CHAPTER ONE
Introduction

INTRODUCTION

Introduction and Purpose

Airport Master Plans are the tools to evaluate the airport's physical facilities, management principals, planned development, and financial foundation and future. Because the aviation industry is not static, periodic updates are needed to refresh this information and lay out future plans and expectations. Skylark Field (ILE) has had some significant changes since the previous master plan was completed in 2004. The role of the airport has changed from a commercial service airport to a general aviation (GA) airport and serves the GA/business traffic of the region.

Many of the projects and objectives from the previous master plan are not relevant with the GA/business direction of ILE. This master plan will be focused on forecasting the aviation need at ILE, identifying the projects necessary to meet demand, and examining the financial and management documents to achieve the short- and long-term goals at ILE. Additionally, the master plan will provide tools for aviation staff in their day-to-day airfield management and provide guidance for meeting future needs. The master plan will assist ILE to identify relevant projects to improve and maintain the airport by laying out a course of projects designed to maintain and improve ILE well into the future.

Public Involvement and Project Committees

An important element to a major planning process is the public involvement. For the ILE Master Plan public involvement took on two different options. The first option was the development and involvement of two committees: Executive Committee (EC) and Project Steering Committee (PSC). A full listing of committee members is included in **Appendix A**.

The EC was comprised of City of Killeen staff from the Aviation Department and others as designated including TxDOT' s Project Manager and the consultant team. The EC role was oversight and overall guidance for the master plan process. The EC, based on their positions in leadership, reviewed draft

reports and documents prior to submission to the PSC or being made available to the general public. The EC were also ex-officio members of the PSC.

The City and ILE staff was engaged to invite individuals to be a part of the PSC. The PSC was comprised of key airport tenants, community leaders, and tenants. The focus of this committee was to provide technical and community review, input and guidance to the project, and act in the role to communicate the project to the greater Killeen region.

The second option for public involvement was comprised of public meetings intended for the ILE tenants and general public of the City of Killeen and surrounding communities. The purpose of these meetings was as much to inform and educate the community as to achieve their input and buy-in on the overall direction for ILE. These meetings were held at three times during the planning process. The first was during the early project stages to inform and open the process; the second followed the EC, PSC, and airport management selection of the preferred development concepts for various locations on the airfield and within the terminal area. The final public meeting followed the final draft approval in the form of a briefing to the City Council for approval.

Strengths, Weaknesses, Opportunities, and Threats Analysis

During the project kickoff meetings a strengths, weaknesses, opportunities, and threats (SWOT) analysis was conducted with each committee. Over a period of 45 to 60 minutes, each committee was asked a series of questions designed to prompt a discussion of each area of the SWOT analysis which elicited varying degrees of interest, responses, and discussion from each committee. During the SWOT analysis with the PSC members some of the EC were present but remained neutral making limited comments in an effort to gain an uninfluenced set of opinions from the PSC. **Figure 1-1** communicates the ideas generated by the EC and PSC through the SWOT analysis.

When looking at the results from both SWOT analyses there are very few overlaps. The input from the PSC differed from the EC in many places. Where the EC's focus seemed to be on strengths and weaknesses the PSC honed in on numerous opportunities available to ILE and the City of Killeen. There were a few areas where the EC and PSC differed in their view. The EC perceived a weakness as the limited development space available while the PSC viewed the available development land as a strength. Because of these type issues, the SWOT analysis was used to influence each phase of the master plan development in an effort to keep the final product focused on the needs of the local community and GA/business users at ILE.

FIGURE 1-1 | EC AND PSC SWOT RESULTS

SKYLARK EC SWOT RESULTS

STRENGTHS
- KILE location outside Ft. Hood airspace
- Landside access
- Instrument Landing System (ILS)
- Hangars all paid off
- Security (Part 139 Equivalent)
- No debt service at ILE
- Index "A" ARFF equivalent
- Positive cash flow
- Hangars full / 40 on waiting list
- Pavement/lighting

WEAKNESSES
- Limited development space
- Open T-hangar condition
- Former Commercial Terminal
- Cost of development limits development
- ILS favors wrong runway end
- Runway length limited for prevailing wind
- KILE branding / image / Web page public perception

OPPORTUNITIES
- Development of future hangars
- Hangar waiting list
- Former terminal (1525)- commercial real estate value
- 17th fastest growing city in the nation

THREATS
- I-14/ Other development and 190 overpass
- Encroachment / development
- Public perception
- Local match money limited today

SKYLARK PSC SWOT RESULTS

STRENGTHS
- Accommodates business aircraft
- Available property
- Location/population
- City fuel provider
- No military bureaucracy (vs. GRK) KILE economics
- CTC (Central Texas College)
- Great training site
- Instrument approaches
- Existing Infrastructure

WEAKNESSES
- Lack of traditional FBO
- Land locked
- Limited facilities for pilots
- KILE Branding and passengers
- Airspace to north controlled/ limited
- Available hangars by Ft Hood
- Airport regulations (Re: Mechanic) Aviation events
- Limited turbine based (fuel revenue)
- No rental aircraft
- Hangars for corporate aircraft
- Airport advertising
- Communication w/ tenants
- Optimal space use
- Utility infrastructure limits development

OPPORTUNITIES
- Development opportunities
- Northwest side hangars
- A&P Program at CTC
- Foreign military
- Expanded flight line services
- Hangar waiting list
- Corporate hangar available
- Jet A sales
- Master Plan news release
- Civic organization contact
- FAA Rules and Regulations
- Operational A/C in hangars
- Economic engine possibility
- Military pilots and proximity
- 1525 terminal (former commercial terminal)

THREATS
- Temple (Central Texas Regional Airport)
- Public Perception
- Five Airports →name and location confusion
- Training detracts from ease of corporate flight use of KILE
- Lack of public knowledge about KILE and its possibilities / services to the community

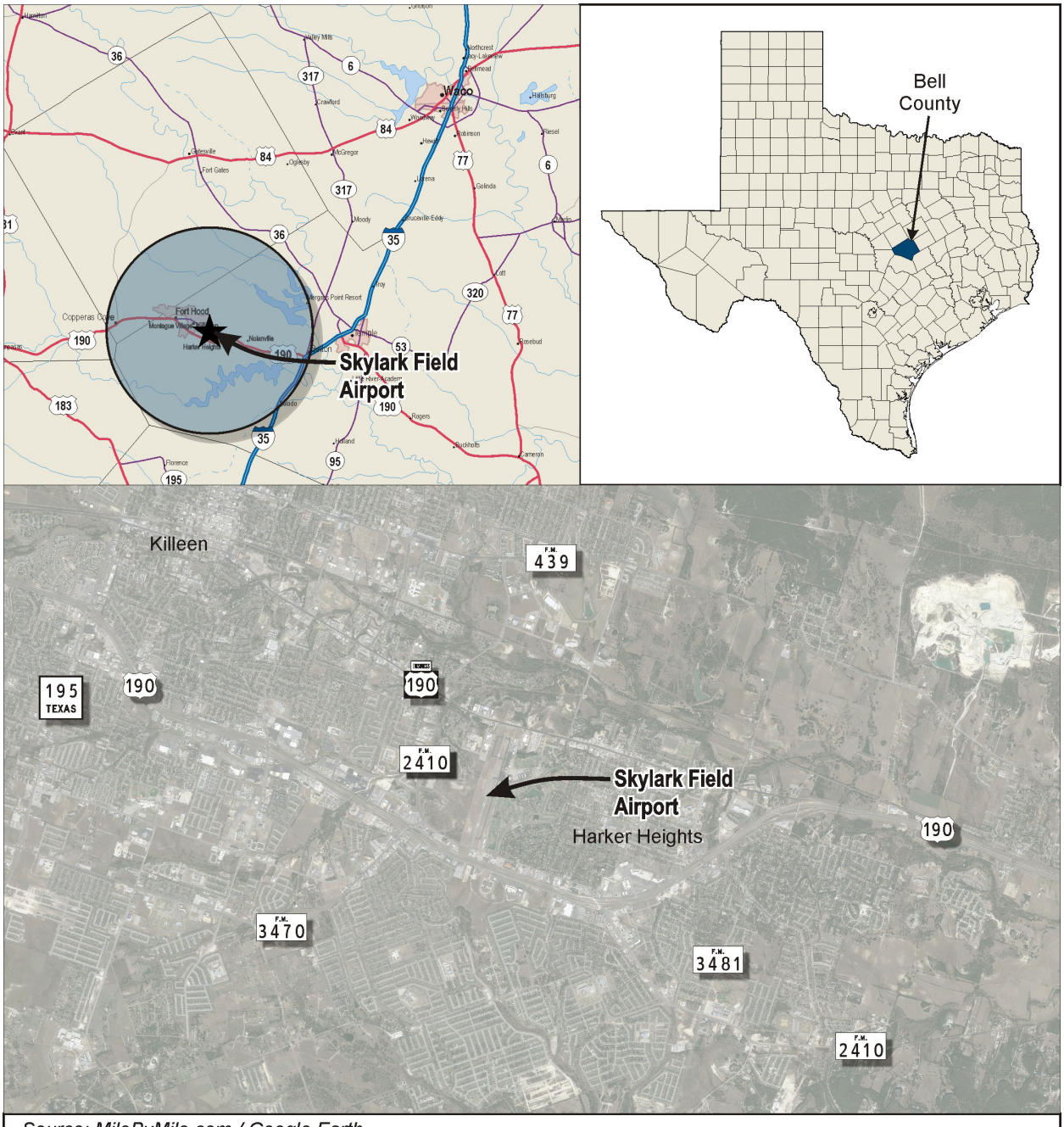
Airport Location and History

The City of Killeen is located in Bell County, on Hwy 190, west of I-35, approximately 50 miles southwest of Waco and about 60 miles north of the capital city of Austin. Skylark Field is classified as a general aviation airport within the Federal Aviation Administration's (FAA) *National Plan of Integrated Airport Systems* (NPIAS) and the T*exas Airport System Plan (TASP)*. ILE comprises approximately 140 acres, experiences an estimated 7,000 annual operations, and houses more than 50 aircraft of various sizes and complexities. The airport serves the general aviation and business community of Killeen and the surrounding area.

Historically, ILE has served both general aviation and commercial passenger aircraft. The airport has supported both these types of services for many years; however, during the early 2000s it was determined that a joint-use facility at Robert Gray Army Airfield (GRK) would provide a better opportunity to serve the future commercial passenger demand in the region. An agreement to move commercial service to GRK was struck and with the completion of a new air carrier terminal complex on August 2, 2004, commercial passenger service was moved from ILE to GRK. Ten years later, ILE continues to be owned and operated by the City of Killeen which is a requirement based on the restrictions imposed by the US Army on GA aircraft operations at GRK and meeting all FAA grant assurances. The Executive Director of Aviation has the day-to-day responsibility for the operation of ILE. The City Council has ultimate responsibility for all airport policy considerations, as well as the compliance with all pertinent federal, state, and local regulations.

ILE is located approximately three miles east of the Central Business District of Killeen. Direct access to the airport and terminal area is provided via Stonetree Drive from the north or south. The north entrance onto Stonetree Drive is from Business US 190, while the southern entrance comes from Farm-to-Market Road (FM) 2410. In the near future access will be provided by an extension of Stonetree Drive to the US Highway 190 frontage road. This will make for much easier access to the airport from US 190. The published airport elevation is 848 feet above mean sea level (MSL), with airfield coordinates of 31˚ 05' 09.00" N and 97˚ 41' 11.40" W. The current magnetic declination at the airport is 4.06˚ E (NOAA National Geophysical Data Center, 11/14) with an estimated variation change of 0.13˚ W per year. **Figure 1-2** depicts the ILE location.

FIGURE 1-2 | AIRPORT LOCATION/VICINITY, SKYLARK FIELD AIRPORT



Source: MileByMile.com / Google Earth

CHAPTER TWO

Inventory

INVENTORY

Facilities Inventory

As the initial step in the airport planning program, the inventory is a systematic data collection process that provides an understanding of past and present aviation factors associated with ILE. A comprehensive inventory, including the following major inventory tasks, is used to form the basis for airport recommendations throughout the Airport Master Plan.

- An on-site inspection (conducted in September 2014) and inventory of airport facilities, equipment, and services to assess existing physical conditions.
- Discussions with Airport and City officials, Fixed Base Operators (FBO), and airport tenants regarding recent airport trends, operations, and services.
- The collection of airport activity data, project records, and aeronautical background information; a review of historical airport information, previous airport layout plans, maps, charts, and photographs of airport facilities; and a record search and review of local airport-related ordinances, policies, operating standards, and lease agreements.
- The collection of regional, county, city and airport development information to understand regional economic conditions and to determine the surrounding airport service area characteristics.
- Review of current and planned on and off-airport land use development and property information, including surrounding land use patterns, existing and proposed transportation developments, infrastructure, and utilities.
- The collection of regional climatic information, including predominant winds, cloud and visibility conditions, and precipitation levels.

Airport Development History

Table 2-1, *Historical Airport Projects with Funding Assistance,* shows the airport's development history that involved funding assistance from federal or state sources as available from the TxDOT. According to records, since 1969, the airport has received $8,328,057 from the FAA and $167,773 from the state (TxDOT, Aviation Division) for various improvements and maintenance.

On FAA grants a local sponsor's grant match share is 10 percent. TxDOT funding can require a match of 10 to 25 percent for improvement grants and 50 percent for Routine Airport Maintenance Program grants. Based on this, the local investment in airport improvements and maintenance with funding assistance at ILE since 1969 is $308,303.

TABLE 2-1 | HISTORICAL AIRPORT PROJECTS WITH FUNDING ASSISTANCE

Year	Local Total	State Total	Federal Total	Funding Total	Project Description
1969	$7,000			$7,000	Property acquisition
1969		$27,495		$27,495	Pave parking aprons and taxiway.
1972		$27,500		$27,500	Land; crosswind runway.
1973	$2,408		$21,670	$24,078	Property acquisition, parking apron, holding pad
1973	$28,000			$28,000	Property acquisition
1974	$5,172		$46,545	$51,717	Land; construct apron.
1977	$15,444		$136,000	$151,444	Upgrade taxiways.
1977	$12,546		$112,914	$125,460	Overlay runway; relocate displaced threshold.
1977			$1,020,000	$1,020,000	1525 Terminal Building US Economic Development Administration Grant.
1978	$15,204		$136,840	$152,044	Road, taxiway, and fence (USDOT Grant).
1979	$3,108		$27,971	$31,079	AMP, R. Dixon Speas Associates.
1979		$17,000		$17,000	Install perimeter fence; construct access road / taxiway.
1979	$17,778		$160,000	$177,778	Construct access road / taxiway to E hangar area; install security fence.
1980	$2,200		$19,800	$22,000	AMP, Espey, Huston, and Associates, Inc.
1982	$40,000		$360,000	$400,000	Expand terminal apron (approx. 4500 SY); construct T-hangar access taxiways / apron, drainage improvements.
1982	$149,000			$149,000	8-Unit T-hangar, rehab T-hangar floor, ramp, north perimeter road, and concrete line ditches.
1983	$8,000			$8,000	Hangar removal
1984			$5,454	$5,454	Amendment to FAA 82-01.
1984	$106,889		$962,000	$1,068,889	Acquire land - runway alignment indicator lights; reconstruct parallel / connecting taxiways; overlay Runway 1/19; acquire ARFF vehicle.
1984	$104,000			$104,000	Roof replacement passenger terminal building.
1985	$89,798		$808,178	$897,976	Taxiway system reconstruction
1985	$10,569		$95,120	$105,689	Amendment to 84-02: delete overlay of taxiway 1/19 and ARFF vehicle; increase of $95,120.
1985	$20,000		$180,000	$200,000	Acquire one ARFF vehicle.
Subtotal 1969-1985	**$637,116**	**$71,995**	**$4,092,492**	**$4,801,603**	

Source: TXDOT, Aviation Division, TADS Database; Federal Total – Federal Aviation Administration

TABLE 2-1 (CONTINUED) | HISTORICAL AIRPORT PROJECTS WITH FUNDING ASSISTANCE

Year	Local Total	State Total	Federal Total	Funding Total	Project Description
1986	$147,098		$1,323,888	$1,470,986	Reconstruct Runway 1/19; rehabilitate Runway 1/19 lights; overlay taxiways.
1986	$27,667		$249,000	$276,667	ARFF truck purchase
1986	$4,189		$37,700	$41,889	Master plan study (site selection).
1987			$18,000	$18,000	Amendment to 85-03: increase of $18,000.
1988	$150,000			$150,000	Roof repair to original terminal building.
1989			$100,000	$100,000	AWOS installation (FAA owned)
1990	$94,444		$850,000	$944,444	Acquire land for approaches.
1990	$8,642		$77,778	$86,420	Airport Master Plan.
1991	$25,556		$230,000	$255,556	Install TW and ramp edge lighting, overlay ramp, install regulator and electrical vault, replace rotating beacon and upgrade windcone.
1993	$60,165		$541,481	$601,646	Extend Runway 1/19; rehabilitate terminal building and apron; obstruction removal.
1993	$82,240		$235,000	$317,240	Baggage claim conveyor installation
1994	$15,832		$142,486	$158,318	Perimeter Road, runway sweeper
1998	$200,000			$200,000	Perimeter Road, runway sweeper
2001	$19,990		$179,910	$199,900	Airport Master Planning
2002	$39,200			$39,200	Terminal building roof repair
2005	$21,405	$21,405		$42,810	RAMP: Crack seal on apron, runway, taxiway, replacement of runway / taxiway sign panels, installation of video surveillance system
2006	$5,265	$5,265		$10,530	RAMP: Crack seal runway, taxiway, apron, purchase herbicide, paint and reflective beads to re-mark pavement, airfield lighting supplies
2006	$280,000			$280,000	1525 mold remediation and new roof
2007	$6,113	$16,113		$22,226	RAMP: Striping for apron and runways. Security camera. Painting T-Hangar. Professional services for SWPPP and SPCC Plans. Herbicide/ pesticides.
2008	$21,223	$21,223		$42,446	RAMP: Purchase paint and beads to re-stripe pavement. DRAINAGE: Erosion repairs on drainage. MISC: Professional services to update environmental plans, installation/maintenance/ upgrade of security system, paint shade hangar, purchase herbicide and airfield lighting supplies/ maintenance
Subtotal 1986-2008	**$1,187,806**	**$64,006**	**$3,985,243**	**$5,237,055**	

Source: TXDOT, Aviation Division, TADS Database; Federal Total – Federal Aviation Administration

TABLE 2-1 (CONTINUED) | HISTORICAL AIRPORT PROJECTS WITH FUNDING ASSISTANCE

Year	Local Total	State Total	Federal Total	Funding Total	Project Description
2009	$10,422		$209,542	$219,964	Engineering for south apron (19,800 SY); Mill, replace / mark apron (200 x 1300); Reconstruct pavement for southeast T-hangar (4200 sy); Drainage improvements for southeast T-hangar; Install main open underdrain (300 lf); Rehabilitate TW B (10,700 sy); Mill / replace Runway 1/19 (5495' x 100'); Mark Runway 1/19 (82,400 sf); Rehabilitate / mark parallel and stub taxiways (48,000); Replace MITL (6500 lf)
2009	$4,622	$4,622		$9,244	RAMP: Purchase airfield lighting parts and contract for herbicide and pesticide application; purchase striping paint and beads; storm water consultant professional service; erosion control; security camera maintenance; perimeter fencing; additional cameras.
2010	$5,158	$5,158		$10,316	RAMP: Paint and beads for apron markings and touch-up of runway, taxiway and markings; airfield lighting, fuel farm, hangar, and fence/gate repair/maintenance; herbicide pesticide; erosion control; environmental compliance; security camera maintenance.
2010	$270,227		$2,432,040	$2,702,267	Mark Runway 1/19 (82,400 SF); Install main open underdrain (300 LF); Rehabilitate and mark parallel and stub taxiways (48,000 SY); Replace MITL (6500 LF); Reconstruct pavement southeast T-hangar (4200 SY); Rehabilitate Taxiway B (10,700 SY); Mill and replace south apron (19,800 SY); Mill and replace Runway 1/19 (5495' x 100'); Mill, replace and mark apron (200' x 1300'); Drainage improvements southeast T-hangar. SBGP-2010-70 $2,432,040 ARRA Funds
2011	$11,961	$11,961		$23,922	RAMP: Perform airport general maintenance
2012	$6,369	$6,369		$12,738	RAMP: Contract for airport general maintenance projects.
2012	$186,203		$600,000	$786,203	Design/Construct 80' x 80' Hangar (NPE '10-'11) SBGP-2009-57 $384,004; SBGP-2011-72 $113,574; SBGP-2010-67 $102,422
2013	$3,662	$3,662		$7,324	RAMP: Airport general maintenance.
2014	$25,900		$233,100	$259,000	Airport Master Plan Update
Subtotal 2009-2014	**$498,624**	**$31,772**	**$3,241,582**	**$3,797,878**	
TOTAL	**$2,323,546**	**$167,773**	**$11,319,317**	**$13,836,536**	

Source: TXDOT, Aviation Division, TADS Database; Federal Total – Federal Aviation Administration

AIRPORT ROLE

The ILE role is well documented in the FAA's NPIAS and General Aviation Airports: A National Asset and TASP. Highlights include:

- Designated as a regional, business/corporate airport in the TASP.
- Designated as a Local airport in the NPIAS.
- Identified by the FAA's Asset study as one of 1,268 "Local" general aviation airports.

The FAA identifies design standards for airports and their operating pavements based on FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*. Pavement categorization is provided for runways through the runway design code (RDC) while taxiway pavements are designated separately through the taxiway design group (TDG). The RDC is defined by three variables: airport approach category (AAC), the airplane design group (ADG), and instrument approach procedure (IAP) visibility minimums. Previously, the Airport Reference Code (ARC) and runway design were not classified based on IAP minimum visibilities. **Table 2-2** defines the AAC, **Table 2-3** documents the ADG, and **Table 2-4** describes the various possibilities defining visibility minimums for IAPs.

TABLE 2-2 | AIRCRAFT APPROACH CATEGORY (AAC)

AAC	V_{REF}/Approach Speed [1]
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*
[1] V_{REF} = Landing Reference Speed or Threshold Crossing Speed

TABLE 2-3 | AIRPLANE DESIGN GROUP (ADG)

Group #	Tail Height (ft [m])	Wingspan (ft [m])
I	< 20' (< 6 m)	< 49' (< 15 m)
II	20' - < 30' (6 m - < 9 m)	49'- < 79' (15 m - < 24 m)
III	30' - < 45' (9 m - < 13.5 m)	79' - < 118' (24 m - < 36 m)
IV	45' - < 60' (13.5 m - < 18.5 m)	118' - < 171' (36 m - < 52 m)
V	60' - < 66' (18.5 m - < 20 m)	171' - < 214' (52 m - < 65 m)
VI	66' - < 80' (20 m - < 24.5 m)	214' - < 262' (65 m - < 80 m)

Source: FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*

TABLE 2-4 | VISIBILITY MINIMUMS

RVR (ft) *	Instrument Flight Visibility Category (statute mile)
5000	Not lower than 1 mile
4000	Lower than 1 mile but not lower than ¾ mile
2400	Lower than 3/4 mile but not lower than 1/2 mile
1600	Lower than 1/2 mile but not lower than 1/4 mile
1200	Lower than 1/4 mile

Source: FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*
* RVR values are not exact equivalents

TxDOT, through the TASP, classifies ILE as a General Aviation – Business/Corporate airport. The TASP describes Business/Corporate Airports as those providing community access by business jets. According to the TxDOT, Aviation Division, Airport System Plan, 2010 minimum requirements for a Business/Corporate Airport are:

- Applicable Design Standard
  - B-II, C-II thru C-IV, D-II thru D-IV
- Minimum Runway
  - Length: 5,000 Feet
  - Width: 100 Feet
  - Strength: 30,000 pound single-wheel loading
- Minimum Taxiway
  - Full-length parallel
- Minimum Landside Development
  - 24 Acres
- Minimum Approach
  - Non-Precision – 250' – ¾ mile LPV
- Minimum Lighting

Based on the application of FAA airport design criteria, TASP/TxDOT Policies and Standards, and a review of the existing facilities and current Airport Layout Drawing (ALD), Skylark Field is a General Aviation Airport with a RDC of C-II-4000. With the final decommissioning of the MALSR the RDC is likely to be revised to C-II-5000. This designation is consistent with the types of aircraft using the airfield and IAPs serving ILE.

AIRFIELD FACILITIES AND CHARACTERISTICS

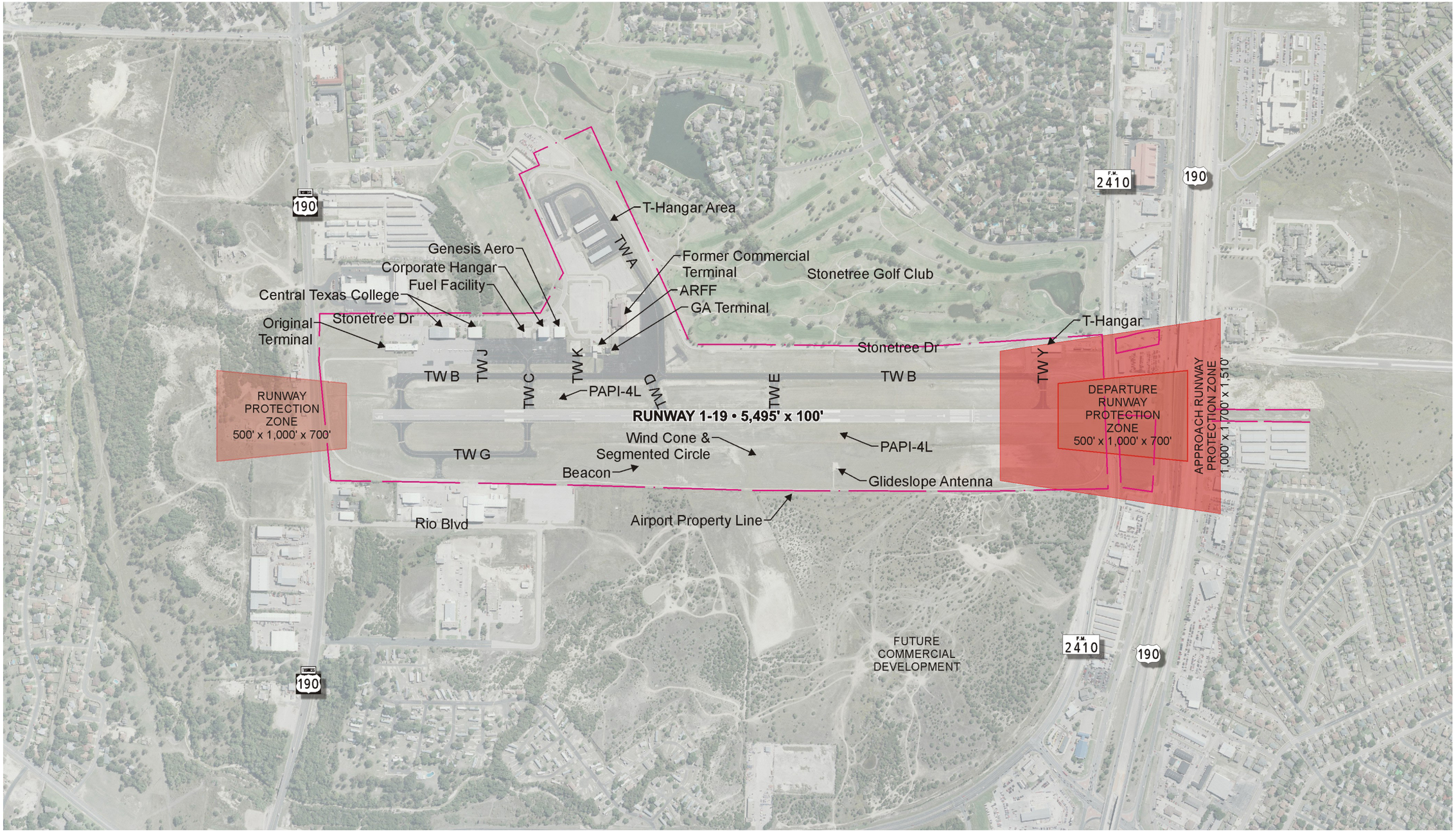
As shown in **Figure 2-1**, *General Airport Layout*, ILE is a single runway system with a full parallel taxiway on the east and partial parallel taxiway on the west. **Table 2-5** provides a summary of the airfield components and data. The airside facilities consist of the runway, taxiways, airfield lighting, navigational aids, weather reporting systems, and other various components.

TABLE 2-5 | AIRFIELD FACILITIES

Runway 01-19	
Length (feet)	5,495
Width (feet)	100
Surface Material/Treatment	Asphalt
Weight Bearing Capacity (pounds) Single Wheel Gear (SWG) Dual Wheel Gear (DWG)	 17,000 50,000
Displaced Threshold (feet) Runway 01 Runway 19	 844 0
Markings	Precision
Runway Lighting	Medium Intensity Runway Lights (MIRL) (See page 2-11)
Approach/Lighting Aids Vertical Guidance Slope Indicators	 Precision Approach Path Indicators (PAPI–4L)
Visual Aids	Rotating Beacon Lighted Windcone Segmented Circle
Instrument Approach Aids	ILS (Localizer/Glideslope) GPS
Weather Reporting Aids	Airport Weather Observation System (AWOS)

Source: FAA Airport Facility Directory/South Central, 2014, FAA 5010 Data, and FAA ASIS Database.

FIGURE 2-1 | GENERAL AIRPORT LAYOUT



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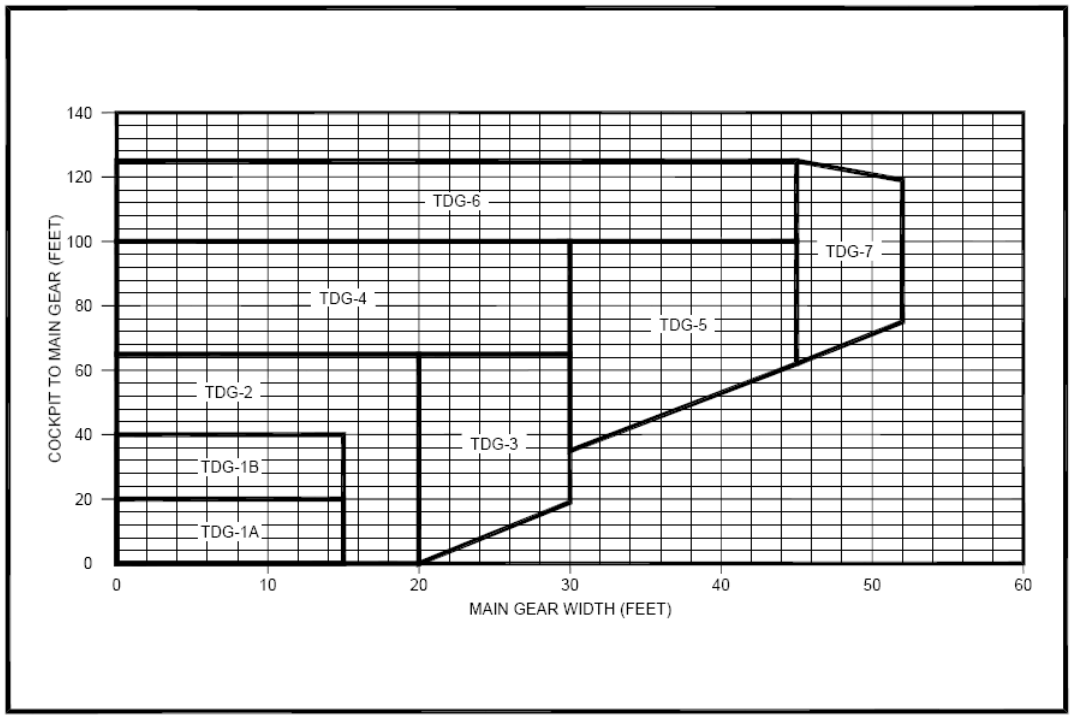
Runway 01-19

Runway 01-19, is 5,495 feet in length, 100 feet in width. The runway is constructed of asphalt, considered to be in good condition, and has a published gross weight bearing capacity of 17,000 pounds single-wheel and 50,000 pounds for aircraft with dual wheel landing gear. The runway is equipped with High Intensity Runway Lights (HIRL), as well as four-box PAPI-4L located on the left side of each runway approximately 500 feet from each runway end. Runway end identifier lights (REIL) and an Instrument Landing System (ILS), composed of a localizer and glide slope, serves Runway 01, which has a displaced threshold of 844 feet.

Taxiways/Taxilanes

Airport operations are coordinated to and from the runway and businesses/hangars on the airfield through the establishment of taxiways and taxilanes. Each taxiway is designated with a unique name and designed to accommodate anticipated aircraft operations based on a taxiway design group (TDG). The TDG is a classification system for taxiways/taxilanes based on an airplanes landing gear dimensions namely the outer to outer main gear width and the cockpit to main gear distance. The TDG is identified by use of **Figure 2-2** then application of the specific safety parameters outlined in FAA AC 150/5300-13A, Change 1, *Airport Design*.

FIGURE 2-2 | TAXIWAY DESIGN GROUPS



Source: FAA AC 150/5300-13A, Change 1, *Airport Design*

There are numerous taxiways and taxilanes at ILE. **Figure 2-1** identifies each major taxiway on the airfield and **Table 2-6** outlines the TDG for each taxiway based on existing conditions, operations, and airport capabilities along with specific design parameters associated each TDG.

TABLE 2-6 | AIRSIDE TAXIWAY DESIGN GROUP AND SAFETY STANDARDS

Taxiway/ Taxilane	TDG	Actual Width (ft)	Design Width (ft)	Taxiway Safety Area (ft)	Taxiway Object Free Area (ft)
Alpha	II	50	35	79	131
Bravo	II	50	35	79	131
Charlie	II	60	35	79	131
Delta	II	60	35	79	131
Echo	II	60	35	79	131
Golf	II	50	35	79	115
Juliet	II	40	35	79	115
Kilo	II	40	35	79	115
Yankee	I	35	25	49	89

Source: FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*. East and west taxiway designations is in reference to its location to Runway 01-19.

Runway 1-19 Parallel Taxiway

The east-side full parallel taxiway is designated as Taxiway Bravo and is designated TDG-II. It is 50 feet wide and offset from Runway 01-19 centerline-to-centerline a distance of 305 feet. This is wider than the standard offset of 300 feet recommended for the RDC of C-II-4000. Taxiway Bravo is equipped with LED medium intensity taxiway edge lights (MITL). Taxiway Golf is a partial parallel taxiway on the west side of the field that connects the Runway 19 end with Taxiway Charlie. Taxiways Alpha, Charlie, Echo, and Foxtrot provide access from Runway 1-19 to the east side of the airfield and the various aprons, taxilanes and hangars. Lighted signage is provided for all the taxiways supporting operations on Runway 1-19.

Airfield Lighting

Lighting is an important part of maintaining the airfield's operational status during night and inclement weather conditions. **Table 2-5** outlines the various airfield lighting features. Pilots identify an airport by locating the rotating beacon a lighting feature designed to provide alternating white and green lights as it rotates and can be seen for up to ten miles from the field. The beacon is located west of Runway 1-19 approximately 2,000 feet from the Runway 19 end and outboard from the runway an estimated 450 feet.

Runway 01-19 is equipped with various lighting features. High intensity runway lights (HIRL) run along each side, at each threshold, and each end/threshold of Runway 01-19 that is served by both visual and instrument lighting systems. Each runway end is served by a PAPI-4L system that provides pilots on approach during visual conditions with colored light cues that can guide the pilot to fly a given flight path along a predetermined slope to the runway environment. Runway 01 is served by a REILs, a lighting system designed to aid pilots in rapidly identifying a runway end location during night and inclement weather and low visibility periods.

Aids to Navigation (NAVAID)

NAVAIDs, located on the field or at other locations in the region, are specialized equipment that provide pilots with electronic guidance and visual references in an effort to execute instrument approaches and point-to-point navigation. The NAVAIDs available for use by pilots using ILE are a Very High Frequency Omnidirectional Range (VOR) with a collocated distance measuring equipment (DME) system and a non-directional beacon (NDB). A VOR/DME is a system of VHF Omnidirectional Range Radio Beacons that emit signals to aid navigation instruments in aircraft to determine the location of the VOR station from the aircraft with respect to magnetic

north. The co-located distance measuring equipment (DME) is used to measure the slant range distance of an aircraft from the navigational aid, in nautical miles. An NDB is a radio system that emits a continuous signal that can be homed in on when received by an appropriately equipped aircraft. The VOR/DME unit in the ILE vicinity is Gray (GRK, 111.8/55). Gray is located approximately seven nautical miles (NM) southwest of ILE. The NDB for ILE is the IRESH NDB that is used as part of the approach procedures at ILE.

The NAVAIDs at ILE are associated with instrument approach procedures and include an instrument landing systems (ILS) serving the Runway 01 end. The ILS is comprised of two components a localizer and glideslope. The localizer provides lateral azimuth guidance while the glideslope provides vertical guidance to all aircraft appropriately equipped. Additionally, ILE has existing global positioning system (GPS) IAP with straight-in minimums to the Runway 01 end.

Currently, there are three published straight-in or circling instrument approach procedures at ILE. Details for these approaches are in **Table 2-7**.

TABLE 2-7 | INSTRUMENT APPROACH PROCEDURES

Runway End	Approach Type	Visibility Minimums	Ceiling Minimum
Runway 1	ILS or LOC	ILS Categories A, B, & C – ¾–mile LOC Categories A, B, & C – ¾–mile Circling: Category A – 1–mile Category B – 1–miles Category C – 1 ½–miles	1,094' MSL/250' AGL 1,180' MSL/336' AGL 1,320' MSL/472' AGL 1,360' MSL/512' AGL 1,360' MSL/512' AGL
Runway 1	RNAV/GPS	LNAV MDA: Categories A, B, & C – ¾–mile Circling: Category A – 1–mile Category B – 1–miles Category C – 1 ½–miles	1,260' MSL/416' AGL 1,320' MSL/472' AGL 1,360' MSL/512' AGL 1,360' MSL/512' AGL
ILE	VOR – A	Circling: Category A – 1–mile Category B – 1 ¼ –miles Category C – 2 ¼ –miles	1,620' MSL/772' AGL

Source: FAA Airport Facility Directory/South Central Instrument Approach Procedures, August 2014
RNAV (GPS Area Navigation); LNAV (GPS Lateral Navigation)

Weather Reporting

ILE has an automated weather observation system (AWOS) that is the primary source of wind direction, velocity, and altimeter data for weather observation purposes for the airport. The AWOS, installed, owned, and maintained by the FAA, is an automated sensor suite that reports weather conditions over a discrete radio frequency for pilots to receive real-time weather information. The ILE AWOS information can be received by tuning to 128.575 MHZ or by calling 254-690-3131.

LANDSIDE / TERMINAL AREA FACILITIES

The landside/terminal area facilities are those central to the business operations of an airfield. They support transition from the airfield to landside businesses and then into city infrastructure. Landside facilities typically include a terminal building, aircraft storage facilities of various types, aircraft parking aprons and other support facilities like fuel storage and delivery and aircraft rescue and firefighting supporting structure.

Former Commercial Terminal Building

As a former commercial service airport, ILE was equipped with a terminal building capable of supporting air carrier activity and all of the airline, rental car, and passenger facilities. This building is located near midfield adjacent to a major aircraft parking apron. In 2004 the City of Killeen adopted a planning document that guided the transition of air carrier/commercial passenger services from ILE to GRK. The former commercial terminal building has been vacant from that time and maintained by the City; however, it does not have a current occupancy permit. The City does maintain the elevator license. The City and airport staff have endeavored to find tenants willing to utilize all or part of this structure. At present it is only being used for storage of various items by city departments.

As part of this study, the former commercial terminal building is being evaluated from two unique aspects. The first is from an architectural and occupancy standpoint and the second is from a commercial real estate need perspective. The architectural/occupancy review was completed by a staff architect and is summarized in this section and included in **Appendix B**. The commercial real estate evaluation was completed by Wright & Brown Associates, is summarized in this section, and is included in **Appendix B**.

Architectural/Structural Evaluation

The evaluation process used by our staff architect was a visual walk-through format. No specific testing equipment was used to validate or confirm observations. The approach was to determine the general overall condition of the basic building elements and evaluate each for obvious conditions in need of repair/refurbishment. The overall condition parameters included structural soundness, exterior weathering, and water damage indications.

The structure is overall in good condition. Drainage in the building vicinity is in good condition and appears to be functioning as designed. Exterior roof looks sound with no signs of damage or leaking and weather tightness does not appear to be an issue. There was some damage to the exterior masonry at the building corners caused by water intrusion and not building settling. It is the opinion of the architect that these conditions could be mitigated if the damaged areas were repaired before further damage can occur.

Inside the former commercial terminal building most building elements were in fair to good condition. There was no visual sign of water intrusion or mold with no odors to indicate the presence of mold or mildew. Internally, no signs of settling were evident. Most of the ceilings are mangled or missing and will require replacement if the building is refurbished in the future. The restrooms were in good repair but in need of cleaning and updating visually to meet current city codes. The two most glaring internal issues were the lack of fire protection and the HVAC equipment being disabled/inoperative. Installation of fire protection sprinklers is recommended. The HVAC system could still use some of the internal ducting provided a thorough cleaning is completed and prior to ceiling replacement for ease of work.

Overall, the spaces within the building could be adapted to various commercial, office, or educational institution use. The former luggage area could be converted to a storage/repair area for a number of different use types. If demand exists for a single or multiple tenant use, the building would be a candidate for rehabilitation.

Commercial Real Estate Evaluation

The former commercial terminal building, constructed in 1984, was evaluated by Wright & Brown Associates of Killeen, TX. The site evaluation consisted of approximately five areas occupied by the former commercial terminal building and associated parking lots. The evaluation consisted of an evaluation of commercial real estate property need in the market, possible reuse options, and bringing the building up to current city building codes.

The building was valued at approximately $2.12 million based on current condition. Improvements to meet City codes and obtain a new occupancy permit were estimated at nearly $1.2 million. With this investment and if the building were retained a recommended lease rate could be as high as $13.20 per square foot lowered to as little as $9.00 per square foot if not leased quickly. Commercial real estate in the region has been strong over the past several years; however, a struggling economy along with sequestration effects have seen both military and military contractors in the region reducing their needs for commercial real estate. Today there is an overabundance of commercial real estate properties for lease in the local market and the location of the building detracts from its lease or sale potential. Wright & Brown Associates indicated that at this time there is not a need/demand for the property in the Killeen commercial real estate market. This could change with building refurbishment or a reversal in military and military contractor needs in the future.

Two potential reuse options were proposed for outright sale of the building and parking lots with some recommended buyers to include local educational institutions or real estate developers. These options were based on the evaluator's expertise in the market and comparable properties in the region. The two sale options included:

1. $2,000,000 sale with City responsible for all required or stipulated repairs and renovations with the estimated cost of repairs set at $1,181,466; and,

2. $1,015,445 sale with the property conveyed in an "as-is" condition.

Bringing the former commercial terminal up to code and obtaining a new occupancy permit comes with a long list of "must do" items. These range from repairs to acoustical ceiling tiles and lighting to fully replacing the heating and air conditioning systems and installing a new fire protection system. Additional costs to outfit the space for office use including design fees and contingency is nearly $1.8 million.

General Aviation Terminal

The airport is equipped with a GA terminal building near midfield. Airport customers are served by Aviation Department staff between the hours of 8:00 AM and 5:00 PM Monday through Saturday from this building. The GA terminal building houses staff office and service counter, restroom, lounge/waiting area, crew rest facilities, pilot flight planning, and an airport information and weather station. Aviation Department staff provide fixed base operator (FBO) type services to include aircraft parking and tiedowns, courtesy car, aircraft fueling, and other miscellaneous support functions.

Original Air Carrier / Commercial Terminal Building

The airport's original commercial terminal building is still on airport property. It is a single story structure with nearly flat roof located at the north end of the aircraft parking apron east of the Runway 19 end and parallel taxiway. Currently, the entire building is in non-aviation use by the Killeen Police Department.

Aircraft Rescue and Fire Fighting Station

The City has retained an Index "A" ARFF equivalent at ILE. The ARFF station was originally built to support commercial/ air carrier operations. The Index "A" ARFF station allows ILE to continue to be able to support five (5) daily departures by aircraft no more than 90 feet in length. As pictured, the City maintains one ARFF truck for exclusive use on the airfield and houses a reserve fire truck.

Commercial Operators

ILE has been home to a number of different commercial operators. During its days as a commercial service airport, ILE was home to a number of different airlines and rental car companies. There have been various different fixed base operators (FBO) in the past and today the only FBO is Genesis Aero. The FBO offers flight instruction, aircraft rental, aircraft maintenance, and pilot supplies to the GA community at ILE.

Central Texas College (CTC) aviation program also calls ILE home. The college provides education towards a professional pilot certificate from the two northern most hangars on the field. CTC has a compliment of 14 aircraft from which it provides pilot training under a FAR Part 141 program for single-engine, multi-engine, instrument, commercial, and instructor ratings.

Aircraft Storage/Hangar Facilities

ILE supports the storage of aircraft in two primary hangar types: T-hangars and box/common hangars. A box/common hangar is a stand-alone structure while T-hangars are individual storage units joined as one standing structure. As a general reference there are four (4) corporate/common/box hangars and five (5) T-Hangar structures (shade/enclosed). The T-Hangars comprise approximately 37,000 square feet of aircraft storage both open/shade and enclosed type. Currently there is approximately 40,000 square feet of box/common hangars space at ILE. **Table 2-8** provides the breakdown of hangar storage at ILE.

TABLE 2-8 | AIRCRAFT STORAGE HANGARS

Building Number	Hangar Type	Area (sq. ft.)	Ownership/Lease Holder
3	Shade T-Hangar	9,000	City/Multiple Leases
5	Box/Common	6,600	City/Genesis Aero
7	Box/Common	16,000	Central Texas College
9	Box/Common	9,000	Central Texas College
10	Enclosed T-Hangar	9,300	City/Multiple Leases
11	Enclosed T-Hangar	9,300	City/Multiple Leases
12	Enclosed T-Hangar	9,300	City/Multiple Leases
13	Box/Common	8,500	City/Open (Negotiating new lease)
14	Enclosed T-Hangar	12,000	City/Multiple Leases

Source: Garver, 2014.

Aircraft Taxilane and Parking Apron

The airport has approximately 627,800 square feet of taxilane and apron space used for parking and maneuvering of aircraft. Within the apron space there are 50 designated tiedown spaces. **Table 2-9** outlines where the major parcels of pavement are within the ILE terminal area and each designated use or lease.

TABLE 2-9 | AIRCRAFT PARKING AND MANEUVERING APRON/RAMP

Taxilane/Apron	Use	Area (sq. ft.)	Number of Tiedowns	Ownership/Lease Holder
Original Terminal	Tiedowns (original terminal)	28,000	5	City
CTC Apron	Maneuvering and Tiedowns	95,000	15	Central Texas College
East Central	Maneuvering and Tiedowns	110,000	20	City
North Apron	Ramp and Tiedowns	13,500	4	City/Open (Negotiating new lease)
Genesis	Ramp and Tiedowns	9,500	2	Genesis Aero
GA Terminal/ 1525 Building	Maneuvering, Ramp, and Tie-downs	129,500	4	City
Taxilane Alpha	Maneuvering	117,500	N/A	City
Enclosed T-Hangars	Maneuvering and Ramp	61,000	N/A	City/Multiple lease holders
Shade T-Hangar	Maneuvering and Ramp	29,400	N/A	City/Multiple lease holders
South T-Hangar	Maneuvering and Ramp	34,400	N/A	City/Multiple lease holders

Source: Garver, 2014.

Fuel Storage Facility

The city owns and operates an above-ground fuel storage facility that is located on the east side of the airport south of the Central Texas College hangars. It is equipped with three (3) fuel tanks: 12,000 gallon capacity for both Jet-A and AvGAS (100LL) and a smaller 1,000 gallon tank for diesel. The AvGAS and Jet-A tanks are equipped with a 24-hour credit card system. Jet-A is delivered via a fuel truck which is staged behind the tanks when not in use.

Table 2-10, provides a summary of fuel sales in gallons conducted at ILE since 2004. The last full year of commercial service operations at ILE was 2003. Commercial service was operated at ILE through July 2004. Following the move of air carrier operations to GRK, fuel sales at ILE have declined from a high in 2006 of 213,277 gallons to a low in 2013 of 103,195. Through September 2014 fuel sales look to be holding steady with those from 2013 for both Jet-A and AvGAS. Another contributing factor in the fuel sales decline is the departure of DynCorp reducing operations and eventually leaving the field in 2012.

TABLE 2-10 | AIRPORT FUEL SALES, 2004 - 2013

Year	AVGAS (gallons)	Jet A (gallons)	Total (gallons)
2004	47,994	357,891	405,885
2005	58,318	115,212	173,530
2006	49,355	163,922	213,277
2007	45,276	138,801	184,077
2008	48,969	93,886	142,855
2009	39,961	85,975	125,936
2010	38,409	80,111	118,520
2011	47,209	93,024	140,233
2012	49,903	70,724	120,627
2013	50,942	52,153	103,095

Source: Killeen - Skylark Field Airport Fuel Flowage Records 2004 – 2013.

Airport Management/ Administration

Airport management is provided by the City of Killeen Aviation Department. Primary management functions and oversight for ILE are performed by an Assistant Director whose office is located in the terminal building at the Killeen – Fort Hood Regional Airport. The day-to-day airfield management and customer service is provided by Aviation Department staff from the general aviation terminal building located at the southern end of the ramp near mid-field.

AIRPORT MANAGEMENT DOCUMENTS

Establishing the appropriate level of management and control of the airport landside environs is an important part of managing a busy and complex airport like Killeen. Beyond the controls established in lease agreements the airport must have two important management documents in place: Minimum Standards and Airport Rules and Regulations. ILE is a mature general aviation facility with long established management practices and documents. Updating these documents periodically and as part of the master plan provides a continuing process of improvement for airport management, the airport sponsor, and tenants.

Minimum Standards

Airports that receive federal funding assistance are required to accept a body of guiding principles known as grant assurances which are designed to ensure the airport is operated for the public good. Two of these grant assurances apply specifically to the development and management of airport minimum standards.

Under Grant Assurances 22 and 23, the airport sponsor is required to make the airport available to the public for use without discrimination to all types of aeronautical service providers. Further, in any contract or lease executed by the airport sponsor under which a right is granted to provide services to the public on the airport the sponsor shall insert and provide provisions outlining certain conduct of service to the general public by the contractor. In general these contract provisions are meant to ensure the service provider do so in a non-discriminatory manner and will not allow an exclusive right to the contractor for providing any specific service on the airport. A full copy of the airport grant assurances are contained in **Appendix C**.

The ILE Minimum Standards have been developed through several iterations with the last update completed, approved, and adopted by City Council in 1991, Resolution 91-37. As things have changed in the aviation industry and at ILE, it is incumbent upon the airport and sponsor that the Minimum Standards be updated periodically to reflect the current service providers on the field and anticipate any current trends towards new or changing situations or conditions on the airfield or service provider industry. In addition the document needs to be updated to reflect the current airport name Killeen – Skylark Field Airport throughout. A full copy of the current ILE Minimum Standards are included in **Appendix D**. After a thorough review of the ADS Minimum Standards the following revision are recommended:

1. Section II: Change language regarding the designation as a primary commercial service airport.

2. Section VI: Subsection 2 revise to specify the minimum service equipment required to operate as an FBO on the field. Additionally, reconsideration of the required minimum acreage and ramp space to reflect existing and anticipated available properties for establishing a new FBO on the airfield.

3. Section X – F Air Taxi, Charter and Air Freight Services: Remove portions referring to commercial services.

Rules and Regulations

Airport rules and regulation documents are designed to influence safe, orderly, and efficient airport operations and are applicable to all persons using the airport regardless of reason or intent. The current ILE Rules and Regulations were adopted as Killeen City Ordinance 88-124 in 1988 and affected by any amendments adopted. Overall, the ILE Rules and Regulations are very well written with only minor recommendations for revision that is included in a revised draft in **Appendix E** for review and adoption by the sponsor and airport. Below is a bulleted list of revisions:

1. Change all references of Killeen Municipal Airport to Skylark Field Airport;
2. Remove all items relating to commercial service;
3. Article II, Section 2 Change "Duties of Assistant Director of Aviation" to "Duties of Airport Manager";
4. Change the day-to-day task responsibilities throughout entire document to Airport Manager instead of Director of Aviation;
5. Remove Article III, Section 5 "Loud Devices in Terminal"; and,
6. Remove Article VII, Section 13 "Paid Parking Lot"

Existing Environmental Overview

Bell County, Texas falls within the Cross Timbers ecoregion of Texas and more specifically in the Limestone Cut Plains sub region. This is a transitional region between what was once prairie that now supports wheat production to the forested low mountains of central Texas. Reports from the US Environmental Protection Agency describe the area as "a mosaic of forest, woodland, savanna, and prairie." Today ILE is in an urban setting with commercial and residential real estate built up or planned for construction around the airport's perimeter.

FIGURE 2-3 | ECOREGIONS OF TEXAS

Source: US Department of Agriculture, Natural Resources Conversation Service.

CLIMATE

The climate of Bell County and Killeen is characterized as humid subtropical with hot summers and moderate winters. Temperature ranges are wide in all seasons. Nearly tropical maritime air controls the climate in spring interrupted by plunges of arctic air masses that cause sudden temperature drops and provide a variety of weather types. Precipitation is evenly distributed across the year with average rainfalls of 34 inches. Generally, summer months, July and August, are the driest while the wettest months occur in the spring or fall. Southern winds dominate the wind patterns of the region. The strongest winds are in March and April that produce high peak gusts associated with the arctic air masses that produce squall lines and thunderstorms.

SOILS

The western half of Bell County where Killeen is located is in Grand Prairie soil region of central Texas. The soils characterizing the area surrounding ILE and Killeen are in the Denton-Purves association. This sub region is described by nearly level to sloping, very shallow to moderately deep clayey soils over top of a hard limestone shelf. Uplands in western Bell County are separated by stream valleys with small bluffs and rocky ledges. These rises can range from 50 feet to as high as 200 feet. The soils in the ILE vicinity are of two varieties or types: Denton and Purves. Denton soils are predominate and are characterized by very dark grayish-brown clay approximately six inches thick. The Purves soil type is similar to Denton but can be as much as 14 inches thick and rests over a hard limestone shelf.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

The National Historic Preservation Act of 1966 requires that an initial review be made to determine if any properties in or eligible for inclusion in the National Register of Historic Places are within the area of a proposed action's potential environmental impact. The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, pre-historic, historical, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded, or federally licensed project. An online query through the Texas Historical Commission revealed that there are no historic site locations in the immediate airport vicinity; however, a more thorough investigation and coordination may need to be conducted through both the state and federal cultural resources offices prior to future airfield construction.

FISH, WILDLIFE, AND PLANTS

The Endangered Species Act requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. As provided by the Texas Parks and Wildlife Department (TPWD), several threatened or endangered species are listed for Bell County. As defined by the U.S. Fish and Wildlife (USFW), Endangered Species is any species of wildlife whose continued existence as a viable component of the state's wild fauna is determined to be in jeopardy, and a Threatened Species is any species of wildlife that appears likely, within the foreseeable future, to become an endangered species. **Table 2-11** lists the threatened and endangered species for Bell County on both a federal and state status regardless of whether they occur at ILE. Research does not show that habitat for any endangered species exists on ILE nor are any endangered plant species known to grow on ILE property. Future coordination with USFW or TPWD may be necessary prior to commencing any major construction project at ILE to confirm that no hazard to an endangered or threatened species is being created.

TABLE 2-11 | BELL COUNTY THREATENED AND ENDANGERED SPECIES

Common Name	Genus/Species	Federal Status	State Status
Amphibians			
Salado Springs salamander	Eurycea chisholmensis	T	
Birds			
American Peregrine Falcon	Falco peregrinus anatum	DL	T
Arctic Peregrine Falcon	Falco peregrines tundrius	DL	
Bald Eagle	Haliaeetus leucocephalus	DL	T
Black-capped Vireo	Vireo atricapilla	LE	E
Golden-cheeked Warbler	Dendroica chrysoparia	LE	E
Interior Least Tern	Sterna antillarum athalassos	LE	E
Mountain Plover	Chardrius montanus		
Peregrine Falcon	Falco peregrines	DL	T
Sprague's Pipit	Anthus spregueii	C	
Western Burrowing Owl	Athene cunicularia hypugaea		
Whooping Crane	Grus Americana	LE	E
Fishes			
Gudalupe bass	Micropterus treculii		
Smalleye shiner	Notropis buccula	E	
Mammals			
Cave myotis bat	Myotis velifer		
Plains spotted skunk	Spilogale putorius interrupta	LE	E
Red wolf	Canis rufus	LE	E
Mollusks			
False spike mussel	Quadrula mitchelli		T
Smooth pimplback	Quadrula houstonensis	C	T
Texas fawnsfoot	Truncilla macrodon	C	T
Reptiles			
Texas garter snake	Thamnophis sirtalis annectens		
Texas horned lizard	Phrynosoma cornutum		T
Plants			
Texabama croton	Croton alabamensis var texensis		

Source: Texas Parks and Wildlife Department; T = State Listed Threatened; E = State Listed Endangered; DL = Federally Delisted; LE = Federally Listed Endangered/Threatened

Aviation Operating Environment

ILE operates in a very busy airspace environment. Immediately north of the airfield is the Fort Hood Airfield, used primarily for helicopter operations; southwest of ILE is the Killeen – Fort Hood Regional Airport, which is comprised of a civilian commercial terminal facility on Robert Gray Army Airfield, a joint-use military facility; approximately 15 miles east of ILE is the Temple – Draughon Miller Central Texas Regional Airport. These four airports make a busy operating environment with complex airspace that support commercial, general aviation, and military aviation traffic. The visual flight rules chart in **Figure 2-4** depicts the airspace surrounding ILE.

AIRSPACE AND AIR TRAFFIC CONTROL

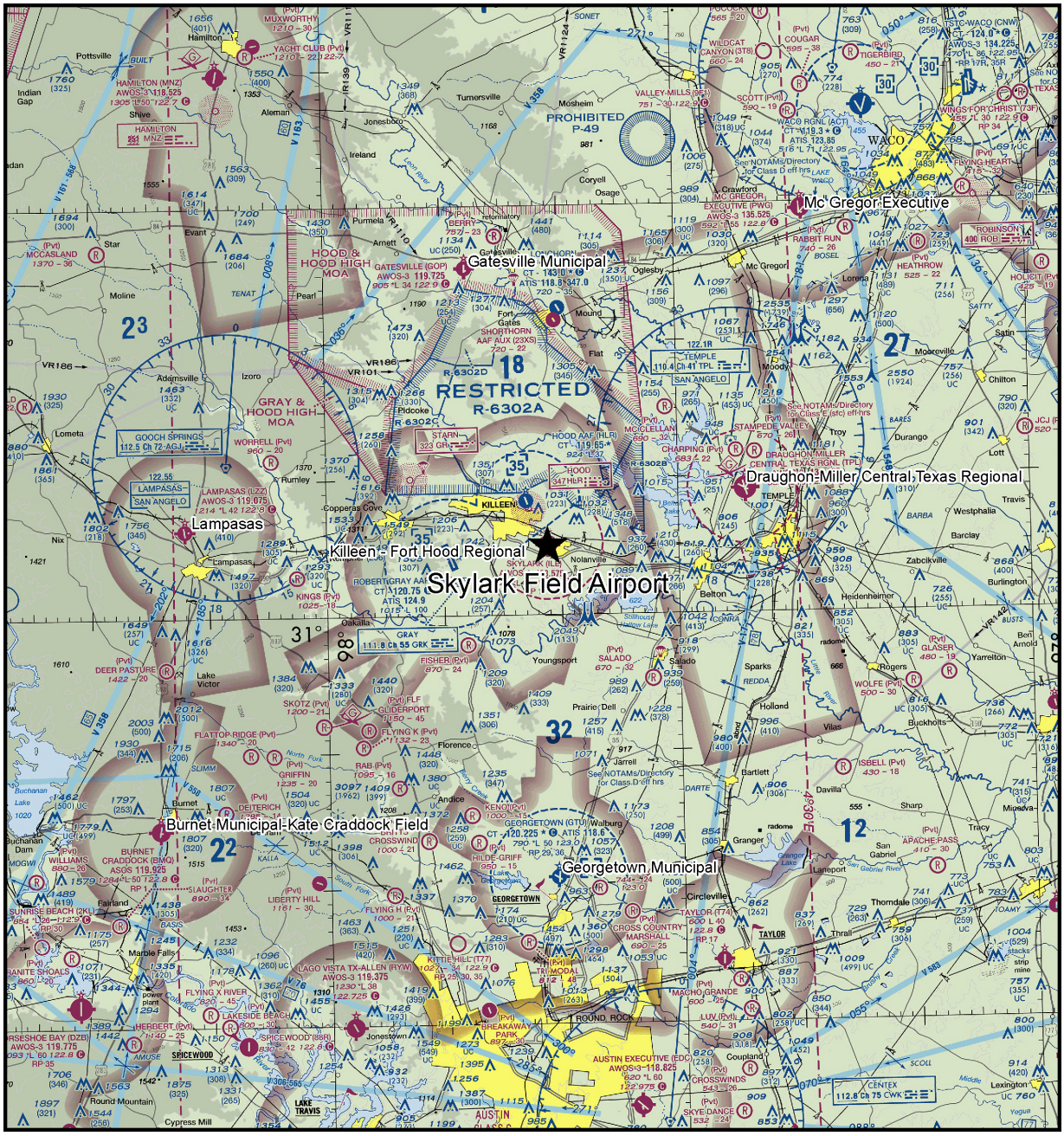
All flights conducted within the national airspace system, whether under Visual Flight Rules (VFR) or Instrument Flight Rules (IFR), do so based on regulations mandated by the FAA. Based on these rules, each airport whether private or public has a specific role that it plays as part of this airspace system. As shown in **Figure 2-4,** the local airspace immediately surrounding ILE is designated as Class E airspace. Immediately north and west of ILE there is Class D airspace associated with Fort Hood Airfield and the Killeen – Fort Hood Regional Airport. Both these Class D airspace surfaces begin at the surface and rise to include elevations up to 3,500 feet above mean sea level (MSL). Both the Class E and D airspace is circular with a radius of 5 miles. The ILE Class E airspace is superseded by the GRK Class D airspace. All flights and aircraft operating to or from ILE should be capable of communicating with air traffic control (ATC) and be equipped with mode C altitude reporting transponders. ILE is equipped with a remote communications outlet (RCO). The RCO allows IFR aircraft to receive hold and release clearances directly from Gray Approach Control and to close flight plans once safely on the ground at ILE.

An additional factor of the airspace around the airport is the designation of Special-Use airspace. Special-Use airspace is that area specifically designated by ATC to separate flight activity related to military and national security needs from other airspace users. Contact with and advisories from ATC are recommended. Currently, there are seven different kinds of special-use airspace: alert areas, military operations areas (MOA), military training routes (MTR), restricted areas, prohibited areas, warning areas, and temporary flight restriction (TFR) areas. Because of the military facilities in the ILE vicinity there are a number of these special-use airspaces in the area that are depicted on **Figure 2-4**.

AIR TRAFFIC SERVICE AREAS AND AVIATION COMMUNICATIONS

ILE is not served by an air traffic control tower (ATCT). Pilots operating to or from ILE are required to communicate through a common traffic advisory frequency (CTAF) and employ see-and-avoid principles. Both Hood Army Airfield to the north of Killeen and Killeen – Fort Hood Regional west of Killeen have operating ATCTs. For aircraft operators arriving at or departing from ILE on an IFR flight plan coordination is handled by Gray Approach on a discrete frequency for coordination and safety. Beyond the immediate airspace boundaries, FAA air traffic controllers, stationed at En-Route Control Centers or Air Route Traffic Control Centers (ARTCC), provide for the safe movement of aircraft operating primarily under IFR conditions within a defined geographic jurisdiction. There are currently 22 geographic ARTCCs established within the continental United States, each responsible for a specific geographic region or boundary delineation. ILE is located within the Fort Worth ARTCC that manages portions of airspace in Oklahoma, Arkansas, Louisiana, and Texas. The Houston ARTCC begins just south of ILE and it manages airspace in portions of Texas, Louisiana, and the Gulf of Mexico.

FIGURE 2-4 | AIRSPACE, AIRPORTS, AND NAVAIDS SUMMARY



Source: FAA VFR Sectional Chart, March 2014

Killeen - Skylark Field Airport Service Area and Area Airports

The airport service area is generally defined as the geographic region served by a select airport. The National Plan of Integrated Airport Systems (NPIAS) developed by the FAA defines service area as that area encompassed by a 25 minute drive time from a given airport. In rural, less densely populated areas this service area is a good model to define a given airports service area. However, at ILE, a service area determination can be made regarding competing airports whose NPIAS service area overlaps with ILE's. Additionally, the ILE Composite Service Area considers each competing airport's relative distance to population centers, paved road access to each airport, and evaluates their facilities, equipment and services, as well as programmed expansion projects. Its location in the Temple – Killeen Metropolitan Area complicates the service area. The number of competing public airports can both widen and contract the service area depending on the users perceived level of service and amenities offered at a given airport.

Surrounding airports have varying degrees of influence on the airport service area with respect to competing services, e.g., available hangar rentals, flight training, charters, fuel, maintenance, courtesy car, security, etc., facilities and equipment, navigational aids, and accessibility. **Table 2-12** lists the primary competing airports for Skylark Field with their major service elements. It should be noted, however, that the demand for aviation facilities does not necessarily conform to political or geographical boundaries. **Figure 2-5** illustrates the various airports in the region along with their specified NPIAS service area. ILE is found in the central sub region of the graphic.

Killeen – Fort Hood Regional Airport:
The City of Killeen operates commercial and business aviation terminal facilities at GRK. The airfield is a joint-use facility owned and operated by the US Army located seven miles west of ILE and is home to the City's Aviation Department. GRK serves military aviation, commercial airline, and GA corporate users. GRK has one runway (15-33) with a total of six instrument approach procedures. The City's Aviation Department runs and manages all services for commercial and civilian aircraft using GRK. Commercial airlines serving GRK include American Airlines/Envoy, Delta Air Lines, and United Airlines.

Draughon Miller Central Texas Airport:
Draughon Miller (TPL) is located 18 miles east of ILE. It serves business and leisure GA aircraft as well as military helicopter operations through a two runway system. Runway 15-33 is the primary runway has dimension of 7,000' x 150' while Runway 2-20, the crosswind, has dimension of 4,740' x 100'. TPL has ILS precision approaches supported by an approach lighting system to Runway 15-33. Services offered at TPL include fuel, line service, airframe and power plant maintenance, avionics service, piston engine overhauls, pilot training, aircraft rentals, aircraft storage hangars, and tie-downs. TPL is home to nearly 58 civilian airplanes and over 100 military aircraft, mostly helicopters, on a temporary basis for maintenance and refurbishment. The airport experiences more than 53,000 annual operations.

Mc Gregor Executive Airport:
Mc Gregor Executive (PWG) is located west of Mc Gregor, Texas, approximately 30 miles northeast of ILE and PWG is a business/corporate GA airport with business and personal aviation transportation facilities. It serves the GA community through a two runway system: Runway 17-35, the primary runway, is 5,501 feet long by 75 feet wide; Runway 4/22 is 3,484 feet long by 55 feet wide. There are 69 planes based at PWG which has approximately 25,000 annual operations. Services offered at PWG include fuel, line service, ground power unit/power cart, airframe and power plant repairs/service, avionics sales/service, aircraft management, hangars, and tiedowns.

Georgetown Municipal Airport:
Georgetown Municipal (GTU) is a business/corporate GA airport located approximately 27 miles south of ILE with an ATCT and a two runway system. The primary runway, Runway 18/36, is 5,004 feet long by 100 feet wide, lighted, and constructed of asphalt; Runway 11-29 is 4,099 feet long by 75 feet wide. GTU bases nearly 190 aircraft and experiences over 200 operations per day. Services provided at GTU through one of two FBOs or by airport staff include fuel service, line handling, aircraft repair/maintenance, GPU, aircraft sales/management/brokering, and support facilities for training, private and business aviation.

Gatesville Municipal Airport:
Gatesville Municipal (GOP) is a basic service GA airport located 30 miles north of ILE. Runway 17-35 is 3,400 feet by 60 ft. with medium intensity lighting and a small terminal area. Services at GOP include fuel, airframe and power plant repairs, hangars, and tiedowns. GOP does not have a published instrument approach. There are only 10 based aircraft and the airport estimates fewer than 5,000 annual operations.

Burnet Municipal Airport/Kate Craddock Field:
Kate Craddock Field (BMQ) is a local, business/corporate GA facility serving the City of Burnet and the central Hill Country of Texas that is approximately 35 miles southwest of ILE. With nearly 50 based aircraft the airport experiences more than 16,000 annual operations. Runway 1-19 is an asphalt paved non-precision runway with dimension of 5,000 feet in length and 75 feet in width. Services provided at BMQ include fuel, line service, airframe and power plant repair, hangars, and tiedowns.

Taylor Municipal Airport:
Taylor Municipal (T74) is a local, community service airport serving the citizens of Taylor, TX. There are nearly 50 planes based at T74 and over 25,000 annual operations. T47 is located 32 miles south-southeast of ILE. T74 and an FBO offer the following services: fueling, aircraft maintenance, avionics sales/service, hangars, and tiedowns. T74 has one runway, Runway 17-35, that is 4,000 feet long and 75 feet wide. It is a non-precision runway served by both a GPS and VOR instrument approach procedures.

Lampasas Municipal Airport:
Lampasas Airport (LZZ) is located 26 miles west of ILE and north of the City of Lampasas. The City runs the FBO offering aviation services including fuel, hangars, courtesy car, and tiedowns. Runway 16-34 is an asphalt runway that is 4,202 feet long and 75 feet wide served by GPS non-precision instrument approach procedures. There are 14 based aircraft and the airport experiences approximately 10,000 annual operations.

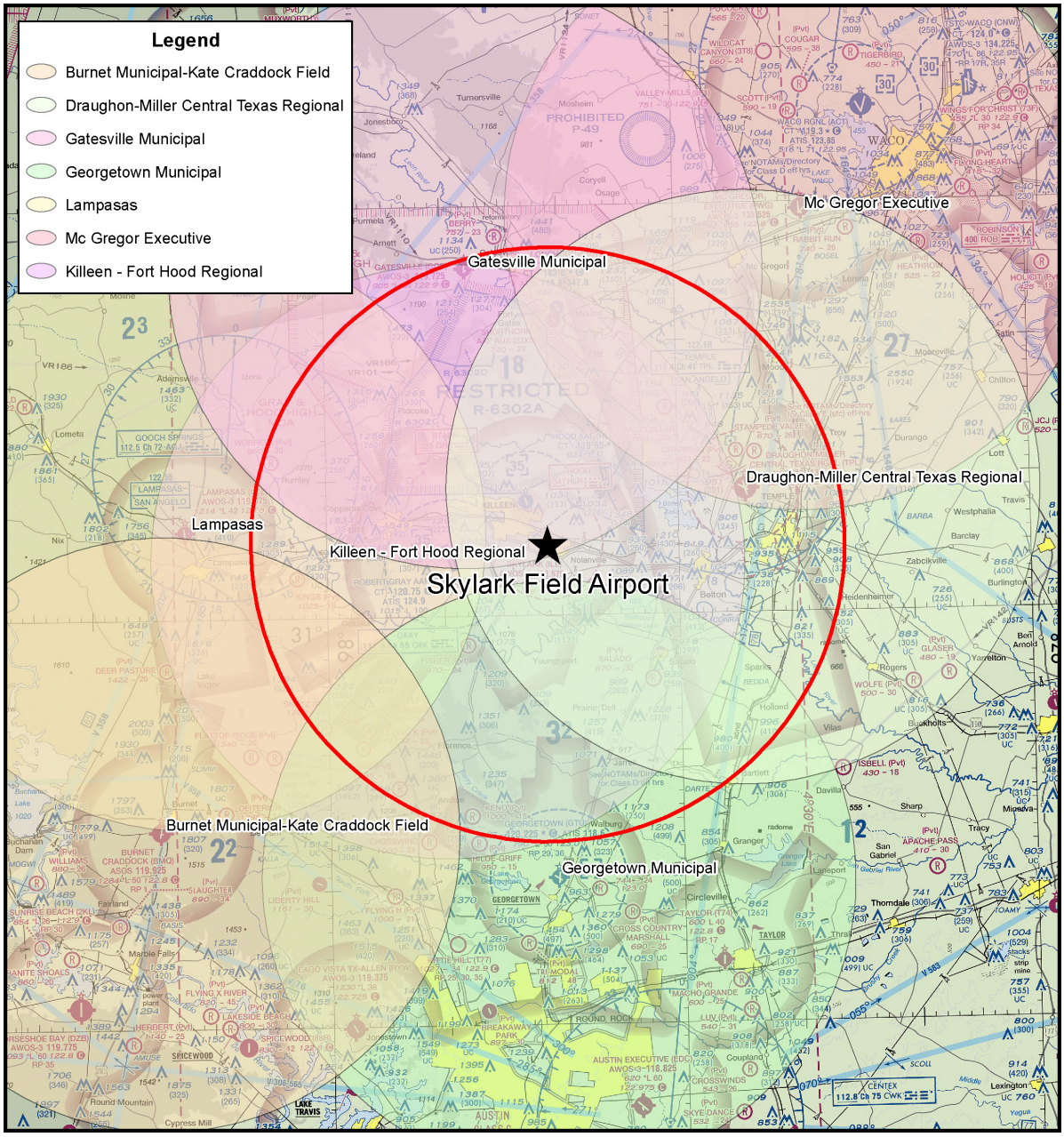
TABLE 2-12 | AREA PUBLIC-USE GA AIRPORT FACILITIES

Airport Name Airport Sponsor Distance From ILE	Airport Role	Runway Characteristics	Aircraft/ Operations	Airport Services
Skylark Field Airport	LB/BC	01-19; 5,495' x 100' (P) (L)	63 planes 6,570 ops	PI (ILS) Fuel/Repair, Hangars/Tie
Draughon Miller Central Texas Regional Airport, Temple, TX 18 miles east	NR/BC	15-33; 7,000' x 150' (P) 02-20; 4,700' x 100' (P)	58 civilian planes 53,275 ops	PI (ILS) Fuel/Repair, Hangars/Tie
McGregor Executive Airport, McGregor, TX 30 miles northeast	NR/BC	17-35; 5,001' x 75' (P) 04-22; 3,484' x 55' (P)	69 planes 25,200 ops	NPI, Fuel/Repair, Hangars/Tie
Georgetown Municipal Airport Georgetown, TX 27 miles south	RL/BC	18-36; 5,004' x 100' (P) 11-29, 4,099' x 75' (P)	184 planes 77,432 ops	NPI Fuel/Repair, Hangars/Tie
Gatesville Municipal Airport, Gatesville, TX 30 miles north	LB/CS	17-35; 3,400' x 60' (P)	10 planes 4,500 ops	NPI, Fuel/Repair, Hangars/Tie
Burnet Municipal / Kate Craddock Field, Burnet, TX 35 miles southwest	LB/BC	01-19, 5,000' x 75' (P)	44 planes 16,200 ops	NPI Fuel/Repair, Hangars/Tie
Taylor Municipal Airport Taylor, TX 32 miles south-southeast	LB/CS	17-35; 4,000' x 75' (P)	47 planes 26,100 ops	NPI, Fuel/Repair, Hangars/Tie
Lampasas Municipal Airport Lampasas, TX 26 miles west	LB/CS	16-34; 4,202' x 75' (P)	14 planes 10,800 ops	NPI Fuel/Repair, Hangars/Tie

Symbols: NPIAS Classification: CS – Commercial Service; NR - National/Regional; LB – Local/Basic Airport; TASP Classification: CMS – Commercial Service; RL – Reliever; BC – Business/Corporate; CS – Community Service; BS – Basic Service;(P) – Paved runway surface; (T) – Turf or gravel runway surface (L) – Pilot controlled runway lighting; (✶) – Control tower; NPI – Non-precision instrument approach; PI – Precision instrument approach, Instrument Landing System (ILS)

Source: FAA Form 5010 Report, Airport Master Records, September 2014

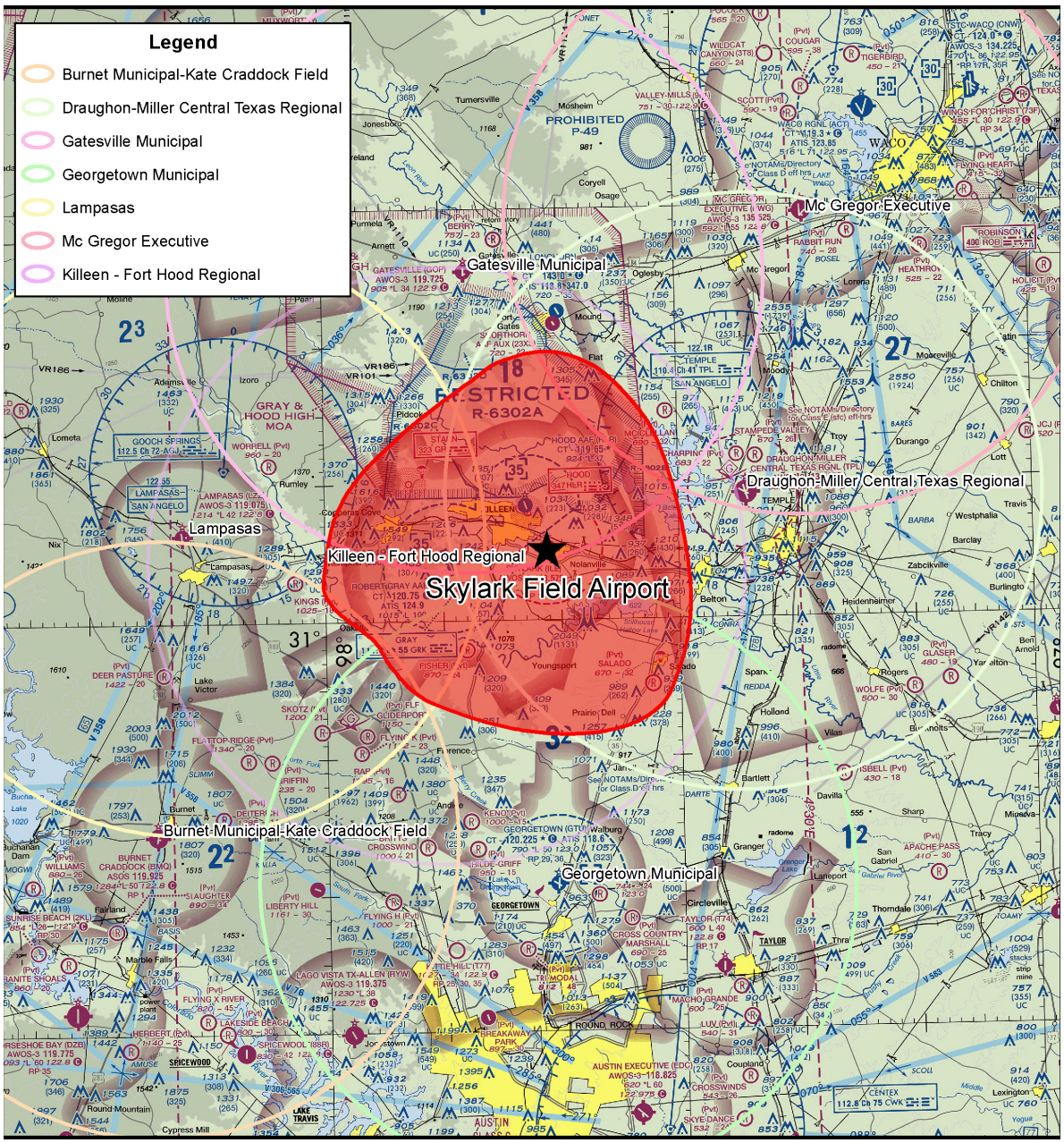
FIGURE 2-5 | AREA AIRPORTS



Source: Garver, 2014

Based on the data available defining a composite service area for ILE is best arrived at through a comparison to competing airports in the region and their relative distance from the Killeen central business district. **Figure 2-6** highlights the competing airports in the region that could impact operations and services at ILE and best defines the ILE composite service area. As this comparison of facilities and services are examined the NPIAS service area is modified to show the composite service area shown in **Figure 2-6**. This area includes all of the Killeen central business district and downtown area without regard for any overlapping services that may be offered at GRK by the City of Killeen. Those beyond this area can and oftentimes do use ILE when the next closer airport does not provide the same level of outstanding service afforded at ILE.

FIGURE 2-6 | COMPOSITE SERVICE AREA



Source: Garver, 2014.

Killeen Socioeconomics

An assessment of regional economic conditions is conducted to gain a better understanding of the relationship between historic and future aviation activity levels within an airport's area of influence. This information is essential and directly influences a local airport. Therefore, the following socio-economic information, population, median family income, and income distribution has been collected to understand current conditions and influence assumptions involved in the development of the aviation demand forecasts for Skylark Field.

REGIONAL ECONOMY

Skylark is located in one of the fastest growing economic corridors in the nation. The city of Killeen is accompanied by the cities of Harker Heights and Copperas Cove, as well as Fort Hood, to create this thriving economic center. The region has prospered for more than a hundred years since Killeen was founded by the Santa Fe Railroad to serve as a shipping station for cotton and cattle. Today, the region is home to more than 1,800 businesses ranging from wholesale food to restaurants, hotels, and manufacturing/industrial facilities. Killeen is the largest incorporated city in Bell County, Texas and is home to Fort Hood which was established in 1942. In 1950 Fort Hood was declared a permanent post and things started to boom for the area. Now Fort Hood is the largest single-site employer in the State of Texas and the largest employer in Bell County. The city developed community infrastructure while encompassing the base to create a unified regional economy. Major projects such as roads, highways, reservoirs, and housing developments were also important for economic growth. Harker Heights is an actively growing city. It has experienced historic residential and commercial growth over the last few years including many recent business additions ranging from retail, hotels, medical, and dining. Copperas Cove is located within the same regional economy and contributes to the success of the economic region. It was founded in the 1870's as a small rural ranching and farming community and has grown into the largest city in Coryell County. It is home to more than 32,000 residents and numerous local businesses.

POPULATION

Population growth can be directly tied to success and growth at the airport supporting a given population set. ILE supports a much wider population base than that solely found within the City of Killeen. ILE supports the GA community and needs of Bell County and eastern Coryell County and the many cities and towns within including Harker Heights and Copperas Cove. Population trends and expected rate of change provide insight into an area's economic potential. Past population changes can be used as an indicator, with State averages for comparison of overall general aviation trends. Population growth from 1980 to 2010 was significant for the City of Killeen with a nearly tripling during this 30-year period. Harker Heights more than tripled its population over the same period. Along with the continuing growth at Fort Hood, the Killeen population has continued to climb and this is reflected in other aspects of the community to include business growth, housing starts, and civilian employment opportunities both on and off Fort Hood. The Texas Water Development Board population forecasts show continued growth for the City of Killeen and Bell County that outpaces the State of Texas growth. This is a reflection of the military community providing the catalyst for growth and more employment opportunities in central Texas.

TABLE 2-13 | HISTORICAL AND FORECAST POPULATION

Historical Growth	Killeen	Harker Heights	Copperas Cove	Bell County	Texas
1980	46,296	7,600	24,519	157,889	14,229,191
1990	63,535	12,841	24,079	191,088	16,986,510
2000	86,911	17,308	29,592	237,974	20,851,820
2010	127,921	26,700	32,032	310,235	25,145,561
Annual Growth Rate	2.13%	2.38%	0.78%	1.64%	1.45%
Forecast Growth					
2020	153,371	32,012	36,989	371,956	29,510,184
2030	177,572	37,064	42,384	430,647	33,628,653
2040	203,934	42,566	48,207	494,582	37,736,338
Forecast Annual Growth Rate	1.24%	1.24%	1.16%	1.24%	1.09%

Source: State and County – U.S. Department of Commerce, Bureau of Economic Analysis. City information – U.S. Census Bureau – Internet lookup, Population projections from the Texas Water Development Board, September 2014

Median Household Income

Table 2-14 provides the historic median household income for the region based on real dollars from 2008 and 2012. Median household income indicates the relative changes between income and population. As the productivity of business and industry increases, median household income also rises. Median household incomes have declined at all levels for the US, Texas, Bell County, and City of Killeen. The greatest decline over the period from 2008 to 2012 occurred in the City of Killeen; however, the Killeen median household income is still only slightly lower than that of both Texas and the US and is higher than Bell County. The City of Killeen median household income has remained higher than Bell County and it is anticipated that as more industry moves into the area in support of the growing military presence median household incomes will begin to recover. Assumptions of general aviation utilization can make use of the trends reflected in the median household incomes of the region.

TABLE 2-14 | MEDIAN FAMILY INCOME

	Historical		
	2008	2012	Annual Growth Rate 2008-2012
Killeen	$53,845	$50,447	-1.68%
Harker Heights	$65,931	$73,220	2.49%
Copperas Cove	$52,624	$53,137	0.29%
Bell County	$50,085	$48,398	-0.87%
State of Texas	$52,935	$50,740	-1.08%
United States of America	$51,726	$51,371	-0.17%

Source: US Census Bureau, 2008-2012 American Community Survey 5-Year Estimates.

Income Distribution

Table 2-15 displays the distribution of household income for Killeen, Bell County, the State of Texas, and the United States. Studies completed by the U.S. Department of Commerce have determined that the likelihood of taking a trip by air increases as household income increases. A parallel can be applied to GA market potential. The inclination to own and/or operate a general aviation aircraft or travel via commercial air carriers for business or pleasure is a direct function of income. Using income as a gauge to aviation activity, statistics indicate that over 27 percent of Killeen households and 30 percent of Bell County households earn income of $75,000 or more. This level of income is important because it identifies a segment of the local population that can be considered capable of participating in GA activity.

TABLE 2-15 | KILLEEN HOUSEHOLD INCOME DISTRIBUTION (2012)

Locale	Less Than $15,000	$15,000- $24,999	$25,000 - $34,999	$35,000 - $49,999	$50,000 - $74,999	$75,000 +
Killeen	9.1 %	9.5%	13.7 %	16.9%	23.5 %	27.2 %
Harker Heights	9.7%	8.7%	8.2%	12.8%	20.3%	40.5%
Copperas Cove	10.1%	8.3%	9.2%	17.6%	22.6%	42.1%
Bell County	8.2 %	7.5 %	11.1 %	15.6 %	21.6 %	36.0 %
State of Texas	8.9%	9.3 %	10.0 %	13.3 %	18.6 %	39.9 %
United States	12.7%	11.3%	10.4%	13.6%	17.6%	34.4%

Source: U.S. Census Bureau, 2008-2012 American Community Survey.

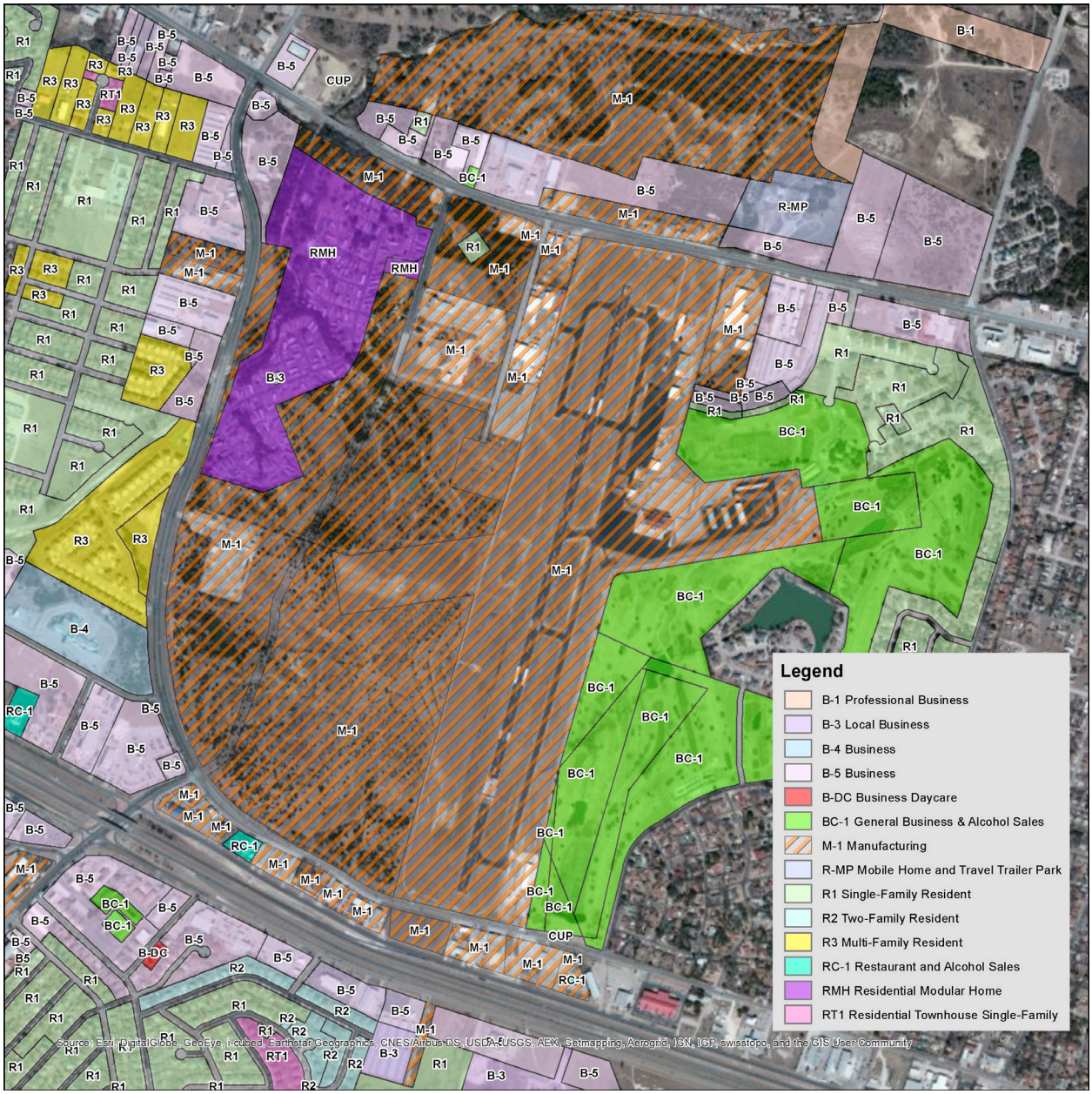
Land Use and Controls

The existing land uses in the ILE vicinity are shown in **Figure 2-7**. North of ILE, land use is predominantly undeveloped and industrial. South of ILE is mostly commercial activity along US Highway 190 and Farm-to-Market Road (FM) 2410. There is also an area of residential land south and southwest of US 190. A retirement center is located directly off US Highway 190, adjacent to the undeveloped area. The Stonetree Golf Club, the City of Killeen's municipal golf course, borders the east side of the airport. There is residential development imbedded within the golf course. The area east of the golf course is in residential land use within the city limits of Harker Heights. West of the airport there is an area of undeveloped land that is being considered for a major mixed-use development including commercial, multi-family, and single-family residential. A majority of the land west of the undeveloped land is classified as residential with the exception of some commercial land use along Veterans Memorial Boulevard.

The City of Killeen provides for land use control through a series of ordinances which are published in the City of Killeen Future Land Use Plan. This land-use plan is available from the City of Killeen upon request.

During the SWOT analysis with the EC the topic of encroachment was broached as a threat to ILE. Recent planned development for the property west of ILE between FM 2410 and ILE was of concern. Specifically the EC was concerned with the potential development of mixed use and having a large number of potential residential neighbors. An additional concern of the EC was the height of the development and ensuring whatever were developed on the site would not pose an obstruction to the existing airspace structure or any of the existing instrument approach procedures. Recent redevelopment of US 190 concerned the EC for many of the same reasons. The potential obstructions created by US 190 will be evaluated by the obstruction survey being completed for ILE as a companion study to this master plan. GIS tools will be developed during the master plan that will aid city staff in evaluating potential development for their impacts to ILE airspace in the future.

FIGURE 2-7 | LAND USE/ZONING



Source: City of Killeen, 2014

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CHAPTER THREE

Aviation Activity Forecasts

AVIATION ACTIVITY FORECASTS

Introduction

Forecasting aviation activity helps the local airport sponsor determine future airport facility and equipment needs. The preferred demand forecasts are used to identify the type, extent, and timing of aviation development. In addition, the forecasts are instrumental in identifying airport-related infrastructure and capacity needs, and guiding the timing and financial feasibility of airport development alternatives.

Airport activity is often influenced by the types of aviation services offered to transient and based aircraft and by the general business environment at an airport and in the local community. In addition, factors such as vigorous local airport marketing, gains in sales and services, increased industrialization, changes in transportation preferences, and fluctuations in the national or local economy all influence aviation demand. Aviation activity forecasts are developed in accordance with national trends with regional/local influences and in context with the inventory findings. They are developed as a guide with the expectations that facilities needed to support them will be available as demands dictate. This chapter examines aviation trends and the numerous factors that have influenced those trends in the United States, Texas, and Killeen.

Summary of Airport Historical Operations and Based Aircraft

Skylark Field (ILE) is a non-towered airport and as such accurately tracking airport operations is a challenge. Without an accurate method of counting operations estimates from on-site staff, reported operations from FAA Form 5010, or FAA Terminal Area Forecasts (TAF) can be used. On-site personnel don't keep a detailed daily traffic count. The latest FAA Form 5010 shows an estimated 6,570 operations which is unconfirmed. This estimate conflicts with the data within the TAF. On-field observations made during site visits confirm that the FAA Form 5010 operational figures appear to be low. During these site visits observations of more than 50 operations were witnessed

during an approximately two hour period, most of these being conducted by the Central Texas College (CTC) aircraft. For the last several years CTC has averaged more than 14,000 annual operations. **Table 2-1**, *Historical Aviation Activity* summarizes the available historical based aircraft and annual operations (local, itinerant, air taxi, and military) at Skylark Field since 2000 as recorded through the TAF program. Based aircraft numbers between all three sources differ only slightly.

A based aircraft is defined as an actively registered airplane stationed at a specific airport that regularly uses the airport as the primary "home base" for filing flight plans, frequently uses available airport amenities, and/or maintains a formal commitment for long-term aircraft parking/storage. An aircraft operation is one take off and/or landing of an aircraft. Aircraft operations are identified as either local or itinerant. Local operations consist of those within a 20-mile radius of the airport, while itinerant operations include all operations other than local, having a terminus of flight or origination of flight at another airport at least 20 miles away.

The following observations were identified at ILE as part of the inventory of historic and current airport activity levels:

- **Aircraft Summary:** Based aircraft at ILE remained steady at between 55 and 60 even after 2009 when the FAA placed stricter rules on counting based aircraft.
- **Operational Summary:** TAF operational history has fallen from a high of over 42,000 operations in 2004, the last year of commercial service at ILE, to and remained steady at approximately 29,000 since 2007. The local and itinerant operations have remained the same since 2000.
- **CTC Operations:** For the period between 2010 and 2013, CTC has conducted more than 14,000 operations annually with a significant level of instrument training conducted by their students and aircraft as well.

TABLE 2-1 | HISTORICAL AVIATION ACTIVITY

Year	Based Aircraft	Local Operations	Itinerant Operations	Air Taxi and Commuter	Total Airport Operations
2000	57	19,500	10,200	12,086	41,786
2001	54	19,500	10,200	12,086	41,786
2002	54	19,500	10,200	12,086	41,786
2003	54	19,500	10,200	12,266	41,966
2004	56	19,500	10,200	12,356	42,056
2005	56	19,500	10,200	12,086	41,786
2006	56	19,500	10,200	12,086	41,786
2007	61	19,500	10,200	0	29,700
2008	55	19,500	10,200	0	29,700
2009	55	19,500	10,200	0	29,700
2010	55	19,500	10,200	0	29,700
2011	55	19,500	10,200	0	29,700
2012	55	19,500	10,200	0	29,700
2013	55	19,500	10,200	0	29,700
2014	55	19,500	10,200	0	29,700

Source: FAA Terminal Area Forecasts

National General Aviation Trends

An understanding of recent and anticipated trends within the general aviation (GA) industry is important when assessing aviation demand at ILE. National trends can provide insight into the potential future of aviation activity. Some may affect aviation demand in the study area while others will have little or no appreciable impact on local/regional aviation demands.

Various data sources were examined and used to support the analysis of national GA trends. Those sources include:

- Federal Aviation Administration, FAA Aerospace Forecasts, Fiscal Years 2014 – 2034;
- National Business Aircraft Association (NBAA), NBAA Business Aviation Fact Book, 2013; and,
- General Aviation Manufacturers Association (GAMA), General Aviation Statistical Databook and Industry Outlook, 2013.

GENERAL AVIATION OVERVIEW

GA aircraft are defined as all aircraft not flown by commercial airlines or the military. GA activity, as defined by the FAA, is divided into six use categories:

- Personal;
- Instructional;
- Corporate;
- Business;
- Air Taxi/Air Tours; and,
- Other

Personal use, air taxi, and FAR Part 135 use of GA aircraft are the largest components of GA activity and occur primarily at GA airports across the nation. At the date of this plan, there are 19,786 public and private airports located throughout the United States, and 5,171 of these are open to public use. **Figure 2-1** displays the breakdown of airports as described in the FAA's *2013 – 2017 National Plan of Integrated Airport System* (NPIAS). The number and distribution of public-use airports available to GA users provides a valuable transportation and economic resource to local communities, businesses, and individuals throughout the region, state, and nation.

SUMMARY OF NATIONAL GENERAL AVIATION TRENDS

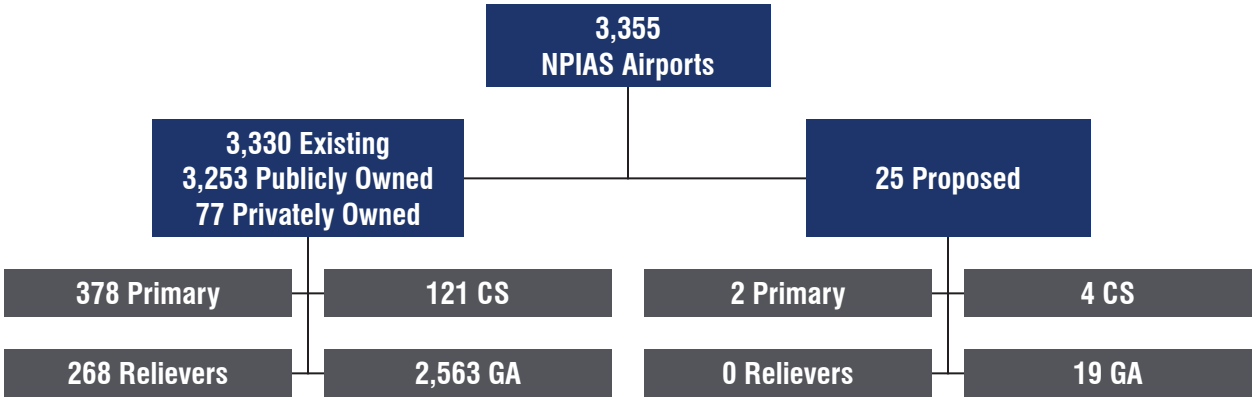
GA activity is cyclical in nature, which has been demonstrated by the historical data presented. Regardless of the GA activity rebounding due to GARA during the mid and late-1990s, the terrorist attacks of 2001, the war on terror, and the recessionary economy have depressed GA activity during recent years. A slow to moderate recovery has begun with increasing aircraft deliveries and hours flown as well as the introduction of new innovative aircraft into the GA fleet. FAA projections of general aviation activity, including active pilots, active aircraft, and hours flown, all show moderate but promising growth through the forecast horizon of 2034. Following stalled growth, most components of GA activity are projected to rebound and surpass previous activity levels. An important national trend that has the potential to impact GA at ILE is the growing proportion of jet aircraft in the active GA fleet and the growing sophistication of both active pilots and aircraft. The continuing ability of ILE to accommodate the existing and growing GA activity, specifically by the turbine fleet, will be an important consideration.

Terminal Area Forecast

The Terminal Area Forecast (TAF) is a detailed FAA forecast-planning database produced each year covering airports in the NPIAS. The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. The TAF forecasts are made at the individual airport level and are based in part on the national FAA Aerospace Forecasts. The TAF contains historical and forecast data for enplanements, airport operations, instrument operations, and based aircraft. TAF data is developed for 264 FAA and 251 contract-towered airports, 31 terminal radar approach control facilities, and 2,817 non-FAA airports as of 2014. Data in the TAF are presented on a U.S. Governmental fiscal year basis which runs from October through September. The TAF assumes an unconstrained demand for aviation services.

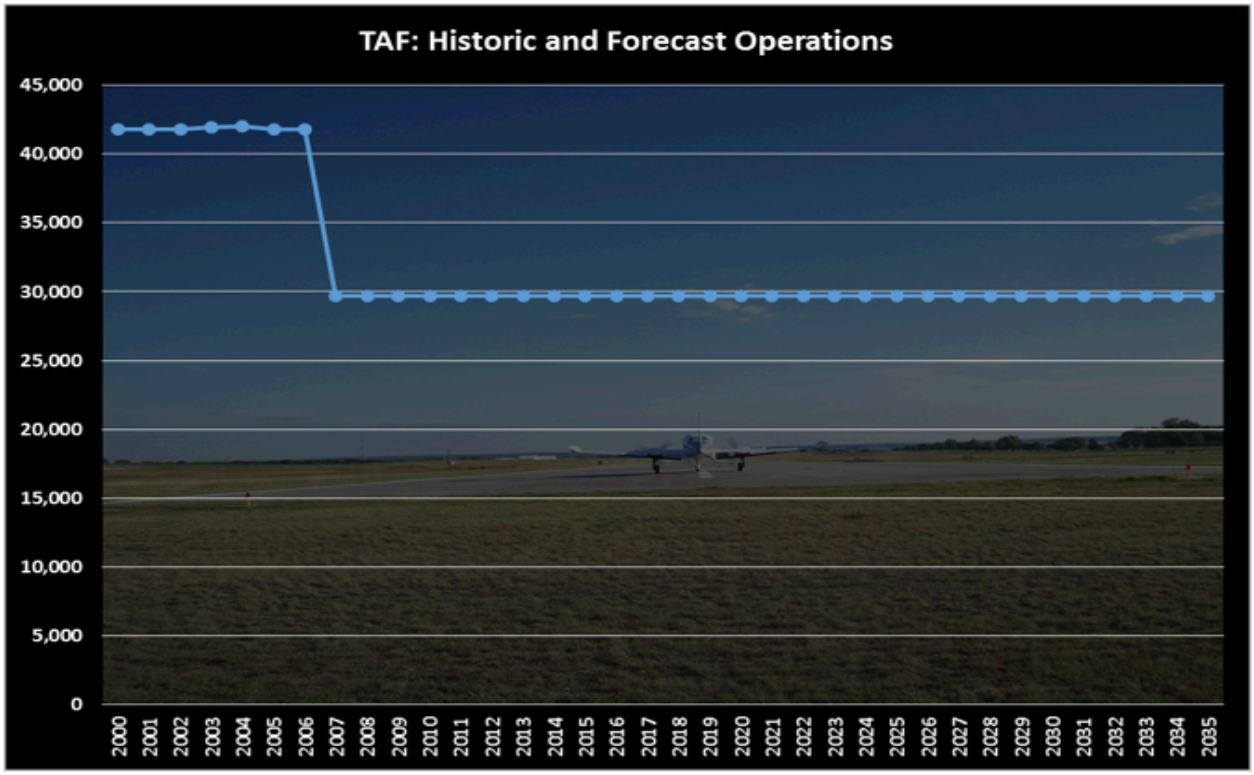
As its primary input, the TAF uses the *FAA Aerospace Forecasts* from the specific year. Aviation activity forecasts for FAA-towered and federal contract-towered airports are developed

FIGURE 2-1 | NPIAS AIRPORT BREAKDOWN



Primary – Commercial Service airports enplaning more than 10,000 passengers per year.
CS – Commercial Service airports having more than 2,500 enplaned passengers per year.

FIGURE 2-2 | ILE TERMINAL AREA FORECAST – HISTORICAL AND FORECAST



Source: FAA TAF, Fiscal Years 2000-2035. Forecast years begin with 2014.

using historical relationships between airport passenger demand and/or activity measures and local and national factors that influence aviation activity. At airports similar to ILE, the TAF data is generated from historical data reported by the airport or airport sponsor. The TAF generally reflects a slight or zero-percent growth rate in the absence of a control tower. Based on the TAF for ILE presented in **Figure 2-2**, the FAA reflects a zero percent growth rate and is showing the same number of annual operations through 2035.

General Aviation Demand Forecasts

Based on information obtained in the inventory analysis, the following factors and assumptions have been incorporated into the GA forecasts of based aircraft and annual operations for ILE:

- An "unconstrained" forecast of aviation demand assumes facility improvements will lead the demand with the proactive nature of the local airport sponsor;
- Greater aircraft utilization resulting from airfield and terminal area improvements can be both directly and indirectly linked to economic development activity;
- Future operational levels are attributable to business needs, flight training, and recreational interests;
- Future airport facilities will continue to accommodate a broad array of GA aircraft and remain flexible in serving larger business-type aircraft; and,
- The forecast of based aircraft and operational levels is tied to the potential for the airport to attract employment and economic development to the area that could be aviation-related.

FORECAST METHODOLOGIES

Development of aviation forecasts involves analytical and judgmental assumptions to realize the highest level of forecast confidence. The GA demand forecasts are developed in accordance with national and regional trends, and in context with the inventory findings, including local population and per capita income trends. The forecasts developed here begin with baseline information from 2014 and with 2015 as the first forecast year. National GA trends and forecasts, used to provide a baseline of growth rates, are provided by the *FAA Aerospace Forecasts, Fiscal Years 2014-2034*. These forecasts are unconstrained, indicating facilities will be developed as the need arises. Various forecast techniques are used to develop GA forecasts for ILE and could include:

Trend Analysis

Trend analysis is the simplest and most familiar form of forecasting and is also one of the most widely used. Historical data is collected and used to forecast an estimate of the aviation demand element into future years. An assumption of this forecast method is that historical levels for aviation demands will continue and influence similar linear progressions on the future demand levels. Though this assumption seems broad in its application, it can serve as a reliable benchmark against other forecast methods.

Regression Analysis

The forecasts of aviation demand (the dependent variable) are projected on the basis of one or more external indicators (the independent variables). Historical values for both the dependent and independent variables are analyzed to determine their relationships. Once defined, this relationship is used to project the dependent variable with a forecast or projection of the independent variable. In aviation forecasting, an example of the dependent variable is based aircraft. Population or median household income levels are commonly used independent variables that aid in the projection of aviation growth.

Market Analysis

These aviation demand forecasts are developed based on a causal model technique in which independent variables statistically relate the relationship(s) between historical events and aviation demands. This forecast method typically uses an easily identifiable independent variable such as population, which has a high correlation on the indirect cause-and-effect relationship within certain segments of the GA industry. The market share often employs a static and dynamic variable relationship between community factors and GA trends that aids in predicting aviation growth based on forecast community indicators such as population.

FORECAST OF BASED AIRCRAFT

The number of GA aircraft that can be expected to base at an airport facility is dependent on several factors, such as available facilities to include any hangar waiting list, airport operator services, airport proximity and access, etc. GA operators are particularly sensitive to both the quality and location of their basing facilities, with proximity of home and work often identified as the primary consideration in the selection of an aircraft-basing location. Hangars at ILE are at capacity. Demand for aircraft hangar storage is strong, with an active list of approximately 40 seeking new or upgraded hangar facilities and businesses/individuals seeking to build new or improved hangars at ILE to store their aircraft.

Determining the number and type of based aircraft anticipated at an airport is a vital component in developing the plan for the airport. Depending on the potential market and forecast, the airport will tailor the plan in response to anticipated demand. One factor that will impact the based aircraft growth is an active hangar waiting list. At present ILE maintains a hangar waiting list that is validated on a periodic basis. The most recent update in fall 2014 revealed a waiting list of over 40 aircraft some of which have been on this list for more than five years and are retained in the list expressing continued interest in basing at ILE. It is anticipated that an additional 10-15 based aircraft could be at the airport if new hangar units were immediately available. The majority of these on the waiting list continue to be small single-engine general aviation aircraft looking for individual hangars or a T-hangar at ILE. The impacts of this active and long hangar waiting list will be introduced to the various based aircraft forecasts scenarios in a phased in approach during the 0-5 year and 5-10 year terms predicated on an active hangar building program at the airport. If hangars are not built in the short-term future based aircraft will not meet forecast.

Numerous different forecast methods were used to predict based aircraft growth for ILE. Four are presented here: Trend Line, FAA Percentage GA Fleet Growth Rate, FAA Percentage Growth Rate per Aircraft Type, and Regression Analysis based on population growth. The Trend Line analysis of ILE looked back at historical figures from 1990 to the present in two groups: 1990 – 2014 and 2009 - 2014. The trend line process revealed a decreasing trend in the 1990 – 2014 group and this time grouping was not used to predict future growth at ILE. The trends from 2009 to 2014 have been utilized to represent trend line growth at ILE. The FAA growth percentages for the overall segments of GA were employed and this forecast showed a very slight growth in based aircraft for ILE. The ILE current aircraft mix is weighted towards the single-engine piston fleet that reflects a 1.35 percent annual growth rate postulated by the *FAA Aerospace Forecasts, 2014-2034*. As each forecast from the *FAA Aerospace Forecasts* were applied a much more aggressive growth rate was identified. Socioeconomic factors like population, median household income, and income distribution can be tied directly to aircraft ownership. The City of Killeen and Bell County have experienced exceptional growth in population following the previous ILE master planning project. Household incomes and income distribution have remained steady. With these socioeconomic influences it is expected that they will influence based aircraft growth and the demands for basing aircraft at ILE including the hangar waiting list. A regression analysis for based aircraft employing both Killeen and Bell County growth rates as the independent variable and based aircraft as the dependent variable formed the final based aircraft forecast.

The multiple regression profile was selected as the preferred based aircraft forecast. Should ILE undertake a hangar building program to accommodate the demands identified on their active hangar waiting list these numbers should ramp up significantly during the short- and mid-term forecasts with an additional 15 based aircraft being added at ILE by 2025. **Table 2-2** and **Figure 2-3** provide a summary of the forecasts for based aircraft anticipated at the airport over the 20-year planning period.

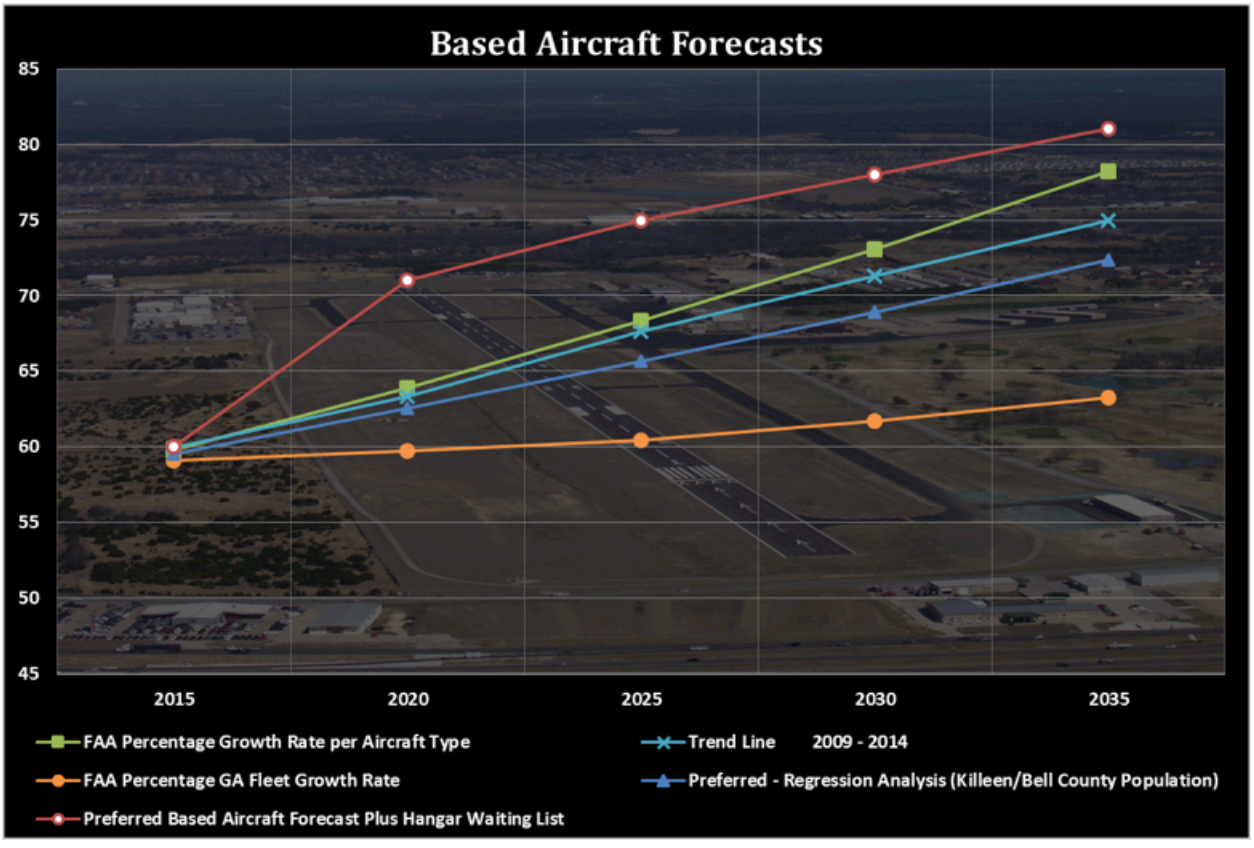
The mix of based aircraft for incremental periods throughout the planning period is illustrated in **Table 2-3** and **Figure 2-4**, *General Aviation Based Aircraft Fleet Mix, 2015-2035*. With an existing high percentage of single-engine aircraft based on the field, the percentage of turbine aircraft, particularly turbo-prop, are expected to increase as a part of the total based aircraft population. This is in line with overall trends in GA with aircraft being used more and more for business purposes.

TABLE 2-2 | SUMMARY OF BASED AIRCRAFT FORECASTS, 2015-2035

Year	Trend Line 2004-2014	FAA Percentage GA Fleet Growth Rate	FAA Percentage Growth Rate per Aircraft Type	Preferred Regressional Analysis (Killeen/Bell County Population)	Preferred Based Aircraft Forecast Plus Hangar Waiting List
2015	60	60	60	60	60
2020	63	60	64	63	71
2025	68	60	68	66	75
2030	71	62	73	69	78
2035	75	63	78	72	81

Source: Garver Forecast Data for ILE, 2015 and FAA Aerospace Forecasts, Fiscal Years 2014 - 2034.

FIGURE 2-3 | BASED AIRCRAFT FORECASTS, 2015-2035



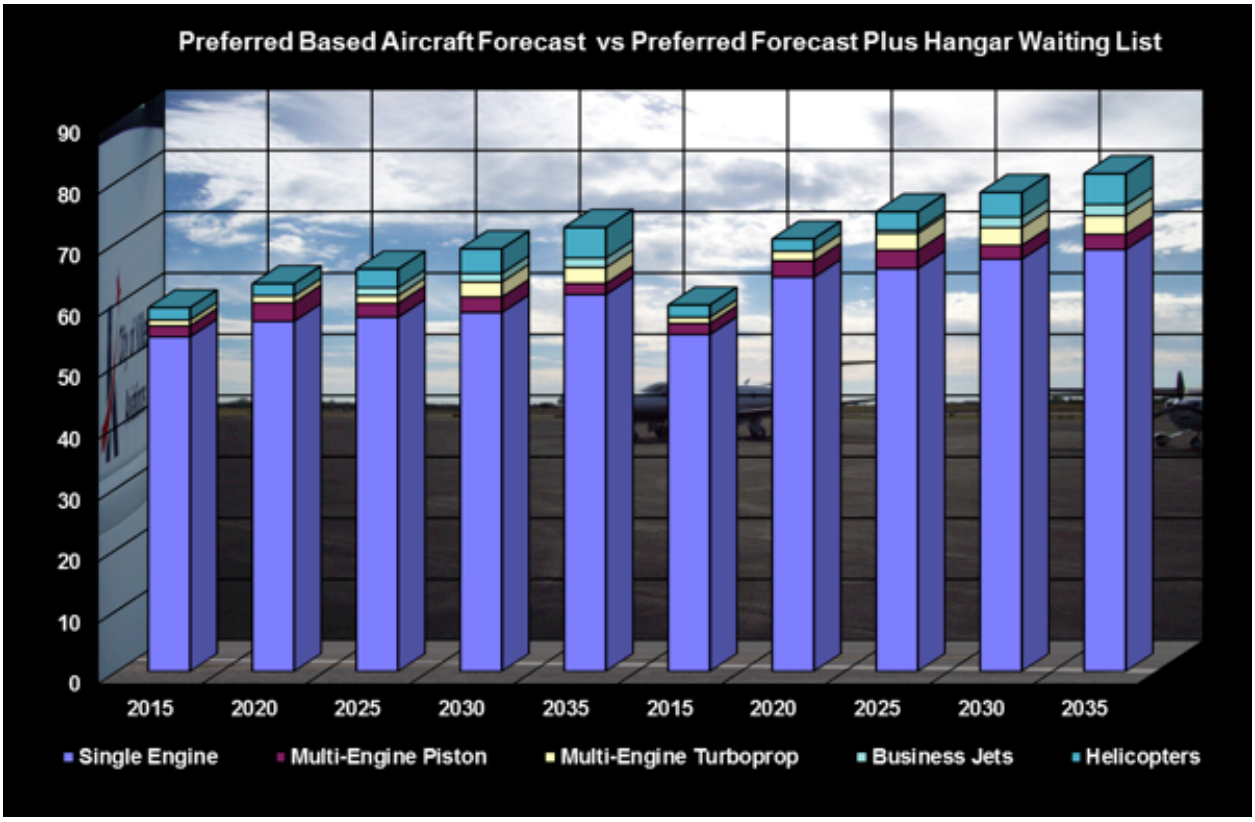
Source: Garver Forecast Data for ILE, 2015 and FAA Aerospace Forecasts, Fiscal Years 2014 - 2034.

TABLE 2-3 | GENERAL AVIATION BASED AIRCRAFT FLEET MIX, 2015-2035

Preferred Based Aircraft Forecast					
Aircraft Type	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Engine Piston	55	57	58	59	62
Multi-Engine Piston	2	3	2	3	2
Multi-Engine Turbo-Prop	1	1	1	2	3
Turbo-Jet	0	0	1	1	2
Helicopter	2	2	3	4	5
Total	**60**	**63**	**66**	**69**	**72**
Preferred Based Aircraft Forecast Plus Hangar Waiting List					
Aircraft Type	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Engine Piston	55	64	66	67	69
Multi-Engine Piston	2	3	3	2	2
Turbo-Prop	1	2	3	3	3
Turbo-Jet	0	0	1	2	2
Helicopter	2	2	3	4	5
Total	**66**	**71**	**75**	**78**	**81**

Source: Garver Forecast Data for ILE, 2015

FIGURE 2-4 | GENERAL AVIATION BASED AIRCRAFT FLEET MIX, 2015-2035



Source: Garver Forecast Data for ILE, 2015

AIRCRAFT OPERATIONS FORECASTS

In developing the ILE projections, several existing forecasts were reviewed. As presented in **Table 2-4** and **Figure 2-5**, *Summary of Aircraft Operations Forecasts, 2015-2035*, this assessment includes the FAA Terminal Area Forecasts, ILE trend line from 1990 to 2013, ILE average utilization rate from 1990 to 2013, ILE 2013 utilization rate for piston operations and the FAA standard utilization rate for turbine aircraft, and the *FAA Aerospace Forecast Fiscal Years, 2014-2034* average annual growth rate of 1.35%.

While most operations growth rates are typically tied to population, it is assumed that population statistics for Bell County and the City of Killeen, as well as the FAA forecast for all of general aviation are too low based on the existing operations and flight training at ILE. Flight training data collected from CTC shows an average annual operations level of over 14,000 for the period 2011 through 2013. This level of flight training operations at ILE supports a more aggressive growth of operations. The FAA Aerospace Forecasts for turbine aircraft was more aggressive than expected for ILE to meet and sustain. As the economy improves, it is not unreasonable to assume ILE could achieve the operations level provided by the higher forecast. However, at this time, the Preferred Forecasts selected provides ILE with an achievable but aggressive growth schedule that exceeds the existing utilization rate but is tempered by knowledge of the economics and opportunities at ILE that include the region being one of the fastest growth areas in Texas.

TABLE 2-4 | SUMMARY OF AIRCRAFT OPERATIONS FORECASTS, 2015-2035

Year	FAA Terminal Area Forecast	ILE Trend Line (1990-2013)	ILE Average Utlization Rate (1990-2013)	ILE 2013 Utilization Rate (SE/ME) / FAA Standard (Jets)	FAA Aerospace Forecasts (2014-2034)
2014	29,700	29,700	**29,700**	29,700	29,700
2015	29,700	31,900	**31,100**	27,300	30,400
2020	29,700	33,300	**31,900**	28,000	34,400
2025	29,700	34,600	**33,700**	29,600	38,800
2030	29,700	35,900	**34,800**	30,400	43,800
2035	29,700	37,200	**36,900**	32,200	49,500

Source: Garver Forecast Data for ILE, 2015, FAA TAF – FAA APO Terminal Area Forecasts

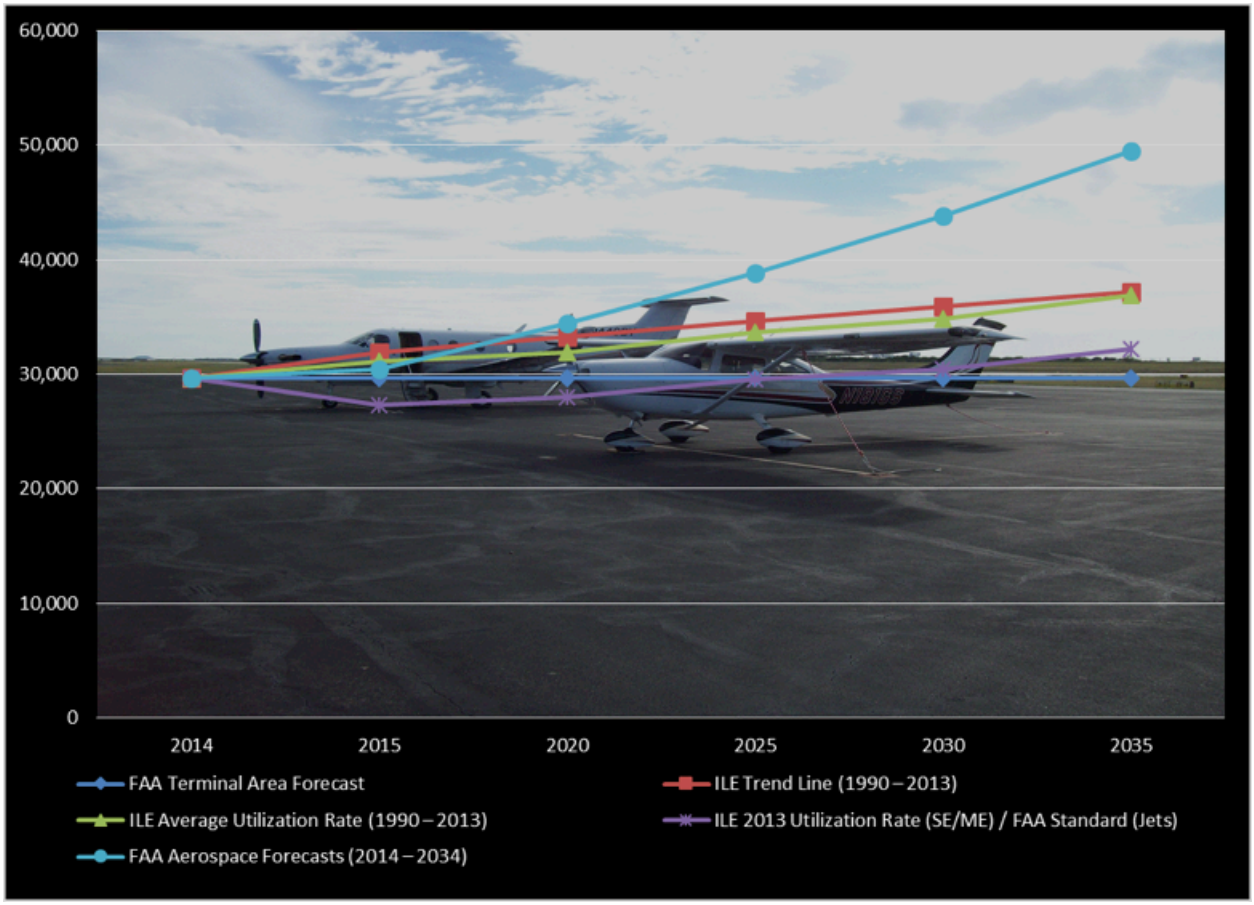
Notes: 2015 is the first forecast year; SE = single-engine piston; ME = multi-engine piston
Preferred Forecast is in Bold

AIRCRAFT FLEET MIX FORECAST

Table 2-5 and **Figure 2-6**, *Summary of Operations by Aircraft Type, 2015-2035*, displays the aircraft fleet mix operations forecast for ILE for each phase throughout the 20-year planning period. An examination of total IFR operations at ILE in combination with the level of flight training conducted provide some guidance towards an accurate fleet mix forecast. These records account for only a fraction of the total operations but provide an accurate indicator of aircraft type usage and the percentages for each aircraft category to be examined in the fleet mix. FAA IFR data from 2010 through October 2014 reveals a fleet mix use that closely mirrors ILE's based aircraft. Records show that nearly 85 percent of all ILE's IFR operations are conducted by small GA aircraft some commercial operators and some private aircraft owners. These records also show that nearly ten percent of all IFR operations were conducted by business jet aircraft of which nearly four percent were by those in aircraft approach categories C and D. The operations forecast of aircraft mix is used to determine future airfield design, facility, and service needs, and the configuration of terminal area facilities.

Total operations can be further broken down into aircraft approach categories and airplane design groups. This additional breakdown helps to better define the types of aircraft that will operate at the airport in the future. It also allows for better planning of future facilities and airside needs for the airport and the ability to justify such facilities when the market demands such construction. **Table 2-6**, *Fleet Mix Operations by Design Group, 2015-2035*, displays this breakdown for the 20-year planning effort.

FIGURE 2-5 | SUMMARY OF AIRCRAFT OPERATIONS FORECASTS, 2015-2035



Source: Garver Forecast Data for ILE, 2015

TABLE 2-5 | SUMMARY OF OPERATIONS BY AIRCRAFT TYPE, 2015-2035

Operations by Type	2015	2020	2025	2030	2035
Single-Engine Piston	21,750	22,740	23,350	25,150	26,760
Multi-Engine Piston	2,020	2,090	2,110	2,260	2,350
Turbo-Prop	3,300	3,500	3,590	3,960	4,200
Turbo-Jet	1,920	2,030	2,100	2,630	2,750
Helicopter	460	490	500	550	590
Military	250	250	250	250	250
Total	**29,700**	**31,100**	**31,900**	**34,800**	**36,900**

Source: Garver Forecast Data for ILE, 2015

FIGURE 2-6 | SUMMARY OF OPERATIONS BY AIRCRAFT TYPE, 2015-2035

Source: Garver Forecast Data for ILE, 2015

TABLE 2-6 | FLEET MIX OPERATIONS BY DESIGN GROUP, 2015-2035

Aircraft Approach Category	2015	2020	2025	2030	2035
Category A (Less than 91 knots)	20,650	21,190	21,240	23,010	24,450
Category B (92-120 knots)	8,270	9,060	9,710	10,780	11,409
Category C (121-140 knots)	300	350	440	480	520
Category D (141-166 knots)	20	30	30	40	40
Airplane Design Group	**2015**	**2020**	**2025**	**2030**	**2035**
Group I (Less than 49 feet)	23,000	23,630	23,900	25,340	26,110
Group II (49 feet to 78 feet)	6,220	6,970	7,570	8,800	10,230
Group III (79 feet to 118 feet)	20	30	50	70	80
Helicopter	210	220	230	240	230
Military	250	250	250	250	250
Total	**29,700**	**31,100**	**31,900**	**34,600**	**36,900**

Source: Garver Forecast Data for ILE, 2015

Aircraft Approach Category is based on 1.3 times the stall speed of the aircraft at the maximum certified landing weight in the landing configuration. Representative of the anticipated operations for each aircraft approach category and airplane design group. Totals may not equal due to rounding.

LOCAL AND ITINERANT OPERATIONS

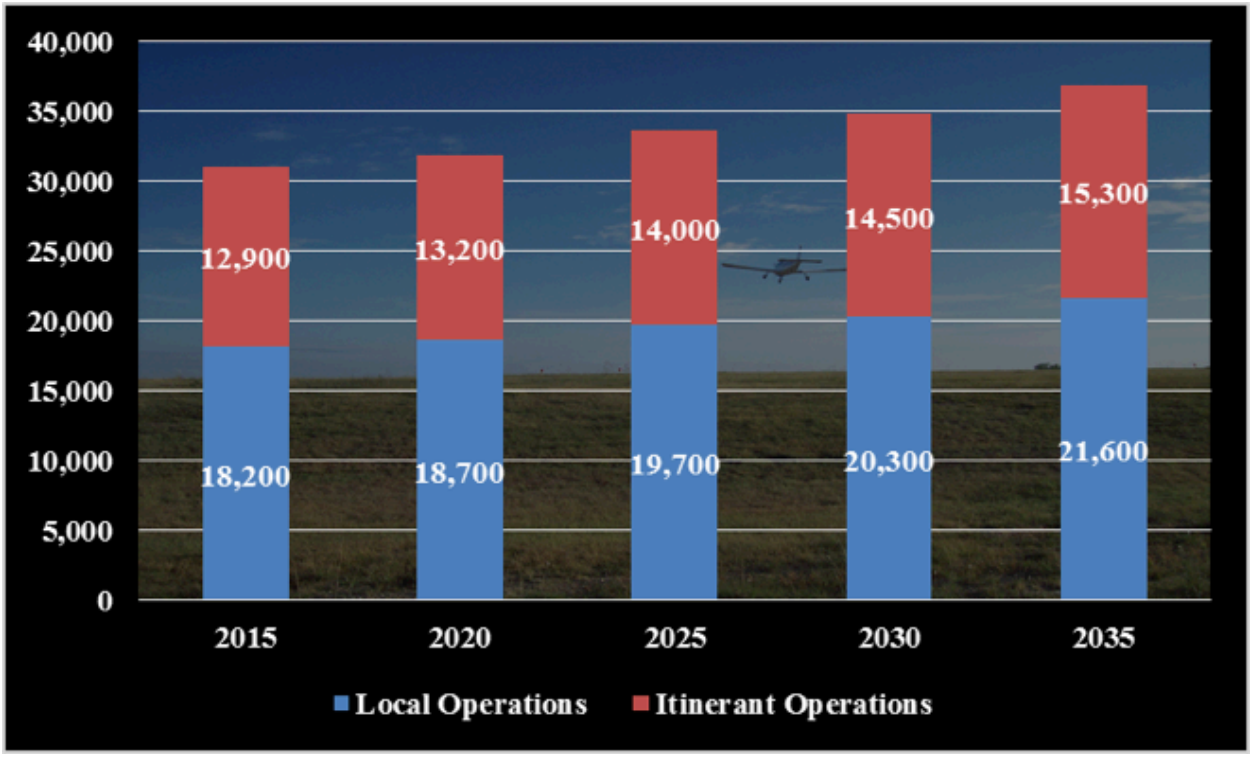
According to FAA Order 7210.3U, Facility Operation and Administration, February 16, 2006, a local operation is any operation performed by an aircraft that "remains in the local traffic pattern, performs a simulated instrument approach, or operates to or from the Airport and a practice area within a 20-mile radius of the field or tower." An itinerant operation is any operation that is not considered local. According to TAF records, only 58 percent of the operations conducted at the airport are local and 42 percent are itinerant. These percentages reflect the business aircraft operations atmosphere at ILE and are expected to remain at or near these same levels throughout the forecast period. **Table 2-7** and **Figure 2-7**, *Summary of Local and Itinerant Operations, 2015-2035*, provides a summary of this information.

TABLE 2-7 | SUMMARY OF LOCAL AND ITINERANT OPERATIONS, 2015-2035

Year	2015	2020	2025	2030	2035
Local Operations	18,200	18,700	19,700	20,300	21,600
Itinerant Operations	12,900	13,200	14,000	14,500	15,300
Total	**31,100**	**31,900**	**33,700**	**34,800**	**36,900**

Source: Garver Forecast Data for ILE, 2015

FIGURE 2-7 | SUMMARY OF LOCAL AND ITINERANT OPERATIONS, 2015-2035



Source: Garver Forecast Data for ILE, 2015

ANNUAL INSTRUMENT APPROACH FORECAST

Table 2-8, *Actual Instrument Approach Forecasts, 2015-2035*, summarizes the forecast of annual civilian instrument approaches at ILE throughout the planning period. The forecast of annual instrument approaches (AIAs) provides further guidance in determining requirements for the type, extent, and timing of future navigational aid (NAVAID) equipment. These figures are strictly for instrument flight rules (IFR) operations conducted during instrument meteorological conditions (IMC), which exist whenever the cloud ceiling is at or below 1,000 feet and/or visibility is lower than 3 miles. If instrument approaches are calculated for marginal visual flight rules (MVFR) conditions, the monthly potential instrument approaches to ILE would nearly double. MVFR weather conditions occur whenever the cloud ceiling is lower than 3,000 feet and/or the visibility is less than 5 miles.

Additional consideration for instrument approach procedures is based on the IFR flight plan filings for the last five year period and the level of training operations conducted by CTC. During the last five year period there have been an average of nearly 1,800 instrument flight plans filed to or from ILE. Of these an average of 26 percent were conducted by CTC. It is estimated that with each one of these instrument flight plans by CTC aircraft that an average of four instrument approaches are conducted which could occur during actual instrument meteorological conditions or as practice approaches for training purposes most at ILE.

FIGURE 2-8 | ACTUAL INSTRUMENT APPROACH FORECASTS, 2015-2035

Category	2015	2020	2025	2030	2035
Annual Operations	31,100	31,900	33,700	34,800	36,900
Forecast Air Taxi Operations	3,400	3,800	4,400	4,900	5,500
% IFR Weather	11.7%	11.7%	11.7%	11.7%	11.7%
% IFR Rated Pilots	50.7%	50.9%	50.8%	50.4%	49.9%
Total Actual Instrument Approaches	450	480	540	580	660
CTC Practice Instrument Approaches	408	428	450	472	500
Total Actual and CTC Practice Approaches	**858**	**908**	**990**	**1,052**	**1,160**

Source: Garver Forecast Data for ILE, 2015 and FAA Aerospace Forecasts 2014 – 2034.

CRITICAL AIRCRAFT

The "critical" aircraft at an airport is the largest and most demanding aircraft conducting at least 500 operations per year. Determining the critical aircraft is important for assessing airport design and layout and the structural and equipment needs for both the airfield and terminal area. It is evaluated with respect to size, speed, and weight. The aircraft operating at ILE vary widely from small piston flight trainers to large, complex, sophisticated business jets. Based on the types of aircraft utilizing the airport, the existing "critical" aircraft at ILE is in the Runway Design Code (RDC) C-II-4000 category. The preferred forecasts confirm this to be the critical aircraft during the short-term and maintain it as such throughout the 20-year planning period.

The existing and future critical aircraft at ILE is not defined by a single aircraft. Based on the myriad of aircraft operating on the field today it requires a group approach to define the critical aircraft. Today there are numerous aircraft models that are in the aircraft approach category C with ample operations to define the critical aircraft group. The growing numbers of Gulfstream 350/450s, Cessna Citations, and Bombardier Challengers are all in the airplane design group II thus defining the airplane design group. Hence, the ILE design aircraft is in the C-II category.

Table 2-9 illustrates aircraft specifications for two representative aircraft that are in the RDC – II category and operate at ILE.

TABLE 2-9 | EXISTING AND FUTURE CRITICAL AIRCRAFT CHARACTERISTICS

Aircraft Type and ARC	Wing Span	Aircraft Length	Aircraft Tall Height	Seating	Max Gross Takeoff Weight	Balanced Field Length	Approach Speed
Existing Critical Aircraft							
Dassault Falcon 20/50 B-II	61.8'	60.7'	22.9'	8-9	37,500 lbs.	5,000'	124
Cessna Citation 650 (VII) B-II	53.5'	55.5'	16.8'	6-9	23,000 lbs.	5,170'	122
Potential Future Critical Aircraft							
Bombardier Challenger 604 ARC C-II	64.3'	68.4'	20.3'	9	47,600 lbs.	5,700'	132
Gulfstream 350 ARC C-II	77.1'	89.2'	24.4'	14 (Typ.)	72,000 lbs.	4,700'	136

Source: Garver

FORECAST SUMMARY

The various forecast elements are displayed in **Table 2-13**, *Aviation Forecast Summary, 2015-2035*. The forecasts, combined with the inventory data, will be used to identify and develop the facility requirements and the need for improved general aviation facilities to serve the ILE. The next chapter, Facility Requirements, identifies the types and extent of facilities needed to adequately accommodate the demand levels identified in this chapter.

TABLE 2-13 | AVIATION FORECAST SUMMARY, 2015-2035

Based Aircraft by Type					
Year	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Engine Piston	55	57	58	59	62
Multi-Engine Piston	2	3	2	3	2
Multi-Engine Turbo-Prop	1	1	1	2	3
Turbo-Jet	0	0	1	1	2
Helicopter	2	2	3	4	5
Total	**60**	**63**	**66**	**69**	**72**
Based Aircraft by Type Plus Hangar Waiting List					
Year	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Engine Piston	55	64	66	67	69
Multi-Engine Piston	2	3	3	2	2
Turbo-Prop	1	2	3	3	3
Turbo-Jet	0	0	1	2	2
Helicopter	2	2	3	4	5
Total	**60**	**71**	**75**	**78**	**81**
Operations					
Year	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Engine Piston	21,750	22,740	23,350	25,150	26,760
Multi-Engine Piston	2,020	2,090	2,110	2,260	2,350
Turbo-Prop	3,300	3,500	3,590	3,960	4,200
Turbo-Jet	1,920	2,030	2,100	2,630	2,750
Helicopter	460	490	500	550	590
Military	250	250	250	250	250
Local Operations	18,200	18,700	19,700	20,300	21,600
Itinerant Operations	12,900	13,200	14,000	14,500	15,300
Total	**31,100**	**31,900**	**33,700**	**34,800**	**36,900**

Source: Garver Forecast Data for ILE, 2015

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CHAPTER FOUR

Airport Facility Requirements

AIRPORT FACILITY REQUIREMENTS

Introduction

This chapter evaluates the airfield's operational capacity and delay and also identifies the long-range requirements used to determine the facilities needed to meet the forecast demand as planned in accordance with Federal Aviation Administration (FAA) airport design standards and airspace criteria. Identification of a needed facility does not necessarily constitute a "requirement" in terms of design standards, but an "option" for facility improvements to accommodate future aviation activity. However, market demand will ultimately drive the requirements for construction and development at Skylark Field Airport (ILE).

Airfield/airside facility components include runways, taxiways, navigational aids (NAVAIDs), airfield marking/ signage, and lighting, while terminal area/landside components are comprised of hangars, terminal building, aircraft parking apron, fuel dispensing units, vehicular parking, and airport access requirements.

As previously presented in the Inventory Chapter, the FAA outlines design standards in FAA Advisory Circular (AC) 150/5300-13 (current series). Runway pavements and associated safety areas are delineated through the runway design code (RDC) while taxiway pavements and safety areas are defined by the taxiway design group (TDG). The RDC/TDG correlate the design and layout of an airport to the operational and physical characteristics of the critical / design aircraft. The RDC/TDG directly influence pertinent safety criteria such as runway length, runway width, runway/taxiway separation distances, building setbacks, size of required safety and object free areas, etc. The critical / design aircraft is based on the largest type aircraft expected to operate at an airport on a regular basis defined as a minimum of 500 annual operations (landings or takeoffs).

Airfield Capacity Analysis

The FAA's standard method for determining airport capacity and delay for long-range planning purposes can be found in

AC 150/5060-5, *Airport Capacity and Delay*. For this portion of the analysis, generalized airfield capacity was calculated in terms of: 1) hourly capacity of runways and 2) annual service volume (ASV). This approach utilizes the projections of annual operations by the proposed fleet mix as projected in the Forecast Chapter while considering a variety of other factors that are described below.

AIRFIELD CHARACTERISTICS

In addition to the aviation activity forecasts, a number of the Airport's characteristics and operational conditions are required to properly conduct the FAA capacity analysis. These elements affecting airfield capacity include:

- Runway Configuration;
- Aircraft Mix Index;
- Taxiway Configuration;
- Operational Characteristics; and,
- Meteorological Conditions.

When analyzed collectively, the above elements provide the basis for establishing the generalized operational capacity of an airport as expressed by Annual Service Volume (ASV). The following sections evaluate each of these characteristics with respect to ILE.

RUNWAY USE CONFIGURATION

The runway use configuration is one of the primary factors determining airfield capacity. The capacity of a two or more runway system is substantially higher than an airport with a single runway. If runways intersect, the capacity is generally not as great as in a parallel runway layout because operations on the second runway are not possible until the aircraft on the first runway has cleared the intersection point.

As previously mentioned in the Inventory Chapter, ILE is a one runway system with Runway 01-19 on a north/south alignment. It is 5,495 feet long and 100 feet wide. Based on the runway at ILE, runway use configuration one (1) from AC 150/5060-5 will be employed.

TAXIWAY CONFIGURATION

The distance an aircraft has to travel to an exit taxiway after landing also sets limits on the airfield capacity. Larger aircraft require more distance to slow to a safe speed before exiting the runway. Thus, they require greater runway occupancy times. If taxiways are placed at the approximate location where the aircraft would reach safe taxiing speed, the aircraft can exit and clear the runway for another user. However, if the taxiway is spaced either too close or too far from the touchdown zone, the aircraft will likely spend more time on the runway than if the taxiway had been in the optimal location. The optimal location for exit taxiways is in a range from 2,000 feet to 4,000 feet from the landing threshold with each exit separated by at least 750 feet.

Based on FAA criteria, the exit factor within the formula is maximized when a runway has four exit taxiways within the optimal range. As previously documented, Runway 01-19 is served by Taxiway Bravo, full-length parallel east of the runway, and Taxiway Golf, a partial parallel taxiway west of the runway. There are five exit/connector taxiways for Runway 01-19 along Taxiway Bravo two that meet the optimal location criteria. Taxiway Golf currently has two connector taxiways to Runway 01-19 that do not meet optimal exit taxiway criteria.

AIRCRAFT MIX INDEX

The operational fleet at an airport influences an airfield's capacity based upon differing aircraft requirements. Various operational separations are set by the FAA for a number of safety reasons. An airfield's capacity is the time needed for the aircraft to clear the runway either on arrival or departure. As aircraft size and weight increases, so does the time needed for it to slow to a safe taxing speed or to achieve the needed speed for takeoff. Thus, a larger aircraft generally requires more runway occupancy time than a smaller aircraft. As additional larger aircraft enter an airport's operating fleet, the lower the capacity will likely be for that airport.

There are four categories of aircraft used for capacity determinations under the FAA criteria. These classifications are based on the maximum certificated takeoff weight, the number of engines, and wake turbulence classifications. The aircraft indexes and characteristics are shown in the following table, **Table 4-1**, *Aircraft Classifications*, and the following figure, **Figure 4-1**, *Cross Section of Aircraft Classifications*.

These classifications are used to determine the mix index,

which is required to calculate the theoretical capacity of an airfield. The mix index is defined as the percent of Class C aircraft plus three (3) times the percent of Class D aircraft, reflected as a percentage (C+3D). The percent of A and B class aircraft do not count towards the calculation of mix index due to the quick dissipation of turbulence produced by this category. Using the FAA formula outlined in AC 150/5060-5, the aircraft mix for ILE will be 20 by the end of the planning effort.

AIRFIELD OPERATIONAL CHARACTERISTICS

Operational characteristics that can affect an airfield's overall capacity include the percent of aircraft arrivals and the percent of touch-and-go operations.

Percent of Aircraft Arrivals

The percent of aircraft arrivals is the ratio of landing operations to the total operations for the airport. This metric is valuable because aircraft approaching an airport for landing require more runway occupancy time than an aircraft departing the airfield. The FAA methodology typically determines airfield capacity using 40 percent, 50 percent, or 60 percent of arrivals. For ILE, the percent of arrivals is not typically a significant factor, thus, for purposes of calculations a 50 percent of arrivals factor was used.

Percent of Touch-and-Go Operations

The percent of touch-and-go operations plays a critical role in determination of airport capacity. Touch-and-go operations are typically associated with flight training activity. At ILE, touch-and-go operations are a large part of the picture primarily due to the training activity conducted by Central Texas College (CTC) and Genesis Aero. These touch-and-go operations are approximately 35 percent of the total airfield operations and are expected to remain consistent throughout the next 20 year period.

Meteorological Conditions

Aircraft operating parameters are dependent upon the weather conditions, such as cloud ceiling height and visibility range. As weather conditions deteriorate, pilots must rely on instruments to define their position both vertically and horizontally. Capacity is lowered during such conditions because the FAA requires aircraft separation to increase for safety reasons. Additionally, some airports may have limitations with regards to their instrument approach capability which also impacts capacity during inclement weather. The FAA defines three (3) general weather categories, based upon the ceiling height of clouds above ground level and visibility.

- **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' AGL and/or the visibility is at least one statute mile but less than three statute miles; and
- **Poor Visibility and Ceiling (PVC):** Cloud ceiling is less than 500 feet AGL and/or the visibility is less than one statute mile.

ILE observes VFR conditions approximately 92.5 percent of the

TABLE 4-1 | AIRCRAFT CLASSIFICATIONS

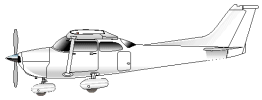
Aircraft Class	Maximum Certificated Takeoff Weight (lbs)	Number of Engines	Wake Turbulence Classification[1]
A and B	Under 12,500	Single-/Multi-	Small
C	12,500 – 300,000	Multi-	Large
D	Over 300,000	Multi-	Heavy

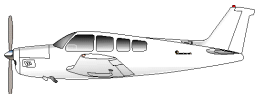
Source: FAA Advisory Circular 150/5360-5, Change 2, Airport Capacity and Delay.

[1] Wake turbulence classifications as defined by the FAA, Small – Aircraft of 41,000 lbs. maximum certificated takeoff; Large – Aircraft more than 41,000 lbs certificated takeoff weight, up to 255,000 lbs: Heavy – Aircraft capable of takeoff weights of more than 255,000 lbs whether or not they are operating at this weight during a particular phase of flight.

TABLE 4-1 | CROSS SECTION OF AIRCRAFT CLASSIFICATIONS

Class A and B
12,500 lbs. or less (Single-/Multi-Engine)

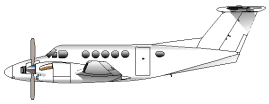

Cessna 172 (Skyhawk)


Beechcraft A36 (Bonanza)


Beechcraft 58TC (Baron)


Cessna 421C (Golden Eagle)


Cessna Citation II


Beechcraft King Air B300

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


Gulfstream V


Embraer 120 (Brasilia)


Saab 340


MD-80


Boeing 737


Boeing 757

Class D
Heavy aircraft, More than 300,000 lbs.


Airbus A340-200


MD-11


Boeing 777-200


Boeing 747-400

Source: Dr. Antonio Trani, Department of Civil Engineering, Virginia Tech University.

time, IFR conditions approximately 6.8 percent of the time, and PVC conditions approximately 0.7 percent of the time.

HOURLY CAPACITY OF RUNWAY

Hourly capacity of a runway measures the maximum number of aircraft operations that can be accommodated by an airport's runway configuration in one hour. This capacity is calculated by analyzing the appropriate series of graphs and tables for VFR and IFR conditions within FAA (AC) 150/5060-5. From these figures, the hourly capacity is calculated by multiplying the hourly capacity base, the touch-and-go factor, and the exit factor together.

The equation for this formula is:

Hourly Capacity =

$$C^* \times T \times E$$

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

Following the calculation of the hourly capacity, a weighted hourly capacity is determined by calculating the ratio of annual demand to average daily demand during the peak month. The mix index (P) and weighting factor are derived from nomographs and tables in AC 150/5060-5.

TABLE 4-2 | HOURLY CAPACITY AND WEIGHTED HOURLY CAPACITY

	Year	2015	2025	2035
Hourly Capacity Base (C*)	VFR	99	92	91.5
	IFR	65	62.5	60
Touch-and-Go Factor (T)	VFR	1.2	1.2	1.2
	IFR	1.0	1.0	1.0
Exit Factor (E)	VFR	0.86	0.86	0.86
	IFR	0.35	0.35	0.35
Hourly Capacity (C)	VFR	102.17	94.94	94.42
	IFR	22.75	21.88	21.00
	PVC	0.0	0.0	0.0
Mix Index (P)	VFR	2.0	5.0	6.0
	IFR	5.0	11.0	13.0
	PVC	25.0	25.0	25.0
Percent Arrivals	VFR	5.0%	5.0%	5.0%
	IFR	2.5%	2.5%	2.5%
	PVC	1.0%	1.0%	1.0%
Weighting Factor (W)	VFR	1.0	1.0	1.0
	IFR	16.0	16.0	16.0
	PVC	25.0	25.0	25.0
Weighted Hourly Capacity (Cw)		24.71	23.47	24.76

Source: FAA Advisory Circular 150/5360-5, Change 2, Airport Capacity and Delay.

The equation formula for calculating the weighted hourly capacity CW is:
Weighted Hourly Capacity =

$$\frac{(P1 \times C1 \times W1) + (P2 \times C2 \times W2) + (Pn \times Cn \times Wn)}{(P1 \times W1) + (P2 \times W2) + (Pn \times Wn)}$$

where: P = mix index
C = hourly capacity
W = weighting factor

Table 4-2, Hourly Capacity and Weighted Hourly Capacity, depicts the factors and the airport's calculated capacity values.

ANNUAL SERVICE VOLUME

Under the FAA methodology, the most important value that must be computed 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 an airport can support annually. Using the FAA's methodology to estimate ASV, the ratio of annual operations to average daily operations, during the peak month, must first be calculated along with the ratio of average daily operations to average peak hour operations, during the peak month. These values are then multiplied together resulting in a product to be multiplied by the weighted hourly capacity.

The equation used to calculate ASV is:
Annual Service Volume =

$$Cw \times D \times H$$

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

ILE's ASV, as calculated based on the method above, can be seen in **Table 4-3**, *Annual Service Volume (ASV)*. Based on these calculations, ILE operates well below the FAA maximum annual service volume of 230,000.

RUNWAY 01-19

Runway Length

FAA AC 150/5325-4B, *Runway Length Requirements*, provides guidance to help determine the most appropriate recommended runway lengths for an airport, which is predicated upon the category of aircraft using the airport. By design, the primary runway typically has the longest runway, the most favorable wind conditions, the greatest pavement strength, and the lowest straight-in instrument approach minimums.

Runway 01-19 meets the length requirements for the existing RDC of B-II-4000 and also 100 percent of the small GA fleet with 10 passenger seats. If the airport were to consider accommodation of 75 percent of the large general aviation fleet

TABLE 4-3 | ANNUAL SERVICE VOLUME (ASV)

Year	Annual Operations	Average Day of Peak Month	Design Hour Operations	Weighted Hourly Capacity (Cw)	Daily Demand (D)	Hourly Demand (H)	Annual Service Volume (ASV)	FAA Maximum ASV[1]	ILE Capacity Level
2015	31,100	100.3	27.5	24.71	310.0	3.65	27,959	230,000	12.2%
2025	33,700	108.7	33.8	23.47	310.0	3.22	23,427	230,000	10.2%
2035	36,900	119.0	46.1	24.76	310.0	2.58	19,803	230,000	8.6%

Source: FAA Advisory Circular 150/5360-5, Change 2, Airport Capacity and Delay.

1 FAA Maximum Annual Service Volume defined in AC 150/5060-5 based on single runway configuration with parallel taxiway, instrumentation, airspace limitations, and percent arrivals and touch-and-go operations.

(12,500 pounds to 60,000 pounds) at 60 percent useful load Runway 01-19 would need to be expanded by only five feet. Upgrading Runway 01-19 to C-II support capabilities impacts property ownership based on expanded safety areas discussed later in this chapter. Expansion beyond B-II level of support would require significant property acquisition and realignment of important arterial feeders like Business 190 on the north or FM 2490/US 190 on the south. Any future runway lengthening to accommodate the larger categories of aircraft will require justification and approval through TXDOT before any funding assistance is granted.

A significant factor to consider when analyzing the generalized runway length requirements is that the actual length necessary for a runway is a function of elevation, temperature, and stage length. As temperatures change, the runway length requirements change accordingly. Thus, if a runway is designed to accommodate 75 percent of the fleet at 60 percent useful load, this does not prevent larger aircraft at certain times and during specific conditions from utilizing the runway. However, the amount of time such operations can safely occur is restricted.

Runway Width

FAA AC 150/5300 (current series) delineates the requirements for runway width. At present, Runway 01-19 is 100 feet wide. This width exceeds the minimum runway width recommended for the existing RDC of B-II-4000 of 75 feet. At the next major runway rehabilitation project runway width will need to be considered along with the forecast growth of C-II type aircraft at ILE. Any initiative to reduce runway width will also encounter the need to move runway edge lighting and possibly visual approach aids.

TABLE 4-4 | RUNWAY LENGTH REQUIREMENTS – RUNWAY 01/19

Aircraft Category	Length (Dry Pavement) (ft)	Length (Wet Pavement) (ft)	Deficiency (ft)
Small Aircraft: 12,500 pounds or less			
95% GA Fleet	3,400	3,400	0
100% GA Fleet	4,100	4,100	0
100% GA Fleet with 10 or more passenger seats	4,500	4,500	0
Large Aircraft: Between 12,500 and 60,000 pounds			
75% of fleet at 60% useful load	5,500	5,500	5
75% of fleet at 90% useful load	7,200	7,200	1,705
100% of fleet at 60% useful load	5,960	5,960	465
100% of fleet at 90% useful load	9,610	9,610	4,115

Source: AC 150/5325-4B, Runway Length Requirements for Airport Design, Figures 3-1 and 3-2.

Generalized length only. Actual lengths should be calculated based on the specific aircraft's operational nomographs.

Useful load refers to all usable fuel, passengers, and cargo.

Calculations based on 848 feet airport elevation, mean maximum daily temperature of 96˚ and maximum difference in runway end elevation of 6.9 feet.

Figures are increased 10 feet for each foot of elevation difference between high and low points of runway centerline.

[1] By regulation, the length for turbo-jet powered airplanes is increased 15% up to 5,500', whichever is less for 60 percent useful loads and 15 percent up to 7,000', whichever is less for 90 percent useful loads.

Runway Alignment

The FAA defines runway alignment based on crosswind coverage. The prescribed crosswind coverage for a given runway is 95 percent for each given ARC. **Table 4-5** shows the crosswind coverage percentages for Runway 01-19 and the various ARCs at the airport indicating that the crosswind component for the 10.5 nautical mile per hour (knots) is above the prescribed threshold of 95 percent.

AIRFIELD DESIGN STANDARDS

Compliance with airport design standards is required to maintain a minimum level of operational safety. The major airport design elements are established from FAA AC 150/5300(current series), *Airport Design* and Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, and should conform with FAA airport design criteria without modification to standards.

Runway Safety Area

The runway safety area (RSA) is a two-dimensional area surrounding and extending beyond the runway and taxiway centerlines. This safety area is provided to reduce the risk of damage to airplanes in the event of undershoot, overshoot, or excursion from the runway. In addition, it must be cleared and free of objects except those required for air navigation and graded to transverse and longitudinal standards to prevent water accumulation, as consistent with local drainage requirements. Under dry conditions, the RSA must support emergency equipment and aircraft without causing structural damage or injury to the occupants. The FAA recommends the airport own the entire RSA in “fee simple” title. Based on FAA B-II design standards, the RSA should extend beyond the end of the runway for 300 feet and be 150 feet wide with no steeper grade than three percent. Due to existing grades beyond the Runway 01 end, only 100 feet of RSA is available. The airport has implemented declared distances to remedy the RSA length deficiency to retain the current usable runway length. **Figure 4-2** graphically illustrates the existing deficiency and declared distances for each runway end of Runway 01-19.

Object Free Area

The object free area (OFA) is a two-dimensional area surrounding runways, taxiways and taxilanes. It must remain clear of objects except those used for air navigation or aircraft ground maneuvering purposes, and requires clearing of above-ground objects protruding higher than the runway edge elevation at an adjacent point within the OFA. An object is considered any ground structure, navigational aid, people, equipment, terrain or parked aircraft. The FAA recommends that the airport own the entire OFA in "fee simple" title. Currently, ARC B-II standards indicate requirements of 500 feet wide and 300 foot length beyond each runway end. **Figure 4-2** depicts the recommended OFA standards along with deficiencies and associated declared distances remedy.

Obstacle Free Zone

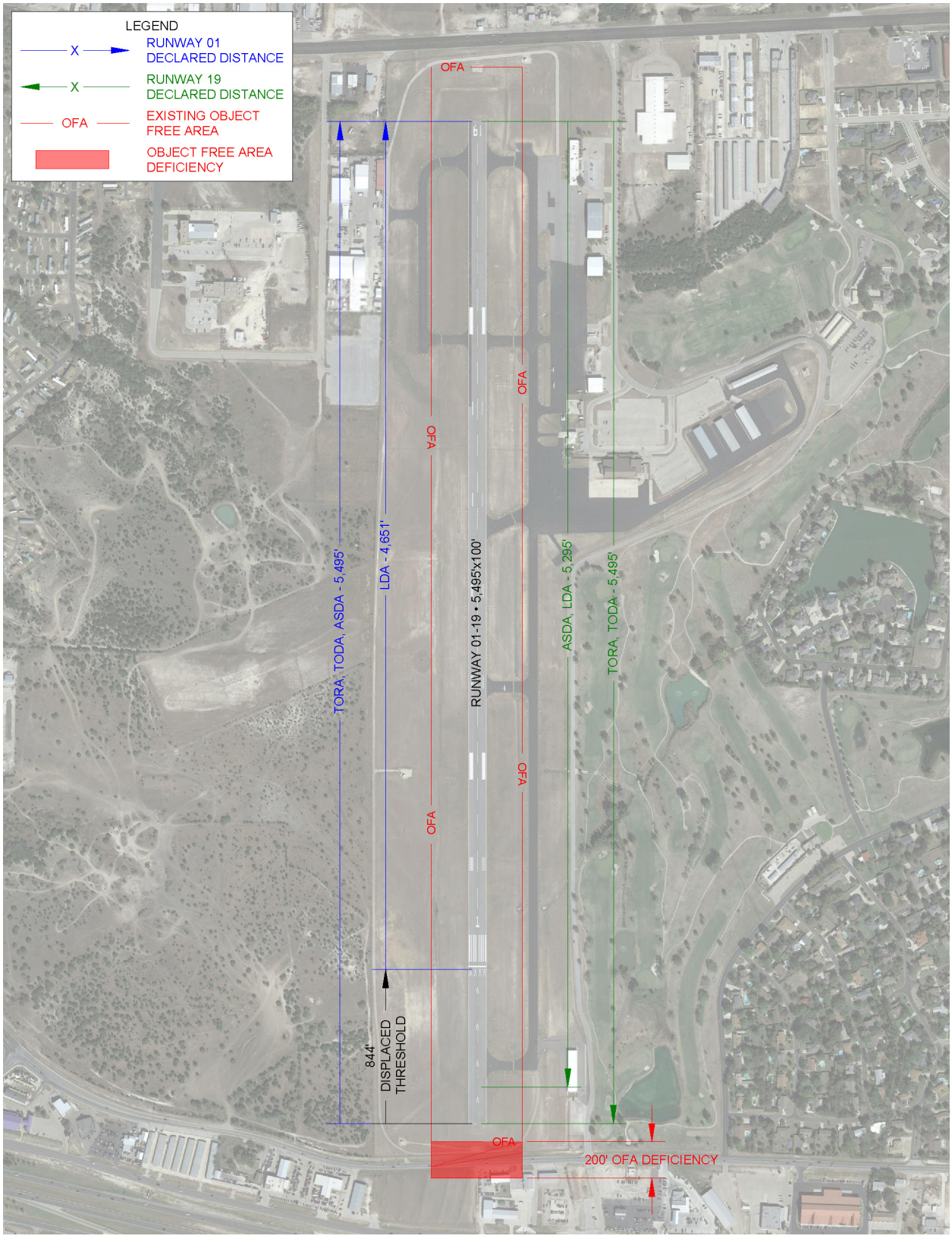
The obstacle free zone (OFZ) is airspace above and centered along the runway centerline, and precludes taxiing and parked airplanes and object penetrations except for frangible post mounted NAVAIDs expressly located in the OFZ by function. Due to the facilities required, only the Runway OFZ is applicable. The length of the OFZ is fixed at 200 feet beyond the associated runway end, but the width is dependent upon the RDC and visibility minimums associated with the instrument approach procedures associated with the runway. The OFZ width at ILE is 400 feet and the elevation of the OFZ is equal to the closest point on the runway. The runway OFZ at ILE is in compliance beyond the northern runway end; however, at the south end a small portion of the runway OFZ has a fence running through it and it extends beyond airport property into

TABLE 4-5 | CROSSWIND COVERAGE

	All Weather Crosswind Coverage (Percent)				Instrument Meteorological Conditions Crosswind Coverage (Percent)			
Runway	10.5 kts	13.0 kts	16.0 kts	20.0 kts	10.5 kts	13.0 kts	16.0 kts	20.0 kts
01/19	94.82	97.92	99.54	99.92	96.03	98.47	98.71	99.95

Source: FAA Airports – GIS Wind Analysis Tool using ILE wind data.

FIGURE 4-2 | EXISTING DECLARED DISTANCES



Source: Garver, 2015

the Farm-to-Market Road 2410 right-of-way. The OFZ elevation beyond the Runway 01 end is equal to the runway end elevation of 848.0 feet above mean sea level (MSL). Terrain beyond the Runway 01 end slopes steeply after the first 100 feet to the airport perimeter road and fence. The airport perimeter fence is an eight foot tall fence with three strands of barbed wire atop and based on ground elevations is also below the OFZ elevations in this area. Ground elevations in the area and the right of way of FM 2410 are approximately 838.0 feet MSL and below the OFZ elevation. Hence this is considered an acceptable condition.

Building Restriction Line

The building restriction line (BRL) represents the boundary that separates the airside and landside facilities and identifies suitable building area locations based on airspace and visibility criteria. The BRL is established with reference to the FAR Part 77 primary and transitional surfaces, as well as the airfield safety areas. Based on existing instrument approach procedures, the Runway 01-19 primary surface is centered on runway centerline, 1,000 feet wide and extends 200 feet beyond each runway end. The transition surfaces slope up (7:1) from the primary surface to the horizontal surface 150 feet above airport elevation. Based on the activity at the field, instrument approach types, and RDC, the 35.0 foot BRL should be 745 feet from the runway centerline. Historically, KILE has maintained a BRL at 600 feet from runway centerline. The existing 600-foot BRL provides approximately 14 feet of airspace clearance beneath the transition surface based on airport elevation as the starting point. Specific building sites must take into account the ground elevation, structure height, and the perpendicular runway edge elevation in determining suitable building locations. The combination of these factors may make it possible for structures to be constructed closer than the established BRL. There are a number of existing buildings that may be an airspace obstruction that could require installation of obstruction lighting.

With the elimination of the approach lighting system serving Runway 01, the precision minimums associated with both the ILS and GPS/RNAV approach may be raised. If this transpires the FAR Part 77 primary surface size shifts down from 1,000 feet wide to only 500 feet wide. As a result of this the recommended 35.0 foot BRL also shifts closer to the runway and will occur at 495 feet from runway centerline.

Runway Approach Surface

The approach surface is a three-dimensional trapezoidal FAR Part 77 imaginary surface extending beyond each runway end and has a defined slope requiring clearance over structures and objects beyond the runway threshold. The purpose of the approach surface is to provide proper clearance for the safe approach and landing of aircraft. The existing approach surface dimensions associated with Runway 01-19 differ on each runway end. The existing approach surface for the Runway 01 end is 1,000' x 50,000' x 16,000' with a 50:1 slope for the first 10,000 feet, then 40:1 for the remaining 40,000 feet based on the precision approach. With the decommissioning of the approach lighting system, the approach surface to the Runway 01 end is reduced in size with dimensions of 1,000' x 10,000' x 4,000' and extends up at a 34:1 slope. Runway 19 is a visual runway end with circling minimums from the Runway 01 instrument approach procedures. The Runway 19 approach surface dimensions are 500' x 5,000' x 1,500' and it extends up a 20:1 slope.

Any obstructions to the approach surfaces will be identified by an obstruction survey and be depicted on the Airport Layout Plan (ALP).

Runway Line-of-Sight

An acceptable runway profile permits any two points, generally each runway end, five feet above the runway centerline, to be mutually visible for the entire runway length. The sight distance along a runway from an intersecting taxiway needs to be sufficient to allow a taxiing aircraft to enter safely or cross the runway, in addition to seeing vehicles, wildlife and other hazardous objects. However, if the runway offers a full-length parallel taxiway, an unobstructed line of sight will exist from any point five feet above the runway centerline to any other point five feet above the runway centerline for one-half the runway length. There are no line-of-sight requirements for taxiways. As ILE is equipped with a nearly full-length parallel taxiway, there are no line of sight deficiencies.

As can be seen in the **Table 4-6**, *Airport Design Standards*, the airport meets or exceeds the design criteria for Runway 01-19 with the exception of the RSA and ROFA. In the future, if any

lowering of the instrument approach minimums occurs, new criteria may impose deficiencies in design standards.

Runway Protection Zone

The purpose of the runway protection zone (RPZ) is to enhance the protection of people and property on the ground, and to prevent obstructions that are potentially hazardous to aircraft operations. The FAA recommends that airports own the entire RPZ in "fee simple" title and that the RPZ be clear of any non-aeronautical structure or object that would interfere with the arrival and departure of aircraft. However, if "fee simple" interest is unachievable, the next option is controlling the heights of objects through an avigation easement.

The RPZ is a two-dimensional trapezoid area that normally begins 200 feet beyond the paved runway end, and extends along the runway centerline. When it begins somewhere other than 200 feet from a runway end, there is a need for two RPZs, approach and departure. The approach RPZ begins 200 feet from the threshold. A departure RPZ begins 200 feet from the end of runway pavement or TORA if different.

An FAA Interim Guidance Letter (IGL) (Sept 2012) addressed acceptable property uses within an RPZ. The IGL was released to specify and emphasize existing use standards and indicates that if any of the following parameters are met then the RPZ ownership must be reevaluated:

TABLE 4-6 | AIRPORT DESIGN STANDARDS

Item	Runway 01/19 (B-II)	FAA Design Standard (B-II Not Lower than ¾-mile vis. Min.)	FAA Design Standard (C-II, Not Lower than ¾-mile vis. Min.)
Runway Design			
Width (ft)	100	75	100
RSA Width (ft)	150	150	500
RSA Length beyond R/W end (ft)	**100**/300	300/300	1,000/1,000
OFA Width (ft)	500	500	800
OFA Length beyond R/W end (ft)	**100**/300	300/300	1,000/1,000
Obstacle Free Zone Width (ft)	400	400	400
Obstacle Free Zone Length (ft)	200	200	200
Runway Setbacks – Runway Centerline to:			
Parallel Taxiway (ft) Centerline (ft)	305	240	400
Holdline (ft)	250	250	250
Aircraft Parking Area (ft)	400	250	400
Taxiway Design			
Width (ft)	50/60	35	50
Safety Area Width (ft)	79	79	79
Object Free Area Width (ft)	131	131	131

Source: AC 150/5300-13A, Change 1, Airport Design.

Bold type indicates design deficiency for B-II Not Lower than 3/4 – mile vis. Min.

ROFA length deficient due to FM 2410 and airport perimeter fencing.

- An airfield project (e.g., a runway extension, runway shift);
- A change in the critical design aircraft that increases the RPZ size;
- A new or revised instrument approach procedure that increases the RPZ dimensions; and,
- A local development proposal in the RPZ (either new or reconfigured).

Land uses within an RPZ that require specific and direct coordination with the FAA include:

- Buildings and structures;
- Recreational land uses;
- Transportation facilities;
- Rail facilities;
- Public road/highways;
- Vehicular parking facilities;
- Fuel storage facilities;
- Hazardous material storage;
- Wastewater treatment facilities; and,
- Above-ground utility infrastructure.

RPZ dimensions are determined by the type/size of aircraft expected to operate at an airport and the type of approach, existing or planned, for each runway end (visual, precision, or non-precision). The recommended visibility minimums for the runway ends are determined with respect to published instrument approach procedures, the ultimate runway RDC, airfield design standards, instrument meteorological conditions, wind conditions, and physical constraints (approach slope clearance) along the extended runway centerline beyond the runway end. **Table 4-7**, *Runway Protection Zone Dimensions*, delineates the RPZ requirements. The current Runway 01 RPZ dimensions are 1,000' x 1,700' x 1,510' while the Runway 19 RPZ dimensions are 500' x 1,000' x 700'.

Not all of the RPZ property is owned or controlled by the City of Killeen as recommended by the FAA. The City does control some of the RPZ property through easements and these easements are based on the data and conditions at the time of acquisition. Acquisition of fee-simple property or avigation easements should be completed as properties/funds are available and should be based on the future runway and approach capabilities.

AIRFIELD LIGHTING AND MARKING REQUIREMENTS

Airport lighting is used to help maximize the utility of the airport during day, night and adverse weather conditions. FAA Order 7021.2C, *Airport Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services* specify minimum activity levels to qualify for visual and electronic navigational aids and equipment. Recommended lighting systems for the Airport include:

Runway Lighting/Pavement Marking

Currently, Runway 01-19 is equipped with medium intensity runway lights (MIRL). If a precision approach is maintained, high intensity runway lights and an approach lighting system are recommended. The current MIRLs are preset on the lowest intensity setting and are installed with a pilot control switch

TABLE 4-7 | RUNWAY PROTECTION ZONE DIMENSIONS

Approach Visibility Minimums	Facilities Expected to Serve	Length (ft)	Inner Width (ft)	Outer Width (ft)	Acres
Visual and Not Lower than 1-Mile	Aircraft Approach Category B	1,000	500	700	29.465
Not Lower Than ¾-Mile	All Aircraft	1,700'	1,000	1,510	48.978
Lower Than ¾-Mile	All Aircraft	2,500'	1,000	1,750	78.914

Source: FAA Advisory Circular 150/5300-13 (current series).

connected to the common traffic advisory frequency (CTAF) radio. Pilots can increase the brightness of the MIRLs through a series of microphone click transmissions on the CTAF.

Runway pavement markings should follow requirements prescribed in FAA AC 150/5300-13 (current series), and AC 150/5340-1J, *Standards for Airport Markings*. Runway 01-19 pavement has precision markings based on the ILS approach to Runway 01 and visual markings at the Runway 19 end. Future consideration should be to remark the Runway 01 end with non-precision markings in accordance with FAA standards for runway markings identified in Table 3-4 of AC 150/5300-13A. This table prescribes non-precision runway markings for a runway end with a precision approach with not lower than ¾-mile visibility minimums and decision height of 250 feet height above threshold.

Taxiway Lighting/Pavement Marking

Medium intensity taxiway lights (MITL) are the recommended lighting system for all taxiway sections and turning radii. MITL's can also be pilot controlled and wired to the same remote system as the runway lights. In 2010, ILE took advantage of new technology in taxiway lighting converting the MITLs to an LED system. While these lights do have a higher up-front cost, their energy saving potential will pay for the lights over the long term. Additional savings are achieved by the airport by setting the MITLs to normally be off but can be activated through the CTAF system similar to the MIRLs. The useful age for these lights is estimated to be three to four times that of traditional incandescent lighting. Taxiway edge/centerline reflectors can be used as a less expensive lighting alternative. Currently, ILE has LED MITLs along the parallel taxiway, connector taxiways, and in most apron areas.

All paved taxiways should be painted with standard taxiway markings as prescribed in FAA Advisory Circular 150/5340 (current series), *Standards for Airport Markings*. Currently, ILE has done an excellent job of having all their taxiway/taxilanes marked appropriately upholding established standards.

Approach Lighting System

An approach lighting system (ALS) provides the basic means to transition from instrument flight to visual flight for landing. Operational requirements dictate the sophistication and configuration of the ALS for a particular runway. Depending on the type of approach, certain ALS are required in aiding pilots in the identification of the airport environment during instrument meteorological conditions. ALS are a configuration of signal lights starting at the landing threshold and extending into the approach area a distance of 2400-3000 feet for precision instrument runways and 1400-1500 feet for non-precision instrument runways. Some systems include sequenced flashing lights that appear to the pilot as a ball of light traveling towards the runway at high speed blinking twice per second. Runway 01 was equipped with an ALS that was recently decommissioned by the FAA due to unresolvable conflicts with elevations resulting from the US 190 improvements completed by TxDOT. A medium intensity approach lighting system with sequenced flashers (MALS-F) was explored as a replacement ALS at ILE; however, it was determined that there would be a 250-foot loss of runway length to implement the MALS-F. The FAA indicated that there was no gain in the IAP minimums through installation of the MALS-F. It was determined that runway length was more important than a new ALS for the Runway 01 IAPs. There are no approach lights for the Runway 19 end. Future consideration for a new ALS will be predicted on user needs, instrument approach minimum requirements, and the restrictions of surrounding property and land use.

Runway End Identifier Lights

This lighting system provides rapid and positive identification of the runway approach end, consisting of a pair of synchronized (directional) flashing white strobes located laterally along the runway threshold. Runway end identifier lights (REIL) are typically installed along with threshold lights at each runway end. REILs are not commonly needed unless an airport is situated within an area of heavy light pollution or adjacent to areas that would deem them necessary at specific times such as a lighted ball field, lighted rodeo grounds, etc. In the future REILs serving both runway ends should be a consideration.

Visual Guidance Slope Indicators

Typical visual guidance slope indicators (VGSI) provide a system of sequenced colored light beams providing continuous visual descent guidance information along the desired final approach descent path (normally at 3 degrees for 3 nautical miles during daytime, and up to 5 nautical miles at night) to the runway touchdown point. The system normally consists of

two precision approach path indicator (PAPI-2) or four (PAPI-4) lamp housing units installed 600 to 800 feet from the runway threshold and offset 50 feet to the left of the runway edge. Runway 01 and Runway 19 are equipped with a PAPI-4 system for visual approach guidance.

Aiport Signs

Standard airport signs provide runway and taxiway location, direction, and mandatory instructions for aircraft movement on the ground. As a former commercial service airport, ILE has a system of standard signs installed that indicate runway, taxiway and aircraft parking destinations. FAA Advisory Circular 150/5345-44G, *Specifications for Taxiway and Runway Signs and FAA Advisory Circular 150/5340-18D, Standards for Airport Sign Systems*, outline the specifications for these items and should be followed for proper implementation, upgrades, and upkeep of airport signs.

Wind Cone/Segmented Circle/Airport Beacon

ILE has a segmented circle with a lighted wind cone which is utilized as a standard wind indicator and airport traffic pattern delineator. The airport rotating beacon is used for visual airport identification during nighttime hours and inclement weather conditions. As mentioned in the previous chapter, both these visual aid cues are in good working order.

Main Parking Apron Lighting

It is essential for safety and security that the primary apron/ramp area is provided with adequate lighting to illuminate aircraft parking, fueling area, and hangar taxilane areas. ILE lighting is considered adequate near the fuel tanks and some of the hangars on the field. Future considerations should be to add ramp lighting near the GA terminal building and between T-hangars to increase night visibility and provide a safer operating environment. There are numerous economical light fixtures available that offer enough lighting between hangars and on the main aircraft parking apron at ILE.

NAVIGATION SYSTEMS AND WEATHER AIDS

Airport navigation aids (NAVAIDs) are installed on or near an airport to increase the airport's reliability during night and inclement weather conditions and to provide electronic guidance and visual references for executing an instrument approach to the airport or runway.

FAA Order 7021.2C, *Airport Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services*, specifies minimum activity levels to qualify for instrument approach equipment and approach procedures. As forecasted in the previous chapter, approximately 4,100 operations, or 2.7 percent of operations, will be conducted under instrument conditions by the end of the 20-year planning period. The following describes the status of existing and new NAVAIDs used at general aviation airports.

Instrument Landing System

An instrument landing system (ILS) system is composed of two primary land-based components, the localizer and glideslope. The ILS system enables an appropriately equipped and piloted aircraft to be flown to a runway end with visibility as low as ½-mile and cloud ceilings at or near 200 feet above ground level. The localizer provides lateral (horizontal) alignment guidance while the glideslope provides descent (vertical) guidance. Often functioning with these two components are marker beacons and non-directional beacons that provide identification of interim points on the approach, and an ALS that provides for rapid identification of the runway environment during inclement weather conditions. The airport has a localizer and glideslope system serving Runway 01. The visibility and decision height minimums on the approach are higher than the minimums described above due to the location of the south T-hangar and terrain west of the runway end. The FAA has deemed the current null-reference glideslope unusable and plans to remove it in the future without replacement.

Distance Measuring Equipment

Distance measuring equipment (DME) provides a continuous readout of the distance remaining to the touchdown point at an airport or to the equipment location when not at an airport. DME are often co-located with Very High Frequency Omni-Directional Radio Range (VOR/VORTAC) systems. See VOR/VORTAC information below for ILE approaches.

Very High Frequency Omni-Directional Radio Range

The Very High Frequency Omni-Directional Radio Range (VOR/VORTAC) system emits a very high frequency radio signal utilized for both enroute navigation and non-precision approaches. It provides the instrument rated pilot with 360 degrees of azimuth information oriented to magnetic north. Due to the recent development of more precise navigational systems it is planned to be phased-out by the FAA (no additional enroute units installed after 1995/deactivation by 2010). ILE is served by the Gray VOR/DME, located on Gray Army Airfield, seven miles southwest of ILE and used for the VOR-A instrument approach procedure to ILE; the Temple VOR/DME located approximately 15 miles east-northeast of ILE; and the Gooch Springs VOR/DME, located 24 miles west-northwest of the field.

Global Positioning System

Global positioning system (GPS) is a highly accurate worldwide satellite navigational system that is unaffected by weather and provides point-to-point navigation by encoding transmissions from multiple satellites and ground-based data-link stations using an airborne receiver. GPS is presently FAA-certified for en-route and non-precision instrument approach navigation with precision instrument approaches based on GPS being developed for commercial airports and coming on-line in the near future. The current program provides for GPS stand-alone and overlay approaches (GPS overlay approaches published for runways with existing VOR/DME, RNAV and NDB approaches). Recently, the selective availability segment of the channel was decommissioned, thereby enhancing the accuracy of the GPS signal. The Wide Area Augmentation System (WAAS) is being installed at or near airports to provide a signal correction enabling these GPS precision approaches. A straight-in area navigation instrument approach is available to Runway 01 utilizing GPS signals and on-aircraft receivers to guide aircraft to a safe landing at ILE.

Weather Observing System

Automated weather observation systems (AWOS) and automated surface observation systems (ASOS) consist of various types of sensors, a processor, a computer-generated voice subsystem, and a transmitter to broadcast minute-by-minute weather data from a fixed location directly to the pilot. The information is transmitted over the voice portion of a local NAVAID (VOR or DME), or a discrete VHF radio frequency. The transmission is broadcast in 20-30 second messages in standard format, and can be received within 25-nautical miles of the automated weather site. AWOS/ASOS are significant for non-towered airports with instrument procedures to relay accurate and invaluable weather information to pilots. At airports with instrument procedures, an AWOS/ASOS weather report eliminates the remote altimeter setting penalty, thereby permitting lower minimum descent altitudes (lower approach minimums). These systems should be sited within 500 to 1,000 feet of the primary runway centerline. FAA Order 6560.20B, *Siting Criteria for Automated Weather Observing Systems*, assists in the site planning for AWOS/ASOS systems. According to all pertinent airport related information (Airport Facilities Directory, AirNav.com, FAA Form 5010), as well as a windshield survey, the Airport is equipped with an AWOS-3 that meets all of the parameters of FAA Order 6560.20B.

LANDSIDE FACILITIES

Terminal Area Requirements

The terminal building serves both a functional and social capacity central to the operation, promotion and visible identity of any airport. Key terminal area requirements are developed in consideration of the following general landside design concepts:

- Future terminal area development for general aviation airports serving utility and larger than utility aircraft should be centralized;
- Planned development should allow for incremental linear expansion of facilities and services in a modular fashion along an established flightline;
- Major design considerations involve minimizing earthwork/grading, avoiding flood-prone areas and integrating existing paved areas to reduce pavement (taxilane) costs;
- Future landside expansion should allow sufficient maneuverability and accessibility for appropriate types (mix) of general aviation aircraft within secured access areas; and,
- Future terminal area development should enhance safety, visibility, and be aesthetically pleasing.

The GA terminal, approximately 1,350 square feet, provides adequate service. However, there is need for improvements and possibly future expansion/redevelopment. It accommodates existing airport staff needs along with a lounge, restrooms, flight planning room, and crew rest area. An estimate of building/space needs based on forecast operational levels and design hour passengers indicates GA terminal building growth as outlined in **Table 4-8**. Public space is allocated for lounge/waiting area, flight planning, restrooms, concession, utility/equipment room, and administrative/management offices. The optional lease area could accommodate a fixed base operator, executive meeting/conference room, leased office space, classrooms, and a restaurant/kitchen space.

Aircraft Storage (Hangars)

Future hangar areas should achieve a balance between maintaining an unobstructed expansion area, minimizing pavement development, and allowing convenient airside and landside access. For planning purposes, hangars should accommodate at least 95 percent of all based general aviation aircraft. Typically, single-engine aircraft demand 1,000 to 1,200 square feet, twin-propeller aircraft require 1,200 to 3,000 square feet, and business turboprop/jet aircraft require approximately 3,000 square feet. General hangar design considerations include the following:

- Construction of aircraft hangars beyond an established building restriction line (BRL) surrounding the runway and taxiway areas and built beyond the runway OFZ, runway and taxiway OFAs, and remain clear of the FAR Part 77 and Threshold Siting Surfaces;
- Maintaining the minimum recommended clearance between T-hangars of 75 feet for one-way traffic, and 125 feet for two-way traffic. Taxilanes supporting T-hangars should be no less than 25 feet wide. Individual paved approaches to each hangar stall are typically less costly, but not preferred to paving the entire T-hangar access/ramp area;
- Construction of additional hangar space to accommodate 95 percent of the current based aircraft, hangar waiting list, and forecast need;
- Interior and exterior lighting and electrical connections on new hangar construction. Enclosed hangar storage with bi-fold doors is recommended;
- Adequate drainage with minimal slope differential between the hangar door and taxilane. A hard-surfaced hangar floor is recommended, with less than one percent downward slope to the taxilane/ramp; and,
- Segregate hangar development based on the hangar type and function. From a planning standpoint, hangars should be centralized in terms of auto access, and located along the established flight line to minimize costs associated with access, drainage, utilities and auto parking expansion.

Today, ILE has T-hangar storage (51,000 square feet) for 40 aircraft and all these T-hangars are occupied. ILE has approximately 37,800 square feet of common/box hangar storage to accommodate all of the twin-engine aircraft, helicopters, and small, single-engine aircraft. Central Texas College occupies two of these hangars, 25,000 square feet, and uses them for aircraft maintenance and storage of their fleet of multi-engine piston aircraft and small, single engine aircraft. Genesis Aero, a commercial operator on the field, performs aircraft storage and maintenance in their 6,400 square foot hangar. An additional 6,400 square foot hangar stands open

TABLE 4-8 | GA TERMINAL BUILDING SPACE/NEED

Facility	Existing 2014	Phase 1 (0-5 Years)	Phase 2 (6-10 Years)	Phase 3 (11-20 Years)
Total Building Space	1,350 ft^2	3,500 ft^2	4,300 ft^2	5,900 ft^2
Design Hour Passenger	27.5	29.5	33.8	46.1
Public Use Space	1,000 ft^2	2,000 ft^2	2,600 ft^2	3,500 ft^2
Lease Use Space	350 ft^2	1,500 ft^2	1,700 ft^2	2,400 ft^2

Source: Garver, 2015

with ILE negotiating a new tenant lease. There are 60 based aircraft on the field with another 40 on an active hangar waiting list. Ten of those on the hangar waiting list are currently based at ILE but desire newer, upgraded T-hangar unit in the future. From this waiting list it is presumed another 15 aircraft could be on the airfield provided enough hangar space existed. Forecast demand takes this need into account and is shown in **Table 4-9**.

Aircraft Storage (Based Aircraft/ Itinerant Aircraft Apron)

Paved aircraft parking and tie-down areas should be provided for approximately 40 percent of the peak/design day itinerant aircraft, plus approximately 25 percent of the based aircraft. FAA airport planning criteria recommends 360 square yards (3,240 square feet) per itinerant aircraft space and approximately 400 square yards (3,600 square feet) per based aircraft. Other site specific apron planning and design considerations include:

- Maintaining the apron area beyond all airfield safety areas per airport design requirements (RSA, OFA, RPZ, and OFZ); and,
- Preserving the minimum runway centerline to aircraft parking apron separation of 500 feet for ARC B-II with approach visibility minimums not lower than ¾ mile;
- Planning for sufficient aircraft taxiing and maneuvering space, for entering and exiting the aircraft parking apron without risk of structural damage;
- Allowing two-way passing of aircraft leading to the runway and taxiway system; and,
- Locating the main aircraft apron near the mid-section of the primary runway with sufficient space to allow for a continuation of building and hangar expansion adjacent to the flight line.

As reported in the Inventory chapter, ILE has approximately 627,000 square feet of apron and taxilane of which approximately 490,000 square feet is apron area for aircraft parking and maneuvering that conforms to the previously mentioned design considerations. The remaining apron and taxilane area is associated with the various T-hangars at ILE. Based on the recommended design parameters set by the FAA, ILE needs an estimated 144,000 square feet of apron/ taxilane under existing conditions. Forecasts for 10- and 20-years indicate a need for 165,900 and 180,300 square feet of additional apron and taxilane, respectively. Apron and taxilane need and layout will be examined during the alternatives evaluation phase of the plan.

Fuel Storage Requirements

Fuel storage requirements are based on the forecast of annual operations, aircraft utilization, average fuel consumption rates, and the forecast mix of GA aircraft anticipated at ILE. On average, the typical single-engine airplane consumes 12.0

TABLE 4-9 | AIRCRAFT HANGAR STORAGE DEMAND

Facility	Existing 2014	Phase 1 (0-5 Years)	Phase 2 (6-10 Years)	Phase 3 (11-20 Years)
Based Aircraft	60	72	77	83
T-Hangar Demand	44	52	55	58
T-Hangar Area Demand	51,000 ft²	52,500 ft²	55,300 ft²	58,800 ft²
Common/Box Hangar Demand	12	16	18	21
Common/Box Hangar Area Demand	37,800 ft²	41,900 ft²	56,000 ft²	78,400 ft²
Total Hangar Demand	56	68	73	79
Total Hangar Space Area Demand	88,800 ft²	94,400 ft²	111,300 ft²	137,200 ft²

Source: Garver, 2015

gallons of fuel per hour and flies approximately 100 nautical miles (1.0 to 1.5 hours) per flight. This figure is slightly higher at ILE due to the flight training conducted by based operators. Turbine aircraft generally will fly greater distances averaging 300 nautical miles and approximately 1.5 – 2.0 hours. Market conditions will determine the ultimate need for fuel tanks and their size. The following guidelines should be implemented when planning future airport fuel facilities:

- Aircraft fueling facilities should remain open continually (24-hour access), remain visible and be within close proximity to the terminal building or FBO to enhance security and convenience;
- Fuel storage capacity should be sufficient for average peak-hour month activity, which normally occurs during the summer months;
- Fueling systems should permit adequate wing-tip clearance to other structures, designated aircraft parking areas (tie-downs), maneuvering areas, and OFAs associated with taxilane and taxiway centerlines;
- Locating the fuel facilities beyond the RSA and BRL;
- Equipping all fuel storage tanks with monitors to meet current state and federal environmental regulations, and be sited in accordance with local fire codes;
- Have a dedicated fuel truck for Jet-A delivery to minimize the liability associated with towing and maneuvering expensive aircraft up to and in the vicinity of fueling facilities;
- Maintaining adequate truck transport access to the fuel storage tanks for fuel delivery; and,
- Capable of storing at least a month's supply of fuel to minimize delivery charges.

As reported in the Inventory chapter, ILE is equipped with two 12,000 gallon above-ground fuel storage tanks (Jet-A and AvGAS), a 500 gallon diesel tank, and a fuel truck for Jet-A deliveries. Both stationary aviation fuel tanks area equipped with 24-hour credit card systems for customer convenience and ease of operations. The tanks are located on the east side of the GA apron near the mid-point but are separated from the GA terminal building by more than 600 feet with no direct line-of-sight for airport staff. Storage levels should be able to accommodate monthly fueling needs without more than one delivery per month. An analysis of current fuel needs based on historic deliveries indicates that existing storage capacity meets the monthly demand. Estimates of future fueling demand does not show a need for expanding the fuel storage capacity. **Table 4-10** depicts the existing and phased fuel storage projections for ILE.

Auto Parking, Circulation, and Access Requirements

Automobile parking requirements are calculated using 1.5 spaces per design hour passenger, which is typical for non-towered general aviation airports with similar levels of flight training. Based aircraft owners commonly park in their individual hangars while flying. Maintaining a dedicated public auto parking lot in close proximity to the terminal building to provide convenient access for pilots and passengers is essential. Currently, with the empty former commercial terminal building, there is ample parking only a short walk from the GA terminal. As this area is considered for redevelopment as well as the area occupied by the GA terminal and ARFF station, potential areas for new auto parking will be reviewed and taken into consideration in the Alternatives chapter of this report.

SUMMARY OF AIRPORT TERMINAL AREA FACILITY REQUIREMENTS

Table 4-10, *Summary – Aviation Facility Requirements*, summarizes terminal area facility requirements to accommodate the general aviation activity projected for the Airport for each of the three phases spanning the 20-year planning period. As the numbers indicate, based aircraft will increase by more than 20 across the 20-year planning period. This brings the need for additional hangar and apron space for based and itinerant aircraft storage. Additional hangar development is needed to accommodate the hangar waiting list and forecast demands. Expansion or redevelopment of a new GA terminal building is an identified need to provide the level of service and amenities that allow ILE to compete in the regional GA marketplace. Future development options will be explored in the Alternatives chapter of this report.

TABLE 4-10 | SUMMARY – AVIATION TERMINAL FACILITY REQUIREMENTS

Facility	2015	Phase 1 (0-5 Years)	Phase 2 (6-10 Years)	Phase 3 (11-20 Years)
Based Aircraft	60	72	77	83
Annual Operations	31,100	31,900	33,700	36,900
TERMINAL BUILDING				
Public Use Space	21,000 ft²	2,600 ft²	3,000 ft²	3,600 ft²
Lease Use Space	1,400 ft²	1,700 ft²	1,900 ft²	2,300 ft²
Total Building Space	3,500 ft²	4,300 ft²	4,900 ft²	5,900 ft²
Paved Auto Parking	17,400 ft²	19,900 ft²	22,700 ft²	27,200 ft²
Auto Parking Spaces	44	51	58	70
AIRCRAFT PARKING APRON				
Based Apron	27,600 ft²	28,400 ft²	29,300 ft²	30,400 ft²
Itinerant Apron	61,400 ft²	66,800 ft²	75,500 ft²	84,600 ft²
HANGARS				
T-Hangars	51,000 ft²	63,300 ft²	66,500 ft²	70,800 ft²
Executive/Corporate	37,800 ft²	41,885 ft²	55,900 ft²	78,300 ft²
Total Hangar Demand	88,800 ft²	105,185 ft²	122,400 ft²	149,100 ft²
ANNUAL FUEL FLOWAGE				
AvGAS (100LL)	62,400 gallons	73,800 gallons	86,900 gallons	112,000 gallons
Jet-A	63,200 gallons	68,600 gallons	76,500 gallons	88,200 gallons
Total Fuel Flowage	125,600 gallons	194,700 gallons	163,400 gallons	200,200 gallons

Source: Garver, 2015; FAA Advisory Circular 150/5300-13 (current series).

CHAPTER FIVE

Airport Alternatives Analysis

AIRPORT ALTERNATIVES ANALYSIS

Evaluation Analysis

This chapter describes the airfield and terminal area development options for the facility design criteria identified and recommended in the Facility Requirements chapter. The focus of this section is to evaluate the merits and deficiencies of alternatives, and provide the technical basis necessary for determining a preferred or recommended airport development plan and property management direction.

While the assessment of development options or concepts is based on technical judgment, the most favorable airport improvement option should be compatible with regional and local planning policies. Additionally, it should be consistent with social, economic, political, and environmental goals. To determine the best possible course of action, the alternatives incorporate the following factors in the development and evaluation of potential design options:

- Compliance with Federal Aviation Administration (FAA) airport and airspace guidelines and standards;
- Adherence with the short- and long-range goals and objectives of the Airport and City of Killeen;
- Compatibility with existing and proposed on- and off-airport land uses; and,
- Minimization of potential environmental impacts.

Critical to the success of Skylark Field (ILE) is an effective use of all the properties at the airfield. Excess property at ILE is limited and a cohesive development plan is critical for future success. Alternatives will be laid out to most effectively use available property with limited property acquisitions predicated only by the need to meet design standards for existing conditions or future expansion and maximizing the hangar development and business use potential for the community.

Airside facilities are those that are used for supporting the active movement and circulation of aircraft and include runways, taxiways, and approach facilities and equipment. Landside facilities are focused in the terminal area development and redevelopment to include aircraft parking aprons, additional aircraft hangar storage areas, and the possibility for a new

general aviation (GA) terminal building.

Because all airport functions relate to and revolve around the runway/taxiway layout, airside development is typically evaluated before landside development. Specific considerations include runway length, runway width, and approach protection criteria needed to support the existing and anticipated use of ILE through the planning period. Following a review of these airside development alternatives, a review of landside development will also be presented. As part of this process, it is important to establish a set of goals that frame future ILE development and redevelopment. These goals include:

- Continuing to have a safe, efficient operating environment;
- Providing an effective direction for future development;
- Enhancing the income potential for ILE by ensuring the highest and best use of available airport property and maximizing airport revenue;
- Plan and develop the airfield in line with the future needs and requirements of ILE and Killeen; and
- Encourage protection of the established investment by minimizing potential land use conflicts.

Airside Alternatives/ Recommendations

The airport reference code (ARC)/runway design code (RDC) for ILE is B-II-4000. The current airside facilities serve the ILE aviation needs for the short-term and with some minor modifications the long-term operations at the field. Runway 01-19, 5,495' x 100', is capable of supporting all of the small general aviation (GA) fleet weighing less than 12,500 pounds up to and including those with ten or more passenger seats. Forecasts indicate in the long-term the level of operations of larger GA business aircraft could exceed 500; hence, the potential to expand the runway to support this forecast need will be examined. The runway meets many of the lateral standards for the next higher ARC/RDC of C-II-4000 including runway width, runway safety area (RSA), obstacle free zone (OFZ), runway object free area (ROFA), and taxiway offset; however, property required for the longitudinal standards for RSA, ROFA, OFZ, and runway protection zones (RPZ) are not met on existing airport property. Runway length is only five feet short of meeting the design length to support 75 percent of the GA fleet at 60 percent useful load. Many of the larger GA business jets operating on a limited basis at ILE will continue to be able to operate at the field with limited restrictions to fuel, passenger, and cargo loading. In order for ILE to support 100 percent of the GA fleet at 60 percent useful load, Runway 01-19 would need to be an extended 465 feet bringing it to 5,960 feet in length and retaining the current width of 100 feet. These issues will be examined in the airside development alternatives that follow.

The key airside development options under consideration include the following general design concepts:

Airside Alternate 1: Status Quo

- Option 1A Status Quo; and,
- Option 1B Revise Declared Distances.

Airside Alternate 2: Modification of Runway 01-19 to meet FAA recommended ARC/RDC design standards without modification

- Option 2A: Runway contraction to meet ARC B-II-4000 standards for aircraft with 10 or more passenger seats; and,
- Option 2B: Runway contraction to meet ARC B-II-4000 standards.

Airside Alternate 3: Expansion of Runway 01-19 to meet ARC/RDC C-II-4000 standards

- Option 3A: Extension to 5,500 feet to support 75 percent of GA fleet at 60 percent useful load and implementation of larger safety area standards;
- Option 3B: Extension to 5,960 feet to support 100 percent of GA fleet at 60 percent useful load and implementation of larger safety area standards;
- Option 3C: Extension to 5,500 feet with Precision Approach for Runway 01, while maintaining a visual approach to the Runway 19 end; and,
- Option 3D: Extension to 5,960 feet with Precision Approach for Runway 01, while maintaining a visual approach to the Runway 19 end.

AIRSIDE ALTERNATIVE 1

The last approved ILE airport layout drawing (ALD) listed the existing and future ARC for Runway 01-19 at B-II. With the transition of commercial passenger flights from ILE to Killeen Fort Hood Regional Airport (GRK) in 2004, ILE has maintained B-II standards or greater. With very few exceptions this has been accomplished. Runway length and width, and parallel taxiway separation all exceed the minimum recommended B-II standards. The exceptions of note are the safety areas (RSA, ROFA, OFZ) beyond the Runway 01 end that are not met physically but are accomplished through publishing of declared distances.

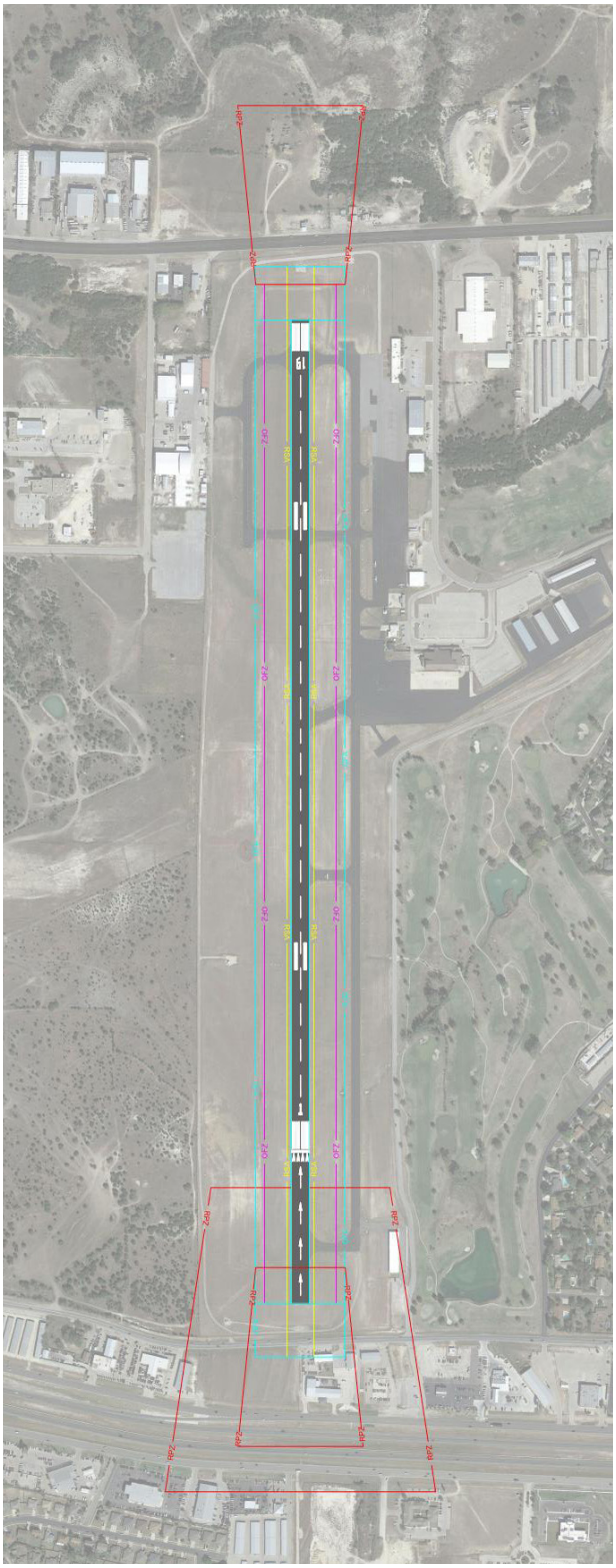
Option 1A
Status Quo

Option 1A is predicated on maintaining the existing ARC B-II conditions for Runway 01-19. This includes the currently accepted displaced threshold and declared distance calculations shown on the last ALP set and the most recently published FAA's Airport/Facility Directory South Central edition. As this option does not change the location of a runway end or threshold, the currently accepted location for approach and departure runway protection zones (RPZ) will be maintained despite some of the incompatible uses within each that have been emphasized by the FAA's Interim Guidance Letter (IGL – Sept 2012). **Figure 5-1** depicts the existing conditions as they relate to Runway 01-19 and associated safety areas. The positives exhibited by Option 1A include: retention of existing pavement, no impacts to existing IAPs, no immediate property acquisition required, and prudent use of local, state, and federal dollars for airport improvements. Drawbacks to the status quo in Option 1A include: retention of declared distances and acceptance of non-standard conditions.

Option 1B
Revise Declared Distances

Option 1B makes one minor modification addressing the use of declared distances to achieve design requirements for RDC B-II-4000 safety area beyond the Runway 01 end. To bring RSA, ROFZ, and ROFA into compliance with FAA design standards, Runway 01-19 would need to see a length reduction of approximately 200 feet. Doing so would bring all these critical safety areas onto airport property and reduce the overall runway length to 5,295 feet. The runway length reduction could be

FIGURE 5-1 | OPTION 1A – STATUS QUO



Source: Garver, 2015.

retained as a part of the RSA/ROFZ/ROFA beyond the Runway 01 end. **Figure 5-2** depicts Option 1B. The positives of Option 1B include Runway 01-19 meeting the prescribed RSA/OFA/OFZ standards beyond the 01-19 end. The detractor for Option 1B is the loss of runway length for aircraft taking off to the north.

AIRSIDE ALTERNATE 2

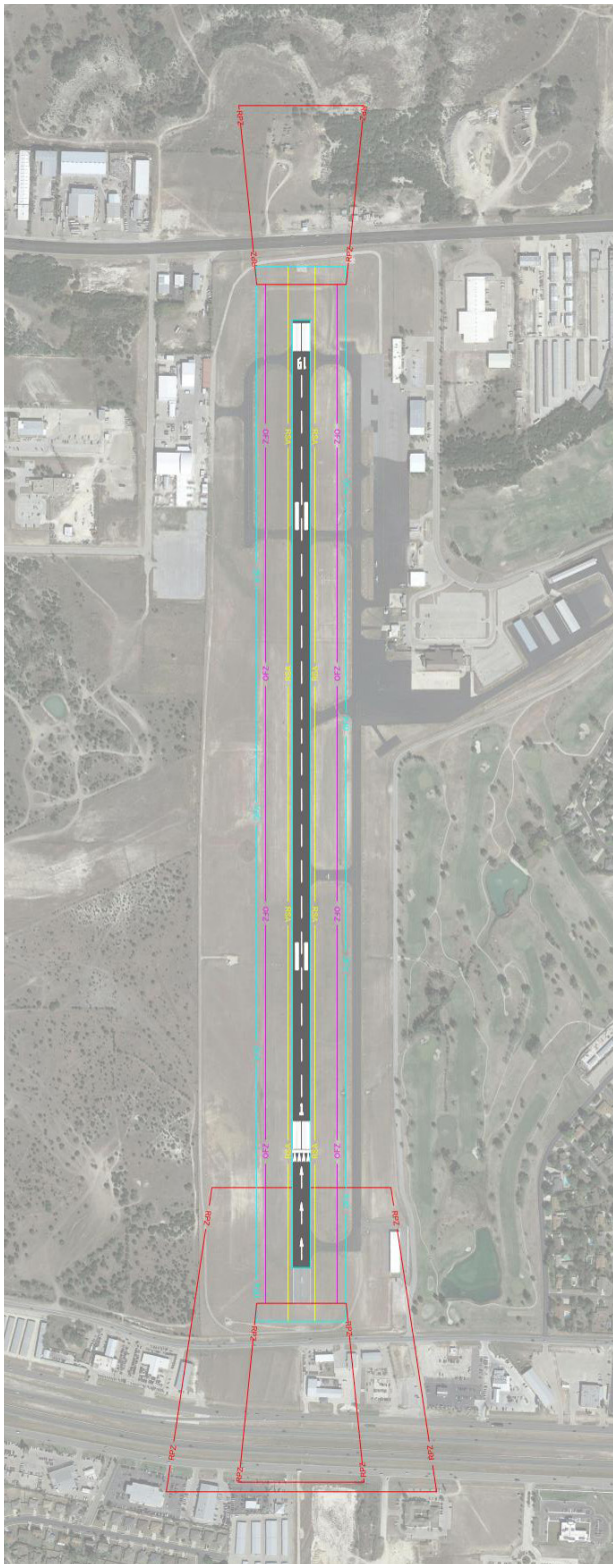
The Facility Requirements chapter examined FAA recommended runway length standards in **Table 4-4**. Runway length to accommodate all of the ARC/RDC B-II-4000 aircraft is 4,100 feet and for B-II aircraft with ten or more passenger seats the design length is 4,500 feet. Runway 01-19, at 5,495 feet in length, is longer than recommended design standards by 1,395 and 995 feet, respectively.

Table 4-6 in the Facility Requirements chapter outlines the various other airport design standards including runway width. The B-II recommended runway width design standard is 75 feet. At ILE this runway width design standard is exceeded by 25 feet and meets RDC/ARC C-II standards.

The design standards for RSA, OFZ, and ROFA are also shown in **Table 4-6**. For Runway 01-19 these standards are met with the exception of the Runway 01-19 end where RSA, OFZ and ROFA are deficient. The prescribed B-II length beyond runway end for both RSA and ROFA is 300 feet. Currently there is a public road and part of a private business within the design standard RSA/ROFA limits. The available RSA and ROFA distance beyond the Runway 01-19 end is only 100 feet based on the previous ALD and incompatible uses. The runway OFZ by design extends 200 feet beyond the runway end; however, a small portion of the OFZ extends off airport property over FM 2410's right-of-way. Within this area lies ILE's perimeter fence which is also an incompatible use within an OFZ. These discrepancies are mitigated through the use of declared distances as shown on **Figure 4-2** of the Facility Requirements chapter.

The centerline separation between runway and parallel taxiway is predicated on both the ARC/RDC and the current instrument approach procedures (IAP). The existing offset is 300 feet and exceeds design standards by 60 feet. This current offset meets the standards for a B-II runway with lower than 3/4-mile visibility minimums. The 300 foot offset meets the RDC C-II-4000 design standards. IAP visibility minimums are expected

FIGURE 5-1 | OPTION 1B – REVISED DECLARED DISTANCES



Source: Garver, 2015.

to remain at 3/4-mile and the decision height is to remain at 250 feet above ground level with the decommissioning of the approach lighting system by the FAA.

Meeting and maintaining currently recommended design standards at ILE allows for a number of different options. Each of the following options is presented with benefits and detractors to empower the decision process and allow the sponsor to select a preferred course of action.

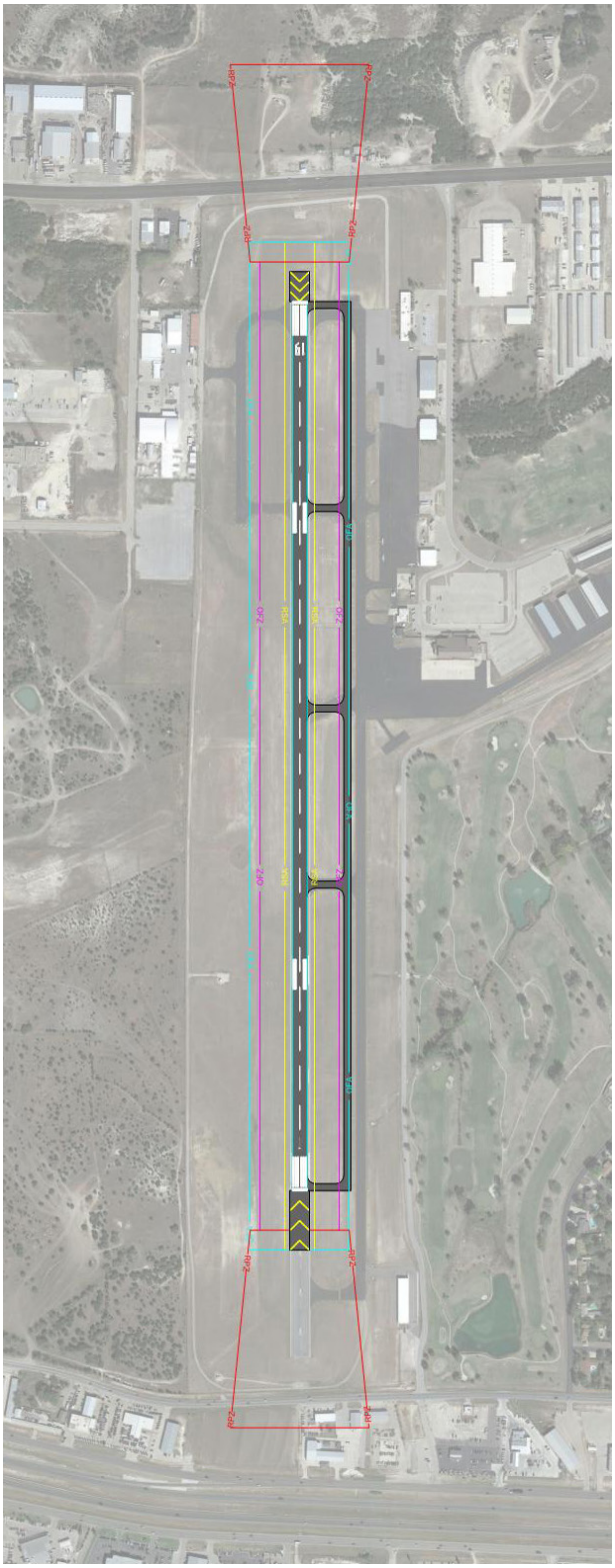
Option 2A

Reduce Runway to 4,500 Feet

To address the ARC/RDC design length for B-II-4000 standards, Option 2A, depicted in **Figure 5-3**, proposes a runway length reduction from 5,495 feet to 4,500 feet the design length that will accommodate all small GA aircraft with as many as ten passenger seats. This option reduces runway length 844 feet from the Runway 01 end and the remaining 151 feet from the Runway 19 end. The runway reduction from the 01-19 end would bring the southern end of the RSA/OFZ/ROFA all north onto existing airport property and eliminate current safety area deficiencies. The reduction would be limited to 844 feet so as to preserve the existing IAPs to this runway end. The 151 foot reduction from the 19 end would not impact any IAP because it is a visual runway and brings the runway end back close to the east and west connecting taxiways nearest the runway end. In conjunction with shortening Runway 01-19, this option shows a reduction in runway width from 100 to 75 feet. With this width reduction, runway lighting will be moved in to the appropriate offset from the new runway edge. Finally, this option moves Taxiway B from 300 feet offset to the design offset of 240 feet. The positives of this option are that airside pavements would now meet the existing minimum design standards and eliminates the need to use declared distances due to the RSA/OFA deficiency at the Runway 01-19 end. The negatives include loss of runway length and width and the cost of reconstructing Taxiway B.

A concern may exist with changing the location of the runway ends. This action could bring into play the FAA's Interim Guidance Letter (IGL) – (Sept 2012) regarding compatible lands uses within RPZs. The IGL states that whenever any of the incompatible land uses would enter into an RPZ as a result of an airfield project including a runway shift the Regional and

FIGURE 5-3 | OPTION 2A – REDUCE RUNWAY TO 4,500 FEET



Source: Garver, 2015.

Airports District Office must consult with the National Airport Planning and Environmental Division (APP-400). If this IGL is applied within the parameters of Option 2A, further reduction of runway length may be necessary to eliminate incompatible uses within the approach and departure RPZs that include US 190, FM 2410, highway frontage roads, and multiple private businesses.

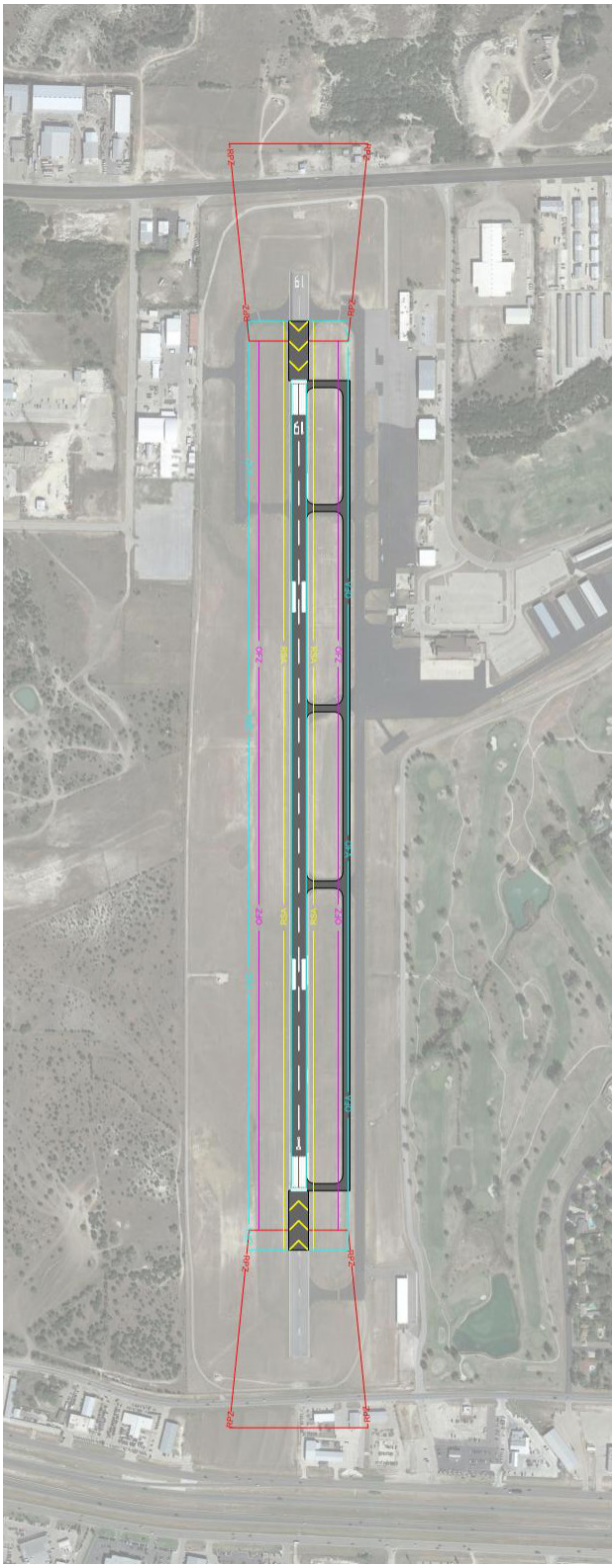
Option 2B
Reduce Runway to 4,100 Feet

Reducing Runway 01-19 to the 4,100 foot length brings it into compliance with B-II-4000 minimum design standards and its impacts must be considered. This is a length reduction of 1,395 feet and could be accomplished from one or both runway ends in combination. As with Option 2A, the reduction from the Runway 01 end is limited to 844 feet bringing the new end up to the existing displaced threshold. The remaining 551 foot reduction could occur from the Runway 19 end. Pavement could be retained beyond each runway end, be marked as a stopway, and be used to satisfy accelerate stop distance requirements. **Figure 5-4** depicts the impacts of this option.

ALTERNATE 3

Aviation demand forecasts indicate the need, as a long-term planning goal, to consider a runway capable of supporting RDC C-II-4000 conditions and design standards. The previous ILE master plan examined this under the supposition that all large GA aircraft would use Killeen Fort Hood Regional Airport (GRK). This has transpired to a degree with the transition to GRK of all the commercial passenger flights in 2004; however, a review of the ILE flights under instrument flight plans since 2008 reveals that nearly four percent of ILE operations are being conducted by aircraft approach category (AAC) C and D aircraft. These AAC C/D aircraft include a mix spread across airplane design group (ADG) I, II, and III aircraft. Less than 0.2 percent of these were ADG III aircraft; however, of the remaining AAC C/D operations nearly two percent of the operations were completed by ADG II aircraft. Typical aircraft within these AAC/ADG include Learjet 35 (C-I), Challenger 604(C-II), and Gulfstream IV/V (C-II and C-III). The options to be examined in Alternate 3 are dependent on runway length. The two lengths to be considered are 5,500 feet, capable of supporting 75 percent of the GA fleet at 60 percent useful load, and 5,960 feet, capable of supporting 100 percent of the GA fleet at 60 percent useful load. Items held

FIGURE 5-4 | OPTION 2B – REDUCE RUNWAY TO 4,100 FEET



Source: Garver, 2015.

constant in both options include: IAP minimums (3/4-mile and 250 feet) and application of the IGL (Sept – 2012) that outlines compatible land uses within RPZs.

Option 3A
C-II-4000 Extend to 5,500 Feet

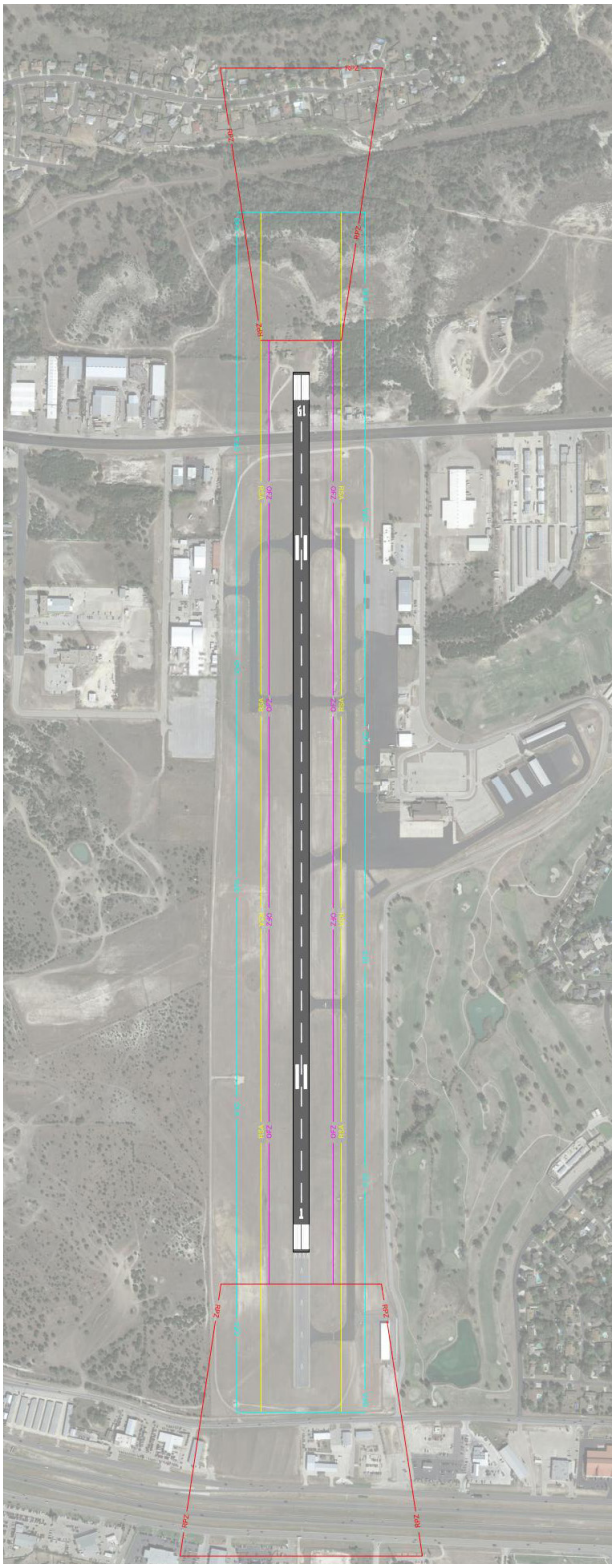
Option 3A shows the runway and supporting facilities to accommodate a 5,500 foot long runway with non-precision approach to the Runway 01 end and continued visual approach to the Runway 19 end. **Figure 5-5** depicts this runway expansion along with the appropriate RSA, ROFZ, ROFA, and RPZs. This option depicts moving the Runway 01 end to the location of the current displaced threshold, eliminating 844 feet of pavement, and extending the Runway 19 end 849 feet to the north to accomplish the total length of 5,500 feet. As a result of the Runway 19 end extension, a section of Business 190 would need to be closed and rerouted. The highway could be rerouted along Roy J. Smith Drive, between South Twin Creek Drive and North Roy Reynolds Drive, connecting along those roadways to the original Business 190 alignment.

This option has the benefit of supporting 75 percent of the GA fleet at 60 percent useful load and the forecast aviation demand identified in the Forecast chapter. Additionally it maintains the current runway width of 100 feet. Detractors of this option include the need to purchase and remove numerous homes in the Creekside Drive neighborhood and providing alternative roadway access to some of the remaining homes in the development to eliminate incompatible uses within the approach and departure RPZs. Another negative is the need to purchase approximately 46 acres. Lastly, this option puts ILE operations in closer proximity to restricted airspace associated with Fort Hood to the north.

Option 3B
C-II-4000, Extend to 5,960 Feet

Option 3B shows the runway and supporting facilities to accommodate a 5,960 foot long runway with non-precision approach to the Runway 01 end and continued visual approach to the Runway 19 end. Option 3B is identical to Option 3A in the treatment of the Runway 01 end. However, Runway 19 would extend 1,309 feet to the north to accomplish the total runway length of 5,960 feet. **Figure 5-6** depicts this runway expansion along with the appropriate RSA, ROFZ, ROFA, and RPZs.

FIGURE 5-5 | OPTION 3A – EXTEND TO 5,500 FEET



Source: Garver, 2015.

With this option, the runway would be able to support 100 percent of the GA fleet at 60 percent useful load and be able to provide for the long-term forecast of aviation demand identified in the Forecast chapter. The impacts to Business 190 and the Creekside Drive neighborhood remain the same as Option 3A. Total land acquisition for this option would be approximately 54 acres.

Options 3C/3D

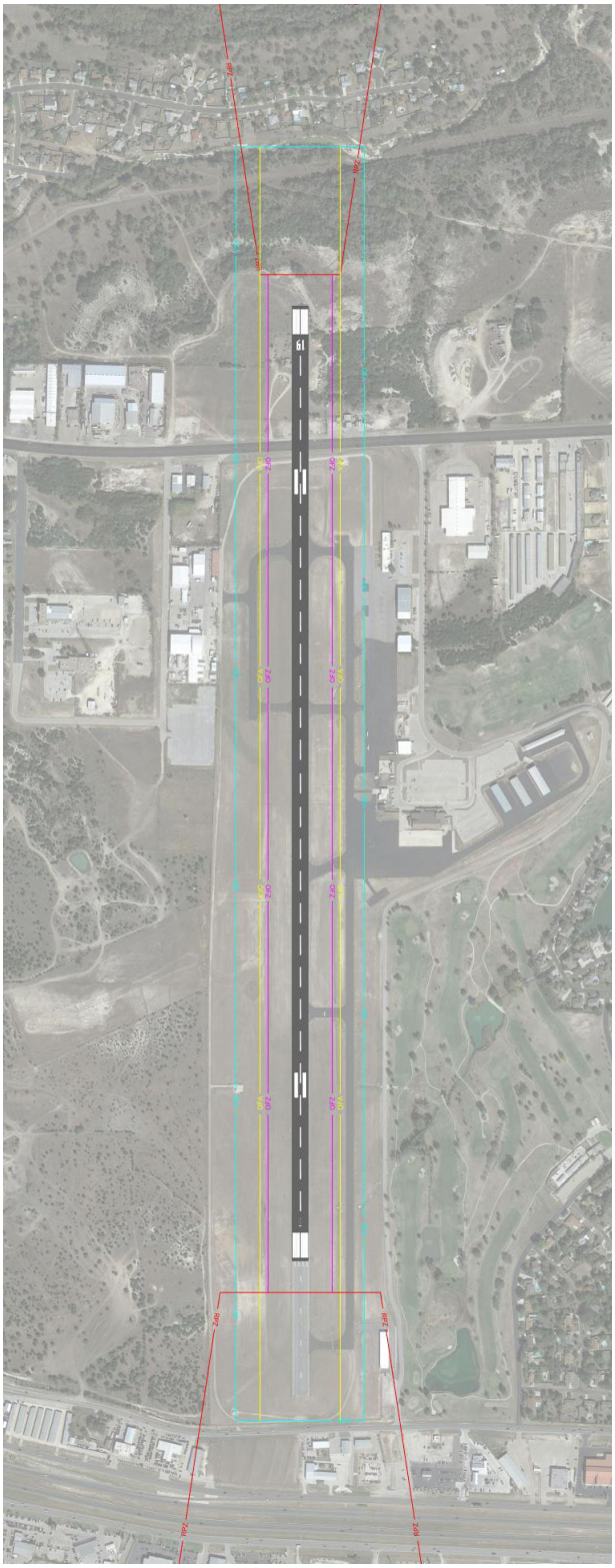
Precision Approaches: C-II-2400, 5,500 Feet and C-II-2400, 5,960 Feet

As part of the process of examining options for Runway 01-19, the possibilities of attaining a precision approach for Runway 01, while maintaining a visual approach to the Runway 19 end, were considered at runway lengths of both 5,500 feet and 5,960 feet.

To attain 5,500 feet in total runway length while eliminating any potential incompatible uses within the Runway 01 RPZ, and provide necessary distance for an ALS, the Runway 01 end would need to be shifted to the north a distance of 2,600 feet. The Runway 19 end would also need to move to the north a distance of 2,605 feet. The result of this move would place a rail line through the Runway 19 RPZ. The runway and taxiway extensions would necessitate the removal of numerous houses from the Creekside Drive subdivision, in addition to the partial closure/rerouting of Business 190. This option would require land acquisition of approximately 11 acres for the Runway 01 end (approximately 7.5 acres of which encompasses Stonetree Golf Course), and approximately 87 acres on the Runway 19 end, for a total land acquisition of approximately 98 acres.

To attain 5,960 feet in total runway length while eliminating any potential incompatible uses within the RPZ, and provide necessary distance for an ALS, the Runway 01 end would need to shift to the north a distance of 2,600 feet. The Runway 19 end would also need to move to the north a distance of 3,065 feet. The result of this move would place a rail line and a portion of Roy J. Smith Drive through the Runway 19 RPZ. The runway and taxiway extensions would necessitate the removal of numerous houses from the Creekside Drive subdivision, in addition to the partial closure/rerouting of Business 190. This option would require land acquisition of approximately 11 acres for the Runway 01 end (approximately 7.5 acres of which encompasses

FIGURE 5-6 | OPTION 3B – EXTEND TO 5,960 FEET



Source: Garver, 2015.

Stonetree Golf Course), and approximately 97 acres on the Runway 19 end, for a total land acquisition of approximately 108 acres.

Both options were deemed too impractical to warrant further pursuit.

AIRSIDE RECOMMENDATIONS

Runway

Runway 01-19 provides adequate capacity to accommodate the existing and forecast aircraft operations without delay. As reported in the Inventory and Facility Requirements chapters, the primary runway orientation provides the recommended crosswind coverage of 95 percent during all-weather and instrument flight rules (IFR) conditions for the 10.5, 13.0, 16.0 and 20.0 nautical miles per hour (knot) crosswind conditions.

Recommendation

The existing runway configuration provides adequate operational capacity and crosswind coverage for all sizes and categories of aircraft expected to operate at the field.

Runway Length

The existing runway length is adequate for existing operations; however, forecast operational demands indicated the need to plan for a runway to meet 75 percent of the general aviation (GA) fleet at 60 percent useful load (usable fuel, passengers, and cargo). As shown in the previous Facility Requirements chapter, Runway 01-19, with a length of 5,495 feet, is only five feet short of the FAA design length to accommodate 75 percent of the GA fleet at 60 percent useful load using declared distances. Based on the alternative evaluation process shown in Alternates 2 and 3, any runway extension/lengthening is only accomplished with major impacts to existing roadways, residential development, and potential land acquisition. A runway extension of five feet would not serve to increase the operational capacity of Runway 01-19 nor increase the level of support for medium and large GA aircraft beyond those existing at ILE today.

Recommendation

Retain the existing runway length of 5,495 feet for Runway 01-19 and use of declared distances.

Runway Width

The existing ILE primary runway width meets the ARC C-II standards. Currently, Runway 01-19 is capable of supporting all of the small and medium business jet aircraft. In the future, as the airport experiences a moderate increase in the medium and large business jet usage it will make full use of the existing 100 foot wide runway.

Recommendation

Retain the existing runway width of 100 feet for Runway 01-19 exceeding existing B-II design standards and meeting C-II design standards now and in the future.

Dimensional Criteria

The primary concerns with regard to the runway and taxiway system dimensional criteria relate to FAA specified RSA/OFA/OFZ, building restriction line (BRL), and taxiway setbacks. Each runway has its own set of standards relating to these dimensional criteria. As a former commercial service airfield that has been converted to a GA facility, ILE has some dimensional criteria that meet existing minimum FAA standards and some that do not meet FAA recommended standards.

- RSA and OFA beyond the south runway end are insufficient;
- Centerline offset of parallel Taxiways B and G are currently at 300 feet. The B-II-4000 standard is 240 feet. The cost to relocate in accordance with standards would not outweigh any perceived benefits or gain an appreciable amount of additional terminal space for future development.; and,
- Building/structure location in the terminal area is defined by adequate airspace clearance beneath Federal Aviation Regulations (FAR) Part 77 Imaginary Airspace Surfaces. With the elimination of the ALS serving Runway 01 IAPs, the existing primary surface at ILE is 500 feet wide beyond which the transitional surface slopes up at a 7:1 angle. These surfaces and slope are used to establish a building setback behind which construction of buildings to a given height can be defined. At ILE the BRL is set at 495 feet and provides 35.0 feet of structure clearance.

Recommendation

The safety area deficiencies have not significantly impacted safe

airport operations. It is recommended that ILE retain existing B-II standards for RSA/OFA/OFZ with the currently published declared distances providing for safety areas beyond the Runway 01 end. Maintaining the current centerline offset for Taxiways B and G should be maintained thus eliminating costs of reconstruction and operational disruptions. Additionally, the BRL should be retained at 495 feet from runway centerline.

Instrument Approach Capabilities

Existing instrument approaches at ILE include an ILS/LOC and RNAV/GPS procedures to Runway 01 with circling minimums to Runway 19 and a VOR-A procedure to the airfield with circling only minimums to both runway ends. The VOR is owned and operated by the U.S. Army; hence, the VOR-A will be maintained as long as the Army maintains the VOR. Should the Army choose to decommission the VOR the VOR-A approach would be eliminated. No straight-in IAPs exist for Runway 19 due to the proximity of confining military airspace north of the airfield. The coinciding visibility and ceiling minimums for these approaches were referenced in **Table 2-7** of the Inventory Chapter.

ILE has airspace reserved by the FAA for aircraft operations based on FAR Part 77 imaginary airspace surfaces and the existing instrument approach procedures. It is important that these airspace surfaces are protected locally through appropriate zoning mechanisms. The City of Killeen has a Height and Hazard Zoning Ordinance for ILE and it requires periodic updates as approaches and airspace changes at the airport.

While most airports desire the best and most accommodating approach to each runway end, this desire does not come without additional increased restrictions or potential compatibility issues. Pursuit of improved visibility minimums below the 3/4-mile minimums currently offered by IAPs at ILE introduces a larger RPZ. At present, ILE's RPZs are not owned in fee simple as recommended by FAA guidance. Lowering the visibility minimums could bring into play stricter guidance on property uses within an RPZ identified in the FAA's IGL. Based on conversations with airport management, the Airport will not pursue improved approach capabilities but maintain and keep intact the existing approaches and respective visibility and ceiling minimums with which ILE is served today.

Recommendation

The existing ILE Height and Hazard Zoning Ordinance should be reviewed and updated as necessary to reflect the existing Part 77 imaginary airspace surfaces. The Airport does not own all of the recommended property associated with the RPZ's off each runway end and these areas are developed to varying degrees. It is recommended this property be purchased in fee simple, when available. However, if this is unachievable or creates an undue burden for the City/Airport, additional avigation easements should be pursued that give ILE the ability to control the height of objects within these areas and the right for aircraft to fly over and operate in the same. Further it is recommended ILE retain the existing instrument approach procedures and minimums.

TAXIWAY SYSTEM

The existing taxiway system at the Airport provides efficient routing for taxiing aircraft between the runway system and various landside use areas at ILE. Currently, Taxiway B, the east-side parallel taxiway, is offset centerline-to-centerline a distance of 300 feet. This taxiway exceeds FAA design criteria for a B-II airport/runway. It continues to meet C-II standards that were established when air carrier operations were conducted at ILE. Taxiway G, the west-side partial parallel taxiway, is offset a distance of 300 feet. The Taxiway G centerline offset also exceeds B-II standards meeting C-II design standards. Both parallel and connecting taxiways are equipped with medium intensity taxiway lights and appropriate signage.

Recommendation

Retain Taxiways B and G at their current offset and width. Potential may exist at the next major reconstruction of any of the taxiways for the width to be reduced to 35 feet to meet FAA design criteria.

Landside Development Concepts

With the framework of the Airport's ultimate airside development identified, concepts involving the placement of landside facilities can now be analyzed. The overall objective of the ILE landside development is to identify and illustrate the highest and best use of areas on the airfield for new development and redevelopment of the former commercial terminal area.

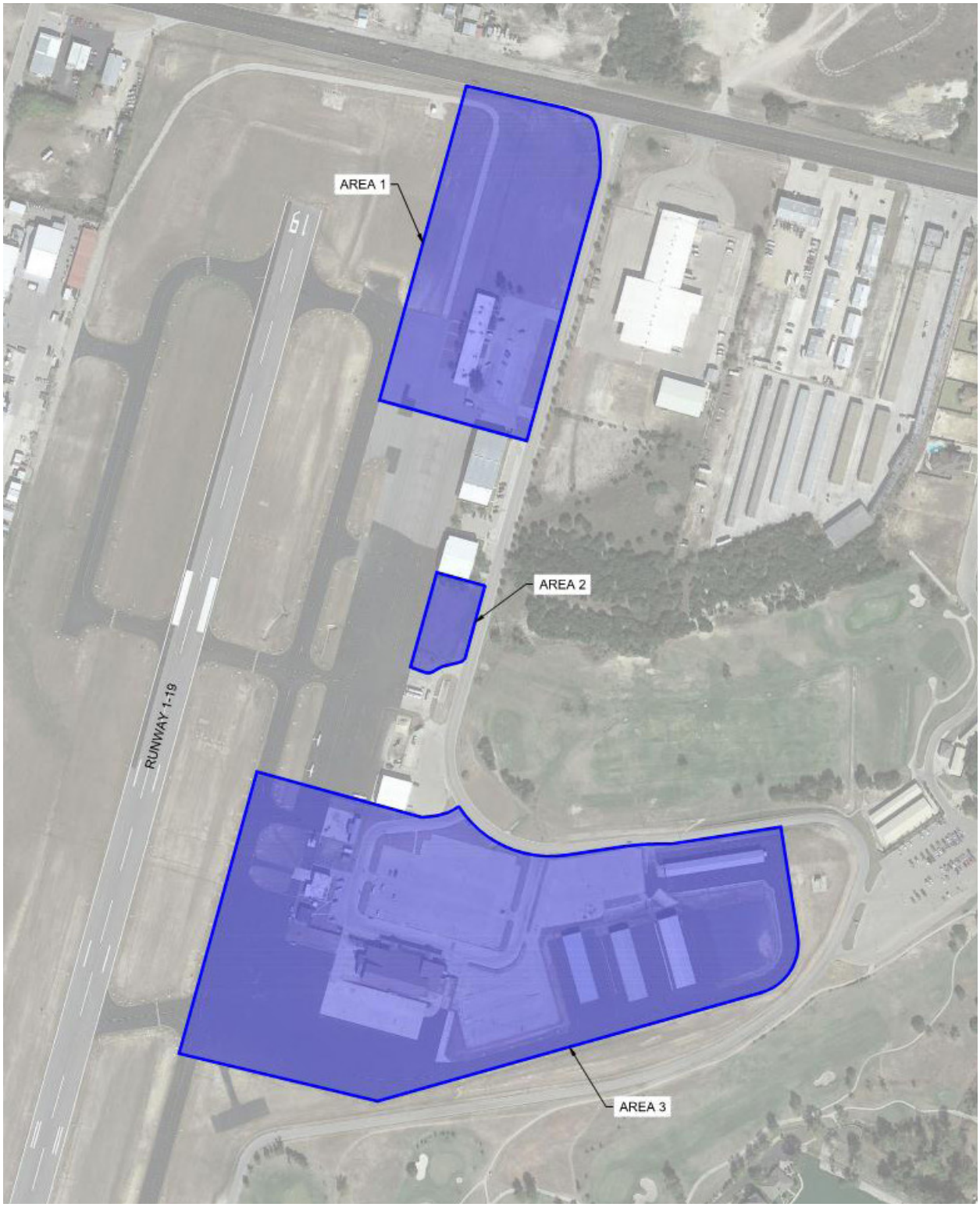
Concepts for the development of aviation use areas at ILE include considerations for the various types of GA and corporate aircraft storage facilities and aircraft maintenance operations as well as the potential for a new GA terminal building.

Facilities to accommodate and better serve the existing and future commercial businesses at ILE is also an important consideration of landside alternatives at ILE.

ILE LANDSIDE DEVELOPMENT AREA CONCEPTS

Two major areas and one minor area on the east side of ILE were identified for new development or regrowth/redevelopment. Three options for each area were created to reflect the broad range of potential options. The following narratives and graphics describe and depict each option/concept. The overall goal of the information presented is to provide guidance and direction towards the selection of a preferred concept or option in each development area ensuring the forecast of based aircraft is accommodated with flexibility for expansion where needed should based aircraft numbers exceed forecasts. **Figure 5-7** depicts the three landside development areas.

FIGURE 5-7 | LANDSIDE DEVELOPMENT AREAS



Source: Garver, 2015.

Area 1

The first major area considered for new development and redevelopment is at the north end of the airfield and includes the original commercial/air carrier terminal building (#1511) currently occupied by the Killeen Police Department. Total area is approximately five acres bounded by Business 190 on the north, Airport Road on the east, the northern most Central Texas College (CTC) hangar on the south, and existing airside facilities on the west. Between the original terminal building and Business 190 the ground is open and slopes gently towards the north. Based on the aviation demands, available space, and integration with existing facilities, the following concepts/ options are presented in **Figures 5-8** through **5-10**.

Option 1A

T-Hangars with Jet Pods

- Estimated Common/Box Hangars: 19,200 square feet (3 Jet Pod units at T-hangar ends);
- Estimated T-hangars: 22,272 square feet and 14 units (44 foot door units);
- Total Apron and Taxilane pavement: 103,000 square feet; and,
- Estimated Taxilane: 2,200 linear feet (25 feet wide).

Option 1B

FBO/Common Hangars

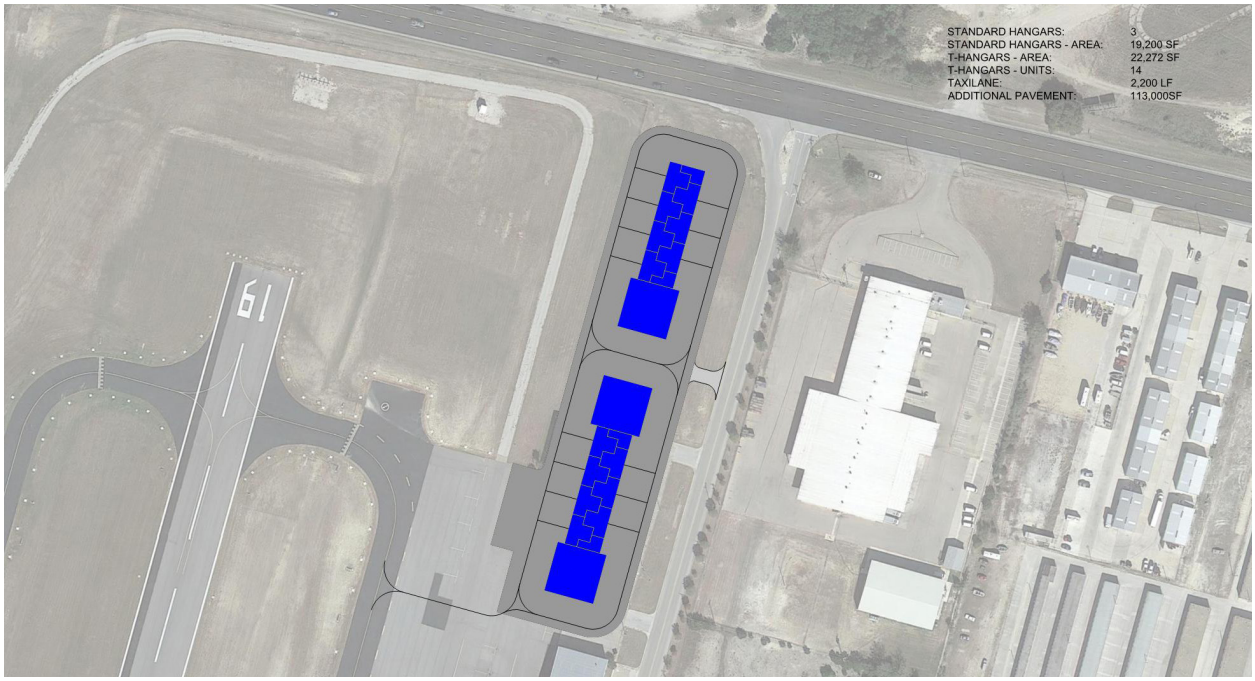
- Estimated Common/Box Hangars: 40,400 square feet (5 common/box hangars of various sizes);
- Estimated Office Space: 4,000 square feet;
- Estimated Taxilane: 1,500 linear feet (25 feet wide);
- Total new Apron and Taxilane pavement: 94,300 square feet; and,
- Estimated Auto Parking: 27,900 square feet with 51 spaces.

Option 1C

T-Hangar Only

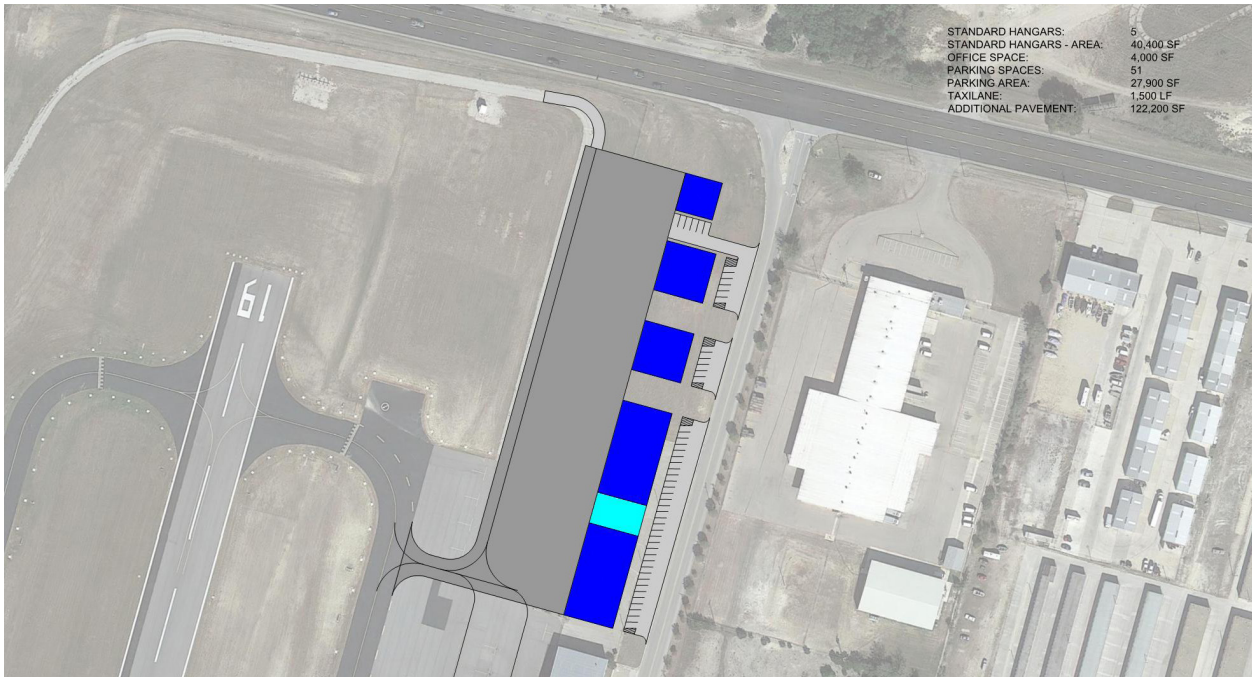
- Estimated T-hangars: 50,400 square feet and 42 units (42 foot door units);
- Total Apron and Taxilane pavement: 122,600 square feet;
- Fencing and Gates: 725 linear feet of new fencing and two gates; and,
- Additional Auto Access: Two T-hangar entrance driveways from Airport Road.

FIGURE 5-8 | OPTION 1A – T-HANGARS WITH JET PODS



Source: Garver, 2015.

FIGURE 5-9 | OPTION 1B – FBO/COMMON HANGARS



Source: Garver, 2015.

FIGURE 5-10 | OPTION 1C – T-HANGARS

Source: Garver, 2015.

Area 2

The development area is small, containing less than one acre. Area 2 is between the southern CTC hangar and the airport's fuel farm. It is in a low lying area that may limit or even restrict development based on location of underground stormwater drainage structures that carry runoff from the apron east of the airfield. The options in this area are limited but could include one or more small storage hangars. This area could also be the new home for a GA terminal building located in close proximity to the fueling facilities. As such, these options reflect a variety of development options to accommodate future airport needs. Based on the proposed layout of Area 2 the following concepts/ options are presented in **Figures 5-11** through **5-13**.

Option 2A

1 Common Hangar

- Estimated Total Hangar Space: 12,000 square feet (1 150' x 80' hangar);
- Estimated Auto Access and Parking: 6,100 square feet; and,
- Estimated Auto Parking: 14 spaces.

Option 2B

2 Common Hangars

- Estimated Total Hangar Space: 5,000 square feet (2 50' x 50' hangars);
- Estimated Auto Access and Parking: 11,600 square feet; and,
- Estimated Auto Parking: 29 spaces.

Option 2C

GA Terminal / Office Space

- Estimated Total Hangar Space: 8,000 square feet (1 hangar 100' x 80');
- Estimated Total GA Terminal/Office Space: 5,600 square feet;
- Estimated Auto Access and Parking: 13,200 square feet; and,
- Estimated Auto Parking: 28 spaces.

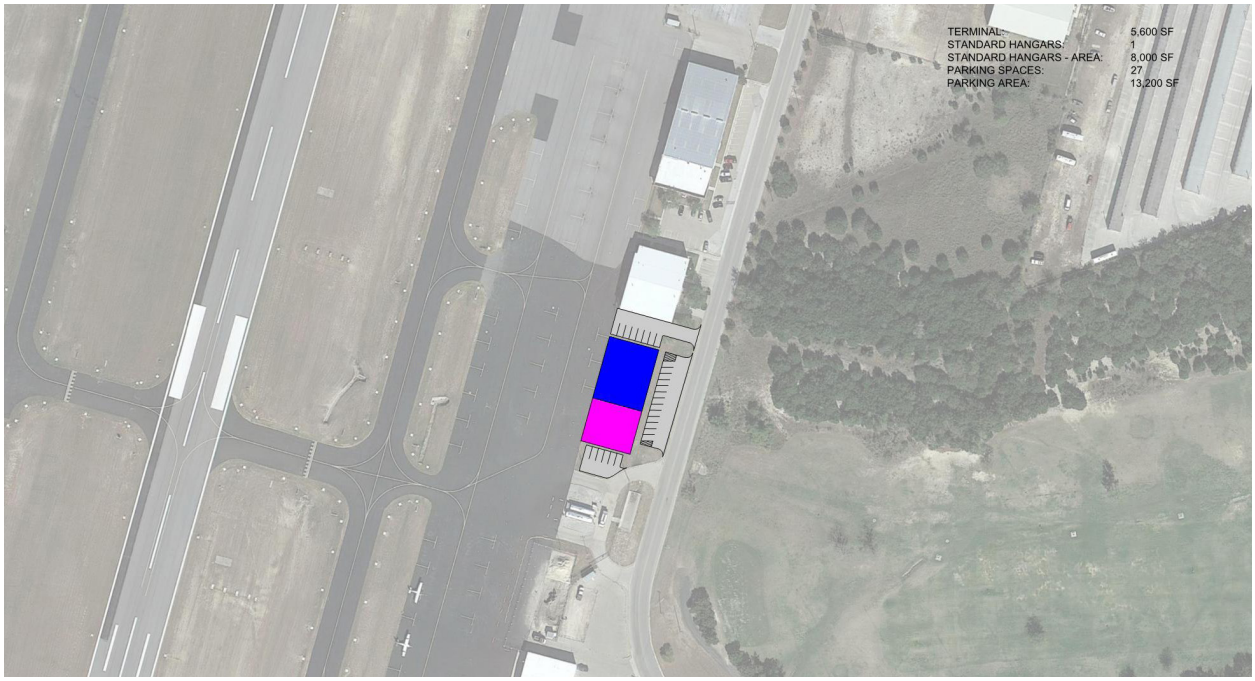
FIGURE 5-11 | OPTION 2A – 1 COMMON HANGAR

Source: Garver, 2015.

FIGURE 5-12 | OPTION 2B – 2 COMMON HANGARS

Source: Garver, 2015.

FIGURE 5-13 | OPTION 2C – GA TERMINAL/OFFICE SPACE



Source: Garver, 2015.

Area 3

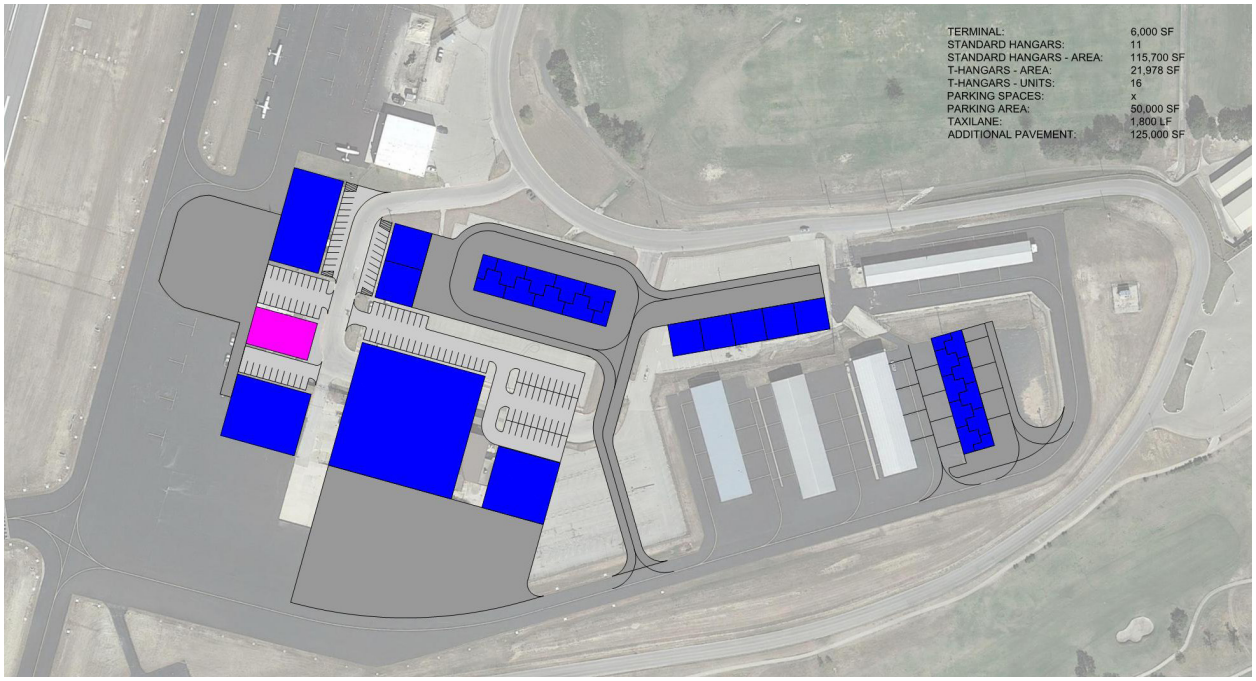
Area 3 encompasses approximately 16 acres of airport property that currently contains four T-hangars with a total of 30 individual units, auto parking lots, aprons, the former commercial terminal building (#1525), GA terminal building, aircraft rescue and firefighting (ARFF) station, and an open hangar pad. As a long-term concept/option, each development concept in this area is predicated on removal of the former commercial terminal building, GA terminal building, and ARFF station. The former commercial terminal building has been vacant for more than ten years with no proposed tenant and requires significant time and funds to bring it up to current building codes to achieve an occupancy permit. The ARFF station is slated for relocation to the southwest of the airfield in conjunction with proposed commercial development in that area. The GA terminal is one of the oldest buildings on the airfield and undersized for its existing and future needs. There are challenges with this area for redevelopment that include removal of the three aforementioned existing buildings and sloping terrain that may require fill material to achieve appropriate grades on taxilanes. The airport has four T-hangars containing a total of 30 individual units in the far eastern end.

Future development could encompass a broad spectrum of hangar development for fixed base operator, corporate flight department, aircraft maintenance operation, and possible redevelopment of a new GA terminal. The aircraft supported by this type development could range from A-I/B-I to B-II/C-II aircraft. Based on the proposed layout of Area 3 the following concepts/options are presented in **Figures 5-14** through **5-16**.

Option 3A

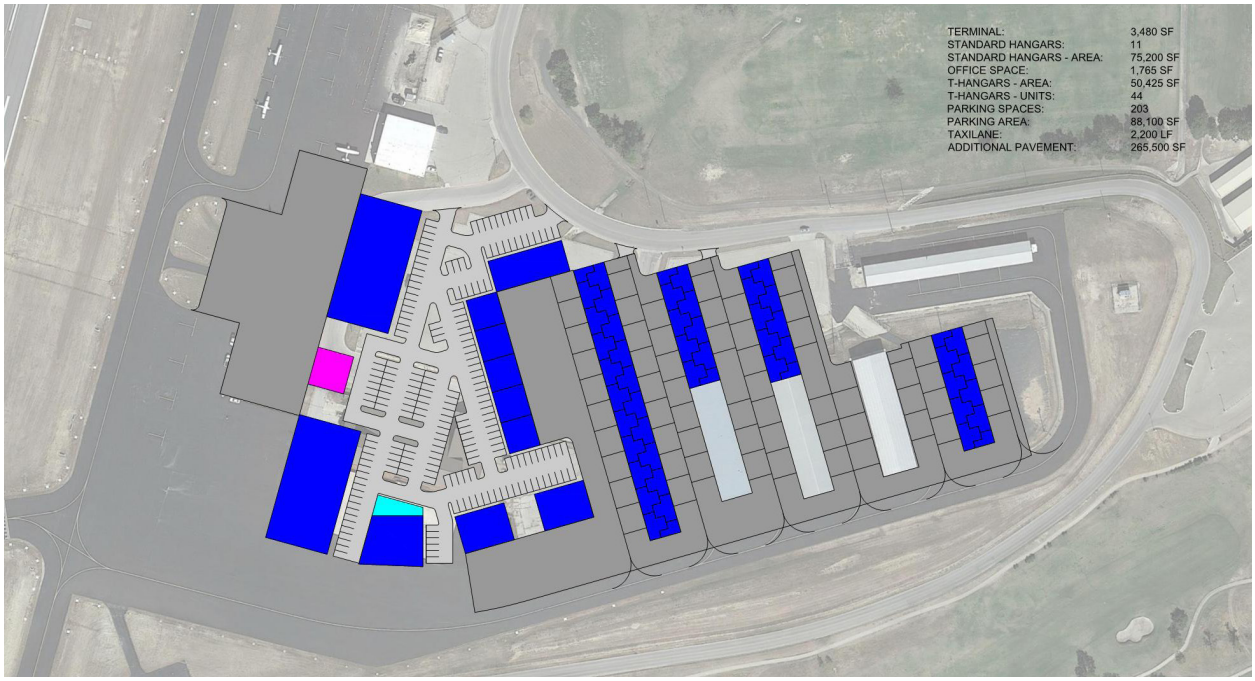
- Estimated Total Box/Common Hangar Space: 115,700 square feet (11 hangars of various sizes);
    - One unit – 200’ x 200’;
    - One unit – 100’ x 100’;
    - One unit – 150’ x 80’;
    - One unit – 120’ x 100’;
    - Two units – 60’ x 60’; and,
    - Five units – 50’ x 50’.
- Estimated Total T-hangar Space: 21,978 square feet (16 48’ wide units in two new 8-unit T-hangars);
- Estimate Office Space/GA Terminal: 6,000 square feet;
- Estimated New Apron and Taxilane Space: 125,000 square feet;

FIGURE 5-14 | OPTION 3A



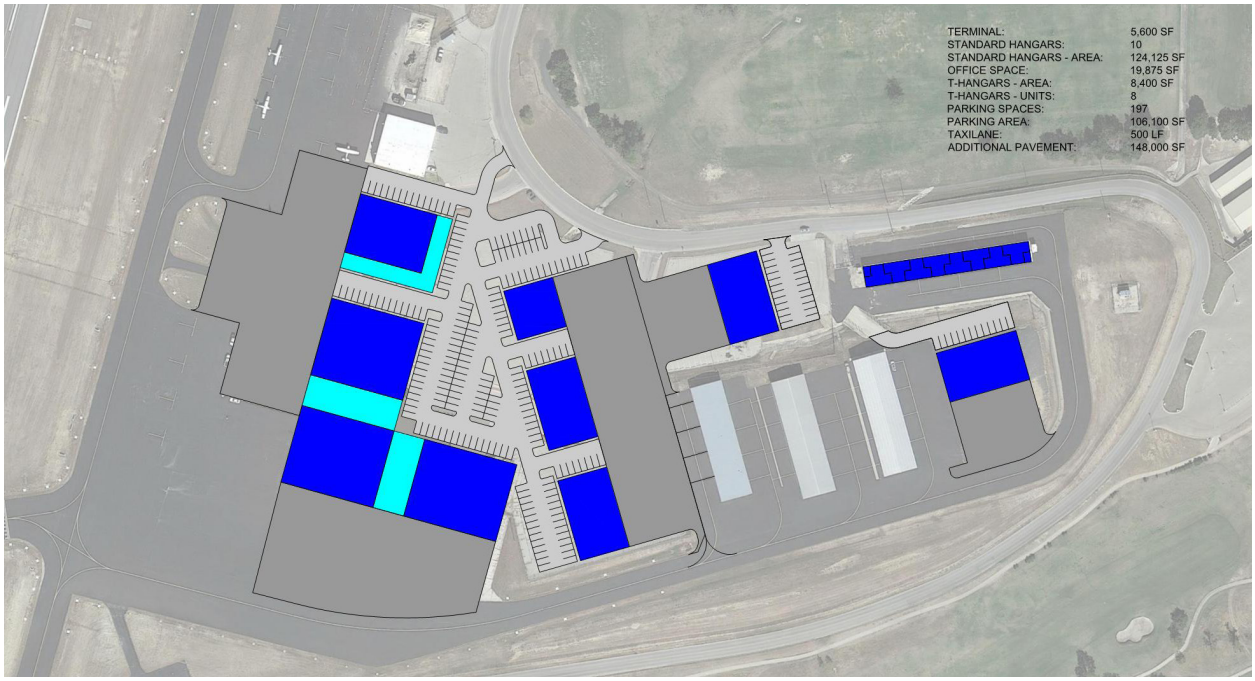
Source: Garver, 2015.

FIGURE 5-15 | OPTION 3B



Source: Garver, 2015.

FIGURE 5-16 | OPTION 3C



Source: Garver, 2015.

- Estimated Taxilane: 1,800 linear feet;
- Estimated Auto Access and Parking: 50,000 square feet; and,
- Estimated Auto Parking: 94 spaces.

Option 3B

- Estimated Box/Common Hangar Space: 75,200 square feet (11 hangars of various sizes and shapes);
    - Two units – 200' x 100';
    - Two units – 80' x 60';
    - Five units – 50' x 50';
    - One unit – 120' x 50';
    - One unit – 90' x 80';
- Estimated T-hangar Space: 50,425 square feet (44 42' wide door units in three 8-unit T-hangars and one 20-unit T-hangar);
- Estimate Office Space Outside of Hangar: 1,765 square feet;
- Estimated GA Terminal Building Space: 3,480 square feet;
- Estimated New Apron and Taxilane: 210,200 square feet;
- Estimated Taxilane: 2,200 linear feet;
- Estimated Auto Access and Parking: 88,100 square feet; and,
- Estimated Auto Parking: 203 spaces.

Option 3C

- Estimated Total Hangar Space: 113,250 square feet (9 hangars of various sizes and shapes);
    - Three units – 150' x 120';
    - One unit – 125' x 90';
    - Four units – 130' x 80';
    - One unit – 80' x 80';
- Estimated T-hangar Space: 8,400 square feet (8 42' wide door units in one T-hangar);
- Estimate Office Space Outside of Hangar: 19,875 square feet;
- Estimated Apron and Taxilane: 148,000 square feet;
- Estimated Taxilane: 500 linear feet;
- Estimated Auto Access and Parking: 106,100 square feet; and,
- Estimated Auto Parking: 197 spaces.

ILE PREFERRED LANDSIDE DEVELOPMENT AREA CONCEPTS

Each of the landside development concepts discussed above was presented to the Executive Committee (EC) and Project Steering Committee (PSC) in separate meetings. During these meetings each of the three development areas were discussed in detail and each committee provided their input on preference and direction for a preferred development concept. Following these meetings airport staff met with members of the PSC committee to further discuss the landside development concepts and make a final recommendation for each of the three development/redevelopment areas on the landside. **Figures 5-17** and **5-18** depict the results of this coordination process and the preferred landside development concepts to be carried forward into the development of an airport layout plan, phased development plan, and capital improvement and airport finance plan. **Figures 5-19** and **5-21** provide a graphic depiction of what the preferred landside development could look like in the future. Outlined below are the major items included in each preferred landside development concept.

Area 1

Preferred Concept: T-Hangars with Jet Pods

- Estimated Common/Box Hangars: 12,800 square feet (2 Jet Pod units on south T-hangar ends);
- Estimated T-hangars: 24,136 square feet and 19 units (40 foot door units);
- Total Apron and Taxilane pavement: 130,000 square feet; and,
- Estimated Taxilane: 2,200 linear feet (25 feet wide).

Area 2

Preferred Concept: One Common Hangar

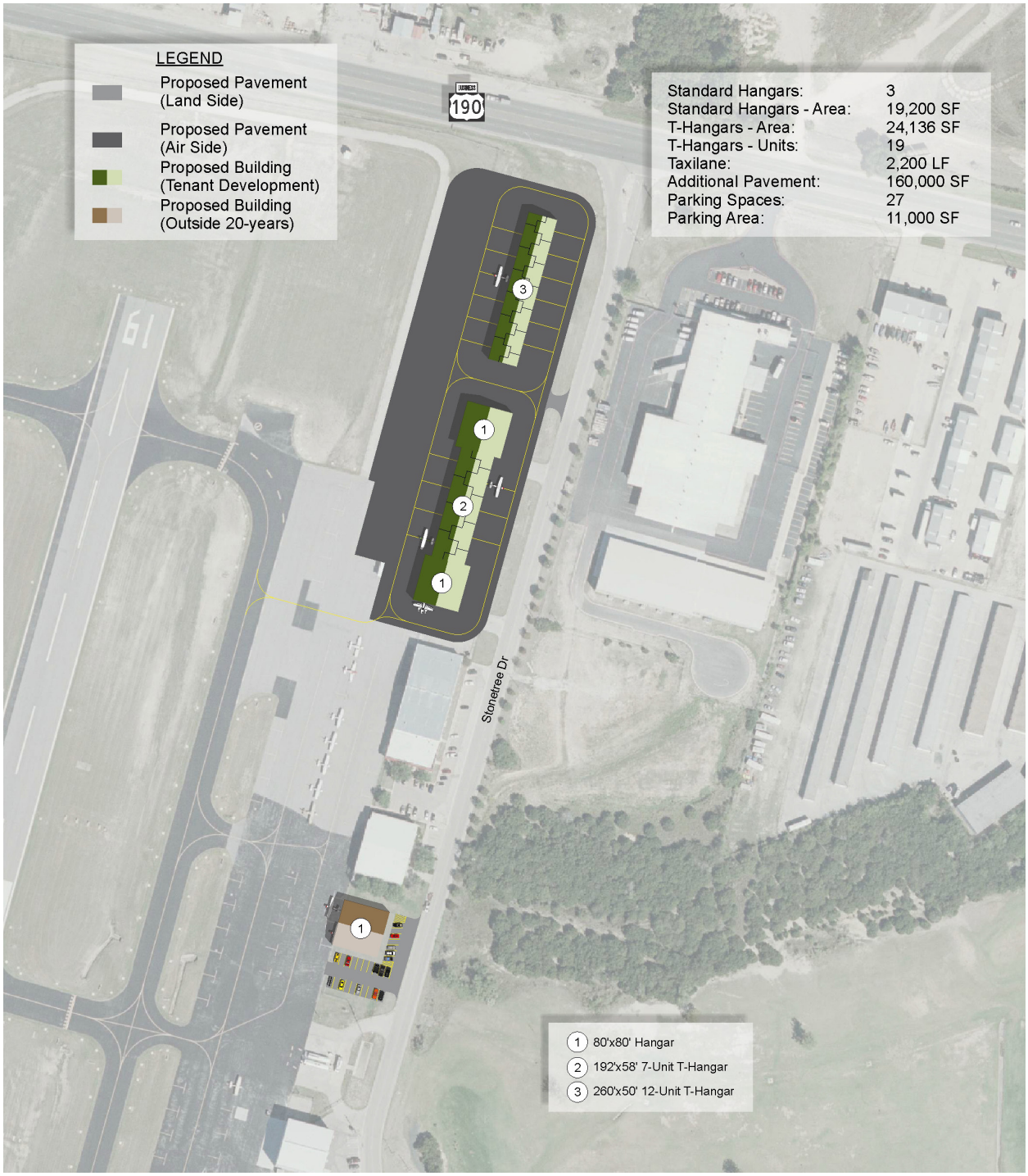
- Estimated Total Hangar Space: 6,400 square feet (80' x 80' hangar);
- Estimated Auto Access and Parking: 11,000 square feet; and,
- Estimated Auto Parking: 27 spaces.

Area 3

Preferred Concept:

- New General Aviation Terminal Building (6,000 square feet)
- Estimated Total Box/Common Hangar Space: 95,950 square feet (9 hangars of various sizes and shapes);
    - One unit – 100' x 100';
    - Five units – 80' x 80';
    - Seven units – 50' x 50';
    - Sixteen units – 45' x 35';
    - Six units – 40' x 35';
- Estimated T-hangar Space: 31,000 square feet (28 40' wide door units in three T-hangars);
- Estimated Apron and Taxilane: 266,130 square feet;
- Estimated Taxilane: 2,200 linear feet;
- Estimated Auto Access and Parking: 49,720 square feet;
- Estimated Auto Parking: 88 spaces;
- Airport Maintenance Barn: 2,400 square feet; and,
- Electrical Vault: 256 square feet in new location.

FIGURE 5-17 | PREFERRED LANDSIDE DEVELOPMENT AREAS 1 AND 2



Source: Garver, 2015.

FIGURE 5-18 | PREFERRED LANDSIDE DEVELOPMENT AREA 3

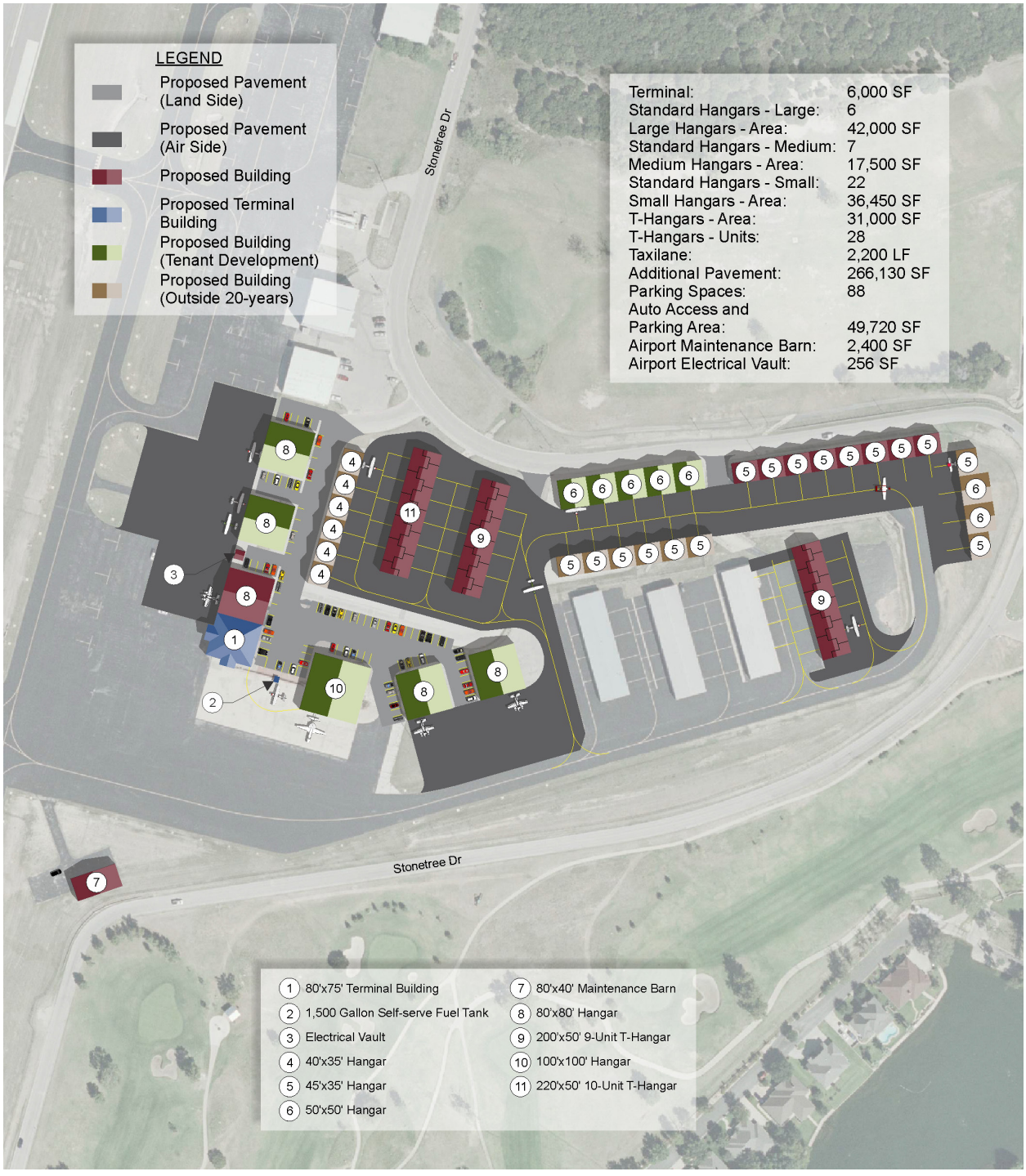


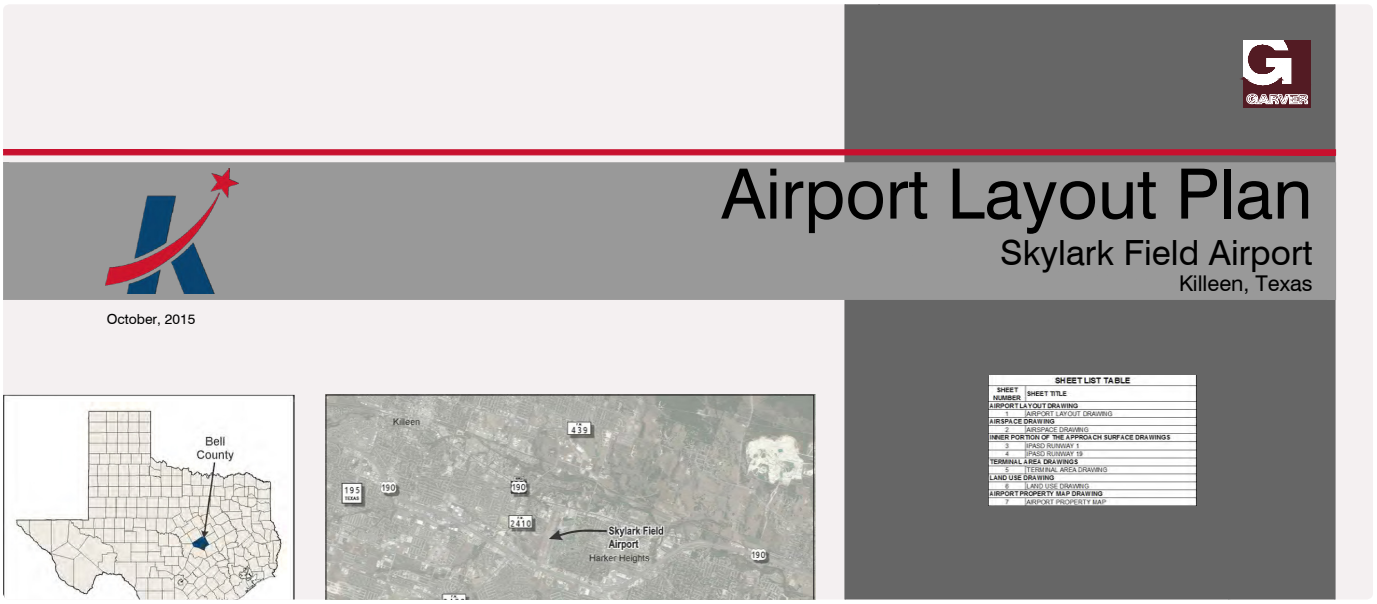
FIGURE 5-19 | 3D GRAPHIC VIEWS
OF PREFERRED LANDSIDE DEVELOPMENT AREA 1

FIGURE 5-20 | 3D GRAPHIC VIEWS
OF PREFERRED LANDSIDE DEVELOPMENT AREA 2

FIGURE 5-21 | 3D GRAPHIC VIEWS
OF PREFERRED LANDSIDE DEVELOPMENT AREA 3

CHAPTER SIX

Airport Layout Plan and Geographic Information Systems



AIRPORT LAYOUT PLAN AND GEOGRAPHIC INFORMATION SYSTEMS

Introduction

A set of Airport Layout Plan (ALP) drawings has been prepared for Skylark Field (ILE) that graphically depict the existing and proposed facilities through the 20-year planning program as recommended and approved by the City of Killeen and the Skylark Field Airport Board. The set includes: Title Sheet, Airport Layout Drawing (ALD), Airport Airspace Drawing, Inner Portion of the Approach Surface Drawings, Terminal Area Drawings, Land Use Drawing, and Airport Property Map.

AIRPORT LAYOUT DRAWING

A scaled single-page drawing depicting existing and ultimate airport development based on proposed land, facilities and equipment recommended for the short and long-term operation and development of the Airport. In addition, the ALD displays separation and clearance distances for future unrestricted development of the Airport and navigational aid (NAVAID) facilities. The layout is the result of a series of analyses and discussions with the Executive Committee and Project Steering Committee to determine the optimum plan to yield a safe and cost-effective facility. The proposed improvements include projects needed to meet the projected aviation demands of the airport service area throughout the next 20-years.

AIRPORT AIRSPACE DRAWING

A graphical depiction showing the land use area covered by Federal Aviation Regulations (FAR) Part 77 imaginary airspace surface criteria, which is used as a federal guideline to determine whether existing or proposed structures represent obstructions to air navigation (penetrate any of the FAR Part 77 imaginary airspace surfaces). Once approved by the FAA, the FAR Part 77 airspace is reserved for aeronautical purposes. Therefore, it is recommended that the controlling government update their Height and Hazard zoning to reflect the updated Airspace Drawing, and to the extent reasonable, restrict and enforce the height of structures and objects of natural growth, as appropriate, within the FAR Part 77 airspace structure. The new airspace map associated with this project should be adopted and put in place as soon as possible to protect the airport.

INNER PORTION OF THE RUNWAY APPROACH SURFACE DRAWINGS

Large-scale drawing showing the plan and profile views of the inner portions of the approach surfaces. The plans are designed to identify current and potential structures (roadways, powerlines, trees, etc.) in relation to the existing and ultimate runway threshold. This drawing aids in determining the clearance or violation of close-in objects based on top elevations as they are encountered along the extended runway centerline and within the approach surfaces. Each violation and/or obstruction is identified, with appropriate future mitigation recommendations.

TERMINAL AREA DRAWING

This is a large-scale drawing of the terminal area showing the ultimate construction of facilities to meet future terminal area requirements. The primary features of this plan include improvements to and new development of facilities and equipment. The ultimate design for the terminal area provides an adequate and functional layout for aircraft parking and maneuvering, hangar and building development, and other types of airport-related development planned for the Airport. Additionally, the plan will provide adequate separation and clearances for future unrestricted development of all terminal facilities and equipment.

LAND USE DRAWING

A single-page drawing, at the same scale as the ALD, showing all on-airport land uses to include: aeronautical purposes (runways/taxiways/safety areas), terminal use, business park development, commercial use development, and light/heavy industrial use. Also depicted beyond the airport boundary are the land uses in the airport vicinity generally based on established zoning patterns.

AIRPORT PROPERTY MAP DRAWING

A single-page drawing, Property Map, showing an overlay of all relevant tracts of existing airport fee-simple property and aviation/navigation easement interests including the size (acres), date (grant agreement) and existing ownership status of proposed airport property acquisition. Properties recommended for the ultimate build-out based on the recommendations of the master plan will be included along with existing ownership, type of ultimate ownership by the Airport, total acreage in the parcel, and ultimate acreage needed for airport development and safety, as available.

Geographic Information Systems

The City of Killeen has a robust GIS maintained by city staff. In order for all of the Skylark Field data to be included into the City's GIS, the base file and obstruction data from the ALP set were converted to GIS shapefiles and submitted to the City's GIS team. Additionally, 3-D airspace surfaces were developed based on the expected instrument approach procedure changes with the elimination of the approach lights to Runway 1. The 3-D surfaces empowers the GIS and Aviation Departments to make accurate assessments of proposed development against Skylark's airspace. These files were transferred to the City of Killeen for incorporation into their GIS. Additionally, this data was uploaded to the FAA Airport's GIS database and can be updated with as-built surveys as part of future project close-out procedure.

Airport Layout Plan

Skylark Field Airport

Killeen, Texas

October, 2016

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
AIRPORT LAYOUT DRAWING	
1	AIRPORT LAYOUT DRAWING
AIRSPACE DRAWING	
2	AIRSPACE DRAWING
INNER PORTION OF THE APPROACH SURFACE DRAWINGS	
3	IPASD RUNWAY 1
4	IPASD RUNWAY 19
TERMINAL AREA DRAWINGS	
5	TERMINAL AREA DRAWING
LAND USE DRAWING	
6	LAND USE DRAWING
AIRPORT PROPERTY MAP DRAWING	
7	AIRPORT PROPERTY MAP

Location Map

Vicinity Map

AIRPORT DATA TABLE		
	EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL)	848.0'	SAME
AIRPORT NAVIGATION AIDS	NDB, GPS	SAME
MEAN MAX TEMP (Hottest Month °F)	96°F	SAME
AIRPORT REFERENCE CODE (ARC)	B-II	SAME
TAXIWAY MARKING	STD W/ ℄ REF	SAME
TAXIWAY LIGHTING	MITL	SAME
AIRPORT REFERENCE POINT COORDINATES	31°05'09.00" N	SAME
	97°41'11.40" W	SAME

NOTES

DATUM COORDINATE SYSTEMS – HORIZONTAL DATUM NAD 1983 (STATE PLAN ZONE 3 – TEXAS CENTRAL (FIPS 4203)', VERTICAL DATUM NAVD88.

NO OFZ OBJECT PENETRATIONS

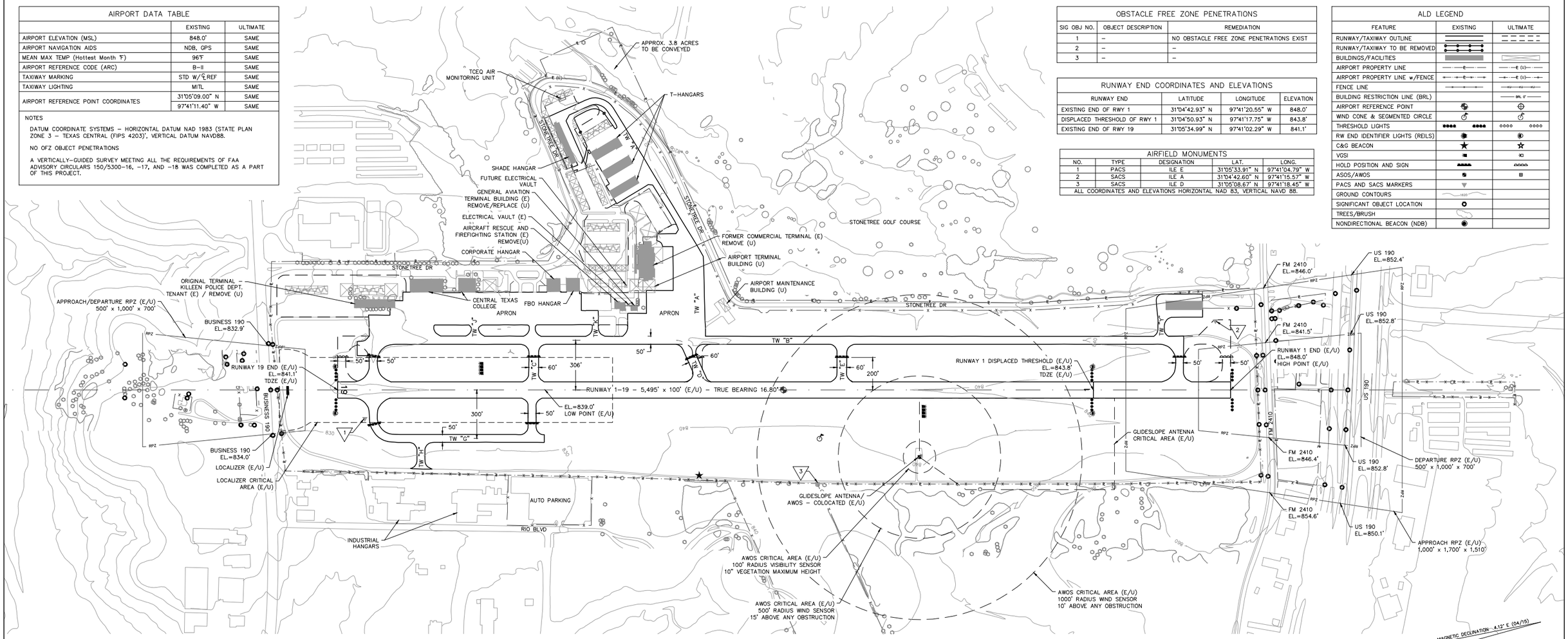
A VERTICALLY-GUIDED SURVEY MEETING ALL THE REQUIREMENTS OF FAA ADVISORY CIRCULARS 150/5300-16, -17, AND -18 WAS COMPLETED AS A PART OF THIS PROJECT.

OBSTACLE FREE ZONE PENETRATIONS		
SIG OBJ NO.	OBJECT DESCRIPTION	REMEDIATION
1	–	NO OBSTACLE FREE ZONE PENETRATIONS EXIST
2	–	–
3	–	–

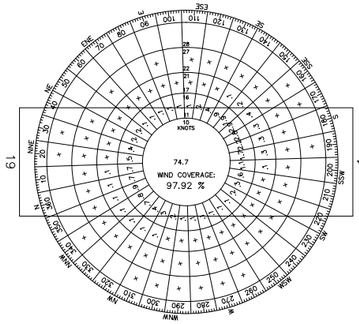
RUNWAY END COORDINATES AND ELEVATIONS			
RUNWAY END	LATITUDE	LONGITUDE	ELEVATION
EXISTING END OF RWY 1	31°04'42.93" N	97°41'20.55" W	848.0'
DISPLACED THRESHOLD OF RWY 1	31°04'50.93" N	97°41'17.75" W	843.8'
EXISTING END OF RWY 19	31°05'34.99" N	97°41'02.29" W	841.1'

AIRFIELD MONUMENTS				
NO.	TYPE	DESIGNATION	LAT.	LONG.
1	PACS	ILE E	31°05'33.91" N	97°41'04.79" W
2	SACS	ILE A	31°04'42.60" N	97°41'15.57" W
3	SACS	ILE D	31°05'08.67" N	97°41'18.45" W
ALL COORDINATES AND ELEVATIONS HORIZONTAL NAD 83, VERTICAL NAVD 88.				

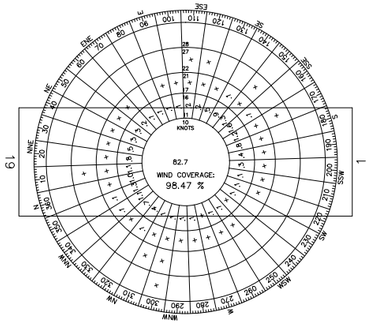
ALD LEGEND		
FEATURE	EXISTING	ULTIMATE
RUNWAY/TAXIWAY OUTLINE		
RUNWAY/TAXIWAY TO BE REMOVED		
BUILDINGS/FACILITIES		
AIRPORT PROPERTY LINE		
AIRPORT PROPERTY LINE w/FENCE		
FENCE LINE		
BUILDING RESTRICTION LINE (BRL)		
AIRPORT REFERENCE POINT		
WIND CONE & SEGMENTED CIRCLE		
THRESHOLD LIGHTS		
RW END IDENTIFIER LIGHTS (REILS)		
C&G BEACON		
VGSI		
HOLD POSITION AND SIGN		
ASOS/AWOS		
PACS AND SACS MARKERS		
GROUND CONTOURS		
SIGNIFICANT OBJECT LOCATION		
TREES/BRUSH		
NONDIRECTIONAL BEACON (NDB)		



RUNWAY DATA TABLE				
	RW 1–19			
	EXISTING		ULTIMATE	
RUNWAY ARC	B-II		SAME	
DESIGN AIRCRAFT & ARC	FALCON 50 (BII)		SAME	
BALANCED FIELD LENGTH	4890'		SAME	
RUNWAY LENGTH & WIDTH (ft.)	5495' X 100'		SAME	
PAVEMENT DESIGN STRENGTH (1000 lbs.)	17 SW / 50 DW		SAME	
RUNWAY LIGHTING	MIRL		SAME	
PERCENT EFFECTIVE GRADIENT	0.13%		SAME	
PERCENT WIND COVERAGE	98.47%		SAME	
MAXIMUM ELEVATION ABOVE MSL	848.00'		SAME	
RW SURFACE TYPE	ASPH		SAME	
RSA – LENGTH BEYOND RW END	300'		SAME	
RSA – WIDTH	150'		SAME	
OFA – LENGTH BEYOND RW END	300'		SAME	
OFA WIDTH	500'		SAME	
OFZ – LENGTH BEYOND RW END	200'		SAME	
OFZ WIDTH	400'		SAME	
RUNWAY END	1	19	1	19
APPROACH TYPE	ILS/GPS	VISUAL	SAME	SAME
APPROACH VISIBILITY MINIMA	3/4 MILE	VISUAL	SAME	SAME
THRESHOLD SITING SURFACE & SLOPE	#6 20:1	#3 20:1	SAME	SAME
RUNWAY MARKING	PIR	BASIC	NPI	NPI
RUNWAY VISUAL AIDS	P4L	P4L	SAME	SAME
TOUCHDOWN ZONE ELEVATION	843.80'	841.10'	SAME	SAME
FAR PART 77 APPROACH CATEGORY	C	VIS-B	SAME	SAME
FAR PART 77 APPROACH SURFACE SLOPE	34:1	20:1	SAME	SAME
TAKE-OFF RUN AVAILABLE (TORA)	5495'	5495'	SAME	SAME
TAKE-OFF DISTANCE AVAILABLE (TODA)	5495'	5495'	SAME	SAME
ACCELERATE STOP DISTANCE AVAIL. (ASDA)	5495'	5295'	SAME	SAME
LANDING DISTANCE AVAILABLE (LDA)	4651'	5295'	SAME	SAME



ALL WEATHER WIND ROSE



IFR WIND ROSE

WIND ROSE ANALYSIS			
RUNWAY	WIND VELOCITY	AWWR WIND COVERAGE	IFR WIND COVERAGE
1–19	13.0 KNOTS (ARC A-II AND B-II)	97.92%	98.47%
WIND SOURCE: NATIONAL CLIMATIC DATA CENTER – SKYLARK FIELD AIRPORT 272,710 OBSERVATIONS, JAN 2004–DEC 2014			

TEXAS DEPARTMENT OF TRANSPORTATION
AVIATION DIVISION

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DAVID FULTON, DIRECTOR, AVIATION DIVISION — DATE

AIRPORT SPONSOR

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SPONSOR ACKNOWLEDGES APPROVAL OF ALP BY TXDOT DOES NOT CONSTITUTE A COMMITMENT TO FUNDING.

SIGNATURE — DATE

TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

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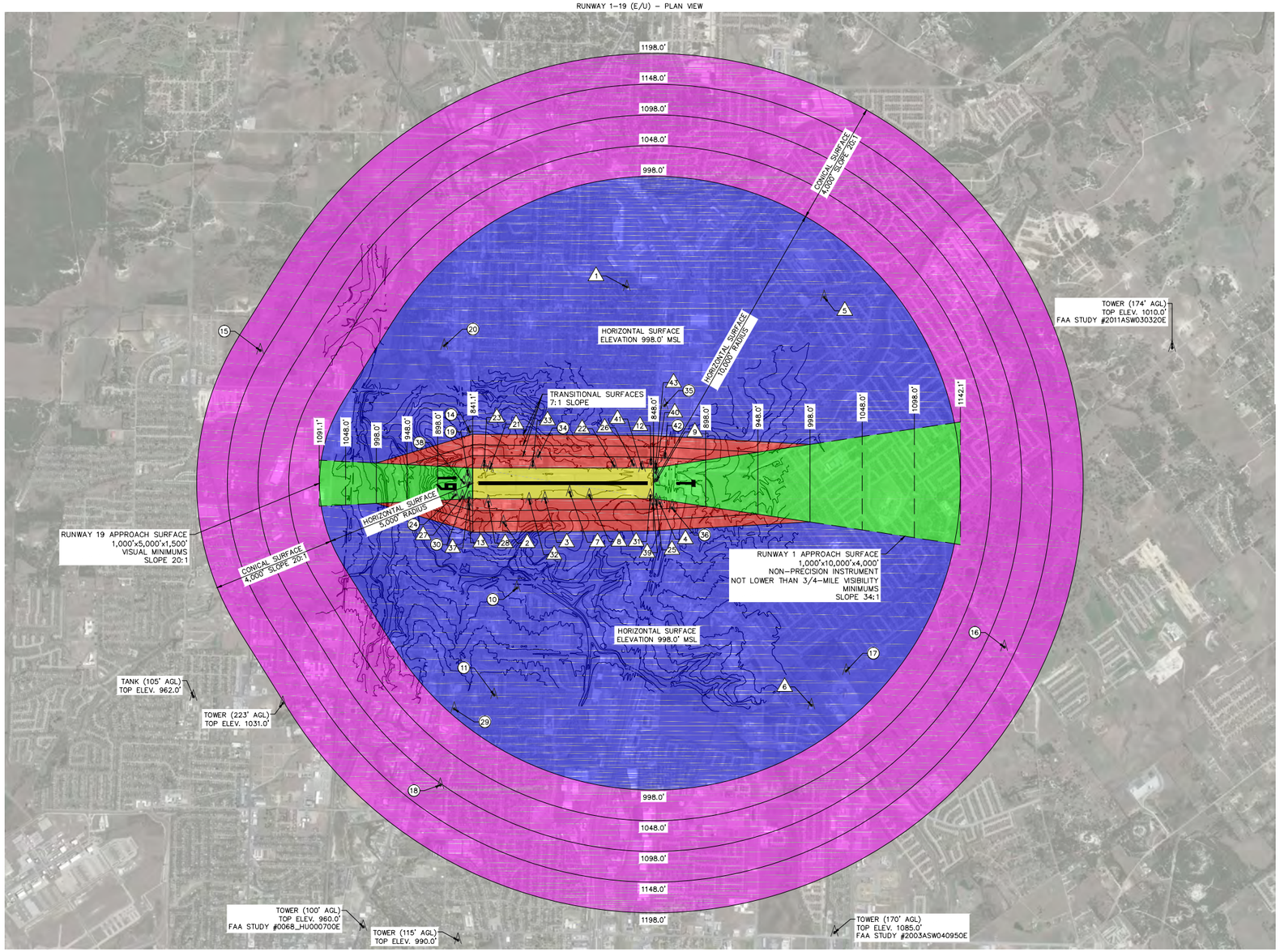
PLH — OCTOBER 2015
DESIGNED BY — DATE

JAH — OCTOBER 2015
DRAWN BY — DATE

AIRPORT LAYOUT DRAWING
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

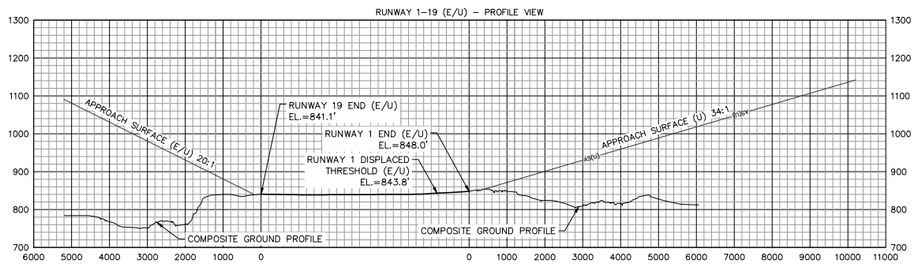
Texas Department of Transportation
Aviation Division

RUNWAY 1–19 (E/U) – PLAN VIEW



NOTE:
ALL OBJECT INFORMATION OBTAINED FROM FAA DIGITAL OBSTACLE FILE (DOF) 48–TX.

RUNWAY 1–19 (E/U) – PROFILE VIEW



LEGEND

- ZONE A: PRIMARY SURFACE
- ZONE B: APPROACH SURFACE
- ZONE C: TRANSITIONAL SURFACES
- ZONE D: HORIZONTAL SURFACE
- ZONE E: CONICAL SURFACES
- (X) DENOTES OBSTRUCTION
- (X) DENOTES OBJECT CLEAR OF AIRSPACE

0 1000 2000 4000 6000
HORIZONTAL SCALE
1" = 4,000'
VERTICAL SCALE
1" = 400'

OBSTRUCTION TABLE

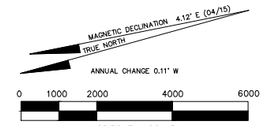
NO.	OBJECT DESCRIPTION	LATITUDE	LONGITUDE	TOP ELEV. (MSL)	PENETRATION IN FEET	SURFACE PENETRATED	OBSTRUCTION REMEDIATION	FAA STUDY NUMBER
1	TOWER	31°04'31.00" N	97°40'08.00" W	1,026.0'	28.0'	HORIZONTAL	NONE – TOWER LIT	N/A
2	TOWER	31°05'31.00" N	97°41'19.00" W	995.0'	36.4'	TRANSITIONAL	NONE – TOWER LIT	1978ASW001710E
3	TOWER	31°05'16.00" N	97°41'15.00" W	905.0'	56.5'	TRANSITIONAL	NONE – TOWER LIT	N/A
4	POLE	31°04'41.00" N	97°41'29.00" W	908.0'	24.7'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
5	TOWER	31°03'31.00" N	97°40'33.00" W	1,067.0'	69.0'	HORIZONTAL	OBSTRUCTION LIGHTING	N/A
6	TANK	31°04'13.00" N	97°42'58.00" W	1,008.0'	10.0'	HORIZONTAL	NONE – TANK LIT	2002ASW036750E
7	POLE	31°05'07.77" N	97°41'15.41" W	874.0'	26.0'	PRIMARY	NONE – POLE LIT	N/A
8	TOWER	31°05'01.99" N	97°41'18.63" W	883.0'	35.0'	PRIMARY	NONE – TOWER LIT	N/A
9	BUILDING	31°04'39.87" N	97°41'20.63" W	857.0'	6.1'	34:1 APPROACH	THRESHOLD DISPLACED	N/A
12	POLE	31°04'40.00" N	97°41'14.00" W	882.0'	15.3'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
13	TOWER	31°05'40.00" N	97°41'09.00" W	893.0'	11.4'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
21	POLE	31°05'30.09" N	97°40'58.09" W	869.0'	21.0'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
22	POLE	31°04'51.56" N	97°41'10.81" W	862.0'	5.5'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
23	POLE	31°05'31.67" N	97°40'56.53" W	869.0'	10.1'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
25	POLE	31°04'41.80" N	97°41'27.64" W	880.0'	17.1'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
26	POLE	31°04'45.50" N	97°41'12.48" W	873.0'	11.1'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
27	POLE	31°05'41.35" N	97°41'05.46" W	868.0'	3.2'	20:1 APPROACH	OBSTRUCTION LIGHTING	N/A
28	BUILDING	31°05'33.81" N	97°41'10.08" W	872.0'	7.7'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
31	BUILDING	31°04'43.14" N	97°41'25.42" W	856.0'	8.0'	PRIMARY	OBSTRUCTION LIGHTING	N/A
32	POLE	31°05'21.00" N	97°41'13.58" W	865.0'	12.5'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
33	POLE	31°05'16.76" N	97°41'01.82" W	869.0'	10.8'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
37	POLE	31°05'39.38" N	97°41'06.56" W	865.0'	11.1'	20:1 APPROACH	OBSTRUCTION LIGHTING	N/A
39	POLE	31°04'43.16" N	97°41'28.71" W	883.0'	8.5'	TRANSITIONAL	OBSTRUCTION LIGHTING	N/A
40	BUILDING	31°04'39.34" N	97°41'17.70" W	859.0'	8.8'	34:1 APPROACH	THRESHOLD DISPLACED	N/A
41	POLE	31°04'43.15" N	97°41'14.57" W	870.0'	22.0'	PRIMARY	OBSTRUCTION LIGHTING	N/A
43	POLE	31°04'39.08" N	97°41'15.93" W	873.0'	23.3'	34:1 APPROACH	THRESHOLD DISPLACED	N/A

SEE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR CLOSE IN OBSTRUCTION INFORMATION

CLEARANCE TABLE

NO.	OBJECT DESCRIPTION	LATITUDE	LONGITUDE	TOP ELEV. (MSL)	CLEARANCE IN FEET	SURFACE CLEARED	FAA STUDY NUMBER
10	TOWER	31°05'33.00" N	97°41'44.00" W	925.0'	73.0'	HORIZONTAL	0000_SW064700E
11	T–L TOWER	31°05'50.00" N	97°42'20.00" W	961.0'	37.0'	HORIZONTAL	N/A
14	TOWER	31°05'33.00" N	97°40'43.00" W	941.0'	57.0'	HORIZONTAL	N/A
15	TOWER	31°06'30.10" N	97°39'51.00" W	1,027.0'	129.1'	CONICAL	2007ASW07739OE
16	TOWER	31°03'08.00" N	97°42'58.00" W	1,020.0'	108.9'	CONICAL	2001ASW017520E
17	TOWER	31°03'59.03" N	97°42'49.41" W	988.0'	10.0'	HORIZONTAL	2008ASW06311OE
18	POLE	31°06'15.01" N	97°42'46.42" W	964.0'	136.1'	CONICAL	2011ASW05830OE
19	BUILDING	31°05'37.52" N	97°40'58.07" W	852.0'	3.5'	APPROACH	N/A
20	TANK	31°05'32.85" N	97°40'09.27" W	940.0'	58.0'	HORIZONTAL	N/A
24	POLE	31°05'43.28" N	97°41'04.00" W	863.0'	12.9'	APPROACH	N/A
29	T–L TOWER	31°06'03.61" N	97°42'20.64" W	932.0'	66.0'	HORIZONTAL	N/A
30	NAVAID	31°05'37.88" N	97°41'01.23" W	843.0'	10.3'	APPROACH	N/A
34	TOWER	31°05'14.18" N	97°40'59.03" W	884.0'	18.2'	TRANSITIONAL	N/A
35	TOWER	31°04'30.42" N	97°40'54.61" W	967.0'	31.0'	HORIZONTAL	N/A
36	POLE	31°04'37.62" N	97°41'32.14" W	894.0'	51.1'	TRANSITIONAL	N/A
38	POLE	31°05'39.57" N	97°41'00.57" W	854.0'	1.4'	APPROACH	N/A
42	SIGN	31°04'35.09" N	97°41'13.16" W	893.0'	7.2'	TRANSITIONAL	N/A

SEE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR CLOSE IN OBSTRUCTION INFORMATION



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SIGNATURE — DATE

TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

PREPARED BY:

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(972) 377–8380 FAX

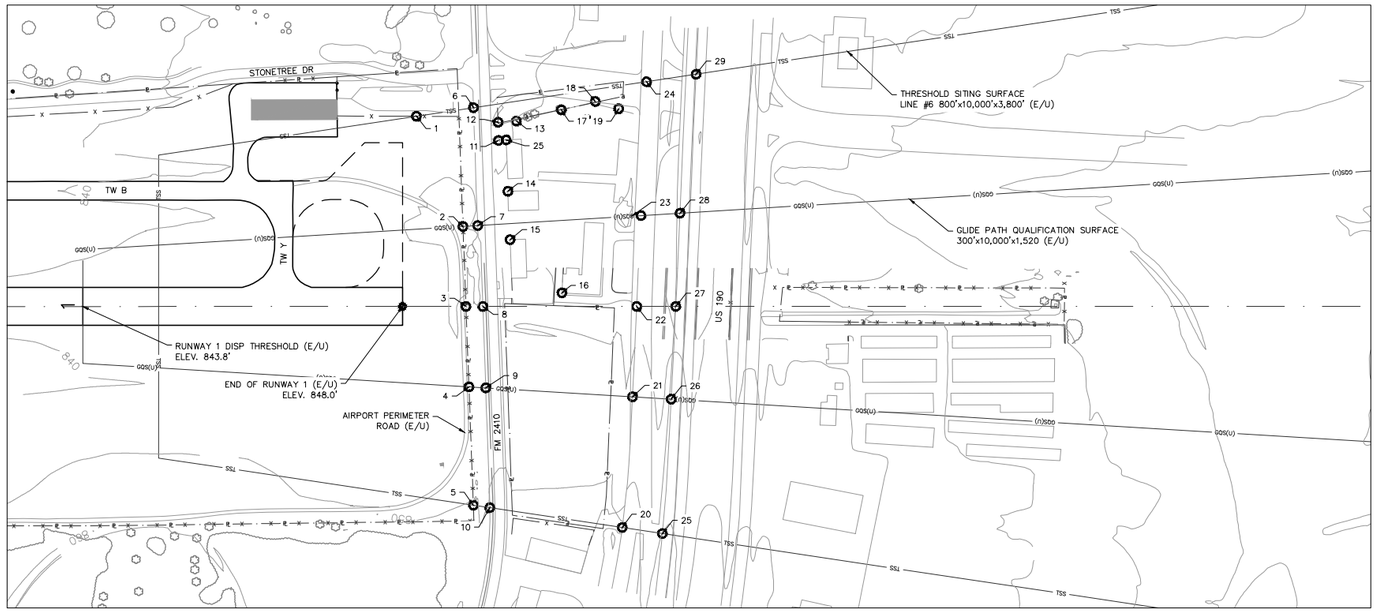
PLH — DESIGNED BY — OCTOBER 2015 — DATE

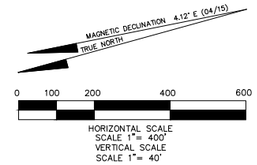
JAH — DRAWN BY — OCTOBER 2015 — DATE

AIRPORT AIRSPACE DRAWING
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

Texas Department of Transportation
Aviation Division

RUNWAY 1 – PLAN VIEW

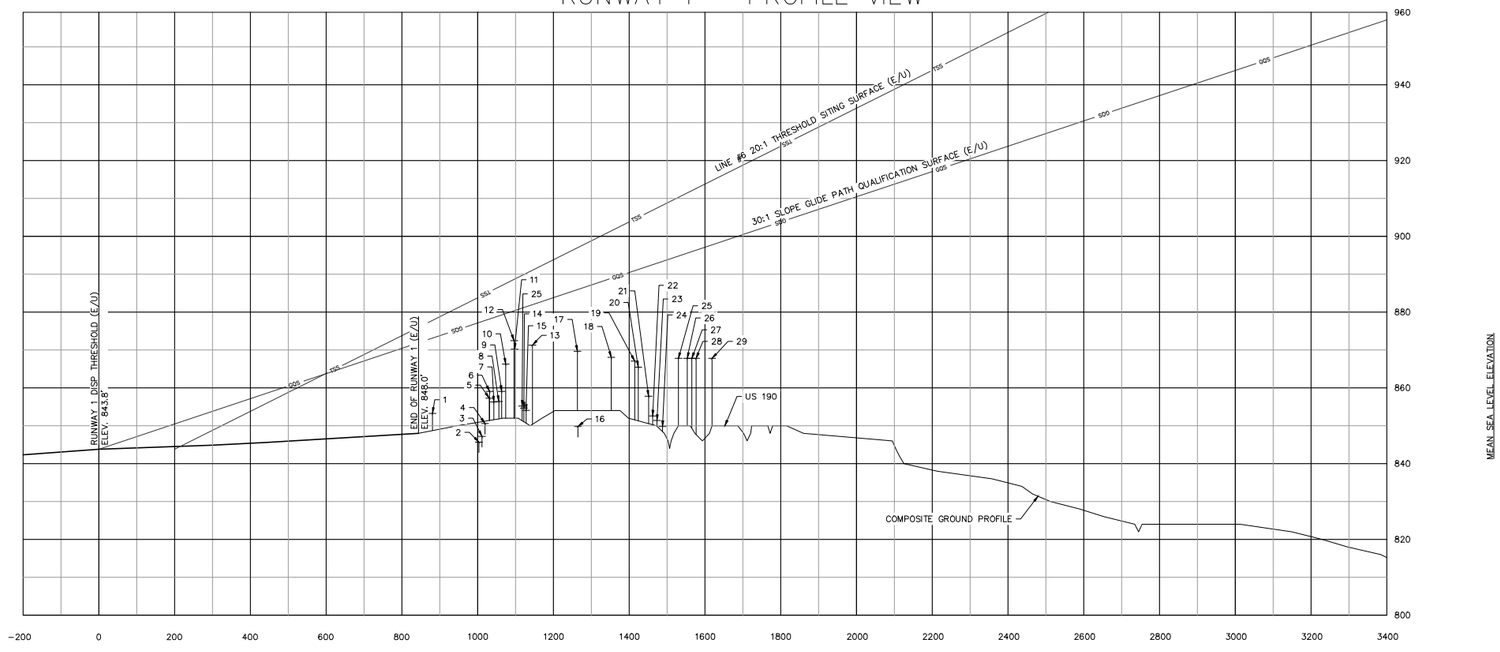




PENETRATIONS TO THRESHOLD SITING SURFACE								
NO.	OBJECT DESCRIPTION	LATITUDE (N)	LONGITUDE (W)	DISTANCE FM RW END	OFFSET FM RW C/L*	TOP ELEVATION**	AMT OF PENETRATION	REMEDIATION
	NO PENETRATIONS							

* OFFSETS FROM CENTERLINE ARE DESCRIBED RIGHT OR LEFT OF THE RUNWAY CENTERLINE AS SEEN BY A PILOT APPROACHING THE RUNWAY TO LAND
** ELEVATIONS ADJUSTED UPWARD 15' FOR PUBLIC ROADWAY, 17' FOR INTERSTATE HIGHWAY, 23' FOR RAILROADS

RUNWAY 1 – PROFILE VIEW



IPASD LEGEND		
FEATURE	EXISTING	ULTIMATE
RUNWAY/TAXIWAY OUTLINE		
RUNWAY/TAXIWAY TO BE REMOVED		
BUILDINGS/FACILITIES		
AIRPORT PROPERTY LINE		
AIRPORT PROPERTY LINE w/FENCE		
THRESHOLD SITING SURFACE	TSS	TSS (U)
FENCE LINE		
THRESHOLD LIGHTS		
RW END IDENTIFIER LIGHTS (REILS)		
GROUND CONTOURS	1630	
SIGNIFICANT OBJECT PLAN VIEW		
SIGNIFICANT OBJECT PROFILE VIEW		
TREES/BRUSH		

TEXAS DEPARTMENT OF TRANSPORTATION
AVIATION DIVISION

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SIGNATURE — DATE

TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

PREPARED BY:

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(972) 377-8380 FAX

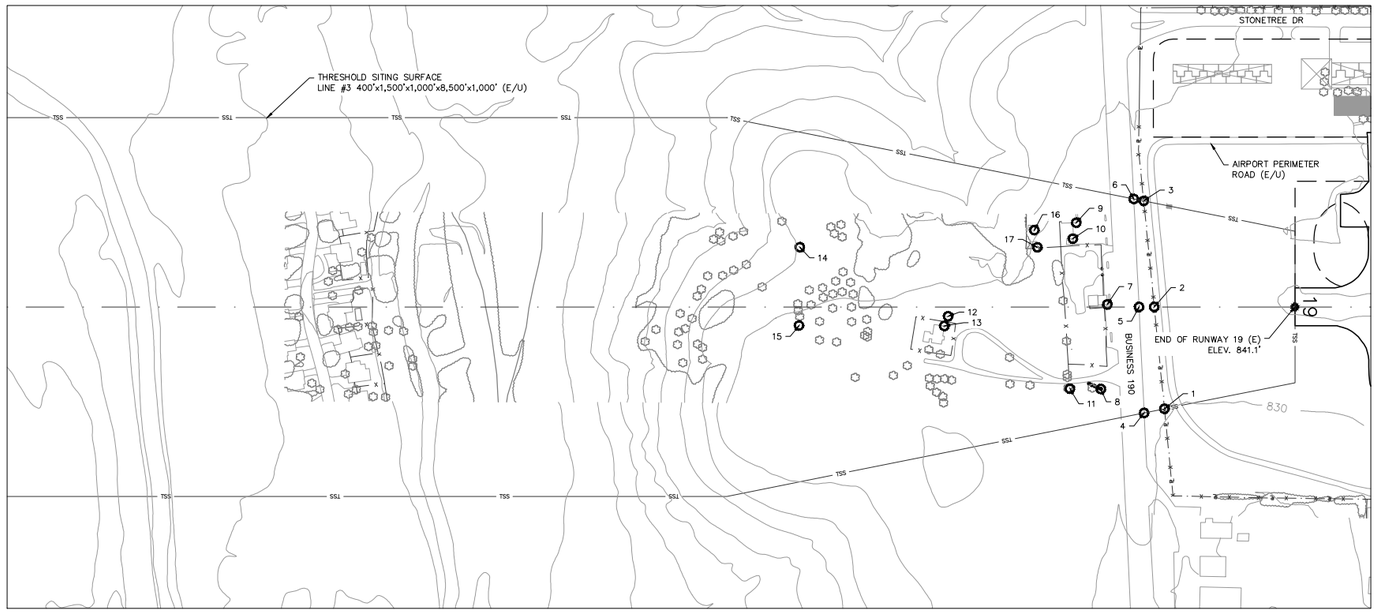
PLH — DESIGNED BY — OCTOBER 2015 — DATE

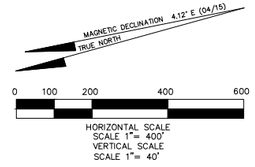
JAH — DRAWN BY — OCTOBER 2015 — DATE

IPASD RUNWAY 1
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

Texas Department of Transportation
Aviation Division

RUNWAY 19 – PLAN VIEW

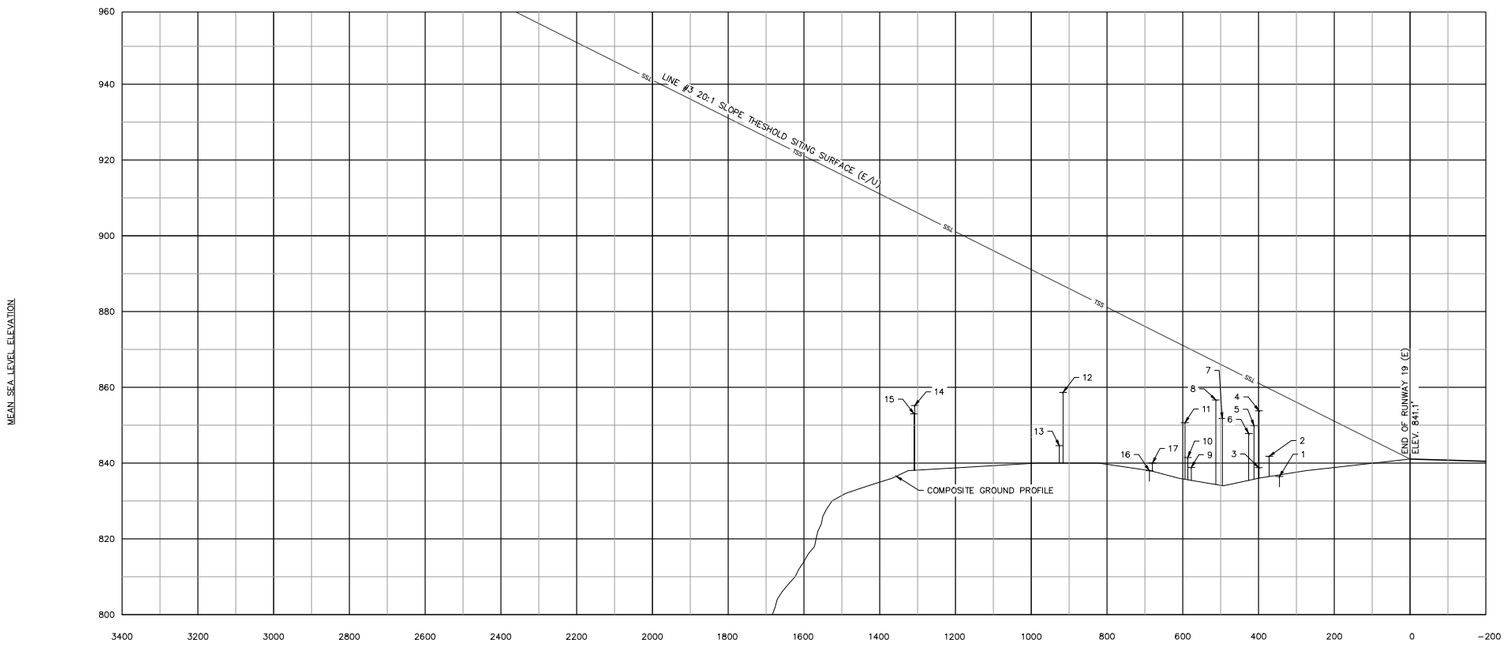




PENETRATIONS TO THRESHOLD SITING SURFACE								
NO.	OBJECT DESCRIPTION	LATITUDE (N)	LONGITUDE (W)	DISTANCE FM RW END	OFFSET FM RW C/L*	TOP ELEVATION**	AMT OF PENETRATION	REMEDIATION
	NO PENETRATIONS							

* OFFSETS FROM CENTERLINE ARE DESCRIBED RIGHT OR LEFT OF THE RUNWAY CENTERLINE AS SEEN BY A PILOT APPROACHING THE RUNWAY TO LAND
** ELEVATIONS ADJUSTED UPWARD 15' FOR PUBLIC ROADWAY, 17' FOR INTERSTATE HIGHWAY, 23' FOR RAILROADS

RUNWAY 19 – PROFILE VIEW



IPASD LEGEND		
FEATURE	EXISTING	ULTIMATE
RUNWAY/TAXIWAY OUTLINE		
RUNWAY/TAXIWAY TO BE REMOVED		
BUILDINGS/FACILITIES		
AIRPORT PROPERTY LINE		
AIRPORT PROPERTY LINE w/FENCE		
THRESHOLD SITING SURFACE	TSS	TSS (U)
FENCE LINE		
THRESHOLD LIGHTS		
RW END IDENTIFIER LIGHTS (REILS)		
GROUND CONTOURS	1630	
SIGNIFICANT OBJECT PLAN VIEW		
SIGNIFICANT OBJECT PROFILE VIEW		
TREES/BRUSH		

TEXAS DEPARTMENT OF TRANSPORTATION
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DAVID FULTON, DIRECTOR, AVIATION DIVISION — DATE

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SPONSOR ACKNOWLEDGES APPROVAL OF ALP BY TXDOT DOES NOT CONSTITUTE A COMMITMENT TO FUNDING.

SIGNATURE — DATE

TITLE, AIRPORT SPONSOR'S REPRESENTATIVE

PREPARED BY:

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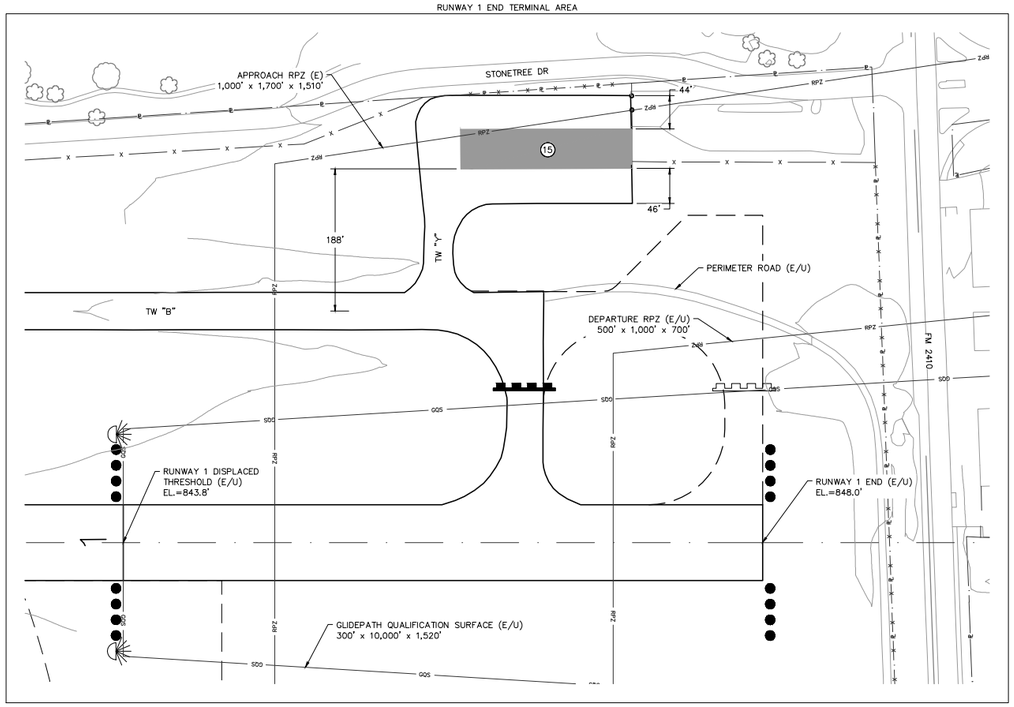
FRISCO, TX 75034
(972) 377-7480
(972) 377-8380 FAX

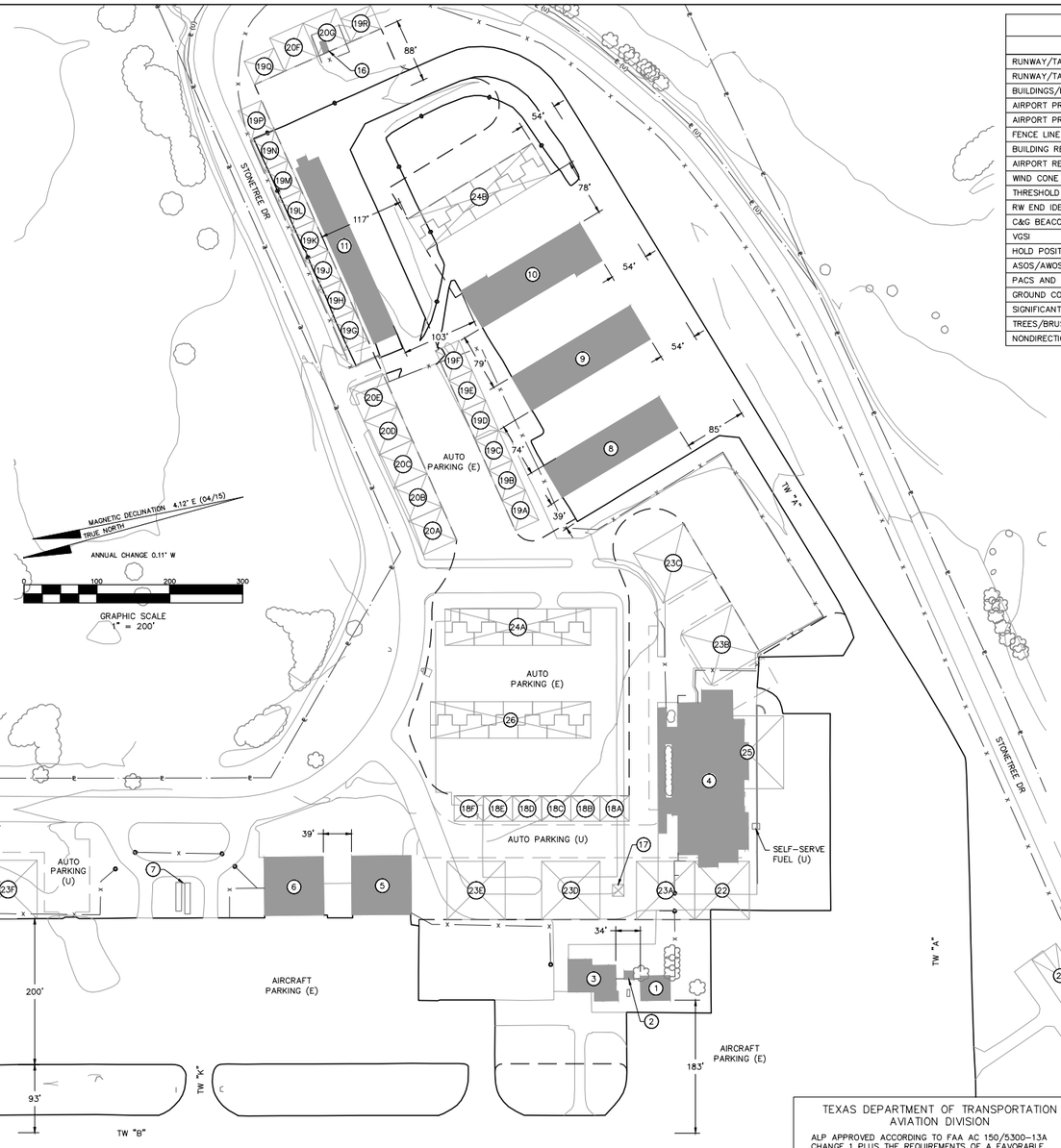
PLH — DESIGNED BY — OCTOBER 2015 — DATE

JAH — DRAWN BY — OCTOBER 2015 — DATE

IPASD RUNWAY 19
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

Texas Department of Transportation
Aviation Division





ALD LEGEND

FEATURE	EXISTING	ULTIMATE
RUNWAY/TAXIWAY OUTLINE		
RUNWAY/TAXIWAY TO BE REMOVED		
BUILDINGS/FACILITIES		
AIRPORT PROPERTY LINE		
AIRPORT PROPERTY LINE w/FENCE		
FENCE LINE		
BUILDING RESTRICTION LINE (BRL)		
AIRPORT REFERENCE POINT		
WIND CONE & SEGMENTED CIRCLE		
THRESHOLD LIGHTS		
RW END IDENTIFIER LIGHTS (REILS)		
C&G BEACON		
VGSI		
HOLD POSITION AND SIGN		
ASOS/AWOS		
PACS AND SACS MARKERS		
GROUND CONTOURS		
SIGNIFICANT OBJECT LOCATION		
TREES/BRUSH		
NONDIRECTIONAL BEACON (NDB)		

BUILDING TABLE

BUILDING NUMBER	DESCRIPTION: EXISTING	DESCRIPTION: ULTIMATE	TOP ELEVATION
1	GENERAL AVIATION TERMINAL	REMOVED	847.77'
2	ELECTRICAL VAULT	REMOVED	846.25'
3	ARFF	REMOVED	852.30'
4	FORMER COMM. TERM.	REMOVED	856.20'
5	CORPORATE HANGAR	–	850.24'
6	CORPORATE HANGAR	–	868.00'
7	FUEL FARM	–	839.55'
8	T-HANGAR	–	841.73'
9	T-HANGAR	–	842.83'
10	T-HANGAR	–	841.59'
11	SHADE HANGARS	REMOVED	831.54'
12	CENTRAL TX COLLEGE	–	853.50'
13	CENTRAL TX COLLEGE	–	857.75'
14	ORIGINAL TERMINAL	REMOVED	851.78'
15	T-HANGAR	–	858.73'
16	TCEQ AIR MONITOR	REMOVED	861.14'
17	–	ELECTRICAL VAULT	TBD
18	–	40'x35' HANGAR	TBD
19	–	45'x35' HANGAR	TBD
20	–	50'x50' HANGAR	TBD
21	–	AIRPORT MAINT BLDG	TBD
22	–	TERMINAL BLDG	TBD
23	–	80'x80' HANGAR	TBD
24	–	200'x50' T-HGR	TBD
25	–	100'x100' HANGAR	TBD
26	–	220'x50' T-HGR	TBD
27	–	192'x58' T-HGR	TBD
28	–	260'x50' T-HGR	TBD

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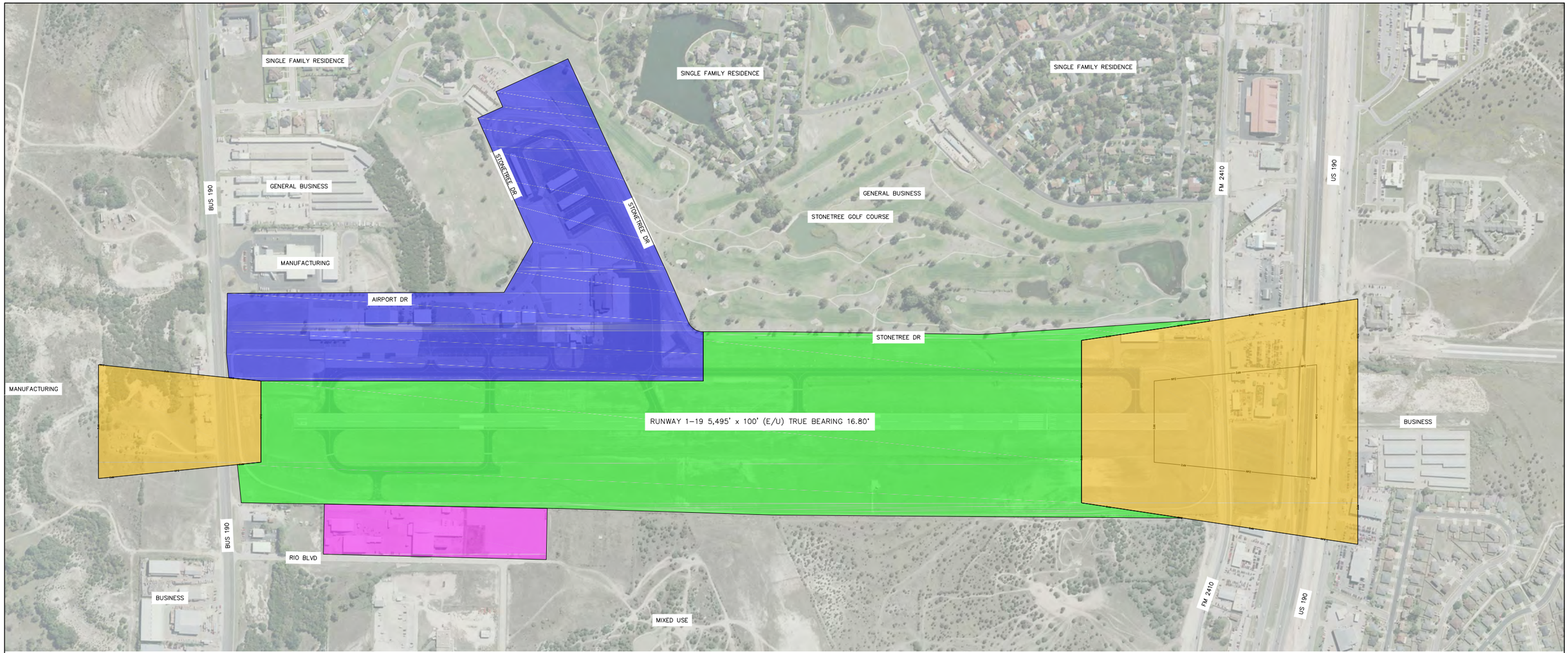
DRAWN BY — DATE

TERMINAL AREA DRAWING
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

Texas Department of Transportation
Aviation Division



LEGEND

- AIRPORT OPERATIONS PROTECTED AREA
- TERMINAL DEVELOPMENT
- RUNWAY PROTECTION ZONE
- POTENTIAL THROUGH-THE-FENCE OPERATION

MAGNETIC DECLINATION 3.65° E (04/14)
TRUE NORTH

ANNUAL CHANGE 0.13° W

0 200 400 800 1200

HORIZONTAL SCALE
GRAPHIC SCALE
1" = 800'

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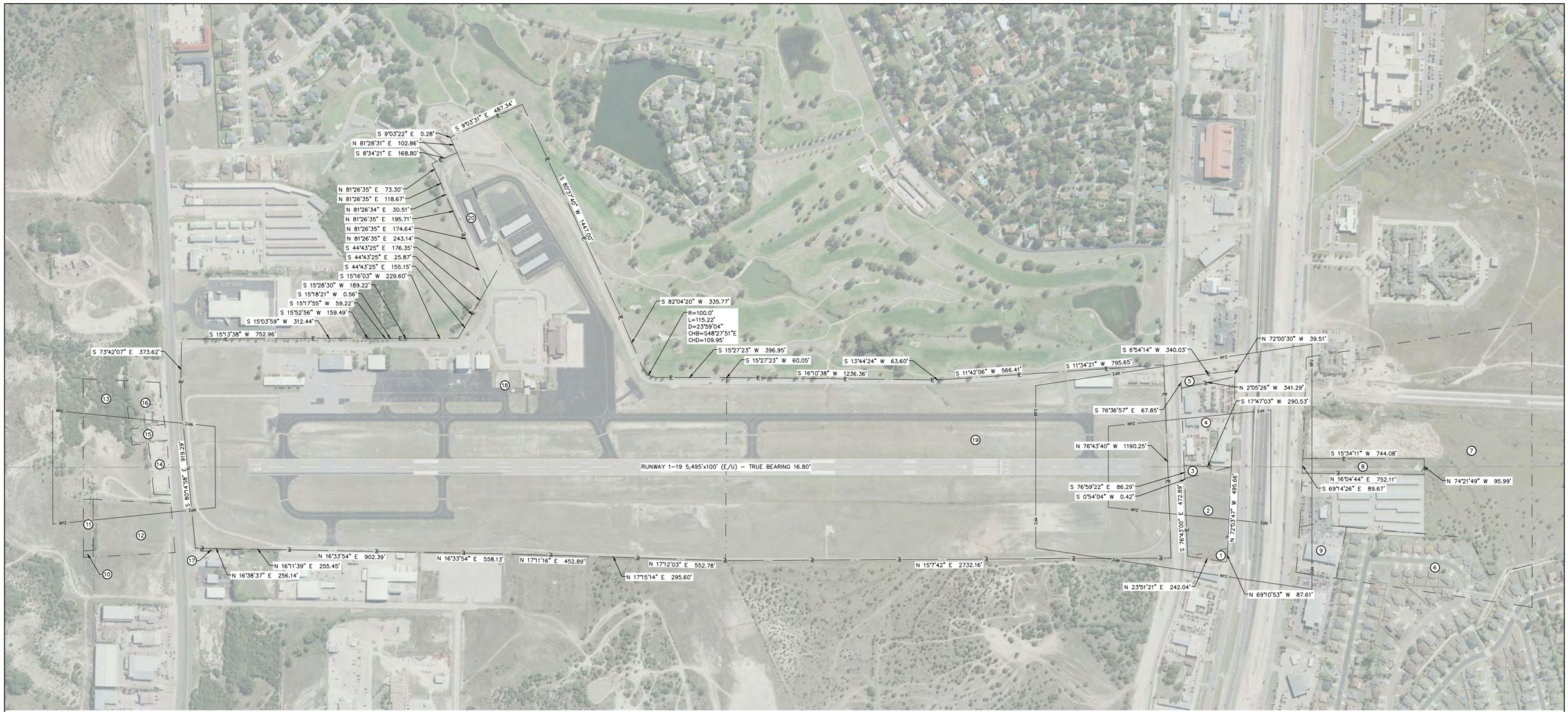
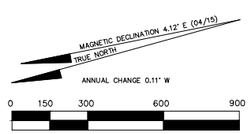
LAND USE DRAWING
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

Texas Department of Transportation
Aviation Division



AIRPORT PROPERTY DATA TABLE						
TRACT	ACRES	TITLE	GRANTOR/REMARKS	COUNTY RECORD VOL./PAGE	DATE	FUNDING
1	0.244	FEE SIMPLE	N/A	N/A	03-20-1991	3-48-0122-06
2	3.002	FEE SIMPLE	N/A	N/A	05-10-1990	3-48-0122-06
3	0.30	FEE SIMPLE	N/A	N/A	06-17-1977	****
4	3.692	AVIGATION EASEMENT	N/A	N/A	05-03-1990	3-48-0122-06
5	0.412	FEE SIMPLE	N/A	N/A	02-01-1990	3-48-0122-06
6	9.782	AVIGATION EASEMENT	N/A	N/A	07/10/1990	3-48-0122-06
7	38.109	AVIGATION EASEMENT	N/A	N/A	02-09-1990	3-48-0122-06
8	1.722	FEE SIMPLE	N/A	N/A	04-03-1984	3-48-0122-02
9	1.687	AVIGATION EASEMENT	N/A	N/A	08-24-1990	3-48-0122-06
10	0.073	AVIGATION EASEMENT	N/A	N/A	04-20-1990	3-48-0122-06
11	0.53	AVIGATION EASEMENT	N/A	N/A	12-16-1991	3-48-0122-06
12	3.367	AVIGATION EASEMENT	N/A	N/A	04-10-1990	3-48-0122-06
13	5.882	AVIGATION EASEMENT	N/A	N/A	02-20-1990	3-48-0122-06
14	0.806	AVIGATION EASEMENT	N/A	N/A	02-02-1966	9-41-186-C501
15	0.448	AVIGATION EASEMENT	N/A	N/A	03-16-1966	9-41-186-C501
16	1.233	AVIGATION EASEMENT	N/A	N/A	05-10-1990	3-48-0122-06
17	0.043	AVIGATION EASEMENT	N/A	N/A	06-01-1990	3-48-0122-06
18	126.67	FEE SIMPLE	N/A	N/A	04-16-1964	9-41-186-C501
19	76.05	FEE SIMPLE	N/A	N/A	04-28-1964	9-41-186-C501
20	3.000	FEE SIMPLE	N/A	N/A	02-24-1975	7-48-0122-01

**--ACQUIRED THROUGH A RELEASE OF A PORTION OF ORIGIAL AIRPORT PROPERTY AND A LAND SWAP. RELEASE DATES: 06-19-60 AND 03-25-88
****--PROPERTY INTEREST WAS NOT ACQUIRED UNDER FAA A.I.P. PROJECT. VALUE PROPERTY INTEREST MAY BE REIMBURSED BY FAA UNDER FUTURE A.I.P. PROJECT.



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JAH — OCTOBER 2015
DRAWN BY — DATE

AIRPORT PROPERTY MAP
SKYLARK FIELD AIRPORT
KILLEEN, TEXAS (ILE)

Texas Department of Transportation
Aviation Division

CHAPTER SEVEN

Capital Improvement and Phased Development Plan

CAPITAL IMPROVEMENT AND PHASED DEVELOPMENT PLAN

Introduction

The Capital Improvement Plan (CIP) and phased development plan is the formulation of an orderly series of improvements intended for Skylark Field's (ILE) growth and development based on the preferred improvement options outlined in the Alternatives chapter. Improvement objectives are outlined to have ILE continue to operate a safe, efficient, and attractive public facility that ties in with the City of Killeen and surrounding region from an aesthetic and economic viewpoint.

Opinions of probable costs for individual projects are based on unconstrained funding and have been prepared for identified improvements. Since these probable costs are based on 2015 dollars, they are intended for planning purposes only and should not be used or construed as construction cost estimates. Formalized opinions of probable costs will be developed as a part of each project's scoping process during the design and engineering phase. It is important to note that market demand not occurrence within a specific time frame will be the driver for when facilities are constructed. The following guidelines have been followed in the formulation of the KILE CIP and Phased Development Plan:

- The scheduling of projects is prioritized to permit improvements in a coordinated approach. The phasing and priority of each project has been determined with respect to airport safety, demand, compatibility with other airport projects, and TxDOT programming schedules;
- Overall, the CIP has been structured to provide the flexibility to meet short- and long-range goals. Therefore, individual projects should not be considered as a single improvement, but as part of a project series that arrive at the ultimate concept;
- The CIP designates specific locations for hangars/ buildings of differing functions and approximate sizes to align with the long-range plans regardless of construction

order allowing the airport flexibiltiy in accommodating surges in demand or third-party funding sources;

- The development plan does not represent an obligation of local funds, nor does it require a funding commitment without justification of demand levels by the City of Killeen, TxDOT, or Federal Aviation Administration (FAA); and,

- The expressed desire, intent, and ability of the City to achieve airport land use compatibility, coupled with favorable aesthetics transition, remains important planning and funding considerations.

The following pages identify the proposed phased development for KILE. Each phase consists of projects and improvements categorized by the following areas: 1) airfield improvements and 2) landside improvements. The Phased Development Plan is divided into the following phases:

Phase I (2015 – 2019)
Short-term development projects

Phase II (2020 – 2024)
Mid-term development projects

Phase III (2025 – 2034)
Long-term development projects

The CIP and Phased Development Plan described below, in **Tables 7-1** through **7-3**, and depicted on **Figure 7-1** encompass three development and funding phases: Phase I (0-5 years), Phase II (6-10 years), and Phase III (11-20 years).

PHASE I INCLUDES THE FOLLOWING PROJECTS:

Airfield Improvements
A1: FAA Memorandum of Agreement; Glideslope Removal; MALSR Removal; RW 01 Localizer Approach Revisions; LPV GPS RW 01 initiation; and,

A2: Design and install runway end identifier lights (REIL) RW 01 End.

Landside Improvements
A3A: Design and construct new 8-unit T-hangar east of current T-hangars (Area 3);

A3B: Design and construct associated taxilane/apron east of current T-hangars (Area 3);

A4: Terminal Area Drainage Improvement: install box culvert in ditch behind T-hangars 10-11 (Area 3)

A5: Civil and Electrical infrastructure improvements in general aviation hangar development (Area 3);

A6: Removal/demolition of former commercial terminal building (#1525) (Area 3);

A7A: Design and construct new 7-unit T-hangar (192' x 58') with jet pods (80' x 80') on each end at north terminal end (Area 1), includes demolition of original terminal building (#1511); and,

A7B: Design and construct associated taxilane and apron in support of new T-hangars and Box Hangars (Area 1).

PHASE II INCLUDES THE FOLLOWING PROJECTS:

Airfield Improvements
B3A: Rehabilitate Runway 1-19 (sealcoat and remarking);

B3B: Taxiway B rehabilitation (sealcoat and remarking);

B4: Remove and replace airfield electrical vault (#1519) and installation of new back-up generator system;

B5: Design and construct new airfield maintenance equipment building (Area 3);

B6: Redesign and construct TW D to meet FAA design criteria and align with Taxiway A; and,

B7: Rehabilitate Taxiways A, C, E, F, Y, G, K, and J (sealcoat and remarking).

Landside Improvements

B1A: Design and construct new general aviation terminal building (Area 3) (includes demolition of existing GA terminal building);

B1B: Design and construct new general aviation terminal building (#1523) (Area 3) auto access and parking;

B2A: Remove shade hangar (#1603) in northeast part of terminal area (Area 3) and replace with series of 8 small box hangars (45' x 35') fronting to the south;

B2B: Design and construct associated taxilane/apron for series of 8 small box hangars (45' x 35');

B8: Design and construct new access taxilane from Taxiway A north into the former commercial terminal building parking area to be redeveloped with new T-hangars and box/common hangars;

B9A: Design and construct new 8-unit T-hangar on former commercial terminal building parking lot;

B9B: Design and construct taxilane/apron on former commercial terminal building parking lot in support of new 8-unit T-hangar;

B10A: Design and construct new box hangar (100' x 100') on former commercial terminal building site;

B10B: Design and construct apron associated with new box hangar (100' x 100');

B10C: Design and construct auto access/parking improvements associated with new box hangar (100' x 100');

B11: Rehabilitate apron (sealcoat and remarking) between Taxiway B, Taxiway K, Central Texas College hangars, and the northern apron end;

B12A: Design and construct new 12-unit T-hangar (300' x 50') (Area 1); and,

B12B: Design and construct associated taxilane/apron for new 12-unit T-hangar (Area 1).

PHASE III INCLUDES THE FOLLOWING PROJECTS:

Airfield Improvements

C4: Runway 1-19 structural overlay/reconstruction;

C5: Design and install medium intensity LED runway lights on Runway 1-19;

C6: Taxiway B structural overlay/reconstruction;

C7: Taxiway A mill and overlay/reconstruction;

C8: Rehabilitate medium intensity taxiway lights along all taxiways;

C9: Extend Taxiway B north to the Runway 19 end;

C10: Extend Taxiway B south to the Runway 1 end; and,

C11: Update the Airport Master Plan.

Landside Improvements

C1A: Design and construct new box hangar (80' x 80') fronting onto TW A east of former commercial terminal building (Area 3)

C1B: Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 3)

C1C: Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 3);

C2A: Design and construct new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building (includes demolition of aircraft rescue and firefighting station);

C2B: Design and construct apron associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately south of new GA terminal building;

C2C: Design and construct auto access and parking associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately south of new GA terminal building;

C3A: Design and construct taxilane/apron associated with new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3);

C12A: Design and construct new box hangar (80' x 80') and associated taxilane/apron fronting onto TW A east of former commercial terminal building (Area 3);

C12B: Design and construct apron associated with new box hangar (80' x 80') (Area 3);

C12C: Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 3);

C13A: Design and construct new 80' x 80' common/box hangar;

C13B: Design and construct taxilane/apron associated with new box hangar (80' x 80');

C13C: Design and construct auto access and parking associated with new box hangar (80' x 80');

C14A: Design and construct series of five 50' x 50' common/box hangars on former commercial terminal east overflow parking area (Area 3); and,

C14B: Design and construct taxilane/apron associated with series of 50' x 50' box hangars;

C15A: New 80' x 80' common/box hangar (Area 2);

C15B: Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 2); and,

C15C: Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 2).

Project Cost Estimates

Opinions of probable costs for individual projects are based on unconstrained funding and have been prepared for improvements identified to meet facility requirements and forecast demand while maximizing available airport property for terminal development. Since these probable costs are based on 2015 dollars, they are intended for planning purposes only and should not be used or construed as construction cost estimates. Formalized opinions of probable costs will be developed as part of each project's scoping process during the design and engineering. It is important to note that market demand, not occurrence within a specific time frame, will drive facility need. Additionally, the project list is flexible and evolving. For example, if a project is slated for year three of the Phasing Plan, this does not mean it needs to occur during this time. Project importance changes over time which may allow certain items to move up or down in the priority order.

TABLE 7-1 | PHASE I (0-5 YEARS) DEVELOPMENT COSTS

	Project Type	Local Funding	State/ Federal Funding	Total Cost
A1	FAA Memorandum of Agreement; Glideslope Removal; LPV GPS RW 01; MALSR Removal; RW 01 Localizer Approach Revisions	$450,000	$	$450,000
A2	Design and install runway end identifier lights (REIL) RW 01 End	$100,000	$0	$100,000
A3A	Design and construct new 8-unit T-hangar east of current T-hangars (Area 3) •	$74,100	$666,900	$741,000
A3B	Design and construct associated taxilane/apron east of current T-hangars (Area 3) •	$36,000	$324,000	$360,000
A4	Terminal Area Drainage Improvement: install box culvert in ditch behind T-hangars 10-11 (Area 3)	$42,000	$378,000	$420,000
A5	Civil and Electrical infrastructure improvements in general aviation hangar development (Area 3)	$250,000	$0	$250,000
A6	Removal/demolition of former commercial terminal building (Area 3)	$9,000	$81,000	$90,000
A7A	Design and construct new 7-unit T-hangar (192' x 58') with jet pods (80' x 80') on each end at north terminal end (Area 1), includes demolition of original terminal building •	$1,800,000	$0	$1,800,000
A7B	Design and construct associated taxilane and apron in support of new T-hangars and Box Hangars (Area 1) •	$88,900	$800,100	$889,000
PHASE I TOTAL		**$2,850,000**	**$2,250,000**	**$5,100,000**

Source: Costs reflect 2015 dollars and should be used for planning purposes only. Engineering/ design and construction costs are inclusive. * Fee exclusive of construction costs to be determined by on-call engineering firm. # Costs for ILS replacement encompassed within the Rosewood Highway Project. • If airport owned, hangars are funded at 80%/20% cost share through NPE up to $600,000. The Airport Sponsor is responsible for 100% of the remaining balance. If privately owned, 100% of the cost is private or third party funding.

TABLE 7-2 | PHASE II (6-10 YEARS) DEVELOPMENT COSTS

	Project Type	Local Funding	State/ Federal Funding	Total Cost
B1A	Design and construct new general aviation terminal building (Area 3) (includes demolition of existing GA terminal building #1523)	$500,000	$500,000	$1,000,000
B1B	Design and construct new general aviation terminal building (Area 3) auto access and parking	$119,000	$119,000	$238,000
B2A	Remove shade hangar (#1603) in northeast part of terminal area (Area 3) and replace with series of 8 small box hangars (45' x 35') fronting to the south •	$89,500	$805,500	$895,000
B2B	Design and construct associated taxilane/apron for series of 8 small box hangars (45' x 35')	$18,000	$162,000	$180,000
B3A	Rehabilitate Runway 1-19 (sealcoat and remarking)	$76,000	$684,000	$760,000
B3B	Taxiway B rehabilitation (sealcoat and remarking)	$23,000	$207,000	$230,000
B4	Remove and replace airfield electrical vault (#1519) and installation of new back-up generator system	$71,000	$639,000	$710,000
B5	Design and construct new airfield maintenance equipment building (Area 3)	$250,000	$50,000	$300,000
B6	Redesign and construct TW D to meet FAA design criteria and align with Taxiway A	$54,000	$486,000	$540,000
B7	Rehabilitate Taxiways A, C, E, F, Y, G, K, and J (sealcoat and remarking)	$28,000	$252,000	$280,000
B8	Design and construct new access taxilane from Taxiway A north into the former commercial terminal building parking area to be redeveloped with new T-hangars and box/common hangars	$29,000	$261,000	$290,000
B9A	Design and construct new 8-unit T-hangar on former commercial terminal building parking lot •	$73,000	$657,000	$730,000
B9B	Design and construct taxilane/apron on former commercial terminal building parking lot in support of new 8-unit T-hangar	$38,400	$345,600	$384,000
B10A	Design and construct new box hangar (100' x 100') on former commercial terminal building site •	$993,000	$0	$993,000
B10B	Design and construct apron associated with new box hangar (100' x 100') •	$9,700	$87,300	$97,000
B10C	Design and construct auto access/parking improvements associated with new box hangar (100' x 100') •	$180,500	$9,500	$190,000
B11	Rehabilitate apron (sealcoat and remarking) between Taxiway B, Taxiway K, Central Texas College hangars, and the northern apron end	$26,000	$234,000	$260,000

TABLE 7-2 (CONTINUED) | PHASE II (6-10 YEARS) DEVELOPMENT COSTS

	Project Type	Local Funding	State/ Federal Funding	Total Cost
B12A	Design and construct new 12-unit T-hangar (300' x 50') (Area 1) •	$943,000	$0	$943,000
B12B	Design and construct associated taxilane/apron for new 12-unit T-hangar (Area 1) •	$90,700	$816,300	$907,000
PHASE II TOTAL		**$3,611,800**	**$6,315,200**	**$9,927,000**

Source: Costs reflect 2015 dollars and should be used for planning purposes only. Engineering/ design and construction costs are inclusive. • If airport owned, hangars are funded at 80%/20% cost share through NPE up to $600,000. The Airport Sponsor is responsible for 100% of the remaining balance. If privately owned, 100% of the cost is private or third party funding.

TABLE 7-3 | PHASE III (11-20 YEARS) DEVELOPMENT COSTS

	Project Type	Local Funding	State/ Federal Funding	Total Cost
C1A	Design and construct new box hangar (80' x 80') fronting onto TW A east of former commercial terminal building (Area 3) •	$620,000	$0	$620,000
C1B	Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 3) •	$28,000	$252,000	$280,000
C1C	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 3) •	$180,500	$9,500	$190,000
C2A	Design and construct new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building (includes demolition of aircraft rescue and firefighting station) •	$64,500	$580,500	$645,000
C2B	Design and construct apron associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately south of new GA terminal building	$30,800	$277,200	$308,000
C2C	Design and construct auto access and parking associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building	$35,500	$35,500	$71,000
C3A	Design and construct new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3) •	$89,000	$801,000	$890,000
C3B	Design and construct taxilane/apron associated with new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3)	$54,400	$489,600	$544,000
C4	Runway 1-19 structural overlay/reconstruction	$482,000	$4,338,000	$4,820,000
C5	Design and install medium intensity LED runway lights on Runway 1-19	$36,000	$324,000	$360,000
C6	Taxiway B structural overlay/reconstruction	$227,000	$2,043,000	$2,270,000
C7	Taxiway A mill and overlay/reconstruction	$56,000	$504,000	$560,000
C8	Rehabilitate medium intensity taxiway lights along all taxiways	$77,000	$693,000	$770,000
C9	Extend Taxiway B north to the Runway 19 end	$66,000	$594,000	$660,000
C10	Extend Taxiway B south to the Runway 1 end	$77,000	$693,000	$770,000
C11	Update the Airport Master Plan	$38,000	$342,000	$380,000
C12A	Design and construct new box hangar (80' x 80') fronting onto TW A east of former commercial terminal building (Area 3) •	$660,000	$0	$660,000
C12B	Design and construct apron associated with new box hangar (80' x 80') (Area 3)	$33,500	$301,500	$335,000
C12C	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 3)	$99,750	$5,250	$105,000

TABLE 7-3 (CONTINUED) | PHASE III (11-20 YEARS) DEVELOPMENT COSTS

	Project Type	Local Funding	State/ Federal Funding	Total Cost
C13A	Design and construct new 80' x 80' common/box hangars •	$650,000	$0	$650,000
C13B	Design and construct taxilane/apron associated with new box hangar (80' x 80')	$33,700	$303,300	$337,000
C13C	Design and construct auto access and parking associated with new box hangar (80' x 80')	$61,750	$3,250	$65,000
C14A	Design and construct series of five 50' x 50' common/box hangars on former commercial terminal east overflow parking area (Area 3) •	$118,500	$1,066,500	$1,185,000
C14B	Design and construct taxilane/apron associated with series of 50' x 50' box hangars	$48,600	$437,400	$486,000
C15a	New 80' x 80' common/box hangar (Area 2)	$650,000	$0	$650,000
C15B	Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 2)	$33,700	$303,300	$337,000
C15C	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 2)	$61,750	$3,250	$65,000
PHASE III TOTAL		**$4,612,950**	**$14,400,050**	**$19,013,000**
TOTAL		**$11,074,750**	**$22,965,250**	**$34,040,000**

Source: Costs reflect 2015 dollars and should be used for planning purposes only. Engineering/ design and construction costs are inclusive. • If airport owned, hangars are funded at 80%/20% cost share through NPE up to $600,000. The Airport Sponsor is responsible for 100% of the remaining balance. If privately owned, 100% of the cost is private or third party funding.

To supplement the information provided by the phased project list and development cost estimates, phasing graphics have been prepared. These graphics, represented in **Figures 7-1**, **7-2**, and **7-3** indicate the suggested phasing for improvements for both short-term, mid-term, and long-term projects throughout the next 20-years. It is set up as a color coded system to easily identify projects as they are listed and itemized in **Tables 7-1**, **7-2**, and **7-3**.

FIGURE 7-1 | PHASE I (0-5 YEARS) DEVELOPMENT COSTS

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FIGURE 7-2 | PHASE II (6-10 YEARS) DEVELOPMENT COSTS

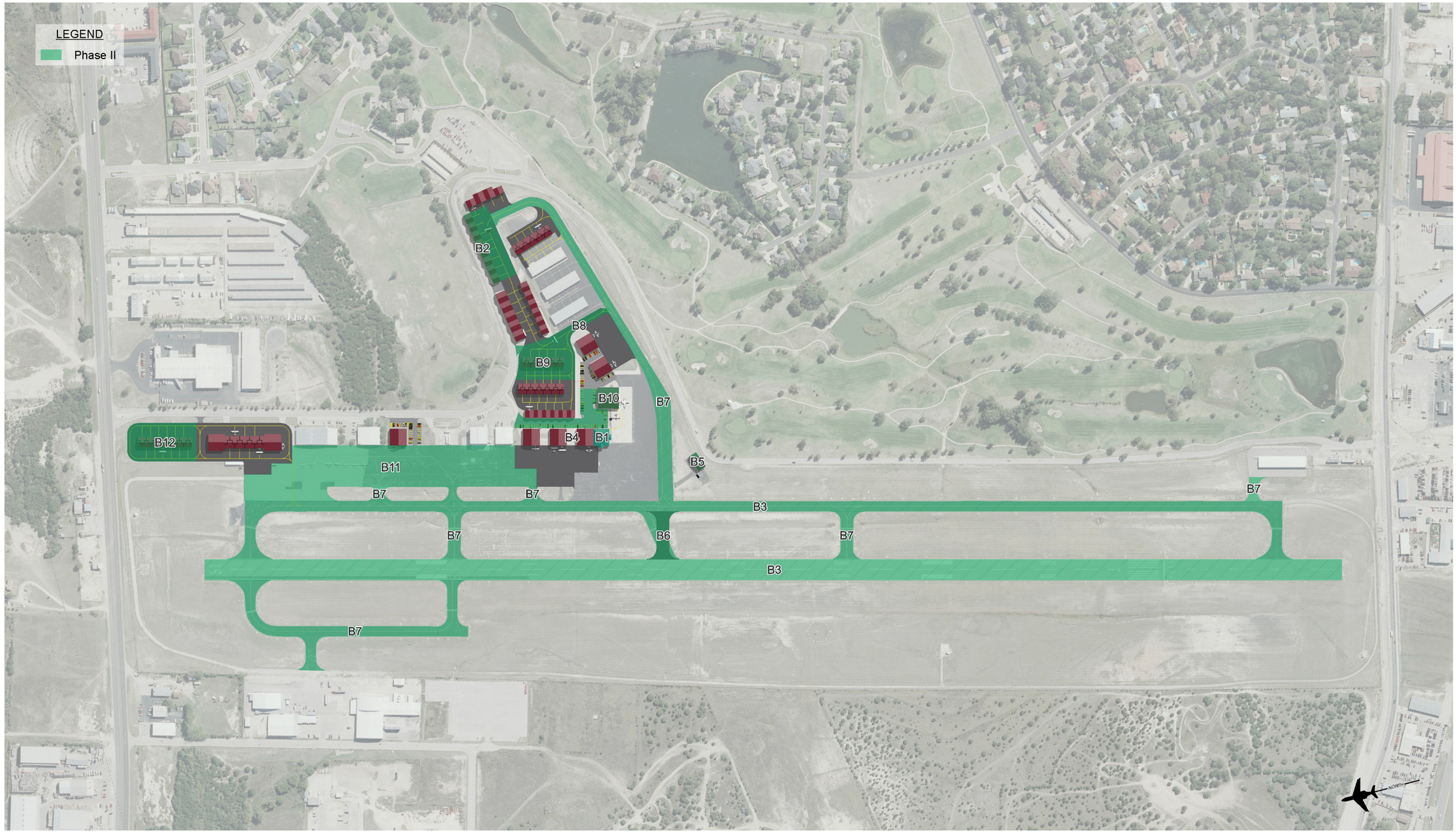

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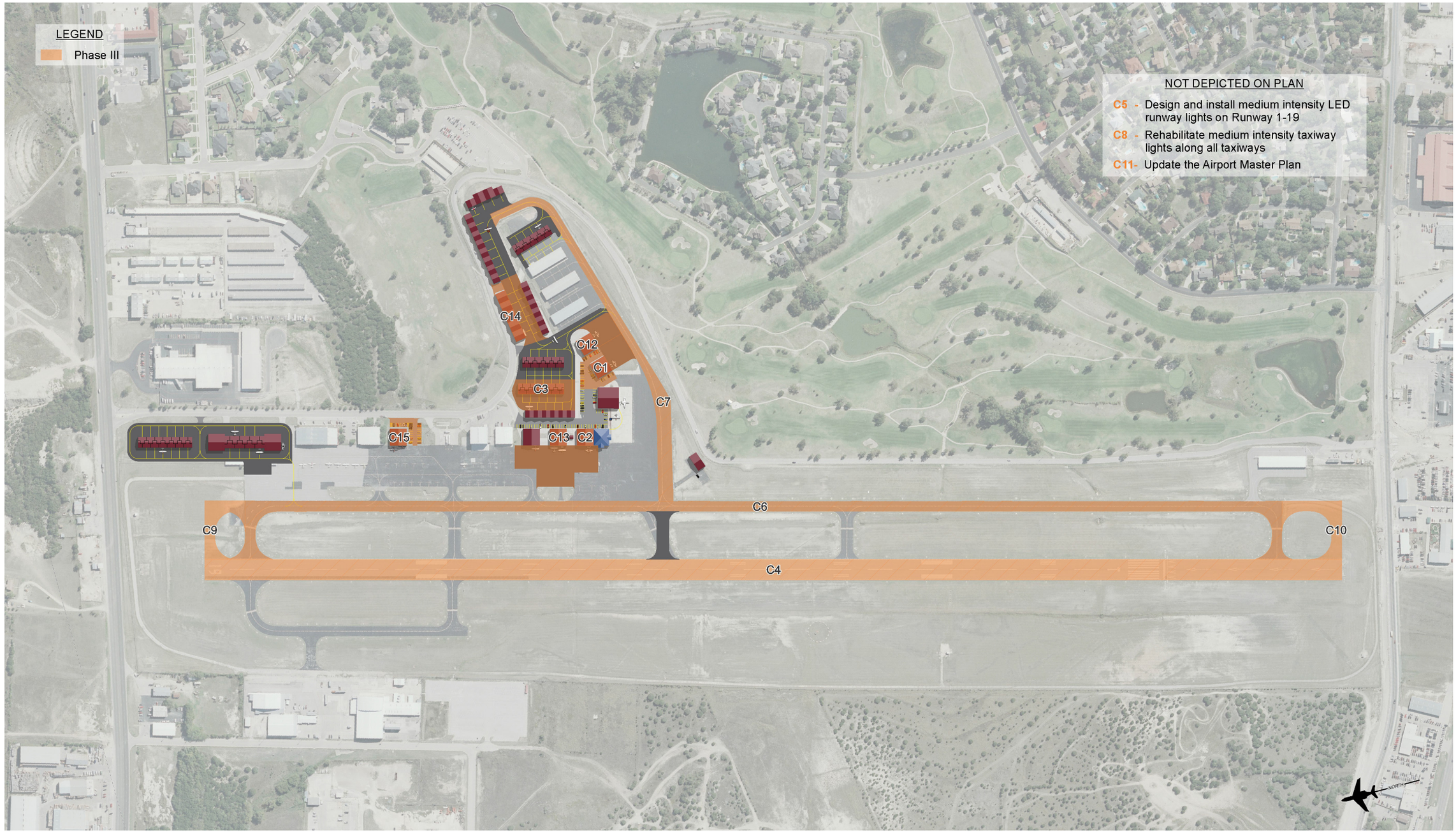
FIGURE 7-3 | PHASE III (11-20 YEARS) DEVELOPMENT COSTS



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CHAPTER EIGHT

Financial Implementation Analysis

FINANCIAL IMPLEMENTATION ANALYSIS

Financial Analysis Objectives

The primary objective of the Financial Implementation Analysis for the Skylark Field (ILE) Airport Master Plan is to evaluate the Airport's capability to fund the Capital Improvement Program (CIP) and to finance Airport operations. The program is planned for implementation through three phases of development including a five-year Phase I period (2015-2019), a five-year Phase II period (2020-2024) and a ten-year Phase III period (2025-2034). The analysis includes development of a detailed Financial Implementation Plan. Objectives for developing the Financial Implementation Plan include presenting the results of the implementation evaluation and providing practical guidelines for matching an appropriate amount and timing of financial sources with the planned use of funds. Detailed schedules of projections for the capital program, operating expenses, operating revenues, and cash flow are provided at the end of **Chapter Eight** in support of the Financial Plan Summary which presents the results of this evaluation.

Overall Approach

Our overall approach for conducting the Financial Implementation Analysis included the following steps:

- Gathering and reviewing key Airport documents related to historical financial results, capital improvement plans, operating budgets, federal and state regulatory requirements, airport practices, and City of Killeen policies;
- Interviewing key airport management personnel to gain an understanding of the existing operating and financial environment, and overall financial management philosophy;
- Reviewing the Master Plan CIP, cost estimates and development schedule anticipated for the planning period, and projecting the overall financial requirements for the program;
- Determining and analyzing the sources and timing of capital funds available to meet the financial requirements for funding the CIP;

- Analyzing historical and budgeted operating expenses, developing operations and maintenance expense assumptions, reviewing assumptions with airport management, and projecting future operating costs for the planning period;
- Analyzing historical and budgeted revenue sources, developing revenue growth assumptions, reviewing assumptions with airport management, and projecting future revenues for the planning period;
- Developing a detailed Financial Implementation Plan that includes capital expenditures balanced with capital funding, operating revenues and expenses that result in positive net revenues, and a projection of overall positive cash flow throughout the twenty-year planning period from 2015 to 2034; and,
- Completing results of the analysis and evaluation in a Financial Plan Summary that provides conclusions regarding the reasonableness of implementing the Airport's Master Plan CIP.

Capital Funding Sources

The Master Plan CIP will be funded by several sources. These sources include Federal Aviation Administration (FAA) Airport Improvement Program (AIP) grants administered by the Texas Department of Transportation (TxDOT) - Aviation Division, TxDOT state aviation grants, private third party financing, Airport cash reserves/net operating cash flow, and other unidentified funding. These capital funding sources are described in the following chapter sections.

FAA AIRPORT IMPROVEMENT PROGRAM STATE BLOCK GRANTS

In Texas, FAA AIP grants for general aviation and reliever airports are administered through TxDOT as part of the FAA State Block Grant Program. Under this Program, the State performs certain AIP administrative functions (such as project prioritization, selection, and monitoring) that are traditionally accomplished by the FAA. The State normally receives one annual block grant based on a formula related to area/population of the state. AIP requirements for airport project eligibility and allowable costs are the same for states receiving a block grant as they would be if the FAA were administering the project. Both AIP entitlement and discretionary grants are administered by TxDOT through the block grant program. Ordinarily, AIP grants fund 90 percent of eligible project costs while the airport sponsor provides the remaining 10 percent in local matching funds.

The FAA classifies certain general aviation, reliever and commercial service airports (those with annual passenger enplanements of 10,000 or less) as Non-Primary Airports for funding purposes. Skylark qualifies as a Non-Primary Airport. Under the AIP reauthorization legislation enacted in 2000 (referred to as AIR-21), Non-Primary Airports receive a non-primary entitlement (NPE) grant equal to 20 percent of the eligible costs of their five year capital improvement program up to a maximum of $150,000 per year. NPEs are available in the year granted and can be carried over for three additional years. This analysis assumes that Skylark will receive the $150,000 maximum annual entitlement throughout the planning period.

In addition to NPEs, Skylark is eligible to receive AIP discretionary grants also administered by TxDOT through the block grant program and awarded in accordance with FAA guidelines. The approval of AIP discretionary funding is based on a project eligibility ranking method the FAA uses to award grants, at their discretion, based on a project's priority and importance within the national airport and airway system. It is reasonable to assume the Airport will continue to receive discretionary funding during the planning period for higher priority, eligible projects, such as runway, taxiway, safety, security, and aircraft apron improvements. However, since the future availability of AIP discretionary grants is not certain until an actual grant is awarded, it should be noted that any future capital projects, which have discretionary funding provided through TxDOT's block grant as a funding source in the implementation plan may need to be delayed until such funds actually become available.

The implementation analysis assumes the Airport will receive AIP block grants through TxDOT (including NPE and discretionary grants) of $2.0 million in Phase I, $6.0 million in Phase II and $19.5 million in Phase III. The implementation analysis further assumes the current AIP funding program will continue to be extended through 2034 and that future program

authorizations will provide substantially similar funding levels as it currently does and as it has historically provided since the program was established in 1982.

FAA FACILITIES AND EQUIPMENT (F&E) FUNDING PROGRAM

Within the FAA's Airways Facilities Division, money is available through the Facilities and Equipment Fund (F&E) to purchase and/or install navigational aids, visual approach guidance indicator systems, approach lighting systems, and other air safety related technical equipment, which includes Air Traffic Control Towers (ATCT). Each F&E development project is evaluated independently through a cost/benefit analysis to determine funding eligibility and priority ranking.

STATE OF TEXAS FUNDING AND PROGRAMMING

In addition to the FAA's AIP, Discretionary Grants and F&E Program, TxDOT, also administers State funded programs for airport planning, maintenance, and construction projects. The funding is derived from a portion of the motor vehicle title and registration fees as part of the State Highway Fund (Fund #6). Each fiscal-year's airport program funding level is appropriated by the State's general appropriations bill as part of the TxDOT budget. The state-local cost sharing for this program is set at 90 percent state and 10 percent local except for terminal building projects, routine maintenance projects, and small capital improvement program items, which are specific funding programs discussed below.

TxDOT Aviation Division Grants

TxDOT sponsors the Routine Airport Maintenance Program (RAMP) that provides partial funding for "lower cost" airside and landside airport projects. Eligibility is determined at TxDOT's discretion. Both maintenance and new construction projects are considered. Airside projects generally have higher priority. RAMP funding is limited to $50,000 per year per airport. The local government match requirement is 50 percent of total project costs up to $100,000 plus any excess cost over $100,000. The implementation analysis assumes that TxDOT RAMP grants will be provided throughout the planning period for several minor projects that are included, but not specifically identified, in the operations and maintenance expense analysis of this chapter.

TxDOT provides other grant programs for general aviation airports that include partial funding support for aircraft hangars, taxilanes and parking aprons owned by the airport, public taxilanes and aprons adjacent to private hangars, automobile parking and entry roads related to general aviation terminals/hangars, automated weather observation systems and aviation fuel facility developments.

Requirements for each additional funding program are provided in the following paragraphs. The implementation analysis assumes that TxDOT will provide state grant funding to support such projects in amounts of approximately $700,000 in Phase I, $1.6 million in Phase II and $2.3 million in Phase III.

Terminal Building Program

- 50/50 cost share for design and construction up to $1,000,000 (furniture/appliances/ fixtures are not included and require 100% local funding);
- 50/50 cost share for parking and entry road construction up to $100,000;
- 90/10 cost share for aircraft parking apron;
- Airport must be publicly owned or leased for 20-years;
- Airport must have an airport manager or designated individual on site on a regular basis;
- Airport must have aviation fuel available for sale to the flying public.

Hangar Program

- 80/20 cost share for locations without pavement, 75/25 cost share for locations with pavement existing;
- Airside needs must first be met;
- Justification for additional hangar space is required;
- Approved ALP designating location must be on file;
- Hangar lease and rate structure must be in place;
- Adoption of airport minimum standards is required.

Fuel Facility Development

- 75/25 cost share;
- Installation of new above ground systems at airports that currently do not have fuel, which are controlled and owned by the airport sponsor;

- Airside needs must first be met;
- Fuel rate and flowage fee standards are required to be in place;
- Approved ALP designating location must be on file; and,
- Adoption of airport minimum standards is required.
- Evidence of compliance with environmental regulations, which includes a Storm Water Pollution Prevention Plan and Spill Prevention Control and Countermeasure Plan both of which are eligible for funding assistance under RAMP.

Automated Weather Observation System (AWOS)

- 75/25 cost share;
- RAMP funds could be used for future maintenance agreements.

PRIVATE THIRD PARTY FINANCING

Many airports use private third party financing when the planned improvements will be primarily used by a private business or other organization and the airport does not want to make such an investment or cannot afford to make such an investment. Projects of this kind typically include private hangars, FBO facilities, rental-car facilities, cargo facilities, exclusive-use aircraft parking aprons, industrial development areas, non-aviation commercial areas, and various other projects. Such projects are usually not eligible for federal or state funding. The implementation analysis assumes that private third parties will provide $2.0 million in funding to support private aircraft hangar developments and related projects in Phase I, $2.6 million in Phase II and $4.5 million in Phase III.

CASH RESERVES/NET OPERATING CASH FLOW

At the beginning of fiscal year 2015, the Airport had accumulated about $627,000 in cash reserves. Primarily due to the overall decline in aviation Jet-A fuel sales during the Phase I planning period, the Airport is projected to generate net operating losses totaling approximately $199,000 for the five-year period. During the Phase II/III time frames, the Airport is projected to generate between $70,000 and $230,000 in net operating revenue per year due to the future construction of aircraft hangar facilities and the rental revenues that will be derived from these developments. Cash reserves and net revenues are projected to be available to support a limited portion of the funding requirements for the capital improvement program. The implementation analysis assumes the Airport's cash reserves/net operating revenues will be used to provide $340,000 in capital funding during Phase I, $370,000 in Phase II and $2.3 million in Phase III.

OTHER UNIDENTIFIED FUNDING

Capital funding sources for the majority of projects listed in the CIP have been identified as the traditional airport capital funding sources described in the preceding sections of this chapter. All the funding sources for Phase I projects have been identified in the capital plan. However, specific funding sources for a number of projects planned for implementation during Phases II and III cannot be completely determined at this time. In Phase II, these include partial funding for the new general aviation terminal, the airfield maintenance equipment building and several City-owned and private third party hangar developments. In Phase III, partial funding for several City-owned and private third party hangar developments cannot be determined. As a result, non-traditional funding sources or other unidentified sources will be needed to finance these projects. The sources of this non-traditional "other" funding are unspecified within the CIP. This "other" funding may potentially include sources such as state/local funding, federal/state/local economic development grants/loans, additional private third party funds, and other possible sources. If other funding sources cannot be identified and obtained in the time frames needed, the projects will have to be delayed until such funding can be identified. Consequently, this source of capital funding has been referenced in the implementation analysis financial plan as "Other Unidentified Funding". The implementation analysis indicates that $1.4 million in "Other Unidentified Funding" is applied to projects during Phase II and about $170,000 in Phase III.

Financial Analysis and Implementation Plan

This analysis, along with the schedules presented at the end of Chapter Eight, provides the results of evaluating the financial reasonableness of implementing the Master Plan CIP during the planning period from 2015 through 2034.

ESTIMATED PROJECT COSTS AND DEVELOPMENT SCHEDULE

The estimated project costs and development schedule is derived from previous results of the Master Plan development analysis. The program for capital expansion and improvement projects is projected for the Phase I planning period from fiscal years ending 2015 through 2019, for the Phase II period from fiscal years ending 2020 through 2024 and for the Phase III period from fiscal years ending 2025 through 2034. For each of these planning periods, **Schedule 8-1** at the end of Chapter Eight presents the capital program for the identified projects.

As shown in **Schedule 8-1**, the total estimated cost of capital projects is $33,851,198 in 2015 dollars. The estimated costs for projects scheduled during the period 2016 through 2034 are adjusted by a three percent annual inflation rate. The resulting total escalated costs are $46,188,141. **Table 8-1** presents a summary of **Schedule 8-1** and provides a comparison of 2015 base year costs with escalated costs adjusted for inflation for each of the planning periods.

TABLE 8-1 | SUMMARY OF 2015 BASE YEAR AND TOTAL ESCALATED COSTS FOR THE MASTER PLAN CAPITAL IMPROVEMENT PROGRAM

Planning Periods	2015 Base Year Costs	Total Escalated Costs
Phase I Projects (2015-2019)	$5,086,000	$5,611,260
Phase II Projects (2020-2024)	9,752,198	11,818,013
Phase III Projects (2025-2034)	19,013,000	28,758,868
Total Project Costs	**$33,851,198**	**$46,188,141**

SOURCE: Leibowitz & Horton AMC analysis

NOTE: Addition errors are due to rounding of calculated amounts.

SOURCES AND USES OF CAPITAL FUNDING

As discussed in previous sections of this analysis, a variety of sources are available for funding capital improvements at the Airport. The funding structure of the capital program depends on many factors, including project eligibility for the various funding sources, the ultimate type and use of facilities to be developed, the amounts and timing of funds available and the priorities for scheduling project completion. For planning purposes, assumptions were made related to the funding source of each capital improvement.

The detailed capital funding analysis is provided in **Schedule 8-2** at the end of Chapter Eight. A summary of the detailed schedule is presented in **Table 8-2** which provides sources of capital funding by type and uses of capital funding by planning period for the capital improvement program.

In the Phase I planning period (2015-2019), it was assumed that City-owned hangar developments would be funded 90 percent with AIP and TxDOT grants and 10 percent local match with airport cash. It was assumed that pavements for private hangar developments would be funded 90 percent with AIP block grants and 10 percent with airport cash while hangar buildings would be privately funded. Other projects in Phase I are funded with a combination of TxDOT aviation grants and airport cash.

In the Phase II planning period (2020-2024), it was assumed that City-owned hangar developments would be funded 90 percent with AIP and TxDOT grants and 10 percent local match

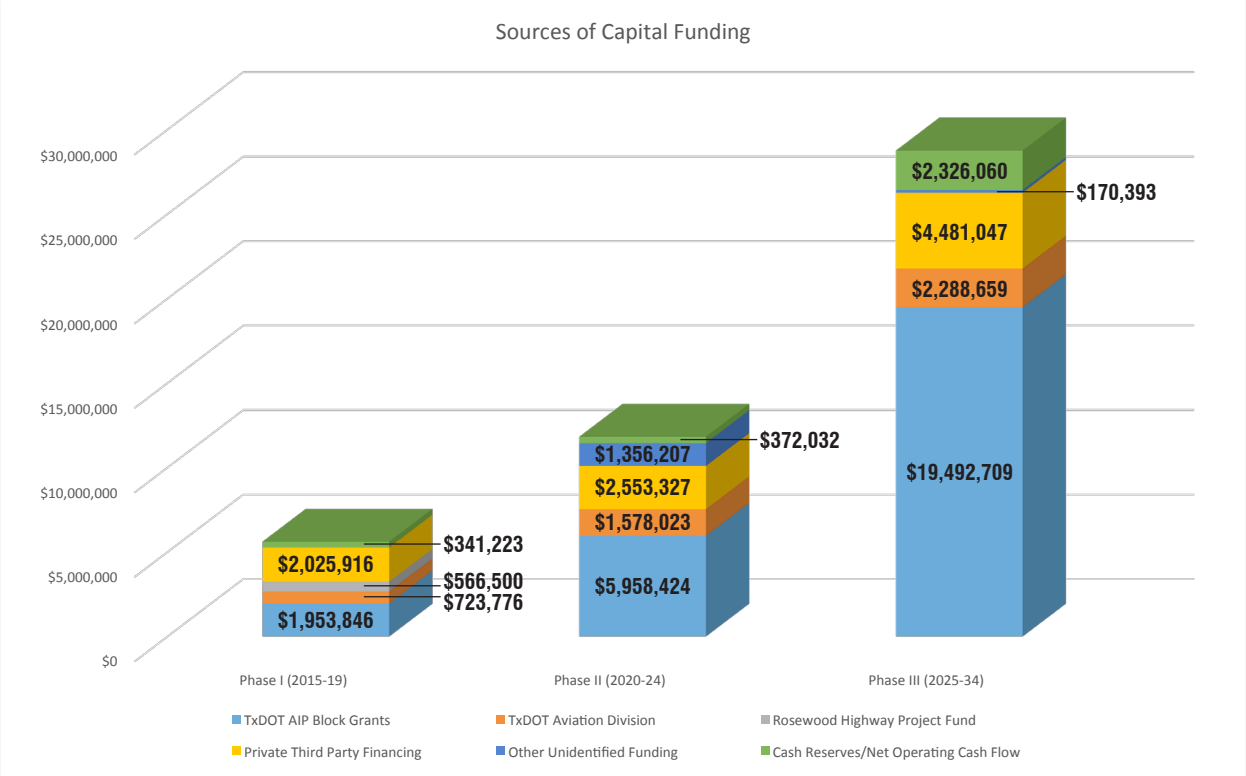
TABLE 8-2 | SUMMARY OF SOURCES AND USES OF CAPITAL FUNDING FOR THE MASTER PLAN CAPITAL IMPROVEMENT PROGRAM

Sources of Capital Funding	Phase I (2015-19)	Phase II (2020-24)	Phase III (2025-34)	Totals
TxDOT AIP Block Grants	$1,953,846	$5,958,424	$19,492,709	$27,404,978
TxDOT Aviation Division	$723,776	$1,578,023	$2,288,659	$4,590,458
Rosewood Highway Project Fund	$566,500	$0	$0	$566,500
Private Third Party Financing	$2,025,916	$2,553,327	$4,481,047	$9,060,290
Other Unidentified Funding	$0	$1,356,207	$170,393	$1,526,600
Cash Reserves/Net Operating Cash Flow	$341,223	$372,032	$2,326,060	$3,039,315
Total Sources of Capital Funding	**$5,611,260**	**$11,818,013**	**$28,758,868**	**$46,188,141**
Uses of Capital Funding				
Runway/Taxiway Improvements	$0	$2,544,845	$13,734,315	$16,279,159
Aircraft Apron Improvements	$0	$315,076	$0	$315,076
City Hangars & Related Improvements	$1,187,794	$2,652,697	$6,245,483	$10,085,975
Private 3rd Party Hangars & Related Improvements	$3,026,493	$3,793,030	$6,495,060	$13,314,584
Other General Aviation Facility Improvements	$830,473	$1,288,416	$0	$2,118,888
Navigational Aids	$566,500	$0	$1,709,226	$2,275,726
Other Improvements	$0	$1,223,949	$574,784	$1,798,733
Total Uses of Capital Funding	**$5,611,260**	**$11,818,013**	**$28,758,868**	**$46,188,141**

SOURCE: Leibowitz & Horton AMC analysis

NOTE: Addition errors are due to rounding of calculated amounts.

FIGURE 8-1 | SOURCES OF CAPITAL FUNDING



with airport cash. It was assumed that pavements for private hangar developments would be funded 90 percent with AIP block grants and 10 percent with airport cash while hangar buildings would be privately funded. It was assumed that airfield pavement and related improvements would be funded 90 percent with AIP grants and 10 percent airport cash. For a number of projects in Phase II where airport cash is unavailable to meet local match requirements, funding was completed with "other unidentified funding" in the analysis - if sufficient actual funding cannot be identified during the Phase II time frame, projects will have to be delayed until funding is identified.

In the Phase III planning period (2025-2034), it was assumed that City-owned hangar developments would be funded 90 percent with AIP and TxDOT grants and 10 percent local match with airport cash. It was assumed that pavements for private hangar developments would be funded 90 percent with AIP block grants and 10 percent with airport cash while hangar buildings would be privately funded. It was assumed that airfield pavement and related improvements would be funded 90 percent with AIP grants and 10 percent airport cash. Local match funding for some of the private hangar pavement projects was not available from airport cash so the implementation analysis indicates "other unidentified funding" as the source for these projects - if this funding cannot be identified in the amounts and time frames needed, these projects will have to be delayed until funding is identified.

PROJECTED OPERATIONS AND MAINTENANCE EXPENSES

Schedule 8-3 presents actual, estimated, and projected operating expenses for the Airport from year 2012 through 2034. Actual amounts for 2012 through 2015 and estimates for 2016 provide a comparison with expenses that are projected for the period 2017 through 2034. Operations and maintenance expense projections are based on the Airport's current budget, the anticipated impacts of inflation, aviation traffic increases, facility improvements, management's near term estimates, and tenant leasing policies which directly affect operating expenses.

Operations and Maintenance Expense Projection Assumptions

Operations and maintenance expense growth assumptions, as reflected in **Schedule 8-3**, were developed to project the Airport's operating expenses during the planning period. The following growth assumptions were applied for the 2017-2034 projection for the following expense categories:

- **Cost of Goods Sold for Aviation Fuel & Products:** Projections are based management estimates through 2020 and a three percent annual growth rate assumption thereafter. Future hangar developments (both City-owned and private) are anticipated to increase based aircraft along with additional fuel and other product sales. The cost of additional fuel sales is netted against additional revenues in **Schedule 8-4** (Actual, Estimated and Projected Operating Revenues) to project the additional margin on sales generated by the anticipated growth in based aircraft.
- **Operating Expenses:** Operating expenses include salaries, employee benefits, supplies, maintenance, repairs, support services, year-end salary accruals, and insurance. Projections are based on management estimates through 2020 with a three percent annual growth rate thereafter.
- **New City Hangar Operating Expenses:** Additional operating expenses for new City-owned hangars are assumed to be $1,500 per 8-unit building one year after construction with a three percent annual inflation growth thereafter.
- **Minor Capital Outlays:** Minor capital outlays include information technology computer expenses, and other expenses. Projections are based on management estimates through 2020 with a three percent annual growth rate thereafter.

Projection of Operations and Maintenance Expenses

The projection of operations and maintenance expenses is provided in **Schedule 8-3** at the end of Chapter Eight. As shown in the schedule, total expenses are expected to grow from $491,552 in 2015 to $549,803 in 2019 with a total of $2,653,685 during the five-year Phase I period. During the five-year Phase II period, expenses are projected to total $2,953,997 and during the ten-year Phase III period, expenses are projected to total $7,427,731. The annual growth rate of operating expenses during the planning period is 2.9 percent.

PROJECTED OPERATING REVENUES

Schedule 8-4 presents actual, estimated, and projected operating revenues for the Airport from 2012 through 2034. Actual amounts for 2012 through 2015 and estimates for 2016 provide a comparison with revenues that are projected for the period 2017 through 2034. Revenue projections are based on the Airport's current budget, the anticipated impacts of inflation, aviation traffic increases, existing facility improvements, new property developments and redevelopments, management estimates, property lease terms and rental rate escalations, anticipated lease extensions, and lease renewals.

Operating Revenue Projection Assumptions

Operating revenue growth assumptions, as reflected in **Schedule 8-4**, were developed to project the Airport's operating revenues during the planning period. The following growth assumptions were applied for the 2017-2034 projection for the various revenue categories:

- **Aviation Fuel and Operating Supply Sales:** Projections are based on management estimates through 2020 with three percent annual growth thereafter (does not reflect additional sales from anticipated growth in based aircraft due to new hangar construction).
- **Margin on Additional Fuel Sales:** Projections are based on management's estimates for the additional sales volume per aircraft based in newly developed hangars and the anticipated gross margin on sales for 100LL and Jet-A sales. Additional sales are projected to occur one year after hangar construction with three percent annual inflation growth thereafter.
- **Operating Revenues:** Operating revenues include fixed base operations rent, existing hangars & tie downs, Central Texas College (CTC) land rent, airport use fees, and miscellaneous receipts. Projections are based on management estimates through 2020 with three percent annual growth thereafter.
- **New Hangar Revenues:** New hangar revenues include hangar rentals for City-owned hangars and ground rent for private hangars. Rent for newly developed City-owned

hangars is based on the current average rental rate per based aircraft times the projected occupancy of each new hangar. Ground rent for newly developed private hangars is based on the current average rental rate per square foot per year times the projected size of each new hangar. Additional rentals are projected to occur one year after hangar construction with three percent annual inflation growth thereafter.

- **Other Revenues:** Other revenue projections for interest earned are based on management estimates through 2020 with no growth thereafter. Other revenue projections for TxDOT RAMP grants are based on management estimates through 2020 with three percent annual growth thereafter.

Projection of Operating Revenues

The projection of operating revenues is provided in **Schedule 8-4** at the end of Chapter Eight. As shown in the schedule, total revenues are expected to grow from $449,467 in 2015 to $526,533 projected for 2019 with a total of $2,451,544 during the five-year Phase I period. During the five-year Phase II period, revenues are projected to total $3,307,936 and during the ten-year Phase III period, revenues are projected to total $9,718,713. The overall annual growth rate for revenues is 5.2 percent during the planning period.

FINANCIAL PLAN SUMMARY

The Financial Plan Summary presented in **Schedule 8-5** at the end of Chapter Eight includes a Capital Cash Flow section that presents a summary of projected capital funding (from Schedule 8-2) and planned capital expenditures (from Schedule 8-1) with the cash flow that results from implementing the Master Plan Capital Improvement Program. **Schedule 8-5** also includes an Operating Cash Flow section that summarizes totals for operating revenues (from Schedule 8-4) and operating expenses (from Schedule 8-3) with the addition of cash reserve balances to provide the cash flow that results from these activities.

In **Schedule 8-1** of the Financial Implementation Analysis, practical approaches were provided for scheduling capital expenditures to match the availability of capital funding. **Schedule 8-2** provided practical approaches for matching specific capital funding sources with each of the identified projects. The Operating Cash Flow and Capital Cash Flow sections of **Schedule 8-5** indicate that the projections of annual cash flow and ending cash reserve balances are positive for every year throughout the twenty-year planning period, subject to key assumptions documented in this analysis. Based on the assumptions underlying the Financial Implementation Analysis summarized in **Schedule 8-5**, implementation of projects in the Master Plan CIP that are scheduled for development during the Phase I planning period are financially reasonable. During Phases II and III, capital project implementation is financially possible for projects that have all funding sources specifically identified.

Key assumptions supporting the achievability of the Master Plan CIP relate to AIP discretionary funding and "other unidentified funding" sources. Implementation of future capital projects that have AIP discretionary grants provided through TxDOT's block grant as a funding source may need to be delayed until it can be confirmed that such grants are actually available. Both Phases II and III include runway and taxiway projects that will require significant AIP discretionary funding - although this funding is not guaranteed, airfield pavements generally have a high priority for receiving such grants. Phases II and III also contain a number of lower priority projects that are partially funded with sources that cannot be currently identified. If specific funding sources cannot be identified and obtained in the time frames needed, these projects will need to be delayed until such funding can be identified.

Additionally, the Financial Implementation Analysis for Skylark relies on achievement of the Master Plan forecast of aviation activity including aircraft operations, based aircraft, and aviation fuel flowage. Actual aviation activity may temporarily vary from the projected levels without a significant adverse impact on the capital program. If decreased activity levels occur and persist, implementation of some of the proposed projects may not be financially feasible. If airport operations exceed those predicted by the forecast of demand some of the higher value projects could be more aggressively pursued or moved up in the development schedule.

FINANCIAL ANALYSIS SCHEDULES

Schedules 8-1 through **8-5** provide the detailed financial analysis for implementation of the Master Plan CIP. These schedules are provided on the following pages.

SKYLARK FIELD AIRPORT (ILE)
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Schedule 8-1

Master Plan - Financial Implementation Analysis
Estimated Project Costs and Development Schedule

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Capital Improvement Program	Funding Schedule: Phase I FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	Phase II FY 2020-24	Phase III FY 2025-34	Total Funding
Funds Used for Capital Improvement Projects									
TxDOT AIP Block Grants	$0	$0	$0	$1,053,326	$900,520	$1,953,846	$5,958,424	$19,492,709	$27,404,978
TxDOT Aviation Division Grants	0	0	0	723,776	0	723,776	1,578,023	2,288,659	4,590,458
Rosewood Highway Project Fund	0	566,500	0	0	0	566,500	0	0	566,500
Private 3rd Party Funding	0	0	0	0	2,025,916	2,025,916	2,553,327	4,481,047	9,060,290
Other Unidentified Funding	0	0	0	0	0	0	1,356,207	170,393	1,526,600
Net Operating Cash Flow	(42,085)	(50,324)	(40,852)	(43,610)	(22,270)	(199,141)	359,249	2,304,271	2,464,379
Funds Available Current Year	(42,085)	516,176	(40,852)	1,733,492	2,904,165	5,070,896	11,805,229	28,737,079	45,613,205
Beginning Cash Balance/Funds Carried Over from Prior Year	626,555	584,470	534,146	493,294	208,519	626,555	86,191	73,408	626,555
Funds Used Current Year	0	(566,500)	0	(2,018,267)	(3,026,493)	(5,611,260)	(11,818,013)	(28,758,868)	(46,188,141)
Funds Carried Over to Next Year	$584,470	$534,146	$493,294	$208,519	$86,191	$86,191	$73,408	$51,619	$51,619

	CITY Hangars / P3 Hangars / Capital Project Description	2015 Base Year Costs	Estimated Project Costs and Development Schedule: Phase I FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	Phase II FY 2020-24	Phase III FY 2525-34	Total Escalated Costs
Phase I Projects (2015-2019)											
-	-	$0	$0					$0			$0
-	-	0	0					0			0
	Total Capital Projects 2015	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
A1	FAA MOA; Glideslope removal; LPV GPS R/W 01; MALSR removal; R/W 01 Localizer Approach Revisions	450,000		463,500				463,500			463,500
A2	Design and install runway end identifier lights (REIL) on both ends of Runway 1-19	100,000		103,000				103,000			103,000
	Total Capital Projects 2016	$550,000	$0	$566,500	$0	$0	$0	$566,500	$0	$0	$566,500
-	-	0			0			0			0
-	-	0			0			0			0
	Total Capital Projects 2017	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
A3a	Design and construct new 8-unit T-hangar east of current T-hangars (Area 3)	741,000				809,711		809,711			809,711
A3b	Design and construct associated taxilane/apron east of current T-hangars (Area 3)	346,000				378,084		378,084			378,084
A4	Terminal Area Drainage Improvement: install box culvert in ditch behind T-hangars 10-11 (Area 3)	420,000				458,945		458,945			458,945
A5	Civil & electrical infrastructure improvements for general aviation hangar development (Area 3)	250,000				273,182		273,182			273,182
A6	Removal/demolition of #1525 former commercial terminal building (Area 3)	90,000				98,345		98,345			98,345
	Total Capital Projects 2018	$1,847,000	$0	$0	$0	$2,018,267	$0	$2,018,267	$0	$0	$2,018,267
A7a	Design and construct new 7-unit T-hangar (192' x 58') with jet pods (80' x 80') on each end at north terminal end (Area 1), includes demolition of #1311 original commercial terminal building	1,800,000					2,025,916	2,025,916			2,025,916
A7b	Design and construct associated taxilane and apron in support of new T-hangars and Box Hangars (Area 1)	889,000					1,000,577	1,000,577			1,000,577
	Total Capital Projects 2019	$2,689,000	$0	$0	$0	$0	$3,026,493	$3,026,493	$0	$0	$3,026,493
	Total Phase I Project Costs	$5,086,000	$0	$566,500	$0	$2,018,267	$3,026,493	$5,611,260	$0	$0	$5,611,260

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Schedule 8-1

Master Plan - Financial Implementation Analysis
Estimated Project Costs and Development Schedule

14-Apr-16

Capital Improvement Program	Funding Schedule: Phase I FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	Phase II FY 2020-24	Phase III FY 2025-34	Total Funding
Funds Used for Capital Improvement Projects									
TxDOT AIP Block Grants	$0	$0	$0	$1,053,326	$900,520	$1,953,846	$5,958,424	$19,492,709	$27,404,978
TxDOT Aviation Division Grants	0	0	0	723,776	0	723,776	1,578,023	2,288,659	4,590,458
Rosewood Highway Project Fund	0	566,500	0	0	0	566,500	0	0	566,500
Private 3rd Party Funding	0	0	0	0	2,025,916	2,025,916	2,553,327	4,481,047	9,060,290
Other Unidentified Funding	0	0	0	0	0	0	1,356,207	170,393	1,526,600
Net Operating Cash Flow	(42,085)	(50,324)	(40,852)	(43,610)	(22,270)	(199,141)	359,249	2,304,271	2,464,379
Funds Available Current Year	(42,085)	516,176	(40,852)	1,733,492	2,904,165	5,070,896	11,805,229	28,737,079	45,613,205
Beginning Cash Balance/Funds Carried Over from Prior Year	626,555	584,470	534,146	493,294	208,519	626,555	86,191	73,408	626,555
Funds Used Current Year	0	(566,500)	0	(2,018,267)	(3,026,493)	(5,611,260)	(11,818,013)	(28,758,868)	(46,188,141)
Funds Carried Over to Next Year	$584,470	$534,146	$493,294	$208,519	$86,191	$86,191	$73,408	$51,619	$51,619

Capital Project Description (CITY Hangars / P3 Hangars)	2015 Base Year Costs	Estimated Project Costs and Development Schedule: Phase I FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	Phase II FY 2020-24	Phase III FY 2525-34	Total Escalated Costs
Phase II Projects (2020-2024)										
B1a Design and construct new general aviation terminal bldg (Area 3) (includes demolition of #1523 existing GA terminal bldg)	$825,198						$0	$1,000,000		$1,000,000
B1b Design and construct new general aviation terminal bldg (Area 3) auto access and parking	238,000						0	288,416		288,416
B2a Remove #1603 shade hangar in northeast part of terminal area (Area 3) and replace with series of 8 small box hangars (45' x 35') fronting to the south	895,000						0	1,084,589		1,084,589
B2b Design and construct associated taxilane/apron for series of 8 small box hangars (45' x 35')	180,000						0	218,130		218,130
B3a Rehab Runway 1-19 (sealcoat and remarking)	760,000						0	920,991		920,991
B3b Rehab Taxiway B (sealcoat and remarking)	230,000						0	278,721		278,721
B4 Remove and replace airfield electrical vault (#1519) and installation of new back-up generator system	710,000						0	860,400		860,400
B5 Design and construct new airfield maintenance equipment building (Area 3)	300,000						0	363,549		363,549
B6 Redesign and construct T/W D to meet FAA design criteria and align with Taxiway A	540,000						0	654,389		654,389
B7 Rehabilitate Taxiways A, C, E, F, Y, G, K, and J (sealcoat and remarking)	280,000						0	339,313		339,313
B8 Design and construct new access taxilane from Taxiway A north into the former commercial terminal building parking area to be redeveloped with new T-hangars and box/ common hangars	290,000						0	351,431		351,431

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Schedule 8-1

Master Plan - Financial Implementation Analysis
Estimated Project Costs and Development Schedule

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Capital Improvement Program	Funding Schedule								
	Phase I						Phase II	Phase III	Total
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2025-34	Funding
Funds Used for Capital Improvement Projects									
TxDOT AIP Block Grants	$0	$0	$0	$1,053,326	$900,520	$1,953,846	$5,958,424	$19,492,709	$27,404,978
TxDOT Aviation Division Grants	0	0	0	723,776	0	723,776	1,578,023	2,288,659	4,590,458
Rosewood Highway Project Fund	0	566,500	0	0	0	566,500	0	0	566,500
Private 3rd Party Funding	0	0	0	0	2,025,916	2,025,916	2,553,327	4,481,047	9,060,290
Other Unidentified Funding	0	0	0	0	0	0	1,356,207	170,393	1,526,600
Net Operating Cash Flow	(42,085)	(50,324)	(40,852)	(43,610)	(22,270)	(199,141)	359,249	2,304,271	2,464,379
Funds Available Current Year	(42,085)	516,176	(40,852)	1,733,492	2,904,165	5,070,896	11,805,229	28,737,079	45,613,205
Beginning Cash Balance/Funds Carried Over from Prior Year	626,555	584,470	534,146	493,294	208,519	626,555	86,191	73,408	626,555
Funds Used Current Year	0	(566,500)	0	(2,018,267)	(3,026,493)	(5,611,260)	(11,818,013)	(28,758,868)	(46,188,141)
Funds Carried Over to Next Year	$584,470	$534,146	$493,294	$208,519	$86,191	$86,191	$73,408	$51,619	$51,619

	CITY Hangars / **P3 Hangars** Capital Project Description	2015 Base Year Costs	Estimated Project Costs and Development Schedule								
			Phase I						Phase II	Phase III	Total Escalated
			FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2525-34	Costs
B9a	Design and construct new 8-unit T-hangar on former commercial terminal building parking lot	730,000						0	884,636		884,636
B9b	Design and construct taxilane/apron on former commercial terminal building parking lot in support of new 8-unit T-hangar	384,000						0	465,343		465,343
B10a	Design and construct new box hangar (100' x 100') on former commercial terminal building site	993,000						0	1,203,348		1,203,348
B10b	Design and construct apron associated with new box hangar (100' x 100')	97,000						0	117,548		117,548
B10c	Design and construct auto access/parking improvements associated with new box hangar (100' x 100')	190,000						0	230,248		230,248
B11	Rehabilitate apron (sealcoat and remarking) between Taxiway B, Taxiway K, Central Texas College hangars and the northern apron end	260,000						0	315,076		315,076
B12a	Design and construct new 12-unit T-hangar (300' x 50') (Area 1)	943,000						0	1,142,756		1,142,756
B12b	Design and construct associated taxilane/apron for new 12 -unit T-hangar (Area 1)	907,000						0	1,099,130		1,099,130
	Total Phase II Project Costs	$9,752,198	$0	$0	$0	$0	$0	$0	$11,818,013	$0	$11,818,013

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Capital Improvement Program	Funding Schedule								
	Phase I						Phase II	Phase III	Total
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2025-34	Funding
Funds Used for Capital Improvement Projects									
TxDOT AIP Block Grants	$0	$0	$0	$1,053,326	$900,520	$1,953,846	$5,958,424	$19,492,709	$27,404,978
TxDOT Aviation Division Grants	0	0	0	723,776	0	723,776	1,578,023	2,288,659	4,590,458
Rosewood Highway Project Fund	0	566,500	0	0	0	566,500	0	0	566,500
Private 3rd Party Funding	0	0	0	0	2,025,916	2,025,916	2,553,327	4,481,047	9,060,290
Other Unidentified Funding	0	0	0	0	0	0	1,356,207	170,393	1,526,600
Net Operating Cash Flow	(42,085)	(50,324)	(40,852)	(43,610)	(22,270)	(199,141)	359,249	2,304,271	2,464,379
Funds Available Current Year	(42,085)	516,176	(40,852)	1,733,492	2,904,165	5,070,896	11,805,229	28,737,079	45,613,205
Beginning Cash Balance/Funds Carried Over from Prior Year	626,555	584,470	534,146	493,294	208,519	626,555	86,191	73,408	626,555
Funds Used Current Year	0	(566,500)	0	(2,018,267)	(3,026,493)	(5,611,260)	(11,818,013)	(28,758,868)	(46,188,141)
Funds Carried Over to Next Year	$584,470	$534,146	$493,294	$208,519	$86,191	$86,191	$73,408	$51,619	$51,619

	CITY Hangars P3 Hangars	2015	Estimated Project Costs and Development Schedule								
			Phase I						Phase II	Phase III	Total
	Capital Project Description	Base Year Costs	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2525-34	Escalated Costs
Phase III Projects (2025-2034)											
C1a	Design and construct new box hangar (80' x 80') fronting onto T/W A east of former commercial terminal building (Area 3)	620,000						$0		$937,806	$937,806
C1b	Design and construct apron associated with new box hangar (80' x 80') (Area 3)	280,000						0		423,525	423,525
C1c	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 3)	190,000						0		287,392	287,392
C2a	Design and construct new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building (includes demolition of #1517 aircraft rescue and firefighting station)	645,000						0		975,620	975,620
C2b	Design and construct apron associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building	308,000						0		465,878	465,878
C2c	Design and construct auto access and parking associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building	71,000						0		107,394	107,394
C3a	Design and construct new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3)	890,000						0		1,346,205	1,346,205
C3b	Design and construct taxilane/apron associated with new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3)	544,000						0		822,849	822,849
C4	Runway 1-19 structural overlay/reconstruction	4,820,000						0		7,290,682	7,290,682
C5	Design and install medium intensity LED runway lights on Runway 1-19	360,000						0		544,532	544,532
C6	Taxiway B structural overlay/reconstruction	2,270,000						0		3,433,579	3,433,579
C7	Taxiway A mill and overlay/reconstruction	560,000						0		847,050	847,050
C8	Rehab medium intensity taxiway lights along all taxiways	770,000						0		1,164,694	1,164,694

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Master Plan - Financial Implementation Analysis
Estimated Project Costs and Development Schedule

14-Apr-16

Capital Improvement Program	Funding Schedule								
	Phase I						Phase II	Phase III	Total
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2025-34	Funding
Funds Used for Capital Improvement Projects									
TxDOT AIP Block Grants	$0	$0	$0	$1,053,326	$900,520	$1,953,846	$5,958,424	$19,492,709	$27,404,978
TxDOT Aviation Division Grants	0	0	0	723,776	0	723,776	1,578,023	2,288,659	4,590,458
Rosewood Highway Project Fund	0	566,500	0	0	0	566,500	0	0	566,500
Private 3rd Party Funding	0	0	0	0	2,025,916	2,025,916	2,553,327	4,481,047	9,060,290
Other Unidentified Funding	0	0	0	0	0	0	1,356,207	170,393	1,526,600
Net Operating Cash Flow	(42,085)	(50,324)	(40,852)	(43,610)	(22,270)	(199,141)	359,249	2,304,271	2,464,379
Funds Available Current Year	(42,085)	516,176	(40,852)	1,733,492	2,904,165	5,070,896	11,805,229	28,737,079	45,613,205
Beginning Cash Balance/Funds Carried Over from Prior Year	626,555	584,470	534,146	493,294	208,519	626,555	86,191	73,408	626,555
Funds Used Current Year	0	(566,500)	0	(2,018,267)	(3,026,493)	(5,611,260)	(11,818,013)	(28,758,868)	(46,188,141)
Funds Carried Over to Next Year	$584,470	$534,146	$493,294	$208,519	$86,191	$86,191	$73,408	$51,619	$51,619

	CITY Hangars P3 Hangars Capital Project Description	2015 Base Year Costs	Estimated Project Costs and Development Schedule								
			Phase I						Phase II	Phase III	Total Escalated
			FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2525-34	Costs
C9	Extend Taxiway B north to the Runway 19 end	660,000						0		998,309	998,309
C10	Extend Taxiway B south to the Runway 01 end	770,000						0		1,164,694	1,164,694
C11	Update the Airport Master Plan	380,000						0		574,784	574,784
C12a	Design and construct new box hangar (80' x 80') fronting onto T/W A east of former commercial terminal building (Area 3)	660,000						0		998,309	998,309
C12b	Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 3)	335,000						0		506,718	506,718
C12c	Design & construct auto access and parking associated with new box hangar (80' x 80') (Area 3)	105,000						0		158,822	158,822
C13a	Design and construct new 80' x 80' common/box hangars	650,000						0		983,183	983,183
C13b	Design and construct taxilane/apron associated with new box hangar (80' x 80')	337,000						0		509,743	509,743
C13c	Design and construct auto access and parking associated with new box hangar (80' x 80')	65,000						0		98,318	98,318
C14a	Design and construct series of five 50' x 50' common/box hangars on former commercial terminal east overflow parking area (Area 3)	1,185,000						0		1,792,419	1,792,419
C14b	Design and construct taxilane/apron associated with series of 50' x 50' box hangars	486,000						0		735,119	735,119
C15a	New 80' x 80' common/box hangar (Area 2)	650,000						0		983,183	983,183
C15b	Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 2)	337,000						0		509,743	509,743
C15c	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 2)	65,000						0		98,318	98,318
	Total Phase III Project Costs	$19,013,000	$0	$0	$0	$0	$0	$0	$0	$28,758,868	$28,758,868
Total Project Costs		$33,851,198	$0	$566,500	$0	$2,018,267	$3,026,493	$5,611,260	$11,818,013	$28,758,868	$46,188,141

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Schedule 8-2

Master Plan - Financial Implementation Analysis
Projected Capital Funding Sources

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	CITY Hangars P3 Hangars Capital Improvement Projects	Total Escalated Costs	TxDOT AIP Block Grants	TxDOT Aviation Div Grants	Rosewood Highway Project Fund	Private 3rd Party Funding	Other Unidentified Funding	Cash Reserves/ Net Revs	Total Funding
Phase I Projects (2015-2019)									
-	-	$0						$0	$0
-	-	0						0	0
	Totals for 2015	$0	$0	$0	$0	$0	$0	$0	$0
A1	FAA MOA; Glideslope removal; LPV GPS R/W 01; MALSR removal; R/W 01 Localizer Approach Revisions	463,500			463,500			0	463,500
A2	Design and install runway end identifier lights (REIL) on both ends of Runway 1-19	103,000			103,000			0	103,000
	Totals for 2016	$566,500	$0	$0	$566,500	$0	$0	$0	$566,500
-	-	0		0				0	0
-	-	0		0				0	0
	Totals for 2017	$0	$0	$0	$0	$0	$0	$0	$0
A3a	Design and construct new 8-unit T-hangar east of current T -hangars (Area 3)	809,711	300,000	428,740				80,971	809,711
A3b	Design and construct associated taxilane/apron east of current T-hangars (Area 3)	378,084	340,275					37,808	378,084
A4	Terminal Area Drainage Improvement: install box culvert in ditch behind T-hangars 10-11 (Area 3)	458,945	413,051					45,895	458,945
A5	Civil & electrical infrastructure improvements for general aviation hangar development (Area 3)	273,182		245,864				27,318	273,182
A6	Removal/demolition of #1525 former commercial terminal building (Area 3)	98,345		49,173				49,173	98,345
	Totals for 2018	$2,018,267	$1,053,326	$723,776	$0	$0	$0	$241,165	$2,018,267
A7a	Design and construct new 7-unit T-hangar (192' x 58') with jet pods (80' x 80') on each end at north terminal end (Area 1), includes demolition of #1311 original commercial terminal building	2,025,916				2,025,916		0	2,025,916
A7b	Design and construct associated taxilane and apron in support of new T-hangars and Box Hangars (Area 1)	1,000,577	900,520					100,058	1,000,577
	Totals for 2019	$3,026,493	$900,520	$0	$0	$2,025,916	$0	$100,058	$3,026,493
	Total Phase I Project Costs	$5,611,260	$1,953,846	$723,776	$566,500	$2,025,916	$0	$341,223	$5,611,260

SKYLARK FIELD AIRPORT (ILE)
Killeen, Texas

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Schedule 8-2

Master Plan - Financial Implementation Analysis
Projected Capital Funding Sources

14-Apr-16

	CITY Hangars P3 Hangars Capital Improvement Projects	Total Escalated Costs	TxDOT AIP Block Grants	TxDOT Aviation Div Grants	Rosewood Highway Project Fund	Private 3rd Party Funding	Other Unidentified Funding	Cash Reserves/ Net Revs	Total Funding
Phase II Projects (2020-2024)									
B1a	Design and construct new general aviation terminal bldg (Area 3) (includes demolition of #1523 existing GA terminal bldg)	$1,000,000		$500,000			$500,000	$0	$1,000,000
B1b	Design and construct new general aviation terminal bldg (Area 3) auto access and parking	288,416		144,208			144,208	0	288,416
B2a	Remove #1603 shade hangar in northeast part of terminal area (Area 3) and replace with series of 8 small box hangars (45' x 35') fronting to the south	1,084,589	600,000	376,130			108,459	0	1,084,589
B2b	Design and construct associated taxilane/apron for series of 8 small box hangars (45' x 35')	218,130	196,317				21,813	0	218,130
B3a	Rehab Runway 1-19 (sealcoat and remarking)	920,991	828,892					92,099	920,991
B3b	Rehab Taxiway B (sealcoat and remarking)	278,721	250,849					27,872	278,721
B4	Remove and replace airfield electrical vault (#1519) and installation of new back-up generator system	860,400	774,360					86,040	860,400
B5	Design and construct new airfield maintenance equipment building (Area 3)	363,549		50,000			313,549	0	363,549
B6	Redesign and construct T/W D to meet FAA design criteria and align with Taxiway A	654,389	588,950					65,439	654,389
B7	Rehabilitate Taxiways A, C, E, F, Y, G, K, and J (sealcoat and remarking)	339,313	305,381					33,931	339,313
B8	Design and construct new access taxilane from Taxiway A north into the former commercial terminal building parking area to be redeveloped with new T-hangars and box/ common hangars	351,431	316,288					35,143	351,431
B9a	Design and construct new 8-unit T-hangar on former commercial terminal building parking lot	884,636	300,000	496,173			88,464	0	884,636
B9b	Design and construct taxilane/apron on former commercial terminal building parking lot in support of new 8-unit T-hangar	465,343	418,809				46,534	0	465,343
B10a	Design and construct new box hangar (100' x 100') on former commercial terminal building site	1,203,348				1,203,348		0	1,203,348
B10b	Design and construct apron associated with new box hangar (100' x 100')	117,548	105,793				11,755	0	117,548
B10c	Design and construct auto access/parking improvements associated with new box hangar (100' x 100')	230,248		11,512		207,223	11,512	0	230,248
B11	Rehabilitate apron (sealcoat and remarking) between Taxiway B, Taxiway K, Central Texas College hangars and the northern apron end	315,076	283,568					31,508	315,076
B12a	Design and construct new 12-unit T-hangar (300' x 50') (Area 1)	1,142,756				1,142,756		0	1,142,756
B12b	Design and construct associated taxilane/apron for new 12 -unit T-hangar (Area 1)	1,099,130	989,217				109,913	0	1,099,130
	Total Phase II Project Costs	$11,818,013	$5,958,424	$1,578,023	$0	$2,553,327	$1,356,207	$372,032	$11,818,013

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Master Plan - Financial Implementation Analysis
Projected Capital Funding Sources

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	CITY Hangars P3 Hangars Capital Improvement Projects	Total Escalated Costs	TxDOT AIP Block Grants	TxDOT Aviation Div Grants	Rosewood Highway Project Fund	Private 3rd Party Funding	Other Unidentified Funding	Cash Reserves/ Net Revs	Total Funding
Phase III Projects (2025-2034)									
C1a	Design and construct new box hangar (80' x 80') fronting onto T/W A east of former commercial terminal building (Area 3)	937,806				$937,806		$0	$937,806
C1b	Design and construct apron associated with new box hangar (80' x 80') (Area 3)	423,525	381,173					42,353	423,525
C1c	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 3)	287,392		14,370		258,653		14,370	287,392
C2a	Design and construct new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building (includes demolition of #1517 aircraft rescue and firefighting station)	975,620	600,000	278,058				97,562	975,620
C2b	Design and construct apron associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building	465,878	419,290					46,588	465,878
C2c	Design and construct auto access and parking associated with new box hangar (80' x 80') fronting west towards Taxiway B immediately north of new GA terminal building	107,394		53,697				53,697	107,394
C3a	Design and construct new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3)	1,346,205	600,000	611,584				134,620	1,346,205
C3b	Design and construct taxilane/apron associated with new 10-unit T-hangar (220' x 50') on former commercial terminal auto parking lot (Area 3)	822,849	740,564					82,285	822,849
C4	Runway 1-19 structural overlay/reconstruction	7,290,682	6,561,614					729,068	7,290,682
C5	Design and install medium intensity LED runway lights on Runway 1-19	544,532	490,079					54,453	544,532
C6	Taxiway B structural overlay/reconstruction	3,433,579	3,090,221					343,358	3,433,579
C7	Taxiway A mill and overlay/reconstruction	847,050	762,345					84,705	847,050
C8	Rehab medium intensity taxiway lights along all taxiways	1,164,694	1,048,225					116,469	1,164,694

SKYLARK FIELD AIRPORT (ILE)
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Master Plan - Financial Implementation Analysis
Projected Capital Funding Sources

14-Apr-16

	CITY Hangars P3 Hangars Capital Improvement Projects	Total Escalated Costs	TxDOT AIP Block Grants	TxDOT Aviation Div Grants	Rosewood Highway Project Fund	Private 3rd Party Funding	Other Unidentified Funding	Cash Reserves/ Net Revs	Total Funding
C9	Extend Taxiway B north to the Runway 19 end	998,309	898,478					99,831	998,309
C10	Extend Taxiway B south to the Runway 01 end	1,164,694	1,048,225					116,469	1,164,694
C11	Update the Airport Master Plan	574,784	517,306					57,478	574,784
C12a	Design and construct new box hangar (80' x 80') fronting onto T/W A east of former commercial terminal building (Area 3)	998,309				998,309		0	998,309
C12b	Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 3)	506,718	456,046				50,672	0	506,718
C12c	Design & construct auto access and parking associated with new box hangar (80' x 80') (Area 3)	158,822		7,941		142,940	7,941	0	158,822
C13a	Design and construct new 80' x 80' common/box hangars	983,183				983,183		0	983,183
C13b	Design and construct taxilane/apron associated with new box hangar (80' x 80')	509,743	458,768				50,974	0	509,743
C13c	Design and construct auto access and parking associated with new box hangar (80' x 80')	98,318		4,916		88,486	4,916	0	98,318
C14a	Design and construct series of five 50' x 50' common/box hangars on former commercial terminal east overflow parking area (Area 3)	1,792,419	300,000	1,313,177				179,242	1,792,419
C14b	Design and construct taxilane/apron associated with series of 50' x 50' box hangars	735,119	661,607					73,512	735,119
C15a	New 80' x 80' common/box hangar (Area 2)	983,183				983,183		0	983,183
C15b	Design and construct taxilane/apron associated with new box hangar (80' x 80') (Area 2)	509,743	458,768				50,974	0	509,743
C15c	Design and construct auto access and parking associated with new box hangar (80' x 80') (Area 2)	98,318		4,916		88,486	4,916	0	98,318
	Total Phase III Project Costs	$28,758,868	$19,492,709	$2,288,659	$0	$4,481,047	$170,393	$2,326,060	$28,758,868
Total Project Costs		$46,188,141	$27,404,978	$4,590,458	$566,500	$9,060,290	$1,526,600	$3,039,315	$46,188,141

SKYLARK FIELD AIRPORT (ILE)
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Schedule 8-3

Master Plan - Financial Implementation Analysis
Actual, Estimated and Projected Operations & Maintenance Expenses

CITY Hangars

14-Apr-16

Operations & Maintenance Expenses	Actual FY 2012	Actual FY 2013	Actual FY 2014	Phase I Actual FY 2015	Phase I Estimated FY 2016	Phase I Projected FY 2017	Phase I Projected FY 2018	Phase I Projected FY 2019	Phase I Total	Phase II Projected FY 2020-24	Phase III Projected FY 2525-34
Cost of Goods Sold							A4-8 T-H				
Aviation Fuel & Products	$425,538	$432,451	$340,738	$236,028	$281,200	$282,606	$284,019	$285,439	$1,369,292	$1,523,011	$3,812,385
-	0	0	0	0	0	0	0	0	0	0	0
Total Cost of Goods Sold	$425,538	$432,451	$340,738	$236,028	$281,200	$282,606	$284,019	$285,439	$1,369,292	$1,523,011	$3,812,385
Annual Growth Rate	-	1.6%	-21.2%	-30.7%	19.1%	0.5%	0.5%	0.5%	-3.5%	2.5%	3.0%
Operating Expenses											
Salaries	$127,737	$126,126	$131,867	$135,082	$134,020	$136,700	$139,434	$142,223	$687,459	$770,186	$1,927,922
Benefits	35,269	34,950	36,464	38,353	32,858	33,515	34,185	34,869	173,780	188,830	472,678
Supplies	9,396	9,501	7,417	6,636	7,818	7,857	7,896	7,936	38,143	42,346	105,999
Maintenance	7,265	4,536	4,326	19,115	10,758	10,812	10,866	10,920	62,471	58,268	145,855
New City Hangar Operating Expenses	0	0	0	0	0	0	0	1,500	1,500	14,339	69,208
Repairs	11,154	7,733	17,925	11,219	13,051	13,116	13,182	13,248	63,816	70,686	176,940
Support Services	39,000	43,528	38,594	34,757	40,595	52,145	52,406	52,668	232,571	281,023	703,455
Year End Salary Accrual	5,677	(439)	0	0	0	0	0	0	0	0	0
Insurance	8,589	9,127	8,900	10,362	11,291	0	0	0	21,653	0	0
Total Operating Expenses	$244,087	$235,062	$245,493	$255,524	$250,391	$254,145	$257,969	$263,364	$1,281,393	$1,425,677	$3,602,056
Annual Growth Rate	-	-3.7%	4.4%	4.1%	-2.0%	1.5%	1.5%	2.1%	1.4%	2.9%	3.1%
Minor Capital Outlays											
IT-Computer	$2,499	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other Capital Outlay	0	0	499	0	0	1,000	1,000	1,000	3,000	5,309	13,290
Total Minor Capital Outlays	$2,499	$0	$499	$0	$0	$1,000	$1,000	$1,000	$3,000	$5,309	$13,290
Annual Growth Rate	-	-100.0%	-	-100.0%	-	-	0.0%	0.0%	14.9%	2.4%	3.0%
Total Operations & Maintenance Expenses	$672,124	$667,513	$586,730	$491,552	$531,591	$537,751	$542,988	$549,803	$2,653,685	$2,953,997	$7,427,731
Annual Growth Rate	-	-0.7%	-12.1%	-16.2%	8.1%	1.2%	1.0%	1.3%	-1.3%	2.7%	3.0%

SKYLARK FIELD AIRPORT (ILE)
Killeen, Texas

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Schedule 8-4

Master Plan - Financial Implementation Analysis
Actual, Estimated and Projected Operating Revenues

CITY Hangars
P3 Hangars

14-Apr-16

Revenues	Actual FY 2012	Actual FY 2013	Actual FY 2014	Phase I Actual FY 2015	Phase I Estimated FY 2016	Phase I Projected FY 2017	Phase I Projected FY 2018	Phase I Projected FY 2019	Phase I Total	Phase II Projected FY 2020-24	Phase III Projected FY 2525-34
Sales							A4-8 T-H	C9-7T/2B			
Aviation Fuel	$544,533	$507,803	$421,883	$295,880	$323,000	$324,615	$326,238	$327,869	$1,597,602	$1,749,408	$4,379,101
Margin on New T-Hangar 100LL Sales	0	0	0	0	0	0	0	1,663	1,663	23,621	121,965
Margin on New Box Hangar JetA Sales	0	0	0	0	0	0	0	0	0	308,575	1,607,345
Operating Supplies	2,688	1,509	1,386	1,287	1,400	1,407	1,414	1,421	6,929	7,581	18,978
Total Sales	$547,221	$509,312	$423,269	$297,167	$324,400	$326,022	$327,652	$330,953	$1,606,194	$2,089,185	$6,127,389
Annual Growth Rate	-	-6.9%	-16.9%	-29.8%	9.2%	0.5%	0.5%	1.0%	-4.8%	7.3%	4.8%
Operating Revenues											
Fixed Base Operations	$18,457	$29,524	$45,100	$16,371	$34,937	$47,337	$47,574	$47,812	$194,031	$255,109	$638,587
Hangars & Tiedowns	80,647	78,291	82,843	87,045	79,495	79,083	78,643	78,176	402,442	412,422	1,032,370
CTC Land Rent	32,416	32,416	32,416	32,416	32,416	33,388	34,390	35,422	168,032	193,701	484,871
New City Hangar Lease Revenue	0	0	0	0	0	0	0	24,000	24,000	229,423	936,902
New P3 Hangar Ground Lease Revenue	0	0	0	0	0	0	0	0	0	74,023	364,805
Airport Use Fees	6,777	6,142	5,230	4,216	2,071	2,081	2,092	2,102	12,562	11,218	28,081
Miscellaneous Receipts	139	3,997	7,895	226	338	340	341	343	1,588	1,832	4,585
Total Operating Revenues	$138,436	$150,370	$173,484	$140,274	$149,257	$162,229	$163,040	$187,855	$802,655	$1,177,728	$3,490,201
Annual Growth Rate	-	8.6%	15.4%	-19.1%	6.4%	8.7%	0.5%	15.2%	1.6%	8.5%	3.8%
Other Revenues											
Interest Earned	$580	$484	$200	$329	$610	$613	$616	$619	$2,787	$3,110	$6,220
TxDOT RAMP Grants (Maintenance)	6,369	1,047	5,520	11,697	7,000	7,035	7,070	7,106	39,908	37,913	94,902
Sale of Property	0	150,000	0	0	0	0	0	0	0	0	0
Total Other Revenues	$6,949	$151,531	$5,720	$12,026	$7,610	$7,648	$7,686	$7,725	$42,695	$41,023	$101,122
Annual Growth Rate	-	2080.6%	-96.2%	110.2%	-36.7%	0.5%	0.5%	0.5%	6.2%	2.3%	2.8%
Total Revenues	$692,606	$811,213	$602,473	$449,467	$481,267	$495,899	$498,378	$526,533	$2,451,544	$3,307,936	$9,718,713
Annual Growth Rate	-	17.1%	-25.7%	-25.4%	7.1%	3.0%	0.5%	5.6%	-2.7%	7.7%	4.4%

SKYLARK FIELD AIRPORT (ILE)
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Schedule 8-5

Master Plan - Financial Implementation Analysis
Financial Plan Summary
Actual, Estimated and Projected Net Revenues, Capital Funding and Capital Expenditures

14-Apr-16

Operating/Capital Cash Flow	Phase I						Phase II	Phase III
	Actual	Estimated	Projected				Projected	Projected
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total	FY 2020-24	FY 2525-34
Operating Cash Flow								
Revenues:								
Aviation Fuel & Product Sales	$297,167	$324,400	$326,022	$327,652	$330,953	$1,606,194	$2,089,185	$6,127,389
Less Cost of Goods Sold	(236,028)	(281,200)	(282,606)	(284,019)	(285,439)	(1,369,292)	(1,523,011)	(3,812,385)
Net Aviation Fuel & Product Sales	$61,139	$43,200	$43,416	$43,633	$45,514	$236,902	$566,175	$2,315,004
Operating Revenues	140,274	149,257	162,229	163,040	187,855	802,655	1,177,728	3,490,201
Other Revenues	12,026	7,610	7,648	7,686	7,725	42,695	41,023	101,122
Total Revenues	$213,439	$200,067	$213,293	$214,359	$241,094	$1,082,252	$1,784,926	$5,906,327
Operating Expenses	(255,524)	(250,391)	(254,145)	(257,969)	(263,364)	(1,281,393)	(1,425,677)	(3,602,056)
Minor Capital Outlays	0	0	(1,000)	(1,000)	(1,000)	(3,000)	(5,309)	(13,290)
Net Operating Cash Flow Available For Capital Expenditures	($42,085)	($50,324)	($40,852)	($43,610)	($22,270)	($199,141)	$359,249	$2,304,271
Capital Cash Flow								
Beginning Cash Balance	$626,555	$584,470	$534,146	$493,294	$208,519	$626,555	$86,191	$73,408
Other Capital Funding Sources:								
TxDOT AIP Block Grants	$0	$0	$0	$1,053,326	$900,520	$1,953,846	$5,958,424	$19,492,709
TxDOT Aviation Division Grants	0	0	0	723,776	0	723,776	1,578,023	2,288,659
Rosewood Highway Project Fund	0	566,500	0	0	0	566,500	0	0
Private 3rd Party Funding	0	0	0	0	2,025,916	2,025,916	2,553,327	4,481,047
Other Unidentified Funding	0	0	0	0	0	0	1,356,207	170,393
Total Other Capital Funding Sources	$0	$566,500	$0	$1,777,102	$2,926,435	$5,270,037	$11,445,981	$26,432,808
Total Funds Available for Capital Expenditures	$584,470	$1,100,646	$493,294	$2,226,786	$3,112,684	$5,697,451	$11,891,421	$28,810,487
Capital Improvement Program Expenditures	0	566,500	0	2,018,267	3,026,493	5,611,260	11,818,013	28,758,868
Ending Cash Balance	$584,470	$534,146	$493,294	$208,519	$86,191	$86,191	$73,408	$51,619