CHAPTER 3: TERMINAL AREA & SUPPORT FACILITIES

Introduction

This Chapter of the Airport Plan is focused on the Terminal Area and Support Facilities which includes the aprons, taxilanes, hangars, and access roads. The chapter follows the Runway and Taxiway chapter where the primary aircraft movement takes place. This chapter addresses the existing and future facility needs at HZE. The chapter analyzes the landside requirements necessary to support airport, aircraft, and passenger operations. It will consider forecasted planning activity levels for based aircraft and operations. Alternatives will be analyzed along with the decision on a preferred alternative. The following elements are provided for examining terminal area/support facilities:

- Planning Activity Levels
- Aircraft Storage
- Aircraft Parking Apron
- Support Facilities
- Requirements Summary
- Alternatives
- Preferred Alternative

Planning Activity Levels (PALs)

These PALs are carried forward from **Chapter 1** and are used later in this chapter to determine the requirements for facilities through the planning period. There are various airport activity measures used to determine airport facility requirements including annual operations, peak hour activity, and based aircraft. Airport activity can be sensitive to industry changes, national and local economic conditions. This results in difficulty in identifying a specific calendar year for associated demand-driven improvements.

For this study, PALs are used to identify demand thresholds for many recommended facility improvements. If an activity level is approaching a PAL, then the airport should prepare to implement the improvements. Alternatively, activity levels that are not approaching a PAL can allow improvements to be deferred. The demand forecasts developed in this study correspond to an anticipated planning level calendar year to each PAL (2027, 2032, 2037, 2042) from the preferred aviation forecasts as seen in **Table 3-1** and **Table 3-2**.

Table 3-1 – Planning Activity Levels (PALs)

Key Activity Metrics	Base	PAL 1	PAL 2	PAL 3	PAL 4
Forecast Year	**2022**	**2027**	**2032**	**2037**	**2042**
Operations	5,000	5,172	5,350	5,534	5,724
Based Aircraft	16	17	17	18	19

Source: KLJ Analysis

Table 3-2 – Peak Airport Operations Forecast

Metric	2022	2027	2032	2037	2042	CAGR
Annual Operations	5,000	5,172	5,350	5,534	5,724	*0.68%*
Peak Month	750	776	802	830	859	*0.68%*
Design Day	25.0	25.9	26.7	27.7	28.6	*0.68%*
Busy Day (Design Day + 15%)	28.8	29.7	30.8	31.8	32.9	*0.68%*
Design Hour	1.8	1.9	1.9	2.0	2.1	*0.68%*

Source: KLJ Analysis, CAGR = Compounded Annual Growth Rate

General Aviation

General Aviation (GA) includes all civil aviation activities except for commercial service. Providing necessary facilities and access for general aviation users at HZE will continue to be important for the vitality of the Hazen and Mercer County community. Current GA activity includes aerial spray applicator operations, business travel, and air ambulance service.

Fixed Base Operators (FBOs) are commercial businesses providing multiple aviation services to the public, primarily for general aviation. Specialized Aviation Service Providers (SASOs) are commercial aviation businesses providing one or a few services. There is no FBO at the airport but there is an arrival/departure terminal building that the airport manager maintains. Vanco Aviation is an aircraft exterior refurbishing and painting operations based at HZE.

HZE currently houses 16 single-engine based aircraft. Based aircraft are planned to grow by 0.76% percent through PAL 4.

Facilities should be planned to provide flexibility for growth including a Fixed-Base Operator (FBO) business providing aeronautical services from HZE. Space should be considered for an onsite flight training and a maintenance facility. General aviation facilities evaluated in this section include aircraft storage hangars, aircraft parking apron and arrival/departure terminal building.

Aircraft Storage

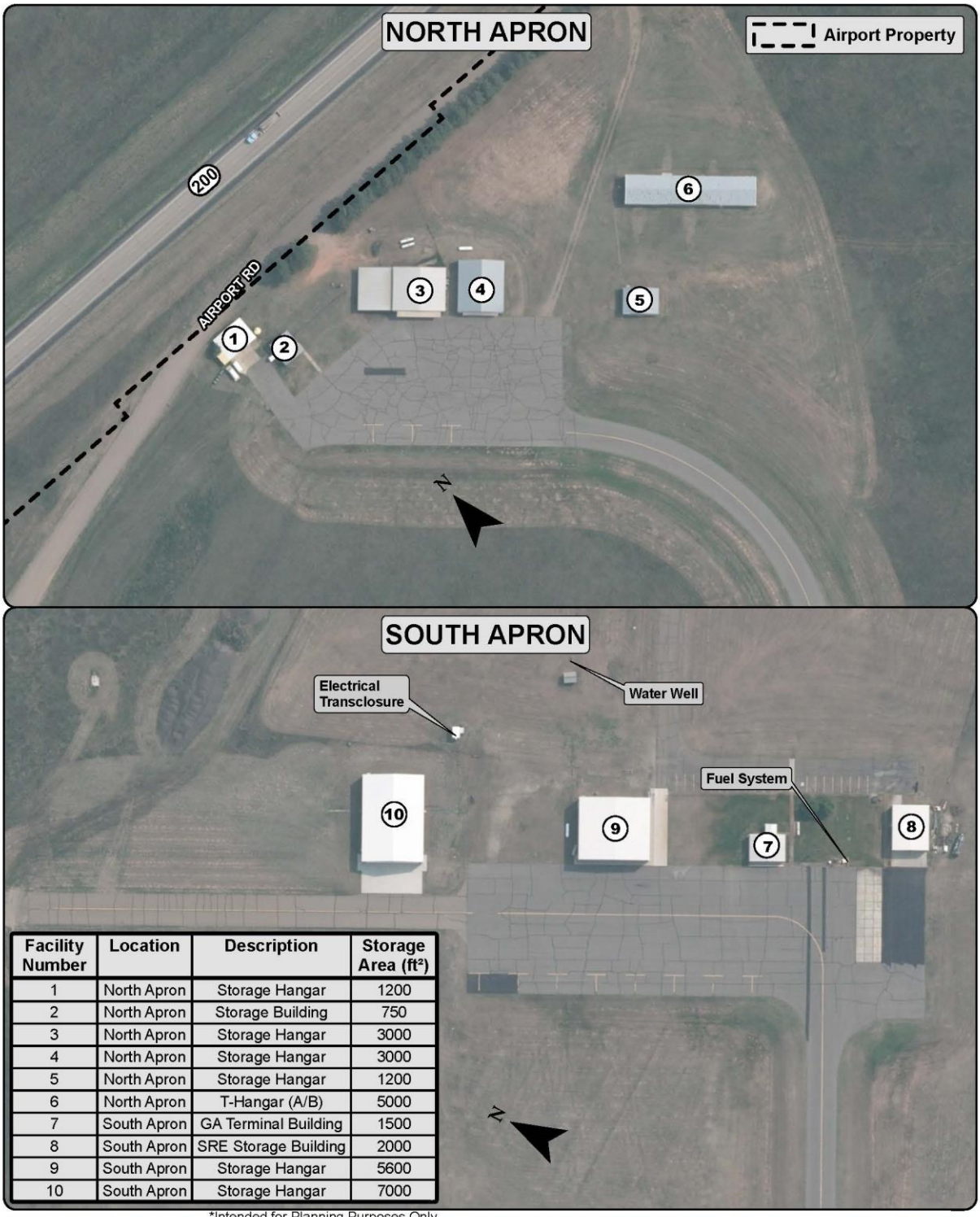
Aircraft storage requirements are driven by operational requirements, aircraft size, local climate, and owner preferences. For based aircraft, the harsh winters in the upper Midwest drive all owners to seek aircraft storage facilities rather than outdoor parking on an aircraft parking apron. Owners prefer to have covered, secure storage for their aircraft with space for other aeronautical facilities including an office or maintenance/storage areas. All based aircraft at HZE are stored in aircraft storage hangars. Transient aircraft travel to airports for up to a few days at a time. These aircraft typically park on the aircraft apron or seek temporary indoor aircraft storage, especially during adverse weather conditions. Aircraft storage facilities are listed in **Table 3-3**.

Table 3-3 – Aircraft Storage Facilities

Facility Number	Location	Description	Storage Area (SF)
1	North Apron	Storage Hangar	1,200
3	North Apron	Storage Hangar	3,000
4	North Apron	Storage Hangar	3,000
5	North Area	Storage Hangar	1,200
6	North Area	T-Hangar (A/B)	5,000
9	South Apron	Storage Hangar	5,600
10	South Area	Storage Hangar	7,000
TOTAL		***Shared Storage Hangars***	*21,000*
		T-Hangars (4 units)	*5,000*
		Grand Total	**26,000**

Source: KLJ Analysis

Figure 3-1 – Terminal Area Facilities Map



Facility Number	Location	Description	Storage Area (ft²)
1	North Apron	Storage Hangar	1200
2	North Apron	Storage Building	750
3	North Apron	Storage Hangar	3000
4	North Apron	Storage Hangar	3000
5	North Apron	Storage Hangar	1200
6	North Apron	T-Hangar (A/B)	5000
7	South Apron	GA Terminal Building	1500
8	South Apron	SRE Storage Building	2000
9	South Apron	Storage Hangar	5600
10	South Apron	Storage Hangar	7000

*Intended for Planning Purposes Only

KLJ

Mercer County Regional Airport Terminal Facility Map

BASED AIRCRAFT STORAGE

All 16 based aircraft are currently stored in approximately 26,000 square feet of available aircraft storage space. The following factors are used for aircraft storage space requirements:

- Single-Engine Piston/Other/Ultralight: 45' x 35' storage area (1,600 SF)
- Multi-Engine/Turboprop: 50' x 50' storage area (2,500 SF)
- Other: 40' x 30' storage area (1,200 SF)
- Additional 20 percent for general aeronautical storage and supplies

Using these factors, a facility space model was developed to estimate aircraft storage hangar size needs. The model uses the based aircraft fleet mix forecast and estimates a size per aircraft type to determine recommended facility space. It is important to understand that this projection provides a broad estimate of needed space into the future for facility planning. Actual space needs are demand-driven.

Table 3-4 – Based Aircraft Storage Requirements

Category	*Existing*	Base	PAL 1	PAL 2	PAL 3	PAL 4
Based Aircraft Forecast						
Single Engine	*16*	16	17	17	17	18
Multi Engine	*0*	0	0	0	1	1
Total	*16*	16	17	17	18	19
Based Aircraft Storage Space (SF)						
Aircraft Storage Space (SF)	*26,000*	25,600	27,200	27,200	29,500	31,300
Capacity/Deficiency (SF)	-	**400**	**1,200**	**1,200**	**3,500**	**5,300**
Based Aircraft Storage Units						
Shared Storage Units	*6*	6	5	2	2	2
T-Hangar (Individual) Units	*4*	4	8	14	17	20
Total Units	*10*	10	13	16	19	22
Capacity/Deficiency	-	-	**3**	**6**	**9**	**12**

Source: KLJ Analysis. Note: RED indicates a deficiency to existing capacity.

The above analysis suggests sufficient aircraft storage space exists to accommodate based aircraft needs only until PAL 1, though is important to note the current issues with the storage hangars.

- Current tenants share hangar space except for the few that are in the north area hangars. There is a liability concern because of having to move other aircraft.
- The north hangars are reaching the end of their useful life and will need to be replaced.
- The north apron area hangars are significantly disconnected from the remainder of the airfield and are required to taxi on active runways for long stretches. This hangar space should be moved to the south apron area.
- It has been stated if the airport had more individual storage hangar space, then the number of based aircraft tenants would increase.

The recommended hangar types to accommodate aircraft storage depend on airport and aircraft owner preferences and financial position. There are two main hangar types:

- T-Hangar: Nested small aircraft storage units within a rectangular building.
- Conventional Hangar: Commonly known as "box" hangars are square/rectangular.

It is recommended T-Hangars be added in the south apron area so current north apron area hangar tenants can relocate. Other hangars should be constructed as soon as demand warrants.

FBO/SASO STOARGE

HZE currently does not have an FBO, but the airport has expressed interest in trying to get an FBO or SASO operator housed at the airport. The airport has potential for an operator through the planning period. FBO/SASO storage is utilized on an as-needed basis as aircraft require temporary storage as well as to support service companies. Aircraft types that require this type of storage are typically larger and more expensive airplanes such as turboprop and turbojet aircraft. Storage timeframes vary but can be for a few hours to several days.

Transient aircraft storage should plan to accommodate one single-engine and one multi-engine/turboprop airplane through the planning period. **It is recommended at least 5,000 SF be made available to accommodate transient aircraft utilizing an FBO or SASO.**

As stated above that the north hangars are aging out, and an option will be examined in the alternatives to determine how to transition to all facilities being located on the south area. One alternative will be if the based aircraft in storage hangars #3 and #4 were to relocate, those hangars could be used for an interested operator for a SASO. Once the hangars have reached the end of their useful life then it is recommended the operator be relocated to a facility on the south apron area. **Table 3-5** represents the total aircraft storage space required through the planning period.

Table 3-5 – Total Aircraft Storage Requirements

Category	*Existing*	Base	PAL 1	PAL 2	PAL 3	PAL 4
Total Aircraft Storage Space (SF)						
Based Aircraft	*26,000*	26,500	27,200	27,200	29,500	31,300
FBO/SASO Hangar	-	4,100	4,100	4,100	4,100	4,100
Total	*26,000*	30,600	31,300	31,300	33,600	35,400
Capacity/Deficiency	**-**	**4,600**	**5,300**	**5,300**	**7,600**	**9,400**

Source: KLJ Analysis. Note: RED indicates a deficiency to existing capacity.

Aircraft Parking Aprons

GA aircraft parking is utilized by transient or based aircraft. With all the based aircraft at HZE stored in hangars, the aircraft parking necessary for transient aircraft requiring parking for a few minutes to a few days. Itinerant aircraft will require either covered aircraft storage (based or transient) or apron parking space.

The apron areas serve the loading, unloading, parking and maneuvering needs for general aviation operations and air medical operations. Locations are identified in **Figure 2-3**.

- **North Apron** is roughly 4,600 square yards (SY) of asphalt with three tiedown parking spots. This apron serves based aircraft tenants only with three storage hangars on the apron and two storage hangars (including T-Hangars) east of the apron.
- **South Apron** is roughly 8,800 SY which is mostly asphalt except for the 340 SY of concrete for larger aircraft parking. This apron houses the SRE building, terminal building, fuel farm, and another storage hangar. It has eight tiedown spots along the west edge and serves both based and transient customers.

AIRCRAFT DEMAND

The apron size is driven by the number and size of maneuvering and parked aircraft.

Only the south apron is considered in the needs analysis because it is necessary to consolidate storage into this one area. Currently, the south apron area has eight tiedown spots for ADG-I aircraft. The number of total and equivalent aircraft parking positions required at HZE is calculated below and identified in **Table 3-6**.

Table 3-6 – Aircraft Parking Requirements

Category	*Existing*	Base	PAL 1	PAL 2	PAL 3	PAL 4
Transient Aircraft Parking						
Total Operations	-	5,000	5,172	5,350	5,534	5,724
Busy Day (Design Day plus 15%)	-	28.8	29.7	30.8	31.8	32.9
Busy Day Parking (25%)	-	7.2	7.4	7.7	8.0	8.2
Total ADG-I Aircraft	-	*4.7*	*4.8*	*5.0*	*5.2*	*5.4*
Total ADG-II Aircraft	-	*2.1*	*2.2*	*2.3*	*2.4*	*2.4*
Equivalent Tie-Downs	-	7.9	8.1	8.4	8.7	9.1
Equivalent Tie-Downs (Rounded)	***8***	**8**	**8**	**8**	**9**	**9**
Capacity/(Deficiency)	**-**	0	0	0	1	1

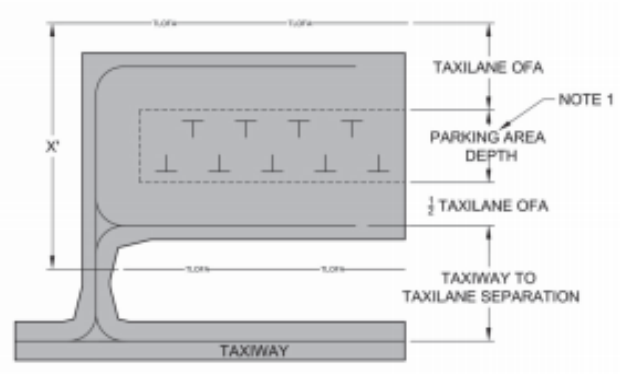
Source: KLJ Analysis. Note: RED indicates a deficiency to existing capacity.

The current amount of tiedowns is adequate through PAL 2. Forecast aircraft tie-down needs through PAL 4 (9) is less than the existing total number of tie-downs (8).

SIZE & CONFIGURATION

The Single Engine aircraft position requires 230 SY of area while larger multi-engine, turboprop and turbojet aircraft require approximately 345 SY. The apron area also includes at least one taxilane and therefore the total apron area can be calculated by multiplying the aircraft parking by 2.42 for ADG-I Taxilanes and by 3.00 for parking with ADG-II Taxilanes.

Apron size must accommodate both the required aircraft parking positions and maneuvering standards. Aircraft maneuvering at HZE is required to accommodate safety setbacks for FAA Airplane Design Group (ADG) II wingspans. The current apron configuration meets maneuvering and parking standards for the design aircraft.



Dual-Taxilane Apron Configuration (ACRP Report 96)

While HZE currently has a single row of ADG-I tiedowns on the west side of the apron, the preferred apron design for Design Group II aircraft is a nested ADG-I configuration which also has sufficient depth for ADG-II aircraft like the figure shows. Parking areas shall be lighted with stand-alone flood lighting to enhance night operations and to improve security. Currently, ADG-II aircraft are being accommodated with parking positions served from a single taxilane.

The apron size is based on the size and number of aircraft, as well as the design standards for the maneuvering taxilanes. Using ADG-I equivalent aircraft and ADG-II taxilanes at HZE, a rate of 900 SY per aircraft was used. This calculation includes dual apron taxilanes for maneuvering.

Table 3-7 – Transient Apron Size Requirements

Category	*Existing*	Base	PAL 1	PAL 2	PAL 3	PAL 4
Apron Area (SY)						
Equivalent Tie-Downs	*8*	8	8	8	9	9
Size Per Aircraft	*750*	900	900	900	900	900
South Apron Area*	*6,000*	7,200	7,200	7,200	8,100	8,100
Capacity/Deficiency	**-**	**1,200**	**1,200**	**1,200**	**2,100**	**2,100**

*Source: KLJ Analysis. Note: RED indicates a deficiency to existing capacity. * Includes only apron north of the taxiway connector to the runway which is used for parking.*

Based on this assessment, the existing apron could be reconfigured in deeper configuration to accommodate the ADG-I and ADG-II projected needs. With the 80' x 70' hangar directly on the apron, if an aircraft is sitting in front of it that does block the taxilane especially if aircraft are parked on the tiedown spots. Layout of the apron configuration will be evaluated later in this chapter. It is recommended all apron space continue to be lighted at all times with stand-alone flood lights around the terminal building area.

PAVEMENT CONDITION

According to the 2021 North Dakota Pavement Condition Index (PCI) Study; the north and south asphalt aprons had a PCI rating of 100. The concrete pad on the south apron had a PCI of 98. These all qualify as good conditions. It is expected by 2031 the north and south apron asphalt will decrease to a 73 PCI and the concrete pad will decrease to 87. It is recommended the airport continue to maintain the pavement in a good condition.

Support Facilities

Support facilities are necessary to support a safe and efficiently run airport supporting airport operations and the travelling public.

GA Terminal Building

The size of the GA terminal building is based on the number of passengers and types of services. Although additional facilities can be provided, at a minimum the terminal building serving general aviation needs should include the following services:

- Passenger Waiting Area
- Restrooms
- Vending
- Pilots Lounge/Flight Planning
- Mechanical Room
- Storage Room
- Circulation

The terminal building should be located adjacent to the transient aircraft parking apron with good visibility to the airfield, and be in close approximately to the automobile parking and waiting area. In most cases the terminal building is located within or near the Fixed Base Operator (FBO) providing

aeronautical services. The terminal building at HZE is provided by the airport sponsor and is located on the south apron towards the center on the east side of the pavement. It is estimated there is 700 SF of terminal space usable for airport users. This excludes the 200 SF meeting area.

The presence of an operator may require additional space such as aircraft maintenance, office space, and road side parking access.

The estimated planning-level size of the terminal building is based on peak hour total airport operations, 2.5 passengers per peak hour operation and 100 square feet of space per passenger as identified in ACRP Report 113. These figures provide an estimate of the number of passengers to arrive, depart and generally flow through the GA terminal. Calculations are summarized in **Table 3-8**.

Table 3-8 – GA Terminal Building Size Requirements

Category	*Existing*	Base	PAL 1	PAL 2	PAL 3	PAL 4
GA Terminal Building Size (SF)						
Peak Hour GA Operations	-	2.1	2.1	2.2	2.3	2.4
Number of Passengers	-	5.25	5.25	5.50	5.75	6.00
Total Building Size	*700*	**525**	**525**	**550**	**575**	**600**
Capacity/Deficiency	**-**	***175***	***175***	***150***	***125***	***100***

Source: KLJ Analysis

The existing GA terminal located inside the FBO sufficiently meets the existing and projected future GA itinerant passenger needs.

PASSENGER CONVENIENCE

Passenger convenience elements for the general aviation pilots and passengers were reviewed. The proximity of the aircraft apron to the terminal building is ideal to minimize outdoor exposure time. The terminal building itself does adequately meet the space and comfort needs for both HZE pilots and passengers. The fuel facility has a 24-hour card reader for ease and is next to the terminal building. The automobile parking is adjacent to the terminal building which minimizes outdoor exposure time. A courtesy car is available on site and is stored in the SRE building which helps regarding winter weather exposure but limits the availability to use the car. To use the courtesy car, flight crews must notify the airport in advance. Information about the courtesy car can be added to airportcourtesycars.com to provide more information to the flying community.

Communication Facilities

Communication facilities allow aircraft to transmit and receive clearances to air traffic control to navigate the national airspace system safely and effectively. HZE does not have an air traffic control tower so communication is up to the pilots to follow standard airspace procedures and practices on the Common Traffic Advisory Frequency (CTAF) and Universal Communications (UNICOM). The Air Route Traffic Control Center (ARTCC) is Minneapolis Center and Flight Service Station (FSS) is Grand Forks. Minneapolis ARTCC is contacted through the RCAG at Dickinson on 124.25 which is 57 nautical miles to the southwest and Grand Forks FSS is contacted with the Hazen RCO on 122.6 which is 6 nautical miles east of the airport. The airport is covered by ADS-B within 500 feet above ground level.

Airport Maintenance & Snow Removal

The airport has a dedicated facility to store airport maintenance equipment. The building is located south of the GA terminal building on the far southeast corner of the south apron. See **Figure 3-1**

Terminal Area Map labeled as SRE. Typical equipment is used to cut grass or control snow and ice. All equipment is stored inside the dedicated building, along with the courtesy car.

Snow and ice control equipment typically required includes a carrier vehicle (i.e. dump truck or tractor), snow plows, spreaders, sweepers, and blowers. For non-winter operations, grass cutting is accomplished with a carrier vehicle (i.e. tractor) and mower attachment. Smaller equipment is also used to facilitate snow removal or grass cutting. Equipment should be stored in a dedicated heated building for timely access and protection from the weather. North facing building doors should be avoided if possible to minimize prolonged snow and ice accumulation.

The airport should continue to maintain the current 2,000 SF equipment storage building while monitoring the amount of equipment and need to keep the equipment protected. It should be noted that not all space areas described in this section are eligible for FAA funding.

Fueling Facilities

Mercer County owns the airport fuel facility storing and dispensing 100 octane low led (Avgas) and jet fuel (Jet-A). Each fuel tank is underground with a 5,000-gallon capacity. Self-service fuel dispensing units are available 24-hours a day with a credit card. There are not fuel trucks at HZE for fueling. Aircraft access the fuel facility in a designated apron space.

The fuel farm was constructed in 2008 and the airport has expressed the current tanks cannot take a full delivery. An ideal fuel farm should provide a tank capacity of 12,000 gallons to accommodate a full tanker truck (10,000 gallons) to minimize the cost of deliveries. **It is recommended both the Jet-A and Avgas tanks be upgraded to 12,000 gallon tanks to accommodate a full fuel load from deliveries.** The airport should continue to upkeep the 24-hour credit card reader though this planning period.

It is important to point out that the movement to achieve unleaded aviation fuel is a developing and changing trend. The FAA's goal is to convert the aviation fleet to unleaded by 2030 through the Eliminate Aviation Gasoline Lead Emissions (EAGLE) program. HZE has expressed the interest of implementing this type of fuel when it becomes available. The airport needs to continue to monitor the needed process of changing current fuel tanks and how 100LL and unleaded users needs will be met through the planning period.

Fencing, Security & Wildlife

SECURITY & FENCING

The first line of security protection infrastructure is a perimeter fence. Perimeter fencing is not a requirement for non-certificated airports such as HZE. Its installation would help prevent unauthorized persons from entering the airfield. A minimum 6-foot high fence with added barbed wire is generally recommended at a minimum for security. Airfield access points should be minimized, however those that are needed should be controlled. Ideally, automated controlled access gates would be installed at the apron and hangar area. Locked field gates would be installed at other airfield access points.

Currently the airport has a 4-foot chain fence surrounding the north and apron area buildings but then turns into a barbed wire fence the further you get from any building. The remainder of the property is outlined by a 4-foot barbed wire fence. Therea is currently one latch gate for vehicle access on the south apron area. It is recommended the airport continue to maintain the current fencing they have through the planning period.

WILDLIFE CONTROL & MITIGATION

Controlling wildlife on or near the airport helps mitigate existing and prevent the creation of potential new hazards to aircraft. The airport can take steps to help increase safety of the airfield by completing a Wildlife Hazard Management Plan (WHMP). The WHMP will recommend any steps to take regarding wildlife including, birds, mammals, or any others that pose hazards to aviation.

Utilities

The airports water is from Southwest Water Authority. There are onsite septic tanks and a 1,000-gallon propane tank next to the GA terminal building. There are efforts in the community to bring natural gas to the area. When that is done, natural gas could be an option for the airport.

There is also a 50' Montana Dakota Utility (MDU) waterline easement roughly 650 feet south of the south terminal area and running between the windcone and AWOS and across the runway. If a parallel taxiway is to be constructed this easement needs to be considered in the evaluation of building area alternatives.

Other Facilities

GROUND ACCESS & CIRCULATION

The overall design objective is to provide ground vehicles with access to and from the terminal building and hangar facilities using a primary access road. To achieve this, access points should be secured to the apron, hangar area and any field access points to reduce undesired automobile access. The number of hangar access points should be limited to reduce the possibility of vehicle/aircraft incidents which improves safety. Fuel delivery trucks should have access to tanks without entering airside operations areas. Access roads should be paved to reduce the likelihood of foreign object debris (FOD) on the airside areas where it may become a hazard to aircraft.

The north apron area can be accessed from Mosset Way then has two access paths, both which lead to the southeast corner of the apron. All the roads on the north apron area are gravel. Car access to the south apron area is provided by 51st Avenue which is a gravel road and then west along a paved airport access road. Vehicles can access the apron just south of the large hangar straight off the access road. The parking lot has two walking access points, one leading to the GA terminal and one directly south of the SRE building.

It is recommended to pave 51st Avenue, and all access points should be secured, with the higher activity access points secured with a controlled access gate. Ideally access points should require a turn from the end of a roadway to discourage inadvertent airfield access. Fuel tanks are currently accessed from the parking lot so the delivery truck does not have to access the apron.

AUTOMOBILE PARKING

Automobile parking at general aviation airports should accommodate landside access needed to serve aeronautical facilities. Facilities requiring automobile parking include the arrival/departure terminal building, aircraft storage hangars, administration, maintenance equipment storage buildings and FBOs. Vehicles should be discouraged from parking in airside areas. Automobile parking lots should be sized for the demand and have appropriate number of handicapped accessible spaces. Lighting is recommended for night-time use and security.

Currently there are no designated parking spaces for the north apron area, so tenants park their personal vehicles next to the hangars. The south apron area has 20 parking spaces (including one

handicapped accessible space) within the paved parking lot that runs along the east side of the hangars. The parking lot is lit by flood lights placed on the SRE building, GA terminal building, and large hangar. The future vehicle parking lots will be evaluated in further detail in the alternatives section later in the chapter.

Requirements Summary

This chapter identifies safety, capacity and development needs for the Mercer County Regional Airport based on forecasted activity levels. These recommendations provide the basis for formulating development alternatives later in this chapter to adequate address recommended improvements. The following summarizes the facility recommendations:

Hangars

- Make space available for additional private use hangars.
- Add group hangars (T-Hangars, Executive Box Hangars) to get current based aircraft out of shared spaces and increase based aircraft tenants.
- Plan space for large hangars for a maintenance facility.

Apron Areas & Taxilanes

- Plan for the north apron facilities to be relocated/moved to the south apron area.
- Provide adequate ADG-II apron and taxilane space for 10 aircraft tiedown spots.
- Proactively add taxilanes and appropriate utilities to allow for hangar development.
- Consider a connector taxiway from the planned crosswind turf runway to the apron area.

Support Facilities

- Once replacement is necessary, upgrade the fuel facility to 6,000-gallon AVGAS storage tank and a 10,000-gallon JET-A storage tank.
- Provide space for the storage and distribution of future alternative aircraft fuels.
- Maintain the existing fencing, plan for a chain and link fence around any hangar areas along with adding automated gate access to any access points.

Landside Facilities

- Pave 51st Avenue to the airport access road.
- Plan vehicle access roads and parking areas for hangar area development.

Alternatives

A wide range of alternatives were evaluated to determine the best solution for the airport to meet facility needs. In many cases the process is iterative to react to new information and input. Please refer to the alternative analysis process in **Chapter 1** for details on the factors considered.

Terminal Area Alternatives

A range of initial alternatives were presented to the Planning Advisory Committee (PAC) for consideration and to create a narrower slate of alternatives for further evaluation. This was followed by a review of refined alternatives with more in-depth analysis. In the end a preferred alternative was selected and is portrayed at the end of this chapter.

All the alternatives focused on different arrangements of the aircraft parking apron, connector taxiways, ADG-I and ADG-II hangar development, corresponding taxilanes, self-fueling location and vehicle access. Below are specific components considered in each of the alternatives presented.

- ADG-II and TDG-2A aircraft maneuvering space on the apron
- Removal of direct access from apron to runway to meet design standards
- Apron configuration and aircraft parking locations
- Fuel system locations
- ADG-I and ADG-II hangar development areas
- FBO/SASO Facility
- Existing structures such as Drainage swale and electrical vault
- Runway Visibility Zone

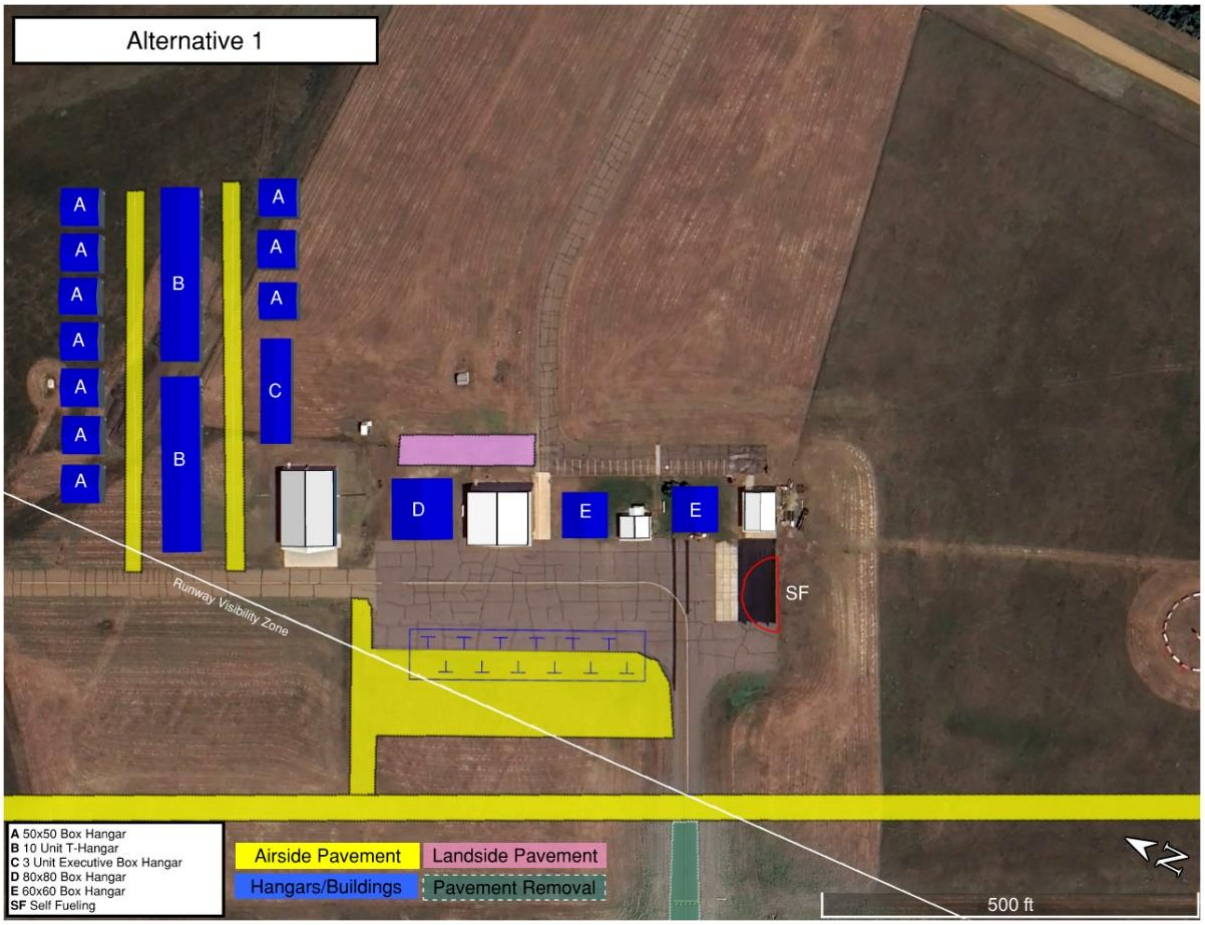
INITIAL ALTERNATIVES:

Six initial alternatives were drafted for the terminal area and presented to the Planning Advisory Committee. The alternatives are described and depicted as follows.

Alternative 1

Apron depth is expanded with nested tie-downs and dual taxilanes in a “racetrack” style. Dual access to the taxiway is provided by a new connector at the northwest end of the apron while also utilizing the existing connector at the southwest corner of the apron. Self-fueling is located at the south end of the apron. Larger ADG-II hangars that could be utilized by an FBO or maintenance facility are located along the apron. Two TDG-1 taxilanes leading to a mix of box hangars, T-hangars and an executive box hangar to the south side of the area.

Figure 3-3 Alternative 1



Alternative 2

Apron depth is expanded to accommodate two rows of nested tie downs spots oriented wings east to west. Box hangars are placed to the west of the taxilane extension[1], as well as a TDG-1 taxilane leading to the east with more box hangars. Self-fueling is moved to the northwest corner of the existing apron. An 80'x80' box hangar that could be utilized by an FBO/SASO is show between the existing terminal building and SRE building.

Figure 3-4 Alternative 2

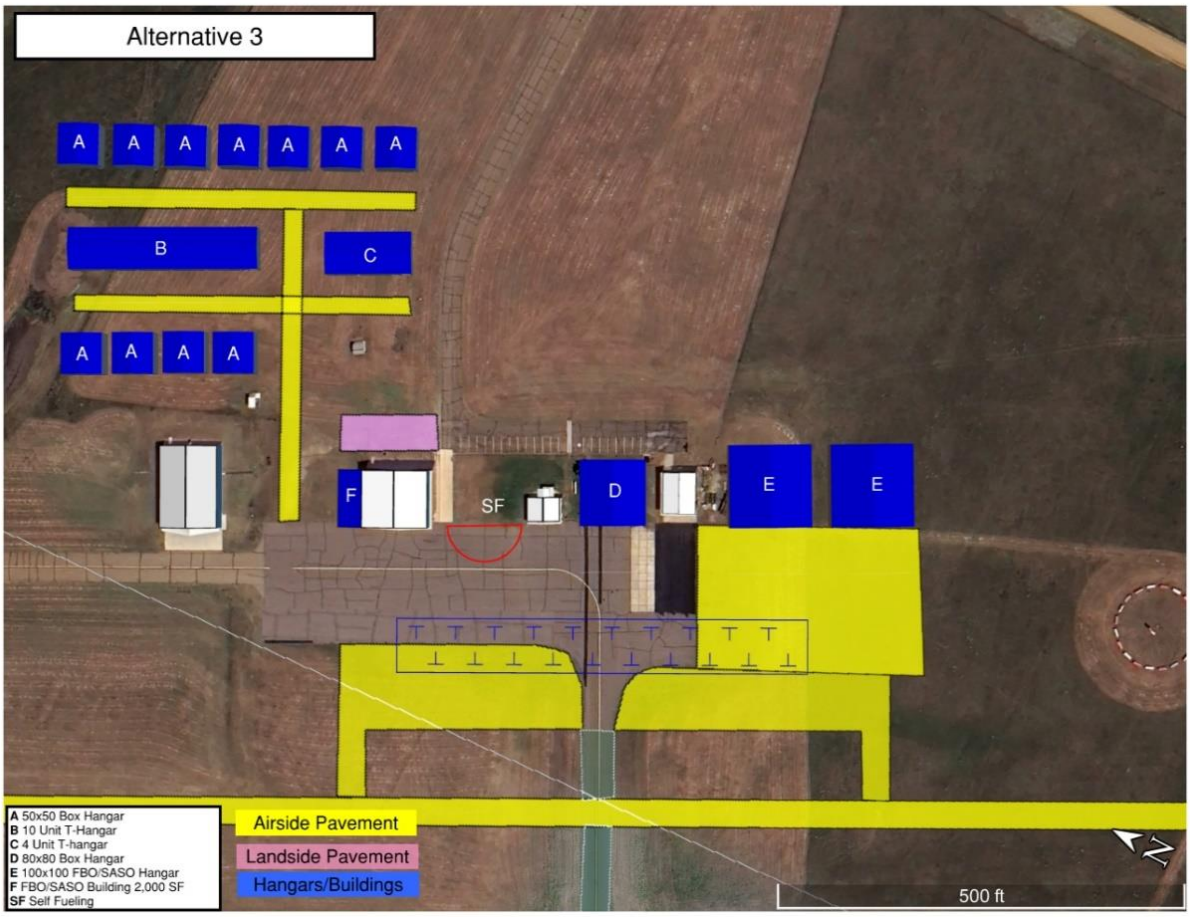


[1] The Box Hangars are placed on the west side of the taxilane as was originally planned when the last Airport Layout Plan was completed. As portrayed, the hangars would be within the Runway Visibility Zone and therefore could not be constructed without impacting the planned crosswind runway.

Alternative 3

Apron depth is expanded to accommodate 20 nested tie down spots. The existing connector will be removed and new taxiway connectors are show on either side of the apron. perpendicular to the runway/taxiway to expand ADG-II hangar development on the south end. ADG-I hangar development is positioned on the northeast side. Larger hangars are shown adjacent to the apron south of the terminal building. Self-fueling is centrally located on the apron.

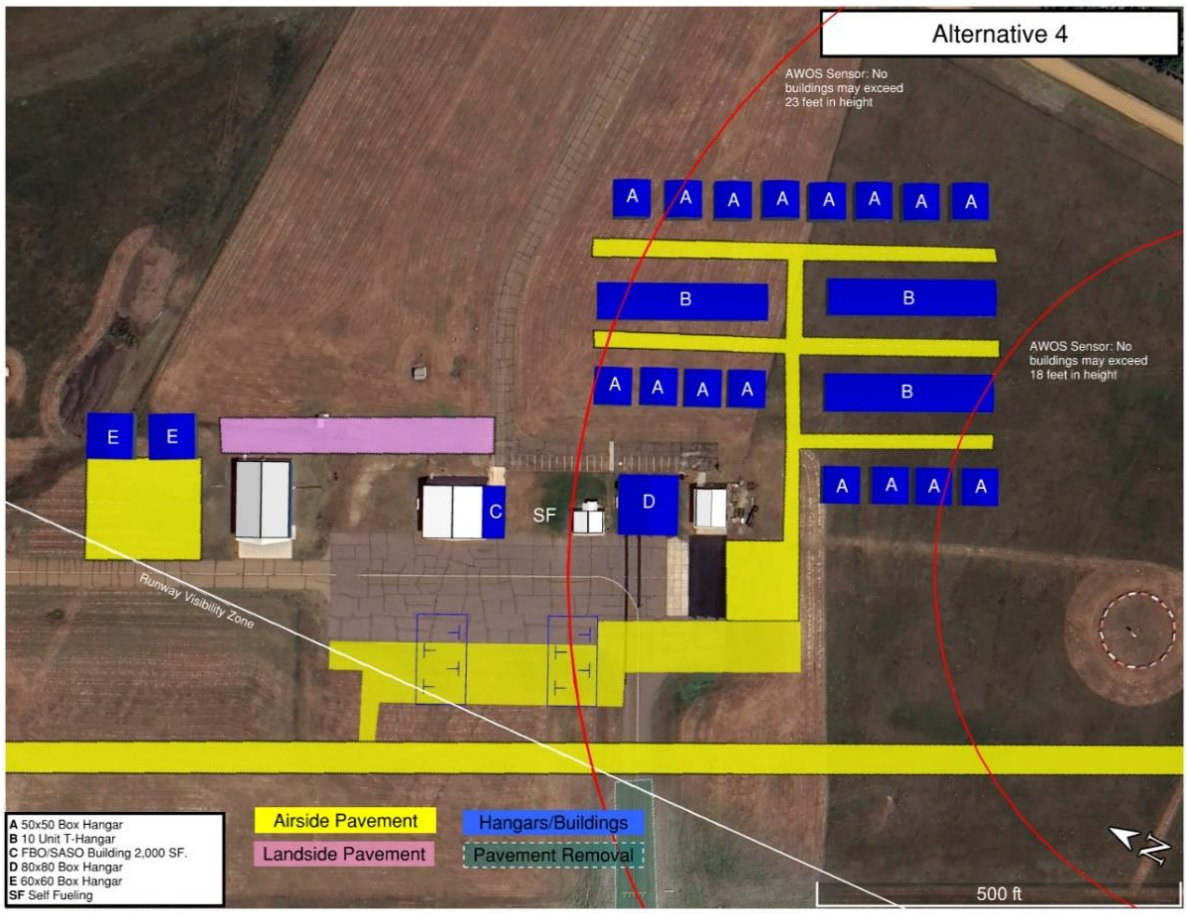
Figure 3-5 Alternative 3



Alternative 4

This alternative explores hangar development to the south using a combination of box and T-hangars. Apron depth is expanded to allow two groups of nested tie-down spots oriented wings east to west. Dual access to the parallel taxiway is provided utilizing the existing connector, as well as one on the north side of the apron. Hangars with dedicated apron space are shown east of the existing taxilane. As seen with the red rings, the hangar development to the south, could have an impact on the existing AWOS and therefore height might be limited or the AWOS would need to be relocated.

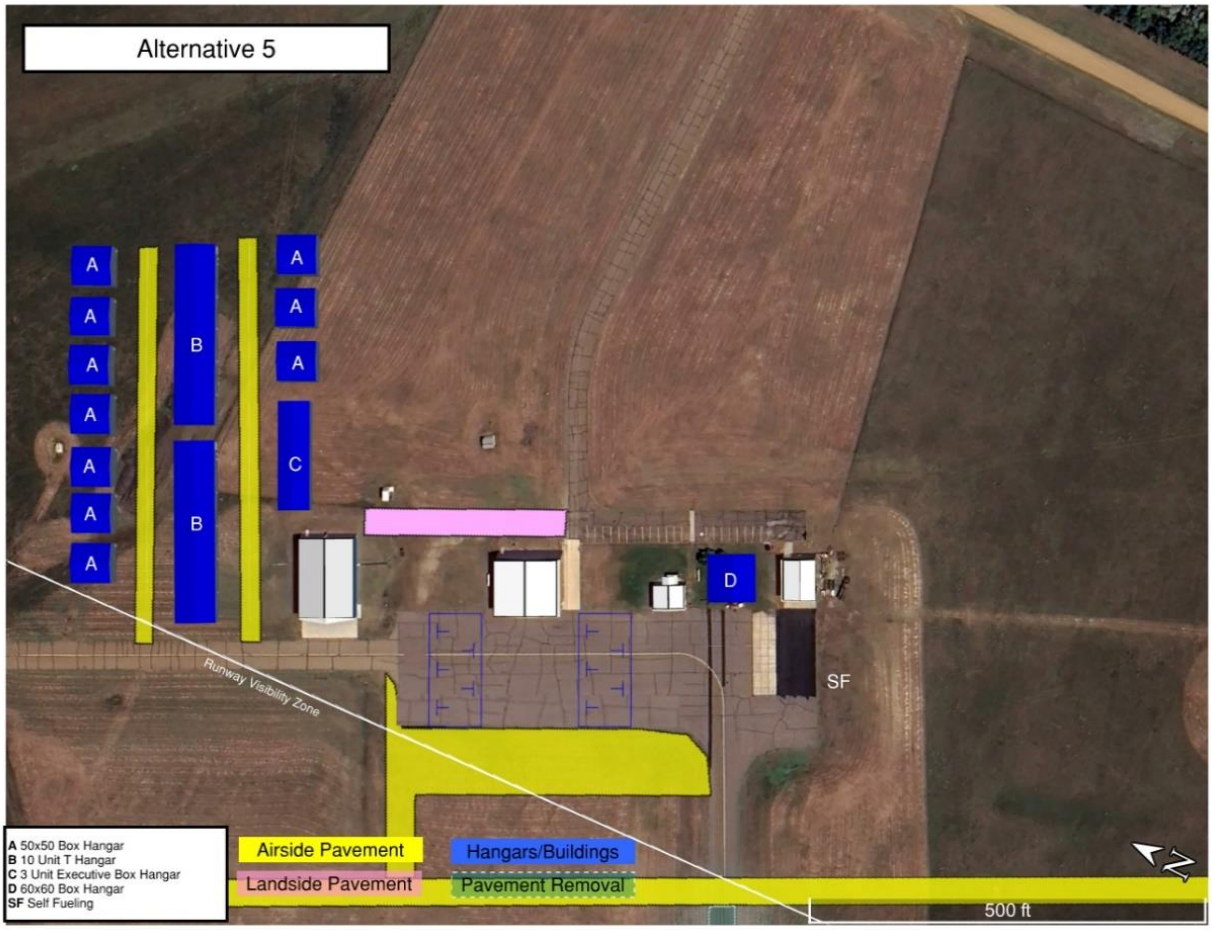
Figure 3-6 Alternative 4



Alternative 5

In this alternative, apron depth is expanded to allow room for aircraft maneuvering. Two rows of nested tiedowns are shifted to the eastern edge of the existing apron. Hangar development is to the northeast with a mix of box and T-hangars.). Self-fueling is located on the southern end of the apron.

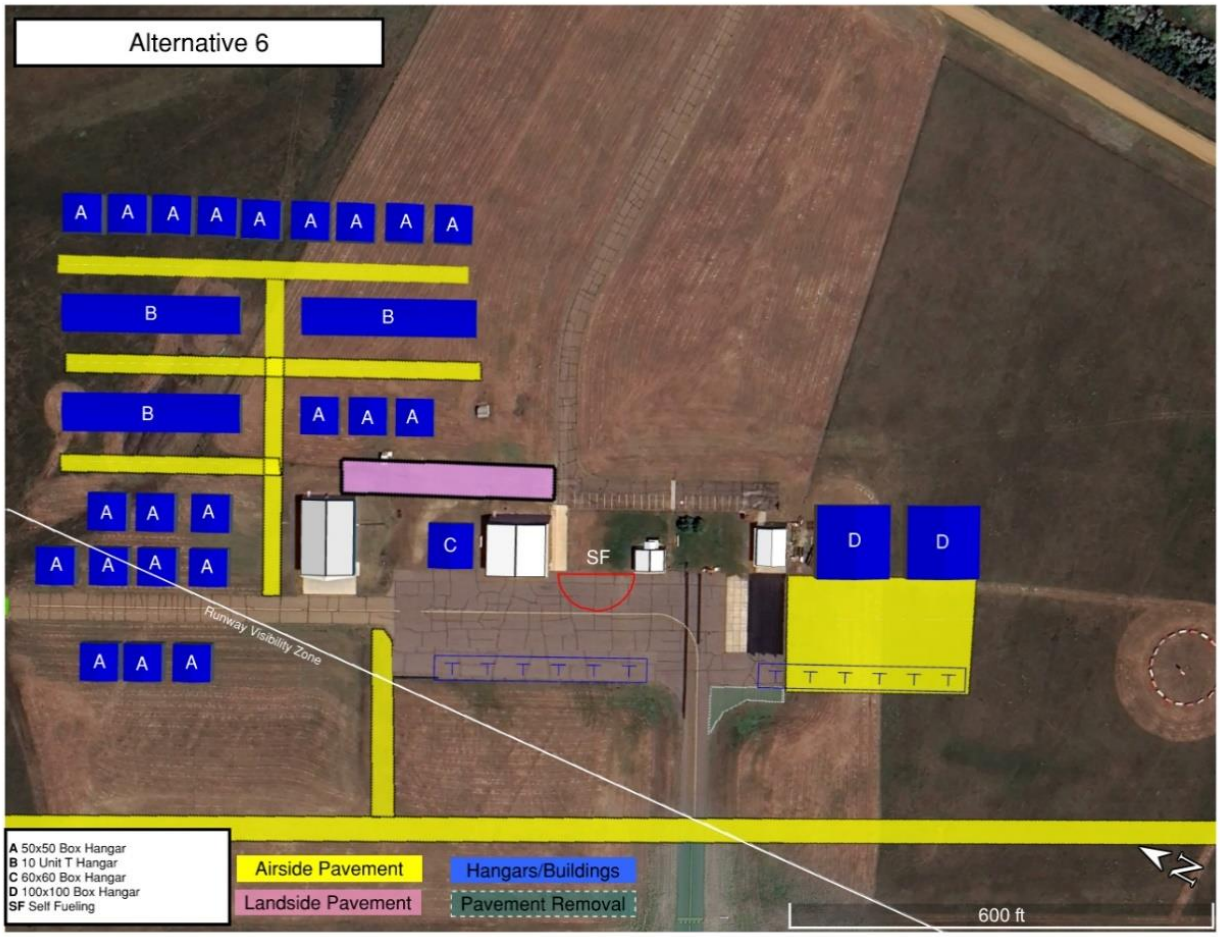
Figure 3-7 Alternative 5



Alternative 6

In this alternative the apron is expanded south, with single row tiedown spots continuing along the edge. Larger hangars are placed at the southeastern edge of the expanded apron. Additional hangars are placed along the existing taxilane within the RVZ (see footnote to Alternative 2). A TDG-1 taxilane leads to a mix of box and T-hangars to the northeast. Self-fueling is located centrally on the apron.

Figure 3-8 Alternative 6



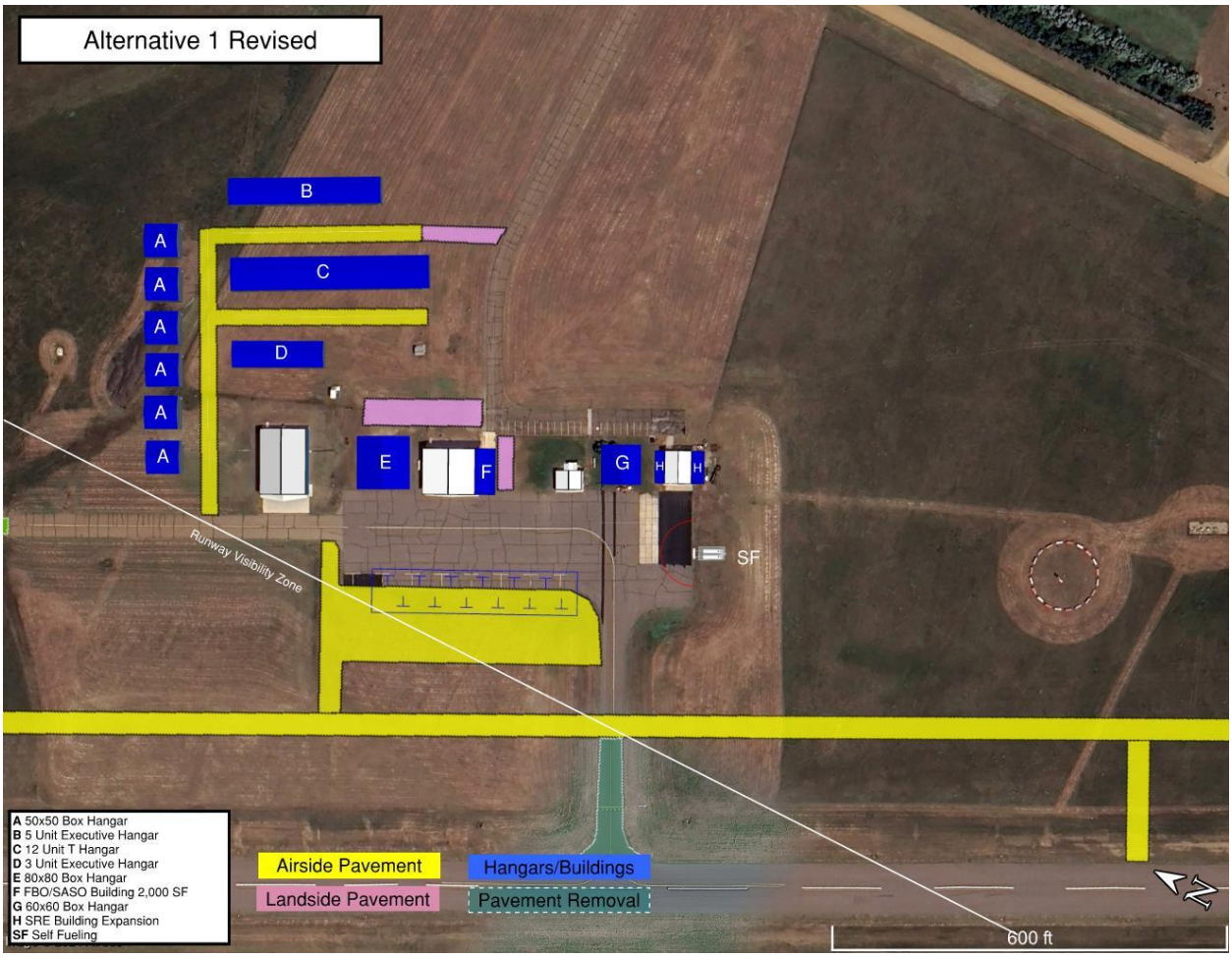
REVISED ALTERNATIVES

After the initial alternatives were reviewed by the PAC, changes were made to Alternative 1 and Alternative 3. The other alternatives for hangar/terminal area development were dismissed.

Revised Alternative 1

In this revision, the individual hangar taxilane was changed to an alignment similar to Alternative 2. The hangars opening east and west were changes to T-hangars and Executive Box Hangars. A lean-to was added to the current large hangar on the apron to allow for establishing an FBO/SASO for aircraft maintenance. The access road would be shifted further south. Additions were made to the current SRE storage building to expand the storage space.

Figure 3-9 Revised Alternative 1



Revised Alternative 3

This alternative was revised by reducing the size of the box hangars on the south area and reducing the apron space. Parking was added for these hangars which would extend the current parking area. The proposed hangars on the current apron from the initial alternative 3 was also reduced in size. The SRE storage building was updated to have lean-to additions for extra space.

Figure 3-10 Revised Alternative 3



Preferred Alternative

After final review by the PAC, it was determined that Revised Alternative 3 will offer the best approach for development for the future of the airport. The recommend development includes the following:

- FBO/SASO Storage: A lean-to is planned to be added to the north of the current hangar on the apron. One large hangar will be planned to the south of the current terminal building where the fuel farm is currently. Two large hangars will be planned to the south of the SRE building on the apron extension to the south.
- Fuel Farm Facility: When the fuel tanks reach the end of their useful life, a 12,000-gallon Jet-A and Avgas tank, both self-serves to meet minimum gallon amount of the deliveries. They will be placed to the south of the current apron access road for easier access of the delivery trucks.
- Apron and Tiedowns: 4,500 SY of pavement will be added to the east of the current tiedowns and 6,600 SY of surface will extend the apron to the south and east where the planned two 80' x 80' hangars will be housed. This will allow a total of 20 ADG-I nested tiedown spots. The nested spots will also be able to accommodate ADG-II aircraft parking.
- SRE Storage: The current building will be expanded in its current location to meet current and future equipment needs.
- Aircraft Storage: A mixture of T-Hangars, Executive Box hangars and small Box Hangars will be added to the east of the north apron area on new taxilanes. All hangar development will be based on demand.
- Apron Taxiways: The current taxiway connecting the apron to the runway will be removed while two connecting taxiways will be placed on the new northern and southern apron.
- Hangar Taxilanes: A 25' wide taxilane will run east and west between the two current large hangars for the aircraft storage hangar area. Two more 25' wide taxilanes will branch off running north and south for east and west facing hangars.
- Access Roads and Parking: An access point will be added to the new furthest east taxilane in the new storage hangar area. All access points should be secured, with the higher activity access points secured with a controlled access gate. The parking lot will extend north to the east of the current large hangar on the apron and extend to the south, east of the proposed two large hangars on the new apron area.
- Other Road Access: It is recommended that the existing graveled road, 51st Avenue, be paved from the airport road north to Highway 200.

Figure 3-11 Preferred Alternative

