

D. Alternatives Development and Recommendations

INTRODUCTION

This chapter presents the development alternatives analysis and recommendations for Stillwater Regional Airport (SWO) to satisfy the facility requirements described in **Chapter C – Facility Requirements**. It does so in terms of concepts and reasoning, and it provides a description of the various factors and influences that meet the needs of the airport users as well as fulfills the strategic vision for the City of Stillwater. The ultimate recommendations will form the basis for SWO's long-term development plan.

DEVELOPMENT ASSUMPTIONS AND GOALS

In concert with the role of SWO and informed by community input received during the planning process, a series of basic assumptions and goals have been established. These goals intend to guide and direct the evaluation process of future SWO development and maintain continuity throughout the process. They involve several categorical considerations relating to both the short- and long-term facility needs. These considerations include safety enhancement, capital improvements, land use compatibility, financial and economic conditions, public interest and investment, and community recognition and awareness. While some represent more tangible and physical activities than others, all are deemed important and appropriate for future airport development.

Development Assumptions

- **Assumption One:** SWO will be developed and operated in a manner that is consistent with local ordinances and codes, federal and state statutes, and Federal Aviation Administration (FAA) grant assurances and regulations.
- **Assumption Two:** The recognized role of SWO will continue to serve as a facility accommodating regional commercial service passenger activity, along with general aviation (private, corporate, and training) activity and a small amount of military aviation activity.
- **Assumption Three:** Runway 17/35 will be designed, constructed, and maintained to FAA-defined Runway Design Code (RDC) C-III-2400 dimensional standards.
- **Assumption Four:** While the existing and future RDC for Runway 4/22 has been determined to be A-I-VIS, SWO desires to maintain this runway in a manner that protects for the limited use of commercial air carrier aircraft operations. This creates redundancy when Runway 17/35 is inoperable due to long lasting maintenance or rehabilitation, or in the event of aircraft incidents. Standards to be maintained include the runway length and width, parallel taxiway separation standards, and instrument approach protection consistent with past recommendations contained on the existing Airport Layout Plan (ALP).
- **Assumption Five:** SWO will accommodate the forecast aviation activity reliably and safely.

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- **Assumption Six:** The existing lengths provided by both runways are adequate to accommodate the needs of the existing and forecast aircraft fleet safely and efficiently.
- **Assumption Seven:** The plan for future airport development should strive to make the most efficient use of the available area for aviation-related activities because the amount of accessible landside development area is at a premium.
- **Assumption Eight:** To the maximum extent possible, future facilities will be designed compatible and complementary with the operation of SWO and the surrounding land uses.

Development Goals

- Provide effective direction for future development through the preparation of a rational plan and adherence to the adopted development program.
- Plan and develop SWO to be capable of accommodating the future needs of the City of Stillwater, Payne County, and the surrounding area.
- Program the construction of facilities when demand is realized (construction is to be demand driven, not forecast driven).
- Plan SWO to accommodate the aviation forecasts safely and efficiently with needed facilities. The primary potential facilities improvement under consideration include:
 - The terminal building.
 - A standalone Airport Traffic Control Tower (ATCT).
 - Improved vehicle roadway access and parking facilities.
 - An Aircraft Rescue and Fire Fighting (ARFF) Facility and a Snow Removal and Equipment (SRE)/Airport Maintenance Facility.
 - Aircraft storage hangars and aprons.
 - Terminal landside development.
- Enhance the self-sustaining capability of SWO and the financial feasibility of future development.
- Integrate the needs of existing tenants with future development plans, recognizing and accommodating the needs of general aviation including corporate and flight training.
- Plan and develop airport facilities to be environmentally compatible with their surroundings, minimizing the potential environmental impact to both on and off airport property.
- Encourage the protection of existing public and private investment in land and facilities, and advocate for the resolution of any potential land use conflicts.

AIRSIDE DEVELOPMENT CONCEPTS, ALTERNATIVES, AND RECOMMENDATIONS

Because all other functions relate to and revolve around the basic runway/taxiway layout and Instrument Approach Procedures (IAPs), airside development alternatives must first be examined and evaluated. The



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primary objective of the airside alternatives analysis is to examine options that will result in the best and safest possible aircraft operating environment. The analysis has been prepared to provide SWO with a comprehensive outline of each alternative’s key components, advantages, and disadvantages associated with each.

Airfield Design Standards

Runway 17/35 Design Standards

As presented in the previous chapter, an FAA-owned glideslope equipment building and antenna are located approximately 370 feet west of the Runway 17/35 centerline. Thus, the Runway Object Free Area (ROFA) width is deficient by 30 feet, providing only a total width of 770 feet. A frangible windsock was also located 250 east of the runway centerline; however, it was constructed recently with FAA approval and is not considered an obstruction or non-standard condition.

Recommendation. Plan and program the relocation of the glideslope antenna and equipment building a minimum of 30 feet to the west outside the ROFA.

Runway 4/22 Design Standards

Also presented in the previous chapter, a utility box is located approximately 80 feet northwest of the Runway 4/22 centerline. In this location the ROFA and Runway Obstacle Free Zone (ROFZ) widths are deficient by 45 feet, providing only a total width of 205 feet.

Recommendation. Relocate the utility box a minimum of 45 feet to the northwest outside the ROFA and ROFZ.

Instrument Approach Procedure Improvement

As stated in the previous chapter, an evaluation of implementing improved GPS IAPs to Runways 35, 4, and 22 is warranted to enhance SWO’s access during inclement weather conditions.

Runway 35

This runway is currently equipped with an Area Navigation (RNAV) Global Positioning Satellite (GPS) approach with visibility minimums as low as 3/4-mile and a Very High Frequency Omni-Directional Range (VOR) approach with visibility minimums as low as 1-1/4 mile. The installation of a Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR) on Runway 35 would provide lighting credit enabling a decrease of the visibility minimums to as low as 1/2-mile. In doing so, the RPZ and the runway end approach surface would increase in size accordingly. **Figure D-1** illustrates the location of the MALSR, increased RPZ, increased runway end approach surface, the existing vertical guidance approach surface, the Federal Aviation Regulations (FAR) Part 77 approach surface, and the Precision Obstacle Free Zone (POFZ) associated with this IAP improvement. The POFZ would extend beyond existing SWO property to the west (approximately 0.7 acres), and the future RPZ would extend beyond SWO property (approximately 12 acres) encompassing West Lakeview Road. Because public roadways are considered incompatible land

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uses within an RPZ, coordination with FAA headquarters is required before approval of this improved IAP can be granted. There are five tree obstructions penetrating the existing and improved FAR Part 77 approach surface.

Runway 4

The existing and future RDC for Runway 4/22 is A-I-VIS, so Runway 4 is a visual approach runway served by no IAPs. However as stated in Development Assumption Four, SWO wishes to maintain the runway for use by commercial air carrier aircraft operations in emergencies. To achieve an IAP with visibility minimums as low as 3/4-mile to Runway 4, as designated on the existing ALP, installation of a RNAV (GPS) approach can be implemented. According to FAA Advisory Circular (AC) 150/5300-13B, an Approach Lighting System (ALS) is recommended but not required for this type of IAP. Non-precision markings are required and are currently provided on Runway 4. In implementing this type of IAP, the RPZ and threshold siting surface would increase in size accordingly. It is anticipated that this IAP would provide vertical guidance so a vertical guidance approach surface would be required that is free of any obstructions. **Figure D-2** illustrates the location of the larger RPZ, increased runway end approach surface, vertical guidance approach surface, and FAR Part 77 approach surface associated with this IAP improvement. The future RPZ would extend beyond SWO property (approximately 10.7 acres). There is a single tree obstruction penetrating the existing and improved FAR Part 77 surface and is within the larger RPZ.

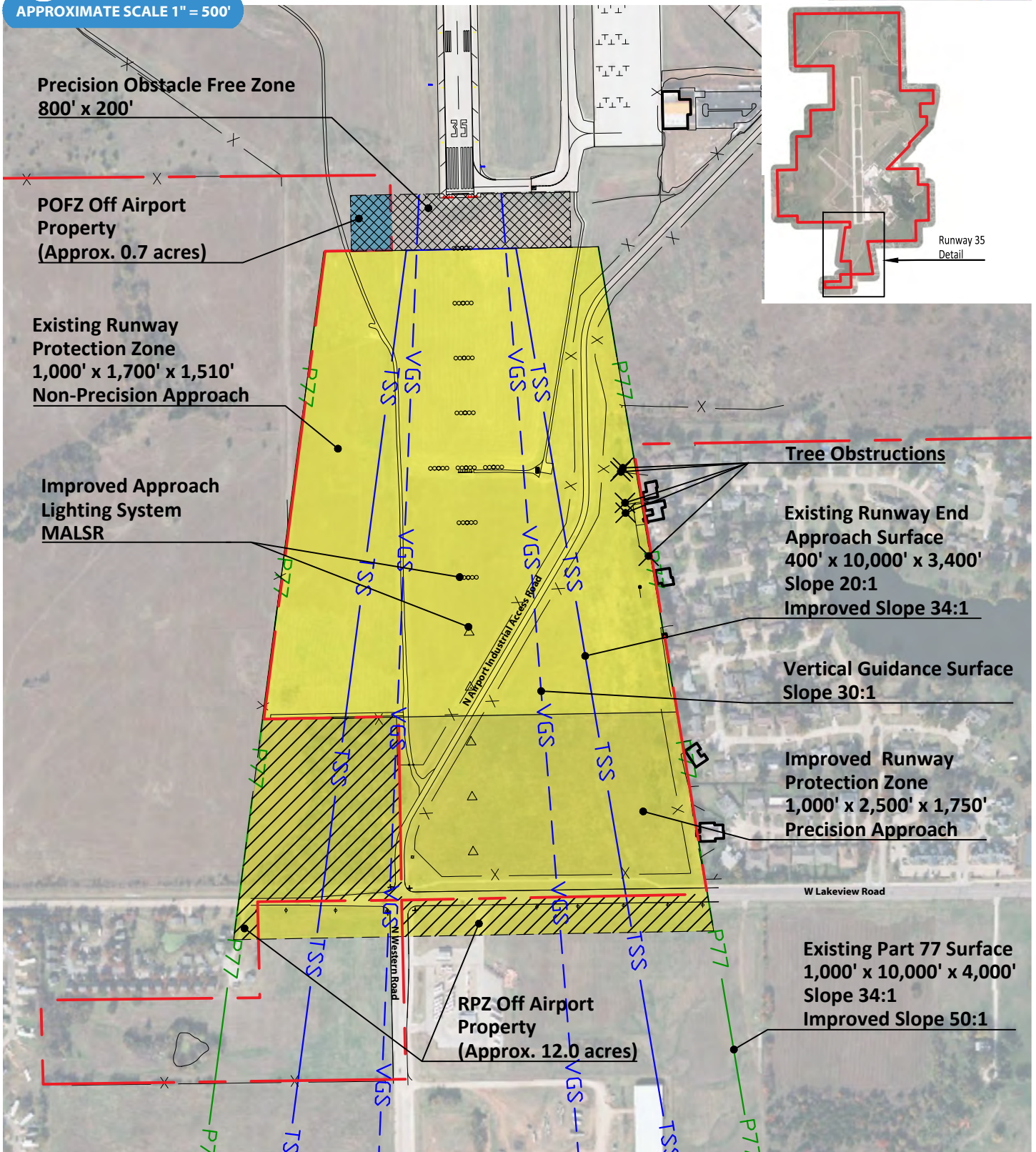
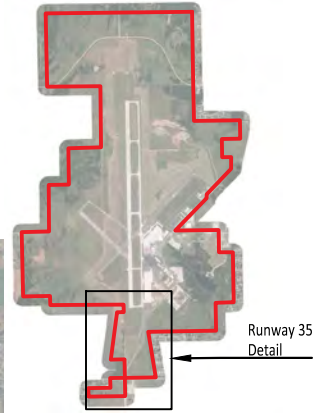
Runway 22

Like Runway 4, Runway 22 is visual approach only but would be maintained to achieve IAP with visibility minimums as low as 3/4-mile. Installation of a RNAV (GPS) approach could also be implemented on Runway 22 to achieve an IAP with visibility minimums as low as 3/4-mile. An ALS is recommended but not required for this IAP, and non-precision markings are required and currently provided. **Figure D-3** illustrates the location of the larger RPZ, increased runway end approach surface, vertical guidance approach surface, and FAR Part 77 approach surface associated with this IAP improvement. The future RPZ would extend beyond SWO property (approximately 10.7 acres). A bush penetrates the improved FAR Part 77 surface and is within the larger RPZ.

Recommendation. Continue to include the improved visibility minimum IAPs as shown on the existing ALP to Runways 35, 4, and 22 for use by commercial air carrier aircraft operations. Removal of the obstructions is recommended at time of IAP implementation. As indicated on the existing ALP, an aviation easement will be sought for property inside the future Runway 35 RPZ that extends south of West Lakeview Road and is outside existing SWO property. Property inside the larger Runway 35 RPZ north of West Lakeview Road and outside existing SWO property is recommended for fee simple acquisition. Property acquisition is recommended for property within the future Runway 4 and 22 PRZs that extend beyond existing SWO property. The cost to mitigate the incompatible land uses within the RPZs might outweigh the benefits gained, but preserving the airspace associated with the improved IAPs assures that future implementation is not impeded by obstructions created beyond SWO's boundary.

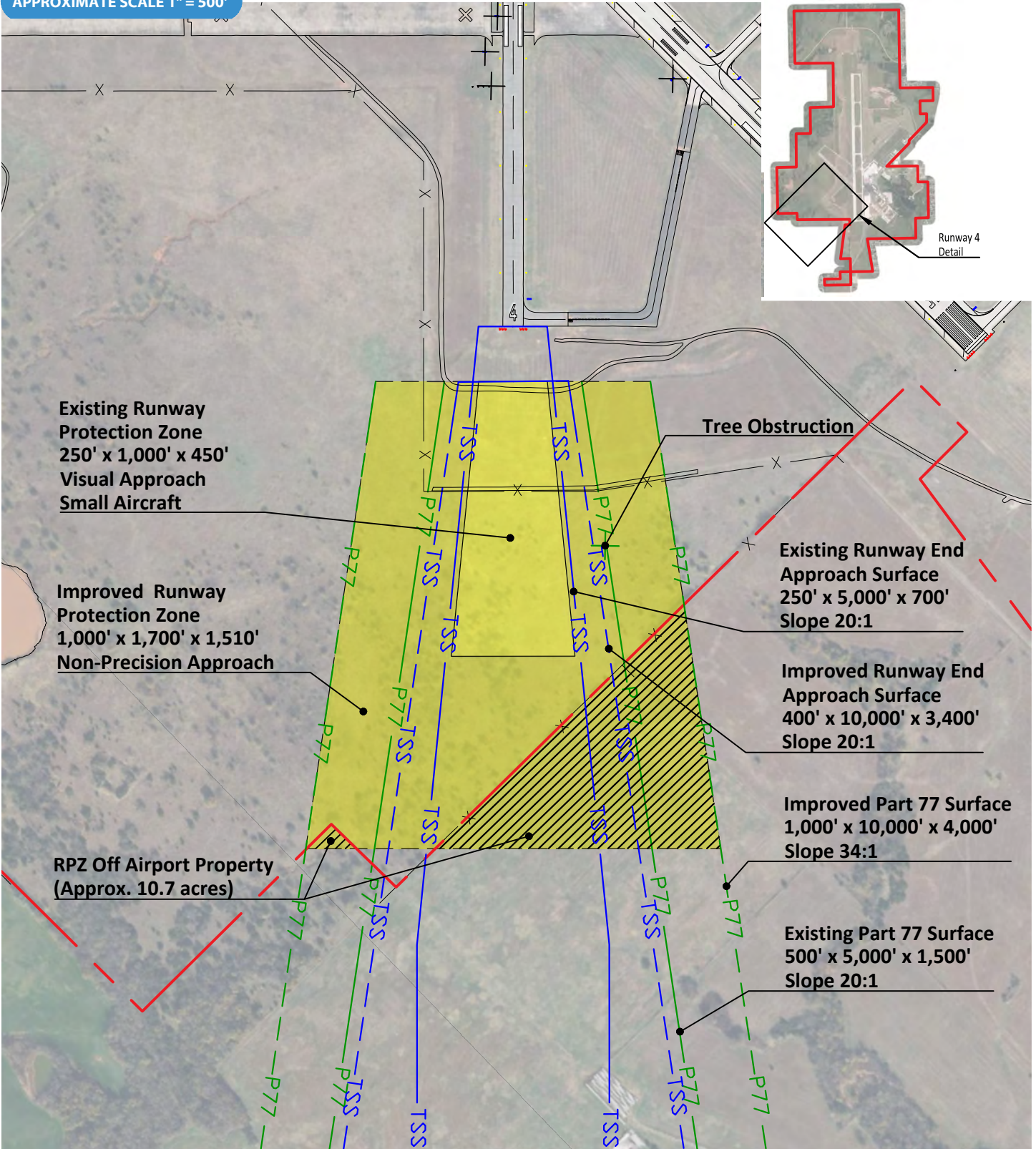
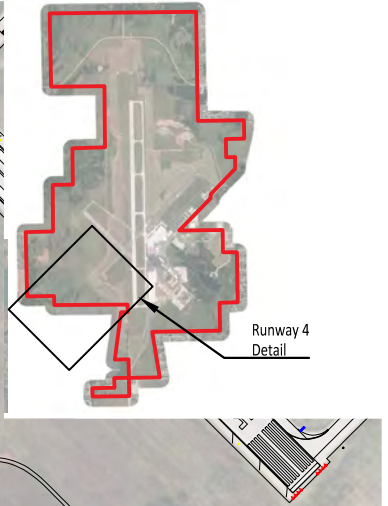


APPROXIMATE SCALE 1" = 500'



SWIO

Figure D-1
Runway 35 IAP
Improvement Requirements



Existing Runway Protection Zone
250' x 1,000' x 450'
Visual Approach
Small Aircraft

Improved Runway Protection Zone
1,000' x 1,700' x 1,510'
Non-Precision Approach

Tree Obstruction

Existing Runway End Approach Surface
250' x 5,000' x 700'
Slope 20:1

Improved Runway End Approach Surface
400' x 10,000' x 3,400'
Slope 20:1

Improved Part 77 Surface
1,000' x 10,000' x 4,000'
Slope 34:1

RPZ Off Airport Property
(Approx. 10.7 acres)

Existing Part 77 Surface
500' x 5,000' x 1,500'
Slope 20:1

Runway 22
Detail

APPROXIMATE SCALE 1" = 500'

Existing Part 77 Surface
500' x 5,000' x 1,500'
Slope 20:1

Improved Part 77 Surface
500' x 10,000' x 3,500'
Slope 34:1

RPZ Off Airport Property
(Approx 10.7 acres)

Existing Runway End
Approach Surface
250' x 5,000' x 700'
Slope 20:1

Bush Obstruction

Improved Runway End
Approach Surface
400' x 10,000' x 3,400'
Slope 20:1

Improved Runway
Protection Zone
1,000' x 1,700' x 1,510'
Non-Precision Approach

Existing Runway
Protection Zone
250' x 1,000' x 450'
Visual Approach
Small Aircraft

Figure D-3
Runway 22 IAP
Improvement Requirements

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Taxiway/Taxilane Design Standards

As presented in the previous chapter, Taxiway F1 nearly leads directly from the Hangar 1 Ramp to Runway 4/22, which could cause inadvertent runway incursions. Additionally, Taxiways F1 and B west of Runway 17/35 are not designed with the recommended right-angled taxiway geometry. The repositioning of Taxiway F northwest of the existing Taxiway F will provide a full-length taxiway parallel to Runway 22. The existing 530-foot separation of Taxiway F from the runway centerline will be reduced to 240 feet; this improvement has been on the existing ALP and is proposed to be continued.

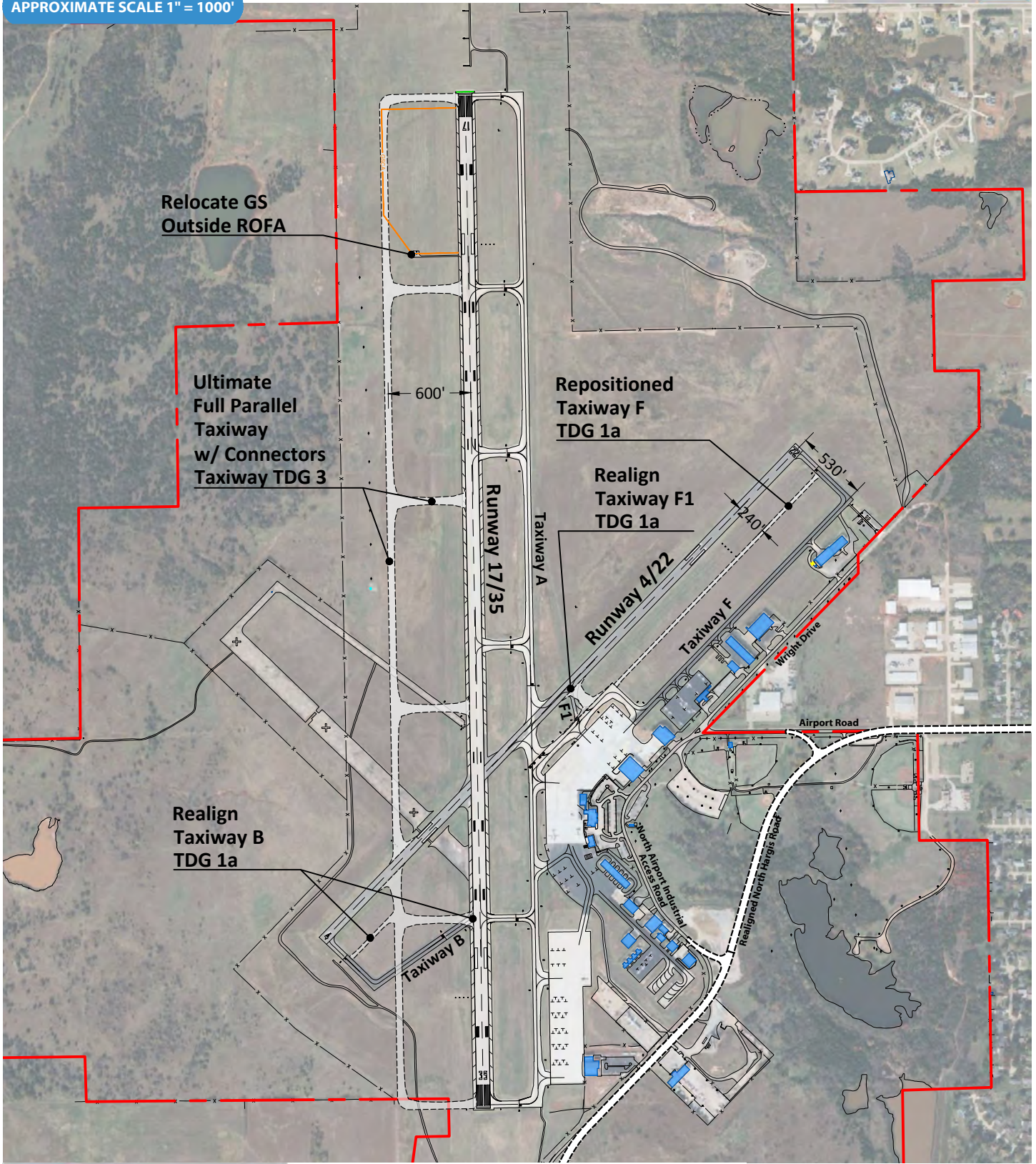
Recommendation. When pavement age and conditions warrant, it is recommended to reconfigure Taxiway F1 to a right-angled intersection and located such that two 90-degree turns are required between the Hangar 1 Ramp and Runway 4/22. The realignment should also help alleviate some of the pilot confusion that occurs near the Taxiways A and F intersections with Runway 4/22. Taxiway B should also be reconfigured to a right-angled intersection perpendicular with Runway 17/35 when its pavement age and condition warrants reconstruction.

When aeronautical development occurs on the west side of SWO, an ultimate parallel taxiway should be provided west of Runway 17/35. The location of this taxiway should be positioned outside the relocated glideslope antenna and its associated Critical Area (i.e., approximately 600 feet west of Runway 17/35, centerline to centerline). Additionally, the previous ALP presented a relocation of Taxiway F 290 feet to the northwest parallel to Runway 4/22. The relocated Taxiway F will be approximately 240 feet southeast of Runway 4/22, centerline to centerline. **Figure D-4** presents the ultimate layout of the taxiway system.



APPROXIMATE SCALE 1" = 1000'

AIRPORT MASTER PLAN



SWO

Regional Airport
Stillwater
OKLAHOMA

Figure D-4
Ultimate Taxiway System

LANDSIDE DEVELOPMENT CONCEPTS, ALTERNATIVES AND RECOMMENDATIONS

With the framework of SWO's ultimate airside development identified, placement of needed landside facilities can now be analyzed. The overall objectives of the landside plan is to provide conceptual development locations for facilities that are conveniently located, accessible to the community, and accommodate the specific requirements of SWO's users.

Passenger Terminal Building

As previously presented in **Chapter B - Forecasts of Aviation Activity** and **Chapter C - Facility Requirements**, programming for the expansion (or replacement) of the existing passenger terminal building at SWO is a critical factor in formulating the Master Plan recommendations.

The most important consideration in making a passenger terminal siting recommendation is the location of existing infrastructure. Locating the passenger terminal improvements where they can be easily accessed by existing utilities (i.e., water, sanitary sewer, electricity, fiber, telecommunications, etc.) is important; however, the real driving influences are:

- Airside access to the existing runway, taxiway, and aircraft parking Terminal Ramp pavement.
- Landside access to the local and regional roadway system.

The existing passenger terminal building area on the east side of SWO has these infrastructure prerequisites, which makes it the logical choice for future passenger terminal improvements.

Siting considerations and other long-term planning and space reservation factors that are considered in the passenger terminal building alternatives evaluation should:

- Accommodate a single-story building consisting of 32,000 square feet.
- Accommodate a minimum of two gates/holdrooms.
- Accommodate a minimum of two airlines.
- Accommodate a minimum of two parking positions for aircraft as large as the Boeing 737-800 (although the ERJ 175 is the critical commercial service aircraft used for the terminal improvement calculations).
- Allow for the development of vehicle parking with an area large enough to accommodate the needed 315 total parking spaces, which includes short-term, long-term, employee, and rental cars.
- Minimize the conflicts between commercial service and GA functions.
- Consider the impacts of the passenger terminal building improvements on existing buildings and infrastructure in the terminal area (e.g., continuation of existing commercial service operations during construction, Group Hangar 1, ARFF Facility, and Fixed Base Operator (FBO) facilities).

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- Maximize use of the existing Terminal Ramp pavement, including consideration of providing Passenger Boarding Bridges (PBB) and ensuring the provision of commercial service aircraft parking positions and on-apron aircraft taxilanes.

Although the future passenger terminal building footprint should be reserved at 32,000 square feet with adequate space for PBBs, the passenger terminal building will likely be phased. The provision of PBBs may also be phased, and initially less than 32,000 square feet will be constructed.

Additionally, even though the planning assumptions considered a single-story building, the final decision will be left to the design phase of the passenger terminal architectural project scheduled to begin in the fall of 2022.

Passenger Terminal Area Plan – Concept 1

Concept 1 proposes the development of a new passenger terminal building northeast of the existing facility. The new terminal would be rotated 45 degrees clockwise from its current configuration and provides a northwest-southeast façade orientation that maximizes the utilization of the Terminal Ramp pavement. The existing passenger terminal building would remain operational during the construction of the new facility and would later be modified to serve an FBO/GA terminal facility role. Siting of the new passenger terminal would also require relocation of Group Hangar 1 and the removal of the existing ATCT to provide increased separation from the adjacent GA facilities. A new facility would be constructed southeast of the new terminal building accessible via the new airport loop access roadway system. The airport loop road will connect to West Airport Road, North Airport Industrial Access Road, and the realigned North Hargis Road.

Key elements and design considerations of Concept 1 are presented in **Figure D-5**. The relative advantages and disadvantages of this concept are outlined below.

Advantages

- Minimizes impacts to existing commercial service operations during construction.
- Maximizes sight-line visibility and prominence of passenger terminal building.
- Maximizes separation between commercial service and GA functions.
- Maximizes utilization of new Terminal Ramp pavement.
- Maximizes redevelopment opportunities of existing passenger terminal building (e.g., for FBO and/or GA terminal uses).
- Potential reduction of construction costs due to site separation from existing passenger terminal building.
- Maximizes phasing options for ATCT removal.

Disadvantages

- Requires removal or relocation of Group Hangar 1.
- Group Hangar 1 removal or relocation impacts existing airport revenue generating tenants.

APPROXIMATE SCALE 1" = 300'

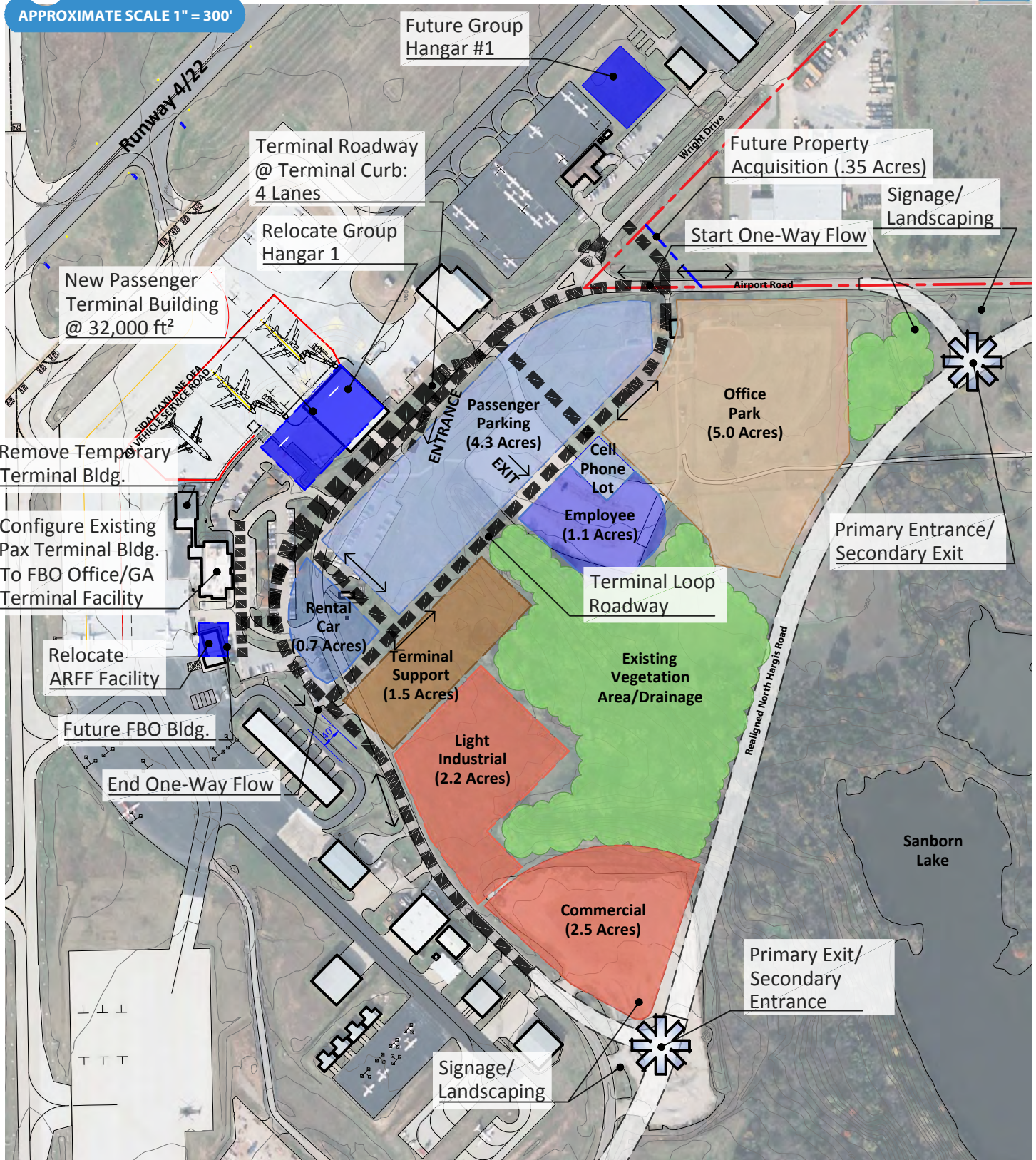


Figure D-5
Terminal Area Plan - Concept 1

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Passenger Terminal Area Plan – Concept 1A

Like Concept 1, Concept 1A proposes the development of a new passenger terminal building northeast of the existing facility. Similarly, this terminal would also be rotated 45 degrees clockwise from its current configuration, providing a northwest-southeast orientation maximizing the utilization of the Terminal Ramp pavement. The existing passenger terminal building would remain operational during the construction of the new portion of the facility, and later be connected to the new terminal building. The existing terminal building would also be modified to serve as a component of the new passenger terminal as well as an FBO/GA terminal facility. Siting of this passenger terminal concept would also require relocation of the existing modular building of the current terminal and the removal of the existing ATCT. A new passenger terminal parking facility would be constructed southeast of the new terminal and would be accessible via the airport loop access roadway, West Airport Road, North Airport Industrial Access Road, and the realigned North Hargis Road.

Key elements and design considerations of Concept 1A are presented in **Figure D-6**. The relative advantages and disadvantages of this concept are outlined below.

Advantages

- Potentially minimizes impacts to existing commercial service operations during construction.
- Potentially minimizes construction costs from reusing portions of existing passenger terminal building.
- Improves separation between commercial service and GA functions.
- Improves utilization of new Terminal Ramp pavement.
- Facilitates redevelopment opportunities for portion of existing passenger terminal building (e.g., for FBO and/or GA terminal uses).

Disadvantages

- Introduces construction phasing and operational complexities through integration of and connection to existing passenger terminal building.
- Provides fewer phasing options for ATCT removal compared to Concept 1.
- Improves, but does not maximize, separation between commercial service and GA functions.
- Potentially accelerates phasing of ATCT removal.
- Minimizes site-line visibility and prominence of passenger terminal building compared to Concepts 1 and 2.

APPROXIMATE SCALE 1" = 300'

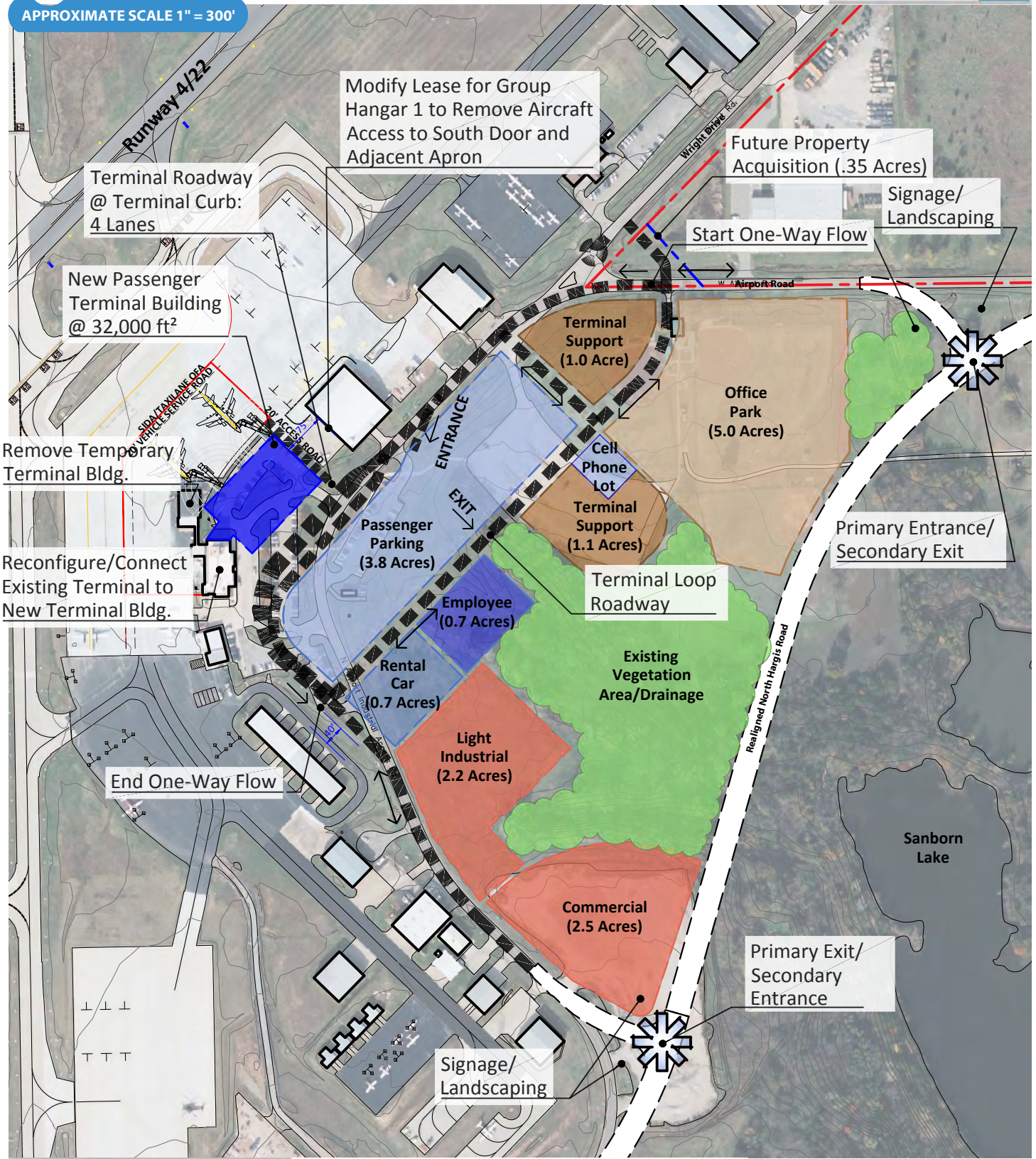


Figure D-6
Terminal Area Plan - Concept 1A

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Passenger Terminal Area Plan – Concept 2

Concept 2 proposes the development of a new passenger terminal building directly east of the existing facility while maintaining the existing east-west facing orientation. The existing passenger terminal building would remain operational during the construction of the new facility and later be removed (including the modular terminal building and ATCT) to accommodate a connection of the terminal apron. Siting of the new passenger terminal building will also require the relocation of the existing ARFF facility. A passenger terminal parking facility serving passenger autos, rental cars, and employees would be constructed east of the new terminal. As with Concepts 1 and 1A, the new parking facilities would be accessible via the airport loop access roadway and its connection to West Airport Road, North Airport Industrial Access Road, and the realigned North Hargis Road.

Key elements and design considerations of Concept 2 are presented in **Figure D-7**. The relative advantages and disadvantages of this concept are outlined below.

Advantages

- Improves sight-line visibility and prominence of passenger terminal building compared to Concept 1A.
- Improves separation between commercial service and GA functions.
- Improves utilization of new Terminal Ramp pavement.
- Facilitates conversion or redevelopment opportunities for Group Hangar 1 for FBO and/or GA terminal uses.

Disadvantages

- Maximizes impacts to existing commercial service operations during construction.
- Potentially increases construction costs due to minimal site separation from existing passenger terminal building.
- Prohibits potential redevelopment opportunities of existing passenger terminal building (e.g., for FBO and/or GA terminal uses).
- Reduces phasing and scheduling options for ATCT removal.
- Requires relocation of existing Group Hangar 1 tenants for reusing or repurposing as FBO/GA terminal.

Recommendation

Passenger Terminal Area Plan Concept 1 is preferred for many reasons. It minimizes impacts to the existing commercial service operations of the existing passenger terminal building during construction, which potentially reduces construction costs. It creates several varied phasing options for the ATCT removal and maximizes separation of the commercial service functions from the GA functions. When construction of the new passenger terminal building is complete, Concept 1 allows the entire existing terminal building to be repurposed into an FBO/GA terminal. It also maximizes the site-line visibility and prominence of the passenger terminal building.

APPROXIMATE SCALE 1" = 300'

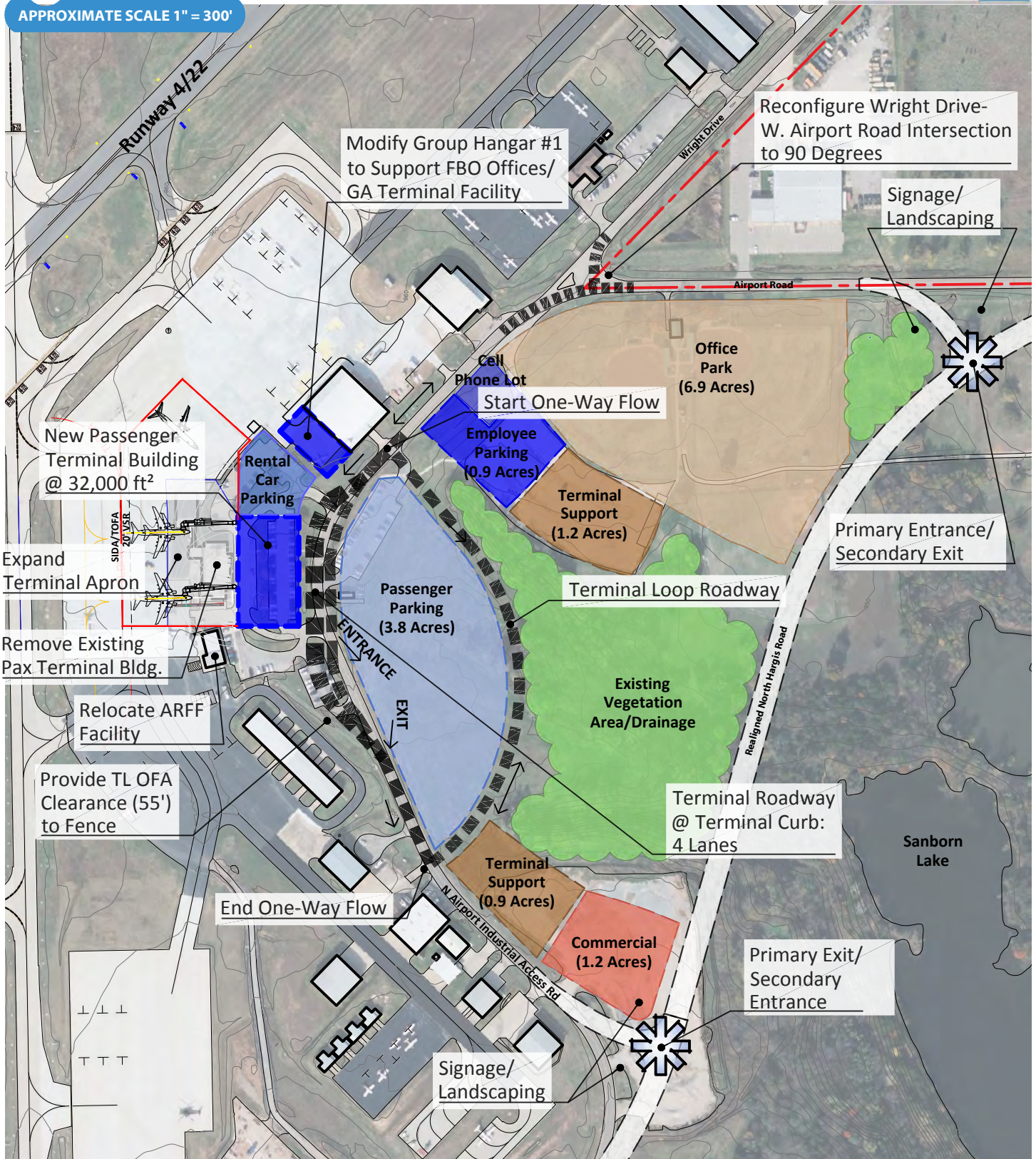


Figure D-7
Terminal Area Plan - Concept 2

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Terminal Area Landside Development

The terminal area landside development analysis focuses on the property directly east of the existing terminal building, between the proposed terminal building improvement options and the realigned North Hargis Road. Landside facility improvements are evaluated on properties not needed to support the passenger terminal functions either directly or indirectly (e.g., vehicle parking facilities and roadway relocation or improvement). This section accounts for on-airport land uses, landside constraints and opportunities, and any physical and environmental constraints. An emphasis will be placed on potential revenue generation, existing and planned infrastructure, and vehicle access.

The alternatives reflect development on all appropriate developable sites. The alternatives all include similar increases in impervious surface, and the associated environmental impacts of the landside alternatives are likely to be very similar. The existing vegetation and drainage area, located roughly in the middle of the development site, remains largely intact and consistent within each development concept. The topography within this area makes development difficult and cost prohibitive. Retaining native vegetation, to the extent possible, benefits the natural environment and minimizes runoff and drainage into Sanborn Lake and other downstream detention facilities. Retention of the existing trees at the primary entrance/secondary exit provides an attractive backdrop for the proposed entrance monumentation signage.

Each passenger terminal building alternative previously presented, Concepts 1, 1A, and 2, has two landside development concepts prepared and presented here.

Terminal Area Landside Alternative – Concept 1-01

Terminal Area Landside Alternative - Concept 1-01, associated with Passenger Terminal Area Plan – Concept 1, proposes the reservation of space for future terminal parking expansion at the southwest end of the passenger parking lot. In the northeast area of Concept 1-01, multi-story office buildings providing a total of 100,000 square feet of space and the required parking are located just beyond the primary entrance/secondary exit of the terminal area. The development of office buildings would provide a professional, welcoming experience for airport visitors.

In the south portion of the development area just beyond the terminal parking expansion reserve, a 17,000-square foot light industrial facility is proposed. Additionally, a multi-unit, 25,000-square foot commercial development is located near the primary exit/secondary entrance intersection with the realigned North Hargis Road. These uses can generate revenue for SWO while enhancing the overall visitor experience and surrounding community amenities.

Key elements and design considerations of Terminal Area Landside Alternative - Concept 1-01 are presented in **Figure D-8**.

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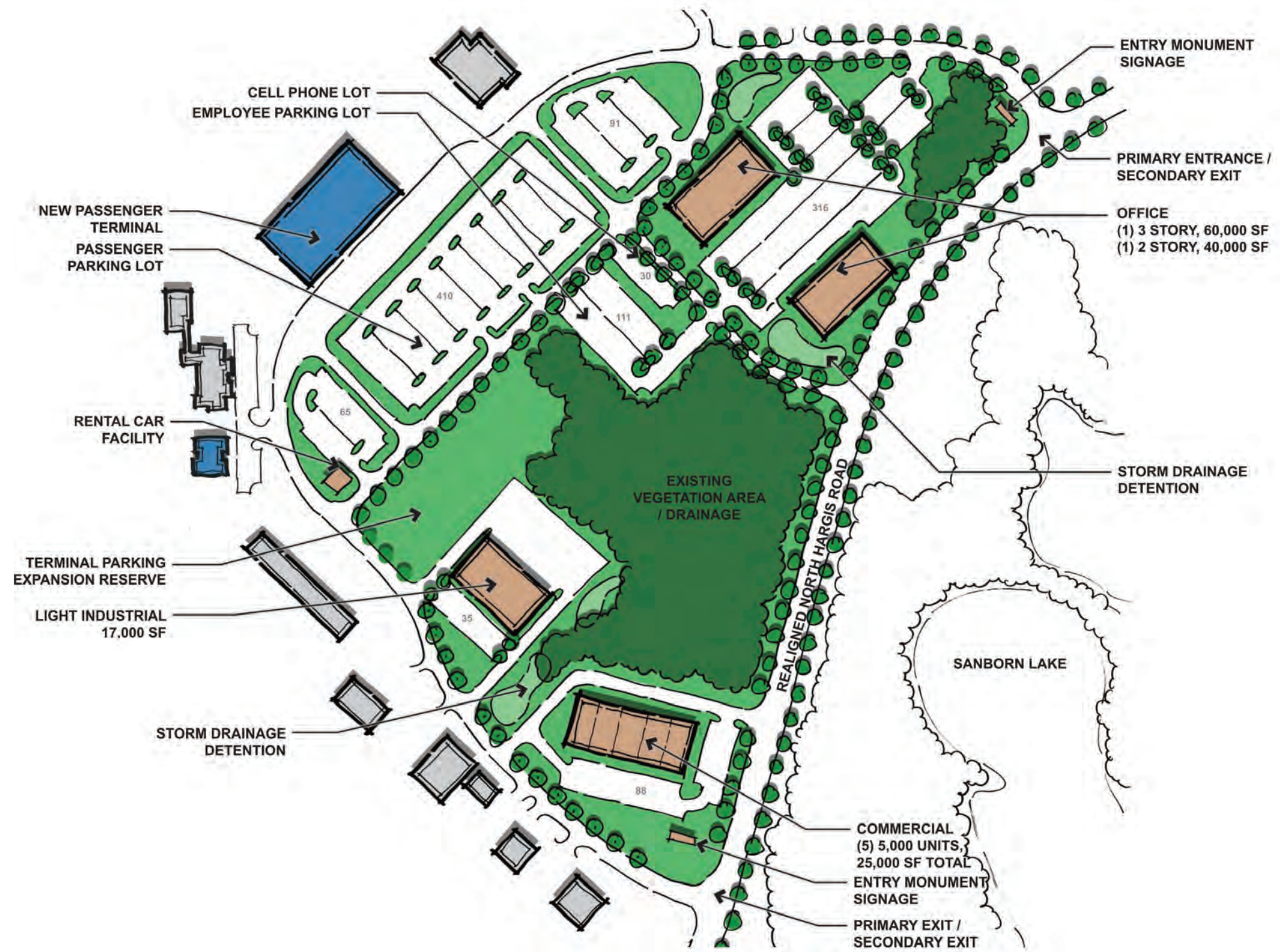
Terminal Area Landside Alternative – Concept 1-02

Terminal Area Landside Alternative - Concept 1-02, likewise associated with Passenger Terminal Area Plan – Concept 1, also proposes the reservation of space for future terminal parking expansion at the southwest end of the passenger parking lot. The multi-story office building development for this concept, providing approximately 80,000 square feet of space, is situated farther to the southwest when compared to Concept 1-01, adjacent the retained native vegetation and drainage area. Parking lots for the office buildings are located next to the buildings, which allows for a more attractive open landscape of native trees and prairie vegetation at the primary entrance/secondary exit. This also maximizes site lines to the proposed passenger terminal building as airport visitors enter and approach the terminal area.

In the south portion of the development area just beyond the terminal parking expansion reserve, a light industrial facility is proposed similar to Concept 1-01. However, this facility is slightly reoriented, and the parking lots are sited differently on the parcel. A smaller multi-unit commercial facility, that is also reoriented, and parking lots redesigned for the site are located near the primary exit/secondary entrance intersection with the realigned North Hargis Road.

Concept 1-02 also proposes the cell phone lot be located east of the realigned North Hargis Road, near the primary entrance/secondary exit. This could be a shared use parking lot that also serves Sanborn Lake Park. Park improvements such as a shelter could be accommodated by this parking lot while also providing parking for airport visitors waiting to pick up arriving passengers.

Key elements and design considerations of Terminal Area Landside Alternative - Concept 1-02 are presented in **Figure D-9**.



APPROXIMATE SCALE 1" = 250'

Source: The Olsson Studio.

Figure D-8
Terminal Area Landside Development
Alternative - Concept 1-01



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APPROXIMATE SCALE 1" = 250'

Source: The Olsson Studio.

Figure D-9
Terminal Area Landside Development
Alternative - Concept 1-02

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Terminal Area Landside Alternative – Concept 1A-01

Terminal Area Landside Alternative - Concept 1A-01, associated with Passenger Terminal Area Plan – Concept 1A, proposes the reservation of space for terminal parking expansion at the southeastern end of the passenger parking lot. A cell phone lot is also proposed in this area. The multi-story office building development for this concept is located just beyond the primary entrance/secondary exit of the terminal area. Similar to Concept 1-01, the development of approximately 100,000 square feet of office space would provide a professional and welcoming experience for airport visitors. Parking lots for the office buildings are located next to the buildings with a slightly different configuration compared to other concepts.

Two 20,000-square foot light industrial buildings are located on the west side of the development area, configured with loading access between the buildings. Like the previous concepts, multi-unit commercial development is located near the primary exit/secondary entrance intersection with the realigned North Hargis Road. However, Concept 1A-01 provides a unique orientation and configuration compared to the previous concepts. Subdivision of the commercial space could be provided to accommodate various potential tenants.

Key elements and design considerations of Terminal Area Landside Alternative - Concept 1A-01 are presented in **Figure D-10**.

Terminal Area Landside Alternative – Concept 1A-02

Terminal Area Landside Alternative - Concept 1A-02, also associated with Passenger Terminal Area Plan – Concept 1A, likewise proposes the reservation of space for terminal parking expansion at the southeast end of the passenger parking lot. This concept proposes two multi-story office buildings providing approximately 80,000 square feet of space, which are located just beyond the primary entrance/secondary exit of the terminal area. The parking lots designed for the office buildings are arranged in a quarter-circle west of the buildings, somewhat shielded from view of airport visitors as they approach the terminal area.

Two smaller light industrial buildings are located on the west side of the development area along the primary exit road. At the southwest corner of the site, near the primary exit/secondary entrance, there are commercial parcels that could be subdivided as needed to accommodate prospective tenants. Parking is located behind the buildings to provide architectural character along the realigned North Hargis Road.

Across the realigned North Hargis Road, a shared use parking lot is proposed that could serve as both the cell phone lot and as a trailhead for the nearby Sanborn Lake Park trails.

Key elements and design considerations of Terminal Area Landside Alternative - Concept 1A-02 are presented in **Figure D-11**.



N
 APPROXIMATE SCALE 1" = 250'

Source: The Olsson Studio.



Figure D-10
 Terminal Area Landside Development
 Alternative - Concept 1A-01



N
APPROXIMATE SCALE 1" = 250'

Source: The Olsson Studio.



Figure D-11
Terminal Area Landside Development
Alternative - Concept 1A-02

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Terminal Area Landside Alternative – Concept 2-01

Terminal Area Landside Alternative - Concept 2-01, associated with Passenger Terminal Area Plan – Concept 2, allocates the reservation of space for future terminal parking expansion at the southeastern end of the proposed passenger parking lot. With the proposed passenger terminal building located on the west side of the site, additional landside development area is available in the northeastern corner. Therefore, Concept 2-01 proposes three multi-story office buildings providing a total of 100,000 square feet of space located just beyond the primary entrance/secondary exit of the terminal area. The required parking is shown between the buildings, somewhat shielding it from airport visitors as they approach the terminal area.

Like the preceding concepts, commercial development is located near the primary exit/secondary entrance intersection with the realigned North Hargis Road. Concept 2-01 shows a convenience store occupying this site, which would benefit the surrounding community, provide revenue to SWO, and provide fuel for drivers returning their rental cars.

Key elements and design considerations of Terminal Area Landside Alternative - Concept 2-01 are presented in **Figure D-12**.

Terminal Area Landside Alternative – Concept 2-02

Terminal Area Landside Alternative - Concept 2-02, likewise associated with Passenger Terminal Area Plan – Concept 2, also proposes the reservation of space for future terminal parking expansion at the southeastern end of the proposed passenger parking lot. This concept provides for commercial development in the northeast corner of the site along the primary entrance road. Providing approximately 16,000 square feet of space, it may be subdivided as needed to accommodate prospective tenants. Southwest of the commercial development, adjacent to the retained native vegetation and drainage area, multi-story office building development is shown providing approximately 80,000 square feet of space. Parking lots for the office buildings are located to the north, which provides separation from the commercial land uses and maximizes the sight lines to the proposed passenger terminal building.

In the southern portion of the site, additional office development is proposed. This three-story building provides an additional 60,000 square feet of space, and ample parking is provided between the building and the primary exit/secondary entrance road. The preserved native vegetation and drainage area is used as an amenity area for the office park development. The office buildings are positioned next to the existing trees to help surround the office users with nature. Trails through the existing vegetation area could connect office users to each building as well as to the public trails at Sanborn Lake Park.

Key elements and design considerations of Terminal Area Landside Alternative - Concept 2-02 are presented in **Figure D-13**.



N
APPROXIMATE SCALE 1" = 250'

Source: The Olsson Studio.

Figure D-12
Terminal Area Landside Development
Alternative - Concept 2-01



N
 APPROXIMATE SCALE 1" = 250'

Source: The Olsson Studio.



Figure D-13
 Terminal Area Landside Development
 Alternative - Concept 2-02

D. Alternatives Development and Recommendations

Recommendation

The six concepts presented in the preceding section represent various landside development schemes for the terminal area. No concept is selected as the preferred development at this time. SWO can use the concepts as a marketing tool for potential developers as demand occurs and financial realities are more defined.

ATCT

As presented in the previous chapter, the existing ATCT is not sited to provide adequate line of sight (LOS) angle of incidence to Runway 17 and unobstructed views to all aircraft movement areas. Additionally, the location atop the terminal building does not meet sufficient safety guidelines of separation from non-secure vehicles and persons. The evaluation of four new ATCT alternative sites is presented below.

Alternative Location One

Alternative One is located approximately 1,285 feet west of the Runway 17/35 centerline and 3,625 feet south of Runway 17. With a primary view to the east, this location affords excellent visibility to all approach areas and runway ends. Based on an eye height elevation of 1,054 feet, which is approximately 95 feet above ground level (AGL), a LOS angle of incidence of 0.80 degrees is achieved to Runway 17. As presented on **Figure D-14**, all aircraft movement areas are afforded unobstructed views. Total tower height would be approximately 120 feet AGL with an approximate top elevation of 1,079 feet¹. This alternative is below all FAR Part 77 obstruction surfaces.

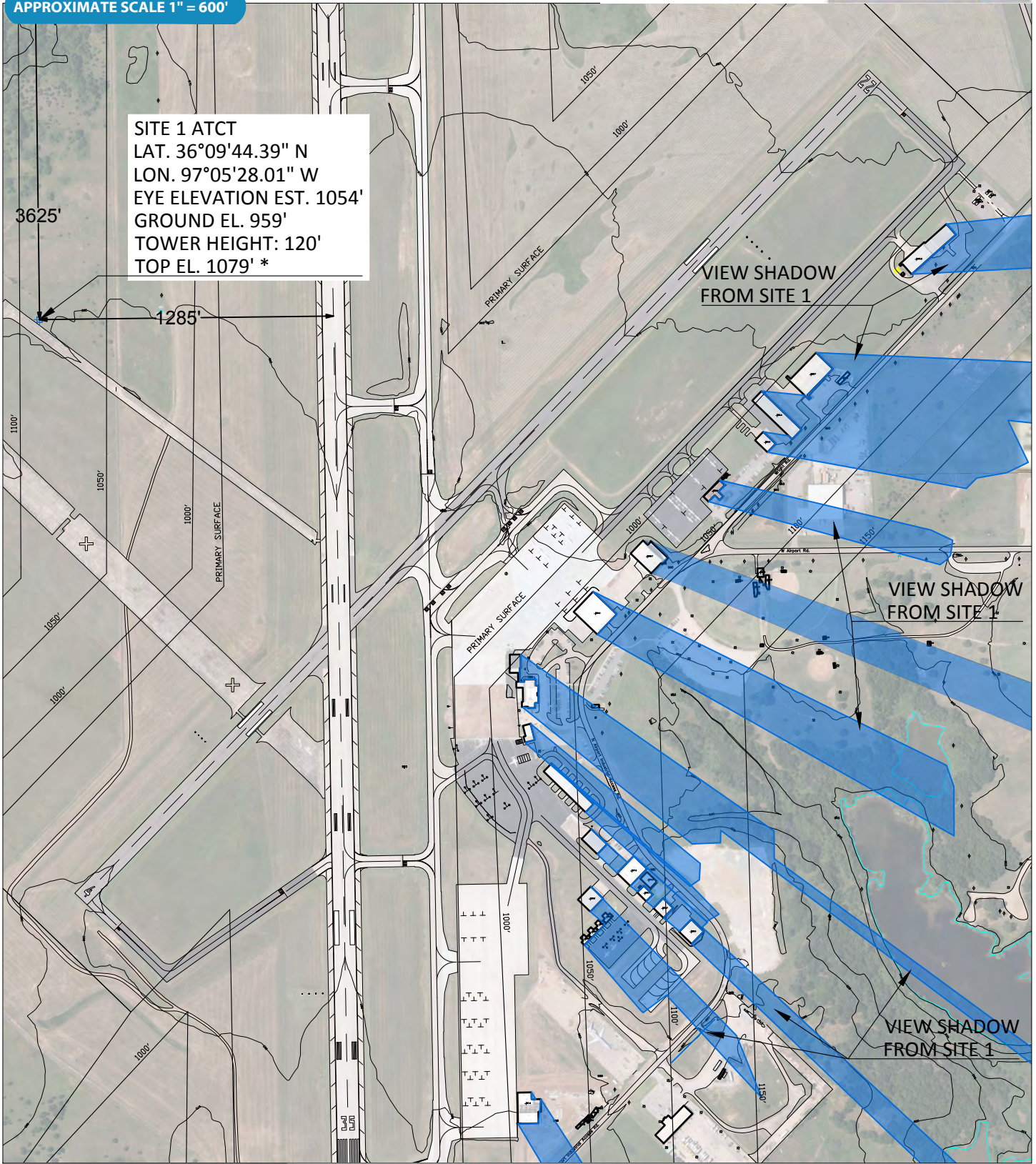
Alternative Location Two

Alternative Two is located approximately 1,142 feet east of the Runway 17/35 centerline and 972 feet northwest of the Runway 4/22 centerline. With a primary view to the west, this location affords acceptable visibility to the approach areas and Runways 17, 35, and 4. The Runway 22 approach area would be behind the primary viewing direction toward Runway 17/35 but is not expected to create controller viewing issues. Based on an eye height elevation of 1,039 feet, which is approximately 60 feet AGL, a LOS angle of incidence of 0.81 degrees is achieved to Runway 17. As presented on **Figure D-15**, most of the primary aircraft movement areas provide unobstructed views except for the Southeast GA Taxilane, which is virtually 100 percent obscured from controller views. Additionally, portions of the south end of the existing Terminal Ramp and the north end of the University Flight Center Ramp South would also be obscured. However, with the expected removal of the portable building housing the TSA security screening checkpoint and secure holding room, and the existing ATCT atop the existing terminal building, some, but not all, of the obstruction areas would be alleviated. Total tower height would be approximately 85 feet AGL with an approximate top elevation of 1,064 feet. This alternative is below all FAR Part 77 obstruction surfaces.

¹ All tower heights estimated at 25 feet above controller eye elevation.



APPROXIMATE SCALE 1" = 600'



SITE 1 ATCT
LAT. 36°09'44.39" N
LON. 97°05'28.01" W
EYE ELEVATION EST. 1054'
GROUND EL. 959'
TOWER HEIGHT: 120'
TOP EL. 1079' *

3625'

1285'

VIEW SHADOW
FROM SITE 1

VIEW SHADOW
FROM SITE 1

VIEW SHADOW
FROM SITE 1

*(EST. 25' ABOVE CONTROLLER EYE ELEVATION)

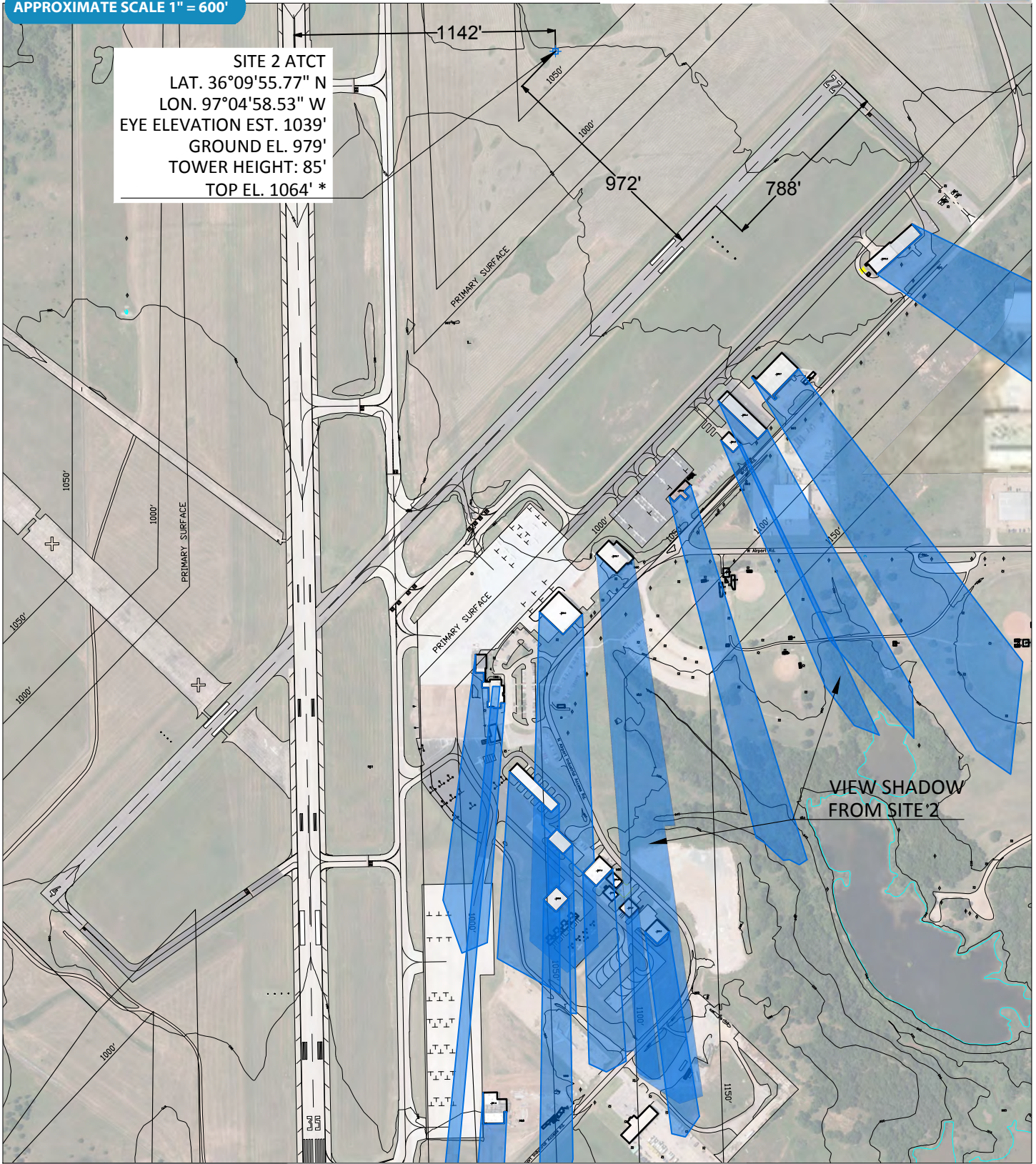
Figure D-14

ATCT Alternative Location One Shadow Study



APPROXIMATE SCALE 1" = 600'

SITE 2 ATCT
LAT. 36°09'55.77" N
LON. 97°04'58.53" W
EYE ELEVATION EST. 1039'
GROUND EL. 979'
TOWER HEIGHT: 85'
TOP EL. 1064' *



* (EST. 25' ABOVE CONTROLLER EYE ELEVATION)

Figure D-15

ATCT Alternative Location Two Shadow Study

D. Alternatives Development and Recommendations

Alternative Location Three

Alternative Three is located approximately 1,543 feet west of the Runway 17/35 centerline and 2,520 feet north of Runway 22. With a primary view to the east, this location affords excellent visibility to all approach areas and runway ends. Based on an eye height elevation of 1,072 feet, which is approximately 120 feet AGL, a LOS angle of incidence of 0.81 degrees is achieved to Runway 17. As presented on **Figure D-16**, all primary aircraft movement areas provide unobstructed views except for a portion of the southern end of the Southeast GA Taxilane. Total tower height would be approximately 145 feet AGL with an approximate top elevation of 1,097 feet. This alternative is below all FAR Part 77 obstruction surfaces.

Alternative Location Four

Alternative Four is located approximately 1,618 feet southwest of Runway 22 and 746 feet southeast of the Runway 4/22 centerline. With a primary view to the west, this location affords adequate visibility to the approach areas and Runways 17, 35, and 4. The Runway 22 approach area would be slightly behind the primary viewing direction toward Runway 17/35 but is not expected to create controller viewing issues. Based on an eye height elevation of 1,065 feet, which is approximately 100 feet AGL, a LOS angle of incidence of 0.80 degrees is achieved to Runway 17. As presented on **Figure D-17**, most primary aircraft movement areas provide unobstructed views except for parts of Taxiways A and B and the southern portion of the Terminal Ramp. With the expected removal of the portable building housing, the TSA security screening checkpoint, secure holding room, and the existing ATCT atop the terminal building, many of the obstructions would be alleviated. However, the existing terminal building would still obscure parts of the Terminal Ramp from the controller's eyesight. Total tower height would be approximately 125 feet AGL with an approximate top elevation of 1,090 feet. A taller tower would alleviate the obstructed views to the Terminal Ramp, but this alternative is above the existing FAR Part 77 obstruction surfaces; additional height will increase the amount of penetration.

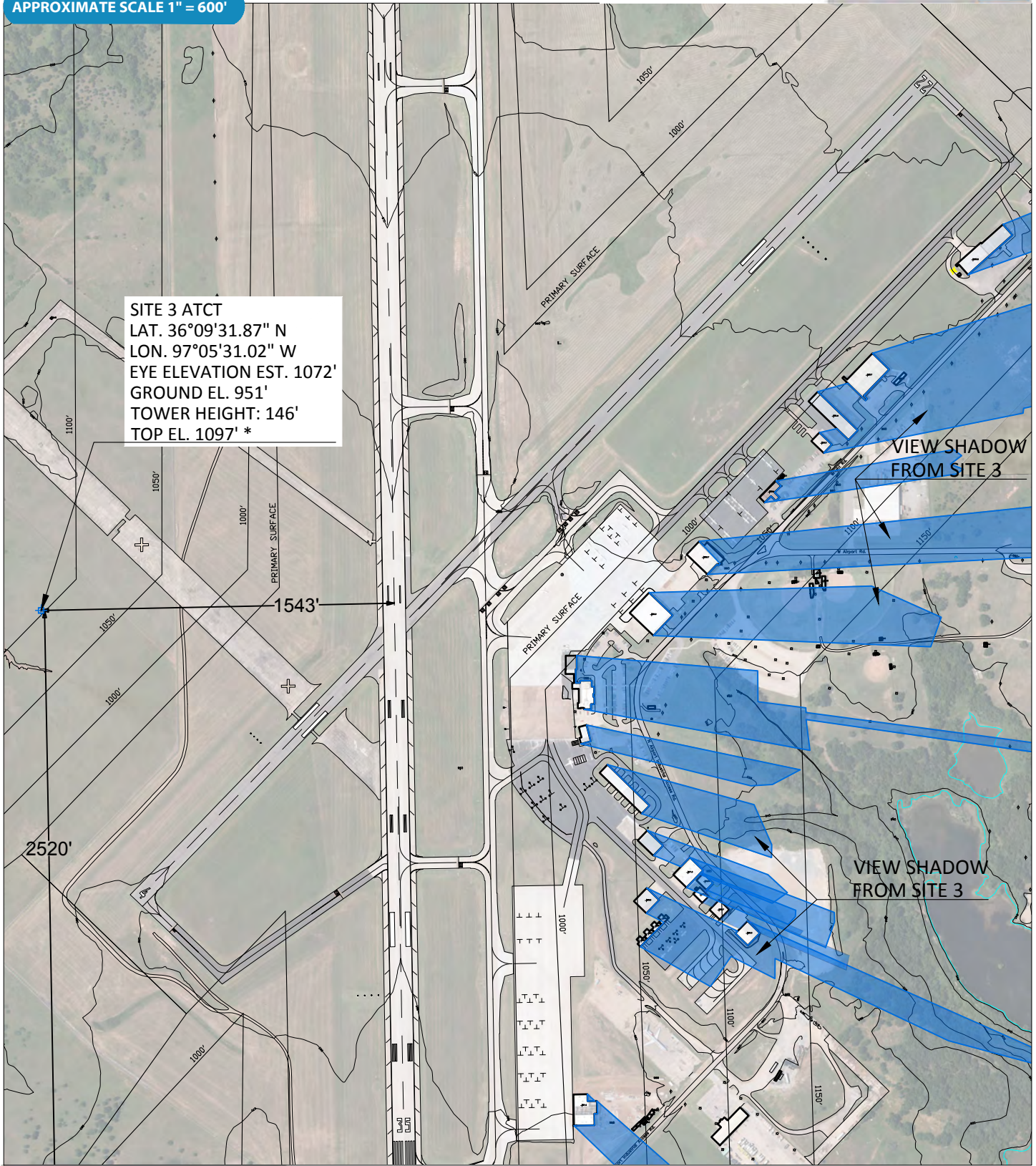
Recommendation

Alternative Location One is preferred because of its more central location of Runway 17/35, lower height, and better visibility to all approach areas, runway ends, and aircraft movement areas.



APPROXIMATE SCALE 1" = 600'

SITE 3 ATCT
 LAT. 36°09'31.87" N
 LON. 97°05'31.02" W
 EYE ELEVATION EST. 1072'
 GROUND EL. 951'
 TOWER HEIGHT: 146'
 TOP EL. 1097' *



* (EST. 25' ABOVE CONTROLLER EYE ELEVATION)

Figure D-16

ATCT Alternative Location Three Shadow Study

D. Alternatives Development and Recommendations

ARFF Facility

As presented in the previous chapter, the existing ARFF Facility is not adequately sized to store both ARFF vehicles indoors, nor does it provide sufficient area for equipment and material storage. There is also generally insufficient space for maintenance activities. With the redevelopment of the terminal area and the proposed reuse of the existing ARFF Facility for additional FBO facilities, alternative locations for a future ARFF facility meeting the siting requirements provided in FAA AC 150/5210-15A should be evaluated and a preferred site selected. Siting factors for an ARFF Facility are summarized below:

- One vehicle must be able to respond to the midpoint of the farthest runway serving air carrier aircraft within three minutes from the time an alarm sounds.
- Any other vehicles must respond within four minutes from the time an alarm sounds to the same point.
- Sites should provide immediate, unimpeded, and straight access to the airfield network with a minimum of turns.
- Direct access to the terminal apron that minimizes crossing of active runways.
- Provide maximum surveillance of the airfield.
- Minimize interference or obstruction from other airport uses such as fuel farms, access roads, and aircraft taxiing or parking areas.

There are four ARFF facility alternative locations presented in **Figure D-18** and the evaluation of each is outlined below.

Alternative Location One

This location is located near the north end of Taxiway A. Direct access to the airfield system can be provided via a connection to the north end of Taxiway A. Response times to the midpoint of Runway 17/35 within the prescribed period should be met from this location. Direct access to the Terminal Ramp is possible without crossing Runway 17/35. No additional airport uses are currently located at this location. This location does not maximize airfield surveillance when compared to Alternative Location Two. Joint use of the ARFF Facility and a City of Stillwater fire station is possible in this location, should SWO and the city choose to enter into a joint use agreement. Landside access can be provided through a road connection to East 580 Road.

Alternative Location Two

This location is located on the west side of SWO, west of Runway 17/35. Utilizing the access road and utilities installed for the preferred ATCT site would reduce the initial installation costs for this location. Airfield surveillance is maximized from this location, as are vehicle response times to the midpoint of Runway 17/35. However, Runway 17/35 would have to be crossed to access the Terminal Ramp. Airside access is less direct for this location compared to the other three alternatives, so an initial paved access road would need to be provided to Runway 17/35. This location also affords the opportunity for a joint ARFF Facility and City of Stillwater fire station.

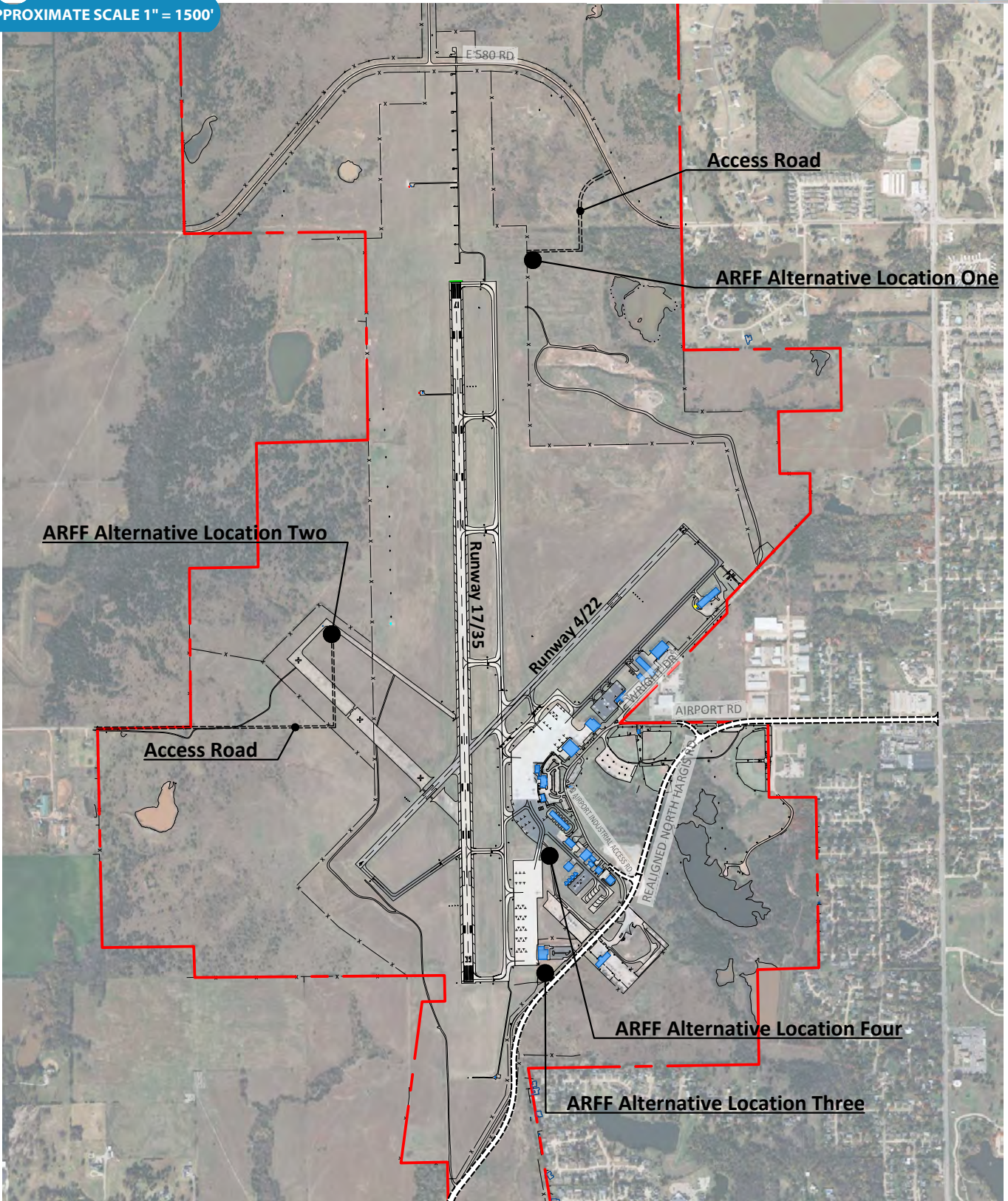


Figure D-18
Aircraft Rescue and Fire Fighting Facility Site Alternatives

D. Alternatives Development and Recommendations

Alternative Location Three

This location is at the south end of Taxiway A, south of the new OSU Flight Center. Currently, this site is the storm water detention facility for the OSU Flight Center facilities. Direct existing airside access is provided by Taxiway A1, thus response times to the midpoint of Runway 17/35 within the prescribed period should be met from this location. Direct access to the Terminal Ramp is provided without crossing Runway 17/35. The University Flight Center Ramp South is near this location, but the tie-down areas are north of Taxiway A1 and should not interfere with the ARFF vehicles responding to an emergency. Like Alternative Location One, this location does not maximize airfield surveillance when compared to Alternative Locations Two and Four. This location also affords the opportunity for a joint ARFF facility and City of Stillwater fire station through landside access directly via North Hargis Road.

Alternative Location Four

This location is at the south end of the Terminal Ramp, near the intersection of the Southeast GA Taxilane and the University Flight Center Ramp South. **Figure D-21** that follows the South GA Area Alternative One analysis provides more details about this site. It is centrally located, provides direct airside access via the Terminal Ramp, and response times to the midpoint of Runway 17/35 within the prescribed period would be met from this location. Aircraft tie-downs associated with both the University Flight Center Ramp South and the Terminal Ramp are close to this location, but these facilities should not interfere with ARFF vehicles responding to an emergency. Like Alternative Location Two, this location maximizes airfield surveillance when compared to Alternative Locations One and Three. Vehicle access can be provided by a new access route serving the future GA development in the area, but its location does not afford the opportunity for a joint ARFF Facility and City of Stillwater fire station.

Recommendation

Based on a central east side location providing excellent response times to the airfield and Terminal Ramp, Alternative Location Four is the preferred ARFF Facility location.

Snow Removal Equipment (SRE) and Airport Maintenance Facility

The previous chapter indicated that an ultimate SRE and Airport Maintenance Facility building totaling approximately 15,500 square feet is considered appropriate for SWO. Thus, alternative locations meeting siting factors outlined in FAA AC 150/5220-18A should be evaluated and a preferred site selected. Siting factors include:

- No interference with fire lanes used by the ARFF services and aircraft taxiing operations.
- Direct access to taxiways and runways without using airport perimeter roads to reduce wear and tear on equipment and prevent slow response times.
- Emphasis on the mitigation of runway incursions by eliminating the need for employee, private, and service vehicles to cross runways or taxiways to access the facility.

D. Alternatives Development and Recommendations

- Consideration of the effect on other existing facilities and avoidance of existing and future revenue-producing areas such as aprons and hangar areas.

There are five SRE and Airport Maintenance Facility alternative locations presented in **Figure D-19**, and the evaluation of each is outlined below.

Alternative Location One

This location is at the northeast end of Taxiway F, northeast of the existing fuel storage facility. Direct airside access is provided to Taxiway F and landside access through a connection to Wright Drive. Ample space is available for outdoor material storage and future expansion needs. This site is not anticipated to be developed for revenue-producing facilities because of its proximity to the fuel storage facility and distance from the airside facilities.

Alternative Location Two

This site is located near the north end of Taxiway A. If developed in conjunction with an ARFF facility, the site development costs could be reduced by combining utilities and vehicle access across two facilities. Near-direct airside access to Taxiway A is available and landside access can be provided by a road connection to East 580 Road.

Alternative Location Three

Located on the west side of SWO, this site can be developed in conjunction with the preferred future ATCT site and ARFF facility, thus benefitting from the utilities provided when the ATCT is constructed. Airside access is less direct than the other alternative locations, requiring an initial paved access road to Runway 17/35. Landside access can make use of the vehicle road provided for the ATCT.

Alternative Location Four

This location is at the south end of Taxiway A, south of the new OSU Flight Center. Currently, this site is the storm water detention facility for the OSU Flight Center facilities. Excellent direct airside access is provided via Taxiway A1 to Taxiway A, and landside access can be provided directly to North Hargis Road. The site's size prevents both an ARFF and SRE and Airport Maintenance Facility from being collocated in the same area, and it would only marginally accommodate a 15,500-square foot facility.

Alternative Location Five

This location is an expansion of existing facilities consisting of the Operations Building, the decommissioned plane wash bay, and the Administration Building. Constructing a facility that makes use of existing structures and reuse of space, to the extent practical provides a fiscally responsible alternative to a new stand-alone facility. Additionally, if the administration offices are relocated to the new terminal building, the vacated space can be used to house SRE staff during extended snow and ice events. Increased staff parking needs indicate a parking lot would need to be provided east of North Airport Industrial Access Road.

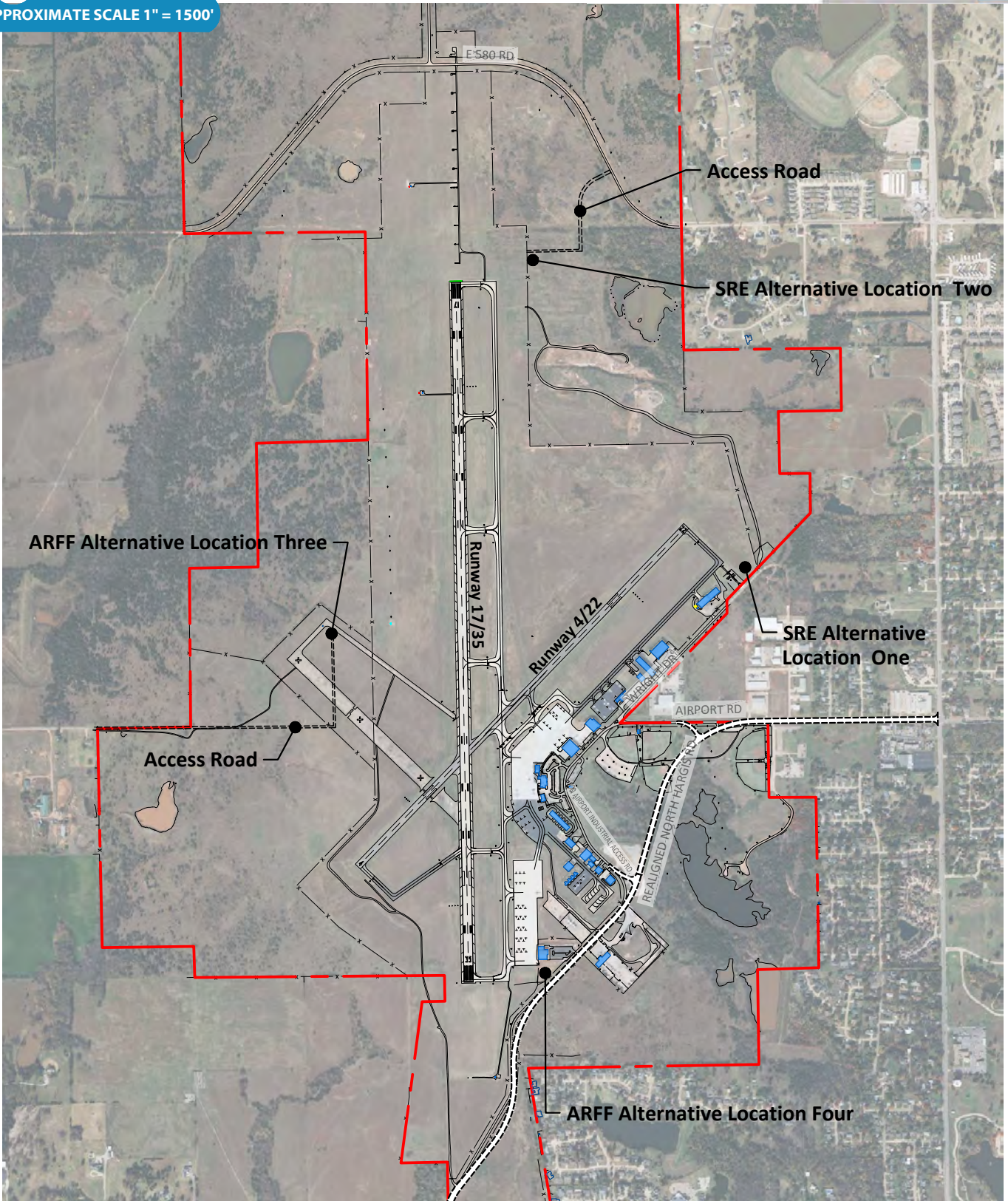


Figure D-19
Snow Removal Equipment and Airport Maintenance Facility Site Alternatives

D. Alternatives Development and Recommendations

Recommendation

With the selection of ARFF Alternative Location Four, the continuation of a centralized location for SRE, Airport Maintenance, and ARFF is most responsible given SWO's current personnel makeup and role responsibilities (e.g., maintenance personnel also staff ARFF equipment). Therefore, for the initial and intermediate period, Alternative Location Five is the preferred site. However, when hangar demand reaches a point that the revenue-producing capability of this site outweighs the convenience of a centralized SRE and Airport Maintenance facility, Alternative Location One is the preferred long-term site.

General Aviation Facilities

As has been established in previous chapters, general aviation (GA) is a very diverse category of aviation uses considering aircraft size, technology and sophistication, mission of the organization operating the aircraft, and both airside and landside access requirements. GA as a category includes private aviation related to recreational flying, flight training, business transportation and storage, corporate aviation related to employee transportation and aircraft storage, and Fixed Base Operators (FBOs) or Specialized Aviation Service Operators (SASOs) providing aviation services. FBOs and SASOs may provide one or many services generally consisting of aircraft maintenance, aircraft charter and rental, aircraft storage, fuel sales, and aircraft manufacturing and/or refurbishment.

The diverse aviation use categories mentioned above will impact the appropriateness of a given location for specific GA uses. However, as in most cases, any given site can accommodate a variety of GA uses. The recommendations provided here attempt to identify the best types of facilities for a specific developable site. Ultimately, SWO must evaluate specific development proposals and make land use determinations based on the proposed site use efficiencies, striving to maximize the utilization of the available property in the most efficient and effective manner (i.e., the highest and best use of each property parcel), and for SWO's best business and financial practices.

With the configuration of the terminal building layout decided, alternative GA facilities can be considered and evaluated. SWO GA landside development is divided by the passenger terminal building into two separate areas: the northeast area and the south area. Conceptual level planning layouts are provided for these two areas in the following sections.

Northeast Area

The proposed GA layout in the northeast area of SWO assumes that Taxiway F will be relocated to the northwest by approximately 280 feet. When relocated, additional aviation development area is made available. However, because of the northeast area's proximity to Runway 4/22, the allowable height of any structures will be limited, so aircraft apron parking is the anticipated primary aviation use between existing Taxiway F and the relocated Taxiway F, similar to the existing Hangar 1 Ramp. Additionally, as the timing of the taxiway relocation is unknown, most initial and intermediate period development will occur southeast of the existing Taxiway F.

D. Alternatives Development and Recommendations

A replacement location for the existing Group Hangar 1 is proposed at the northeastern edge of the University Flight Center Ramp North. Ample space is available for a 10,000-square foot hangar and an adjoining 5,000-square foot office space. The vacated Flight Center building is proposed for demolition, providing development space for additional hangars or support facilities. Sufficient space for two electric aircraft charging stations is recommended at the south end of the apron.

Between the OSU Maintenance Hangar and the Rock Hangar, space is reserved for additional box hangars or T-hangars. An off-season storage building is currently proposed for construction between the fuel storage facility and the Rock Hangar. **Figure D-20** provides the layout of proposed GA facilities in this area.

South Area

Both South Area alternatives assume continued development of the OSU Flight Center facilities adjacent to the University Flight Center Ramp South. Minor variations to the existing layout are proposed. Additionally, development at the southeast end of the Southeast GA Taxilane reflects current plans for additional T-hangars, box hangars, and corporate hangars. A proposed airport road provides vehicle access from North Hargis Road along the northeast side of the MD-80 site.

South Area GA Alternative One

This alternative retains the two proposed OSU Maintenance Hangars north of the existing flight center. Aircraft parking apron is provided along the north ends of the hangars. The T-hangar layout remains unchanged.

Two corporate hangars are proposed north of the OSU T-hangars on the east edge of the University Flight Center Ramp South. Two additional corporate hangars are provided southwest of the Southeast GA Taxilane adjacent to the Simmons Hangar. An ARFF facility is proposed at the junction of the University Flight Center Ramp South and the Southeast GA Taxilane, as described above. **Figure D-21** shows the proposed South Area GA Development – Alternative One.

South Area GA Alternative Two

This alternative slightly modifies the current OSU Flight Center plans by proposing one maintenance hangar directly north of the existing flight center facility instead of two. Additional aircraft parking apron is proposed between the east edge of the University Flight Center Ramp South and the proposed Maintenance Hangar. The T-hangar layout remains unchanged.

Like Alternative One, this alternative proposes two corporate hangars north of the OSU T-hangars on the east edge of the University Flight Center Ramp South. One 10-unit T-hangar is proposed at the northwestern end of the Southeast GA Taxilane. This alternative provides for an ARFF south of the existing OSU Flight Center. Provided with both excellent airside and landside access, this facility could be a joint use ARFF and city fire station facility, as described above. **Figure D-22** shows the proposed South GA Area Development – Alternative Two.

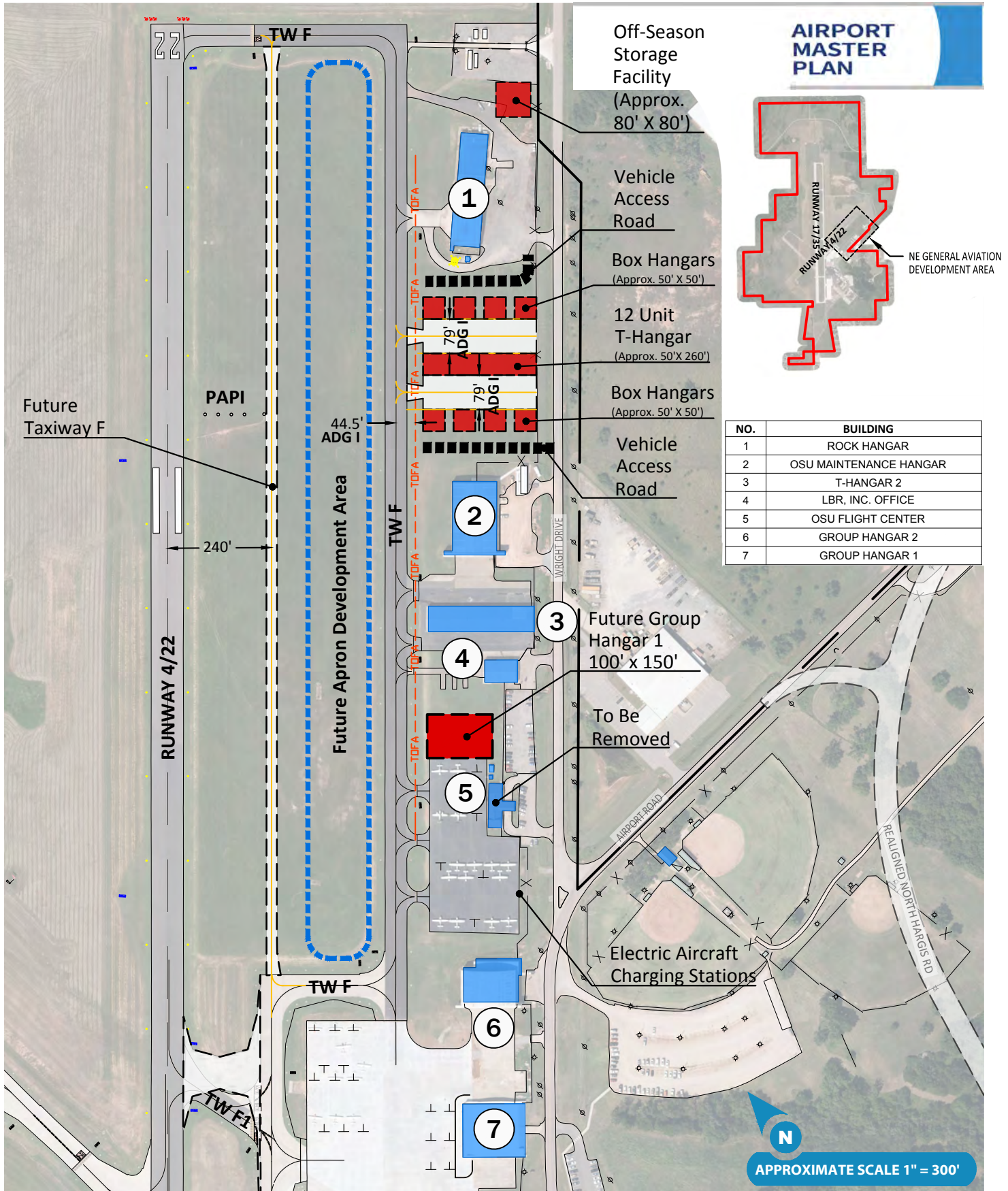


Figure D-20
 Northeast Area General Aviation Proposed Development

AIRPORT MASTER PLAN

N
APPROXIMATE SCALE 1" = 300'

| NO. | BUILDING |
|-----|--|
| 8 | TERMINAL/ATCT |
| 9 | ARFF |
| 10 | T-HANGAR 1 |
| 11 | COWBOY HANGAR |
| 12 | ADMINISTRATION AND OPERATIONS |
| 13 | DOUBLE C HANGAR - SIMMONS HANGAR |
| 14 | ADMINISTRATION BUILDING |
| 15 | DECOMMISSIONED PLANE WASH BAY |
| 16 | WAITS HOLDING HANGAR |
| 17 | PORT-A-PORT HANGARS |
| 18 | WASTE MANAGEMENT BUILDING AND FACILITY |
| 19 | SPECIAL ENERGY HANGAR |
| 20 | OSU FLIGHT CENTER SOUTH |

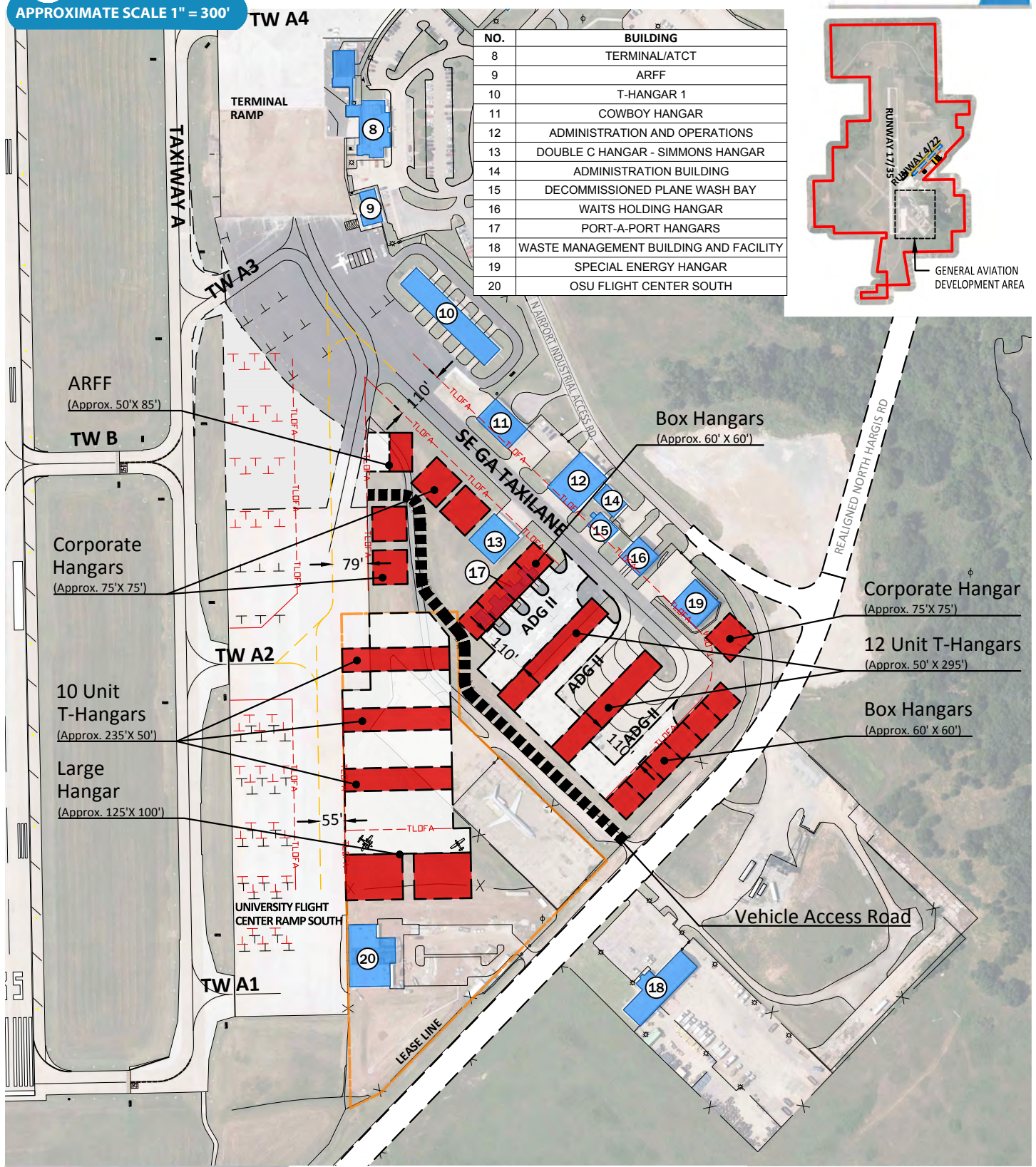
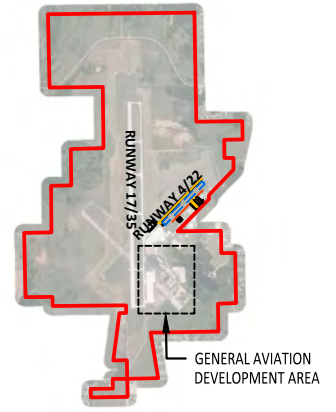
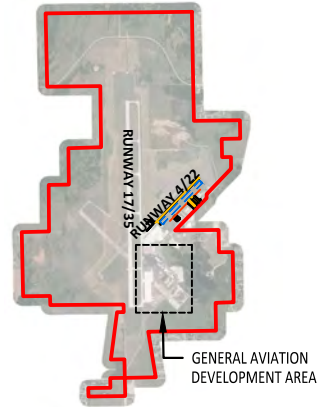


Figure D-21
South Area General Aviation Proposed Development - Alternative One

AIRPORT MASTER PLAN



N
APPROXIMATE SCALE 1" = 300'

| NO. | BUILDING |
|-----|--|
| 8 | TERMINAL/ATCT |
| 9 | ARFF |
| 10 | T-HANGAR 1 |
| 11 | COWBOY HANGAR |
| 12 | ADMINISTRATION AND OPERATIONS |
| 13 | DOUBLE C HANGAR - SIMMONS HANGAR |
| 14 | ADMINISTRATION BUILDING |
| 15 | DECOMMISSIONED PLANE WASH BAY |
| 16 | WAITS HOLDING HANGAR |
| 17 | PORT-A-PORT HANGARS |
| 18 | WASTE MANAGEMENT BUILDING AND FACILITY |
| 19 | SPECIAL ENERGY HANGAR |
| 20 | OSU FLIGHT CENTER SOUTH |

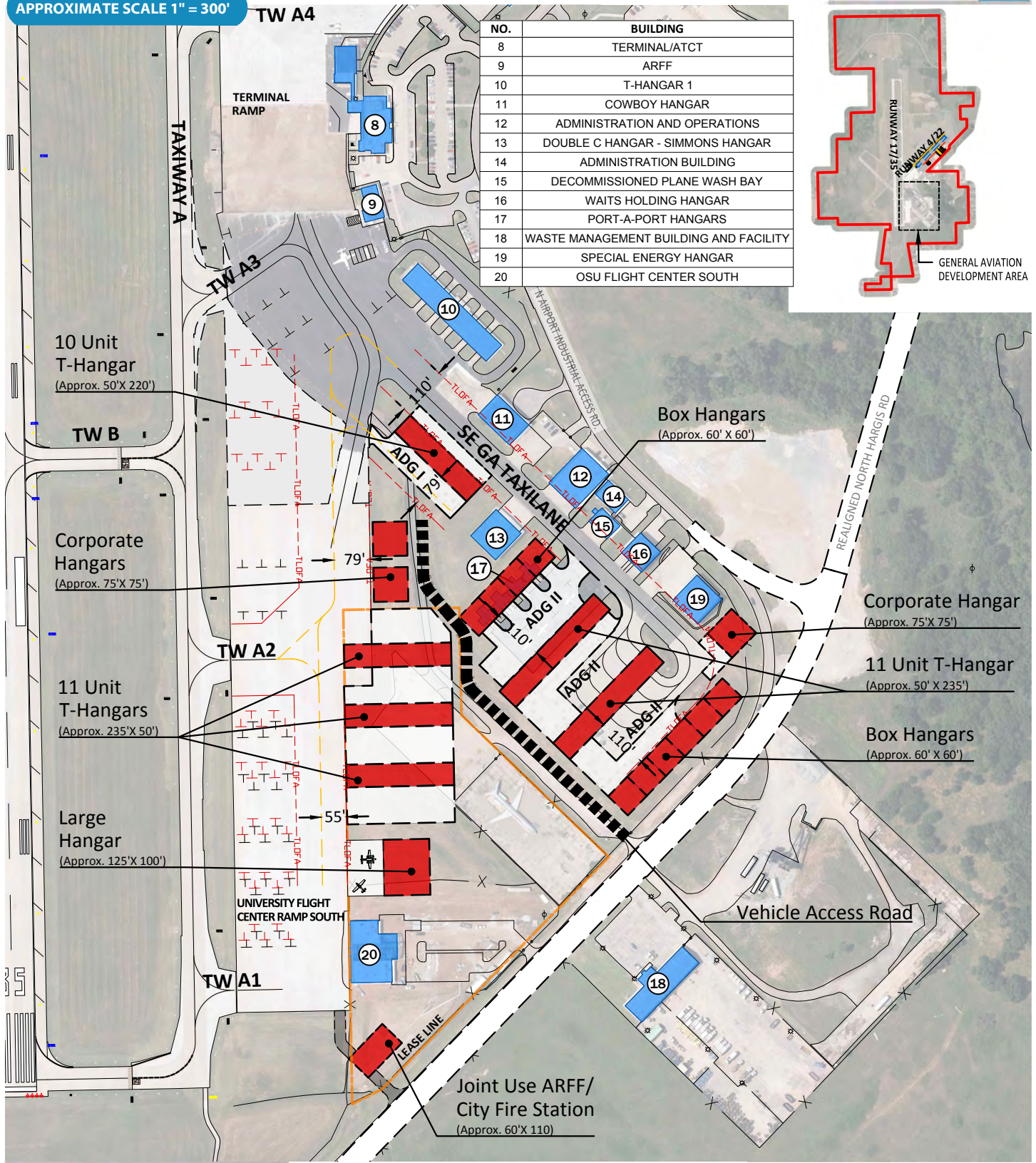


Figure D-22

South Area General Aviation Proposed Development - Alternative Two



D. Alternatives Development and Recommendations

Recommendation

Alternative One is the preferred GA development concept for the south area.

Large Scale Aeronautical Development

As presented in the previous chapter, large scale aeronautical development should be reserved for such facilities as Unmanned Aerial System (UAS) research and development (R&D), aircraft Maintenance, Repair, and Overhaul (MRO), larger corporate aviation facilities, and aeronautical training and education industries.

Two large areas on SWO property are reserved for this development:

1. **Northeast Area** – East of Runway 17/35 and northwest of Runway 4/22.
2. **West Area** – West of Runway 17//35 and northwest of Runway 4/22.

Northeast Area

The area east of Runway 17/35, consisting of approximately 60 acres, has excellent airside access via Taxiway A but is lacking in landside access and utilities. The current use is for a hay and pasture lease. This area should be reserved for development of corporate aviation facilities, utilizing the airside access provided by Taxiway A. Landside access can be provided via a connection to East 580 Road.

West Area

The west area, consisting of approximately 100 acres, is located west of Runway 17/35 and northwest of Runway 4/22. Currently, this area lacks both airside and landside access, is undeveloped, and leased for hay and pasture uses. It is recommended that this area be reserved for UAS R&D facilities, MRO hangars, and aeronautical training and education capabilities. Airside access can eventually be provided through a future parallel taxiway west of Runway 17/35 and northwest of Runway 4/22. Landside access can make use of the access road and utilities developed for the future ATCT.

Non-Aeronautical Development

There are three large areas of SWO property that are available for non-aeronautical development.

Southeast Area

This area is located southeast of the future relocated North Hargis Road. Current uses include Sanborn Lake Park, ballfields, and hiking trails in the eastern portion of the area. Hay and pasture lease comprise the southern and western portions. It is recommended that the recreation uses remain, acting as a buffer between airport facilities and the residential areas to the east. Trail head access improvements can be incorporated into the design of relocated North Hargis Road. The hay and pasture leased land adjacent to and southeast of the relocated North Hargis Road (containing approximately 48 acres) is recommended for future light industrial, R&D facilities, or cargo handling and sorting facilities as the demand materializes. Utilities available along North Hargis Road make this area valuable for short- and medium-term development. Zoning changes

D. Alternatives Development and Recommendations

from Public to Industrial would be required, and it is recommended that a buffer remain between the existing residential development and any facilities recommended here.

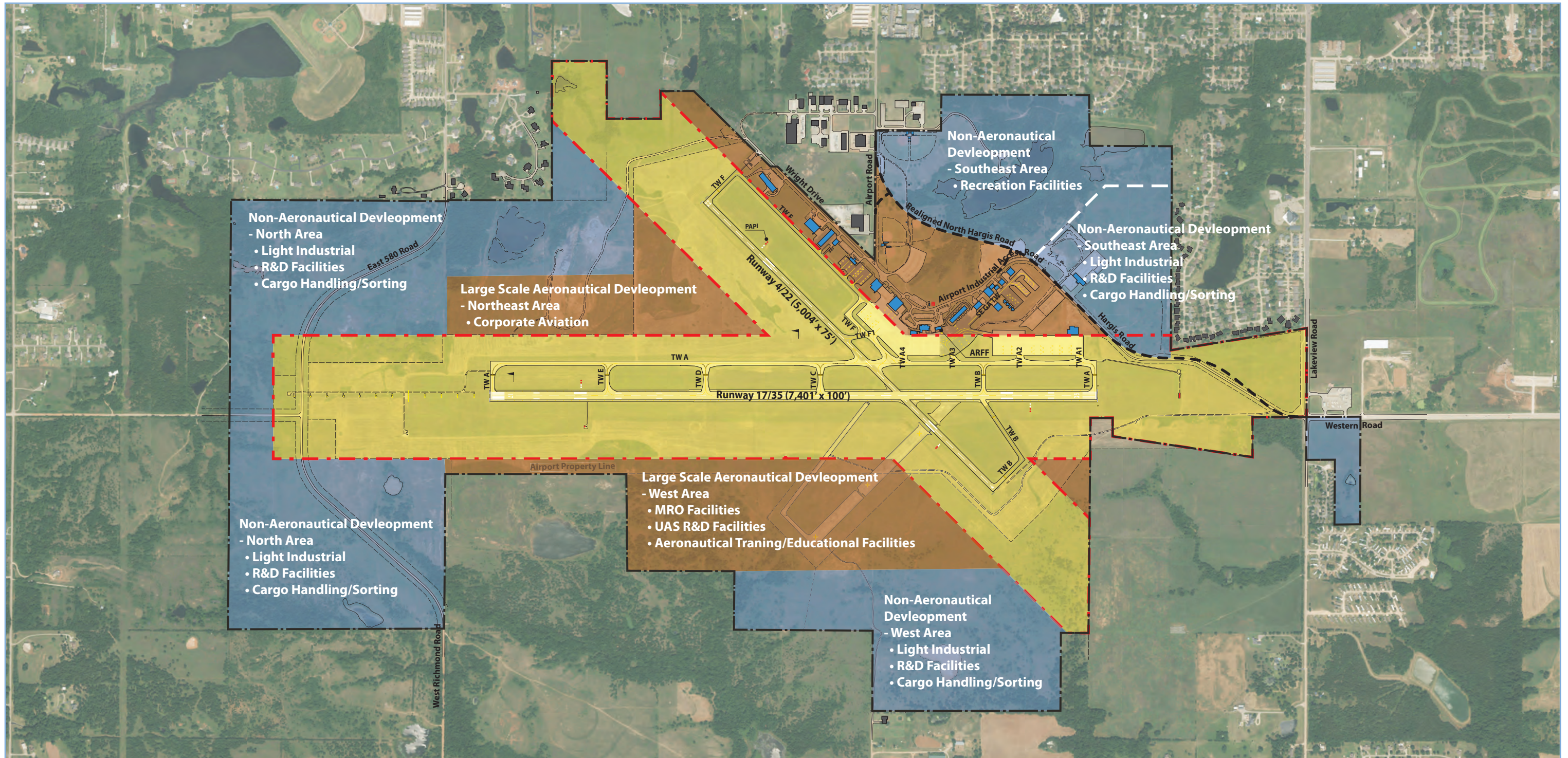
North Area

This area is in the far northern section of Airport property, both east and west of Runway 17/35 as well as north and south of East 580 Road. Consisting of approximately 260 acres, the area is currently undeveloped and leased for hay and pasture. Like the southeast area, it is recommended that the hay and pasture leases continue until such time as light industrial, R&D facilities, or cargo handling and sorting facilities demand is realized. Adequate utilities are presently lacking, so improvements are anticipated for future development. Zoning changes from Public to Industrial would also be required.

West Area

The area in the western part of Airport property, west of the proposed large-scale aeronautical development, is recommended for reservation of non-aeronautical development. Consisting of approximately 100 acres, this area is currently undeveloped and leased for hay and pasture. Like the other areas, it is recommended that the hay and pasture leases continue until such time as light industrial, R&D facilities, or cargo handling and sorting facilities demand is realized. Also like the other areas, adequate utilities are presently lacking and improvements are anticipated for future development. Zoning changes from Public to Industrial would similarly be required.

Figure D-23 presents the large scale aeronautical and non-aeronautical development areas within SWO property.



LEGEND

- Airport Property Line
- Building Restriction Line
- Airfield Reserve
- Developable Area - Airside
- Developable Area - Landside Only

Figure D-23
 Large Scale Aeronautical and Non-Aeronautical Development

D. Alternatives Development and Recommendations

SUMMARY

The main goals for this chapter are to identify airport improvements that accommodate existing and future demand safely and efficiently, and to develop SWO in a financially feasible and environmentally sustainable manner as demand is realized. The alternative evaluation and selection are based on input and comments provided by airport users and key airport and community stakeholders.

Utilizing the recommended components of SWO's airside and landside development areas results in the Conceptual Development Plan presented in **Figure D-24**. The plan presents SWO with a comprehensive development scheme accommodating a wide range of aviation user groups and operational activities. As with any airport planning decision, the ultimate build-out of the various aviation and aviation-compatible development areas will be demand driven, and the depicted development far exceeds that which is projected during the 20-year planning period. The Conceptual Development Plan will be carried forward to the Capital Improvement Plan (CIP) and will be used for the preparation of the ALP set representing the ultimate long-term airport configuration.

N
APPROXIMATE SCALE 1" = 1000'

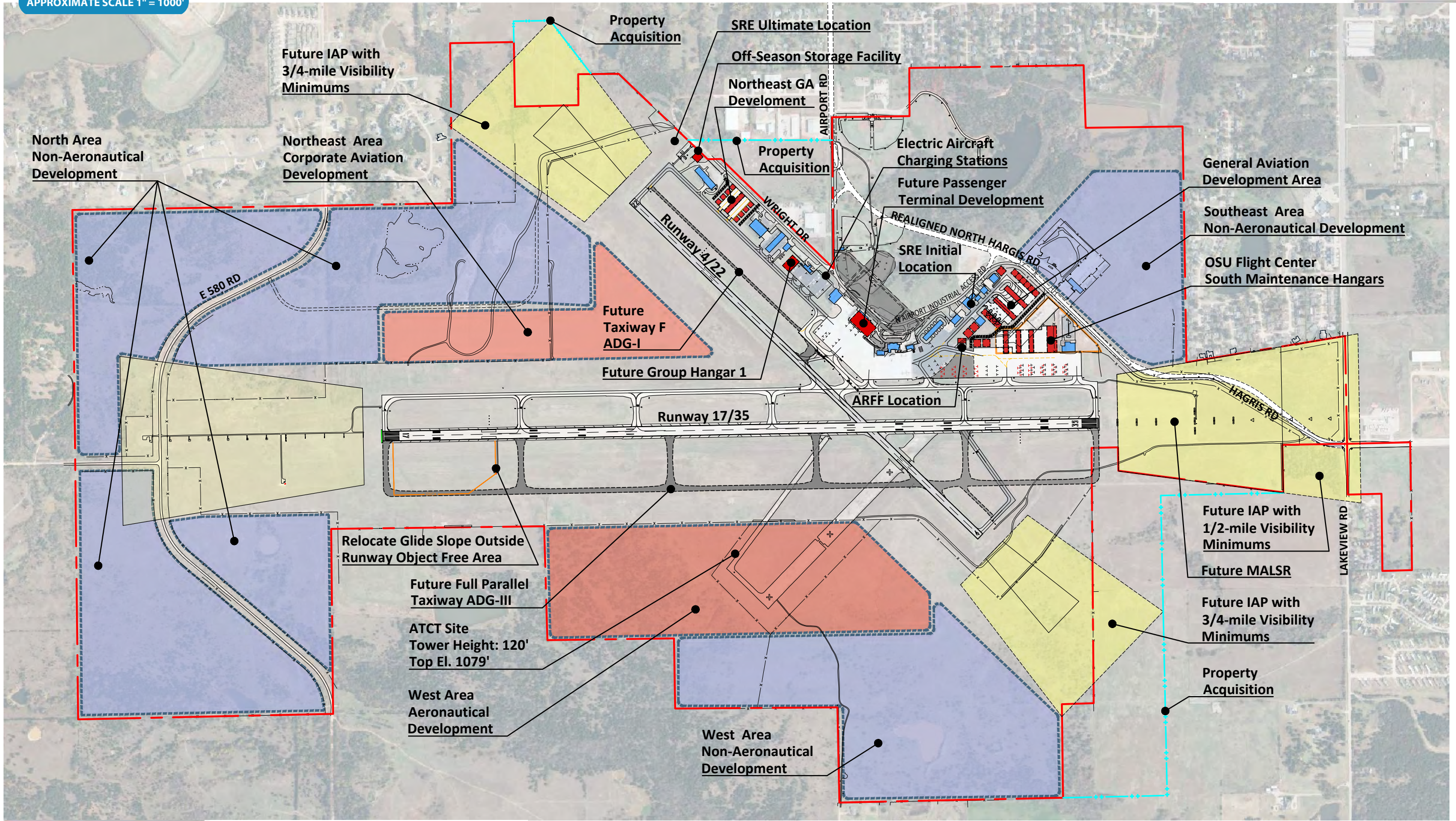


Figure D-24
Conceptual Development Plan