shows a direct correlation between the transformation of the economy from an industrial to professional service base and a sharp increase in the demand for aviation services. This growing segment of highly trained, qualified and well-compensated workforce is expected to increase air travel demand for both business as well as leisure travel.

The Tyler Market Share forecast is a hybrid of the top-down and the bottom-up approaches, in that it applies local historical trends in demand for aviation services to national estimates. In doing so, the Market share forecasts assumes aircraft operations will grow in proportion to the national trend. However, this hybrid also assumes that while growth itself may be at the national trend, the ratio between operations and enplanements will be lower than what FAA expects to occur nationally.

This fractionally lower ratio is based on the historical ratio relationship between Tyler and the national market. Therefore, local considerations play a significant influence on the Market Share Forecast as well. This is important in light of the fact that the FAA shows extreme optimism for the Regional/Commuter segment o f the air travel industry for the duration of this study's planning period, ending in 2024.

TABLE 3-10
PROJECTED PASSENGER SERVICE OPERATIONS

Year	TAF	National	NPIAS	Market Share National Regional / Commuter Airlines	Conservative Growth Forecast (Preferred)	Business Growth Forecast
				As Share of National Market	Economic Contingency Forecast	Known & Projected Economic Growth
Base Year						
2004	10,195	10,143	10,143	10,143	10,143	10,143
Forecast						
2009	11,347	11,199	11,702	10,875	10,598	13,707
2014	12,072	12,364	13,500	11,320	11,895	17,656
2019	12,843	13,584	15,574	17,673	13,284	22,282
2024	13,663	14,925	17,967	21,478	14,859	27,698

Source: Tyler Pounds Regional Airport, 2005; FAA Terminal Area Forecasts; 2006
THE LPA GROUP INCORPORATED, 2005

However, the agency historically does not share the enthusiasm of many local airports when high-growth forecasts are submitted; therefore, based upon historical economic growth and on-going changes within the aviation industry, the Economic Contingency Forecast (Conservative Growth Forecast) was chosen. Yet, the community is enjoying an increased prosperity which may provide a fertile growth for growth in air service. As such, the introduction of new service or the expansion of existing service at TYR may trigger growth in line with the Business Growth Forecast, and, therefore, should be considered as part of this commercial operations forecast.

A measure of the comparative optimism of the six forecasts presented is summed up in the table below, which shows the magnitude of increased activity at Tyler Pounds Regional Airport, as estimated in each of the forecast projections.

Comparison of Federal and Local Forecasts
Commercial Air Service Operations
Tyler Pounds Regional Airport
Estimated 20-year growth potential: Six Federal and Local Projections

FAA National	FAA TAF	NPIAS	Market Share	Economic Contingency	Business Growth
47.15%	34.02%	77.14%	111.75%	46.50%	173.08%

Source: THE LPA GROUP INCORPORATED

COMMERCIAL AIRCRAFT FLEET MIX

Annual Air Carrier Operations by Category of Aircraft

Commercial airline service at Tyler Pounds Regional Airport ended with a small fleet of reliable all-turboprop aircraft types, including the 30-seat Saab 340, the 30-seat Embraer-120 and the 48-seat ATR-42. The fleet was split between the two major carriers, American Eagle, which carried 64.8 percent of the passenger traffic passing through the airports gates in 2004, and Sky West, which carried 54.2 percent of the traffic.

Together, the two carriers flew 10,143 operations in 2004 of which American Eagle flew a total of 4942 in its fleet of ATR-42 and Saab 340 aircraft. According to local flight schedules, Saab aircraft were primarily used

Sky West, utilizing only the Embraer-120, a 300-seat aircraft like the Saab-340, flew slightly more operations, a total of 5201 in 2004, according to airport counts.

Scheduled Air Carrier Aircraft Orders by Carrier: New Aircraft Joining Fleet

Starting in January of 2005, American Eagle introduced the first regional jet into service at Tyler Pounds Regional Airport, a CRJ-50, the 50-seat Canadair Regional Jet that is gaining much popularity on U.S. domestic flights by the regional airlines, and which is expected to replace all turboprop airliners still flying commercial passenger service in the U.S. approximately at the end of the current decade.

However, at the time of this report, Sky West, American Eagle's rival at Tyler Pounds, said the carrier was not immediately considering placing such an aircraft in service from Tyler at the time of this study. Nevertheless, the preparers of the forecasts believe that regional carriers by the end of the decade will follow the industry trend and fly all-regional jet fleets by 2009-2010.

Although both carriers present at Tyler announced late in 2004 numerous orders for additional regional jet aircraft, the airlines kept silent about which routes would see the service. The Tyler area, within approximately a 100 to 150 mile radius of Houston and Dallas, can be considered a short-haul destination, unless the existing carriers, or a possible third carrier add new destinations to more distant population centers. It is not known that either existing carrier is planning such a move; the potential remains for a third carrier to add destinations that may serve the latent, unmet demand passenger found in the preceding analysis.

TABLE 3-11
PROJECTED COMMUTER FLEET MIX

Seating Configuration	Base Year	2009	2014	2019	2024
80 –104	N/A	N/A	N/A	N/A	N/A
40 – 79	Saab 340 ATR 42	CRJ 50	CRJ 50	CRJ 50	CRJ 50
21 – 39	EMB 120	EMB 120 ERJ 135	ERJ 135	ERJ 135	ERJ135

Source: THE LPA GROUP INCORPORATED, 2005.

Scheduled Air Carrier Seating Capacity, Historical & Projected

The projected fleet mix, then, initially for the end of the five-year initial term of the planning period foresees an all-jet fleet operating from Tyler in 2009-10. On a one-for-one replacement basis, this means an increase in collective carrying capacity among the new carriers, since all aircraft in service will have a minimum of 50 seats, replacing the two 30-seat models still in service at the outset of the forecast period.

On an annual basis, and assuming flight frequencies remain scheduled as publish in January, 2005, the addition of the regional jet to the American Eagle fleet represents a jump in airline passenger capacity of 32.2 percent, in 2005. In terms of numbers of actual seats, the fleet addition brings the scheduled carrier carrying capacity from 138,000 annually of the preceding year to a total of 183,600 available revenue seats in 2005. If, hypothetically, Sky West were also to add an RJ to its fleet and fly it according to the same frequency now flown by the Embraer-120, Sky West's total annual revenue seats would increase to 208,000 annually, and the total commercial service capacity of the combined carriers would be 341,280 scheduled airline revenue seats annually a 40.7 increase over the December 2004 capacity at Tyler Pounds Regional Airport.

Historically (over the five years preceding the 2004 base year of this study), however, the combined carriers have flow an average 57.17 percent field-wide load factor. In the event that this load factor remains steady, then each airline, with its current fleet intact, and operating one 50-seat RJ each would serve a mathematically computed 196,919 passengers.

The maximum passengers under the "Business Growth" forecasts reach 179,320 at the close of the planning period. If all events and conditions remain constant, then the number of passengers estimated to fly from Tyler Pounds would be adequately served. However, numerous events, many unforeseeable could increase this projected number, or decrease it.

Therefore, continuous review of annual passenger and operations counts is recommended, in order to enable the airport to prepare facilities accordingly and on a timely basis. The estimated future fleet mix, as discussed above is detailed in **Table 3-11**.

Air Cargo Forecast

Historical data from 2000-2004 was collected in order to determine the amount of air freight and mail coming into Tyler Pounds Regional Airport. From this historical record, and a comparison with the U.S. national rate of growth for the delivery of air cargo, a growth factor was derived. The growth factor was determined to equal an average annual growth rate of approximately 1.04 percent. This factor was applied to the know quantity of freight and mail

coming into Tyler Pounds Regional Airport either as belly cargo on scheduled airliners, or as "just-in-time" delivery services for local business and industry.

From the analysis it was determined that, generally, air mail deliveries are increasing at approximately triple the rate of other materials shipped as general cargo. Over the 20-year planning period, freight is expected to increase by 119.3 percent over the volume that was shipped in 2000. In contrast, the mail sent by air is projected to increase by 336.4 percent over the same period.

The air transfer of freight and mail is usually presented in terms of Revenue Tons; however, the volume of materials shipped by air at Tyler was still being measured in pounds in 2004 and 2005. While it is considered unlikely that the volume of materials will require any kind of dedicated cargo handling facility than what operators already have devised for use at the airport, it remains useful to track the growth in volume of freight and mail so that strategies can be devised for more sophisticated systems, when shipments may reach levels that could be beyond the ability of basic systems in place for processing and transshipment on surface transportation.

While the table of processed mail and freight gives volumes in poundage, this narrative lists the materials in tons, fin the following summary, for comparison purposes that are standard to the freight shipment industry. According to the growth rates as calculated, the airport can expect to see freight shipments grow by nearly 120 percent over the 20-year planning term. In terms of tonnage, that is an increase of 3.93 tons of freight, from 3.3 tons in 2000, 7.23 tons by 2024.

Mail shipments increase at a higher rate. In 2000, some 4.5 tons of mail came through the airport from the airways. Projecting the amount of mail at the calculated rate shows that an increase of more than 15 tons annually can be expected by 2024. The total volume of mail is projected to increase from 4.5 tons in 2000 to 19.7 tons in 2024.

The volume total of freight and mail combined is projected to grow from 7.8 tons in 2000 to 26.9 tons by 2024, an increase of 19.1 tons overall.

TABLE 3-12
AIR CARGO FORECAST

	Freight	Mail	Total Air Cargo
Base Year			
2004	7,270	19,765	27,035
Forecast			
2009	8,634	23475	32,109
2014	10,255	27,880	38,136
2019	12,180	33,113	45,293
2024	14,466	39,328	53,794

Note: Figures reported in pounds.
Source: THE LPA GROUP INCORPORATED

GENERAL AVIATION ACTIVITIES FORECAST

Many elements of aviation make up the broad definition of general aviation activity. General aviation includes all segments of the aviation industry except for those conducted by commercial air carriers. Its activities include the training of new pilots, sightseeing, aerial photography, law enforcement, and medical flights, as well as business, corporate, and personal travel. General aviation operations are divided into the categories of local or itinerant. Local operations are those arrivals or departures performed by aircraft that remain in the airport traffic pattern, or are within sight of the airport. This covers an area within a 20 nautical mile radius of the airfield. Local operations are most often associated with training activity and flight instruction. Itinerant operations are arrivals or departures other than local operations, performed by either based or transient aircraft that do not remain in the airport traffic pattern.

Most of the local operations consist of flight training and recreational flying. The FAA defines an operation as either a single aircraft landing or takeoff. Under this definition, touch-and-go training procedures are considered two operations (one arrival and one departure) and are considered local operations. Itinerant general aviation operations are typically comprised of private, business/corporate, and air taxi flight activity. Additionally, itinerant activity may include law enforcement and medical flights. Discussions on the anticipated local/itinerant split and operational fleet mix are included in the subsequent section entitled, "Types of Aircraft Operations."

Historic Based Aircraft and General Aviation Operations

Reviewing activity at the Airport, operations at TYR are dominated by general aviation with some limited military activity. According to interviews, the types of aircraft based at this facility include: single- and multi-engine (piston and turboprop) aircraft, corporate jets, and a limited number of rotorcraft.

In order to realistically forecast of both based aircraft and GA operations, a reliable source or combination of sources must be obtained. In this case, Airport management and tower operators provided historical based aircraft information and operations from 1994 through 2004. The numbers provided from 1994 through 2004 were based upon discussions with Airport management and FAA ATCT, and, therefore, are considered the most accurate. This data is reflected in **Table 3-13**.

According to **Table 3-13**, based aircraft have fluctuated at an average annual rate of .09 percent over the last ten years, while annual operations have also fluctuated by an average annual rate of –2.57 percent. These fluctuations in both based and general aviation activity at the Airport may be directly related to fluctuations in local flight training activity as well as the impact of September 11, 2001 of general aviation operations as a whole.

TABLE 3-13
HISTORIC BASED AIRCRAFT AND GENERAL AVIATION OPERATIONS

Year	Based Aircraft	General Aviation Operations
1994	109	90,446
1995	107	73,298
1996	137	68,488
1997	111	96,696
1998	111	109,986
1999	107	89,850
2000	112	99,616
2001	117	92,070
2002	136	140,682
2003	111	132,267
2004	110	53,298
AAGR % 1994-2004	**0.09%**	**-5.15%**

Source: Tyler Pounds Regional Airport, 2005
THE LPA GROUP INCORPORATED, 2005

Previous Aviation Activity Forecasts

There have been no significant forecasting efforts at TYR since the 1995 Master Plan. Although new forecasts were created for this Master Plan Update, forecasts provided by the FAA Terminal Area Forecast, FAA Aerospace Forecast, 2004-2016, and FAA's National Plan of Integrated Airport Systems in addition to the 1995 Master Plan Update proved valuable for comparison purposes and are used to supplement the analyses conducted during this study.

1995 Master Plan Update

For the purposes of this study, the 1995 Master Plan Update forecast was reviewed in order to obtain a historical trend of both based aircraft and general aviation operations. Based aircraft and GA operations associated with the 1995 Master Plan Update are shown in **Table 3-14**. For comparison purposes, forecast data was extrapolated to the year 2024.

TABLE 3-14
1995 MASTER PLAN UPDATE ENPLANEMENTS & OPERATIONS

Year	GA Operations	Based Aircraft
Base Year		
1993	87,580	107
Forecast		
2004	113,928	136
2009	139,514	155
2014	180,722	177
Extrapolated by LPA		
2019	219,249	201
2024	321,633	262,896
AAGR 1993-2004	3.61%	2.46%

Source: Tyler Pounds Field Airport Master Plan Update, 1995; THE LPA GROUP INCORPORATED, 2005

According to the 1995 MP forecast, it was estimated that the amount of based aircraft and GA operations would grow at an average yearly rate of 2.46 percent and 3.61 percent, respectively. This aggressive growth estimate exceeds the national general aviation forecast rate, but may account for significant fluctuations of activity at the Airport over the past 10 plus years.

FAA Terminal Area Forecasts

Terminal Area Forecasts (TAF) are prepared by the FAA to meet the planning needs of their offices concerned with future traffic levels at the nation's airport facilities. Except for specific regional or state requests, the airports included in the FAA's TAF report must meet at least one of the following criteria:

- Have an existing FAA tower.
- Have an existing FAA Contact tower.
- Candidate for a FAA tower.
- Currently receiving or expected to receive scheduled air carrier or regional/commuter service.
- Currently exceed 60,000 itinerant or 100,000 total aircraft operations.
- Reported 10 or more based aircraft on the latest available Airport Master Record (FAA 5010 Form).

Forecasts in the FAA TAF are calculated using a number of methods. Typically, projections are calculated using regression analysis with various national economic indicators as the independent variables. **Table 3-15** depicts the figure contained in the TAF for TYR.

TABLE 3-15
FAA TERMINAL AREA FORECASTS

Year	GA Operations	Based Aircraft
Base Year		
2004	69,708	159
Forecast		
2009	48,627	218
2014	51,454	278
2019	54,451	337
2024	57,627	429
AAGR 2004-2024	-1.46%	5.06%

Source: FAA Terminal Area Forecasts, 2006; THE LPA GROUP INCORPORATED, 2005

As reflected in the TAF, the FAA has forecasted a straight-line projection of activity over a 20-year period for both based aircraft and aircraft operations. This forecast indicated that there is 5.06 percent growth in based aircraft and only a -1.46 percent growth in GA aircraft operations throughout the 20-year planning period. Based upon fluctuations in activity at the Airport, the TAF projection of both based and GA aircraft operations at TYR appear high. However, the TAF projection will be used for comparison purposes and may be used to project future activity levels during the planning period.

The National Forecast

The national forecast is based upon projections created by the FAA to project aviation growth for the U.S. The FAA Aerospace Forecasts, Fiscal Years 2004-2016, was used to express national trends in the general aviation industry in order to determine the correlation between national trends and activity at TYR. The 2004 national forecast projects an average annual growth of 0.70 percent. This percentage is applied to the base year to predict a forecast for TYR that reflects general aviation activity at the national rate of growth. The results of these calculations are shown in **Table 3-16**.

TABLE 3-16
THE NATIONAL FORECAST

Year	GA Operations	Based Aircraft
Base Year		
2004	53,298	110
Forecast		
2009	55,190	114
2014	57,149	118
2019	59,177	122
2024	61,277	126
AAGR 1993-2004	0.70%	.70%

Source: FAA Aerospace Forecasts, Fiscal Years 2004-2016; THE LPA GROUP INCORPORATED, 2005

NPIAS Forecast

The National Plan of Integrated Airport Systems (NPIAS) Forecast projects national aviation growth in the U.S. Like the FAA Aerospace Forecasts, the NPIAS was used to provide a correlation between the national trends and TYR operations. The NPIAS projects an average annual growth rate of 1.70 percent and 2.30 percent for based aircraft and general aviation operations, respectively, over the twenty-year planning period. These percentages were applied to the base year to provide a forecast of TYR aircraft activity that reflects general aviation activity at the national rate of growth. The results of these calculations are shown in **Table 3-17**.

TABLE 3-17
NPIAS FORECAST

Year	GA Operations	Based Aircraft
Base Year		
2004	53,298	110
Forecast		
2009	59,716	120
2014	66,906	130
2019	74,963	142
2024	83,989	154
AAGR 1993-2004	2.30%	1.70%

Source: FAA NPIAS; THE LPA GROUP INCORPORATED, 2005

General Aviation Forecast Approach

Historic trends are one of the primary considerations that can influence activity forecasts at an airport. By tracing these trends, it is possible to determine the impact that economic fluctuations, as well as changes in the industry have had on activity at the airport. The study of historical trends is particularly valuable at those airports having an air traffic control tower (ATCT) recording takeoff and landing operations for several years.

Historic data for TYR from sources such as the FAA TAF and FAA Form 5010 seem to be inconsistent. Therefore, historic information obtained from the FAA ATCT and Airport management was used in the development of activity forecasts at the Airport. Since 10-plus years of historic data were available, airport activity could be compared to various local economic indices including population, employment and per capita income. Due to the high correlation between the number of based aircraft and the socioeconomic data for Smith County, similar analyses for aircraft operations were developed. Unfortunately, an immediate concern surfaced during the creation of these various regression models. This concern had to do with the significant fluctuations of annual operations recorded for the Airport. General aviation activity at TYR has fluctuated significantly over the historic eleven-year period. Most recently, GA operations dropped from 132,267 operations in 2003 to 53,298 operations in 2004. This drop in activity is directly attributable to local flight training activity at the TYR. Since socioeconomic activity within Smith County also fluctuated over the same eleven-year period, it was anticipated that some sort of correlation existed between airport operations and various socio-economic variables to explain changes in airport operations.

Following this assumption, a regression analysis was created only to determine that no correlation between socioeconomic variables and aircraft activity at TYR existed. As a result, the use of regression analysis was abandoned as a means to create the forecasts of general aviation activity. A different approach was then pursued to provide realistic forecasts of activity for TYR.

Since there is no correlation between socioeconomic activity and TYR GA activity, industry trends, including national and regional economy reviews, were used to project general aviation activity at the Airport. As stated earlier, the best sources of information concerning the nation's general aviation activity is contained in the 2004 FAA Aerospace Forecasts and 2003 NPIAS. Given the nature of airport operations at TYR, projection of future activity based upon these industry trends, as well as national and local economy review, were also used to project aircraft activity at the Airport. The best source of information on the nation's general aviation activity is contained in the 2004 FAA Aerospace Forecasts. Given the nature of the airport operations, projection of future activity based on these forecasts with an adjustment based on local trends was considered a reasonable forecasting approach. Many different factors were also considered which might influence the course in which activity at the airport develops. These included evaluating anticipated general aviation development, airport geographical constraints, and industrial/business development on and surrounding TYR. The primary goal of the analysis was to develop an approach that gives reasonable attention to these factors while at the same time providing a rational basis on which to base the forecast selection.

It is also noteworthy that substantial demographic and economic growth in an area rarely triggers an equal general aviation activity expansion. Today, general aviation growth at an airport usually falls within a narrow range, at a rate usually somewhat lower than the socioeconomic data alone would suggest. Unless an airport has readily developable land and funds, as well as excessive general aviation demand, annual average growth rates over a 20-year planning period usually fall under five percent. Therefore, a projection of aircraft activity assuming national growth and customized for local conditions can be just as useful. Additionally, general aviation growth relies on many other factors, which include: level of services offered, competitive pricing, space availability, airfield characteristics, local area attractiveness, and pilot perception of services. While these factors cannot be tailored into the equation leading to the airport activity forecast, these do contribute directly to the level of general aviation operations at TYR. As a result, these forecasts assume that Airport Management, Fixed Based Operators (FBO), and other tenants, will

actively support general aviation activity and initiate the appropriate measures to either maintain or extend air traffic at the airport.

Industry Trends and Impacts of September 11, 2001

Decreases in general aviation activity were experienced across the nation in the late 1980's and early 1990's due to significant increases in the cost of owning a general aviation aircraft. A large part of this cost was directly attributable to increasing product liability costs, as well as increasing operating costs. Unfortunately, this period, which was also affected by a national recession, ultimately forced the closure of nearly every manufacturer of general aviation piston aircraft. Legislators responded to the severe downturn with the passage of the General Aviation Revitalization Act of 1994. The signing of this act provided a renewed era of growth for the general aviation market, which has led to recovery in the industry up through the end of 2001.

After passage of the General Aviation Revitalization Act, two of the largest manufacturers of small aircraft resumed production in the general aviation market. The Cessna Aircraft Corporation re-entered the single-engine piston aircraft market for the first time since 1986. In addition, the New Piper Aircraft Corporation emerged from Chapter 11 bankruptcy protection to restart and increase its previous production schedule. Other aircraft manufacturers and aviation suppliers also began hiring and expanding their production. Overall, revitalization of the industry has had a positive effect on the number of active general aviation aircraft, and therefore on the number of operations these aircraft conduct in the U.S. According to the 2004 FAA Aerospace Forecasts, annual shipment of U.S. manufactured general aviation aircraft has constantly increased from 1994 to 2000. This was significantly facilitated by the strong economic cycle of the mid to late 1990s.

However, over the last two and half years, the general aviation industry has declined, due primarily to the overall economic recession nationwide, as well as the impact from September 11. Signs of economic recession materialized in the first months of 2001 with a decrease in the number of general aviation aircraft shipments and activity. Further, the lingering events of September 2001 have only made the situation worse for general aviation and, today, the industry has still not fully recovered.

According to the 2004 FAA Aerospace Forecasts, general aviation aircraft shipments fell from 2,994 in 2001 to 2,539 in 2002, a 15.20 percent decrease. The U.S. portion of industry shipments fell from 2,634 in 2001 to 2,214 in 2002, a 15.95 percent drop. As a result, employment among the manufacturers of fixed-wing general aviation airplanes, avionics, and components, represented by the General Aviation Manufacturers Association (GAMA), fell in 2002, down a 12.40 percent from the 2001 level.

The economic slowdown, high fuel prices, and increased insurance rates are just some of the factors that have forced many pilots to limit their flying activities in the past two years. Additionally, after the terrorist attacks on the U.S., many restrictions were placed on the operations of general aviation aircraft. In the same way, the number of individuals holding student pilot certificates, which is key for the future of aviation growth, declined by 8.93 percent in 2002, from 94,420 to 85,991. According to the FAA, it has been estimated that as many as 20 percent of the student pilots in the U.S. are foreign nationals, who are now subject to increased scrutiny and lengthy background checks. At the same time, support for industry-wide programs designed to attract new pilots to general aviation "appears to be waning" among some segments of the industry.

Based upon available traffic counts provided by Airport Management, aircraft activity has decreased by more than 60,000 operations in 2004, which can be attributed directly to decreases in local flight training operations and may be the result of the economic recession rather than terrorist events. Based upon the overall vitality of the region, decreases in activity experience by TYR were less severe than the national average.

While the general aviation industry will be facing challenges in the years ahead, aircraft activity and sales are anticipated to recover. The most important driving force of this recovery will be the U.S. economy. Unfortunately, there is not a whole lot the general aviation industry can do about the economy. According to the FAA, general aviation activity is expected to experience slight declines in 2003, and then return to more normal growth patterns beginning in 2004 as the economy recovers. According to the 2004 FAA Aerospace Forecasts, the active general aviation aircraft fleet is forecast to increase at an annual average growth rate of 0.70 percent and general aviation hours flown are forecast to increase by 1.50 percent annually from 2002 to 2015. Finally, the total pilot population is anticipated to increase at an annual average growth rate of 1.40 percent over the next 11 years.

The FAA's predication of further declines in 2003 for the general aviation industry was realistic. The national economy was marked by a slow growth in the second quarter of 2003, with an increase of the real Gross Domestic Product (GDP) by 3.30 percent, according to the estimates of the Bureau of Economic Analysis (BEA). In the first quarter, real GDP increased 1.40 percent. Nonetheless, it is still not possible to tell whether the economy is coming out of the recession. The decrease in the federal fund rate in June 2003 to 1.00 percent illustrates the concern of the Federal Reserve Bank officials regarding the slow recovery of the U.S. economy. This rate reduction is aimed to moderate the economy's downturn by fueling increased consumer spending. In addition, the outcome of the war in Iraq remains uncertain and future terrorist strikes on the U.S. are still perceived as likely. Therefore, as indicated in the FAA forecast, the general aviation industry recovery is not expected before 2004.

FORECAST OF BASED AIRCRAFT

The development of future facilities such as hangars, aprons and tie-downs is heavily driven by the forecasted number of based aircraft expected at TYR during the planning period. Projections for the anticipated number of based aircraft were generated using the following methods.

Projections of Based Aircraft using Historic Growth

One method of deriving the based aircraft projection is by using the historical growth rate. Typically, historical data gives a relatively good indication of what kind of growth can be expected at an airport. Based aircraft data was collected for past eleven years to determine the historical growth rate at TYR. Unfortunately, the number of based aircraft has fluctuated, resulting in limited growth rate over the entire period. From the historical data, it can be derived that the based aircraft grew at a 0.25 percent average annual rate. When using the historical growth rate to project future operations, 116 aircraft are expected to be based at the Airport by the end of the planning period. **Table 3-18** depicts the results that of the calculation.

TAF Based Aircraft Projections

The TAF forecast projection is prepared by the FAA based upon socioeconomic and historical growth data for the Airport. Based upon the TAF for TYR, the average annual growth for based aircraft at TYR is 5.06 percent annually. Using this annual growth rate, anticipated based aircraft using the TAF methodology was extrapolated through 2024. Using this methodology, based aircraft is expected to equal 426 based aircraft by the year 2024. The TAF Based Aircraft projection is shown in **Table 3-18**.

Projections of Based Aircraft based on National Growth

Another method to forecast projected based aircraft for TYR considers the national forecast. This data is used to derive a projection of based aircraft through the application of national trends in the aviation industry. The national forecast was obtained from 2003 FAA Aerospace Forecasts, which forecasts the number of active aircraft in the nation. The Aerospace forecast defines an active aircraft as any aircraft flying at least one hour during the year. According to the 2003 FAA Aerospace forecast, the number of active general aviation

aircraft is expected to increase by an average of 0.70 percent per year over the next ten years. This growth rate was applied to the based aircraft for 2004 to extrapolate the forecast national growth for the planning period, as indicated in **Table 3-18**.

Projections of Based Aircraft Based on NPIAS Growth

The NPIAS projects that based aircraft growth nationally will average 1.70 percent annually. By applying the national growth rate to historic base year aircraft at TYR, resulted in a projection of 154 based aircraft by the end of the planning period. This forecast appears realistic based upon regional demand and facilities currently available at the Airport.

Projections of Based Aircraft per Regional Market Share

The Texas Department of Aviation in 2003 provided a regional projection of both based and GA aircraft operations through the period 2022. Using historic local and regional based aircraft data, it was determined that in 2002 and 2003, TYR represented 25 percent of region's based aircraft. However, with the drop in based aircraft in 2004, this percentage decreased to 10 percent of total regional aircraft. In order to project based aircraft operations, a percentage of anticipated TYR aircraft was applied to the regional forecast through the period 2024. This resulted in 187 based aircraft by the end of the planning period with an average annual growth of 1.62 percent.

Projections of Based Aircraft Based Upon 1995 Master Plan

This methodology uses the data and growth rate of the 1995 Master Plan Update to determine the based forecast. The 1995 Master Plan Update based aircraft forecast growth rate is 2.5 percent annually. This percentage is then extrapolated to obtain the forecast over the planning period. This growth applied to the base year (2004) resulted in a projection of 227 aircraft by the year 2024. The results of the Master Plan calculation are depicted in **Table 3-18.**

Composite Based Aircraft Forecast

The composite forecast is an average of anticipated based aircraft activity at the Airport. Based upon the composite forecast, based aircraft will increase from 110 based aircraft in 2004 to 206 based aircraft by the end of the planning period. While this jump in based aircraft may be plausible, it is highly unlikely given the economic climate, available facilities, and historic trends. As a result, the composite forecast was discounted.

Preferred Based Aircraft Forecast

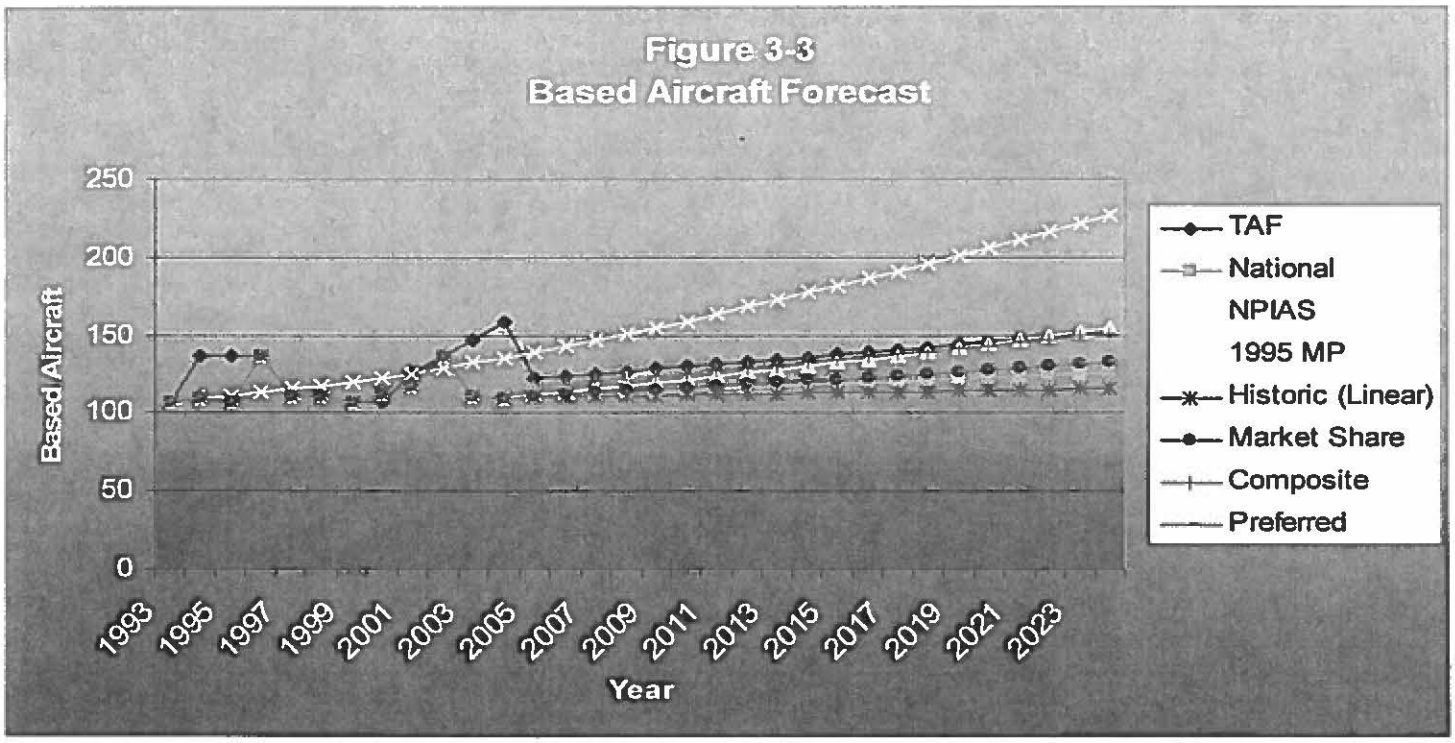
When selecting the forecast of based aircraft, all the previously mentioned forecasting methods were taken into account. Forecasts were analyzed, reviewed and compared to determine how they compare to the expected growth at the Airport. The selected based aircraft forecast should be the best representation of what is expected to occur at TYR. The selected forecast can be one of the previously mentioned methods or a combination of them.

Since all of the various projections with the exception of the TAF and 1995 Master Plan Update appeared to be valid, the preferred based aircraft forecast consists for a composite of FAA Aerospace Growth (National), NPIAS Growth, Historic or linear growth and Market Share. The TAF and 1995 Master Plan projections of based aircraft at TYR were discounted since the average annual growth rate projections forecast growth significantly higher than that predicted for both the national and regional markets. This resulted in a preferred annual growth rate of .92 percent through the 2024 planning period. The projected based aircraft forecast of 132 aircraft by 2024 is representative of expected growth at TYR. **Figure 3-3** is a graphical representation of the selected forecast. **Table 3-18** depicts the selected forecast data.

TABLE 3-18
PROJECTED BASED AIRCRAFT FORECAST

Year	Historic	TAF	National	Market Share	NPIAS	1995 Master Plan Update	Composite	Preferred
Base Year								
2004	110	159	110	110	110	136	110	110
Forecast								
2009	111	218	114	115	120	155	125	115
2014	113	278	118	121	130	177	139	120
2019	114	337	122	126	142	201	155	126
2024	116	426	126	132	154	227	174	132

Source: Tyler Pounds Regional Airport, 2004; FAA TAF; FAA Aerospace Forecast
THE LPA GROUP INCORPORATED, 2005



GENERAL AVIATION ACTIVITY FORECASTS

General aviation activity strictly refers to non-commercial aircraft activity at an airport. In this case, general aviation operations refer to non-commercial, non-scheduled operations performed by civil aircraft. The determination of general aviation operations is based upon a variety of factors. Local GA operations are attributed to operations performed by aircraft physically based at the Airport. Therefore, a correlation of GA operations to based aircraft exists. Based aircraft refers to aircraft that are registered and stored at the Airport. The development of future facilities associated with aircraft storage, tie-downs, apron, etc. is heavily driven by projections of both local and itinerant GA operations.

Historic General Aviation Operations Forecast

Historic GA operations at TYR were obtained from annual counts obtained from the FAA ATCT. As may be noted, operations at TYR have significantly fluctuated over the 10-year period. At the beginning of the decade (1994-1998), TYR experienced near 5 percent growth in GA operations. This was followed by a two-year decline of -6.3 percent, most likely associated with the recession. During the period of 2001-2003, TYR again experienced growth in general aviation activity that is largely attributed to flight training. However in 2004, the Airport experienced a 60 percent reduction in GA operational activity. This is primarily associated with the departure of the previous flight school tenant. As a result of these fluctuations, an annual growth rate of 0.09 percent was calculated by averaging the changes observed during key transitional periods over the decade. Data associated with 2004 general aviation operations was excluded so as not to skew the results. This growth rate is representative of historic general aviation operations at TYR and was used to extrapolate the future operations trend over the 20-year planning period. **Table 3-20** depicts the general aviation operations forecast.

Projection of GA operations Based Upon Adjusted Terminal Area Forecast

The Terminal Area Forecast provides projections of GA operational data through 2025. Based upon FAA's projections, TYR will accommodate 57,627 operations in the year 2024. However, an adjusted TAF was also developed using the existing TAF growth rate of one (1) percent based upon actual reported GA Operations for 2005. This forecast predicts that TYR will accommodate 63,475 GA operations in 2024. Since the 2006 TAF predicted a significantly lower number of GA operations than actually occurred in 2005, the adjusted TAF forecast is considered more realistic indicator of future GA operations. **Table 3-19** depicts the existing and adjusted terminal area forecasts through the year ending 2024.

TABLE 3-19
ADJUSTED TERMINAL AREA FORECAST

Year	TAF	Adjusted TAF
2004	69,708	53,298
2009	48,627	53,511
2014	51,454	56,649
2019	54,451	59,967
2024	57,627	63,475
AAGR 2004-2024	**-1.46%**	**1.05%**

Source: 2006 TAF, Tyler Pounds Regional Airport ATCT, & LPA Group Inc.

Projection of GA Aircraft Operations based upon National Growth

As seen in the projection of based aircraft, the FAA Aerospace Forecast provides an average annual growth rate of .7 percent for national general aviation operations. Using the historic growth rate and historic base

year operations resulted in 61,277 general aviation operations in 2024. Projections of peak years based upon the National Growth rate are shown in **Table 3-20**.

Projections of GA Aircraft Operations based upon NPIAS Growth

Again, as shown in the based aircraft forecast, the FAA NPIAS provides a national forecast and growth rate for general aviation operations. Based upon NPIAS data, GA operations will grow at an average annual percentage of 2.3 percent. The general aviation projections based upon the NPIAS methodology are outlined in **Table 3-20**.

Projections of GA aircraft operations Based Upon Regional Growth

Using the methodology outlined in the FAA Aerospace Forecasts, the Texas cumulative regional growth rate was applied to historic operations at TYR to project growth at the airport through the planning period. Using the growth rates projected for the periods 2002-2007, 2007-2012, 2012-2017, and 2017-2022 extrapolated through 2024, applied to historic GA operations resulted in a projection of GA operations through the year 2024. Based upon this methodology, it is anticipated that 81,187 GA operations will occur in the year 2024.

Projections of GA Aircraft Operations Based Upon Operations per Based Aircraft

As stated earlier, there is a correlation between based aircraft and general aviation activity at an airport. Therefore, using an average of the airport's historic operations per based aircraft (485) applied to the preferred based aircraft forecast provided a projection of general aviation operations through the 20-year planning period. Based upon this methodology, 64,068 operations are projected for 2024 representing a growth rate of approximately .92 percent annually.

In addition to the historical operations per based aircraft (OPBA) forecast, the FAA estimates operations per based aircraft for NPIAS category airports. In the case of TYR, the Airport is designated as a reliever under NPIAS and, therefore, has an OPBA of 492. By applying the FAA's OPBA to the preferred TYR based aircraft forecast resulted in 64,993 operations in the year 2024.

Projections of GA Aircraft Operations Based Upon Regional Market Share

As stated earlier, the Texas Department of Transportation in 2003 provided a regional projection of airport operations through the year 2022. Using this information extrapolated to 2024, a correlation between the historic GA operations and historic regional data was developed. As seen in the historic based aircraft forecast, TYR GA operations accounted for 25 percent of total regional GA operations for the years 2002 and 2003, but dropped to 9 percent in 2004. Thus, using an average annual market share increase of seven (7) percent per year through the year 2024, it is anticipated that GA operations at TYR will again represent 25 percent of total regional operations or 202,809 GA operations. This represents an average annual growth rate of 2.13 percent. This forecast is in line with regional projections of aviation activity through the planning period.

Preferred General Aviation Operations Forecast

Each of the projected forecasts uses a viable methodology for determining future GA operations at TYR. However, in order to determine a logical prediction of future operations, the average of historical, adjusted TAF and FAA Operations per Based Aircraft was used. The Market Share, Regional Growth and NPIAS growth rates were determined to be too high based upon both historic airport information as well as current market conditions. Conversely, the FAA Aerospace Forecast Growth Rate (National Growth Rate) was determined to be too low. Since airport operations, especially GA operations, have fluctuated so dramatically in recent years, it is plausible that aircraft activity may grow at a rate significantly higher than projected. However, based upon national, regional and local data, the composite forecast provides the most viable

projection of general aviation operations through the year 2024. The results of this forecast are shown in **Table 3-20**.

TABLE 3-20
PROJECTED GENERAL AVIATION OPERATIONS FORECAST

Year	Historical	Adjusted TAF	National	NPIAS	Regional Growth	FAA OPBA	Airport OPBA	Market Share	Preferred
Base Year									
2004	53,298	53,298	53,298	53,298	53,298	53,298	53,298	53,298	53,298
Forecast									
2009	58,845	53,921	55,190	59,716	60,026	56,596	55,791	83,503	56,454
2014	64,970	57,086	57,149	66,906	66,911	59,226	58,384	126,322	60,428
2019	71,732	60,434	59,177	74,963	73,893	62,021	61,139	176,216	64,729
2024	79,198	63,974	61,277	83,989	81,187	64,993	64,068	202,809	69,388

Source: Tyler Pounds Regional Airport, 2004; FAA TAF 2006; FAA Aerospace Forecast
THE LPA GROUP INCORPORATED, 2005

LOCAL VERSUS ITINERANT GENERAL AVIATION FORECAST

General aviation is also subdivided into two sub categories: local and itinerant operations. Local operations are those arrival or departures performed within a 20 nautical mile radius of the airfield. Local operations consist mainly of flight training activity and flight instructions. Itinerant operations consist of those arrivals or departures performed by either based or transient aircraft that do not remain within the airport's traffic pattern or within a 20 nautical mile radius.

Usually flight-training and recreational flying activities make up a majority of the local general aviation operations at an airport. Over the past ten years, local operations have accounted for approximately 48 percent (average) of all general aviation operations at TYR. In 2004, local operations represented 45 percent of GA operations. This figure is well within a range of local GA activity that has fluctuated between 40 and 58 percent over the past decade. It is believed that the historical average local and itinerant split will remain consistent over the planning period. The results for the local versus itinerant split forecast are depicted in **Table 3-21**

TABLE 3-21
PROJECTED LOCAL VERSUS ITINERANT SPLIT FORECAST

Year	Local Operations	Itinerant Operations
Base Year		
2004	26,649	26,098
Forecast		
2009	29,757	26,697
2014	33,092	27,336
2019	36,719	28,010
2024	40,939	28,449

Source: Tyler Pounds Regional Airport, 2005; THE LPA GROUP INCORPORATED, 2005
THE LPA GROUP INCORPORATED, 2005

PEAK ACTIVITY PROJECTIONS

Peak operational activity such as peak month, average day of the peak month, and peak design hour forecasts are used in airport planning to determine the airfield's ability to accommodate projected demand and for the sizing of facilities. There are a number of different peaking analyses that can be conducted. For example, airfield evaluations require that every annual aircraft operation be considered, while passenger terminal facilities need only those operations associated with commercial passenger airlines. To properly plan, size and design passenger terminal facilities, peaking analyses need to also include the levels of enplanements. Basically commercial service airports experience peaks in both passenger airline operations as well as passenger enplanements, although these do not necessarily occur at the same time. Therefore, each of these peaking elements must be evaluated separately since peak airline operations define the demand for airside facilities (gates and ramp), while peak enplanements pose a direct impact on landside facilities (terminal and parking). The following sections provide individual peaking analyses for total airport operations, passenger enplanements and passenger operations.

Peaks in Total Airport Operations

Operational levels at Tyler Pounds Regional Airport are spread out fairly evenly throughout the year. Since 1998, the highest operations levels have been observed during the four same months. Of these, March has consistently been one of the busiest months for the years 2002 to 2003. July was the peak month during the base year.

The values for the average day of peak month and for the peak hour were calculated using the FAA's methodology found in Advisory Circular 150/5360-7, *Planning and Design Considerations for Airport Terminal Building Development*. In 2004, approximately 10.6 percent of all operations were conducted in the peak month (July). It is assumed that this trend will continue throughout the planning period. Under this methodology, taking the number of operations calculated for the peak month and dividing that figure by the number of days in the peak month derives the average day of the peak month. No historical data was available to determine the peak hour operations; therefore, it was estimated that 15 percent of the peak month average day would represent the number of peak hour operations. The results for the peak total operations forecast are depicted in **Table 3-22**.

TABLE 3-22
PEAK TOTAL OPERATIONS

	Base Year		*Forecast*		
	2004	**2009**	**2014**	**2019**	**2024**
Total Annual Operations	63441	67824	73021	78645	84819
Peak Month	6718	7183	7733	8328	8982
Average Day Peak Month	217	232	249	269	290
Peak/Design Hour	33	35	37	40	43

Source: The LPA GROUP INCORPORATED, 2005

Peaks in Passenger Enplanements

This methodology is employed to drive the peaks in passenger enplanements. Monthly airline schedules were evaluated to identify trends during the peak month. Over the past year, the airline schedule has remained consistent from month to month; however, the peak month has fluctuated from month to month over the past several years. Since July was the peak month for the base year, it was used to characterize the peak month for

the planning period. A review of the passenger enplanements for the base year revealed that 9.45 percent of all passenger enplanements were conducted in July. The average day of the peak month (ADPM) was determined by taking the number of passenger enplanements calculated for the peak month and dividing that figure by the number of days in the month. Previous planning efforts at TYR have estimated that approximately 20 percent of the peak month average day would best represent the number of peak hour passenger enplanements. No historical support data was available to confirm this calculation but it is within normal ranges for this category. The results for the low and high range passenger enplanements forecast are depicted in **Table 3-23.**

TABLE 3-23
PEAK PASSENGER ENPLANEMENTS

	Base Year		*Forecast*		
	2004	**2009**	**2014**	**2019**	**2024**
Total Annual Enplanements	70,549	88,743	114,310	144,253	179,320
Peak Month	6,667	9,398	12,105	15,276	18,990
Average Day Peak Month	215	303	390	493	613
Peak/Design Hour	43	61	78	99	123

Source: Tyler Pounds Regional Airport, 2004; THE LPA GROUP INCORPORATED, 2005

Peaks in Passenger Service Operations

A review of historical monthly passenger service operations was evaluated to identify trends of the peak month. Over the past year, the airline schedule has remained consistent from month to month, however, the peak month has fluctuated from month to month over the past years. Between 1999 and 2004, July has been the busiest month for passenger service operations for two of the five years. Typically the peak period occurs in the summer or late spring. Nonetheless, the peak month passenger service operations during the period of 1997 to 2004 have historically accounted for 9.3 percent of the total annual passenger service operations. TYR experienced a low of 9.0 percent in 2004 and a high of 9.9 in 2003. As with the total operations, it is assumed that the level of passenger operations conducted during the busiest month will remain consistent over the planning period. Because all of the peak months have 31 days, this number was used to determine the number of average day of the peak month enplanements.

The same methodology employed to evaluate peaks in passenger enplanements was applied to passenger service operations. Like enplanements, peak hour passenger service operations reflect approximately 20 percent of the average day enplanements. Due to changes in the future aircraft fleet mix, this value is anticipated to decrease to approximately 10 percent as the fleet transitions from turboprop to regional jet aircraft. As such, the above values were applied to establish the general passenger service operational peaks, which are shown in **Table 3-24.**

TABLE 3-24
PEAK PASSENGER SERVICE OPERATIONS

	Base Year 2004	Forecast 2009	2014	2019	2024
Total Annual Operations	10,143	10,598	11,895	13,284	14,859
Peak Month	931	1,122	1,260	1,407	1,574
Average Day of Peak Month	30	36	41	45	51
Peak/Design Hour	6	5	4	5	5

Source: Tyler Pounds Regional Airport, 2004; THE LPA GROUP INCORPORATED, 2005

Peaks in General Aviation Operations

Historical general aviation activities were evaluated to identify trends of the peak month. Over the past several years, the peak month has fluctuated from month to month. Since July was the peak month for the base year, it is used to represent peak activity over the 20-year planning period. Using this method, taking the number of operations calculated for the peak month and dividing that figure by the number of days in the peak month (31 for July) derives the average day of the peak month. A review of the general aviation operations for the base year revealed that 10.9 percent of all general aviation operations were conducted in the month of July. No historical data was available to determine the peak hour operations, therefore it was estimated that 10 percent of the peak month average day would be the best representative of the number of peak hour operations. The results for the peak general aviation operations forecast are depicted in **Table 3-25**.

TABLE 3-25
PEAK GENERAL AVIATION OPERATIONS

	Base Year 2004	Forecast 2009	2014	2019	2024
Total Annual Operations	53,298	56,454	60,428	64,729	69,388
Peak Month	5,799	6,142	6,575	7,043	7,549
Average Day Peak Month	187	198	212	227	244
Peak/Design Hour	19	20	21	23	24

Source: The LPA GROUP INCORPORATED, 2005

MILITARY AIRCRAFT ACTIVITY FORECAST

Military operations include aircraft operations that are conducted by an official branch of the U.S. military services. Although there are no military aircraft based at TYR, both local and itinerant military operations are recorded. A majority of these operations are training-related flights. As such, when these aircraft arrive or depart the airfield, many will take the opportunity to practice flying various instrument approaches available. The level of military activity recorded at TYR over the past decade is depicted in **Table 3-26** below.

TABLE 3-26
HISTORICAL MILITARY ACTIVITY

Year	Itinerant	Local	Total
1994	190	74	264
1995	139	24	163
1996	114	18	132
1997	94	68	162
1998	143	10	153
1999	269	56	325
2000	187	101	288
2001	180	46	226
2002	320	92	412
2003	**185**	**117**	**302**
2004	599	237	**836**

Source: Tyler Pounds Regional Airport, 2005

The number of military operations at Tyler Pounds Regional Airport has increased steadily over the past four years. However, the split between itinerant and local military operations has fluctuated over the past decade. During that ten-year period the number of local military operations has ranged from 37 to 96 percent, averaging approximately 69 percent. In 2004, the percentage of local military operations was approximately 60 percent. For the purpose of this analysis, local military operations are expected to grow from the current level of 59 percent to 69 percent over the planning period. During the years 1993 to 2003 military operations at the Airport grew at a rate of 10.93 percent annually. This growth rate is expected to continue over the next five years and then taper off to about half the current rate over the rest of the planning period. The results for the military activity forecast are depicted in **Table 3-27**.

TABLE 3-27
FORECAST OF MILITARY ACTIVITY

Year	Itinerant	Local	Total
Base Year			
2004	599	237	836
Forecast			
2009	561	211	772
2014	514	184	698
2019	472	160	632
2024	394	177	571

Source: Tyler Pounds Regional Airport, 2004; THE LPA GROUP INCORPORATED, 2005

Peaks in Military Aviation Activity

Historical military aviation activities were evaluated to identify trends during the peak month. Over the past 10 years, peaks in monthly military activity fluctuated. . Since December represents the peak month for the base year, it is used to depict typical peaking characteristics for the planning period. Using this method, the number of peak month operations is divided by the number of days in the month (31 for December) to

determine the level of operations occurring on an average day during the peak month. A review of the military operations for the base year revealed that approximately 19 percent of all military operations at TYR were conducted in December. No historical data was available to determine the peak hour operations, therefore it was estimated that 8 percent of the peak month average day would be the best representative of the number of peak hour operations. The results for the peak military activity forecast are depicted in **Table 3-28**.

TABLE 3-28
PEAK MILITARY ACTIVITY

	Base Year		*Forecast*		
	2004	2009	2014	2019	2024
Total Annual Operations	836	772	698	632	571
Peak Month	155	144	130	117	106
Average Day of Peak Month	5	5	4	4	3
Peak/Design Hour	0	0	0	0	0

Source: Tyler Pounds Regional Airport, 2004; THE LPA GROUP INCORPORATED, 2005

INSTRUMENT OPERATIONS

It is vital for an airport to know the number of instrument approaches that are conducted annually at the airport. This is especially important to know when forecasting the future activities at the airport. Knowing the number of instrument approaches that can be expected allows the airport to plan and establish the necessary instrument approaches. **Table 3-29** depicts the results for the forecasted total instrument operations at Tyler Pounds Regional Airport.

TABLE 3-29
TOTAL INSTRUMENT OPERATIONS

Year	Total Operations	Instrument Operations	Percentage
Base Year			
2004	63,441	9,516	15%
Forecast			
2009	67,824	11,530	17%
2014	73,021	13,874	19%
2019	78,645	16,515	21%
2024	84,819	19,508	23%

Source: FAA Terminal Area Forecast; THE LPA GROUP INCORPORATED, 2005

Over the past 10 years, instrument operations at the Airport accounted for approximately 23 percent (average) of total operations. In 2004, approximately 15 percent of all operations at TYR were recorded as instrument operations. This percentage is expected to increase up to approximately 23 percent by the end of the planning period.

SUMMARY OF AVIATION ACTIVITY FORECASTS

Tables 3-30 and 3-31 present a summary of the aviation forecasts presented in this chapter, including commercial and regional enplanements and operations, general aviation operations, military operations, and instrument operations. GA and military operations were categorized into either local or itinerant operations.

TABLE 3-30
COMPARISON OF TAF AND AIRPORT FORECASTS

	Year	TAF Forecast	Adjusted TAF Forecast	Airport Forecast	AF/TAF (Difference)	Adjusted AF/TAF (Difference)
Passenger Enplanements						
Base Year	2004	71,594	70,549	70,549	-1%	0%
Base Year + 5 Years	2009	82,543	95,883	88,743	8%	-7%
Base Year + 10 Years	2014	91,566	106,461	114,310	25%	7%
Base Year + 15 Years	2019	101,575	118,206	144,253	42%	22%
Base Year + 20 Years	2024	112,679	131,246	179,320	59%	37%
Commercial Operations/Air Taxi						
Base Year	2004	10,195	10,143	10,143	0%	0%
Base Year + 5 Years	2009	11,347	10,440	10,598	-7%	2%
Base Year + 10 Years	2014	12,072	11,110	11,895	-1%	7%
Base Year + 15 Years	2019	12,843	11,823	13,284	3%	12%
Base Year + 20 Years	2024	13,663	12,583	14,859	9%	18%
Total Operations						
Base Year	2004	80,454	63,441	63,441	-21%	0%
Base Year + 5 Years	2009	60,953	64,930	67,824	11%	4%
Base Year + 10 Years	2014	64,505	68,738	73,021	13%	6%
Base Year + 15 Years	2019	68,273	72,769	78,645	15%	8%
Base Year + 20 Years	2024	72,269	77,037	84,819	17%	10%

Note: TAF data is on a U.S. Government fiscal year basis (October through September)
Source: FAA TAF, 2006 and THE LPA GROUP INCORPORATED, 2006

TABLE 3-31
AIRPORT PLANNING FORECASTS
FORECAST LEVELS AND GROWTH RATES

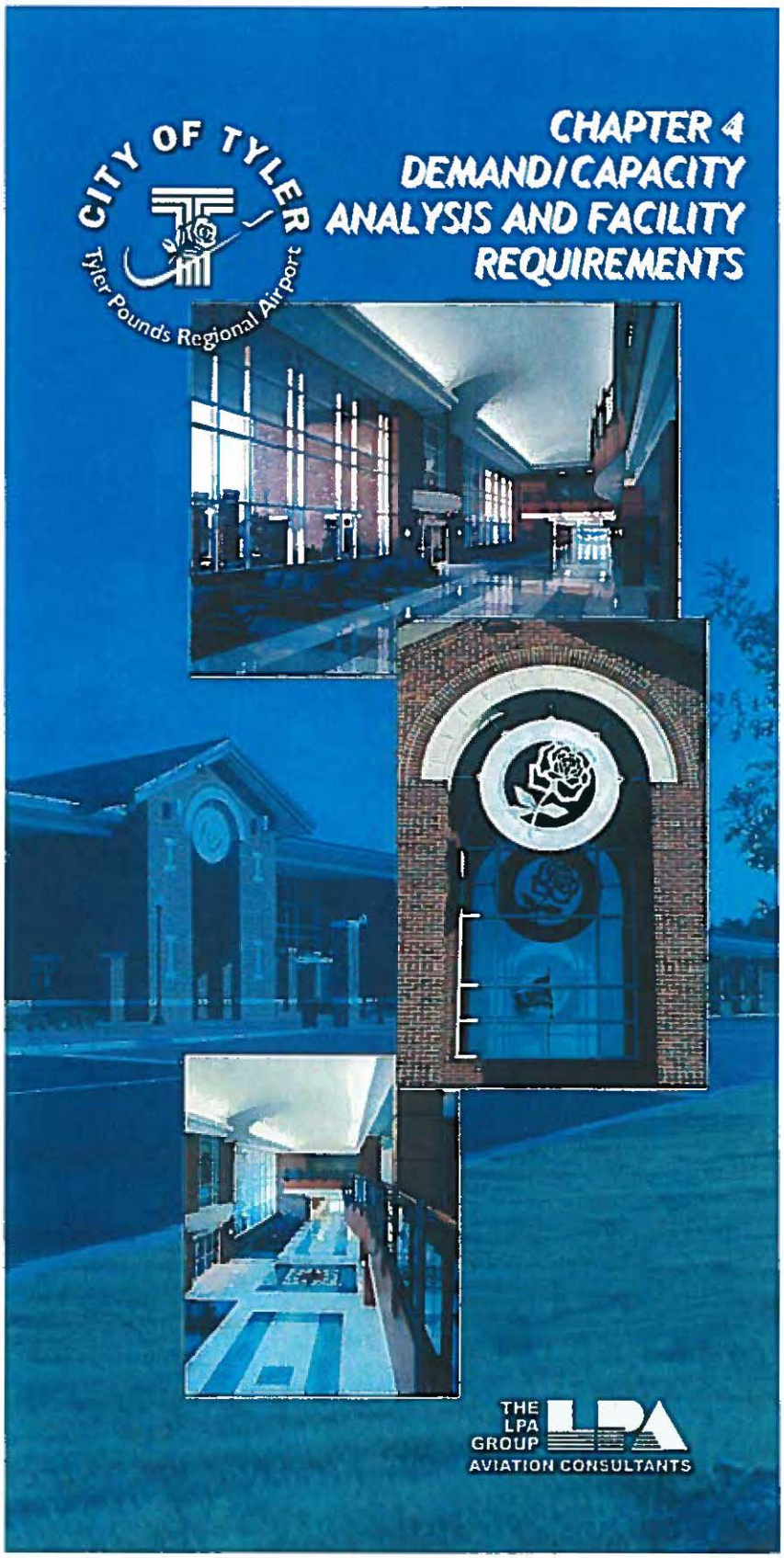
	Base Year: 2004						Average Annual Compound Growth Rates				
	Base Yr. Level	Base Yr. + 1yr.	Base Yr. + 5yrs.	Base Yr. + 10yrs.	Base Yr. + 15yrs.	Base Yr. + 20yrs.	Base yr. to +1	Base yr. to +5	Base yr. to +10	Base yr. to +15	Base yr. to +20
Passenger Enplanements	70,549	73,862	88,743	114,310	144,253	179,320	4.7%	4.7%	4.9%	4.9%	4.8%
Operations											
Itinerant											
Air Carrier	18	25	25	25	25	25	38.9%	6.8%	3.3%	2.2%	1.7%
Air Taxi	10,125	10207	10,573	11,870	13,284	14,834	0.8%	0.9%	1.6%	1.8%	1.9%
General Aviation	26,649	28,028	29,757	33,092	36,719	40939	5.2%	2.2%	2.2%	2.2%	2.2%
Military	314	599	561	514	472	394	90.8%	12.3%	5.1%	2.7%	1.1%
Total Itinerant Operations	37,106	38,859	40,915	45,501	50,499	56,192	4.7%	2.0%	2.1%	2.1%	2.1%
Local											
General Aviation	26,098	26,929	26,697	27,336	28,010	28449	3.2%	0.5%	0.5%	0.5%	0.4%
Military	237	237	211	184	160	177	0.0%	-2.3%	-2.5%	-3.9%	-1.4%
Total Local Operations	26,335	27,166	26,908	27,520	28,170	28,626	3.2%	0.4%	0.4%	0.7%	0.4%
TOTAL OPERATIONS	63,441	66,025	67,824	73,021	78,670	84,819	4.1%	1.3%	1.4%	1.4%	1.5%
Instrument Operations	9,516	10,118	11,530	13,874	16,515	19,508	6.3%	3.9%	3.8%	3.7%	3.7%
Peak Hour Operations	33	34	35	37	40	43	4.1%	1.3%	1.4%	1.4%	1.5%
Cargo/Mail (Exported and Imported Tons)	27,035	27,981	32,109	38,136	45,293	53794	3.5%	3.5%	3.5%	3.5%	3.5%
Based Aircraft											
Single Engine (Piston)	78	76	75	76	77	75	-2.6%	-0.8%	-0.2%	-0.1%	-0.2%
Multi Engine	20	19	20	20	20	20	-1.0%	-0.2%	0.1%	0.1%	0.0%
Jet	11	11	12	14	16	18	0.9%	2.1%	2.4%	2.5%	3.4%
Helicopter	1	1	2	2	2	2	0.9%	0.9%	0.9%	0.9%	1.2%
Other	0	3	7	8	11	17	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	110	111	115	120	126	132	1.2%	1.0%	0.9%	0.9%	1.2%
Operational Factors											
Average Aircraft Size (Seats)	38	38	50	50	50	70					
Average Enplaning Load Factor	63%	63%	63%	63%	63%	63%					
GA Operations Per Based Aircraft (OPBA)	480	494	489	502	513	525	3.0%	0.4%	0.5%	0.5%	0.6%

Source: THE LPA GROUP INCORPORATED, 2006

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 4
DEMAND/CAPACITY ANALYSIS AND FACILITY REQUIREMENTS



THE LPA GROUP

AVIATION CONSULTANTS

CHAPTER FOUR
DEMAND CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

INTRODUCTION

The airfield demand/capacity analysis examines the capability of the runway and taxiway system at Tyler Pounds Regional Airport (TYR) t o address existing levels of activity as well as determine the ability of the airfield to handle the forecasted traffic levels without any adverse impacting the levels or capacity or aircraft delay. This assessment was conducted using the methodology established by the Federal Aviation Administration (FAA).

FEDERAL AVIATION ADMINISTRATION METHODOLOGY

The FAA's standard method for determining airport capacity and delay for long-range planning purposes can be found in Advisory Circular (AC) 150/5060-5, Change 2; *Airport Capacity and Delay*. For the purpose of this analysis, generalized quantitative airfield capacity was calculated in terms of hourly capacity of the runways, annual service volume and average delay, using the FAA's methodology. This approach utilizes the projections of annual operations by specified fleet mix as projected in the Chapter 3, Aviation Forecast.

Airfield Characteristics

In addition to the aviation activity forecasts, a number of the airport's airfield characteristics and operational conditions are required in order to properly conduct the FAA capacity analyses. The elements that affect an airfield's capacity are:

- Aircraft mix Index
- Runway configuration
- Taxiway configuration
- Operational characteristics
- Meteorological conditions

The following section evaluates each of these capacity characteristics with respect to TYR.

Aircraft Mix Index

The aircraft mix is the relative percentage of operations conducted by each of the following four classes of aircraft of aircraft (A, B, C, and D). **Table 4-1** and **Exhibit 4-1** identify the physical aspects of the four aircraft classes and their relationship used in wake turbulence standards.

The FAA methodology to calculate the aircraft mix index is %(C + 3D). The majority of the aircraft currently operating and forecasted to operate at TYR consists of Class A and B aircraft. The rest of the operations fleet consists of Class C aircraft, as there are virtually no Class D aircraft operations at the Airport.

TABLE 4-1
AIRCRAFT CLASSIFICATIONS

Aircraft Class	Max. Cert. T.O. Weight (pounds)	Number of Engines	Wake Turbulence Classification
A	12,500 or less	Single Multi	Small (s)
B		Multi	Small (s)
C	12,500 – 300,000	Multi	Large (L)
D	Over 300,000	Multi	Heavy (H)

Source: AC 150/5060-5, Airport Capacity and Delay

Runway Configuration

The existing Tyler Pounds Regional Airport airfield consists of a three-runway configuration. There are no parallel runways and all three runways cross each other. Runway 13-31 (5,200') has a northwest to southeast orientation; Runway 4-22 (7,200') has a northeast to southwest orientation, while Runway 17-35 (4,850') has a north to south orientation. Runway 13-31 intersects Runway 4-22 approximately 2,787 feet from the Runway 13 threshold. Runway 4-22 intersects Runway 13-31 approximately 2,151 feet from the Runway 22 threshold and intersects Runway 17-35 approximately 2,276 feet from the Runway 4 threshold. The Runway 17 threshold is located 283 feet south of the Runway 13 threshold. Runway 17-35 intersects Runway 4-22 approximately 1,183 feet from the Runway 35 threshold.

For the purpose of the demand/capacity calculations, the airfield was divided into two distinctive runway configurations: a single runway configuration (Runway 17-35) and a crossing runway configuration (Runway 4-22 and Runway 13-31). Runway 17-35 was designated as the small GA aircraft runway, which only supports Class A & B aircraft, while Runway 4-22 and Runway 13-31 were identified as the runways that support Class C aircraft and a small percentage of Class A & B aircraft.

Taxiway Configuration

The taxiway exit location, in respect to the runway threshold, determines how quickly an aircraft can vacate the runway. While an aircraft is on the runway or on final approach, all other aircraft waiting to use that runway or crossing runways must hold short until the aircraft on approach has landed and cleared the runway. Therefore, the quicker that an aircraft get exit the runway, the more capacity the airfield can handle. In this section the taxiway exits for the TYR airfield will be reviewed.

As mentioned in the Inventory Chapter, there are no full-length parallel taxiways to any of the runways. Several taxiways provide ingress and egress from and connect the runway system. The following three (3) exit taxiways provide ingress/egress from Runway 17-35. Taxiway E provides access to the Runway 35 threshold. There is no taxiway that provides direct access to the Runway 17 threshold. To access that threshold, aircraft have to cross the Runway 17 threshold. Other connectors include Taxiway B and Taxiway F which are located north of the intersection with Runway 4-22. The taxiway exit distances from the runway thresholds are depicted in **Table 4-2**.

Class A Small single-engine, gross wt. 12,500 lbs.

MOONEY OVATION

CESSNA 152/172
BEECHCRAFT BONANZA
CESSNA 182/210
MOONEY 201
PIPER CHEROKEE

Class B Small twin-engine, gross wt. 12,500 lbs.

KING AIR 350

BEECHCRAFT BARON
MITSUBISHI MU-2
CESSNA CITATION I
CESSNA 310/402
PIPER NAVAJO
KING AIR 90/100/200/350

Class C Large aircraft, gross wt. 12,500 lbs. to 300,000 lbs.

GULFSTREAM IV

GULFSTREAM III/IV
LEAR 35/55
SAAB 340
CESSNA CITATION II
FALCON 20/50/90
BOEING 727/737/767
DOUGLAS DC-9/MD-80

Class D Large aircraft, gross wt. more than 300,000 lbs.

BOEING 747

AIRBUS A300/310/340
BOEING 747
DOUGLAS DC-8/MD-11
LOCKHEED L-1011

EXHIBIT 4-1
AIRCRAFT CLASSIFICATIONS

The following five (5) exit taxiways provide ingress/egress from Runway 13-31. Taxiway A is an outboard partial parallel to Runway 13-31. Both Taxiway A and Taxiway H provide access to the runway thresholds. Taxiway G is located at the intersection with Runway 4-22, while Taxiways F and B are located north of Runway 4-22 intersection. The taxiway exit distances from the runway thresholds are depicted in **Table 4-2**.

The following five (5) exit taxiways provide ingress/egress from Runway 4-22. Taxiway F is an outboard partial parallel to Runway 4-22. Taxiways C, F1, and H provide access to the runway thresholds. Taxiways E/F2 are located east of the intersection of Runway 17-35 and Runway 13-31 near the midpoint of Runway 4-22. The taxiway exit distances from the runway thresholds are depicted in **Table 4-2**.

TABLE 4-2
EXIT TAXIWAY LOCATIONS

Taxiway	From Runway 17 Threshold	From Runway 35 Threshold
B	1,281'	3,569'
F	3,087'	1,673'
E	4,825'	25'
	From Runway 13 Threshold	**From Runway 31 Threshold**
A	25'	5,175'
B	1,802	3,398'
F	2,385'	2,815'
G	2,786'	2,414'
H	5,175'	25'
	From Runway 4 Threshold	**From Runway 22 Threshold**
F	7,175'	25'
E	3,021'	4,179'
D	5,981'	1,219'
H	25'	7,175'

Source: THE LPA GROUP INCORPORATED, 2005

Operational Characteristics

Operational characterizes also have a significant effect on the capacity or throughput that an airfield can handle. Operational characteristics that affect the overall capacity include the percentage of arrivals and the percentage of touch and gos.

Percentage of Arrivals

The percentage of arrivals is the ratio of landing operations to the total operations at the airport. Arrivals have a significant effect on runway usage. When aircraft are on final approach, it restricts the usage of that runway and crossing runways. Since aircraft fly slower on final approach, it means that the runway will be occupied for a longer time. The FAA methodology used herein provides figures for the capacity calculations for airfields with 40, 50 or 60 percent arrivals.

During a February 2005 interview, the Chief air traffic controller at TYR estimated that aircraft arrivals represent approximately 50 percent of total operations. The arrivals percentage is expected to remain at 50 percent over the entire planning period.

Percentage of Touch and Gos

The percentage of touch and gos is the ratio of touch and go operations to the total operations at the airport. Touch and go percentages play a key role in determining an airport's capacity. A touch and go consists of two operations; one landing followed by an immediate takeoff. A touch and go operation are normally associated with flight training. Usually the number of these operations decreases as the number of air carrier operations increase, as demand for service approaches runway capacity, or as weather conditions deteriorate. In addition, touch and go operations at TYR are mainly conducted by smaller GA aircraft.

As mentioned previously, the runways were divided to separate configurations; a single runway configuration (Runway 17-35) and a crossing runway configuration (Runways 4-22/13-31). In the conversation with the chief air traffic controller on February 2005, he indicated that the touch and go percentage at TYR is 40 percent.

Meteorological Conditions

Meteorological conditions influence the decision as to which runway end a pilot will choose to make an approach to based on wind and other weather related conditions. Thus, these conditions can have an affect on the overall capacity for the airfield. Runway utilization is normally determined by wind conditions while the cloud ceiling and visibility dictates spacing requirements.

There are three measures of cloud ceiling and visibility conditions recognized by the FAA in calculating the capacity of an airport. These include:

- Visual Flight Rules (VFR) – Cloud ceiling is greater than 1,000 feet above ground level (AGL) and the visibility is at least three statute miles.
- Instrument Flight Rules (IFR) – Cloud ceiling is at least 500 feet AGL but less than 1,000 feet AGL and/or the visibility is at least one statute mile but less than three statute miles.
- Poor Visibility and Ceiling (PVC) – Cloud ceiling is less than 500 feet AGL and/or the visibility is less than one statute mile.

AIRFIELD CAPACITY ANALYSIS

The preceding airfield characteristics were used in conjunction with the methodology developed by the FAA to determine airfield capacity. As mentioned previously, this FAA methodology generates the hourly capacity of runways and the annual service volume for measuring airfield capacity.

Hourly Capacity of Runway

Hourly capacity of the runways measures the maximum number of aircraft operations that can be accommodated by the airport's runway configuration in one hour. Based on the FAA methodology, hourly capacity for runways is calculated by analyzing the appropriate VFR and IFR figures for the airport's runway configuration. From these figures, the aircraft mix index and percent of aircraft arrivals are utilized to calculate the hourly capacity base. A touch and go factor is also determined based on the percentage of touch and go operations combined with the aircraft mix index. These figures also consider the taxiway exit factor.

For both VFR and IFR conditions, the hourly capacity for runways is calculated by multiplying the hourly capacity base, touch and go factor, and exit factor. This equation is:

$$\text{Hourly Capacity} = C^* \times T \times E$$

where:
- C^* = hourly capacity base
- T = touch and go factor
- E = exit factor

Figure 50, in Chapter 3 of AC 150/5060-5, *Airport Capacity and Delay*, was selected as the figure that best represents the airfield configuration and usage. Since the runway configuration is not expected to physically change over the planning period, Figure 50 is used for the hourly capacity calculations for this study.

The mix index for this runway configuration was calculated in order to determine the hourly capacity. The mix index is calculated as follows: Mix Index = (C + 3D). The hourly capacity for the key years of the planning period is shown in **Table 4-3**. The weighted hourly capacities shown were calculated using the percentages that these conditions occurred at the airport.

TABLE 4-3
CALCULATION OF HOURLY CAPACITY

Year	VFR Operations/Hour	IFR Operations/Hour	Weighted Hourly Capacity (Cw)
Base Year			
2004	116	59	91
Forecast			
2009	116	59	91
2014	116	59	91
2019	116	59	91
2024	116	59	91

Source: THE LPA GROUP INCORPORATED, 2005.

Annual Service Volume

Under the FAA methodology, the most important value that must be computed in order to evaluate the capacity at an airport is the annual service volume (ASV). ASV represents a measure of the approximate number of total operations that the airport can support annually. In other words, the ASV represents the theoretical limit of operations that the

airport can safely accommodate. Using the FAA's methodology to estimate ASV, first the ratio of annual operations to average daily operations, during the peak month, is calculated along with the ratio of average daily operations to average peak hour operations, during the peak month. These values are then multiplied together, and the resulting product is multiplied by the weighted hourly capacity. This equation is:

Annual Service Volume = Cw x D x H

where:
- Cw = weighted hourly capacity
- D = ratio of annual operations to average daily operations during the peak month
- H = ratio of average daily operations to average peak hour operations during the peak month

Both runway configurations were used for the calculation of the ASV. Airport and ATCT staff interviews were conducted, and traffic schedules and records were obtained to evaluate the characteristics of peak month, day, and hourly operations. These records showed that there are several peak month activities for the various aviation segments operating at TYR; however, March was selected as the overall peak month because it maintained the most consistent operational peaks of all the peak periods. Using historical operations data for TYR, peak month operations were determined to account for 10.59 percent of annual operations. Average daily operations during the peak month were derived by taking the number of operations calculated for the peak month and dividing that figure by the number of days in the peak month, which for March is 31 days. The average peak hour for the peak month was determined by multiplying the Average Daily Operations for the Peak Month by 15%, which was based upon the cumulative average of peak operations for commercial and general aviation operations. These figures were then used to calculate the ratio of annual operations to average daily operations during the peak month (D) for the ASV calculation. The results are reflected in **Table 4-4.**

TABLE 4-4
CALCULATION OF DEMAND RATIOS

Element	2004	2009	2014	2019	2024
Annual Operations	63,441	67,824	73,021	78,645	84,819
Average Peak Month Operations	6,718	7,183	7,733	8,328	8,982
Average Daily Operations – Peak Month	217	232	249	269	290
Daily Demand Ratio (D)	293	293	293	293	293
Average Peak Hour – Peak Month	33	35	37	40	43
Hourly Demand Ratio (H)	7	7	7	7	7

Source: THE LPA GROUP INCORPORATED, 2005.

The final ASV calculations are reflected in **Table 4-5**. This value was then compared to the existing and forecast level of annual operations for Tyler Pounds Regional Airport. According to the FAA methodology, a demand that exceeds the ASV will result in significant delays on the airfield. However, no matter how substantial an airport's capacity may appear, it should be realized that delays could occur even before an airport reaches its stated capacity. In fact, a number of projects that would increase the capacity at an airport are eligible for funding from the FAA.

According to FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, this eligibility is achieved once the airfield has reached 60 percent of its current capacity. This allows improvements to be made before demand levels exceed the capacity of the facility in order to avoid lengthy delays. Future capacity levels for the airport have been calculated based on the forecasted annual operations and the calculated ASV for the airport. These levels are depicted in **Table 4-5** and are shown graphically in **Exhibit 4-2**.

TABLE 4-5
ANNUAL SERVICE VOLUME

Year	Annual Operations	Annual Service Volume	Capacity Level
Base Year			
2004	63,441	178,159	36%
Forecast			
2009	67,824	174,195	39%
2014	73,021	199,130	37%
2019	78,645	213,869	37%
2024	84,819	211,521	40%

Source: THE LPA GROUP INCORPORATED, 2005.

In 2009 the annual operations increase significantly, which also increases the capacity level to 53%. Later in the planning period, the benefits of a runway extension and an additional instrument approach are considered in this analysis. At that point, the majority of the operations (both VFR and IFR) are expected to shift to Runway 4-22, since it will be the longest instrument runway. In addition to the Runway extension, a new taxiway exit is constructed in the optimal range (2,000' to 4,000' from the runway threshold). The runway extension, new exit taxiway and shift of operations results in an increase in ASV for the airfield. In 2024, the ASV decreases somewhat due to an increase in the mix index at the airfield, but at no point does it exceed the 60% level which requires airport management to plan for additional airfield capacity. **Exhibit 4-2** provides a graphical representation of annual capacity and annual service volume.

Annual Aircraft Delay

As an airport's level of annual operations increase, so do the times when the airfield experiences periods of delay. Calculating the average delay for each aircraft allows a total to be estimated for all of the delay incurred at the airport over a year. FAA AC 150/5060-5 also provides a method by which the annual delay can be quantified. This estimate includes arriving and departing aircraft operations under both VFR and IFR conditions. Essentially the ratio of annual demand to ASV is applied to FAA charts to determine the average delay per aircraft. This value is then applied to the actual or forecasted annual demand to calculate the total hours of annual delay for the airport. The results of these calculations are included in **Table 4-6**.

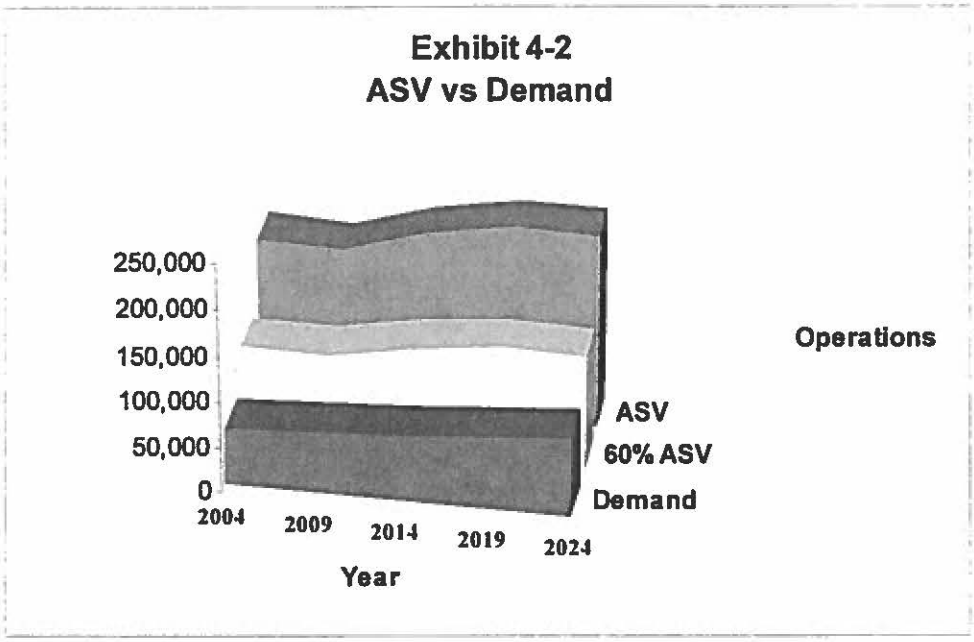


TABLE 4-6
ANNUAL AIRCRAFT DELAY

Year	Average Delay per Aircraft (Minutes)		Total Annual Delay (Hours)	
	Low	High	Low	High
Base Year				
2004	0.05	0.05	1	1
Forecast				
2009	0.08	0.08	2	2
2014	0.10	0.10	3	3
2019	0.10	0.10	3	3
2024	0.12	0.12	4	4

Source: THE LPA GROUP INCORPORATED, 2005.

As indicated, the average delays per aircraft remain consistent throughout the planning period, while the total annual delay is expected to increase slightly. As a result, delay at TYR is considered insignificant.

Summary

Based upon the forecasts provided in Chapter 3, Aviation Activity Forecast, TYR will not exceed airfield capacity within the twenty-year planning period. However, if a sudden influx of operations occurs as a result of the entrance of

a commercial carrier or flight school, then it is possible that demand will equal or exceed the 60 percent ASV. Since historically TYR was home to a significant flight training operation, it may be wise to begin preliminary planning for future development in case such an event occurs during the planning period.

FACILITY REQUIREMENTS

To ensure that the Tyler Pounds Regional Airport will adequately accommodate demand expected during the twenty-year planning period, this chapter is intended to establish facility requirements for the future development of the airport. The principal challenge facing any growing airport is that of meeting future development requirements. Airport development is costly, and since each project is typically planned to last many years, care must be taken to ensure that each development project will help satisfy the projected level of airport needs. Increasingly, the nation's airports are facing serious deficiencies in their ability to provide the requisite facilities necessary to meet the public's demand for aviation services, both general aviation and commercial.

It is important that airport owners and managers not overlook valuable opportunities to develop facilities and resources. When these opportunities are missed, the airport loses potential revenues, tenants do not receive maximum benefit from their leases, and the users experience a lower level of service than might otherwise be obtainable. Conversely, it is equally important when planning development that owners continue to consider the quality of life for local residents around the airport. Meeting the growth demands of an airport in today's world is routinely balanced with the community's desire for aesthetics and environmental conservation. The planning process for TYR is no exception.

This facility requirements analysis evaluates existing airport facilities (airfield and landside) against the projected level of demand to determine the ability of the airport to meet the forecast of future activity. The primary output of this analysis is the identification of excess or deficient capacity for an array of individual facilities comprising the airport. Before facilities at TYR are evaluated, it is important to review criteria that are employed by the FAA for the planning and design of airports. These criteria establish certain benchmarks that are used in the definition of adequacy or inadequacy for specified airport areas and facilities.

Airport Role and Service Level

The FAA, through their publishing of the National Plan of Integrated Airport Systems (NPIAS), establishes the role and service level of each airport included within this national planning document. The role for each airport identifies one of four basic service levels, which describes the type of public aviation service TYR is expected to provide to the community or area it serves. The role and service level also define the funding category set up by Congress within which the Airport will be placed and thereby compete for federal funds to assist in airport development. TYR is included in the FAA's NPIAS as a primary commercial service (airline service) airport. While classified as an airline service airport, it is important to remember that TYR experiences significant operations by GA aircraft. Notable among this category of user is the upper end segment of the GA industry composed of multiple mid- to large-sized business jet aircraft that routinely operate in significant numbers at TYR.

Airport Reference Code and Critical Aircraft

A key element in defining facility needs is establishing development guidelines that are directly related to the size and type of aircraft that the Airport will be expected to serve. By determining the size and types of aircraft currently using or expected to operate at TYR, it is possible to designate a critical aircraft for facility planning and design purposes. To be considered a critical aircraft, this particular aircraft, at a minimum, must conduct 500 annual itinerant operations at the Airport. Itinerant operations are defined as flights originating at TYR and flying to a facility a minimum of 20 miles away or those operations terminating at TYR from an airport more than 20 miles away.

Therefore, this critical aircraft is usually the most demanding aircraft using an airport, when considering aircraft size, weight, and approach speed. It should be noted that existing and future airport development is not only limited to aircraft size, weight and approach speed. It is sometimes necessary to establish critical aircraft for specific airport design parameters identified, if necessary, by approach category, wingspan, and/or weight. For instance, an aircraft defining the critical wingspan for design purposes may not be the critical aircraft defining the runway load bearing capability. In addition, some aircraft might have large wingspans and relatively slow approach speeds, while others have high approach speeds and short wingspans. Therefore, several aircraft may define the critical aircraft requirements based upon the critical weight, approach speed, wingspan, etc.

Once the critical aircraft has been determined, an Airport Reference Code (ARC) that will be referenced throughout this chapter is established based on specific characteristics of the selected critical aircraft. The FAA source document that will be used to determine an ARC is FAA Advisory Circular (AC) 150/5300-13, Change 9, *Airport Design.* According to the design circular, the two characteristics defining the ARC are aircraft approach speed and aircraft wingspan that are shown in **Tables 4-7 and 4-8.**

TABLE 4-7
AIRCRAFT APPROACH CATEGORIES

Category	Approach Speed (knots)
A	<91
B	91 – 120
C	121 – 140
D	141 – 164
E	≥166

Source: FAA AC 150/5300-13 Change 9.

TABLE 4-8
AIRPLANE DESIGN GROUPS

Design Group	Wingspan (feet)
I	<49
II	49 – 78
III	79 – 117
IV	118 – 170
V	171 – 213
VI	214 - 262

Source: FAA AC 150/5300-13 Change 9.

At TYR, there are three active runways with unique operational characteristics. Runways 13-31 and 17-35 are designed to accommodate B-II aircraft, while Runway 4-22 is designed to accommodate D-II aircraft. Since these runways have historically used different ARCs, it is likely that alternative critical aircraft designations for the three runways will continue throughout the 20-year planning period.

As previously noted, Runway 17-35 was designed to meet the criteria associated with ARC B-II. Operational activity on Runway 17-35 is primarily limited to general aviation activity, primarily consisting of a mix of small single-engine piston aircraft and some limited multi-engine piston aircraft activity. However, commercial aircraft occasionally use Runway 17-35 when prevailing winds favor this runway.

RUNWAY REQUIREMENTS

As the primary airfield facility at any airport, a runway should have the proper width, length, and strength to safely accommodate the critical aircraft type(s) expected to use the airfield. In general, as the primary airfield facility at any airport, a runway should have the proper length, width, and strength to safely accommodate the critical aircraft type(s) expected to use the airfield. FAA AC 150/5300-13, Change 9, *Airport Design,* and the FAA Airport Design software, Version 4.2D, provide guidance in determining the runway length required at an airport facility. Runway width and length requirements are presented in Chapter 3 of the Airport Design Circular. These design standards are based on the critical aircraft's approach category, design group, and the approach visibility minimums.

Pavement strength is predicated upon the critical aircraft's weight and how that weight is distributed through the landing gear configuration. Pavement evaluations establish load bearing capacity for expected operations, assess the ability of pavements to support significant changes from expected volumes or types of traffic, and determine the condition of existing pavements for use in the planning or design of improvements that may be required. Pavement strength determines the maximum load bearing that the runway could sustain, and is dependent upon the aircraft's undercarriage configuration: single wheel, dual wheel, tandem wheel or dual wheel tandem. As stated earlier, an evaluation of overall pavement strength based upon a pavement management assessment for the Airport is outlined in Appendix C. The results of this assessment were used to prioritize future pavement improvements at TYR. Currently, the Airport intends to undertake the rehabilitation of Runway 4-22 in the next two to four years in conjunction with its planned runway safety area improvement program.

Typically, projects to rehabilitate runway pavements are routinely conducted every 15 to 20 years after the previous major rehabilitation, strengthening, or new construction. These projects, which repair damage to the runway pavements resulting from normal wear, need to be conducted even at airports with a scheduled pavement maintenance program, including crack sealing and surface seal coats.

In addition to issues associated with the physical characteristics of the runway are other safety-related criteria tied to the requirement for a Runway Safety Area, Runway Object Free Area, and Runway Protection Zone. The FAA definitions for these surfaces are defined as:

> **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, overrun, or excursion from the runway. The RSA needs to be: (1) cleared and graded with no potentially hazardous ruts, humps, depressions, or other surface variations; (2) drained by grading or storm sewers to prevent water accumulation; and (3) capable, under dry conditions of supporting the occasional passage of aircraft without causing structural damage to the

aircraft. Finally, the RSA must be free of objects, except for those that need to be located in the safety area because of their function.

Runway Object Free Area (ROFA) - The ROFA is centered on the runway centerline. Standards for the ROFA require clearing the area of all ground objects protruding above the RSA edge elevation. Except where precluded by other clearing standards, it is acceptable to place objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes and to taxi and hold aircraft in the ROFA. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the ROFA. This includes parked airplanes and agricultural operations.

Runway Protection Zone (RPZ) - A RPZ, or clear zone as it was formerly named, is a two-dimensional trapezoidal shaped area beginning 200 feet from the usable pavement end of a runway. The primary function of this area is to preserve and enhance the protection of people and property on the ground. The size or dimension of the runway protection zone is dictated by guidelines set forth in FAA AC 150/5300-13, Change 9. Airports are required to maintain control of each runway's RPZ. Such control includes keeping the area clear of incompatible objects and activities. While not required, this control is much easier to achieve and maintain through the acquisition of sufficient property interests in the RPZs.

The dimensions of the RSA, ROFA and RPZ are a function of an approach category and airplane design group and as well as the minimums associated with the most critical approach to the runway. TYR operates three runways, Runway 13-31 and Runway 17-35 with the same ARC designation of B-II and the third, Runway 4-22, designated with an ARC D-II.

RUNWAY LENGTH ANALYSIS

A runway is the principal facility of an airfield, as it serves as the primary method for aircraft to access an airport. To safely accommodate aircraft operations, it is vital to ensure that the runway has the proper length, width and strength to meet demand. In this section, the existing runway length was analyzed to determine if the runway could safely accommodate both existing and future critical aircraft requirements.

The existing runway lengths at TYR are: 13-31 (5,201 feet), 17-35 (4,849 feet), and 4-22 (7,199 feet). Runway length and width requirements are presented in FAA AC 150/5300-13, Change 8, *Airport Design*. These design standards are based upon a critical aircraft's approach speed, wingspan and the approach minimum for that runway. Based upon discussions with management, an ARC D-III group aircraft represents the most demanding aircraft (e.g. "critical aircraft") expected to use the airfield in the future.

The runway length analysis was conducted in accordance with the guidelines provided in FAA AC 150/5325-4A, *FAA Airport Design Software (Version 4.2D)*, and the manufacturer's airplane characteristics manuals. These calculations consider variable conditions including airport elevation, mean temperature, stage length and runway gradient that impact runway length requirements. The runway length determination also weighed critical aircraft data such as payload, landing and takeoff weight.

Runway length requirements were initially calculated for the critical class aircraft using FAA AC 150/5325-4A and the FAA's Airport Design Software. Use of this analysis provided a general picture of runway length for various groups of aircraft and provided a starting point for the review. This initial analysis was based on the following assumptions and specific TYR data:

Airport Elevation	544 feet
Mean Daily Maximum Temperature of the Hottest Month	96° F
Maximum Difference in Runway Centerline Elevation	15 feet
Average Length of Haul	500 – 1,000 – 1,500 miles
Runway Conditions	Wet and Slippery

In order to obtain an accurate estimate of required runway lengths over the next 20 years, the runway length analysis evaluated three different scenarios. Each scenario gauged the runway length requirement based upon different stage lengths associated with either existing or forecast changes in Airport operations.

Scenario One: Runway length requirements were determined based upon the existing commuter fleet mix as well as stage lengths. Currently, commuter airlines operating at TYR provide direct service to Dallas/Fort Worth International Airport and Bush Intercontinental Airport, which represents haul lengths of 100 and 150 miles, respectively. Since the FAA Software requires a minimum stage length of 500 miles, runway length calculations are based upon this minimum 500-mile stage length. The results are displayed in **Table 4-9**.

TABLE 4-9
SCENARIO 1: RECOMMENDED RUNWAY LENGTH

Design Group	Wingspan (feet)
Small airplanes with approach speeds of less than 30 knots	320 feet
Small airplanes with approach speeds of less than 50 knots	840 feet
Small airplanes with less than 10 seats:	
75 percent of these small aircraft	2,750 feet
95 percent of these small aircraft	3,290 feet
100 percent of these small aircraft	3,940 feet
Small airplanes with more than 10 seats:	4,470 feet
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60 percent useful load	5,500 feet
75 percent of these large airplanes at 90 percent useful load	7,370 feet
100 percent of these large airplanes at 60 percent useful load	6,030 feet
100 percent of these large airplanes at 90 percent useful load	9,480 feet
Airplanes of more than 60,000 pounds	Approximately 5,200 feet

Source: FAA Airport Design Software, Version 4.2D, 2005.

From the calculations, the runway system can accommodate the safe operation of most aircraft traveling over a stage length of 500 miles. The FAA model states that TYR can safely accommodate 75 percent of large airplanes at 90 percent useful load, and 100 percent of large aircraft at 60 percent useful load.

Scenario Two: Scenario two assumes that TYR will attract new airline service, and, as a result, stage length will increase to 1,000 NM. Again, using the FAA Runway Length Software, the calculated runway lengths required for a stage length of 1,000 miles is depicted in **Table 4-10.**

TABLE 4-10
SCENARIO 2: RECOMMENDED RUNWAY LENGTH

Design Group	Wingspan (feet)
Small airplanes with approach speeds of less than 30 knots	320 feet
Small airplanes with approach speeds of less than 50 knots	840 feet
Small airplanes with less than 10 seats:	
75 percent of these small aircraft	2,750 feet
95 percent of these small aircraft	3,290 feet
100 percent of these small aircraft	3,940 feet
Small airplanes with more than 10 seats:	4,470 feet
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60 percent useful load	5,500 feet
75 percent of these large airplanes at 90 percent useful load	7,370 feet
100 percent of these large airplanes at 60 percent useful load	6,030 feet
100 percent of these large airplanes at 90 percent useful load	9,480 feet
Airplanes of more than 60,000 pounds	Approximately 6,180 feet

Source: FAA Airport Design Software, Version 4.2D, 2005.

From the calculations, it is clear that the existing runway system offers sufficient length for the safe operation of most aircraft traveling over a stage length of 1,000 miles. Based upon the FAA calculations, the airfield can safely accommodate 100 percent of large airplanes at a 60 percent useful load.

In addition to commuter airline traffic, TYR receives a significant amount of corporate aircraft traffic. TYR is located almost midway between the east coast and the west coast of the country. Therefore, a significant amount of corporate jet traffic utilizes the Airport for refueling or as a "rest stop" between coast-to-coast flights. To determine the runway lengths necessary to safely accommodate various corporate aircraft, a stage length of 1,500 NM was used. Again,

using the *FAA Runway Requirement Design Software*, the following runway length requirements were determined based upon a 1,500 NM stage length.

Scenario Three: Scenario three assumes that corporate jet aircraft will continue to utilize TYR as a refueling stop on transcontinental flights between the east and west coasts of the U.S. As a result, a stage length of 1,500 NM was considered. Again, using the FAA Runway Length Software, the calculated runway lengths required for a stage length of 1,500 miles is depicted in **Table 4-11**.

TABLE 4-11
SCENARIO 3: RECOMMENDED RUNWAY LENGTH

Design Group	Wingspan (feet)
Small airplanes with approach speeds of less than 30 knots	320 feet
Small airplanes with approach speeds of less than 50 knots	840 feet
Small airplanes with less than 10 seats:	
75 percent of these small aircraft	2,750 feet
95 percent of these small aircraft	3,290 feet
100 percent of these small aircraft	3,940 feet
Small airplanes with more than 10 seats:	4,470 feet
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60 percent useful load	5,500 feet
75 percent of these large airplanes at 90 percent useful load	7,370 feet
100 percent of these large airplanes at 60 percent useful load	6,030 feet
100 percent of these large airplanes at 90 percent useful load	9,480 feet
Airplanes of more than 60,000 pounds	Approximately 7,070 feet

Source: FAA Airport Design Software, Version 4.2D, 2005.

According to the results of this analysis, TYR has only sufficient runway length to handle 75 percent of the large airplanes over 60,000 pounds at a 60 percent useful load.

The runway lengths were calculated using the FAA Airport Design Software, Version 4.2D; however, this program only provides a rough estimate that is commonly used for long-term planning purposes. Therefore, it should be noted that these calculated runway lengths are often shorter than designated manufacturer and insurance company requirements. In order to obtain a more accurate runway length requirement, the FAA recommends in AC 150/5325-4A, that individual length analyses be conducted for critical aircraft operating at the airport.

As a result, the critical runway length was obtained from manufacturer specifications. Using a number of variables, such as temperature, airfield elevation, and aircraft load characteristics, the aircraft specification manuals provide more realistic and accurate runway length requirements based upon aircraft demand.

Table 4-12 lists critical aircraft that currently operate or are expected to operate at TYR in the foreseeable future. The runway length requirements data obtained from the manufacturer was for Maximum Takeoff Weight (MTOW), at sea level and with standard ISA temperature (59° F). As a result, these runway length specifications were adjusted to meet the specific temperature and elevation characteristics at TYR. Since the air becomes less dense the greater the elevation above sea level, this lack of air density requires greater runway length and airspeed for aircraft to become airborne. Using an adjustment rate of 7 percent per 1,000 feet above sea level, the runway length requirements for TYR were increased by 3.87 percent.

Higher temperatures also have an adverse affect on aircraft performance, especially jet turbine aircraft. Jet engines rely on the difference in temperature outside and inside the engine to produce thrust. Therefore, as the outside temperature increases, the engine becomes less efficient and requires more runway length to build the thrust necessary to get the aircraft airborne. The runway length is adjusted for temperature by increasing the length at a rate of 1 percent for every 1 degree Celsius. The mean temperature on the hottest day of the month at TYR is 96° F or 35.55° C, while the ISA temperature at sea level is 59° F or 15° C. This is a difference of 37° F or 20.55° C. Therefore, the runway length is increased by a factor of 20.55 percent.

Finally, runway length was calculated under wet pavement conditions since aircraft often divert to TYR during inclement weather conditions. Wet pavement requires additional runway length. To simulate wet pavement conditions, a 15 percent increase was applied to the previously calculated runway lengths. The results of these calculations are also depicted in **Table 4-12**.

Runway 13-31

As reflected in Chapter 2, Inventory, Runway 13-31 is the primary instrument runway with an overall length of 5,201 feet and width of 150 feet. Currently Runway 13 has precision instrument approach capability, while Runway 31 is limited to a straight-in non-precision instrument approach with not lower than one statute mile approach visibility minimums. Runway 13-31 is designated to accommodate aircraft meeting ARC B-II design criteria.

Runway 13-31 currently has, and will continue to have an ARC of B-II. Criteria contained in FAA AC 150/5300-13, Change 9, states that ARC B-II runways with approach visibility minimums of below ¾ miles visibility require a minimum width of 100 feet. In addition, it states that the runway should have 10-foot paved shoulders and runway blast pad configuration of 95 feet by 150 feet. Since the airport supports a variety of operations, the current runway width of Runway 13-31 is 150 feet. Therefore, the current 150-foot width of Runway 13-31 is more than adequate to meet planning period demand, and any future extension should be planned to match the existing pavement width configuration.

TABLE 4-12
RUNWAY LENGTH CALCULATION

Aircraft	MTW[1]	Manufacturer's Runway Length Recommendation[2]	Calculated Runway Length Requirement[3]	Wet Runway Length Requirement[4]
EMB-120	26,443	5,118	6,409	7,370
EMB-135	44,092	5,774	7,230	8,314
EMB-140	46,517	6,070	7,601	8,741
EMB-145	48,501	7,448	9,326	10,725
Gulfstream IV	74,600	5,450	6,824	7,848
Gulfstream V	90,500	5,990	7,500	8,625
Challenger 600	48,200	5,700	7,137	8,208
ATR-42	41,005	3,822	4,786	5,504
CRJ-200	51,000	5,010	6,273	7,214
Global Express	98,000	6,190	7,751	8,913
Challenger 604	48,200	5,840	7,313	8,409
Falcon 2000	39,700	4,890	6,123	7,041
Falcon 900DX	46,700	4,890	6,123	7,041
Hawker 800	28,000	5,030	6,298	7,243
Citation X	36,100	5,140	6,436	7,401
BBJ	171,000	6,950	8,702	10,008
ACJ	166,450	6,300	7,889	9,072

Source: The LPA GROUP INCORPORATED, 2005

Runway 13-31 Width Requirements

A runway designed to accommodate ARC B-II aircraft with a precision approach landing system with less than ¾-statute mile visibility, requires a width of 100 feet based upon FAA design criteria. In review of the previous Master Plan, the recommended ARC for the future of Runway 13-31 was to remain an ARC of B-II. If, at some point over the course of the 20-year planning period the Airport desires to change the critical aircraft design criteria from an ARC B-II to a C-III, then the pavement will need to be strengthened to allow for the operation of aircraft with a certificated takeoff weight greater than 150,000 pounds. This change in airport reference code would also impact the widths of the runway shoulders and blast pad. Based upon FAA airport design criteria, runway strength and dimensional requirements associated with ARC C-III or D-III are shown in **Table 4-13**.

Although Runway 13-31 serves ARC B-II aircraft, the existing runway dimensions currently meet the C-III requirements. Since Runway 13-31 is intended to continue to serve aircraft with a certificated takeoff weight equal and/or less than 100,000 pounds and within Aircraft Approach Category "B" limits, the current 150-foot runway width exceeds FAA runway width design criteria for ARC B-II. Therefore, it is recommended that no change should be conducted to alter its width throughout the planning period. Pavement strength will be discussed later in this section.

Runway 13-31 Safety Criteria

With an ARC B-II designation, Runway 13-31 has a published length of 5,200 feet by 150 feet in width and is equipped with a Category I/ILS precision approach lighting system which provides a visibility minimum of less than 3/4-statute mile. Therefore based upon the safety area requirements outlined in FAA AC 150/5300-13, Change 9, the RSA and ROFA dimensions were based upon the precision instrument approach requirements. However, since Runway 13 is designated as a precision approach and Runway 31 is designated as non-precision approach with visibility minimums greater than 3/4-statute mile, the RPZ zone dimensions associated with each of these runways is different. Based upon the criteria outlined in the AC, the safety area dimensions associated with Runway 13-31 are outlined in **Table 4-13**:

TABLE 4-13
RUNWAY 13-31 RUNWAY SAFETY AREA CRITERIA

Runway	Approach	Dimensions RSA (in feet)	ROFA (in feet)	RPZ (in feet)
Runway 13	Precision	300 x 600	800 x 600	1,000 x 1,750 x 2,500
Runway 31	Non-Precision	300 x 600	800 x 600	1,000 x 1,510 x 1,700

Source: FAA AC 150/5300-13, Change 9

Runway 4-22

Runway 4-22 is designated the primary runway based upon length and has a published length of 7,199 feet and 150 feet in width. Runway 4-22 is primarily utilized during the spring and summer due to southerly winds. Runway 4-22 is designed to accommodate ARC D-II design aircraft. The runway is constructed of asphalt and is rated to accommodate single wheel capacity of 40,000 pounds, dual wheel capacity of 60,000 pounds, and dual tandem wheel of 100,000 pounds.

As mentioned earlier, the ARC for Runway 4-22 is expected to remain an ARC D-II throughout the remainder of the planning period. Currently, Runway 4 and 22 have a straight-in non-precision instrument approach, with not lower than 1-statute mile approach visibility minimums. Ultimately, it should be planned for Runway 4-22 to have approach visibility minimums, possibly lower than ¾ of a statute mile on one end or the other. The possibility for better instrument approaches is discussed later. Criteria contained in FAA AC 150/5300-13, Change 9, states that runways with an ARC of C-II or D-II are required to have a width of at least 100 feet, for any type of instrument approach. Therefore, the current runway width of 150 feet more than adequately meets existing and anticipated operational requirements for the planning period.

Runway 4-22 Width Requirements

Based upon the runway design requirements stated in FAA AC 150/5300-13, Change 9, for an ARC D-II aircraft, Runway 4-22 is required to have a runway width of 100 feet. Runway 4-22, however, currently has a width of 150 feet, thus exceeding FAA's design standards. Based upon a review of the previous Master Plan as well as recommendations outlined in the preceding chapters, it was recommended that the ultimate airport reference code for Runway 4-22 would be a D-III with a pavement strength rating of 150,000 pounds.

In reviewing FAA runway design criteria associated with ARC C-III and D-III aircraft, the dimensional requirements vary based upon the aircraft's maximum certificated takeoff weight. As a result, and, as outlined in **Table 4-14**, runway width will increase from 100 to 150 feet. Therefore, the current runway width for Runway 4-22 meets the design requirements associated with heavier aircraft usage. In addition to the standard runway width dimensions, dimensional requirements associated with runway shoulders and blast pads will also need to be greater in size to accommodate the demands of the heavier aircraft. **Table 4-14**

outlines the dimensional standards associated with C and D-III aircraft with less than and greater than 150,000 pounds. A review of Runway 4-22 existing dimensional standards shows that the Runway 4-22 currently meets all applicable design standard requirements associated with a heavier aircraft. Even though runway blast pads are recommended, they do not currently exist, at the time of this writing, on Runway 4-22.

TABLE 4-14
COMPARISON OF FAA RUNWAY DESIGN STANDARDS

Runway Dimensions	C and D-III Runway Design Standards (feet)	
	150,000 lbs or less	Greater than 150,000 lbs
Runway Width	**100**	**150**
Runway Shoulder	**20**	**25**
Runway Blast Pad Width	**140**	**200**

Source: FAA AC 150/5300-13, Change 9

Since Runway 4-22 meets the FAA design requirements associated with C and D-III aircraft, it is recommended that future runway improvements, such as, pavement rehabilitation be based on the current 150-foot runway width. The increase in airport reference code to a D-III would allow for the operation of aircraft such as the Boeing B737 series, the Boeing Business Jet (B 737) for corporate general aviation and the Airbus A330, which all exceed the 150,000-pound threshold.

Runway 4-22 Safety Criteria

Since Runway 4-22 is designed to accommodate ARC D-II design aircraft, it should have a RSA width of 500 feet, and OFA width of 800 feet. In addition, according to AC 150/5300-13, Change 9, both the RSA and OFA should extend 1000 feet beyond the runway threshold, unless the provision of a safety area of this dimension is not technologically feasible nor considered viable due to the existing conditions and costs versus benefits of providing the RSA.

However, an analytical study of the standard RSA on Runway 4-22 revealed some concerns. On the Runway 4 approach end, the RSA extends beyond the pavement end, enclosing the Airport Operations Area (AOA) as well as Pleasant Retreat Road. As a result of existing obstructions within the Runway 4 RSA, the existing RSA length is 476 feet rather than the required 1,000 feet. Similarly, Runway 22 RSA extends only 705 feet beyond its pavement end, due to the location of the AOA and two roadways, State Highway 64 and Dixie Drive. According to FAA AC 150/5300-13, Change 9, when the standard RSA dimensions are not met, a continuous evaluation of all practicable alternatives for improving each sub-standard RSA is required until it meets all standards for grade, compaction, and object frangibility. Options for meeting the FAA's RSA requirements will be evaluated as part of the alternatives component of this study.

In addition to the non-standard RSA, the existing ROFA was also found to be deficient when compared to the FAA standards. Currently, the existing ROFA dimensions for Runway 4 are 800 feet x 327 feet, which is a deficiency of approximately 673 feet. Runway 22 also has a non-standard ROFA with dimensions of 800 feet by 618 feet, which is a deficiency of 382 feet. Therefore, at the writing of this report, TYR currently operates Runway 4-22 with a non-standard RSA and ROFA off both ends.

The RPZ's for an ARC D-II with a non-precision approach (visibility minimums not lower than ¾-statute mile) needs to extend 200 feet beyond the end of the area usable for takeoff or landing and for both ends of Runway 4-22. It must have an inner width of 1,000 feet, an outer width of 1,510 feet and an overall length of 1,700 feet for aircraft safety. However, due to the relatively close proximity of State Highway 64 and Pleasant Retreat Road, both RPZs are impacted. An evaluation of the FAA Part 77 Imaginary Surfaces revealed that no hazard to air navigation associated with either of these roads was determined. **Table 4-15** summarizes the key dimensional and design requirements relative to Runway 4-22.

Runway 17-35

Runway 17-35 is designated as the crosswind runway at TYR, and is primarily used by general aviation aircraft. Runway 17-35 provides the greatest wind coverage and has a published length of 4,850 feet and width of 150 feet. This runway is designated as an ARC B-II. According to the Airport Facility Directory, Runway 17-35 is rated to accommodate single wheel bearing capacity of 40,000 pounds, dual wheel capacity of 60,000 pounds and dual tandem wheel of 100,000 pounds.

Since Runway 17-35 is also designated as an ARC of B-II, it will require a minimum width of 75 feet. In addition, it will require 10-foot paved shoulders and runway blast pads of 95 feet x 150 feet. Since it is the intent that Runway 17-35 will remain a B-II Runway for the remainder of the planning period, its current width of 150 feet more than adequately meets the runway width requirements as designated in AC 150/5300-13, Change 9. Again, any future extension of Runway 17-35 should match the existing pavement configuration width.

Runway 17-35 Width Requirements

Like Runway 13-31, Runway 17-35 is designed to accommodate ARC B-II aircraft. However, Runway 17-35 is a visual only approach with no less than 1-statute mile visibility requirements. As a result, based upon the design criteria outlined in FAA AC 150/5300-13, Change 8, Runway 17-35 requires a width of only 75 feet. Thus, Runway 17-35 exceeds the minimum design requirements.

A review of the previous Master Plan recommended "no change" in the designation of the current airport reference code. The same recommendation was also stated in the preceding alternatives chapter. Thus, with no change in the airport reference code forecast during the master planning period, dimensional changes to the Runway 17-35 are not required.

Runway 17-35 Safety Criteria

Runway 17-35 with an ARC B-II designation is the smallest of all three runways with dimensions of 4,850 feet in length and 150 feet in width. As a runway that only supports visual approaches, the runway is required to have a RSA measuring 150 feet in width (75 feet either side of the runway centerline) and extends 300 feet in length beyond the runway end. The required ROFA should be 500 feet wide and also extends 300 feet in length beyond runway end. Since Runway 17-35 is designated for small aircraft only with an approach visibility of not lower than 1-statute mile, the required RPZ dimensions should have an inner width of 250 feet, an outer width of 450 feet and an overall length of 1,000 feet. Runway 17-35 meets all applicable FAA standards for RSA, ROFA and RPZs. **Table 4-15** summarizes the key dimensional and design requirements relative to Runway 17-35.

TABLE 4-15
SAFETY AREA CRITERIA

	Runway 13-31 (ARC B-II)	Runway 4-22 (ARC D-II)	Runway 17-35 (ARC B-II)
Runway Length (Ft)	5,201	7,199	4,850
Runway Width (Ft)	150	150	150
Runway Shoulder (Ft)	10	25	10
Runway Blast Pad Dimensions (Ft)	120' x 150'	120' x 150'	95' x 150'
Standard ROFA (Ft)	800' x 600'	800' x 1000'	500' x 300'
Standard RSA (Ft)	300' x 600'	500' x 1000'	150' x 300'
Standard RPZ (Ft)	2,500 x 1,000 x 1,750 1,700 x 1,000 x 1,510	1,700' x 1,000' x 1,510' 1,700' x 500' x 1,010'	1,000' x 250' x 450'
Existing ROFA Dimensions (Ft)	800' x 600'	800' x 327' (Rwy 4) 800' x 618' (Rwy 22)	500' x 300'
Existing RSA Dimensions (Ft)	300' x 600'	500' x 476' (Rwy 4) 500' x 705' (Rwy 22)	150' x 300'
Obstructions	None	Fencing	None

Source: THE LPA GROUP INCORPORATED, 2005

Pavement Strength

According to the current FAA Airport Facility Directory (2005), the following pavement strengths, based upon specific landing gear configuration, were listed for TYR.

- 40,000 pounds for single-wheel
- 60,000 pounds for dual-wheel
- 100,000 pounds for dual tandem

An assessment of pavement conditions including key findings and pavement strength for each runway is provided in the Appendix of this report. Thus, based upon current and future aircraft operational fleet mix, a brief description of runway pavement strength is discussed below.

Runway 4-22

The existing strength of Runway 4-22 is adequate to meet the weight demand of the current aircraft fleet mix as well as the occasional operation of a Boeing B737 aircraft. However, even though Runway 4-22 is designated as the primary runway based upon length, its existing pavement strength is inadequate to meet future operational demand. Based upon previous analysis, Runway 4-22 should be upgraded to accommodate ARC D-III aircraft with MTOW greater than 150,000 pounds. Thus, Runway 4-22 will need to be extended to safely accommodate projected future aircraft operations as outlined in Scenario 3 and **Table 4-6**, and strengthened/overlaid to accommodate projected aircraft weight requirements.

At the time of this writing, the runway pavement was reported in good condition and was last overlaid in 1992. Nevertheless, to ensure the integrity and useful life expectancy of the pavement, it is essential to continue routine maintenance.

Runway 13-31

Runway 13-31 is termed as the primary instrument runway, and its pavement strength ratings are sufficient to serve the current operational aircraft fleet mix at TYR. Based upon a recent site visit, the pavement strength was reported in good condition. A review of airport records indicated that the pavement was overlaid in 1992.

Since Runway 13-31 will continue to accommodate B-II aircraft, no pavement strengthening is required. However, to ensure the useful life expectancy of the runway and to prevent costly repairs, it would be recommended that the Airport establish a Pavement Maintenance/Management Program.

Runway 17-35

With a length of 4,849 feet, Runway 17-35 is the shortest runway and least frequently used. Runway 17-35 is primarily used by single-engine and limited multi-engine GA aircraft. Although commercial aircraft occasionally use the runway under favorable wind conditions, the runway aircraft designation will remain a B-II.

During a site visit, August 2004, the pavement was reported to be in fair to poor condition with isolated areas of distress, cracking and depressions. The approach end of Runway 35 exhibits the worst pavement conditions of all three runways, but a visual observation indicated no evidence of base failures. It is recommended that the entire runway be rehabilitated in the near future due to its condition.

Since an increase in the airport reference code was not recommended for Runway 17-35, the existing pavement dimensions and strength will remain unchanged However, due to the Runway's proximity to the new terminal and other projected future development, use of Runway 17-35, not projected within this master plan, may occur. At such time, it is recommended that a runway analysis be performed to assess future operational demand.

Line of Sight

Line of sight on an airfield is absolutely essential to ensure the safe operation of aircraft regardless of its state of motion. In examining the ALP, there exist a line of sight issue associated with trees located between the approach ends of Runways 4 and 31. It is recommended that these trees be permanently removed from their current location and the site remained clear of future development.

Taxiway System Requirements

An efficient taxiway system is designed to provide freedom of movement between aviation-related facilities and the runway system. This taxiway system includes entrance and exit taxiways, taxiway run-up areas, apron taxiways and taxilanes. The width of a taxiway is determined from the wingspan of the critical aircraft design group utilizing the runway. Some of the basic design principles for a taxiway system as provided by FAA guidance include the following:

- Provide each active runway with a full parallel taxiway
- Construct as many by-pass, multiple access, or connector taxiways as possible to each runway
- Provide taxiway run-up areas for each runway
- Build all taxiway routes as direct as possible
- Provide adequate curve and fillet radii for the operational fleet mix
- Avoid developing areas that might create ground traffic congestion

Even though Runways 13-31, 17-35 and 4-22 have differing ARCs, the required width for taxiways serving the three runways is the same. Based upon the minimum standards, all taxiways serving operational activity of a runway with ADG II, will require a 35-foot wide taxiway pavement. Therefore, all taxiways at TYR exceed applicable FAA standards. It has been noted that on some occasions, large commercial aircraft have conducted operations on Runway 13-31 due to its precision approach landing system, but not frequently enough to justify increasing the existing taxiway widths. Besides, with a taxiway width of 50 feet, it can support aircraft with a wingspan of 79 – 117 feet in ADG III, but with a wheelbase less than 60 feet.

Those taxiways serving, or ultimately proposed to serve the alignment of all three runways must also conform to the Taxiway Safety Area (TSA) and Taxiway Object Free Area (TOFA) criteria associated with Aircraft Design Group II. As stated in FAA AC 150/5300-13, Change 9, these taxiways should have a TSA, centered on the taxiway centerline, of 79-feet and a TOFA of 131 feet in width. These dimensional standards were utilized to review existing and proposed taxiway system that is delineated in the following sections.

As with runway pavements, the rehabilitation of taxiway pavements is anticipated over the course of the planning period. A recently completed visual inspection of the taxiway pavements in August 2004 revealed the following results. The taxiway that serves the new Passenger Terminal apron is in good condition and while several others, notably, Taxiway B and E that are directly connected to Runway 17-35 are in relatively poor condition. Both of these taxiways display existing deteriorating conditions that can be associated to the seldom utilization of Runway 17-35. Therefore, it is anticipated that for the taxiway serving the new Terminal, rehabilitation will probably occur in the next 10 to 20 year timeframe. For Taxiways B and E, immediate rehabilitation will be needed as property located on the northwestern portion of the airfield is forecast for future general aviation development. It is absolutely essential that routine maintenance be continued on an annual basis to ensure the protection of the pavement and to enhance the life expectancy of the taxiways. The location and configuration of the existing airfield, including the location of the three runways and all existing taxiways, are shown in **Exhibit 4-3** of this report.

EXISTING AIRFIELD FACILITIES

EXHIBIT 4-3

TYLER POUNDS
REGIONAL AIRPORT

MASTER PLAN UPDATE

Taxiway A

Taxiway A is a partial parallel taxiway located on the northeast side of Runway 13-31 and is directly connected to the Runway 13 threshold. It provides access to the former terminal area and Fixed Base Operator (FBO) facilities located north of the airfield. Taxiway A intersects Taxiways B, C, and F and then terminates at the former terminal apron. As previously mentioned above, taxiways serving runways with an ARC B-II designation require a width of 35 feet. In addition, FAA standards specify that taxiways serving runways with lower than ¾-statute mile approach visibility minimums and with an ARC B-II designator, require a runway centerline to parallel taxiway centerline separation of 300 feet. Currently the width of Taxiway A is 50 feet and the runway centerline to parallel taxiway centerline separation is 375 feet, which both exceed FAA standards. Due to the importance and high use of this taxiway serving the only instrument runway at TYR, it should be rehabilitated during the planning period.

Taxiway B

Taxiway B runs from the former terminal apron and connects to Taxiway A, Runway 13-31 and Runway 17-35. The portion of the taxiway that is between Runway 13-31 and Runway 17-35, with an approximate length of 1,134 feet, is seldom used due to limited utilization of Runway 17-35. Therefore, the portion of Taxiway B that connects to the former terminal apron is primarily used as a turnoff taxiway for aircraft exiting Runway 13-31 after landing. Taxiway B has an ARC D-II designation and is, therefore, required to meet the standards outlined in **Table 2-2** of FAA 150/5300-13, Change 9. This taxiway also exceeds the FAA required standards for taxiway width by 15 feet and runway centerline to taxiway centerline separation distance by 75 feet.

A site visit and investigation revealed that Taxiway B is partially lighted and has no lights west of Runway 13-31, but reflective pavement markers are located along the centerline.

Taxiway C

Taxiway C is a partial parallel taxiway that begins at the Runway 22 threshold and connects with the former terminal apron. Taxiway C can be used by aircraft entering and exiting Runway 4-22, and also provides access for aircraft transitioning to Taxiway H via the threshold end of Runway 22. As stated above, taxiways serving runways designated with an ARC D-II require a width of 35 feet. In addition, FAA standards specify that taxiways serving visual runways and runways with not lower than ¾-statute mile approach visibility minimums with an ARC D-II designator, require a runway centerline to parallel taxiway centerline separation of 300 feet. Currently the width of Taxiway A is 50 feet and the runway centerline to parallel taxiway centerline distance is 375 feet, which both exceed FAA standards.

Taxiway D

Taxiway D is perpendicular and connected to Runway 4-22 and Taxiway H. This taxiway serves both the former terminal apron and the general aviation facilities located to the northeast of the airfield. It is frequently utilized, and reported to be in good condition from the last inspection. Taxiway D has a width of 50 feet and meets FAA standards for ADG II.

Taxiway E

Taxiway E is orientated in a north/south direction and begins at the Runway 35 threshold, and provides access to Runway 4-22 and Taxiway F. As it is parallel to Runway 17-35 and primarily serves this runway, Taxiway E is seldom utilized. During the last inspection conducted in August 2004, Taxiway E pavement showed signs of weathering and cracking due to lack of use. However, runway markings were recently repainted on August 19, 2004. This taxiway is forecast to play an important role as property located northeast of the

taxiway has been reserved for future general aviation development. Further evaluation and development of the taxiway will be discussed in Chapter 6, Airfield Alternatives.

Taxiway F

Taxiway F is orientated in a northeast/southwest direction and is partially parallel to Runway 4-22. Taxiway F connects the threshold of Runway 4 to the new passenger terminal apron. Furthermore, it is connected to both Taxiway E, midfield of Runway 13-31, and Taxiway G and terminates at the former passenger terminal apron. As Runway 4-22 is considered as the primary runway based on length (7,199 feet) and with an ARC D-II, Taxiway F could be considered a primary taxiway since it provides direct access to the Runway 4 threshold. Also, since Taxiway F is designed to accommodate D-II aircraft, it exceeds all applicable FAA standards. Based upon a preliminary survey of the airfield, Taxiway F's pavement was reported in good condition. In addition, at the time of this writing, drainage improvements to the south side of Taxiway F are planned. Other improvements include the removal of reflective pavement markers along its centerline. Also, due to the importance and high use of this taxiway, pavement rehabilitation is recommended during the planning period.

Taxiway G

Taxiway G is a very short stub taxiway (approximately 462 feet in length) that originates at the cross-section (at a 90-degree angle) of Runways 13-31 and 4-22. Taxiway G provides access to Taxiway F and A. Taxiway G has a width of 50 feet, which exceeds FAA taxiway design standards for ADG II by 15 feet. Due to its relative orientation, no parallel taxiway centerline to runway centerline separation requirement applies. This taxiway was also reported in good condition. The future disposition of this taxiway will be considered during the alternatives phase of this study.

Taxiway H

Taxiway H located northeast of the airfield provides entry to the Runway 22 threshold and Runway 31 threshold. Taxiway H provides access to Taxiway D and the general aviation facilities located northeast of the airfield. Since Taxiway H runs perpendicular to both Runway 4-22 and 13-31, no parallel taxiway centerline separation requirements apply. Taxiway H has a width of 50 feet, which exceeds FAA design standards for taxiway widths associated with ADG II aircraft.

Future Taxiway Development

It is proposed that future airport developments will likely occur on areas depicted on the ALP, and, as these developments occur, it will be necessary to improve the taxiway system. For example, south and west of the airfield, development of aviation facilities might occur. Based on these developments, a taxiway system will be needed to support aircraft operations at both ends west of Runway 17-35, at the southern end of Runway 13-31, as well as provide some accessibility to Runway 4-22. The proposed taxiway would connect to the threshold end of Runway 31 and should be designed to conform to the ARC B-II standards associated with Runway 13-31. This would require a taxiway width of 35 feet and taxiway centerline to runway centerline separation of 300 feet. This perpendicular taxiway, as depicted on **Exhibit 4-3** as Taxiway J, would provide access to existing Taxiway E and Runway 4-22 via Taxiway F.

As development occurs west of Runway 17-35, it is likely that aircraft operating within this area will require access to Runways 4-22 and 13-31. Construction of a full-length parallel taxiway along the western side of Runway 17-35 would enable a safe and expeditious transition of aircraft to and from the runway and other airport facilities. The proposed taxiway, depicted on **Exhibit 4-3** as Taxiway I, would conform to ARC D-III FAA taxiway design standards. Therefore, it should have a width of 50 feet and a taxiway centerline to runway centerline separation of 400 feet. To provide access to Taxiway B, a small stub connector would be constructed perpendicular to Runway 17-

35 and Taxiway B with the necessary fillets. This stub connector will be designed to the FAA taxiway design standards for an ADG III that would require a taxiway width of 50 feet. Proposed Taxiway I will also be connected to Taxiway F (that serves Runway 4-22 and terminates at the old passenger terminal apron) and Runway 4-22. Taxiway construction should be considered at such time when demand emerges in the form of aviation-related development in the area.

Both proposed taxiways would not significantly impact existing conditions. However, as with any airfield improvement, an Environmental Assessment will be required.

Existing Apron Parking Area

As outlined in Chapter 2, the passenger terminal parking apron at TYR is approximately 26,130 SY and is located on the west end of the Airport adjacent to the terminal building. Only American Eagle, Continental Connection and any future Part 121 operators use the apron area at the commercial terminal area. Based and transient GA aircraft currently use the apron areas at Jet Center of Tyler and Johnson Aviation. The primary apron near the old terminal area provides approximately 65 multi-use tie-downs adjacent to the two Fixed Based Operators.

The northeast development area approximately 7,000 SY of apron and is constructed of asphalt, and is primarily used by Tyler School of Aviation, the Civil Air Patrol, Tyler Turbine, and three (3) on-field corporate users. There are approximately 12 tie-down spaces used for based and itinerant aircraft parking. A full analysis of apron parking demand will be discussed under terminal, air cargo and GA facility requirements.

AIRFIELD FACILITIES

The following sections address other airfield facility requirements necessary to support the existing and future increase in aircraft operations expected over the course of the master planning timeframe.

Precision Instrument Approaches

As known today, there are several types of precision instrument approach systems that are approved by the FAA for installation at airports. The most recognizable and utilized is an Instrument Landing System (ILS) that is installed at most airports around the world. The other, which is gaining in notability and has been installed at several airports, is the use of Global Positioning Satellites (GPS). The installation of a precision approach helps alleviate delays experienced at an airport during instrument meteorological conditions, thus increasing the airfield's overall annual service volume or throughput capacity. It has also been widely reported, that many aircraft operators prefer a precision approach when operating into and out of an airport facility.

Currently at TYR, there is only one precision instrument approach system and is installed on the approach end of Runway 13. Thus, it would be necessary to plan for the installation of several precision instrument approach systems. It would be applicable that Runway 4-22 would greatly benefit from the installation of a precision instrument approach system, as it is the longest primary runway serving aircraft operations at Tyler Pounds Regional Airport. It should be stated, that it is of great concern that there only exist one CAT I/ILS and if this runway becomes unusable, temporarily closed for any reason, and meteorological conditions are below approach minimums for the remaining two runways, the airport would be closed to aircraft operations. Since TYR is currently served by two regularly scheduled airlines, it has been noted that many airlines have policies to avoid flying non-precision instrument approaches. Therefore, it is recommended that one additional precision approach be included in the planning period. This would also prove to be beneficial to the numerous amount of high performance GA Jets that operate in and out of TYR.

Tyler Pounds Regional Airport should plan for the implementation of a precision instrument approach system on Runway 4-22, with lower than ¾ statute mile visibility minimums. With the installation of an ILS, current FAA standards require a 50:1 approach slope surface to any runway that has a published precision instrument approach. To properly plan, the space required to obtain the proper clearance and safety criteria associated with such an approach needs to be considered. Furthermore, an Environmental Assessment for the planned precision approach will be necessary for its implementation.

Airfield Lighting

Airfield lighting requirements are necessary at all airports intended to be utilized for nighttime operations as well as for operations during less than visual meteorological conditions. The following sections address the airfield lighting requirements at TYR over the planning period.

Identification Lighting

As noted in the Inventory – Chapter 2, the existing rotating beacon is located on top of the ATC tower located at the old terminal site. It is in operable condition but parts are becoming obsolete. A new beacon is programmed for replacement in 2004.

Runway Lighting

The High Intensity Runway Lights (HIRL) installed on Runway 13-31 and the Medium Intensity Runway Lights (MIRL) installed on Runways 4-22 and 17-35 are in good condition. Outside of routine maintenance, these fixtures are not anticipated to need any improvements until the latter part of the planning period. On Runway 17-35, the MIRLs were recently installed in year 2002. Towards the end of the planning period, the HIRL system for Runway 13-31 may require refurbishing. According to FAA AC 150/5340-24, *Runway and Taxiway Edge Lighting Systems*, HIRLs are required for those runways with precision instrument approaches. Therefore, Runway 4-22 MIRL system will have to be upgraded to an HIRL system at such time as a precision instrument approach system is installed. TYR is also planning to upgrade the runway and taxiway lighting systems by installing Pilot Controlled lighting receivers for the entire airfield lighting systems. This project was scheduled for completion in the beginning of 2006.

Taxiway, Taxilane, and Apron Lighting

All of the current taxiways, except for the western portion of Taxiway B and segment of Taxiway E south of Runway 4-22, are equipped with Medium Intensity Taxiway Light (MITL) systems. Unfortunately, all the taxiways equipped with stake-mounted lighting systems will need to be upgraded due to the deterioration of the buried cables. These deteriorated conditions were observed during the last taxiway lighting inspection. In recent years, TYR maintenance department has been aggressively upgrading and replacing all direct buried MITL cables with cable in duct when funding is available. Therefore, it should be noted that TYR Maintenance Department has taken a pro-active stance since they have been replacing directly buried cable with cable in duct. TYR is currently replacing all the taxiway lighting systems. All lights are mounted on canisters containing the transformers and all wiring is being placed in conduit. The replacement of taxiway lighting systems is scheduled for completion in early 2006.

Pavement Markings

Airport pavements are marked with painted lines and numbers in order to aid in the identification of the runways from the air and to provide information to the pilot during the approach to a runway phase of flight. All pavement markings at TYR are in good condition. As stated by the FAA, there are three standard sets of markings used depending on the type of runway:

Basic - For runways with only visual or circle to land procedures. These markings consist of runway designation markers and a centerline stripe.

Non-precision - For runways to which a straight-in, non-precision instrument approach has been approved. These markings consist of runway designation markers, a centerline stripe, and threshold markings.

Precision - For runways with a precision instrument approach. These markings consist of the non-precision markings plus aiming point markings, touchdown zone stripes, and side stripes indicating the extent of the full strength pavement.

Depending on the type of aircraft activity and physical characteristics of the pavement, additional markings may be required for any of the three categories above. The FAA also allows markings on a runway to be upgraded at any time to include elements that are not required, but may be deemed to enhance safety. Runway pavement and displaced threshold markings are painted white, while taxiway pavement markings are painted yellow. Taxiways generally have a centerline and pavement edge stripes, plus holding line markings at the entrance to a runway. FAA AC 150/5340-1H, *Standards for Airport Markings*, contains the precise details of these markings. All runway and taxiway markings periodically need to be remarked so that they remain visible to the users of the airport.

The runways at TYR currently have the proper pavement markings for the existing approaches. Both runways have designation numbers, centerline striping, threshold markings, and aiming point markers. Only Runway 13 has touchdown zone markings and side stripes to support the ILS approach. Construction of blast pads on both Runways 13-31 and 4-22 will be marked with yellow chevrons. In addition, if a precision instrument approach with runway visibility of less than ¾ statute mile is established on Runway 4-22, precision instrument runway markings and touchdown zones will need to be added. Further, as with all new construction and periodic maintenance, airfield markings will need to be repainted on a periodic basis to meet FAA safety requirements.

FAA guidelines state that all taxiways should have centerline markings and runway hold position markings whenever they intersect with a runway. As mentioned previously, all of the taxiways at TYR have visible taxiway centerline stripes with hold short lines located at all of the required locations. As with the runways, all of the taxiway markings at TYR will need to be repainted on a periodic basis. Similarly, all new taxiways, taxilanes, and aprons should have the appropriate centerline, sideline, and hold position markings required by the FAA.

Air Traffic Control

TYR has a FAA Contract Tower, which is located on the north side of the airport on the third floor of the former terminal facility. The Tower operates between the hours of 6:30 am and 9:30 pm local standard time. The former terminal building and ATCT Tower are in fair condition. Existing ATCT equipment is approximately 10-years old but is in good condition. However, as part of redevelopment of the former terminal facilities, a site selection study for the relocation of the ATC Tower is recommended.

Aircraft Rescue and Fire Fighting

Since TYR is a full-service commercial airport, it is required to maintain certain levels of Aircraft Rescue and Fire Fighting (ARFF) equipment and personnel based upon the requirements in Federal Aviation Regulation Part 139. These requirements are determined by an airport's ARFF Index, which is based upon the type of commercial service aircraft operating five or more daily departures. Aircraft, grouped by their length, are divided into the following ARFF Index categories:

- Index A includes aircraft less than 90 feet in length;
- Index B includes aircraft at least 90 feet but less than 126 feet in length;
- Index C includes aircraft at least 126 feet but less than 159 feet in length;
- Index D includes aircraft at least 159 feet but less than 200 feet in length; and
- Index E includes aircraft at least 200 feet in length.

A review of the commercial flight schedule was conducted to determine the number of daily departures per aircraft type currently operating at TYR. As a result, TYR should be classified as an Index A airport for the purposes of ARFF equipment and personnel. In the future, TYR is expected to continue to have at least five or more daily departures of narrow body regional jets such as those listed in the forecasts. Most of these aircraft fall within Index A. Thus, base on this forecast fleet mix, it is expected that the Airport will remain Index A throughout the planning period.

Minimum standards for the response time of an ARFF facility are outlined in FAA AC 150/5210-15, *Airport Rescue Firefighting Station Building Design*. These include, but are not limited to:

- Immediate, straight, and safe access towards the airside;
- Unimpeded access routes with a minimum number of turns to runways, taxiways, and aircraft parking areas;
- Direct access to terminal aprons without crossing active runways, taxiways, or difficult terrain;
- Noninterference with the ATCT line-of-sight;
- Maximum surveillance of the air operations area;
- Shortest response times to the most probable aircraft accident areas;
- Compliance with building restriction lines (BRL);
- Future additions or expansion of the station without limiting or reducing airport surveillance, blocking fire traffic lanes, or intruding on adjacent roads, buildings, aprons, runway or taxiway clearances, and air traffic control tower's line-of-sight;
- Airport expansion, such as new runways or extensions that will not jeopardize its emergency service areas by creating emergency response runs of excessive length; and
- Minimum obstructions or interference from existing facilities or uses, such as access roads, fueling areas, and aircraft taxiing operations or parking areas.

Based on the existing location of the ARFF facility and the expected growth at TYR, it is believed that the current location is adequate to maintain the response criteria mentioned above.

Electrical Vault

As the airport adds additional airfield lighting and electronic aids, the need for a newer and larger facility dedicated to the housing the airfield electrical equipment will exist. The timeframe for a new vault will depend upon the rate of airfield improvements and stress on the existing system, but should be constructed as part of one of the more significant airfield electrical improvement projects.

Airport Security Fencing

A key requirement of the Part 139 Certificate for TYR is to have the appropriate airport security fencing required under federal regulation. In order to maintain its certification, the existing fence must be maintained to preserve airfield security throughout the planning period. Likewise, as additional facilities and features are added or other enhancements to the airport occur, each project must provide the measures necessary to ensure that the integrity of the current fencing is not compromised. Each future facility development will require a determination as to whether access to secured access points is necessary. Wireless gate controls should be considered in the future.

Fuel Storage Requirements

At TYR, fuel storage associated with general aviation, military and commercial aviation aircraft are located on the northeast and northwest quadrants of the airport. Both FBOs, the Jet Center of Tyler and Johnson Aviation, provide 100LL and Jet A fuel service. In addition, some tenants maintain their own fuel facilities. Based upon discussions with a Jet Center of Tyler representative, the FBO has exclusive contracts to provide fuel services to both the commercial airlines and military aircraft at TYR. Fuel delivery by both FBOs is provided through the use of fuel trucks. **Table 4-16** outlines the current fuel facilities at TYR.

TABLE 4-16
EXISTING FUEL FACILITIES

Service Provider	Content	Capacity (Gallons)	Storage Type
Johnson Aviation	Jet A	12,000	Underground
	100LL (Avgas)	12,000	Underground
	Jet A	3,000	Fuel Truck
	100LL (Avgas)	2,000	Fuel Truck
Jet Center of Tyler	Jet A	10,000	Above Ground
	Jet A	10,000	Above Ground
	Jet A	10,000	Above Ground
	100LL	10,000	Above Ground
	Jet A	3,000	Fuel Truck
	Jet A	3,000	Fuel Truck
	100LL	2,000	Fuel Truck

Source: 2004 Airport Surveys, Tyler Pounds Regional Airport

Based upon fuel consumption provided by Airport Management and the FBOs, a correlation between historical operations and fuel consumption was determined. In order to forecast future fuel storage requirements, historical 100LL and Jet A fuel flowage was compared to historical piston and turbine operations. This provided fuel to operations ratios that were used to estimate future fuel demand based upon the forecast operational fleet mix. According to ATCT management, annual GA jet operations have averaged approximately 20-25 percent of the total GA operational traffic over the last decade. Thus, 25 percent was used as a representative figure to estimate GA turbine operations throughout the 20-year planning period. Further, based upon historical data, commercial operations and military turbine operations represent approximately 17 percent of total operations at TYR. Thus, using this information, average fuel ratios for Jet A and 100LL were determined as follows:

- Each GA turbine operation requires on average 9.12 gallons of Jet A
- Each commercial and military jet operation on average requires 86.74 gallons of Jet A
- Each GA piston operation requires on average 3.19 gallons of 100LL

Based upon the average fuel to operation ratio, future fuel demand utilizing the fleet mix forecast for the 20-year planning period was developed and illustrated in **Table 4-17**. Based upon these fuel calculations, it was estimated that in excess of 1.2 million gallons of Jet A fuel will be sold annually by 2014.

TABLE 4-17
AVIATION FUEL REQUIREMENTS

Year	Commercial and Military		GA Operations			
	Air Carrier/ Air Taxi & Military	Jet A Fuel (Gallons)	*Jets	Jet A Fuel (Gallons)	Piston	Avgas (Gallons)
Base Year						
2004	10,694	515,693	13,187	171,898	41,217	67,520
Forecast						
2009	11,370	986,197	15,353	140,094	41,101	131,226
2014	12,593	1,092,318	17,749	161,952	42,679	136,264
2019	13,916	1,207,027	20,476	186,834	44,278	141,371
2024	15,430	1,338,420	24,198	220,797	45,190	144,283

**Jets includes operations associated with the new Very Light Aircraft (VLJs)*
Source: THE LPA GROUP INCORPORATED, 2005

As operations requiring Jet A fuel is projected to increase at TYR, current fuel storage tanks were reviewed to ensure that adequate level of Jet A capacity is provided. Based upon existing facilities and discussions with the local FBOs, it was determined that sufficient capacity exists to meet forecast Jet A demand. In addition, based upon discussions with the Jet Center of Tyler representative, it was reported that only two of their Jet A storage tanks are currently used to meet existing demand. The third tank is used to meet peak demand, and, therefore, is not kept at full capacity.

Fuel storage truck requirements were also evaluated to determine adequate capacity to accommodate peak hour demand. Thus, using the peak hour operation provided in Chapter 3, Aviation Activity Forecasts, peak hour demand for both Jet A and AvGas was determined. As illustrated in **Table 4-18**, five fueling trucks are currently being used at TYR to deliver fuel to both GA and commercial aircraft.

TABLE 4-18
FUEL TRUCK DEMAND

Year	Peak Hour Demand	Jet A Peak Hour Demand: Commercial & Military Demand	Jet A Peak Hour Demand: GA Turbine Demand	Jet A Peak Hour Demand: Total Jet A Demand	Total Avgas Demand	Jet A Fuel Trucks*	AvGas Fuel Trucks**
Existing Facilities	NA	NA	NA	NA	NA	3	2
			Base Year				
2004	33	279	88	367	35	3	2
			Forecast				
2009	35	505	66	571	69	3	2
2014	37	560	71	630	74	3	2
2019	40	618	76	694	79	3	2
2024	43	686	81	767	85	3	2

**Note: Each Jet A Truck has a 3,000 gallon capacity*
***Note: Each AvGas Truck has a 2,000 gallon capacity*
Source: Tyler Pounds Regional Airport and The LPA Group Incorporated, 2005

Thus, based upon existing fuel storage requirements and anticipated peak hour demand for both Jet A and AvGas (100LL), the Airport is currently equipped to accommodate anticipated fuel flow demand over the twenty year planning period.

PASSENGER TERMINAL REQUIREMENTS

In 1998, LPA developed terminal facility requirements during the terminal design process. Since the existing passenger terminal building was recently constructed in 2002, the requirements contained in the Terminal Area Planning Study were validated using the forecasts presented in Chapter 3, Aviation Activity Forecasts. Due to the level of operations at TYR, specific function areas require a closer look.

The terminal building at TYR is broken into several different areas each serving a specific function. The main activity areas include ticketing, bag claim, and passenger holding. Each area can be further subdivided into specific components, which are analyzed in the following sections.

A general overview of the passenger terminal requirements, in the form of commercial service aircraft gates, terminal building space, and automobile parking, are evaluated in the following sections. The terminal facility requirements have been determined utilizing methodologies provided in FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities,* and based on planning experience at similar size airports.

Aircraft Gate Requirements for Passenger Service

Currently, the passenger terminal building at TYR has a total of 3 gates to accommodate the existing airline activity. The gates provide access directly to the apron area without the assistance of loading bridges. Peak commercial passenger activity data was generated to enable an evaluation of the existing passenger terminal operations. The peak operations for the passenger service at TYR were calculated as shown in **Table 4-19**.

TABLE 4-19
PEAK PASSENGER SERVICE OPERATIONS

	Base Year 2004	Forecast 2009	2014	2019	2024
Total Annual Operations	63,441	67,824	73,021	78,670	84,819
Peak Month	6718	7183	7733	8,328	8,982
Average Day of Peak Month	217	232	249	269	290
Peak/Design Hour	33	35	37	40	43

Source: Tyler Pounds Regional Airport, 2004; THE LPA GROUP INCORPORATED, 2005

The number of gates ultimately needed may vary considerably depending on a number of factors. Primarily these would include determining what size aircraft and the type of operations the various airlines serving TYR are conducting. For example, the number of turns conducted each day at each gate has a significant influence on the number of gates required for a terminal.

Based on the existing peak hour operations, three aircraft gates are currently required. The peak hour demand provides a good indication of the number of gates the terminal would require to provide unconstrained passenger operations during peak periods. Therefore, based on this analysis and through discussions with Airport representatives, it was determined that TYR currently has a sufficient number of gates to accommodate peak passenger and operational demand and no additional gates are needed by the end of the planning period. However, the addition of passenger loading bridges should be considered in the future.

Terminal Space Requirements

The terminal building can be divided into many sub-areas each serving a specific function. The primary activity areas include ticketing, baggage claim, and passenger holding. Each can then be further subdivided into specific components, which are analyzed below. The various components of a terminal building should be designed to accommodate the level of peak hour passengers during the peak hour. Therefore, the forecasted peak hour passengers depicted in **Table 4-20** were utilized for this analysis.

TABLE 4-20
PEAK PASSENGER ENPLANEMENTS

	Base Year 2004	Forecast 2009	2014	2019	2024
Total Annual Enplanements	70,549	88,743	114,310	144,253	179,320
Peak Month	6,667	9,229	11,888	15,003	18,650
Average Day Peak Month	215	298	383	484	602
Peak/Design Hour	43	59	76	96	120

Source: Tyler Pounds Regional Airport, 2004; THE LPA GROUP INCORPORATED, 2005

Ticketing

Ticketing areas of a terminal include the ticket counter, the ticket agent area, the ticket lobby and circulation corridor, the airline ticket offices behind the ticket counters, and beyond those, the baggage make-up area. The ticketing area components are traditionally configured around the ticket counter. Ticketing facilities are designed to accommodate the peak hour enplanement levels without incurring unacceptable wait times. In general, for a terminal facing the demand that TYR is forecast to experience, passenger queues in front of each check-in position of six persons or less are considered acceptable. The peak hour enplanements divided by six determines the number of required agent positions. The ticket counter is typically four feet long per agent, three feet for counter and one foot for a shared bag well. An access through the counters for employees should also be included for each airline. Generally, a ratio of approximately 0.5 feet of access per agent position provides adequate ingress and egress to and from the agent area. The area from the front of the counter to the wall behind the counter is typically 10 to 12 feet deep to allow space for the counter, lateral circulation by agents and a bag conveyor device that moves bags from the counter area to the make-up area. The passenger queue space in front of the counter should provide approximately 24 square feet per peak hour enplanement. For planning purposes, for every three peak hour enplanements one "well-wisher" is assumed. Finally, behind the queued passengers and "well-wishers" should be a lateral circulation space. The minimum circulation depth at terminal similar in size to TYR should be no less than 20 feet of unimpeded lateral movement area.

Airline ticket offices (ATO) are typically located directly behind the ticket counter area for convenience and efficiency. This space is different for every airline due to their unique operating procedures and policies relative to leased support space for their stations. However, for non-hub airports, such as TYR, ATO space requirements are determined by multiplying the length of the ticket counter by a standard of 25 feet. The baggage make-up area space requirement is calculated similar to the ATO area. A standard 25-foot deep space multiplied by the forecasted length of the ticket counter is used to calculate the baggage make-up area.

Table 4-21 provides the estimated ticketing area facility requirements based on the criteria delineated above.

TABLE 4-21
TICKETING AREA SPACE REQUIREMENTS

Year	Agent Positions (ea)	Ticket Counter Length (lf)	Ticket Agent Area (sf)	Ticket Lobby w/Circ. (sf)	Airline Ticket Offices (sf)	Baggage Make-Up (sf)
Base Year						
2005	7	28	280	1,232	700	700
Forecast						
2009	10	36	360	1,584	900	900
2014	13	48	480	2,112	1,200	1,200
2019	16	60	600	2,640	1,500	1,500
2024	20	72	720	3,168	1,800	1,800

Source: THE LPA GROUP INCORPORATED, 2005

Baggage Claim

The baggage claim areas of a terminal are typically comprised of the baggage claim display device, the claim lobby and circulation corridor, inbound baggage operations, and the rental car agency spaces and associated queuing area. The baggage claim facilities are designed to display the deplaning passenger's bags and provide sufficient space to retrieve the bags to avoid unacceptable delays to the public. TYR currently has a recirculating conveyor claim device, which is typical at similar airports. The recirculating conveyor allows more bags to be retrieved in a smaller space.

For baggage claim purposes, the peak 30-minute time frame is the critical time interval for facility planning and sizing. Typically, the conveyor is sized to display approximately two-thirds of the peak hour arriving baggage in a 30-minute span. Due to the modest scale of operations forecast for TYR throughout the planning period, this formula has been modified to reflect a more reasonable peak condition. At TYR, it is reasonable to expect that of the three scheduled peak hour arrivals two of these peak hour aircraft could arrive within a few minutes of each other. Therefore, the full passenger load of these two peak hour aircraft is used to determine the baggage claim needs at the airport. The results of such are delineated in **Table 4-22.**

Behind the wall separating the public portion of the bag claim area from the secure or airside portion of the baggage area, is the secure inbound baggage operations area. This area should include space for two baggage tugs and carts to stop for loading of bags or drive through, and a small area for baggage workers. The secure inbound baggage claim area should consist of the following: conveyor should occupy a minimum of five feet of depth; the two tug lanes should be no less than 10 feet each; at least five feet of depth is needed adjacent to the claim device for bag unloading; and an additional two-feet is needed to allow for circulation around equipment. The total depth in this area should be a minimum of 32 feet. The length of the space should accommodate the anticipated peak bag/tug cart activity. A 37-seat aircraft can be handled with a one-or two-cart train and a two-cart train can accommodate a 50-seat aircraft. Each train requires a tug to pull it and each tug and cart is 15 feet long. In addition, 6 feet should be provided to allow for circulation around each end of the equipment within the drop off area.

In order to determine the appropriate linear feet of conveyor frontage to support activity over the planning period, the following analysis was conducted. The passengers of the two peak hour aircraft previously mentioned were assumed to have checked 1.5 bags per person, which is normal for an airport the size of TYR. A conveyor device can generally distribute 3.0 bags per hour, or 1.5 bags per half-hour per lineal foot of display frontage. The results of such are indicated in **Table 4-22.**

The baggage claim lobby depth typically includes five feet for the claim device, five feet for active bag retrieval by passengers, an additional five feet for passengers waiting to access the claim device to retrieve their bags, and ten feet for passenger and meeter and greeter maneuvering and the stacking of retrieved bags. An additional 20 feet for circulation corridor is required beyond the actual baggage claim lobby. Therefore, the baggage claim lobby area including the corridor is derived utilizing the length of the conveyor display frontage, plus an additional 6 feet per claim device for access doors and equipment clearance, and multiplying by a standard of 45 feet. The space requirements for the baggage claim lobby needed over the course of the planning period are indicated in **Table 4-22.**

Based on previous planning experience and results of analysis conducted for airports of similar size, a modest 300 square feet per rental car agency is adequate to meet the projected needs of the Airport. In addition, based on discussions with rental car agency and Airport representatives, it has been assumed that four agencies are adequate to meet future demand while maintaining the viability of each agency given demand.

Table 4-22 illustrates the calculated facility requirements for the baggage claim components of the terminal program.

Table 4-22
Baggage Claim Space Requirements

Year	Claim Devices (ea)	Inbound Baggage Ops. (sf)	Conveyor Frontage (lf)	Claim Lobby w/ Circ. (sf)	Rental Car Areas (sf)
Base Year					
2004	1	1,920	53	2,366	1,200
Forecast					
2009	1	1,920	61	2,758	1,200
2014	1	2,400	61	2,758	1,200
2019	1	2,400	70	3,150	1,200
2024	1	2,400	70	3,150	1,200

Source: THE LPA GROUP INCORPORATED, 2005

Passenger Holding

For purposes of this study, the passenger holding area includes the security screening area, the secure passenger holding area, and often the concessions for food, beverage, and merchandise.

The security screening station includes an X-ray machine for scanning bags and a magnetometer for scanning people as well as a station for random explosive detection and for the individual screening of randomly selected passengers. This equipment can process approximately 240 people per hour, more than the forecast peak hour enplanements. Therefore, only one screening station is required. The station needs space for the equipment, the security officers, a search area or office, and an area for queued passengers waiting to be processed. This area requires approximately 1,000 square feet.

The secure passenger holding area includes space for seating and circulation of enplaning and deplaning passengers. The seating area assumes an industry standard of 20 square feet per person for terminals of this size. As previously mentioned, it was determined that three aircraft gates will be sufficient to accommodate peak passenger demand. The holdroom should also allow for an additional 320 square feet per gate location in order to accommodate space for queuing, ticket lift station, and random search of boarding passengers due to new security guidelines.

Core Concessions

The core concessions include food, beverages, and merchandise. The core concessions are very difficult to predict at small airports because some airport concessions are supported from customers not otherwise using the airport. Therefore the concession space needed for TYR will be whatever the local operator believes to be appropriate. However, for planning purposes, a rule of thumb for concessions is that each annual

enplanement can generate $3.00 in concession sales and that properly located and sized concession areas can achieve a productivity ratio of $300 per square foot of space.

The facility requirements for the passenger holding area are illustrated in **Table 4-23**.

Table 4-23
Passenger Holding Space Requirements

Year	Security Screening (sf)	Passenger Holding (sf)	Core Concessions (sf)
Base Year			
2004	1,000	2,064	705
Forecast			
2009	1,000	2,832	887
2014	1,000	3,648	1,143
2019	1,000	4,608	1,443
2024	1,000	5,760	1,793

Source: THE LPA GROUP INCORPORATED, 2005

Miscellaneous and Administration Space

In addition to the specific function areas analyzed above for the terminal building, other miscellaneous space is not so readily calculated without a specific layout. The largest of these areas is public circulation. In airport terminal buildings, this can account for 30 to 40 percent of the facility. Also, other spaces such as restrooms, mechanical and electrical rooms, and janitor's closets have not been calculated. A rule of thumb for planning terminals of this size is to assume this miscellaneous space to be 50 to 60 percent of the rest of the terminal (not including administration space).

Lastly, the airport administration requirements of airports vary to a wide degree due to the different operations at every airport and the activities performed by the administration staff. However, for planning purposes, 400 to 1,000 square feet per administration employee generates a reasonable area requirement. For TYR, an average of 700 square feet per employee was used.

Since the passenger terminal was recently constructed in 2002, this section represents a brief evaluation of terminal facilities to determine how changes since September 11, 2001 have affected terminal facilities at Tyler Pounds Regional Airport. As a result, terminal development concepts will be developed during the alternatives analysis to address how the terminal will be expanded in the future in light of the security requirements. **Table 4-24** summarizes the terminal building facility requirements.

Table 4-24
Terminal Building Facility Requirements Summary

TERMINAL AREA	2004	2009	2014	2019	2024
Agent Positions (ea)	7	10	13	16	20
Ticket Counter Length (lf)	28	36	48	60	72
Ticket Agent Area (sf)	280	360	480	600	720
Ticket Lobby w/Circ. (sf)	1,232	1,584	2,112	2,640	3,168
Airline Ticket Offices (sf)	700	900	1,200	1,500	1,800
Baggage Make-Up (sf)	700	900	1,200	1,500	1,800
Claim Devices (ea)	1	1	1	1	1
Conveyor Frontage (lf)	53	61	61	70	70
Claim Lobby w/ Circ. (sf)	2,366	2,758	2,758	3,150	3,150
Inbound Baggage Operations (sf)	1,920	1,920	2,400	2,400	2,400
Rental Car Areas (sf)	1,200	1,200	1,200	1,200	1,200
Security Screening (sf)	1,000	1,000	1,000	1,000	1,000
Passenger Holding (sf)	2,064	2,832	3,648	4,608	5,760
Public Waiting (sf)	705	887	1,143	1,443	1,793
AREA SUBTOTAL (sf)	12,168	14,341	17,141	20,041	22,791
Miscellaneous Space (sf)	12,168	14,341	17,141	20,041	22,791
Administration Space (sf)	2,800	2,800	2,800	3,500	3,500
TOTAL BUILDING AREA (sf)	27,135	31,483	37,082	43,581	49,082

Source: THE LPA GROUP INCORPORATED, 2005

GENERAL AVIATION FACILITIES

General aviation facilities address the aircraft parking and storage requirements for the airport as well as the pilot/passenger space required. For planning purposes, based and itinerant aircraft requirements are usually considered separately since they serve different functions. At TYR, some aircraft parking areas accommodate both itinerant and based aircraft. However, for this study, the two will be analyzed separately and then the total requirements for each will be combined as a summary of the total required.

In general, the aircraft parking and storage requirements at an airport are typically provided through the combination of some or all of the following facilities:

Apron Area

Small aircraft - an outdoor parking space with tie-down capability, sized to accommodate single-engine and light multi-engine aircraft.

Large aircraft - spaces on a paved apron suitable for parking the larger business type aircraft, such as the Citation, Falcon, Gulfstream, and Learjet business jet aircraft fleets.

Hangars

T-hangars units - a fully enclosed building housing individual stalls, each capable of storing one aircraft, typically a single-engine or a light multi-engine aircraft.

Clearspan hangars - a fully enclosed building typically capable of holding multiple aircraft (five to seven each); these are often referred to as storage hangars.

Conventional hangars - similar to clearspan hangars, but typically have an attached office. These hangars are assumed to hold one to three business jet or turboprop aircraft each.

Shade hangars - a structure with a protective roof but no walls, typically capable of holding numerous aircraft each; these are often referred to as aircraft shelters or shade ports.

TYR currently utilizes both T-hangars and Conventional Hangar facilities as described above to accommodate aircraft parking and storage. A review of existing and future general aviation and support facilities was completed to identify any additional facilities that would be needed over the 20-year planning period. As noted in the Inventory Chapter, general aviation (GA) accounts for approximately 87 percent of annual operations (based upon FAA ATCT data for the years 1994-2003). GA facilities, including hangars, office space, and fuel facilities are owned and operated by two fixed base operators (FBO), Jet Center of Tyler and Johnson Aviation. Tyler Turbine also provides maintenance, hangar space and ramp space. Based upon the forecasts presented in Chapter Three, it is anticipated that demand for GA storage will be above and beyond existing facilities. Information developed as part of the activity forecasts, along with subsequent applications of generally accepted planning standards were utilized to determine whether facility expansion is warranted, and to what degree. Hangar storage and associated aircraft maintenance areas, aircraft parking apron, and FBO terminal are among the functional areas evaluated under this section.

Another issue addressed in this section is the peak nature of GA operations at TYR. TYR is home to several based corporate/business jet hangars and has also seen a large number of GA business/corporate and recreational transient users. Currently, peak time operations have been managed successfully on both FBOs' leasehold areas.

Overall, GA facilities include apron areas for based and transient aircraft parking, hangars for based aircraft storage, and fuel facilities. **Tables 2-15 and 2-16** from Chapter 2, *Inventory of Existing Conditions*, depict a breakdown of the amount of aircraft storage and apron parking facilities, respectively, at Tyler Pounds Regional Airport. The following sections identify existing capacity shortfalls in these areas when the existing capacity is compared to future needs. However, the proposed layout, taking into account the requirements below, as to meet demand/capacity for GA operations will be addressed in the airfield alternatives chapter.

Aircraft Ramp and Parking Area

Transient Aircraft Parking Apron Area Requirements

Transient aircraft are generally at an airport for only a short time, since they are arriving from and then departing to other airports. Therefore, parking and storage areas for transient aircraft are usually provided adjacent to the FBO apron areas. The requirements for transient aircraft parking were derived using the guidelines provided in FAA AC 150/5300-13, Change 9. Based upon these FAA guidelines, the itinerant parking demands for TYR were computed using the following steps:

1. To determine the Peak Month Transient GA activity, multiply the Total Transient GA Operations forecast by 10.59 percent, which represents the historical percentage of peak transient operations)
2. To determine the Average Peak Day, divide the Peak Month by 31 days.
3. To determine the Peak Hour Transient Operations, multiply the Average Peak Day by 15 percent, which represents the historic peak hour transient operations at TYR.
4. Assume that 50 percent of the total number of peak hour transient operations will need to be accommodated at one time, and
5. Increase the final calculated amount by 10 percent to accommodate potential demand over the short-term planning period.

Based upon the transient aircraft fleet mix, as shown in **Table 4-25**, aircraft parking requirements were determined. **Table 4-26** denotes the transient aircraft parking requirements based upon forecast demand through the year 2025.

TABLE 4-25
TRANSIENT GA AIRCRAFT FLEET MIX

Year	Jet[1]	Multi Engine	Single Engine[2]	Rotorcraft
Base Year				
2004	40%	16%	43%	1%
Forecast				
2009	43%	14%	43%	1%
2014	45%	12%	41%	1%
2019	48%	11%	40%	1%
2024	52%	11%	36%	1%

Note: 1. Jet includes the new very light jets (VLJs)
2. Single Engine includes experimental aircraft
Source: TYR ATCT, 2005 and THE LPA GROUP INCORPORATED, 2005

TABLE 4-26
PEAK HOUR TRANSIENT AIRCRAFT APRON DEMAND

Year	*Single-Engine	Multi-Engine	Jet	Total Peak Aircraft
Base Year				
2004	4	1	3	8
Forecast				
2009	4	1	4	9
2014	4	1	4	9
2019	4	1	5	10
2024	4	1	6	11

Source: The LPA GROUP INCORPORATED, 2005
*Note: *Single-Engine also includes demand for Rotor*

Itinerant aprons are intended for relatively short-term parking periods, usually less than 24 hours (but could be overnight) and are primarily for transient aircraft. Such aprons should be located as to provide easy access to terminal, fueling, and ground transportation facilities. FAA AC 150/5300-13, Change 9, suggest that for planning purposes, the size of an itinerant apron should be based upon a minimum area of 360 square yards (SY) per itinerant aircraft. This includes a reasonable amount of room for maneuvering and taxiing of aircraft. This value of 360 SY was applied for each single engine, multi engine and rotorcraft aircraft.

However, for the larger business jet aircraft, areas up to 2,300 square yards per aircraft (Boeing Business Jet (BBJ) or comparable) may be necessary. Therefore, with the introduction of larger aircraft at TYR towards the end of the planning period, it is feasible to reserve an area for at least one aircraft of this type on the apron. Based on this assumption, 2,300 square yards was used to adequately accommodate the apron requirements of the BBJ and other comparable large corporate aircraft.

In addition, TYR accommodates a number of high performance corporate/business jets. Therefore, for this study, a tie-down area of approximately 1,750 square yards was used to accommodate the small to midsized business jets. This area will provide adequate apron space for the most demanding aircraft, such as the Gulfstream V, that frequent the airfield. **Table 4-27** illustrates the parking areas required by various corporate/business jet aircraft.

TABLE 4-27
BUSINESS JET PARKING AREA REQUIREMENTS

Manufacturer/Model	Length / Wing Span (Feet)	Required Parking Area* (Square Yards)
Gates/Learjet 35A	49 / 40	586
Beech/Beechjet BE-400	48 / 44	624
Cessna/Citation I	44 / 47	625
Israel Aircraft/Westwind 2	52 / 45	664
Gates/Learjet 55C	55 / 44	676
Cessna/Citation II	47 / 52	696
Cessna/Citation V	49 / 52	712
Cessna/Citation III	56 / 54	789
Dassault/Falcon 200	56 / 54	789
Dassault/Falcon 900	66 / 63	978
Canadair/Challenger	69 / 64	1,017
Gulfstream II	80 / 68	1,173
Gulfstream IV	88 / 78	1,394
Gulfstream V	97 / 94	1,735
Global Express	99 / 94	1,761
Airbus Corporate Jetliner	111 / 112	2,215
Boeing Business Jet	110 / 117	2,283

*Note: Required Parking Area includes 10± feet of clearance from each wingtip, plus 40± feet in front of the aircraft to the centerline of the taxilane.
Source: Manufacturer aircraft specification manuals.
THE LPA GROUP INCORPORATED, 2005.

Using the required number of transient aircraft parking spaces, the value of 360 square yards was applied for each single-engine (rotor included) and multi-engine aircraft, 1,750 square yards for small and midsized jet, and 2,300 square yards for large jets. **Table 4-28** reflects the transient aircraft apron area demand expected at TYR.

TABLE 4-28
TRANSIENT AIRCRAFT APRON REQUIREMENTS

Year	*SE (SY)	ME (SY)	Jet (SY)	Total Transient Aircraft Area (SY)
Base Year				
2004	1,175	428	5,217	6,820
Forecast				
2009	1,287	415	6,256	7,958
2014	1,385	415	7,406	9,206
2019	1,423	392	8,339	10,155
2024	1,420	435	11,600	13,455

Source: The LPA GROUP INCORPORATED, 2005
*Note: *Single-Engine also includes demand for Rotor*

Based Aircraft Parking Apron Area Requirements

Planning for the necessary facilities for based aircraft parking in the future at TYR requires identifying the current needs at the airport and applying the existing data to the projected scenario set forth in the Chapter 3, *Aviation Activity Forecasts*, of this document. Currently, there are approximately 77 tie-down spaces available (62 spaces on the north side and 12 on the east side of the old terminal) for the storage and parking of based and transient aircraft. Therefore, an analysis was completed to identify the based aircraft apron parking requirements throughout the 20-year planning period utilizing a historical percentage of tie-down to total based aircraft. Thus, using the forecast information provided in **Table 3-22**, a forecast of based aircraft apron parking requirements was developed and outlined in **Table 4-26**.

For based aircraft, FAA AC 150/5300-13, Change 9, suggests that a minimum are of 300 SY be used for planning purposes. This figure is lower than that used for the itinerant aircraft because it is assumed that a tighter spacing between based aircraft can be achieved. The actual area per aircraft on the apron will most likely vary, depending on the configuration and layout of parking positions. As with itinerant aircraft calculations, the 300 SY per based aircraft allows for sufficient wingtip clearance and maneuvering. **Table 4-29** outlines the amount of apron area that is needed to accommodate forecast based aircraft.

Based upon the methodology described above, a based aircraft tie-down requirement of 12 percent per total based aircraft was used to determine future apron parking requirements. It is assumed that future jets and helicopters based at the airport would be stored in hangars. **Table 4-29** shows the amount of apron area that will be needed to accommodate the based aircraft at TYR.

TABLE 4-29 BASED AIRCRAFT APRON REQUIREMENTS		
Year	Total Based Aircraft Stored on Apron	Total Based Aircraft Apron Area (SY)
Base Year		
2004	13	3,924
Forecast		
2009	14	4,284
2014	15	4,608
2019	16	4,896
2024	18	5,364

Source: THE LPA GROUP INCORPORATED, 2005.

Summary of Transient and Based Aircraft Apron Area Requirements

Although total available apron area at TYR equals 60,000 SY, a significant portion of the Terminal Apron area is used for the operation of commercial aircraft. Therefore, using anticipated demand, as denoted in Chapter 3, Aviation Activity Forecasts, minimum total apron area needed by the end for the planning period is 18,819 SY. This will require an apron expansion of approximately 20,000 SY to accommodate anticipated demand in 2024. The based and transient apron requirements for the forecast years are outlined in **Table 4-30.**

TABLE 4-30 TOTAL APRON AREA REQUIREMENTS			
Year	Total Transient Aircraft Apron Area (SY)	Total Based Aircraft Apron Area (SY)	Total Aircraft Apron Area Required (SY)
Base Year			
2004	6,820	3,924	10,774
Forecast			
2009	7,958	4,284	12,242
2014	9,206	4,608	13,814
2019	10,155	4,896	15,051
2024	13,455	5,364	18,819

Source: THE LPA GROUP INCORPORATED, 2005.

Hangar Demand

As depicted in **Table 2-15**, *Aircraft Storage Facilities*, the hangar storage at TYR consists of conventional and T-hangar storage facilities. Because based aircraft demand is anticipated to remain at roughly 12 percent of total based aircraft throughout the planning period, the demand for based aircraft hangar space at TYR is estimated to equal approximately 88 percent of the total based aircraft demand throughout the planning period. Since only a very small percentage of itinerant traffic (maintenance and occasional overnights) use an airport's hangar facilities, only based aircraft demand was used to plan the minimum hangar space requirements.

T-Hangar facilities are primarily used for the storage of single engine and some smaller multi-engine aircraft, whereas, conventional hangars are primarily used for the storage of larger twins, jets and rotorcraft. As stated in Chapter 2, *Inventory*, there are currently 30 T-hangars at the Airport. At the time of this writing, all T-hangar facilities were being used, representing 27 percent of total based aircraft.

Based upon existing and forecast aviation demand as outlined in Chapter 3, Aviation Activity Forecasts, it was determined that in the base year at least 35 T-hangar storage facilities were required. This represents a deficit of at least 5 T-hangar facilities. Although the Airport currently has a 15-unit waiting list for T-hangar facilities, it was determined, based upon similarly sized airports, that only 30 percent of participants on the current waiting list were likely to relocate their aircraft to TYR, which is in line with forecast demand. Thus, assuming current T-hangar usage would remain constant over the 20-year planning period, this percentage (40 percent of total single-engine aircraft) was applied to forecast based aircraft to determine required T-Hangar facilities through the year 2024. The results are presented below in **Table 4-31.**

TABLE 4-31
REQUIREMENTS FOR T-HANGARS

Year	T-Hangar Aircraft Storage Demand	Additional T-Hangars Required[1]
Base Year		
2004	35	5[1]
Forecast		
2009	36	1
2014	38	2
2019	40	2
2024	42	2

Note: 1 - This is equal to demand minus existing 30 t-hangar units.
Source: Tyler Pounds Regional Airport, 2005; THE LPA GROUP INCORPORATED, 2005

Thus, based upon anticipated demand through the year 2024, an additional 12 T-Hangar units will need to be constructed to meet existing and forecast storage area requirements.

Conventional Hangar Requirements

The number of aircraft per hangar varies depending on the hangar owner or operator. It was observed during the inventory site visit, that some of the hangars are used for the storage of one aircraft and others for the storage of several aircraft of various types. Typically, a conventional hangar can accommodate up to three (3) aircraft depending upon size and configuration.

It was previously determined that 12 percent of the total based aircraft are stored on aprons or tie-downs, and approximately 32 percent of primarily single engine aircraft are stored in T-Hangar facilities. Therefore, the remaining 56 percent of total based aircraft will be stored in conventional hangar facilities. Using the forecast based aircraft data outlined in Chapter 3, **Table 3-22**, and the percentages of based aircraft parking apron and T-hangar demand, the following number of aircraft that would likely be stored in conventional hangar facilities through the 20-year planning period is outlined in **Table 4-32**.

TABLE 4-32
CONVENTIONAL HANGAR AIRCRAFT STORAGE DEMAND

Year	Single-Engine*	Multi-Engine	Jet	Rotorcraft
Base Year				
2004	32	18	11	1
Forecast				
2009	34	18	11	2
2014	34	18	14	2
2019	35	18	16	2
2024	36	18	18	2

Note: *Note: Single-Engine also includes forecast aircraft designated as "other"
Source: The LPA GROUP INCORPORATED, 2005

Given the variability of size, use, and aircraft storage requirements, an alternate approach was used to determine the needed hangar area for the remaining based aircraft. Using a factor of three (3) single-engine or multi-engine aircraft per conventional hangar, or two (2) jet engine or rotorcraft per conventional hangar, it is possible to estimate the total number of conventional hangars needed to accommodate forecast demand. In addition, using a typical conventional hangar configuration of 120 feet x 120 feet, a total conventional square footage may be obtained based upon forecast demand. The numbers presented in **Table 4-33** assumed that all existing and future jets and rotorcraft would be stored in hangars.

TABLE 4-33
CONVENTIONAL HANGAR REQUIREMENTS

	Hangars Required							
Year	Single-Engine	Multi-Engine	Jet	Rotorcraft	Total Conventional Hangars Required	Total Space Required	Existing Area	Surplus / (Deficiency)
Base Year								
2004	11	6	6	1	23	**326,400**	**204,350**	(122,050)
Forecast								
2009	11	6	6	1	24	**343,200**	**204,350**	(138,850)
2014	11	6	7	1	25	**364,800**	**204,350**	(160,450)
2019	12	6	8	1	27	**384,000**	**204,350**	(179,650)
2024	12	6	9	1	28	**403,200**	**204,350**	(198,850)

Source: THE LPA GROUP INCORPORATED, 2005

Having determined the future hangar requirements using the employed methodology, it is evident that there is insufficient storage hangar storage space to meet both existing and forecast demand. In addition, the total existing hangar area as identified in **Table 2-29** includes the square footage of the corporate hangars of AVTEC Aviation, Mewbourne, and other private owners. The total existing hangar area also includes maintenance areas that are not used for based aircraft storage. Furthermore, some of the corporate hangars are used for the storage of a single aircraft, which under normal operating conditions would be utilized for the storage of several aircraft. Thus, the actual hangar capacity available for aircraft storage is closer to 190,000 SF, further impacting the overall demand for hangar storage.

It should also be emphasized that the future of hangar storage demand is partially dependent on future market demand of expected based aircraft owners. As with the type of level or services offered, the owners and managers of the various FBOs will make hangar decisions based on their particular business needs. In addition, individual users may determine that they have a need for additional hangar units beyond those for which the study has identified. With the growth expected at TYR, it is anticipated that all jet, multi-engine and rotorcraft aircraft will prefer hangar storage.

Demand for General Aviation Pilot and Passenger Terminal Space

Currently there are two FBOs on the airfield that provide an undetermined amount of pilot and passenger space. As a result, general aviation passenger services are split between these two facilities. Based upon forecast general aviation demand, the following analysis was conducted to estimate what size of general aviation passenger facilities would be required to accommodate the pilots/passengers expected during the planning period.

Peak hour pilots/passengers for general aviation operations project the highest average number of pilots and passengers that use an airport during a one-hour period. To estimate the peak hour pilots/passengers for TYR, the following assumptions were made:

- Only itinerant operations would require FBO space at the Airport.
- Since arriving and departing general aviation pilots/passengers could use the FBO passenger facilities at the same time, the number of peak hour itinerant operations was not adjusted (i.e. was not split in half).
- Each general aviation transient operation (arriving or departing) was estimated to have an average of three people on board (passengers and pilots).
- An area of 200 square feet was used for each pilot/passenger to determine the FBO pilot/passenger space requirements. This value per pilot/passenger incorporates all functions of a full service general aviation terminal building such as FBO counter, flight planning, waiting area, snack room, pilot's lounge, restrooms, etc.

The results in **Table 4-34** show that 12,587 square feet (SF) of GA terminal space will be required by the end of the planning period. These estimations are based on the peak hour projections provided in Chapter 3, Aviation Activity Forecasts.

TABLE 4-34
GENERAL AVIATION TERMINAL SPACE

Year	Transient Aircraft Peak Day (ADPM)	Peak Hour Transient Ops	Number of Pilots/Passengers	Total Terminal Space (SF)
Base Year				
2004	91	14	41	8,193
Forecast				
2009	102	15	46	9,149
2014	113	17	51	10,174
2019	125	19	56	11,289
2024	140	21	63	12,587

Source: The LPA GROUP INCORPORATED, 2005

Ground Access

Ground access and terminal roadways serve passengers, employees, visitors, and anyone who travels to and from the Airport. The roadway system must be able to accommodate peak levels of activity, without creating excessive or unwarranted delay. The Airport ground access system consists of primary access roads, terminal access roads, terminal frontage road, terminal curb frontage, and Airport service roads.

Primary Access

In a practical manner, it is necessary to focus attention on a small subset of the road network providing access to the Airport. Although many roads may support the Airport infrastructure indirectly, it is unnecessary to improve roads that only host a small percentage of Airport traffic. On the contrary, improving an airport's primary access roads is worthy of attention and should be considered a central goal. It is ideal for primary access roads to be well marked, clearly visible, easy to navigate, and free from obstruction and congestion.

Primary access to TYR is provided via Texas Highway 64. This four-lane highway provides connects TYR to the City of Tyler from the east and Canton from the west. The primary access points are Skyway Boulevard, providing access to the terminal, Airport Drive, which leads to the fixed base operators, and Dixie Drive. There are no major capacity or congestion issues associated with any of the primary access points at TYR.

In the future, anticipated commercial/economic development at TYR will likely require capacity enhancements to existing roadways and development of additional airport roads. As part of future Airport development, an eastern access roadway system off of Dixie Drive may be considered. As part of the roadway improvements, adequate signage along major roadway arteries as well as local routes should be improved in order to attract business as well as facilitate locating the Airport. This will be discussed in more detail in later chapters of this report.

Terminal Access Roads

Terminal access roads connect the primary Airport access roads with the terminal buildings and parking facilities. The terminal access road should be designed to allow smooth channeling of traffic into the appropriate lanes, for safe and unobstructed access to the terminal curbs, parking lots, and other public facilities. Traffic circulation should be one-way in a counterclockwise direction for convenience of right-side passenger loading and unloading. Recirculation of vehicles to the passenger terminal should be permitted, by providing a recirculation road that includes ingress and egress lanes for the primary access road. Where necessary, traffic streams should be separated at an early stage, with appropriate signage, to avoid congestion and assure lower traffic volume on the terminal frontage roads.

FAA AC 150/5360-13, *Planning and Design for Airport Terminal Facilities*, recommends that terminal area access roads should accommodate 900 to 1,200 vehicles per lane per hour, with a minimum of two 12-foot lanes. Additionally, recirculation roads should accommodate approximately 600 vehicles per hour per lane, with standard lane widths of 12 feet each. The existing terminal access road at TYR, Skyway Boulevard, meets these guidelines and provides the recommended level of vehicular capacity. Proposed improvements east of Skyway Boulevard will require additional points of secondary access in the future.

Terminal Frontage Road and Curb Frontage

The terminal frontage road is that section of the terminal access road directly in front of the terminal building. This section of roadway directs vehicular traffic to the front of the terminal building. The number of traffic lanes typically increases in this section of the terminal access roadway, to allow for vehicles stopping at the enplaning and deplaning terminal curbs, vehicular maneuvering, and sufficient travel lanes for through traffic. The terminal frontage road is a critical element in maintaining vehicular flow with minimum congestion as part of the overall terminal access roadway system.

The terminal frontage includes two lanes of traffic, one through lane and one right-side loading/unloading lane. The frontage road offers drivers recirculation with little complication. In addition, the curb frontage allots space to meet current needs. However, as demand increases the need for expansion should be monitored and assessed.

Service Roads

Service roadways can be categorized as general-use or restricted-use roads. General use roads allow for the delivery of goods and services in the terminal area. Restricted access roads are restricted to Airport vehicles only (i.e., Airport management, fire, police, etc.), and serve areas of the airfield where public vehicles are not allowed due to safety and/or security reasons. Designation of Airport service roads to reach other areas of the airfield is favored. As the improvements proposed in this chapter are implemented, the need for adequate service roads will become more apparent. Planning and design of additional service roads should be completed to fulfill safety and security requirements and assist Airport officials in day-to-day operations.

Vehicle Parking

The public parking at the new terminal at Tyler Pounds Regional Airport is accommodated with two parking lots, one for long-term parking and the other for short-term parking. The short-term parking lot provides 46 spaces and the long-term parking lot provides 190 spaces with a 24-hour access gate. All traffic in the long-term and short-term parking lots exit through toll facilities. For the purpose of this analysis, the Terminal Area Planning Master Plan Verification Study and 1995 Master Plan Update were used as guides for historical reference. Historically, long-term parking has averaged at approximately 70 percent full capacity at any given time. However, at peak times, it reaches capacity. The average parking duration in the long-term lot is three days. A similar analysis was used to revalidate long-term parking lot capacity with considering the forecast peak passenger enplanements as depicted in **Table 3-14**. This analysis yielded an average day of approximately 44 cars parked in the long-term lot. This represents approximately 21 percent of the average day enplanements at Tyler Pounds Regional Airport for the base year. During peak times, the lot fills to capacity. The peak day's cars represent approximately 30 percent of the ADPM enplanements. Using these percentages, the long-term parking lot capacity was determined.

According to the FAA, usage of airport long-term and short-term parking is generally split with 70-85 percent of all cars using short-term lots and 15-30 percent using the long-term lots. Based on FAA guidelines, the number of short-term cars can be derived from the calculation of long-term cars. It is obvious that the time spent by the number of cars in the short-term lot will be significantly shorter than in the long-term lot. On the average, cars in the short-term lot stay approximately one hour. Therefore, each space (46 total spaces) could accommodate 16-18 cars per day if traffic was evenly spread and with consideration given to those that might extend beyond the average one hour. However, since traffic is not spread evenly, each space probably accommodates 6-8 cars per day. The required capacity of the short-term lot can be determined from these ratios.

Table 4-35 illustrates the public parking requirements for Tyler Pounds Regional Airport.

TABLE 4-35
PUBLIC PARKING TERMINAL FACILITY REQUIREMENTS

PARKING LOT	Base Year		Forecast		
	2004	2009	2014	2019	2024
Long-term Cars/Peak Day (20%)	68	86	111	140	174
Short-term Cars/Peak Day (80%)	273	344	442	558	694
Long-term Spaces (1 car/3 days)	205	258	332	419	521
Short-term Spaces (6 cars/1 day)	46	57	74	93	116

Source: THE LPA GROUP INCORPORATED INC., 2005

Rental Car Parking Requirements

There are four rental car companies and a total of 104 parking spaces equally divided into four sets of 26 spaces to serve each rental car agency operating in the terminal. There is currently no separate rental car return and storage lot for the four agencies. This requirement will be addressed further in the alternatives chapter. However, this was calculated and included in the requirements table below. Currently, there is only one on-airport wash facility located on the north side of the airfield and along from State Highway 64. This facility is owned and operated by National, which the other three car agencies are allowed to use on a first-come first-served basis and for a fee. It is recommended that a common use wash facility with an oil-water separator be constructed and located within relative close proximity to the rental car agencies. It would also be feasible that the airport considers the installation of an aboveground storage tank for the sole purpose of dispensing unleaded gas at a fee, to the rental car agencies. This requirement will also be discussed in the alternatives chapter.

Historically, annual car rentals at TYR have represented approximately 17 percent of its annual enplanements. There are approximately 22 percent more rentals during peak months than the average month. Also, the number of cars returned is assumed to be equal to the number of cars returned.

The analysis for determining the required number of parking spaces for rental cars activities is predicated on the ADPM cars rented and returned. Also, included in the analysis, are the operational characteristics of the rental car agencies. Rental car parking requirements include ready, return, service, and storage facilities.

Given the close proximity of the rental car lot to the terminal, the more consolidated the parking area, the greater the efficiency achieved in parking facilities. The more separated the parking area, the lesser the efficiency achieved. The following assumptions were made in order to calculate the rental car parking requirements:

- The number of required parking spaces is less than the total amount of cars rented and returned in a day.
- Due to the assignment of 26 spaces for each rental car agency and that some of the returned cars in the morning will be serviced and rented later in the day, the overall parking space requirement is reduced.

Common in the industry, rental car parking lots are typically sized to accommodate two-thirds of the total cars rented and returned in a day. As TYR features favorable and annual competitive facility leases for rental car operators, and it has only one rental car servicing area shared by all four agencies, the turnover rate for returned cars to rented cars is noted to be lower than other airports of similar size. Considering this, a more conservative approach was utilized in determining the facility requirements analysis for rental car parking at Tyler Pounds Regional Airport. **Table 4-36** illustrates the planned rental car parking requirements.

TABLE 4-36 RENTAL CAR PARKING LOT REQUIREMENTS					
PARKING LOT	Base Year		Forecast		
	2004	2009	2014	2019	2024
Annual Cars Rented	11,993	15,086	19,433	24,523	30,484
ADPM Cars Rented	50	63	81	102	127
Ready/Return Parking Lot (spaces)	38	47	61	77	95
Service/Storage Lot (spaces)	38	47	61	77	95

Source: THE LPA GROUP INCORPORATED INC., 2005

Curb Parking Requirements

An airport's curb requirement is very unique as it is predicated upon several factors, which all play an important role. Some of these factors that influence the number of curb area parking spaces required are:

- TSA regulations regarding curb parking at airports
- The time spent by an average parked car at the curb
- The location and convenience of the parking lots
- The community's tendency to send someone to drop off a traveler and immediately depart

However, there are some general observations that can be made that are consistent at most regional airports.

- Considering that TSA regulations require someone always with the vehicle, the smaller the airport the longer the waiting time of an average parked car.
- The smaller the community the more likely someone will pick up or drop off a traveler.

Due to the activity levels at TYR, the empirical formulas for curb parking are not applicable. Therefore, based upon our experience at airports of similar size and function, the curb parking requirement was assumed to be between 5 and 15 percent of the peak hour enplanements, and deplanements will wish to use the curb parking at the same time. For calculation of curb length, each parking space along the curb is 25 feet long. **Table 4-37** depicts the curb-parking requirement.

TABLE 4-37 CURBSIDE PARKING REQUIREMENTS					
PARKING AREA	Base Year		Forecast		
	2004	2009	2014	2019	2024
Personal Car Space Required	34	43	55	70	87
Curb Length (25 feet)	853	1,074	1,383	1,745	2,169

Source: THE LPA GROUP INCORPORATED INC., 2005

LAND REQUIREMENTS

The master plan analysis to this point has focused on the development of physical improvements to the airport and its ancillary facilities that are deemed necessary to meet the projected level of future operational activity at TYR. However, the requirement to absorb additional property for aviation related development at TYR and to ensure future land use compatibility must remain as one of the short-term priorities of the Airport Authority. Given the surrounding uses and development to the current airport property, land development pressure continues to be strong in the area increasing the potential for the development of land that is presently devoted to uses other than aviation related. Once these other surrounding lands are committed to another form of developed land use, the ability of the airport to acquire the property is essentially non-existent. In short, as development pressure builds in the areas near the airport, the window of opportunity for the airport to acquire enough land at a reasonable cost to ensure its future viability closes. For these reasons, consideration must be given to the identification of a future property envelope that the airport should secure to address demand and development needs beyond this master planning horizon. Based on the actions of numerous general aviation and even large hub commercial airports, this approach to determining future land acquisition requirements is not unique to TYR. While defining the boundaries and extent of future property the airport has targeted for acquisition, it is recognized that the availability of federal funding for the acquisition of these tracts will be based on the provision of justification in conformity with FAA priorities and funding formulas.

The amount of land, options available, and associated costs are addressed in later sections of this study.

SUMMARY OF FACILITY REQUIREMENTS

Table 4-38 provides a summary of the facility requirements that were determined necessary to satisfy the forecasts of aviation demand presented earlier in this study. Essentially, this table includes the minimum facility requirements over the 20-year planning period. Some additional facilities are planned and included as part of the final ALP and Capital Improvement Program to enhance the airport. The order in which these improvements are listed does not have any relation to the priority or phasing of such projects. It is also recommended that the airport refine and update minimum operating standards to provide guidance for future development at the airport.

TABLE 4-38
SUMMARY OF BUILDING AREA FACILITY REQUIREMENTS BASED UPON EXISTING OPERATIONAL CAPACITY/DEMAND

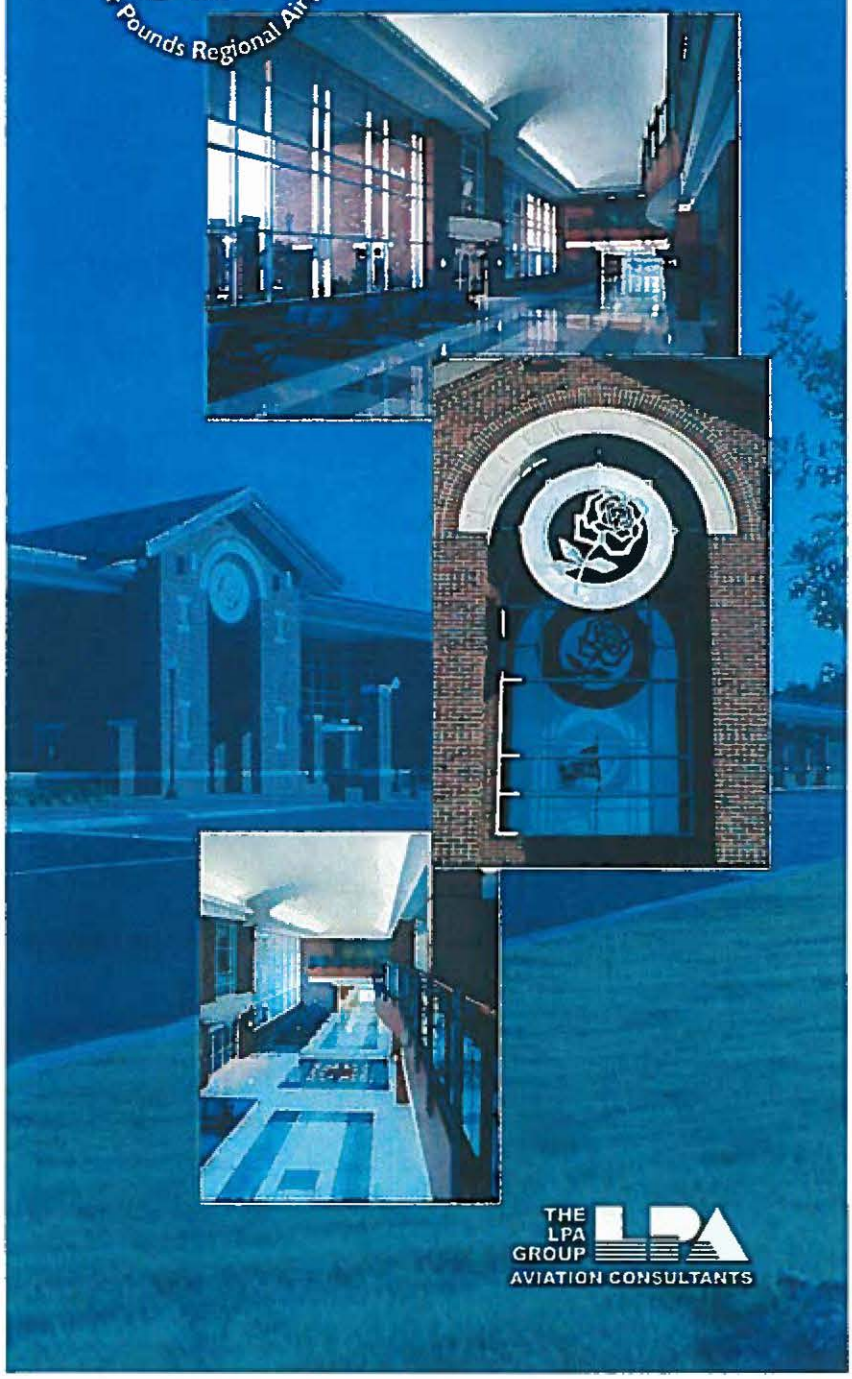
	Existing 2004	PAL 1 2009	PAL 2 2014	PAL 3 2024
Activity:				
Peak Hour Passengers	43	59	76	120
Aircraft operations				
General aviation	52,747	56,054	60,428	69,388
Military	551	772	698	571
Air Carrier	10,143	10,598	11,895	14,859
Total operations	63,441	67,824	73,021	84,819
Based Aircraft	110	115	120	132
Requirements:				
Terminal complex				
Terminal building (sq ft)	27,135	31,483	37,082	49,082
Curbside (lin ft)*	853	1,074	1,383	2,169
Parking spaces				
Public-Long-Term (1 car/3 days)	205	258	332	521
Public – Short-Term (6 cars/1 day)	46	57	74	116
Rental car (Ready Return and Storage)	76	94	122	190
General Aviation				
T-hangars	35	36	38	42
Conventional Hangars:				
Hangars Required	23	24	25	28
Total Space Required	326,400	343,200	364,800	403,200
GA Terminal Space	11,114	16,062	18,281	16,062
GA tie-down apron (sq yd):				
Transient Aircraft Apron Requirements	6,820	7,958	9,206	13,455
Based Aircraft Apron Requirements	3,924	4,284	4,608	5,364

*Note: * Curbside requirement based upon FAA AC 150-5360-13, Planning and Design Guidelines for Airport Terminal Facilities*
Source: THE LPA GROUP INCORPORATED, 2005 and TYR Airport Management, 2005

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 5 ALTERNATIVES AND RECOMMENDED DEVELOPMENT



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CHAPTER FIVE
Alternatives and Recommended Development

GENERAL

The primary objective of this chapter is to identify an overall development plan for Tyler Pounds Regional Airport (TYR) that will meet the Airport's long-term aviation needs. Now that airside and landside facility requirements were identified that will satisfy expected demand, the next step in the master planning process is to evaluate potential ways in which these facilities can be provided. This chapter applies the facility needs as shown in Chapter 4, Demand Capacity and Facility Requirements, to various Airport development alternatives. Since the combination of possible alternatives is limitless, intuitive judgment was applied to those alternatives that have the greatest potential for implementation. These choices provide the underlying rationale for the preferred recommendation. Implementation of the selected alternatives will be defined in subsequent chapters.

DEVELOPMENT CONSIDERATIONS

Prior to determining the ultimate alternatives, the various airside, landside, terminal area and general airport requirements were identified in **Chapter 4**. The evaluation criteria for each of these requirements vary with each particular functional area. In general, similar criteria were used to measure the effectiveness and the feasibility of the various growth options available. Criteria used in the alternatives review and evaluation process are grouped into four general categories. These include:

1. Operational Performance – Any selected development alternative should be capable of meeting the Airport's facility needs (capacity, capability and efficiency) as they have been identified for the planning period. Further, preferred options should resolve any existing or future deficiencies as they relate to Federal Aviation Administration (FAA) design and safety criteria.
2. Environmental – Airport growth and expansion has the potential to impact the Airport's environs. The selected plan should seek to minimize impacts in the areas outside the Airport's boundaries. Alternatives should also seek to obtain a reasonable balance between expansion needs and off-site acquisition and relocation needs. The preferred development plan should also recognize sensitive environmental features that may be impacted by the alternatives evaluated herein.
3. Cost – Some alternatives may result in excessive costs as a result of expansive construction, acquisition, or other development requirements. In order for a preferred alternative to best serve the Airport and the community it must satisfy development needs at reasonable costs.
4. Feasibility – The selected alternatives should be capable of being implemented. Therefore, they must be acceptable to the FAA, Texas Department of Transportation (TxDOT), City government, and the community served by the Airport. The preferred development options should proceed along a path that supports the area's long-term economic development and diversification objectives.

Using the evaluation criteria, each proposed alternative was evaluated based upon anticipated long-term planning goals and development needs. Proposed development alternatives were presented in separate but interrelated functional areas of the Airport. These are:

- Airfield Development

- Land Use/Land Acquisition
- Landside Facilities – Building Areas
- Landside Facilities – Surface Access

Functional areas were further subdivided into primary and secondary elements. Primary elements typically consist of large areas of land, and, therefore, the airfield configuration represents the primary element within this study. Secondary elements, such as terminal complex, general aviation, access and support facilities were evaluated both individually and collectively to ensure the orderly evolution of a final master plan concept that is functional, efficient, cost effective, and compatible with the environment.

Based upon each respective alternative analysis and comments received from Airport management, the Airport Advisory Board, the Technical Advisory Committee and the public, a recommended development concept will form the basis of the Airport Layout Plan (ALP) Drawing set.

Previous Master Plan

In the process of evaluating potential airfield development concepts, the previous Master Plan Update was reviewed to identify trends and issues, which may impact future development of the Airport. An evaluation of the previous demand capacity analysis revealed that TYR Airport will not reach the 60 percent capacity threshold until the final years of the planning period, approximately 2020. This capacity assessment was verified during the current master plan analysis. Thus, development of a new runway was and is not considered as part of the alternatives analysis. However, both the previous Master Plan Update and the current master plan update recommend, for capacity relief, additional taxiway exits, in accordance with **AC 150/5060-5, Change 2,** *Airport Capacity and Delay*, in order to decrease runway occupation time and, thereby, increase capacity.

However, the previous Master Plan Update did recognize the need for a longer runway to accommodate the expected design aircraft or group of aircraft, which was justified within Chapter 4, *Demand Capacity and Facility Requirements*, of this report. An evaluation of Runways 22, 17 and 13 revealed that an extension of any of these runways would require a major road realignment of State Highway 64. This was determined to be cost prohibitive. Additionally, even though Runway 13-31 is designated as the primary instrument runway because it is equipped with an instrument landing system (ILS), an extension to this runway was not considered. Due to the location of State Highway 64 to the Runway 13 threshold and the location of Dixie Drive and a small residential community south of Runway 31, an extension of this runway was also determined to be cost prohibitive.

In order to accommodate a runway extension that is operationally feasible and cost effective, three airfield alternatives were considered in the previous master plan update. These airfield alternatives include:

- Extending Runway 4-22 by 2,300 feet for a total length of 9,500 feet and add a new parallel 6,100 x 150 foot runway, designated 13R-31L, to the west of Runway 17-35.
- Extending Runway 13-31 by 900 feet to the south to provide a total length of 6,100 feet and extend Runway 4-22 1,100 feet to the south for a total length of 8,300 feet; or
- Extending Runway 4-22 approximately 1,100 feet to the south for a total length of 8,300 feet.

Consideration was given to these alternatives as part of this master plan analysis in order to limit the number of potential alternatives to consider as well as address existing and future demand aircraft requirements.

PREFERRED ALTERNATIVE SUMMARY

Each alternative, both airside and landside, were evaluated as to operational performance, environmental impacts, cost, and feasibility. Significant airfield issues identified as part of this analysis included runway safety area (RSA) deficiencies, existing demand for greater takeoff and landing length as well as improved access via additional taxiways to enhance overall capacity and safety. Utilizing the established evaluation criteria, Airfield Alternative II is the recommended alternative for airfield development.

Airfield Alternative II provides for additional runway length, meets and exceeds airport service volume for the twenty-year planning period, resolves RSA deficiencies, and provides additional precision instrument approach capability. This alternative incurred the least impact to the surrounding communities and roadway system. Furthermore, Airfield Alternative II provides the most flexible and cost effective method of meeting future runway length demand. However, based upon further discussions with the FAA and Texas Department of Transportation (TxDOT), it was determined that a displaced threshold on Runway 13 and an extension to Runway 31 may not be required to accommodate the inadequate safety area on the approach end of Runway 13. Based upon FAA and TxDOT recommendations, either a modification to standards could be implemented to accommodate the current alignment of State Road 64 or TxDOT could adjust the right of way of SR 64 to accommodate the appropriate safety area dimensions to meet the critical aircraft anticipated to use Runway 13-31.

In addition, three general aviation development areas, identified as the North GA Complex, West GA Complex and South GA Complex, provide development opportunities for mixed aviation and non-aviation use for additional revenue generation and diversification. Thus, considering landside parking requirements, terminal demand, terminal reuse, hangar demand and aviation and non-aviation commercial development, a preferred development concept for each of these areas was determined. Justification for the preferred growth is discussed in the following sections. The suggested airside alternative development, as shown in **Exhibit 5-20**, will be further refined through discussions with Airport Management, City of Tyler staff, the AAB/TAC Committee and the general public.

DEVELOPMENT CONCEPTS

Development concepts discussed herein are based upon suppositions that State Road 64 will not be relocated and that the FAA will not allow a modification to standards associated with Runway 13-31's non-standard runway safety areas. As a result, all proposed airfield alternatives considered improvements based upon the use of a displaced threshold on Runway 13 to accommodate the standard safety area requirements.

Runway Safety Area Improvements

Prior to considering airfield development alternatives to meet capacity and runway length requirements, alternatives to address runway safety area (RSA) compliance were considered. The Airport is required to meet RSA requirements by federal grant obligations. The appropriate RSA requirements, which are determined by the most demanding aircraft regularly using the runway, are delineated in **Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13, Change 9**. When RSAs do not meet the appropriate requirements, the existing FAA policy is to require resolution of the problem. **FAA Order 5200.8**, *Runway Safety Area Program*, provides several alternative methods of achieving the proper RSA including: 1) relocation, shifting or realignment of runway; 2) reduction in runway length where the existing runway length exceeds what is required to accommodate the existing design aircraft; 3) a combination of runway relocation, shifting, grading, realignment or reduction; 4) implementation of declared distances; or 5) constructing an engineered material arresting system (EMAS). Potential impacts of these options were previously reviewed with regards to their impacts upon the existing RSAs at the Airport.

The existing safety areas beyond the ends of Runways 13, 22 and 4 impact the airport operating area (AOA) as well as State Highway 64, Dixie Drive and Pleasant Retreat Road. As a result, Runway 13 does not meet the safety area criteria for a B-II aircraft nor does Runway 4-22 meet the safety area requirement for a D-II runway. According to **FAA Advisory Circular (AC) 150/5300-13 Change 9**, a D-II runway requires a safety area width of 500 feet and should extend 1,000 feet beyond on the end of the runway pavement whereas a B-II runway requires a safety area dimension equivalent to 300 feet x 600 feet. The existing runway safety area dimensions for Runway 13, 22, and 4 are outlined in **Table 5-1**.

TABLE 5-1
EXISTING RUNWAY SAFETY AREA DIMENSIONS

Runway	Existing Airplane Reference Code	RSA Dimensions	
		Width	*Beyond Runway End*
Runway 13	B-II	300 feet	350 feet
Runway 22	D-II	500 feet	750 feet
Runway 4	D-II	500 feet	476 feet

Source: Tyler Pounds Regional Airport and The LPA Group Incorporated, 2005

The FAA also has grading and strength criteria for RSAs. The grading in these areas is consistent with the criteria.

RSA Option One considers relocation, shifting or realignment of Runway 4-22 and Runway 13-31 in order to obtain the required RSA dimensional standards. However, due to development in and around TYR Airport as well as wind and noise impacts, runway realignment of Runways 4-22 and 13-31 is not feasible and thus discounted from further discussion. Relocation and/or shifting of Runways 4-22 and 13-31 is plausible but will limit runway length to current conditions. RSA Option Two considers the reduction of runway length, as shown in the runway length analysis provided in **Chapter 4**, *Demand Capacity and Facility Requirements*, a decrease in runway length by approximately 774 feet would negatively impact the Airport's ability to accommodate commercial and mid to large charter and corporate aircraft. Thus, Option Two was discounted from further analysis.

RSA Option Three evaluates the use of declared distances in order to obtain the required RSA dimensional requirements for an ARC D-II. Displacing the runway thresholds on either end of Runway 4-22 as well as Runway 13 will provide the required RSA length beyond the departure threshold. However, as discussed in *Facility Requirements*, the need for additional pavement on landings would be beneficial to some existing and future users of the Airport. Thus, in order to provide adequate runway length to meet the demand aircraft runway length requirements, an extension will need to be considered in order to provide additional pavement for landing and offset the displaced thresholds. Thus, in order to remove the threshold displacements, 250 feet would need to be constructed at the Runway 4 end and Pleasant Retreat Road would need to be relocated to accommodate 1,000 foot RSA requirement. Whereas, an extension of Runways 22 or 13 will require the relocation of State Highway 64, Dixie Drive and the AOA. Options for resolving the Runway 4-22 and Runway 13 RSA issues will be explored by the airfield alternatives analysis provided in subsequent sections.

RSA Option Four considers utilizing EMAS. The FAA has provided guidance on the construction of EMAS units in **FAA AC 150/5220-22**, *Engineered Material Arresting System for Aircraft Overruns*, which gives general EMAS design parameters. Generally, EMAS units are designed to stop the design aircraft if it were to the leave the runway at 70 knots. The unit requires an offset from the runway pavement edge to avoid damage from jet blast or short landings and a 100-foot lead-in ramp at the beginning of the EMAS structure. The offset length is determined by land available and the materials used in the EMAS construction. A review of these FAA design parameters showed that EMAS may be a viable option for Runway 22 but may be difficult to implement on Runways 4 and 13. Land available between the Runway 4 threshold and Pleasant Retreat Road is inadequate to meet the EMAS design

requirements. Further, since aircraft with takeoff and landing weights of less than 25,000 pounds typically uses Runway 13-31, EMAS is not appropriate.

In order to determine the most appropriate RSA improvements, order of magnitude cost estimates for each applicable alternative were developed. Estimates assume average unit costs for major materials, including labor, plus engineering services at 25 percent of construction estimate and 20 percent contingency estimate. Engineering services include design, construction administration, inspection, testing and survey work. Environmental impacts were not included since an accurate estimate of potential environmental impacts is not known at the time of this writing. Environmental impacts associated with proposed development are presented in detail in **Chapters 6**, *Environmental Overview* and **8**, *Implementation Plan*, for this master plan update. Estimated costs associated with RSA improvements to Runways 4, 13, and 22 are shown in **Table 5-2**.

TABLE 5-2
ESTIMATED IMPACTS AND COST FOR RSA IMPROVEMENTS

Alternative	Runway 4		Runway 22		Runway 13	
	Estimated Cost	Potential Impacts	Estimated Cost	Potential Impacts	Estimated Cost	Potential Impacts
Declared Distances	$~30,000	Total Runway length available is 6,951 feet. However landing distance available on Runway 4-22 would be reduced to 6,177 to accommodate displaced thresholds	~$30,000	Landing length available on Runway 4-22 decreased from 6,951 to 6,177 to accommodate displaced thresholds	~$550,000	Runway landing length would be decreased from 5,200 feet to 4,950 feet
Runway Extension and Relocated Threshold	~$4 million	An extension of 250 feet would be required to accommodate RSA deficiency on Runway 22. Runway length would remain 7,201 feet. Will require road relocation.	~$5.6 million	An extension of 420 feet would be required to accommodate RSA deficiency on Runway 4. Runway length would remain 7,201 feet. Will require relocation of State Highway 64.	~$2.4 million	An extension of 250 feet on Runway 31 and threshold relocation of 250 feet on Runway 13 will provide required safety area dimensions. Will require relocation of MALSR, Glide slope, localizer, ODALs and VASIs, and maintain runway length of 5,200 feet.
Runway Extension and Declared Distances	~$4 million	Runway extension and use of declared distance will provide additional runway length for takeoff while standardizing safety area requirements. Will require relocation of Pleasant Retreat Road and property acquisition.	~5.7 million	Runway extension and use of declared distance will provide additional runway length for takeoff while standardizing safety area requirements. Will require relocation of State Highway 64 and property acquisition	~$2.4 million	Runway extension and use of declared distance will provide additional runway length for takeoff while standardizing safety area requirements. Will require relocation of Dixie Drive south of the airfield and property acquisition.
EMAS	Not Applicable	Not enough property beyond threshold of Runway 4 to accommodate EMAS requirements	$4.5 Million		Not Applicable	EMAS cannot be used on aircraft lighter than 25,000 pounds.

Source: The LPA Group Incorporated, 2005

As stated earlier, use of declared distances only from a cost effective point of view is the most reasonable. However, since demand currently exists for additional landing pavement length, this option will negatively impact operations as well as the Airport's ability to accommodate future demand.

Between the potential runway extensions of Runway 4, 13, 22 and/or 31, an extension to Runways 4 and 31 are the most viable options. Runway 4 requires the relocation of Pleasant Retreat Road, which is a local road bordering the Airport. Whereas, Runway 22 will require the relocation of both State Highway 64 and Dixie Drive which is estimated to be at least three times more costly. The EMAS alternative is a viable option on Runway 22 only due to the lack of land area available beyond the Runway 4 threshold and the use of the runway by larger and heavier aircraft.

Standard EMAS can accommodate 90 percent of overruns and 90 percent of aircraft undershoots. However, in reviewing **FAA Order 5200.9**, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*, it is not practicable to provide either a standard RSA or a standard EMAS installation either because the costs of both is above the maximum feasible cost, or because displacing the landing threshold will adversely affect operations. This considers not only the loss of runway length but also the effects on taxiing aircraft, including changes in required holding positions. When neither a standard RSA nor a standard EMAS system can be provided within maximum feasible costs, a non-standard EMAS that will stop the design aircraft traveling at 40 knots or more should be considered. An EMAS that cannot provide at least this minimum performance is not considered a cost effective safety solution. Since the use of EMAS will significantly impact airport operations and capacity at TYR Airport, it was removed from further investigation.

The deciding factors associated with the recommended RSA improvement options came down to estimate cost and operational capacity. It is suggested, therefore, that the Airport consider an extension to Runway 4 and 31 with or without the use of declared distances in order to provide standardized RSA dimensions and to accommodate existing and future design aircraft operational requirements.

Airfield Configuration

Airfield facilities are, by their very nature, a focal point of the Airport complex. Because of their role, and the fact that they physically dominate a significant portion of the Airport's property, airfield facility needs are often the most critical element in the determination of viable Airport development alternatives. In particular, the runway system requires the greatest commitment of land area and is often the greatest influence on the identification and development of other Airport facilities.

The potential for physical expansion of the Airport to accommodate airfield development is the primary factor that determines development in the long term. The runway and taxiway system directly affects the efficiency of aircraft movements both on the ground and in the surrounding airspace, not only in the terminal area but regional airspace as well. It also limits the ability of the Airport to handle certain aircraft, which can directly affect the types of air service the Airport can offer or accommodate. In addition, the efficiency of aircraft movement is also affected by local approach and departure procedures, which can be influenced by local restrictions due to noise, airspace congestion, or other considerations.

On any typical day at the Airport, passenger jets and turboprops regularly intermingle with large and small general aviation (GA) aircraft. In addition to being an important regional airport, TYR Airport currently enjoys a unique niche as a commuter airport providing commercial service within the eastern Texas region. However, as outlined in **Chapter 4**, *Demand Capacity Analysis and Facility Requirements*, anticipated changes in both aircraft and average length of haul will not only impact runway length requirements but taxiway and navigational requirements as well. This is especially true in the hot, humid climate of east Texas.

The airfield's current configuration of three runways (Runway 13-31, Runway 4-22, and Runway 17-35) has to date accommodated air traffic levels reasonably well. However, forecast increases in domestic passenger operations, combined with GA operations, could put a strain on Airport capacity and limit the ability of the Airport to efficiently handle the anticipated rise in traffic.

While any evaluation of alternatives can also include a "no action" alternative, this would effectively reduce the quality of services being provided to the general public, and potentially affect the Tyler area's ability to accrue additional economic growth. In general, the viability of the Airport as an economic generator for the City of Tyler, Smith County and surrounding communities would be stifled by such a development approach.

A "no action" alternative in any of the functional areas identified would effectively limit the future development at TYR Airport to the existing airside and landside configuration and those projects necessary to meet forecasted demand. Additional development, with the exception of tenant-funded projects, would be made over the 20-year planning period only when absolutely necessary.

In addition to limiting Airport growth potential, this approach would restrict increases in larger passenger and/or cargo aircraft activity or their frequency, virtually eliminating the possibility of attracting further charter or scheduled commercial service. Projected increases in both commercial and general aviation operations would likely be limited due to inadequate facilities. Additionally, actual increases in based aircraft may be less than forecast due to a lack of available hangar space and high construction lag times that typically occur with reactive approaches to development. This alternative will fail to completely meet the previously discussed development evaluation criteria and goals set by the Airport.

To address these issues, it will be necessary to expand the overall capacity of the airfield to address operational and aircraft group capacity demand. This will entail runway safety area improvements, a runway extension and taxiway and navigational aid improvements to accommodate the expected increase in traffic as well as the aircraft fleet mix currently using and anticipated to use the Airport during the planning period.

Airfield Alternative I – Threshold Relocation and Runway Extensions

As recommended in **FAA Order 5200.8**, Runway Safety Area Program, shifting and relocation of an existing runway may be used to provide a standardized safety area per **FAA AC 150/5300-13 Change 9**. According to AC 150/5300-13, RSA dimensions of 500 x 1000 feet and 300 x 600 feet are required for Aircraft Design Groups (ADG) D-III and B-II, respectively, with visibility minimums of lower than ¾-statute mile.

In addition, as outlined in the runway length analysis in **Chapter 4**, an increase in runway length available for both takeoff and landing for the existing aircraft is needed. Due to favorable wind conditions, limited impacts to surrounding roadways and residential communities, it was determined that an extension to Runway 4 would be most prudent. Major projects associated with Airfield Alternative I are outlined below and in **Exhibit 5-1**, *Airfield Alternative I*:

Major Projects Associated with Airfield Alternative I include:

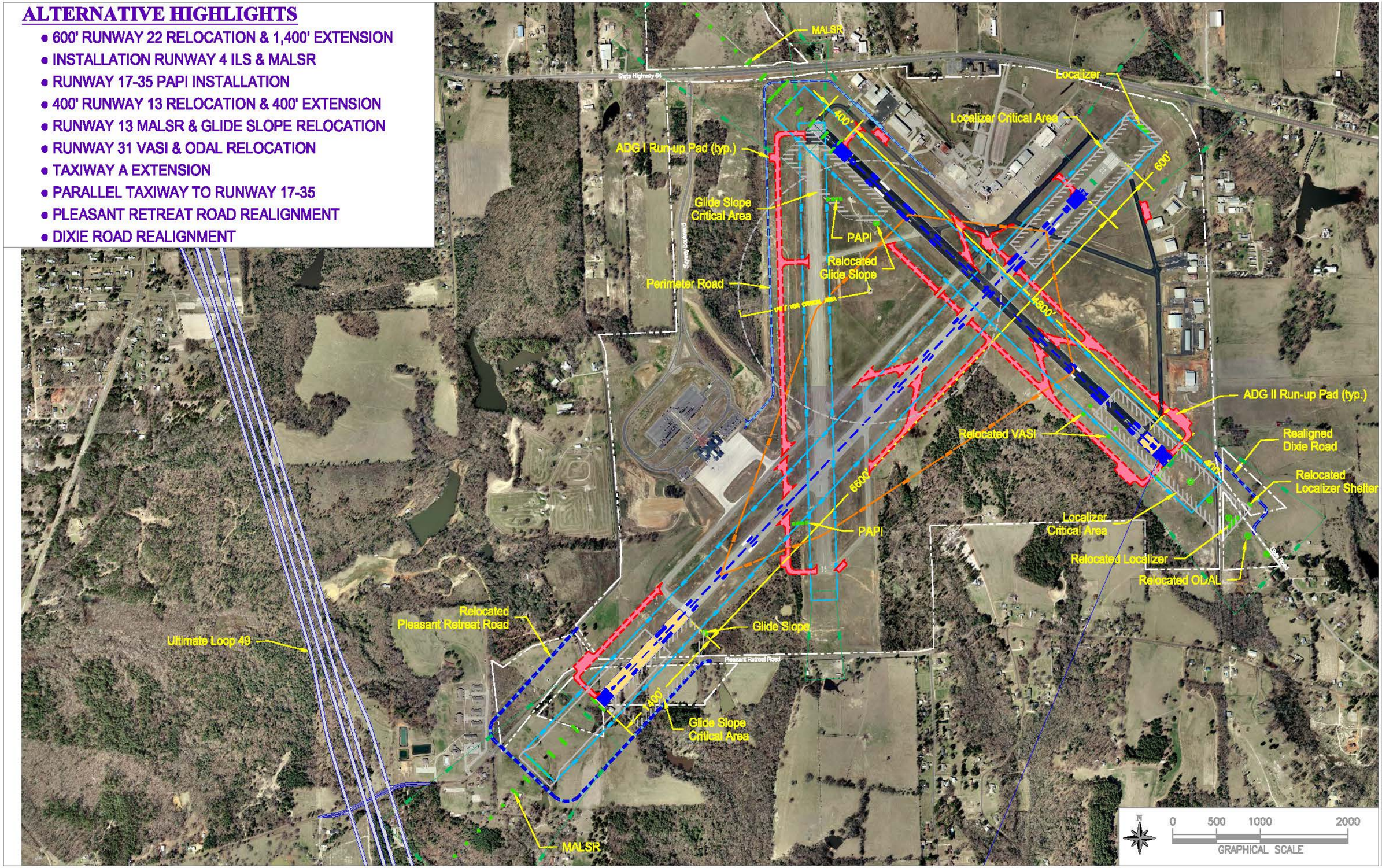
- Relocate Runway 22 Threshold 600 feet
- Extend Runway 4 by 1,400 feet
- Install Runway 4 ILS and MALSR
- Relocate PAPI from Runway 4 to Runway 17
- Relocate Runway 22 VASI
- Construct 400 foot extension to Runway 31
- Relocate Runway 13 Threshold 400 feet
- Relocate Runway 13 MALSR and Glide Slope
- Relocate Runway 31 VASI and ODALs
- Construct Taxiway F extension
- Construct high-speed exit taxiway from 4-22 to Taxiway F
- Extend parallel Taxiway A to full length of Runway 13-31
- Construct parallel Taxiway to Runway 17-35
- Install PAPI on Runway 35
- Realign Pleasant Retreat Road, and
- Realign Dixie Road

In order to provide 8,000 feet of available runway as well as correct runway safety area deficiencies, Airfield Alternative I recommends relocating the threshold of Runway 22 by 600 feet and extending Runway 4 by 1,400 feet. Thus, by extending and shifting Runway 4-22 to the south and west, adequate runway length and standardized safety areas can be obtained as well as providing localizer critical clearance requirements.

A shift and relocation of the Runway 13-31 thresholds were also recommended to obtain standardized safety area requirements north of Runway 13. Shifting Runway 13 400 feet to the south and east while constructing a runway extension of 400 feet on Runway 31 will allow the Airport to maintain 5,200 feet on Runway 13-31 while also providing greater separation between the Runway 17 and Runway 13 thresholds. This option also allows the Airport to keep part of the existing lighting system in place.

ALTERNATIVE HIGHLIGHTS

- 600' RUNWAY 22 RELOCATION & 1,400' EXTENSION
- INSTALLATION RUNWAY 4 ILS & MALSR
- RUNWAY 17-35 PAPI INSTALLATION
- 400' RUNWAY 13 RELOCATION & 400' EXTENSION
- RUNWAY 13 MALSR & GLIDE SLOPE RELOCATION
- RUNWAY 31 VASI & ODAL RELOCATION
- TAXIWAY A EXTENSION
- PARALLEL TAXIWAY TO RUNWAY 17-35
- PLEASANT RETREAT ROAD REALIGNMENT
- DIXIE ROAD REALIGNMENT



AIRFIELD ALTERNATIVE 1

EXHIBIT 5-1

Both proposed relocations of Runway 4-22 and 13-31 will require roadway realignment. Dixie Drive located along the east side of the airfield would be realigned to the east, whereas Pleasant Retreat Road, which runs along the south side of the airfield property, would be realigned approximately 5,674 feet to the south and west to accommodate standardized safety area dimensions and extensions to Runways 4 and 31. It is anticipated, due to the type of roads as well as limited residential development south and east of the airfield, that these improvements would provide a cost effective and operationally efficient solution to the Airport's need to standardize safety areas and increase available runway length.

Additional projects associated with recommended development include a pavement overlay of Runway 17-35, the construction of a parallel taxiway, designated Taxiway J, a 1,050 foot extension of Taxiway F, a 4,000 foot plus extension of Taxiway A to provide full parallel access to Runways 17-35, 4-22, and 13-31, respectively, and construction of run-up pads. All taxiway improvements will conform to ARC standards for a Category D-III aircraft group, thereby requiring a runway-to-taxiway separation of 400 feet. The greater separation will allow larger aircraft to access various portions of the airfield and, therefore, eliminate the need to segregate large aircraft and small aircraft facilities. In addition, both Runways 13-31 and 4-22 have a 400-foot runway-taxiway separation, thus any proposed improvements will maintain that separation requirement. In addition, several connector taxiways will be installed and two high-speed taxiway exits will be constructed, one between Runway 4-22 and Taxiway F and the other between Runway 13-31 and Taxiway A, in order to improve access and egress from the runways, thus decreasing runway occupancy and increasing overall Airport capacity. All taxiways will be equipped with medium intensity taxiway lighting.

Currently, the only available precision instrument approach to TYR Airport occurs on Runway 13. Thus, with the runway shift to the south and east, the glide slope antenna, medium intensity airport lighting system (MALSRs), omni directional approach lighting system (ODALS), localizer and VASIs are to be repositioned to adjust for the threshold relocation of Runways 13 and 31. In addition as part of the recommended airfield development, an additional precision instrument approach is recommended. Since Runway 4-22, under Airfield Alternative I, will become the longest runway on the airfield, it is recommended as part of this development that an instrument approach and associated lighting and markings be installed. Due to wind and existing traffic patterns around TYR Airport, an instrument land system (ILS), including glide slope, high intensity runway lighting and MALSR, should be installed on Runway 4 to provide an approach visibility of less than ¾-statute mile. With the installation of a precision instrument approach to Runway 4-22, the runway markings will be upgraded to a precision approach in conformance with **AC 150/5340-1H**, *Standards for Airport Markings*. Runway marking improvements include the installation of aircraft hold markings, touchdown zones and aiming points.

It is important to note that threshold relocation and roadway realignment are impacted to some degree by the critical areas associated with the Glide Slope and Localizer Antenna. The localizer (LOC) signal is used to establish and maintain the aircraft's horizontal position until visual contact confirms the runway alignment and location. The LOC antenna is usually sited on the extended runway centerline outside the runway safety area between 1,000 to 2,000 feet beyond the stop end of the runway. The localizer critical area refers to the area surrounding the localizer antenna that overlies the stop end of the runway that must be clear of objects. The localizer critical area dimensions, depending upon the system used, can range from 2,000 feet to 7,000 feet in length by 400 feet to 600 feet in width.

The Glide Slope Antenna (GS) is used to establish and maintain the aircraft's descent rate until visual contact confirms the runway alignment and location. As such, the GS antenna may be located on either side of the runway, but is recommended to be located on the side of the runway offering the least possibility of signal reflections from buildings, power lines, vehicles, aircraft, etc. The glide slope critical area, depending upon the system used, can range from 800 feet to 3,200 feet long by 100 feet to 200 feet wide. The critical areas associated with the existing and future precision instrument approach to Runway 13 and 4, respectively, are identified in **Exhibit 5-1**, *Airfield Alternative I.*

In developing cost estimates, no land acquisition was included since no on or off-site development is planned. **Table 5-3**, *Airfield Alternative I, Preliminary Order of Magnitude Cost Estimates*, provides costs in 2005 dollars for proposed development.

A listing of key strengths and weaknesses associated with Alternative I are listed below:

ALTERNATIVE I "RUNWAY RELOCATION" SCENARIO	
Strengths	**Weaknesses**
• Provides required runway length of 8,000 feet • Accommodates airplane design group D-III • Standardizes Runway 4-22 and 13-31 RSAs • Provides additional precision instrument approach • Limits runway crossing and improves airfield access with additional taxiway construction • Increased airfield and runway capacity due to installation of additional high-speed and connector taxiways • Maintains runway length and width on Runway 13-31 • All runways equipped with navigational aids	• Requires realignment of Dixie Drive (approximately 1,014 linear feet) • Requires relocation of Pleasant Retreat Drive (approximately 4,613 linear feet) • Requires acquisition of 71 acres of land, including residential properties, along the approach to Runway 4 • Impacts 20 acres of residential dwellings north and west of the airfield. • Requires relocation of Runways 4, 22, 13 and 31 thresholds, including runway markings, lighting and NAVAIDs. • Significant cost (~$25 million)

An analysis of proposed development as shown in Alternative I will be evaluated in more detail in the Airfield Alternative Analysis section.

TABLE 5-3
ALTERNATIVE I
PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES

PROJECT DESCRIPTION	ESTIMATED COST
Planning Work	
Environmental Assessment	$500,000
Airside Work	
Runway 4 Extension, including lighting, markings and drainage	$2,407,200
Replace MIRL with HIRL on Runway 4-22	$28,800
Taxiway F Extension, Connectors & Run up Pad	$2,313,240
Taxiway F MITL	$27,000
Runway 4 MALSR Installation	$250,000
Runway 4 Glide Slope & Localizer Installation	$350,000
Runway 22 VASI Relocation	$10,000
Runway 4-22 Marking Removal	$294,005
Runway 4-22 Remarking	$197,478
Pleasant Retreat Road Relocation	$510,711
Install PAPIs on Runway 35	$113,500
Relocate PAPIs from Runway 4 to Runway 17	$83,500
Rehabilitate Pavement on Runway 17-35, including markings	$1,616,667
Runway 31 Extension 400 feet, including lighting, marking and drainage	$502,400
Taxiway A Extension, Connectors & Run up Pads	$4,024,080
Taxiway A MITL	$75,000
Runway 13 MALSR & Glide Slope Relocation	$425,000
Runway 31 ODAL Relocation	$40,000
Runway 31 VASI Relocation	$10,000
Runway 13-31 Marking Removal	$325,980
Runway 13-31 Remarking	$168,390
Dixie Road Relocation, includes lighting and drainage	$271,787
Taxiway J Connectors & Run up Pads	$4,337,280
Taxiway E Run up Pad	$104,400
Taxiway H Run up Pad	$251,040
Property Acquisition	$212,220
TOTAL CONSTRUCTION COSTS	$19,449,677
Sum of Total Fees[1]	$5,834,903
Total Phase I Development Costs[1]	**$25,284,581**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

Airfield Alternative II – Extend Runway 4-22 1,050 feet

As discussed previously, Runways 4, 22 and 13 do not have standard RSA dimensions as outlined in **AC 150/5300-13 Change 9**. Thus, in order to accommodate expected demand, standardized safety area criteria must be implemented. For this reason Airfield Alternative II proposes much of the same development as discussed in Airfield Alternative I with one key difference: Instead of relocating the thresholds of Runways 13 and 22 to obtain a standard safety area requirement, it is recommended that declared distances be used to obtain the standard RSA dimensions for each runway's critical design aircraft.

Furthermore, demand for increased runway length to accommodate the anticipated design aircraft requires a length of at least 8,000 feet. Thus, as shown in Airfield Alternative I, an extension of 1,400 feet is warranted. Major construction projects associated with proposed development outlined in Airfield Alternative II are shown below:

Major Projects Associated with Airfield Alternative II include:

- Displace Runway 22 threshold 600 feet
- Extend Runway 4 by 1,400 feet
- Install ILS system and MALSR for Runway 4
- Install ILS system and MALSR for Runway 22
- Relocate Runway 4 PAPI to Runway 17
- Install PAPI on Runway 35
- Construct 400 foot extension to Runway 31
- Displace Runway 13 Threshold 400 feet
- Relocate Runway 13 MALSR and Glide Slope
- Relocate Runway 31 VASIs, localizer and ODALs
- Construct Taxiway F extension
- Construct two high-speed exit taxiways from 4-22
- Construct partial parallel taxiway east and south of Runway 4-22
- Construct three high-speed exit taxiways from Runway 13-31
- Extend parallel Taxiway A to full length of Runway 13-31
- Construct partial parallel taxiway along west side of Runway 13-31
- Construct parallel Taxiway to Runway 17-35
- Pavement overlay to Runway 17-35
- Realign Pleasant Retreat Road, and
- Realign Dixie Road

In conjunction with the projects outlined above, the use of declared distances will provide additional available pavement for takeoff procedures. As stated in **AC 150/5300-13, Change 9, Appendix 14**, *Declared Distances*, "the use of declared distances shall be limited to cases of existing constrained airports where it is impracticable to provide RSA, runway object free area (ROFA) or the runway protection zone (RPZ) in accordance with the design standards…". Due to the location of State Highway 64 and Dixie Drive north of the Airport property line, the use of declared distances was deemed viable. Based upon the runway landing length requirement of 8,000 feet, as discussed in **Chapter 4**, *Demand Capacity and Facility Requirements*, a 1,400-foot extension to Runway 4 is still warranted. However, as shown in **Exhibit 5-2**, *Airfield Alternative II*, the use of declared distances on Runway 4 and 13 provides the following dimensional requirements for airplane performance as outlined in **Table 5-4**, *Declared Distance Evaluation.*

TABLE 5-4
DECLARED DISTANCE EVALUATION

Airplane Performance Distances	Runway 4	Runway 22	Runway 13	Runway 31
Takeoff Run Available (TORA)	8,000	8,250	5,450	5,200
Takeoff Distance Available (TODA)	8,000	8,250	5,450	5,200
Accelerate Stop Distance Available (ASDA)	8,000	8,250	5,450	5,200
Landing Distance Available (LDA)	8,000	8,000	5,200	5,200

Source: AC 150/5300-13, Change 9, Appendix 14 and The LPA Group, Inc. 2005

In conjunction with the runway extensions and use of declared distance on Runways 4-22 and 13-31, a variety of taxiway and navigational aid improvements are recommended. In order to provide access to the relocated thresholds of Runways 4 and 31, extensions of parallel Taxiways F and A, respectively, are recommended. In order not to impact runway capacity or access to various portions of the airfield, all taxiway development will remain at the existing runway-to-taxiway separation requirement of 400 feet (ARC D-III). Additional parallel taxiways J, H and I, parallel to Runway 17-35, Runway 13-31 and Runway 4-22, respectively, will provide additional access to the south side of the airfield and midfield area. Based upon the demand capacity assessment provided in **Chapter 4**, the installation of three high-speed taxiways on Runway 13-31 and two high-speed taxiways on Runway 4-22 will improve airfield capacity by limiting runway occupation time. All runways will be marked to meet ARC D-III requirements as required and will be equipped with MITL.

Navigational aid improvements include the installation of an instrument landing system (ILS) on Runway 4 and 22 to provide two additional precision instrument approaches to TYR Airport. As part of the approach upgrade, Runway 4-22 will be remarked as a precision approach and its lighting will be upgraded to a high intensity approach lighting system to coincide with the installation of the MALSR, glide slope antenna and localizer. As mentioned earlier, the Runway 13-31 localizer, glide slope antenna, MALSR, VASI and ODALs will all need to be relocated as part of the extension to 31 and implementation of displaced threshold on Runway 13. In order to accommodate the displaced threshold on both Runway 13 and 22, in-pavement MALSR lighting will need to be used instead of frangible mounted lighting for lights located prior to the landing thresholds of each of these runways

As mentioned in Airfield Alternative I, roadway realignment and threshold displacement are associated not only with runway safety area requirements but also with instrument approach critical areas as well. The displaced threshold is a runway threshold located at a point other than the physical end of the runway. The displaced portion of the runway may be used for takeoff but not for landing. Also, landing aircraft may use the displaced area on the opposite end for roll out. As shown in **Exhibit 5-2, Airfield Alternative II**, Dixie Drive along the south and east portion of the airfield will need to be realigned to accommodate the localizer critical area. Also, due to the displaced landing threshold on Runway 13, both the localizer antenna and glide slope antenna must be moved. The addition of a precision instrument approach system on both Runways 4 and 22 requires the installation of a glide slope antenna and localizer antenna at both ends of the runway. In addition, to provide a Category I precision instrument approach, which is visibility of less than ¾ -statute mile, an approach lighting system was added to each end of the runway. In this case, MALSRs were installed on both Runway 4 and 22. The MALSR consists of medium intensity lights positioned symmetrically along the extended runway centerline.

The lighting system begins at the runway-landing threshold and extends outward towards the approach for a distance of 2,400 feet. An approach lighting system may be shielded to limit the impact to the neighboring communities and to adjacent roadways. In the case of TYR Airport, the existing approach lighting system to Runway 13 crosses State Highway 64, as would the proposed approach lighting system associated with Runway 22. Impacts associated with the implementation of a precision instrument landing system to Runway 4 and 22 will be discussed in more detail within the airfield alternatives evaluation section of this report.

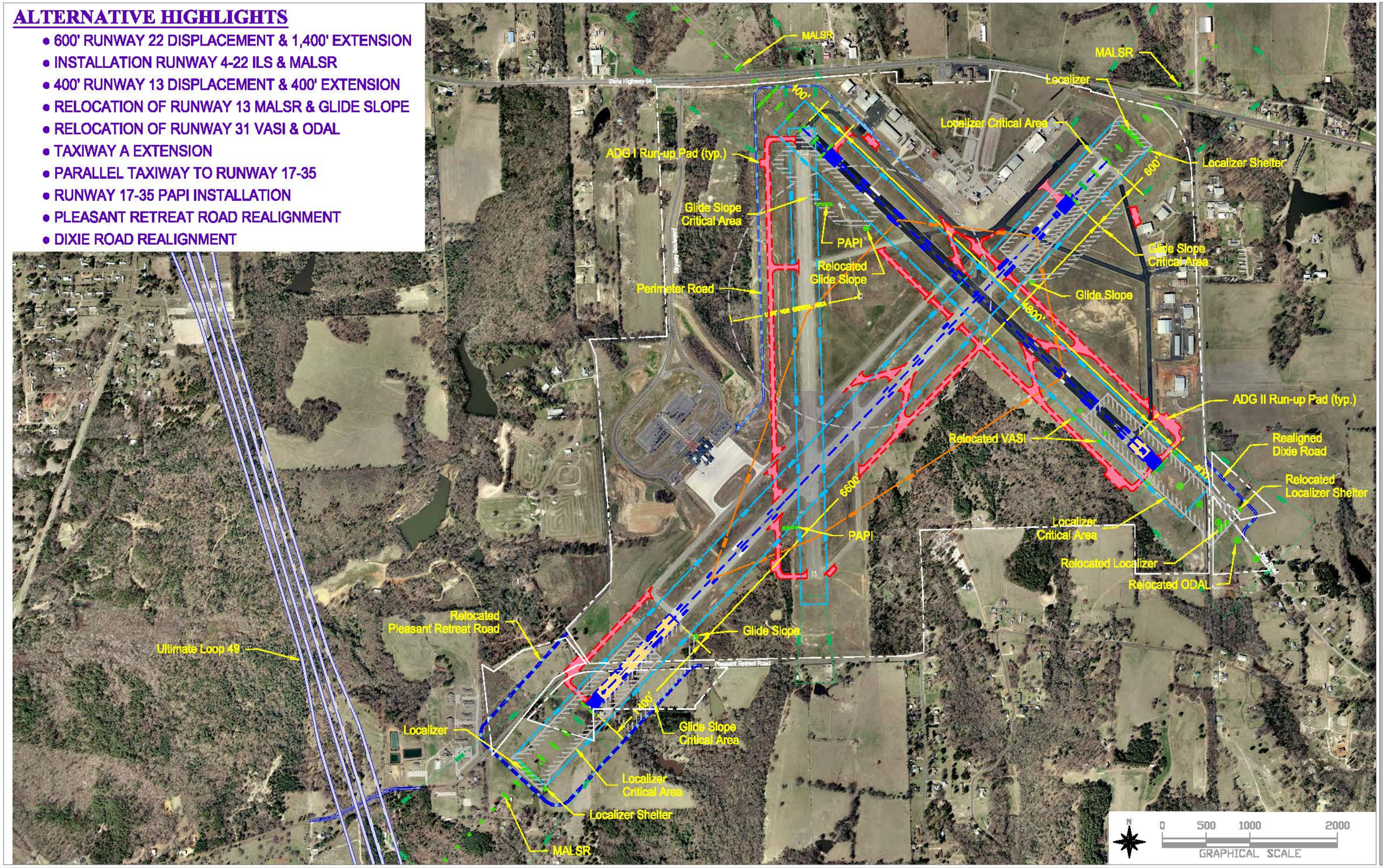
Anticipated costs associated with the proposed airfield development are shown in order of magnitude in 2005 dollars. A comparison of the airfield alternatives will be provided later in this chapter in order to identify a preferred alternative from one or a combination of proposed airfield alternatives.

A listing of key strengths and weaknesses associated with Alternative II are listed below:

ALTERNATIVE II "USE OF DECLARED DISTANCES" SCENARIO	
Strengths	**Weaknesses**
• Provides landing length (LDA) of 8,000 feet and a takeoff distance available (TODA) of 8,600 (Runway 22). • Standardizes RSA dimensions • Provides full and partial parallel runways to Runway 17-35, 4-22 and 13-31. • Provides for the installation of two additional precision instrument approaches to the Airport • Accommodates ARC D-III separation requirements • Improves capacity of airfield with installation of parallel and high-speed taxiways • Improves access to southern, midfield, west and northeast portions of the airfield. • All runways equipped with navigational aids	• Requires the realignment of Pleasant Retreat Road • Requires the realignment of Dixie Drive along the southern portion of the airfield • Requires acquisition of 71 acres of land, including residential properties, along the approach to Runway 4 • Impacts 20 acres of residential dwellings north and west of the airfield. • Requires relocation of Runways 4, 22, 13 and 31 thresholds, including runway markings, lighting and NAVAIDs. • Significant cost (~$26.9 million)

ALTERNATIVE HIGHLIGHTS

- 600' RUNWAY 22 DISPLACEMENT & 1,400' EXTENSION
- INSTALLATION RUNWAY 4-22 ILS & MALSR
- 400' RUNWAY 13 DISPLACEMENT & 400' EXTENSION
- RELOCATION OF RUNWAY 13 MALSR & GLIDE SLOPE
- RELOCATION OF RUNWAY 31 VASI & ODAL
- TAXIWAY A EXTENSION
- PARALLEL TAXIWAY TO RUNWAY 17-35
- RUNWAY 17-35 PAPI INSTALLATION
- PLEASANT RETREAT ROAD REALIGNMENT
- DIXIE ROAD REALIGNMENT



AIRFIELD ALTERNATIVE 2

EXHIBIT 5-2

TYLER POUNDS REGIONAL AIRPORT

MASTER PLAN UPDATE

TABLE 5-5
ALTERNATIVE II "DISPLACED THRESHOLDS"
PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES

PROJECT DESCRIPTION	ESTIMATED COST
Planning Work	
Environmental Assessment	$500,000
Airside Work	
Runway 4 Extension, includes lighting, drainage and markings	$2,400,000
Replace MIRL with HIRL on Runway 4	$28,800
Taxiway F Extension, Connectors & Run up Pads	$2,313,240
Taxiway F MITL	$27,000
Runway 4 MALSR Installation	$250,000
Runway 4 Glide Slope & Localizer Installation	$350,000
Runway 22 MALSR Installation	$250,000
Runway 22 Glide Slope & Localizer Installation	$350,000
Runway 4 PAPI Relocation to Runway 17	$83,500
Runway 4-22 Marking Removal	$294,005
Runway 4-22 Remarking	$201,348
Pleasant Retreat Road Relocation	$1,225,707
Rehabilitate Pavement on Runway 17-35, including markings	$1,616,667
Install PAPI on Runway 35	$113,500
Runway 13 Extension, includes lighting, drainage and markings	$500,000
Taxiway A Extension, Connectors & Run up Pads	$4,024,080
Taxiway A MITL	$75,000
Runway 13 MALSR & Glide Slope Relocation	$425,000
Runway 31 ODAL Relocation	$40,000
Runway 31 VASI Relocation	$10,000
Runway 13-31 Marking Removal	$325,980
Runway 13-31 Remarking	$174,980
Dixie Road Relocation	$271,787
Taxiway I, Connectors & Run up Pads	$4,337,280
Taxiway E Run up Pad	$104,400
Taxiway H Run up Pad	$251,040
Property Acquisition	$212,220
TOTAL CONSTRUCTION COSTS	$20,755,533
Sum of Total Fees[1]	$6,226,660
Total Phase I Development Costs[1]	**$26,982,192**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

Airfield Alternative III – Extend Runway 4-22 2,400 feet

Airfield Alternative III provides for similar development as that discussed in Airfield Alternatives One and Two. All three airfield alternatives include an extension of Runway 4-22 and 13-31, the installation of an instrument landing system on Runway 4, the use of declared distances to obtain standardized RSA dimensions, as well as a number of taxiway improvements. However, Airfield Alternatives III, as shown in **Exhibit 5-3**, provides for an extension of Runway 4-22 by 2,400 feet for a total runway length of 9,000 feet as well as an extension of Runway 13-31 by 1,200 feet to provide a total runway length of 6,000 feet, thereby accommodating anticipated airplane performance requirements through the year 2024. Projects associated with Airfield Alternative III recommended development are outlined below:

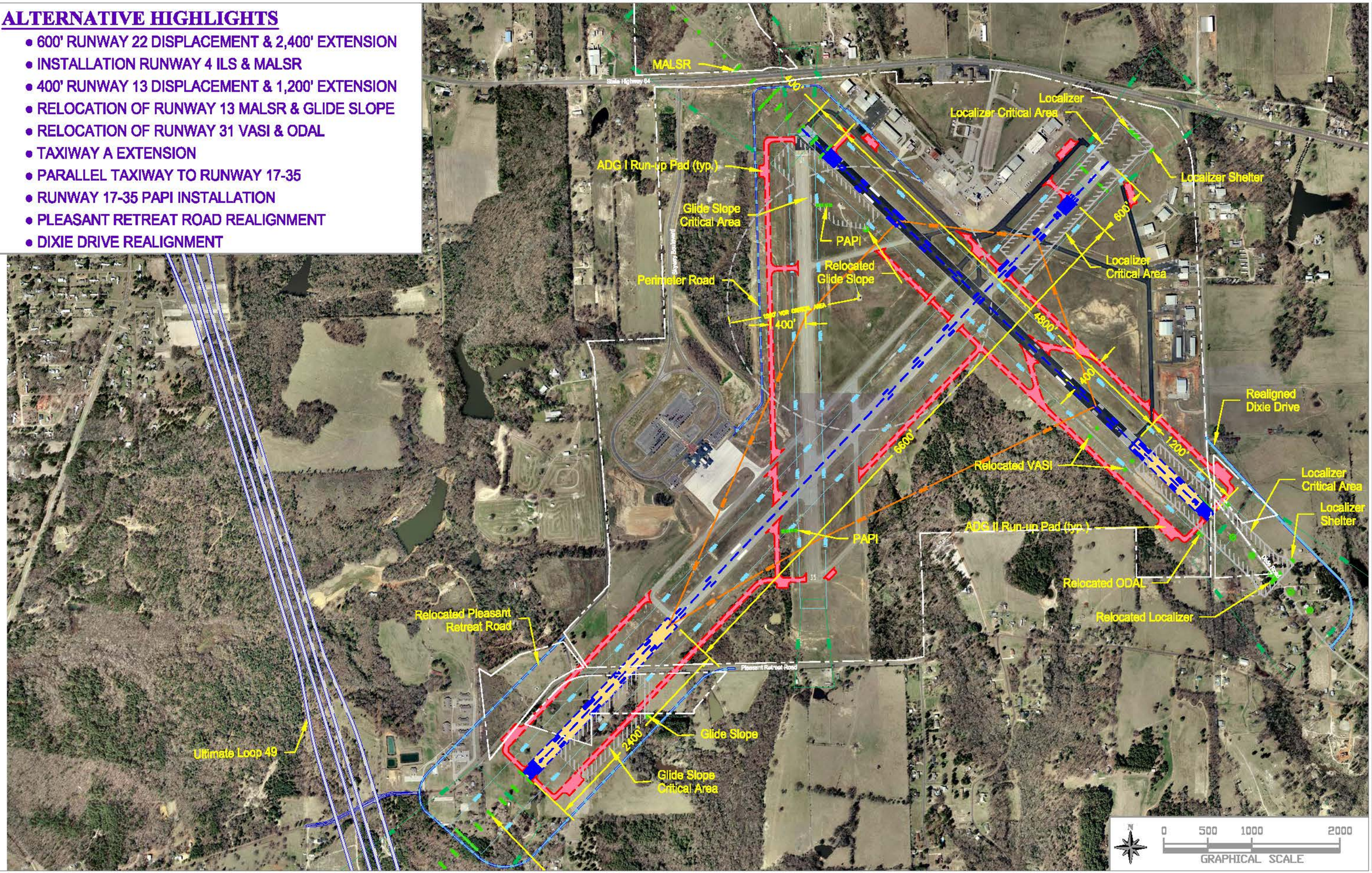
Major Projects Associated with Airfield Alternative III include:

- Relocate Runway 22 Threshold 600 feet.
- Extend Runway 4 by 2,400 feet
- Install Runway 4 ILS and MALSR
- Relocate Runway 22 VASI
- Construct 1,200 foot extension to Runway 31
- Relocate Runway 13 Threshold 400 feet
- Relocate Runway 13 MALSR and Glide Slope
- Relocate Runway 31 VASI, localizer and ODALs
- Relocate Runway 4 PAPI to Runway 17
- Install PAPI on Runway 35
- Construct Taxiway F extension
- Construct high-speed exit taxiway from 4-22 to Taxiway F
- Extend parallel Taxiway A to full length of Runway 13-31
- Construct parallel Taxiway to Runway 17-35
- Realign Pleasant Retreat Road, and
- Realign Dixie Road

The use of declared distances as discussed in Airfield Alternative II provides an airport greater flexibility when unable to accommodate standardized runway safety areas. Therefore, in order to accommodate the runway safety area requirement on Runways 13 and 22 as well as the critical areas associated with the precision instrument approaches, the Runway 13 landing threshold was displaced 400 feet while the Runway 22 landing threshold was displaced 600 feet. However, the extensions of Runway 4 and Runway 31 will provide adequate landing length to accommodate larger and heavier aircraft. An analysis of airplane performance criteria using declared distances is outlined in **Table 5-6**, *Alternative III Declared Distance Evaluation.*

ALTERNATIVE HIGHLIGHTS

- 600' RUNWAY 22 DISPLACEMENT & 2,400' EXTENSION
- INSTALLATION RUNWAY 4 ILS & MALSR
- 400' RUNWAY 13 DISPLACEMENT & 1,200' EXTENSION
- RELOCATION OF RUNWAY 13 MALSR & GLIDE SLOPE
- RELOCATION OF RUNWAY 31 VASI & ODAL
- TAXIWAY A EXTENSION
- PARALLEL TAXIWAY TO RUNWAY 17-35
- RUNWAY 17-35 PAPI INSTALLATION
- PLEASANT RETREAT ROAD REALIGNMENT
- DIXIE DRIVE REALIGNMENT



AIRFIELD ALTERNATIVE 3

EXHIBIT 5-3

TABLE 5-6
ALTERNATIVE III DECLARED DISTANCE EVALUATION

Airplane Performance Distances	Runway 4	Runway 22	Runway 13	Runway 31
Takeoff Run Available (TORA)	9,000	9,250	6,250	6,000
Takeoff Distance Available (TODA)	9,000	9,250	6,250	6,000
Accelerate Stop Distance Available (ASDA)	9,000	9,250	6,250	6,000
Landing Distance Available (LDA)	9,000	9,000	6,000	6,000

Source: AC 150/5300-13, Change 9, Appendix 14 and The LPA Group, Inc. 2005

In association with the runway improvements recommended in Airfield Alternative III, a number of taxiway and navigational aid improvements are also considered. First, the extension of Runway 4-22 to a total pavement length of 9,250 feet warrants the installation of a Category I precision instrument approach and associated equipment. As a result, pavement markings on Runway 4-22 are to be upgraded and the runway lighting is to be upgraded from medium intensity to high intensity. The VASI located on Runway 22 will also be relocated to accommodate the displaced threshold, and the PAPI on Runway 4 will be relocated to Runway 17.

Additional improvements to various lighting and NAVAIDs include the relocation of the MALSR and glide slope antenna on Runway 13 in conjunction with the 250-foot displaced threshold, as well as the relocation of the localizer antenna, VASIs, and ODALs as a result of the extension of Runway 31.

Also, in order to accommodate heavier aircraft and to provide ease of movement throughout the airfield, various taxiway and pavement improvements are recommended. Due to the extension of Runway 4-22, an extension of Taxiway F is recommended, as is the construction of a partial parallel taxiway to the south and east. This taxiway (tentatively called Taxiway K) will provide access to the proposed parallel taxiway (Taxiway J) to Runway 17-35. Further, the construction of Taxiway K will provide midfield access to Taxiway H, a partial parallel taxiway associated with Runway 13-31, which provides midfield access. In addition to a variety of new taxiways, including the addition of several access and high-speed taxiways is the construction of a number of aircraft run-up pads near the runway thresholds. The run-up pads provide an area outside the main taxiway in which aircraft can perform engine run-ups prior to taxiing to the runway for takeoff. Run-up areas are useful in not only improving aircraft access but an airport's overall capacity as well. Finally, pavement rehabilitation on all three runways is recommended as part of this alternative development since an effective pavement maintenance program is crucial to airport and aircraft safety.

Cost estimates associated with the recommended development were developed in 2005 dollars. A cost analysis of the recommended airfield development option will be discussed in more detail later in this report.

TABLE 5-7 ALTERNATIVE III "DECLARED DISTANCE AND 1,800-FOOT RUNWAY EXTENSION" PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES	
PROJECT DESCRIPTION	**ESTIMATED COST**
Planning Work	
Environmental Assessment	$500,000
Airside Work	$0
Runway 4 Extension, includes lights, drainage and markings	$3,600,000
Replace MIRL with HIRL on Runway 4-22	$28,800
Taxiway F Extension, Connectors & Run up Pads	$2,242,920
Taxiway F MITL	$27,000
Runway 4 MALSR Installation	$250,000
Runway 4 Glide Slope & Localizer Installation	$350,000
Runway 22 VASI Relocation	$10,000
Runway 4-22 Marking Removal	$294,005
Runway 4-22 Remarking	$204,048
Pleasant Retreat Road Relocation	$1,746,000
Rehabilitate Pavement on Runway 17-35, including markings	$1,616,667
Relocate Runway 4 PAPIs to Runway 17 Install PAPIs on Runway 35	$113,500
Runway 31 Extension, including lights, markings and drainage	$1,599,960
Taxiway A Extension, Connectors & Run up Pads	$4,019,520
Taxiway A MITL	$75,000
Runway 13 MALSR & Glide Slope Relocation	$425,000
Runway 31 ODAL Relocation	$40,000
Runway 31 PAPI Relocation	$10,000
Runway 13-31 Markings Removal	$325,980
Runway 13-31 Remarking	$175,880
Taxiway I, Connectors & Run up Pads	$4,337,280
Dixie Road Relocation	$226,750
Taxiway J, Connectors & Run up Pads	$3,866,280
Taxiway K, Connectors & Run up Pads	$3,833,760
Taxiway E Run up Pad	$104,400
Taxiway H Run up Pad	$251,040
Property Acquisition	$310,920
TOTAL CONSTRUCTION COSTS	$30,584,709
Sum of Total Fees[1]	$9,175,413
Total Phase I Development Costs[1]	$39,760,122

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

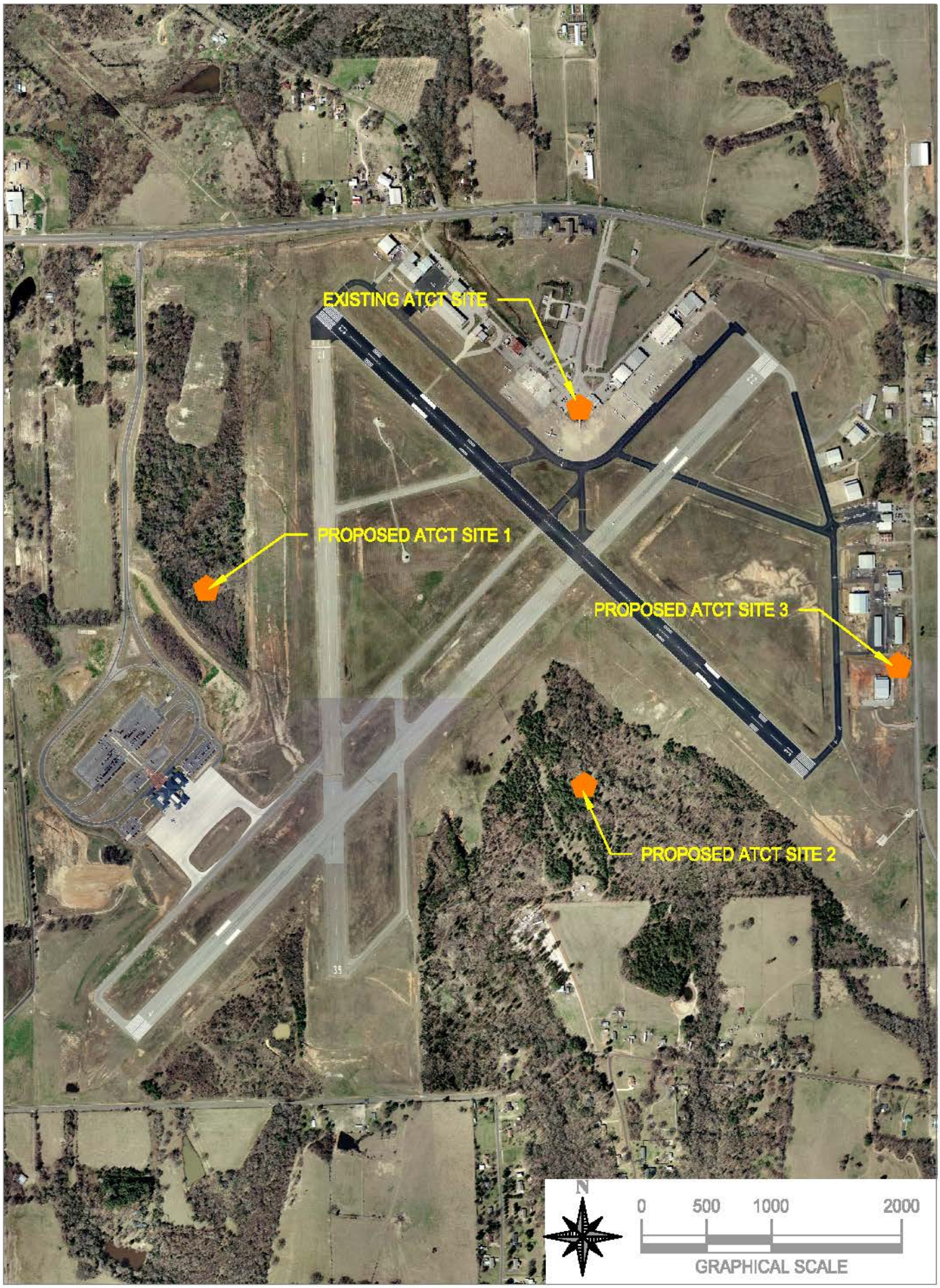
A listing of key strengths and weaknesses associated with Alternative III are listed below:

AIRFIELD ALTERNATIVE III	
Strengths	**Weaknesses**
• Provides landing length of 9,000 feet on Runway 4-22 and 6,000 on Runway 13-31 • Standardizes RSA dimensions • Provides full and partial parallel runways to Runway 17-35, 4-22 and 13-31. • Provides for the installation of an additional precision instrument approaches to the Airport • Accommodates ARC D-III separation requirements • Improves capacity of airfield with installation of parallel and high-speed taxiways • Improves access to southern, midfield, west and northeast portions of the airfield. • All runways equipped with navigational aids	• Requires the realignment of Pleasant Retreat Road • Requires the realignment of Dixie Drive along the southern portion of the airfield • Requires at a minimum 103 acres of land, including residential properties, along the approach to Runway 4 • Impacts 20 acres of residential dwellings north and west of the airfield. • Requires relocation of Runways 4, 22, 13 and 31 thresholds, including runway markings, lighting and NAVAIDs. • Significant cost (~39.7 million) • Ultimate design of Loop 49 will impact approach to Runway 4 since it will be located within the Runway RPZ.

Air Traffic Control

Once the extensions to Runways 4-22 and 13-31 have been completed, the current FAA air traffic control tower (ATCT) facility will fall inside the resulting new runway visual zone (RVZ) between the two runways. This, in addition to the condition of the existing air traffic control facility in the former terminal building, will require relocation and construction of a new ATCT facility. It is recommended that an independent ATCT site selection study be undertaken in coordination with the FAA to determine the most appropriate location for the relocated tower.

Several alternate sites were considered including midfield between Runways 13-31 and 17-35, south of Runway 4-22 and west of Runway 13-31, and east of Runway 13-31. The sites, with the exception of the third site east of Runway 13-31, are positioned in a more secure location away from the passenger terminal complex, and would provide superior views of the Airport at its ultimate 20-year build out. The sites also appear to provide excellent unobstructed line-of-sight to all major approach and ground operation surfaces, with minimal shadowing. Whichever ATCT site is chosen, a cab floor height of at least 100 feet above ground level is recommended. The suggested sites are depicted in **Exhibit 5-4**.



ATCT SITES ANALYSIS

EXHIBIT 5-4

TYLER POUNDS
REGIONAL AIRPORT

MASTER PLAN UPDATE

Environmental Assessment

A complete environmental assessment (EA) will be required for each of the runway improvements discussed. Each EA must be completed before design and construction begins. Additionally, initial improvements should begin within the first five years of the Master Plan, as a reactive measure to increased demand, and should include the extension of Runways 4-22 and 13-31.

Evaluation of Alternatives

The airfield concepts are evaluated within this section to weigh the inherent strengths and weaknesses of each in comparison with the other concepts. Concepts were evaluated within the following categories: best planning tenets, phasing/construction, operational performance, environmental impacts, fiscal factors and community recommendations and acceptance.

Best Planning Tenets – pertains to the total growth potential that each concept affords and the process inherent to achieving that growth. The evaluation criteria associated with this category includes: the ability to provide airfield facilities that will satisfy the needs of unconstrained levels of demand, provides the best practices for safety and security, conforms to applicable FAA design and other appropriate standards, provides the highest and best on and off-airport land use, provides balance between elements, provides flexibility to adjust to unforeseen changes, conforms to appropriate local, regional and state transportation plans, is technically feasible, socially and politically feasible and satisfies users needs throughout the twenty-year planning period.

Phasing/Construction – pertains to existing on-airport land uses and associated impacts to existing facilities as well as the level of difficulty and the cost involved in implementing the proposed airfield concepts. The evaluation criteria associated with this category include the ability to phase construction and expand incrementally, the costs associated with construction, the impact on existing facilities, and any engineering difficulties associated with airfield build-out requirements.

Operational Performance – compares the overall operational efficiency of the proposed airfield layouts. The evaluation criteria associated with this category include the compatibility with the long-range airfield in terms of length requirements and the efficiency of the supporting taxiway system.

Environmental Effects – performs a general assessment to determine the degree to which proposed airfield improvements would potentially affect various components of the surrounding environment as outlined in **FAA Order 1050.1**, *Environmental Impacts: Policies and Procedures* and **FAA Order 5050.4**, *FAA guidance for complying with NEPA*.

Fiscal Factors – performs an order of magnitude cost analysis to determine if alternatives are responsive to the fiscal constraints of the Airport. This includes an evaluation of the respective cost advantages and disadvantages of the alternatives as well as identification of likely funding sources to determine if the proposed alternatives are realistically within the fiscal capability of the Airport.

Community Recommendations/Acceptance – performs a general assessment of the likelihood that the proposed improvements will obtain acceptance from the community at large.

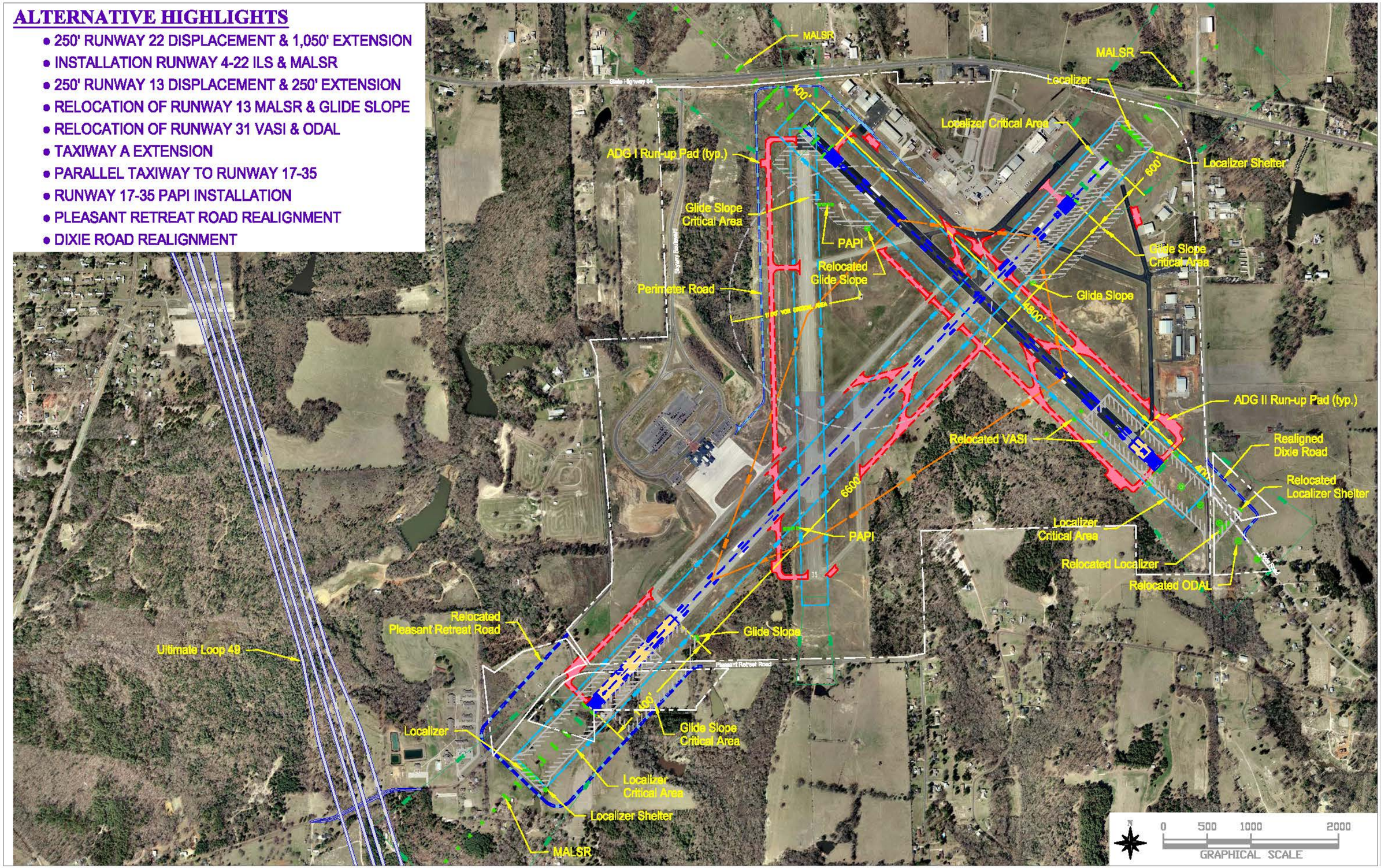
An evaluation matrix, which addresses the aforementioned criteria, is presented in **Table 5-8**, *Airfield Alternative Evaluation*. This matrix summarizes the consultant's analyses of the development concepts. The recommended airfield concept for TYR Airport is based upon qualitative and quantitative assessment of each airfield alternative option. The evaluation scores afford a measurable assessment of the three airfield alternative concepts with respect to the criteria described above.

Recommended Airfield Alternative

Based upon an evaluation of preliminary airfield alternatives, Airfield Alternative II, as shown in **Exhibit 5-5**, *Preferred Airfield Alternative*, provides the recommended airfield development. The use of declared distances in Alternative II can be used to solve the runway safety issues on Runways 13 and 22, and maintain the existing runway length on Runway 13-31. An extension of Runway 31 by approximately 400 feet will maintain the existing landing length of 5,200 feet. Also, an extension of 1,400 feet on Runway 4-22 is recommended to accommodate the displaced threshold on Runway 22 of 600 feet and provide a landing length of 8,000 feet. This will accommodate existing and forecast demand for a longer runway length while also meeting the standard runway safety area criteria. Airfield Alternative II also provides a more flexible airfield configuration by providing two additional Category I precision instrument approaches to both Runway 22 and 4 while also providing a number of taxiway and pavement improvements, including run-up pads and high-speed taxiway exits, to overall airfield capacity. Finally, land acquisition beyond the Airport boundary will be minimized as will roadway realignment of both Pleasant Retreat Road and Dixie Drive thus minimizing the potential impacts to the surrounding communities. Based upon comments received from Airport Management, the City of Tyler, AAB/TAC Committee members and the public, a refined airfield alternative plan will be developed.

ALTERNATIVE HIGHLIGHTS

- 250' RUNWAY 22 DISPLACEMENT & 1,050' EXTENSION
- INSTALLATION RUNWAY 4-22 ILS & MALSR
- 250' RUNWAY 13 DISPLACEMENT & 250' EXTENSION
- RELOCATION OF RUNWAY 13 MALSR & GLIDE SLOPE
- RELOCATION OF RUNWAY 31 VASI & ODAL
- TAXIWAY A EXTENSION
- PARALLEL TAXIWAY TO RUNWAY 17-35
- RUNWAY 17-35 PAPI INSTALLATION
- PLEASANT RETREAT ROAD REALIGNMENT
- DIXIE ROAD REALIGNMENT



PREFERRED AIRFIELD ALTERNATIVE

EXHIBIT 5-5

TYLER POUNDS REGIONAL AIRPORT

MASTER PLAN UPDATE

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION

Evaluation Criterion	Airfield Alternative I		Airfield Alternative II		Airfield Alternative III	
	Score	Comment	Score	Comment	Score	Comment
Legend: 1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent						
Best Planning Tenets:						
Accommodates unconstrained demand	3	Ability to accommodate future demand limited due to relocated thresholds on Runways 13 and 22	5	Increased runway length, the addition of two Cat I instrument approaches, and the implementation of 5 high speed taxiways will provide higher utilization of the airfield	5	Increased runway length will provide larger D-II and higher to utilize the airfield.
Conforms to best practices for safety and security	4	Resolves RSA Issues on Runways 13 and 22 by relocating thresholds, and meets ARC D-III separation requirements	5	Resolves RSA Issues on Runways 13 and 22 by displacing thresholds, and meets ARC D-III separation requirements	5	Same as Airfield Alternative II
Provides highest and best land use	4	Limits development on the airfield	5	Requires land acquisition but provides access to various portions of the airfield for future development	4	Significantly impacts areas surrounding the airfield and require land acquisition
Meets forecast growth	4	Accommodates anticipated growth and demand for longer runway, but may not meet ARC D-III heavy aircraft requirements	5	Accommodates Forecast growth	5	Same as Airfield Alternative II
Provides growth beyond planning horizon	3	May hamper growth due to limited access to the midfield area.	5	Proposed development does allow for growth but does not require the over-building of the Airport at the time of this writing.	5	Alternative three will accommodate ARC D-III or larger aircraft, and proposed taxiway development will provide access to all portions of the airfield.

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION (CON'T)

Evaluation Criterion	Airfield Alternative I		Airfield Alternative II		Airfield Alternative III	
	Score	Comment	Score	Comment	Score	Comment
Legend: 1. Poor	2. Fair	3. Satisfactory	4. Very Good	5. Excellent		
Improves airfield capacity	3	Airfield capacity is improved as a result of runway and taxiway improvements. However, access to the midfield area is hampered.	5	Provides increased runway length, variety of taxiway improvements, including 5 high-speed taxiway exits, and two additional Cat I instrument approaches	4	Provides 9,000 foot and 6,000 foot runways, construction of several taxiway improvements including parallel taxiways, and implementation of Cat I instrument approach to Runway 4
Provides flexibility	3	Provides additional instrument approach, but taxiway access is limited to the perimeter of the airfield	5	Additional Cat I approach to Runway 22 and taxiway improvements provide greater runway flexibility	4	Additional Cat I approach to Runway 4 provides an additional precision approach. Also, all taxiway-to-runway separation is equal D-III facility requirement
Conforms to Sponsor's vision	3	Does not fully meet Sponsor's desire to develop existing airfield south of Runways 13-35 and 4-22.	5	Meets Sponsors desire to have precision approach on both Runway 4 and 22 as well as meet safety area requirements and runway length demand	4	Exceeds runway length requirement and standardizes RSA dimensions. However, does not meet demand for precision instrument approach on both Runway 4 and 22.
Conforms to applicable transportation plans	5	Conforms with existing transportation plans	5	Same as Airfield Alternative I	5	Same as Airfield Alternative I
Technically feasible	5	Alternative is technically feasible	5	Same as Airfield Alternative I	5	Same as Airfield Alternative I
Socially and politically feasible	5		5		4	This will require a greater realignment of both Pleasant Retreat Road and Dixie Drive as well as may impact residential housing south of the airfield

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION (CON'T)

Evaluation Criterion	Airfield Alternative I		Airfield Alternative II		Airfield Alternative III	
	Score	Comment	Score	Comment	Score	Comment
Legend: 1. Poor	2. Fair	3. Satisfactory	4. Very Good	5. Excellent		
Satisfies users needs	4	Due to relocated threshold, will not satisfy user demand for an 8,000 ft runway	5	The use of displaced thresholds on both Runways 13-31 and 4-22 will allow the full runway length for takeoff thus satisfying user needs for the longer runway	5	The extensions of Runway 4-22 and 13-31 in conjunction with the use of declared distances exceeds user runway length demands
Phasing/Construction:						
Ability to phase construction/ expansion	4	Runway construction will need to be phased to minimize potential impacts. Phase I involves closing Runway 4-22 and shifting operations to Runway 13-31 and 17-35. Phase II involves shifting all operations to Runway 4-22 and 17-35 while construction on Runway 13-31 is completed. Associated taxiway construction may be performed with runway improvements.	4	See Alternative I	4	See Alternative I
Impact on existing facilities	3	Impacts to existing facilities include realignment of Dixie Drive, Pleasant Retreat Road, Airport Perimeter Road, and threshold lighting, markings and navigational aids	3	Same as Alternative I	3	Same as Alternative I

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION (CON'T)

Evaluation Criterion	Airfield Alternative I		Airfield Alternative II		Airfield Alternative III	
	Score	Comment	Score	Comment	Score	Comment
Legend: 1. Poor	2. Fair	3. Satisfactory	4. Very Good	5. Excellent		
Engineering/ Land Build-out or acquisition requirements	4	Land acquisition will be required associated with the extension of Runway 13-31 and 4-22. Approximately 75 acres of land may be impacted.	3	This includes land acquisition associated with Runway 4 and 31 extensions and also includes property necessary to accommodate the critical approach areas related to the precision approaches to Runways 4 and 22. Approximately 75 acres may be impacted.	2	Alternative III requires the largest build-out due to the extensions of Runway 4-22 to 9,000 feet and 13-31 to 6,000 feet. Further, additional land will be required to accommodate critical area requirements associated with instrument approach procedures.
Operational Performance:						
Capacity	3	Limited taxiway improvements do limit airfield operational capacity.	5	Improves overall airfield capacity and accommodates future aircraft activity	5	Accommodates future activity levels beyond the existing and forecast design aircraft
Capability	5	Accommodates Design Aircraft and provides additional runway length	5	Accommodates design aircraft, provides additional runway length and provides three precision approaches with visibility of less than ¾-mile.	5	Accommodates design aircraft, provides additional instrument approach and accommodates longer runway requirements throughout the twenty year planning period.
Efficiency	3		5	Improves airfield capacity due to high-speed taxiways as well as ability to accommodate precision approaches at both ends of Runway 4-22	4	

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION (CON'T)

Evaluation Criterion	Airfield Alternative I		Airfield Alternative II		Airfield Alternative III	
	Score	Comment	Score	Comment	Score	Comment
Legend: 1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent						
Environmental Effects:						
Noise	3	Impact limited due to relocated thresholds on the north side and limits noise impacts to residential area to the south and east of the airfield.	3	Same as Airfield Alternative I	2	Additional noise impacts could occur as a result of moving Runway 31 and 4 closer to residential housing south of the airfield.
Land Use	4	Majority of land currently on-airport. Alternative impacts only 75 acres beyond the existing Airport boundary.	4	Will require additional land acquisition associated with runway extensions. However, majority of proposed development will occur on existing Airport property.	3	Will require additional land acquisition associated with runway extensions. However, majority of proposed development will occur on existing Airport property.
Social Impacts	3	Social impacts are anticipated to be limited as a result of the proposed development	3	Same as Alternative One	3	Same as Alternative One
Induced Socio-Economic Impacts	4	No anticipated socio-economic impacts	4	Same as Alternative One	4	Same as Alternative One
Air Quality	5	No Impact	5	No Impact	5	No Impact
Water Quality	4	Potential impacts	4	Potential impacts	4	Potential impacts
DOT Act, Section 303 (c)	5	No Impact	5	No Impact	5	No Impact
Historical, Architectural, Archaeological, and Cultural Resources	5	No potential impacts	5	No potential impacts	5	No potential impacts
Biotic Communities	3	Possible impact, site survey recommended	3	Possible impact, site survey recommended	3	Possible impact, site survey recommended
Air Quality	5	No Impact	5	No Impact	5	No Impact
Water Quality	4	Potential impacts	4	Potential impacts	4	Potential impacts

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION (CON'T)

Evaluation Criterion	Airfield Alternative I		Airfield Alternative II		Airfield Alternative III	
	Score	Comment	Score	Comment	Score	Comment
Legend: 1. Poor	2. Fair	3. Satisfactory	4. Very Good	5. Excellent		
DOT Act, Section 303 (c)	5	No Impact	5	No Impact	5	No Impact
Endangered and Threatened Species	3	Protected species survey be performed prior to construction	3	Protected species survey be performed prior to construction	3	Protected species survey be performed prior to construction
Wetlands	3	Potential impacts associated with Runway construction. Mitigation and regulatory permits most likely would be required	3	Potential impacts associated with Runway construction. Mitigation and regulatory permits most likely would be required	3	Potential impacts associated with Runway construction. Mitigation and regulatory permits most likely would be required
Floodplains	5	No Impact	5	No Impact	5	No Impact
Coastal Zone Management	5	No Impact	5	No Impact	5	No Impact
Coastal Barriers	5	No Impact	5	No Impact	5	No Impact
Wild and Scenic Rivers	5	No Impact	5	No Impact	5	No Impact
Farmland	5	No Impact	5	No Impact	5	No Impact
Energy Supply and Natural Resources	5	No Impact	5	No Impact	5	No Impact
Light Emissions	3	Impacts associated with light emissions could be associated with MALSRs and ODALs	3	Impacts associated with light emissions could be associated with MALSRs and ODALs	3	Impacts associated with light emissions could be associated with MALSRs and ODALs
Solid Waste Impact	5	No Impact				
Construction Impacts	4	Possible impacts associated with proposed development	3	Significant impacts may occur as a result of runway and taxiway construction as well as implementation of additional NAVAIDs	3	Same as Alternative II

TABLE 5-8
AIRFIELD ALTERNATIVE EVALUATION (CON'T)

Evaluation Criterion	Airfield Alternative I Score	Airfield Alternative I Comment	Airfield Alternative II Score	Airfield Alternative II Comment	Airfield Alternative III Score	Airfield Alternative III Comment
Legend: 1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent						
Fiscal Factors:						
Cost Estimates	4	Cost will be significant due to proposed runway extensions on Runway 4 and 31 as well as installation of precision approach to Runway 4 and associated land acquisition. **Cost = ~$22 million**	3	Cost will be significant due to installation of two Cat I precision approaches, extensions to Runways 4 and 31, relocation of lighting and NAVAID equipment as well as extensive Taxiway improvements. **Cost =~$23 million**	3	Significant expense associated with additional construction and equipment relocation. **Cost=~$36 million**
Fiscal Capability of Airport	5	Based upon an evaluation of existing Airport funding and financial status, the Airport will be able to pay for the local share of all projects recommended within this alternative.	5	Same as Alternative I	3	Cost Benefit Analysis may not justify runway length requirement greater than 8,000 feet and 6,000 feet
Community Recommendations/Acceptance						
Public Acceptance	4	Extensions of runways recommended; however, runway length is limited due to threshold relocation on Runway 13-31.	4	Runway length maintained and increased through limited runway extensions as well as the use of declared distances. Taxiway connectors will limit runway crossings.	3	Significant runway development south of the airfield will impact residential housing and two major roads (Dixie Drive and Pleasant Retreat Road)
Total Evaluation Score	**179**		**189**		**177**	
Average Evaluation Score	**4.07**		**4.30**		**4.02**	

Source: The LPA Group Incorporated, 2005

Land Use/Land Acquisition

The objective of the Land Use/Land Acquisition Analysis is to evaluate the impacts that the alternative airfield and landside improvements will have on the use of land within the Airport's boundary, on contiguous parcels, and on the community as a whole. As described in Chapter 2, Inventory of Existing Conditions, TYR Airport is located on approximately 999 acres of land of which 974 acres is designated Fee Simple ownership with the remaining 25 acres designated as easements. Current easements at the Airport include the RPZ associated with Runway 13-31. As a result, development associated with Runway 13-31 will require the acquisition of property for both the physical development as well as to accommodate the new RPZ areas.

In addition to land required for airside use, TYR Airport can support a wide variety of discretionary uses on the Airport, including: Airport-related commercial service businesses, aviation-related business, aviation/aerospace manufacturers, non-aviation industrial/commercial uses, and low-density uses in approach/transition areas. Each of these areas is described in the following sections.

Airport Operations

Prior to the extension of Runways 4-22 and 13-31, additional land area will need to be acquired to maintain compliance with FAA directives and avoid incompatible land use in the immediate vicinity of TYR Airport. The majority of land to be acquired is deemed agricultural. Although the physical runway facilities for the extensions of Runway 4-22 and 13-31 remain within Airport property, easements or land acquisition are required to accommodate navigational aids as well as RSA and RPZ requirements. Potential land acquisition or easements are associated with the following development:

- Runway 4 extension to the south, including runway safety areas (RSA) and runway protection zones (RPZs) and to accommodate the Airport approach lighting system. Total acreage required equals 55 acres.
- Addition of Runway 22 Airport approach lighting system to the north and east. Includes 10 acres of land for acquisition or easement,
- Construction of Runway 31 extension to the south, including RSA and RPZ
- Incompatible land use will require the acquisition of an additional 6 acres.

Since Airfield Alternative II does not necessarily include acquisition of land, the Airport must negotiate with the owners and operators of the property to mitigate any existing or future incompatible land use or obstructions. A runway extension would ensure increases in commercial and GA operations and would no longer limit aircraft performance requirements due to inadequate facilities, thus making the Airport more attractive to larger corporate, commercial and cargo operators currently operating elsewhere. The establishment of future Airport development on the west and south side of the airfield will maximize utilization of available land areas not only for Airport protection but also to increase Airport revenue generation.

Patterns of land obtained via easement or purchase will offer new opportunities for both aviation and non-aviation development on adjacent and contiguous parcels. In addition, the realignment of both Dixie Drive and Pleasant Retreat Road will provide access to the Airport's east, south and west sides of the airfield. The extension of Runway 4-22 and 13-31 will provide a significant swath of available land area between the two runways, thus providing an ideal location for future GA or non-aviation development. Proposed taxiway development will also provide airside access to currently underutilized areas of the Airport, thus improving airfield capacity and utilization.

Commercial Facilities

TYR Airport provides the east Texas region with commercial air services via American Eagle and Continental Connection. Existing commercial facilities at the Airport include the new terminal area, west of Runway 4-22, the former terminal area, located on the north side of the Airport adjacent to Runway 4-22, and the northeast development area located east of Runway 13-31 on the northeast side of the airfield. Based upon anticipated demand, commercial development, including restaurants, rental car facilities, parking, etc, will continue to be developed along the western portion of Runway 4-22. Access to this area is provided via Skyway Boulevard with connections to State Highway 64. Compatible development along Skyway Boulevard could include hotels, retail space, gas stations, and other commercial facilities.

Reuse of both the former terminal facilities as well as northeast development area may be designated for both aviation and non-aviation use. Considerable interest in the reuse of the former terminal facility by an aviation museum or other organization is under consideration as is the use of the facility for a restaurant and retail space. The northeast development area should be limited to aviation only development due to its proximity to airfield facilities. Further development discussion associated with the reuse of the former terminal facility as well as northeast airfield will be discussed in more detail later in this chapter.

Corporate and Light General Aviation

As mentioned earlier, the large areas of land between the Runways 17-35 and 13-31 as well as west of Runway 17 and northeast of Runway 22 creates several ideal location for dedicated GA development. Facilities dedicated to larger corporate GA aircraft could be located west of Runway 17 or northeast of Runway 22. Development within this area would include corporate and conventional hangars as well as larger apron and aircraft parking areas.

An area dedicated to lighter GA development such as T-hangars, small conventional hangars and FBO facilities would be constructed between Runway 17-35 and 13-31 on the south side of the airfield. All south side development may be accessed either via Dixie Drive or Pleasant Retreat Road, while the larger facilities may be accessed via Skyway Drive on the west and State Highway 64 or Dixie Drive on the northeast.

Airport Commerce Park

In an effort to increase the generation and diversification of revenues at TYR Airport, an Airport Commerce Park is recommended along the south and eastern portion of the airfield, as shown in **Exhibit 5-6**. A commerce park will play a key role in providing a location for aviation-oriented businesses since these firms generally require direct access to the airfield. In addition, firms such as parts suppliers and avionics repair shops often operate from locations not directly accessible to the airfield. There are also a number of companies that prefer to locate their facilities at an airport due to the orientation of their products, market and/or operations. These include a number of firms that operate their own aircraft in addition to using commercial air services.

TYR Airport should consider taking advantage of the recent resurgence in demand for corporate aircraft by marketing the Airport Commerce Park as a potential site for a new aircraft manufacturing plant. Typically these types of companies will locate in areas with an aviation-oriented labor force. In developing a Commerce Park, an area must be chosen which has ample apron frontage and easy surface access in order to make it an attractive site for an aircraft manufacturer. Manufacturers of specialized parts or components do not require sites on the airfield, but many due to the aviation orientation of their business would make an airport a preferred location.

The Commerce Park may offer advantages in location for commercial businesses that neither support the Airport operations, such as motels, hotels, rental car agencies, restaurants, service stations and small executive offices that provide services and facilities for business travelers. Since many of these businesses area accommodated in off-airport locations, especially where air transport plays a relatively minor role in the overall commercial activity of the area, the addition of a Commerce Park offers ideal opportunities to attract such businesses. In addition, the Airport's location adjacent to Loop 49, Pleasant Retreat Road and Dixie Drive will provide easy access to development along the south and east side of the airfield.

Air Cargo

Air cargo at TYR Airport currently consists of commercial belly freight and limited air taxi operations. There are no designated air cargo facilities at the Airport since limited air cargo operations are performed by the airlines within the terminal facility. Based upon anticipated increases in belly freight associated with increased airline operations as well as the possibility of attracting a limited cargo carrier and/or heavy maintenance operation, it is recommended that cargo facilities be located to provide sufficient apron space and facilities for operations as well as ease of access to both the airfield and highway system to facilitate the flow of operations.

As a result, taxiway, ramp area, hangar and warehouse facilities should be constructed within the northeast corner of the airfield adjacent to the former terminal facilities to serve existing and future air cargo and maintenance demand. Due to the underutilized land adjacent to State Highway 64 as well as West Access Road and former Airport Entrance Road, the Airport could utilize this land to more easily market cargo areas to potential tenants.

Mixed Use

While TYR Airport should give priority consideration in its real estate policy to firms that are aviation oriented, it should not preclude using available properties to attract other industrial/commercial activities. Creating strong business activities near the Airport will create beneficial effects and a favorable climate for the potential attraction of aviation-related companies.

In order to maintain flexibility and take advantage of opportunities that may arise from market demand expansion, areas adjacent to the former terminal facility, State Highway 64 and Dixie Drive on the north side of the airfield can

be reserved for mixed-use development. As a result, the northern portion of the airfield east of Runway 13-31 may be used for both aviation and non-aviation development, including commercial, industrial or retail, depending upon market demand. This approach maximizes land use within this area, provides a viable location for a variety of industries and businesses as well as providing an additional source of revenue

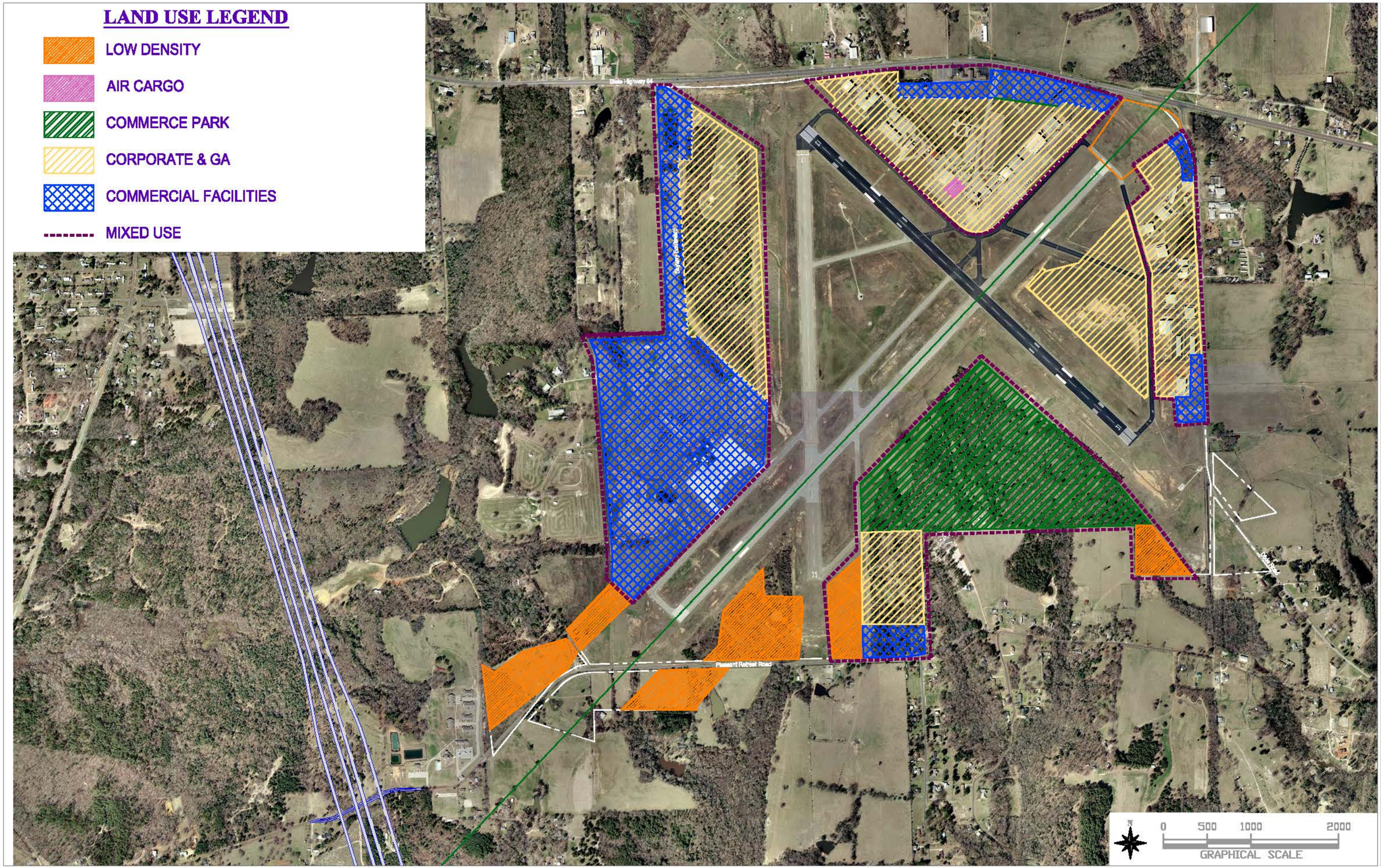
Low Density Uses for Approach/Transition Zones

There is a small area that will fall within the approach/transition zone, for future Runways 4-22 and 13-31, which are unsuitable for most commercial and industrial development due to height limitations and/or obstacle free zone criteria. This area falls within the runway protection zones and approach zones of Runways 4, 22 and 31.

Many airports have been successful in developing low-density recreational facilities in approach/departure zones. Golf courses are frequently regarded as a good use in this area, although clubhouses and other areas where large groups of people congregate should not be located within the RPZ. Ball fields may be developed outside the RPZ, although caution needs to be used when placing similar facilities in approaches to limit potential placement of large concentrations of persons within the RPZ.

Caution should also be exercised before planning recreational facilities, even on an interim basis, in areas reserved for future aeronautical development. The required relocation of such facilities may require special environmental approvals.

When considering potential land uses within high noise zones, consideration should be given to the land use guidelines included within the Airport's approved Noise Compatibility Program, which specifies the level of noise reduction which should be included in structures, local zoning and general compatibility of various types of land uses. Proposed land use areas are illustrated in **Exhibit 5-6, Land Use Map**.



ON-AIRPORT LAND USE

EXHIBIT 5-6

TYLER POUNDS
REGIONAL AIRPORT

MASTER PLAN UPDATE

Landside Facilities-Building Areas

All landside facilities, particularly building areas, are ideally developed to be in balance with the airfield/airspace facilities. At TYR Airport, existing and proposed development areas include:

- Terminal facilities
- Air cargo facilities
- GA and related aeronautical development areas
- Commerce Park

The focus of this section is to evaluate those building areas directly related to supporting aviation activity. Non-aviation building on-Airport was evaluated in a cursory manner considering location, function, and future utility, and compatibility with aviation operations.

Building area alternatives were conceptualized with the goal of developing a facilities development plan that exhibits the following characteristics:

- **Flexibility:** A plan that is demand-responsive, and can adjust over time to changes in quantifiable demands as well as changes in the nature of demands.
- **Vision:** A plan that addresses probable future aviation trends and technologies, as well as trends in other transportation arenas.
- **Definition:** A plan that sets a sure course of action for the short range, and is clearly supported and realistic.
- **Order:** A plan that views each part of the landside system as an interrelated part of the whole Airport – and of a global and regional transportation system.
- **Balance:** A plan that can extend the landside to its required fullest extent while maintaining balance with the capacity of the fully expanded airside.
- **Convenience:** A plan that enables TYR Airport and its tenants to achieve a high level of public service.
- **Stability:** A plan that properly guides small increments of growth and modification that TYR Airport and its tenants may need over time.
- **Economic Soundness:** A plan that enables TYR Airport and its tenants to prosper over the years.
- **Suitability:** A plan that meets the needs of the tenants and its users.

Table 5-9 presents a cursory summary of estimated building area facility requirements derived from the previous chapter. These requirements are presented in terms of Planning Activity Levels (PALs), which emphasize that it is future increases in activity that "trigger" the requirement for expanding or upgrading major facilities at the Airport, not time-dependent forecasts. These requirements were used as the basis for the formulation and evaluation of alternative building area concepts. These requirements are based on analysis of facilities at TYR Airport and comparisons with other major US airports that currently accommodate activity levels equivalent to the future levels projected for the Airport.

TABLE 5-9
SUMMARY OF BUILDING AREA FACILITY REQUIREMENTS BASED UPON EXISTING OPERATIONAL CAPACITY/DEMAND

	Existing 2004	PAL 1 2009	PAL 2 2014	PAL 3 2024
Activity:				
Peak Hour Passengers	43	53	69	110
Aircraft operations				
General aviation	52,747	56,054	60,428	69,388
Military	551	772	698	571
Air Carrier	10,143	10,598	11,895	14,859
Total operations	63,441	67,824	73,021	84,819
Based Aircraft	110	115	120	132
Requirements:				
Terminal complex				
Terminal building (sq ft)	27,135	31,483	37,082	49,082
Curbside (lin ft)*	853	1,074	1,383	2,169
Parking spaces				
Public-Long-Term (1 car/3 days)	205	258	332	521
Public – Short-Term (6 cars/1 day)	46	57	74	116
Rental car (Ready Return and Storage)	76	94	122	190
General Aviation				
T-hangars	35	36	38	42
Conventional Hangars:				
Hangars Required	23	24	25	28
Total Space Required	326,400	343,200	364,800	403,200
GA Terminal Space	11,114	16,062	18,281	16,062
GA tie-down apron (sq yd):				
Transient Aircraft Apron Requirements	6,820	7,958	9,206	13,455
Based Aircraft Apron Requirements	3,924	4,284	4,608	5,364

*Note: * Curbside requirement based upon FAA AC 150-5360-13, Planning and Design Guidelines for Airport Terminal Facilities*
Source: The LPA Group Incorporated, 2005 and Airport Management

Considering the seemingly endless range of possibilities for facility development, broad alternatives were first developed in their long-range configuration to a limited extent of detail to understand their potential and reasonableness based upon anticipated demand. These concepts were then narrowed according to their ability to meet the characteristics described above. As a result, the following landside development area alternatives were considered.

Terminal Facilities

Terminal facilities at TYR Airport consist of the new terminal facility west of Runway 17-35 and the former terminal facility north and east of Runway 4-22. An analysis of the new terminal facility will be provided to identify areas for development associated with increases in passenger and commercial traffic. Key areas to be addressed will include terminal expansion to accommodate recent security requirements and anticipated passenger demand.

The former terminal facility will be evaluated for potential reuse for both aviation and non-aviation opportunities, including an aviation museum, aviation themed restaurant, GA terminal facility, etc. Security requirements associated with redevelopment will also need to be considered as will anticipated demand for access to the airfield. Located on the second and third floors of the former terminal facility is the FAA Air Traffic Control Tower (ATCT). Thus, as part of the redevelopment plan, the FAA ATCT should be relocated to another site on the airfield. Further discussion of terminal facility redevelopment will be discussed later in this report.

Commercial Passenger Terminal Facilities

The passenger terminal complex includes: the terminal building, airline aircraft parking aprons, roadway circulation, public parking, and support facilities.

As was indicated in the analysis undertaken in the previous chapter, future projections of domestic passenger traffic indicate that some areas of the terminal will reach capacity within the twenty-year planning period, confirming the need to plan for additional functional areas within the terminal, and to provide for additional vehicular parking space. The size of these functional areas will of course need to correspondingly increase with passenger growth, although the number of carriers, leasing conditions, and tenant preferences will also affect the extent of future expansion.

The objectives behind the development of future terminal complex improvements are to ensure the balanced and timely development of passenger terminal facilities, aircraft parking positions, curbside and roadway improvements, and public/employee parking. In addition to these overall planning objectives, the following specific criteria have been established:

- Minimizing passenger-walking distance.
- Providing convenient passenger loading and unloading.
- Providing an equal level of service and access to the passenger terminal from the parking areas.
- Maintaining operational flexibility.
- Permitting future expansion facilities with minimal disruption of Airport operations, in accordance with planning activity level estimates.

Commercial Terminal Development Options

Since a new passenger terminal was recently constructed in 2002, only a brief evaluation of terminal facilities was conducted in this report to determine how changes since September 11, 2001 might affect terminal facilities at Tyler Pounds Regional Airport. In light of these changes, particularly related to security requirements, several terminal development options shown in **Exhibit 5-7** were created to address the following facility needs:

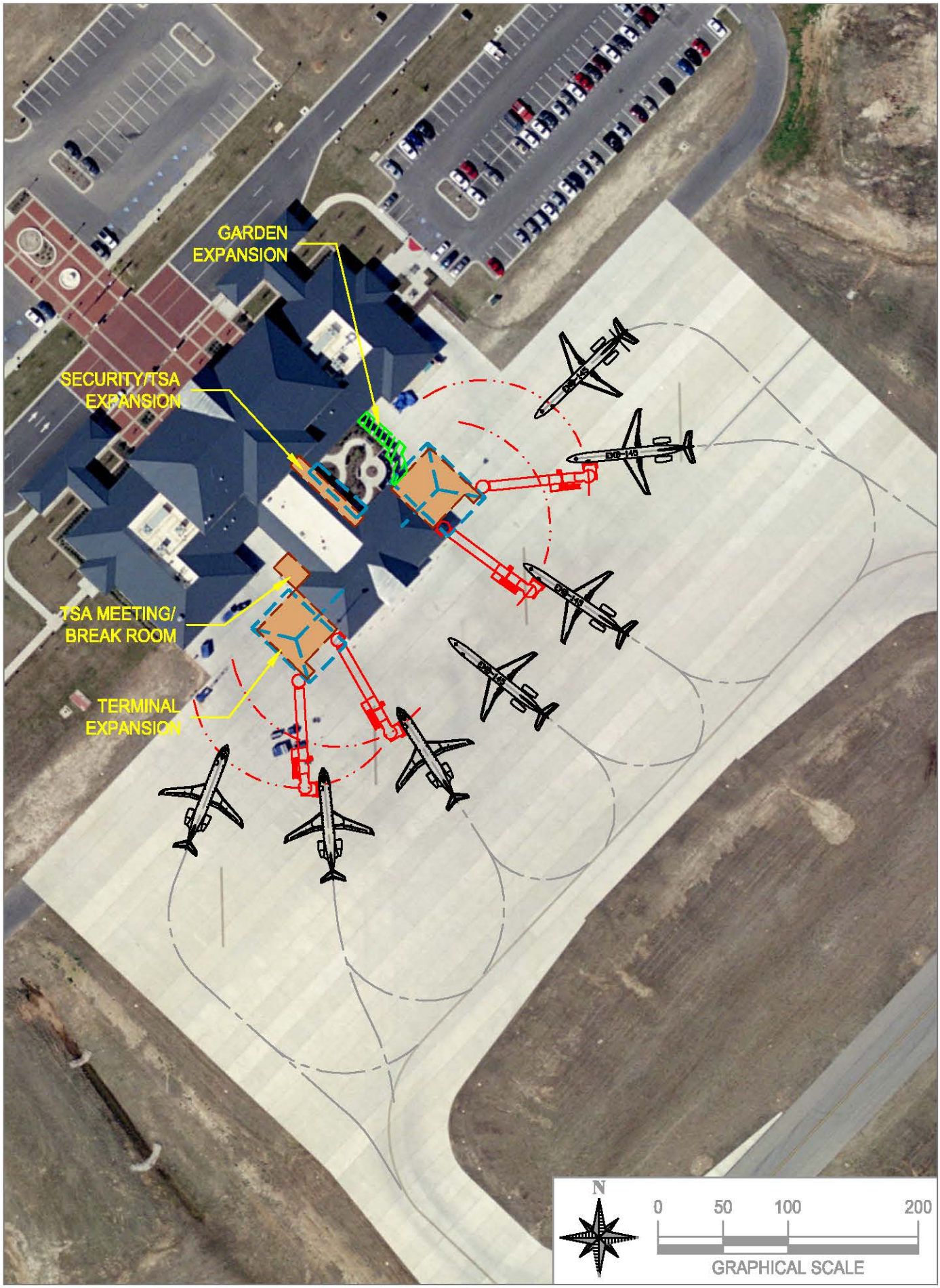
- Improved Security Screening
- Dedicated TSA Offices/Break Room
- Additional Secure Passenger Holding Area, and
- Jet Boarding Bridges

Security Screening

Currently, a single screening station is used for the scanning of passengers and baggage. Although a single screening station is capable of accommodating the number of peak hour passengers projected throughout the 20-year planning period, the Airport should consider an additional screening station in the future to improve the processing of passengers through the security check point during peak periods. In the future, the central corridor connecting the main terminal to the secure hold room should be expanded to accommodate an additional screening station. The most feasible and cost effective means of accomplishing this effort involves expanding the corridor towards the garden by approximately 10 feet. As a result, the outer garden wall could be shifted outward to compensate for the proposed expansion of the corridor and the secure passenger hold room discussed later in this section.

TSA Offices

TSA is currently occupying the underutilized airline office space located in the area between American Airlines and Continental Airlines. Although this arrangement is acceptable at present, there would not be adequate space to accommodate TSA offices in the event that additional air carrier service is introduced at TYR. Also, additional space is currently needed for training of TSA personnel and for periodic shift breaks. Therefore, it is recommended that this area be located near the screening station to facilitate employee breaks. The area best suited for such development is located adjacent to the corridor and secure passenger holding area. However, expansion would be limited in order to maintain airside access to the baggage make-up area and restaurant loading dock. Therefore, it is recommended that approximately 350 square feet of additional space be dedicated for a TSA meeting/break room. Personnel would gain access to this area via the secure passenger holding area. This area could also be expanded to meet future TSA needs in conjunction with an addition to the secure passenger holding area.



TERMINAL DEVELOPMENT OPTIONS

EXHIBIT 5-7

TYLER POUNDS REGIONAL AIRPORT

MASTER PLAN UPDATE

Secure Passenger Holding Area

The existing secure passenger holding area includes approximately 4,500 square feet of space for seating and circulation of enplaning and deplaning passengers. As discussed in previous sections of this report, most aspects of the passenger terminal are designed to accommodate projected passenger activity over the 20-year planning period. However, additional expansion of the secure passenger holding area will be required at various stages during the 20-year planning period. In order to facilitate this future growth, the holding area can be expanded to the northeast and to the southwest. Over time, this area of the terminal is capable of nearly doubling in size to meet future demand. The benefit of this approach is that the expansion can be phased over time to meet future needs without over building.

Passenger Boarding Bridges

Currently, passengers gain access to their aircraft via the two center gates (Gates 2 and 3). Passengers are then subjected to the elements while walking across the terminal apron to their aircraft. However, the existing terminal was designed to accommodate changes in the future aircraft fleet mix. Specifically, Gates 1 and 4 are designed to accommodate regional jets through the use of passenger boarding bridges. Passenger boarding bridges will both protect passengers from inclement weather and provide an added measure of security. Two passenger boarding bridges should be installed during the short term to accommodate the recent influx of regional jets at TYR. Future improvements to the secure passenger holding area will also include provisions for two additional passenger boarding bridges.

Terminal Area Improvements

There are a number of facilities that support the overall operation of the passenger terminal. Previous sections of this report have identified areas of deficiency that must be addressed as part of the planning process. These areas include:

- Car Rental Facilities, and
- Automobile Parking and Access

Car Rental Facilities

Existing car rental facilities are located northeast of the terminal next to the baggage claim exit. The existing ready return lot is conveniently located close to the passenger terminal and adequately meets the airport's current needs. However, cars are fueled, cleaned, and processed off site. In response to this issue, a development option was created to provide a future rental car service area within the terminal area. The service area shown in **Exhibit 5-8** will be designed to accommodate the combined activities of up to four rental car companies. This area will include wash facilities, fuel island cueing, fueling/vacuuming facilities, and final cueing. Fuel storage facilities would be located in proximity to the fueling island. Dedicated access to the fuel storage tanks would also be provided off of Skyway Boulevard.

TERMINAL AREA IMPROVEMENTS

EXHIBIT 5-8

LPA

TYLER POUNDS
REGIONAL AIRPORT

MASTER PLAN UPDATE

Passenger Terminal Parking and Access

As discussed previously in **Chapter 4**, *Facility Requirements*, improvements to both the short- and long-term parking lots will be necessary over the 20-year planning period. Fortunately, the existing terminal parking area has ample expansion capability incorporated into its design. Parking options were developed to maximize the capacity of the existing parking lot and adjacent areas. Construction of the improvements depicted in **Exhibit 5-8** are designed to meet future TYR's short- and long-term parking needs and should be phased in accordance with future passenger demand.

In conjunction with these improvements, the parking plaza will also be expanded to meet future demand. This includes two additional attendant booths and associated roadway improvements to the exit drive and portions of Skyway Boulevard.

Employee Parking

As the airport development program grows in the future to accommodate additional airline passenger service, it will be necessary to expand the existing employee parking lot to accommodate approximately 20 additional spaces. There is ample room to expand this area and the project can be phased in conjunction future terminal area improvements.

GA and Related Aeronautical Development Areas

The existing GA facilities are primarily located on the east side of the airfield adjacent and directly south of the former passenger terminal facility. Since it is desirable to separate commercial operations from GA operations, several new GA development areas are proposed to the north, south and west of the airfield. The north GA area would be located within the existing boundaries of the airfield north of former Terminal Facility, and would include an expansion of existing GA facilities including the fixed based operators. This area would be known as the North GA Complex. Additional GA development to the west of Taxiway I and Runway 17 and east of Skyway Boulevard would be designated as the West GA Complex. This area could be utilized for small GA and larger corporate development. Finally, GA development to the south and east of Runway 31 will be designated as the South GA Complex. The preferred locations for GA development considered topography, utilities, airfield and roadway access, and environmental impacts. These criteria were also used to evaluate the preferred facility development for each of the GA areas outlined above.

Moving GA operations to these areas maximizes development within the existing property line and separates larger aircraft operations from smaller business and recreational aircraft operations. Corporate, conventional and T-hangar development as well as expanded apron tie-down facilities will ease congestion and enhance safety in the vicinity of the new terminal facility as both commercial traffic and GA traffic increase. The efficient use of runways 17-35 and 13-31, by corporate and GA traffic, are anticipated to increase the overall capacity of the Airport by providing a system of separating larger commercial aircraft from smaller GA aircraft.

Aircraft storage facilities at TYR Airport consist of a combination of conventional and T-hangar facilities as well as some limited aircraft tie-down facilities. Aircraft hangar facilities are provided and managed by the two Fixed Based Operators (FBOs) currently on the Airport. The FBOs lease the land from the City of Tyler. Since the Airport's current T-hangar facilities are operating at 100 percent capacity with a current waiting list of at least 15 T-hangar units needed, demand for hangar storage over the long-term planning period is significant. Proposed development accommodates the capacity requirements outlined in **Chapter 4** while also providing various leasehold options and, therefore, providing an increase in aviation related lease revenue. The demand for T-hangars in Texas exceeds the

ability of the TxDOT to meet anticipated demand for storage facilities. Therefore, if TYR Airport were to build T-hangars beyond those forecast, the Airport may attract new based-aircraft tenants.

Proposed GA development alternative concepts build upon the airfield alternative concepts evaluated earlier in the report. The following subsections provide a detailed analysis of GA development in conjunction to proposed airfield development. Following an evaluation of the GA alternative concepts, a preferred concept for each area (north, south and west) may be recommended to provide the framework to support and guide future development at the Airport, including support facilities and landside access.

Each GA development considers storm water retention, airfield capacity and issues associated with line-of-sight requirements. Each considers the nine fundamental areas for GA facilities, including:

Airport Operations Area (AOA) – includes all runways, taxiways, Runway Protection Zones (RPZ), obstacle-free areas, and Federal Aviation Regulations (FAR) Part 77 areas that are object free so as not to affect navigable airspace.

T-Hangars – as required for the planning period based on the anticipated preference for this type of aircraft storage.

Conventional Hangars – encompassing conventional hangar storage and maintenance hangars provided by the FBOs.

Based Aircraft Apron – includes the required based aircraft tie-down apron as well as the areas required for aircraft maneuvering.

Transient Aircraft Apron – consists of the required transient aircraft parking apron, tie-down and the areas required for aircraft fueling.

Other Apron Areas – includes the apron areas associated with maneuvering aircraft for storage as well as aircraft maintenance.

Terminal – includes the terminal and office areas for intermodal and FBO operations.

Automobile Parking – consists of the required vehicular parking for general aviation facilities.

Corporate Facilities – represent all hangar storage, aircraft apron, and automobile parking areas for aviation-related businesses and private corporations.

All proposed development was evaluated based upon the assessment criteria of best planning tenets, phasing/construction, operational performance, environmental impacts, fiscal factors and community recommendations and acceptance to determine the preferred development alternative for each of the proposed GA development areas. Proposed layouts for GA facilities on the north side, westside and southside are shown in **Exhibits 5-9 through 5-20**, respectively.

As stated earlier in the chapter, three areas on the Airport were considered for future GA development. These areas include: the Northeast GA Complex adjacent to the former Terminal Facilities and the former Airport Entrance Road; the West GA Complex, which is to be located on the land between Skyway Boulevard and Taxiway I, north of the new terminal facilities; lastly, the Southern GA Complex is recommended to be located east of Runway 35 adjacent to the extension of Taxiway A. Proposed development concepts for each of these areas is outlined in detail below and shown in **Exhibits 5-9** through **5-20**, respectively.

North GA Complex Development

Included in the North GA Complex development are options for the reuse of the former terminal passenger facilities as well as reserving areas for potential air cargo development. As stated in **Chapter 2**, *Airport Inventory*, the apron area surrounding the former passenger terminal is in poor condition. Adjacent facilities include Tyler International School of Aviation, Tyler Turbine, Texas Civil Air Patrol, Mewbourne, Southwest Business Jet, Herd Producing Company, and the HAMF Historic Aviation. Terminal reuse and redevelopment options and air cargo development consider adjacent tenants, facility demand, as well as surface access requirements. In addition, approximately 7,000 square yards of existing apron pavement is currently available and is used primarily by Tyler International Flight School, the Civil Air Patrol, Tyler Turbine and three corporate aircraft users. In addition, twelve tie-down parking facilities are located in the east side of the apron that is used for based and transient aircraft parking.

In addition to the former terminal redevelopment, four proposed general aviation development alternatives were evaluated for the North GA Complex. As stated, the North GA Complex is located adjacent to the former Terminal Facility and existing general aviation facilities east of Runway 22. The boundaries of the North GA Complex include the former Terminal facility apron area to the southwest and southeast as well as the property boundary to the north. Four GA development layouts for this area were identified and include hangar development, apron expansion and construction, access road improvements, and fence line adjustments. Order of magnitude cost estimates for each alternative will be provided in 2005 dollars, and proposed development will be shown through the long-term planning period.

Former Passenger Terminal Reuse

As discussed in previous chapters, the former terminal building is located northwest of Runway 4-22 and Runway 13-31 intersection at the apex of the existing apron. The building consists of two floors and a tower of which the first floor is empty, while the second floor and tower are occupied by Air Traffic Control Personnel. However, as mentioned under airfield development, relocation of the Air Traffic Control Tower (ATCT) is recommended to another portion of the airfield as a result of recommended airfield development as well as operational demand, line of sight requirements and controlled security access. It is important to note that the FAA offices currently located on the second floor of the former terminal facility will remain.

As part of the new Terminal Area Development Plan, a workshop was held on May 4, 1999 to discuss new terminal development as well as reuse options for the former terminal facilities. Four approaches for reuse of the former terminal facilities was considered including:

- Reuse of existing building
- Demolition of part and reuse of the remaining
- Demolition of the entire building or
- Demolition of the entire building and construction of new structure in its place.

As a result of this workshop, it was determined that reuse of the former terminal facilities with demolition of the bag claim addition, provides the most cost effective option. As a result, Airport management has and is working with existing and future tenants on various options for reuse. One interested Airport tenant is the Historic Aircraft Memorial Museum (HAMM), which constructed an Exhibits Hall and aviation hangar at TYR Airport to offer a permanent place for the display of historic aircraft and aviation memorabilia. Based upon HAMM's desire to continue to expand their facilities, discussions are on-going to have the museum rent out a portion of the first floor of the former terminal facility. The City is also interested in having an observation area developed within the former terminal facility as well as attract an aviation themed restaurant. The former terminal location near the

other HAMM facilities as well as its ease of surface access and available parking make it a suitable site for future development.

Air Cargo Development

Air Cargo associated with increased air carrier and air taxi operations has increased steadily over the past decade. A goal of the Airport, in addition to attracting new businesses, is to attract a cargo operator by developing facilities that may attract interest by a cargo operation. As a result, several areas on the airfield were considered, but it was determined due to ease of surface access as well as airside access and available apron area that the Northwest GA Complex, where the former Terminal facility is located would be an ideal location. This would allow air taxi operators to remain close to both fixed based operator facilities (Tyler and Oxford Air) as well as offering a cargo operator room to expand.

The amount of truck and delivery van traffic that can be generated from an air cargo complex is an important consideration, as is the ability to expand apron and sort buildings. A dedicated cargo facility that would include at least one large cargo warehouse with room to expand us proposed on the northeast side of Runway 4-22 and 13-31, would have direct airside access to Taxiway A and Runway 13-31. The area provides a good location from the standpoint of proximity to the airfield, separation from the passenger terminal complex, and ease of access to both State Highway 64 and Dixie Drive.

Proposed locations for future air cargo development within the North GA Complex are denoted in the general aviation alternatives outlined in the following sections. Significant demand for air cargo facilities is considered limited within the twenty-year planning period. However, dependent upon the type of development both aviation and non-aviation within the existing and contiguous to the Airport property, demand for air cargo facilities could be generated. Therefore, planning for future development in relation to other GA development within the North GA Development Complex is recommended.

GA Development

North GA Alternative 1

North GA Alternative 1 proposes limited non-aviation commercial development with the exception of reserving 18,740 square feet for a commercial center located along the northern perimeter of the Northern GA Complex. Access to this facility will be provided via State Highway 64 to the existing Old Entrance Road located to the east of the proposed facility.

Hangar development and associated apron include the following:

- Five 10-unit T-Hangar facilities
- Twenty-one (21) 36 foot by 46 foot box hangar facilities
- Five (5) 80 foot by 80 foot corporate hangars
- One (1) 100 foot by 100 foot corporate hangar; and
- One (1) 125 foot by 125 foot corporate hangar

In conjunction with hangar development, apron and taxi lane construction is also proposed to accommodate aircraft hangar demand. Thus, approximately 12,421.3 square yards of apron is associated with GA development within the western portion of the North GA Complex, whereas 24,726.5 square yards of taxi lane and aircraft apron, which includes an 80-foot by 80-foot wash rack is recommended within the eastern portion of the North GA Complex.

In addition, landside improvements include the extension of the perimeter road to the north side of the airfield, construction of surface access and automobile parking associated with hangar development, area reserved for cargo development, as well as fence line adjustments to accommodate new development. Landside or surface access improvements include approximately 2,765 square yards (approximately 66 spaces) of parking associated with the corporate, box and T-hangar facilities within the eastern portion of the North GA complex, 10,574 square yards (approximately 110 parking spaces) of parking associated with the proposed commercial center, and 3,607 square yards (approximately 42 parking spaces) associated with the corporate hangar facilities adjacent to the west GA area and 5,548 square yards (approximately 133 parking spaces) associated with the T-hangar facilities and large corporate hangar facility.

Anticipated construction costs associated with this proposed development are shown in **Table 5-10.**

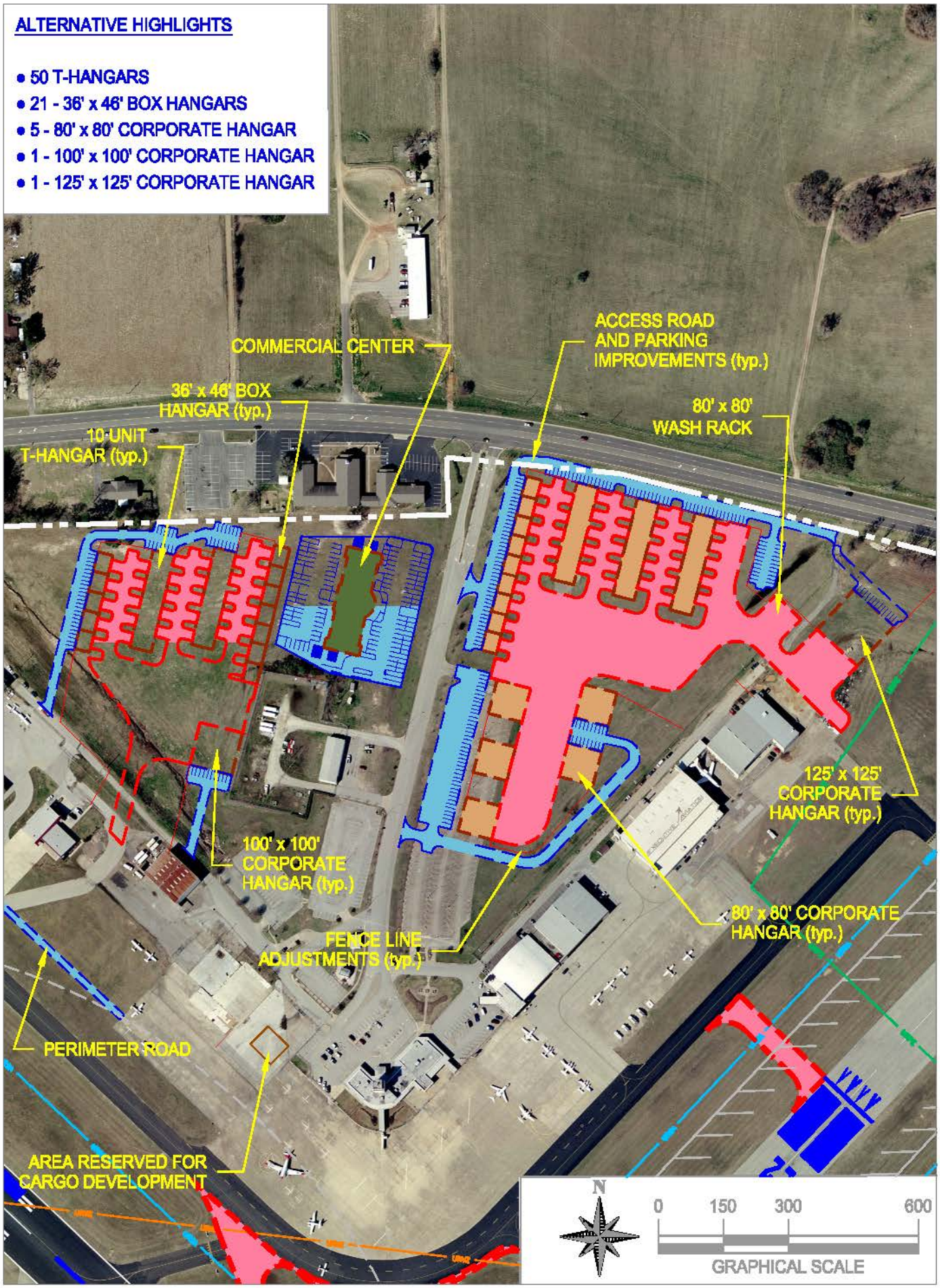
TABLE 5-10 NORTH GA COMPLEX DEVELOPMENT OPTION 1 PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES		
PROJECT DESCRIPTION		**ESTIMATED COST**
T-Hangar Construction	$	1,550,000.00
Box Hangar Construction	$	1,564,920.00
Commercial Center	$	2,248,800.00
Corporate Hangar Development	$	2,632,187.50
Apron Construction	$	1,232,400.00
Access Road and parking improvements	$	1,174,700.00
Wash Rack Construction	$	40,000.00
Fence line Adjustment	$	1,200.00
TOTAL CONSTRUCTION COSTS	$	10,444,207.50
Sum of Total Fees[1]	$	3,133,262.25
Total Development Costs[1]	**$**	**13,577,469.75**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

NORTH GA DEVELOPMENT COMPLEX ALTERNATIVE 1	
Strengths	**Weaknesses**
▪ Efficiently utilizes existing space available for future development ▪ Includes area for commercial aviation and non-aviation development ▪ Accommodates significant portion of hangar demand forecast through 2024 ▪ Reserves area for future cargo development ▪ Development remains on existing Airport property ▪ Uses existing access road to provide access to Dixie Drive and State Highway 64	▪ Development primarily associated with smaller aircraft with limited large aircraft hangar development ▪ Wash rack facilities located on east apron area only ▪ Limits potential revenue diversification associated with aviation and non-aviation development. ▪ Nested T-hangars limited to 10-units each ▪ Estimated Cost for development is $13.5 million.



NORTH GA ALTERNATIVE 1

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North GA Alternative 2

North GA Alternative II within the North Complex includes development of smaller GA storage facilities, including box, T-hangar and an 80-foot by 80-foot corporate hangar facility. Development is proposed on either side of the Airport Old Entrance Road. Proposed development associated with this alternative includes:

- Reserve approximately 426 square yards between Tyler Jet facilities for air cargo.
- Construct eleven (11) 80 foot by 80 foot corporate hangars
- Construct two (2) 13-unit nested T-hangar facilities
- Construct two (2) 14-unit nested T-hangar facilities
- Construct one (1) 10-unit nested T-hangar facility
- Construct fifteen (15) 36 foot by 46 foot box hangar facilities
- Construct one (1) 120 foot by 120 foot corporate hangar facility
- Construct one (1) 125 foot by 125 foot corporate hangar facility
- Construct 75 foot by 75 foot wash rack facility
- Construct approximately 38,428 square yards of apron and taxi lane pavement, and
- Construction of associated automobile parking facilities (approximately 347 parking spaces) and facility access roads

In conjunction with proposed GA development within the North GA Complex, an extension of the Airport perimeter road is recommended, as is an adjustment to the existing fence line to accommodate development. Anticipate construction costs associated with this proposed orientation is shown in **Table 5-11**:

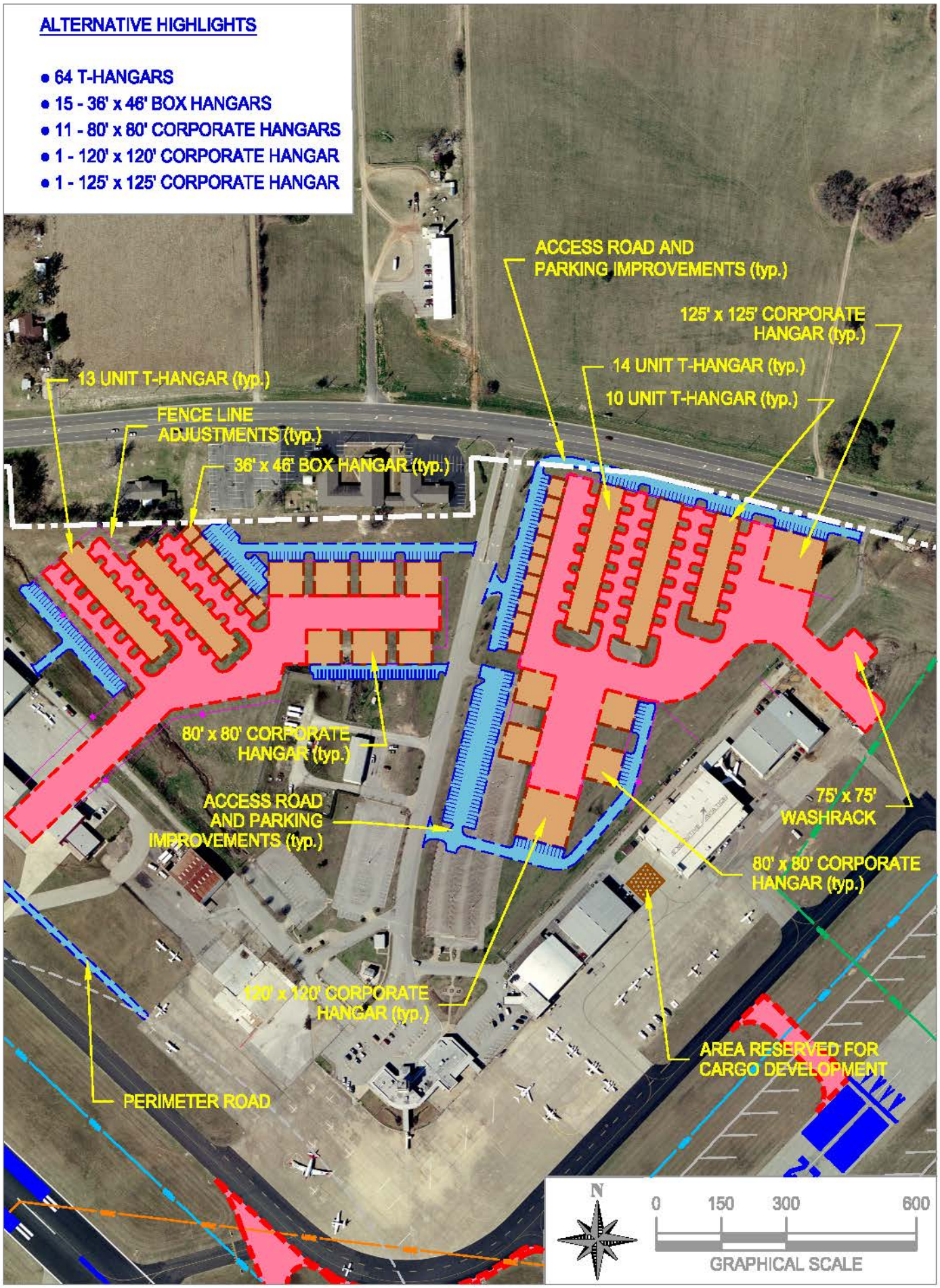
TABLE 5-11 NORTH GA COMPLEX DEVELOPMENT OPTION 2 PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES	
PROJECT DESCRIPTION	**ESTIMATED COST**
Construct eleven 80 x 80 ft corporate hangars	$3,168,000
Construct two 13-unit T-hangars	$403,000
Construct two 14-unit T-hangars	$434,000
Construct one 10-unit T-hangar facility	$310,000
Construct fifteen 36 x 46 ft box hangars	$1,117,800
Construct 120 x 120 ft corporate hangar	$684,000
Construct 125 x 125 corporate hangar	$742,188
Construct 75 x 75 ft wash rack facility	$55,000
Construct 38,428 SY of apron and taxi lanes, includes markings and lighting	$3,082,100
Construct 16,609 SY of automobile parking and surface road access, includes lighting and markings	$880,450
Relocate fence line	$1,200
Extend Perimeter Road	$80,000
TOTAL CONSTRUCTION COSTS	$10,957,738
Sum of Total Fees[1]	$3,287,321
Total Development Costs[1]	**$14,245,059**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

NORTH GA DEVELOPMENT COMPLEX ALTERNATIVE 2	
Strengths	**Weaknesses**
▪ Accommodates T-hangar demand through the long-term planning period ▪ Provides a mix hangar storage options for small, mid-size and large ▪ Accommodates potential for air cargo growth by reserving property contiguous to the Tyler Jet Center site ▪ Does not require land acquisition ▪ Surface access provided by Old Entrance Road ▪ Provides unimpeded access to former terminal facility ▪ Extension of perimeter road provides surface access other portions of the airfield.	▪ Doesn't provide for diversification for revenue due to aviation only development ▪ Fencing relocation required ▪ Anticipated cost is approximately $14.2 million.



NORTH GA ALTERNATIVE 2

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North GA Alternative 3

North GA Alternative 3 includes mixed-use development of the Northern GA Complex by recommending development of both aviation and non-aviation facilities. Proposed development includes several commercial development complexes, including a gas station and hotel, adjacent to the northern property line as well as various aircraft storage facilities to include T-hangar, box hangar and corporate hangar facilities. In addition, an area of approximately 425 square yards adjacent to the Oxford Aviation on the southwest portion of the apron is reserved for air cargo development relating primarily to air taxi operations.

In order to accommodate both aviation and non-aviation demand, an additional two-lane access road to the east of the proposed development connecting to State Highway 64 will provide access to the existing Tyler Jet facilities as well as proposed GA aircraft storage facilities and adjacent automobile parking.

Proposed commercial development includes:

- Designate area for Hotel Construction
- Designate area for Gas station
- Construct 18,741 square foot commercial center
- Construct two (2) 10,000 square foot commercial facilities, and
- Construct 15,625 square foot commercial facility east of the proposed hotel facilities.

Proposed aviation development associated with North GA Alternative III includes:

- Construction of 50 foot by 50 foot wash rack facility, East Apron
- Construction of 100 foot by 100 foot wash rack, West Apron
- Construction of Twenty three (23) T-hangar units
- Construction of Seventeen (17) 36 foot by 46 foot Box Hangars
- Construction of five (5) 80 foot by 80 foot corporate hangars, and
- Construction of 22,063 square yards of apron and taxi lane pavement, including lighting and markings

Associated development includes: construction of 24 foot wide entrance road north and east Tyler Jet facilities, construction of approximately 49,598 square yards of parking and associated access roads and drives, as well as fence line relocation to accommodate anticipated growth.

This alternative development scenario provides diversification of the Airport's revenue sources while accommodating expected increases in GA aircraft storage demand. Anticipated construction costs associated with this alternative are outlined in **Table 5-12.** However, it is anticipated that an operator independent of the Airport will construct the hotel, gas station and commercial facilities.

TABLE 5-12 NORTH GA COMPLEX DEVELOPMENT OPTION 3 PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES	
PROJECT DESCRIPTION	**ESTIMATED COST**
Construct 9-unit T-hangar	$279,000
Construct 14-unit T-hangar	$434,000
Construct 5 80 x 80 ft Corporate hangars	$1,440,000
Construct 17 36 x 46 ft box hangars	$1,266,840
Construct 100 x 100 ft wash rack	$125,000
Construct 50 x 50 ft wash rack	$40,000
Construct 22,063 SY of apron and taxi lanes, including lighting and markings	$1,954,725
Construct 18,741 SF commercial facility	$890,198
Construct new two-lane west access road	$345,600
Construct automobile parking and access road facilities, including lighting and markings	$2,479,900
TOTAL CONSTRUCTION COSTS	$9,255,263
Sum of Total Fees[1]	$2,776,579
Total Development Costs[1]	**$12,031,841**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

Impacts associated with the Alternative 3 North GA development are outlined below:

NORTH GA DEVELOPMENT COMPLEX ALTERNATIVE 3	
Strengths	**Weaknesses**
▪ Provides for significant commercial development ▪ Provides for diversification of revenues through aviation and non-aviation development ▪ Utilizes on-Airport land for revenue diversification ▪ Does not require the acquisition of contiguous land parcels ▪ Provides option and facilities for the development of new businesses ▪ Accommodates access and parking demand ▪ Increases overall capacity of the Airport ▪ Additional access road provides direct access to facilities on the west apron. ▪ Wash rack facilities located on both the east and west apron areas	▪ Aircraft storage hangars primarily limited to small aircraft ▪ Only accommodates a limited portion of demand requirements through the long-term planning period. ▪ Possible environmental impacts ▪ Significant cost ▪ Requires fence line relocation ▪ Requires additional storm water retention facilities ▪ Increased traffic on State Highway 64 and Dixie Drive could negatively impact both roadway capacity and aircraft operations at Tyler Airport.

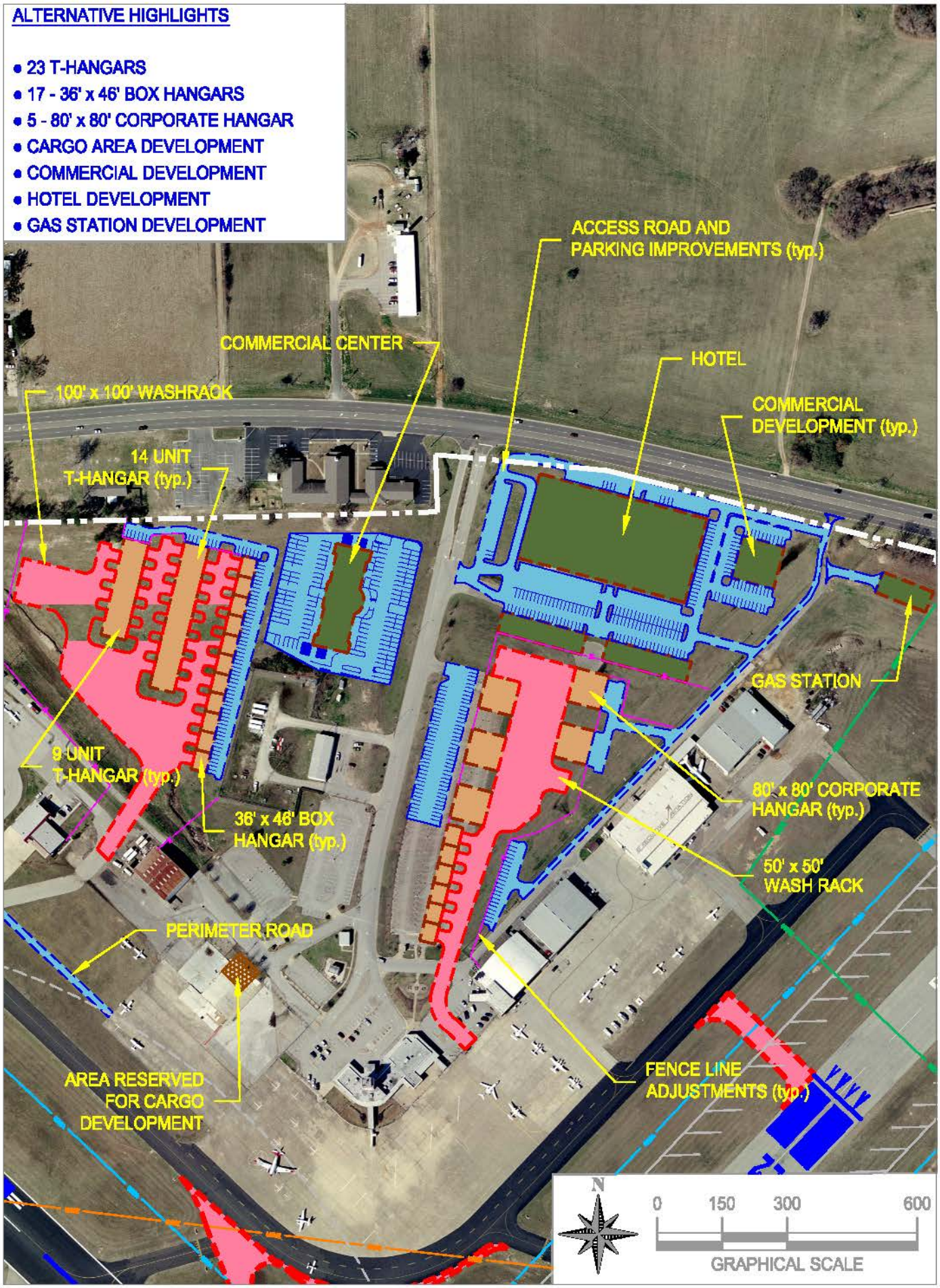
North GA Alternative 4

Development outlined in North GA Development Alternative 4 focuses primarily on aviation development with the exception of the proposed commercial center located west of the Old Entrance Road and just south of the existing Airport property line. Future recommended development, within the North GA Complex, includes the following aviation construction:

- Construction of 63 T-hangar units
- Construction of twenty-four (24) 36 foot by 46 foot box hangars
- Construction of two (2) 80 foot by 80 foot corporate hangars
- Construction of two (2) 100 foot by 100 ft corporate hangars
- Construction of one (1) 125 foot by 125 foot corporate hangar
- Construction of 18,740 SF commercial center
- Construction of approximately 35,155 square yards of apron and taxi lane pavement, and
- Construction of associated access roads and parking improvements

Additional development associated with proposed aircraft storage facilities includes the extension of the perimeter roadway as well as adjustments to the existing fence line to accommodate proposed development and construction of a 60 foot by 60 foot wash rack on the along the northeast apron. As shown in all four-development alternatives, proposed construction will occur on either side of the existing Old Entrance Road thus providing access to existing and proposed development.

Anticipated construction costs associated with Alternative 4 development is outlined in **Table 5-13.**



NORTH GA ALTERNATIVE 3

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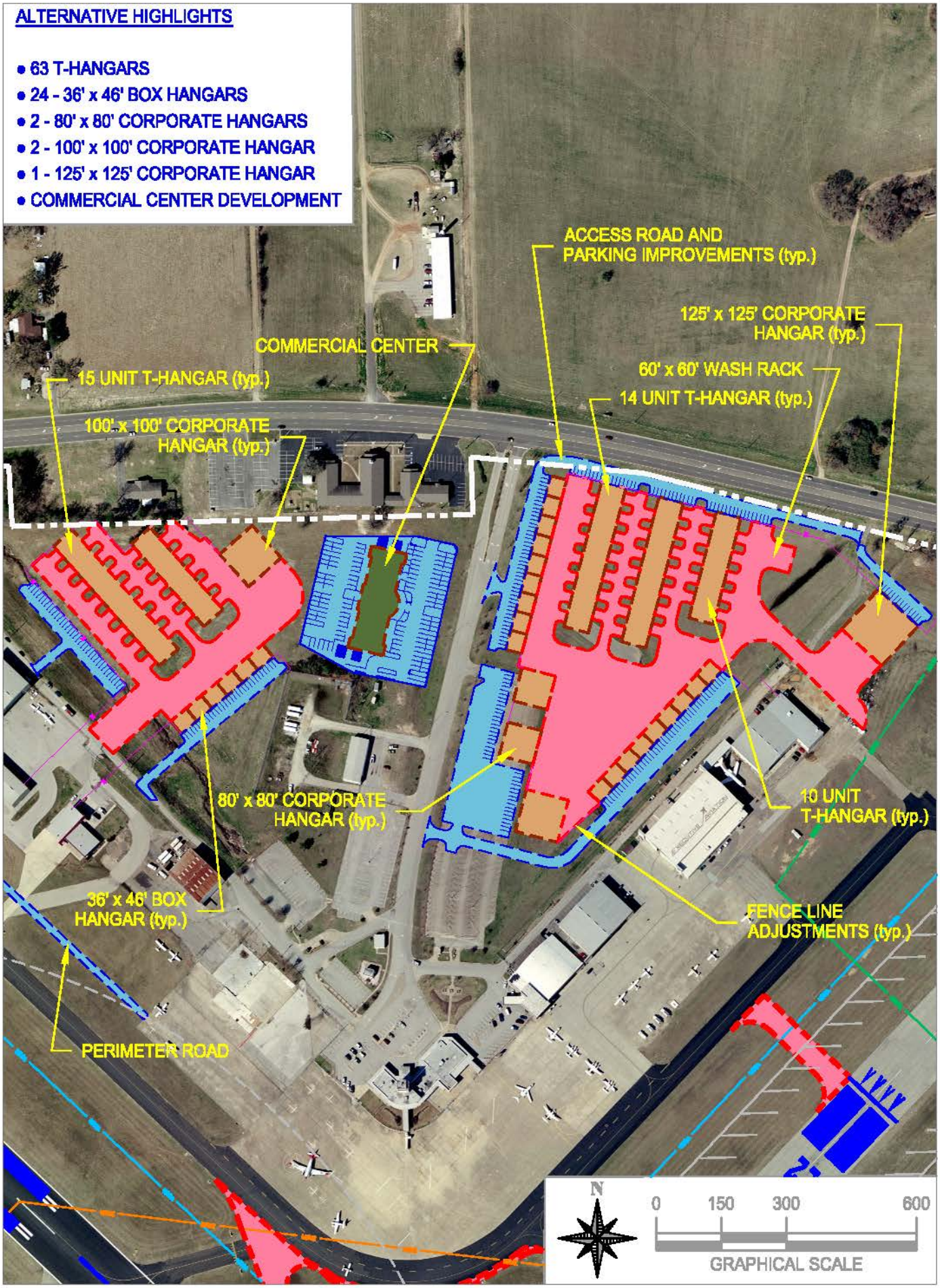

NORTH GA ALTERNATIVE 4

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TABLE 5-13 NORTH GA COMPLEX DEVELOPMENT OPTION 4 PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES	
PROJECT DESCRIPTION	**ESTIMATED COST**
Construct 63 T-hangar units	$1,953,000
Construct 24 36 x 46 foot box hangars	$1,788,480
Construct 2 80 x 80 foot corporate hangars	$576,000
Construct 2 100 x 100 foot corporate hangars	$900,000
Construct 125 x 125 foot corporate hangar	$742,188
Construct 18,740 SF commercial center	$2,248,800
Construct 60 x 60 foot wash rack	$50,000
Construct 35,155 SY apron and taxi lanes, including lighting and markings	$2,636,625
Construct extension to Perimeter Road	$33,333
Adjust existing fence line	$1,200
Construct parking and access road improvements, including lighting and markings	$1,258,250
TOTAL CONSTRUCTION COSTS	$12,187,876
Sum of Total Fees[1]	$3,656,363
Total Development Costs[1]	**$15,844,239**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

Potential strengths and weaknesses associated with North GA Complex Alternative 4 are identified in the table below.

NORTH GA DEVELOPMENT COMPLEX ALTERNATIVE 4	
Strengths	**Weaknesses**
▪ Meets T-hangar demand over the long-term planning period ▪ Utilizes existing Airport property and doesn't require land acquisition ▪ Reserves an area of development for both aviation and non-aviation development ▪ Provides a mix of facilities for aircraft hangar storage ▪ Provides adequate automobile parking facilities and aircraft ramp space	▪ Doesn't allow for development of air cargo facilities ▪ Requires fence line adjustment to accommodate development ▪ Will require additional storm water retention facilities ▪ Surface access from State Highway 64 limited to Old Entrance Road ▪ Significant cost: $15.8 million

Recommended North GA Complex Development

A single concept or a combination of elements from two or more concepts presented will be recommended to serve as the framework for future development. The concepts, both general aviation and air cargo development, are evaluated within this section to weigh the inherent strengths and weaknesses of each in comparison to each other and against the following evaluation criteria.

- Ease of implementation
- Efficiency in meeting facility requirements
- Engineering factors
- Phasing
- Airside and landside accessibility
- Environmental impacts
- Integration with the airfield
- Ease of ground access to existing and future roadways
- Impact to other aviation related uses on the Airport,
- Overall cost of development, and
- Availability of requisite infrastructure

Table 5-14 presents an evaluation matrix that addresses the aforementioned criteria. This matrix summarizes the consultant's analyses of the development concepts presented in the following paragraphs

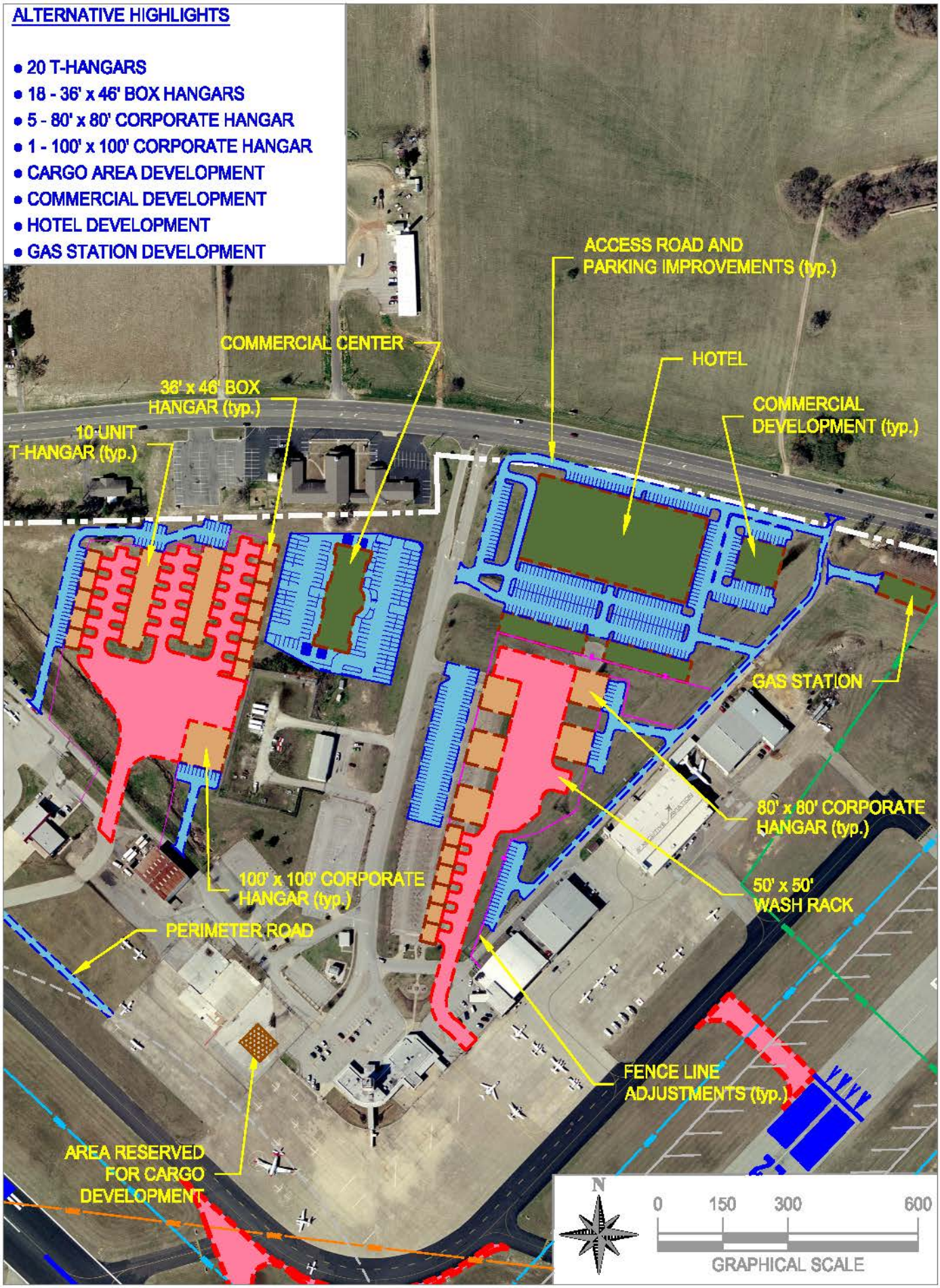
TABLE 5-14
NORTH GA DEVELOPMENT COMPLEX EVALUATION MATRIX

Evaluation Criterion	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Legend: 1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent				
Best Planning Tenets				
Meets Facility Requirements	4	4	4	4
Availability of requisite Infrastructure				
Ease of implementation	4	3	4	2
Conforms to Sponsors Vision	5	3	5	3
Phasing/Construction				
Ability to Phase Construction/Expansion	4	3	5	2
Impact on existing facilities	4	3	4	3
Engineering or Land Build out Requirements	3	2	4	3
Operational Performance				
Airside and landside accessibility	5	4	5	3
Integration with the airfield	5	3	4	3
Ease of ground access to existing and future roadways	4	4	5	3
Impact to other aviation related uses	5	4	5	4
Environmental Impacts	4	4	4	4
Fiscal Factors				
Cost Estimates	4	3	5	3
Subtotal	**51**	**40**	**54**	**37**
Average	**3.9**	**3.0**	**4.1**	**2.8**

Legend
1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent
Source: The LPA Group Incorporated, 2005

Based upon the evaluation criterion outlined in **Table 5-14**, North GA Alternatives 1 and 3 were deemed similar in their scores. As a result, considering input from Airport Management, TAC and Airport Advisory Board, an alternative based upon a combination of elements outlined in Alternatives One and Three was deemed the most viable based upon phasing, forecast demand, fiscal and environmental elements all while accommodating the sponsors requirements.

Development west of the Old Airport Entrance Road, as shown in Alternative 1, in conjunction with air cargo facilities to the west of the former terminal facilities provided the best utilization of existing facilities. This in conjunction to proposed commercial development to the east of the old Entrance Road, as shown in Alternative 3, provides for diversification of revenue sources, improves access to the North Complex with the construction of an additional entrance road to the east, and meets anticipated aviation demand for aircraft storage facilities.



PREFERRED NORTH GA ALTERNATIVE

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West GA Development

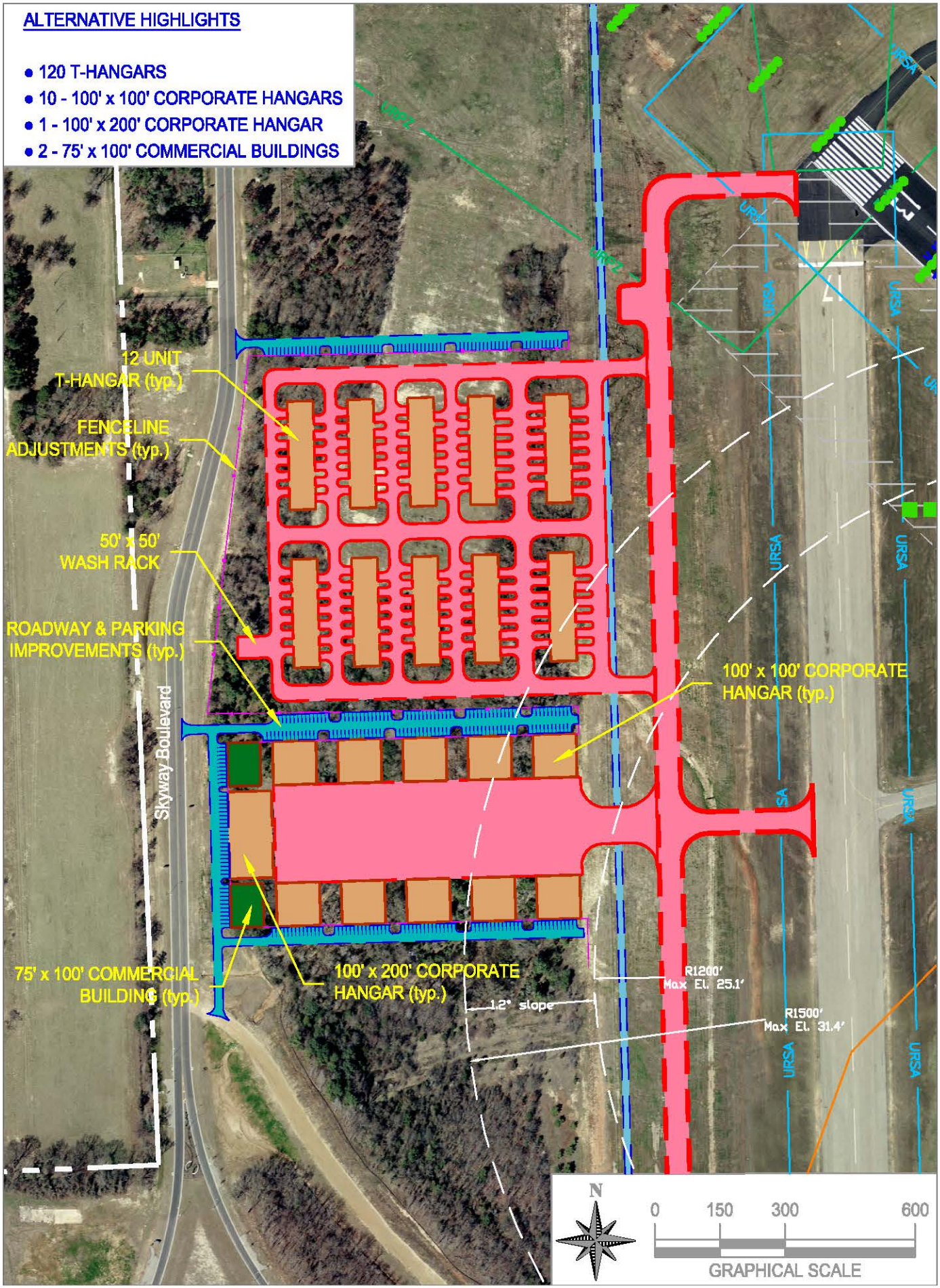
Several general aviation concepts were considered for the grassy area west of the proposed Taxiway I and Runway 17-35 and east of the new entrance road, Skyway Boulevard, and consist of approximately 40 acres of vacant land. Any wetland areas located within the west complex parcel would require wetland mitigation prior to construction. Proposed development consists of a combination of aviation and non-aviation development, including hangar storage facilities, apron, automobile parking and access roads as well as commercial buildings. Considering surface and airfield access, environmental impacts, operational considerations, including Part 77 height requirements, facility demand and revenue diversification, and three alternative concepts for the West GA Aviation Complex were developed.

West GA Alternative 1

Alternative Concept 1, as shown in **Exhibit 5-14**, proposes development of a variety of hangar storage facilities to accommodate small to medium aircraft demand via construction of T-hangar units and corporate hangar facilities within the entire 40-acre parcel. Surface access would be provided via Skyway Boulevard and airside access would be provided through three connector taxiways to the proposed Taxiway I. A perimeter surface road would be constructed parallel to Taxiway I to provide controlled internal surface access to different portions of the airfield. In addition to hangar storage facilities, two commercial buildings and automobile parking facilities would be developed parallel and perpendicular to Skyway Boulevard. Proposed projects associated with Alternative 1 include construction of:

- 120 T-Hangar Units
- Ten (10) 100 foot by 100 foot corporate hangars
- One (1) 100 foot by 200 foot corporate hangar
- Two (2) 75 foot by 100 foot commercial facilities
- 50 foot by 50 foot wash rack with oil and water separator, and
- Associate aircraft apron and automobile parking

Additional construction associated with hangar development includes fence line adjustment, construction of three connector taxiways and construction of a perimeter access road. Order of magnitude cost estimates in 2005 dollars are shown in **Table 5-15**:



WEST GA ALTERNATIVE 1

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TABLE 5-15 WEST GA COMPLEX DEVELOPMENT OPTION 1 PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES	
PROJECT DESCRIPTION	**ESTIMATED COST**
120 T-hangar units	$3,720,000
10, 100 x 100 ft corporate hangars	$4,500,000
100 x 200 ft corporate hangar	$950,000
2, 75 x 100 ft commercial buildings	$675,000
50 x 50 ft wash rack with oil and water separator	$125,000
Fence line adjustment	$15,000
Perimeter Road Extension	$160,000
Apron construction, includes lighting and markings	$1,378,020
Taxilane construction, includes lighting, drainage and markings	$4,728,850
Roadway improvements and associated parking, includes lighting, drainage and markings	$1,583,568
TOTAL CONSTRUCTION COSTS	$17,835,438
Sum of Total Fees[1]	$5,350,631
Total Development Costs[1]	**$23,186,069**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

A comparison of anticipated impacts associated with proposed development outlined in Alternative 1 are shown below.

WEST GA DEVELOPMENT COMPLEX ALTERNATIVE 1	
Strengths	**Weaknesses**
▪ Exceeds T-hangar demand over the long-term planning period ▪ Utilizes existing Airport property and doesn't require land acquisition ▪ Reserves an area of development for both aviation and non-aviation development ▪ Provides a mix of facilities for aircraft hangar storage ▪ Provides adequate automobile parking facilities (~282 parking spaces) and aircraft ramp space	▪ Requires fence line adjustment to accommodate development ▪ Will require additional storm water retention facilities ▪ Surface access from State Highway 64 limited to Skyway Boulevard ▪ Significant cost: $23 million ▪ May require wetland mitigation

West GA Alternative 2

Alternative 2, as shown in **Exhibit 5-15**, also includes development of both aviation and non-aviation oriented facilities to accommodate anticipated demand while attracting new users to the Airport. Access to hangar facilities and commercial facilities is via an access road, which runs parallel to Skyway Boulevard. Automobile parking is designed border the proposed aviation facilities. Proposed aircraft storage facilities include box hangars, corporate hangars, and T-hangars. In addition, approximately 37,470 square yards of proposed development associated with Alternative 2 include construction of the following facilities:

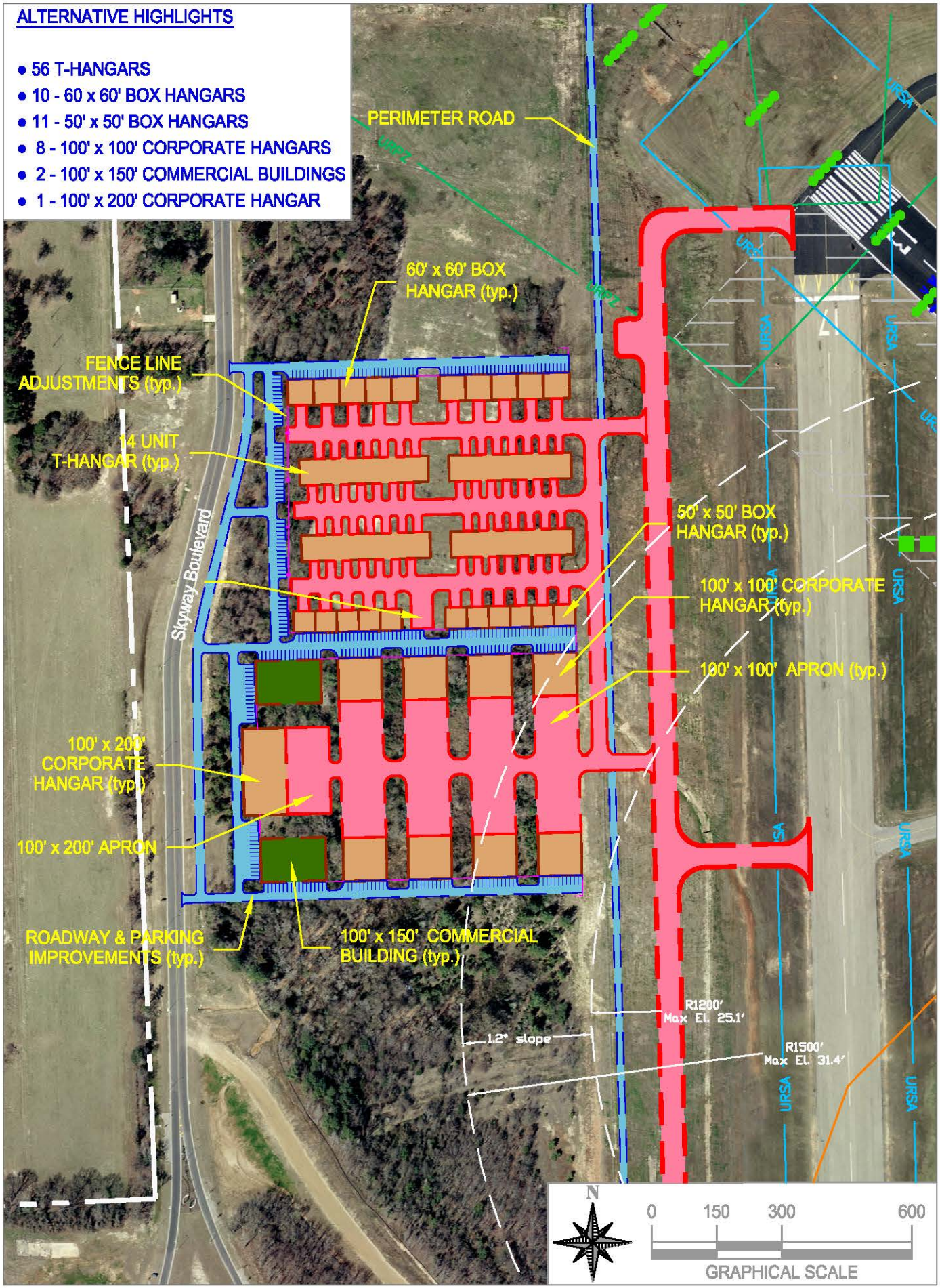
- 56 T-hangar units
- Ten (10) 60 foot by 60 foot box hangars
- Eleven (11) 50 foot by 50 foot box hangars
- Eight (8) 100 foot by 100 foot corporate hangars
- Two (2) 100 foot by 150 foot commercial buildings
- One (1) 100 foot by 200 foot corporate hangar,
- Perimeter road expansion,
- Fence line relocation,
- Connector taxiway construction,
- Wash Rack with oil and water separator, and
- Associated apron, roadway and parking improvements.

Anticipated costs, in 2005 dollars, associated with proposed development is outlined in **Table 5-16**.

TABLE 5-16
WEST GA COMPLEX DEVELOPMENT
OPTION 2
PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES

PROJECT DESCRIPTION	ESTIMATED COST
56 T-hangar units	$1,736,000
10 – 60 x 60 ft box hangars	$1,080,000
11 – 50 x 50 ft box hangars	$825,000
8 – 100 x 100 corporate hangars	$3,600,000
2 – 100 x 150 ft commercial buildings	$1,425,000
100 x 200 ft corporate hangar	$950,000
50 x 50 ft wash rack	$125,000
Construction of apron and taxilanes, including markings, lighting and drainage	$3,747,000
Access road and parking facilities, including lighting, drainage and markings	$3,717,599
Fence line Relocation	$15,000
Perimeter Road Extension	$160,000
TOTAL CONSTRUCTION COSTS	$17,380,599
Sum of Total Fees[1]	$5,214,180
Total Development Costs[1]	**$22,594,778**

Note:
1 Project Costs include 30% engineering and contingency fee
Source: The LPA Group, Incorporated



WEST GA ALTERNATIVE 2

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A comparison of anticipated impacts associated with proposed development outlined in Alternative 2 is shown below.

WEST GA DEVELOPMENT COMPLEX ALTERNATIVE 2	
Strengths	**Weaknesses**
▪ Utilizes existing Airport property and doesn't require land acquisition ▪ Reserves an area of development for both aviation and non-aviation development ▪ Provides a mix of facilities for aircraft hangar storage ▪ Provides adequate automobile parking (~292 spaces) facilities and aircraft ramp space ▪ Provides improved access to airfield facilities ▪ Allows for diversification of revenue sources ▪ Provides improved airside access through extension of internal perimeter road	▪ Does not accommodate anticipated T-hangar requirements in the short-term ▪ Possible environmental impacts ▪ Roadway capacity may be negatively impacted ▪ Will require additional storm water retention and treatment areas ▪ Cost: $22.5 million ▪ May require wetland mitigation

West GA Alternative 3

Alternative 3, as shown in **Exhibit 5-16**, identifies only aviation related development within the West GA Development Complex. Proposed facilities include a combination of T-hangar, box hangars, and corporate hangar development. Access to the airfield is via connector taxiways, and landside access is provided using Skyway Boulevard. To satisfy aircraft parking demand, approximately 38,262 square yards of apron space is designated for aircraft staging. Construction of additional apron space to accommodate aircraft operations on the west side of the airfield exceeds anticipated demand for airfield apron space in general. However, provides sufficient facilities to accommodate both aircraft storage facilities and associated tie-down parking within the vicinity. Recommended development within the 40 acre parcel includes:

- Construction of 60 T-Hangar Units
- Construction of Twenty (20) 60 foot by 60 foot Box Hangars
- Construction of Twenty-four (24) 50 foot by 50 foot Box Hangars
- Construction of two (2) 100 foot by 200 foot Corporate hangars
- Construction of four (4) 150 foot by 200 foot Corporate Hangars
- Construction of one (1) 100 foot by 100 foot Corporate Hangar
- Construction of 50 foot by 50 foot Wash Rack with oil/water separator
- Construction of approximately 38,262 square yards of airfield apron, and
- Construction of approximately 10,960 square yards of automobile parking to accommodate 274 parking spaces.

Surface access to hangar facilities will be provided via Skyway Boulevard with construction of four service access roadways. Three of the service roads with adjacent parking facilities will provide access to the corporate hangar

facilities. Access to the T-hangar facilities is provided by the northernmost service road. Adjacent automobile parking is limited since T-hangar users typically park their vehicles inside their hangars when using their aircraft.

Anticipated order of magnitude costs, in 2005 dollars, associated with Alternative 3 development is shown in **Table 5-17** below:

TABLE 5-17
WEST GA COMPLEX DEVELOPMENT
OPTION 3
PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES

PROJECT DESCRIPTION	ESTIMATED COST
60 T-hangar units	$1,860,000
20 – 60 x 60 ft box hangars	$2,160,000
24 – 50 x 50 ft box hangars	$1,800,000
1 – 100 x 100 corporate hangars	$450,000
2 – 100 x 200 ft commercial buildings	$1,900,000
4 - 150 x 200 ft corporate hangar	$5,700,000
50 x 50 ft wash rack with oil and water separator	$125,000
Construction of connector taxilanes, including drainage, lighting and markings	$7,648,544
Apron construction, including lighting, drainage and markings	$2,877,133
Access road and parking facilities, including lighting, drainage and markings	$1,775,027
Perimeter road extension	$160,000
Fence line Relocation	$15,000
TOTAL CONSTRUCTION COSTS	$26,470,704
Sum of Total Fees[1]	$7,941,211
Total Development Costs[1]	**$34,411,916**

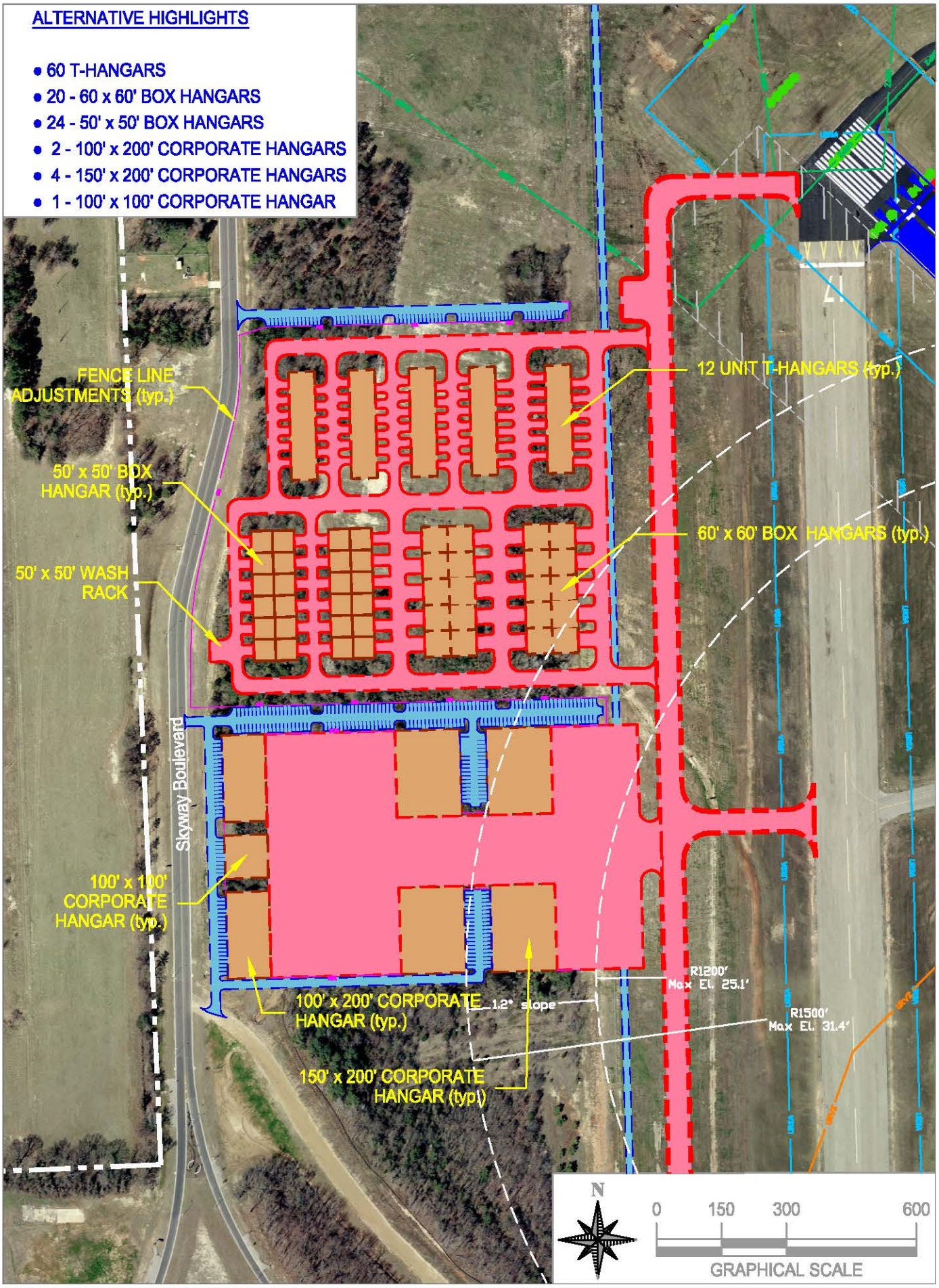
Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

A comparison of anticipated impacts associated with proposed development outlined in Alternative 3 is shown below.

WEST GA DEVELOPMENT COMPLEX ALTERNATIVE 3	
Strengths	**Weaknesses**
▪ Utilizes existing Airport property and doesn't require land acquisition ▪ Reserves an area of development for both aviation and non-aviation development ▪ Provides a mix of facilities for aircraft hangar storage ▪ Provides adequate automobile parking (~292 spaces) facilities and aircraft ramp space ▪ Provides improved access to airfield facilities ▪ Allows for diversification of revenue sources ▪ Provides improved airside access through extension of internal perimeter road	▪ Does not accommodate anticipated t-hangar requirements in the long-term ▪ Possible environmental impacts ▪ Roadway capacity may be negatively impacted ▪ Will require additional storm water retention and treatment areas ▪ Cost: $36 million ▪ May require wetland mitigation



WEST GA ALTERNATIVE 3

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MASTER PLAN UPDATE

Preferred West GA Alternative

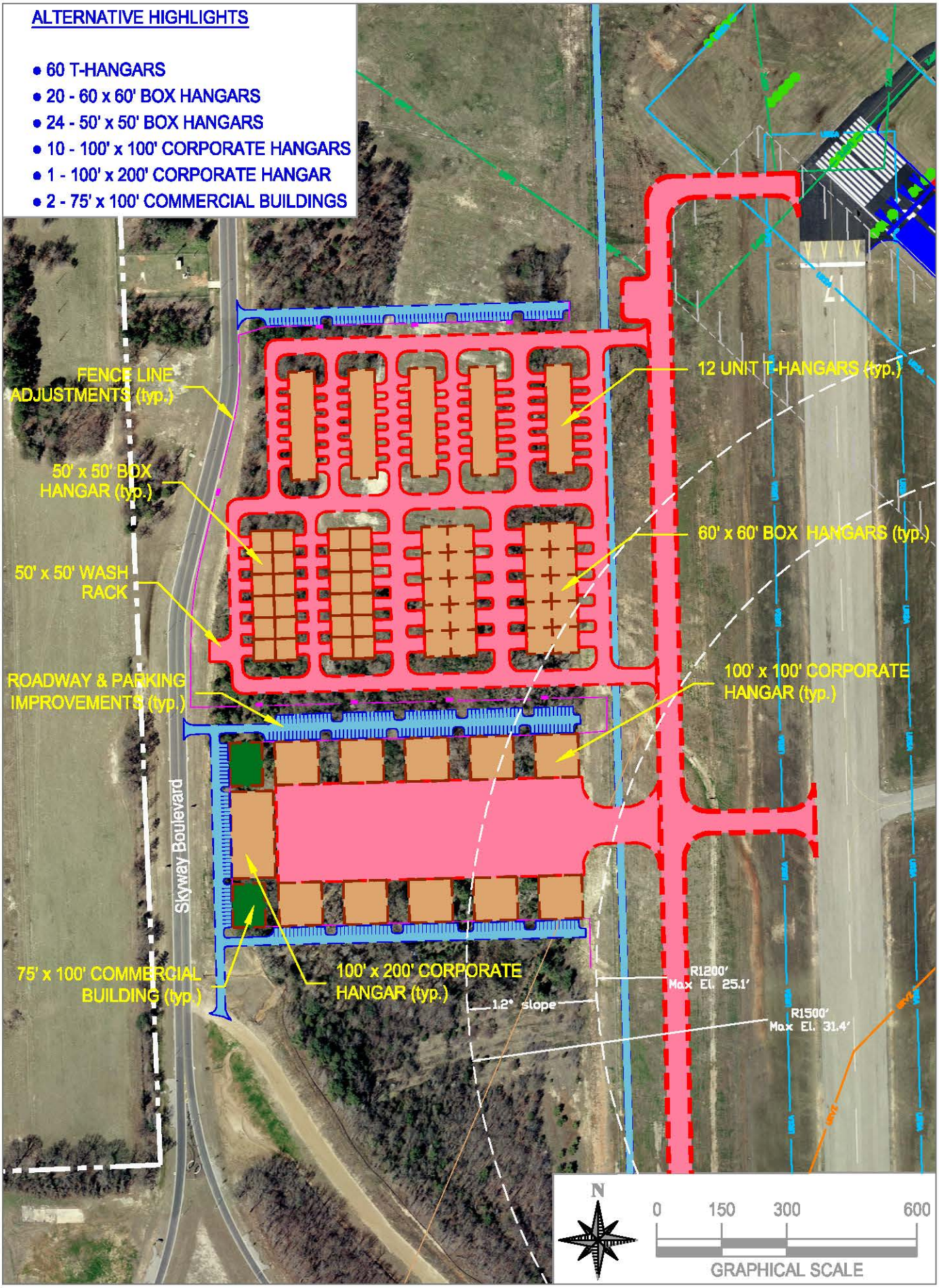
The Airport development plans described previously for West GA development outline the necessary facility improvement to meet forecast demand while creating an environment for future diversification and development and fiscal viability. In evaluating landside and airside elements associated with the West GA Development Complex, each alternative was weighed as to its inherent strengths and weaknesses in comparison to other alternatives as well as against the evaluation criteria outlined in **Table 5-18.**

TABLE 5-18
WEST GA DEVELOPMENT EVALUATION MATRIX

	Alternative 1 Rating	Alternative 2 Rating	Alternative 3 Rating
Legend: 1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent			
Best Planning Tenets			
Meets Facility Requirements	5	3	5
Availability of requisite Infrastructure	4	3	4
Ease of implementation	4	3	4
Conforms to Sponsor's vision	4	2	4
Phasing/Construction			
Ability to Phase Construction/Expansion	5	3	5
Impact on existing facilities	4	4	5
Engineering or Land Build-out Requirements	4	4	4
Operational Performance			
Airside and landside accessibility	4	4	4
Integration with the airfield	4	3	4
Ease of ground access to existing and future roadways	4	3	5
Impact to other aviation related uses	4	3	4
Environmental Impacts	2	2	2
Fiscal Factors			
Cost Estimates	4	5	3
Subtotal	52	42	53
Average	**4.0**	**3.23**	**4.0**

Legend
1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent
Source: The LPA Group Incorporated, 2005

Based upon anticipated demand for aircraft storage facilities as well as ease of airside and landside access to facilities, it was deemed that a combination of elements from **Alternative 1 and 3, as shown in Exhibit 5-17,** provide the most efficient and cost effective option for development of the West GA Development Complex. The combination of T-hangar and box hangar development as shown in Alternative 3 provides greater flexibility for phasing development and revenue generation as well as utilization of space. Whereas the corporate hangar and landside access outlined in Alternative 1 provides for a diversification of revenue sources while accommodating anticipated aircraft demand for both apron and aircraft storage facilities.



PREFERRED WEST GA ALTERNATIVE

EXHIBIT 5-17

TYLER POUNDS REGIONAL AIRPORT

MASTER PLAN UPDATE

South GA Development

Proposed development adjacent to the extension of Taxiway A and Runway 35 is denoted as the South GA Complex. Proposed development remains within the existing Airport property boundaries and includes development of vacant land. Surface access is provided via a service road connection to Pleasant Retreat Road, a two-lane highway south of the airfield. Two development alternatives considering both aviation and non-aviation oriented development were considered based upon anticipated demand.

South GA Alternative 1

Alternative 1 identifies limited aviation facility development but reserves approximately 29,290 square yards for future aviation development adjacent to the south Airport property line and Pleasant Retreat Road. Airside access is provided via an extension of Taxiway E and a series of taxi lanes providing access to the six nested T-hangars. Surface access will be provided through construction of an access road to the east of the proposed development parallel to the Airport property line connecting to Pleasant Retreat Road to the South. Automobile parking facilities is limited to approximately 112 spaces since the majority of T-hangar tenants park their cars in their t-hangar units when on-Airport. In order to accommodate future development, the existing fence line will need to be readjusted and a 50 foot by 50 foot wash rack with oil and water separator will be constructed to the north of the proposed T-hangar facilities. Construction projects associated with Alternative 1 development include:

- 72 T-hangar units
- Construction of approximately 19,249 square yards of apron and taxi lane improvements
- Installation of 50 foot by 50 foot wash rack
- Construction two Airport service roads, and
- Construction of 112 automobile parking spaces

Anticipated order of magnitude costs associated with proposed development is provided in **Table 5-19.** Anticipated environmental costs associated with proposed development is not included within this evaluation due to the difficulty of determining the environmental implications without further research. Anticipated costs associated with determined environmental impacts will be provided in detail within the implementation program.

TABLE 5-19 SOUTH GA COMPLEX DEVELOPMENT OPTION 2 PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES	
PROJECT DESCRIPTION	**ESTIMATED COST**
72 T-hangar units	$2,232,000
Construct 19,249 SY of apron and taxi lane improvements, including lighting, drainage and markings	$1,924,900
Installation of 50 x 50 ft wash rack with oil/water separator	$125,000
Construction of service access roads and associated automobile parking, including lighting, drainage and markings	$4,193,049
Adjust fence line	$10,000
TOTAL CONSTRUCTION COSTS	$8,484,949
Sum of Total Fees[1]	$2,545,485
Total Development Costs[1]	**$11,030,434**

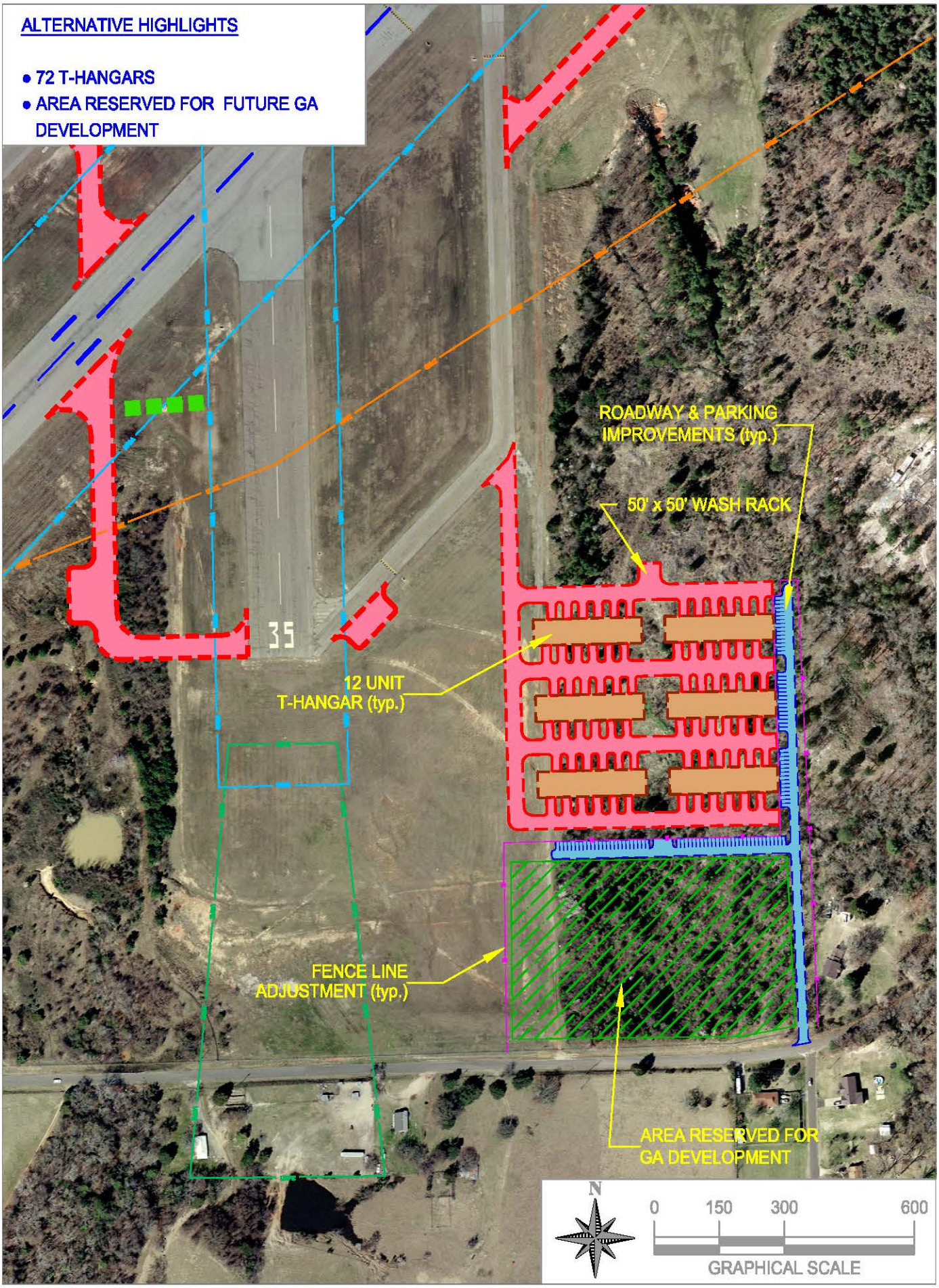
Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated

Anticipated advantages and disadvantages associated with this proposed development is outlined below.

WEST GA DEVELOPMENT COMPLEX ALTERNATIVE 3	
Strengths	**Weaknesses**
▪ Utilizes existing Airport property and doesn't require land acquisition ▪ Reserves an area of development for future GA development ▪ Provides additional T-hangar facilities to accommodate expected demand through 2024 ▪ Provides adequate automobile parking (~112 spaces) facilities and access roads ▪ Provides improved access to airfield facilities ▪ Provides airside access through extension of Taxiway E	▪ Does not accommodate anticipated t-hangar requirements alone in the long-term ▪ Possible environmental impacts ▪ Roadway capacity of Pleasant Retreat Road may be negatively impacted ▪ Will require additional storm water retention and treatment areas ▪ Cost: $11 million ▪ May require wetland mitigation



SOUTH GA ALTERNATIVE 1

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MASTER PLAN UPDATE

South GA Alternative 2

Alternative 2 includes development of two commercial facilities of approximately 25,000 square feet each adjacent to the southern boundary of the airfield for ease of access to and from Pleasant Retreat Road. Aviation related development, including T-hangar and corporate hangar construction, occurs to the north of the proposed commercial development, as shown in **Exhibit 5-18**. Construction of a service road connecting corporate hangar and t-hangar development as well as commercial facilities would be located on the eastern side of the facility parallel to the Airport property line. Automobile parking facilities are to be constructed adjacent to the proposed facilities along the east and north side of the proposed development. Proposed construction associated with Alternative 1 includes:

- 72 T-Hangar units
- Two (2) 150 foot by 150 foot corporate hangars
- One (1) 150 foot by 125 foot corporate hangar
- Two (2) 25,000 square foot commercial facilities
- Construction of 45,752 square yards of aircraft apron and taxi lane pavement, and
- 10,353 square yards of automobile parking and service access road development.

As with all proposed development, the existing Airport fence line will need to be relocated and adjusted to accommodate proposed development. Anticipated order of magnitude costs associated with proposed development are outlined in **Table 5-20**.

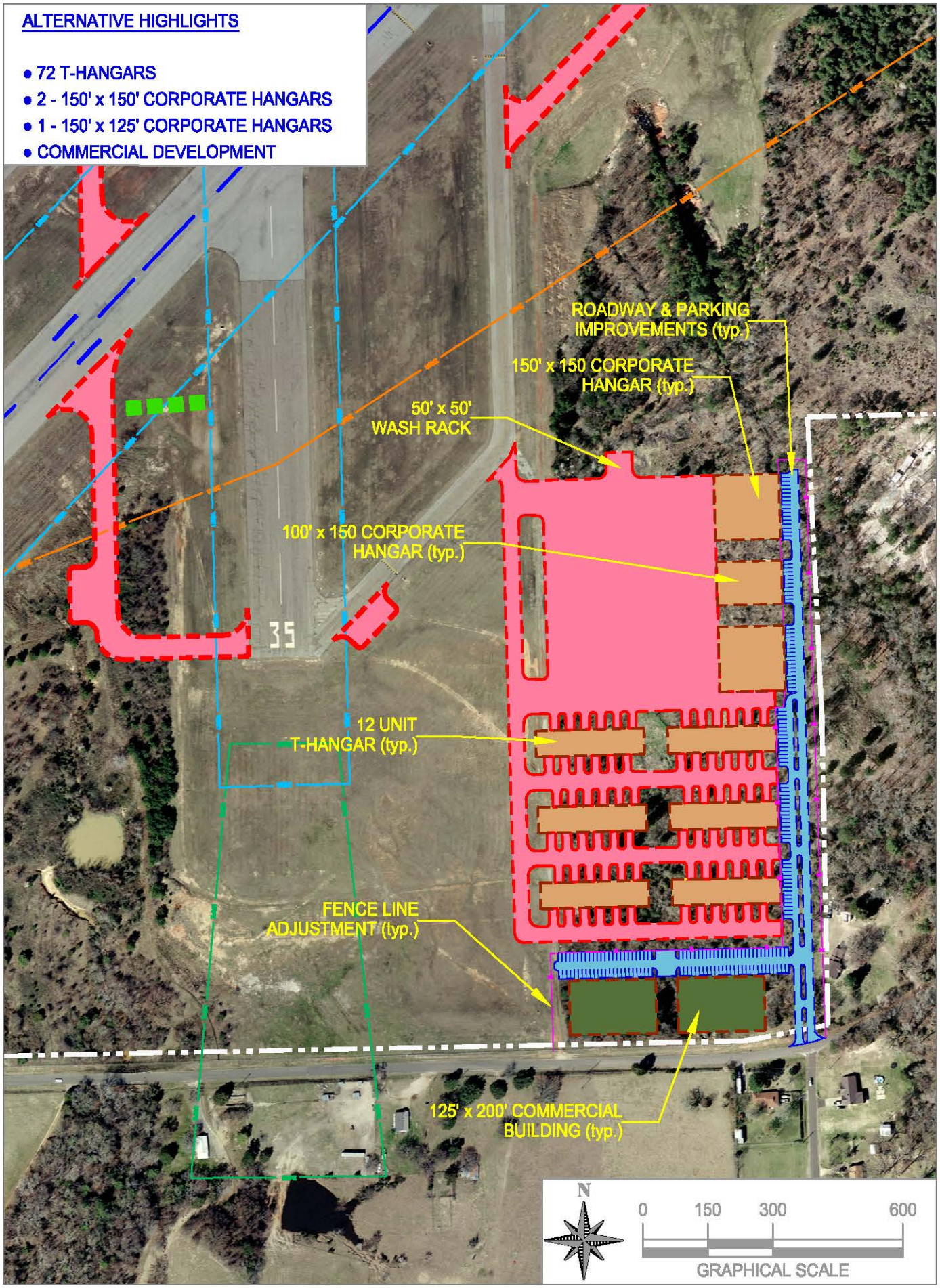
TABLE 5-20
SOUTH GA COMPLEX DEVELOPMENT
OPTION 2
PRELIMINARY ORDER OF MAGNITUDE COST ESTIMATES

PROJECT DESCRIPTION	ESTIMATED COST
72 T-Hangar Units	$2,232,000
2 – 150 x 150 ft corporate hangars	$2,137,500
1 – 150 x 125 ft corporate hangars	$890,625
2 – 25,000 SF commercial facilities	$2,375,000
Construction of aircraft apron and box and t-hangar taxi lanes, including lighting, drainage and markings	$4,575,244
Access Road construction and parking facilities, including lighting, drainage and markings	$1,242,395
Construct 50 x 50 ft wash rack with oil and water separator	$125,000
1000 ft Fence line Relocation	$10,000
TOTAL CONSTRUCTION COSTS	$13,587,765
Sum of Total Fees[1]	$4,076,329
Total Development Costs[1]	**$17,664,094**

Note:

1 Project Costs include 30% engineering and contingency fee

Source: The LPA Group, Incorporated



SOUTH GA ALTERNATIVE 2

EXHIBIT 5-19

TYLER POUNDS REGIONAL AIRPORT

MASTER PLAN UPDATE

Positive and negative impacts of proposed GA development as outlined in Alternative are identified below, and are used for comparison purposes in determining the preferred development of the South GA Complex.

SOUTH GA DEVELOPMENT COMPLEX ALTERNATIVE 2	
Strengths	**Weaknesses**
▪ Utilizes existing Airport property and doesn't require land acquisition ▪ Reserves an area of development for both aviation and non-aviation development ▪ Provides a mix of facilities for aircraft hangar storage ▪ Provides adequate automobile parking facilities and aircraft ramp space ▪ Provides improved access to airfield facilities ▪ Allows for diversification of revenue sources ▪ Provides improved airside access through extension of internal perimeter road ▪ Allows for phased development	▪ Does not accommodate anticipated T-hangar requirements in the long-term ▪ Possible environmental impacts ▪ Roadway capacity may be negatively impacted ▪ Will require additional storm water retention and treatment areas ▪ Cost: approximately $17 million ▪ May require wetland mitigation

Preferred South GA Alternatives

The preferred Southside Complex development will not only be determined by quantitative impacts and costs associated with development but also by the long-term vision of the Airport authority. Quantitative impacts are outlined in the matrix below. However, it is likely that the preferred Southside Complex development may include a combination of development options to provide the most cost effective approach to accommodating future Airport development and anticipated demand.

TABLE 5-21
SOUTH GA DEVELOPMENT EVALUATION MATRIX

	Alternative 1	Alternative 2
Legend: 1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent	**Rating**	**Rating**
Best Planning Tenets		
Meets Facility Requirements	2	5
Availability of requisite Infrastructure	3	5
Ease of implementation	4	4
Conforms to Sponsor's vision	3	5
Phasing/Construction		
Ability to Phase Construction/Expansion	3	5
Impact on existing facilities	4	4
Engineering or Land Build-out Requirements	4	3
Operational Performance		
Airside and landside accessibility	4	4
Integration with the airfield	4	4
Ease of ground access to existing and future roadways	4	4
Impact to other aviation related uses	4	4
Environmental Impacts	3	4
Fiscal Factors		
Cost Estimates	5	4
Subtotal	47	55
Average	**3.62**	**4.23**

Legend
1. Poor 2. Fair 3. Satisfactory 4. Very Good 5. Excellent
Source: The LPA Group Incorporated, 2005

Thus, based upon the analysis provided in **Table 5-21** as well as input from the AAB and TAC, the preferred Southside Complex development is Alternative 2. The long-term vision of the Airport includes redevelopment and expansion of existing facilities as well as development of both aviation and non-aviation resources in an effort to expand and diversify revenue sources at the Airport as well as become a significant economic generator for development within Smith County and the east Texas region.

Recommended Airside Development

Based upon the evaluation of recommended development, Airfield Alternative II combined with the preferred GA development concepts provides the preferred development option. However, based upon further discussion with the FAA and TxDOT concerning the recommended development, it was recommended that the threshold of Runway 13 not be displaced and therefore an extension to Runway 31 would not be required to maintain adequate length. Alternative options discussed with FAA and TXDOT to meet the safety area requirements included a possible impact to the right-of-way associated with SR64 or a modification to standards which would allow a small non-standard portion of RSA on Runway 13. Based upon these discussions, the recommended development is shown in **Exhibit 5-20**, *Recommended Airside Development*. The selected alternatives provide for an increase in runway length, while standardizing safety area requirements, improving airfield and landside access, improves NAVAIDs, and provides for additional aviation and non-aviation development.

The selected alternative development program outlines the necessary facility improvements to meet the majority of forecast demand presented in **Chapter 4**. However, the enhanced hangar and non-aviation development included in

the selected alternative will ultimately lead to increases in revenue and revenue sources for the Airport and may help offset operational limitations.

Support Facilities

Support facilities are based upon the recommended Airfield Alternative development in relation to airside and landside requirements.

Fuel Facilities

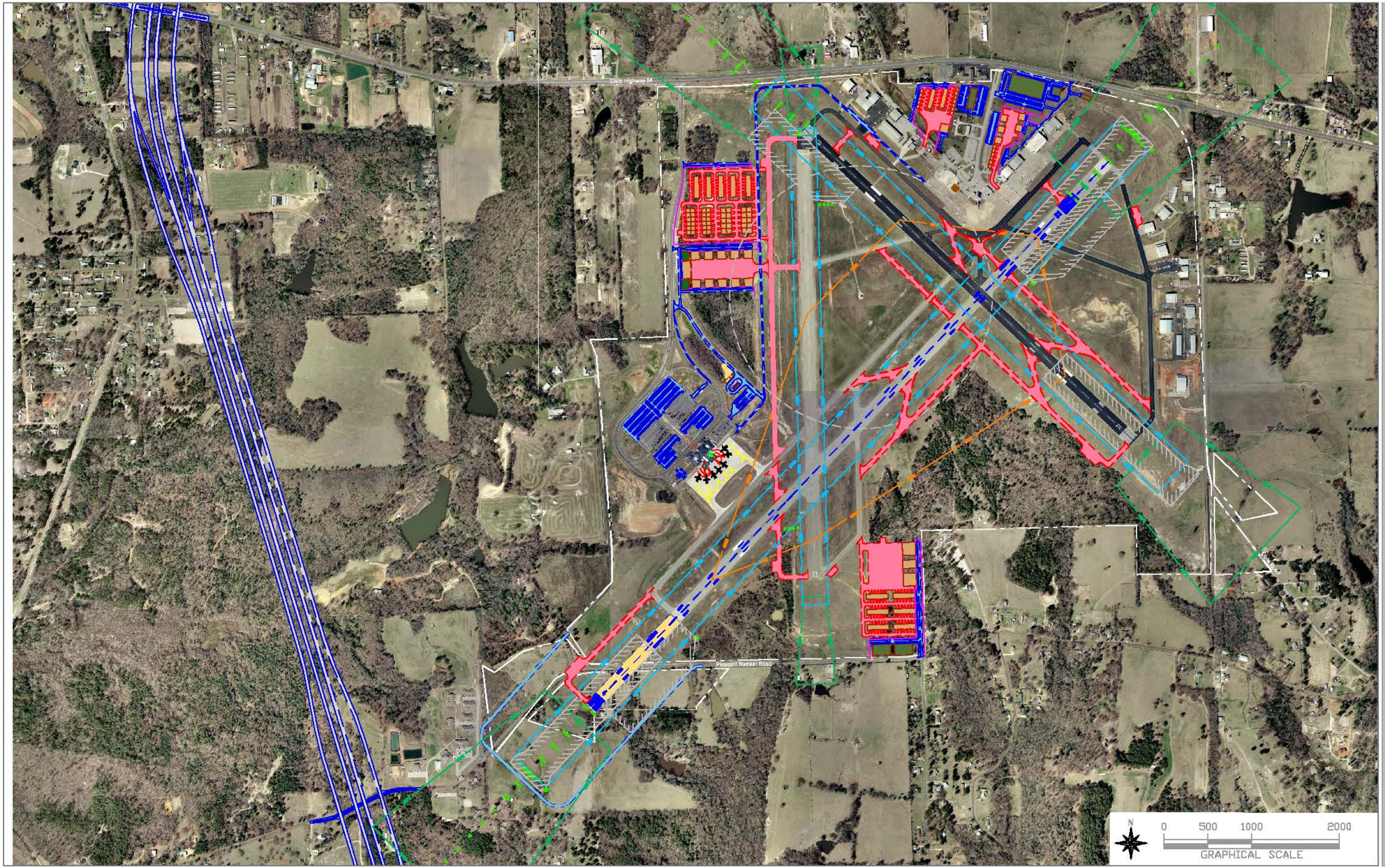
At the Airport, Jet A and Avgas (100LL) to the majority of general aviation, military and commercial service users is provided by the Jet Center of Tyler and Johnson Aviation. The Jet Center of Tyler owns and operates three fuel trucks: two 3,000 gallon Jet A and one 2,000 gallon avgas. Whereas, Johnson Aviation owns and operates two fuel trucks: one 3,000 gallon capacity for Jet A and one 2,000 gallon for avgas. The Jet Center of Tyler has exclusive contracts to provide fuel to all military and commercial service providers at TYR Airport. Current fuel facilities are located within the North GA Complex Area.

As determined in **Chapter 4**, twenty-five percent of existing GA operations at TYR Airport historically have been attributed to GA jet operations. Using the twenty-five percent as a representative figure of GA turbine operations throughout the 20-year planning period, a significant increase in Jet A fuel sales is expected. Anticipated aviation fuel requirements over the long-term period are outlined in **Table 5-22**.

TABLE 5-22
AVIATION FUEL DEMAND

Year	Yearly Jet A Demand (in gallons)			Yearly Avgas (in gallons)	Peak Hour Fuel Truck Demand (number of trucks)	
	Commercial	GA Operations	Total Demand	GA Operations	Jet A	Avgas
2024	1,875,530	515,221	2,390,751	337,426	3	2

Source: The LPA Group Incorporated, 2005



PREFERRED DEVELOPMENT CONCEPT

EXHIBIT 5-20

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Although a review of existing fuel capacity at the Airport revealed that additional fuel storage tanks are unnecessary to accommodate future growth, their location on the far northeast portion of the airfield makes it difficult for the efficient distribution of fuel especially with the development of the West and South GA Complexes. Therefore, based upon circulation and access, a currently vacant area located south and west of the existing terminal facility is recommended for future fuel farm development. This location provides ease of access to Skyway Boulevard as well as to the airfield through the existing Terminal Apron pavement. Access to on-Airport facilities including the new West GA Complex would be provided utilizing the new perimeter roadway north and east of the terminal facilities. Due to the significant demand for Jet A fuel as a result of both commercial and GA turbine operations, an area to accommodate approximately four 20,000 gallon above ground tanks and associated facilities should be reserved. It is important to note, however, that a spill prevention, control and countermeasure program will need to be completed as part of the installation of any additional fuel facilities on the airport. Cost estimates associated with construction of new fuel facilities will be discussed in more detail in **Chapter 8**, *Implementation Plan*.

Security and Fencing

Airport security which includes: perimeter, cargo, terminal, and ramp security, parked aircraft control, aircraft movement areas, passenger flow control, baggage and cargo screening, etc. Terminal and associated ramp improvements were discussed as part of the expansion to the existing Terminal Facility. However, perimeter fencing, as denoted in FAR Part 139, is an airport's first line of defense against intruders. Typically, the perimeter fence has a 10-foot clear area on either side, thus proposed improvements to the existing perimeter fence at Tyler will need to accommodate this requirement. As discussed earlier, additional facilities and features, including electronic gates and surveillance equipment, must be incorporated as part of the recommended facility development. In order not to compromise the perimeter security fencing, each future facility development was evaluated to determine whether access to the secured portions of the airfield is necessary. Costs associated with fence line relocation were evaluated in each of the proposed GA development alternatives. Fence line realignment will coincide with the preferred commercial and GA development.

Aircraft Rescue and Firefighting Facilities

The current ARFF facilities are located in the North GA Complex between Oxford Aviation facilities and 1,000 feet northwest of the old terminal facilities adjacent to Runway 13-31. The Airport is currently classified as an ARFF Index A since it serves both scheduled Index A (less than 90 feet in length) air carrier aircraft as well as unscheduled air carrier aircraft. Services are provided 24-hours per day. Current vehicle and extinguishing agent information is shown in **Table 5-23**.

TABLE 5-23
AIRCRAFT RESCUE AND FIRE FIGHTING EQUIPMENT

VEHICLE TYPE	BRAND	CONDITION	RESPONSE TIME	WATER GALLONS	FOAM PRODUCTION	DRY CHEMICAL AGENTS (LBS)
ARFF	1991 Oshkosh	Excellent	3 minutes	1585/750	205/1000	700/15
ARFF	1974 International	Good	3 minutes	500/750	100/750	500/15
Structural	1992 E-one Pumper	Good	3 minutes	500/1250		205/15

Source: Tyler Pounds Regional Airport, 2004

Based upon aviation activity forecasts, TYR Airport is expected to continue to have service by narrow body regional jets throughout the long-term planning period. As a result, the Airport is expected to remain an ARFF Index A throughout the planning period. Although airfield development, such as extensions to Runway 4-22 and 13-31 are recommended, it is anticipated that the location of the current ARFF facility will be able to accommodate anticipated development without negatively impacting response times to the most probable aircraft accident areas.

Utilities

Improvements to necessary utilities associated with development on Airport include electric, sewer and water. As stated in **Chapter 2**, *Inventory of Existing Conditions*, existing Airport water supply and distribution as well s wastewater collection is provided by Tyler Water Utilities. Water and sewer lines already exist within the North GA Complex due to the location of a number of aviation facilities including the former terminal facility. However, water and sewer lines will need to be extended to accommodate the aviation and non-aviation development recommended for the West and South GA Development Complexes. Even with the anticipated increase in demand for potable water, Tyler Water Utilities will be able to easily accommodate projected demand beyond the end of the planning period.

In addition to expanding electrical utility lines to accommodate aviation and non-aviation growth, it is recommended that either the existing on-Airport electrical vault or a new vault be constructed to accommodate additional airfield lighting and electronic aids. It is recommended that improvements to the vault structure be performed as part of one or more significant airfield electrical improvement projects.

Land Use-Surface Access

To provide adequate levels of service to accommodate all Airport users, TYR Airport has been working with Smith County and TxDOT to ensure adequate vehicular capacity on the primary surface access roads, and to reduce overall traffic congestion. Projects underway or in planning are discussed in the following sections. Further coordination with appropriate local and state officials will likely be required in order to continue to provide the most appropriate and effective means of ensuring adequate ground access to the Airport.

Roadway Access

Additional access routes and roadway improvements will be required in conjunction with the proposed development of the east, south and west sides of the Airport. Roads, with the exception of State Highway 64, in this area currently are two-lane routes utilized mostly by residential and agricultural traffic. Industrial and/or commercial traffic which would be associated with development of both aviation and non-aviation development will require capacity

enhancements to these roadways as well as construction of new roads and general infrastructure as aviation and non-aviation commercial development occurs on and contiguous to the airfield.

State Highway 64

Primary access to the Airport from the north is provided via State Highway 64 and Skyway Boulevard. Skyway Boulevard is the primary Airport access road on the west side of the Airport feeding traffic directly into the landside terminal facilities. Increased vehicular traffic associated with GA development to the northeast, west and south will likely necessitate the expansion of State Highway 64 as well as the development of a new intersection to accommodate expected demand. This will accommodate the greater volume of truck traffic as well as larger volume of other vehicular traffic created from the new terminal facilities and aviation and non-aviation development on the north, east and west sides of Airport.

Dixie Drive

Dixie Drive provides access to State Highway 64 along the easternmost portion of the airfield. This two-lane highway provides access to residential communities south of the Airport and businesses to the east of the airfield. Anticipated development along the east and south sides of the airfield in addition to the extension of Runway 31 will likely require an expansion and relocation of Dixie Drive to accommodate increased vehicular traffic associated with development both on and off the Airport.

Pleasant Retreat Road

Pleasant Retreat Road borders the south side of the airfield providing access to residential and agricultural development south of the airfield. Recommended development including the extension of Runway 4 will require the realignment of Pleasant Retreat Road. Thus, expansion associated with increased vehicular traffic necessitated by both aviation and non-aviation development along the South GA Complex while also providing a south side access to the Terminal Facilities along the western portion of the airfield. As a result, expansion of Pleasant Retreat Road from a two-lane to four-lane highway with left hand turn lanes is recommended to accommodate greater volumes of traffic.

Skyway Boulevard

Skyway Boulevard is the main entrance road to the terminal facilities on the west side of the airfield. Skyway Boulevard connects with State Highway 64 to the North and runs southward parallel to the Airport property boundary. Skyway Boulevard is currently a two-lane highway. However, based upon planned development adjacent to the new terminal facilities as well as GA and commercial development associated with the West GA Complex area, it is anticipated that vehicular traffic, including fuel trucks, will become significant. As a result, expansion of Skyway Boulevard to a minimum of four-lanes with separate turning lanes should be developed to accommodate expected demand.

Terminal circulation in conjunction with proposed rental car and terminal area expansion will be realigned to follow the face of the terminal building with the potential of providing separate lanes for departure and arrival terminal curb frontage. Traffic circulates around the front of the terminal facility reconnecting with Skyway Boulevard to the north and east.

Signage

Clear and understandable signage along primary access roads is necessary for Airport development. Currently Airport signage along State Highway 64, Dixie Drive and Pleasant Retreat Road is minimal. Therefore, signage improvements along these routes are recommended. Further, as part of on-going aviation and non-aviation

development, additional signage along Dixie Drive, Skyway Boulevard, the former Airport Entrance Road and Pleasant Retreat Road is recommended to complement development in the north, west and south sides of the airfield.

Implementation of on-Airport signage will assist users and visitors to the Historic Aviation Museum, Tyler International Flight Training Facilities, as well as to other facilities on the airfield

SUMMARY

The Recommended Airport Development Plan described above outlines the necessary development and facility improvements to not only meet the forecast demand presented in **Chapter 3**, but to ultimately ensure competitiveness and financial viability for the Airport, and provide the Airport and surrounding community with the greatest overall benefit considering the goals of the TYR Airport.

The process utilized in assessing airside and landside development alternatives involved an analysis of long-term requirements and growth potential. Current Airport design standards were reflected in the analysis of runway and taxiway needs, with consideration given to the safety areas required by the FAA in runway approaches. As design standards are further modified in the future, revisions may need to be made in the plan, which could affect future development options.

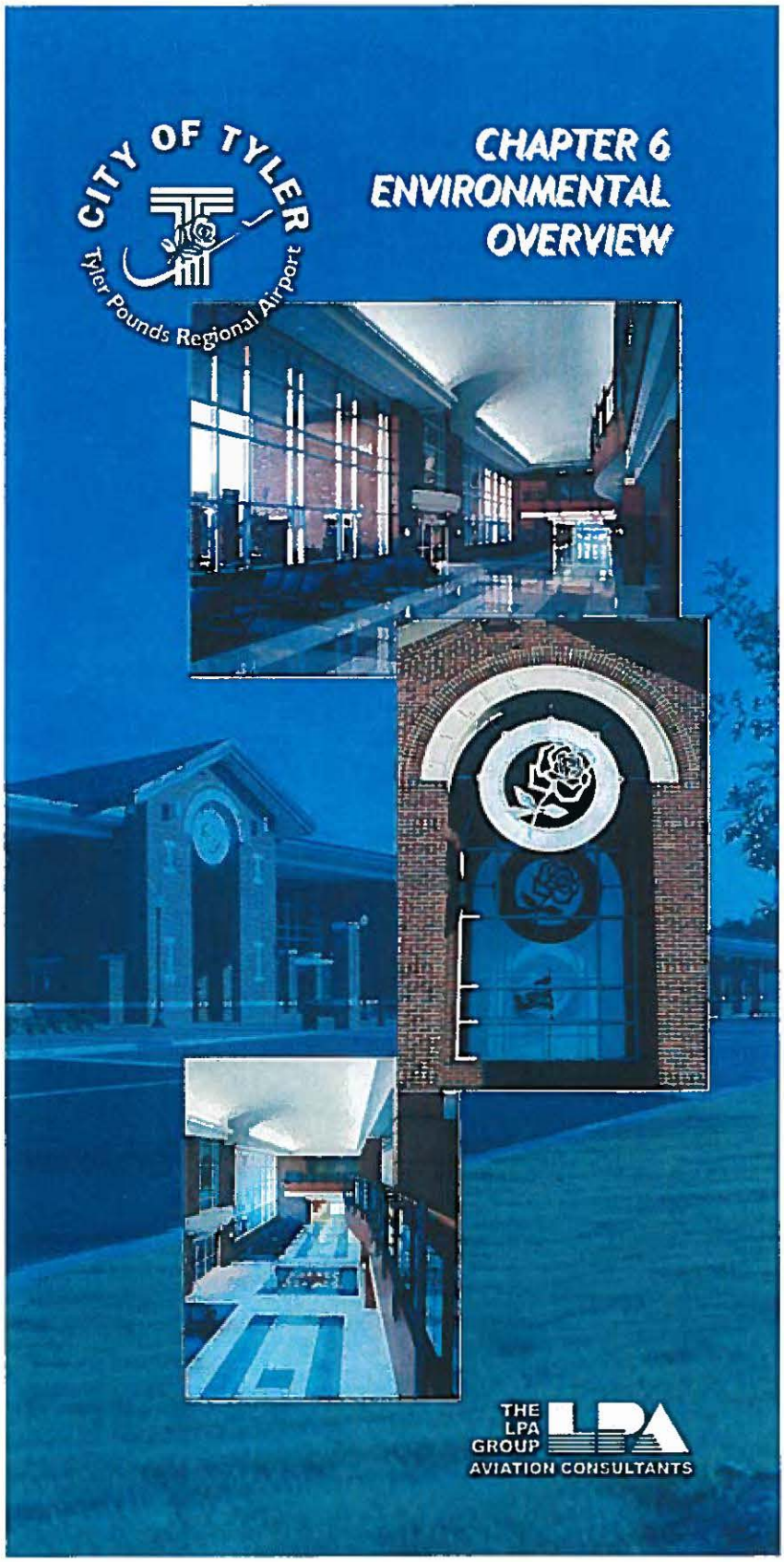
As any good long-range planning tool, the final master-planning concept should remain flexible to unique opportunities that may be presented to the Airport. It should also be kept in mind that changes in market conditions such as passenger enplanements may dictate the acceleration or delay of projects.

The remaining portions of the Master Plan will be directed towards the preparation and phasing of a detailed implementation program, and an evaluation of funding options currently available to the TYR Airport. A detailed review of the projects, including construction costs and phasing, is discussed in **Chapter 8**, *Plan Implementation*.

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 6 ENVIRONMENTAL OVERVIEW



THE LPA GROUP

AVIATION CONSULTANTS

CHAPTER SIX
Environmental Overview

INTRODUCTION

The purpose of this chapter is to provide a review of existing environmental conditions and a preliminary assessment of potential environmental impacts of planned development at Tyler Pounds Regional Airport (TYR). This overview does not constitute an Environmental Assessment (EA), as defined by the Federal Aviation Administration (FAA) Order 5050.4A. The analysis in this chapter is conducted according to the guidelines set forth in the FAA Order, entitled Environmental Handbook. Under this document, 20 categories have been determined as potential areas of impact and must be addressed. These categories are:

1. Noise
2. Land Use
3. Social Impacts
4. Induced Socio-Economic Impacts
5. Air Quality
6. Water Quality
7. Department of Transportation Act, Section 303(c)
8. Historical, Architectural, Archaeological, and Cultural Resources
9. Biotic Communities
10. Endangered and Threatened Species
11. Wetlands
12. Floodplains
13. Coastal Zone Management Program
14. Coastal Barriers
15. Wild and Scenic Rivers
16. Farmland
17. Energy Supply and Natural Resources
18. Light Emissions
19. Solid Waste Impact
20. Construction Impacts

For the purpose of this overview, these environmental categories will only be addressed if they apply specifically to TYR. This environmental overview identifies potential environmental impacts that may require a more detailed analysis in a formal EA for the preferred development alternative.

The proposed projects listed in the Master Plan are not anticipated to impact the following:

1. Land Use
2. Social Impacts
3. Induced Socio-Economic Impacts
4. Air Quality
5. Department of Transportation Act, Section 303(c)
6. Historical, Architectural, Archaeological, and Cultural Resources
7. Floodplains
8. Coastal Zone Management Program

9. Coastal Barriers
10. Wild and Scenic Rivers
11. Farmland
12. Energy Supply and Natural Resources
13. Light Emissions
14. Solid Waste Impact
15. Construction Impacts

However, the categories that are anticipated to or have the potential to have some impacts are discussed in the following paragraphs.

NOISE

An updated aircraft noise study was conducted as part of the master planning process using standard FAA methodologies and procedures. The noise study included noise modeling and the estimation of noise exposure in terms of affected land area and associated land use. The analysis used the Day-Night Average Sound Level (L_{dn} or DNL) noise metrics as a descriptor of cumulative aircraft noise exposure.

Noise contours generated by the FAA Integrated Noise Model (INM), version 6.1, do not depict a strict demarcation of where the noise levels end or begin but rather describe the general expected noise exposure. INM noise modeling requires the input of several variables. The noise contours represent average annual conditions rather that single event occurrences. Noise exposure on any one day may be greater or less than that of the average day. The noise model is useful for comparison of noise impacts and can provide a reasonable basis for performing airport noise compatibility planning. The noise exposure contours presented in this report do not consider operational noise abatement measures that could reduce projected noise impacts.

Assumptions

The noise environment for TYR was modeled to determine the existing and future noise impacts on neighboring properties. Noise Exposure Maps were modeled for the Base Year 2004 and Future Year 2024 conditions. The noise model generated noise contours for the 65, 70 and 75 DNL.

To perform a noise analysis and generate the noise exposure maps, various input variables were required. These variables include the following:

- The number of aircraft operations by time of day and aircraft type for an average day
- Operational information, including the use of each runway end
- Departure, arrival and touch-& go flight profiles.

The fleet mix at Tyler Pounds Regional Airport consists of commercial and general aviation turbine and piston aircraft and helicopters. **Tables 6-1** and **6-2,** depict the average aircraft operations per aircraft type used in INM model for the base year and final year the planning period.

TABLE 6-1
YEAR 2004 AVERAGE DAILY OPERATIONS

General Aviation Operations - (No military, touch and go, or commercial)

Runway	Utilization %	Total Operations	Ops per Runway	SEP	MEP	MET	MEJ
				0.72	0.09	0.09	0.1
4	0.27	31,648	8,545				
Arrival/Departure Split			4,272				
Daily Ops ((split/365)*.8))			9.364	6.74	0.84	0.84	0.94
Night / Eve Ops ((split/365)*.1))			1.171	0.843	0.105	0.105	0.117
22	0.18	31,648	5,697				
Arrival/Departure Split			2,848				
Daily Ops ((split/365)*.8))			6.243	4.495	0.562	0.562	0.624
Night / Eve Ops ((split/365)*.1))			1.561	1.124	0.140	0.140	0.156
13	0.33	31,648	10,444				
Arrival/Departure Split			5,222				
Daily Ops ((split/365)*.8))			11.445	8.241	1.030	1.030	1.145
Night / Eve Ops ((split/365)*.1))			1.431	1.030	0.129	0.129	0.143
31	0.22	31,648	6,963				
Arrival/Departure Split			3481				
Daily Ops ((split/365)*.8))			7.630	5.494	0.687	0.687	0.763
Night / Eve Ops ((split/365)*.1))			0.954	0.687	0.086	0.086	0.095

Commercial Operations - (No military, touch and go, or general aviation)

Runway	Utilization %	Total Operations	Ops per Runway	Saab 340	ATR 42	EMB 120
				1.02%	47.69%	51.29%
4	0.6	10,143	6,085.8			
Arrival/Departure Split			3,043			
Daily Ops ((split/365)*.8))			6.669	0.068	3.181	3.421
Night / Eve Ops ((split/365)*.1))			0.834	0.009	0.398	0.428
22	0.4	10,143	4,057.2			
Arrival/Departure Split			2,029			
Daily Ops ((split/365)*.8))			4.446	0.045	2.120	2.280
Night / Eve Ops ((split/365)*.1))			0.556	0.006	0.265	0.285

TABLE 6-1
YEAR 2004 AVERAGE DAILY OPERATIONS

Military Operations

Runway	Utilization %	Total Operations	Ops per Runway	C130	Trainer
				50.00%	50.00%
4	0.6	551	330.6		
Arrival/Departure Split			165		
Daily Ops ((split/365)*.8))			0.362	0.181	0.181
Night / Eve Ops ((split/365)*.1))			0.045	0.023	0.023
22	0.4	551	220.4		
Arrival/Departure Split			110		
Daily Ops ((split/365)*.8))			0.242	0.121	0.121
Night / Eve Ops ((split/365)*.1))			0.030	0.015	0.015

Touch and go Operations - Runway 17-35

Runway	Utilization %	Total Operations	Ops per Runway	SEP	MEP
				0.9	0.1
17	0.5	21099	10549.5		
Arrival/Departure Split			5275		
Daily Ops ((total/365)*.8))			11.561	10.405	1.156
Night / Eve Ops ((total/365)*.2))			1.445	1.301	0.145
35	0.5	21099	10549.5		
Arrival/Departure Split			5275		
Daily Ops ((total/365)*.8))			11.561	10.405	1.156
Night / Eve Ops ((total/365)*.2))			1.445	1.301	0.145

Source: THE LPA GROUP INCORPORATED, 2006

TABLE 6-2
YEAR 2024 AVERAGE DAILY OPERATIONS

General Aviation Operations - (No military, touch and go, or commercial)

Runway	Utilization %	Total Operations	Ops per Runway	SEP	MEP	MET	MEJ
				0.7	0.07	0.07	0.16
4	0.33	46629	15388				
Arrival/Departure Split			7694				
Daily Ops ((split/365)*.8))			16.863	11.80	1.18	1.18	2.70
Night / Eve Ops ((split/365)*.1))			2.108	1.476	0.148	0.148	0.337
22	0.22	46629	10258				
Arrival/Departure Split			5129				
Daily Ops ((split/365)*.8))			11.242	7.869	0.787	0.787	1.799
Night / Eve Ops ((split/365)*.1))			2.811	1.967	0.197	0.197	0.450
13	0.27	46629	12590				
Arrival/Departure Split			6295				
Daily Ops ((split/365)*.8))			13.797	9.658	0.966	0.966	2.208
Night / Eve Ops ((split/365)*.1))			1.725	1.207	0.121	0.121	0.276
31	0.18	46629	8393				
Arrival/Departure Split			4197				
Daily Ops ((split/365)*.8))			9.198	6.439	0.644	0.644	1.472
Night / Eve Ops ((split/365)*.1))			1.150	0.805	0.080	0.080	0.184

Commercial Operations - (No military, touch and go, or general aviation)

Runway	Utilization %	Total Operations	Ops per Runway	CRJ 50	EMB 120
				50.00%	50.00%
4	0.6	14859	8915.4		
Arrival/Departure Split			4458		
Daily Ops ((split/365)*.8))			9.770	4.885	4.885
Night / Eve Ops ((split/365)*.1))			1.221	0.611	0.611
22	0.4	14859	5943.6		
Arrival/Departure Split			2972		
Daily Ops ((split/365)*.8))			6.514	3.257	3.257
Night / Eve Ops ((split/365)*.1))			0.814	0.407	0.407

TABLE 6-2
YEAR 2024 AVERAGE DAILY OPERATIONS

Military Operations

Runway	Utilization %	Total Operations	Ops per Runway	C130	Trainer
				50.00%	50.00%
4	0.6	571	342.6		
Arrival/Departure Split			171		
Daily Ops ((split/365)*.8))			0.375	0.188	0.188
Night / Eve Ops ((split/365)*.1))			0.047	0.023	0.023
22	0.4	571	228.4		
Arrival/Departure Split			114		
Daily Ops ((split/365)*.8))			0.250	0.125	0.125
Night / Eve Ops ((split/365)*.1))			0.031	0.016	0.016

Touch and go Operations - Runway 17-35

Runway	Utilization %	Total Operations	Ops per Runway	SEP	MEP
				0.9	0.1
17	0.5	22759	11379.5		
Arrival/Departure Split			5690		
Daily Ops ((total/365)*.8))			12.471	11.224	1.247
Night / Eve Ops ((total/365)*.2))			1.559	1.403	0.156
35	0.5	22759	11379.5		
Arrival/Departure Split			5690		
Daily Ops ((total/365)*.8))			12.471	11.224	1.247
Night / Eve Ops ((total/365)*.2))			1.559	1.403	0.156

Source: THE LPA GROUP INCORPORATED, 2006

The runway utilization percentage is very important in deriving the noise exposure size and direction. The runway utilization primarily depends on the prevailing wind direction and speed. Runway utilization percentages were obtained from the ATCT, assigned to each runway end and input into the INM.

The flight track data was also obtained from the ATCT at the airport. No specialized departure and arrival procedures were used in this analysis and touch-and-go flight procedures were modeled by FAA standard, left-hand traffic patterns for all runways. The flight tracks, track assignments, and runway utilization percentages remained unchanged throughout the study.

Existing Noise Contours

The total land area impacted within the 65 DNL during the base year is approximately **224 acres**. As depicted, nearly the entire 65 DNL noise contour resides on airport property with exception of a very small area near Runway 4 that overlays Pleasant Retreat Road. Since roadways are compatible noise areas, no mitigation or land acquisition is required under the current operational scenario. **Figure 6-2** illustrates the noise contour data for the base year, while **Table 6-3** lists the estimated noise impacts.

Future Year 2024 Noise Contours

The noise exposure map for both the base year and the year 2024 revealed that a majority of the 65 DNL and above contours remain on airport property with the exception of approximately 12 acres of the 65 contour resulting from the extension of Runway 4. This contour crosses Pleasant Retreat Road and then extends beyond the airport parcel to the south. The extension of Runway 4 project includes the relocation of Pleasant Retreat Road along with the acquisition of property including the entire 65 DNL contour and a portion of the adjacent runway protection zone. For this reason, noise mitigation or land acquisition beyond the amount of acquisition planned in the extension project should not be required. Both the existing and future noise contours are depicted in the Airport Land Use Drawing shown in Chapter 7. **Table 6-3** denotes the area of impacts associated with the existing and future noise contours.

TABLE 6-3
BASE YEAR AND YEAR 2024 SUMMARY OF NOISE EXPOSURE BY LAND USE

	Land Area (Acres)					
	Base Year			*Year 2024*		
Land Use	**65-69 DNL**	**70-74 DNL**	**75+ DNL**	**65-69 DNL**	**70-74 DNL**	**75+ DNL**
Airport Property	223.2	115.2	77.0	333.6	179.2	115.2
Residential	0	0	0	0	0	0
Institutional	0	0	0	0	0	0
Total Acreage	224.0	115.2	77.0	345.6	179.2	115.2

Source: The LPA Group Incorporated, 2006

Recommendations

The noise exposure map for both the base year and the year 2024 reveals that the majority of the 65 DNL and above contours remains on airport property. As a result, noise impacts to the areas surrounding the airport are negligible. The future extension of Runway 4 will require additional property acquisition. This acquisition of property should include all areas that lie beneath the 60 DNL noise contour at TYR.

WATER QUALITY

Legislation

The Federal Water Pollution Control Act, as amended by the Clean Water Act provides the authority to establish water control standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and for dredged and filled materials into surface waters. The Fish and Wildlife Coordination Act requires consultation with the United States Fish and Wildlife Service (USFWS) and the Texas Commission on Environmental Quality (TCEQ) formerly Texas National Conservation Commission when any alteration and/or impounding of water resources is expected. The Federal National Pollution Discharge Elimination System (NPDES) provides regulations that govern the quality of stormwater discharge into water resources of the United States.

Regulatory Agencies

The United States Army Corps of Engineers (COE) and TCEQ have jurisdiction over and regulate activities that alter the landscape and disrupt water flow to waters of the state and the United States. The TCEQ is also responsible for conducting Section 401 certification reviews of the COE 404 permit applications for the discharge of fill material into waters or wetlands of the United States. The wetland section details the regulatory requirement for this permit.

The United States Environmental Protection Agency (EPA) administers the NPDES Program. On September 14, 1998, the EPA authorized Texas to develop and implement the Texas Pollutant Discharge Elimination System (TPDES) Program. The TCEQ administers the TPDES Program and is the stormwater permitting authority for industrial activity, construction activity, and Municipal Separate Storm Sewer Systems (MS4)

Permitting requirements for construction at TYR are specified by the TPDES. Therefore, proposed improvement projects at the TYR that would impact jurisdictional wetlands and surface waters require a TCEQ general permit prior to construction. As part of the permitting process, stormwater runoff has to be treated prior to discharge to any waterbody.

Existing Conditions

Several wetlands were identified to be in TYR. The wetlands are discussed in detail in the wetlands section.

Potential Impacts

Proposed development in TYR may potentially impact wetlands and water quality.

Recommendations

It is recommended that coordination with TCEQ be completed during the environmental review phase of each development project at TYR, to determine potential avoidance or minimization of environmental impacts.

DEPARTMENT OF TRANSPORTATION ACT, SECTION 303(C)

Legislation

United States Code 49, Section 303 (c) is the recodified Section 4(f) of the Department of Transportation Act of 1966. It specifies that the use of publicly owned land from public parks, recreation areas, wildlife and waterfowl refuges, and historic sites shall not be approved unless there is not feasible or prudent alternative to that use and all negative impacts to Section 303 (c) area have been minimized.

Regulatory Agencies

Agencies that have jurisdiction over Section 303 (c) properties include the Advisory Council on Historic Places, the United States Department of Interior (DOI), National Park Service (NPS), COE, and United States Department of Agriculture (USDA). Coordination with these agencies is required when impacting Section 303 (c) properties.

Existing Conditions

According to the Environmental Overview of the Terminal Facility Relocation at TYR (LPA Group, 1999), there are no Section 3039(c) properties in the northern, eastern, and western areas of TYR. A review of the southern area of TYR did not identify Section 303 (c) properties within the project study area.

Potential Impacts

There are no anticipated impacts.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Legislation

The National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 provide protection against development impacts that would cause change in the historical, architectural, archaeological, or cultural resources. Section 106 of the National Historic Preservation Act, Protection of Historic and Cultural Resources requires federal agencies to consider the effects of their actions on site listed on the National Register of Historic Places (NRHP) and sites that are eligible for listing.

Regulatory Agencies

The Antiquities Code of Texas and Texas Local Government Code, Chapter 318, Historic Preservation by Counties appointed the Texas Historical Commission as the state agency for historic preservation, responsible for preserving Texas' architectural, archaeological, and cultural landmarks.

Existing Conditions

The Texas Historical Commission Historic Site Atlas does not list any historic sites within TYR. A preliminary historic and archaeological reconnaissance was performed during the Environmental Overview of the Terminal Facility Relocation project (LPA Group, 1999) at TYR. This study identified two potential historic sites:

1. A turn of the century rock-lined well or cistern and the remaining undisturbed foundations; and
2. Other World War II features associated with the former Army Corp facility in the western area of TYR, north of Pleasant Retreat Road, east of CR 1184 and west of Runway 17/35.

The Texas Historical Commission did not require further testing near the rock lined well cistern or recording the location of the remaining foundations of the Army Air Corps facility. No other potential historic or archaeological sites were identified during the study.

Potential Impacts

There is low potential for impacts for projects proposed in TYR because the two potential historic sites identified in the preliminary historic and archaeological reconnaissance were determined to be not significant.

Recommendations

A Phase One Cultural Resource Assessment Survey should be performed for each project, in areas where there is a potential for archaeological artifacts to be discovered and where excavation is proposed to avoid or minimize archaeological or historical impacts.

BIOTIC COMMUNITIES

Legislation

The Fish and Wildlife Coordination Act (48 Statute 401 as amended; 16USC et. Seq.) takes into consideration impacts to habitat and wildlife. Section 2 of this act requires consultation with USFWS, the DOI, and state agencies that regulate wildlife whenever water resources are modified by a federal agency, public or private agency under federal permit of license.

Regulatory Agencies

The USFWS and TCEQ have authority under the act to provide comments and recommendations concerning vegetation and wildlife resources.

Existing Conditions

The Texas Parks and Wildlife Department (TPWD) divided the state into natural regions, ecoregions, and biotic provinces. The classifications were developed to identify physiographic and biological differences of one area from another. TYR is within the Piney region, South Central Plain ecoregion, and Austroriparian province. Piney Woods topography is gently rolling to hill forested land with elevations that vary from 200 to 500 above sea level. Biotic communities that are typically found in the Piney Woods region include native pine-hardwood forests, mixed pine-oak forests, farmland, and pastureland.

The northern area, south of Highway 64 is the most developed area of TYR with gently sloping topography ranging from approximately 490 feet MSL in the northwest to 520 feet MSL in the south. Aviation related development structures, paved areas, and maintained grass areas are currently located in this area.

The eastern area of TYR, west of Dixie Drive has a developed area with gently sloping terrain ranging in elevation from approximately 510 feet above MSL in the northeast to 550 feet MSL in the southeast. This area consists mainly of maintained grass or undeveloped upland between the intersection of Runways 4/22 and 13/31. The remaining area consists of aviation-based commercial development including building, paved surfaces, and maintained grass areas.

The western area of TYR, west of Runway 4/22 is currently partially developed, with elevations ranging from approximately 470 feet MSL in the west along an intermittent stream to 560 feet MSL in the south. This area consists of young upland, bottomland forest, former borrow areas, and open pastureland. The terminal is located in this area.

The southern area of TYR, north of Pleasant Retreat Road in undeveloped and consist of a forested wetland, former borrow areas, and maintained grass areas. The elevations range from 540 feet MSL from the western section to 490 feet MSL in the south.

Potential Impact

The proposed airport development would impact altered uplands, disturbed uplands, forested uplands, non-forested wetlands, and forested wetlands. Soil types, comparative elevation, and drainage characteristics determine plant community type while dominant vegetation and other environmental factors determine wildlife value and utilization.

Although the biotic communities are disturbed, they provide wildlife habitat to various animals some of which are threatened and endangered species.

Recommendations

A site survey to evaluate specific biotic community types and threatened and endangered species within the boundaries of the proposed development and the potential presence of threatened and endangered species should be completed during the EA and/or Environmental Impact Statement (EIS) for each project. It is recommended that a biotic communities and threatened and endangered species survey be completed in the proposed development areas to determine the potential for the presence of threatened and endangered species.

ENDANGERED AND THREATENED SPECIES

Legislation

The Endangered Species Act of 1973 (ESA), as amended, requires federal agencies, in consultation with and assisted by the United States Fish and Wildlife Service (USFWS), to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat of such species. Section 7 of the Act states that federal agencies must review their actions; if those actions will affect a listed species or its habitat they must consult with the USFWS. By federal definition, an endangered species is any species of fish, wildlife, or plant that is in danger of extinction throughout all or a significant portion of its range. A threatened species is any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Species identified as in need of protection are placed on the federal list. Any species that is officially proposed for inclusion on the list as threatened or endangered is given the same protection as listed species.

In 1973, the Texas legislature authorized the TPWD to establish a list of endangered animals in the state. Endangered species are those species that the TPWD Executive Director has named as being "threatened statewide with extinction." Threatened species are those that the Texas Parks and Wildlife Commission has determined are likely to become endangered in the future. Chapters 67 and 68 of the Texas Parks and Wildlife Code and Sections 65.171-65.184 of Title 31 of the Texas Administrative Code contain the laws and regulations that address endangered and threatened animal species.

Texas Administrative Coded Sections 69.01 to 69.14 and Chapter 88 of the TPW Code contains authorizes TPWD to establish a list of threatened and endangered plant species for the state and to administer the laws and regulations pertaining to endangered and threatened plant species.

Both federal and state regulations prohibit the taking, possession, transport, or sale of any animal species designated as endangered or threatened without the issuance of a permit. State laws and regulations prohibit commerce in threatened and endangered plants and the collection of listed plants from public land without a permit from TPWD. Federal laws and regulations also prohibit commerce and the collection of listed plants in federal land without a permit from USFWS.

Regulatory Agency

USFWS and TPWD have jurisdiction over and administer native endangered and threatened species permits for Texas. During the consultation process, the USFWS and TPWD will determine the significance of potential impacts and methods to mitigate and/or avoid them to complete the proposed project.

Existing Conditions

Available GIS maps and literature were compiled and reviewed to determine the types of plant communities and wildlife occurrences that have been previously documented within the project study area. Data sources used in this evaluation included:

1. TPWD Rare Resources Data for Smith County (2004);
2. TPWD Texas Threatened and Endangered Species (2004);
3. USFWS Threatened and Endangered Species System Listing for Texas (2004);
4. The Nature Conservancy, Texas Conservation Data Center (CDC) Animal Tracking List (2003);
5. CDC Plant Tracking List (2003);
6. CDC Annotated List of G3/T3 and Rarer Plant Taxa of Texas (2004);
7. Texas Organization for Endangered Species Endangered, Threatened, and Watch List of Texas Plants (2004); and
8. Environmental Overview Terminal Facility Relocation of Tyler Pounds Regional Airport (LPA Group, 1999).

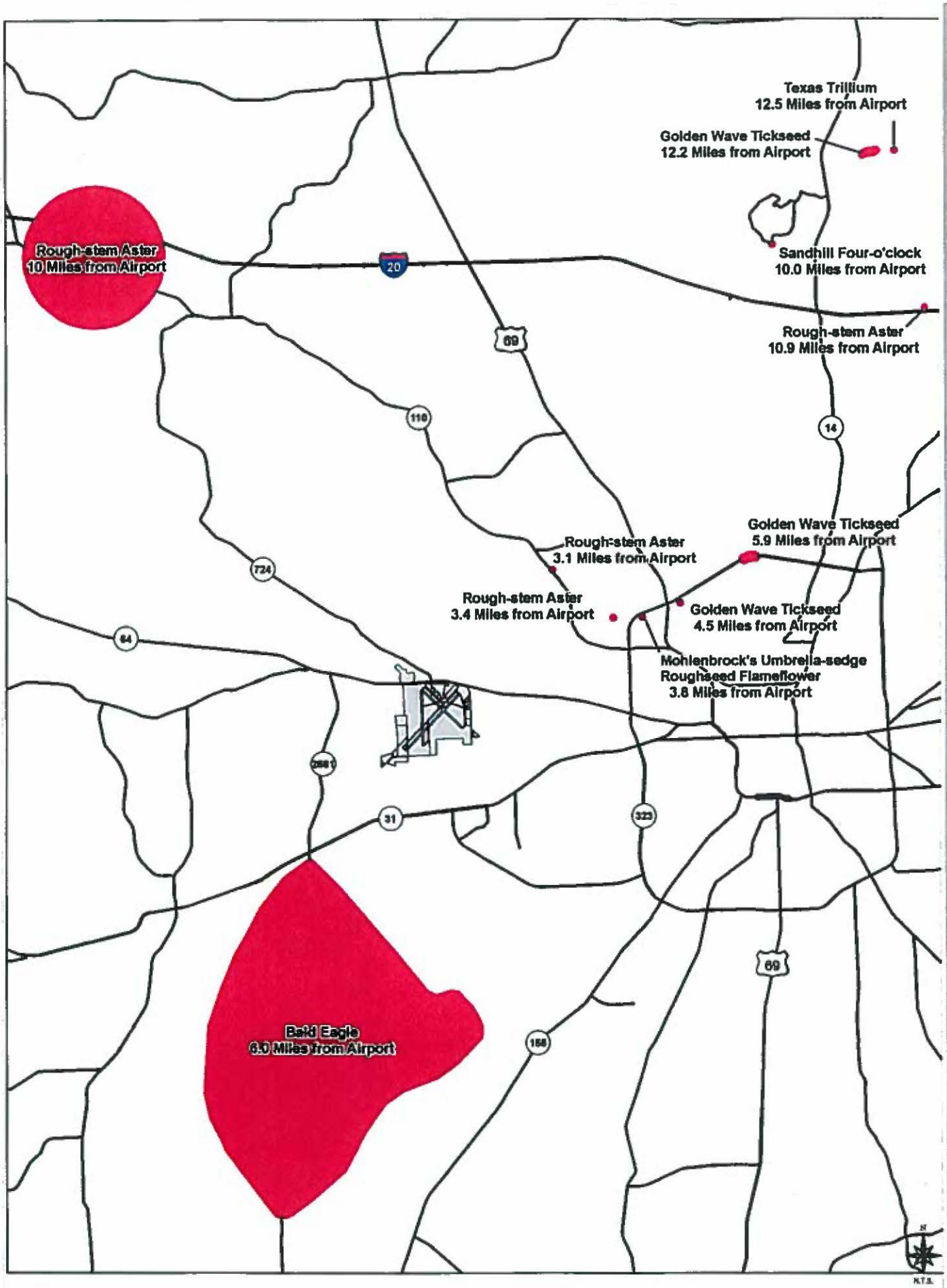
The USFWS maintains the Threatened and Endangered Species System (TESS) that contains information on threatened and endangered wildlife and plants and lists of threatened and endangered species by state including listed species, delisted species, proposed species for listing, and candidate species. In Texas, there are currently 91 listings consisting of 63 animals and 28 plants. There have been 20 delisted species for reasons including recovery, extinction, taxonomic revisions, new information discovered, and erroneous data. There is one proposed species for listing as endangered, a snail (*Pecos assiminea*) and 20 candidate species that consist of 16 animals and 4 plants.

The TPWD maintains a database of rare, threatened, and endangered species, and significant natural communities including known locations. The data for TYR was requested from TPWD and a review of the records indicates the following:

- There are no recorded occurrences of threatened or endangered species at TYR
- The nearest rough stem aster *(Aster scabricaulis)* is approximately 3.1 miles northeast of TYR;
- The nearest golden wave tickseed (*Coreopsis intermedia*) is approximately 4.5 miles northeast of TYR;
- The nearest bald eagle *(Haliaeetus leucocephalus)* recorded is approximately 6 miles southwest of TYR; and
- The nearest Mohlenbrock's umbrella-sedge *(Cyperus grayoides)* and roughseed flameflower (*Talimum rogosspermum)* is approximately 3.8 miles of TYR **(Figure 6-1)**.

Table 6-4 lists the potential occurring listed fauna at TYR.

In 1999, the western, northern, and eastern areas of TYR were surveyed to determine the presence of listed species. The survey determined that there is potential habitat for scarlet snake (*Cemophora coccinea)* and timber/canebrake rattlesnake *(Crotalus horridus)*. Additionally, TPWD performed an environmental review of the northern, eastern, and western areas of TYR that resulted in a determination that proposed improvements in 1999 would not have anticipated negative impact to rare species or natural communities.



TPWD RARE RESOURCES OCCURENCE MAP

FIGURE 8-1

TYLER POUNDS
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TABLE 6-4
LIST OF POTENTIALLY OCCURRING LISTED FAUNA

SCIENTIFIC NAME	COMMON NAME	STATUS	
		USFWS	TPWD
Cemophora coccinea	Scarlet snake	T	
Crotalus horridus	Timber/canebrake rattlesnake	T	
Macrolemys temminckii	Alligator snapping turtle	T	
Phrynosoma cornutum	Texas horned lizard	T	
Falco peregrinus	American peregrine falcon	E, T	
Falco peregrinus tundris	Arctic peregrine falcon	T	
Haliaeetus leucocephalus	Bald eagle	T	PT
Ursus americanus	Black bear	T	TS
Ursus americanus luteolus	Louisiana black bear	T	T

LEGEND:
USFWS = United States Fish and Wildlife Service
TPWD = Texas Parks and Wildlife Department

E = endangered species
T = threatened species
SSC = species of special concern
P = proposed for delisting
TS = threatened by similarity in appearance

Sources: Texas Official Lists of Endangered and Threatened Species in Texas 2004.
Official Lists of Endangered and Threatened Species in Texas 2004

Recommendations

It is recommended that a protected species survey be completed during the EA or EIS of each project to:

- Update existing protected species data;
- Determine the presence and location or protected species in sections of the project area that were not previously surveyed; and
- Determine the type of mitigation necessary to complete the project.

WETLANDS

Legislation

Executive Order 11990, Protection of Wetlands, mandates that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and preserve and enhance their natural values. This Executive Order and the permitting requirement of the Clean Water Act Section 404 require a permit for dredged and fill material in navigable waters of the United States.

In 1989, the Texas legislature established a single statewide definition for wetlands, "Wetlands means an area (including a swamp, marsh, bog, prairie pothole, or similar area) having a predominance of hydric soils that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances supports the growth and regeneration of hydrophytic vegetation." In August 17, 2000 as state rule, the Texas Surface Water Quality Standards (TSWQS) further clarified the protection of wetlands as waters in the state. As mentioned in the Water Quality Section, TCEQ implements a tiered system of review of federal permits for compatibility of state requirements as outlined in the "Memorandum of Agreement between the COE and TCEQ on Section 401 Certification Procedures." The Section 401 Certification Procedure is based upon state water project size and the amount of state water/wetland affected. Tier I projects are those that will directly impact 3 acres or less of waters and/or wetlands in the state or less thank 1,500 linear feet of streams. The TCEQ anticipates proposed Tier I projects to result in substantial compliance with state water quality standards and therefore waives certification for Tier I projects. Projects above the threshold and those below the threshold that are not eligible for Tier I processing, such as projects that will impact certain rare or ecologically significant wetlands are considered Tier II. Tier II projects are subject to an individual review by the TCEQ that involves participation in the pre-application process and public comment process.

Regulatory Agency

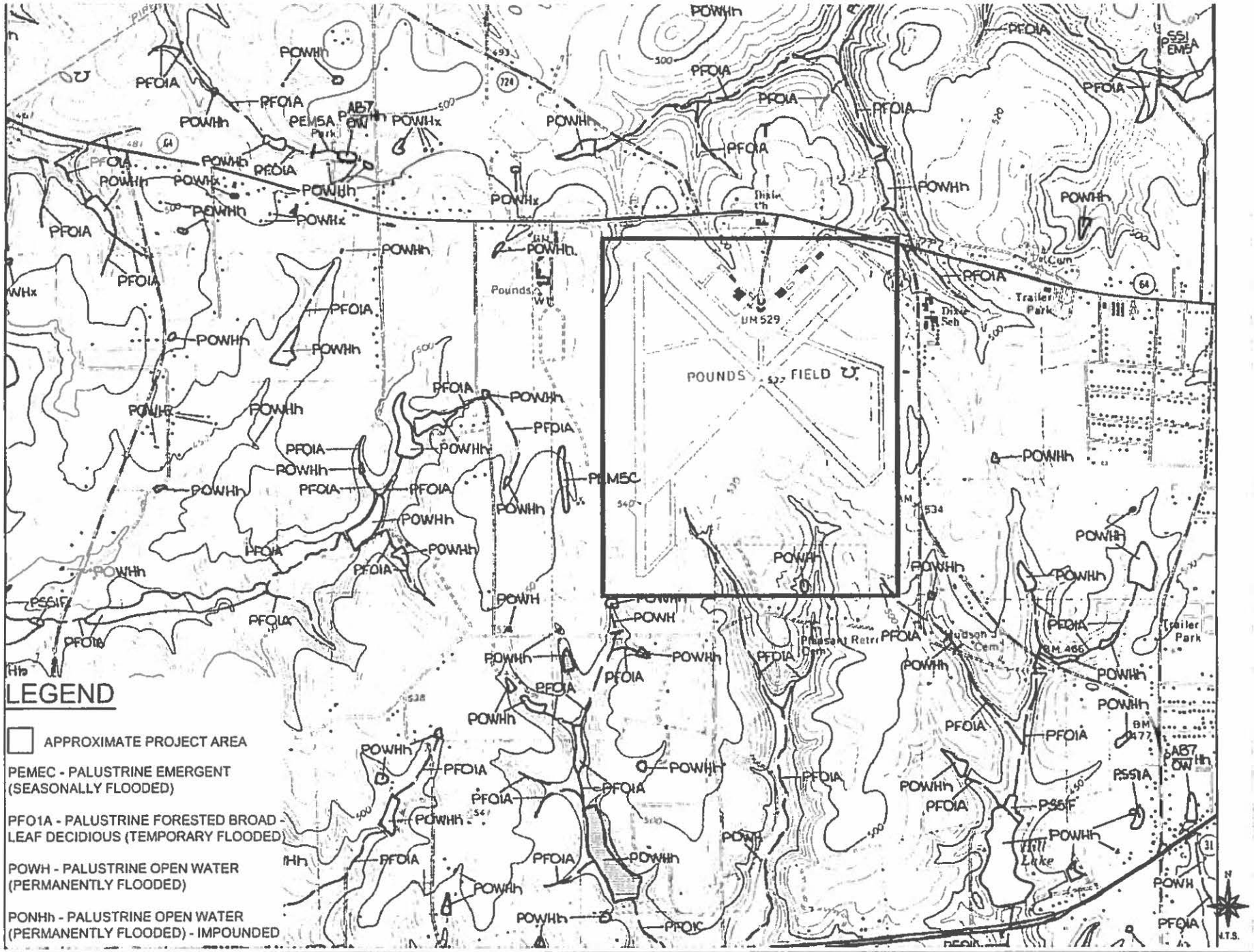
The COE, have jurisdiction over and regulate activities that alter the landscape and disrupt water flow to waters of the United States. TCEQ reviews 404 permit applications through the Section 401 Certification Program.

Proposed improvement projects at TYR require a Section 404 permit and a Section 401 Certification prior to construction of projects that would impact jurisdictional wetlands and surface waters. As part of the permitting process, compensatory mitigation for unavoidable wetland impacts would be required.

Existing Conditions

Available GIS maps and literature were compiled and reviewed to determine the types of wetland systems that have been previously documented within TYR. Data sources used in this evaluation included:

- National Wetlands Inventory wetlands map (**Figure 6-2**);
- National Resource Conservation Service soils survey;
- United States Geological Survey (USGS) topographic map;
- Texas Natural Resources Information System digital, ortho-photo quadrangle aerial map; and
- Environmental Overview for the Terminal Facility Relocation at Tyler Pounds Regional Airport (LPA Group, 1999).



TYLER POUNDS REGIONAL AIRPORT

MASTER PLAN UPDATE

NWI WETLANDS MAP

FIGURE 6-2

In 1999, The LPA Group Incorporated performed a survey at TYR that identified and delineated several wetlands. Three wetlands were identified in the western area, one intermittent stream in the northern area, and no wetlands were identified in the eastern area. The survey determined that COE jurisdictional wetlands were present in the western area.

A formal COE jurisdictional determination of the three wetlands in the western area of TYR was approved by COE on February 1, 2000. The wetland determination is valid for five years and expires on February 1, 2005. The emergent wetland is approximately 6,000 square feet in size and located west of Runway 4/22 and north of the terminal. The wetland vegetation consists of sweetgum *(Liquidambar styraciflua)*, wax myrtle *(Myrica cerifera)*, black willow *(Salix nigra)*, winged elm (*Ulmus alata)*, sedges *(Carex spp.)*, Savannah panic grass (*Chanopyrum gymnocarpon)*, and southern dewberry (*Rubus trivialis)*. The pond located is approximately 0.3 acre in size and is located immediately west of the terminal. A stream approximately 5, 000 square feet in size meanders through the western limits of TYR west of the terminal.

Review of soils, NWI, and aerial maps indicate a potential forested wetland and two ponds in the southern area of TYR.

Potential Impacts

Proposed projects in the southern and western section of TYR will likely impact wetlands that will require mitigation and regulatory permits from COE with review comments from TCEQ.

Recommendation

It is recommended that a formal jurisdictional wetland determination, wetland survey and characterization be completed for wetlands in TYR. The wetland determination will provide the necessary information in determining potential wetland impacts associated with the proposed improvements. This phase maybe completed during the EA or EIS of each project to determine wetland impacts and compensatory mitigation necessary to meet state and federal regulatory requirements.

FLOODPLAINS

Legislation

Executive Order 11988, "Floodplain Management" defines floodplains as lowland areas adjoining inland and coastal waters, especially those areas subject to one percent or greater chance of flooding in any given year. In September 1, 2001, the 77th Legislature of Texas amended Subchapter I, Chapter 16, of the Water Code to authorize all political governing bodies to:

- Adopt more comprehensive floodplain management regulations that the political subdivision determines are necessary for planning and appropriate to protect public health and safety.
- Participate in floodplain management and mitigation initiatives such as the National Flood Insurance Program's Community Rating System. Project Impact or other initiatives developed by federal, state, or local government; and
- Collect reasonable fees to cover administrative costs incurred by the administration of a local floodplain management program.

Additionally, Senate Bill 936 provides for Criminal and Civil Penalties and injunctive relief.

Regulatory Agencies

The Federal Emergency Management Agency (FEMA) has produced flood insurance rate maps (FIRM) for communities participating in the National Flood Insurance Program. The maps detail the 100-year and 500-year base flood elevations.

The TCEQ is the state coordinating agency for the National Flood Insurance Program. TCEQ staff conducts site visits in communities throughout the state to provide planning assistance and information to local officials. Texas does not have current rules and regulation that require floodplain compensation for floodplain impacts.

Existing Conditions

A review of the FEMA FIRM (FIRM No. 481185-0255 B) indicates that the 100-year floodplain extends approximately 1,300 feet southward from Highway 64 into the western area of TYR (**Figure 6-3**).

Potential Impacts

There are no projects currently proposed for the southwestern area of TYR and therefore no anticipated impact.

Recommendations

None.

COASTAL ZONE MANAGEMENT PROGRAM

Legislation

The Coastal Zone Management Act (CZMA) aims to preserve, protect, develop, and where possible, restore and enhance the resources of the nation's coastal zone. The Texas Coastal Management Program (CMP) is designed to accomplish goals set by the legislature for coastal resource and to meet specific requirements for an approved plant under the federal CZMA.

Regulatory Agency

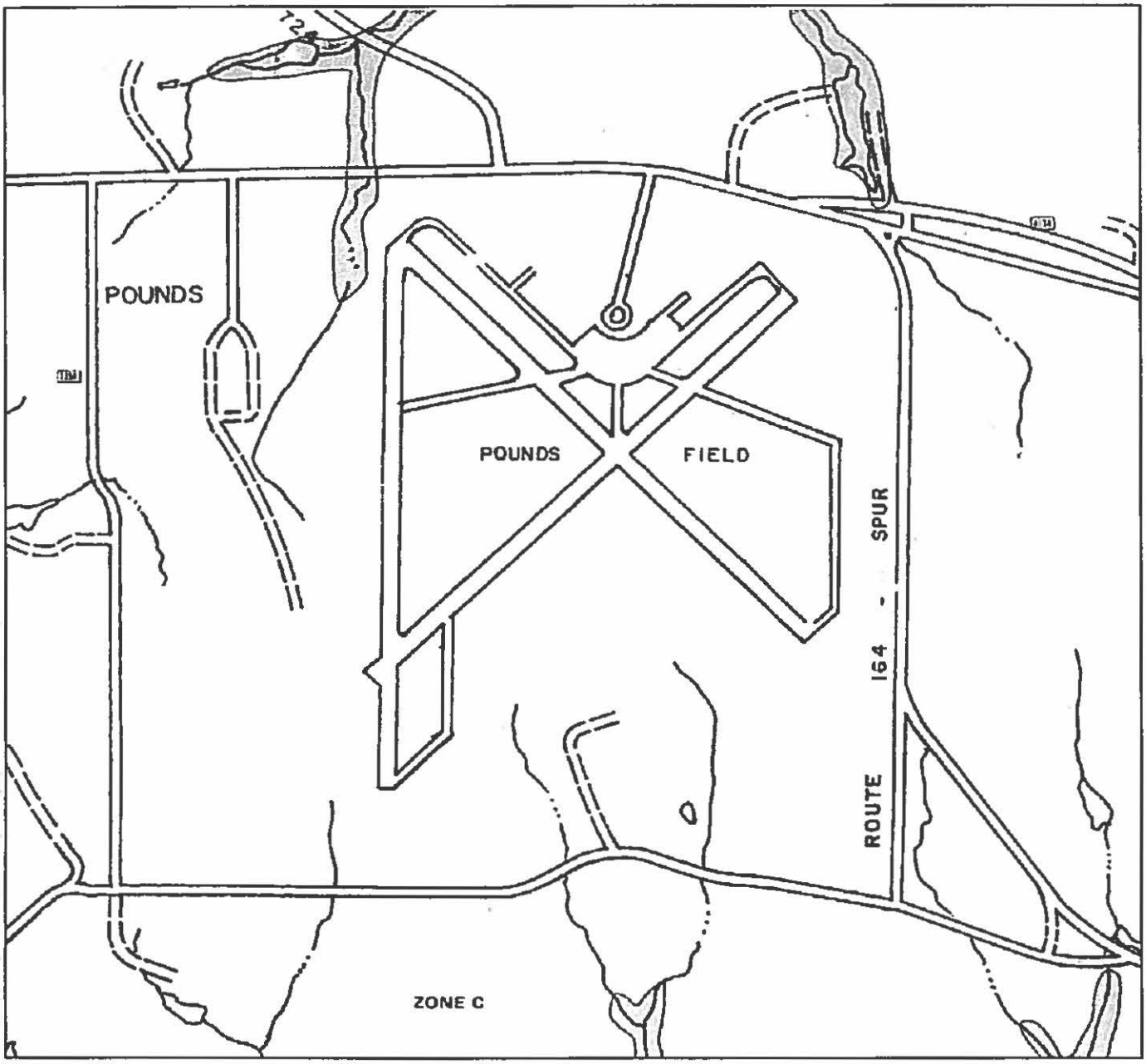
The Coastal Coordination Council (CCC) administers the CMP and is chaired by the Commissioner of the General Land Office. The CCC is charged with adopting uniform goals and policies to guide decision-making by all entities regulating or managing resource use within the Texas coastal area. The CCC reviews significant actions taken or authorized by state agencies and other entities that may adversely affect coastal natural resources to determine consistency with the CMP goals and policies. Additionally, the Texas Section 401 Certification Program is a component for protecting coastal wetland resources under the CMP.

Existing Conditions

Based upon the Bureau of Economic Geology Texas Coastal Hazards map, TYR is not within the coastal zone and the coastal high hazard area.

Potential Impacts

All proposed structural improvements for this project are consistent with the goals and objectives of the Texas Coastal Management Program. There are no anticipated impacts for the proposed development of TYR.



LEGEND

SHADED AREA = 100-YEAR FLOODPLAIN

N

N.T.S.

FEMA FLOODPLAIN MAP

FIGURE 6-3

FARMLAND

Legislation

The Farmland Protection Policy Act of 1981 requires the evaluation of farmland conversion to non-agricultural areas. Prime farmland is land best suited for producing food, feed, forage, fiber, and oilseed crops. This land has the quality, growing season, and moisture supply necessary to produce sustained crop yields with minimal energy and economic input.

Regulatory Agencies

The National Resources Conservation Service (NRCS) has jurisdiction and should be consulted is farmland is to be converted to non-agricultural use by a federally funded project. The consultation determines whether the farmland is classified as "prime" or "unique." If it is, the Farmland Protection Act requires rating the farmland conversion impacts based upon the length of time farmed, amount of farmland remaining in the area, level of local farm support services, and the level of urban land in the area.

Existing Conditions

Based on the soil survey of Hernando County (NRCS 1977), there are five soil types within the project area (**Figure 6-4**):

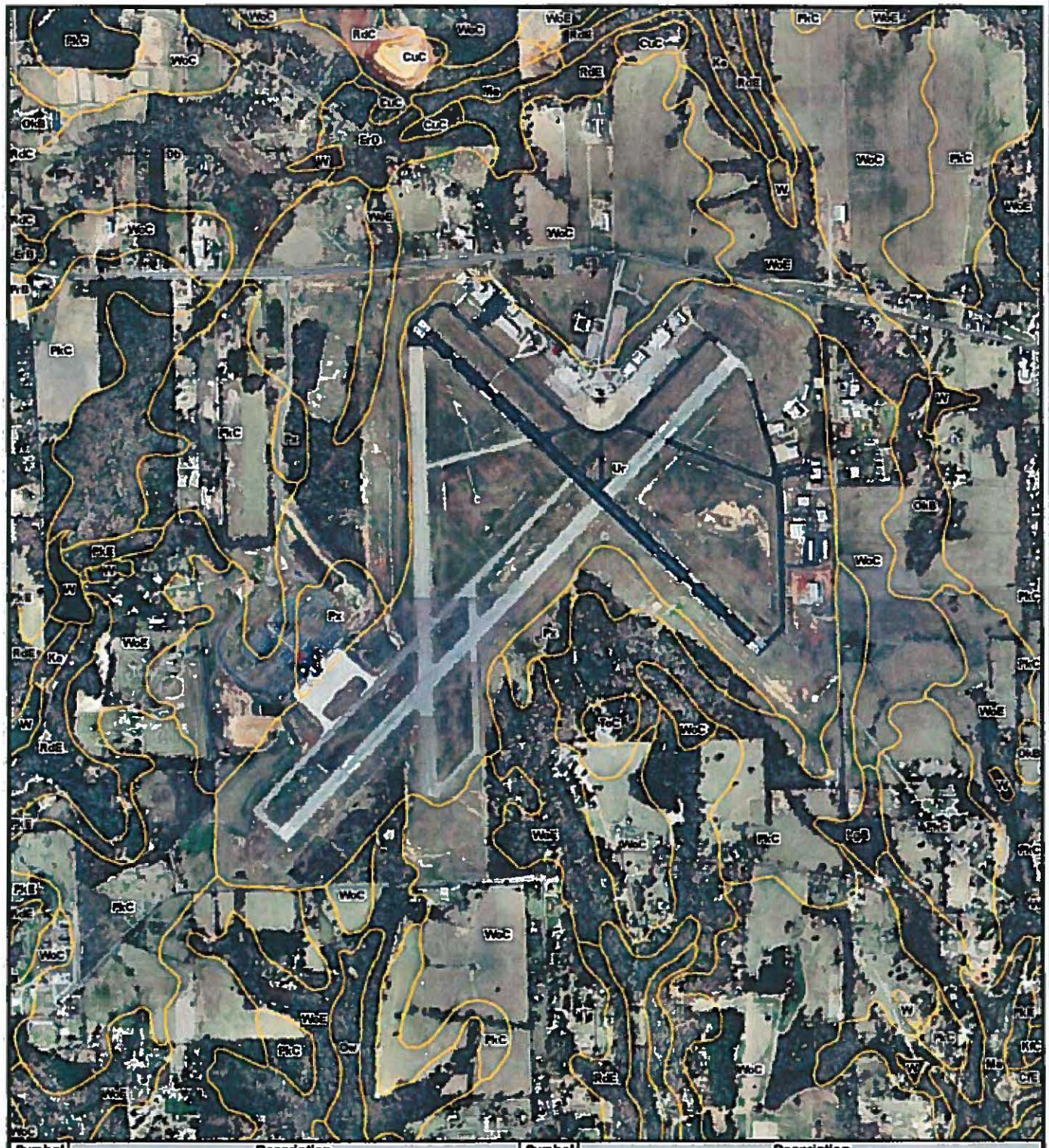
- Pits (Px);
- Pickton loamy finesand, 1 to 6 percent slopes (Pkc);
- Tonkawa fine sand, 1 to 6 percent slopes (Toc);
- Wolfpen loamy fine sand, 1 to 6 percent slopes (Woc);
- Wolfpen loamy fine sand, 8 to 15 percent slopes (Woe); and
- Urban land (Ur)

Of these six soil types, urban land is the predominant soil and covers more than 50 percent of TYR (**Figure 6-4**). Urban land consists of areas where 85 to 100 percent of the surface is covered by works or structures such as streets, sidewalks, pave parking lots, office buildings, etc. This soil type has been severely altered and obscured that classification of the soils is not practical. At TYR the areas with urban land are covered with airport related development including taxiways, runways, terminal building, aprons, maintained grass areas and other related structures.

The second most dominant soil type is wolfpen loamy fine sand, 1 to 6 percent slopes covers approximately 25 percent of TYR. This soil type located at the north area, another area north of the terminal in the western area, and a small portion of the forest at the south area of TYR (**Figure 6-4**). It is a gently sloping soil typically found on broad interstream divides in uplands. This soil is well drained. Surface runoff is slow. Permeability and available water capacity is moderate. The hazard of erosion is slight. The seasonal high water table is at a depth of 4 to 6 feet during winter and spring. This soil is used mainly as pasture, and in small areas as woodland or cropland.

The third dominant soil type is wolfpen loamy fine sand, 8 to 15 percent slopes covers approximately 10 percent of TYR. This soil type is located in the northwest of Runway 4/22 and in a section of the southern area of TYR (**Figure 6-4**). It is a sloping to moderately steep soil on side slopes of drainage ways. This soil is well drained and surface runoff is slow. Permeability and available water capacity are moderate. The hazard erosion is moderate or severe. The seasonal high water table is at depth of 4 to 6 feet during winter and spring. This soil type is mainly used as pasture or woodland.

NRCS SOILS MAP



Symbol	Description	Symbol	Description
CtE	CUTHBERT FINE SANDY LOAM, 5 TO 20 PERCENT SLOPES	PkC	PICKTON LOAMY FINE SAND, 1 TO 6 PERCENT SLOPES
CuC	CUTHBERT AND REDSPRINGS SOILS, GRADED, 3 TO 8 PERCENT SLOPES	PkE	PICKTON LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES
Db	DERLY-BESNER COMPLEX, 0 TO 1 PERCENT SLOPES	Px	PITS
ErB	ELROSE FINE SANDY LOAM, 1 TO 3 PERCENT SLOPES	Ra	RAINO FINE SANDY LOAM, 0 TO 2 PERCENT SLOPES
ErD	ELROSE FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES	RdC	REDSPRINGS VERY GRAVELLY SANDY LOAM, 2 TO 5 PERCENT SLOPES
FrB	FREESTONE FINE SANDY LOAM, 1 TO 3 PERCENT SLOPES	RdE	REDSPRINGS VERY GRAVELLY SANDY LOAM, 8 TO 25 PERCENT SL OPES
Ke	KEECHI LOAM, FREQUENTLY FLOODED	ToC	TONKAWA FINE SAND, 1 TO 6 PERCENT SLOPES
KfC	KIRVIN VERY FINE SANDY LOAM, 1 TO 5 PERCENT SLOPES	Ur	URBAN LAND
LgB	LEAGUEVILLE LOAMY FINE SAND, 0 TO 5 PERCENT SLOPES	W	WATER
Ms	MANTACHIE LOAM, FREQUENTLY FLOODED	WoC	WOLFPEN LOAMY FINE SAND, 1 TO 6 PERCENT SLOPES
OkB	OAKWOOD FINE SANDY LOAM, 1 TO 5 PERCENT SLOPES	WoE	WOLFPEN LOAMY FINE SAND, 8 TO 15 PERCENT SLOPES
Ow	OWENTOWN LOAMY FINE SAND, OCCASIONALLY FLOODED		

N

N.T.S.

FIGURE 8-4

Pickton loamy fine sand, 1 to 6 percent slopes is a gently sloping soil typically found in broad interstream divides. This soil type is located at the western area and covers approximately 8 percent of TYR (**Figure 6-7**). This soil is well drained. Surface runoff is very slow. Permeability is moderate and available water capacity is low. The hazard of erosion is slight. During wet periods in winter, the seasonal high water table is at a depth of 4 to 6 feet. This soil is mainly used as pasture with some areas used as woodland and cropland.

Pits consist mainly of sand pits and clay pits and cover approximately 5 percent of TYR. Pits area located north of the terminal, underneath the terminal, and along the south side of Runway 4/22.

Tonkawa fine sand, 1 to 6 percent slope covers approximately 2 percent of TYR and is located in a small section of the southern area. It is a gently sloping soil typically found on broad interstream divides. This soil is excessively drained. Surface runoff is very slow. Permeability is rapid and available water capacity is low. The hazard of erosion is slight. This soil type is mainly used as woodland and some pasture and cropland.

Potential Impacts

The results of the literature review did not identify unique or prime farmland in TYR.

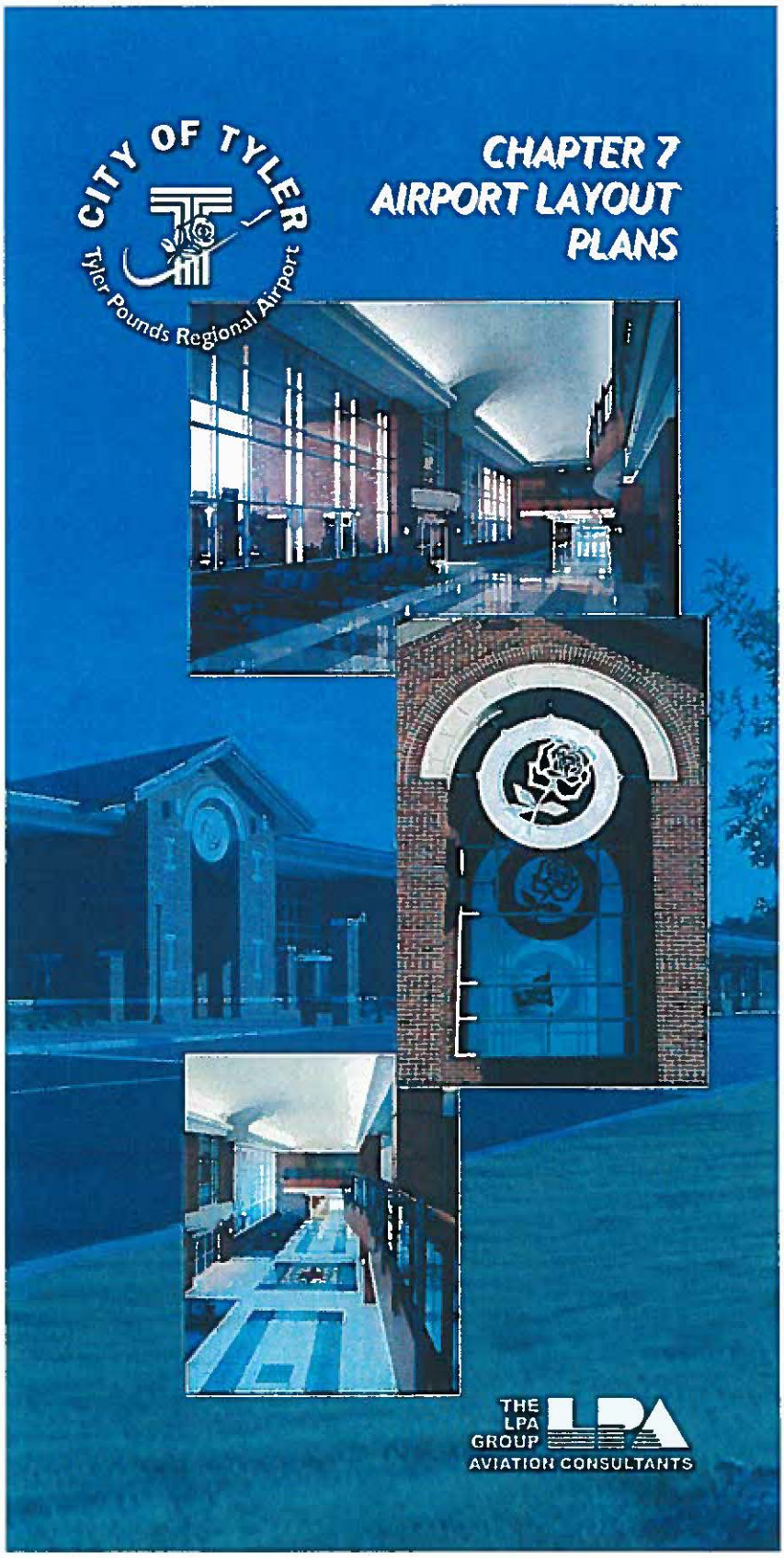
Recommendations

It is recommended that a Farmland Conversion Impact Rating form be prepared and submitted to NRCS to received concurrence of no potential impacts to farmland resulting from the proposed development of TYR.

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 7 AIRPORT LAYOUT PLANS



THE LPA GROUP

AVIATION CONSULTANTS

CHAPTER SEVEN
AIRPORT LAYOUT PLANS

GENERAL OVERVIEW

An update to the Airport Layout Plan drawing set (ALP) for the Tyler Pounds Regional Airport (TYR) is included and discussed in this chapter. The Federal Aviation Administration (FAA) as a part of the Master Plan process requires the Airport Layout Plan set. This drawing set provides a portion of the input required to determine the eligibility of proposed airport improvement projects. The FAA will generally not provide financial assistance for projects that are not depicted on the ALP. The drawings which comprise the updated ALP illustrate the current (2005) facilities at TYR and proposed improvements resulting from the analyses contained in the previous sections of the Master Plan Study for the short, intermediate, and long-term planning periods.

The Airport Layout Plan (ALP) set was prepared in conformity with the criteria established by the Federal Aviation Administration (FAA) in **Advisory Circular (AC) 150/5070-6B, "Airport Master Plans"** and **AC 150/5300-13 Change 9, "Airport Design"** and supporting circulars and orders.

The ALP set includes the following individual drawing sheets:

- Cover Sheet
- Airport Layout Drawing
- Airspace Drawing
- Airspace Drawing (Runway 4 Extended Approach)
- Airspace Drawing (Runway 13 Extended Approach)
- Airspace Drawing (Runway 22 Extended Approach)
- Runway 4 Inner Portion of the Approach Surface Drawing
- Runway 22 Inner Portion of the Approach Surface Drawing
- Runway 13 Inner Portion of the Approach Surface Drawing
- Runway 31 Inner Portion of the Approach Surface Drawing
- Runway 17 Inner Portion of the Approach Surface Drawing
- Runway 35 Inner Portion of the Approach Surface Drawing
- Terminal Area Drawing - Terminal Area Development
- Terminal Area Drawing – North Area Development
- Terminal Area Drawing - West Area Development
- Terminal Area Drawing - South Area Development
- Airport Property Map
- Land Use Drawing

Additionally both a location and a vicinity map for the airport are incorporated onto the cover sheet, which also provides an index of individual drawing sheets. A reduced version of the ALP set is included at the end of this chapter.

Airport Layout Drawing

The airport layout drawing depicts all existing facilities as well as proposed development over the course of the master plan. These facilities include, but are not limited to: the runway and taxiway system, taxilanes, hold aprons, lighting, NAVAIDs, terminal facilities, hangars, other airport buildings, aircraft parking areas, automobile parking, and airport access elements. Key dimensional criteria are included for the airfield geometry. This includes, but is not limited to, the size of the runways and various taxiways; runway safety and runway object free areas; building restriction lines; and navigational aid critical areas. Airport coordinates, airport elevations, general airport data, basic runway data, a modification approval block, and wind rose data are included on the separate Airport Layout Plan Data Sheet.

One of the most significant improvements shown on the ALP involves the extension of Runway 4-22 to the southwest by approximately 1,400 feet. An extension of this length will allow Runway 4-22 to function as a primary runway capable of accommodating the future aircraft fleet mix projected to operate at TYR. Additionally, improvements to the runway safety areas associated with Runways 4, 22 and 13 will be a funding priority.

Additional airfield improvements include the integration of high-speed taxiway exits for increased capacity along with the addition of various taxiway connectors for improved airfield circulation. Precision approach capability to Runway 4-22 is also planned.

Several apron and taxilane improvements are shown on the plan including general aviation facility development on the north, west and south areas of the airport. These expansions create additional room for ground circulation and aircraft parking and are required to accommodate the growth of general aviation traffic that is expected to occur during the planning period.

The plan also indicates proposed commercial hangar construction for the expansion of existing business or for new businesses that are expected to commence at TYR throughout the planning period. Additional t-hangar and corporate hangar development is also incorporated in future plans for the three primary general aviation development areas.

Airspace Drawings

To enhance the safe operation of aircraft in the airspace around the airport, the FAA has adopted **Federal Aviation Regulations (FAR) Part 77 "Obstructions Affecting Navigable Airspace."** Subpart C of FAR Part 77 establishes standards for determining obstructions to air navigation. These regulations enable the establishment of imaginary surfaces, which no object, manmade or natural, should penetrate. FAR Part 77 surfaces are utilized in zoning and land use planning adjacent to an airport to protect the navigable airspace from encroachment by hazards that would potentially affect the safety of airport operations.

The FAR Part 77 Imaginary Surfaces Plan depicts the physical features of the area around the airport including existing obstructions that penetrate the surfaces. The specific imaginary surfaces, which should be protected from obstructions, include:

> **Primary Surface** - A rectangular area symmetrically located about each runway centerline and extending a distance of 200 feet beyond each runway threshold. Width of the Primary Surface is based on the type of approach a particular runway has, while the elevation is the same as that of the runway centerline at all points.
>
> **Horizontal Surface** – A level oval-shaped area situated 150 feet above the airport elevation, extending 5,000 or 10,000 feet outward, depending on the runway category and approach procedure available.

Conical Surface - Extends outward for a distance of 4,000 feet beginning at the outer edge of the Horizontal Surface, and sloping upward at a ratio of 20:1.
Approach Surfaces - These surfaces begin at the end of the Primary Surface (200' beyond the runway threshold) and slope upward at a ratio determined by the runway category and type of approach available to the runway. The width and elevation of the inner end conforms to that of the Primary Surface while approach surface length and width of the outer end are governed by the runway category and approach procedure available.

Transitional Surface - A sloping area beginning at the edges of the Primary and Approach Surfaces and sloping upward and outward at a ratio of 7:1 until it intersects the Horizontal Surface.

Inner Portion of the Approach Surface Drawings

The Inner Portion of the Approach Surface drawing denotes a plan and profile view of a particular runway end. Obstructions are listed numerically in a table with data describing the obstruction, obstruction elevation, affected Part 77 surface, surface elevation, amount of penetration, and proposed dispositions. Potential obstructions in the approach zones include vertical clearances required over roadways and railroads as well as incursions by power poles, trees, buildings, etc. for both the existing and ultimate approaches.

The drawings identify that prior to the installation of a precision approach, removal of obstructions will be required to keep the heights of these objects below the required 50 to 1 approach surface. As indicated, the existing approaches to Runways 4-22 and 13-31 are impacted by various objects penetrating the approach surfaces. Most of these objects are trees; however, the plans also indicate penetrations by man made objects including light poles and a building as well. The approach drawings for Runways 17 and 35 demonstrate that the existing approaches are unobstructed.

Terminal Area Plan

The Terminal Area Plan drawings (TAP) depict the same configuration and dimensional information shown on the ALP drawing, but provide a larger scale version of the terminal development areas so that certain features and greater detail of the proposed improvement can be discerned. The plans include recommended improvements to access roads, parking areas, the buildings, hangars, commercial development, and support facilities.

Airside improvements shown on the Terminal Area Plan for Terminal Area Development include provisions to expand the main terminal. As illustrated, future terminal expansion will create additional gates for expected increases in airline activity and similar expansions to the passenger terminal will accommodate additional passenger traffic associated with the increased airline activity.
Landside improvements shown include expansion to existing long-term and short-term parking facilities and also consider the construction of an airport maintenance complex and a rental car service center.

The drawing for the North Development area characterizes general aviation growth balanced with commercial development opportunities along the frontage to Highway 64. Drawings for the West and South Development areas depict options for various general aviation development opportunities at TYR during the 20-year planning period and beyond.

Airport Property Map

The Airport Property Map is intended to accurately show the airport property line and all current lease boundaries. To develop this property map, an extensive review of recorded deeds, plats, and rights of way was conducted. The Property Map not only displays the existing inventory of property on the airport but also identifies those tracts of land that have been recommended for future acquisition. As noted on this drawing, approximately 126.5 acres are identified for acquisition to the southwest of the airport. This area is required to address existing runway safety area deficiencies and the proposed extension of Runway 4-22. Given the continued expansion of developed land uses in the immediate airport environs, it is important that a property envelope sufficient to provide for airport needs well into the future be defined and acquired. This avoids the need to acquire costly developed property in the future to meet airport's development needs. The proposed acquisitions depicted on the Airport Property Map will ensure the viability of the airport for an extended period of time and will provide proper protection for the future development of approaches and the runway extension that is expected to occur in the future.

Airport Land Use Plan

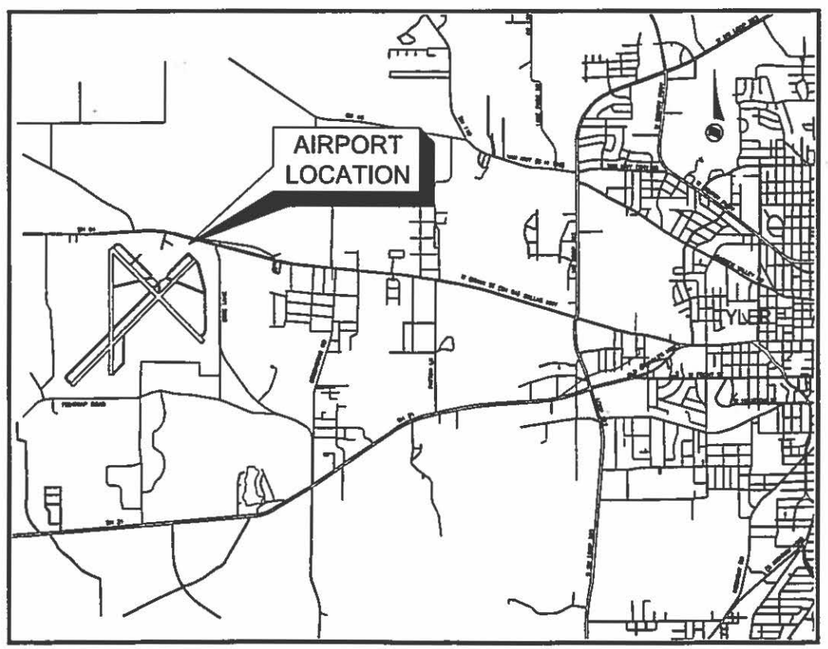
The Airport Land Use Plan shows the proposed utilization of property within the existing and future boundary of Tyler Pounds Regional Airport. The land use designations illustrated correspond with the future developments shown on Airport Layout Plan and assign undeveloped areas to their most desired or likely use for the future. The purpose of the plan is to ensure that the airport strategically allocates areas of property for future need such that future acquisition of land and easements are minimized.

SUMMARY

The preceding chapters have identified the forecast level of activity at TYR, applied that demand to the existing available facilities to determine future facility needs, and investigated an array of alternatives that could be employed to meet the projected demand. From the alternatives analysis and its subsequent refinement, a set of development actions have been defined for use in graphically depicting the future extent and configuration of facilities at TYR. These have been briefly discussed in the preceding sections. The next step in the planning process consists of refining the preliminary costs that were first identified in the alternatives analysis, developing a prioritized phasing program for the recommended development actions and determining the funding sources that will be employed to pay for the recommended improvements. The financial considerations including phasing, development and capital costs and funding options will be addressed in the Implementation Plan Chapter.

AIRPORT LAYOUT PLANS
FOR THE

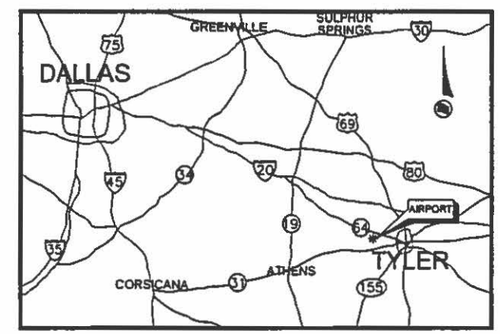
CITY OF TYLER, TEXAS
TYLER POUNDS REGIONAL AIRPORT



LOCATION MAP

INDEX OF DRAWINGS

TITLE SHEET
AIRPORT LAYOUT DRAWING
AIRSPACE DRAWING
AIRSPACE DRAWING RUNWAY END 4 EXTENDED APPROACH
AIRSPACE DRAWING RUNWAY END 13 EXTENDED APPROACH
AIRSPACE DRAWING RUNWAY END 22 EXTENDED APPROACH
RUNWAY END 4 INNER PORTION OF THE APPROACH SURFACE DRAWING
RUNWAY END 22 INNER PORTION OF THE APPROACH SURFACE DRAWING
RUNWAY END 13 INNER PORTION OF THE APPROACH SURFACE DRAWING
RUNWAY END 31 INNER PORTION OF THE APPROACH SURFACE DRAWING
RUNWAY END 17 INNER PORTION OF THE APPROACH SURFACE DRAWING
RUNWAY END 35 INNER PORTION OF THE APPROACH SURFACE DRAWING
TERMINAL AREA DRAWING
TERMINAL AREA SOUTH DEVELOPMENT
TERMINAL AREA NORTH DEVELOPMENT
TERMINAL AREA WEST DEVELOPMENT
LAND USE DRAWING
AIRPORT PROPERTY MAP



VICINITY MAP

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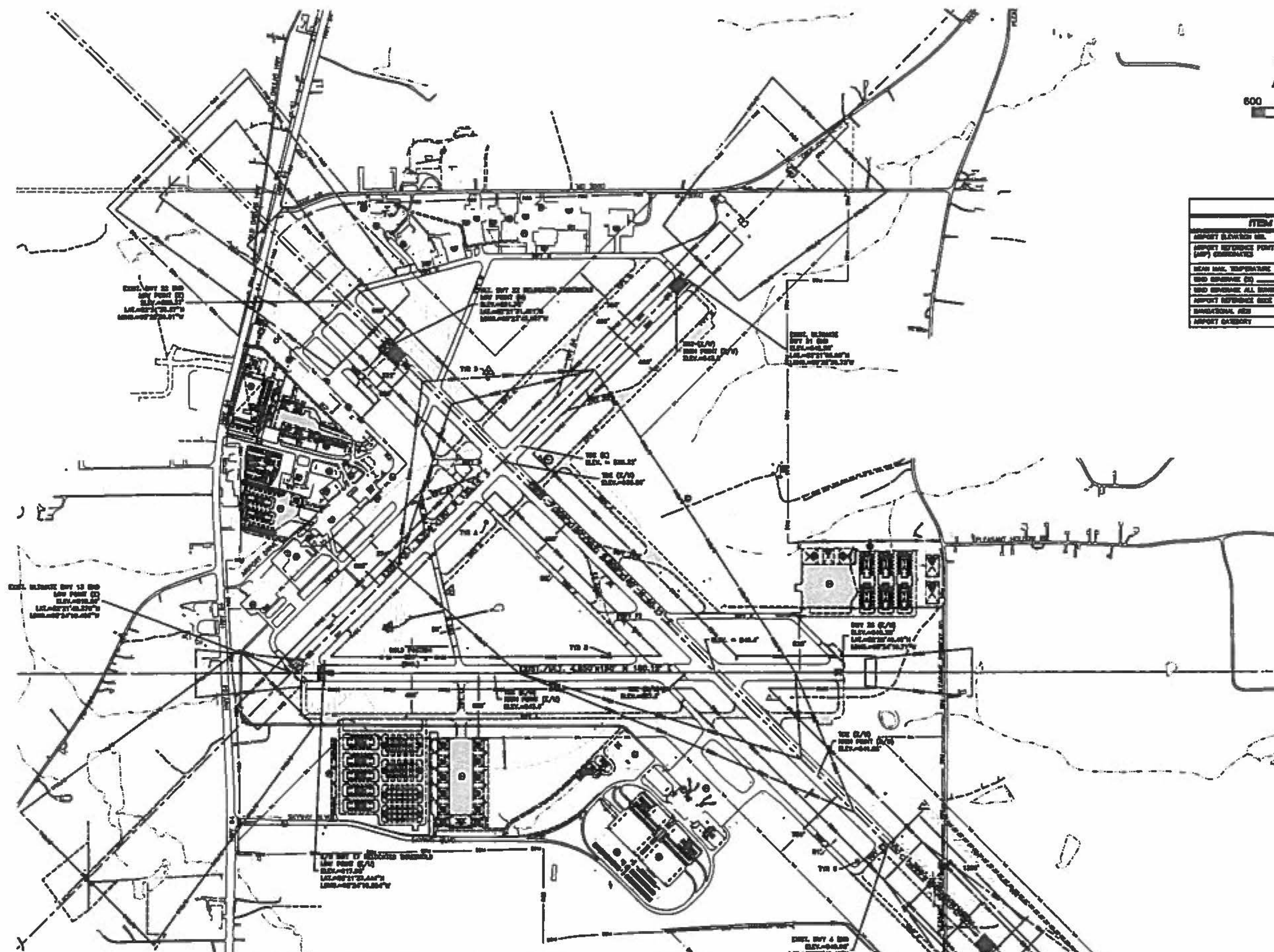
MOBILE, AL • ORLANDO, FL • RALEIGH, NC • RICHMOND, VA
SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KSA ENGINEERS



3°48'E
TRUE NORTH

Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

600 0 600 1200

SCALE: 1"=600'

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		[illegible]
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
		GROUND CONTOURS
		THRESHOLD LIGHTS
		DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	OBSTACLE FREE ZONE (OFZ)
—IAS(e)—	—IAS(u)—	INNER APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LCA—		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		AVIGATION EASEMENT
		CONTROL MONUMENT
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		HOLD POSITION AND GUIDANCE SIGNS

AIRPORT DATA

ITEM		EXISTING	ULTIMATE
AIRPORT ELEVATION MSL		[illegible]	[illegible]
AIRPORT REFERENCE POINT (ARP) COORDINATES	LATITUDE	N 32° 21' [illegible]	N 32° 21' [illegible]
	LONGITUDE	W 95° 24' [illegible]	W 95° 24' [illegible]
MEAN MAX. TEMPERATURE OF HOTTEST MONTH (F°)		[illegible] / JULY	[illegible] / JULY
WIND COVERAGE (%)		–	–
WIND COVERAGE ALL RUNWAYS		–	–
AIRPORT REFERENCE CODE (ARC)		[illegible]	[illegible]
NAVIGATIONAL AIDS		[illegible]	[illegible]
AIRPORT CATEGORY		CAT. I	CAT. I

RUNWAY DATA

Item	Runway 13–31 Existing		Runway 13–31 Ultimate		Runway 4–22 Existing		Runway 4–22 Ultimate		Runway 17–35 Existing		Runway 17–35 Ultimate	
Runway End	13	31	13	31	4	22	4	22	17	35	17	35
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CONTROL MONUMENTS
1. SURVEYED TO THE STANDARDS OF FAA 405, APPENDIX B, PARAGRAPH 2.7.
SURVEY WAS CONDUCTED ON SEPTEMBER 20, 2005 BY GEODETIX, INC.

PAC: DESIGNATION–TYR A AB2006
LAT. 32°21'22.363"N
LONG. 95°24'03.189"W
STAINLESS STEEL ROD IN SLEEVE

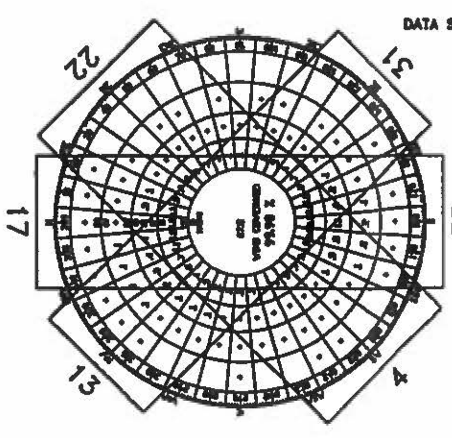
SAC: DESIGNATION–TYR B AB3077
LAT. 32°21'11.005"N
LONG. 95°24'17.883"W
STAINLESS STEEL ROD IN SLEEVE

SAC: DESIGNATION–TYR C AB3079
LAT. 32°20'48.197"N
LONG. 95°24'40.185"W
CONTROL DISK SET IN TOP OF CONCRETE MONUMENT

SAC: DESIGNATION–TYR D AB3078
LAT. 32°21'22.152"N
LONG. 95°23'47.813W
CONTROL DISK SET IN TOP OF CONCRETE MONUMENT

WIND ROSE DATA

CROSSWIND COVERAGE:
RWY 4–22 = 16 KNOTS
RWY 13–31 = 13 KNOTS
RWY 17–35 = 13 KNOTS
COMBINED WIND COVERAGE: 99.98%
OBSERVATIONS:
PERIOD: 1988–1997
STATION: DALLAS, TEXAS
DATA SOURCE:
DATA PROCESSING DIVISION, NATIONAL CLIMATIC CENTER, NOAA



BUILDING LEGEND

BLDG. #	OWNER	ELEV.	BLDG. #	OWNER	ELEV.
1	TERMINAL/ADMINISTRATION BUILDING	[illegible]	[illegible]	[illegible] HISTORIC AVIATION MUSEUM	[illegible]
2	AIRPORT PARKING	–	[illegible]	TYLER [illegible]	[illegible]
3	[illegible] AVIATION	[illegible]	[illegible]	TYLER [illegible]	[illegible]
4	[illegible] PROPERTIES	–	[illegible]	TYLER [illegible]	[illegible]
5	AUTO PARKING	–	[illegible]	TYLER [illegible]	[illegible]
6	FUEL STORAGE	[illegible]	[illegible]	CIVIL AIR PATROL	[illegible]
7	AIRPORT ACCESS ROAD	–	[illegible]	TYLER SCHOOL OF AVIATION	[illegible]
8	AIRPORT RESCUE AND FIRE FIGHTING	[illegible]	[illegible]	TYLER SCHOOL OF AVIATION	[illegible]
9	[illegible] ENTERPRISES	[illegible]	[illegible]	[illegible] PRODUCING COMPANY	[illegible]
[illegible]	AIR CARGO FACILITY	–	[illegible]	[illegible] OIL COMPANY	[illegible]
[illegible]	F.A.A. CONTROL TOWER	[illegible]	[illegible]	[illegible] VOLUNTEER FIRE DEPARTMENT	[illegible]
[illegible]	HANGAR [illegible]	[illegible]	[illegible]	[illegible] VOLUNTEER FIRE DEPARTMENT	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	–
[illegible]	SMITH AVIATION	[illegible]	[illegible]	T-HANGARS	–
[illegible]	[illegible] AVIATION	[illegible]	[illegible]	CONVENTIONAL HANGAR/FIXED BASE OPERATION	–
[illegible]	FUEL STORAGE/AIRPORT MAINTENANCE	[illegible]	[illegible]	OFFICE BUILDING	–
[illegible]	JET CENTER OF TYLER	[illegible]	[illegible]	[illegible] HANGAR	–
[illegible]	JET CENTER OF TYLER	[illegible]	[illegible]	COMMERCIAL DEVELOPMENT	–
[illegible]	JET CENTER OF TYLER	[illegible]	[illegible]	–	–
[illegible]	JET CENTER OF TYLER	[illegible]	[illegible]	–	–
[illegible]	RENTAL CAR WASH	[illegible]	A	TYLER TURBINE	[illegible]
[illegible]	AIRPORT LIGHT VAULT	[illegible]	B	CLINT ABBOTT	[illegible]
[illegible]	F.A.A. STORAGE BUILDING	[illegible]	[illegible]	–	–

NOTES:
SURVEY WAS CONDUCTED TO THE STANDARDS OF FAA #405 ON SEPT. 20, 2005 BY GEODETIX, INC.

THE REFERENCE DATUM USED FOR ALL HORIZONTAL COORDINATES IS NORTH AMERICAN DATUM 1983 – NAD 83 AND THE DARUM USED FOR ALL MSL ELEVATIONS IS NORTH AMERICAN VERTICAL DATUM 1988 – NAV 88.

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KBA ENGINEERS

Designer: Steve M. Creamer P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name: TYLER POUNDS REGIONAL AIRPORT AIRPORT LAYOUT PLANS

Drawing Name: AIRPORT LAYOUT DRAWING

FAA A.I.P. Project Number:

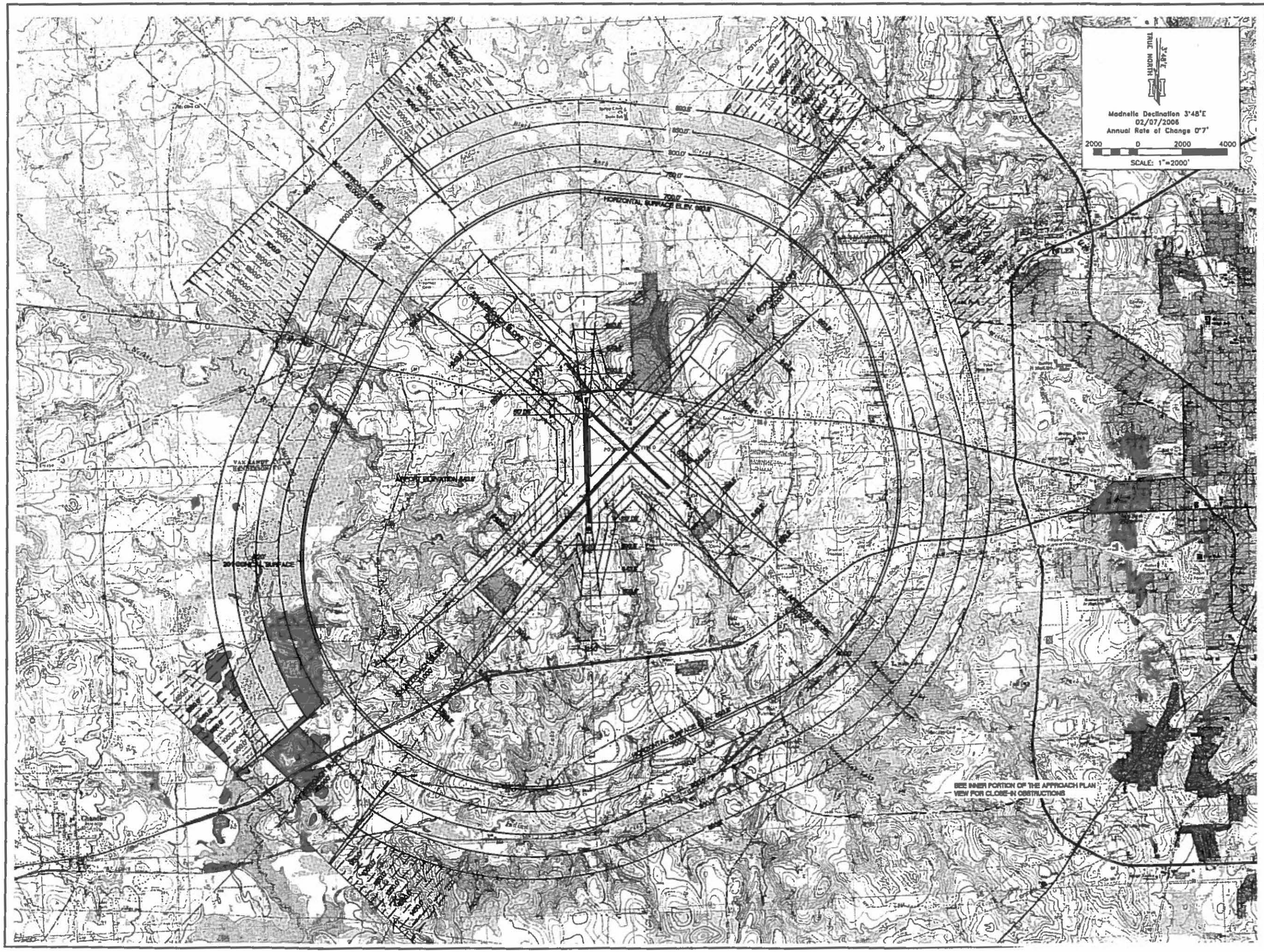
Autocad Drawing Reference:

Date: January, 2007

Division:

Scale: 1"=600'

Drawing Number: TYL229 ALD



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KSA ENGINEERS

Designer:	Steve M. Creamer, PE
Technician:	Sharon B. Coe
Checked by:	Steve M. Creamer, PE
Project Number:	

NOTES

REVISIONS

No.	Description	Date	By

Project Name:

TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
AIRSPACE DRAWING

FAA A.I.P. Project Number:

Autocad Drawing Reference:

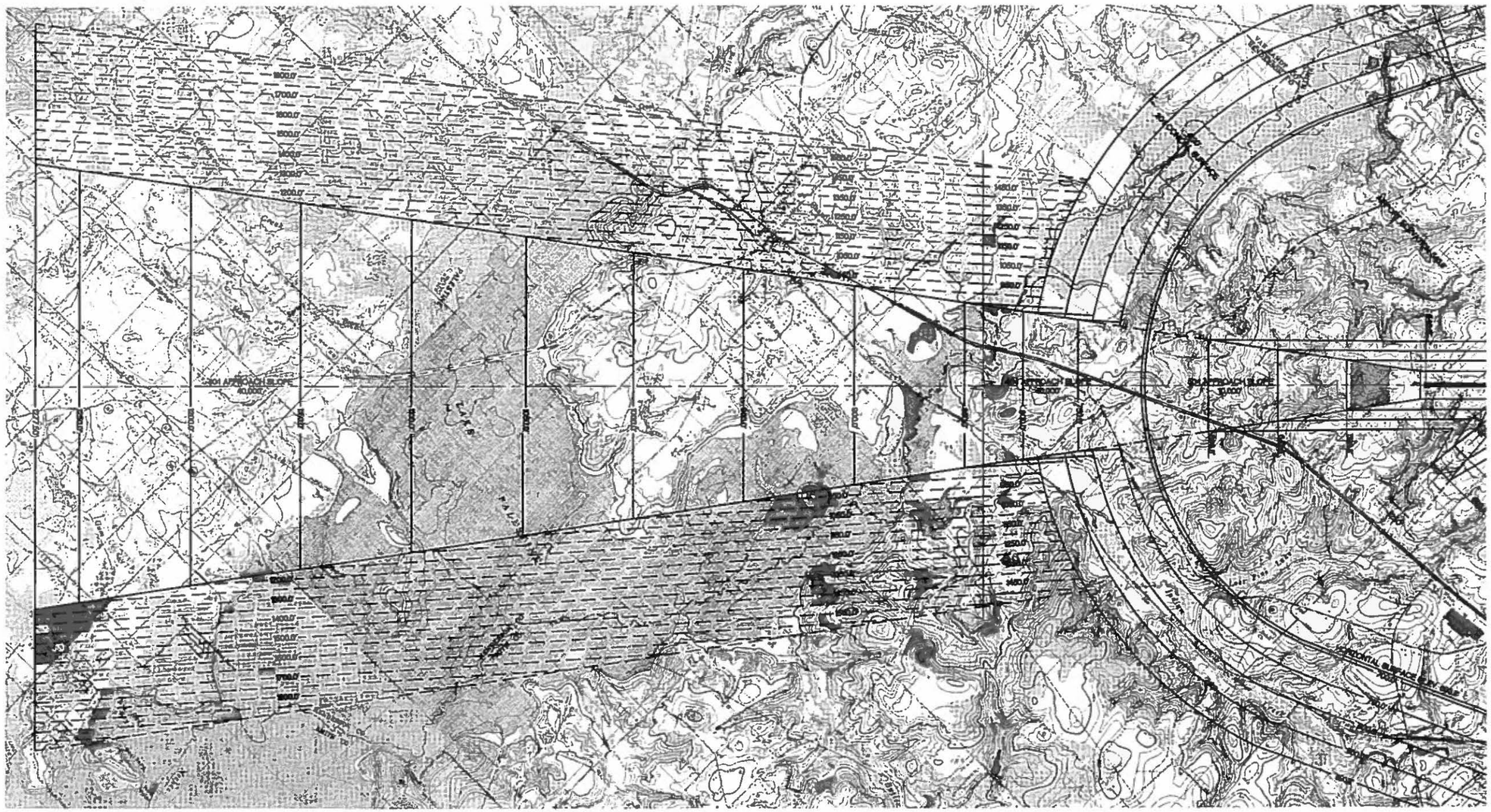
Date: June, 2006	Division:
Scale: 1"=2000'	Drawing Number: AS 1

TRUE NORTH
3°48'E

Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

2000 0 2000 4000
SCALE: 1"=2000'

RUNWAY 4 END 40,000' 40:1 APPROACH



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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KSA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
AIRSPACE DRAWING
RUNWAY 4
EXTENDED APPROACH

FAA A.I.P. Project Number:

Autocad Drawing Reference:

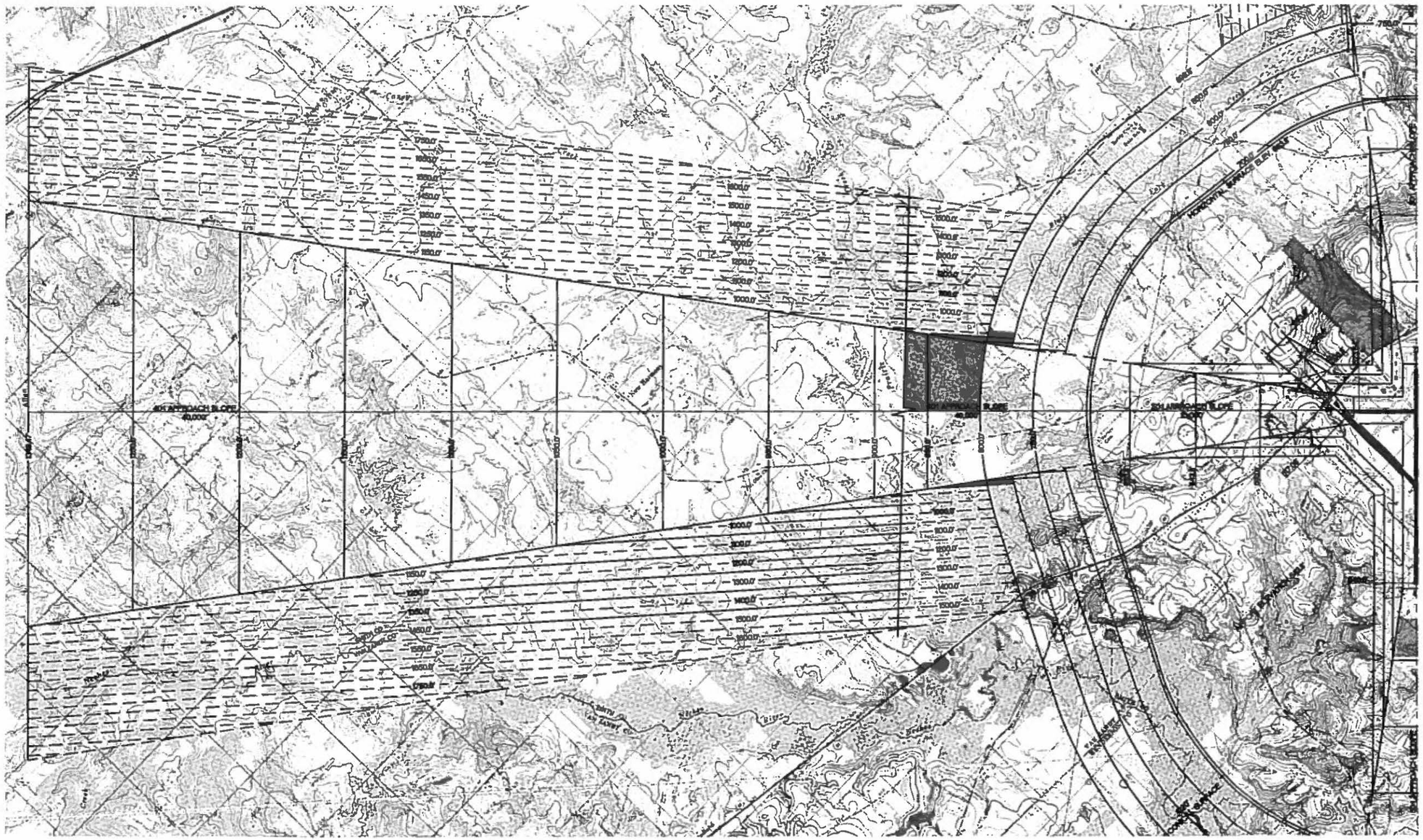
Date: June, 2006
Division:
Scale: 1"=2000'
Drawing Number: 4 EXT APP

Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

2000 0 2000 4000

SCALE: 1"=2000'

RUNWAY 13 END 40,000' 40:1 APPROACH



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KSA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
AIRSPACE DRAWING
RUNWAY 13
EXTENDED APPROACH

FAA A.I.P. Project Number:

Autocad Drawing Reference:

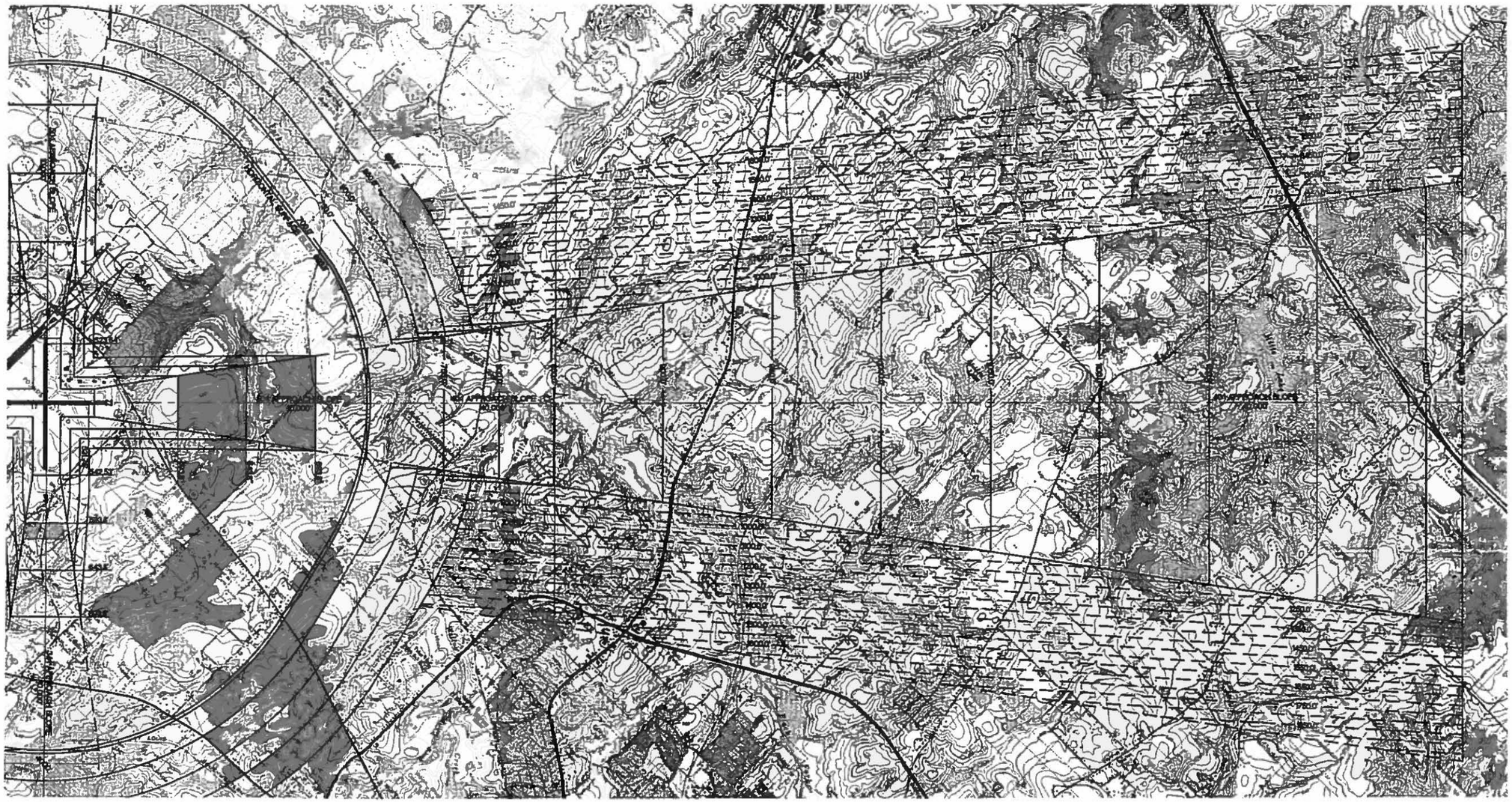
Date: June, 2006
Division:
Scale: 1"=2000'
Drawing Number: 13 EXT APP

TRUE NORTH
3°48'E

Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

2000 0 2000 4000
SCALE: 1"=2000'

RUNWAY 22 END 40,000' 40:1 APPROACH



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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KSA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

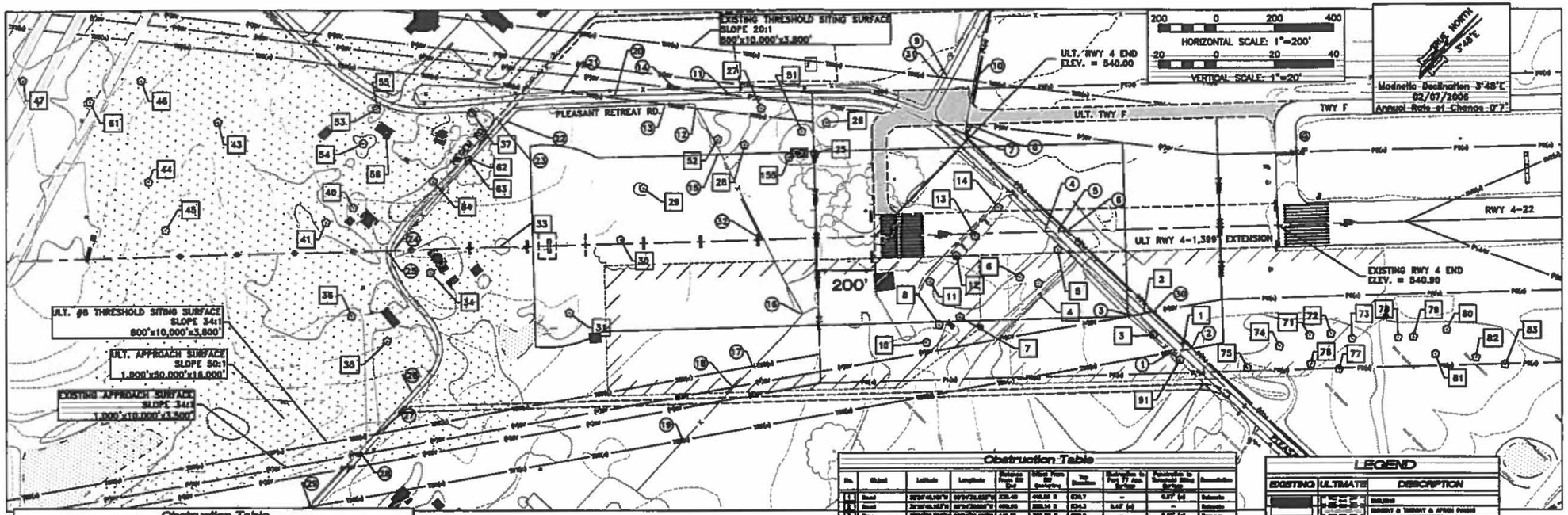
Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
AIRSPACE DRAWING
RUNWAY 22
EXTENDED APPROACH

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:
Scale: 1"=2000'
Drawing Number: 22 EXT 2PP



Obstruction Table

No.	Object	Latitude	Longitude	Elevation Feet MSL End	Object Rise Above Surrounding	Top Elevation	Obstruction to Part 77 Approx. Surface	Penetration to Transitional Sloping Surface	Remarks
1	Road	32°07'48.00"N	95°24'24.00"W	538.40	0.0	538.4	-	0.40' (a)	Defensible
2	Road	32°07'48.00"N	95°24'20.00"W	539.00	0.0	539.0	0.10' (a)	-	Defensible
3	Tree	32°07'50.70"N	95°24'20.11"W	545.30	0.0	545.3	-	0.30' (a)	Remove
4	Tree	32°07'50.30"N	95°24'18.00"W	571.30	0.0	571.3	11.77' (a)	1.7' (a) SLAN	Remove
5	Tree	32°07'50.00"N	95°24'16.00"W	574.00	0.0	574.0	14.47' (a) SLAN	-	Remove
6	Tree	32°07'50.00"N	95°24'14.00"W	577.30	0.0	577.3	17.77' (a)	-	Remove
7	Tree	32°07'50.00"N	95°24'12.00"W	580.00	0.0	580.0	20.47' (a) SLAN	-	Remove
8	Tree	32°07'50.00"N	95°24'10.00"W	582.30	0.0	582.3	22.77' (a)	-	Remove
9	Tree	32°07'50.00"N	95°24'08.00"W	585.00	0.0	585.0	25.47' (a) SLAN	-	Remove
10	Tree	32°07'50.00"N	95°24'06.00"W	587.30	0.0	587.3	27.77' (a)	-	Remove
11	Tree	32°07'50.00"N	95°24'04.00"W	590.00	0.0	590.0	30.47' (a) SLAN	-	Remove
12	Tree	32°07'50.00"N	95°24'02.00"W	592.30	0.0	592.3	32.77' (a)	-	Remove
13	Tree	32°07'50.00"N	95°24'00.00"W	595.00	0.0	595.0	35.47' (a) SLAN	-	Remove
14	Tree	32°07'50.00"N	95°23'58.00"W	597.30	0.0	597.3	37.77' (a)	-	Remove
15	Tree	32°07'50.00"N	95°23'56.00"W	600.00	0.0	600.0	40.47' (a) SLAN	-	Remove
16	Tree	32°07'50.00"N	95°23'54.00"W	602.30	0.0	602.3	42.77' (a)	-	Remove
17	Tree	32°07'50.00"N	95°23'52.00"W	605.00	0.0	605.0	45.47' (a) SLAN	-	Remove
18	Tree	32°07'50.00"N	95°23'50.00"W	607.30	0.0	607.3	47.77' (a)	-	Remove
19	Tree	32°07'50.00"N	95°23'48.00"W	610.00	0.0	610.0	50.47' (a) SLAN	-	Remove
20	Tree	32°07'50.00"N	95°23'46.00"W	612.30	0.0	612.3	52.77' (a)	-	Remove
21	Tree	32°07'50.00"N	95°23'44.00"W	615.00	0.0	615.0	55.47' (a) SLAN	-	Remove
22	Tree	32°07'50.00"N	95°23'42.00"W	617.30	0.0	617.3	57.77' (a)	-	Remove
23	Tree	32°07'50.00"N	95°23'40.00"W	620.00	0.0	620.0	60.47' (a) SLAN	-	Remove
24	Tree	32°07'50.00"N	95°23'38.00"W	622.30	0.0	622.3	62.77' (a)	-	Remove
25	Tree	32°07'50.00"N	95°23'36.00"W	625.00	0.0	625.0	65.47' (a) SLAN	-	Remove
26	Tree	32°07'50.00"N	95°23'34.00"W	627.30	0.0	627.3	67.77' (a)	-	Remove
27	Tree	32°07'50.00"N	95°23'32.00"W	630.00	0.0	630.0	70.47' (a) SLAN	-	Remove
28	Tree	32°07'50.00"N	95°23'30.00"W	632.30	0.0	632.3	72.77' (a)	-	Remove
29	Tree	32°07'50.00"N	95°23'28.00"W	635.00	0.0	635.0	75.47' (a) SLAN	-	Remove
30	Tree	32°07'50.00"N	95°23'26.00"W	637.30	0.0	637.3	77.77' (a)	-	Remove
31	Tree	32°07'50.00"N	95°23'24.00"W	640.00	0.0	640.0	80.47' (a) SLAN	-	Remove
32	Tree	32°07'50.00"N	95°23'22.00"W	642.30	0.0	642.3	82.77' (a)	-	Remove
33	Tree	32°07'50.00"N	95°23'20.00"W	645.00	0.0	645.0	85.47' (a) SLAN	-	Remove
34	Tree	32°07'50.00"N	95°23'18.00"W	647.30	0.0	647.3	87.77' (a)	-	Remove
35	Tree	32°07'50.00"N	95°23'16.00"W	650.00	0.0	650.0	90.47' (a) SLAN	-	Remove
36	Tree	32°07'50.00"N	95°23'14.00"W	652.30	0.0	652.3	92.77' (a)	-	Remove
37	Tree	32°07'50.00"N	95°23'12.00"W	655.00	0.0	655.0	95.47' (a) SLAN	-	Remove
38	Tree	32°07'50.00"N	95°23'10.00"W	657.30	0.0	657.3	97.77' (a)	-	Remove
39	Tree	32°07'50.00"N	95°23'08.00"W	660.00	0.0	660.0	100.47' (a) SLAN	-	Remove
40	Tree	32°07'50.00"N	95°23'06.00"W	662.30	0.0	662.3	102.77' (a)	-	Remove
41	Tree	32°07'50.00"N	95°23'04.00"W	665.00	0.0	665.0	105.47' (a) SLAN	-	Remove
42	Tree	32°07'50.00"N	95°23'02.00"W	667.30	0.0	667.3	107.77' (a)	-	Remove
43	Tree	32°07'50.00"N	95°23'00.00"W	670.00	0.0	670.0	110.47' (a) SLAN	-	Remove
44	Tree	32°07'50.00"N	95°22'58.00"W	672.30	0.0	672.3	112.77' (a)	-	Remove
45	Tree	32°07'50.00"N	95°22'56.00"W	675.00	0.0	675.0	115.47' (a) SLAN	-	Remove
46	Tree	32°07'50.00"N	95°22'54.00"W	677.30	0.0	677.3	117.77' (a)	-	Remove
47	Tree	32°07'50.00"N	95°22'52.00"W	680.00	0.0	680.0	120.47' (a) SLAN	-	Remove
48	Tree	32°07'50.00"N	95°22'50.00"W	682.30	0.0	682.3	122.77' (a)	-	Remove
49	Tree	32°07'50.00"N	95°22'48.00"W	685.00	0.0	685.0	125.47' (a) SLAN	-	Remove
50	Tree	32°07'50.00"N	95°22'46.00"W	687.30	0.0	687.3	127.77' (a)	-	Remove
51	Tree	32°07'50.00"N	95°22'44.00"W	690.00	0.0	690.0	130.47' (a) SLAN	-	Remove
52	Tree	32°07'50.00"N	95°22'42.00"W	692.30	0.0	692.3	132.77' (a)	-	Remove
53	Tree	32°07'50.00"N	95°22'40.00"W	695.00	0.0	695.0	135.47' (a) SLAN	-	Remove
54	Tree	32°07'50.00"N	95°22'38.00"W	697.30	0.0	697.3	137.77' (a)	-	Remove
55	Tree	32°07'50.00"N	95°22'36.00"W	700.00	0.0	700.0	140.47' (a) SLAN	-	Remove
56	Tree	32°07'50.00"N	95°22'34.00"W	702.30	0.0	702.3	142.77' (a)	-	Remove
57	Tree	32°07'50.00"N	95°22'32.00"W	705.00	0.0	705.0	145.47' (a) SLAN	-	Remove
58	Tree	32°07'50.00"N	95°22'30.00"W	707.30	0.0	707.3	147.77' (a)	-	Remove
59	Tree	32°07'50.00"N	95°22'28.00"W	710.00	0.0	710.0	150.47' (a) SLAN	-	Remove
60	Tree	32°07'50.00"N	95°22'26.00"W	712.30	0.0	712.3	152.77' (a)	-	Remove
61	Tree	32°07'50.00"N	95°22'24.00"W	715.00	0.0	715.0	155.47' (a) SLAN	-	Remove
62	Tree	32°07'50.00"N	95°22'22.00"W	717.30	0.0	717.3	157.77' (a)	-	Remove
63	Tree	32°07'50.00"N	95°22'20.00"W	720.00	0.0	720.0	160.47' (a) SLAN	-	Remove
64	Tree	32°07'50.00"N	95°22'18.00"W	722.30	0.0	722.3	162.77' (a)	-	Remove
65	Tree	32°07'50.00"N	95°22'16.00"W	725.00	0.0	725.0	165.47' (a) SLAN	-	Remove
66	Tree	32°07'50.00"N	95°22'14.00"W	727.30	0.0	727.3	167.77' (a)	-	Remove
67	Tree	32°07'50.00"N	95°22'12.00"W	730.00	0.0	730.0	170.47' (a) SLAN	-	Remove
68	Tree	32°07'50.00"N	95°22'10.00"W	732.30	0.0	732.3	172.77' (a)	-	Remove
69	Tree	32°07'50.00"N	95°22'08.00"W	735.00	0.0	735.0	175.47' (a) SLAN	-	Remove
70	Road	32°07'-"N	95°22'-"W	539.5	0.0	539.5	-	1.00' (a)	Defensible
71	Road	32°07'-"N	95°22'-"W	539.5	0.0	539.5	-	1.00' (a)	Defensible

NOTES:
SURVEY WAS CONDUCTED TO THE STANDARDS OF FAA #405 ON SEPT. 20, 2005 BY GEODETIX, INC.

THE REFERENCE DATUM USED FOR ALL HORIZONTAL COORDINATES IS NORTH AMERICAN DATUM 1983 – NAD 83 AND THE DARUM USED FOR ALL MSL ELEVATIONS IS NORTH AMERICAN VERTICAL DATUM 1988 – NAV 88.

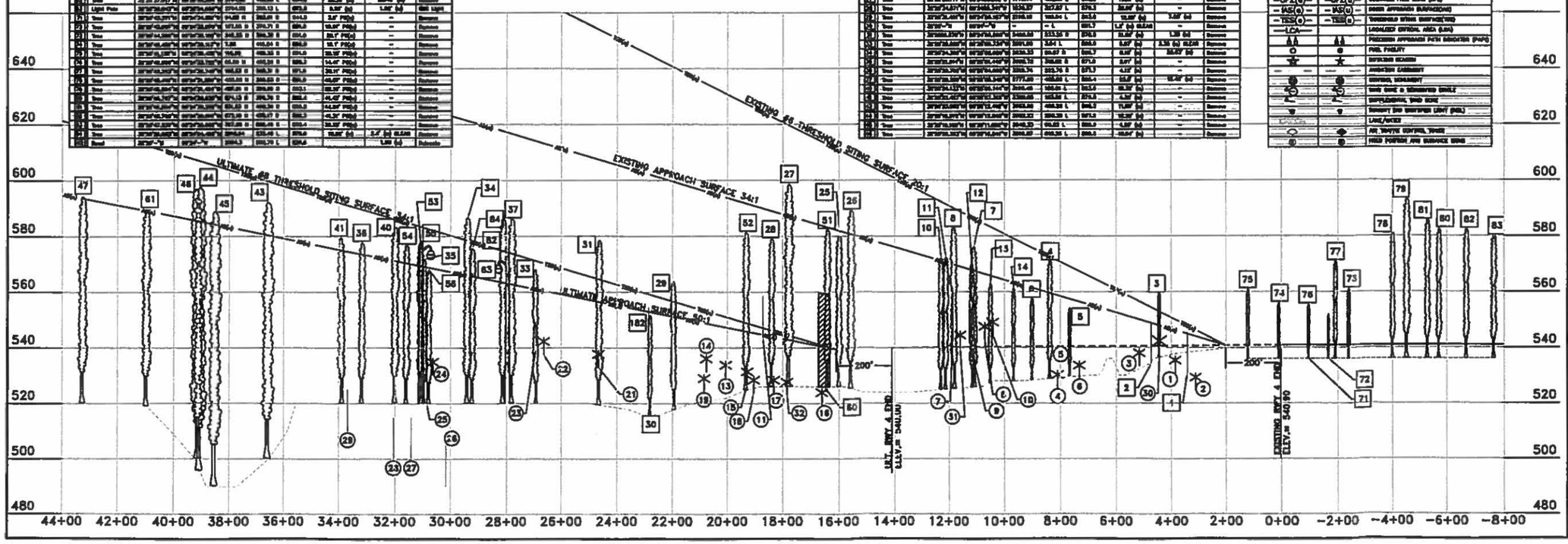
OBJECT LEGEND

(X) OBJECT INTERSECTED BY AN APPROACH SURFACE BUT NOT AN OBSTRUCTION

(XX) OBJECT AN OBSTRUCTION TO AN APPROACH SURFACE

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		CONCRETE & TARMAC & APRON PAVING
		ACCESS ROADWAYS
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
—XX—		GROUND CONTOURS
		THRESHOLD LENGTH
		DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	OBSTACLE FREE ZONE (OFZ)
—IAS(e)—	—IAS(u)—	INNER APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LCA—		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		POEL FIXLIT
		ROTATING BEACON
		OBSTRUCTION EASEMENT
		CONTROL MONUMENT
		TWO SIDE 2 SEGMENTED SIGNS
		SUPPLEMENTAL WIND SIGNS
		SEGMENT SIGN SHEPHERD LIGHT (SSL)
		LAKE/WATER
		FAA TRAFFIC CONTROL TOWER
		FIXED PORTION AND SURVEYED SIGNS



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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KSA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon S. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
RUNWAY END 4
INNER PORTION OF THE APPROACH SURFACE

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:
Scale: HORIZONTAL: 1"=200' VERTICAL: 1"=20'
Drawing Number: RCP01001

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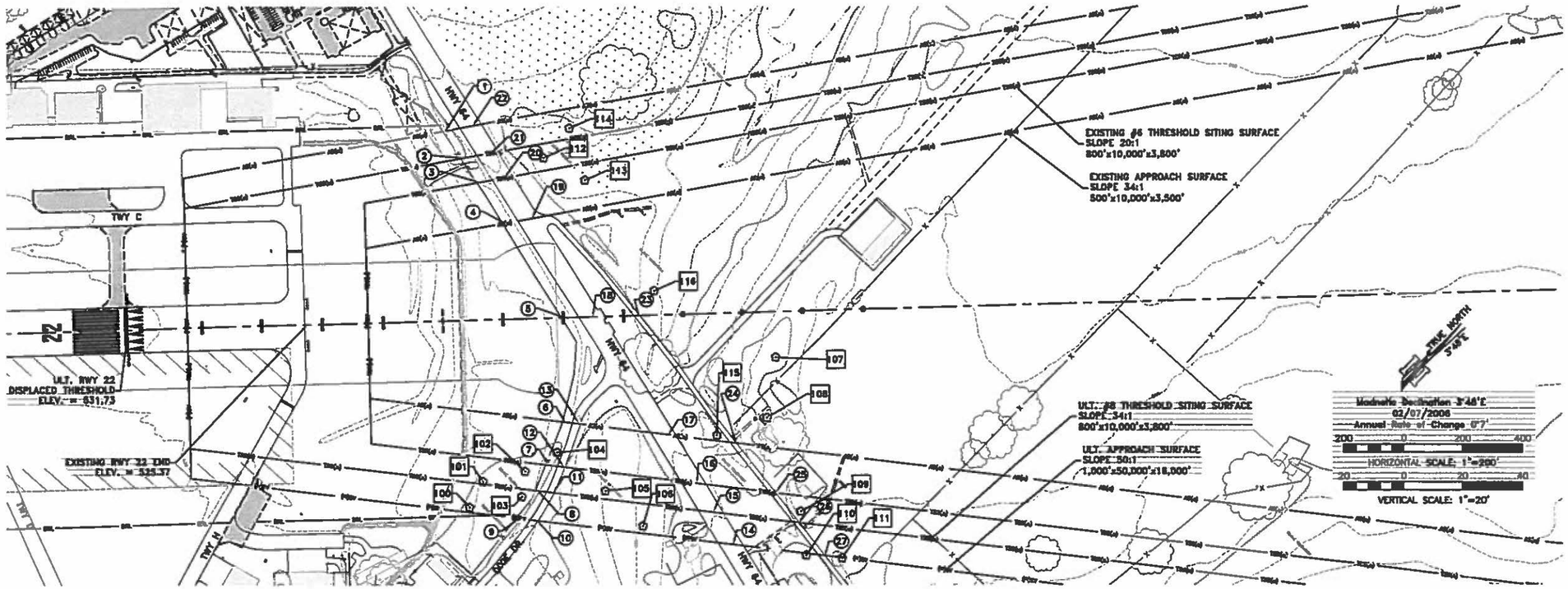

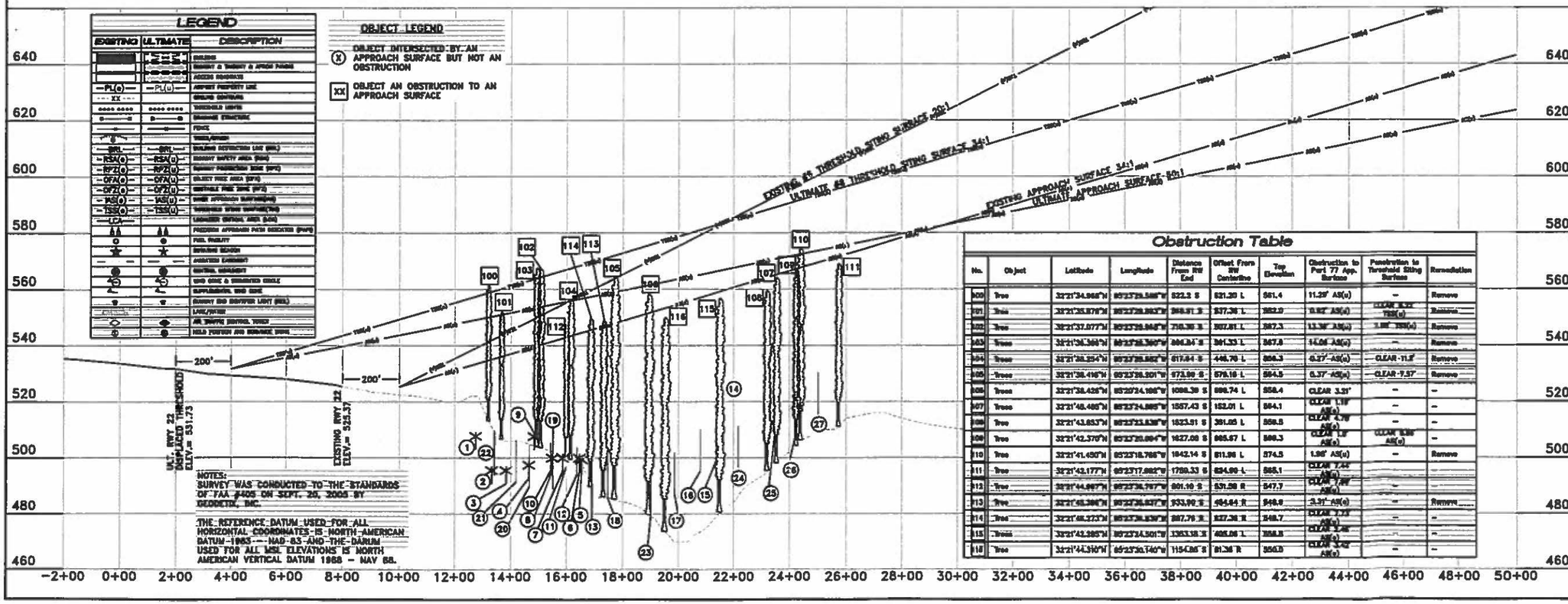

NOTES:
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Obstruction Table

No.	Object	Latitude	Longitude	Distance From RW End	Offset From RW Centerline	Top Elevation	Obstruction to Part 77 App. Surface	Penetration to Threshold Siting Surface	Remediation
100	Tree	32°21'34.968"N	95°23'29.588"W	522.2 S	521.20 L	561.4	11.29' AS(u)	--	Remove
101	Tree	32°21'35.878"N	95°23'29.863"W	568.91 S	537.36 L	562.0	0.82' AS(u)	CLEAR 9.82' TSS(u)	Remove
102	Tree	32°21'37.077"N	95°23'29.948"W	716.39 S	557.81 L	567.3	13.38' AS(u)	3.88' TSS(u)	Remove
103	Trees	32°21'34.368"N	95°23'28.360"W	594.34 S	391.33 L	547.8	14.04' AS(u)	--	Remove
104	Trees	32°21'36.254"N	95°23'28.582"W	617.84 S	446.70 L	556.3	6.37' AS(u)	CLEAR 11.8'	Remove
105	Trees	32°21'36.416"N	95°23'28.301"W	673.99 S	579.10 L	564.5	6.37' AS(u)	CLEAR 7.57'	Remove
106	Trees	32°21'36.426"N	95°23'24.198"W	1086.39 S	596.74 L	558.4	CLEAR 3.31'	--	--
107	Trees	32°21'46.465"N	95°23'24.885"W	1557.43 S	152.01 L	564.1	CLEAR 1.19' AS(u)	--	--
108	Tree	32°21'43.853"N	95°23'23.838"W	1523.81 S	391.05 L	558.5	CLEAR 4.76' AS(u)	--	--
109	Tree	32°21'42.370"N	95°23'20.884"W	1427.08 S	665.67 L	569.3	CLEAR 1.8' AS(u)	CLEAR 5.86' AS(u)	--
110	Tree	32°21'41.490"N	95°23'18.766"W	1842.14 S	811.96 L	574.5	1.96' AS(u)	--	Remove
111	Tree	32°21'42.177"N	95°23'17.882"W	1789.33 S	834.90 L	565.1	CLEAR 7.44' AS(u)	--	--
112	Tree	32°21'44.667"N	95°23'36.797"W	801.10 S	531.58 R	547.7	CLEAR 7.89' AS(u)	--	--
113	Tree	32°21'45.396"N	95°23'36.537"W	933.90 S	494.44 R	548.9	3.31' AS(u)	--	Remove
114	Tree	32°21'46.273"N	95°23'36.539"W	987.76 S	527.38 R	548.7	CLEAR 3.13' AS(u)	--	--
115	Trees	32°21'42.285"N	95°23'34.501"W	1353.18 S	405.06 L	558.8	CLEAR 2.46' AS(u)	--	--
116	Tree	32°21'44.310"N	95°23'30.140"W	1154.06 S	81.36 R	556.0	CLEAR 3.42' AS(u)	--	--

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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KSA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
RUNWAY END 22
INNER PORTION OF THE APPROACH SURFACE

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:

Scale: HORIZONTAL: 1"=200' VERTICAL: 1"=20'
Drawing Number: RCP02001

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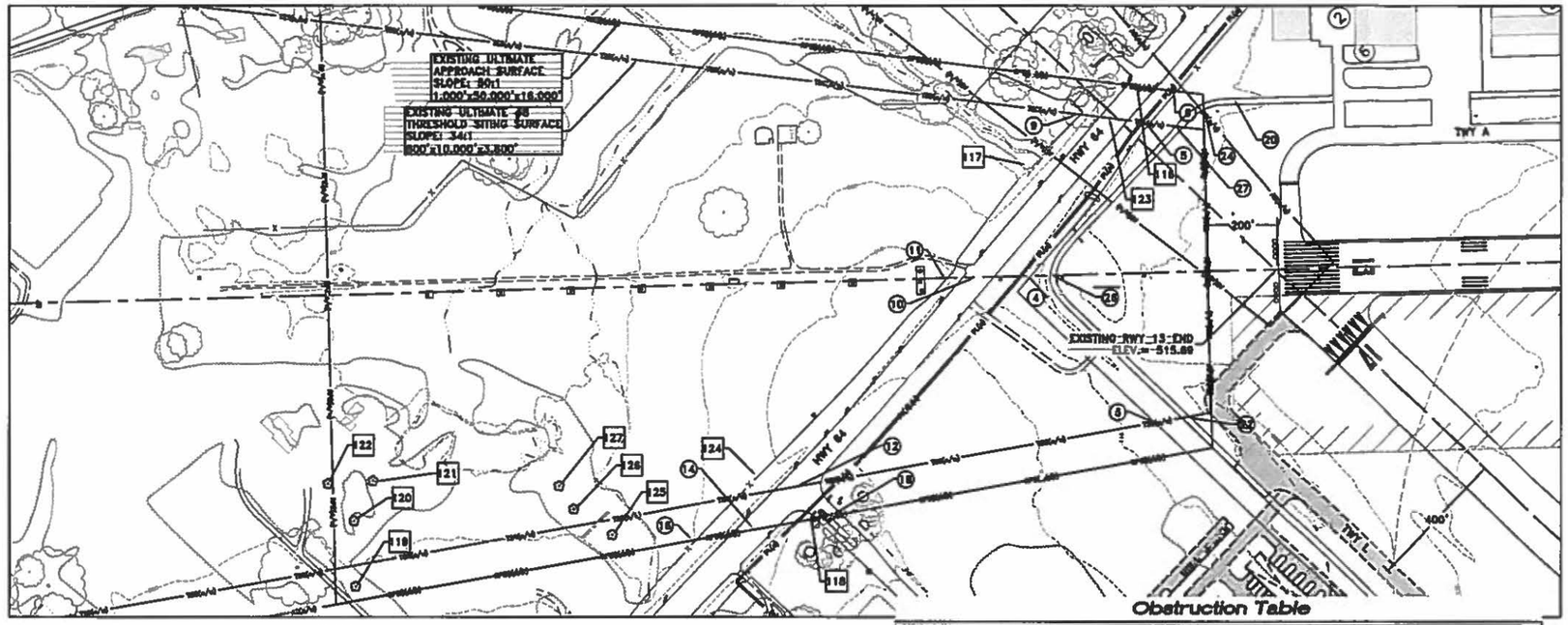
Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

200 0 200 400
HORIZONTAL SCALE: 1"=200'
20 0 20 40
VERTICAL SCALE: 1"=20'

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & RUNWAY & APRON PAVING
		ACCESS ROADWAY
—PL(e)—	—PL(u)—	PROPERTY LINE
—XX—		GUARD BARTIZAN
		THRESHOLD LIGHTS
		DRAINAGE STRUCTURE
		FENCE
		TREE/BUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	INNER PORTION OF THE APPROACH SURFACE (OFZ)
—IAS(e)—	—IAS(u)—	INNER APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LPA—		LANDING AREA, AREA (LPA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		AVIGATION EASEMENT
		CONTROL MONUMENT
		TIED GENC & GENETICS CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		MILS PATTERN AND GLIDEPATH SIGNS



NOTES:
SURVEY WAS CONDUCTED TO THE STANDARDS OF FAA #405 ON SEPT. 20, 2005 BY GEODETIX, INC.

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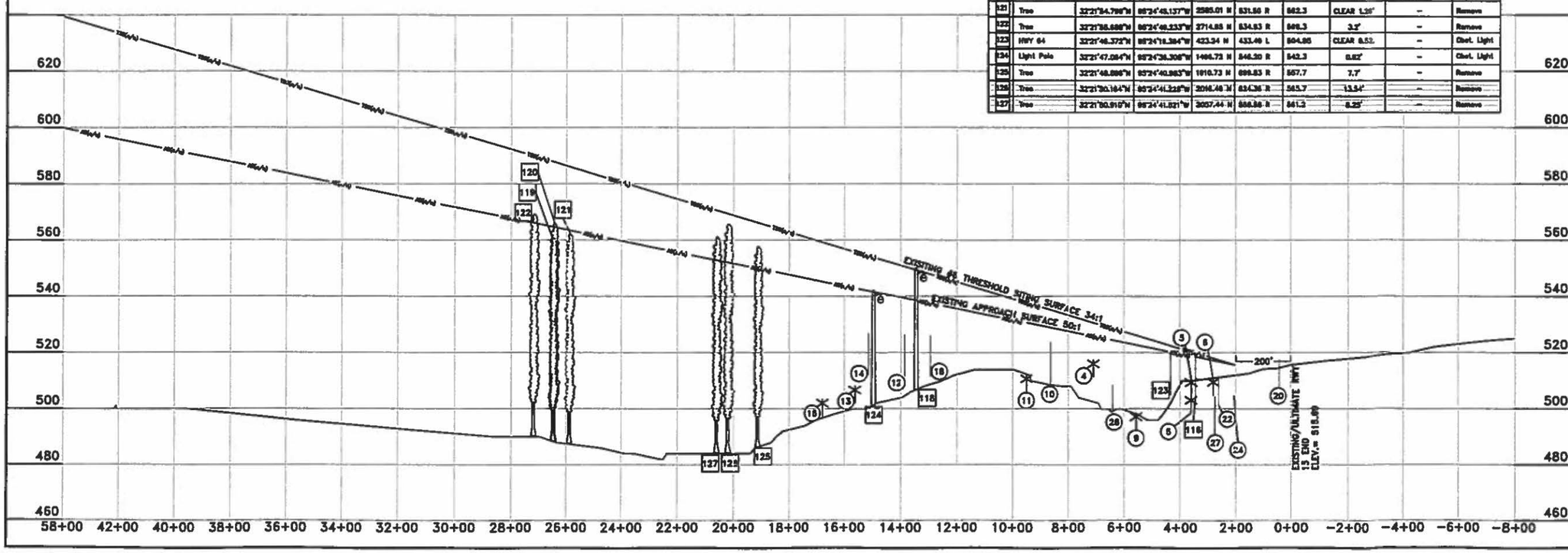
OBJECT LEGEND

(X) OBJECT INTERSECTED BY AN APPROACH SURFACE BUT NOT AN OBSTRUCTION

[XX] OBJECT AN OBSTRUCTION TO AN APPROACH SURFACE

Obstruction Table

No.	Object	Latitude	Longitude	Distance From RW End	Offset From RW Centerline	Top Elevation	Obstruction to Part 77 App. Surface	Penetration to Threshold Siting Surface	Remediation
116	Hwy 64	32°21'56.425"N	95°24'16.036"W	348.47 N	919.36 L	903.7	0.08'	–	Obst. Light
117	Light Pole	32°21'57.463"N	95°24'22.883"W	703.13 N	312.82 L	523.7	CLEAR 2.07	–	–
118	Light Pole	32°21'48.154"N	95°24'38.089"W	1345.40 N	807.84 R	530.2	11.55'	–	Obst. Light
119	Tree	32°21'53.140"N	95°24'48.088"W	2644.89 N	829.29 R	550.7	CLEAR 4.06'	–	Remove
120	Tree	32°21'54.438"N	95°24'48.508"W	2641.73 N	846.75 R	558.0	1.4'	–	Remove
121	Tree	32°21'54.798"N	95°24'48.137"W	2585.01 N	831.56 R	562.3	CLEAR 1.26'	–	Remove
122	Tree	32°21'56.688"N	95°24'48.233"W	2714.85 N	834.83 R	568.3	3.2'	–	Remove
123	HWY 64	32°21'46.372"N	95°24'19.384"W	423.34 N	433.49 L	504.85	CLEAR 8.52.	–	Obst. Light
124	Light Pole	32°21'47.084"N	95°24'36.308"W	1404.73 N	846.30 R	542.3	0.62'	–	Obst. Light
125	Tree	32°21'48.886"N	95°24'40.963"W	1610.73 N	899.83 R	557.7	7.7'	–	Remove
126	Tree	32°21'50.164"N	95°24'41.218"W	2016.46 N	834.36 R	565.7	13.54'	–	Remove
127	Tree	32°21'50.918"N	95°24'41.821"W	2057.44 N	886.86 R	561.2	8.25'	–	Remove



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MOBILE, AL • ORLANDO, FL • RALEIGH, NC • RICHMOND, VA
SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KBA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon S. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
RUNWAY END 13
INNER PORTION OF THE APPROACH SURFACE

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:

Scale: HORIZONTAL: 1"=200' VERTICAL: 1"=20'
Drawing Number: RCP01002

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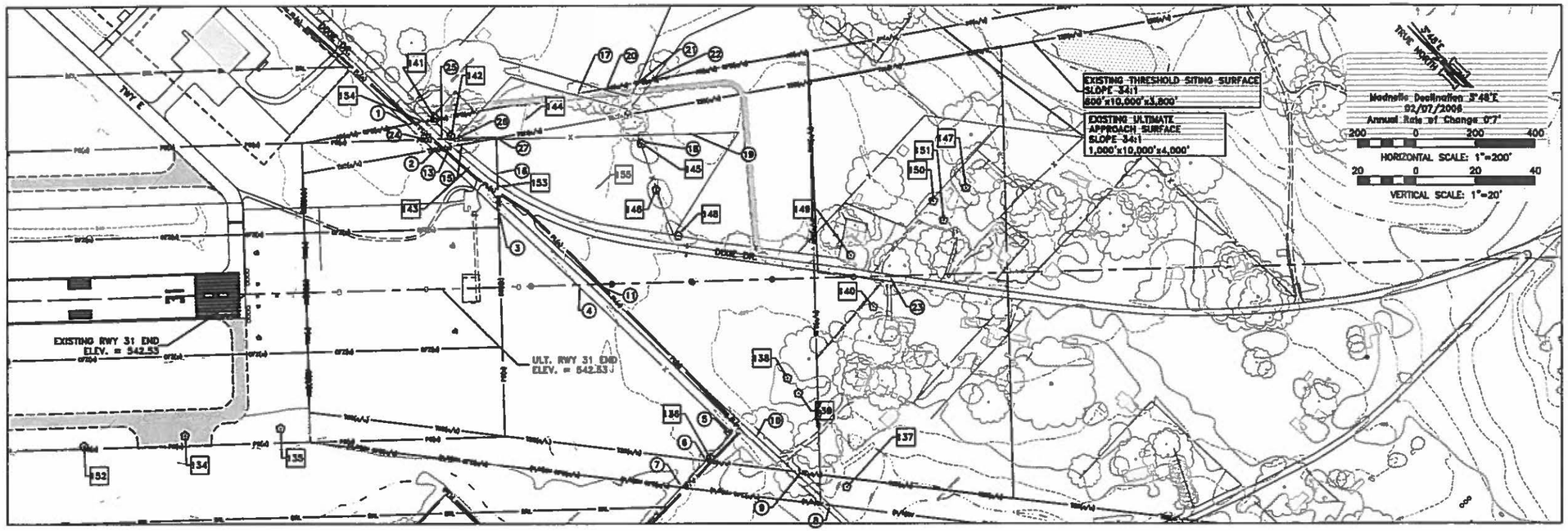

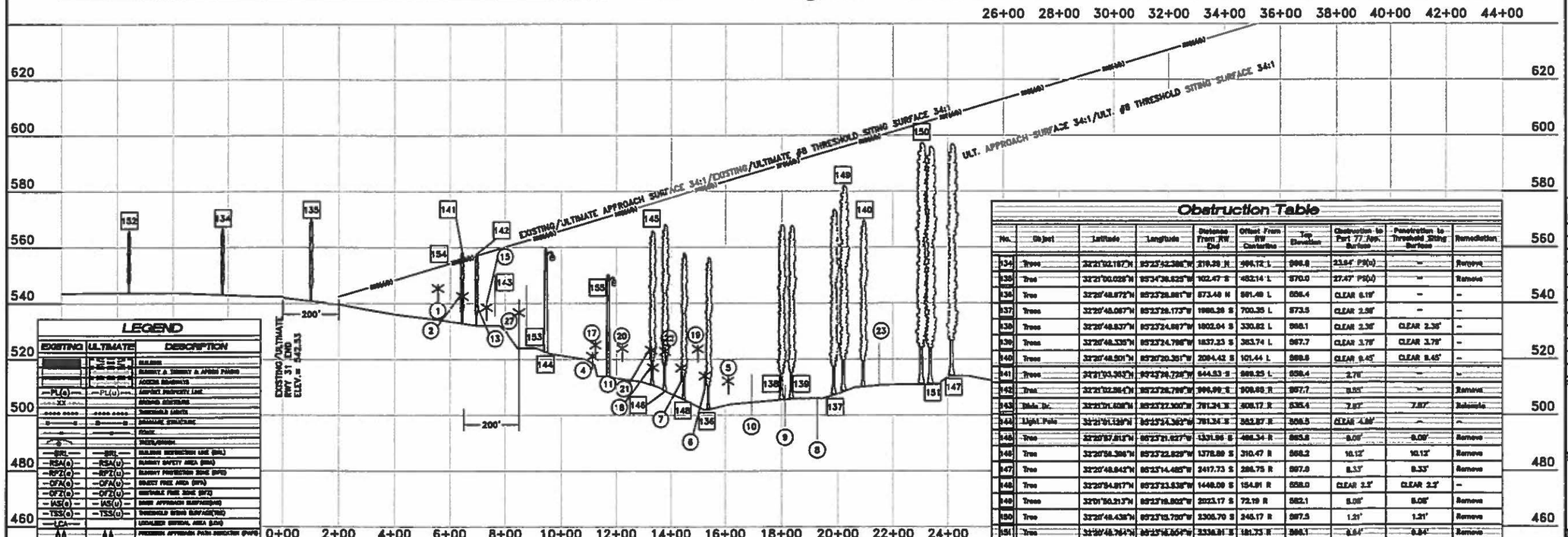

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		ACCESS ROADWAY
PL(e)	PL(u)	AIRPORT PROPERTY LINE
XX		GROUND CONTOURS
		THRESHOLD LIGHTS
D	D	DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
RSA(e)	RSA(u)	RUNWAY SAFETY AREA (RSA)
RPZ(e)	RPZ(u)	RUNWAY PROTECTION ZONE (RPZ)
OFA(e)	OFA(u)	OBJECT FREE AREA (OFA)
OFZ(e)	OFZ(u)	OBSTACLE FREE ZONE (OFZ)
IAS(e)	IAS(u)	INNER APPROACH SURFACE(IAS)
TSS(e)	TSS(u)	THRESHOLD SITING SURFACE(TSS)
LCA		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		AIRPORT ENTRANCE
		CONTROL MONUMENT
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		VOLS PERSON AND GUIDANCE SIGNS

NOTES:
SURVEY WAS CONDUCTED TO THE STANDARDS OF FAA #405 ON SEPT. 20, 2005 BY GEODETIX, INC.

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OBJECT LEGEND

(X) OBJECT INTERSECTED BY AN APPROACH SURFACE BUT NOT AN OBSTRUCTION

[XX] OBJECT AN OBSTRUCTION TO AN APPROACH SURFACE

Obstruction Table

No.	Object	Latitude	Longitude	Distance From RW End	Offset From RW Centerline	Top Elevation	Obstruction to Part 77 Sfc. Surface	Penetration to Threshold Siting Surface	Remediation
134	Trees	32°21'02.187"N	95°23'52.386"W	219.20 N	499.72 L	546.8	23.94' PS(u)	–	Remove
135	Trees	32°21'00.028"N	95°24'36.825"W	102.47 S	482.14 L	570.0	27.47' PS(u)	–	Remove
136	Trees	32°20'48.872"N	95°23'28.881"W	573.49 N	591.49 L	556.4	CLEAR 6.19'	–	–
137	Trees	32°20'48.067"N	95°23'28.173"W	1988.20 S	700.35 L	573.5	CLEAR 2.58'	–	–
138	Trees	32°20'48.837"N	95°23'24.987"W	1802.04 S	330.82 L	568.1	CLEAR 2.38'	CLEAR 2.38'	–
139	Trees	32°20'48.335"N	95°23'24.798"W	1837.23 S	383.74 L	567.7	CLEAR 3.78'	CLEAR 3.78'	–
140	Trees	32°20'48.501"N	95°20'20.351"W	2094.42 S	101.44 L	569.8	CLEAR 9.45'	CLEAR 9.45'	–
141	Trees	32°21'03.263"N	95°23'28.726"W	644.53 S	689.25 L	558.4	2.78'	–	–
142	Trees	32°21'02.984"N	95°23'28.786"W	599.09 S	908.80 R	567.7	9.55'	–	Remove
143	Dead Tr.	32°21'01.628"N	95°23'27.300"W	781.24 S	508.12 R	535.4	7.87'	7.87'	Relocate
144	Light Pole	32°21'01.128"N	95°23'24.363"W	781.24 S	362.87 R	568.5	CLEAR 4.88'	–	–
145	Trees	32°20'57.812"N	95°23'31.027"W	1331.96 S	486.34 R	565.8	9.08'	9.08'	Remove
146	Trees	32°20'56.396"N	95°23'32.829"W	1378.89 S	310.47 R	568.2	10.12'	10.12'	Remove
147	Trees	32°20'48.842"N	95°23'14.485"W	2417.73 S	286.75 R	567.0	8.33'	8.33'	Remove
148	Trees	32°20'54.817"N	95°23'33.538"W	1448.09 S	154.91 R	558.0	CLEAR 2.2'	CLEAR 2.2'	–
149	Trees	32°21'00.213"N	95°23'19.802"W	2023.17 S	72.19 R	562.1	8.08'	8.08'	Remove
150	Trees	32°20'48.438"N	95°23'13.750"W	2308.70 S	240.17 R	567.5	1.21'	1.21'	Remove
151	Trees	32°20'48.741"N	95°23'16.854"W	2336.31 S	181.73 R	568.1	0.64'	0.64'	Remove
152	Trees	32°21'04.368"N	95°23'16.804"W	857.71 N	490.98 L	565.0	22.42' PS(u)	–	Remove
153	Dead Tr.	32°20'58.888"N	95°23'26.865"W	309.64 N	305.88 R	531.6	3.27'	3.27'	Relocate
154	Dead Tr.	32°21'03.899"N	95°23'27.138"W	602.48 S	561.85 R	541.58	3.18'	–	Remove
155	Light Pole	32°20'57.894"N	95°23'24.821"W	1109.14 N	315.39 R	550.3	CLEAR 1.62'	CLEAR 1.62'	–

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KBA ENGINEERS

Designer: Steve M. Cresmer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Cresmer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
RUNWAY END 31
INNER PORTION OF THE APPROACH SURFACE

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:

Scale: HORIZONTAL: 1"=200' VERTICAL: 1"=20'
Drawing Number: RCP02002

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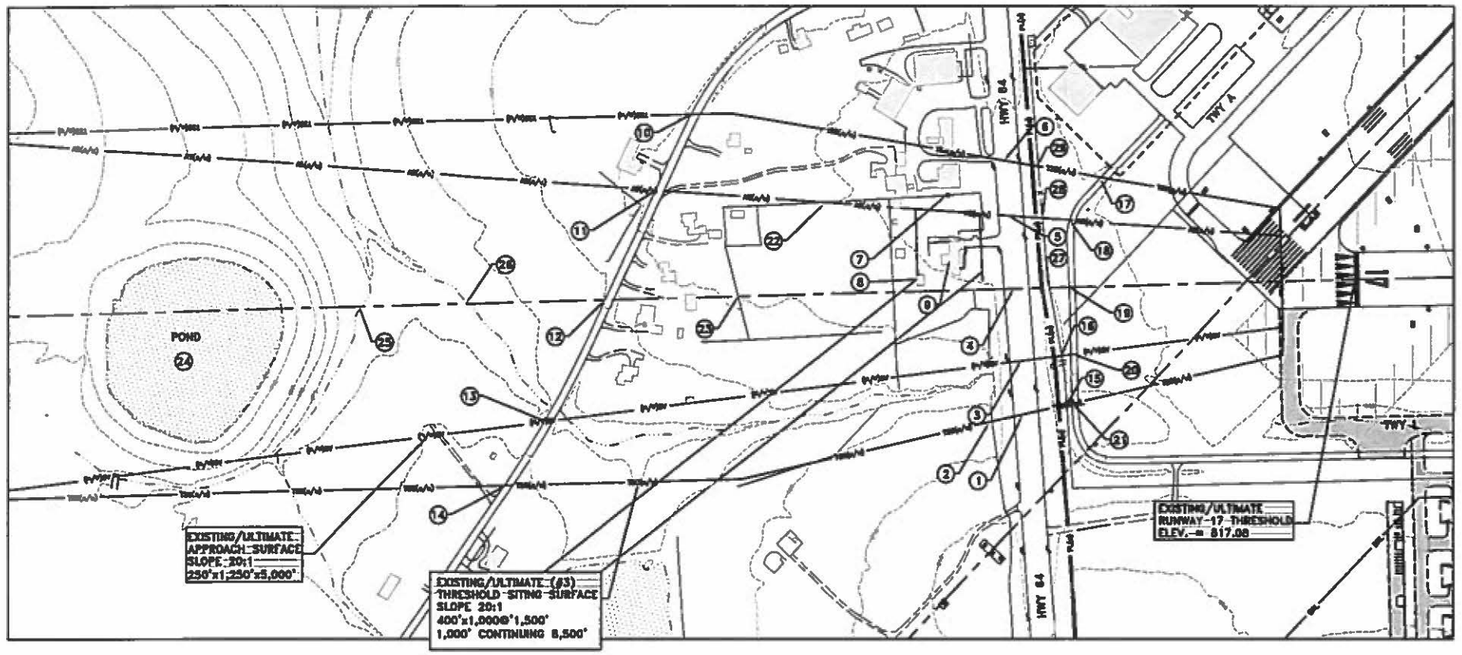

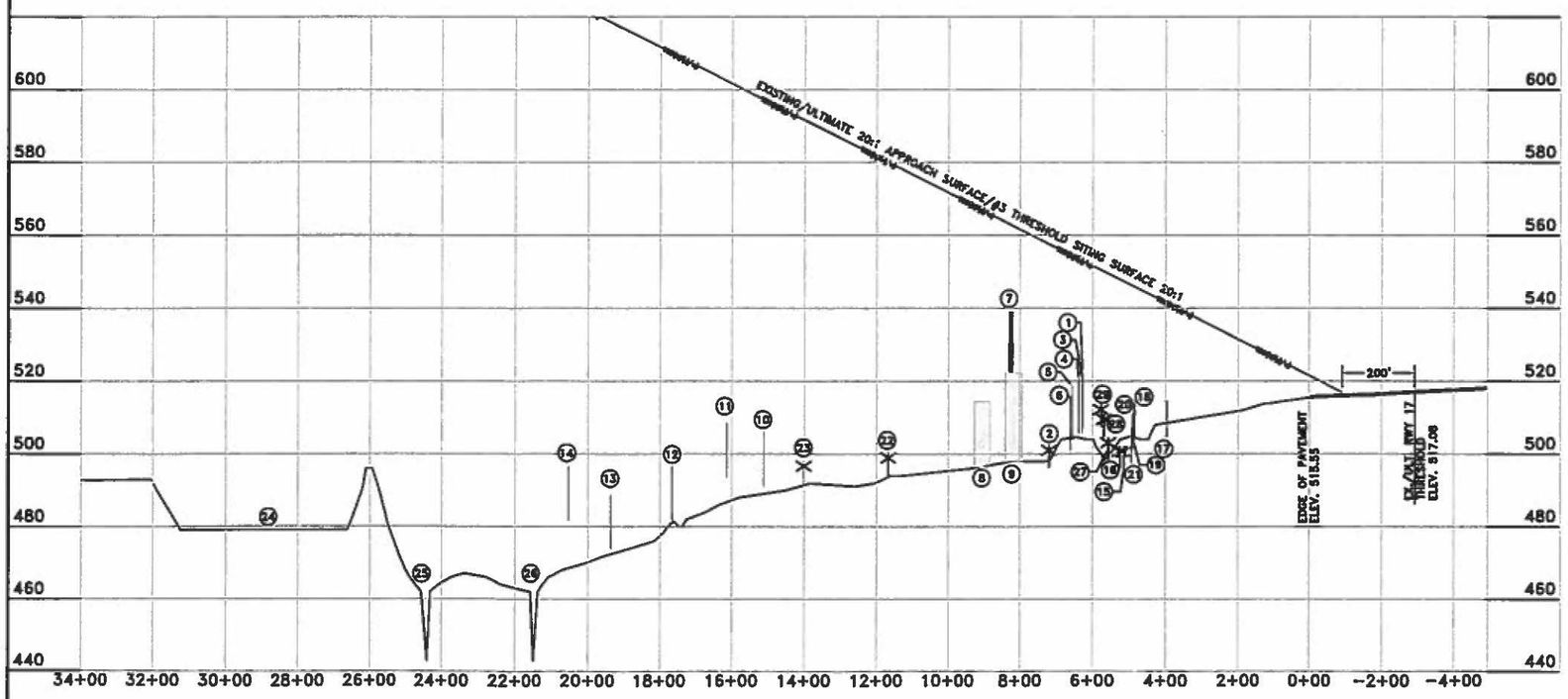

TRUE NORTH

Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

200 0 200 400
HORIZONTAL SCALE: 1"=200'

20 0 20 40
VERTICAL SCALE: 1"=20'

OBJECT LEGEND

(X) OBJECT INTERSECTED BY AN APPROACH SURFACE BUT NOT AN OBSTRUCTION

XX OBJECT AN OBSTRUCTION TO AN APPROACH SURFACE

NOTES:
SURVEY WAS CONDUCTED TO THE STANDARDS OF FAA #405 ON SEPT. 20, 2005 BY GEODETIX, INC.

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LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		ACTIVE RUNWAYS
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
		GROUND CONTOURS
		THRESHOLD LIMITS
		DRAINAGE DIRECTIONS
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	RUNWAY FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	RUNWAY FREE ZONE (OFZ)
—IAS(e)—	—IAS(u)—	INNER APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LCA—		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		WINDSOCK LOCATION
		RUNWAY EMBAYMENT
		VOR RING & BEARINGS SCALE
		SUPPLEMENTAL WIND ZONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		ARFF STATION AND RESCUE ZONE

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MOBILE, AL • ORLANDO, FL • RALEIGH, NC • RICHMOND, VA
SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KBA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLAN

Drawing Name:
RUNWAY END 17 INNER PORTION OF THE APPROACH SURFACE

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:
Scale: HORIZONTAL: 1"=200' VERTICAL: 1"=20'
Drawing Number: RCP01003

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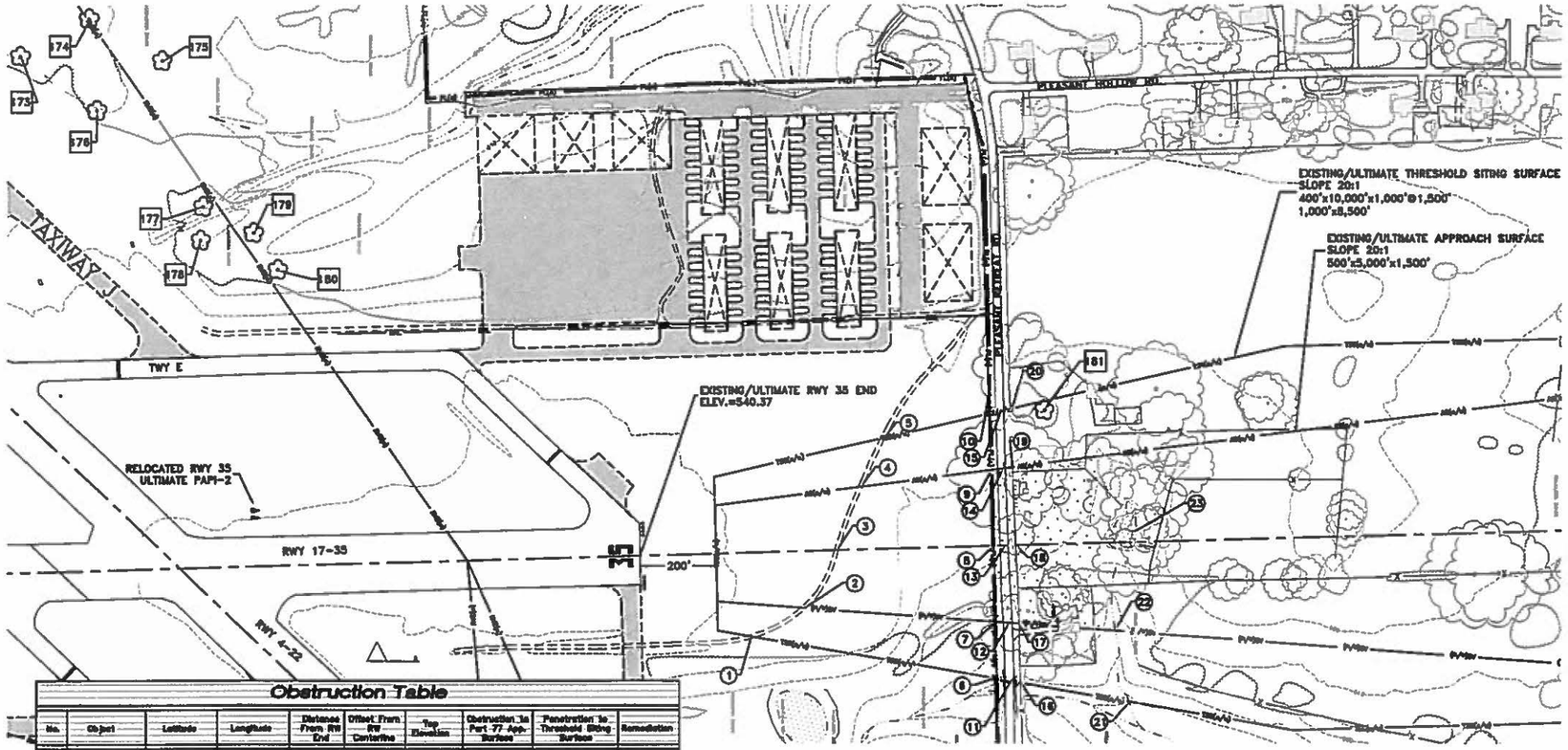
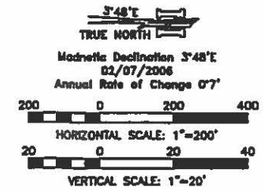


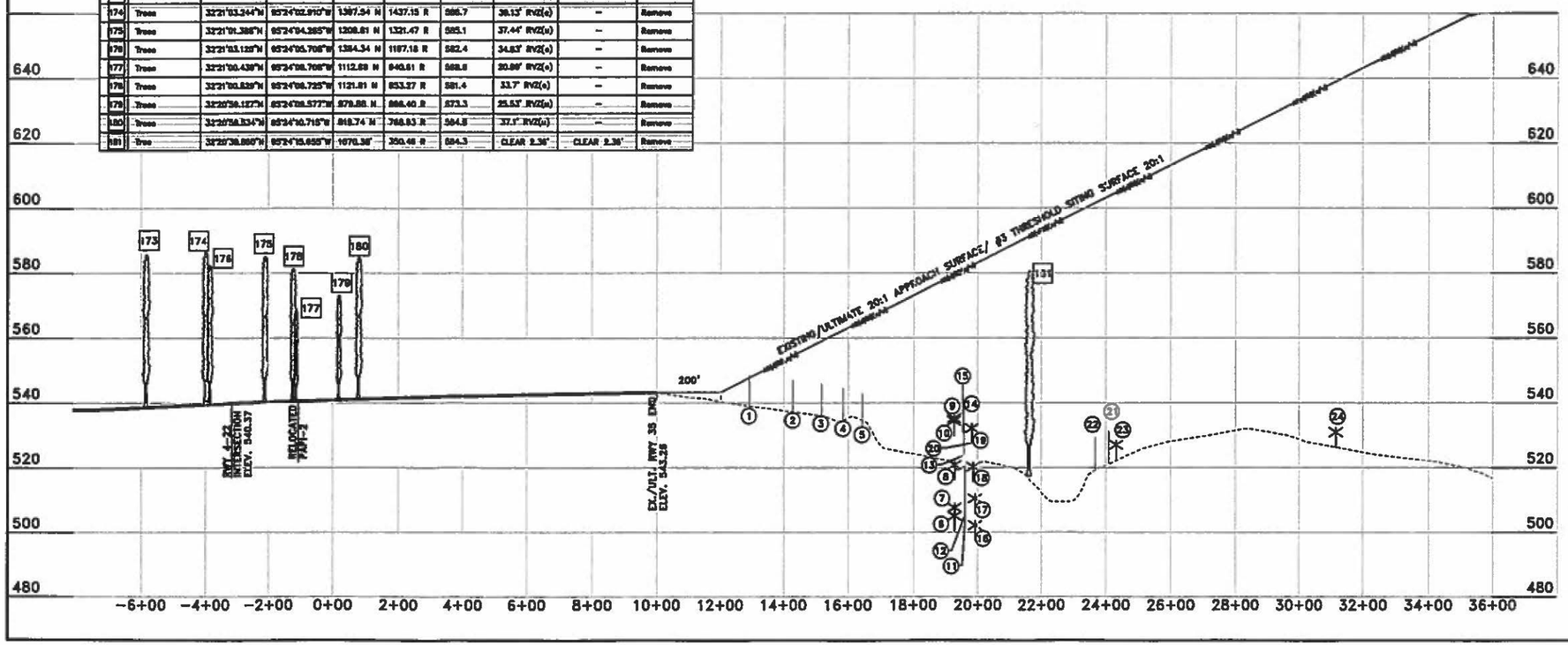


LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		ROADWAY & TRANSIT & SPRUR FACILITY
		PARKING FACILITY
PL(e)	PL(u)	AIRPORT PROPERTY LINE
		GROUND CONTOURS
		THRESHOLD LIGHTS
		DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
RSA(e)	RSA(u)	RUNWAY SAFETY AREA (RSA)
RPZ(e)	RPZ(u)	RUNWAY PROTECTION ZONE (RPZ)
OFA(e)	OFA(u)	OBJECT FREE AREA (OFA)
OFZ(e)	OFZ(u)	OBSTACLE FREE ZONE (OFZ)
IAS(e)	IAS(u)	NONE APPROACH SURFACE(IAS)
TSS(e)	TSS(u)	THRESHOLD SITING SURFACE(TSS)
LCA		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		AWOS/ASOS EQUIPMENT
		CONTROL MONUMENT
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		HOLD POSITION AND GUIDANCE SIGNS

Obstruction Table

No.	Object	Latitude	Longitude	Distance From RW End	Offset From RW Centerline	Top Elevation	Obstruction In Part 77 App. Surface	Penetration to Threshold Siting Surface	Remediation
173	Trees	32°21'05.073"N	95°24'03.973"W	1685.12 N	1346.47 R	565.8	38.27' RVZ(e)	–	Remove
174	Trees	32°21'03.244"N	95°24'02.910"W	1397.34 N	1437.15 R	566.7	39.13' RVZ(e)	–	Remove
175	Trees	32°21'01.385"N	95°24'04.285"W	1208.81 N	1321.47 R	565.1	37.44' RVZ(e)	–	Remove
176	Trees	32°21'03.125"N	95°24'05.708"W	1384.34 N	1187.18 R	562.4	34.83' RVZ(e)	–	Remove
177	Trees	32°21'00.439"N	95°24'08.708"W	1112.69 N	940.61 R	568.8	30.89' RVZ(e)	–	Remove
178	Trees	32°21'00.829"N	95°24'08.725"W	1121.81 N	853.27 R	561.4	33.7' RVZ(e)	–	Remove
179	Trees	32°20'58.127"N	95°24'08.577"W	979.88 N	666.40 R	573.3	25.53' RVZ(e)	–	Remove
180	Trees	32°20'58.334"N	95°24'10.715"W	918.74 N	768.83 R	564.8	37.1' RVZ(u)	–	Remove
181	Tree	32°20'38.860"N	95°24'15.655"W	1070.38'	350.48 R	584.3	CLEAR 2.38'	CLEAR 2.38'	Remove



OBJECT LEGEND

- (X) OBJECT INTERSECTED BY AN APPROACH SURFACE BUT NOT AN OBSTRUCTION
- [XX] OBJECT AN OBSTRUCTION TO AN APPROACH SURFACE

NOTES:
SURVEY WAS CONDUCTED TO THE STANDARDS OF FAA #405 ON SEPT. 20, 2005 BY GEODETIX, INC.

THE REFERENCE DATUM USED FOR ALL HORIZONTAL COORDINATES IS NORTH AMERICAN DATUM 1983 – NAD 83 AND THE DATUM USED FOR ALL MSL ELEVATIONS IS NORTH AMERICAN VERTICAL DATUM 1988 – NAV 88.

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KSA ENGINEERS

Designer: Steve M. Creamer, P.E.
Technician: Sharon B. Coe
Checked by: Steve M. Creamer, P.E.
Project Number: TYL-229

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS REGIONAL AIRPORT
MASTER PLAN UPDATE

Drawing Name:
RUNWAY END 35 INNER PORTION OF THE APPROACH SURFACE

FAA A.I.P. Project Number:

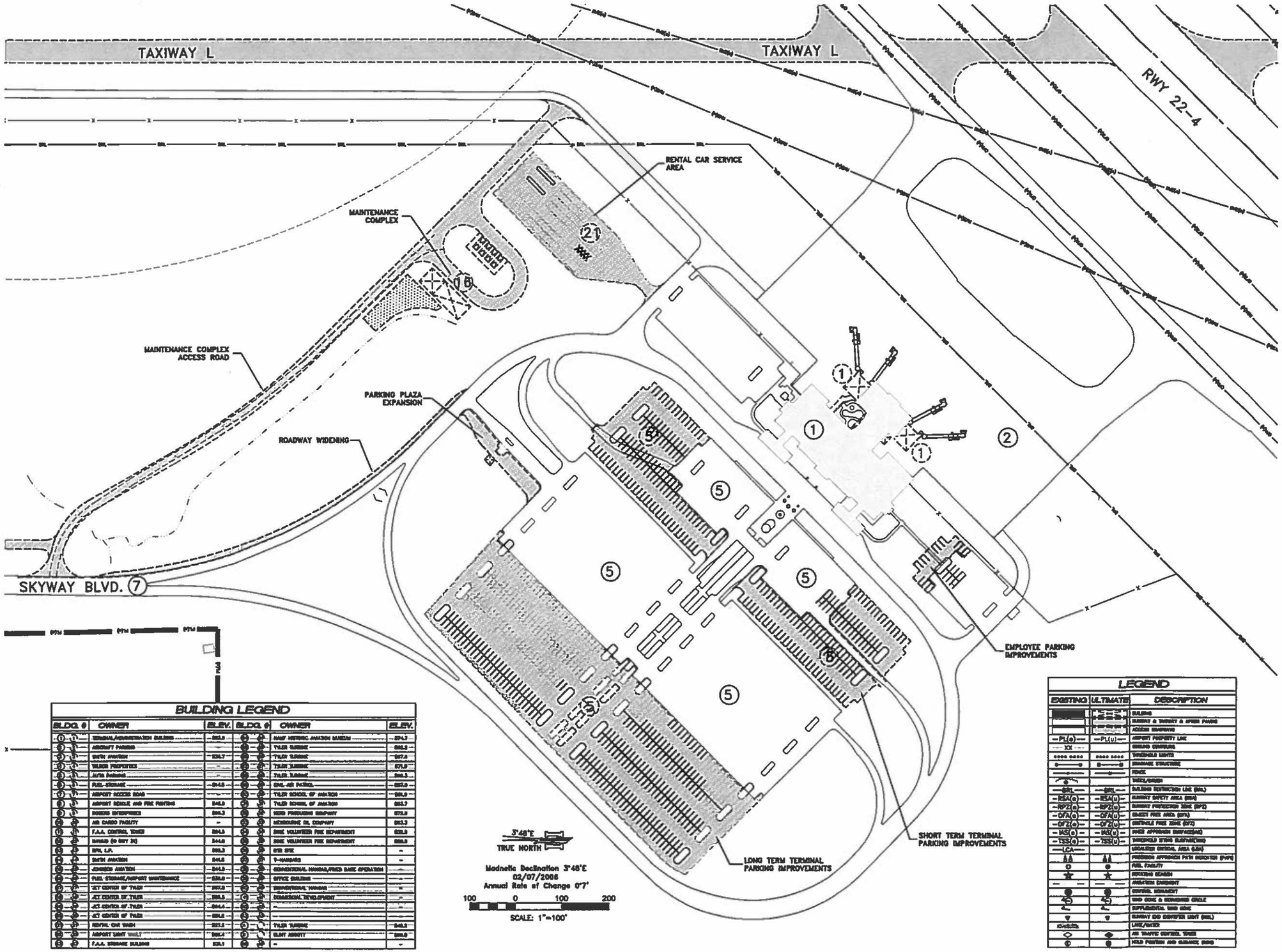
Autocad Drawing Reference:

Date: June, 2006
Division:

Scale: HORIZONTAL: 1"=200' VERTICAL: 1"=20'

Drawing Number: RCP02003

P:\Projects\TYL229\DRAW\ALP DWGS\RCp02003.dwg



BUILDING LEGEND

BLDG. #	OWNER	ELEV.	BLDG. #	OWNER	ELEV.
1	TERMINAL/ADMINISTRATION BUILDING	563.0	14	HAAF HISTORIC AVIATION MUSEUM	574.7
2	AIRCRAFT PARKING	–	15	TYLER TURBINE	592.3
3	SMITH AVIATION	538.7	16	TYLER TURBINE	587.8
4	TYLER PROPERTIES	–	17	TYLER TURBINE	571.9
5	AUTO PARKING	–	18	TYLER TURBINE	594.3
6	FUEL STORAGE	564.5	19	CIVIL AIR PATROL	557.0
7	AIRPORT ACCESS ROAD	–	20	TYLER SCHOOL OF AVIATION	565.0
8	AIRPORT RENTAL AND FIRE FIGHTING	545.0	21	TYLER SCHOOL OF AVIATION	553.7
9	BOEING ENTERPRISES	545.3	22	NEW PROGRESS GROPWY	573.0
10	AIR CARGO FACILITY	–	23	MERIDIANE OIL COMPANY	553.3
11	F.A.A. CONTROL TOWER	594.5	24	SKIE VOLUNTEER FIRE DEPARTMENT	533.0
12	HANGAR (to SHY 3)	544.0	25	SKIE VOLUNTEER FIRE DEPARTMENT	555.0
13	SPA, L.P.	552.3	26	SYE SYE	–
14	SMITH AVIATION	545.0	27	T-HANGARS	–
15	JOHNSON AVIATION	544.0	28	COMMERCIAL HANGAR/FIXED BASE OPERATION	–
16	FUEL STORAGE/AIRPORT MAINTENANCE	539.0	29	OFFICE BUILDING	–
17	JET CENTER OF TYLER	557.0	30	COMMERCIAL HANGAR	–
18	JET CENTER OF TYLER	555.3	31	COMMERCIAL DEVELOPMENT	–
19	JET CENTER OF TYLER	554.4	32	–	–
20	JET CENTER OF TYLER	555.0	33	–	–
21	RENTAL CAR WASH	557.0	34	TYLER TURBINE	545.5
22	AIRPORT UNIT (SHY)	555.4	35	SLINT AIRCITY	555.0
23	F.A.A. STORAGE BUILDING	539.1	36	–	–

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		ACCESS ROADWAY
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
—XX—		BUILDING CONTOURS
		THRESHOLD LIGHTS
		DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	OBSTACLE FREE ZONE (OFZ)
—IMS(e)—	—IMS(u)—	INNER APPROACH SURFACE(IMS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LCA—		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		AIRFIELD EMBLEM
		CONTROL SEGMENT
		VOR CONE & SECONDARY CIRCLE
		SUPPLEMENTAL VOR CONE
		RUNWAY END IDENTIFER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		HOLD POSITION AND GUIDANCE SIGNS

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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KBA ENGINEERS

Designer: Steve M. Creamer P.E.
Technician: Sharon S. Coe
Checked by: Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

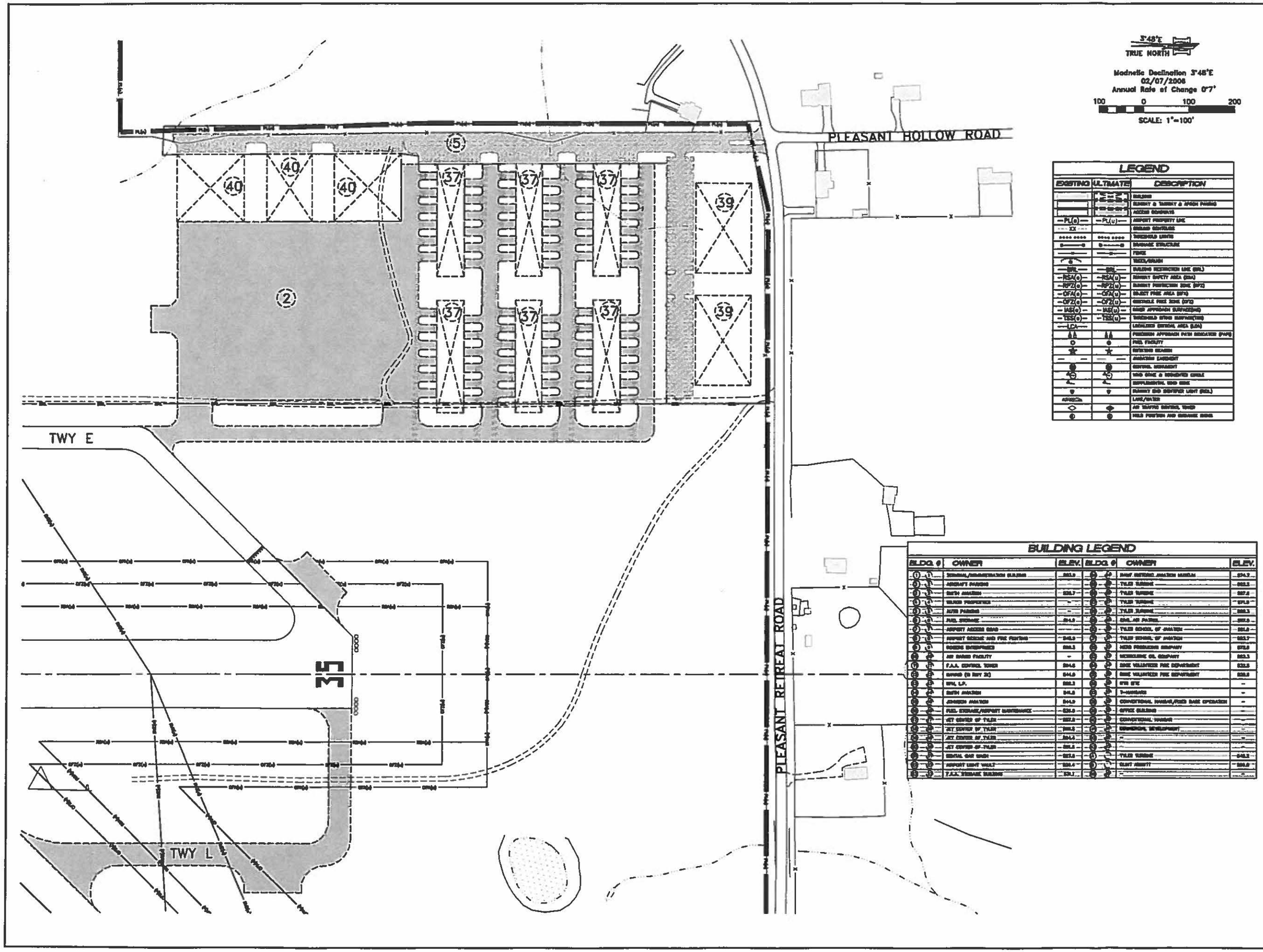
Project Name:
TYLER POUNDS REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
TERMINAL AREA DRAWING
TERMINAL AREA DEVELOPMENT

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2008
Division:
Scale: 1"=100'
Drawing Number: TYL229TAD



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		ACCESS ROADWAYS
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
— XX —		GUARD CONTROLS
		THRESHOLD LIGHTS
		DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	OBSTACLE FREE ZONE (OFZ)
—IAS(e)—	—IAS(u)—	SHORT APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LDA—		LOCALIZER SENSING AREA (LDA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		EASEMENT
		CONTROL MONUMENT
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		FIELD POSITION AND DIMENSION SIGNS

BUILDING LEGEND

BLDG. #	OWNER	ELEV.	BLDG. #	OWNER	ELEV.
1	TERMINAL/ADMINISTRATION BUILDING	563.0	21	EAST INTERNAT. AVIATION HANGAR	574.7
2	AIRCRAFT PARKING	–	22	TYLER TURBINE	563.3
3	SMITH AVIATION	563.7	23	TYLER TURBINE	567.0
4	WALKER PROPERTIES	–	24	TYLER TURBINE	571.0
5	AUTO PARKING	–	25	TYLER TURBINE	568.3
6	FUEL STORAGE	564.0	26	SMALL JET PARKING	563.0
7	AIRPORT ACCESS ROAD	–	27	TYLER SCHOOL OF AVIATION	561.0
8	AIRPORT RESCUE AND FIRE FIGHTING	565.0	28	TYLER SCHOOL OF AVIATION	563.7
9	ROGERS ENTERPRISES	566.3	29	HERO PRODUCTION COMPANY	572.0
10	AIR RADIO FACILITY	–	30	MERIDIANE OIL COMPANY	563.3
11	F.A.A. CONTROL TOWER	594.5	31	DIKE VOLUNTEER FIRE DEPARTMENT	572.5
12	RAMP (S END 31)	544.0	32	DIKE VOLUNTEER FIRE DEPARTMENT	572.0
13	SPA, L.P.	566.3	33	STR STX	–
14	SMITH AVIATION	561.5	34	T-HANGARS	–
15	JOHNSON AVIATION	564.0	35	CONVENTIONAL HANGAR/FIXED BASE OPERATION	–
16	FUEL STORAGE/AIRPORT MAINTENANCE	561.0	36	OFFICE BUILDING	–
17	JET CENTER OF TYLER	567.0	37	CONVENTIONAL HANGAR	–
18	JET CENTER OF TYLER	566.5	38	COMMERCIAL DEVELOPMENT	–
19	JET CENTER OF TYLER	564.4	39	–	–
20	JET CENTER OF TYLER	566.5	40	–	–
41	RENTAL CAR WASH	567.0	42	TYLER TURBINE	568.3
43	AIRPORT LIGHT VAULT	564.4	44	SLIPT AIRFIT	566.0
45	F.A.A. TERMINAL BUILDING	564.1	46	–	–

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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KSA ENGINEERS

Designer:
Steve M. Creamer P.E.
Technician:
Sharon B. Coe
Checked by:
Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS
REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

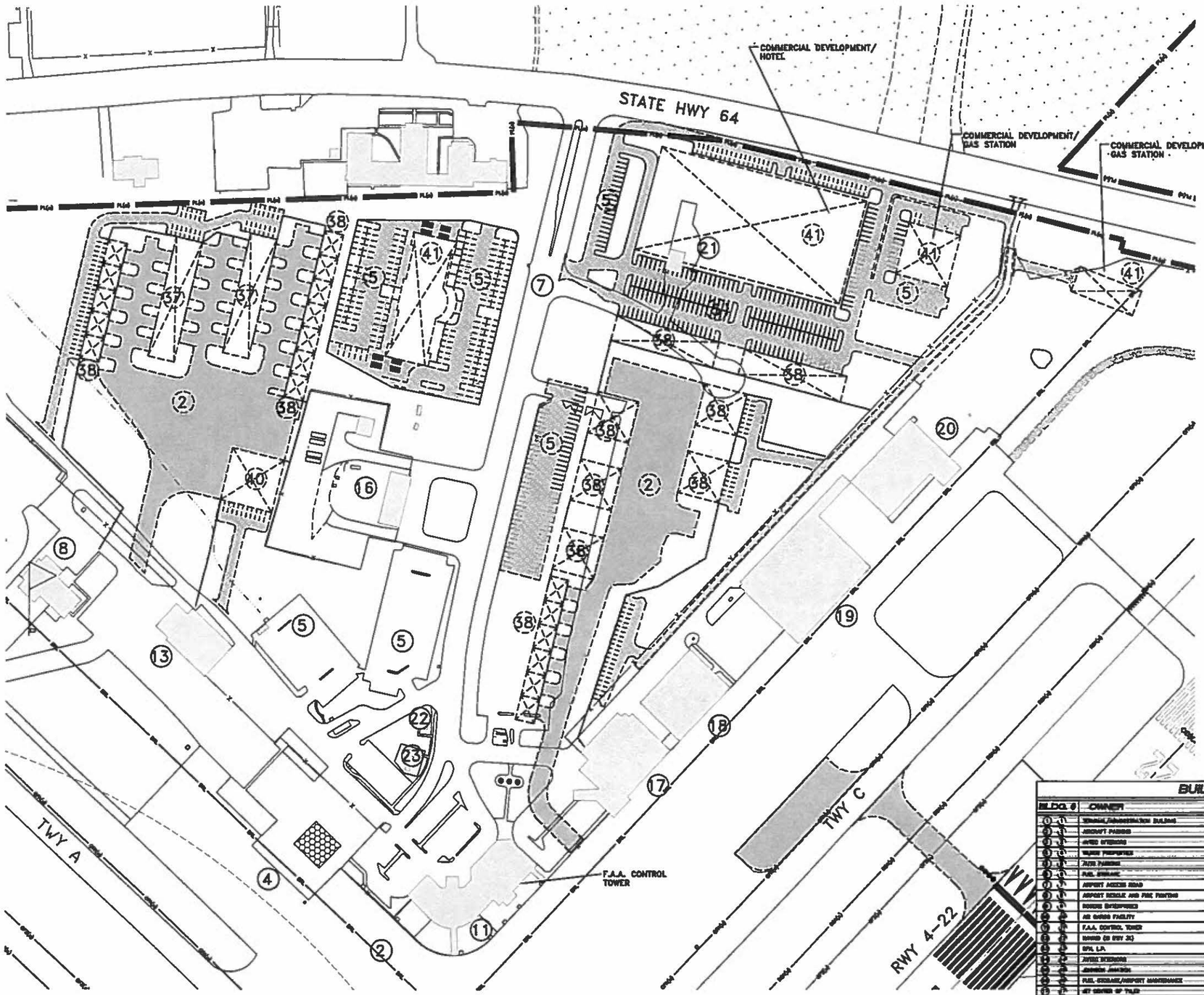
Drawing Name:
TERMINAL AREA
DRAWING
SOUTH DEVELOPMENT

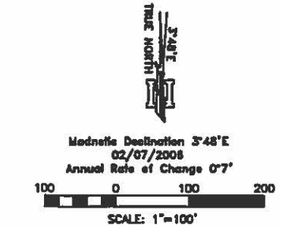
FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:

Scale: 1"=100'
Drawing Number: TYL229TADS





LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		AUTO PARKING
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
XX		BRACED CENTERLINE
		THRESHOLD LIGHTS
		STORAGE STRUCTURE
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	OBSTACLE FREE ZONE (OFZ)
—IAS(e)—	—IAS(u)—	INNER APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LCA—		LOCALIZER CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		ROTATING BEACON
		ARRESTING EQUIPMENT
		WIND/SEG. MONOMAST
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		FIELD PORTION AND OBSTACLE ZONE

BUILDING LEGEND

BLDG. #	OWNER	ELEV.	BLDG. #	OWNER	ELEV.
1	TERMINAL/ADMINISTRATION BUILDING	563.6	26	AMR NORTHWEST AVIATION MARSHAL	554.7
2	AIRCRAFT PARKING	--	27	TYLER TURBINE	562.3
3	AVIES OPERATIONS	563.7	28	TYLER TURBINE	567.6
4	WARREN PROPERTIES	--	29	TYLER TURBINE	571.8
5	AUTO PARKING	--	30	TYLER TURBINE	566.3
6	FUEL STORAGE	564.6	31	SNL AIR PATROL	567.0
7	AIRPORT ACCESS ROAD	--	32	TYLER SCHOOL OF AVIATION	571.0
8	AIRPORT RESCUE AND FIRE FIGHTING	565.0	33	TYLER SCHOOL OF AVIATION	563.7
9	ROGERS ENTERPRISES	566.3	34	GEO PRODUCTION COMPANY	572.0
10	AIR CARGO FACILITY	--	35	MERIDIAN OIL COMPANY	563.3
11	F.A.A. CONTROL TOWER	574.6	36	SNE VOLUNTEER FIRE DEPARTMENT	572.5
12	HANGAR (S SIDE 2K)	564.0	37	SNE VOLUNTEER FIRE DEPARTMENT	569.0
13	EPA L.P.	562.3	38	ETR SITE	--
14	AVIES HANGARS	564.8	39	T-HANGARS	--
15	JEANNIE JANSEN	564.0	40	CONDITIONAL HANGAR/FIXED BASE OPERATION	--
16	FUEL STORAGE/AIRPORT MAINTENANCE	570.0	41	OFFICE BUILDING	--
17	JET CENTER OF TYLER	567.0	42	CONDITIONAL HANGAR	--
18	JET CENTER OF TYLER	566.8	43	CONDITIONAL DEVELOPMENT	--
19	JET CENTER OF TYLER	564.4	44	--	--
20	JET CENTER OF TYLER	564.0	45	--	--
21	RENTAL CAR WASH	567.0	46	TYLER TURBINE	566.3
22	AIRPORT LIGHT VAULT	566.4	47	GUST ASSIST	566.8
23	F.A.A. STORAGE BUILDING	571.1	48	--	--

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MOBILE, AL • ORLANDO, FL • RALEIGH, NC • RICHMOND, VA
SARASOTA FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KBA ENGINEERS

Designer:
Steve M. Creamer P.E.
Technician:
Sharon B. Coe
Checked by:
Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

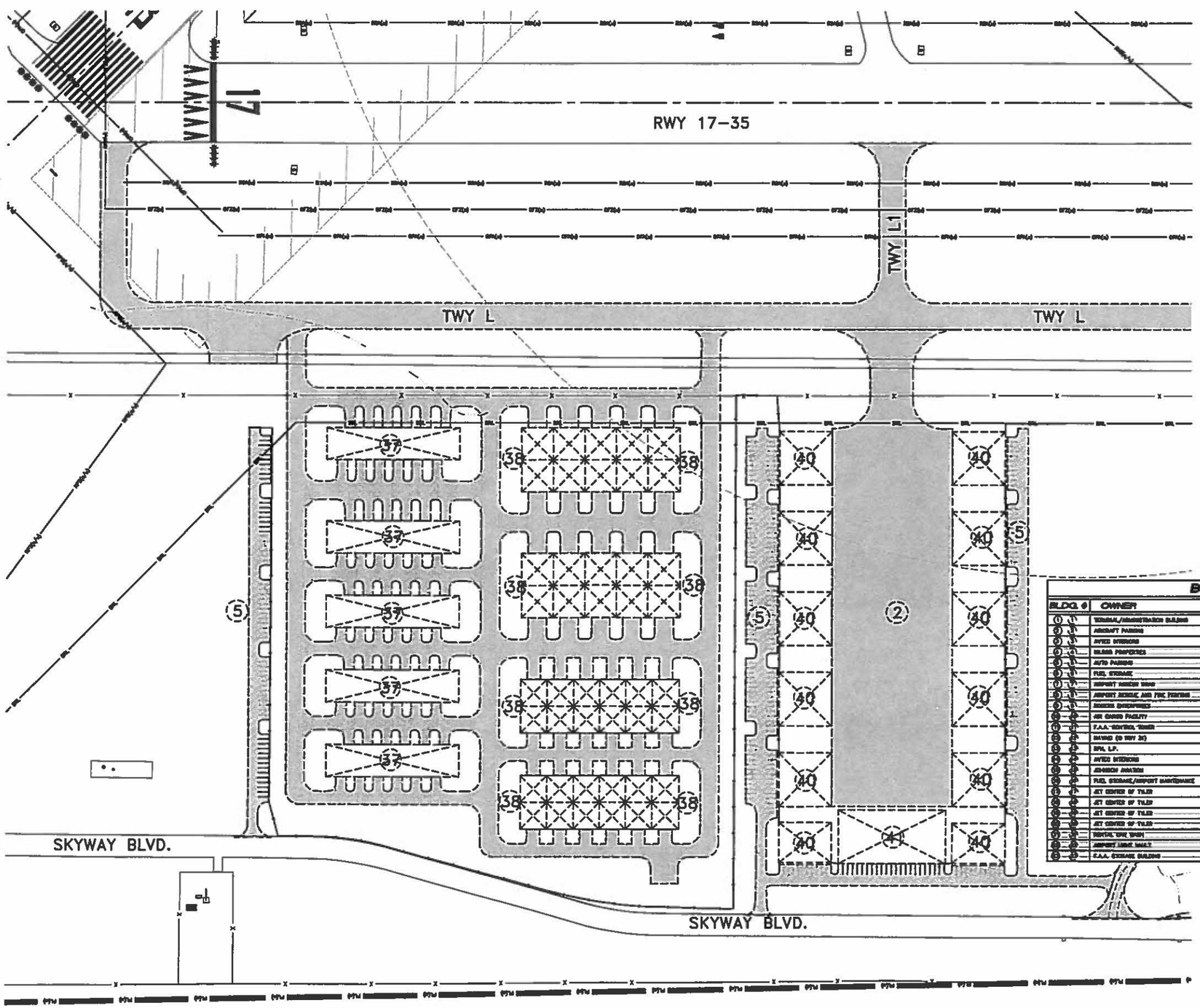
Project Name:
TYLER POUNDS
REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
TERMINAL AREA
DRAWING
NORTH DEVELOPMENT

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:
Scale: 1"=100'
Drawing Number: TYL229TADN



3°48'E
TRUE NORTH

Magnetic Declination 3°48'E
02/07/2006
Annual Rate of Change 0°7'

100 0 100 200
SCALE: 1"=100'

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		BUILDING
		RUNWAY & TAXIWAY & APRON PAVING
		ACCESS ROADWAYS
—PL(e)—	—PL(u)—	AIRPORT PROPERTY LINE
—XX—		GROUND CONTOURS
		THRESHOLD LIGHTS
		DRAINAGE STRUCTURE
		FENCE
		TREES/BRUSH
—BRL—	—BRL—	BUILDING RESTRICTION LINE (BRL)
—RSA(e)—	—RSA(u)—	RUNWAY SAFETY AREA (RSA)
—RPZ(e)—	—RPZ(u)—	RUNWAY PROTECTION ZONE (RPZ)
—OFA(e)—	—OFA(u)—	OBJECT FREE AREA (OFA)
—OFZ(e)—	—OFZ(u)—	OBSTACLE FREE ZONE (OFZ)
—IAS(e)—	—IAS(u)—	INNER APPROACH SURFACE(IAS)
—TSS(e)—	—TSS(u)—	THRESHOLD SITING SURFACE(TSS)
—LCA—		LIGHTED CRITICAL AREA (LCA)
		PRECISION APPROACH PATH INDICATOR (PAPI)
		FUEL FACILITY
		EXISTING BEACON
		AVIGATION EASEMENT
		EXISTING HANGARS
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		RUNWAY END IDENTIFIER LIGHT (REIL)
		LAKE/WATER
		AIR TRAFFIC CONTROL TOWER
		HOLD POSITION AND GUIDANCE SIGNS

BUILDING LEGEND

BLDG. #	OWNER	ELEV.	BLDG. #	OWNER	ELEV.
1	TERMINAL/ADMINISTRATION BUILDING	553.0	21	HAAF HISTORIC AVIATION MUSEUM	574.7
2	AIRCRAFT PARKING	--	22	TYLER TURBINE	566.3
3	AVTEC INTERIORS	556.7	23	TYLER TURBINE	557.6
4	BUSINESS PROPERTIES	--	24	TYLER TURBINE	571.6
5	AUTO PARKING	--	25	TYLER TURBINE	566.3
6	FUEL STORAGE	554.3	26	CIVIL AIR PATROL	557.0
7	AIRPORT RESCUE TOWER	--	27	TYLER SCHOOL OF AVIATION	561.0
8	AIRPORT RESCUE AND FIRE FIGHTING	548.0	28	TYLER SCHOOL OF AVIATION	563.7
9	BUSINESS PROPERTIES	556.3	29	NEED PRODUCING COMPANY	573.0
10	AIR CARGO FACILITY	--	30	MORRISONS OIL COMPANY	563.3
11	F.A.A. CONTROL TOWER	554.0	31	EAST VOLUNTEER FIRE DEPARTMENT	570.0
12	HANGAR (D NOT 24)	544.0	32	EAST VOLUNTEER FIRE DEPARTMENT	570.0
13	EPA, L.P.	552.3	33	ATM SITE	--
14	AVTEC INTERIORS	545.0	34	T-HANGARS	--
15	JOHNSON AVIATION	544.0	35	COMMERCIAL HANGAR/FIXED BASE OPERATION	--
16	FUEL STORAGE/AIRPORT MAINTENANCE	538.0	36	OFFICE BUILDING	--
17	JET CENTER OF TYLER	557.0	37	COMMERCIAL HANGAR	--
18	JET CENTER OF TYLER	556.3	38	COMMERCIAL DEVELOPMENT	--
19	JET CENTER OF TYLER	554.4	39	--	--
20	JET CENTER OF TYLER	553.0	40	--	--
21	RENTAL CAR WASH	557.0	41	TYLER TURBINE	563.3
22	AIRPORT LIGHT VAULT	556.4	42	FLIGHT AMENITY	564.0
23	F.A.A. STORAGE BUILDING	559.1	43	--	--

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SARASOTA, FL • TALLAHASSEE, FL • TAMPA, FL • WEST PALM BEACH, FL

KBA ENGINEERS

Designer:
Steve M. Creamer P.E.
Technician:
Sharon B. Coe
Checked by:
Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

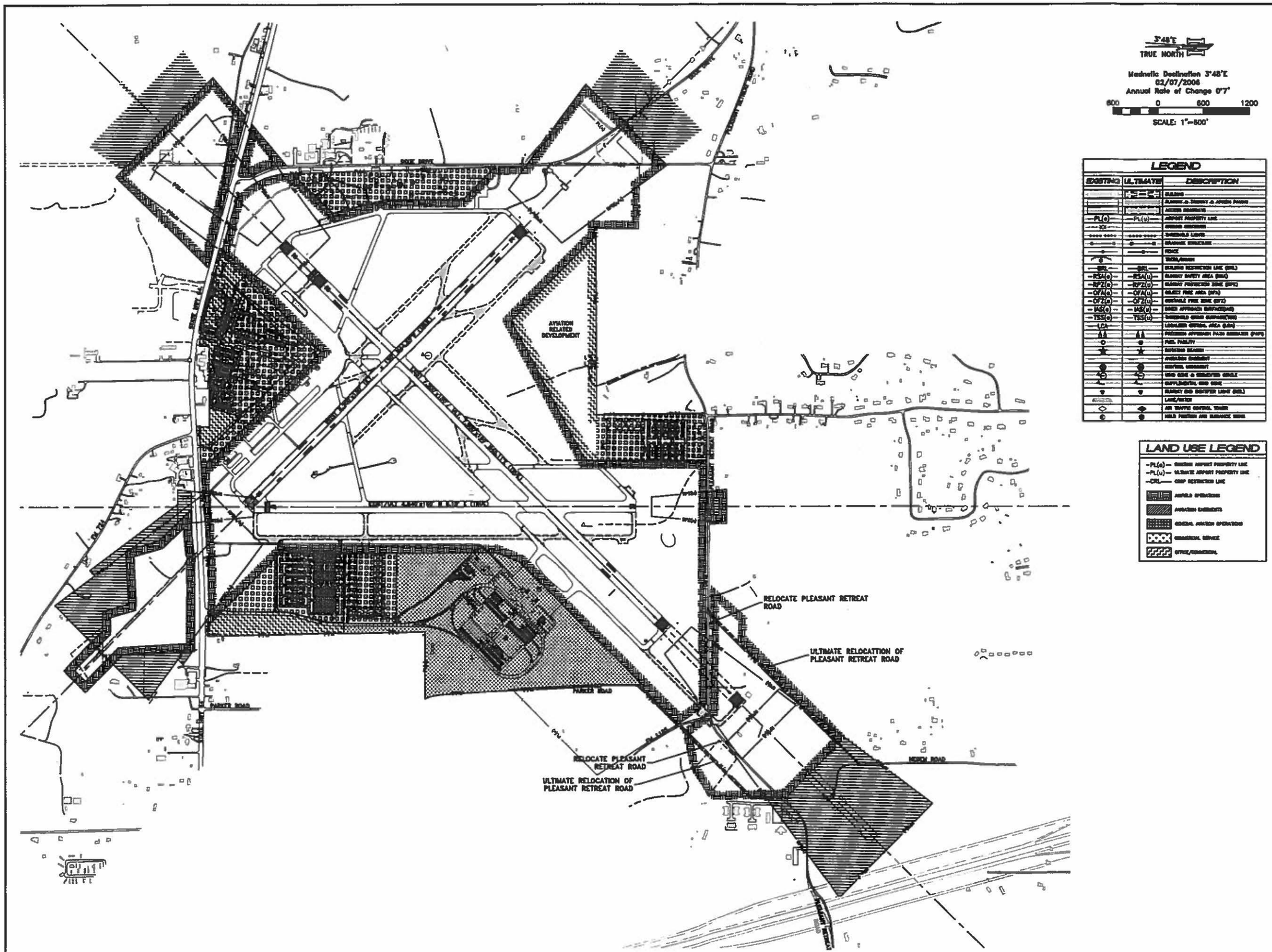
Project Name:
TYLER POUNDS
REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
TERMINAL AREA
DRAWING
WEST DEVELOPMENT

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:
Scale: 1"=100'
Drawing Number: TYL229TADW



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KBA ENGINEERS

Designer:
Steve M. Creamer P.E.
Technician:
Sharon B. Coe
Checked by:
Steve M. Creamer, P.E.
Project Number:

NOTES

REVISIONS

No.	Description	Date	By

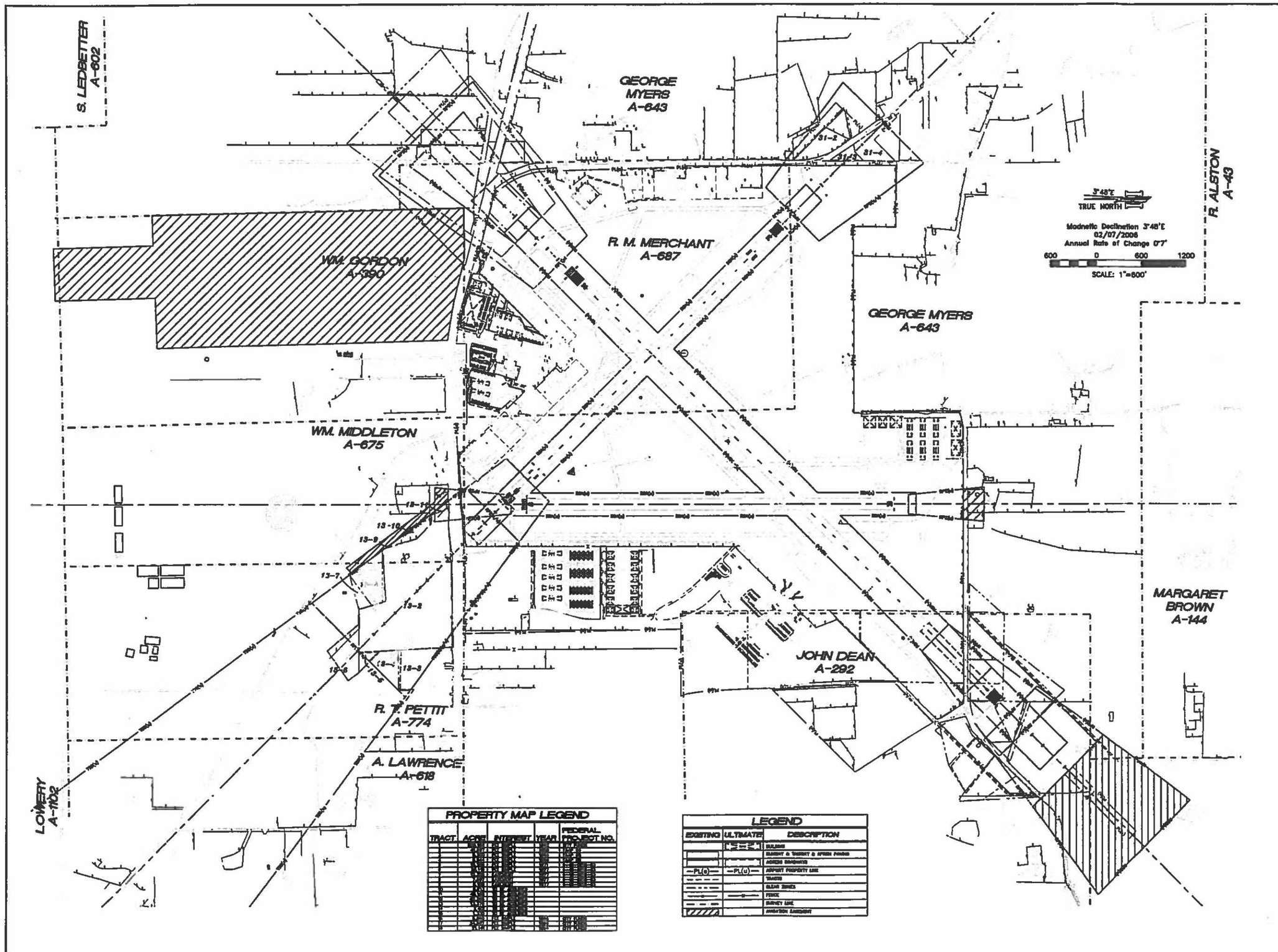
Project Name:
TYLER POUNDS
REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
LAND
USE
DRAWING

FAA A.I.P. Project Number:

Autocad Drawing Reference:

Date: June, 2006
Division:
Scale: 1"=600'
Drawing Number: TYL229 LUD



CITY OF TYLER
Tyler Pounds Regional Airport

THE LPA GROUP
TRANSPORTATION CONSULTANTS

KEA ENGINEERS

Designer: Steve M. Creamer P.E.	
Technician: Sharon B. Coe	
Checked by: Steve M. Creamer, P.E.	
Project Number:	

NOTES

REVISIONS

No.	Description	Date	By

Project Name:
TYLER POUNDS
REGIONAL AIRPORT
AIRPORT LAYOUT PLANS

Drawing Name:
AIRPORT
PROPERTY
MAP

FAA A.I.P. Project Number:

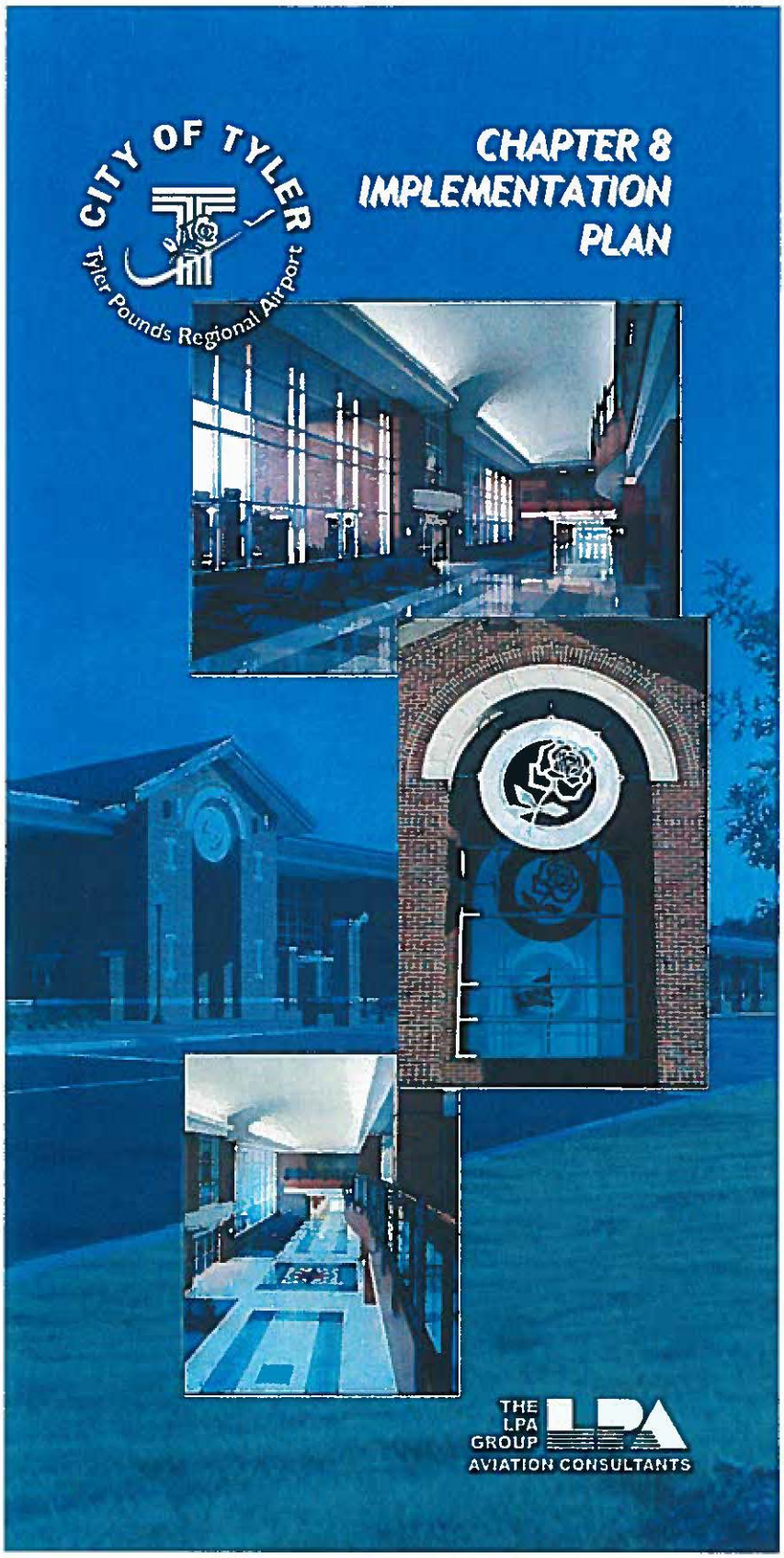
Autocad Drawing Reference:

Date: June, 2006	Division:
Scale: 1"=600'	Drawing Number: TYL229 APM

CITY OF TYLER

Tyler Pounds Regional Airport

CHAPTER 8 IMPLEMENTATION PLAN



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CHAPTER EIGHT
Implementation Plan

INTRODUCTION

An implementation plan for Tyler Pounds Regional Airport (TYR) has been prepared based upon the facility needs identified in the Facility Requirements and the Alternatives Analysis of possible solutions to meet these needs. The implementation plan presented herein describes the staging of proposed improvements, provides the basic financial requirements of each, and identifies various means of funding these improvements. It is the intent of this implementation plan to provide general financial guidance to the City of Tyler's Aviation Department and Airport staff in making policy decisions regarding the recommended development of the Airport over the 20-year planning period.

PROGRAM PHASING AND COST ESTIMATING

An initial development schedule for the proposed improvements was prepared based upon facility requirements, which were determined by the levels of passenger enplanements and operational forecasts. Therefore, since actual activity levels realized at the Airport may vary, it is important that the staging of these proposed improvement projects remain sensitive to such variation. Given that some time has passed between the development of the aviation forecasts and this implementation plan, the staging of projects begins with 2006 instead of the first year (2005) of the aviation forecasts. Some projects may take precedence over other projects, depending on changes in priority and demand. Thus, a list of prioritized improvements was established based on the urgency of need, ease of implementation, logic of project sequencing, and Airport staff input. The objective was to establish an efficient order for project development and implementation that satisfied the forecasted aviation activity for TYR and the needs expressed by Airport staff. The development schedule is divided into three general stages: the short-term (2006-2010), the mid-term (2011-2015), and the long-term (2016-2024).

Cost estimates were developed for each project from 2007 through 2024. The projected costs were based on the preliminary layouts developed as a part of the Alternatives Analysis. Estimated quantities of major items, such as pavement or fill material, were used in conjunction with unit cost values to determine a construction cost. A final project cost was then determined by adding set percentages of the construction cost for mobilization, drainage (where applicable), and engineering services. Additionally, a contingency amount of 30 percent of the estimated construction cost was added to account for items that were unknown at the time.

CAPITAL IMPROVEMENT PROGRAM

The projects and their estimated costs for each period are discussed in the following sections. The Capital Improvement Program (CIP), which includes the development schedule and project cost summaries, are presented in the following sections which discuss each development phase. The CIP for each period presents the improvements required during that period, but it does not assume how financially feasible it will be for the City of Tyler's Aviation Department to undertake these projects. A subsequent section of this chapter will address in general terms the financial feasibility of this development program. Cost projections are based on constant 2006 dollars and include estimated engineering fees and contingencies. The projections, however, should be used for planning purposes only and do not imply that funding for these will necessarily be available. Each year indicates the initiation of design

and/or environmental efforts as identified in these tables. It is assumed that construction would be undertaken either in that same year or the next.

Short-Term Developments

Table 8-1 shows the short-term CIP program for TYR. Many of the projects listed are currently in the Airport's work program and have already received an allocation of grant funding. The projects are shown in order by timeline rather than by priority. A graphic showing the short-term phasing plan of project improvements is shown on **Exhibit 8-1**.

TABLE 8-1
SHORT-TERM CAPITAL IMPROVEMENT PROGRAM

Year	Development Items	Total
2007	Acquire Jet Bridges for safe passenger movement	$752,631
2007	Property Acquisition (Runway 4-22 ext)	$100,000
2007	EA for Runway 4-22 RSA improvements, road relocation, and taxiway and runway extension	$800,000
2007	Pleasant Retreat Road Relocation (Design)	$474,500
2007	Runway 4-22 RSA Grading Improvements Design	$400,000
2007	Runway 13 RSA Grading Improvements (Design)	$170,000
2007	Unidentified TxDOT pavement maintenance project	$60,000
2007	Pavement / Maintenance Allocation	$200,000
	Total 2007	**$2,957,131**
2008	Runway 13 RSA Grading Improvements (construction)	$1,530,000
2008	Runway 13 MALSR Relocation (with RSA improvements)	$260,000
2008	Unidentified TxDOT pavement maintenance project	$60,000
2008	RVZ Tree Clearing Project	$60,000
2008	Pavement / Maintenance Allocation	$200,000
2008	Pleasant Retreat Road relocation (construction)	$4,270,500
2008	EA for North GA & Commercial Development	$600,000
	Total 2008	**$6,980,500**
2009	Northwest GA Development (Infrastructure)	$6,372,992
2009	Runway 22 VASI relocation	$39,000
2009	Runway 4-22 RSA Improvements (construction)	$4,000,000
2009	Runway 4 Extension (Design)	$384,000
2009	FAA Tower - Phase I (Siting)	$50,000
2009	Taxiway G Reconstruct	$635,000
2009	Taxiway C connector and H Hold Pad	$650,000
2009	Unidentified TxDOT pavement maintenance project	$60,000
2009	Pavement / Maintenance Allocation	$200,000
	Total 2009	**$12,390,992**

TABLE 8-1
SHORT-TERM CAPITAL IMPROVEMENT PROGRAM

Year	Development Items	Total
2010	Taxiway F Extension (along with Runway 4-22 ext)	$2,140,000
2010	Runway 4 Extension (Construction)	$1,750,000
2010	Taxiway F MITL	$325,000
2010	Parking Improvements (Phase 1) (Terminal Parking)	$611,000
2010	Runway 17-35 Overlay Design	$150,000
2010	FAA Tower - Phase II (Design)	$400,000
2010	Unidentified TxDOT pavement maintenance project	$60,000
2010	Pavement / Maintenance Allocation	$200,000
2010	EA for West GA Development	$150,000
	Total 2010	**$5,786,000**

Intermediate-Term Developments

A CIP for the period of 2011 through 2015 was also developed, projects were assigned a year for their planned completion. It is assumed that priorities for these developments could change as this timeframe draws near, especially since another master plan update will be undertaken during this period. **Table 8-2** lists the planned improvements for the intermediate-term. A graphic showing the intermediate-term phasing plan of project improvements is shown on **Exhibit 8-2**.

TABLE 8-2
INTERMEDIATE-TERM CAPITAL IMPROVEMENT PROGRAM

Year	Development Items	Total
2011	Corporate / Commercial Complex (Infrastructure)	$2,340,000
2011	Taxiway E Rehabilitation	$465,000
2011	Taxiway B Rehabilitation	$335,000
2011	Runway 17-35 Overlay (Construction)	$1,500,000
2011	Northwest GA Development (Phase 1)	$1,064,440
2011	Runway 4-22 HIRL	$286,000
2011	Runway 4 ILS (MALSR, ILS, and Glideslope)	$1,950,000
2011	FAA Tower - Phase III (Construction)	$4,000,000
2011	Unidentified TxDOT pavement maintenance project	$60,000
2011	Pavement / Maintenance Allocation	$200,000
	Total 2011	**$12,200,440**
2012	Corporate / Commercial Complex (Phase 1)	$2,080,000
2012	North Commercial Building Infrastructure	$1,105,000
2012	Master Plan Update	$400,000
2012	Runway 4-22 Reconstruction (Phase I)	$7,335,000
2012	Maintenance Complex Roadway and infrastructure	$2,750,000
2012	Unidentified TxDOT pavement maintenance project	$60,000
2012	Pavement / Maintenance Allocation	$200,000
2012	West GA T-Hangar / Box Hangar Complex (Infrastructure)	$2,925,000
	Total 2012	**$16,855,000**

TABLE 8-2
INTERMEDIATE-TERM CAPITAL IMPROVEMENT PROGRAM

Year	Development Items	Total
2013	Northeast GA Development (Infrastructure)	$4,125,437
2013	North Commercial Building Development	$2,925,000
2013	Terminal Building Expansion - (Phase 1)	$612,820
2013	Loading Bridge Additions (2 bridges - Phase 1)	$780,000
2013	Runway 4-22 Reconstruction (Phase II)	$7,335,000
2013	RAC Service Center Infrastructure and Service Center Improvements	$750,000
2013	West GA T-Hangar / Box Hangar Complex (Phase 1)	$3,595,800
2013	Taxiway E Hold Pad	$71,500
2013	Taxiway D Rehabilitation	$335,000
2013	Unidentified TxDOT pavement maintenance project	$60,000
2013	Pavement / Maintenance Allocation	$200,000
2013	Taxiway F3 connector	$800,000
	Total 2013	**$21,590,557**
2014	Hotel, Gas Station, and Commercial Infrastructure (NE)	$3,510,000
2014	Hotel Development (NE)	$12,480,000
2014	Commercial Building Development (NE)	$2,925,000
2014	Runway 22 ILS (MALSR, ILS, and Glideslope)	$1,950,000
2014	Unidentified TxDOT pavement maintenance project	$60,000
2014	Pavement / Maintenance Allocation	$200,000
	Total 2014	**$21,125,000**
2015	Northeast GA Development (Phase 1)	$897,728
2015	Northwest GA Development (Phase 2)	$1,584,440
2015	Corporate / Commercial Complex (Phase 2)	$4,160,000
2015	EA for South GA Development	$125,000
2015	Terminal Exit Road Improvements	$448,500
2015	Unidentified TxDOT pavement maintenance project	$60,000
2015	Pavement / Maintenance Allocation	$200,000
2015	Taxiway H Rehabilitation	$675,000
2015	Terminal Parking Improvements (Phase 2)	$611,000
	Total 2015	**$8,761,668**

Long-Term Developments

As with the intermediate-term CIP, needed developments were identified for the long-term period. As with the intermediate-term projects, actual planning years were assigned to each project. A full listing of projects needed from 2016 until 2024 is given in **Table 8-3**. A graphic showing the long-term phasing plan of project improvements is shown on **Exhibit 8-3**.

TABLE 8-3
LONG-TERM CAPITAL IMPROVEMENT PROGRAM

Year	Development Items	Total
2016	Unidentified TxDOT pavement maintenance project	$60,000
2016	South GA Development (Infrastructure)	$4,866,711
2016	Taxiway A Reconstruction and Rehab	$1,955,000
2016	Master Plan Update	$400,000
2016	Pavement / Maintenance Allocation	$200,000
	Total 2016	**$7,481,711**
2017	Unidentified TxDOT pavement maintenance project	$60,000
2017	Pavement / Maintenance Allocation	$200,000
	Total 2017	**$260,000**
2018	West GA T-Hangar / Box Hangar Complex (Phase 2)	$3,595,800
2018	South GA Development (Phase 1)	$861,900
2018	Unidentified TxDOT pavement maintenance project	$60,000
2018	Pavement / Maintenance Allocation	$200,000
2018	Taxiway C Reconstruction and Rehabilitation	$1,225,000
	Total 2018	**$5,942,700**
2019	Runway 13-31 Reconstruction	$10,830,000
2019	Unidentified TxDOT pavement maintenance project	$60,000
2019	Northeast GA Development (Phase 2)	$1,352,000
2019	Pavement / Maintenance Allocation	$200,000
	Total 2019	**$12,442,000**
2020	Parking Improvements (Phase 3)	$611,000
2020	Taxiway F Reconstruction and Rehab	$4,050,000
2020	South GA Development (Phase 2)	$3,447,600
2020	Unidentified TxDOT pavement maintenance project	$60,000
2020	EA for Taxiway L and Taxiway J	$200,000
2020	Pavement / Maintenance Allocation	$200,000
	Total 2020	**$8,568,600**
2021	Master Plan Update	$400,000
2021	Unidentified TxDOT pavement maintenance project	$60,000
2021	EA for Taxiway A and Taxiway K	$300,000
2021	Terminal Building Expansion - (Phase 2)	$693,940
2021	Loading Bridge Additions (2 bridges - Phase 2)	$780,000
2021	Pavement / Maintenance Allocation	$200,000
	Total 2021	**$2,433,940**

TABLE 8-3
LONG-TERM CAPITAL IMPROVEMENT PROGRAM

Year	Development Items	Total
2022	Taxiway A Extension with A1, A3, A4, hold pads, G, and north apron improvements	$240,500
2022	Taxiway K with K4 and hold pad	$5,300,000
2022	Unidentified TxDOT pavement maintenance project	$60,000
2022	Taxiway L (RW 17-35 full parallel with hold pads and L1 connector)	$7,429,500
2022	Taxiway J & J1 Connector	$2,756,000
2022	Pavement / Maintenance Allocation	$200,000
2022	Taxiway A MITL	$5,263,000
	Total 2022	**$15,986,000**
2023	West GA T-Hangar / Box Hangar complex (Phase 3)	$4,605,900
2023	Unidentified TxDOT pavement maintenance project	$60,000
2023	Pavement / Maintenance Allocation	$200,000
	Total 2023	**$4,865,900**
2024	Unidentified TxDOT pavement maintenance project	$60,000
2024	Pavement / Maintenance Allocation	$200,000
	Total 2024	**$260,000**
2025	Parking Improvements (Phase 4)	$611,001
2025	Unidentified TxDOT pavement maintenance project	$60,000
2025	Pavement / Maintenance Allocation	$200,000
2025	South GA Development (Phase 3)	$3,120,000
2025	Runway 4-22 Rehabilitation	$2,500,000
2025	Runway 17-35 Reconstruction	$10,255,000
	Total 2025	**$16,746,001**
	Total (2006-2025)	**$183,634,140**

SHORT-TERM PHASING PLAN

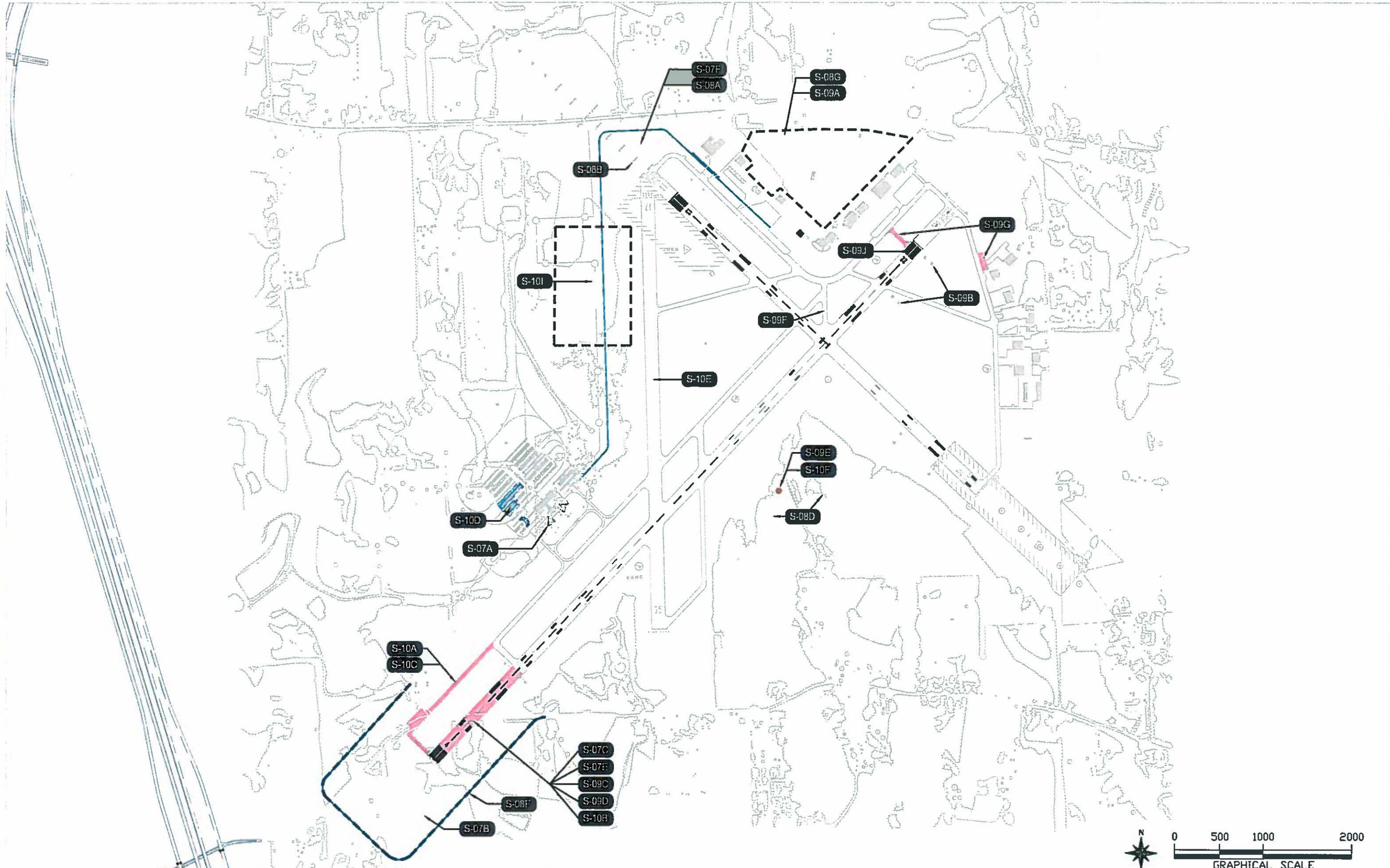


EXHIBIT 8-1

INTERMEDIATE-TERM PHASING PLAN

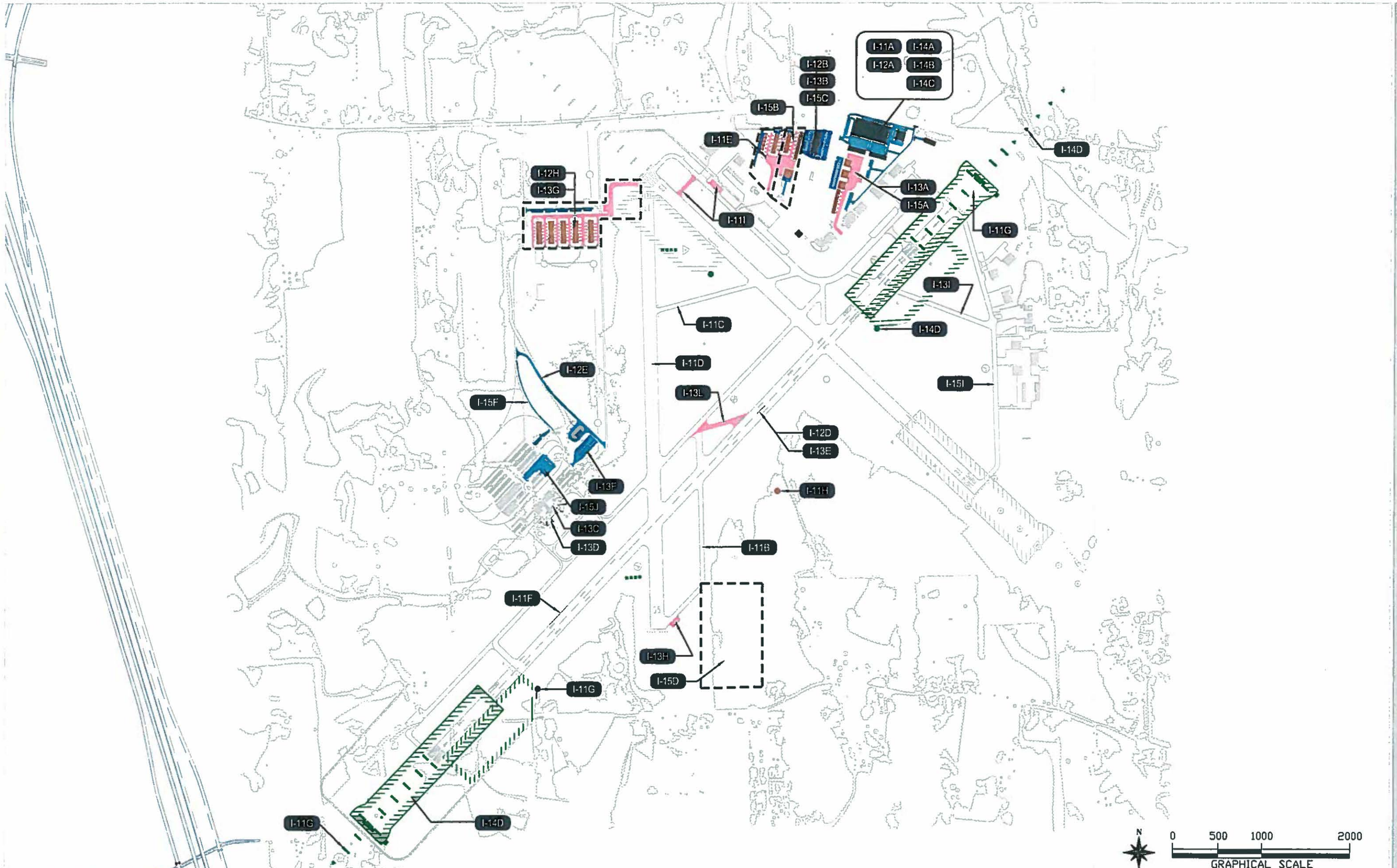


EXHIBIT 8-2

LONG-TERM PHASING PLAN

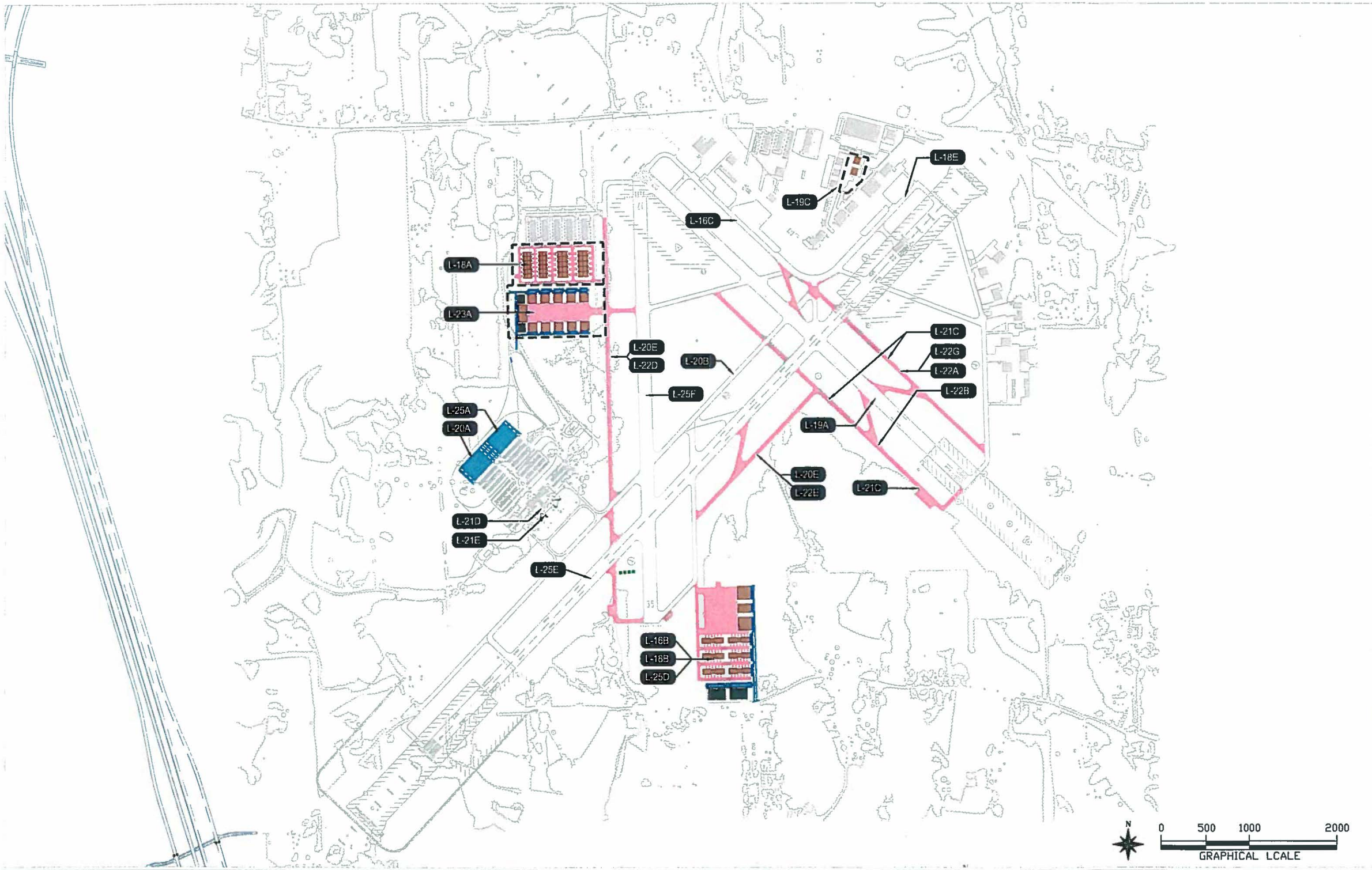


EXHIBIT 8-3

CIP SUMMARY

Having presented the highlights of each of these development periods, a summary of the related financial needs for these projects is presented in **Table 8-4**. This combined development program will provide the facilities needed at TYR to meet the forecasted demands through the end of the 20-year planning period. This 20-year CIP is estimated to cost roughly $183 million. These estimated costs were determined in 2006 dollars; thus, as time goes by these values should be adjusted for the annual inflation rate, which can be accomplished by converting the interim change in the National Consumer Price Index (CPI) into a multiplier ratio as shown by the formula:

CPI Multiplier Ratio = X / CPI

where: X = CPI in any given future year
CPI = National CPI in 2006

Multiplying the change ratio times any 2006 based cost or income figure presented in this study will yield the adjusted dollar amounts appropriate in any future year re-evaluation. However, only National CPI data should be used, as local or regional measures may vary. This information is available from the economic research departments of most banks and online at the U.S. Department of Labor, Bureau of Labor Statistics - http://www.bls.gov.

TABLE 8-4
20-YEAR CAPITAL IMPROVEMENT PROGRAM

Short-Term	$28,114,623
Intermediate-Term	$80,532,665
Long-Term	$74,986,852
Total 20-Year CIP	**$183,634,140**

Source: LPA Group 2006

FUNDING SOURCES

To meet the anticipated need of $183 million in improvements, the City of Tyler's Aviation Department is able to draw from several funding sources in addition to Airport operating revenue. Given the high cost of Airport infrastructure improvements, the federal government has instituted several funding mechanisms to assist airports in meeting their facility needs. The other major source of funding available to airports is through the public agency operating the Airport to undertake debt, through either traditional bank loans or through the issuance of bonds. The availability of funds from these funding mechanisms, as well as others, is presented in the following sections.

Airport Improvement Program

The Airport Improvement Program (AIP) provides funding for airport planning and development projects at airports included in the National Plan of Integrated Airport Systems (NPIAS). As mentioned previously, Tyler Pounds Regional Airport is classified in the NPIAS as a primary commercial service airport. This classification defines the

funding category set up by Congress within which the Airport will be placed and compete for federal funds to assist in Airport development. The goal of this funding is to develop and maintain a nationwide system of public-use airports adequate to meet current and projected growth of civil aviation.

The Airport and Airway Trust Fund, originally established by the Airport and Airway Revenue Act of 1970, generates funds through various aviation taxes, including a domestic passenger ticket tax, a passenger flight segment tax, a passenger ticket tax at rural airports, general aviation fuel tax, commercial fuel tax, international flight tax, and frequent flyer taxes, among others and apportions these revenues based on airport type. The current AIP legislation apportions both entitlement funds and discretionary funds. The distribution of entitlement funding at a primary airport, such as TYR, is apportioned based upon the number of enplanements, or passenger boardings, at the Airport. The base for the normal disbursement of funds are calculated as follows:

- $7.80 for each of the first 50,000 passenger boardings;
- $5.20 for each of the next 50,000 passenger boardings;
- $2.60 for each of the next 400,000 passenger boardings;
- $0.65 for each of the next 500,000 passenger boardings; and
- $0.50 for each passenger boarding in excess of 1 million.

Vision 100 – Century of Flight Authorization Act of 2003, which was signed into law on December 14, 2003, increased AIP funding from $3.4 billion to $3.7 billion through fiscal year 2007. Essentially, this legislation continued a doubling of the apportionment funding under a "Special Rule" for primary airports. Therefore, the following revenues per passenger enplanement were used as applicable to project anticipated funding at TYR through 2007.

- $15.60 for each of the first 50,000 passenger boardings;
- $10.40 for each of the next 50,000 passenger boardings;
- $5.20 for each of the next 400,000 passenger boardings;
- $1.30 for each of the next 500,000 passenger boardings; and
- $1.00 for each passenger boarding in excess of 1 million.

Additionally, airports with service by all-cargo carriers, which are defined as air carriers that only transport cargo, are awarded cargo entitlements through the AIP program. These funds are given out to airports based upon what percent the airport's activity is of the national total landed weight of cargo aircraft operations at all eligible airports. Presently, there are no all-cargo carriers operating at TYR; however, it is conceivable that these types of operations could occur at the airport in the future. This scenario would not only allow the airport to earn additional revenues from the cargo tenant but it would also allow the airport gain eligibility for cargo entitlements under the AIP program.

Thus, in projecting AIP funding over the 20-year planning period, only passenger entitlements were assumed. According to AIP program guidance, entitlement determinations are based upon the enplaned passenger levels for the calendar year two years prior to the then current federal fiscal year. For example, calendar year 2002 levels are used to determine AIP entitlements for federal fiscal year 2004. As a measure of conservatism, it was assumed that the AIP would be authorized below the $3.2 billion minimum threshold required for the "Special Rule" to affect the doubling of AIP entitlements. As a result, the Airport's AIP entitlements from 2008 through the end of the Long-Term CIP were estimated based on the "normal" disbursement formula set forth above and are presented in **Table 8-5**. As shown, in 2007 the airport is expected to earn approximately $1,028,164.80 based on the Vision 100 – Century of Flight Authorization act. Using the assumption that this act will no exist, in 2008 airport entitlements are expected to drop substantially to $533,427.70 in the following year and continue at the lower rate through the remainder of the planning period. This drop will likely affect the amount of funds available for variety of projects

shown in the CIP program and may ultimately affect the amount of local funding contributions or the timing, phasing, or viability projects within the CIP program.

TABLE 8-5
AIP ENTITLEMENT REVENUE PROJECTION

Year	*Enplanements	First 50,000	Next 50,000	Next 400,000	AIP Entitlement Projection
		$15.60	*$10.40*	*$5.20*	
2007	73862	50000	23862		$1,028,164.80
		$7.80	*$5.20*	*$2.60*	
2008	77582	50000	27582	0	$533,427.70
2009	81303	50000	31303	0	$552,773.00
2010	85023	50000	35023	0	$572,118.30
2011	88743	50000	38743	0	$591,463.60
2012	93856	50000	43856	0	$618,053.28
2013	98970	50000	48970	0	$644,642.96
2014	104083	50000	50000	4083	$660,616.32
2015	109197	50000	50000	9197	$673,911.16
2016	114310	50000	50000	14310	$687,206.00
2017	120299	50000	50000	20299	$702,776.36
2018	126287	50000	50000	26287	$718,346.72
2019	132276	50000	50000	32276	$733,917.08
2020	138264	50000	50000	38264	$749,487.44
2021	144253	50000	50000	44253	$765,057.80
2022	151266	50000	50000	51266	$783,292.64
2023	158280	50000	50000	58280	$801,527.48
2024	165293	50000	50000	65293	$819,762.32
2024	172307	50000	50000	72307	$837,997.16
				Total	**$13,474,542.12**

** Enplaned passengers given for the calendar year two years prior to the fiscal year. For example, for fiscal year 2007, the enplaned passengers are given for the calendar year of 2005.*
Source: THE LPA GROUP INCORPORATED, 2006

Discretionary Funding

In addition to entitlement funds, the FAA also distributes discretionary funding. Discretionary funding is made up of two types: "set-aside" funds and "remaining" funds. The "set-aside" funds are allocated for noise compatibility programs and the military airport program. The "remaining" discretionary funds are used primarily for projects that enhance capacity, safety, security, and noise compatibility programs at primary and reliever airports; however, a portion of these remaining discretionary funds are purely discretionary, which may be used for any eligible project at any airport.

Project eligibility for FAA AIP funding is based on guidelines set forth in FAA Order 5100.38B, which is entitled "The Airport Improvement Handbook." Generally, all airport improvement and development projects qualify for funding except for those facilities that generate revenues or those projects associated with revenue-producing facilities. Under most circumstances, projects at small and non-hub airports that qualify for AIP funding are eligible for up to 90 percent of total project costs. The latest AIP authorizing legislation, Vision 100, raised the eligibility cap

to 95 percent for airports classified as "small hub" or smaller through federal fiscal year 2007. In determining eligible project costs, FAA eligibility rules were observed. In order to remain conservative, it was assumed that the AIP authorization would revert back to 90 percent for all AIP projects planned beyond 2007. **Table 8-7** shows a detailed listing of projects anticipated during the planning period and includes federal grant eligibility amounts as applicable.

Passenger Facility Charges

The Aviation Safety and Capacity Expansion Act of 1990 and Part 158 of the Federal Aviation Regulations sets forth the guidelines of the Passenger Facility Charge (PFC) Program, which authorizes commercial service airports to collect a PFC, which at that time was capped at $3.00 per revenue enplanement. PFCs are revenues generated from a charge imposed on enplaning revenue passengers, who have paid for their ticket instead of redeeming various flight vouchers or frequent flier points. These PFC funds are then used to finance capital improvements that have been identified by the City of Tyler's Aviation Department and approved by the FAA prior to PFC implementation. Current legislation allows up to a $4.50 PFC to be imposed on revenue passengers enplaning at an airport. The airline collecting the PFC is allowed to keep a handling fee to cover their program administration costs. This rate is currently set at $.08 per passenger. For the PFC projections in this study, it was estimated that a $0.08 airline handling fee per revenue passenger would continue throughout the planning period. The anticipated levels of PFC revenues have been projected for TYR over the 20-year planning period and are shown in **Table 8-6**. These funds can be used to pay the annual debt service related to PFC eligible projects when approved by the FAA. In its PFC Application, the City of Tyler's Aviation Department anticipates collecting PFCs at the $4.50 ($4.42 after handling fee) level through the remainder of the planning period. The PFC collections shown in **Table 8-6** were estimated to illustrate the potential PFC funding available to City of Tyler's Aviation Department.

Local funding for projects is typically paid through airport reserves, project allocations, or through the City of Tyler's general fund or ½ cent tax fund. Although PFC revenues are often eligible as a source for local project funding, these funds are often not received until a project is either under construction or has been completed. Therefore, as PFC reimbursements are realized, local funding sources are reimbursed by the PFC collections.

TABLE 8-6 PFC REVENUE PROJECTIONS			
Year	Enplanements	PFC charge	PFC Revenues
2005	73862	4.42	$326,470.04
2006	77582	4.42	$342,913.55
2007	81303	4.42	$359,357.05
2008	85023	4.42	$375,800.56
2009	88743	4.42	$392,244.06
2010	93856	4.42	$414,845.29
2011	98970	4.42	$437,446.52
2012	104083	4.42	$460,047.74
2013	109197	4.42	$482,648.97
2014	114310	4.42	$505,250.20
2015	120299	4.42	$531,719.81
2016	126287	4.42	$558,189.42
2017	132276	4.42	$584,659.04
2018	138264	4.42	$611,128.65
2019	144253	4.42	$637,598.26
2020	151266	4.42	$668,597.49
2021	158280	4.42	$699,596.72
2022	165293	4.42	$730,595.94
2023	172307	4.42	$761,595.17
2024	179320	4.42	$792,594.40
		Total	**$10,673,298.87**

THE LPA GROUP INCORPORATED, 2006

Other Funding Options

As shown in **Table 8-4**, the City of Tyler's Aviation Department needs approximately $183 million to cover capital developments from 2006 through the end of the planning period, with over 63% of that amount (about $116 million) will be needed within the first 10 years. It is prudent for the City of Tyler's Aviation Department to continue to seek other sources of funding in order to provide the necessary facilities in a timely manner. Other potential sources of funds, other than undertaking a greater debt burden amount, include non-conventional federal, state, and local government programs as well as private capital investments, some of which are identified below:

- State Agencies: In support of the State airport system, the Texas Department of Transportation (TxDOT) also participates in the development of airport improvements. Presently, the State contributes $30,000 for up to 50% project match on airport pavement improvements. For this reason, an unidentified TxDOT pavement maintenance project has been allocated during each year of the CIP. This project assumes a total cost of $60,000 with 50% match from TxDOT. Nearly $600,000 in State participation is anticipated through the analysis projection period.

- Federal Discretionary Funding: With respect to discretionary grants, it is very difficult to predict reasonable levels that can be applied to the CIP given today's status concerning federal funding of airport-related capital projects. To the extent that projected discretionary grants are not received, the Airport may have to reevaluate

the phasing of the CIP in the future. For the purpose of this study it is assumed that discretionary funding will be available for all eligible projects shown in the CIP throughout the planning period.

- Private Sources: This group of potential funds could include private businesses as well as non-profit grant agencies. While private funding may not be available to make terminal or airfield improvements, private funds may be used to cover some development costs associated with general aviation facilities, corporate hangars, or with the development of a business park. Funding in this category is likely to be limited, but the City of Tyler's Aviation Department should seek out options to identify potential funding from private sources.

Table 8-7 shows a detailed breakdown of all projects expected to occur during the planning period at TYR and includes the various grants and other funding sources that are anticipated from each sector.

Table 8-7 Tyler Pounds Regional Airport Capital Improvement Program

Capital Improvement Program

Phasing / Identifier	Year	Development Items	Development Cost + Contingencies (30%)	FAA	State	PFC	Local	Private / Other Sources	Total
Short-Term Projects (2006-2010)									
S-07A	2007	Acquire Jet Bridges for safe passenger movement	$752,631	$714,999			$37,632		$752,631
S-07B	2007	Property Acquisition (Runway 4-22 ext)	$100,000	$95,000			$5,000		$100,000
S-07C	2007	EA for Runway 4-22 RSA improvements, road reloc, and taxiwa	$800,000	$760,000			$40,000		$800,000
S-07D	2007	Pleasant Retreat Road Relocation (Design)	$474,500	$450,775			$23,725		$474,500
S-07E	2007	Runway 4-22 RSA Grading Improvments Design	$400,000	$380,000			$20,000		$400,000
S-07F	2007	Runway 13 RSA Grading Improvements (Design)	$170,000	$161,500			$8,500		$170,000
S-07G	2007	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
S-07H	2007	Pavement / Maintenance Allocation	$200,000	$190,000			$10,000		$200,000
		Total 2007	**$2,957,131**	**$2,752,274**	**$30,000**		**$174,857**		**$2,957,131**
S-08A	2008	Runway 13 RSA Grading Improvements (construction)	$1,530,000	$1,377,000			$153,000		$1,530,000
S-08B	2008	Runway 13 MALSR Relocation (with RSA improvements)	$260,000	$234,000			$26,000		$260,000
S-08C	2008	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
S-08D	2008	RVZ Tree Clearing Project	$60,000	$54,000			$6,000		$60,000
S-08E	2008	Pavement / Maintenance Allocation	$200,000	$180,000			$20,000		$200,000
S-08F	2008	Pleasant Retreat Road relocation (construction)	$4,270,500	$3,843,450			$427,050		$4,270,500
S-08G	2008	EA for North GA & Commercial Development	$600,000					$600,000	$600,000
		Total 2008	**$6,980,500**	**$5,688,450**	**$30,000**		**$662,050**	**$600,000**	**$6,980,500**
S-09A	2009	Northwest GA Development (Infrastructure)	$6,372,992					$6,372,992	$6,372,992
S-09B	2009	Runway 22 VASI relocation	$39,000	$35,100			$3,900		$39,000
S-09C	2009	Runway 4-22 RSA Improvements (construction)	$4,000,000	$3,600,000			$400,000		$4,000,000
S-09D	2009	Runway 4 Extension (Design)	$384,000	$345,600			$38,400		$384,000
S-09E	2009	FAA Tower - Phase I (Siting)	$50,000					$50,000	$50,000
S-09F	2009	Taxiway G Reconstruct	$635,000	$571,500			$63,500		$635,000
S-09G	2009	Taxiway C connector and H Hold Pad	$650,000	$585,000			$65,000		$650,000
S-09H	2009	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
S-09I	2009	Pavement / Maintenance Allocation	$200,000	$180,000			$20,000		$200,000
		Total 2009	**$12,390,992**	**$5,317,200**	**$30,000**		**$620,800**	**$6,422,992**	**$12,390,992**
S-10A	2010	Taxiway F Extension (along with runway 4-22 ext)	$2,140,000	$1,926,000			$214,000		$2,140,000
S-10B	2010	Runway 4 Extension (Construction)	$1,750,000	$1,575,000			$175,000		$1,750,000
S-10C	2010	Taxiway F MITL	$325,000	$292,500			$32,500		$325,000
S-10D	2010	Parking Improvements (Phase 1) (Terminal Parking)	$611,000				$611,000		$611,000
S-10E	2010	Runway 17-35 Overlay Design	$150,000	$135,000			$15,000		$150,000
S-10F	2010	FAA Tower - Phase II (Design)	$400,000					$400,000	$400,000
S-10G	2010	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
S-10H	2010	Pavement / Maintenance Allocation	$200,000	$180,000			$20,000		$200,000

Table 8-7 Tyler Pounds Regional Airport Capital Improvement Program

Capital Improvement Program

Phasing / Identifier	Year	Development Items	Development Cost + Contingencies (30%)	FAA	State	PFC	Local	Private / Other Sources	Total
S-10I	2010	EA for West GA Development	$150,000					$150,000	$150,000
		Total 2010	**$5,786,000**	**$4,108,500**	**$30,000**		**$1,097,500**	**$550,000**	**$5,786,000**
Intermediate-Term Projects (2011-2015)									
I-11A	2011	Corporate / Commercial Complex (Infrastructure)	$2,340,000					$2,340,000	$2,340,000
I-11B	2011	Taxiway E Rehabilitation	$465,000	$418,500			$46,500		$465,000
I-11C	2011	Taxiway B Rehabilitation	$335,000	$301,500			$33,500		$335,000
I-11D	2011	Runway 17-35 Overlay (Construction)	$1,500,000	$1,350,000			$150,000		$1,500,000
I-11E	2011	Northwest GA Development (Phase 1)	$1,064,440					$1,064,440	$1,064,440
I-11F	2011	Runway 4-22 HIRL	$286,000	$257,400			$28,600		$286,000
I-11G	2011	Runway 4 ILS (MALSR, ILS, and Glideslope)	$1,950,000	$1,755,000			$195,000		$1,950,000
I-11H	2011	FAA Tower - Phase III (Construction)	$4,000,000					$4,000,000	$4,000,000
I-11K	2011	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
I-11L	2011	Pavement / Maintenance Allocation	$200,000	$180,000			$20,000		$200,000
		Total 2011	**$12,200,440**	**$4,262,400**	**$30,000**		**$503,600**	**$7,404,440**	**$12,200,440**
I-12A	2012	Corporate / Commercial Complex (Phase 1)	$2,080,000					$2,080,000	$2,080,000
I-12B	2012	North Commercial Building Infrastructure	$1,105,000					$1,105,000	$1,105,000
I-12C	2012	Master Plan Update	$400,000	$360,000			$40,000		$400,000
I-12D	2012	Runway 4-22 Reconstruction (Phase I)	$7,335,000	$6,601,500			$733,500		$7,335,000
I-12E	2012	Maintenance Complex Roadway and infrastructure	$2,750,000	$2,475,000			$275,000		$2,750,000
I-12F	2012	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
I-12G	2012	Pavement / Maintenance Allocation	$200,000	$180,000			$20,000		$200,000
I-12H	2012	West GA T-Hangar / Box Hangar Complex (Infrastructure)	$2,925,000					$2,925,000	$2,925,000
		Total 2012	**$16,855,000**	**$9,616,500**	**$30,000**		**$1,098,500**	**$6,110,000**	**$16,855,000**
I-13A	2013	Northeast GA Development (Infrastructure)	$4,125,437					$4,125,437	$4,125,437
I-13B	2013	North Commercial Building Development	$2,925,000					$2,925,000	$2,925,000
I-13C	2013	Terminal Building Expansion - (Phase 1)	$612,820	$551,538			$61,282		$612,820
I-13D	2013	Loading Bridge Additions (2 bridges - Phase 1)	$780,000	$702,000			$78,000		$780,000
I-13E	2013	Runway 4-22 Reconstruction (Phase II)	$7,335,000	$6,601,500			$733,500		$7,335,000
I-13F	2013	RAC Service Center Infrastructure and Service Center Improven	$750,000					$750,000	$750,000
I-13G	2013	West GA T-Hangar / Box Hangar Complex (Phase 1)	$3,595,800					$3,595,800	$3,595,800
I-13H	2013	Taxiway E Hold Pad	$71,500	$64,350			$7,150		$71,500
I-13I	2013	Taxiway D Rehabilitation	$335,000	$301,500			$33,500		$335,000
I-13J	2013	Unidentified Txdot pavement maintenance project	$60,000		$30,000		$30,000		$60,000
I-13K	2013	Pavement / Maintenance Allocation	$200,000	$180,000			$20,000		$200,000
I-13L	2013	Taxiway F3 connector	$800,000	$720,000			$80,000		$800,000
		Total 2013	**$21,590,557**	**$9,120,888**	**$30,000**		**$1,043,432**	**$11,396,237**	**$21,590,557**
Note: PFC's come online in 2014									
I-14A	2014	Hotel, Gas Station, and Commercial Infrastructure (NE)	$3,510,000					$3,510,000	$3,510,000
I-14B	2014	Hotel Development (NE)	$12,480,000					$12,480,000	$12,480,000

Table 8-7 Tyler Pounds Regional Airport Capital Improvement Program

Capital Improvement Program

Phasing / Identifier	Year	Development Items	Development Cost + Contingencies (30%)	FAA	State	PFC	Local	Private / Other Sources	Total
I-14C	2014	Commercial Building Development (NE)	$2,925,000					$2,925,000	$2,925,000
I-14D	2014	Runway 22 ILS (MALSR, ILS, and Glideslope)	$1,950,000	$1,755,000		$195,000			$1,950,000
I-14E	2014	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
I-14F	2014	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2014	**$21,125,000**	**$1,935,000**	**$30,000**	**$245,000**		**$18,915,000**	**$21,125,000**
I-15A	2015	Northeast GA Development (Phase 1)	$897,728					$897,728	$897,728
I-15B	2015	Northwest GA Development (Phase 2)	$1,584,440					$1,584,440	$1,584,440
I-15C	2015	Corporate / Commercial Complex (Phase 2)	$4,160,000					$4,160,000	$4,160,000
I-15D	2015	EA for South GA Development	$125,000					$125,000	$125,000
I-15F	2015	Terminal Exit Road Improvements	$448,500			$448,500			$448,500
I-15G	2015	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
I-15H	2015	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
I-15I	2015	Taxiway H Rehabilitation	$675,000	$607,500		$67,500			$675,000
I-15J	2015	Terminal Parking Improvements (Phase 2)	$611,000				$611,000		$611,000
		Total 2015	**$8,761,668**	**$787,500**	**$30,000**	**$566,000**	**$611,000**	**$6,767,168**	**$8,761,668**
Long-Term Projects (2016-2025)									
L-16A	2016	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-16B	2016	South GA Development (Infrastructure)	$4,866,711					$4,866,711	$4,866,711
L-16C	2016	Taxiway A Reconstruction and Rehab	$1,955,000	$1,759,500		$195,500			$1,955,000
L-16D	2016	Master Plan Update	$400,000	$360,000		$40,000			$400,000
L-16E	2016	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2016	**$7,481,711**	**$2,299,500**	**$30,000**	**$285,500**		**$4,866,711**	**$7,481,711**
L-17A	2017	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-17B	2017	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2017	**$260,000**	**$180,000**	**$30,000**	**$50,000**			**$260,000**
L-18A	2018	West GA T-Hangar / Box Hangar Complex (Phase 2)	$3,595,800					$3,595,800	$3,595,800
L-18B	2018	South GA Development (Phase 1)	$861,900					$861,900	$861,900
L-18C	2018	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-18D	2018	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
L-18E	2018	Taxiway C Reconstruction and Rehab	$1,225,000	$1,102,500		$122,500			$1,225,000
		Total 2018	**$5,942,700**	**$1,282,500**	**$30,000**	**$172,500**		**$4,457,700**	**$5,942,700**
L-19A	2019	Runway 13-31 Reconstruction	$10,830,000	$9,747,000		$1,083,000			$10,830,000
L-19B	2019	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-19C	2019	Northeast GA Development (Phase 2)	$1,352,000					$1,352,000	$1,352,000
L-19E	2019	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2019	**$12,442,000**	**$9,927,000**	**$30,000**	**$1,133,000**		**$1,352,000**	**$12,442,000**

Table 8-7 Tyler Pounds Regional Airport Capital Improvement Program
Capital Improvement Program

Phasing / Identifier	Year	Development Items	Development Cost + Contingencies (30%)	FAA	State	PFC	Local	Private / Other Sources	Total
L-20A	2020	Parking Improvements (Phase 3)	$611,000			$611,000			$611,000
L-20B	2020	Taxiway F Reconstruction and Rehab	$4,050,000	$3,645,000		$405,000			$4,050,000
L-20C	2020	South GA Development (Phase 2)	$3,447,600					$3,447,600	$3,447,600
L-20D	2020	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-20E	2020	EA for Taxiway L and Taxiway J	$200,000	$180,000		$20,000			$200,000
L-20F	2020	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2020	**$8,568,600**	**$4,005,000**	**$30,000**	**$1,086,000**		**$3,447,600**	**$8,568,600**
L-21A	2021	Master Plan Update	$400,000	$360,000		$40,000			$400,000
L-21B	2021	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-21C	2021	EA for Taxiway A and Taxiway K	$300,000	$270,000		$30,000			$300,000
L-21D	2021	Terminal Building Expansion - (Phase 2)	$693,940			$693,940			$693,940
L-21E	2021	Loading Bridge Additions (2 bridges - Phase 2)	$780,000			$780,000			$780,000
L-21F	2021	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2021	**$2,433,940**	**$810,000**	**$30,000**	**$1,593,940**			**$2,433,940**
L-22A	2022	Taxiway A Extension with A1, A3, A4, hold pads, G, and north	$240,500	$216,450		$24,050			$240,500
L-22B	2022	Taxiway K with K4 and hold pad	$5,300,000	$4,770,000		$530,000			$5,300,000
L-22C	2022	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-22D	2022	Taxiway L (RW 17-35 full parallel with hold pads and L1 conne	$7,429,500	$6,686,550		$742,950			$7,429,500
L-22E	2022	Taxiway J & J1 Connector	$2,756,000	$2,480,400		$275,600			$2,756,000
L-22F	2022	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
L-22G	2011	Taxiway A MITL	$5,263,000	$4,736,700			$526,300		$5,263,000
		Total 2022	**$15,986,000**	**$14,333,400**	**$30,000**	**$1,622,600**			**$15,986,000**
L-23A	2023	West GA T-Hangar / Box Hangar complex (Phase 3)	$4,605,900					$4,605,900	$4,605,900
L-23B	2023	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-23C	2023	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2023	**$4,865,900**	**$180,000**	**$30,000**	**$50,000**		**$4,605,900**	**$4,865,900**
L-24A	2024	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-24B	2024	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
		Total 2024	**$260,000**	**$180,000**	**$30,000**	**$50,000**			**$260,000**
L-25A	2025	Parking Improvements (Phase 4)	$611,001				$611,001		$611,001
L-25B	2025	Unidentified Txdot pavement maintenance project	$60,000		$30,000	$30,000			$60,000
L-25C	2025	Pavement / Maintenance Allocation	$200,000	$180,000		$20,000			$200,000
L-25D	2025	South GA Development (Phase 3)	$3,120,000					$3,120,000	$3,120,000
L-25E	2025	Runway 4-22 Rehabilitation	$2,500,000	$2,250,000		$250,000			$2,500,000
L-25F	2025	Runway 17-35 Reconstruction	$10,255,000	$9,229,500		$1,025,500			$10,255,000
		Total 2025	**$16,746,001**	**$11,659,500**	**$30,000**	**$1,325,500**	**$611,001**	**$3,120,000**	**$16,746,001**
		Total (2006-2025)	**$183,634,140**	**$88,445,612**	**$570,000**	**$8,180,040**	**$6,422,740**	**$80,015,748**	**$183,634,140**

FINANCIAL FEASIBILITY ASSESSMENT

The previous discussion has focused on the needed developments at TYR over the 20-year planning period. Several sources of funding are being considered to cover the expense of Airport capital development costs. Although a cash flow assessment was conducted for the entire planning period, the financial feasibility component focuses primarily on the initial 10 years of the planning period. The purpose of this assessment was to generally assess the Airport's ability to fund the previously discussed CIP through 2016. This assessment assumes that the maximum discretionary AIP funds are received for those projects meeting FAA AIP eligibility requirements during the short-term period. Therefore, the City of Tyler's Aviation Department would only be responsible for those amounts related to the local share match for AIP projects and for non-AIP eligible project costs.

Cash Flow Analysis

The first step in this financial assessment was to compile information related to historical income and expenditures at TYR. Using this data as a starting point, future revenue and expenditures were then estimated from 2006 through 2024. The yearly data reflects TYR's fiscal year, which runs from October 1 of the prior year to September 30 of the current fiscal year. The initial values for 2005 were obtained from City of Tyler staff and were based upon the budget previously adopted by the City Commission. Descriptions of each category as well as the assumptions that were made regarding each category's projection are discussed below.

Operating Revenues

There are a variety of businesses located at TYR that pay rent based upon either building or land area occupied, or commissions based upon the amount of gross revenue the company collects. Key items under this heading include FBO's, rental car, fuel flowage, public parking, interest income and terminal concessions. Revenues generated at or by the airport are currently invoiced and collected by airport administration staff. The following list denotes the operating revenue assumptions used during the development of the Cash Flow Analysis spreadsheet for TYR:

- Airline facility rental revenues utilized the base revenue of $75,203 and included a $.25 charge for each commercial passenger through 2007. Afterward, passenger charges were increased to $.50 through 2024.
- Misc. rent and car leasing agency rental fees were both increased at 2.5% annually throughout the remainder of the planning period.
- Long-term parking fees were estimated at $6.01 per enplanement; therefore, this factor was applied to future enplanement projections through the year 2024.
- Landing fees were estimated at $5.36 per commercial landing; therefore, this factor was applied to future enplanement projections through the year 2024.
- The restaurant concession was recently negotiated through the year 2010. Existing leasehold assumptions were used until 2010 and then these revenues were increased at 3% for each year thereafter.
- FAA building space utilized existing leasehold assumptions through 2008 and then these revenues were increased at 1.25% annually for each year thereafter.
- Distributed interest, and interest income on PFC's and Agricultural leases were assumed to remain constant throughout the planning period.

- Land leases and FBO leases were increase annually by 2.5% and then adjusted every few years in anticipation of lease renegotiations.

Service Charges & Miscellaneous Income

Fees earned through airport fuel flowage, copying, passenger facility charges, and advertising space fees all fall under the category of service charges. Income generated from prior balances, oil leases & royalties, and other miscellaneous sources are categorized under the miscellaneous income section. The following assumptions were used to forecast revenues in these categories:

- Fuel flowage fees were calculated at an average of $.573 per general aviation operation; therefore, flowage fees were estimated by multiplying this factor by the number of forecast general aviation operations throughout the planning period. Fuel flowage fees do not apply to commercial fuel flowage.

- Advertising fees, copying fees, and miscellaneous income were all increased by 2.5% annually.

Operating Expenses

Operating and maintenance (O&M) expenses relate to the general day-to-day operational costs and the necessary maintenance that is required to keep Airport facilities in good operating order. For budgetary purposes, these expenses are spread among the operating departments of the Airport. These departments include administration, Airport services, janitorial/maintenance, operations and public safety. The following list denotes the operating expense assumptions used during the development of the Cash Flow Analysis spreadsheet for TYR:

- Salaries were increased at a rate of 2% annually and an additional employee with a salary of $40,000 was recognized every three years (2008, 2011, 2014, 2017, 2020, and 2023).

- Utilities were increased by 25% during the first year and then escalated at 3% annually through the remainder of the planning period.

- Sundry items, services, supplies, and maintenance were all increased by 3% annually.

Transfers In

The Transfers In category includes funds that are being transferred from surplus recognized within the ending balance of prior years. The funds within this category are shown to illustrate the amount of revenues that can be accrued over time provided that all previously identified funding sources deliver. This account can be used to save up for large projects later in the program or can be used to pay for unexpected expenses and project overruns that may occur in the future.

Capital Projects

Another major category of annual expenditures pertains to the development of capital items. At TYR, these costs are related to major facility improvements to existing structures or to the construction of new buildings as well as the purchase of higher priced equipment such as ARFF vehicles. The capital project totals from each year were taken from the Capital Improvement Program shown in **Table 8-7**.

Debt

Although many projects listed in the CIP program are eligible to receive grant funding from state and/or federal agencies, almost all projects require a portion of funding to be provided through one of the airport's local funding mechanisms. During times when the airport lacks the required capital, local funds may be obtained from alternate sources such as the City's general fund or through 1/2 cent tax proceeds. Similar to other types of loans, both the City's general fund and the 1/2 cent tax funds will often require repayment including accrued interest charges. Larger projects that require substantial local contributions will likely favor bond financing in order to prevent a strain on local government's finances. General Airport Revenue Bonds (GARBs) are the typical instrument used during these circumstances. The GARBs rely on revenues generated by the airport and/or PFCs to pay the debt service and interest on bonds. If possible, bond financing should be used only after all other sources of revenue have been exhausted.

Summary

As pointed out earlier, the various projects listed in **Table 8-7** show the total project costs along with the respective amount of funding anticipated from each agency during each year. The remaining balances, those not eligible for grants or PFCs, are paid for by local or private funding sources. In order to obtain a vision of what impact future CIP projects have on airport finances, revenues obtained from federal, state, local, and private sources were incorporated into the Capital Improvement Program column of the Cash Flow Analysis Worksheet, **Table 8-8**. It is assumed that local funds, if required, would be obtained from the general fund and/or by using ½ cent tax proceeds to cover the remainder of CIP program resources. An evaluation of the Cash Flow Analysis Worksheet reveals that the Airport could pursue all planned projects shown in the CIP without experiencing a negative balance provided that the City can contribute approximately $4.8 million from the ½ cent tax or general fund through 2013. After 2013, PFCs currently used to pay back the terminal construction financing will once again become available for the airport's use. Afterward, the airport will continue to accrue an ending balance that will grow from $380,000 in 2014 to more than $5 million by the year 2025. Thus, despite the many projects necessary to meet demand projections, the Airport finances will remain stable and growing throughout the planning period. **Table 8-8** shows a detailed view of Airport finances through the year 2025.

Table 8-8 CIP Cash Flow Analysis Worksheet (FY 2006 - FY 2024)
Tyler Pounds Regional Airport

										Forecast Period									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
ENPLANEMENTS	77,582	81,303	85,023	88,743	93,856	98,970	104,083	109,197	114,310	120,299	126,287	132,276	138,264	144,253	151,266	158,280	165,293	172,307	179,320
COMMERCIAL OPERATIONS	10325	10416	10507	10,598	10,857	11,117	11,376	11,636	11,895	12,173	12,451	12,728	13,006	13,284	13,599	13,914	14,229	14,544	14,859
GA / OTHER OPERATIONS	54869	55655	56440	57226	58006	58786	59566	60346	61126	61973	62820	63667	64514	65361	66281	67201	68120	69040	69960
REVENUES																			
Use of Money & Property																			
Airline Facilities Rental	94,598.56	95,528.63	$ 117,714	$ 119,575	$ 122,131	$ 124,688	$ 127,245	$ 129,801	$ 132,358	$ 135,352	$ 138,347	$ 141,341	$ 144,335	$ 147,330	$ 150,836	$ 154,343	$ 157,850	$ 161,356	$ 164,863
Miscellaneous Rent	$ -	$ 10,000	$ 10,250	$ 10,506	$ 10,769	$ 11,038	$ 11,314	$ 11,597	$ 11,887	$ 12,184	$ 12,489	$ 12,801	$ 13,121	$ 13,449	$ 13,785	$ 14,130	$ 14,483	$ 14,845	$ 15,216
Commercial Realty Land Lease						$ 5,000	$ 5,000	$ 18,000	$ 18,000	$ 39,500	$ 45,000	$ 45,000	$ 45,000	$ 55,000	$ 70,000	$ 75,000	$ 75,000	$ 75,000	$ 80,000
Long Term Parking	$ 466,269	$ 488,628	$ 510,987	$ 533,345	$ 586,603	$ 618,561	$ 650,520	$ 682,479	$ 714,438	$ 751,866	$ 789,295	$ 826,724	$ 864,153	$ 901,581	$ 945,415	$ 989,249	$ 1,033,083	$ 1,076,916	$ 1,120,750
Distributed Interest	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421	$ 12,421
Landing Fees	$ 55,342	$ 55,830	$ 56,318	$ 56,805	$ 58,196	$ 59,586	$ 60,976	$ 62,367	$ 63,757	$ 65,246	$ 66,735	$ 68,224	$ 69,713	$ 71,202	$ 72,891	$ 74,579	$ 76,267	$ 77,956	$ 79,644
Airport Restaurant Concession	$ -	2400	$ 3,600	$ 4,200	$ 4,200	$ 4,305	$ 4,413	$ 4,523	$ 4,636	$ 4,752	$ 4,871	$ 4,992	$ 5,117	$ 5,245	$ 5,376	$ 5,511	$ 5,649	$ 5,790	$ 5,934
FAA Building Space Rental	$ 35,934	45052	$ 45,615	$ 46,185	$ 46,763	$ 47,347	$ 47,939	$ 48,538	$ 49,145	$ 49,759	$ 50,381	$ 51,011	$ 51,649	$ 52,294	$ 52,948	$ 53,610	$ 54,280	$ 54,958	$ 55,645
Car Leasing Agencies Rental	$ 168,640	$ 172,856	$ 177,177	$ 181,607	$ 186,147	$ 190,801	$ 195,571	$ 200,460	$ 205,471	$ 210,608	$ 215,873	$ 221,270	$ 226,802	$ 232,472	$ 238,284	$ 244,241	$ 250,347	$ 256,606	$ 263,021
Agricultural Leases	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659	$ 659
Land Leases (FBO etc.)	$ 73,331	82750	$ 82,750	$ 82,750	$ 103,500	$ 106,088	$ 108,740	$ 111,458	$ 114,245	$ 117,101	$ 120,028	$ 123,029	$ 126,105	$ 129,257	$ 132,489	$ 135,801	$ 139,196	$ 142,676	$ 146,243
Interest Income on PFC's	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250											
Total Use of Money & Property	$ 907,445	$ 966,375	$ 1,017,742	$ 1,048,304	$ 1,131,639	$ 1,180,744	$ 1,225,048	$ 1,282,554	$ 1,327,017	$ 1,399,449	$ 1,456,099	$ 1,507,473	$ 1,559,075	$ 1,620,911	$ 1,695,104	$ 1,759,543	$ 1,819,234	$ 1,879,183	$ 1,944,397
Current Service Charges																			
Airport Fuel Flowage Fees	$ 31,440	$ 31,890	$ 32,340	$ 32,790	$ 33,237	$ 33,684	$ 34,131	$ 34,578	$ 35,025	$ 35,511	$ 35,996	$ 36,481	$ 36,967	$ 37,452	$ 37,979	$ 38,506	$ 39,033	$ 39,560	$ 40,087
Copying Fees	$ 639	$ 655	$ 671	$ 688	$ 705	$ 723	$ 741	$ 760	$ 779	$ 798	$ 818	$ 838	$ 859	$ 881	$ 903	$ 925	$ 949	$ 972	$ 997
Passenger Facility Charge (33% of PFC revenues u	$ 114,304	$ 119,786	$ 125,267	$ 130,748	$ 138,282	$ 145,815	$ 153,349	$ 160,883	$ 505,250	$ 531,720	$ 558,189	$ 584,659	$ 611,129	$ 637,598	$ 668,597	$ 699,597	$ 730,596	$ 761,595	$ 792,594
Advertising Space Fees	$ 12,669	$ 15,000	$ 15,375	$ 15,759	$ 16,153	$ 16,557	$ 16,971	$ 17,395	$ 17,830	$ 18,276	$ 18,733	$ 19,201	$ 19,681	$ 20,173	$ 25,000	$ 25,625	$ 25,625	$ 25,625	$ 25,625
Total Service Charges	$ 159,052	$ 167,331	$ 173,653	$ 179,986	$ 188,378	$ 196,780	$ 205,193	$ 213,616	$ 558,884	$ 586,304	$ 613,736	$ 641,180	$ 668,636	$ 696,104	$ 732,479	$ 764,653	$ 796,203	$ 827,753	$ 859,303
Miscellaneous Income																			
Miscellaneous Income	$ 3,102	$ 3,180	$ 3,260	$ 3,341	$ 3,425	$ 3,510	$ 3,598	$ 3,688	$ 3,780	$ 3,875	$ 3,971	$ 4,071	$ 4,172	$ 4,277	$ 4,384	$ 4,493	$ 4,606	$ 4,721	$ 4,839
Total Misc. Income	$ 3,102	$ 3,180	$ 3,260	$ 3,341	$ 3,425	$ 3,510	$ 3,598	$ 3,688	$ 3,780	$ 3,875	$ 3,971	$ 4,071	$ 4,172	$ 4,277	$ 4,384	$ 4,493	$ 4,606	$ 4,721	$ 4,839
Transfers In (Rollover from prior year)		$ 9,428	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 380,706	$ 208,332	$ 691,846	$ 1,151,831	$ 1,644,706	$ 2,183,157	$ 2,725,182	$ 3,313,088	$ 3,943,625	$ 4,553,666
Total Operating Revenues	$ 1,069,600	$ 1,146,314	$ 1,194,655	$ 1,231,631	$ 1,323,441	$ 1,381,034	$ 1,433,838	$ 1,499,858	$ 1,889,681	$ 2,370,334	$ 2,282,139	$ 2,844,569	$ 3,383,714	$ 3,965,998	$ 4,615,124	$ 5,253,872	$ 5,933,130	$ 6,655,282	$ 7,362,205
EXPENSES																			
Salaries	$ 267,241	$ 272,586	$ 318,037	$ 324,398	$ 330,886	$ 377,504	$ 385,054	$ 392,755	$ 440,610	$ 449,422	$ 458,411	$ 507,579	$ 517,731	$ 528,085	$ 578,647	$ 590,220	$ 602,024	$ 654,065	$ 667,146
Benefits	$ 147,784	$ 150,740	$ 175,875	$ 179,392	$ 182,980	$ 208,760	$ 212,935	$ 217,193	$ 243,657	$ 248,531	$ 253,501	$ 280,691	$ 286,305	$ 292,031	$ 319,992	$ 326,392	$ 332,919	$ 361,698	$ 368,932
Supplies	$ 36,408	$ 37,501	$ 38,626	$ 39,784	$ 40,978	$ 42,207	$ 43,474	$ 44,778	$ 46,121	$ 47,505	$ 48,930	$ 50,398	$ 51,910	$ 53,467	$ 55,071	$ 56,723	$ 58,425	$ 60,178	$ 61,983
Services	$ 199,368	$ 205,349	$ 211,509	$ 217,855	$ 224,390	$ 231,122	$ 238,056	$ 245,197	$ 252,553	$ 260,130	$ 267,934	$ 275,972	$ 284,251	$ 292,778	$ 301,562	$ 310,609	$ 319,927	$ 329,525	$ 339,410
Utilities	$ 245,347	$ 252,708	$ 260,289	$ 268,097	$ 276,140	$ 284,425	$ 292,957	$ 301,746	$ 310,798	$ 320,122	$ 329,726	$ 339,618	$ 349,806	$ 360,301	$ 371,110	$ 382,243	$ 393,710	$ 405,521	$ 417,687
Maintenance	$ 81,241	$ 83,678	$ 86,188	$ 88,774	$ 91,437	$ 94,180	$ 97,006	$ 99,916	$ 102,913	$ 106,001	$ 109,181	$ 112,456	$ 115,830	$ 119,305	$ 122,884	$ 126,570	$ 130,368	$ 134,279	$ 138,307
Capital Outlay	$ 30,976	$ 31,750	$ 32,544	$ 37,544	$ 38,483	$ 39,445	$ 44,445	$ 45,556	$ 46,695	$ 51,695	$ 52,987	$ 54,312	$ 59,312	$ 60,794	$ 62,314	$ 67,314	$ 68,997	$ 70,722	$ 77,490
Sundry Items	$ 51,807	$ 53,361	$ 54,962	$ 56,611	$ 58,309	$ 60,058	$ 61,860	$ 63,716	$ 65,627	$ 67,596	$ 69,624	$ 71,713	$ 73,864	$ 76,080	$ 78,363	$ 80,714	$ 83,135	$ 85,629	$ 88,198
Total Operating Expenses	$ 1,060,172	$ 1,087,672	$ 1,178,030	$ 1,212,456	$ 1,243,604	$ 1,337,701	$ 1,375,786	$ 1,410,857	$ 1,508,976	$ 1,551,001	$ 1,590,293	$ 1,692,738	$ 1,739,008	$ 1,782,842	$ 1,889,942	$ 1,940,784	$ 1,989,505	$ 2,101,616	$ 2,159,153
Yearly Net Balance / (Loss)	$ 9,428	$ 68,071	$ 16,625	$ 19,176	$ 79,837	$ 43,334	$ 58,053	$ 89,000	$ 380,706	$ 819,332	$ 691,846	$ 1,151,831	$ 1,644,706	$ 2,183,157	$ 2,725,182	$ 3,313,088	$ 3,943,625	$ 4,553,666	$ 5,203,052
CAPITAL IMPROVEMENT PROGRAM (CIP)																			
Transfers In																			
FAA Entitlement Grant Draws (AIP)		$ 2,752,274	$ 5,688,450	$ 5,317,200	$ 4,108,500	$ 4,262,400	$ 9,616,500	$ 9,120,888	$ 1,935,000	$ 787,500	$ 2,299,500	$ 180,000	$ 1,282,500	$ 9,927,000	$ 4,005,000	$ 810,000	$ 14,333,400	$ 180,000	$ 180,000
TexDot / State Grant Draws		$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000
PFC - Passenger Facility Charges		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 245,000	$ 566,000	$ 285,500	$ 50,000	$ 172,500	$ 1,133,000	$ 1,086,000	$ 1,593,940	$ 1,622,600	$ 50,000	$ 50,000
Private Investment		$ -	$ 600,000	$ 6,422,992	$ 550,000	$ 7,404,440	$ 6,110,000	$ 11,396,237	$ 18,915,000	$ 6,767,168	$ 4,866,711	$ -	$ 4,457,700	$ 1,352,000	$ 3,447,600	$ -	$ -	$ 4,605,900	$ -
Operating Balance (if any)		$ 68,071	$ 16,625	$ 19,176	$ 79,837	$ 43,334	$ 58,053	$ 89,000	$ 380,706	$ 819,332	$ 691,846	$ 1,151,831	$ 1,644,706	$ 2,183,157	$ 2,725,182	$ 3,313,088	$ 3,943,625	$ 4,553,666	$ 5,203,052
Total CIP Transfers	$ -	$ 2,850,345	$ 6,335,075	$ 11,789,368	$ 4,768,337	$ 11,740,174	$ 15,814,553	$ 20,636,125	$ 21,505,706	$ 8,970,000	$ 8,173,557	$ 1,411,831	$ 7,587,406	$ 14,625,157	$ 11,293,782	$ 5,747,028	$ 19,929,625	$ 9,419,566	$ 5,463,052
Local (Transfers In From General Fund or 1/2 cent tax)		$ 106,786	$ 645,425	$ 601,624	$ 1,017,663	$ 460,266	$ 1,040,447	$ 954,432	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total CIP Funds Available		$ 2,957,131	$ 6,980,500	$ 12,390,992	$ 5,786,000	$ 12,200,440	$ 16,855,000	$ 21,590,557	$ 21,505,706	$ 8,970,000	$ 8,173,557	$ 1,411,831	$ 7,587,406	$ 14,625,157	$ 11,293,782	$ 5,747,028	$ 19,929,625	$ 9,419,566	$ 5,463,052
Total CIP Project Costs	$ -	$ 2,957,131	$ 6,980,500	$ 12,390,992	$ 5,786,000	$ 12,200,440	$ 16,855,000	$ 21,590,557	$ 21,125,000	$ 8,761,668	$ 7,481,711	$ 260,000	$ 5,942,700	$ 12,442,000	$ 8,568,600	$ 2,433,940	$ 15,986,000	$ 4,865,900	$ 260,000
End Balance	$ 9,428	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 380,706	$ 208,332	$ 691,846	$ 1,151,831	$ 1,644,706	$ 2,183,157	$ 2,725,182	$ 3,313,088	$ 3,943,625	$ 4,553,666	$ 5,203,052

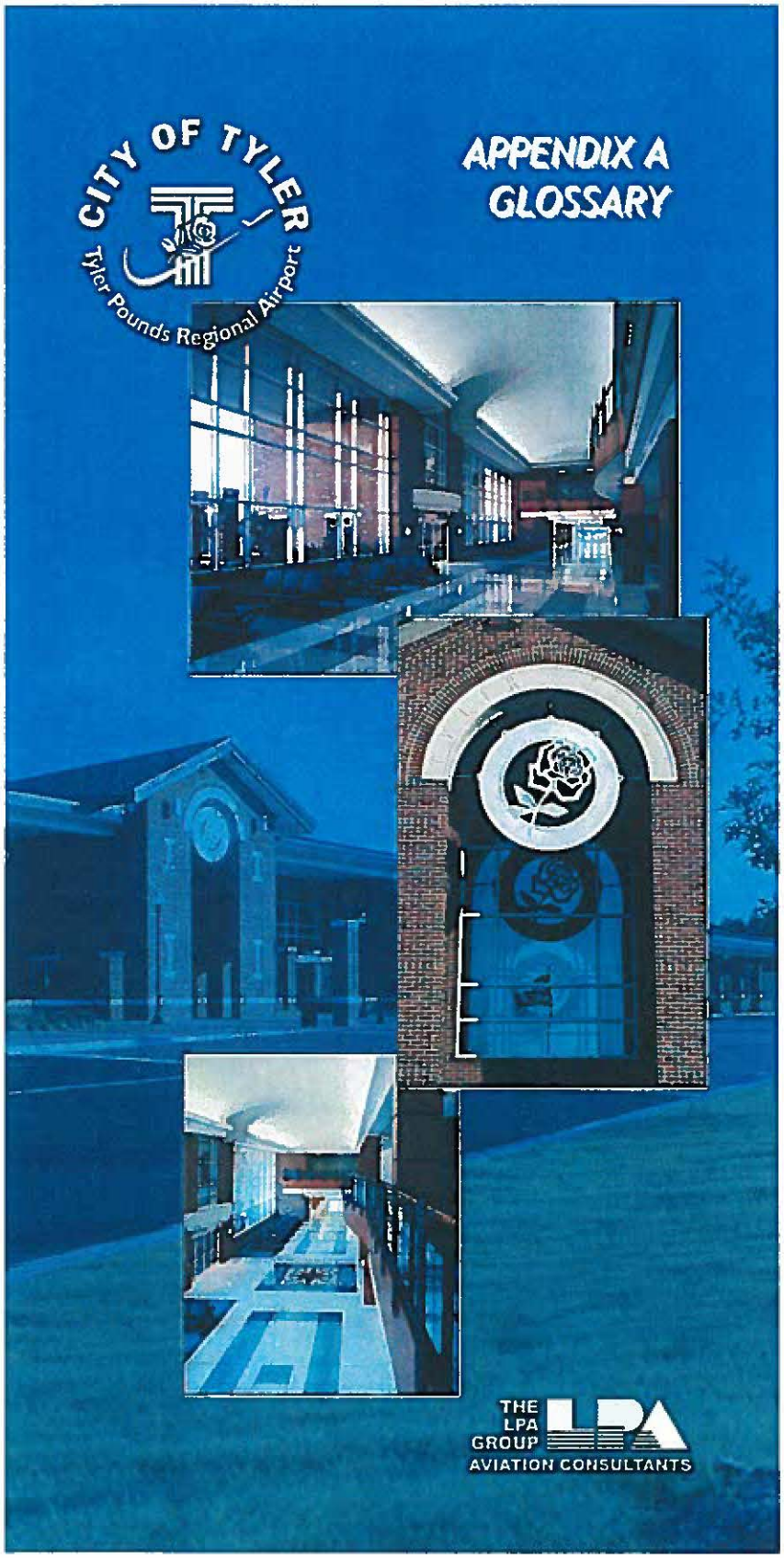
CONCLUSION

TYR is a significant economic catalyst for the City of Tyler and surrounding areas and provides essential aviation service to meet community demand; therefore, it is important that the city be able to undertake the CIP discussed herein so that it can continue to provide these necessary services to the community. Based on the general financial assessment presented in this section, TYR is in a financially stable position regarding operating revenue and expenditures and will actually accrue a surplus of funds by the end of the planning period. As discussed earlier, the actual implementation schedule for the capital projects identified in the CIP may need to be adjusted according to development triggers and the actual demand experienced. As the Airport seeks to move forward with these developments, more detailed financial analyses will be required to take into account the actual financial situation of the Airport at that time. The actual funding for specific projects will be determined as implementation becomes more imminent, and will depend on the Airport's development schedule, its financial health, and the overall local economic conditions

CITY OF TYLER

Tyler Pounds Regional Airport

APPENDIX A
GLOSSARY



THE LPA GROUP

AVIATION CONSULTANTS

APPENDIX A
GLOSSARY OF TERMS

A

ABBREVIATED VISUAL APPROACH SLOPE INDICATOR SYSTEM (AVASI)

ABOVE GROUND LEVEL (AGL)

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA) – The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff (see Declared Distances).

ADVISORY CIRCULAR (AC) – Federal Aviation Administration Advisory Circular. This is an FAA document which provides guidance on aviation issues.

ADVISORY SERVICE – Advice and information provided by a facility to assist pilots in the safe conduct of flight and aircraft movement.

AIR CARGO - Freight, mail, and express packages transported by air. Includes perishable foods and livestock.

AIR CARRIER - Aircraft operating under certificates of public convenience and necessity issued by the FAA, which authorizes scheduled air transportation over specified routes, a limited amount of non-scheduled air transportation over specified routes, and a limited amount of non-scheduled flights.

AIR FORCE BASE (AFB)

AIR NAVIGATION AID FACILITY (NAVAID) – Any facility used or available for use as an aid to air navigation, including landing areas; lights; any apparatus or equipment for disseminating weather information, for signaling, for radio direction-finding, or for radio or other electronic communication; and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or during the landing or takeoff of aircraft.

AIR ROUTE SURVEILLANCE RADAR (ARSR) - Long-range radar that increases the capacity of air traffic control for handling heavy en route traffic. An ARSR site is usually some distance from the Air Route Traffic Control Center it serves. Its range is approximately 200 nautical miles. Also, called ATC Center Radar.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC) - A facility providing air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TAXI - Aircraft operated by a company or individual that provides transportation on a non-scheduled basis over unspecified routes usually with light aircraft.

AIR TAXI - A FAR Part 135 certificated air carrier carrying passengers and cargo for hire and operating under exemption authority from the Civil Aeronautics Board; aircraft of 30 seats or less or maximum payloads of 7,500 lbs.

AIR TRAFFIC CONTROL CLEARANCE – An authorization by air traffic control for the purpose of preventing collision between known aircraft, or for an aircraft to proceed under specified traffic conditions within controlled airspace. A clearance is also a communicated authorization or approval from ATC for an aircraft to conduct certain maneuvers, such as altering heading or altitude, taking off, and landing.

AIR TRAFFIC CONTROL SERVICE (ATC) – A service provided for the purpose of promoting the safe, orderly, and expeditious flow of air traffic, including airport, approach, and en route air traffic control services. ATC is provided by the Federal Aviation Administration, a branch of the federal government under the Department of Transportation.

AIR TRAFFIC CONTROL TOWER (ATCT) – A facility providing airport traffic control service to an airport and its associated airspace area.

AIR TRANSPORT ASSOCIATION (ATA)

AIRCRAFT APPROACH CATEGORY - A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft that falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are:

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; and,
Category E - Speed 166 knots or more.

AIRCRAFT CLASSES - For the purposes of wake turbulence separation minima, ATC classifies aircraft as heavy, large, and small as follows:

Heavy - Aircraft of 300,000 pounds or more maximum certification;
Large - Aircraft of more than 12,500 pounds but less than 300,000 pounds, maximum certificated takeoff weight; and,
Small - Aircraft of 12,500 pounds or less maximum certificated takeoff weight.

AIRCRAFT PARKING LINE LIMIT – An aircraft parking line limit is a line established by FAA AC 5300-13, beyond which no part of a parked aircraft should protrude.

AIRCRAFT RESCUE AND FIREFIGHTING FACILITIES (ARFF)

AIRCRAFT TYPES - An arbitrary classification system that identifies and groups aircraft having similar operational characteristics for the purpose of computing runway and terminal area capacity.

AIRPLANE DESIGN GROUP (ADG) (PHYSICAL CHARACTERISTICS) – The FAA airplane Design Group subdivides airplanes by wingspan. The airplane Design Groups are:

(1) Group I: Wingspan up to but not including 49 feet (15 m);
(2) Group II: Wingspan 49 feet (15 m) up to but not including 79 feet (24 m);
(3) Group III: Wingspan 79 feet (24 m) up to but not including 118 feet (36 m);
(4) Group IV: Wingspan 118 feet (36 m) up to but not including 171 feet (52 m);
(5) Group V: Wingspan 171 feet (52 m) up to but not including 197 feet (60 m);
(6) Group VI: Wingspan 197 feet (60 m) up to but not including 262 feet (80 m).

AIRPLANE DESIGN GROUP (ADG) - A grouping of airplanes based on 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; and,
Group VI: 214 feet up to but not including 262 feet.

AIRPORT AIRSPACE ANALYSIS (AAA)

AIRPORT DESIGN (AD)

AIRPORT DEVELOPMENT AID PROGRAM (ADAP) – A program originally established by the Airport and Airway Development Act of 1970 to provide federal funds for certain airport improvements and new airport development; the original legislation has been revised on various occasions, resulting in the present day Airport and Airway Improvement Act of 1982. This program has been replaced by the Airport Improvement Program (AIP).

AIRPORT HAZARD – An airport hazard is any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport.

AIRPORT IMPROVEMENT PROGRAM (AIP) - The AIP provides federal funding from the Aviation Trust Fund for airport development, airport planning, noise compatibility planning, and similar programs. The AIP is implemented under various authorization acts that cover a specific time period.

AIRPORT LAYOUT PLAN (ALP) – An airport layout plan is a scale drawing of the airport showing:

(1) The boundaries of the airport and all its proposed additions together with the boundaries of offsite areas owned or controlled by the airport authorities for air-purposes, including additions;
(2) The exact location, type, and dimensions (including height) of all existing and proposed airport facilities and structures such as runways, taxiways, aprons, terminal buildings, and roads, as well as all proposed extensions and reductions of existing airport facilities; and,
(3) The location of all existing and proposed non-aviation areas and all their existing improvements.

AIRPORT LAYOUT PLAN DRAWING SET -The airport layout plan drawing set consists of a number of graphics drawn to scale, showing both existing and planned airport facilities as well as on-airport and adjoining-airport land uses. Depending on the specific requirements of the planning project, airport size, and activity level, some drawings may not be required or can be combined. Drawings that should be created:

- Title Sheet;
- Airport Layout Drawing;
- Terminal Area Drawing;
- Inner Portion of the Approach Surface Drawing;
- Airport Airspace Drawing;
- Airport Property Drawing;
- Land Use Drawing; and,
- Airport Access Drawing.

AIRPORT REFERENCE CODE - The airport reference code (ARC) is a coding system used to relate airport design criteria to the operational and physical characteristics of airplanes anticipated to operate at the airport. As described in FAA AC 150/5300-13, the ARC is made up of two components. The first considers the aircraft approach category to be served. For example, aircraft with approach speeds of less than 91 knots are within Category A. Speeds of 91 knots but less than121 knots are within Category B. Speeds of 121 knots but less than 141 knots are within Category C, and speeds of 141 knots but less than 166 knots are within Category D. The second component considers the airplane design group (ADG) to be served, which is based on wingspan. For example, Group I includes aircraft having a wing span of up to but not including 49 feet. Group II includes aircraft having a wing span of 49 feet up to but not including 79 feet, and Group III includes aircraft having a wingspan of 79 feet up to but not including 118 feet.

AIRPORT REFERENCE POINT (ARP) – An ARP is a point having equal relationship to all existing and proposed landing and takeoff which is used to locate the airport geographically.

AIRPORT ROLE - The capability of an airport defined in terms of the classes of aircraft that it can accommodate or in the case of air carrier airports, the route length it serves non-stop in its market area.

AIRPORT SERVICE LEVEL - Classification of an airport based on its functional role in the community. Service levels include:

- Commercial Service Airport;
- General Aviation Airport; and,

• Reliever Airport.
(See specific service level type for definition).

AIRPORT SURFACE DETECTION EQUIPMENT (ASDE) – Radar equipment specifically designed to detect all principal features on the surface of an airport, including vehicular traffic, and to present the entire picture on a radar indicator console.

AIRPORT SURVEILLANCE RADAR (ASR) - Radar tracking aircraft by azimuth and range data without elevation data. It has a range of 50 miles. Also, called ATC Terminal Radar.

AIRPORT SURVEILLANCE RADAR (ASR) – Radar providing the position of an aircraft by azimuth and range data without elevation data. It is used for terminal approach, departure, and aircraft overflights.

AIRPORTS DISTRICT OFFICE (ADO) - Administrative regional office of FAA that oversees airport development projects.

AIRSPACE - The space above a certain area of land or water, used for flight, landings, and takeoffs.

AIRWAY – A control area in the form of a corridor, in which the centerline is defined by radio or other navigational aids. Airways are used by aircraft in a similarly to the way automobiles use highways.

AIRWAY FACILITIES SECTOR FIELD OFFICE (AFSFO)

ALERT AREA - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude where DOD flight training occurs.

ALSF-II - High intensity approach lighting system with sequenced flashing lights.

ALTERNATE AIRPORT – An airport specified on a flight plan to which a flight may proceed when a landing at the point of first intended landing becomes inadvisable.

ANNUAL SERVICE VOLUME (ASV) - A reasonable estimate of the maximum number of annual aircraft operations that can theoretically be conducted at an airport, based on configuration, aircraft fleet mix, use, etc.

APPROACH CONTROL SERVICE – Air traffic control service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, tower en route control service.

APPROACH END OF RUNWAY – The approach end of runway is the near end of the runway as viewed from the cockpit of a landing airplane.

APPROACH FIX – The navigational point, determined electronically or geographically, from or over which the final approach (IFR) to an airport is executed.

APPROACH GATE – That point on the final approach course which is one mile from the approach fix on the side away from the airport or five miles from the landing threshold, whichever is farther from the landing threshold.

APPROACH LIGHT SYSTEM (ALS) – An airport lighting system designed to assist pilots in finding the runway during instrument approaches for landing. The lights extend from the runway end outwards along the extended centerline for a certain distance, depending on the type of runway.

APPROACH SEQUENCE – The order in which aircraft are positioned while awaiting approach clearance or while on approach.

APPROACH SURFACE – An imaginary surface extending out from the end of the Primary Surface at a slope and width defined in FAR Part 77, above which the airspace must be free of obstacles as aircraft approach or depart the runway.

AQUEOUS FILM FORMING FOAM (AFFF) –Used by Aircraft Rescue and Fire Fighting (ARFF) vehicles for aircraft related emergencies.

AREA NAVIGATION (RNAV) – A method of navigation that permits aircraft operations on any desired course within the coverage of station referenced navigation signals or within the limits of self-contained system capability.

ARMY NATIONAL GUARD (ANG)

ASPH - Abbreviation for runway surface composed of asphalt.

AUTOMATED RADAR TERMINAL STATION (ARTS)

AUTOMATED WEATHER OBSERVING SYSTEM (AWOS)

AVIATION SAFETY AND NOISE ABATEMENT ACT OF 1979 (ASNA)

AVIGATION EASEMENT - The conveyance of a specified property interest in the airspace over real property which grants rights and imposes restrictions. Rights include: right-of-flight; right-of-entry to remove and/or mark obstructions; right to cause noise, vibration, fumes, dust, and fuel particles, etc. Restrictions include: penetration of Far Part 77 surfaces by structures, growths, or obstructions; creation of electrical interferences with aircraft avionics, lighting that may confuse a pilot during approach, air emissions that may visually impair a pilot's vision, incompatible land uses, etc.

AZIMUTH (AZ) - The horizontal angle measured clockwise from north to an object. Also, see True Bearing.

B

BASED AIRCRAFT - An aircraft permanently stationed at an airport, usually by agreement between the aircraft owner and airport management (or FBO).

BASIC UTILITY AIRPORT - Airports that can accommodate 95 percent of the general aviation propeller-drive fleet of aircraft under 12,500 pounds maximum gross weight.

BRL - Building Restriction Line.

C

CAPACITY - The number of takeoffs and landings that can be safely handled within an acceptable level of delay. Airfield capacity represents the maximum number of operations (landings and takeoffs) that can be performed hourly or annually at an airport.

CATEGORY I, II, AND III LANDINGS –

- Category I: 200 foot ceiling and 2400 foot RVR;
- Category II: 100 foot ceiling and 1200 foot RVR;
- Category IIIA: zero ceiling and 700 foot RVR;
- Category IIIB: zero ceiling and 150 foot RVR;
- Category IIIC: zero ceiling and zero RVR.

To make landing under these conditions, aircraft must be equipped with special avionics, pilot must be qualified to land under specified conditions for that category, and aircraft must have proper ground equipment for conditions.

CATEGORY I INSTRUMENT LANDING SYSTEM (CAT I) - Precision Approach Category I. An instrument approach procedure that provides for approaches to a decision height of not less than 200 feet (60m) and visibility of not less than 1/2 mile (800m), or a runway visual range 2,400' (or 1,800' with operative touchdown zone and runway centerline lights).

CATEGORY II INSTRUMENT LANDING SYSTEM (CAT II) - Precision Approach Category II. An instrument approach procedure that provides for approaches to a minima less than CAT I to as low as a decision height of not less than 100 feet (30m) and runway visual range of not less than 1,200'.

CATEGORY III A INSTRUMENT LANDING SYSTEM (CAT III A) - Precision Approach Category III. An instrument approach procedure which provides for approaches to a minima less than CAT II.

CEILING – The height above the earth's surface of the lowest layer of clouds or obscuring phenomena that is reported as "broken", "overcast", or "obscured" and not classified as "thin" or "partial". The ceiling is reported in feet above the surface in a given location.

CENTER FIELD WIND (CFW)

CENTERLINE LIGHTING (CL)

CENTRAL BUSINESS DISTRICT (CBD)

CERTIFICATED POINT – A city, place, or population center authorized to receive scheduled air service under a Certificate of Public – Convenience and Necessity, or under an exemption issued to an air carrier.

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY - A document issued to an air carrier under Section 401 of the Federal Aviation Act by the Civil Aeronautics Board authorizing the carrier to engage in air transportation.

CIRCLING APPROACH - A descent in an approved procedure to an airport; a circle-to-land maneuver.

CIVIL AERONAUTICS BOARD (CAB) - Former federal agency responsible for overseeing and regulating the air carrier industry; the FAA carries out these tasks.

CIVIL AIR FACILITY (CAF)

CLEAR ZONE - Formally, the inner portion of the runway approach zone, now called the Runway Protection Zone (RPZ).

CLEAR ZONE – Defined by FAR Part 77 as an area off each runway end to be void of trees and other obstacles. The FAA has replaced this area with the Runway Protection Zone (RPZ).

CLEARWAY (CWY) - A defined rectangular area beyond the end of a runway cleared or suitable for use in lieu of a runway to satisfy takeoff distance requirements.

CLEARWAY – A clearway is an area beyond the stop end of runway, not less than 500 feet (150 m) wide, centered on the extended centerline of the runway, and controlled by the airport authorities. The clearway is expressed in terms of a geometric plane extending from the end of the runway, with an upward slope not exceeding 1.25 percent, above which no object nor terrain may protrude. Threshold lights, however, may protrude above the clearway plane if their height above the end of the runway is 26 inches (66 cm) or less and if they are located to each side of the runway. A clearway increases the allowable operating takeoff weights of turbine-powered airplanes. For most airplanes, the maximum usable length of the clearway is less than 1,000 feet (300 m).

CODE OF FEDERAL REGULATION (CFR)

COMMERCIAL SERVICE AIRPORT - An airport that handles scheduled passenger service by FAA-certified air carriers.

COMMERCIAL SERVICE AIRPORT – A public airport which enplanes 2,500 or more passengers annually and receives scheduled commercial passenger service. See "AIR CARRIER" for more information.

COMMUTER AIRLINE - Aircraft operated by an airline that performs scheduled flights over specified routes using light aircraft. Light aircraft have 30 seats or less and a maximum payload capacity of 7,500 pounds or less.

COMMUTER AIRLINES – Scheduled commuter air carrier operating with passengers, cargo, or mail for revenue in accordance with FAR Part 135 or Part 121.

COMPOSITE NOISE RATING (CNR) – An aircraft noise impact measuring methodology.

CONTROL TOWER - A central operations facility in the terminal air traffic control system consisting of a tower cab structure (including an associated 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.

CONTROLLED AIRSPACE - An airspace of defined dimensions within which air traffic control service is provided to IFR and VFR flights in accordance with the airspace classification.

Note 1: Controlled airspace is a generic term that covers Class A, Class B, Class C, Class D, and Class E airspace.

Note 2: Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in Part 91 (for specific operating requirements, please refer to Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an airport contains at least one primary airport around which the airspace is designated (for specific designations and descriptions of the airspace classes, please refer to Part 71). Controlled airspace in the United States is designated as follows:

• **Class A** - Generally, the airspace from 18,000 feet MSL up to and including Flight Level 600 (60,000 feet), including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous states and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.

• **Class B** - Generally, the airspace from the surface to 10,000 feet MSL and surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace is individually tailored and consists of a surface area and two or more layers (some Class B airspaces resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."

• **Class C** - Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) and surrounding those airports that have an operational control tower, are serviced by a radar approach control, and have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area(s) with a five nautical miles radius and an outer area. Each person must establish two-way radio communications with the ATC facility providing air traffic services before entering the airspace and then maintain communications while in the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.

• **Class D** - Generally, the airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) and surrounding those airports that have an operational control tower. The configuration of each Class D airspace is individually tailored, and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services before entering the airspace and then maintain communications while in the airspace. No separation services are provided to VFR aircraft.

• **Class E** - Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. 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. Also, in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to and from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles off the coast of the 48 contiguous states and Alaska, and up to, but not including, 18,000 feet MSL, and the airspace above FL600.

D

DAY-NIGHT AVERAGE SOUND LEVEL (DNL) - The 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7:00a.m., and between 10:00 p.m. and midnight, local time. The symbol for DNL is Ldn.

DAY NIGHT AVERAGE SOUND LEVEL – NOISE METRIC (DNL) – Standard unit of measure for aircraft noise studies.

DECIBEL (Db)

A-WEIGHTED DECIBEL (DbA)

DECISION HEIGHT (DH) - The height at which a decision must be made, using an ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.

DECISION HEIGHT (DH) – The height above the highest runway elevation in the touchdown zone at which a missed approach shall be initiated if the required visual reference has not been established. This term is used only in procedures where an electronic glide slope provides the reference for descent, as in ILS.

DECLARED DISTANCES - The distances the airport owner declares available and suitable for satisfying the airplane's takeoff run, takeoff distance, accelerate stop distance, and landing distance requirements. The distances are: (see TORA, TODA, ASDA, and LDA).

DECLARED DISTANCES – Declared distances are the runway distances that limit turbine-powered airplane operations and thus the airport operational capacity. The distances are the accelerated stop distance available (ASDA), the Landing Distance Available (LDA), the Takeoff Distance Available (TODA), and the Takeoff Run Available (TORA).

1) ASDA is equal to TORA plus the length of the stopway (SWY), if provided.

2) LDA is equal to the length of runway available and suitable for the landing ground run of airplanes.

3) TODA is equal to TORA plus the length of the clearway (CWY), if provided.

4) TORA is equal to the length of runway available and suitable for the takeoff ground run of airplanes.

DEPARTMENT OF DEFENSE (DOD)

DEPARTURE CONTROL – A function of air traffic control providing service for departing IFR aircraft and, on occasion, VFR aircraft.

DESIGN AIRCRAFT – The Design Aircraft is an aircraft whose dimensions and/or other requirements make it the most demanding aircraft for an airport's facilities (i.e., runways and taxiways). The Design Aircraft is used as the basis for airport planning and design; because if the airport's facilities are designed to accommodate the Design Aircraft, they can accommodate less demanding aircraft as well. An aircraft can be utilized as the Design Aircraft for an airport if it will (has) conduct(ed) 500 or more annual operations (250 landings) at that airport.

DISPLACED THRESHOLD - The portion of pavement behind a displaced threshold may be available for takeoffs in either direction and roll-out landings from the opposite direction.

DISPLACED THRESHOLD – A displaced threshold is a threshold located at a point on the runway other than at the runway end. Except for the approach standards defined in FAR Part 77, approach surfaces are associated with the threshold location.

DISTANCE MEASURING EQUIPMENT (DME) - An electronic installation with either a VOR or ILS to provide distance information from the facility to pilots by electronic signals. It measures, in nautical miles, the distance of an aircraft from a NAVAID.

DISTANCE MEASURING EQUIPMENT (DME) – Equipment (airborne and ground) used to measure, in nautical miles, the distance of an aircraft from a NAVAID.

DME FIX – A geographical position determined by reference to a NAVAID which provides distance and azimuth information. The DME fix is defined by a specified distance in nautical miles and a radial in degrees magnetic from that aid.
DXF - AutoCAD Drawing Interchange file format.

E

ELEVATION (EL)

EN ROUTE - The route of flight from departure to destination, including intermediate stops (excludes local operations).

EN ROUTE AIRSPACE - Controlled airspace above and/or adjacent to terminal airspace.

EN ROUTE FLIGHT ADVISORY SERVICE (Flight Watch) – Is a service specifically designed to provide the pilot with timely weather information pertinent to his type of flight, route of flight, and altitude.

ENPLANED PASSENGER – The number of revenue passengers boarding aircraft, including originating, stopover, and transfer passengers.

ENPLANEMENTS - The total number of revenue passengers boarding aircraft, including originating, stopover, and transfer passengers in scheduled and nonscheduled services.

ENVIRONMENTAL ASSESSMENT (EA)

ENVIRONMENTAL DATA SERVICE (EDS)

ENVIRONMENTAL IMPACT STATEMENT (EIS) – An environmental report describing environmental impacts which would occur during the implementation of airport improvement projects. This report includes mitigation measures and public comment.

ENVIRONMENTAL PROTECTION AGENCY (EPA)

F

FEDERAL AID TO AIRPORTS PROGRAM (FAAP) – FAA program to provide financial aid to airports. This has been replaced by the Airport Improvement Program (AIP).

FEDERAL AVIATION ADMINISTRATION (FAA) – Branch of the Federal Government (Department of Transportation) responsible for the safety of aviation and the operation of the air traffic control system, as well as other aviation related tasks.

FEDERAL AVIATION REGULATION (FAR) – Regulations developed by the FAA in order to maintain safety, define standards, and institute uniform practices throughout the industry.

FILLET – A concave junction formed where two surfaces meet (as at an angle), a strip that gives a rounded appearance to such a junction; also, a strip to reinforce the corner where two surfaces meet.

FINAL APPROACH – A flight path of a landing aircraft in the direction of landing along the extended runway centerline from the base leg to the runway. For instrument approaches, the final approach begins at the final approach fix (FAF).

FINAL APPROACH FIX (FAF) – The fix from or over which final approach (IFR) to an airport is executed.

FINAL APPROACH IFR - The flight path of an aircraft that is inbound on an approved final instrument approach course, beginning at the point of interception of that course and extending to the airport or the point where circling for landing or missed approach is executed.

FINAL APPROACH VFR - A flight path of landing aircraft in the direction of landing along the extended runway centerline from the base leg to the runway.

FISCAL YEAR (FY)

FIX – A geographical position determined by visual reference to the surface by reference to one or more radio NAVAIDS, by celestial plotting, or by another navigational device.

FIXED BASE OPERATION OR FIXED BASE OPERATOR (FBO) – A sales and/or service facility located at an airport, or the person who operates such a facility.

FLEET MIX - The proportion of aircraft types or models expected to operate at an airport.

FLIGHT PLAN – Specified information relating to the intended flight of an aircraft that is filed orally or in writing with an air traffic control facility.

FLIGHT SERVICE STATION (FSS) - A facility operated by the FAA to provide flight assistance services.

FLIGHT TRACK (FT)

G

GENERAL AVIATION (GA) – All civil aircraft and aviation activity except that of the certified air carriers and military operations. GA includes corporate flying and private flying (recreation or personal).

GENERAL AVIATION AIRPORT - All public airports except commercial service airports.

GENERAL UTILITY (GU) AIRPORT - Airports that can accommodate all general aviation aircraft under 12,500 pounds maximum gross weight.

GENERIC VISUAL GLIDESLOPE INDICATOR (GVGI) – This is a general term which includes all airport light systems used to assist pilots in maintaining the proper glideslope while on final approach to the runway during landing. These systems use colored lights to warn pilots of their position in reference to the proper glideslope. GVGI's include Precision Approach Path Indicators (PAPI) and Visual Approach Slope Indicators (VASI).

GLIDE SLOPE (GS) – Vertical guidance provided by a ground based radio transmitter to an aircraft landing by use of an Instrument Landing System. This guidance informs the pilot if the aircraft is either too high or too low as it flies its approach to the runway for landing.

GLOBAL POSITIONING SYSTEM (GPS) - A system of navigation beacons mounted on satellites that orbit the earth. The system allows users to fix their position to a high degree of accuracy anywhere on earth.

GLOBAL POSITIONING SYSTEM (GPS) – GPS is a navigational system based on the use of multiple satellites strategically placed in the earth's orbit. GPS is used by aircraft equipped with the proper GPS receiving equipment for en route navigation, as well as instrument approaches to airports for landing. GPS allows aircraft to fly more freely and set waypoints (destinations) without the need or reliance on ground based radio navigation facilities such as VORs.

GROUND SERVICE (GS) – An indication that a given airport is staffed – usually offering aviation fuel and at least minor maintenance services.

H

HAZARD TO AIR NAVIGATION – Any object which has a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft or on the operation of air navigation facilities is a hazard to air navigation. The FAA will conduct an aeronautical study of any object to determine whether or not the object is a hazard to air navigation. As part of the airport layout plan approval process, the FAA conducts aeronautical studies of all obstructions to air navigation identified on the Airport Layout Plan. Hazards or potential hazards to air navigation are eliminated by either altering the existing or proposed object or adjusting the aviation operation to accommodate the object, in that order of priority.

HEIGHT ABOVE AIRPORT (HAA) – Indicates the height of the MDA above the published airport elevations. This is published in conjunction with circling minimums.

HELIPORT - A specialized airport for the exclusive operation and basing of rotorcraft.

HERTZ (Hz) – Cycles per second.

HIGH ALTITUDE AIRWAYS - Air routes above 18,000 feet MSL. These are referred to as Jet Routes.

HIRL - High Intensity Runway Edge Lighting.

HOLDING - A predetermined maneuver that keeps an aircraft within a specified airspace while awaiting clearance to land.

HOLDING FIX – A specified geographical point or NAVAID used as a reference point in establishing and maintaining the position of an aircraft while holding.

HUD - Department of Housing and Urban Development.

I

IFR CONDITIONS – Weather conditions below the minimum prescribed for flight under VFR.

INITIAL APPROACH – The segment of a standard instrument approach procedure between the initial approach fix and the intermediate fix, or the point where the aircraft is established on the intermediate segment of the final approach course.

INITIAL APPROACH ALTITUDE – The altitude prescribed for the initial approach segment of an instrument approach.

INITIAL GRAPHICS EXCHANGE SPECIFICATION (IGES) – Initial graphics exchange specification file format.

INNER MARKER (IM)

INSTRUMENT APPROACH - An approach conducted while the final approach fix is below VFR minimums.

INSTRUMENT FLIGHT RULES (IFR) - Instrument Flight Rules that govern flight procedures under limited visibility or other operational constraints.

INSTRUMENT FLIGHT RULES (IFR) – Aircraft operation rules as prescribed by Federal Aviation Regulations for flying by instruments.

INSTRUMENT LANDING SYSTEM (ILS) - A precision approach landing system consisting of a localizer (azimuth guidance), glide scope (vertical guidance), outer marker (final approach fix), and approach light system.

INSTRUMENT LANDING SYSTEM (ILS) – A system of electronic devices whereby the pilot guides his aircraft to a runway solely by reference to instruments in the cockpit. In some instances the signals received from the ground can be fed into the automatic pilot for automatically controlled approaches. The ILS consists of a Localizer, Glideslope and Marker Beacons (and Approach Light System).

INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)

INSTRUMENT OPERATION - A landing or takeoff conducted while operating on an instrument flight plan.

INTEGRATED NOISE MODEL (INM)

INTEGRATED NOISE MODEL (INM) - The primary FAA sponsored noise model. This is a Windows-based model that produces noise contours and a variety of other noise data outputs pertinent to the development of airport noise impact assessments.

INTERMODAL - Refers to the means of changing modes of transportation such as airplane to road or rail.

INTERMODEL SURFACE TRANSPORTATION AND EFFICIENCY ACT (ISTEA)

ITINERANT OPERATION - All aircraft arrivals and departures other than local operations.

J

JET ROUTES - See High Altitude Airways.

JET PORT – An airport designed to handle jet airplanes.

JETWAYS (JET ROUTES) – An air route designed for aircraft operating at altitudes from 18,000 feet to 45,000 feet. These routes comprise the high altitude airway system. The name jetway is derived from the fact that most aircraft utilizing these routes are jet powered.

JOINT AUTOMATED CAPITAL IMPROVEMENT PLAN (JACIP) – A coordinated process between the FDOT and the FAA to plan airport capital improvements and expenditures on a short and long-term basis. The JACIP process has been designed as an ongoing and interactive process by which airports, the FAA and the FDOT can develop a realistic plan of staged capital improvements at each facility.

L

LANDING DIRECTION INDICATOR - A device that visually indicates the direction in which landings and takeoffs should be made.

LANDING DISTANCE AVAILABLE (LDA) - The runway length declared available and suitable for landing (see Declared Distances).

LANDING MINIMUMS/IFR LANDING MINIMUMS - The minimum visibility prescribed for landing while using an instrument approach procedure.

LARGE AIRCRAFT – A large aircraft is an aircraft of more than 12,500 pounds (5,700 kg) for its maximum certificated takeoff weight.

(Ldn) SYMBOL FOR DAY-NIGHT AVERAGE SOUND LEVEL

LEAD-IN LIGHTS (LDIN)

(Leq) EQUIVALENT SOUND LEVEL

LINEAR FEET (LF)

LOCAL OPERATIONS - Operations performed by aircraft which:

a) Operate in the local traffic pattern or within sight of the tower;
b) Are known to be departing for or arriving from flight in a local practice area located within a 20-mile radius of the control tower; or
c) Execute simulated instrument approaches or low passes at the airport.

LOCALIZER (LOC) – A ground based radio transmitter which provides pilots with course guidance as they approach a runway for landing utilizing an Instrument Landing System. The course guidance is known as "azimuth".

LOCALIZER TYPE DIRECTIONAL AID (LDA) – A facility of comparable utility and accuracy to a localizer but which is not part of a complete ILS and will not be aligned with the runway.

LOM - Compass locator at an outer marker (part of an ILS). Also, called COMLO.

LONG HAUL AIRPORT - Commercial service airports that serve scheduled trips longer than 1,500 miles.
LOW ALTITUDE AIRWAYS - Air routes below 18,000 feet MSL. These are referred to as Victor Airways.
LOW IMPACT RESISTANT SUPPORTS (LIRS)

LOW INTENSITY RUNWAY EDGE LIGHTING (LIRL)

LOW LEAD (LL)

M

MALSF - MALS with sequenced flashing lights.

MALSR - MALS with runway alignment indicator lights (RAILs).

MARKER BEACON - A VFR navigational aid that transmits a narrow directional beam. It is associated with an airway or instrument approach.

MARKER BEACON – An instrument which provides aural and/or visual identification of a specific position along an Instrument Landing System approach to a runway.

MASTER PLAN - Long-range plan of airport development requirements.

MAXIMUM CERTIFICATED TAKEOFF WEIGHT (MCTW)

MAXIMUM GROSS WEIGHT (MGW)

MEAN SEA LEVEL (MSL)

MEDIUM HAUL AIRPORT - Commercial service airports that serve scheduled trips between 500 and 1,500 miles.

MEDIUM (INTENSITY) APPROACH LIGHT SYSTEM (MALS) – An airport approach light system of medium intensity.

MEDIUM INTENSITY RUNWAY EDGE LIGHTING (MIRL) – An airport runway lighting system of medium intensity.

MEDIUM INTENSITY TAXIWAY EDGE LIGHTING (MITL)

MICROWAVE LANDING SYSTEM (MLS) - An instrument landing system operating in the microwave spectrum, which provides lateral and vertical guidance to aircraft having compatible avionics equipment.

MICROWAVE LANDING SYSTEM (MLS) – A type of instrument approach system which uses different radio signals than an ILS. MLS is more flexible and is less susceptible to interference. MLS is very rare due to its high cost.

MIDDLE MARKER (MM) - Part of an ILS that defines a point along the glide slope normally at or near the point of decision height (DH).

MILITARY OPERATION - All arrivals and departures by aircraft not classified as civil (civilian).

MILITARY OPERATIONS AREA (MOA)

MINIMUM CROSSING ALTITUDES (MCA) – The lowest altitudes at certain radio fixes at which an aircraft can cross when proceeding in the direction of a higher minimum en route IFR altitude.

MINIMUM DESCENT ALTITUDE (MDA) - The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circling-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided.

MINIMUM OBSTRUCTION CLEARANCE ALTITUDE (MOCA) - The specified altitude in effect between radio fixes on VOR/LF airways, off-airway routes, or route segments, which meets obstruction

clearance requirements for the entire route segment and which assures acceptable navigational signal coverage only within 22 nautical miles of a VOR.

MINIMUM VECTORING ALTITUDE (MVA) – The lowest altitude at which aircraft will be guided by a radar controller. This altitude ensures communications, radar coverage, and meets obstruction clearance criteria.

MISSED APPROACH - A prescribed procedure to be followed by aircraft that cannot complete an attempted landing at an airport.

MOVEMENT - Synonymous with the term operation, i.e., a takeoff or a landing.

MOVEMENT AREA – The runways, taxiways, and other areas of an airport which are used for taxiing, takeoff, and landing of aircraft, excluding loading ramps and parking areas.

N

NATIONAL AIRSPACE SYSTEM (NAS_1) - The common system of air navigation and air traffic control communications facilities, air navigation facilities, airways, controlled airspace, special use airspace, and flight procedures authorized by Federal Aviation Regulations for domestic and international aviation.

NATIONAL CLIMATIC DATA CENTER (NCDC)

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS (NPIAS)
NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

NATIONAL WEATHER SERVICE (NWS)

NAUTICAL MILE (NM) – The unit of measure of distance in both nautical and aeronautical context. A nautical mile equals 1.15 statute miles (6,080 feet). The measure of speed in regards to nautical miles is known as *KNOTS* (nautical miles per hour).

NAVAID - See Air Navigational Facility.

NAVAL AIR STATION (NAS_2)

NOISE ABATEMENT - A procedure for the operation of aircraft at an airport that minimizes the impact of noise on the environs of the airport.

NOISE COMPATIBILITY PROGRAM (NCP) - List of actions the airport proprietor proposes to undertake to minimize noise/land use incompatibilities.

NOISE EXPOSURE FORECAST (NEF)

NOISE EXPOSURE MAP (NEM) - Graphic depiction of both existing and future noise exposure resulting from aircraft operations and land uses in the airport environs.

NOISE LEVEL REDUCTION (NLF)

NOISEMAP - FAA-approved computer model used to generate noise contours.

NON-DIRECTIONAL BEACON (NBD) - A ground station transmitting in all directions in the L/MF frequency spectrum; provides azimuth guidance to aircraft equipped with direction finder receivers. These facilities often have ILS outer markers to provide transition guidance to the ILS system.

NON-DIRECTIONAL BEACON (NBD) – A radio beacon transmitting non-directional signals whereby an aircraft equipped with direction finding equipment can determine headings to or from the radio beacon and "home" in on a track to or from it.

NON-PRECISION APPROACH PROCEDURE/NON-PRECISION APPROACH - A standard instrument approach procedure in which no electronic glideslope is provided. A localizer, NDB, or VOR is often used.

NON-PRECISION INSTRUMENT RUNWAY – A non-precision instrument runway is one with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight in non-precision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned or indicated on an FAA or DOD approved Airport Layout Plan, or on other FAA or DOD planning documents.

NORTH AMERICAN DATUM (NAD) - A mathematical model of North America that allows the making of "flat" maps that represent curved surfaces.

NOTICE TO AIRMEN (NOTAM) - A notice essential to personnel concerned with flight operations containing information (not known sufficiently in advance to publicize by other means) concerning the establishment of, conditions of, or change in any component (facility, service, or procedure, or hazard in the National Airspace System).

NOTICE TO AIRMEN (NOTAM) – A notice identified either as a NOTAM or an Airmen Advisory containing information concerning the establishment, condition, or change in any component of, or hazard in, the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.

1) *NOTAM*: A notice to Airmen in message form requiring expeditious and wide dissemination by telecommunications means.

2) *AIRMEN ADVISORY*: A Notice to Airmen normally only given local dissemination, during pre-flight or in-flight briefing, or otherwise during contact with pilots.

NP - Non-Precision Instrument runway marking.

O

OBJECT FREE AREA (OFA) - A two dimensional ground area surrounding runways, taxiways, and taxilanes, which is clear of objects except for those objects whose location are fixed by function.

OBSTACLE FREE ZONE (OFZ) - The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.

OBSTACLE FREE ZONE (OFZ) – An OFZ is an area comprised of the runway OFZ, the approach OFZ, and the inner-transitional surface OFZ.

(A) Runway OFZ: The runway OFZ is the volume of space above a surface longitudinally centered on the runway. The elevation of any point on the surface is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet (60 m) beyond each end of the runway and its width is:

1) 120 feet (36 m) for visual runways serving or expected to serve only small airplanes with approach speeds less than 50 knots.
2) 250 feet (75 m) for non-precision instrument and visual runways serving or expected to serve small airplanes with approach speeds of 50 knots or more and no large airplanes.
3) 300 feet (90 m) for precision instrument runways serving or expected to serve only small airplanes.
4) 180 feet (54 m), plus the wingspan of the most demanding airplane, plus 20 feet (6 m) per 1,000 feet (300 m) or airport elevation; or, 400 feet (120 m), whichever is greater, for runways serving or expected to serve large airplanes.

(B) Approach OFZ: The approach OFZ is the volume of space above a surface which has the same width as the runway OFZ and rises at a slope of 50 (horizontal) to 1 (vertical) away from the runway into the approach area. It begins 200 feet (60 m) from the runway threshold at the same elevation as the runway threshold and it extends 200 feet (60 m) beyond the last light unit in the approach lighting system. The approach OFZ applies only to runways with an approach lighting system.

(C) Inner-Transitional Surface OFZ: The inner-transitional surface OFZ is the volume or space above the surfaces which slope 3 (horizontal) to 1 (vertical) laterally from the edges of the runway.

1) OFZ and approach OFZ end at the height of 150 feet (45 m) above the established airport elevation. The inner-transitional surface OFZ applies only to precision instrument runways.

2) Free of all fixed objects. FAA approved frangible equipment which provides an essential aviation service may be located in the OFZ, provided the amount of penetration is kept to a practical minimum.
3) Clear of vehicles as well as parked, holding, or taxiing aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff or departure.

OBSTRUCTION - Any object/obstacle exceeding the obstruction standards specified by FAR Part 77.

OBSTRUCTION CHART (OC)

OBSTRUCTION LIGHT - A light, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction.

OBSTRUCTION TO AIR NAVIGATION – An existing object, including a mobile object, is, and a future object would be, an obstruction to air navigation if it is of a greater height than any of the heights or surfaces defined in FAR PART 77.23.

OFFICIAL AIRLINE GUIDE (OAG)

OMNI-DIRECTIONAL APPROACH LIGHTING SYSTEM (ODALS)

OPERATION - An aircraft arrival (landing) or departure (takeoff).

OPERATION – Generally thought of as either a take-off or a landing of an aircraft. FAA ATCT operations include all radio contacts with an aircraft, regardless of whether or not they are taking off or landing. Operations used for planning purposes include only takeoffs, landings and touch and gos.

OPERATIONS PER BASED AIRCRAFT (OPBA)

ORIGINATION AND DESTINATION (O & D)
OUTER FIX - A point in the destination terminal area from which aircraft are cleared to the approach fix or final approach course.

OUTER FIX – A fix in the destination terminal area, other than the approach fix, to which aircraft are normally cleared by an air route traffic control center or an approach control facility, and from which aircraft are cleared to the approach fix or final approach course.

OUTER MARKER (OM) - A marker beacon, which is part of an ILS, located at or near the glide slope intercept altitude of an ILS approach.

P

P - Precision Instrument runway marking.

PRACTICAL ANNUAL CAPACITY (PANCAP) – The practical annual capacity of an airport based, based on the runway(s).

PRACTICAL HOURLY CAPACITY (PHOCAP) – The practical hourly capacity of an airport based, based on the runway(s).

PRECISION APPROACH - A standard approach in which an electronic glide slope is provided.

PRECISION APPROACH PATH INDICATOR (PAPI) – An airport approach light aid to pilots. See GVGI.

PRECISION APPROACH RADAR (PAR) – Radar used by air traffic control specialists in a ground-controlled approach to assist a pilot on final approach down a prescribed path leading to the runway.

PRECISION INSTRUMENT RUNWAY – A precision instrument runway is one with an instrument approach procedure utilizing an Instrument Landing System (ILS), microwave landing system (MLS), or precision approach radar (PAR). A planned precision instrument runway is one for which a precision approach system or procedure is indicated on an FAA or DOD approved airport layout plan, or on other FAA or DOD planning documents.

PRIMARY RADAR – Primary Radar occurs when the original radar pulse generated by the ground station (air traffic control) returns to the same ground station after it "bounces" off of an object (aircraft). This return notifies the controller that an aircraft is present as well as where it is and in which direction it is moving. This return cannot tell a controller the altitude of the aircraft.

PRIMARY SURFACE – An imaginary horizontal surface extending out an equal distance on each side of the runway centerline a width as defined in FAR Part 77.

PRIVATE AIRPORT - A privately owned airport closed to the general public.

PRIVATE PILOT – A licensed pilot authorized to fly an aircraft carrying passengers provided he does not receive compensation.

PROHIBITED AREA - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude where all flight activity is prohibited, e.g. the White House.

PUBLIC USE AIRPORT - A publicly or privately owned airport open to the public without advanced permission.

R

RADAR APPROACH CONTROL CENTER (RAPCON)

RADAR BEACON (SECONDARY RADAR) – A radar system in which the object to be detected is fitted with cooperative equipment in the form of a radio receiver/transmitter (transponder). Radio pulses transmitted from the ground based searching transmitter/receiver interrogator (air traffic control radar) site are received in the cooperative equipment and used to trigger a distinctive transmission. This transmission, not a reflected signal, is then received back at the interrogator site in order to track the aircraft and determine its altitude.

RADAR IDENTIFICATION – The process of ascertaining that a radar target is the radar return from a particular aircraft.

RADAR NAVIGATION (RNAV)

RADAR (RADIO DETECTION AND RANGING) – A device which, by measuring the time interval between transmission and reception of radio pulses, provides information on range, azimuth and/or elevation of objects in the path of the transmitted pulses.

RADAR SERVICE – A term which encompasses aircraft separation, navigation guidance, and/or flight track monitoring services based on the use of radar which can be provided by a controller to a pilot of a radar-identified aircraft.

RADAR SURVEILLANCE - The radar observation of a given geographic area for the purpose of performing some radar function.

RADAR VECTOR – A heading issued to an aircraft by air traffic control to provide navigational guidance based upon radar observations.

RADIAL – A magnetic bearing extending from a VOR, a VORTAC, or a TACAN navigational facility.

RANDOM AREA NAVIGATION ROUTE – Direct flight, based on area navigation capability, between waypoints defined in terms of degree distance fixes or offset from published or established routes/airways at a specified distance and direction.

REGIONAL AIRPORT SYSTEM PLAN (RASP)

RELIEVER AIRPORT - A specially designated general aviation airport that reduces congestion at busy commercial service airports by providing alternate landing areas for business aircraft.

RELIEVER AIRPORT - An airport designated as having the primary function of relieving congestion at a commercial airport and providing more general aviation access to the overall community. Reliever Airports are allowed to receive AIP (federal) funds for improvement.

RELOCATED THRESHOLD - The portion of pavement behind a relocated threshold is not available for takeoff or landing. It may be available for taxiing aircraft.

RELOCATED THRESHOLD – A relocated threshold is a permanent threshold located at the relocated runway end.

REMOTE COMMUNICATIONS OUTLET (RCO) - An unmanned communications facility remotely controlled by air traffic personnel. RCO's serve FSSs. RTRs serve terminal ATC facilities. An RCO or RTR may be UHF or VHF and will extend the communication range of the air traffic facility. There are several classes of RCOs and RTRs. The class is determined by the number of transmitters or receivers. Classes A through G are used primarily for air/ground purposes. RCO and RTR class O facilities are non protected outlets subject to undetected and prolonged outages. RCOs and RTRs were established for the express purpose of providing ground-to ground communications between air traffic control specialists and pilots at a satellite airport delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times. They may also be used for advisory purposes whenever the aircraft is below the coverage of the primary air/ground frequency.

RESTRICTED AREAS - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude within which the flight of aircraft, while not wholly prohibited, is subject to restrictions.

REQUEST FOR PROPOSALS (RFP)

ROTATING BEACON - A visual NAVAID flashing white and/or colored light to indicate the location of an airport.

RUNUP – A part of the final checkout of the aircraft just before takeoff where the engine (or engines) is revved to a percentage of maximum power. During this exercise, all airplane systems are checked to make a final determination of whether or not the aircraft is fit for safe flight.

RUNWAY (RW, R/W AND RWY) – A runway is a defined rectangular area on an airport prepared for the landing or takeoff of airplanes.
RUNWAY ALIGNMENT INDICATOR LIGHTS (RAIL) – (usually part of a MALS system).

RUNWAY END IDENTIFIER LIGHTS (REIL) – Flashing strobe lights (usually white) which indicate the end of a runway. They are located at each end of the runway.

RUNWAY OBJECT FREE AREA (ROFA)

RUNWAY PROTECTION ZONE (RPZ) - An area of the runway end (formerly the clear zone) used to enhance the protection of people and property on the ground.

RUNWAY PROTECTION ZONE (RPZ) – A trapezoidal area centered about the extended runway centerline beginning 200 feet beyond the end of the area usable for takeoff or landing. The dimensions are a function of the approach visibility minimum and the type of aircraft. Refer to AC 150/5300-13 for specific dimensions and land use guidelines.

RUNWAY REFERENCE POINT (RRP) – The point on the runway where the effective visual glide slope intercepts the runway surface.

RUNWAY SAFETY AREA (RSA) - A 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 SAFETY AREA (RSA) – A runway safety area is a rectangular area, centered on the runway centerline, which includes the runway (and stopway, if present) and the runway shoulders. The portion abutting the edge of the runway shoulders, runway ends, and stopways is cleared, drained, graded and usually turfed. Under normal conditions, the runway safety area is capable of supporting snow removal, firefighting, and rescue equipment and accommodating the occasional passage of aircraft without causing major damage to the aircraft.

RUNWAY VISIBILITY RANGE (RVR) – An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end.

S

SAFETY AREA – An actual graded area surrounding the runway that can be safely negotiated in case of an emergency by an aircraft that will be using that runway.

SEAPLANE BASE - A body of water licensed for operation and basing of seaplanes.

SEGMENTED CIRCLE - An aid identifying the traffic pattern direction.

SEPARATION – Spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.

SEPARATION MINIMA - The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.

SHORT APPROACH LIGHT SYSTEM (SALS)

SHORT HAUL AIRPORT - Commercial service airports that service scheduled trips for less than 500 miles.

SHORT TAKEOFF AND LANDING (STOL) RUNWAY – A runway specifically designated and marked for STOL operations. Except for the standards for locating thresholds, specified in appendix 9, and for marking and lighting, STOL runways are designed and maintained to the standards and recommendations applicable to conventional takeoff and landing airplanes.

SIMPLIFIED SHORT APPROACH LIGHT SYSTEM (SSALS)

SIMPLIFIED SHORT APPROACH LIGHT SYSTEM WITH SEQUENCED FLASHING LIGHTS (SSALF)

SINGLE-EVENT NOISE EXPOSURE LEVEL (SENEL)

SMALL AIRCRAFT – A small aircraft is an aircraft of 12,500 pounds (5,700 kg) or less maximum certificated takeoff weight.

SOUND EXPOSURE LEVEL (SEL)

SQUARE FEET (SF)

STANDARD INSTRUMENT DEPARTURE (SID) – A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and/or written form.

STANDARD METROPOLITAN STATISTICAL AREA (SMSA)

STANDARD TERMINAL ARRIVAL ROUTE (STAR) – A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and/or written form.

STATUTE MILE – A regular "highway" mile measuring 5,280 feet.

STOL AIRCRAFT - A STOL (short takeoff and landing) aircraft is an aircraft with a certified performance capability to execute approaches along a glide slope of 6 degree or steeper and to execute missed approaches at a climb gradient sufficient to clear a 15:1 missed approach surface at sea level. The gradient is based on the airport elevation and decreases at the rate of 5 percent per 1,000 feet (300 m), i.e., for an airport at 4,000 feet (1,200 m) above Mean Sea Level (MSL), the gradient of the missed approach surface would be 18:1, 120 percent of 15:1.

STOP END OF RUNWAY – The stop end of runway is the far runway end as viewed from the cockpit of a landing airplane.

STOPWAY (SWY) - A rectangular surface beyond the end of a runway prepared or suitable for use in lieu of a runway to support an aborted takeoff, without causing structural damage to the airplane.

STOPWAY (SWY) – A stopway is an area beyond the stop end of the takeoff runway which is no less wide than the runway and is centered on the extended centerline of the runway. It is able to support an airplane during an aborted takeoff without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

STRAIGHT-IN APPROACH - A descent in an approved procedure in which the final approach course alignment and descent gradient permit authorization of straight-in landing minimums.

STRAIGHT-IN APPROACH – Entry into the traffic pattern by interception of the extended runway centerline (final approach) without executing any other portion of the traffic pattern.

STUDY ADVISORY COMMITTEE (SAC)

SUPPLEMENTARY AVIATION WEATHER REPORTING STATIONS (SAWRS) – A weather observation station used solely for aviation purposes and manned by non-Federal personnel. The local airport management usually provides the equipment and personnel for the station.

SURFACE ACCESS - Ground transportation modes, such as auto or public transit, used to travel to and from the airport.

SURVEILLANCE APPROACH – An instrument approach conducted in accordance with directions issued by a controller referring to the surveillance radar display.

SYSTEM PLAN - A representation of the aviation facilities required to meet the immediate and future air transportation needs and to achieve the overall goals.

T

TACTICAL AIR NAVIGATION (TACAN) – A military navigation aid that provides distance and direction information to appropriately equipped aircraft. Derived from "tactical air navigation".

TACTICAL AIRLIFT GROUP (TAG)

TAKEOFF DISTANCE AVAILABLE (TODA) - The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA (see Declared Distances).

TAKEOFF RUNWAY AVAILABLE (TORA) - The runway length declared available and suitable for the ground run of an airplane taking off (see Declared Distances).

TAXI – To operate an airplane under its own power on the ground, except the movement incident to actual takeoff and landing.

TAXILANE (TL) – A taxilane is the portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc. A taxilane is outside the movement area, and is normally not controlled by the Air Traffic Control Tower.

TAXIWAY (TW, TWY, AND T/W) – A taxiway is a defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft.

TAXIWAY SAFETY AREA (TSA) – A taxiway safety area is an area centered on the taxiway centerline, which includes the taxiway and taxiway shoulders. The portion abutting the edge of the taxiway shoulders is cleared, drained, graded, and usually turfed. Under normal conditions, the taxiway safety area is capable

of supporting snow removal, fire fighting, and rescue equipment and accommodating the occasional passage of aircraft without causing major damage to the aircraft.

TERMINAL AIRSPACE - The controlled airspace normally associated with aircraft departure and arrival patterns to and from airports within a terminal system and between adjacent terminal systems in which tower en route air traffic control service is provided.

TERMINAL AREA FORECAST, FAA'S (TAF)

TERMINAL AREA PLAN (TAP)

TERMINAL CONTROL AREA (TCA) – The aircraft traffic control area surrounding a hub airport in which all aircraft must be under radar control and have radio communications established. This airspace is now known as Class B airspace.

TERMINAL INSTRUMENT PROCEDURES (TERPS)

TERMINAL RADAR SERVICE AREA (TRSA) - This area identifies the airspace surrounding an airport wherein air traffic control provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. Although pilot participation is urged, it is not mandatory within the TRSA.

TERMINAL VERY HIGH FREQUENCY OMNIRANGE RADIO STATION (TVOR)

TEXAS AIRPORT SYSTEM PLAN (TASP) -The aviation plan for Texas that provides documentation related to airports and related facilities needed to meet current and future statewide aviation demands.

T-HANGAR - A T-shaped aircraft hangar that provides shelter for a single airplane.

THRESHOLD – The threshold is the beginning of that portion of the runway available and suitable for the landing of airplanes.

THRESHOLD (TH) - The physical end of runway pavement. (Also see Displaced Threshold and Relocated Threshold.)

THRESHOLD CROSSING HEIGHT (TCH) – The height of the straight line extension of the visual or electronic glide slope above the runway threshold.

TOUCH-AND-GO OPERATION – A training operation in which a landing approach is made, the aircraft touches down on the runway, but does not fully reduce speed to turn off the runway. Instead, after the landing, full engine power is applied while still rolling and a takeoff is made, thereby practicing both maneuvers as part of one motion. It counts as two separate aircraft operations.

TOUCHDOWN ZONE LIGHTS (TDZ)

TRACK – The flight path of an aircraft over the surface of the earth.

TRAFFIC PATTERN - The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The usual traffic pattern consists of five segments, or "legs". These components are the upwind leg, crosswind leg, downwind leg, base leg, and the final approach. Traffic patterns are followed by aircraft in order to exit the airport area after takeoff in an orderly fashion, and to enter an Airport area and ultimately land, also in an orderly fashion.

TRANSIENT OPERATIONS - An operation performed at an airport by an aircraft that is based at another airport.

TRANSITION ZONE - An imaginary surface extending upward at a 7 to 1 slope (i.e., up one foot for every seven feet moved horizontally) from the Primary Surface and Approach Surface defined in Federal Aviation Regulations (FAR) Part 77.

TRANSPORT AIRPORT - Airports that can accommodate high performance aircraft over 150,000 pounds maximum gross weight.

TRANSPORT AIRPORT – A transport airport is an airport designed, constructed, and maintained to specifically serve airplanes in Aircraft Approach Category C and D. Please refer to the definition for Aircraft Approach Category. Airports which accommodate Category C and D aircraft on a semi regular basis are not necessarily Transport Airports.

TRANSPORT CATEGORY AIRCRAFT - Aircraft with a maximum gross takeoff weight of 12,500 pounds or more.

TRUE AIR SPEED (TAS) – The actual speed at which an aircraft is traveling through the air.

TRUE BEARING (Azimuth) - The clockwise angle between a direction line and a meridian line that is referenced to the geographic north.

TURBINE – A mechanical device or engine that spins in reaction to fluid flow through or over it. This device is used in turbofan, turbojet, and turboprop powered aircraft.

TURBOFAN – A turbojet engine whose thrust has been increased by the addition of a low pressure compressor fan.

TURBOJET - An engine that derives power from a fanned wheel spinning in reaction to burning gases escaping from a combustion chamber. The turbine in turn drives a compressor and other accessories.

TURBOPROP - A turbine engine in which the rotating turbine turns a propeller.

U

ULTRA HIGH FREQUENCY (UHF)

UNCONTROLLED AIRSPACE - Airspace that has not been designated as Continental Control Area, control area, control zone, terminal control area, or transition area and within which ATC has neither the authority nor the responsibility for exercising control over air traffic.

UNICOM - Radio communications station that provides pilots with pertinent information (winds, weather, etc.) at specific airports.

UNITED STATES GEOLOGICAL SERVICE (USGS)

UNITED STATES WEATHER BUREAU (USWB)

USEFUL LOAD – In aircraft, the difference between the empty weight of the plane and the maximum authorized gross weight.

UTILITY AIRPORT – A utility airport is an airport designed, constructed, and maintained to serve airplanes in Aircraft Approach Category A and B. For discussion on airport type, see paragraph 5.

V

V - Visual Approach runway marking.

V_1 - Takeoff Decision Speed.

V_2 - Takeoff Safety Speed.

V_{LOF} - Lift-off Speed.

V_{SO} - Stalling Speed or the minimum steady flight speed in the landing configuration.
VECTOR - A heading issued to an aircraft to provide navigational guidance by radar.

VERTICAL/SHORT TAKEOFF AND LANDING (V/STOL)

VERTICAL TAKEOFF AND LANDING (AIRCRAFT) (VTOL) – An aircraft which has the capability of vertical takeoff and landing. These aircraft include, but are not limited to, helicopters.

VERY HIGH FREQUENCY (VHF)

VERY HIGH FREQUENCY OMNI DIRECTIONAL RANGE (VOR) – A ground radio station that provides a pilot of a properly equipped aircraft with his radial location in reference to that station. A VORTAC is an electronic air navigation facility combining a VOR and a TACAN.

VFR AIRCRAFT - An aircraft conducting flight in accordance with Visual Flight Rules.

VFR CONDITIONS – Basic weather conditions prescribed for flight under Visual Flight Rules; usually implies a ceiling of at least 1000 feet and a forward visibility of three miles or more.

VFR TRAFFIC – Aircraft traffic operated solely in accordance with Visual Flight Rules.

VICTOR AIRWAYS - See Low Altitude Airways.

VICTOR AIRWAYS – Established air routes connecting most VORs in the United States. The victor airways comprise the low altitude (up to but not including 18,000 feet) airway system. (Jetways comprise the high altitude airway system).

VISIBILITY, PREVAILING – The horizontal distance at which targets of known distance are visible over at least half of the horizon. It is normally determined by an observer on or close to the ground viewing buildings or other similar objects during the day and ordinary city lights at night.

VISUAL APPROACH – A VFR approach granted to an IFR flight by air traffic control under special circumstances. Visual approaches are normally conducted by aircraft operating under visual flight rules.

VISUAL APPROACH SLOPE INDICATOR (VASI) – The VASI is a device used by pilots to determine their position in regard to the recommended approach path for a particular airport. See also GVGI.

VISUAL FLIGHT RULES (VFR) - Visual Flight Rules that govern flight procedures in good weather.

VISUAL FLIGHT RULES (VFR) – "See and be seen" flight rules. Each pilot is responsible for the safe spacing and proper operation of his aircraft. Under VFR, a pilot is not required to file a flight plan or be in constant radar and communication contact with air traffic control. Visual flight rules are determined by weather and require a ceiling of at least 1,000 feet and visibility of at least 3 miles.

VISUAL RUNWAY - A visual runway is a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA or Department of Defense (DOD) approved layout plan, or, on other FAA or DOD planning documents.

VORDME - VOR facility supplemented with Distance Measuring Equipment (DME).

VORTAC - VOR facility supplemented with Tactical Air Navigation (TACAN).

VORTAC – A combination of the civil VOR/DME and the military TACAN which can provide both distance and direction of an aircraft from the station.

W

WAKE TURBULENCE – The air turbulence caused by a moving aircraft, originating at the tips of the wings. The turbulence is caused by vortices generated by an aircraft's wingtips as it travels through the air. This turbulence is greatest when the aircraft is taking off and landing.

WARNING AREA - A category of special use airspace of defined dimensions identified by an area from the surface of the earth to a specified altitude, which exists in international airspace along the U.S. coastal borders.

WATER MANAGEMENT DISTRICT (WMD)

WIND-CONE (WIND SOCK) - Conical wind direction indicator.

WIND COVERAGE – Wind coverage is the percent of time for which aeronautical operations are considered safe due to acceptable crosswind components.

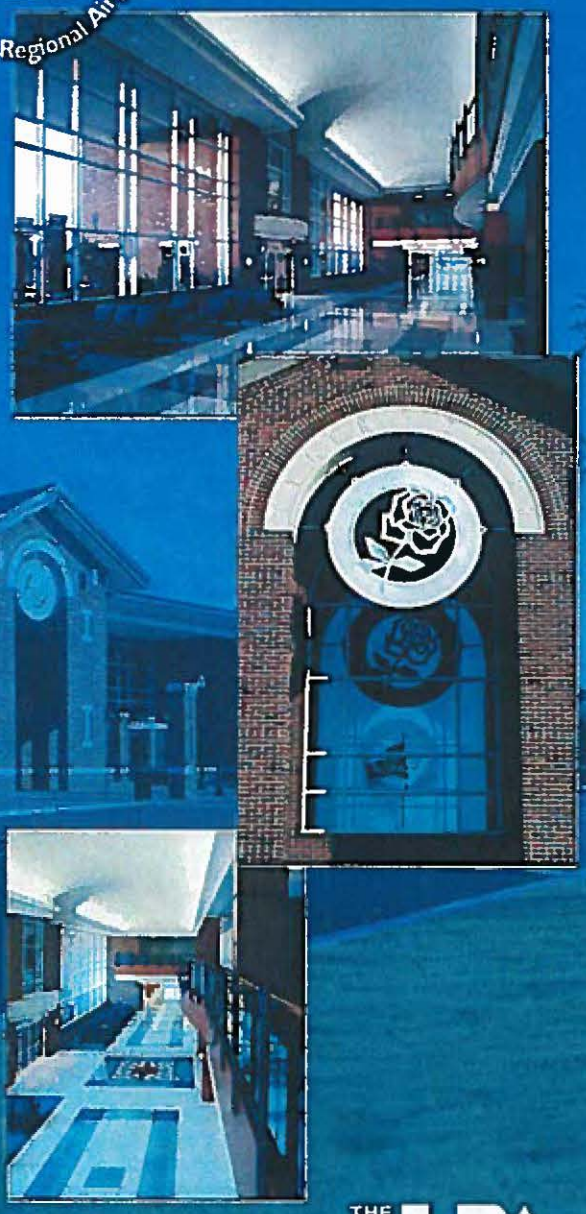
WIND ROSE - A graphic documenting the wind persistency and wind coverage provided by the runway system.

WIND TEE - A visual device used to advise pilots about wind direction at an airport.

CITY OF TYLER

Tyler Pounds Regional Airport

APPENDIX B
AGENCY COORDINATION



THE LPA GROUP

AVIATION CONSULTANTS

APPENDIX B
AGENCY COORDINATION

May 10, 2005

Mr. Guillermo Villalobos
Program Manager
Texas Airports District Office
Federal Aviation Administration
2601 Meacham Boulevard
Fort Worth, Texas 76137-4298

Dear Mr. Villalobos:

Enclosed you will find drafts of Chapters 1 through 4 and Chapter 6 of the Airport Master Plan Update for Tyler Pounds Regional Airport. We respectfully request the Federal Aviation Administration's (FAA) review of, and concurrence with Chapter 3, the projections of aviation activity at Tyler Pounds Regional Airport. These projections of activity were prepared as part of the ongoing development of the Master Plan Update.

We believe that the document reasonably projects aviation activity at Tyler Pounds Regional Airport over the next twenty years. We look forward to working with you as we continue to develop the TYR Airport Master Plan and Airport Layout Plan. If you need any additional information or have any questions, please feel free to contact Phil Jufko at (813) 889-3892.

Thank you for your time and consideration in this matter.

Respectfully,

TYLER POUNDS REGIONAL AIRPORT

Davis Dickson
Airport Manager

Enclosure (1)

CC: Philip Jufko (LPA)

DAVIS DICKSON
Airport Manager

TYLER POUNDS REGIONAL AIRPORT
700 Skyway Boulevard, Suite 201
Tyler, Texas 75704

Office (903) 531-9825
Fax (903) 531-9843

U.S. Department
of Transportation
Federal Aviation
Administration

Federal Aviation Administration
Southwest Region, Airports Division, Texas Airports
Development Office

Fort Worth, Texas 76193-06

February 9, 2006

Mr. Davis Dickson
Airport Manager
Tyler Pounds Field Airport
150 Airport Drive, Suite 201
Tyler, Texas 75704

Dear Mr. Dickson:

This is to confirm our verbal approval of the Tyler Pounds Regional Airport Aviation Activity Forecast submitted by the LPA Group Incorporated, adjusting the operations forecast to within ten (10) percent of the 2006 Federal Aviation Administration (FAA) Terminal Area Forecasts, and submitted as part of the Tyler Regional Airport Master Plan Update.

Sincerely,

ORIGINAL SIGNED By:

Guillermo Y. Villalobos
Program Manager
Texas Airports Development Office

cc: Ms. Tricia Fantinato
Senior Aviation Planner
The LPA Group Incorporated
4503 Woodland Corporate Boulevard, Suite 400
Tampa, Florida 33614

From: Davis Dickson [ddickson@tylertexas.com]
Sent: Friday, May 19, 2006 12:21 PM
To: Jufko, Philip; screamer@ksaeng.com; Chris Wiggins
Subject: Meeting with TXDOT

On Wednesday, May 17, I had a meeting with TXDOT about the attached drawing. I explained that we would save millions of dollars if TXDOT would grant us an easement or the ability to acquire a small portion of their ROW. The acquisition/easement would allow us to extend the safety area on Runway 13 and avoid requirements to alter the runway threshold location, etc.

They understand the circumstances and are receptive to the option of not displacing our threshold. However they want us to proceed in the following order before we ask to acquire ROW.

1. After more precise surveys are performed and we determine exactly how much of the safety area should extend in their ROW, TXDOT requested that we ask FAA for a variance before requesting their ROW. They hope that since it appears that such a small area is needed, that we could get a variance. I explained that even with a variance, we may need to enter TXDOT ROW to place fill dirt to achieve proper grades. The parkway slopes up from the curb line and then drops to a box culvert within the ROW. They weren't concerned about the need to place fill in the ROW as long as all storm drainage factors were considered.

2. If a variance is not granted, then TXDOT will negotiate with us to sell the needed ROW to achieve our goal provided we perform the necessary drainage improvements. They also want the relocation of the fencing to be at a slight angel from the current alignment for easier maintenance.

With that in mind, I believe it is safe to show this plan in the ALP and alternatives.

Let me know if you have any questions.

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