

### 3. ALTERNATIVES ANALYSIS FINAL

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This chapter presents alternative concepts for the Central Wisconsin Airport (CWA or the Airport) Terminal Area Master Plan (TAMP). This chapter's purpose is to identify and evaluate alternatives to resolve the existing issues discussed in the Inventory/Facility Requirements Chapter (Chapter 1) and meet the future activity demands of CWA over the next 20 years. This chapter also evaluates the alternatives against a set of screening criteria and identifies a set of preferred alternatives. Alternative development concepts are presented and evaluated in the following chapter sections:

- Near-Term Landside Development Concepts
  - Concept Evaluations
  - Air Carrier Apron Alternatives
  - General Aviation Apron Alternatives
  - Deicing Location Alternatives
  - Near-Term Hangars Alternative
- Mid-Term Development Alternative
- Long-Term Development Alternative

#### 3.1 Near-Term Landside Development Concepts

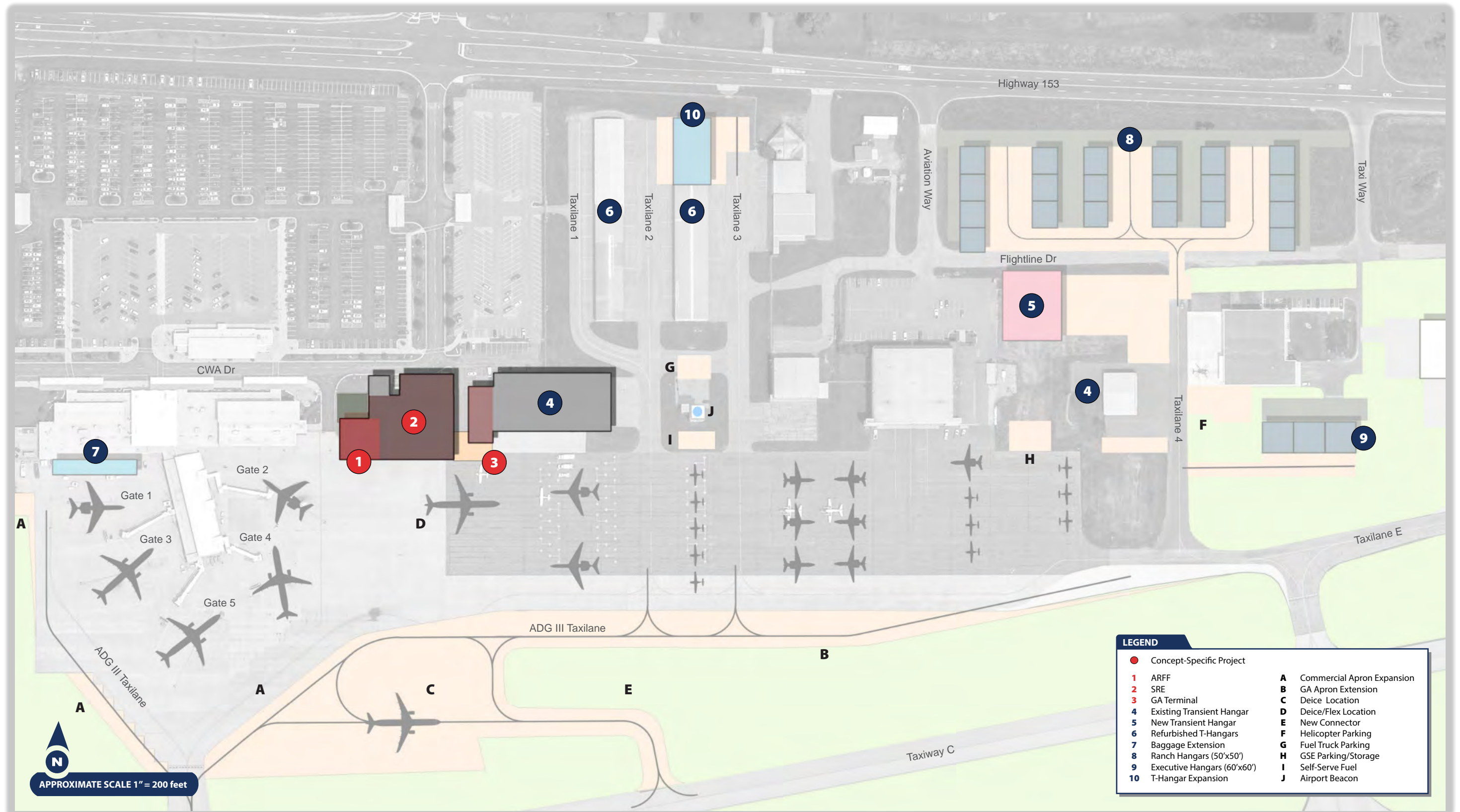
Four preliminary global near-term concepts for the existing landside development area at CWA were prepared and refined with input from Airport staff and stakeholders. All four concepts consider demolition of the existing general aviation (GA) terminal and aircraft rescue and firefighting (ARFF)/snow removal equipment (SRE) facility, and replacement with entirely new, purpose-built facilities. The primary differences between the four concepts are the location of the proposed replacement GA terminal and the configuration of the proposed replacement ARFF/SRE facility. Due to their proximity to one another, and the need to keep ARFF/SRE facility in its current location due to response times and shared personnel, the GA terminal location affects what is possible in terms of the ARFF/SRE facility configuration. For these reasons, this section focuses primarily on the proposed GA terminal location and ARFF/SRE facility configuration under each concept. These are described in further detail in the following sections. The similarities between all four concepts are summarized at the end of this section.

Other improvements depicted on each near-term landside development concept include reconstruction and expansion of the GA apron, expansion of the air carrier apron, and designation of dedicated aircraft deicing locations. Several alternatives were considered for these improvements, as described in **Sections 3.3 through 3.5** of this chapter, but only the preferred alternatives are depicted on the global near-term concept graphics presented in this section.

Near-Term Landside Development Concepts 1, 2, 3, and 4 are depicted on **Exhibits 3-1, 3-2, 3-3, and 3-4** on the following pages.



Exhibit 3-1: Near-Term Landside Development Concept 1

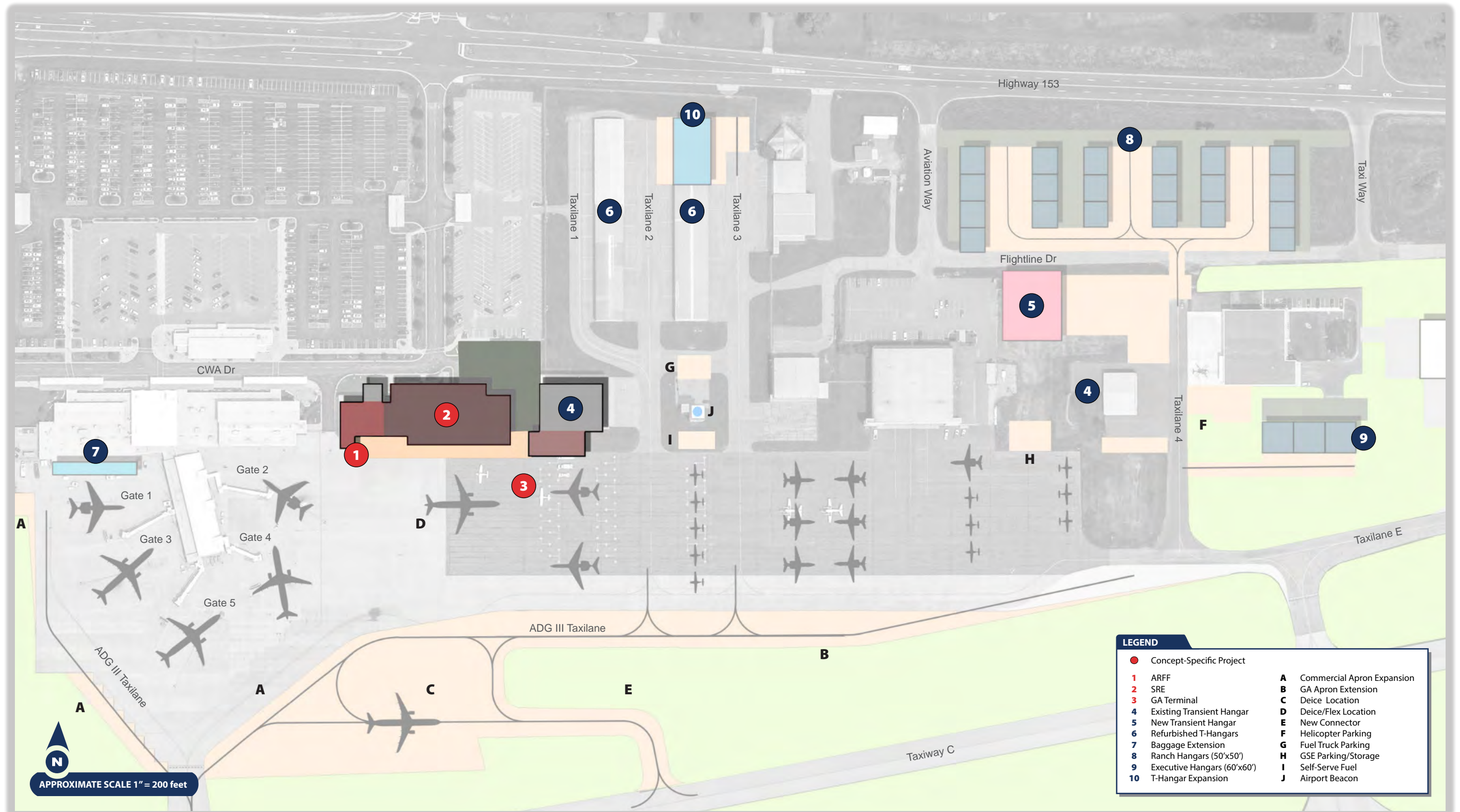


LEGEND	
●	Concept-Specific Project
1	ARFF
2	SRE
3	GA Terminal
4	Existing Transient Hangar
5	New Transient Hangar
6	Refurbished T-Hangars
7	Baggage Extension
8	Ranch Hangars (50'x50')
9	Executive Hangars (60'x60')
10	T-Hangar Expansion
A	Commercial Apron Expansion
B	GA Apron Extension
C	Deice Location
D	Deice/Flex Location
E	New Connector
F	Helicopter Parking
G	Fuel Truck Parking
H	GSE Parking/Storage
I	Self-Serve Fuel
J	Airport Beacon





Exhibit 3-2: Near-Term Landside Development Concept 2

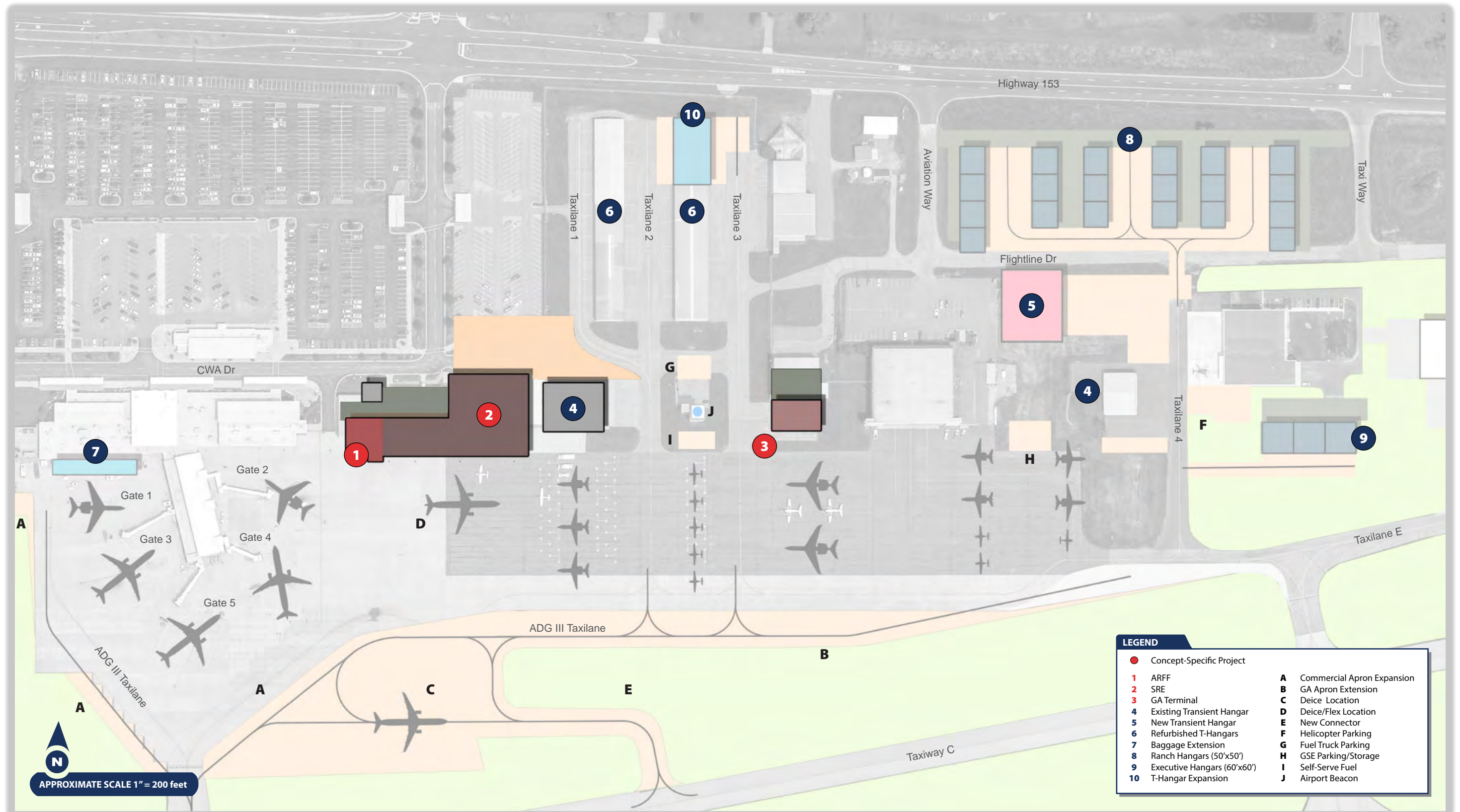


LEGEND	
●	Concept-Specific Project
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H	GSE Parking/Storage
I	Self-Serve Fuel
J	Airport Beacon





Exhibit 3-3: Near-Term Landside Development Concept 3







Concept 1 includes replacing the GA terminal in its existing location. This concept would require the least amount of sitework and have the least impact on other existing facilities. However, this concept does not improve GA terminal visibility or landside access and parking, and severely limits the functionality of the proposed replacement SRE/ARFF facility, as it maintains a stacked equipment parking configuration, does not allow storage of sand/salt and deicing materials on-site, and expands the facility onto the current aircraft parking apron. Phasing replacement of the GA terminal and ARFF/SRE facilities would also be challenging under this concept.

Concept 2 includes demolishing the west transient hangar and replacing the GA terminal on the south side of the existing east transient hangar. This would allow for a more functional GA terminal floorplan but would continue to have visibility, landside access, and parking concerns. The west transient hangar would be replaced with a larger transient hangar capable of accommodating an airplane design group (ADG) III corporate jet on another site behind the Endeavor maintenance, repair, and operations (MRO) facility. Demolishing the west transient hangar would free up space for the development of a larger, more functional ARFF/SRE facility that reduces the stacked equipment parking configuration, provides on-site sand and deicing material storage, and does not expand onto the aircraft parking apron.

Concept 3 replaces the GA terminal at the site of an existing corporate hangar located just east of the air traffic control tower (ATCT). This location would allow the Airport to relocate the landside entrance for the GA terminal to Aviation Way, separating landside GA access from the commercial terminal drive thereby improving landside access and parking. This location would also place the GA terminal near the center of the GA apron, creating prominent exposure for incoming aircraft and improving airside access and parking. This alternative also includes demolishing the west transient hangar for construction of an expanded replacement ARFF/SRE facility, like Concept 2. Unlike Concept 2, this concept would allow for an airside apron north of the proposed SRE equipment storage area, thereby providing drive through access capability in the new facility. To create a north apron with enough depth to accommodate vehicle turning, the apron expansion would require expansion into the existing East Parking Lot, the Airport would lose approximately 30 paid parking spaces.

Concept 4 explores replacing the GA terminal north of its existing location at the site of the existing T-hangars. This concept would require the most amount of sitework and would have the greatest impact on other existing facilities, translating into significant additional cost when compared to the other three concepts. This concept also requires an additional enabling project to modify to the east transient hangar to allow wingtip clearance for ADG III corporate jets accessing the new apron adjacent to the south side of the proposed GA terminal. The circulation of ADG III aircraft in this location would be constrained and would require tug and tow operations by the fixed-base operator (FBO) staff. This concept would also require construction of a new landside access point from State Highway 153, which may not provide adequate spacing from other, existing landside access points along the highway.



### Concept Similarities

Although the GA terminal and ARFF/SRE projects are different for each concept, the following projects are do not vary across concepts:

- **New Transient Hangar** – A new transient hangar, sized for an ADG III general aviation aircraft, is planned north of the existing MRO. This transient hangar will replace the western transient hangar that will be demolished to allow the expansion of the ARFF/SRE facility. The hangar provides apron space to accommodate an aircraft parked outside of object free areas (OFAs). This hangar requires Taxilane 4 to be upgraded to an ADG III taxilane.
- **Outbound Baggage Room Expansion** – As mentioned in Chapter 1, the existing outbound baggage room is undersized as it is designed for regional jets. With the addition of regularly scheduled Boeing 737 flights at CWA, the existing room will impact the ability to get baggage onto the aircraft on time. The expansion will provide additional space for baggage belts to speed up the process.
- **T-hangars** – Concepts 1 through 3 all provide rehabilitation of existing T-hangar units. As mentioned in Chapter 1, some units are in poor condition and some improvements include replacing deteriorating flooring, upgrading utilities, and replacing siding and roofing as required. The existing T-hangars were constructed with a foundation that does not meet the requirements of the building code. The foundation has failed in at least one hangar bay and will continue to degrade due to the inadequate nature of the original design. Concepts 1 through 3 also expand the existing eastern row of T-hangars to meet future-based aircraft requirements. These concepts also shift Taxilane 1 slightly to the west to clear objects from the existing taxilane OFA. See **Section 3.6** for additional information.
- **Ranch Hangars** – A campus of 50 by 50-foot ranch hangars are planned to be developed in the open space between Flightline Drive and State Highway 153. The construction of these hangars would require a portion of Flightline Drive to be demolished; therefore, a roadway north of the hangars would be constructed connecting Aviation Way with Taxi Way. Parking areas are planned to be provided behind the hangars. See **Section 3.6** for additional information.
- **Executive Hangars** – Three 60 by 60-foot hangars are planned to be constructed south of the existing helicopter hangar. A taxilane would be constructed off Taxilane 4 to provide access to aircraft. Parking areas are planned to be provided behind the hangars. These hangars do not impact the ATCT line-of-sight (LOS) to movement areas. See **Section 3.6** for additional information.
- **Air Carrier Expansion** – All concepts provide the preferred air carrier expansion to resolve the issues discussed in Chapter 1. See **Section 3.3** for additional information and alternatives.
- **Deicing Locations** – All concepts identify two deicing locations. The primary location is integrated into the air carrier apron expansion. This location allows aircraft to deice without any impact to surrounding activity on the apron. The secondary flex location is identified in front of the ARFF/SRE facility. Some concepts allow the aircraft in this location to deice without interrupting surrounding activity while in other concepts, this deicing aircraft could impact other activity. See **Section 3.4** for additional information and alternatives.
- **General Aviation Expansion** – All concepts provide an expansion to the south of the general aviation apron. This expansion accommodates the forecasted itinerant general aviation activity discussed in Chapter 1. See **Section 3.5** for additional information.





- **New Taxiway Connector** – As part of the additional air carrier expansion driven by the deicing location, existing Taxiway B will be relocated. This relocation eliminates the existing non-standard condition of direct apron to runway access. Concept 3 depicts a refined taxiway connector that extends further than the other concepts. It was determined that the existing non-standard slope from the apron to Taxiway C could be resolved with the taxiway connector extension.
- **Helicopter Apron Expansion** – The construction of the new transient hangar on the west side of Taxilane 4 requires the taxilane to be upgraded to serve ADG III aircraft; therefore, the OFA is also increased. The medical evacuation (medevac) helicopter that parks on the apron on the east side of Taxilane 4 would fall inside the taxilane OFA. The medevac helicopter must park outside on apron space rather than inside the hangar to meet lifesaving response times. Additional pavement to the south of the hangar is provided so the helicopter can park on the apron outside of all OFAs. Additionally, during night hours, when the FBO is closed, the helicopter requires a fuel truck to be available in case it needs fuel. Additional pavement is provided on the west side of Taxilane 4 south of the existing transient hangar, outside of OFAs.
- **Fuel Truck Parking** – As discussed in Chapter 1, fuel trucks currently park on tie-down positions, reducing available parking spaces. Although it has not been an issue in the past, relocating fuel trucks away from where aircraft park and maneuver will improve overall safety, preventing any possible incident between the two. All concepts identify a new location for fuel trucks. In Concepts 1 through 3, the location is on the existing pavement north of the ATCT between Taxilane 2 and 3. The location of fuel trucks is shown south of the existing transient hangar located off Taxilane 4.
- **Ground Service Equipment (GSE) Parking/Storage** – As discussed in Chapter 1, the air carrier apron does not provide sufficient space for GSE parking, and some equipment is stored behind Gate 1. Additionally, with the outbound baggage expansion there will be less space for equipment on the apron. Additional space and possibly shelter is provided on all concepts for GSE parking and storage.
- **Self-serve Fuel** – All concepts identify the grassy area between the ATCT and general aviation apron as the location for self-serve fuel.
- **Cargo Apron** – All four concepts show the cargo apron as relocated off the general aviation apron. The relocated cargo apron is discussed in **Section 3.7**.
- **Airport Beacon** – all concepts relocate the airport beacon from the North Parking Lot to on top of the ATCT. The airport beacon meets the Federal Aviation Administration (FAA) requirement of placing the beacon within 5,000 feet of the runways.

## 3.2 Concept Evaluations

### 3.2.1 General Facility Considerations

Civic buildings such as commercial passenger and GA terminals offer the opportunity to express a clear vision of regional qualities that residents will identify with, and travelers will recognize. The Airport's goal is to provide a quality environment suitable for the destination as passengers arrive. For this reason, the architecture should connect with and draw inspiration from local history, industry, culture, geology, and landscape. Local building materials and methods should be employed where they are cost-effective.





Architectural quality expectations are provided primarily as a baseline for developing the financial analysis but also to illustrate material attributes. The building materials and finishes chosen will be developed and refined during the design process. The building materials used will be durable, of high quality, have low life cycle costs and require low ongoing maintenance. The building modifications described in this plan will provide new facilities designed to have a minimum useful lifespan of 40 years.

### 3.2.2 Concept Layouts

In generating initial conceptual alternatives, the focus is on the program and on taking a broad view, considering the relationship between the building and the site. During concept development, the focus is on interior space and adjacencies, and the relationship of functional areas inside the building. As the concepts develop, they in turn inform the program since the arrangement of space in the building will affect the final sizes needed for individual areas.

Several building layout concepts were developed to compare advantages, disadvantages, and adjacencies within the new building. They were assessed for aeronautic utility and operational performance, leading to discussions involving the Airport, terminal planning committee, airport users, the public and the planning team.

### 3.2.3 Concept 1

#### **GA Terminal**

This alternative evaluated building a new GA terminal at the existing GA terminal location. This alternative would require the demolition of the existing facility to facilitate building a new larger terminal. The construction of the new facility would require the least amount of site work and have the lowest impact on existing facilities compared to the other three concepts.

The advantages identified in this alternative are:

- Maintains current access to airfield and GA apron.
- Maintains proximity to rental car center.
- Minimizes impact on surrounding infrastructure.
- Provides structure designed to support photovoltaic (PV) panels with minimal added cost.

The disadvantages of this alternative include:

- Limits future ARFF/SRE development to its existing site.
- Uses current commercial terminal road that often confuses motorists accessing the GA terminal.
- Constrains GA apron toward the west end where larger aircraft would park near the commercial terminal and ARFF/SRE facility.

#### **ARFF/SRE Facility**

The new ARFF/SRE facility for this alternative is sited at the location of the current facility. This alternative would require demolition of the existing facility to facilitate construction of a new larger building but leaves the electrical vault in place. A new facility would be developed between the commercial terminal and existing



GA terminal. The ARFF apparatus bay would be adjacent to the admin spaces on the west end of the building. The SRE functions would then be built to the east with a maintenance bay and a large open storage bay. The storage bay would be expanded east toward a new service road and to the south onto the GA apron to accommodate tandem parking. This option would require all back-in parking with mezzanines included to increase storage space. The construction of the new facility would require the least amount of site work and have the least impact on existing facilities compared to the other three concepts. The foundation for the facility would have to be close to the commercial terminal, GA terminal, and vault buildings and so would require shored excavations. The foundation for the existing vault structure is entirely undocumented. Construction adjacent to unknown foundations is problematic and intricate.

The advantages of this alternative are:

- Provides increased storage area for equipment.
- Maintains current access to the airfield and GA apron.
- Minimizes impact on surrounding infrastructure.
- Provides a structure designed to support PV panels with minimal added cost.

The disadvantages of this alternative include:

- Expands the facility onto the aircraft parking aprons.
- Requires tandem back-in parking in storage bay.
- May impose phasing challenges.
- May not consolidate all equipment.
- Maintains off-site sand and deicing equipment storage.
- Requires elevated foundation costs for adjacencies.
- Requires elevated cost of construction around undocumented vault foundation and structure.

This concept does not improve GA terminal visibility or landside access and parking, and severely limits the functionality of the proposed replacement ARFF/SRE facility, as it maintains a stacked equipment parking configuration, does not allow storage of sand and deicing equipment on-site, and would expand the facility onto the aircraft parking apron to meet equipment storage needs. Phasing replacement of the GA terminal and ARFF/SRE facility would also be challenging under this concept. For these reasons, this concept was eliminated from further consideration.



### 3.2.4 Concept 2

#### **GA Terminal**

This alternative considers building a new GA terminal along the south side (airside) of the east existing transient hangar. This alternative would require the demolition of the existing west transient hangar that was constructed in the early 1970's. Demolishing the older hangar and existing GA terminal would allow construction of a new GA terminal that meets the program requirements along the south edge of the remaining east transient hangar which has an east facing door. Demolition of the hangar would also free up space for the development of a larger ARFF/SRE facility. A replacement larger transient hangar for the FBO operations would be constructed on another open site to accommodate the loss of hangar capacity. New foundations would be required adjacent to the east transient hangar. The location of these foundations would have to be located such that the loading on the new foundations does not cause settlement of the existing foundations. New walls must be three feet away from existing walls, and columns must be five feet away from existing walls.

The advantages of this alternative are:

- Maintains current access to airfield and GA apron.
- Maintains proximity to rental car center.
- Allows space to construct a larger ARFF/SRE facility.
- Provides a new structure designed to support PV panels with minimal added cost.

The disadvantages of this alternative include:

- Requires an enabling project that constructs a new transient hangar for FBO operations on another site to accommodate the loss of hangar space by demolishing the old hangar.
- Places the GA terminal on the existing airside, decreasing landside visibility and making it more difficult for motorists to locate the GA terminal.
- Constrains the GA apron toward the west end where larger aircraft would be parked near the commercial terminal and ARFF/SRE facility.
- Creates architectural and structural constraints to provide foundation adjacencies.

This alternative was recommended by the working groups to be further developed. A preliminary floor plan concept for a larger, more functional, and efficient GA terminal are shown in **Exhibit 3-5**, and this plan was used in developing preliminary costs for a cost comparison as shown in **Section 3.2.8**.



Exhibit 3-5: General Aviation Terminal Floorplan Concept 2





### **ARFF/SRE Facility**

This alternative proposes replacing and expanding the main ARFF/SRE facility at its existing location. The proposed GA terminal and existing east transient hangar border the site to the east. An electrical vault, CWA Drive (provides vehicle circulation for the commercial passenger and GA terminals), and parking borders the site to the north. The commercial terminal is west of the site. There is sufficient space from the ARFF/SRE building to the airside building restriction line (BRL) to complete this expansion. The current operations building would be demolished as well as the existing GA terminal and the west transient hangar to increase developable area. This option would utilize all back-in parking with mezzanines included to increase storage space. The administrative portion of the facility including the watch room and potential emergency operations center (EOC) would be on the west end of the building adjacent to the commercial terminal. ARFF apparatus would be housed in a separate bay which, due to site constraints, would require back-in parking like current operations. The SRE maintenance and storage spaces would wrap the existing electrical vault and extend east to a new access road between the ARFF/SRE facility and the new GA terminal. The increased storage area and adjacency to the main drive would allow for the heated salt/sand storage to be relocated to this location. The main SRE equipment storage bay would be placed adjacent to the maintenance areas with two parking bays for the larger boom/plows and angled equipment parking. Site constraints would require back-in parking, but the expanded bays would allow for more circulation around parked equipment.

The foundation for the facility would have to be close to the GA terminal and vault buildings; therefore, it would require shored excavations. The foundation for the existing vault structure is entirely undocumented. Construction adjacent to unknown foundations is problematic and intricate.

The advantages of this alternative are:

- Allows space flexibility for new development.
- Provides phasing opportunities.
- Allows co-location of all equipment into one facility with on-site sand, salt and deicing equipment storage.
- Provides a larger structure designed to support more PV panels with minimal added cost.

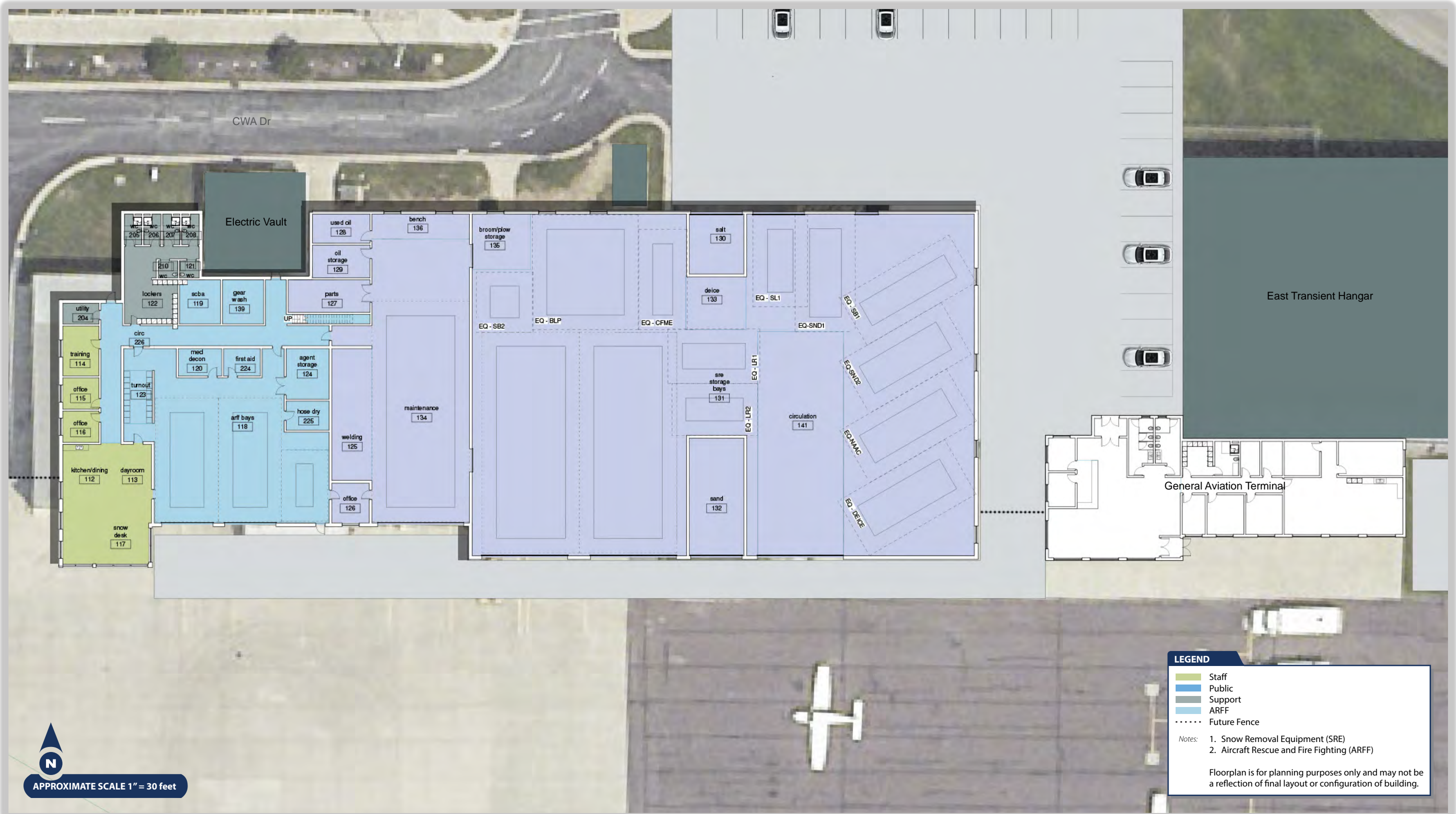
The disadvantages of this alternative include:

- Requires back-in equipment bays.
- Requires elevated foundation costs for adjacencies.
- Requires elevated cost of construction around undocumented vault foundation and structure.

This alternative was recommended by the working groups to be further developed. A preliminary floor plan concept for a larger, more functional, and efficient operations building are shown in **Exhibit 3-6**, and this plan was used in developing preliminary costs for a cost comparison as shown in **Section 3.2.8**.



Exhibit 3-6: ARFF/SRE Facility Floorplan Concept 2



N  
APPROXIMATE SCALE 1" = 30 feet



### 3.2.5 Concept 3

#### **GA Terminal**

Concept 3 explores building a new larger, more functional, and efficient GA terminal at the site of an underutilized existing corporate hangar located near the midpoint of the GA parking apron east of the ATCT. This location would allow the Airport to relocate the landside vehicle entrance road for the GA terminal to Aviation Way; separating the traffic between the GA and commercial terminals and reducing confusion for motorists accessing the GA terminal. Constructing the GA terminal at this location would place the GA terminal near the center of the GA apron, creating a prominent location aiding in wayfinding for incoming aircraft. This alternative would require the demolition of an existing underutilized corporate hangar to clear the site for the construction of the new terminal. This concept proposes also demolishing the existing west transient hangar that was constructed in the early 1970's. Demolishing this hangar would free up space for the development of a larger ARFF/SRE facility. A replacement transient hangar for the FBO operations would be constructed on another open site to accommodate the loss of hangar capacity.

The advantages of this alternative are:

- Maximizes space flexibility for new development, on the site of old corporate hangar.
- Provides airside access to the mid-point of the current GA apron, moves larger aircraft away from commercial terminal and ARFF/SRE buildings.
- Separates landside access point from the main terminal road, CWA Drive.
- Provides a structure designed to support PV panels with minimal added cost.

The disadvantages of this alternative include:

- Is not connected or adjacent to any of the transient hangars.
- Requires demolition and possible reconstruction of the existing corporate hangar.

This alternative was recommended by the working groups to be further developed. A preliminary floor plan concept for a larger, more functional, and efficient GA terminal near the mid-point of the GA apron is shown in **Exhibit 3-7**, and this plan was used in developing preliminary costs for a cost comparison as shown in **Section 3.2.8**.







### **ARFF/SRE Facility**

This alternative reconstructs and expands the main ARFF/SRE facility at its existing site similar to Alternative 2. The current ARFF/SRE facility would be demolished along with the existing GA terminal and west transient hangar to increase developable area. The relocation of the GA terminal to another location would allow the Airport to realign the fence line and create airside apron north of the proposed SRE storage area and allow for drive through equipment bays. The administrative portion of the facility, including the watch room and potential EOC, would be on the west end of the building adjacent to the apparatus bays. ARFF apparatus would be housed in a separate bay which, due to site constraints, would require back-in parking like current operations. The SRE maintenance and storage spaces would wrap the existing electrical vault and expand east to a new access road between the ARFF/SRE facility and the remaining east transient hangar. This option would include mezzanines to increase storage space. The increased storage area and adjacency to CWA Drive would allow for the heated salt/sand storage to be relocated to this location. The main SRE equipment storage bay would be placed adjacent to the maintenance areas with two main drive aisles: one for tandem parking for the larger boom/plows and the second drive through with angled equipment parking to the sides.

The advantages of this alternative are:

- Allows space flexibility for new development.
- Provides phasing opportunities.
- Allows co-location of all equipment into one facility with on-site sand, salt, and deicing equipment storage.
- Provides drive through bays with two separate entrances/exits, providing redundancy if equipment is disabled on either end.

The disadvantages of this alternative include:

- Requires more apron work on north side.
- Requires losing approximately 30 paid parking spaces to create apron on north side.

This alternative was recommended by the working groups to be further developed. A preliminary floor plan concept for a larger, more functional, and efficient drive-through operations building are shown in **Exhibit 3-8**, and this plan was used in developing preliminary costs for a cost comparison as shown in **Section 3.2.8**.



Exhibit 3-8: ARFF/SRE Floorplan Concept 3



### 3.2.6 Concept 4

#### **GA Terminal**

The GA terminal for Concept 4 was sited at the location of the existing T-hangars. This alternative would require the demolition of existing facilities to begin construction of a new larger GA terminal. The construction of the new facility would require the most amount of site work and have the highest impact on existing facilities, requiring multiple enabling projects that includes demolition, construction, and remodeling of existing buildings to facilitate development at this site.

The advantages of this alternative are:

- Allows construction of the new GA terminal and transient hangar at the same site.
- Maintains proximity to rental car center.
- Separates corporate jets from other users.
- Provides a structure designed to support PV panels with minimal added cost.
- Removes inadequate T-hangar foundations.

The disadvantages of this alternative include:

- Requires significant demolition and reconstruction/remodeling of existing facilities.
- Requires significant apron reconstruction to park and maneuver corporate jets on pavement originally designed for smaller aircraft.
- Constrains the apron in front of the new GA terminal with poor circulation for ADG III aircraft access.

This concept would require the most sitework and would have the greatest impact on other existing facilities, translating into significant additional cost when compared to the other three concepts. This concept also requires modifications to the east transient hangar to allow wingtip clearance for ADG III corporate jets accessing the new apron adjacent to the south side of the proposed GA terminal. The circulation of ADG III aircraft in this location would be constrained and would require tug and tow operations by FBO staff. This concept would also require construction of a new landside access point from State Highway 153, which may not provide adequate spacing from other, existing landside access points along the highway. For these reasons, this concept was eliminated from further consideration.

#### **ARFF/SRE Facility**

The ARFF/SRE facility for Concept 4 would be constructed at the site of the existing SRE facility and could be similar to either Concepts 2 or 3 presented above. However, because the GA terminal for Concept 4 was determined not feasible, this concept was not developed further.





### 3.2.7 Concept Comparison

The four near-term landside development concepts are compared in **Table 3-1** below. The screening criteria used to compare the concepts includes:

- **GA Terminal Experience** – the concept reduces passenger walking distances, separates GA and commercial traffic, and improves both landside and airside wayfinding.
- **ARFF/SRE Experience** – the concept meets storage and maintenance requirements, provides efficient vehicle circulation, and provides building phasing opportunities.
- **Safety and Operational Efficiency** – the concept meets aircraft parking requirements, provides efficient aircraft circulation, and provides efficient passenger access.
- **Sustainability and Environmental** – the concept offers opportunities for sustainability-related grant funding, maximizes reuse of existing infrastructure, supports efficient land use, maximizes opportunities to increase energy efficiency, optimizes layout footprint to minimize energy consumption, and provides opportunities for photovoltaic.
- **Implementation, Phasing, and Feasibility** – the concept allows for phased expansion, has reasonable project costs, minimizes impacts to tenants and operations during construction, and does not require enabling projects.



Table 3-1 Terminal Area Alternatives Screening Criteria

Screening Criteria	Alt. 1	Alt. 2	Alt. 3	Alt. 4
<b>GA Terminal Experience</b>				
Enhances passenger experience	✓	✓	✓	✓
Reduces passenger walking distances	■	■	■	✗
Separates GA and commercial traffic	✗	✗	✓	✓
Improves landside wayfinding	■	✗	✓	■
Improves airside wayfinding	■	✓	✓	✗
<b>ARFF/SRE Experience</b>				
Meets storage/maintenance requirements	✗	✓	✓	✓
Provides efficient vehicle circulation	✗	■	✓	✓
Building phasing opportunities	✗	✓	✓	✓
<b>Safety and Operational Efficiency</b>				
Meets short, medium, and long-term aircraft parking requirements	✓	✓	✓	✓
Provides efficient aircraft circulation	✓	✓	✓	✗
Provides efficient passenger landside access	■	■	✓	✗
Provides efficient passenger airside access	■	■	✓	✗
<b>Sustainability and Environment</b>				
<i>Focus Area: Airport Finance</i>				
Offers opportunities for sustainability-related grant funding	■	✓	✓	✓
Maximizes reuse of existing infrastructure	✓	■	✓	✗
<i>Focus Area: Planning and Resilience</i>				
Supports efficient land use*	■	✗	✓	✓
<i>Focus Area: Energy</i>				
Maximizes opportunities to increase energy efficiency	■	✓	✓	✓
Optimizes layout footprint to minimize energy consumption**	✗	✓	✓	✓
Provides opportunities for photovoltaic	■	✓	✓	✓
<b>Implementation, Phasing, and Feasibility</b>				
Allows for phased expansion	✓	✓	✓	✓
Project costs are reasonable	✓	■	■	✗
Minimizes impacts to tenants and operations during construction	■	■	✓	✗
Limits number of enabling projects	✓	■	■	✗

Sources: Mead & Hunt, 2023

Notes: ✓ Strength of the concept

✗ Weakness of the concept

■ Neither a strength or weakness of the concept

\* Considers maintenance impacts of underlying soils, accommodating future growth in facility design, and reserving space for future needs.

\*\* Considers airport fleet travel distance for equipment, efficient aircraft movement, etc.



**Table 3-1** shows that both Concepts 1 and 4 had more weaknesses than strengths, and therefore were eliminated from further evaluation. Although Concept 3 has more strengths than Concept 2, both of these concepts were carried forward for further detailed evaluation to develop a cost comparison between the two which is discussed in the following section.

### 3.2.8 Cost Comparison

Project costs can often differentiate between two alternatives; therefore, the two finalist alternatives, Concepts 2 and 3, were further evaluated to compare the costs associated with each project. Typical construction parameters are listed below and are included in the evaluation of the project costs. The cost comparison between the two concepts is summarized in **Table 3-2**.

**Table 3-2 Concepts 2 and 3 Cost Comparison**

Project	Concept 2	Concept 3
<b>Enabling Projects</b>		
Construct New Transient Hangar	\$2,660,000 – 4,320,000	
<b>GA Terminal &amp; ARFF/SRE Projects</b>		
Existing Transient Hangar Demo	\$89,246	\$89,246
Site Work GA Terminal		\$243,432
Site Work ARFF/SRE Facility	\$683,293	\$969,451
Corporate Hangar Demo	-	\$54,481
Construct New GA Terminal	\$3,002,400	\$3,155,400
Construct New ARFF/SRE Facility	\$11,854,140	\$12,630,120
ARFF Facility	\$4,741,800	\$4,358,400
SRE Facility	\$7,112,340	\$8,271,720
<b>TOTAL</b>	<b>\$15,629,179</b>	<b>\$17,142,230</b>
<b>Other Projects</b>		
T-Hangar Rehab		\$1,500,000
Air Carrier Apron Expansion		\$970,352
Deicing Location and Circulation		\$4,093,878

Sources: Mead & Hunt, Becher Hoppe 2023

Based on both the concept screening criteria and cost comparison, Concept 3 is the recommended preferred alternative. This alternative provides the Airport with the most flexibility for future development and separates GA traffic from commercial traffic, reducing congestion on the aircraft apron.

#### General Design Assumptions

- Option 2 - New single-story GA terminal constructed on south (airside) side of remaining east transient hangar and a single story with storage mezzanine Operations building.
- Option 3 - New single-story GA terminal constructed on a cleared site and a single-story drive through with storage mezzanine Operations building.





### **Site Civil Design Assumptions**

- Parking lot improvements.
- Security fencing modifications.
- Site lighting modifications.
- Access road and wayfinding.

### **Site Utilities Design Assumptions**

- New electrical service and expansion of existing fiber optic campus loop connection.
- New connection and transfer switch tied to existing generator distribution system.
- Assuming existing gas, water and sanitary connections are adequate.

### **General Construction Assumptions**

- General Contractor Markup assumptions, 15 percent General Conditions (airport, FAA reporting, among others.), 10 percent Overhead and Profit, and 5 percent subcontractor markup.
- Same square footage cost used in all estimates.
- Metal roofing with snow and ice bars.
- Rain screen wall system (combination of masonry and metal panels).
- Thermally broken aluminum window and curtainwall system with performance glazing.
- Most interior walls are steel stud and painted gypsum board, hollow metal door frames with wood doors.
- Acoustic tile ceiling, a combination of hard tile in toilet and wet areas, luxury vinyl tile (LVT) and carpet in finished spaces, and sealed concrete in mechanical/electrical spaces.

### **Building Support System Assumptions**

- New communication/information/security, inclusive of door access control, security cameras and paging system for interior and exterior airside apron and wireless network system. A new equipment room will be created with all new cabling for systems.
- Existing antenna systems moved to new building.
- Traditional high-performance ventilation and heating and cooling systems (geothermal or PV not included in this estimate).
- High efficiency condensing hot water boilers with variable speed circulating pumps.
- Variable volume direct expansion (DX) rooftop air handler.
- Variable air volume terminal boxes with heating coils for each thermal zone.
- Roof exhaust fans for toilets and janitor spaces.
- Hot water baseboard at exterior walls/windows.
- Hot water heaters in vestibules.
- Light-emitting diode (LED) lighting, lighting controls per building code.
- Fire alarm systems per building code.
- Potential for solar on roof to supply energy to facility.



### 3.3 Air Carrier Apron Alternatives

As discussed in Chapter 1, the goals for the air carrier apron alternatives are to eliminate aircraft tails inside the taxilane OFA and improve GSE vehicle circulation. It was determined that an additional 30 feet was needed to eliminate the tail penetration. Also discussed in Chapter 1 is the need to provide an additional 25 feet to meet the FAA recommendation from Advisory Circular 150/5300-13B, *Airport Design* (AC 150/5300-13B) of safety clearance surrounding a parked ADG III aircraft. Two solutions were considered to clear the tails of the taxilane OFA: 1) reorienting lead-in lines and 2) shifting the taxilane south and expanding the air carrier.

#### 3.3.1 Air Carrier Alternative 1

The first alternative for the air carrier apron is to reorient Gate 3 and Gate 4's lead-in lines. This alternative is shown in **Exhibit 3-9**. The goal was to rotate the lead-in lines so the tails would no longer be inside the taxilane OFA. However, it was determined that aircraft tail penetrations cannot be eliminated by only reorienting the lead-in lines.





Exhibit 3-9: Air Carrier Apron Alternative 1





### 3.3.2 Air Carrier Apron Alternative 2

Alternative 2 is shown in **Exhibit 3-10**. Alternative 2 requires a taxilane shift 55 feet south and requires approximately 29,100 square feet of air carrier apron expansion. Due to the airspace surfaces behind Gate 1, the portion of taxilane between Gates 1 and 3 only shifts approximately 18 feet. The taxilane shift successfully eliminates the tail penetrations at both Gates 3 and 4 but does not provide the full 25 feet of clearance around the aircraft parked at Gate 3 because there was not enough space to shift the taxilane to provide that safety clearance. Due to the taxilane shift, an aircraft parked at Gate 1 cannot push back from the gate and turn onto the taxilane. Therefore, 2,800 square feet of additional pavement is required to allow an aircraft to push back from Gate 1 and turn onto the taxilane. This additional pavement would not allow GSE to park behind Gate 1; therefore, this space must be relocated.

#### **Evaluation of Airspace Surfaces**

**Exhibit 3-11** depicts a CRJ-700 pushing back from Gate 1. When the aircraft pushes back it falls inside Section 2 of the Departure Surface and inside the precision approach path indicator (PAPI) Light Signal Clearance Surface (LSCS). The profile view on the exhibit shows that the aircraft tail does not penetrate either of these surfaces.

The plan view on the exhibit shows that the aircraft remains outside of the Part 77 Approach Surface; however, if the aircraft does accidentally enter the Part 77 Approach, the tail would penetrate the surface by approximately 10 feet. To prevent an aircraft from entering the surface, the air carrier apron expansion intentionally ends right where the main gear of the aircraft sit on the pavement which would be a physical sign to tow operators that the aircraft cannot be pushed back any further. Further evaluations on the safety of an aircraft accidentally entering the Part 77 Approach Surface are listed below:

- Aircraft typically do not land on Runway 17; they land on Runway 35 so the Part 77 Approach Surface would not be of concern most of the time.
- The Part 77 Approach Surface is a warning surface for the Threshold Siting Surface (TSS) and Runway Protection Zone (RPZ) both of which the aircraft remains clear of.
- The aircraft will only be under the surface for a short period; it is being pushed back to depart and will be taxied to the runway shortly after.

Given the evaluation of the surfaces, the air carrier apron expansion does not present a safety concern.



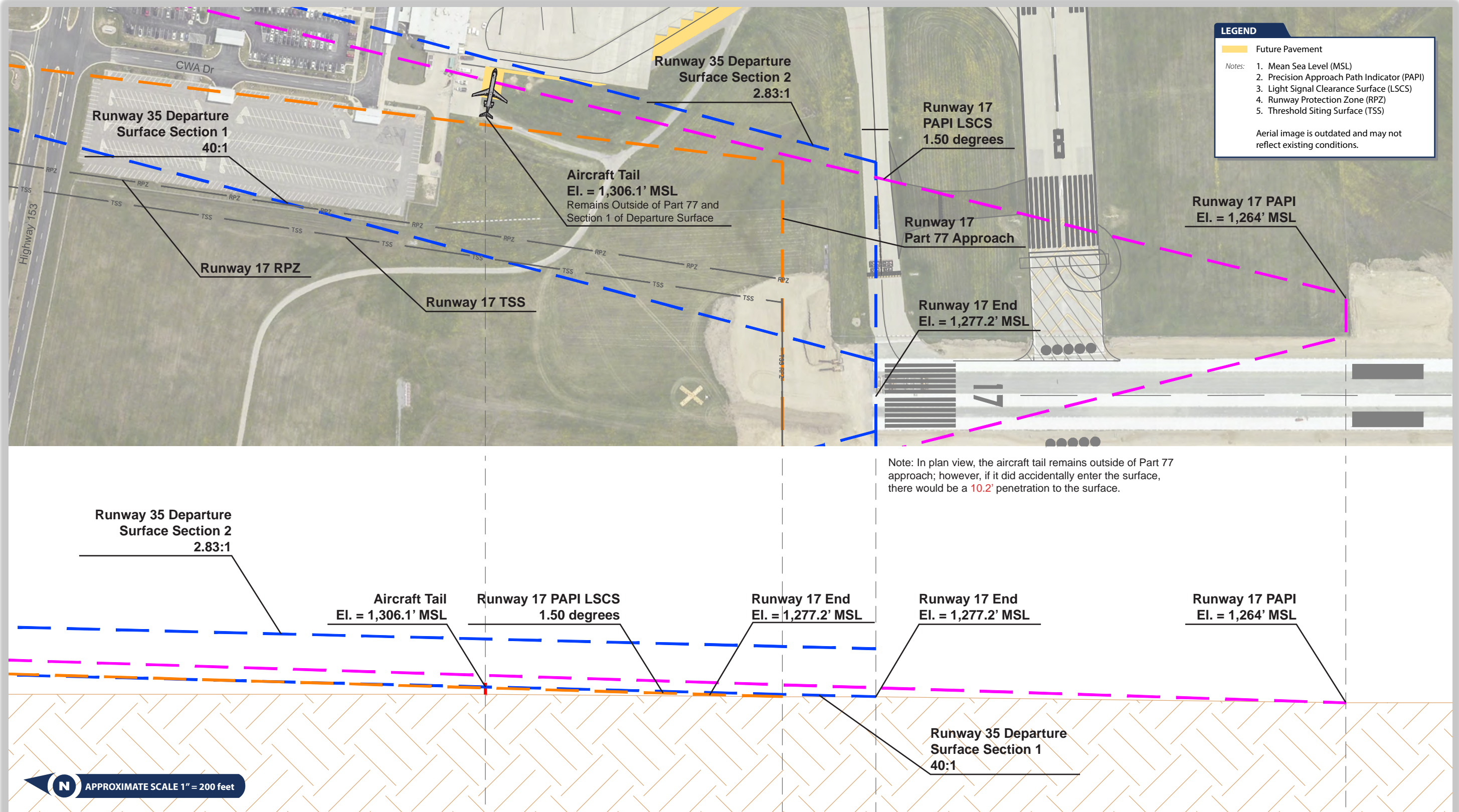


Exhibit 3-10: Air Carrier Alternative 2





Exhibit 3-11: Evaluation of Airspace Surfaces Surrounding Air Carrier Apron





### 3.3.3 Air Carrier Apron Alternatives Screening Criteria

Both alternatives are evaluated in **Table 3-3** based on their ability to meet the screening criteria discussed below:

- **Design Standards** – the alternative meets FAA and Code of Federal Regulations (CFR) Part 77 design standards by remaining outside OFAs and airspace surfaces specifically the Departure Surface, Part 77 Approach, and PAPI LSCS.
- **Safety and Operational Efficiency** – the alternative improves safety surrounding the apron, improves aircraft operations, and improves GSE vehicle operations.
- **Implementation** – the alternative can be constructed, phased, and is not an unreasonable cost.

**Table 3-3 Air Carrier Apron Alternatives Screening Criteria**

Screening Criteria	Alt. 1	Alt. 2
<b>Design Standards</b>		
Aircraft remain outside of all OFAs	✗	✓
Aircraft do not penetrate Departure Surface when pushing back from gate	✓	✓
Aircraft do not penetrate PAPI LSCS when pushing back from gate	✓	✓
Aircraft do not penetrate Part 77 Approach when pushing back from gate	✓	✓
<b>Safety and Operational Efficiency</b>		
Improves safety around air carrier apron	✗	✓
Improves aircraft operations and circulation	✗	✓
Improves GSE vehicle operations and circulation	✗	✓
Provides FAA recommended 25-foot safety clearance around parked aircraft	✗	✗
<b>Implementation, Phasing, and Feasibility</b>		
Project costs are within reason	✓	✓
Minimizes impact to aircraft operations during construction	✓	✗

Sources: Mead & Hunt, 2023

- Notes: ✓ Strength of the concept  
✗ Weakness of the concept

### 3.3.4 Air Carrier Apron Preferred Alternative

The Air Carrier Apron Preferred Alternative is shown on **Exhibit 3-12**. As mentioned above, Alternative 1 does not meet OFA requirements while Alternative 2 does. However, Gate 3 in Alternative 2 does not meet the recommended 25 feet safety clearance. Therefore, the lead-in line at Gate 3 was rotated to meet the recommended safety clearance.

During stakeholder engagement meetings, airline staff mentioned that the outbound baggage area does not provide enough space to accommodate baggage for the larger Boeing 737 aircraft utilized by the ultra-low-cost carrier at CWA. An expansion of the outbound baggage area was added to the preferred air carrier alternative. This additional space will also allow some GSE to park inside the building, relieving some of the congestion on the apron. However, this expansion restricts Gate 1 to only serve ADG II aircraft due to wingtip clearances.





Exhibit 3-12: Preferred Air Carrier Alternative





### 3.4 Deicing Location Alternatives

The goal for deicing alternatives is to identify two locations that allow simultaneous deicing of two commercial service aircraft to occur without interrupting other activities surrounding the apron.

Three deicing location alternatives were considered: 1) southwest of the air carrier apron, 2) southeast of the air carrier apron, and 3) a flexible location located along the GA apron. Each of these locations are discussed in the sections below.

#### 3.4.1 Deicing Location Alternative 1

The first location evaluated is an expansion to the southwest of the air carrier apron. Deicing Location Alternative 1 is depicted on **Exhibit 3-13**.

The advantages of this alternative include:

- Poses no impacts to ATCT line of sight (LOS).
- Uses a space not conducive to any other use, given the number of airport design surfaces surrounding the location.
- Separates deicing from all other activity and does not directly interfere with any other activity.
- Provides perpendicular connection to Taxiway C.

The disadvantages of this alternative include:

- Results in poor aircraft circulation because aircraft must taxi into a tight space and introduce more congestion to the area behind Gate 3.
- Provides a small margin of error for aircraft to remain outside of airport design surfaces.
- Requires aircraft departing Runway 8 to make tight "S" turn to get to the runway because the radii of the two connector taxiway centerlines are too close to each other.





Exhibit 3-13: Deicing Location Alternative 1



**LEGEND**

- Future Pavement
- Future Building
- Maneuvering Area for Deicing Vehicles
- Aircraft Parking Areas
- Shadow Cast by Aircraft

*Notes:*

1. Runway Protection Zone (RPZ)
2. Runway Object Free Area (ROFA)
3. Part 77 Approach Surface (P-77)
4. Departure Surface (DS)
5. Taxiway Object Free Area (TLOFA)
6. Taxiway Object Free Area (TOFA)
7. Runway Safety Area (RSA)
8. Airplane Design Group (ADG)
9. Air Traffic Control Tower (ATCT)
10. Precision Approach Path Indicator (PAPI)
11. Light Signal Clearance Surface (LSCS)

Aerial image is outdated and may not reflect existing conditions.



### 3.4.2 Deicing Location Alternative 2

The second location evaluated is an expansion to the southeast of the air carrier apron. Deicing Location Alternative 2 is depicted on **Exhibit 3-14**.

The advantages of this alternative include:

- Separates deicing from all other activity and does not directly interfere with any other activity.
- Provides more flexible space to design and maneuver within (compared to Alternative 1).
- Does not impact airspace surfaces like Alternative 1.
- Allows deice fluid to drain south to existing catch basins.
- Poses no impact to the ATCT LOS as the tower can still see aircraft taxiing on Taxiway C while an aircraft is deicing.

The disadvantages of this alternative include:

- Requires aircraft departing Runway 17/35 to make tight “S” turn to get to the runway because the radii of the two connector taxiway centerlines are too close to each other.

This alternative was refined so that the deicing aircraft can align parallel to the apron edge taxilane as depicted on **Exhibit 3-15**. The hold line in this alternative has been placed based on the FAA’s taxiway to taxilane centerline separation standards found in AC 150/5300-13B.

Advantages of this refinement include:

- Eliminates direct access from apron to Runway 8/26.
- Eliminates existing non-standard slope from apron to Taxiway C.
- Provides improved aircraft circulation and bypass capability around deicing aircraft.
- Can be used as a bypass taxiway during periods when deicing is not necessary.

### 3.4.3 Deicing Location Alternative 3

The third location evaluated is on the existing general aviation apron. Deicing Location Alternative 3 is depicted on **Exhibit 3-16**.

The advantages of this alternative include:

- Does not impact ATCT LOS.
- Does not require apron expansion.

The disadvantages of this alternative include:

- May interrupt other activity depending on building alternative.
- Requires concrete to replace existing asphalt and support larger aircraft.





Exhibit 3-14: Deicing Location Alternative 2A

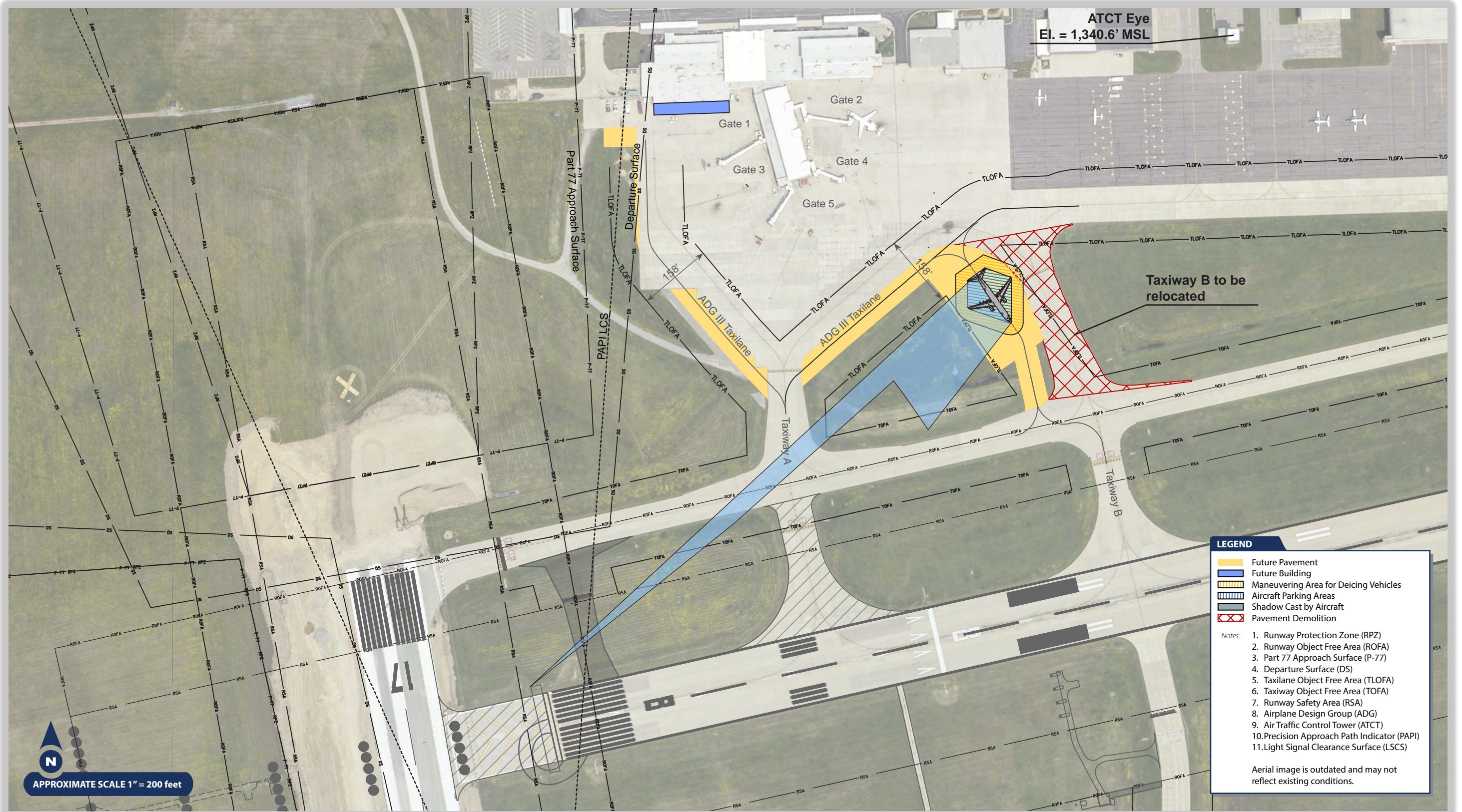




Exhibit 3-15: Deicing Location Alternative 2B

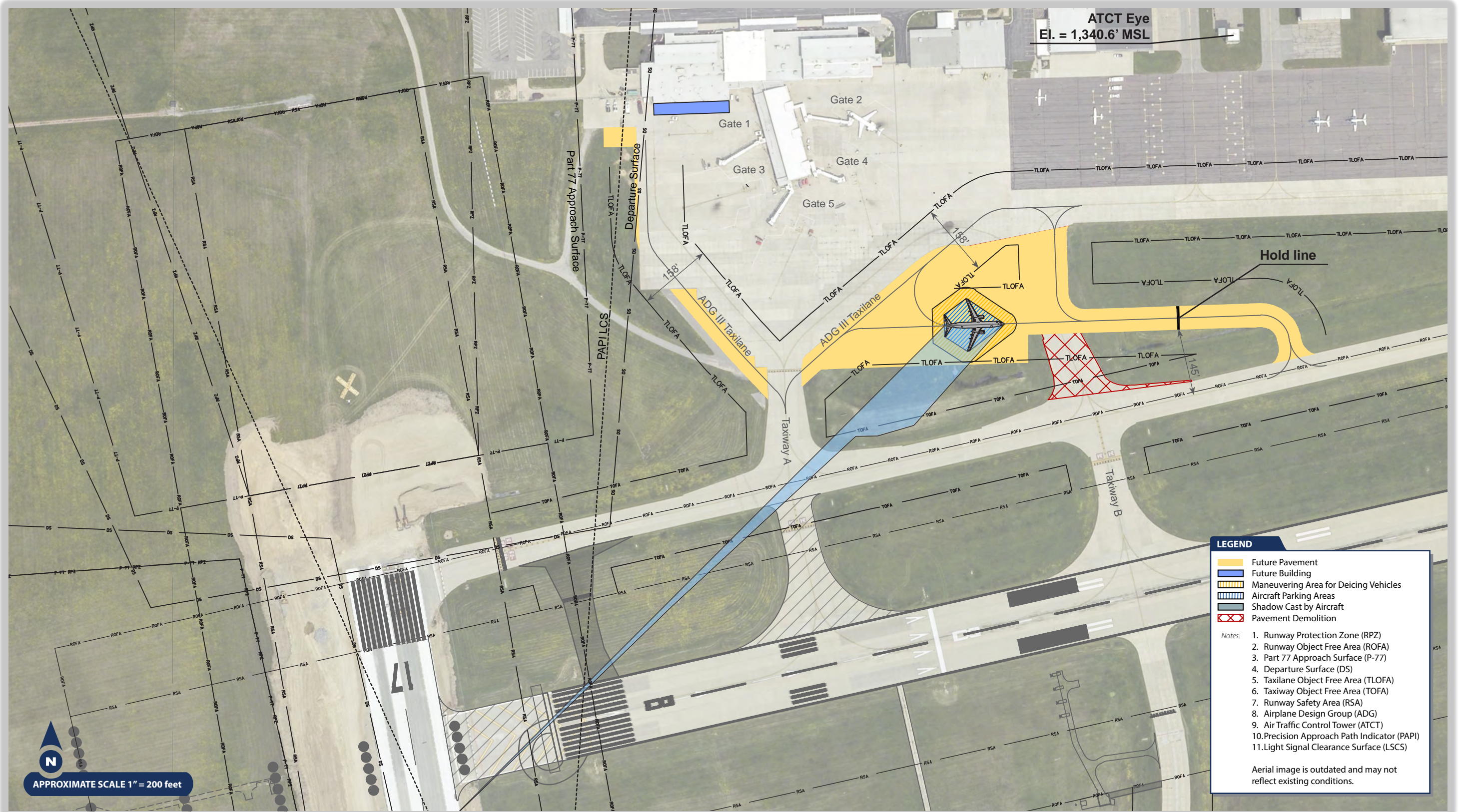
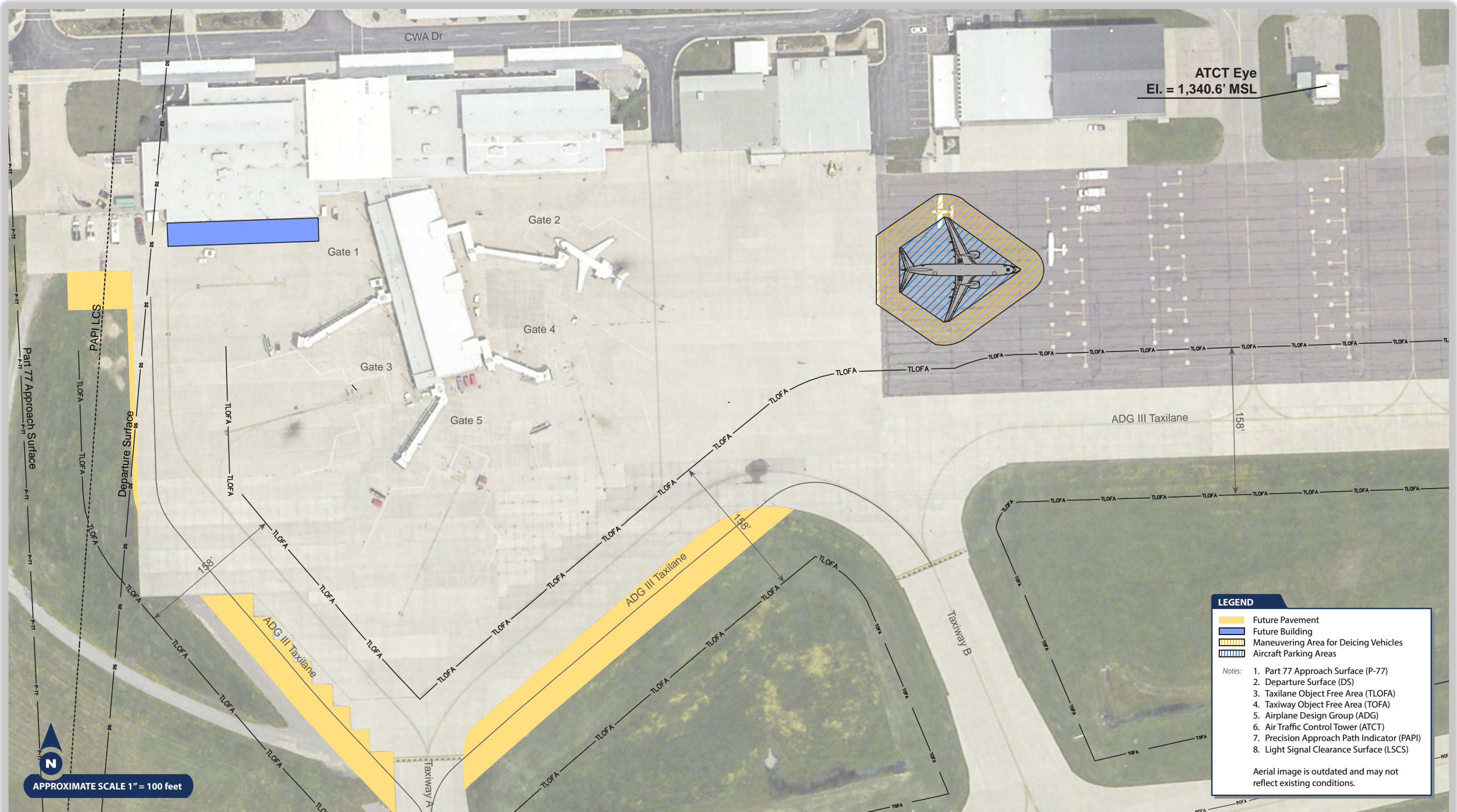




Exhibit 3-16: Deicing Location Alternative 3





### 3.4.4 Deicing Location Screening Criteria

All deicing location alternatives are evaluated in **Table 3-4** based on their ability to meet the screening criteria discussed below:

- **Design standards** – Alternative remains outside of all OFAs and airspace surfaces and does not significantly impact ATCT LOS on movement areas.
- **Safety and Operational Efficiency** – Alternative improves safety, deicing operations, and all operations surrounding the apron.
- **Sustainability and Environment** – Alternative can collect deice fluid.
- **Implementation, Phasing, and Feasibility** – Alternative can be constructed and phased at a reasonable cost.

**Table 3-4 Deicing Alternatives Screening Criteria**

Screening Criteria	Alt. 1	Alt. 2	Alt. 2b	Alt 3
<b>Design Standards</b>				
Aircraft remain outside of all OFAs	✓	✓	✓	✓
Aircraft do not penetrate any airspace surfaces	✓	✓	✓	✓
Aircraft minimize impact of ATCT LOS on movement areas	✓	✓	✓	✓
<b>Safety and Operational Efficiency</b>				
Improves safety around apron	✗	✓	✓	■
Improves aircraft operations and circulation	✗	✓	✓	■
Allows for aircraft bypass capability	✗	✗	✓	✗
Improves deicing and surrounding SRE operations	✓	✓	✓	■
Eliminates direct access from apron to runway	✗	✗	✓	✗
Eliminates non-standard slope from apron to taxiway	✗	✗	✓	✗
<b>Sustainability and Environment</b>				
Allows for deicing fluid drainage	✓	✓	✓	✗
<b>Implementation, Phasing, and Feasibility</b>				
Allows for phased expansion	✓	✓	✓	✓
Project costs are reasonable	✓	✓	✓	✓

Sources: Mead & Hunt, 2023

Notes: ✓ Strength of the concept

✗ Weakness of the concept

■ Dependent on GA Terminal & ARFF/SRE Concept

**Table 3-4** shows that Deicing Location Alternative 2B is the preferred alternative. The next best alternative (excluding Alternative 2 as it is a variation of Alternative 2B) is Alternative 3 which will be used as a flex location. This location will only be needed when two aircraft are scheduled to depart within close proximity of each other and the preferred location is in use.





### 3.5 General Aviation Apron Alternatives

The goals of GA apron alternatives are to relieve apron congestion, improve aircraft circulation, and meet the demand determined from Chapter 1. The demand is dependent on forecasted itinerant aircraft. The existing and forecasted demand calculated in Chapter 1 is summarized in **Table 3-5**.

**Table 3-5 GA Apron Demand**

Aircraft Size	Baseline	2027	2032	2037	2042
<b>ADG I</b>					
Forecasted Aircraft	8	9	10	11	11
Cumulative Aircraft Growth	-	+1	+2	+3	+3
<b>ADG II</b>					
Forecasted Aircraft	4	5	6	6	7
Cumulative Aircraft Growth	-	+1	+2	+2	+3
<b>ADG III</b>					
Forecasted Aircraft	2	2	2	2	2
Cumulative Aircraft Growth	-	+0	+0	+0	+0
<b>TOTAL</b>					
Forecasted Aircraft	14	16	18	19	20
Cumulative Aircraft Growth	-	+2	+4	+5	+6

Sources: Mead & Hunt, 2023

The apron will be designed to accommodate ADG I, II, and III aircraft. For planning purposes, the representative aircraft used for each design group is summarized in **Table 3-6**.

**Table 3-6 Representative Aircraft by ADG**

ADG	Representative Aircraft
I	Cirrus SR22
II	Cessna Citation Latitude
III	Gulfstream G550

Sources: Mead & Hunt, 2023.

Three apron concepts were developed for the four near-term development concepts, as they are dependent on the location of the GA terminal and ARFF/SRE facility under each concept. To meet requirements, two solutions were considered: 1) reconfiguring the existing apron and 2) shifting the taxilane south and expanding the apron south. It was determined that either of these solutions alone cannot satisfy the apron requirements; therefore, all alternatives consider both an apron reconfiguration along with an apron expansion. Additional consistencies between the three alternatives are listed below:

- Apron reconstruction to support greater aircraft loads.
- 80-foot taxilane shift to south including approximately 75,000 square feet of new pavement, allowing three ADG II to park side-by-side and two ADG III to park side-by-side.
- Cargo apron relocation to east of fuel farm, allowing GA aircraft to park in its place.



- ADG III aircraft parking in front of GA terminal, a stakeholder desire from the perspective that the highest paying customer should have the best experience and passenger safety should be maximized during enplaning and deplaning the aircraft.

Primary differences between the three alternatives are aircraft parking configuration and taxilanes running through apron. It is not necessary to mark all these areas to allow flexibility with aircraft parking during the diverse scenarios that CWA experiences. Alternatives are not parking plans, and aircraft are not designated to these areas. The goal of each alternative is to park aircraft such that aircraft can self-park, as GA terminal staff are limited, have multiple responsibilities, and may not be available to tow aircraft to parking positions. Another goal of each alternative was to provide the recommended clearance surrounding a parked aircraft – although if needed, the spacing between these aircraft can be reduced allowing more aircraft to park in these areas. There are some locations that should prioritize certain aircraft and, due to taxilane OFAs, some spaces will only allow ADG I to park there. Each alternative is presented in the sections below.

### 3.5.1 General Aviation Apron Alternative 1

GA Apron Alternative 1 is depicted on **Exhibits 3-17 and 3-18** and is compatible with Concepts 1 & 2. This alternative has two ADG III aircraft parked in front of the existing east transient hangar. Five ADG I aircraft are parked in front of the ATCT. Six ADG II park on the existing cargo apron, which, in the ultimate condition will be relocated east of the fuel farm. One additional ADG II aircraft along with six ADG I aircraft park on the east end of the GA apron.

The portion of Taxilane 2 that runs through the GA apron would need to be upgraded to an ADG III taxilane to allow the ADG III aircraft to maneuver to their parking positions. The portion of Taxilane 3 that runs through the apron would need to be upgraded to an ADG II taxilane to allow the ADG II aircraft that are parked on the former cargo apron to maneuver to their parking positions.

Parked aircraft in Alternative 1 remain outside of all OFAs, remain clear of all airspace surfaces, and provide the FAA recommended separation for parked aircraft.





Exhibit 3-17: General Aviation Apron Alternative 1A

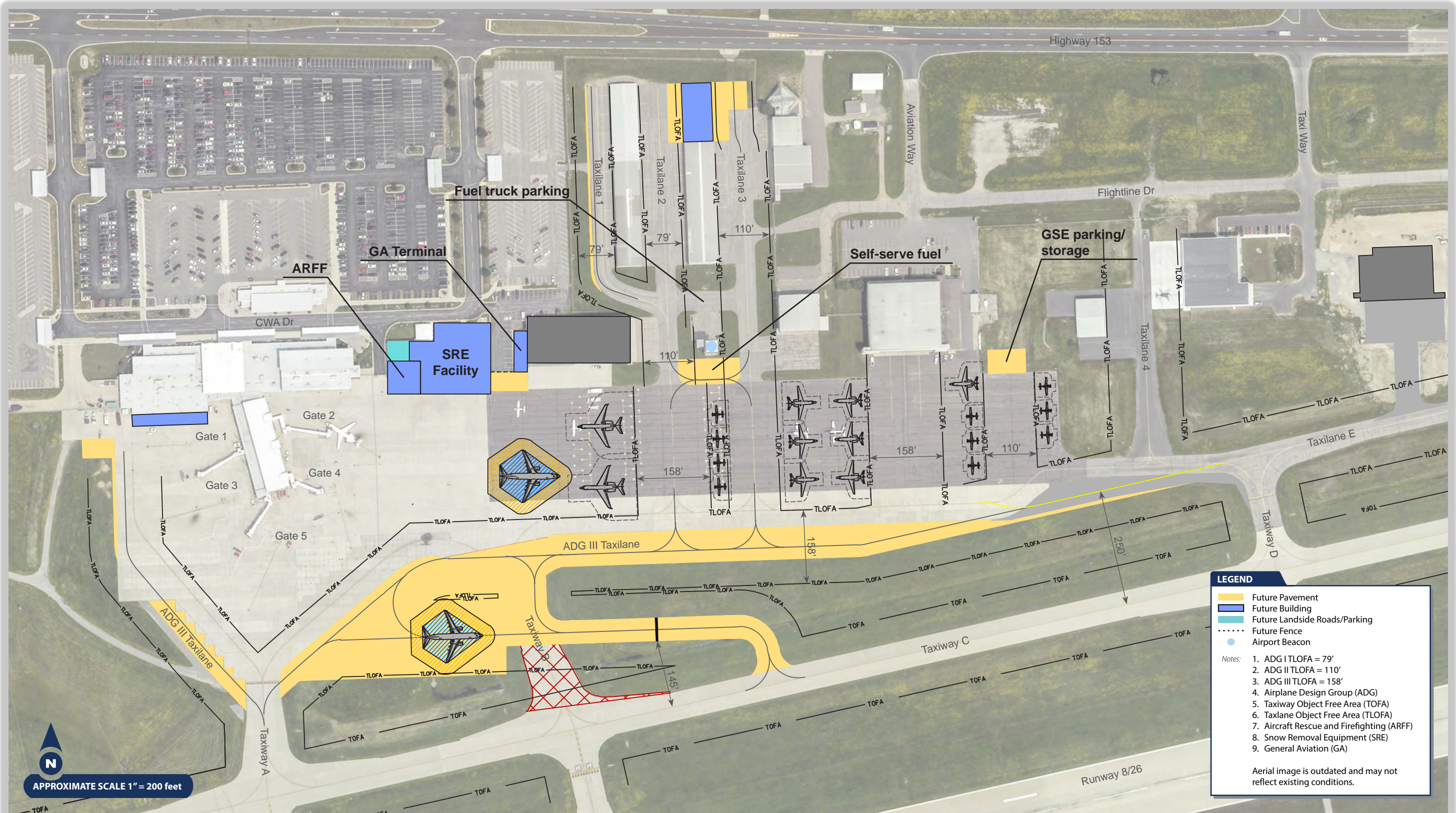
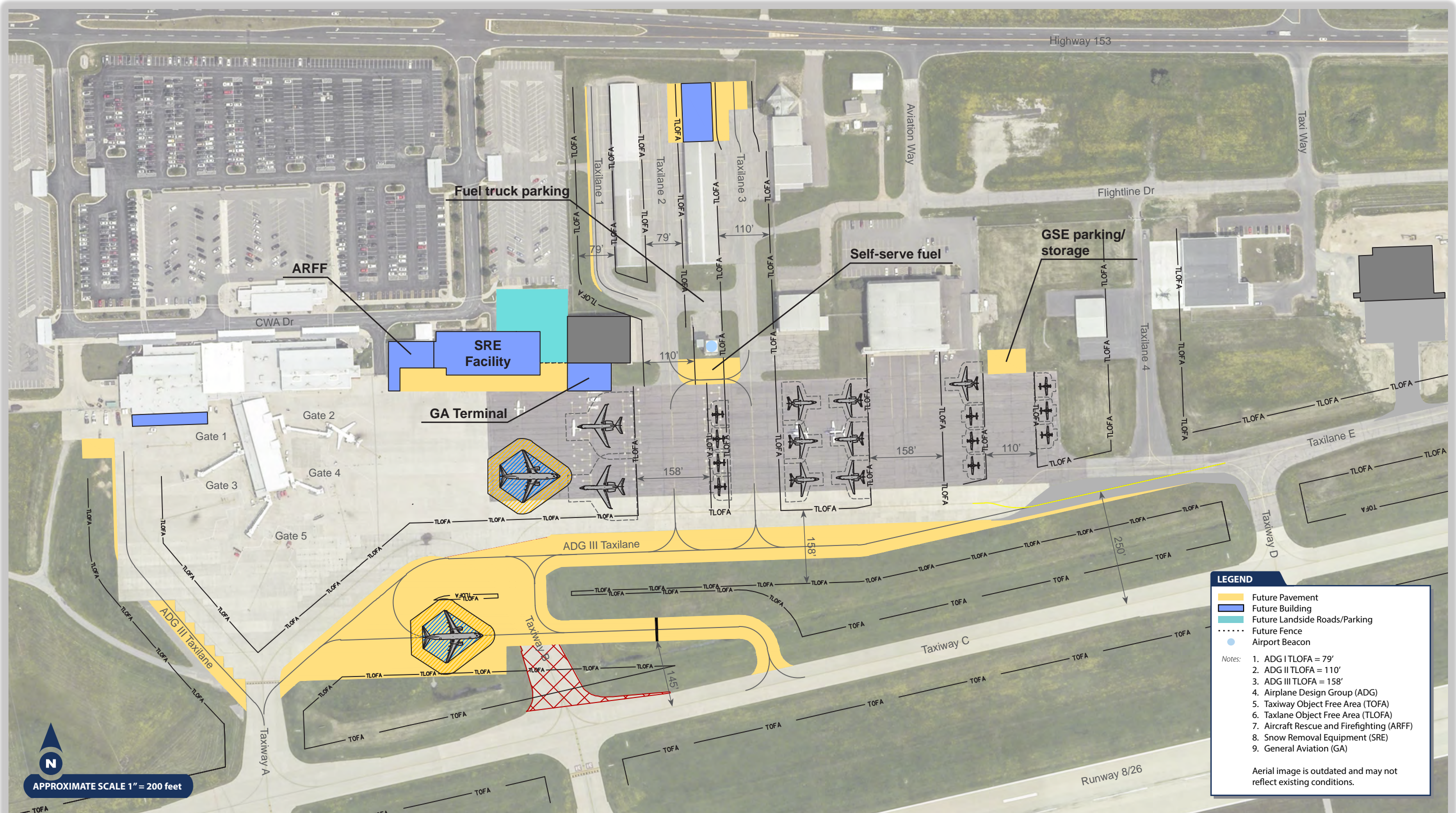




Exhibit 3-18: General Aviation Apron Alternative 1B





### 3.5.2 General Aviation Apron Alternative 2

GA Apron Alternative 2 is depicted on **Exhibit 3-19** and is compatible with Concept 3. This alternative shows three ADG II aircraft parked in front of the east transient hangar, five ADG I in front of the ATCT, two ADG III on the former cargo apron, and a mixture of four ADG II and three ADG I aircraft on the east end of the apron. The portion of Taxilane 3 that runs through the GA apron would need to be upgraded to an ADG III taxilane to allow the ADG III aircraft to park on the former cargo apron.

Parked aircraft in Alternative 2 remain outside of all OFAs, remain clear of all airspace surfaces, and provide the FAA recommended separation for parked aircraft. This is the recommended alternative because it meets all of the screening criteria and is compatible with preferred near-term development Concept 3.

### 3.5.3 General Aviation Apron Alternative 3

GA Apron Alternative 3 is depicted on **Exhibit 3-20** and is compatible with Concept 4. This alternative has six ADG I aircraft south of the ATCT, six ADG II on the former cargo apron, and five ADG I along with one ADG II aircraft park on the far east of the GA apron. Two ADG III aircraft would park where the existing T-hangars are located and the T-hangars would relocate to the east, just north of Flightline Drive. To allow ADG III aircraft to taxi behind the ATCT tower, Taxilane 2 would need to be upgraded to an ADG III taxilane. This would mean that a portion of the east transient hangar would be inside the ADG III taxilane OFA. For Alternative 3 to work, a portion of the east transient hangar would be removed to clear the taxilane OFA.

Parked aircraft in Alternative 3 remain outside of all OFAs, remain clear of all airspace surfaces, and provide the FAA recommended separation for parked aircraft. However, the second ADG III aircraft, parked nearest to the ATCT, is parked right between the two taxilane OFAs with little margins to clear both OFAs.





Exhibit 3-19: General Aviation Apron Alternative 2

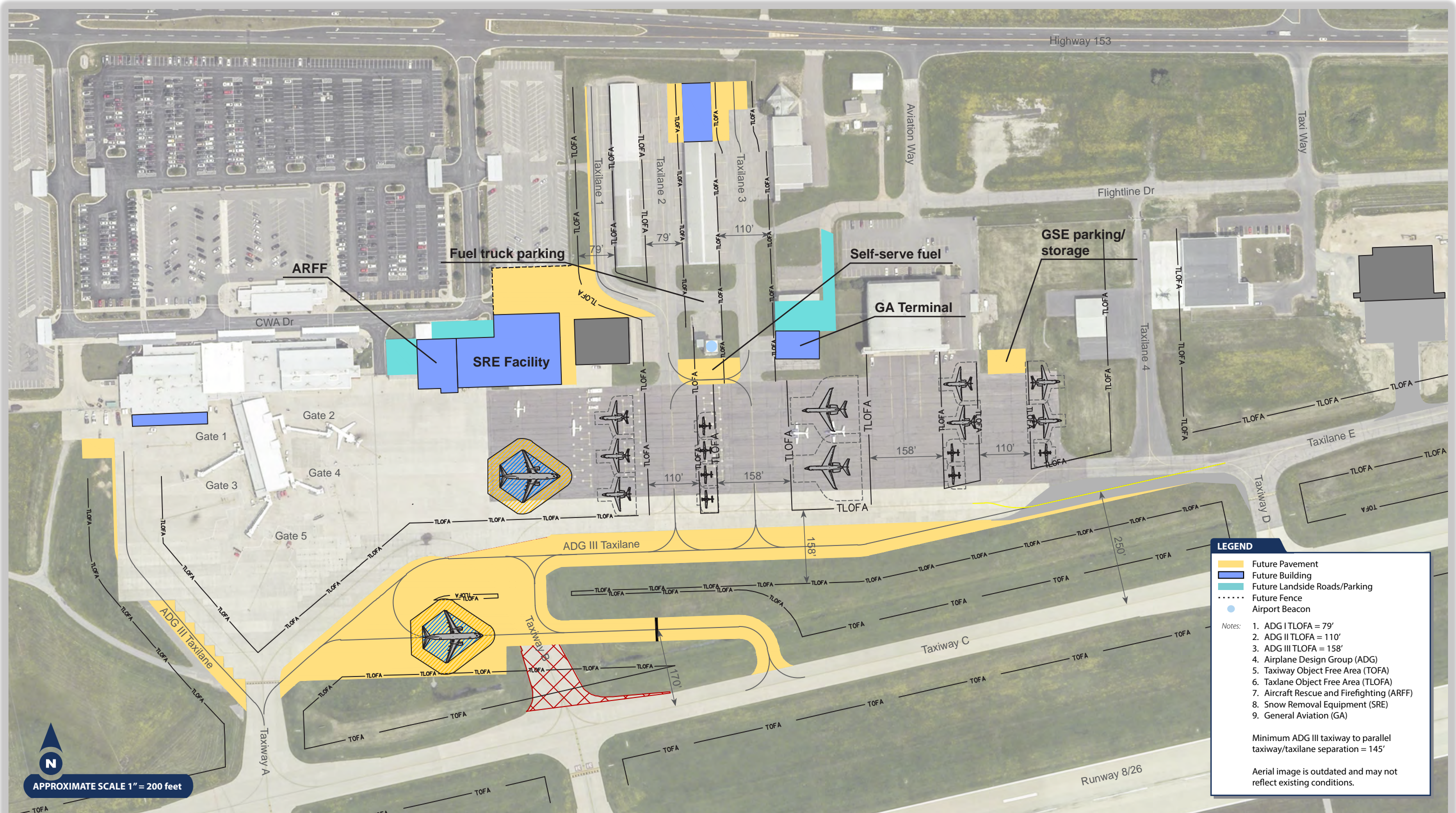
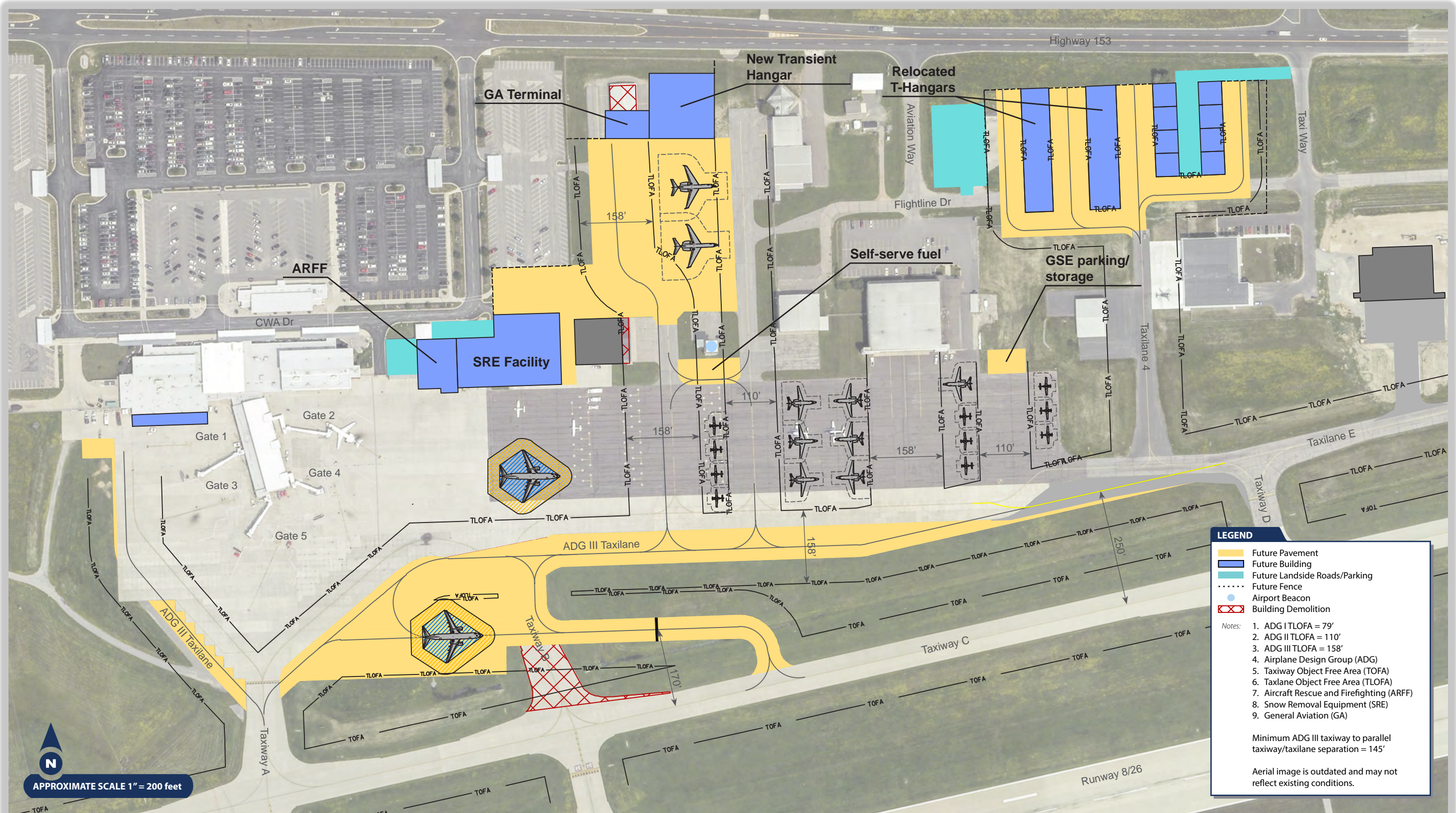




Exhibit 3-20: General Aviation Apron Alternative 3





### 3.6 Near-Term Hangars Alternative

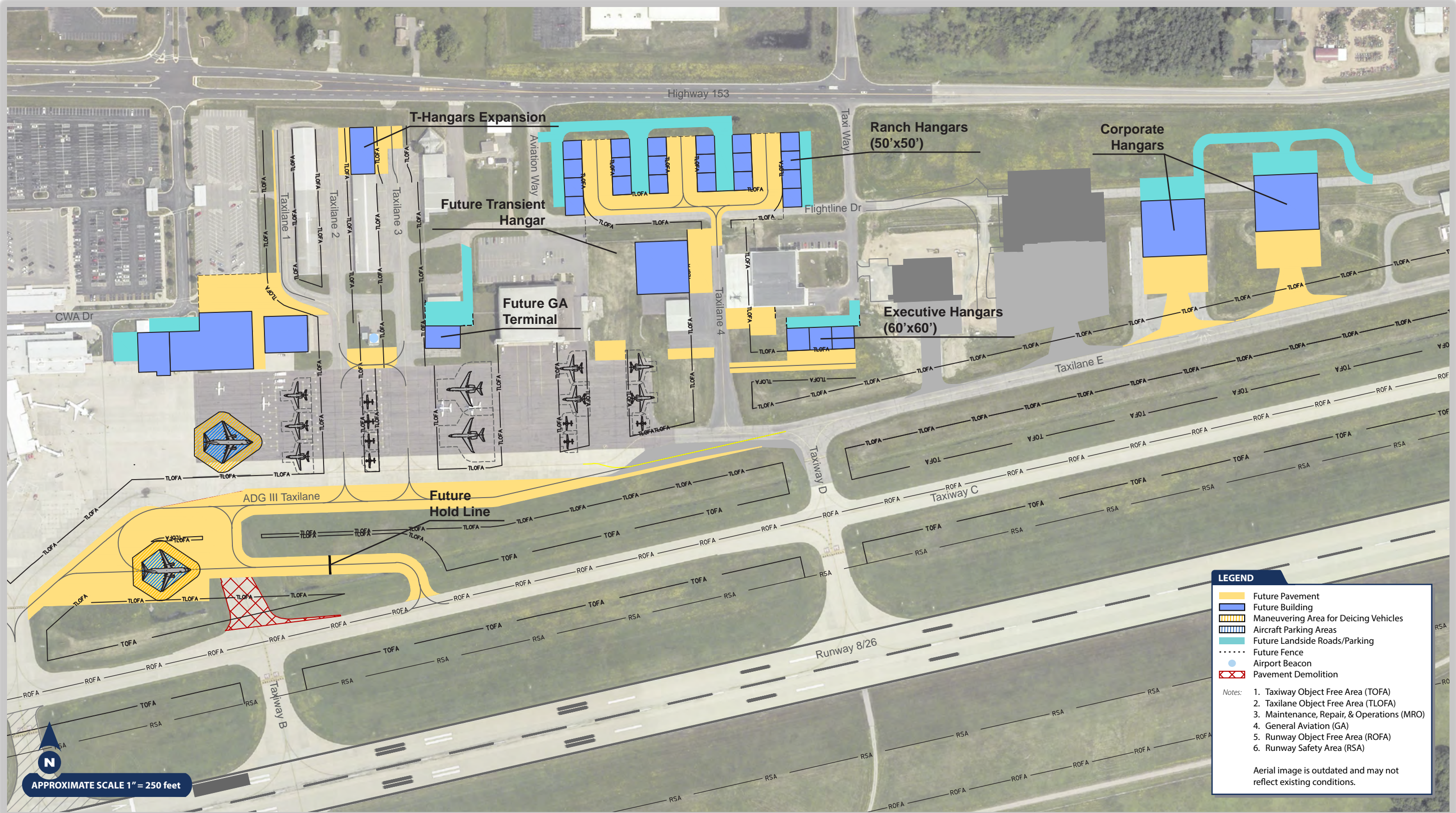
The preferred Near-Term Hangars Alternative is depicted on **Exhibit 3-21**. Various stakeholders were involved in the development of this preferred alternative. Several hangar sizes are provided in the preferred alternative allowing pilots to decide their hangar experience at CWA.

- **T-Hangars** – Provide pilots with a location to park their aircraft without any additional accommodation.
- **Ranch Hangars** – Provide more space for aircraft compared to the space of the T-hangar units and may provide heating.
- **Executive Hangars** – Larger than the ranch hangars and providing heating and restrooms.
- **Corporate Hangars** – Intended for business jets and would provide heating, restrooms, and administrative space.





Exhibit 3-21: Near-Term Hangars



**LEGEND**

- Future Pavement
- Future Building
- Maneuvering Area for Deicing Vehicles
- Aircraft Parking Areas
- Future Landside Roads/Parking
- Future Fence
- Airport Beacon
- Pavement Demolition

*Notes:*

1. Taxiway Object Free Area (TOFA)
2. Taxilane Object Free Area (TLOFA)
3. Maintenance, Repair, & Operations (MRO)
4. General Aviation (GA)
5. Runway Object Free Area (ROFA)
6. Runway Safety Area (RSA)

Aerial image is outdated and may not reflect existing conditions.



### 3.7 Mid-Term Development Alternative

Development east of the fuel farm was considered for the mid-term (5-20 years). Several factors were considered for future development in this location which are summarized below.

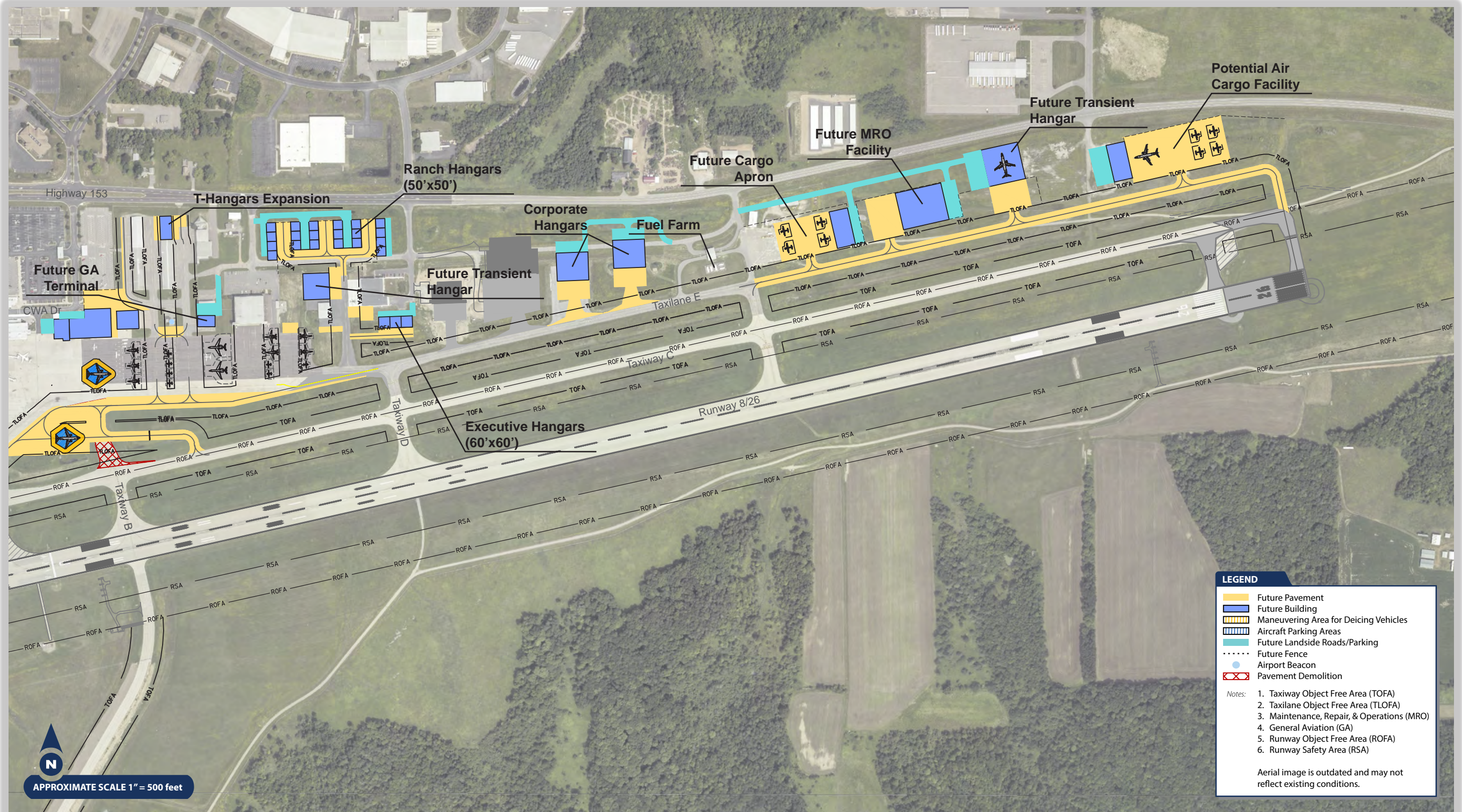
- **ARFF/SRE Facility Project Completion** – The ARFF/SRE facility replacement project must be completed before any development east of the fuel farm can begin. Salt, sand, and deicing equipment are currently stored in buildings in this area and must be relocated to the new ARFF/SRE facility before site work can begin east of the fuel farm.
- **No Existing Utilities** – There are currently no utilities running underneath the area east of the fuel farm. However, given the site's proximity to existing infrastructure, tying new utilities into existing utilities can be done easily.
- **Existing Landside Access Points** – This site provides established access points to State Highway 153. Therefore, landside access to this site can be easily developed.
- **Type of Aeronautical Development** – Based aircraft hangar requirements can be met west of the fuel farm. While the area east of the fuel farm could be developed for additional hangars, the Mid-Term Development Alternative considers several types of aeronautical use.
- **Opportunity to Attract Different Aeronautical Users** – The Mid-Term Development Alternative will be used to show the community what is possible in this area. Aeronautical users might not be aware of what is possible in the undeveloped space east of the fuel farm.

The Mid-Term Development Alternative is shown on **Exhibit 3-22**. Projects proposed for mid-term development are summarized below.

- **Relocated Cargo Apron** – The cargo apron will need to be relocated from the GA apron in the future to meet itinerant GA demand. The proposed cargo apron is sized for four turboprop cargo feeder aircraft and an adjacent sorting facility.
- **Future Maintenance, Repair, and Operations Facility** – An MRO sized for a Boeing 737-800, including a hangar with a west facing door and apron space in front. The door faces west to allow an aircraft to park on the apron outside of all OFAs.
- **Future Transient Hangar** – A transient hangar sized for a Boeing 737-800 with apron space in front to allow the aircraft to park outside of all OFAs.
- **Potential Air Cargo Facility** – Space for additional air cargo facility development at CWA. The apron is sized for a narrowbody cargo aircraft with additional apron space for smaller cargo aircraft. This project also includes a sorting facility with landside space reserved for freight trucks.









### 3.8 Long-Term Development Alternative

Development south of Runway 8/26 was considered for the long-term (>20 years). Several factors were considered for the development in this location which are summarized below.

- **No Existing Utilities** – The area south of Runway 8/26 does not currently have utilities and connecting utilities to this area will be more difficult than the Mid-Term Development Alternative. To tie into existing utilities, future utilities need to either go under or around Runway 8/26.
- **No Existing Access Roads** – Access roads will need to be constructed to provide landside access for future development.
- **Grading Issues** – The terrain in this area has significant grade changes. To develop this area, a lot of fill may be required. It may be a challenge to construct infrastructure to meet FAA design standard slopes.
- **Remove or Avoid Trees** – The area south of Runway 8/26 has many trees which must be removed or avoided.
- **Avoid Wetlands** – The area south of Runway 8/26 contains wetlands that will need to be avoided. This will also require environmental surveying and evaluation in compliance with applicable regulations.

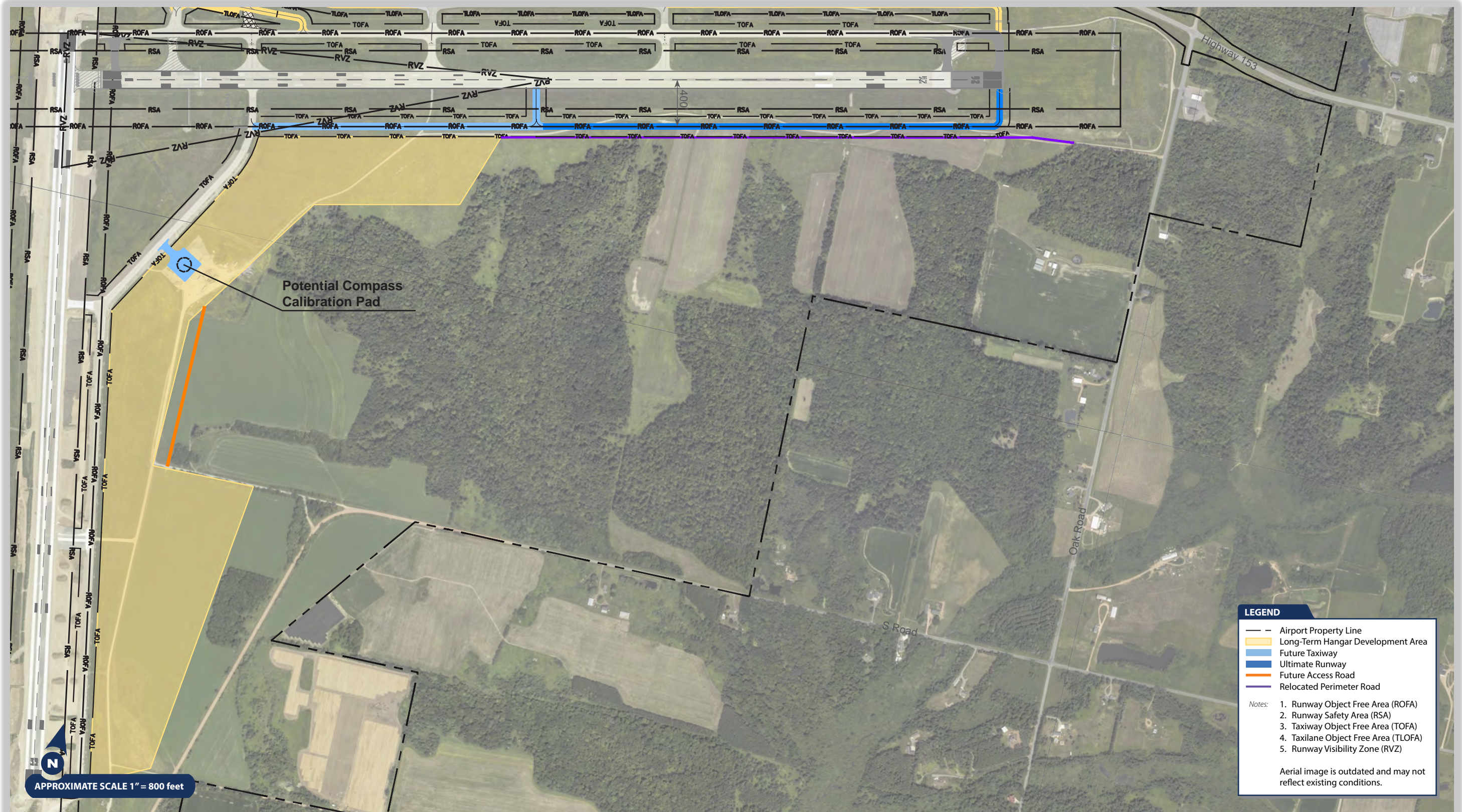
The Long-Term Development Alternative is shown on **Exhibit 3-23**. Projects proposed for long-term development are summarized below.

- **Long-Term Hangar Development** – The area south of Runway 8/26 will be developed to maximize hangar development. Hangars will be placed outside of the building restriction line, OFAs, airspace surfaces, and the runway visibility zone.
- **Future Taxiway** – A future partial parallel taxiway will be constructed off existing Taxiway B to provide airside access for the long-term hangars.
- **Future Access Road** – A future access road will be constructed to provide landside access for the long-term hangars. This road will be connected off existing S Road. Constructing the future access road off existing Oak Road was considered but given the earthwork and construction required it was determined to construct it from S Road.
- **Compass Calibration Pad** – The existing MRO currently calibrates aircraft at CWA. However, the existing location may not be clear of magnetic impacts when calibrating the aircraft. This new location meets FAA recommended guidelines for a compass calibration pad.
- **Ultimate Taxiway** – A ultimate full parallel taxiway is proposed to connect from the proposed future taxiway to Runway 26. The construction of the ultimate taxiway is beyond the planning period and is depicted for preserving space.
- **Relocated Perimeter Road** – When the ultimate taxiway is constructed, portions of the perimeter road and fence will fall inside the ultimate taxiway's OFA. Both the existing perimeter road and fence will be relocated outside the OFA as part of this project.





Exhibit 3-23: Long-Term Development





### 3.9 Alternatives Analysis Summary

Four terminal area concepts were developed and evaluated. The primary difference between these concepts is the location of the GA terminal which directly impacts the size and configuration of the ARFF/SRE facility and aircraft apron. Concept 3 was selected as the preferred alternative because the advantages of the concept outweighed the disadvantages. While it is more expensive than the runner-up, Concept 2, the cost is not significant enough to rule the concept out.

Concept 3 has several associated project concepts developed in consultation with affected stakeholders. Some of these projects include an air carrier apron expansion, GA apron expansion, outbound baggage room expansion, hangar development, and deicing locations that remain clear of surrounding activity. These projects resolve the issues that were identified and discussed in Chapter 1.

Mid-term and long-term development concepts were also explored. The preferred Mid-Term and Long-Term Development Alternatives seek to provide the Airport with the highest and best use of all Airport property. The Mid-Term Development Alternative's main goal is to provide various aeronautical uses to attract different users to the Airport, while the Long-Term Development Alternative's main goal is to evaluate what is possible given the number of constraints in that area.

Implementation of the preferred alternative will be discussed in the following chapter to provide CWA with a plan to construct these projects.

