

Chapter 5 – Airport Development Alternatives



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The evaluation of future development options represents a critical step in the airport master planning process. The primary goal is to define a path for future development that provides an efficient use of resources and is capable of accommodating the forecast demand and facility needs defined in the master plan.



Introduction

As noted in the facility requirements evaluation, current and long term planning for Bremerton National Airport is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft.

All proposed facility improvements are consistent with applicable FAA airport design standards and FAR Part 77 airspace planning standards. Airplane Design Group II (ADG II) standards are recommended for all facilities including the runway, major taxiways, aircraft parking apron and access taxiways used by business aircraft. Aircraft tiedown aprons and hangar taxilanes used exclusively by smaller aircraft are typically designed based on Airplane Design Group I standards. For hangar areas with a variety of hangar sizes, the largest hangar door width determines the maximum size of aircraft to be accommodated. All proposed improvements are compatible with protecting and enhancing the Airport's existing precision instrument approach capabilities.

Evaluation Process

Creating preliminary alternatives represents the first step in a multi-step process that leads to the selection of a preferred alternative. It is important to note that the current FAA-approved airport layout plan (ALP) identifies future improvements that were the product of the last master planning process. The master plan update provides a fresh look at addressing facility needs, but also allows the components of the previous preferred alternative to be retained if they meet current needs.

The preliminary alternatives are evaluated to identify general preferences for both individual items and the overall concepts being presented. The process will allow the widest range of ideas to be considered and the most effective facility development concept to be defined. From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements. The Consultant will integrate these items into a draft preferred alternative that will be reviewed and refined as the Port proceeds through the process of selecting a final preferred development alternative for Bremerton National Airport. Throughout this process, public input and coordination with the FAA will also help to shape the preferred alternative.

Once the preferred alternative is selected by the Port, a detailed capital improvement program is created that identifies and prioritizes specific projects that can be implemented. The elements of the preferred alternative are integrated into the updated airport layout plan (ALP) drawings that will be used to guide future improvements at the airport.

Executive Summary

A preferred alternative was developed through the evaluation process described above. For the convenience of the reader, an executive summary of the preferred alternative is presented on the following page. The original sequence and process of evaluation that was reflected in draft working papers is maintained in the sections that follow the executive summary.

The Bremerton National Airport Master Plan Update has defined current and future airport facility needs for the next twenty years. A primary goal of the airport master plan is to provide the Port of Bremerton with a realistic and economical path for facility development that meets their operational and financial requirements, while meeting all Federal Aviation Administration (FAA) standards.

The preferred development alternative for Bremerton National Airport has three primary components or areas of emphasis: the runway-taxiway system (airside), the existing west development area (west landside), and the new east development area (east landside).

The existing airfield facilities at Bremerton National Airport have been designed, constructed and maintained to a very high standard. By starting with excellent facilities, only minor improvements or changes in configuration are recommended to improve operational safety, efficiency and these projects will be interspersed with new development through the planning period.

RUNWAY-TAXIWAY

There are no changes to Runway 2/20 recommended in the current twenty year planning period. Runway extension reserves are identified at both ends as place holders that may be triggered by future events that cannot currently be quantified.

Minor improvements are recommended for the west parallel taxiway and South aircraft hold area. A new aircraft hold area is planned for the north end of the west parallel taxiway.

A parallel taxiway will be constructed on the east side of Runway 2/20 to serve future aviation related development as needed. A new access taxiway will added from the north end of the runway to serve new landside facilities in the east landside area.

WEST LANDSIDE AREA

Improvements in the west landside area include reconfiguration of the existing north and south aircraft tiedown aprons to meet FAA design standards and targeted areas of infill development for new hangars and a new aviation fuel storage area.

A new hangar area will be developed at the south end of the west landside area. The south hangar area development will accommodate approximately 48 small aircraft, which is about half the of airport's forecast growth in based aircraft over the next 20 years. The south hangar area will require taxiway, vehicle access, and vehicle parking improvements.

EAST LANDSIDE AREA

The east landside area is a new aviation use development located along the airport's former second runway, which has been closed for 20+ years. The existing raceway drag strip facilities located on the closed runway are planned for relocation which will allow redevelopment for aviation use. The area is largely undeveloped and will require access, utility and stormwater improvements. The planned development provides a compact site that minimizes potential impacts on environmentally sensitive areas.

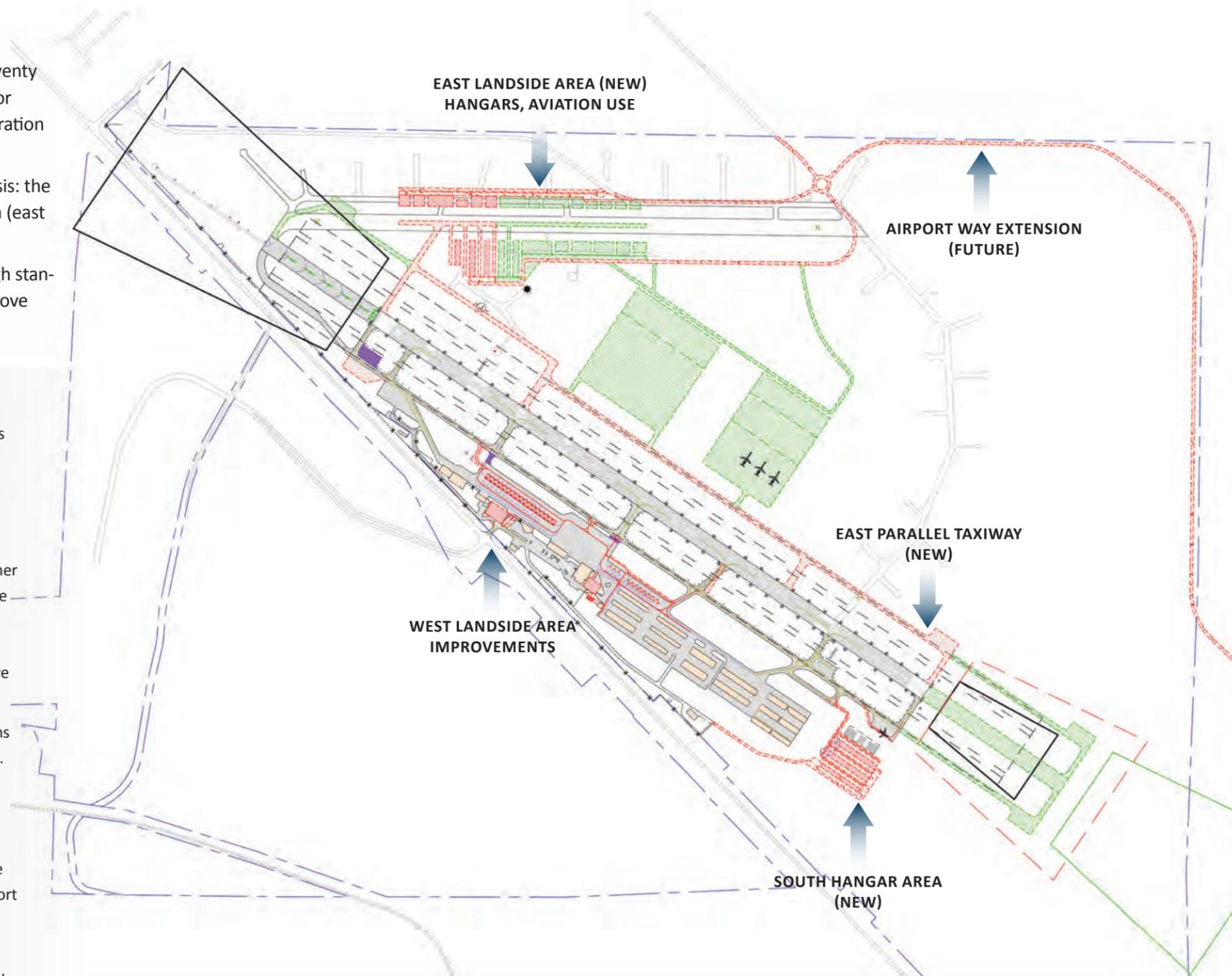
The additional hangar capacity provided in the east landside area will be developed based on demand, particularly for new business aviation tenants requiring larger hangars. The area will accommodate a variety of hangars for large and small aircraft, including mixed use facilities capable of accommodating aircraft storage other functions for both individual and commercial tenants.

Hangar sites are located along the east and west sides of the former runway. When combined with planned hangar development in the west landside area, the northern section of the east hangar area provides enough capacity to meet the airport's 20-year forecast demand. Additional capacity is provided by a development reserve in the southern section of the hangar area.

Vehicle access to the area will be provided through new connections to the Airport Way, which travels along the eastern side of the area.

Two aviation development reserves are identified south of the hangar development area. One reserve is for an aircraft parking apron and fixed base operation (FBO) area that could accommodate hangars, buildings and aircraft fueling. The demand for these facilities could occur as the east landside area develops and support services are needed.

The second development reserve is a commercial airline terminal area that includes space for aircraft parking, a small terminal building complex and vehicle parking. This reserve is designed to create a placeholder (land area) capable of accommodating the facility development that would be needed in the event that commercial air service for Bremerton was established. There is no timeframe associated with this potential need and the development reserve is recommended to preserve the option for the future.



KEY FEATURES:

RUNWAY/TAXIWAY SYSTEM

- Maintain current capabilities (length, width, instrumentation, lighting)
- Runway extension reserves
- Limited reconfiguration of exit and connecting taxiways on west parallel taxiway
- Future east parallel taxiway

WEST LANDSIDE AREA

- Infill development/redevelopment
- Transient aircraft storage hangar
- Above ground fuel storage tanks and containment/parking area for fuel trucks
- New south hangar area (will accommodate approximately 48 small aircraft)
- Aircraft parking apron reconfiguration to meet FAA standards

EAST LANDSIDE AREA (NEW)

- Aircraft hangars (conventional and multi-unit storage)
- Mixed-use hangar sites intended to accommodate business and commercial tenants
- New access taxiway from north end of the runway
- New surface access to connect to existing/future sections of Airport Way
- Long term development reserves identified for general aviation and commercial air terminal areas

No-Action Alternative

In addition to proactive options that are designed to respond to future facility needs, a “no-action” option also exists, in which the Port may choose to maintain existing facilities and capabilities without investing in facility upgrades or expansion to address future demand. The existing airfield configuration would remain unchanged from its present configuration and the airport would essentially be operated in a “maintenance-only” mode.

The primary result of this alternative would be the inability of the airport to accommodate forecast aviation demand beyond current facility capabilities. Future aviation activity would eventually be constrained by the capacity, safety and operational limits of the existing airport facilities.

The no-action alternative concept establishes a baseline from which the action alternatives can be developed and compared. The purpose and need for the action alternatives is defined by the findings of the forecasts and facilities requirements analyses. Forecast aviation activity and the factors associated with increased activity (potential for congestion, safety, etc.) are the underlying rationale for making facility improvements. Market factors (demand) effectively determine the level and pace of private investment (hangar construction, business relocation to the airport, etc.) at an airport. Public investment in facilities is driven by safety, capacity and the need to operate an airport on a financially sustainable basis.

Based on the factors noted above, the no-action alternative is inconsistent with the management and development policies of the Port of Bremerton and its long-established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable.

Preliminary Development Alternatives

The facility needs identified in the previous chapter include a variety of airside (runway-taxiway) and landside needs (aircraft parking, hangars, fueling, support facilities, etc.). Items such as fencing, lighting improvements, minor roadway extensions and pavement maintenance do not typically require an alternatives analysis and will be incorporated into the preferred development alternative. The preliminary alternatives have been organized into three groups to address these broad needs and other related needs:

- **Airside Development Options (Runway/Taxiway)**
- **West Landside Improvement Options**
- **East Landside Improvement Options**

The preliminary development alternatives are described below with graphic depictions (**Figures 5-1 through 5-8**) provided to illustrate the key elements of each alternative. The preliminary alternatives are

intended to facilitate a discussion and evaluation about the best path to meet the facility needs of the airport.

It is important to note that the eventual preferred alternative selected by the Port may come from one of the preliminary alternatives, a combination or hybrid of the preliminary alternatives, or a new concept that evolves through the evaluation and discussion of the preliminary alternatives. Once the elements of the preferred alternative are defined, they will be integrated into the updated Airport Layout Plan (ALP) as “future” development and the individual projects will be included in the updated capital improvement program.

AIRSIDE DEVELOPMENT OPTIONS (RUNWAY – TAXIWAY IMPROVEMENTS)

As noted in the Facility Requirements chapter, Runway 02/20 is capable of accommodating the current and future design aircraft (medium business jets) under most weather conditions. The runway is also capable of accommodating larger business jets, transport, and military aircraft with varying operational limits. Long term development reserves for runway improvements are proposed. An east side parallel taxiway is proposed to provide access to future aviation development areas on the east side of the runway. Minor improvements to the aircraft hold areas on the west parallel taxiway (Taxiway A) are proposed. Taxiway F is reconfigured to provide a 90-degree exit connection to the runway. The proposed runway-taxiway improvements and development reserves are depicted in **Figure 5-1** and summarized below.

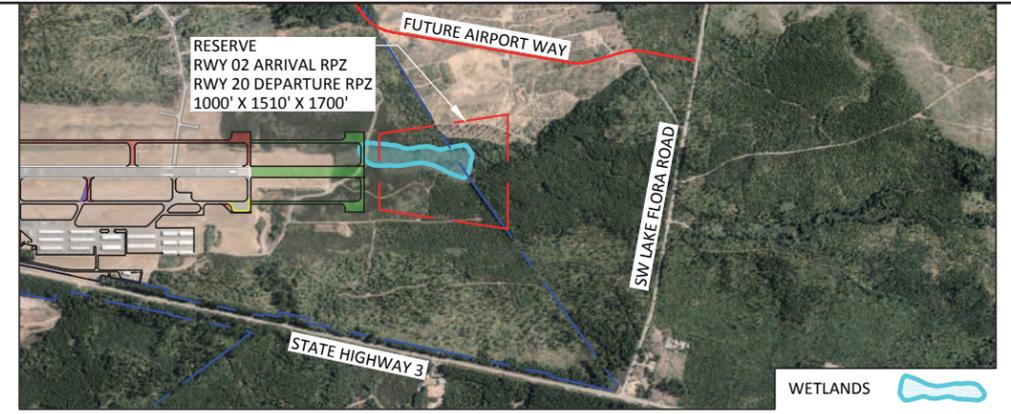
Development Reserves

With current and projected needs addressed for the current twenty year planning period, the Port has also expressed an interest in preserving operational capabilities that may occur either beyond the current planning period, or through a significant, unanticipated change in market demand.

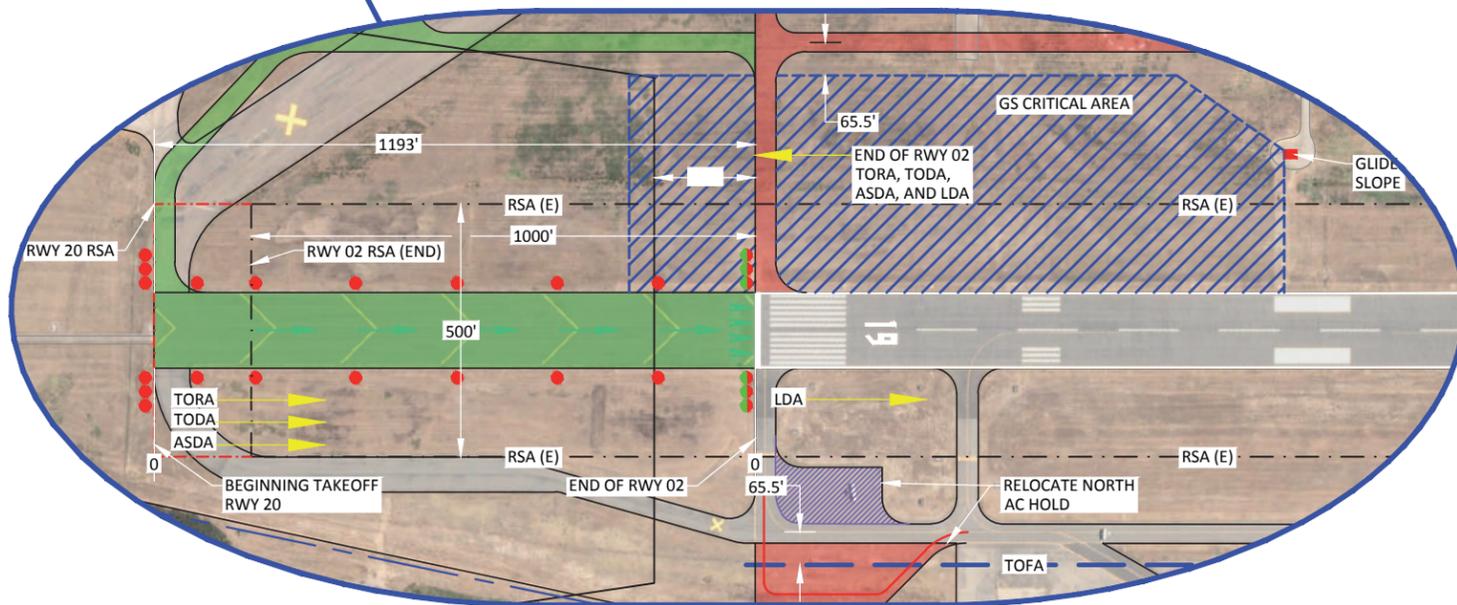
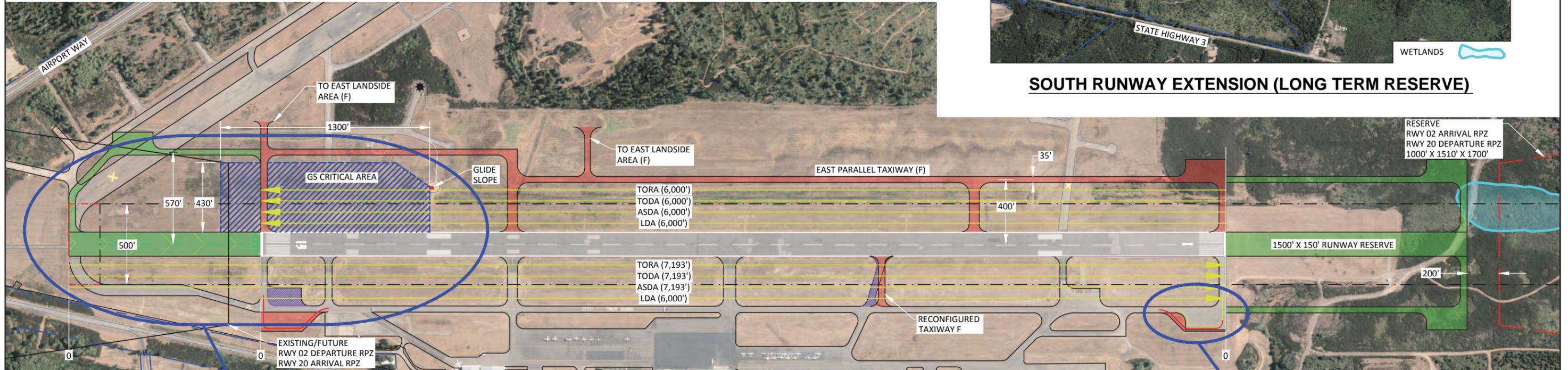
The potential for Bremerton National Airport to accommodate commercial air service has been a of topic of discussion for decades and continues to be acknowledged in the current Washington Long Term Air Transportation Study (LATS). The presence of a large military population and employment base could also create a unique market niche that could support specialized air service. Airport management reports that airlines periodically expressing interest in Bremerton have indicated that a runway length of 7,000 feet would be ideal for their aircraft fleets. Another activity that could produce demand for increased runway length at the Airport is the effort spearheaded by the Kitsap Aerospace and Defense Alliance (KADA), a public-private partnership, to attract and expand the commercial and defense aerospace industry to the local area. The ability to accommodate a wide range of military and transport aircraft similar to other Puget Sound airports with existing aircraft manufacturing capabilities is considered to be a critical element in attracting prospective activity. A runway length of 7,500 to 8,000 feet is believed to be capable of serving this segment of activity at Bremerton National Airport.

Two runway improvement reserves are proposed to address the potential development opportunities noted above. The runway improvement reserves are intended to protect long-term development options and to identify potential land use and surface transportation needs. It is recognized that sufficient justification for the runway improvements will be required by FAA in order for the projects to be eligible for FAA funding. As development reserves, these improvements would be depicted on the updated airport layout plan (ALP), but projects would not be included in the airport's FAA-approved 20-year capital improvement program (CIP) at this time.

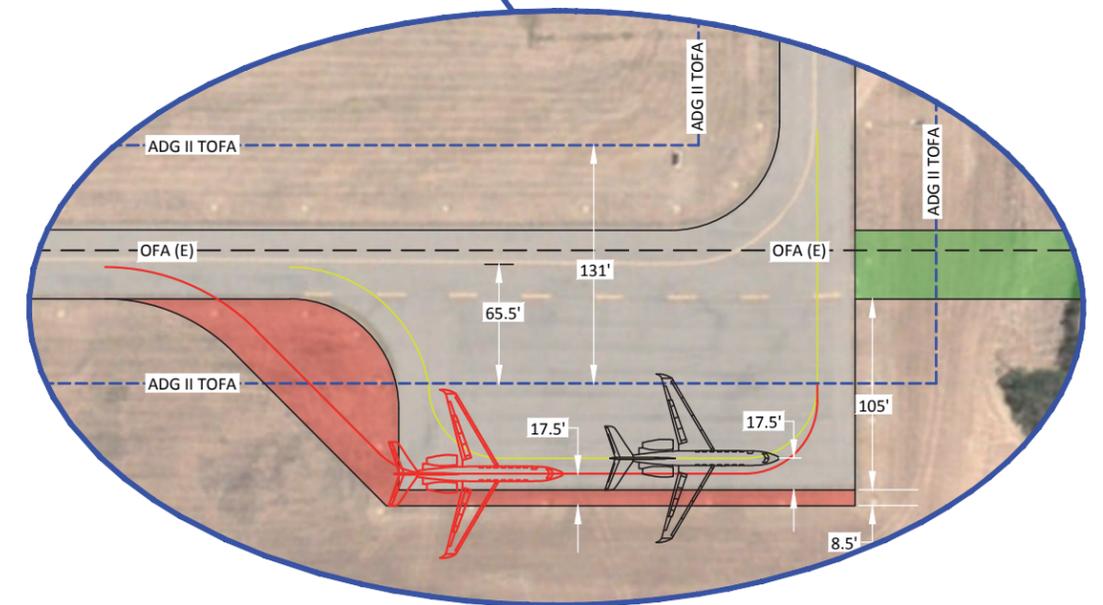
Note: Runway numbers have been changed (repainted 02-20) to reflect current magnetic heading 020-200 degrees.



SOUTH RUNWAY EXTENSION (LONG TERM RESERVE)



DISPLACED THRESHOLD (RESERVE)



SOUTH AC HOLD AREA

Runway 20 End

The proposed improvement would convert the existing 1,193-foot paved overrun at the north end of Runway 02/20 to displaced threshold. The former displaced threshold for Runway 20 was converted to an overrun as part of a south runway extension project several years ago. The proposed improvement would convert the overrun back to the original displaced threshold configuration. The reconfiguration would not affect the glide slope for the instrument landing system (ILS) approach or require any changes to the approach lights or visual guidance indicators for Runway 20.

The displaced threshold combined with the existing 6,000-foot runway increases the length available for takeoff to 7,193 feet on Runway 20. This length is generally sufficient for narrow body transport aircraft such as the McDonnell Douglas/Boeing MD80 series or various Boeing 737 models to operate in Bremerton. Due to other design standards requirements, all other aircraft runway operations (landing on Runway 20, takeoff and landing on Runway 02) are limited to the current 6,000-foot runway length.

By maintaining the existing Runway 20 threshold location for landing, this option provides a full 1,000 feet of RSA in front of the landing threshold. The portion of RSA located north of the threshold would also be used for Runway 20 takeoffs. Full-width RSA (500 feet wide) is required from the beginning of takeoff in the event of an aircraft leaving the sides of the runway on its takeoff roll.

The proximity of the north end of the runway to Highway 3 eliminates the ability for the displaced threshold portion of the runway to be used for takeoff or landing on Runway 02. For transport aircraft such as MD80s and 737s, FAA design standards require 1,000 feet of runway safety area (RSA) beyond the useable end of runway (for takeoff or landing roll out) and leading up to the landing point. Based on this requirement, the usable length of Runway 02 for takeoff and landing operations is 6,000 feet based on the ability to provide 1,000 feet of RSA beyond the Runway 20 threshold. This configuration also keeps the departure runway protection zone (RPZ) for Runway 02 in its current location, 200 feet beyond the Runway 20 threshold. As a result, no changes occur to roads within the RPZ.

Published declared distances (specific runway lengths available for various operations) and appropriate runway lighting and signage will be required to clearly indicate the limits of usable runway for operations in both directions on the runway.

Runway 02 End

A 1,500-foot south runway extension reserve is identified to address potential development related to the region's ongoing efforts to develop an aerospace manufacturing base on the Kitsap Peninsula. The extension would provide 7,500 feet of usable runway in both directions; the runway available for takeoff on Runway 20 would be 8,693 feet if the north displaced threshold reserve is included. The future runway protection zone (RPZ) for the runway extension reserve extends beyond airport property. The future RPZ

is clear of any existing or proposed roads, including the planned extension of Airport Way to Lake Flora Road, near Highway 3. The reserve includes dual parallel taxiways and would require 1,000 x 500 feet of prepared safety area extending beyond the runway end (500 feet wide) and relocation of the existing ILS localizer. The runway safety area for the south extension reserve is in the vicinity of an existing wetland, which would require mitigation.

East Parallel Taxiway

A full length parallel taxiway (35 feet wide) is proposed on the east side of Runway 02/20. The taxiway would provide efficient movement of air traffic to/from the runway and provide access to future landside development on the east side of the runway. A runway-parallel taxiway separation of 400 feet is depicted for most of the taxiway, which mirrors the separation for the west parallel taxiway. The northern section of the parallel taxiway has an increased runway separation (570 feet) to avoid the ILS glide slope transmitter and to reduce aircraft taxiing through the glide slope critical area. Aircraft hold areas are located at both ends of the runway. Four 90-degree exit taxiways are depicted on the existing runway; additional exit taxiway connections are included in the north and south runway reserves. The taxiway could be widened to 50 feet in the future if transport category aircraft use was anticipated without requiring relocation.

Aircraft Hold Areas

Improvements to the existing aircraft hold area located on Taxiway A at the south end of the runway are proposed to address taxiway object free area (TOFA) clearance requirements. In its current configuration, portions of larger aircraft may extend into the TOFA creating a potential hazard (wing tip clearance) for aircraft traveling on the taxiway. The hold area would be expanded to provide additional clearance and a fillet is added to improve taxiing geometry for aircraft entering and exiting the hold area.

The existing north aircraft hold area located on Taxiway A (runway side) would be replaced with a hold area on the outside of the taxiway. A similar improvement is depicted on the current airport layout plan drawing, although this location is compatible with the diagonal taxiway that extends from the north hangar area to Taxiway A. The reconfigured holding area provides increased runway separation for holding aircraft and reduces contact between the flows of arriving and departing aircraft.

WEST LANDSIDE AREA

As indicated earlier in the master plan, the Airport's west landside area is approaching full build out. Based on land availability and suitability for development, the majority of future landside facility demand (hangars, aircraft parking, etc.) will be accommodated on the east side of the runway. However, in an effort to maximize the efficiency of existing facilities and infrastructure, several targeted improvements have been identified in the west landside area (see **Figure 5-2** and **Figure 5-3**).

South Hangar Development

The land area located at the south end of the west landside area has been previously cleared and graded to accommodate future aviation development. As depicted, the site would accommodate two 4-unit executive hangars and several (four depicted) conventional hangars. Taxiway access to the hangar area would be provided from the taxiway that extends south of Taxiway G. An existing unpaved airport access road would be upgraded and paved and vehicle parking would be added. The proposed taxiways and hangar sites are designed to avoid the subsurface stormwater detention pipes that are installed adjacent to the aircraft hold area.

FBO Facility Reconfiguration (Hangar and Fuel)

The airport business plan, currently being developed, has identified several improvements or actions that the Port may consider to attract and serve a wide range of general aviation users. One specific need identified is hangar space for transient aircraft, particularly business jets and turboprops. The ability to provide enclosed storage for overnight or extended stays is a valued service among business users, particularly for operators of multi-million dollar aircraft. The availability of transient hangar space is among the many factors that distinguish individual airports competing for business aviation market share.

A large transient aircraft hangar is located immediately south of the existing Avian building. The proposed location provides centralized FBO facilities for customers at the south end of the main apron. The hangar development will require relocation of the existing aircraft fueling island. The Port has previously identified a need to replace several underground fuel storage tanks with new above ground tanks. The relocation of the fueling island would coincide with tank replacement. A new aircraft fueling island is proposed immediately south of Taxiway F, opposite the hangar area. The fueling area would be capable of accommodating four 12,000 gallon fuel tanks, with multiple fueling locations. The new fuel storage tanks would be double-wall construction and the fueling area would be designed with secondary containment for inadvertent fuel spills.

South Aircraft Tiedown Apron

Expansion and reconfiguration of the south aircraft tiedown apron is proposed to meet FAA design standards for separation from the adjacent taxilane. The double tiedown row would be shifted to the east to provide the standard 79 feet of taxilane object free area clearance between the adjacent T-hangars and parked aircraft (tiedowns). The apron would be expanded along its east edge to accommodate a taxilane to access the east-facing tiedowns. The outer taxilane would connect to Taxiway F at the south end and the apron near the transient hangar. The north section of the tiedown row would be configured with a single row of west-facing tiedowns in order to accommodate an ADG II taxilane for the proposed

transient aircraft hangar. As depicted, the reconfigured south tiedown apron would have 19 small airplane tiedowns.

Large and Corporate Aircraft Parking Apron

The section of the main apron that accommodates transient business and military aircraft is unchanged, although ADG II taxilanes around the outer edges of the apron define useable parking area. The taxilanes require a clear 115-foot path (no parked aircraft or other objects) to meet ADG II object free area dimensional standards. FBO ground crews direct aircraft parking within the area.

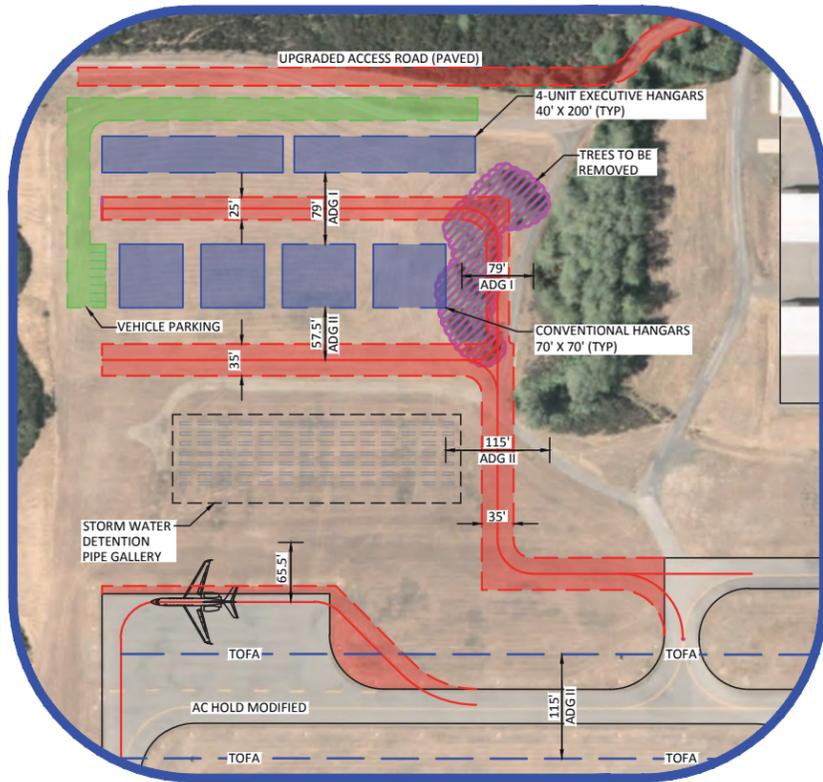
North Apron Reconfiguration

Two options are presented for reconfiguring the north tiedown apron to meet FAA taxilane design standards. As noted in the facility requirements analysis, the clearance provided for the existing apron taxilanes does not meet FAA standards for small aircraft (ADG I).

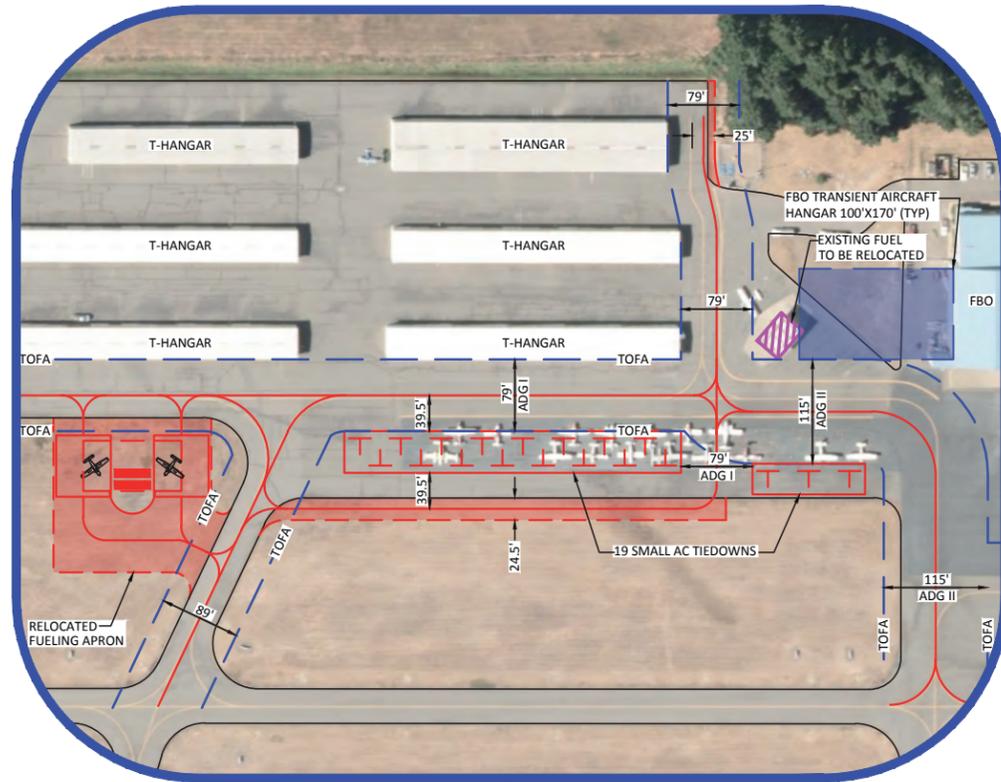
Option A uses an ADG I taxilane object free area (TOFA) dimension of 79 feet between tiedown rows. The tiedown rows are shifted east to provide standard taxilane clearance between the west row and adjacent buildings (airport restaurant, etc.) and between the west and east tiedown rows. The eastern row of tiedowns is shifted to align with the existing outer edge of the apron. The apron reconfiguration is compatible with development of additional hangars (for ADG I aircraft) between the airport restaurant and the Lent hangar. The existing access road/gate entering the apron would be reconfigured to accommodate hangars and vehicle parking. ADG II taxilane clearances are maintained at the north and south ends of the tiedown apron to provide access to adjacent facilities. Option A provides 60 small airplane tiedowns.

Option B uses an ADG II taxilane object free area (TOFA) dimension of 115 feet between the west tiedown row and the back edge of the apron. The apron reconfiguration is compatible with development of large hangars for ADG II aircraft between the airport restaurant and the Lent hangar. The existing access road/gate entering the apron would be reconfigured to accommodate hangars and vehicle parking. In this configuration, one double sided tiedown row is provided (33 tiedowns). An ADG I taxilane is located on the east side to the tiedown row. ADG II taxilanes at the north and south ends of the tiedown apron connect to the western taxilane to provide access to adjacent facilities.

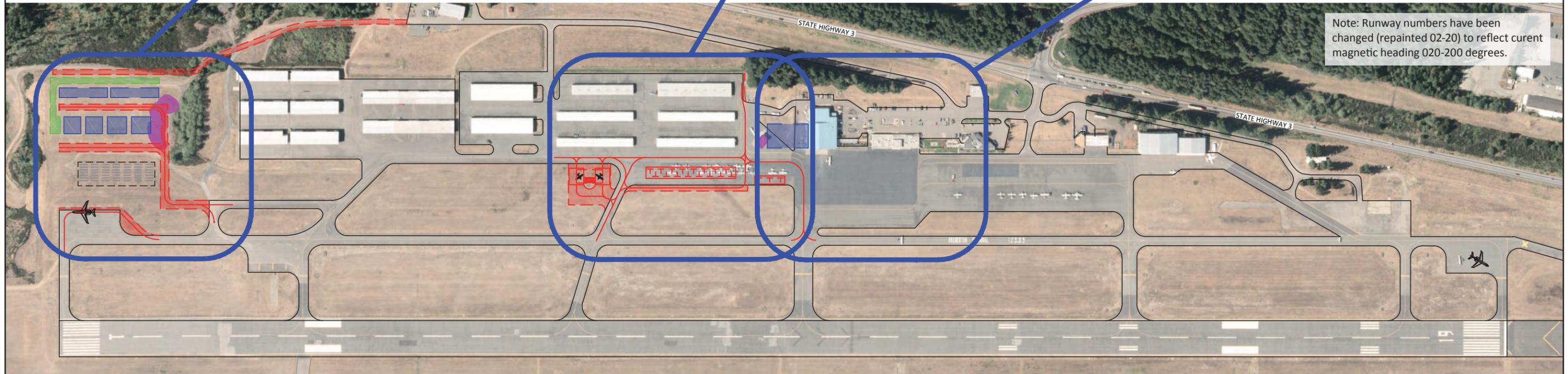
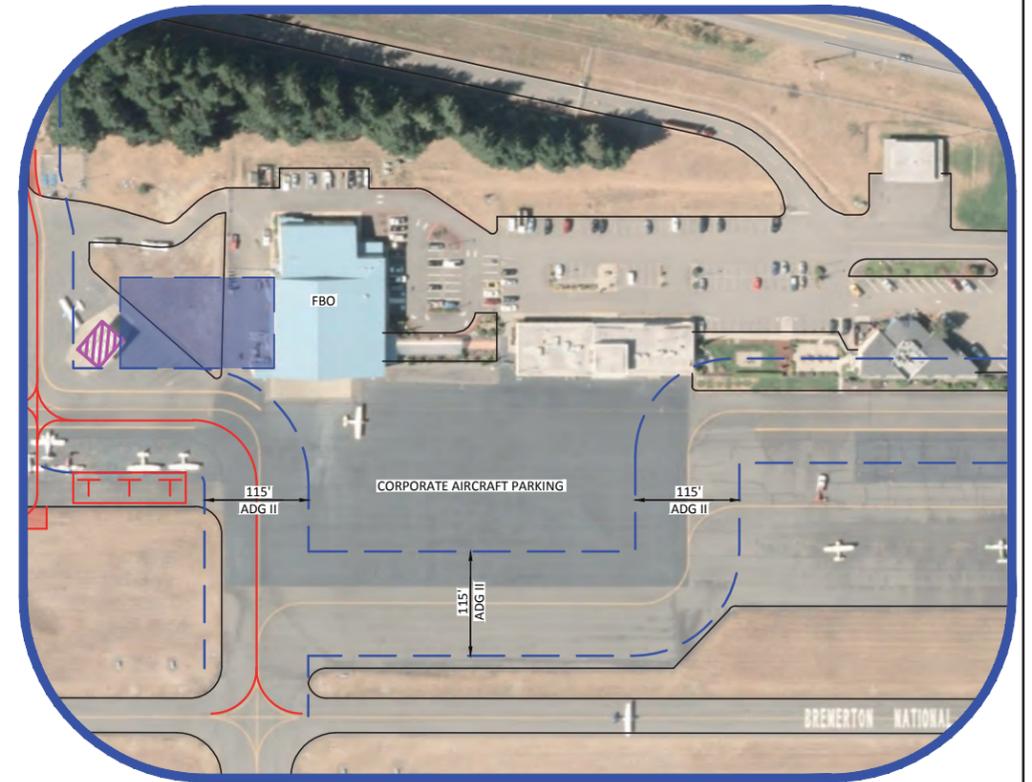
SOUTH DEVELOPMENT OPTION



FBO AREA OPTION

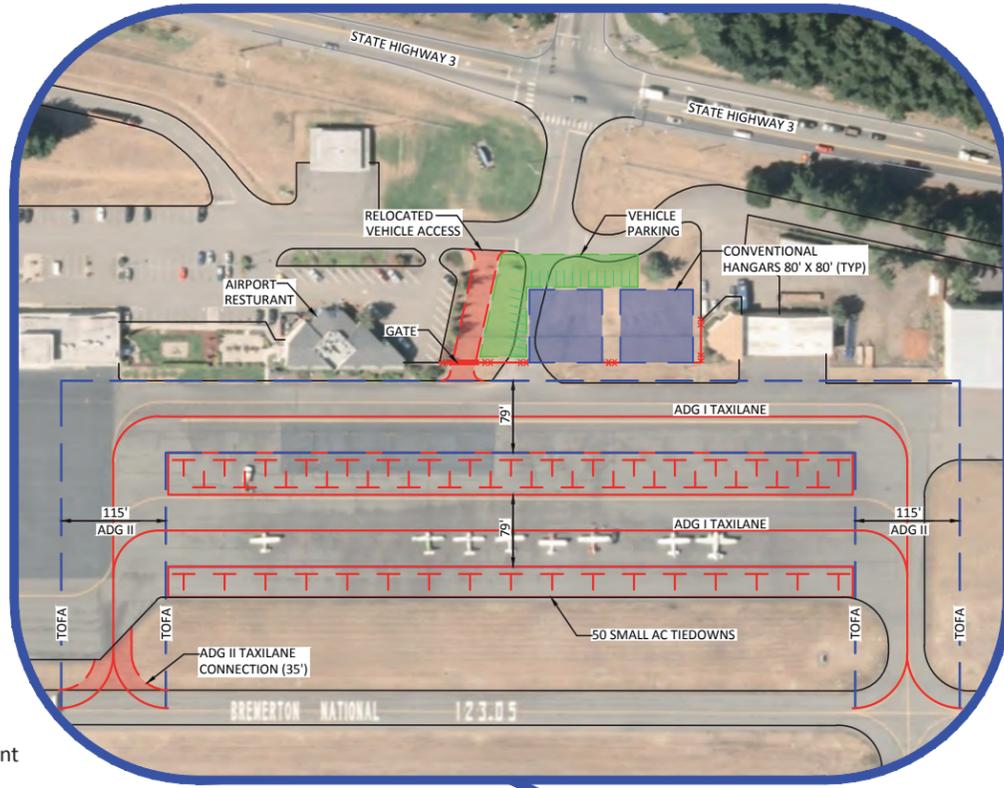


CORPORATE AIRCRAFT PARKING OPTION

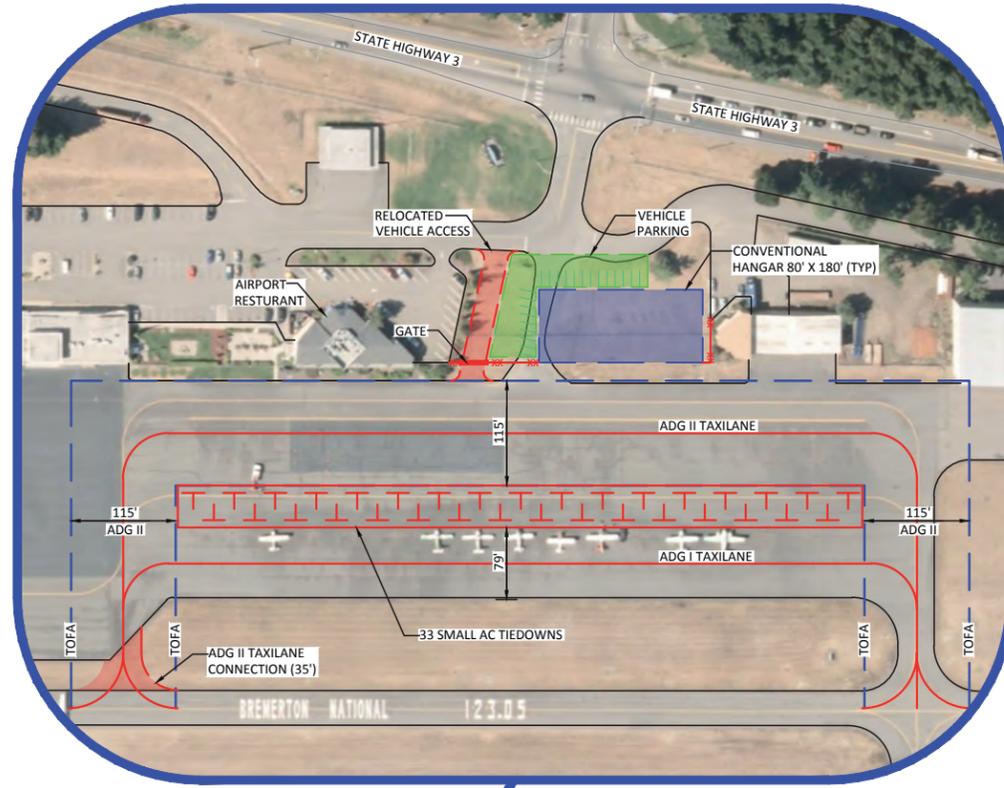


Note: Runway numbers have been changed (repainted 02-20) to reflect current magnetic heading 020-200 degrees.

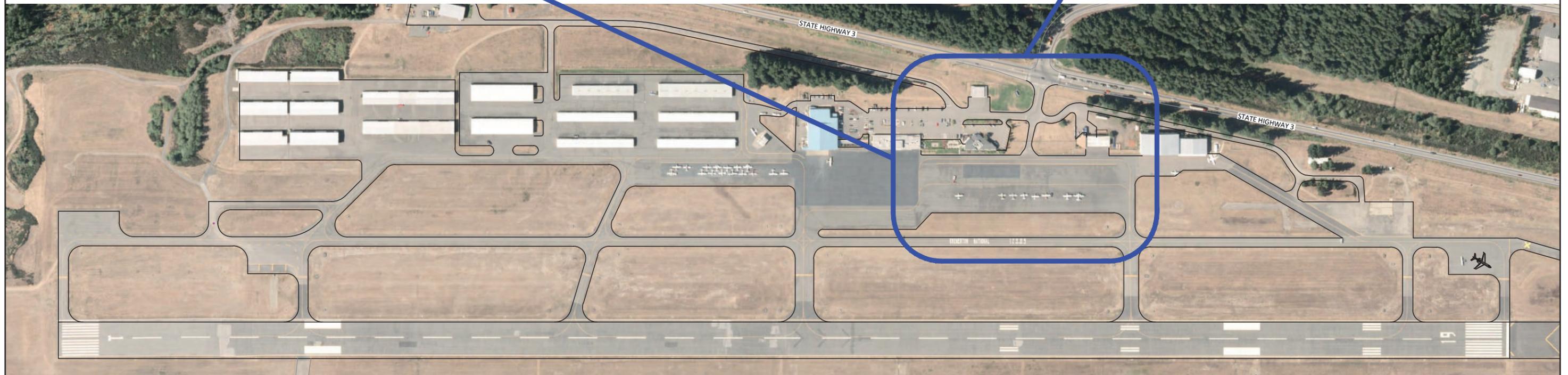
NORTH APRON RECONFIGURATION OPTION A



NORTH APRON RECONFIGURATION OPTION B



Note: Runway numbers have been changed (repainted 02-20) to reflect current magnetic heading 020-200 degrees.



EAST LANDSIDE AREA

The primary focus for the east landside area is to develop facilities for general aviation that can be incrementally developed as demand warrants and funding is available. Demand for hangar space and hangar sites for a variety of types (corporate, executive, commercial hangars, T-hangars, etc.) is expected to drive development needs in this area.

Aircraft parking capacity, support facilities and services in the west landside area are expected to satisfy demand well into the current twenty year planning period. However, as noted in earlier, development options for new hangar construction in the west landside area is limited. Potential longer term demand for fixed base operator (FBO) facilities including aircraft parking, fuel and commercial hangar space is accommodated through development reserves.

A terminal area reserve (approximately 16 acres) is also accommodated in the east landside area as a placeholder in the event that commercial air service was established. The terminal reserve provides sufficient space to accommodate a typical non-hub terminal building (20,000-30,000 sf), curbside area and roadways, vehicle parking, aircraft apron, and airport rescue and firefighting (ARFF) facilities. A terminal area reserve has been included in each of the three east landside options.

Options B and C include a long term development reserve for fixed base operator (FBO) facilities, such as aircraft parking apron, fuel storage, aircraft parking, commercial hangars, vehicle access and parking, and other related facilities. The expectation is that over time, the development of facilities on the east side of the runway will drive demand for services. The FBO reserve is intended to protect the ability to develop facilities that may be needed to serve tenants in the east landside area.

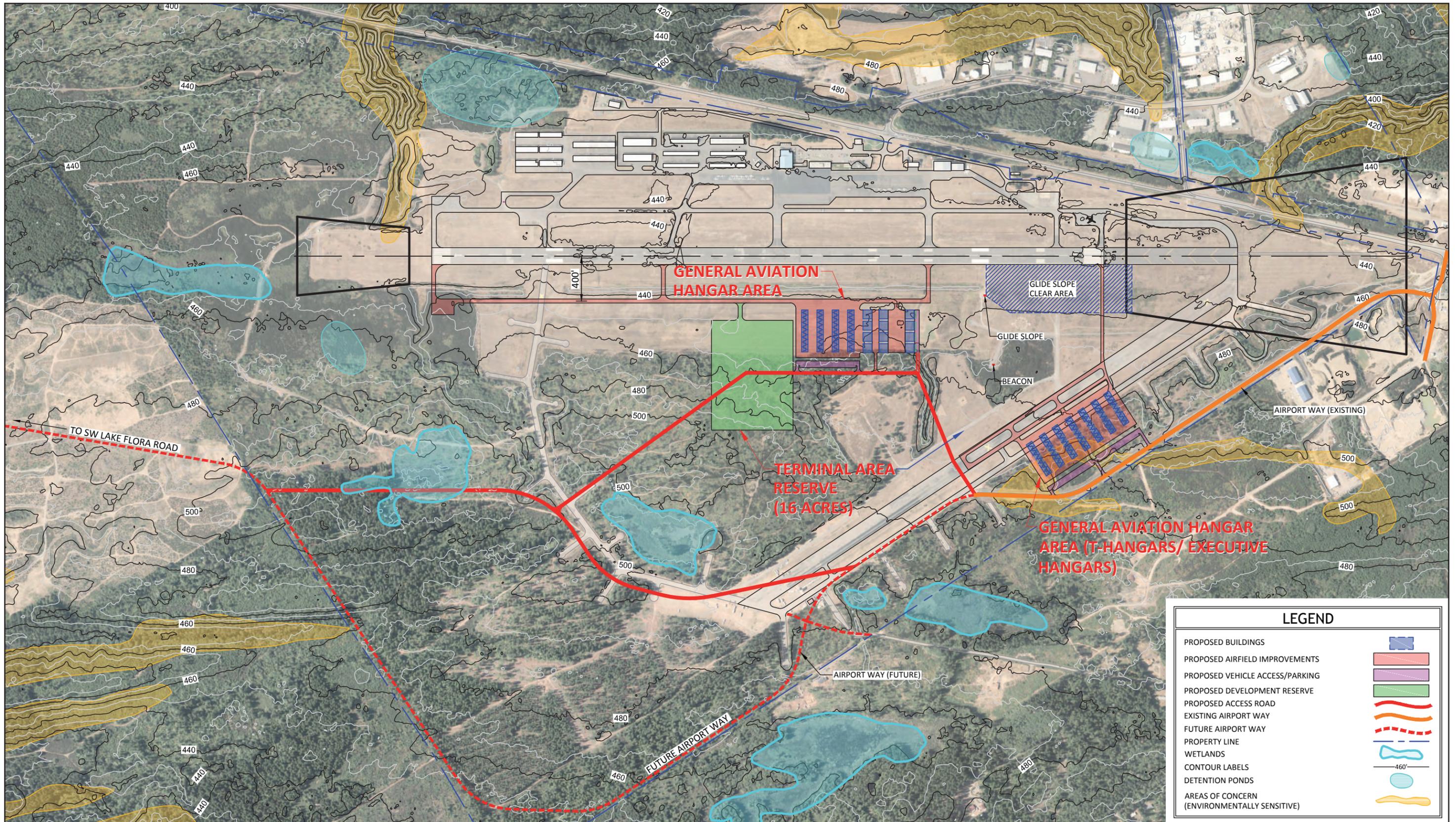
East Landside Option A

Option A (see **Figure 5-4**) reflects the landside configuration of the 2004 Airport Master Plan that consisted of two separate hangar areas. The primary hangar area is located along the east side of the former runway, with seven rows of T-hangars (14 units each, 98 spaces total). The hangars are perpendicular to the former runway, which is converted/reconfigured into a series of access taxiways. The hangar development area has a single taxiway connection to the runway (at the Runway 20 threshold). Vehicle access to the hangar area is provided from Airport Way, although a significant change in elevation exists between the road and the hangar area.

A second hangar development is located along the east side of Runway 02/20 and the future east parallel taxiway. The hangar configuration is unchanged from the previous master plan preferred alternative. However, the hangar development is shifted west, toward the runway, with the elimination of the previously-recommended short parallel runway. The hangar area has four T-hangars (16 units each, 64 spaces total) and three rows of conventional hangars (12 buildings depicted). The overall T-hangar

capacity is 162 aircraft. The conventional hangars would typically accommodate 1 to 3 aircraft per building (12 to 36 aircraft). The proposed landside development is fully compatible with the future east parallel taxiway depicted in **Figure 5-1**.

As noted in the facility requirements analysis, the capacity provided by the existing runway-taxiway system is adequate to accommodate forecast demand and considerable volume beyond. The functionality of the 2,400-foot runway would be very limited, while consuming a large amount of prime developable land. The FAA also indicated a low probability for funding a second runway.



LEGEND	
PROPOSED BUILDINGS	
PROPOSED AIRFIELD IMPROVEMENTS	
PROPOSED VEHICLE ACCESS/PARKING	
PROPOSED DEVELOPMENT RESERVE	
PROPOSED ACCESS ROAD	
EXISTING AIRPORT WAY	
FUTURE AIRPORT WAY	
PROPERTY LINE	
WETLANDS	
CONTOUR LABELS	
DETENTION PONDS	
AREAS OF CONCERN (ENVIRONMENTALLY SENSITIVE)	

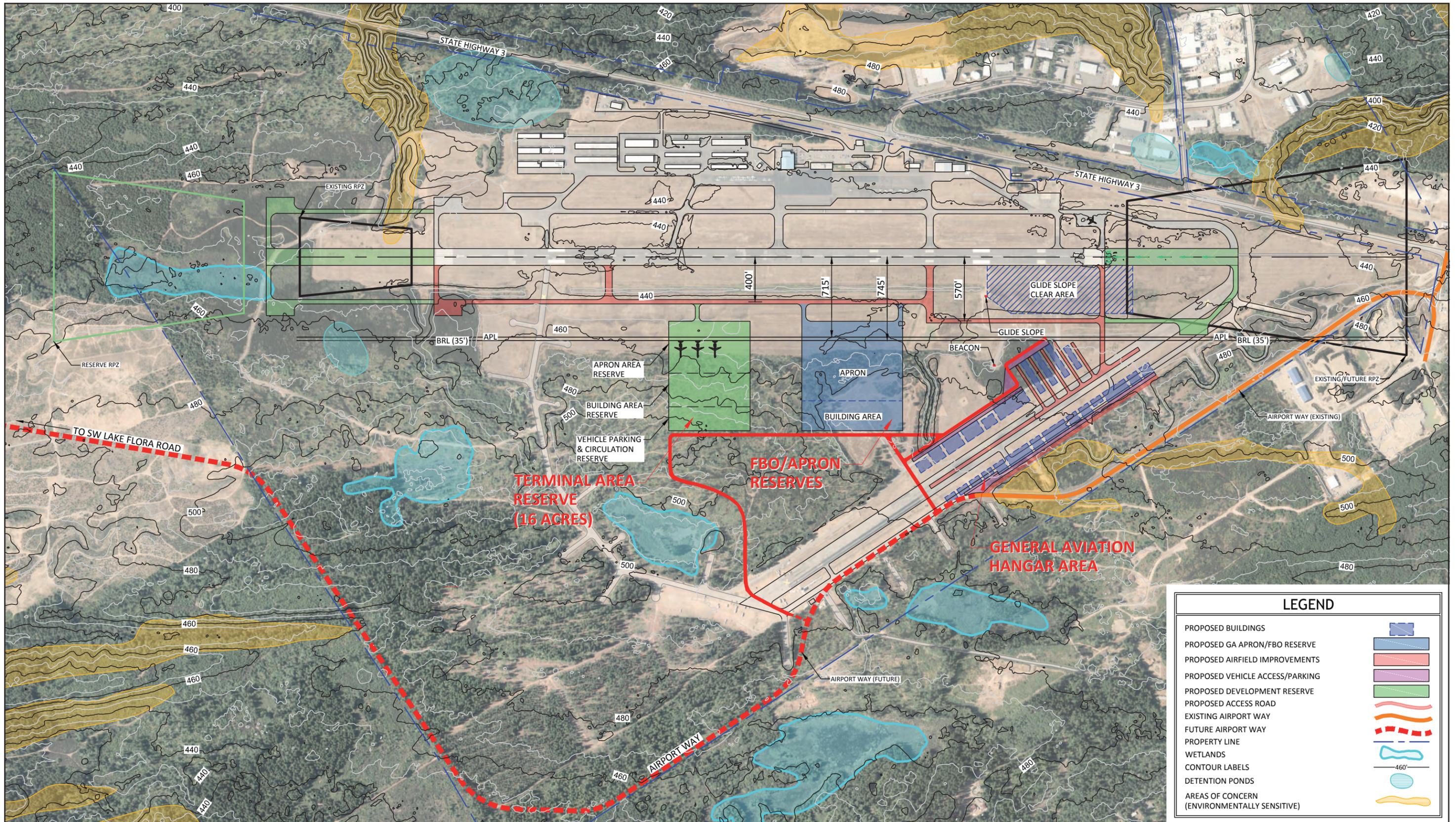
East Landside Option B

Option B (see **Figure 5-5** and **Figure 5-6**) also utilizes the former runway to provide primary taxiway access within the development area and to the runway-taxiway system. The hangar development configuration is designed to make use of the relatively level area along both sides of the former runway. A variety of conventional hangar sites (20 individual buildings depicted) are located on both sides of the main taxiway. The hangar sites would accommodate a full range of hangar types and sizes. Four T-hangars (approximately 44 units) are located on the west side of the main access taxiway served by individual stub taxilanes. Vehicle access and parking areas are identified for each hangar area. The proposed landside development is fully compatible with the future east parallel taxiway depicted in **Figure 5-1**.

East Landside Option C

Option C (see **Figure 5-7** and **Figure 5-8**) also utilizes the former runway to provide primary taxiway access within the development area and to the runway-taxiway system. The hangar development configuration is designed to maintain the east-west orientation of hangar doors that is used exclusively on the airport today.

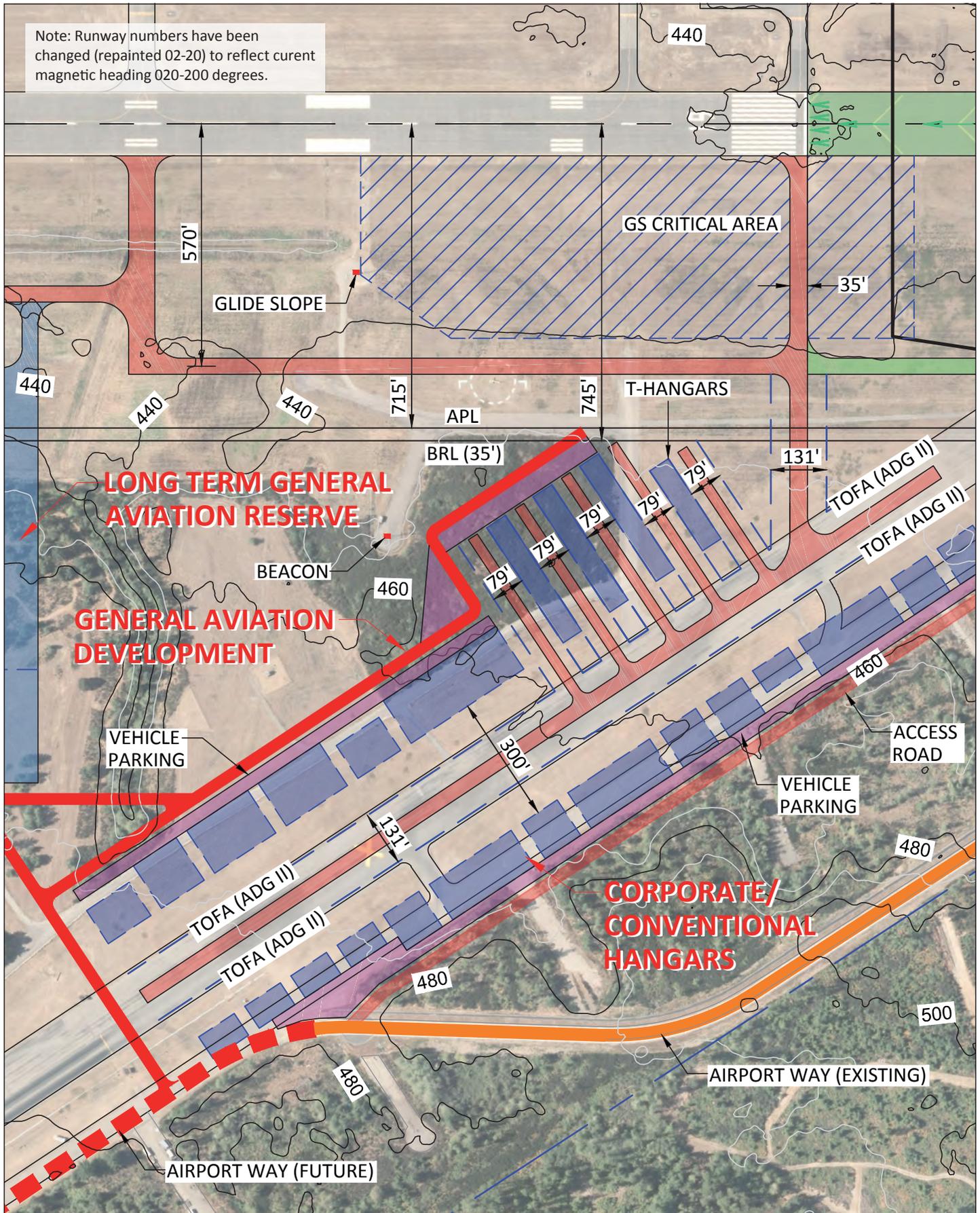
A series of stub taxilanes (parallel to Runway 02/20) extend from the main access taxiway to serve conventional hangar sites. Hangar sites are also located on the east side of the main access taxiway; buildings can be constructed parallel to the adjacent taxiway or turned to face west. As with Option B, this option makes use of the relatively level area along both sides of the former runway for conventional hangars, access roads and vehicle parking. A variety of conventional hangar sites (26 individual buildings depicted) are located on both sides of the main taxiway. The hangar sites would accommodate a full range of hangar types and sizes. A separate hangar development is located further south to avoid a deep east-west drainage located between the original “Open-V” runway configuration. The overall area depicted includes T-hangars, executive hangars, and conventional hangars. Not including the large conventional hangars, which could accommodate a variety of commercial and mixed use activities, the storage hangar capacity depicted is approximately 90 to 100 aircraft. Vehicle access and parking areas are identified for each hangar area. The proposed landside development is fully compatible with the future east parallel taxiway depicted in **Figure 5-1**.

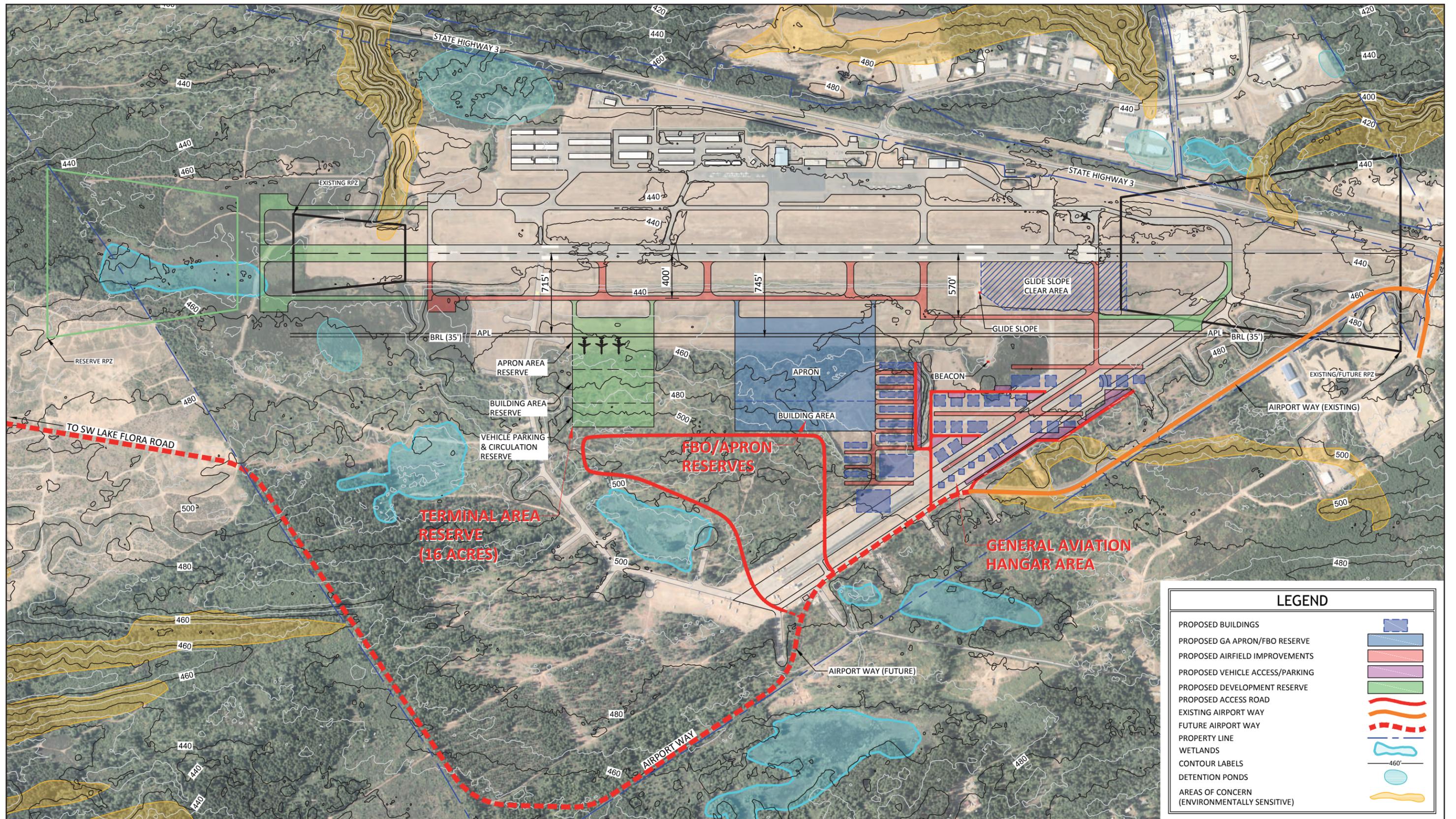


LEGEND	
PROPOSED BUILDINGS	
PROPOSED GA APRON/FBO RESERVE	
PROPOSED AIRFIELD IMPROVEMENTS	
PROPOSED VEHICLE ACCESS/PARKING	
PROPOSED DEVELOPMENT RESERVE	
PROPOSED ACCESS ROAD	
EXISTING AIRPORT WAY	
FUTURE AIRPORT WAY	
PROPERTY LINE	
WETLANDS	
CONTOUR LABELS	
DETENTION PONDS	
AREAS OF CONCERN (ENVIRONMENTALLY SENSITIVE)	

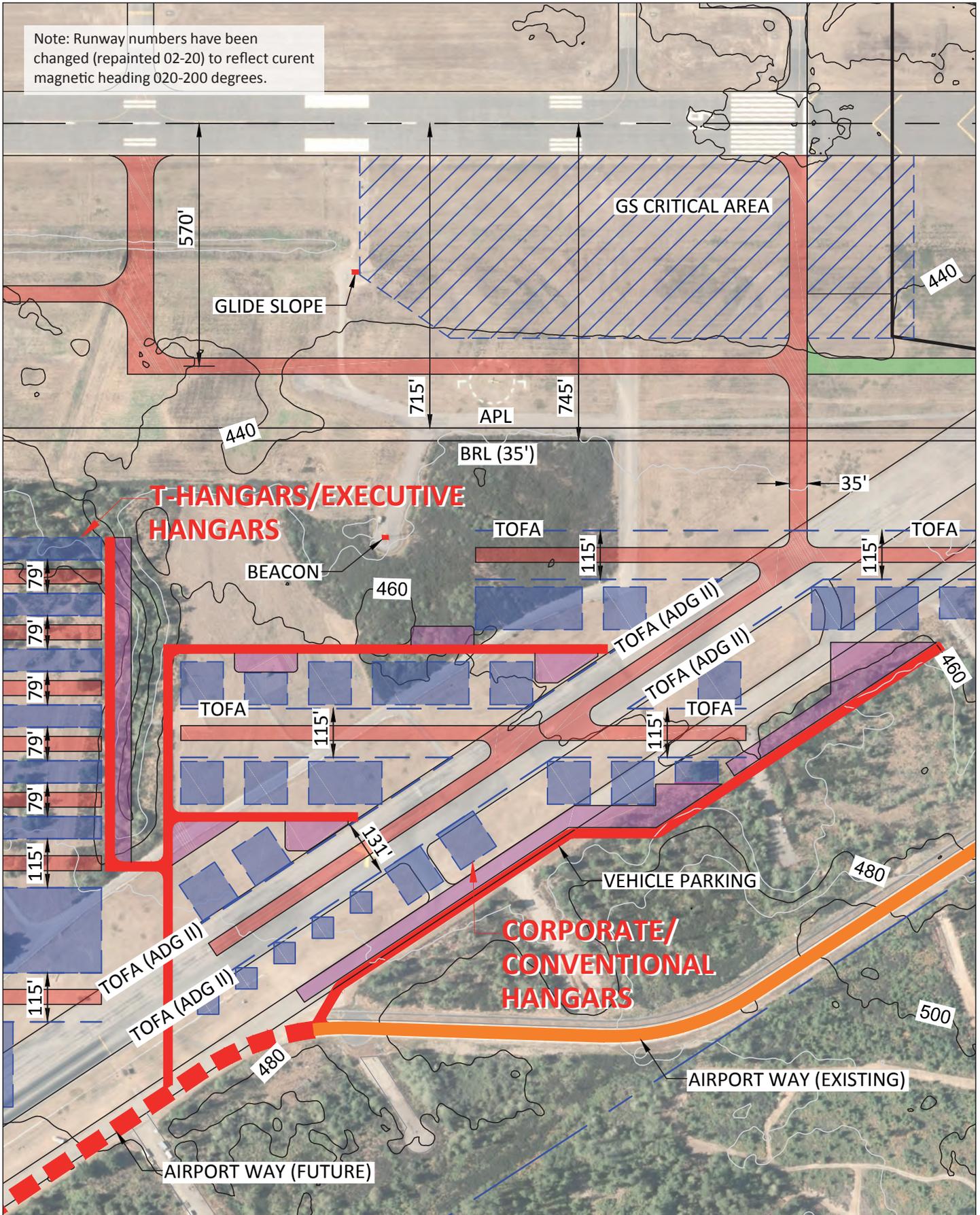
Insert Figures 5-6

Note: Runway numbers have been changed (repainted 02-20) to reflect current magnetic heading 020-200 degrees.





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Preferred Development Alternative

The preliminary development alternatives, presented earlier in the chapter, were designed to accommodate the forecast aviation demand and the corresponding facility requirements for Bremerton National Airport described in Chapter 4 for the twenty year planning period (2012-2032).

The preliminary development alternatives were presented to the Master Plan Advisory Committee, the Port Commission, and to the general public at meetings held in August, 2013. The draft documents were also submitted to FAA and WSDOT Aviation for review and comment.

Based on the wide range of input provided during these meetings and through subsequent discussions, the elements of the preferred alternative were formed. Additional coordination with Port staff led to further refinement and the concepts were prepared for presentation to the Port Commission. The preferred alternative presented in this section has been reviewed and approved by the Port Commission.

The components of the preferred development alternative are presented in **Figures 5-9 through 5-12**, located at the end of the chapter. These will be incorporated into the draft Airport Layout Plan (ALP) and a draft Capital Improvement Program when approved by the Port Commission, and presented for public and agency review in the Draft Final Airport Master Plan.

Below is a short summary of key items:

RUNWAY-TAXIWAY (AS DEPICTED IN FIGURE 5-1)

There are no changes proposed for the preliminary runway-taxiway improvements previously presented (see **Figure 5-1**). Runway extension and associated taxiway reserves are identified at both ends of Runway 2/20 (the runway numbers were recently changed due to magnetic declination). The reserves depict the footprint of potential development that may occur beyond the airport master plan's 20-year planning period. It is also conceivable that demand justifying one or both of the runway reserves could occur within the current planning period, although this is not reflected in the recently approved aviation forecasts. A change of activity of this magnitude would require updated activity forecasts and an assessment of specific project needs. No projects related to the runway reserves will be included in the updated 20-year capital improvement program.

One of the recommended improvements on the west parallel taxiway (Alpha) is currently being designed for 2014 construction (reconfiguration of Taxiway Foxtrot near mid runway). Other future improvements include expansion of the south aircraft hold area and replacement of the north aircraft hold area.

A future east parallel taxiway is recommended to provide safe and efficient aircraft access to the runway from the future east landside area. The taxiway may be constructed in phases based on activity levels (i.e., the pace of construction in the east landside area) and funding availability. The northern section of the east parallel taxiway will have increased runway separation to avoid conflicts with the instrument landing system electronic glide slope. The open ditch that runs along the east side of the runway will be affected by the new east parallel taxiway. At a minimum, several of the connecting taxiways would require culverts to cross the ditch. Converting the open ditch to a closed ditch may be recommended to reduce wildlife attraction potential and as part of the overall stormwater design (to be determined).

The main access taxiway entering the new east landside area will extend from the north end of the runway at the runway threshold. The east parallel taxiway and the east access taxiway will be designed to meet airplane design group II (ADG II) standards.

SOUTH HANGAR AREA (AREA DEPICTED IN FIGURE 5-9)

The previously proposed mixed of corporate aircraft and small aircraft hangar development (ADG II/I) in the south hangar area has been modified to focus exclusively on ADG I aircraft. This area will provide readily accessible hangar development on the west side of the airfield, allowing implementation of the new east landside development area to be phased in more gradually.

The hangar development will include an access taxiway extending from the parallel taxiway system near the south end (west side) of the runway. Three stub taxilanes will extend from the access taxiway to serve three rows of small aircraft hangars. The majority of the site was cleared and graded as part of a previous project. The development avoids the underground pipe gallery for the stormwater detention system. Modification of the existing stormwater collection/detention system may be required to accommodate an increase in impervious surface (taxiways and hangar roofs).

Improved vehicle access (realigned and paved) will be extended from the existing road near the airport maintenance shop. Two areas of vehicle parking are identified for the hangar area. The access road and vehicle parking areas may incorporate a variety of stormwater design elements (vegetated swales, gravel, porous pavement, etc.) to complement conventional asphalt.

FBO AREA (AREA DEPICTED IN FIGURE 5-9)

Improvements to the FBO area include reconfiguration/expansion of the existing aircraft tiedown area, minor expansion/reconfiguration of aircraft taxilanes, future construction of a second large FBO hangar, a small increase in apron pavement directly in front of the new hangar, and development of bulk fuel storage area near the west end of the hangar area (adjacent to existing paved access road). The new FBO hangar will be sited to avoid the existing aircraft fuel island.

The new fuel storage facility will replace several existing underground single-wall fuel tanks with aboveground double wall tanks. The number of new tanks will depend on market, but the area would be able to accommodate up to four 12,000-gallon tanks and provide parking (with secondary containment) for several mobile fuel vehicles. The existing underground tanks will be removed. The need for site remediation is unknown, although the existing tanks are lined and monitored and there is no history of leakage.

NORTH APRON (AREA DEPICTED IN FIGURE 5-10)

The primary changes to the north apron involve reconfiguration of aircraft tiedowns to meet FAA taxilane clearance standards. The preferred option upgrades the rear (western) apron taxilane to Airplane Design Group II (ADG II) standards to accommodate larger business aircraft in new hangars to be located along the back of the apron. The change in taxilane configuration will reduce the number of available small airplane tiedowns, although capacity is expected to be adequate well into the planning period. As long-term apron reserve is located along the front (east edge) of the apron to provide additional tiedown capacity if needed.

The alternative ADG I apron configuration is also depicted for reference. This configuration more closely resembles the existing parking configuration, adjusted to meet FAA taxilane clearing standards. The final decision on apron reconfiguration will be made at design and will be driven by the type of aircraft hangars or other facilities developed along the rear of the apron that would require either ADG I or ADG II aircraft access.

The apron reconfiguration also includes changes to existing taxiway connections to the west parallel taxiway (Alpha) to conform to current FAA guidance on runway-taxiway safety. Two existing taxiway connections at the north and south ends of the apron, in line with Taxiways Delta and Echo, will be removed and replaced with new connectors.

The future development of one or two large hangars at the rear of the apron will require relocation of an existing access road and automated gate that is near the airport entrance to Highway 3. Additional vehicle parking will be required.

A Portland Cement Concrete (PCC) aircraft hard stand is depicted (with MD81) in the same location as the proposed large hangars at the back of the apron. Airport management is currently in discussions with a prospective tenant that retrofits older generation airliners and this site may be leased for that use. If this occurs, the activity would be restricted (tow only on the ramp) so no changes in apron configuration or taxilane clearances would be required.

EAST LANDSIDE DEVELOPMENT (DEPICTED IN FIGURES 5-11 AND 5-12)

The preferred east landside development is a refined version of **East Landside Option B (Figures 5-5 and 5-6)** which consolidates new development of aircraft hangars along the old runway with vehicle access provided via Aviation Way. The east land side area will be capable of accommodating a variety of private and commercial hangars ranging from T-hangars and multi-unit conventional hangars to medium and large conventional or mixed use hangars.

A large long term development reserve is identified adjacent to the future east parallel taxiway to accommodate future apron and fixed base operator (FBO) facilities including aircraft parking and fueling. A second development reserve is identified for commercial air service terminal needs including a terminal building, aircraft ramp space, an aircraft rescue and firefighting (ARFF) building, and vehicle parking and roadway circulation. The area is a potential site for locating a new air traffic control tower, should airfield activity levels ever reach the threshold used by FAA at the time.

The preferred east landside development area is also compatible with concepts being developed and marketed through the Kitsap Aerospace Defense Alliance (KADA), which will become more refined as market opportunities are pursued.

The primary development items in the East Landside Area include:

- The main access taxiway will extend from the north end of the runway directly into the east landside area and continue along the old runway.
- Stub taxilanes on the west side of the access taxiway to serve T-hangars and smaller multi-unit conventional hangars.
- An access road to serve conventional hangar sites on the east side of the main access taxiway.
- Hangar sites and vehicle parking on the east side of the main access taxiway; full service utilities (water, sewer, electric) will be extended from existing lines.
- Phase II of Airport Way required to access second roundabout. The single point of access to the majority of the east landside area will extend from the new roundabout.
- Additional surface access and vehicle parking required for planned hangar development on the west side of the main access taxiway and future development areas (depicted as long-term development reserves).
- Hangar sites and vehicle parking on the west side of the main access taxiway; full service utilities (water, sewer, electric) will be extended from existing lines.

- Stormwater systems required for new development. No existing systems currently in place.

Previously mapped wetlands have been avoided by proposed development (not including the south runway/parallel taxiway extension), although the potential buffer requirements (worst case) will be reviewed to determine if any changes will be recommended on facility configurations.

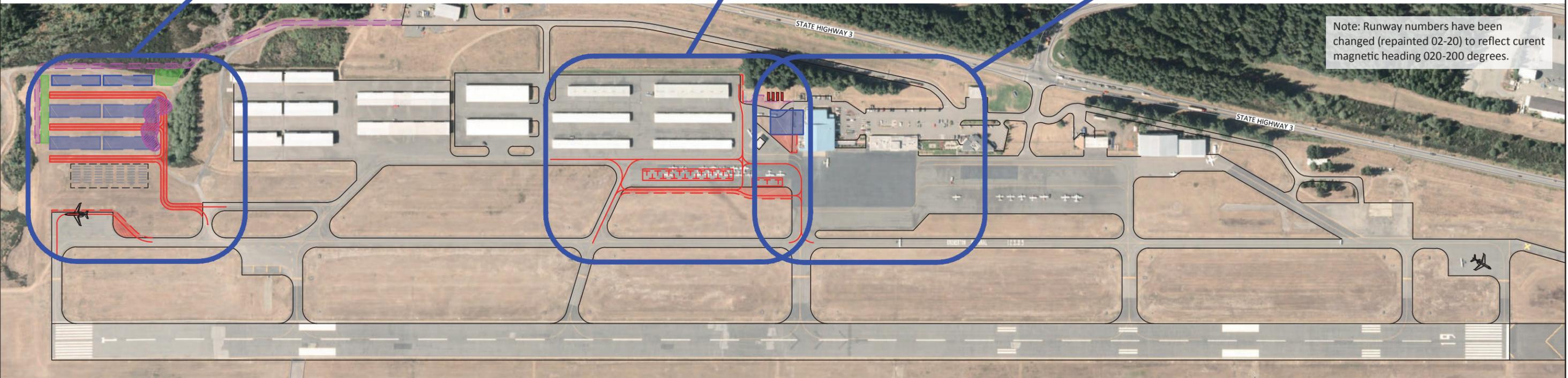
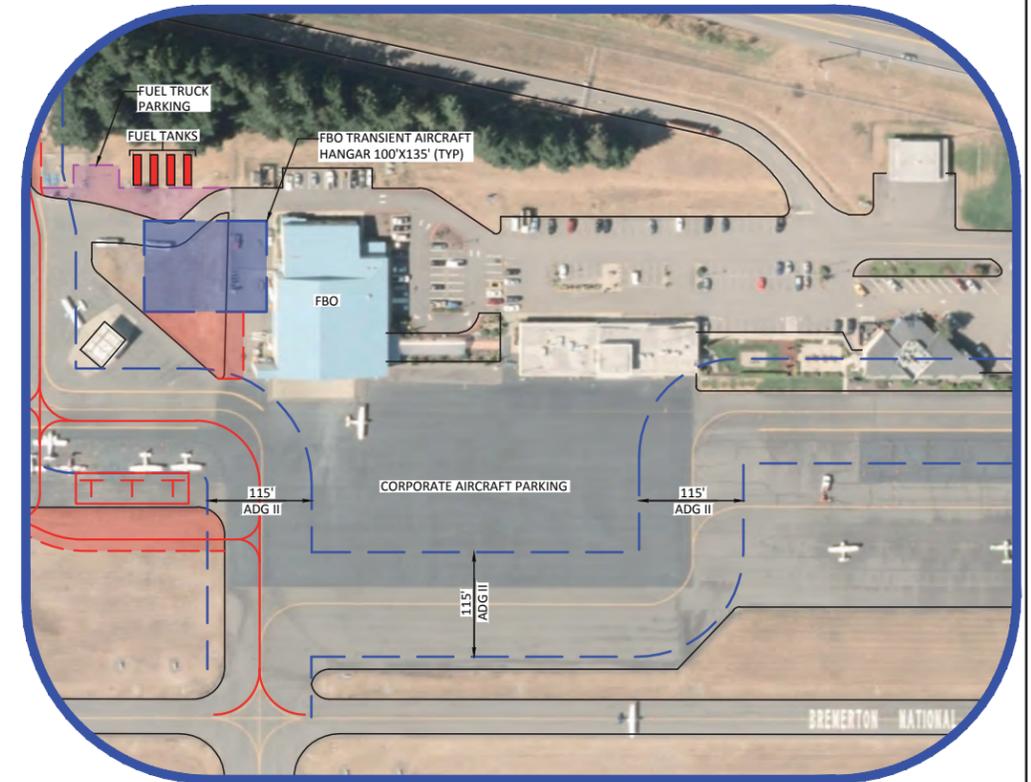
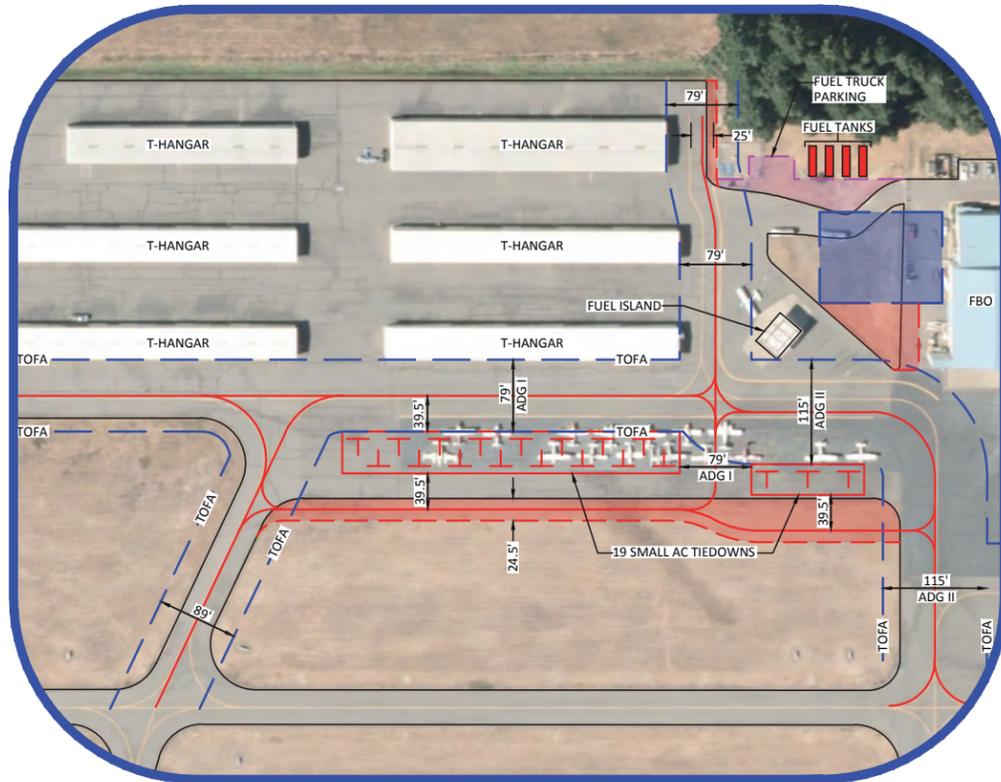
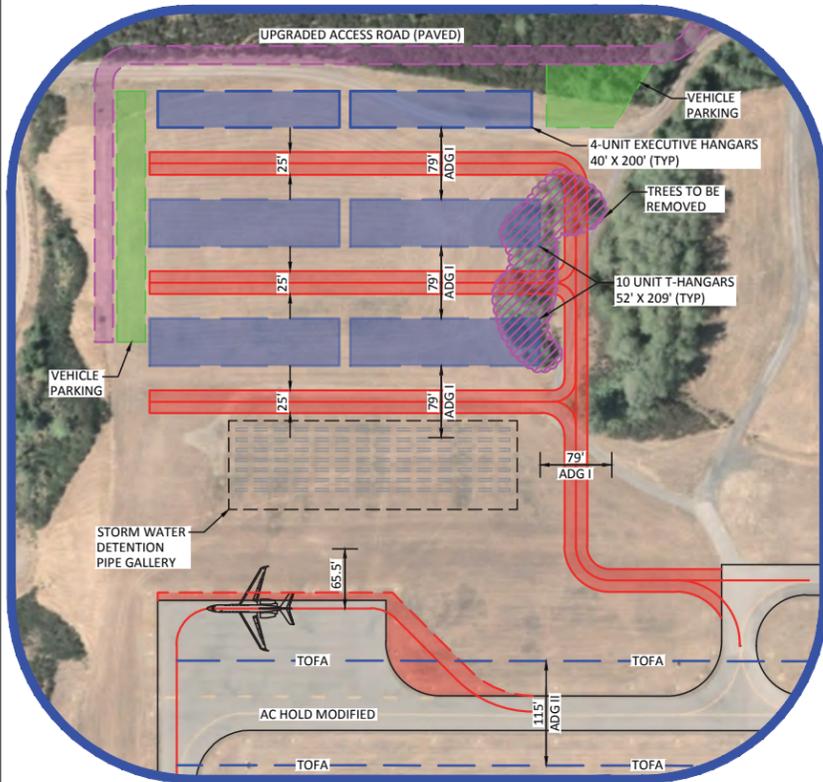
PROPERTY ACQUISITION

During the evaluation of airport development needs, no areas of property acquisition were identified.

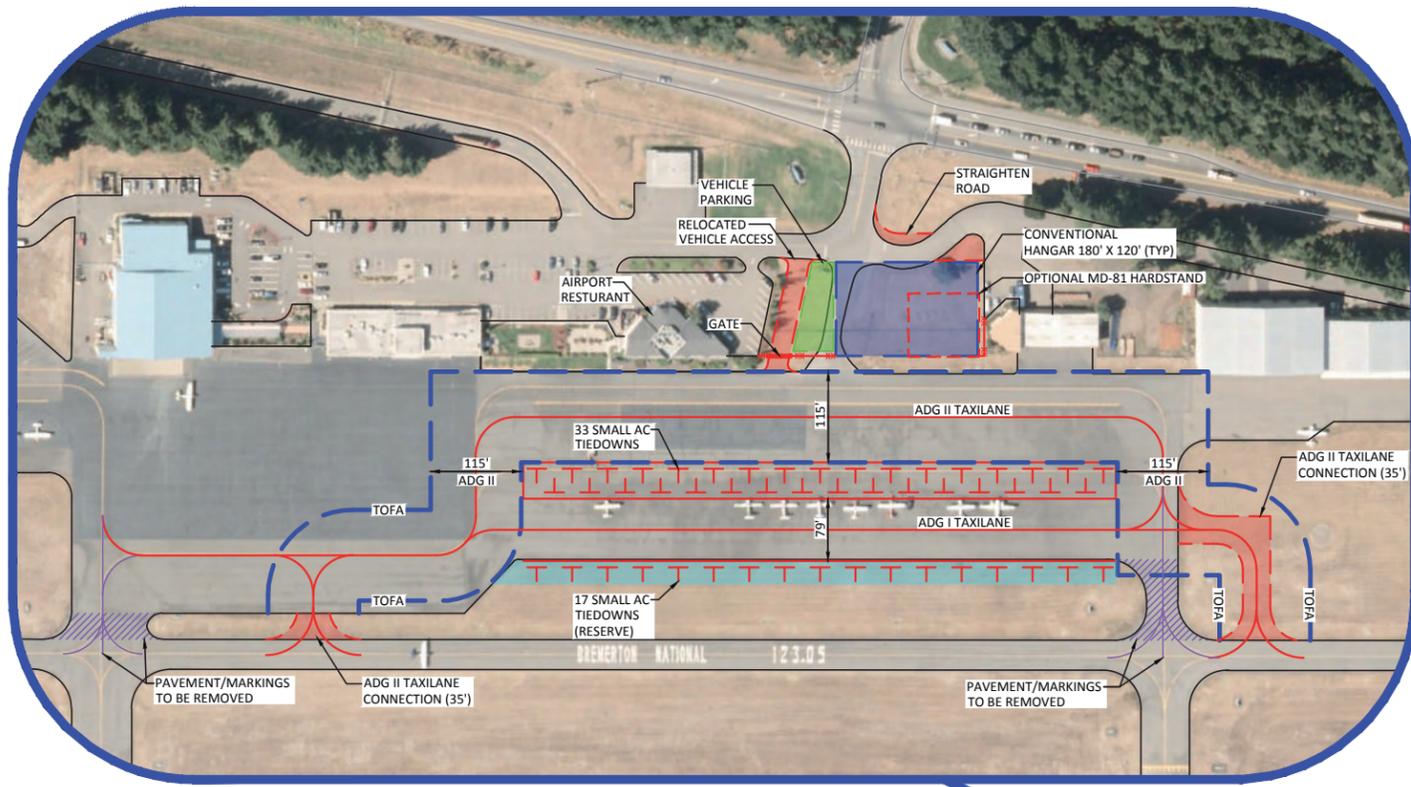
SOUTH HANGAR AREA

FBO AREA IMPROVEMENTS

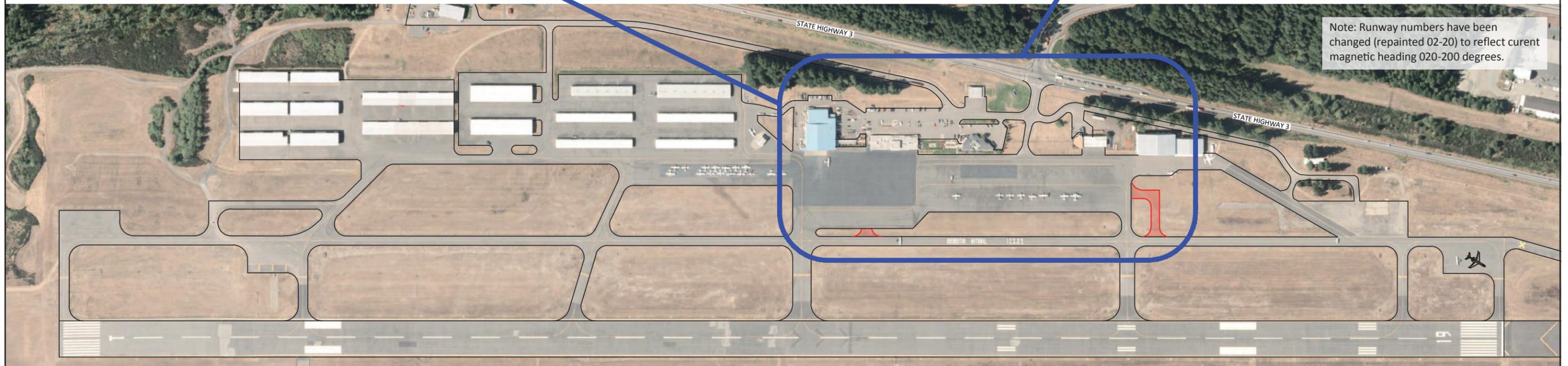
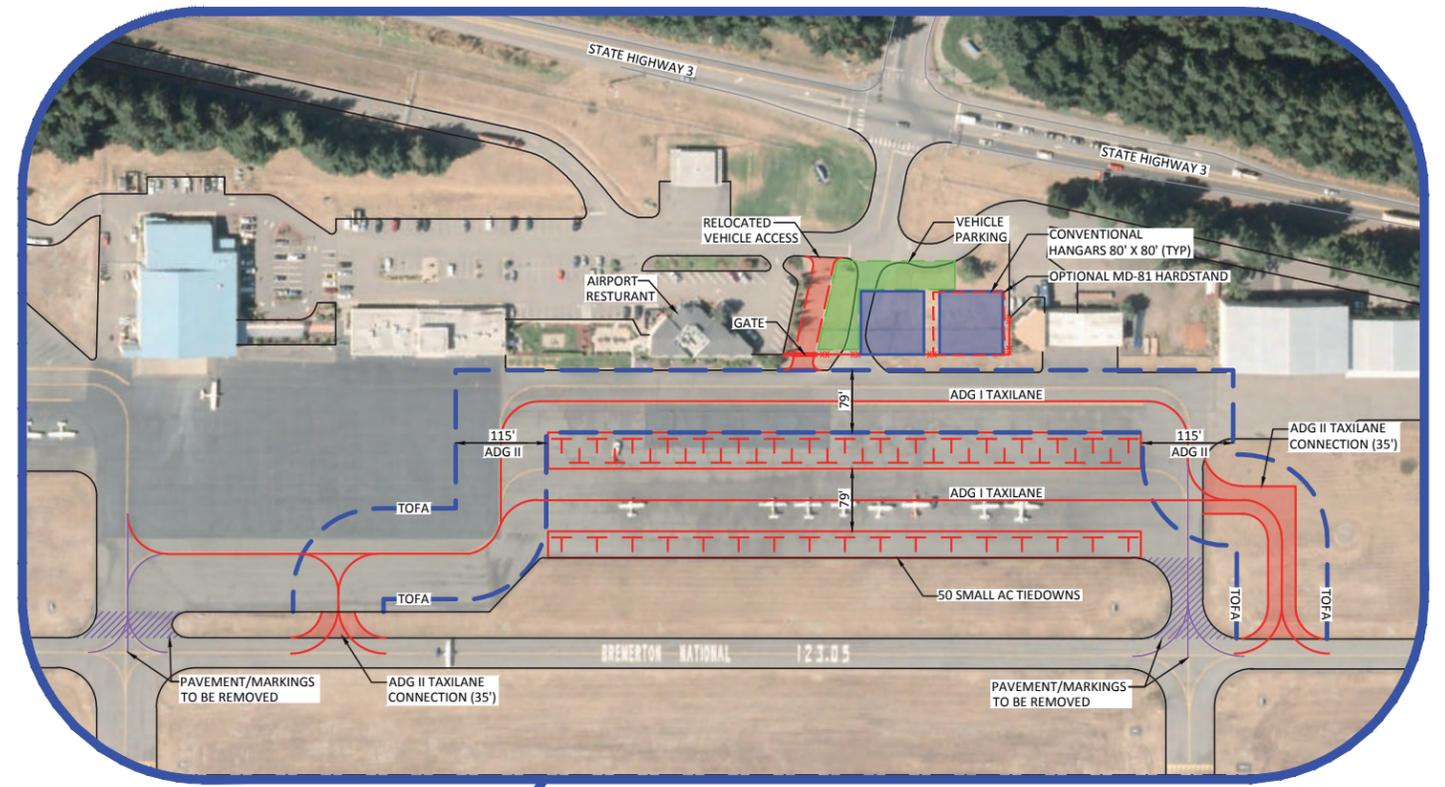
FBO AREA/CORPORATE AIRCRAFT PARKING



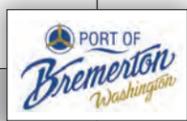
**NORTH APRON RECONFIGURATION
PREFERRED ALTERNATIVE**

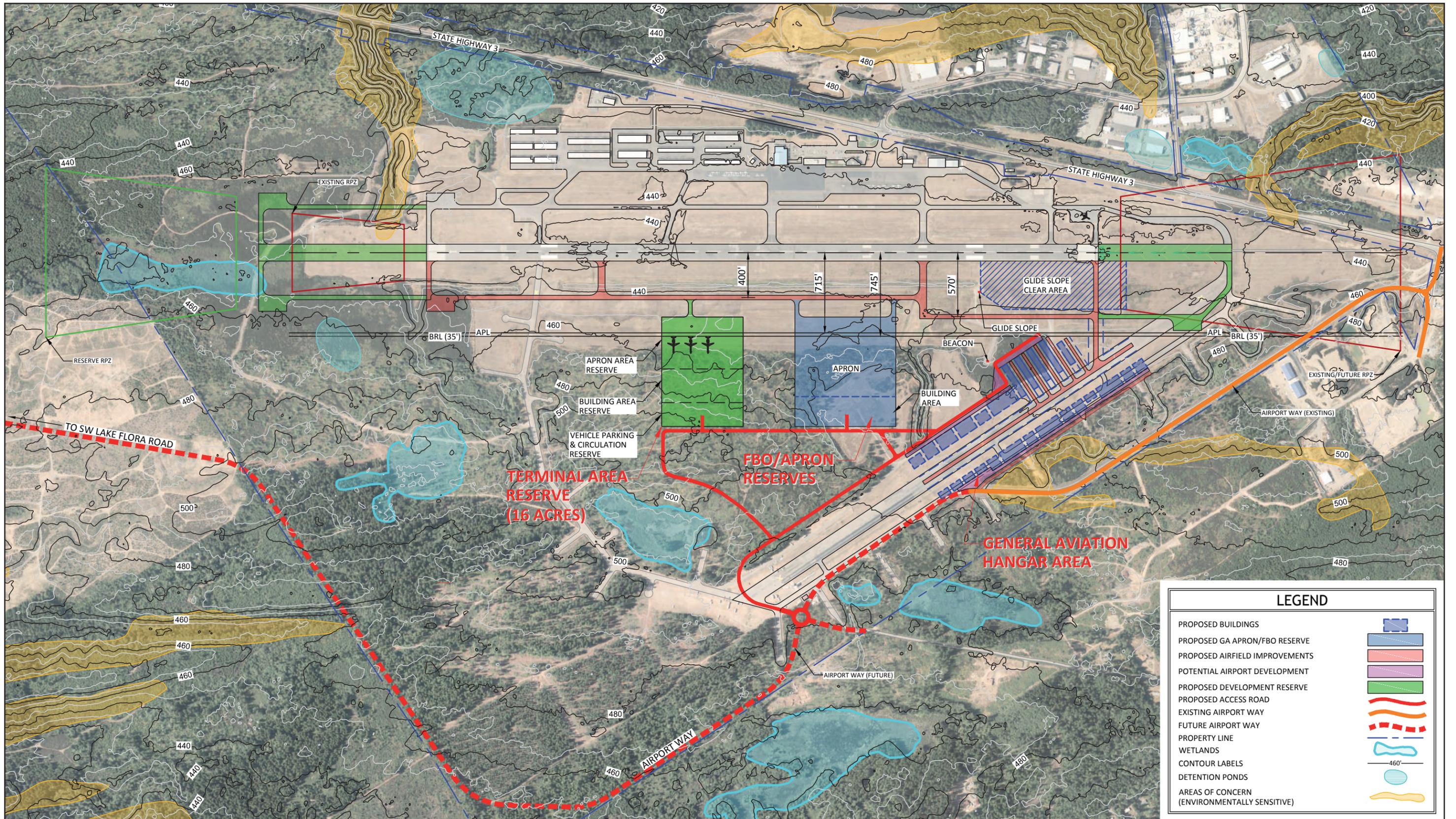


**NORTH APRON RECONFIGURATION
SMALL AIRPLANE OPTION (ADG I)
(TO BE DETERMINED AT DESIGN)**



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