



CHAPTER FIVE

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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.

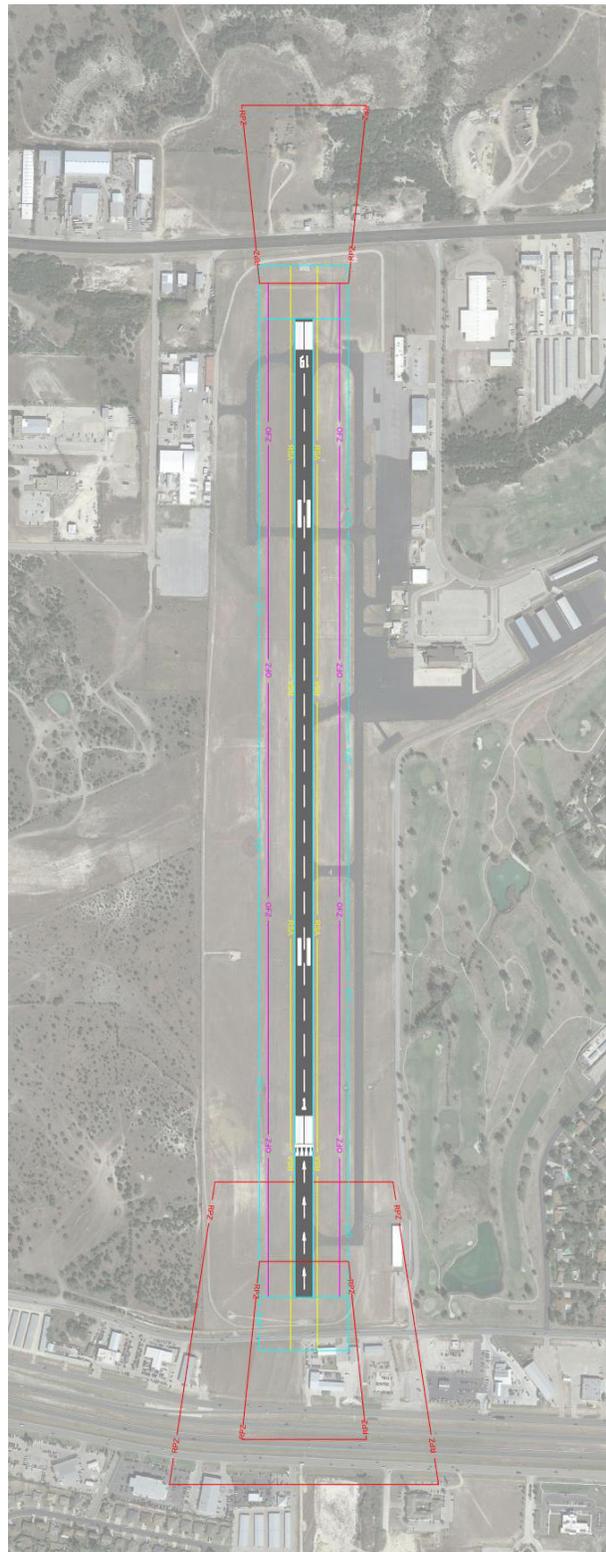
Option 1A Status Quo

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

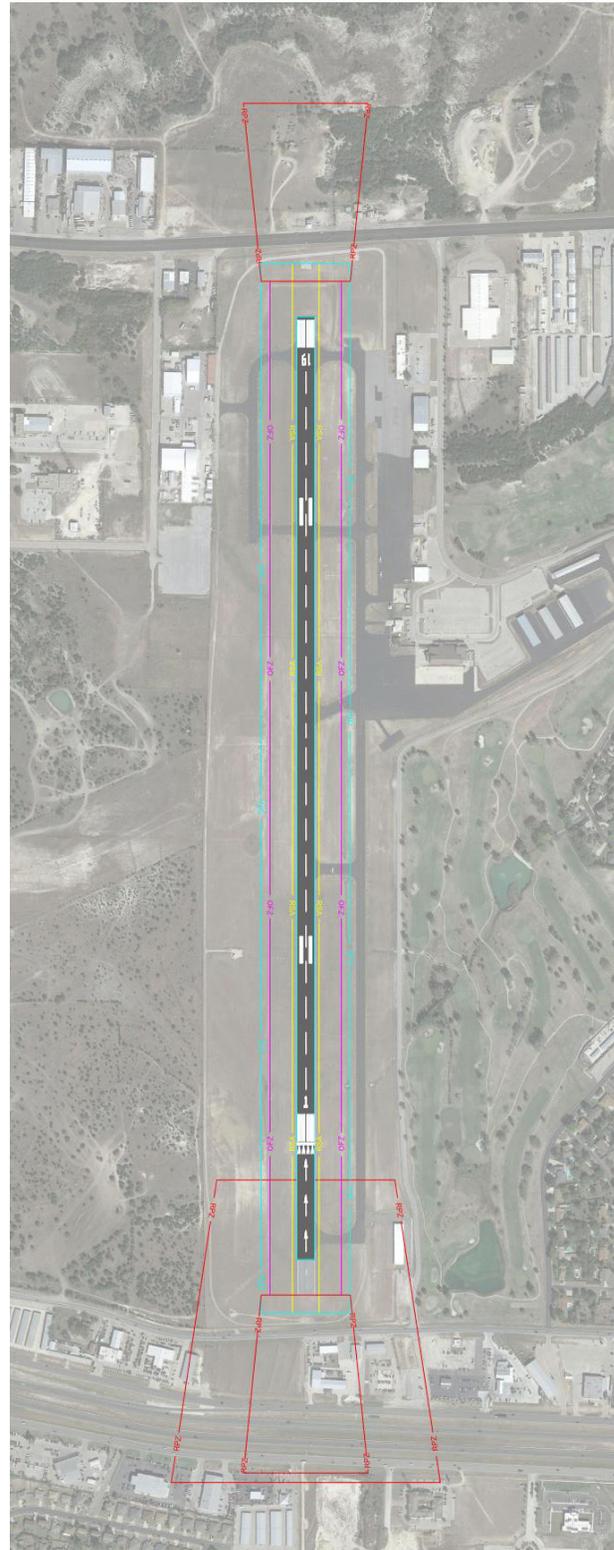
The Facility Requirements chapter examined FAA recommended runway length standards in **Table 4-4**. Runway length to accommodate all of the ARC/RDC B-II-4000 aircraft is 4,100 feet and for B-II aircraft with ten or more passenger seats the design length is 4,500 feet. Runway 01-19, at 5,495 feet in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



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

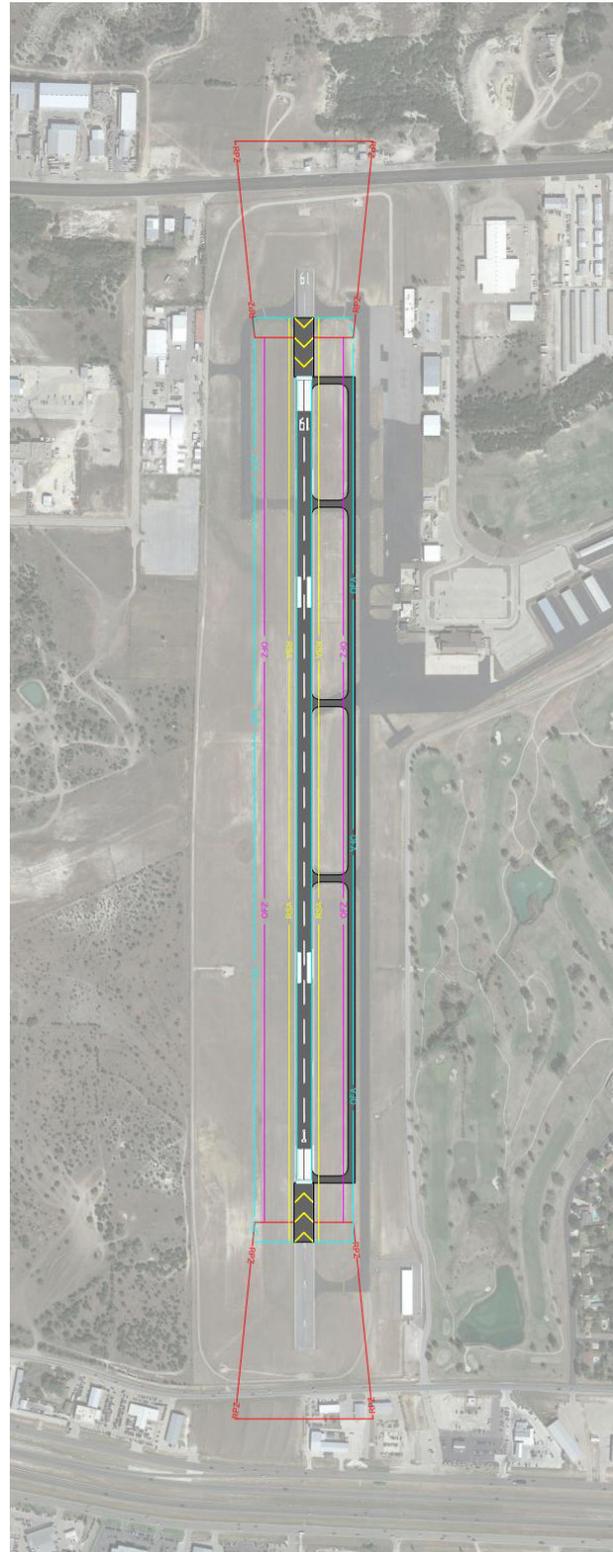
Reducing Runway 01-19 to the 4,100 foot length brings it into compliance with B-II-4000 minimum design standards and its impacts must be considered. This is a length reduction of 1,395 feet and could be accomplished from one or both runway ends in combination. As with Option 2A, the reduction from the 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 Killen 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

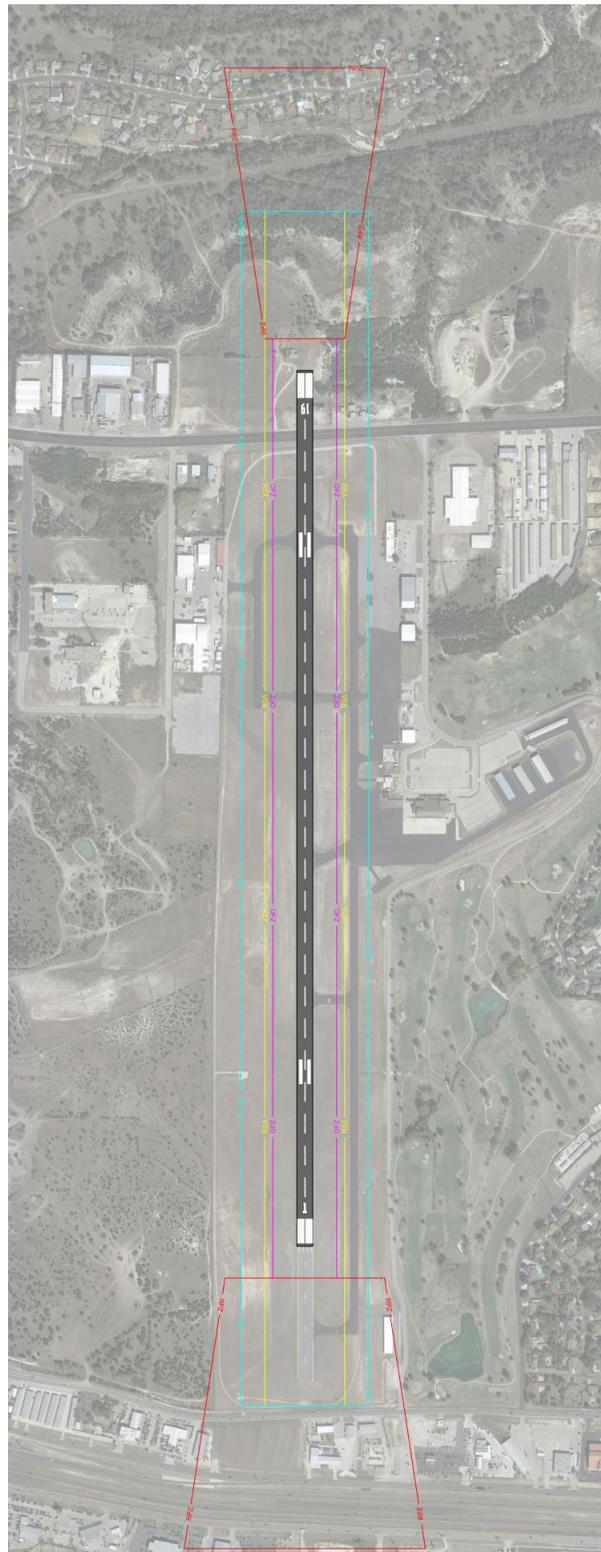
Option 3A shows the runway and supporting facilities to accommodate a 5,500 foot long runway with non-precision approach to the Runway 01 end and continued visual approach to the Runway 19 end. **Figure 5-5** depicts this runway expansion along with the appropriate RSA, ROFZ, ROFA, and RPZs. This option 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

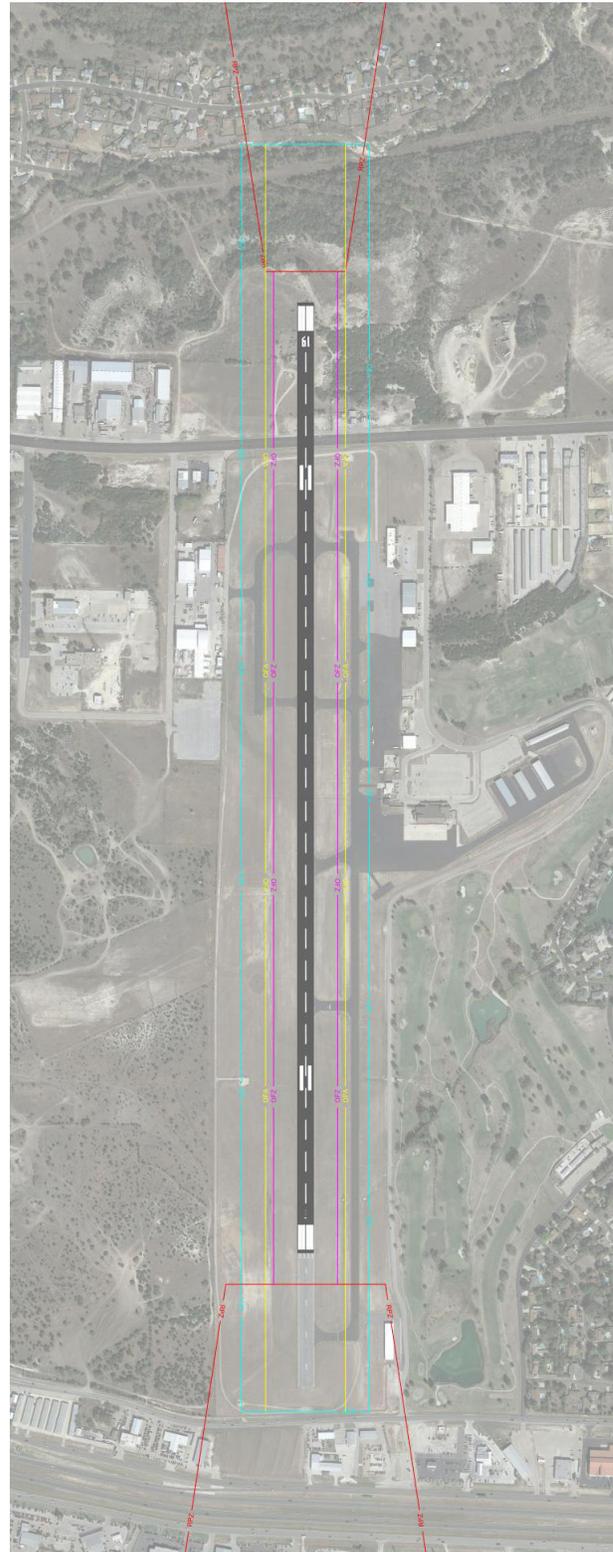
Precision Approaches: C-II-2400, 5,500 Feet and C-II-2400, 5,960 Feet

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 aviation 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.

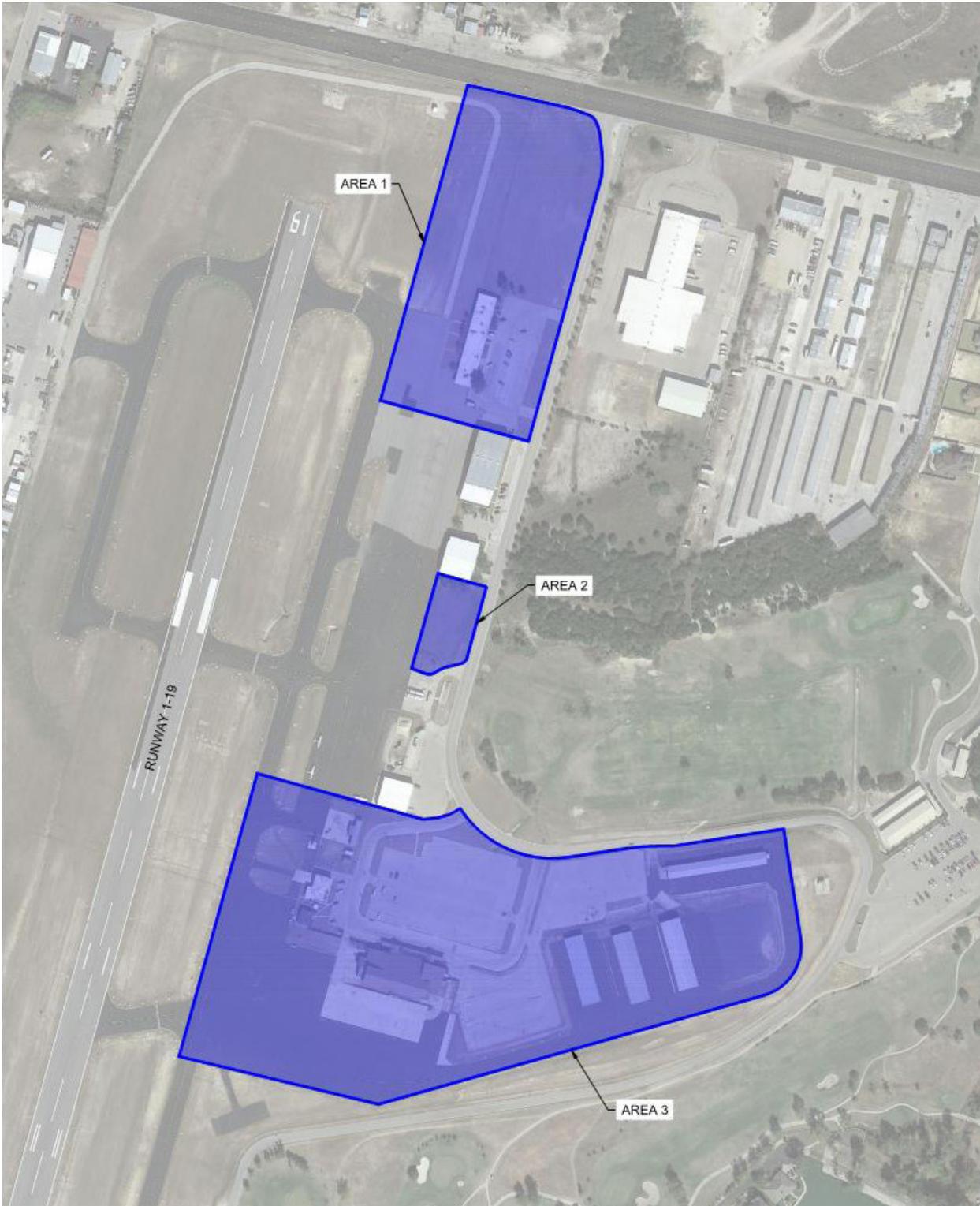
Facilities to accommodate and better serve the existing and future commercial businesses at ILE is also an important consideration of landside alternatives at ILE.

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



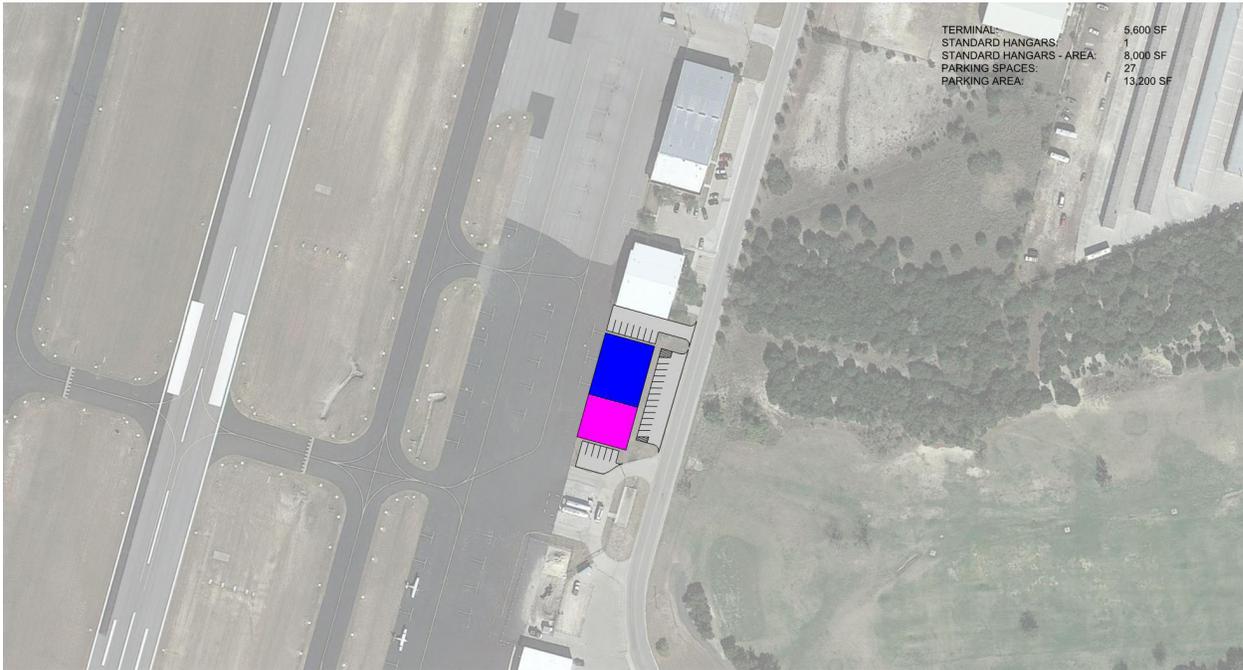
Source: Garver, 2015.

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

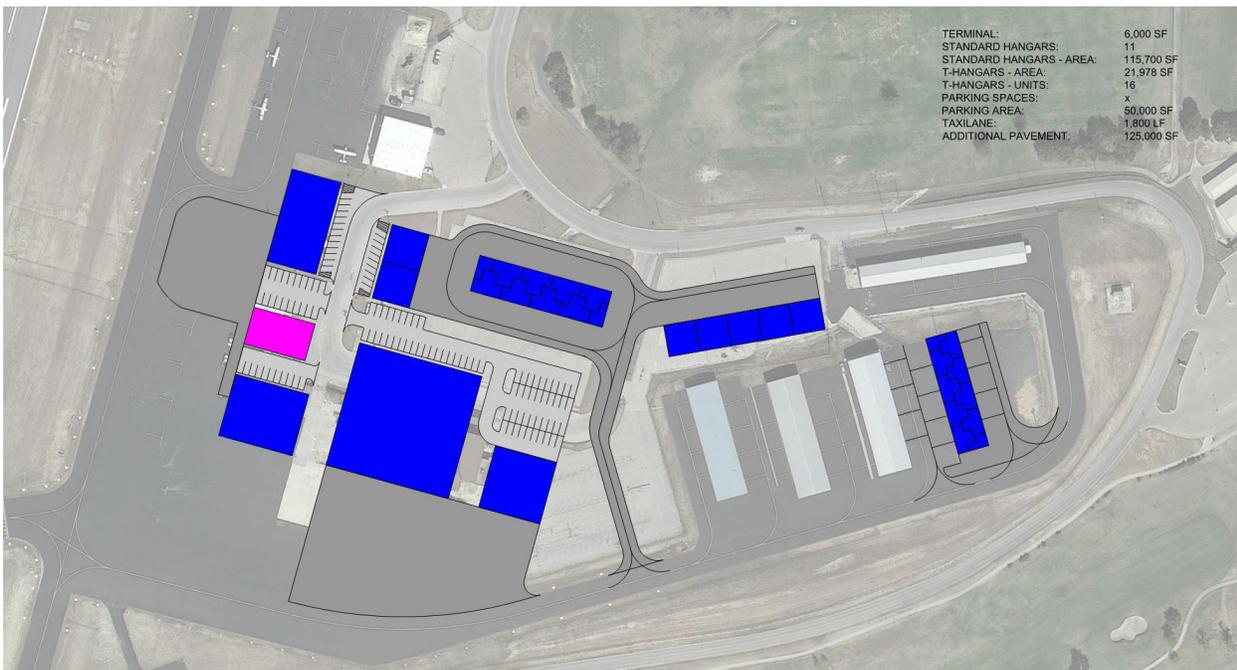
Area 3 encompasses approximately 16 acres of airport property that currently contains four T-hangars with a total of 30 individual units, auto parking lots, aprons, the former commercial terminal building (#1525), GA terminal building, aircraft rescue and firefighting (ARFF) station, and an open hangar 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 taxiways. 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 Taxiway Space: 125,000 square feet;

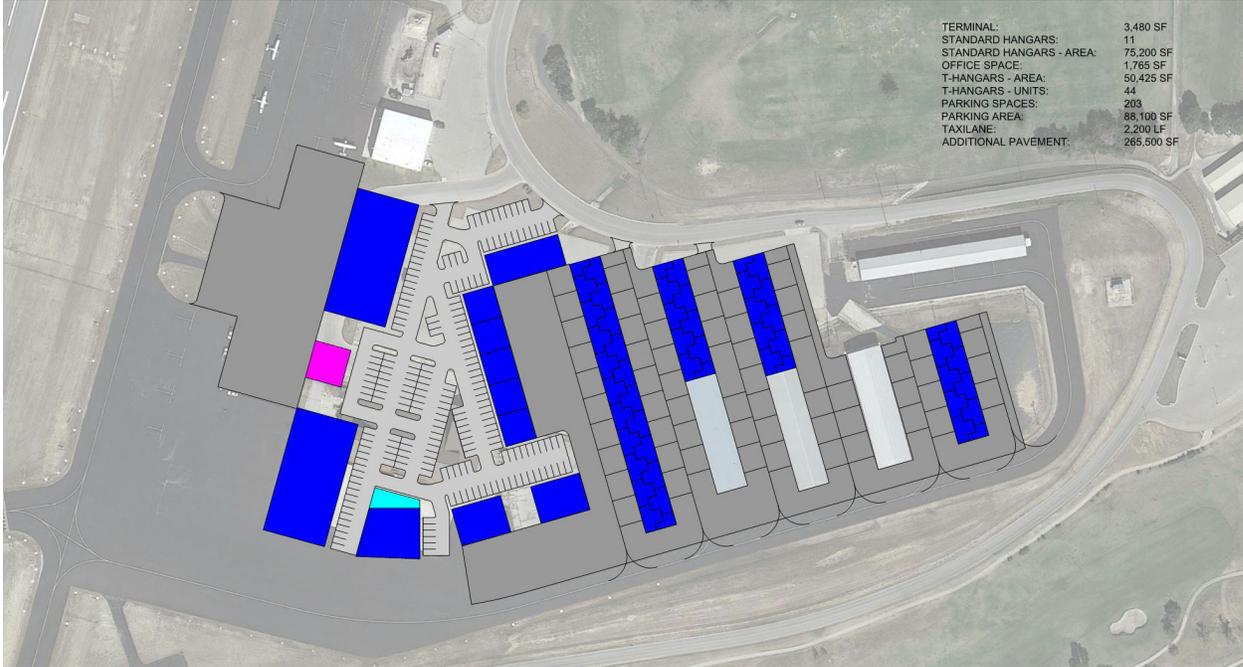
FIGURE 5-14 | OPTION 3A



Source: Garver, 2015.

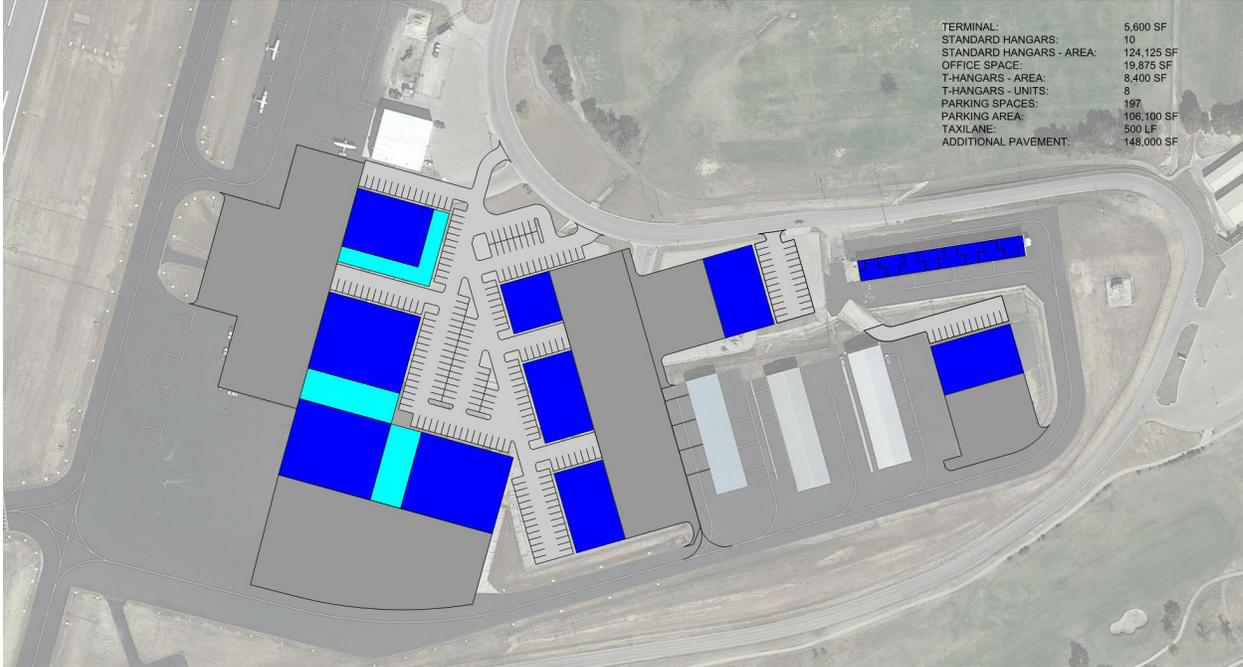


FIGURE 5-15 | OPTION 3B



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.

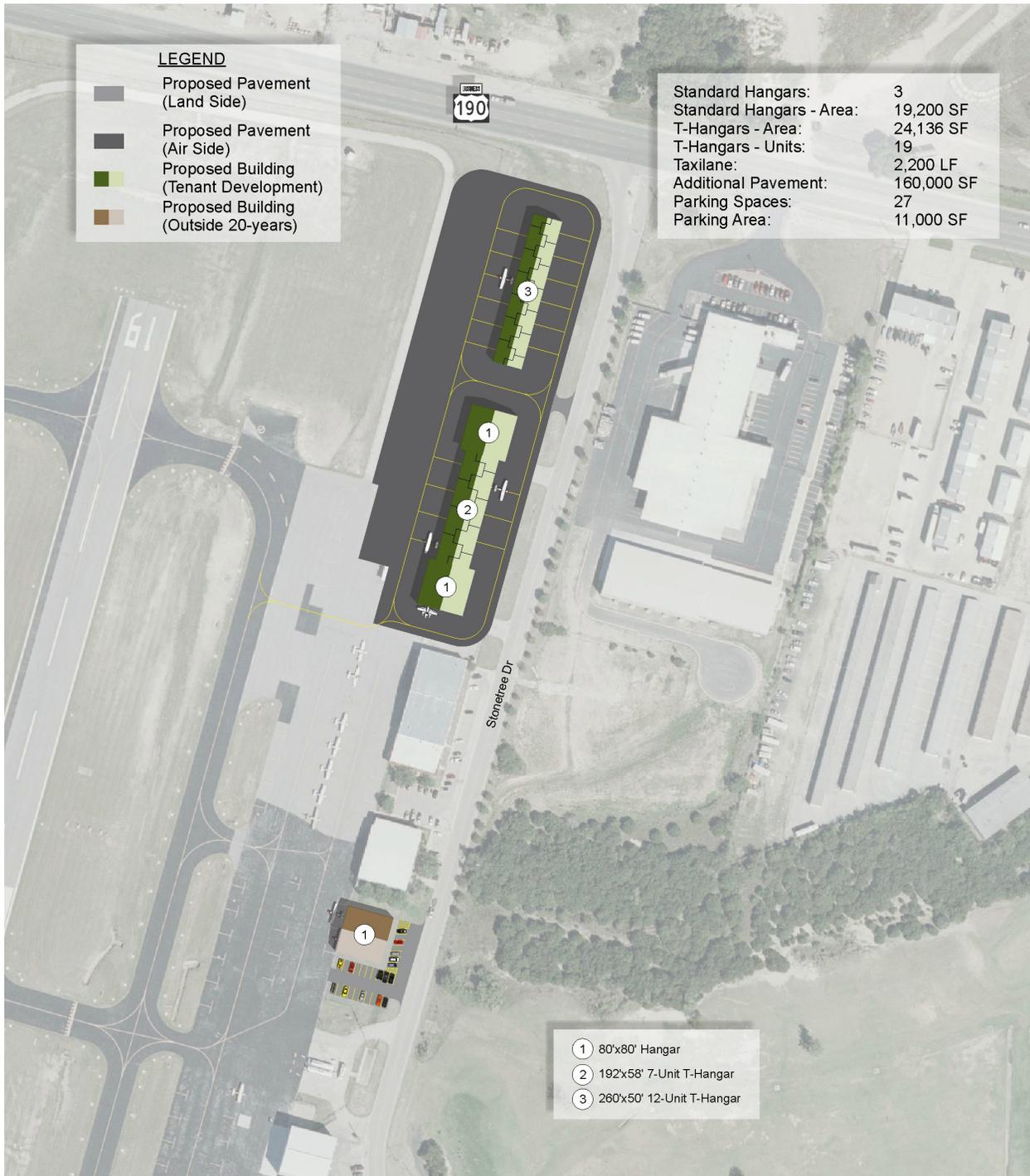
Area 3

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**

