



CHAPTER FIVE AIRPORT DEVELOPMENT ALTERNATIVES

The purpose of this evaluation is to develop alternatives (options) capable of accommodating the forecast demand and facility needs defined in the previous master plan chapters. As noted in the facility requirements evaluation, current and long-term planning for Sanderson Field is based on maintaining and improving the airport's ability to serve a wide range of general aviation and business aviation aircraft. Based on the recently updated activity forecasts, the development needs associated with landside facilities (aircraft parking spaces, hangars, etc.) at Sanderson Field are expected to be strong during the current twenty year planning period.

Creating preliminary alternatives represents the first step in a multi-step process that leads to selection of a preferred alternative. The preliminary alternatives will be 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 with the process of approving a preferred development alternative for Sanderson Field. Once the preferred alternative is defined, a detailed capital improvement program will be created that identifies and prioritizes specific projects that can be implemented. The elements of the preferred alternative will be incorporated into the updated airport layout plan drawings that will be used to guide future development of the airport.



Preliminary Development Alternatives

The preliminary alternatives include three options for accommodating landside facility needs (hangar, aircraft parking, etc.) in different areas of the airport; options for runway and taxiway improvements are also presented. A “Do Nothing/No-Action” alternative also exists and is described below. The preliminary development alternatives are depicted in **Figures 5-1** through **5-6**, later in this chapter. A summary of development costs for the alternatives is presented at the end of the chapter in **Table 5-1**.

Do-Nothing/No-Action Alternative

This alternative does not include the development of any aviation-related facilities or use of additional land for aviation-related development. As a result, 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 adequately accommodate forecast aviation demand and the associated demand-driven facility requirements. In addition, this alternative would not address facility requirements associated with conformance to FAA design standards, FAR Part 77 protected airspace, capacity, safety or security. Future aviation activity would be constrained by the capacity, safety and operational limits of the existing airport facilities.

The Do-nothing/No-action alternative concept established a baseline from which the action alternatives were 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 (i.e. hangar construction) at an airport. Public investment in facilities is driven by safety, capacity and the need to operate the airport on a financially self-sufficient basis.

Based on the factors noted above, the Do-nothing/No-action alternative is inconsistent with the management and development policies of the Port of Shelton and its long-established commitment to provide a safe and efficient public air transportation facility that is socially, environmentally, and economically sustainable in Mason County.



Runway-Taxiway Improvements

The proposed runway-taxiway system improvements address runway length requirements, runway approach clearance requirements, approach lighting, taxiway lighting, and development reserves. (see **Figure 5-1**).

Runway Length and Configuration

A 300-foot extension at the west end of Runway 5/23 is proposed, which would increase overall runway length to 5,300 feet. This length corresponds with the FAA runway length model calculation for 75 percent of the large airplane fleet noted in **Table 4-8** in the facility requirements chapter. The future design aircraft selected for Runway 5/23 is a Cessna Citation Bravo type business jet, which is included among the family of aircraft that comprise “75 percent” of the large airplane fleet.

Adding runway length at the west end of Runway 5/23 is consistent with the recommended runway configuration depicted on the current airport layout plan, prepared in 1997. The option of adding runway length to the east end (Runway 23) was also examined, but was found to be limited by approach surface clearances for vehicles traveling on Highway 101. The existing 34:1 nonprecision instrument approach surface for Runway 23 is penetrated by vehicles traveling on the highway; extending the runway closer to the road would increase the amount of approach surface penetration, which is not consistent with maintaining a clear approach to the runway end. Relocating Highway 101 could mitigate approach surface penetrations, although this may be difficult to justify based on the ability to add length at the opposite end of the runway within airport property. In the addition, extending the runway in the direction away from the more densely populated areas of the community mitigates potential noise exposure east of the airport. For these reasons, extending the runway to the west appears to be the most feasible option available.

Runway and Taxiway Reserves

A runway extension reserve is identified beyond the west end of Runway 5/23 reflecting a long established interest in preserving the option of accommodating large, transport category aircraft at Sanderson Field. The 1,480-foot runway reserve is comparable to “ultimate” runway configuration depicted on the current airport layout plan, which also was based on preserving potential for accommodating transport category aircraft in the future. The runway extension reserve is used to identify general land requirements for the runway and taxiway system. It is noted that a runway extension of this magnitude is not justified for the current or future design



aircraft. The reserve reflects the potential needs of a larger class of aircraft, which would require an upgrade in design standards from airplane design group II to III (see Chapter Four for technical information regarding design aircraft). As a result, upgrading Runway 5/23 would also require that increased development setbacks are observed along the sides of the runway. However, since Runway 5/23 is planned as precision instrument runway, the lateral airspace clearances (primary surface, transitional surfaces, etc.) used to define building and aircraft parking setbacks generally exceed those of either airplane group II or III based on airfield geometry (runway and parallel taxiway separations, etc.). To summarize, protecting airspace associated with a future precision instrument approach will provide the lateral setbacks needed to accommodate the setbacks needed for either airplane design group II or III.

A south parallel taxiway reserve is identified for Runway 5/23 based on the long term potential of accommodating aircraft activity on the south side of the runway. The existing fairgrounds site has been identified by the Port as a long-term aviation related development reserve, which would require taxiway access. The taxiway reserve and associated setbacks (aircraft parking lines, building restriction lines, etc.) are based on the design standards for the future critical aircraft (airport reference code B-II) and a planned precision instrument approach. As noted above, the development setbacks associated with precision instrument approach airspace clearances would also protect the ability to construct parallel taxiway based on airplane design group III standards (400 feet from runway centerline) if that need materialized. The appropriate airplane design group II runway to taxiway separation standard is 300 feet based on planned instrument approach visibility minimums.

Approach Obstruction Mitigation (Runway 23)

In addition to adding runway length, options for mitigating the vehicle/roadway obstructions to the Runway 23 approach surface were examined. It is noted that the 1992 National Ocean Service obstruction survey identified a 4-foot penetration to a 34:1 nonprecision instrument approach surface. The FAA permits use of a displaced landing threshold in conjunction with FAA threshold siting criteria¹ when the obstruction is “*beyond the airport owner’s power to remove, relocate or lower.*” Based on the planned upgrade to a precision instrument approach, a 50:1 approach slope is required, which will increase the approach surface penetration to approximately 13 feet.

It also recommended that an obstacle clearance surface (OCS) be used to mitigate the existing vehicle obstruction to the current nonprecision instrument approach to Runway 23. This type of

¹ FAA Advisory Circular (AC) 150/5300-13, Appendix 2 – Runway End Siting Requirements



obstacle clearance surface uses a 20:1 slope, which is consistent with approach visibility minimums between $\frac{3}{4}$ mile and 1-mile commonly associated with the next generation global positioning system (GPS) approaches that provide vertical descent and course guidance. No displacement of the Runway 23 threshold is required to obtain a clear approach by using an obstacle clearance surface for current nonprecision instrument capabilities.

For long term planning purposes, the following obstacle clearance surface criteria is recommended for Runway 23: *“Approach end of runways expected to accommodate instrument approaches having visibility minimums < $\frac{3}{4}$ statute mile or precision approach (ILS, GLS, or MLS), day or night.”* Based on the clearing criteria, a 240-foot displaced threshold would be needed to clear the Highway 101 obstruction for a precision instrument approach. The future displaced threshold will reduce landing distance available for Runway 23, although other runway operations would be unaffected since the runway meets all other relevant clearing standards. For the current 5,000-foot runway, the landing distance on Runway 23 would be reduced to 4,760 feet; the landing distance for the future 5,300-foot runway would be 5,060 feet. Runway 5 and 23 are both designated as instrument departure runways. A 40:1 instrument departure surface begins at the runway end and extends 10,200 feet. The FAA requirements for clearing this surface will be evaluated to determine if any further changes in the end of Runway 23 are required.

In addition to the close-in obstructions, concerns have been raised about potential approach clearances over a new residential subdivision located approximately 4,000 to 5,000 feet from the east end of the runway. Based on a review of available topography and an assumed maximum structure height of 35 feet above the ground within the development area, no penetration to either a 34:1 nonprecision or a 50:1 precision instrument approach appears to occur. In the absence of approach surface penetrations, the FAA will not typically fund runway reconfigurations such as shifting a runway or displacing the landing threshold. No additional displacement of the Runway 23 landing threshold is recommended beyond clearing the close-in obstructions.

Approach Lighting

The addition of approach lighting at the end of Runway 23 is recommended to reduce instrument approach visibility minimums below 1 mile. For planning purposes, a medium intensity approach light system (MALS) with runway alignment indicator lights (RAIL) is typically recommended for runway ends equipped with conventional precision instrument approaches such as instrument landing systems (ILS). However, at a cost of approximately \$1 million, installation of MALS-R systems is limited. Lower cost approach light systems, such as an omni directional approach lighting system (ODALS) can typically provide a $\frac{1}{4}$ -mile reduction in approach visibility minimums for approach procedures with vertical guidance (referred to as “AVP-RNP” by FAA),



from 1 statute mile to $\frac{3}{4}$ statute mile. A decision on the specific type of approach lighting system will be made as the technical evaluation of new instrument approach options are evaluated by FAA and the Port.

Taxiway Lighting

Based on the frequency of low visibility conditions and the lengthy taxiing distances at Sanderson Field, the installation of medium intensity taxiway edge lights (MITL) is recommended on the major taxiways (Taxiway A and exit taxiways, Taxiway B, and Taxiway A1). Taxiway edge lights have blue lenses and have a similar configuration as runway edge lights.

Landside Development Alternatives

Three preliminary options have been created to address future landside development needs at the airport. Sanderson Field's large land base and expansive facilities allow for a wide range of development options to be considered. However, this also presents a challenge in that the majority of forecast facility demands can be accommodated within a relatively compact area. A primary objective when evaluating development options is to identify the areas best suited for near term development and to reserve other areas for longer term aviation facility needs.

The forecast increase in based aircraft at Sanderson Field is expected to create demand for T-hangars, conventional hangars, and apron parking. As noted in the facility requirements chapter, the main apron has substantial unused capacity. Options for reconfiguring the apron to improve utilization and efficiency are presented as part of the terminal area landside development option (see below), although elements of these options could be integrated into any landside facility configuration selected as the preferred alternative.

The majority of Sanderson Field based aircraft are currently stored in T-hangars. It is reasonable to expect that this trend will continue in the future, although demand for small or medium conventional hangars (also referred to as "executive hangars") could also be expected based on hangar development trends within business and general aviation. While T-hangars are typically used to accommodate single-engine and light twin-engine aircraft, conventional hangars are capable of accommodating a wide range of aircraft types, including larger business class aircraft. Conventional hangars also offer the flexibility to accommodate multiple aircraft. For example, a 50-foot by 60-foot executive hangar can accommodate from one to four aircraft of varying sizes (1,000 to 3,000 square feet per aircraft). By comparison, the 16-unit T-hangars at Sanderson Field (17,000 square feet) average just over 1,020 square feet per unit, excluding corner storage units.



From a planning perspective, it is desirable for an airport to be able to offer sites for the construction of both T-hangars and a variety of conventional hangar sizes. While the construction and ownership of hangars (public versus private) varies from airport to airport, the ability to provide well defined and readily developable hangar sites is a basic indication of an airport's competitiveness in attracting prospective tenants.

Figure 5-2 identifies the location of the landside development options on the airport. **Figures 5-3 through 5-6** illustrate the details associated with each of the landside options.

Landside Development Option 1 – Terminal Area

Landside Development Option 1 (Figure 5-3) locates new facilities within the existing terminal area, which results in a relatively compact development that is located adjacent to existing access taxiways, roadways, utilities, and fixed base operator (FBO) facilities and services.

Issues have been raised about the need to improve the aircraft parking configuration on the main apron, particularly in the vicinity of the fixed base operator (FBO). To address both aircraft parking needs and options for accommodating additional conventional hangar construction, three apron options were developed as a subset within the overall terminal area landside option. These options are intended to facilitate the evaluation of the apron as part of the overall terminal area development option. The apron options are depicted on **Figure 5-4**.

Hangar Development

In this option, all new T-hangars are located south of the main apron and east of Taxiway A1 and new conventional hangars are accommodated adjacent to the main aircraft apron and in the north end (reserve) of the expanded hangar area east of Taxiway A1. Based on a review of the airspace clearances associated with a future precision instrument approach, two additional hangar rows can be accommodated south of the existing hangars without penetrating the runway transitional surface. These hangar sites use the existing taxilanes (with some modification) that connect directly to Taxiway A1 and require nominal site preparation.

The sites have the same development footprint as the existing hangar rows immediately to the north. This development footprint establishes the required taxilane clearances between buildings; buildings can smaller, but not larger without requiring some reconfiguration of taxilanes. These rows can accommodate a single 16-unit T-hangar, a smaller T-hangar combined with individual conventional hangar sites, or just individual hangar sites. The Port is planning for construction of a new hangar in summer 2008 and is currently evaluating hangar configuration options.



Depending on the configuration of the buildings in the two hangar rows, up to 32 additional hangar spaces can be provided, which is about half of the twenty year forecast increase in based aircraft at Sanderson Field.

Intermediate and long term T-hangar needs are addressed by developing additional hangar sites east of the current T-hangar rows. New taxiway access would be extended into the area with a direct connection to Taxiway A1 (connecting at the intersection of Taxiway A and A1). The new taxiway would extend from the east end of Taxiway A before being turning north-south between the existing T-hangars and the new hangar rows. A series of east-west taxiway stubs would serve the hangars, but would not connect to the existing hangar taxiways due to the non-standard spacing between the existing hangar rows. The north-south section of the new access taxiway is planned so that the fencing located along the east edge of the existing T-hangars would not require modification, except near the automated vehicle gate located near the south end of the development. The gate would be relocated to the north end of the development to accommodate the new taxiway. The existing gravel access lane located between the hangars and fence would not be affected. The north end of the hangar expansion area can accommodate several aircraft in small or medium conventional hangars. Reconfigured vehicle parking and surface access is located adjacent to the north end of the expanded development area. The location of the new sanitary sewer line that is currently under construction will be reviewed to ensure that the hangar sites are completely clear of any associated easements. The northern section of the new hangar development area is shown as reserve, based on the forecast demand and facility requirements.

This option assumes that the two older existing T-hangars located in the northern row of the development (just south of the FBO) will reach the end of their useful lives within the current twenty year planning period. As depicted, the two hangars (10 spaces) are replaced with a single 16-unit T-hangar, although the site could also accommodate several smaller conventional/executive hangars. Regardless of hangar type, the future development in this area assumes that new building(s) will be shifted slightly to the north (requiring a new north-side taxiway) in order to correct nonstandard taxiway separation between the first and second row of existing hangars. The area located north of the existing T-hangars is leased to Olympic Air for future aviation use, although it has not been developed. Minor modification of the lease boundaries may be needed to accommodate the reconfigured taxiway and new hangar location, although it appears that adequate space exists to accommodate these items and a new maintenance hangar (as depicted).



It is assumed that the T-hangar located at the north end of the main apron will also reach the end of its useful life within the current twenty year planning period. Redevelopment of the existing hangar site is addressed in the terminal area apron options (see below). Replacement/relocation of the existing T-hangar can be accommodated within the planned T-hangar expansion area, east of Taxiway A1.

The proposed hangar sites and facilities within the terminal area are accessible from existing access roads. Some minor reconfiguration of fencing, gates and service road connections would be required to accommodate specific configurations. Water, electric and sanitary sewer (or self contained storage tanks) service is located within the terminal area, requiring relatively short extensions to new construction.

The new hangars depicted in the areas east of Taxiway A1 total approximately 114,000 square feet. This includes up to six 16-unit hangars (96 units) and several individual hangars (8 to 10 aircraft spaces based on 1,200 to 1,500 square feet per aircraft). This potential capacity exceeds twenty year forecast demand (new based aircraft) by approximately 60 percent. When combined with the proposed conventional hangar development from any of the apron options, it is evident that the existing terminal area has sufficient landside capacity to accommodate projected demand through the current planning period and well beyond.

Terminal Area - Apron Option A

This option retains the existing aircraft taxilane configuration by maintaining the Taxiway B connection through the apron with north-south access provided by Taxiway A1 and the interior apron taxilane between two rows of aircraft tiedowns. Business aircraft parking directly in front of the FBO is expanded. The adjacent aircraft tiedown rows are adjusted to provide standard object free clearances both for the interior taxilane (airplane design group I aircraft - wingspans up to 49 feet) and Taxiway B and A1 (airplane design group II aircraft - wingspans up to 79 feet).

A double aircraft tiedown row (tail-in east and west facing positions) is located on the eastern section of the apron and a single row of east facing tiedowns is located on the west side of the apron. As currently planned, this configuration provides approximately 41 light aircraft tiedowns, which exceeds the 20-year projected demand for locally-based and itinerant light aircraft tiedowns.

Expanded parking for business class aircraft is provided by extending a small section of apron opposite of the FBO. Four drive-through parking positions are sized to accommodate business class turboprops and most small and medium business jets. The southern-most parking position could accommodate two aircraft (nose to tail) although when both positions are occupied ground



operations would require assistance (powered tug to tow aircraft). Smaller aircraft could also use these parking spaces for loading and unloading directly in front of the FBO. This configuration accommodates the projected demand for business aircraft parking positions well into the planning period; additional business aircraft parking positions can be provided by further extending the apron to the south and by developing the area located immediately south of the Olympic Air hangar (east side of Taxiway A1) as apron.

Additional parking apron designed to accommodate a larger aircraft is proposed south of the Kapowsin Air hangar adjacent to the east side of Taxiway A1. This parking position can accommodate a larger aircraft, such as the Twin Otter or Caravan models used in skydiving operations. It is noted that the interior north-south taxilane within the main apron is planned to accommodate smaller aircraft (airplane design group I). Although larger aircraft, such as the locally based skydiving aircraft, could be parked in the tiedown row and remain clear of the adjacent taxilane object free areas, the aircraft would need to enter and exit the parking positions on the Taxiway A1 side only, which makes ground maneuvering difficult.

Hangar Development

In addition to the T-hangar replacements noted above in the overall terminal area option, sites for three small/medium conventional hangars are located near the northeast corner of the main apron. The hangars would access Taxiway A1 directly; vehicle access and parking would be located on the north and east sides of the hangars. The conceptual layout of the three new conventional hangars totals approximately 16,500 square feet, which provides enough area to accommodate 11 aircraft (assuming 1,500 square feet per aircraft). When combined with the T-hangar development and reserve areas proposed in the overall terminal area option, this option provides the ability to accommodate landside demand well into the current twenty-year planning period.

Terminal Area - Apron Option B

This option modifies the existing apron taxilane configuration by eliminating the direct connection between Taxiway B and A1 and routing aircraft through the middle of the apron on the interior taxilane. The interior taxilane is designed to accommodate airplane design group II aircraft (wingspans up to 79 feet). By realigning the taxilane that connects to Taxiway B, five drive-through parking positions for business class aircraft are provided directly opposite the FBO. The positions vary from 50 feet to 80 feet wide, which accommodates aircraft from a small single aircraft to the larger business jet, such as a Gulfstream IV. A dual row of tiedowns (approximately 18 positions) extends northward from the business aircraft parking positions. Two aircraft drive through parking positions are located at the north end of the row, capable of accommodating



larger skydiving aircraft that could access the positions from either adjacent taxilane. The west row of east-facing tiedowns is modified to accommodate the larger airplane design group II taxilane object free area clearances associated with the interior taxilane. The north ends of both aircraft parking rows would be located to provide adequate clearance from the existing T-hangar, and would be modified when the hangar was removed.

Hangar Development

This option significantly increases the development of conventional hangar sites in the vicinity of the apron (east side of Taxiway A1) and on the apron itself by creating hangar sites in areas not required for aircraft parking and through infill. The hangar sites depicted near the northeast corner of the apron provides a different configuration to accommodate different hangar types/sizes than depicted in Apron Option A. A taxilane would extend over existing pavement from Taxiway A1 to provide access to four conventional hangar spaces. Another conventional hangar site faces directly toward Taxiway A1. Two additional hangar sites are identified in the area immediately north of the aircraft fueling area. A portion of this area may be currently leased although this option illustrates that additional hangar capacity can be accommodated by increasing the density of hangars (infill) within the terminal area.

A row of conventional/executive hangar sites is proposed at the north end of the main apron. Three medium and one large conventional hangar sites are depicted. Vehicle access and parking improvements would be planned on the north side of the hangars. The existing fencing would be modified to accommodate new hangars.

Although conceptual, the hangars depicted in this option total approximately 36,000 square feet, capable of accommodating 24 to 30 aircraft (based on 1,200 to 1,500 square feet per aircraft). This capacity, combined with the T-hangar development proposed in the overall terminal area option illustrates that expansion within the terminal area has the ability to accommodate projected landside demand well into and beyond the current twenty-year planning period.

Terminal Area - Apron Option C

This option also modifies the existing apron taxilane configuration by eliminating the direct connection between Taxiway B and A1 and routing aircraft through the middle of the apron on the interior taxilane. However, in this option the interior taxilane is designed to accommodate airplane design group I aircraft (wingspans up to 49 feet) with standard object free area clearances provided. The reconfigured business aircraft parking positions from Apron Option B are unchanged. The taxilane access for airplane design group II aircraft in the southern section of the



main apron is also unchanged from Apron Option B, however an east-west taxiway connection is provided to Taxiway A1 beyond the north end of the business aircraft parking positions.

A dual row of tiedowns (approximately 19 positions) begins on the north side of the east-west taxiway connection. A western row of tiedowns (approximately 10 east facing tiedowns) would be replaced over time as new hangars are constructed. The north ends of both aircraft parking rows would be located to provide adequate clearance from the existing T-hangar, and would be modified when the hangar was removed. The airplane design group II parking position located south of the Kapowsin Air hangar (from Apron Option A) is also used in this option.

Hangar Development

A row of large conventional hangar sites is located at the north end of the main apron. Three large conventional hangar sites are depicted. Vehicle access and parking improvements would be planned on the north side of the hangars. The existing fencing would be modified to accommodate new hangars.

This option includes the development of a single row of small/medium conventional hangars along the west side of the main apron. As noted above, upgraded aircraft tiedowns would be installed as part of the overall apron reconfiguration. The tiedowns would be gradually replaced as new hangars were constructed through the planning period. The hangars located in the western row have increased spacing between buildings to accommodate vehicle parking and turnaround due to limited space between the existing fence and the proposed hangars. Modifications to vehicle access would be incorporated to provide controlled access to the hangar area and apron. The hangar sites located near the northeast corner of the apron use a slightly different configuration from earlier options, with direct aircraft access to Taxiway A1.

The hangars depicted in this option total approximately 49,000 square feet, capable of accommodating 32 to 40 aircraft (based on 1,200 to 1,500 square feet per aircraft). This capacity, combined with the T-hangar development proposed in the overall terminal area option illustrates that expansion within the terminal area has the ability to accommodate projected landside demand well into and beyond the current twenty-year planning period.

Landside Development Option 2 – Infield Area

Landside Development Option 2 (Figure 5-5) locates new facilities in the undeveloped area between the existing terminal area and the inactive runway. This option represents the current “preferred alternative,” that is depicted on the 1997 airport layout plan, approved by FAA and the



Port of Shelton. As noted in previous chapters, the landside improvements implemented since the 1997 master plan have been limited to the terminal area and immediately east of Taxiway A1.

For the purposes of comparison, this option is presented in its original form, as depicted on the airport layout plan. No significant modifications to facility configurations have been made in an attempt to preserve the original development concept. If this development concept is supported as the “preferred alternative,” additional refinement would be completed to better represent proposed development elements. Regardless of the specific configuration, it is evident that the overall development area has the ability to accommodate a wide range of landside facilities with ample reserve areas available to accommodate demand beyond the current twenty year planning period.

The proposed development area is bordered by Taxiway A to the south and Taxiway B to the east. Vehicle access to the infield development area is provided by a new 3,500-foot access road that extends from West Sanderson Way along the western side of the industrial developments located adjacent to the main apron. Upon reaching the infield development area, a 1,600-foot section of roadway parallels the aviation use facilities and provides access to large vehicle parking areas (approximately 10 acres) that extend the full length of the development.

As originally planned, this development concept assumed that the fixed base operator (FBO) facilities would be relocated from the main apron to the new development area. The layout identifies one FBO hangar (40,000 square feet), but does not identify new aircraft fuel storage or fuel dispensing areas.

A new 200,000 square foot apron is depicted providing approximately 47 aircraft tiedowns. The apron is configured with three rows of tiedowns served by three east-west apron taxilanes. The new apron would be located immediately east of the existing segmented circle on the north side of Taxiway A.

A 120,000 square foot “terminal area development” area is depicted adjacent to the northwest corner of the new apron. No specific facility configurations are provided, although a note appearing on the airport layout plan indicates that this area is intended to accommodate air taxi and air cargo operations.

Hangar Development

A new aircraft hangar area extends beyond the east end of the apron and includes a series of hangar taxilanes. As depicted, the area has three T-hangars and four large conventional hangars. The hangar sites depicted in this option total approximately 168,000 square feet, excluding the FBO hangar. Based on the overall square footage shown, 112 to 140 aircraft could be



accommodated (based on 1,200 to 1,500 square feet per aircraft). It is evident that this option provides the land area needed to accommodate projected hangar demand well into and beyond the current twenty-year planning period. Although not depicted in detail, the area immediately north of the proposed development is reserved for aviation landside development and could accommodate additional hangars or apron.

A “corporate hangar development” area is depicted extending along the north side of Taxiway A, across the inactive runway, ending at the end of Runway 5. No specifics regarding building configuration were provided in the original layout, although it appears that the long rectangular area (2,300 x 200 feet) would be capable of accommodating a row of south-facing conventional hangars. The overall area is 460,000 square feet, which would likely accommodate both hangars and a limited amount of aircraft parking directly in front of the hangars. Depending on the specific hangar designs and the sizes of aircraft to be hangared, it appears that this area could easily accommodate dozens of large corporate aircraft, or potentially more than 100 large and small “corporate” aircraft. Access to the corporate hangar area is provided by the currently unused section of parallel taxiway located north of Taxiway A. Approximately 300 feet of the inactive runway located immediately north of Taxiway A would be used to access the east end of the hangar row; two additional connections to the Taxiway A and the runway are provided at Taxiway A5 and at the future end of Runway 5.

Landside Development Option 3 – Inactive Runway Area

Landside Development Option 3 (Figure 5-6) locates new landside development along the sides of the inactive north-south runway, which would be converted to an access taxiway. Although the development depicted in this option is designed to accommodate airplane design group II aircraft, the overall clearances along the taxiway (object free area) are increased to accommodate potential use by airplane design group III aircraft.

As depicted, the proposed development includes a 2,300-foot section of taxiway that extends from Taxiway A to near the midpoint of the old runway. This configuration assumes that demand for general aviation hangars would occur relatively early in the planning period and initial taxiway improvements costs could be reduced by locating hangars at the south end of the development area. However, it is also possible to flip the proposed development to locate the general aviation hangars at the north end of the inactive runway and reserve the areas closer to the runway and parallel taxiway for larger, commercial aircraft activities. In this scenario, the initial development of general aviation hangars would require approximately 4,600 feet of taxiway to be extended from Taxiway A to provide access to the development area. It is assumed that the inactive runway pavement (constructed in 1943) will require an overlay during the current



planning period if it is reactivated as a taxiway, consistent with the pavement upgrades that have been conducted on other major taxiways and the runway at Sanderson Field.

As currently depicted, the north section of the inactive runway is identified as taxiway reserve, with commercial aviation related development reserves located on both sides. This development concept has the flexibility to accommodate the construction of a wide variety of conventional hangar sizes and facing the access taxiway.

West Side of Taxiway (Hangar Development)

As depicted, the western side of the access taxiway accommodates an extended row of conventional/executive hangars of varying sizes facing the taxiway. The hangar sites on the west side of the taxiway are located within the existing cleared area, adjacent to the inactive runway. The development area could also be expanded further west to accommodate larger conventional hangars in the adjacent forested area. With approximately 2,100 of taxiway frontage, the development area could accommodate 20 to 30 hangars of varying sizes. A potentially significant drawback with this type of hangar configuration is that the paved connections between individual hangars and the access taxiway are not eligible for FAA funding. By maintaining taxiway setbacks to accommodate large aircraft, the fronts of the hangars would be located approximately 100 feet from the west edge of the access taxiway, which requires long apron connections for each hangar to access the taxiway. There are a variety of other development configurations that could accommodate smaller conventional hangars in different ways. If this development area is included as part of the preferred development alternative, additional refinement of hangar layouts may be required.

The phased development of hangar spaces would be determined by taxiway access and vehicle access improvements. Vehicle access to this area is provided from an existing access road that extends south from West Sanderson Way and parallels the inactive runway, approximately 500 feet west of the original runway centerline. Approximately 2,200 feet of existing road would reach the north end of the hangar development area; a new section of road (approximately 2,200 feet) would be extended into the hangar area from north to south based on demand.

East Side of Taxiway (Hangar and Apron Development)

The proposed development on the east side of the access taxiway includes T-hangar development and space for large and small conventional hangars. Development reserves are identified on the north side of the development area for additional T-hangars and aviation related use. The T-hangar are comparable in size and configuration to the newer T-hangars located adjacent to Taxiway A1. The T-hangar area depicted in this option provides 64 hangar spaces, with an



additional 64 spaces in reserve. As depicted, the hangar rows and hangar taxilanes would have an east-west alignment, with connections to the main access taxiway. An access taxiway connection to Taxiway A is also identified as part of the development reserve.

This option accommodates several conventional hangar sites north of the T-hangar area. These hangars total approximately 78,000 square feet, capable of accommodating 52 to 65 aircraft (based on 1,200 to 1,500 square feet per aircraft). Based on the anticipated commercial use of the hangars, aircraft apron is located in front of the hangars to provide limited parking.

Vehicle access to this area is provided by converting approximately 2,000 feet of the inactive runway to public roadway from West Sanderson Way to the development area. A new section of road (approximately 1,500 feet) would be required to serve the hangar area on the east side of the access taxiway. Alternative surface access to the east side of the inactive runway could be provided through the industrial development areas located northeast of the site.

Large areas of commercial aviation related industrial reserves are located adjacent to the northern section of the inactive runway. The future development of aviation related facilities in this area would require extension of the access taxiway and development of new vehicle access to the development areas located on the east side of inactive runway (south end).

Overview of Development Costs

A summary of the development costs associated with each of the preliminary alternatives is presented in **Table 5-1**. These estimates are intended provide “order of magnitude” costs to enable a comparison among the development options being considered. Additional refinement of cost estimates will be conducted during the preparation of the airport’s updated twenty year capital improvement program.



TABLE 5-1: COMPARISON OF PLANNING LEVEL COST ELEMENTS

Project Elements	Runway-Taxiway Improvements	Landside Option 1 Terminal Area	Landside Option 2 Infield Area	Landside Option 3 Inactive Runway Area
Airfield Paving - runway or parallel and access taxiways (not including development reserve areas)	\$625,000	--	\$470,000	\$360,000
Apron, Hangar Taxilanes (not including development reserve areas)	--	\$625,000	\$2,225,000	\$470,000
Runway/Taxiway Edge Lighting & Signage	\$450,000	--	--	\$90,000
Approach Lighting	\$500,000	--	--	--
Access Roads/Parking	--	\$80,000	\$375,000	\$275,000
Utility Extensions (water, sewer, electrical)	--	\$50,000	\$100,000	\$200,000
Miscellaneous (tree clearing, site preparation, fencing, gate relocations, hangar demo, etc.)	--	\$360,000	\$350,000	\$60,000
Environmental	To be determined	To be determined	To be determined	To be determined
Subtotal	\$1,575,000	\$1,115,000	\$3,520,000	\$1,455,000
40% Contingency, Engineering, and Sales Tax	\$630,000	\$446,000	\$1,480,000	\$582,000
Total	\$2,205,000	\$1,561,000	\$4,928,000	\$2,037,000