

Chapter 6 – 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 Bowers Field is based on maintaining and improving the airport's ability to serve a wide range of general aviation, business aviation, and fire-fighting aircraft. The airport accommodates a wide variety of fixed-wing aircraft and helicopters.

Evaluation Process

Creating preliminary alternatives represents the first step in a multi-step process that leads to the selection of a preferred alternative, which will define the airport's future development needs. The preliminary alternatives are created to respond to defined facility needs, with the goal identifying general preferences for both individual items and the overall concepts being presented. The process allowed a wide range of ideas to be considered and the most effective facility development concept to be defined. All proposed facility improvements were consistent with applicable FAA airport design standards (based on the design aircraft) and FAR Part 77 airspace planning standards.

From this evaluation process, elements of a preferred alternative emerged that effectively accommodated all required facility improvements. Based on the preferences of the airport sponsor (Kittitas County), the Consultant consolidated these elements into a draft preferred alternative that was refined further through the process of finalizing the remaining elements of the airport master plan. Throughout this



process, public input and coordination with the Planning Advisory Committee (PAC), FAA, WSDOT, airport users, and the general public will also help to shape the preferred alternative.

Preferred Development Alternative Summary

The preferred alternative was developed through the evaluation process described above and includes both the preferred airside and landside development. For convenience of the reader, the recommended preferred alternative is summarized at the beginning of chapter. The preliminary alternatives evaluation, the process that was undertaken to get to the preferred alternative, is presented following this section.

The evaluation of the airport development alternatives was organized to first address airside development needs. A primary focus of the airside evaluation was to determine the primary and secondary runway designations and configurations for Bowers Field from both an operational and funding perspective. Taxiway improvement options were also evaluated. Once a preferred airside development option was selected, the evaluation of landside development options was conducted. At the end of the process, the elements of the preferred airside and landside improvements were incorporated into the Airport Layout Plan (ALP) and Terminal Area Plan drawings.

The evaluation of the airfield development options was an interactive process involving the local 12-member project Planning Advisory Committee (PAC), airport users, and the general public. Two PAC meetings were held to discuss preliminary development options. The preliminary alternatives were also presented to FAA. PAC members provided review comments and preferences that were considered by Kittitas County when selecting the preferred alternatives.

In April 2017, the preliminary airside (runway) options were presented to the PAC and the public. The meeting was followed by an extended period of local review, comment, and concept refinements that led to a preliminary preferred airside alternative. The preliminary preferred airside alternative was presented to the PAC in June 2017.

Preliminary landside alternatives were also presented to the PAC at the June 2017 meeting. The alternatives focused primarily on different hangar configuration options for the west and east sections of the terminal area. This meeting was also followed by a period of local review, comment, and concept refinements that led to a preliminary preferred landside alternative by July 2017.

The recommended airside configuration is depicted on **Figure 6.1** and the preferred landside alternative (east and west areas) is depicted on **Figure 6.2**. These concepts were added to the Airport Layout Plan (ALP) and Terminal Area Plan drawings and were subsequently refined through the normal ALP review process.



2018 Update: The decision by Kittitas County in August 2017 to close Runway 7/25 by NOTAM¹ increased the focus and urgency to seek a practical long-term solution to address the deteriorated condition of the closed runway. The master plan's preferred airside alternative recommended that Runway 7/25 be reconfigured to 3,700 x 60 feet in conjunction with its rehabilitation. Century West Engineering prepared cost estimates for three runway rehabilitation options ranging from minor repair (crackfill and sealcoat) to full depth reconstruction.

The master plan also recognized that the runway is not eligible for FAA funding and that other sources of funding would be required to rehabilitate the runway. Central Washington University (CWU) has indicated that Runway 7/25 is vital to their flight training operations at Bowers Field. Ongoing discussions between Kittitas County and CWU include developing a financial plan for rehabilitating Runway 7/25 while also maintaining adequate funds to match the FAA-funded improvements to Runway 11/29 and its new parallel taxiway. The timeline for rehabilitation of Runway 7/25 is entirely dependent on funding, which at this time, remains an unknown. However, the runway rehabilitation project will remain among the short-term priority projects in the master plan capital improvement program (CIP), pending funding.

The loss of Runway 7/25 increased aircraft use of Runway 11/29. As a result, the need for the parallel taxiway increased significantly and the project was elevated ahead of the rehabilitation of Runway 11/29 and the longer-term extension of Runway 11/29. These events were coordinated with FAA in the late summer/early fall 2017 and were addressed in the updated capital improvement program (CIP) project implementation sequence. Based on the effective coordination with Kittitas County leading into the October 5, 2017 Joint Planning Conference (JPC), and the discussion of FAA development priorities during the JPC, the FAA supported initial project implementation in early 2018 while FAA completed its final review of the master plan elements: the Runway 7/25 pavement break (eliminating the intersection with Runway 11/29) and the Environmental Assessment (EA) for projects included in the airport's 5-year CIP.

PREFERRED AIRSIDE DEVELOPMENT

As noted above, the preferred airside development was selected and refined, based on a review of the preliminary development options presented later in the chapter. The basic elements of the preferred airside alternative retain Runway 11/29 as the primary runway at Bowers Field. For planning purposes, Runway 7/25 is maintained as the secondary runway (not eligible for FAA funding) and will be reconfigured to meet Airplane Design Group I (ADG I) standards when funding is obtained.

As noted earlier, Runway 7/25 was closed by airport management in August 2017 based on professional engineering opinions related to its pavement condition, concerns about user safety, and the potential legal liability facing Kittitas County if aircraft operations were allowed to continue on the runway in its seriously deteriorated condition.

¹ NOTAM = Notice to Airmen



Key features of the Preferred Airside Alternative are summarized below:

Runway 11/29 (future 12/30)

- The runway is extended to 5,128 feet. Runway extensions are added at the north end (660 feet) and the south end (167 feet) for a total of 828 feet (project schedule dependent on forecast activity/justification for design aircraft);
- The future Runway Protection Zones (RPZ) for both runway ends are contained entirely on airport property with no incompatible land uses, including roads;
- The runway is narrowed to 75 feet to meet ADG II standards:
 - The excess 75 feet of runway width, consisting of two outer sections (37.5 feet wide each) and the original 1,460-foot stopway at the north end of the runway (original 1943 asphalt pavement) will be removed as part of the runway project;
- The existing runway lighting, airfield signage, visual approach aids, and stormwater drainage system will be replaced as part of the runway rehabilitation;
- The runway will be re-designated “12/30” due to a change in magnetic variation;
- Non-precision instrument markings are recommended for both runway ends;
- A full-length south parallel taxiway is added to Runway 11/29:
 - Four 90-degree connecting taxiways to the runway;
 - The existing angled Taxiway Foxtrot connection to Runway 11/29 will be removed (from the parallel taxiway to the runway);
 - Aircraft hold area added to Runway 29 end (Runway 11 hold area planned for future runway/parallel taxiway extension);
- Taxiway access to the Runway 29 end will be reconfigured in conjunction with the south runway extension to eliminate the existing aligned taxiway;

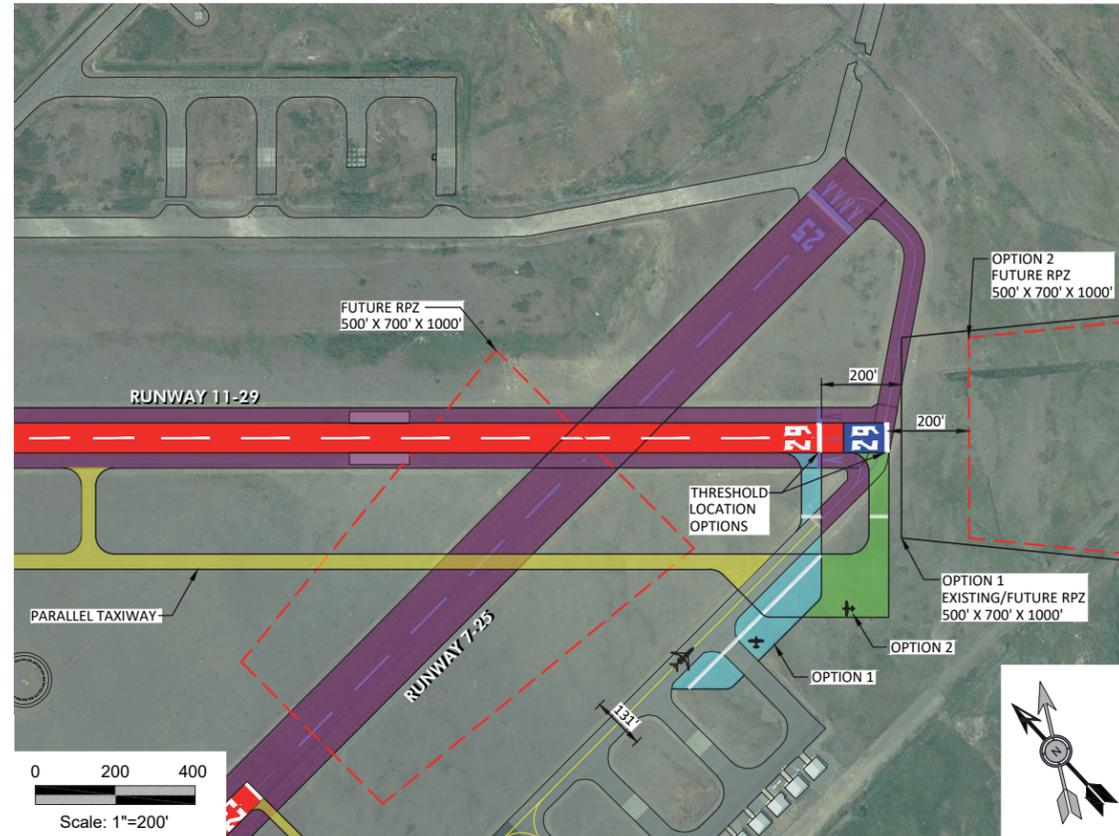
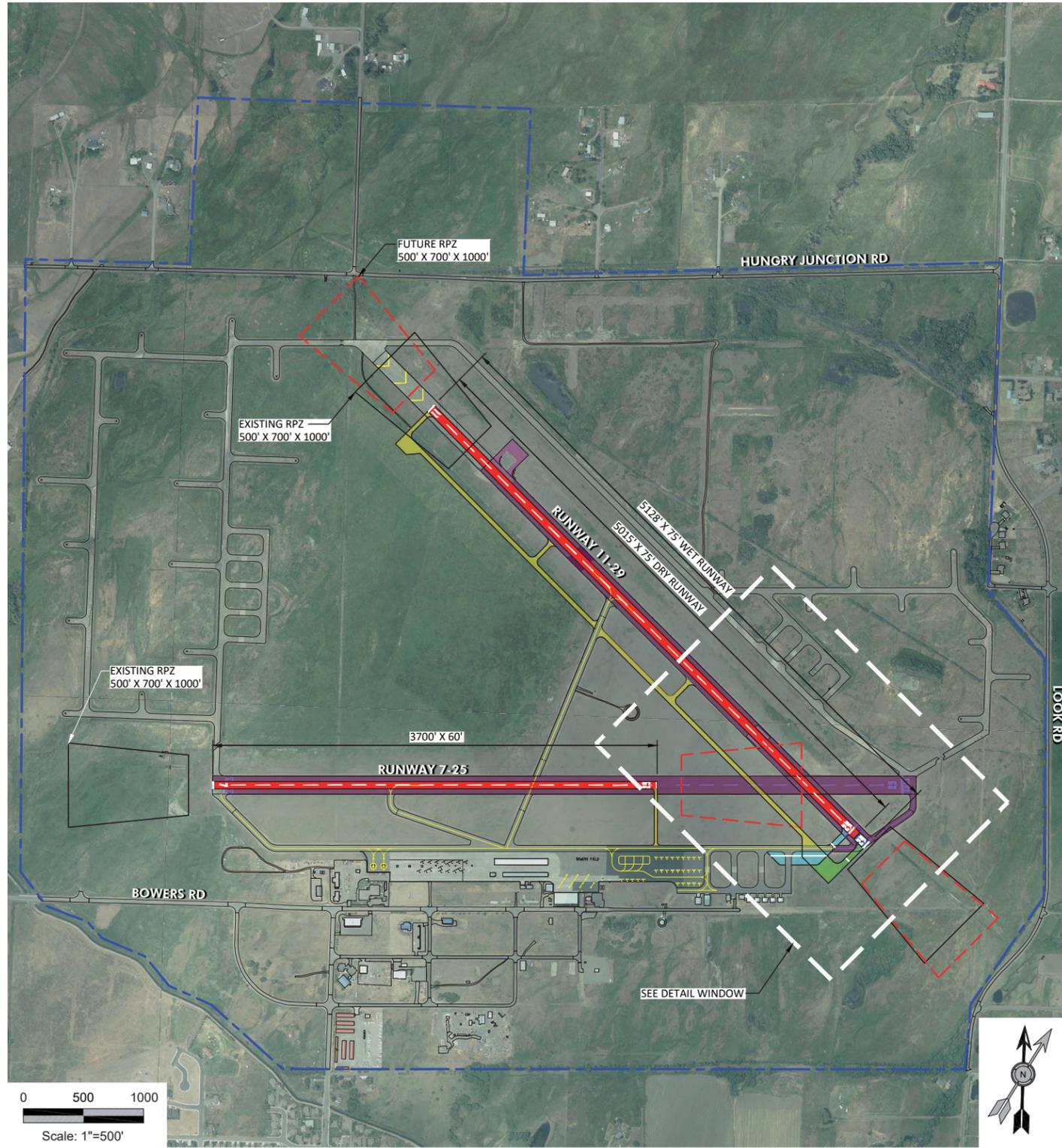
Airspace protections and building setbacks required to accommodate an instrument approach with 1-mile approach visibility minimums on Runway 11/29 will be maintained.



Runway 7/25

Runway 7/25 is reconstructed/reconfigured to 3,700 x 60-feet and shifted to its western end. The existing pavement located east of the future Runway 25 end will be removed to eliminate the runway intersection and the excess pavement created by the runway narrowing is recommended to be removed when the runway is reconstructed. A new 90-degree taxiway connector is required to access the future Runway 25 end from Taxiway Bravo. The aligned taxiway at the Runway 7 end will be eliminated as part of the runway reconfiguration.

2018 Update: The first project related to Runway 7/25 is a pavement break at the east end of the closed runway to eliminate the intersection with Runway 11/29. Taxiway Echo, which connects the Runway 29 and 25 thresholds will also be removed. The pavement removal is consistent with the future configuration of Runway 7/25.



LEGEND	
BUILDING (EXISTING)	
RUNWAY LENGTH (FUTURE)	
PARALLEL TAXIWAY	
TAXIWAY OPTION A	
TAXIWAY OPTION B	
TO BE REMOVED	
AIRPORT PROPERTY LINE	

PREFERRED AIRSIDE ALTERNATIVE
FIGURE 6.1



PREFERRED LANDSIDE DEVELOPMENT

As noted above, the preferred landside development was selected and refined, based on a review of the preliminary development options presented later in the chapter. Infill and incremental expansion of facilities within the existing landside development area on the south side of the airfield is recommended to maximize access to existing utilities, surface access, and security features (controlled access gates, fencing). The recommended west and east landside configurations are depicted in Figure 6.2. As noted earlier, the landside concepts have been incorporated into the Terminal Area Plan drawing with additional refinement (see Chapter 7 for final recommended configuration).

West Landside Area

The west landside area includes lease areas for Central Washington University (CWU) and Washington Department of Natural Resources (DNR), the west apron, and hangars located west of the FBO hangar. The existing CWU and DNR lease areas are assumed to accommodate all future tenant buildings, aircraft parking needs, and vehicle parking. All future development within the DNR and CWU lease areas are subject to applicable county regulations and FAA review through the 7460 (Notice of Proposed Construction) process.

The primary focus of the public use portions of the west landside area is to accommodate hangars and taxilanes for ADG I aircraft. Removal of several existing hangars is planned at the end of their useful lives to allow standard taxilane clearances and accommodate new aeronautical uses. Phasing of new hangar construction may be dictated by the ability to build around existing hangars planned for future removal. Hangar reserve areas are identified for areas with existing hangars. As currently depicted, a north facing 8-unit hangar, hangar access taxilane, and vehicle parking can be constructed without impacting any existing hangars. Subsequent hangar construction requires removal of individual existing hangars.

Key features are summarized below:

- T-hangars and multi-unit hangars (20 new units, plus reserve for 8 units);
- New ADG I taxilane to new hangar sites;
- ADG I taxilane object free area (OFA) clearances (79 feet) for all taxilanes;
- Two ADG I taxilane connections to Taxiway Bravo within the hangar area;
- The existing vehicle gate located west of the FBO hangar is maintained;
- Existing fencing would be relocated (north side of Bowers Road and existing sidewalk);
- Vehicle parking is located along the south side of the new hangar development;



- Two non-aeronautical use building sites with vehicle parking are located adjacent the southeast corner of the CWU lease area (no direct access to apron or taxilanes – optional aeronautical development by CWU or other tenants if apron access is provided);
- Snow storage pad south of the apron to control localized site flooding during snow melt;
- Future DNR helicopter parking pads (within existing lease); and
- CWU Aviation Complex Expansion (TBD).

East Landside Area

The primary focus of the east landside area is to accommodate hangars and taxilanes for ADG I and ADG II aircraft. The east landside area includes the main aircraft parking apron, FBO and storage hangars, and the aircraft fuel island. The 2017 construction of a new FBO hangar near the east end of the main apron will require reconfiguration of adjacent taxilanes to accommodate ADG II aircraft, which will result in the loss of 5 existing tiedowns.

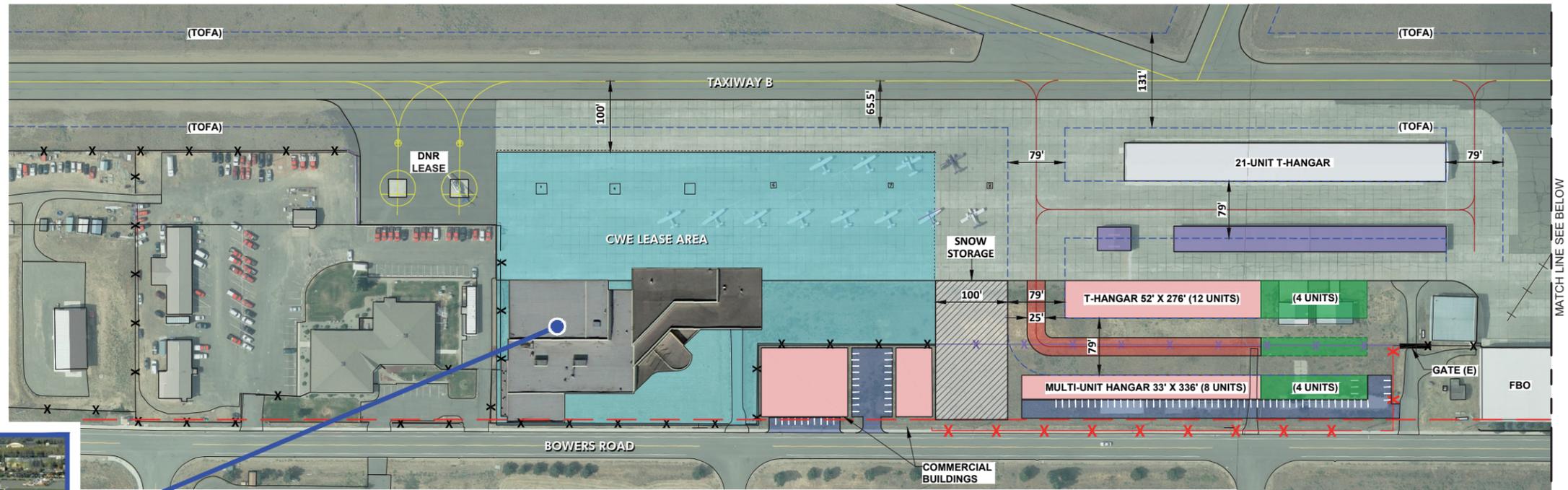
Key features are summarized below:

- Main apron ADG II taxilane reconfiguration (eliminates 11 existing tiedowns at full development);
- Tiedown apron expansion (9 small airplane tiedowns in unpaved cutout immediately east of main apron);
- Large (multi-unit) hangars located south of main apron:
 - 2 large conventional hangars (north facing doors);
 - Typical 3 or 4-unit hangars with interior bays and common roof; and
 - Vehicle parking adjacent to hangars (2 new controlled access gates).
- Infill development - small conventional hangars along east hangar taxilane (3 depicted);
- Additional small hangar development in east unpaved cutouts (11 hangars depicted);
- Snow storage pad south of the main apron to control localized site flooding during snow melt; and
- Pave Bowers Road to the east access gate (future connection to Look Road).

The planned development of an aircraft holding area for Runway 29 adjacent to Taxiway Bravo will require removal of one existing taxilane from the east end of the hangar area to Taxiway Bravo.

LEGEND	
BUILDING (EXISTING)	
BUILDING (FUTURE)	
AIRFIELD PAVEMENT (FUTURE)	
CWU LEASE AREA	
TO BE REMOVED	
VEHICLE PARKING (FUTURE)	
TAXIWAY (RESERVE)	
BUILDING (RESERVE)	
SNOW STORAGE (FUTURE)	
FENCE (EXISTING)	
FENCE (FUTURE)	
TAXIWAY OBJECT FREE AREA (TOFA)	

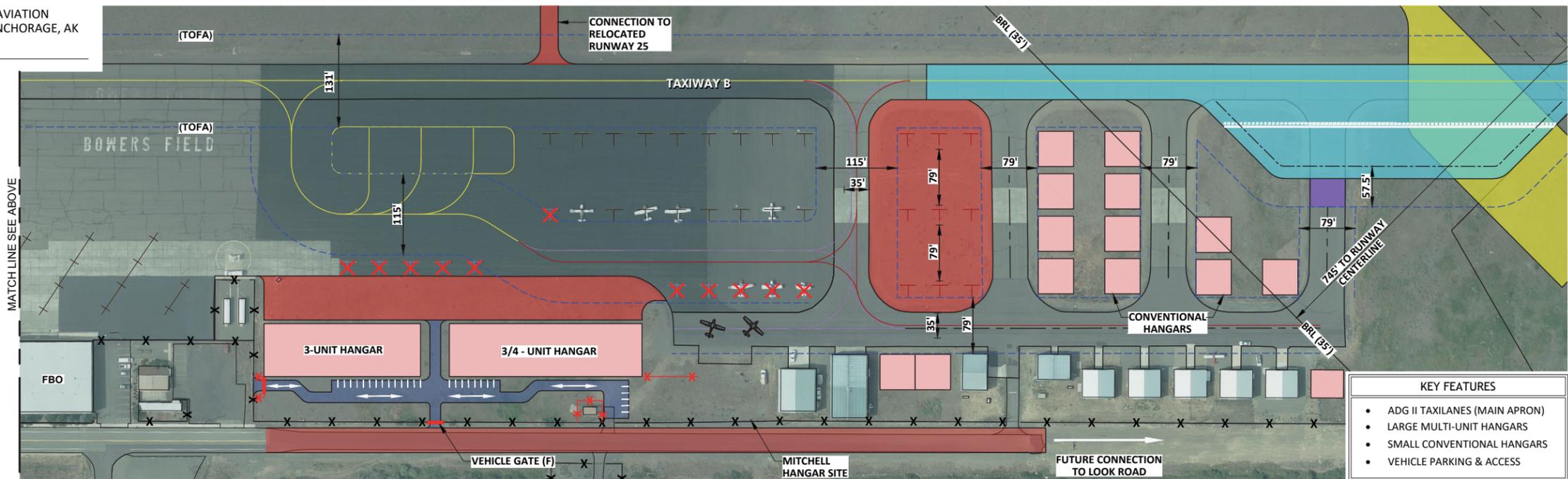
- | KEY FEATURES | |
|--------------|--------------------------------------|
| • | COMMERCIAL HANGAR AREA |
| • | LARGE CONVENTIONAL HANGARS |
| • | VEHICLE PARKING & ACCESS |
| • | EXISTING LONG TERM LEASES UNAFFECTED |



WEST LANDSIDE

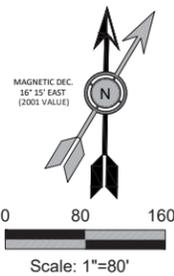


UNIVERSITY OF ALASKA ANCHORAGE AVIATION TECHNOLOGY BUILDING, MERRILL FIELD, ANCHORAGE, AK (EXAMPLE OF CONCEPT)



EAST LANDSIDE

- | KEY FEATURES | |
|--------------|-------------------------------|
| • | ADG II TAXILANES (MAIN APRON) |
| • | LARGE MULTI-UNIT HANGARS |
| • | SMALL CONVENTIONAL HANGARS |
| • | VEHICLE PARKING & ACCESS |



PREFERRED LANDSIDE ALTERNATIVE
FIGURE 6.2



Preliminary Alternatives Assessment

Note: This section was is presented in its original form and has not been updated to reflect any subsequent analyses leading to selection of the preferred airside or landside alternatives.

Unique Circumstances

As noted in the facility requirements chapter, the current master planning evaluation at Bowers Field has been made more complicated by the need to address several design and policy issues raised by FAA since their approval of the previous Airport Layout Plan (ALP) in 2013. These issues affect previously planned airside (runway-taxiway) improvements and they present several unanswered questions affecting future facilities at Bowers Field.

Since the airside issues present numerous design challenges and a multitude of configurational options, it was determined that the most efficient process would be to fully address airside alternatives prior to addressing landside facility options (e.g., hangars, aircraft parking, support facilities, etc.). Once the preferred airside alternative is determined, the evaluation of landside alternatives will be performed, again with preliminary alternatives, then a preferred alternative identified. The evaluation of alternatives will be conducted in two parts:

- Part 1 - Airside Development Alternatives (Runway-Taxiway System)
- Part 2 - Landside Improvement Alternatives (Aprons and Hangar Areas)

Once the overall preferred alternative is selected by the Kittitas County, a detailed capital improvement program will be created that identifies and prioritizes specific projects to be implemented. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the airport.

Part 1 - Airside Development Alternatives

OVERVIEW

The evaluation of airside development alternatives includes three areas of emphasis specifically identified by FAA in the master plan scope of work: **Primary-Secondary Runway Options**; **Confusing Geometry** (intersecting runways); and **Runway Protection Zone (RPZ) Land Use Compatibility Policy**.

The preliminary airside alternatives attempt to provide the runway lengths recommended for the primary and secondary runways in the facility requirements chapter. Unless specific factors require a modification, the primary runway lengths used in planning are 5,015 feet (length needed to accommodate design aircraft in dry conditions) and 5,460 feet (length needed to accommodate design aircraft in wet/slippy conditions). The former is the length for the design aircraft to operate unconstrained in the



most common hot day conditions; the latter is required to compensate for slippery conditions that typically occur in winter conditions. In some of the preliminary alternatives, the full recommended lengths may not be met due to site limitations. The ability to accommodate future runway lengths is also dependent on availability of County and FAA funding. It is important to note that while both extension lengths are justified, the addition of either runway extension will significantly improve operational safety for the design aircraft at Bowers Field.

The 2013 Bowers Field Airfield Needs Assessment study produced a preferred alternative that included a 1,199-foot extension of Runway 11/29 to meet the needs of the design aircraft. Other runway improvements included narrowing, and replacement of lighting systems. A parallel taxiway for Runway 11/29 was also recommended. These improvements are depicted on the current FAA-approved Airport Layout Plan (ALP) drawing for Bowers Field and are currently programmed in the FAA and WSDOT State Capital Improvement Program (SCIP). 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 or modified, if they meet current needs.

The preliminary airside alternatives were developed in schematic form to support the first level of evaluation. This evaluation is used to identify the option or options that appear to best meet the runway requirements identified in the facility requirements chapter. In the event that Kittitas County does not wish to pursue future runway improvements, further supporting documentation would be added to outline ongoing maintenance of existing facilities.

The preliminary airside alternatives include one “no-build” alternative (Alternative 1) and seven “build” alternatives (Alternatives 2-8). Uniform planning criteria is used for the primary and secondary runways in each of the “build” alternatives. Site or other considerations may result in different runway lengths, which are noted when they appear. The “No-Action” alternative maintains existing runway capabilities within the practical limits of maintenance, although this alternative does not address the runway length requirements defined in the facility requirements analysis.

ITEMS OF INTEREST

Runways 11/29 and 7/25 are both 150 feet wide, which exceeds the applicable design standard (75 or 60 feet) for both the primary and secondary runway. A runway narrowing is assumed in all of the alternatives. The narrowing may trigger several other improvements, depending on the runway and its planned use.

Each of the “build” alternatives includes two configurational options (A and B) that address “confusing” runway geometry identified by FAA, which has been attributed to the intersecting runway configuration. The options maintain and eliminate the existing runway intersection. Breaking the existing runway



intersection is the simplest way to address FAA design issues. It is noted that an option to eliminate the runway intersection was also presented in the 2013 Airfield Needs Assessment. It was not selected as the preferred alternative, nor did FAA indicate a preference in its review of the proposed airside alternatives. Maintaining the runway intersection, which has been in place since 1942, with adequate signage and markings to improve pilot situational awareness, also appears to present a reasonable option. The FAA will be asked to provide formal guidance on this issue specific to the conditions at Bowers Field that will be considered in the selection of the preferred alternative by Kittitas County.

Due to a recent change in magnetic variation, Runway 11/29 now needs to re-designated “12/30” to provide the correct magnetic heading reference for pilots. To avoid confusion, the runway will continue to be identified as “11/29” in the alternatives analysis and be updated during the final development of the airport layout plan (ALP) drawing set. The change in runway designation requires replacing the runway end number markings and runway-specific directional signage. These improvements are required for all of the airside alternatives described below, and possibly modified depending on the recommended configuration of Runway 11/29.

PRELIMINARY DEVELOPMENT ALTERNATIVES

The preliminary Airside Development Alternatives are described below with graphic depictions (Figures 6-3 through 6-12) illustrating the key elements of each alternative. The preliminary alternatives are intended to facilitate a discussion and evaluation about the most efficient way to meet the facility needs of the airport. With the exception of the no-action alternative, each of the “build” alternatives provides two options related to the existing intersecting runways. **Option A** maintains the intersecting runway configuration in each alternative; **Option B** eliminates the runway intersection in each alternative.

The alternatives figures are intentionally schematic to address the key configurational issues noted above. The evaluation of the preliminary airside alternatives is intended to narrow the range of options to allow more detailed evaluation and refinement leading to the selection of a preferred alternative. Additional analysis and refinement will be performed on the recommended option, if it is clearly identified, or on the final group of options being considered, if a single option is not clearly identified. The refinement of the runway development concepts will include future taxiway configurations and improvements, as applicable.

It is important to note that the eventual preferred alternative 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. As noted earlier, Kittitas County also has the option of limiting future facility improvements based on financial considerations or development limitations.



NO-BUILD ALTERNATIVE

Airside Alternative 1 (Maintenance Only)

Airside Alternative 1 (see Figure 6-3) is a “no-action” alternative for Bowers Field, which effectively places the airside facilities into a “maintenance only” mode. Existing facilities and equipment would be maintained to the extent feasible with targeted improvements required through normal life cycle maintenance. These would include pavement maintenance, repainting runway/taxiway markings, and replacing lighting and visual navigational aids at the end of their useful life. The current level and eligibility for FAA funding is maintained, although funding allocated to Bowers Field may be forfeited (e.g., reallocated by FAA) in years when specific projects are not identified and funding is due to expire. The maintenance only mode for airside facilities would not necessarily apply to landside facilities, unless specifically selected by Kittitas County.

This alternative does not provide the recommended runway length for the primary runway identified in the facility requirements analysis; the secondary runway is maintained, although its remaining useful life is limited in the maintenance mode due to very poor pavement condition.

Runway 11/29

In this alternative, Runway 11/29 is maintained as the primary runway at its current length of 4,301 feet. The existing 150-foot runway width exceeds the ADG II design standard (75 feet) and the runway would be narrowed as part of its next major maintenance project. The outer 37.5 feet on each side of the runway is constructed of asphalt (original 1942 pavement), which is in poor condition (23/100 PCI predicted in 2017). The inner 75 feet of the runway is constructed of Portland Cement Concrete (PCC) (1997 new pavement), which is in excellent condition (90/100 PCI predicted in 2017). This section of the runway has a useful life that extends beyond the current twenty-year planning period and will require only normal pavement maintenance.

The runway narrowing project assumes replacement of the existing storm drainage system, runway edge lighting, and visual aids (PAPI and REIL on Runway 29), all of which are designed based on the 150-foot runway width. Signage for Runway 11/29 will also require replacement (at end of useful life or sooner due to change runway designation “12/30”).

The FAA typically requires removal of the excess runway pavement at the time of narrowing to eliminate future maintenance issues related to ongoing pavement deterioration (foreign object debris – FOD). The paved overrun located beyond the end of Runway 11 would also be removed as part of the runway safety area re-grading to meet FAA standards.



The timing of the runway narrowing project will dictate whether any interim pavement maintenance (crack filling, sealcoat) on the outer asphalt sections would be effective in preserving pavement condition until the more costly runway improvements are completed.

Future taxiway upgrades (e.g., parallel taxiway, elimination of aligned taxiways, etc.) would be evaluated for the existing runway.

Runway 7/25

In this alternative, Runway 7/25 is maintained at its current length 5,590 feet or any reduced length that could be supported by Kittitas County without FAA funding. As noted in the facility requirements analysis, the current condition of Runway 7/25 indicates a limited remaining operational life without major rehabilitation. The ability to maintain a safe operating surface through minor maintenance (crack filling, sealcoats, etc.) also appears to be limited; rehabilitating at least a portion of the runway is required to maintain some level of runway function. Without significant funding support from WSDOT Aviation or other outside sources (CWU, etc.), it is anticipated that Runway 7/25 would be closed permanently at some point during the current twenty year planning period in this alternative.

The primary elements of **Airside Alternative I** include:

- Runway 11/29 is the primary runway (FAA eligible)
 - Runway is maintained at current length (4,301 feet)
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
- Runway 7/25 is the secondary runway (not FAA eligible)
 - Maintained as feasible; closed if conditions warrant
- The alternative does not provide the primary runway length recommended to accommodate the design aircraft. The airport would continue to operate with constraints for design aircraft in both dry and wet/slippery conditions.

“BUILD ALTERNATIVES” (ALTERNATIVES 2-8)

A series of “build” alternatives (Airside Alternatives 2-8) were developed that address runway improvements in line with the defined facility requirements. The alternatives are summarized below and depicted in Figure 6-4 to Figure 6-12.



Airside Alternative 2

Airside Alternative 2 (see **Figure 6-4**) reflects a modified version of the future runway configuration depicted on the 2013 ALP. In this alternative, Runway 11/29 is the primary runway with extensions at the north end (Runway 11) to provide the “dry” and “wet/slippery” lengths identified in the facility requirements chapter. The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the two length options. The dry runway length (blue) accommodates the design aircraft (multi-engine turboprop/medium business jet) in the most common operating conditions (hot day, summer) found at Bowers Field. The wet/slippery runway length (red) provides additional operating margins for the same aircraft during winter months when runway surface conditions (snow or ice residue) can reduce aircraft performance. Both options improve the ability of the existing 4,301-foot runway to accommodate the design aircraft. This alternative maintains the Runway 29 threshold location in its current location. This alternative requires construction of a parallel taxiway to provide taxiway access the future end of Runway 11.

It is noted that the proposed runway configuration results in the future Runway Protection Zones (RPZ) for Runway 11 extending partially over an adjacent county road (Hungry Junction Road). Consistent with FAA guidance on addressing incompatible land uses within RPZs, this alternative represents the “unmitigated” condition that results in a roadway (deemed to be an incompatible land use by FAA) within the RPZ. The FAA evaluation of Runway/RPZ configurations contains an element of subjectivity that is intended to address site specific conditions and overall feasibility of available options. The other airside alternatives presented in this section mitigate RPZ conditions to varying degrees when addressing proposed runway configurations.

Runway 7/25 is maintained as the secondary runway (3,700 x 60 feet) to accommodate small aircraft. In this alternative, Runway 7/25 is not eligible for FAA funding, and would require local, state, or airport user funding. It is assumed that the runway will require rehabilitation as part of its reconfiguration. The useful life issues noted in Alternative 1 also affect the ability to maintain current use of the runway without interruption.



The primary elements of Airside Alternative 2 include:

- Runway 11/29 is the primary runway (FAA eligible)
 - Runway extended at Runway 11 end (714 feet/445 feet)
 - 5,015 feet/5,460 feet (dry/wet lengths)
 - The outer corner of future Runway 11 RPZs extend over Hungry Junction Road
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
 - Parallel taxiway required to provide access to Runway 11 end
- Runway 7/25 is the secondary runway (not FAA eligible)
 - Reconstructed at 3,700 feet long
 - Runway width would be reduced to 60 feet (A-I Small)
- The alternative provides the primary runway length recommended to accommodate the design aircraft and the existing operational constraints are eliminated.

Airside Alternative 3

Airside Alternative 3 (see Figure 6-5) maintains Runway 11/29 as the primary runway, but limits the north runway extension to 660 feet to avoid Hungry Junction Road entering the future Runway 11 RPZ. The alternative also converts the existing south aligned taxiway (167 feet) into useable runway to offset the reduced extension provided at the Runway 11 end.

The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the lengths associated with “dry” and “wet/slippery” conditions. The proposed configuration provides the defined dry runway length (5,015 feet) but provides 332 feet less than the defined wet runway length. Both options improve the ability of the existing 4,301-foot runway to accommodate the design aircraft, although the wet runway length provided in this alternative is marginally constrained (when measured against the runway length analysis in the facility requirements chapter). This alternative requires construction of a parallel taxiway to provide taxiway access the future end of Runway 11.

Runway 7/25 is maintained as the secondary runway (3,700 x 60 feet) with the same operational and funding issues noted in Alternative 2.



The primary elements of **Airside Alternative 3** include:

- Runway 11/29 is the primary runway (FAA eligible)
 - Runway extended at Runway 11 end (660 feet)
 - Existing aligned taxiway (167 feet) at Runway 29 end is converted to runway (54 feet/113 feet - dry/wet lengths)
 - 5,015 feet/5,128 feet (dry/wet lengths)
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
 - Parallel taxiway required to provide access to Runway 11 end
- Runway 7/25 is the secondary runway (not FAA eligible)
 - Reconstructed at 3,700 feet long
 - Runway width would be reduced to 60 feet (A-I Small)
- The alternative provides the primary runway length required to accommodate the design aircraft on dry runway conditions; the existing operational constraint for wet/slippery runway conditions is partially mitigated, although some operational limits will remain.

Airside Alternative 4

Airside Alternative 4 (see Figure 6-6) maintains Runway 11/29 as the primary runway with runway extensions located at both ends. The runway extensions are limited to keep the future RPZs from crossing existing roads. The north end runway extension (660 feet) is identical to Alternative 3. The south end of the runway includes two elements—converting 167 feet of existing aligned taxiway into runway (as depicted in Alternative 3) and an additional 308 feet of new pavement beyond the existing taxiway. The Runway 29 threshold is relocated approximately 475 feet south of its existing location. The threshold location is determined by the limits of the Runway 29 RPZ (1-mile approach visibility) and the adjacent road (Look Road). The future Runway 29 approach surface (34:1) would clear Look Road by approximately 29 feet, which exceeds the FAR Part 77 standard of 15 feet for vehicles travelling on public roads.

The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the lengths associated with “dry” and “wet/slippery” conditions. The proposed configuration provides the defined dry runway length (5,015 feet) through the north runway extension and reconfiguring existing taxiway pavement. The south runway extension, limited by the RPZ location, provides 24 feet less than the defined wet runway length. Both options improve the ability of the existing 4,301-foot runway to accommodate the design aircraft, although the wet runway length provided in this alternative is marginally constrained (when measured against the runway length analysis in the facility



requirements chapter). This alternative requires construction of a parallel taxiway to provide taxiway access the future end of Runway 11 and Runway 29.

Runway 7/25 is maintained as the secondary runway (3,700 x 60 feet) with the same operational and funding issues noted in **Alternative 2**.

The primary elements of **Airside Alternative 4** include:

- Runway 11/29 is the primary runway (FAA eligible)
 - Extended at Runway 11 end (660 feet)
 - Existing aligned taxiway (167 feet) at Runway 29 end is converted to runway (54 feet/113 feet - dry/wet lengths)
 - Extended at Runway 29 end (308 feet)
 - 5,015 feet/5,436 feet (dry/wet lengths)
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
 - Parallel taxiway required to provide access to Runway 11 and new Runway 29 end
- Runway 7/25 is the secondary runway (not FAA eligible)
 - Reconstructed at 3,700 feet long
 - Runway width would be reduced to 60 feet (A-I Small)
- The alternative provides the primary runway length required to accommodate the design aircraft on dry runway conditions; the existing operational constraint for wet/slippery runway conditions is largely mitigated, although a minor operational limits will remain.

Airside Alternative 5

Airside Alternative 5 (see **Figure 6-7**) maintains Runway 11/29 as the primary runway, and combines the north 714-foot runway extension proposed in **Alternative 2** with an additional north runway extension (445 feet) to provide the “dry” and “wet/slippery” lengths. The south taxiway conversion (167 feet) proposed in **Alternative 3** is also included in this option to provide the “dry” lengths.

To address FAA RPZ land use policy, this alternative realigns Hungry Junction Road outside the future RPZs for Runway 11. County road design standards were used to conceptually define the roadway alignment. The realigned roadway is contained entirely within airport property on the north side of Hungry Junction Road. The existing Hungry Junction Road-Tipton Road connection would be relocated approximately 400 feet north, near the apex of the realigned curved roadway section.



The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the lengths associated with “dry” and “wet/slippery” conditions. The proposed configuration provides the defined dry and wet/slippery runway lengths (5,015/5,460 feet) through the north runway extensions and reconfiguring existing taxiway pavement. Both options improve the ability of the existing 4,301-foot runway to accommodate the design aircraft. This alternative requires construction of a parallel taxiway to provide taxiway access the future end of Runway 11 and Runway 29.

Runway 7/25 is maintained as the secondary runway (3,700 x 60 feet) with the same operational and funding issues noted in **Alternative 2**.

The primary elements of **Airside Alternative 5** include:

- Runway 11/29 is the primary runway (FAA eligible)
 - Extended at Runway 11 end (547- and 445-foot extension options)
 - Existing aligned taxiway (167 feet) at Runway 29 end is converted to runway (dry length)
 - 5,015 feet/5,460 feet (dry/wet lengths)
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
 - Parallel taxiway required to provide access to Runway 11 end
- Hungry Junction Road realigned to avoid future Runway 11 RPZ
- Runway 7/25 is the secondary runway (not FAA eligible)
 - Reconstructed at 3,700 feet long
 - Runway width would be reduced to 60 feet (A-I Small)
- The alternative provides the primary runway length required to accommodate the design aircraft on dry and wet/slippery runway conditions; the existing operational constraints are eliminated in this alternative.

Airside Alternative 6

Airside Alternative 6 (see **Figure 6-8**) is a modified version of the previously recommended upgrade in instrument approach capabilities for Runway 29. This alternative accommodates an upgrade to ¾-mile approach visibility minimums to Runway 29, which requires a larger RPZ. The previously recommended upgrade (as depicted on the 2013 ALP drawing) resulted in the future RPZ extending off airport property and over a public roadway (Look Road). As noted earlier, the FAA RPZ land use policy now discourages incompatible land uses, including roads being located in an RPZ.



To address this policy and maintain the previous recommendation to upgrade approach visibility minimums, the Runway 29 threshold is displaced 390 feet north of its existing threshold location and combined with runway extensions at both ends (limited by RPZ placements). The north end runway extension (660 feet) is identical to Alternative 3. The south end extension (308 feet of new pavement) is combined with converting 167 feet of existing aligned taxiway into runway. This configuration is identical to the south extension depicted in Alternative 4, which is also limited by RPZ clearance. In this alternative however, the south RPZ limit is based on the future departure RPZ for Runway 11 (located at the Runway 29 end).

In its future configuration, the Runway 29 threshold is displaced 863 feet from the future runway end, which reduces the amount of runway available for landing to 4,571 feet. The full runway length (5,434 feet) is available for takeoff on Runway 29, and for both takeoff and landing on Runway 11.

The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the lengths associated with “dry” and “wet/slippery” conditions. The proposed configuration provides the defined dry runway length (5,015 feet) through the north runway extension and reconfiguring a portion of the existing taxiway pavement.

The runway extensions, which are limited by the future RPZ locations, provides 24 feet less than the defined wet runway length and the use of a displaced threshold on Runway 29 reduces available runway length for landing. However, both options improve the ability of the existing 4,301-foot runway to accommodate the design aircraft, although the wet runway length provided in this alternative is marginally constrained (when measured against the runway length analysis in the facility requirements chapter). This alternative requires construction of a parallel taxiway to provide taxiway access the future end of Runway 11 and Runway 29.

Runway 7/25 is maintained as the secondary runway (3,700 x 60 feet) with the same operational and funding issues noted in **Alternative 2**.



The primary elements of Airside Alternative 6 include:

- Runway 11/29 is the primary runway (FAA eligible)
 - Extended at Runway 11 end (660 feet)
 - Existing aligned taxiway (167 feet) at Runway 29 end is converted to runway (54 feet/113 feet - dry/wet lengths)
 - Extended at Runway 29 end (308 feet)
 - 5,015 feet/5,436 feet (dry/wet lengths)
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIREL, replace PAPI and REIL
 - Runway 29 instrument approach visibility minimums reduced to 3/4-mile, which requires larger future RPZ and 1,000 foot wide runway primary surface and increased building and aircraft parking setbacks
 - A 863-foot displaced threshold is added to Runway 29 to mitigate future RPZ road conflict
 - Parallel taxiway required to provide access to Runway 11 and new Runway 29 end
- Runway 7/25 is the secondary runway (not FAA eligible)
 - Reconstructed at 3,700 feet long
 - Runway width would be reduced to 60 feet (A-I Small)
- The alternative provides the primary runway length required to accommodate the design aircraft on dry runway conditions; the existing operational constraint for wet/slippery runway conditions is largely mitigated, although a minor operational limits will remain.

Airside Alternative 7

Airside Alternative 7 (see Figure 6-9) applies the primary runway designation and planning criteria to Runway 7/25. In this alternative, the Runway 7 threshold location is maintained in its current location and the Runway 25 threshold is relocated west. Runway 11/29 is designated as the crosswind runway (required for both large and small aircraft).

The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the lengths associated with “dry” and “wet/slippery” conditions. The proposed configuration provides the defined dry and wet/slippery lengths (5,015/5,460 feet) for the primary runway.

As with the other “build” alternatives, options are depicted for maintaining and eliminating the existing intersecting runway configuration. If the existing runway intersection is maintained, Runway 11/29 is



maintained at its current length 4,301 feet. The option for eliminating the existing runway intersection requires relocating the Runway 29 threshold 1,195 feet north, and adding 594 feet at the north end to provide the recommended 3,700 feet for the secondary/crosswind runway length. The relocation for the Runway 29 threshold is determined by independently clearing the runway safety areas for both runways.

A primary advantage of this alternative is the existing full length parallel taxiway serving Runway 7/25. Future taxiway access to Runway 11 would become a lower priority as a crosswind runway. Based on wind coverage of the primary runway, Runway 11/20 would meet the FAA eligibility criteria for funding, although FAA priorities may affect the ability to support both runways.

Runway 11/29 is maintained as the crosswind runway, either at its current length or reduced to 3,700 feet if the existing runway intersection is eliminated. In this alternative, the crosswind runway has the same design aircraft (ADG II) as the primary runway and will be planned based on the ARC B-II standards that are currently applied to the runway. A future runway width of 75 feet is recommended.

The primary elements of **Airside Alternative 7** include:

- Runway 7/25 is the primary runway (FAA eligible)
 - Full reconstruction required
 - 5,015 feet/5,460 feet (dry/wet lengths)
 - Maintains existing Runway 25 threshold location
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
 - Modified taxiway connections to existing full length parallel
- Runway 11/29 is the secondary runway (FAA eligible)
 - Maintained at current 4,301-foot length or reconfigured to 3,700 feet long, depending on runway intersection evaluation
 - Runway width reduced to 75 feet (B-II)
- The alternative provides the primary runway length recommended to accommodate the design aircraft on dry and wet/slippery runway conditions; the existing operational constraints are eliminated.

Airside Alternative 8

Airside Alternative 8 (see Figure 6-10) provides the same future primary and secondary runway lengths and features as Alternative 7, although in this alternative, the Runway 7 (west end) threshold location is



maintained, which shifts the Runway 25 end west, in both the dry and wet/slippery runway length configuration.

The proposed runway extensions are depicted separately (blue and red) to illustrate the incremental difference between the lengths associated with “dry” and “wet/slippery” conditions. The proposed configuration provides the defined dry and wet/slippery lengths (5,015/5,460 feet) for the primary runway.

The primary elements of **Airside Alternative 8** include:

- Runway 7/25 is the primary runway (FAA eligible)
 - Full reconstruction required
 - 5,015 feet/5,460 feet (dry/wet lengths)
 - Maintains existing Runway 7 threshold location
 - Runway width reduced to 75 feet (B-II)
 - Requires new/modified storm drainage system
 - Requires new MIRL, replace PAPI and REIL
 - Modified taxiway connections to existing full length parallel
- Runway 11/29 is the secondary runway (FAA eligible)
 - Maintained at current 4,301-foot length or reconfigured to 3,700 feet long, depending on runway intersection evaluation
 - Runway width reduced to 75 feet (B-II)
- The alternative provides the primary runway length recommended to accommodate the design aircraft on dry and wet/slippery runway conditions; the existing operational constraints are eliminated.

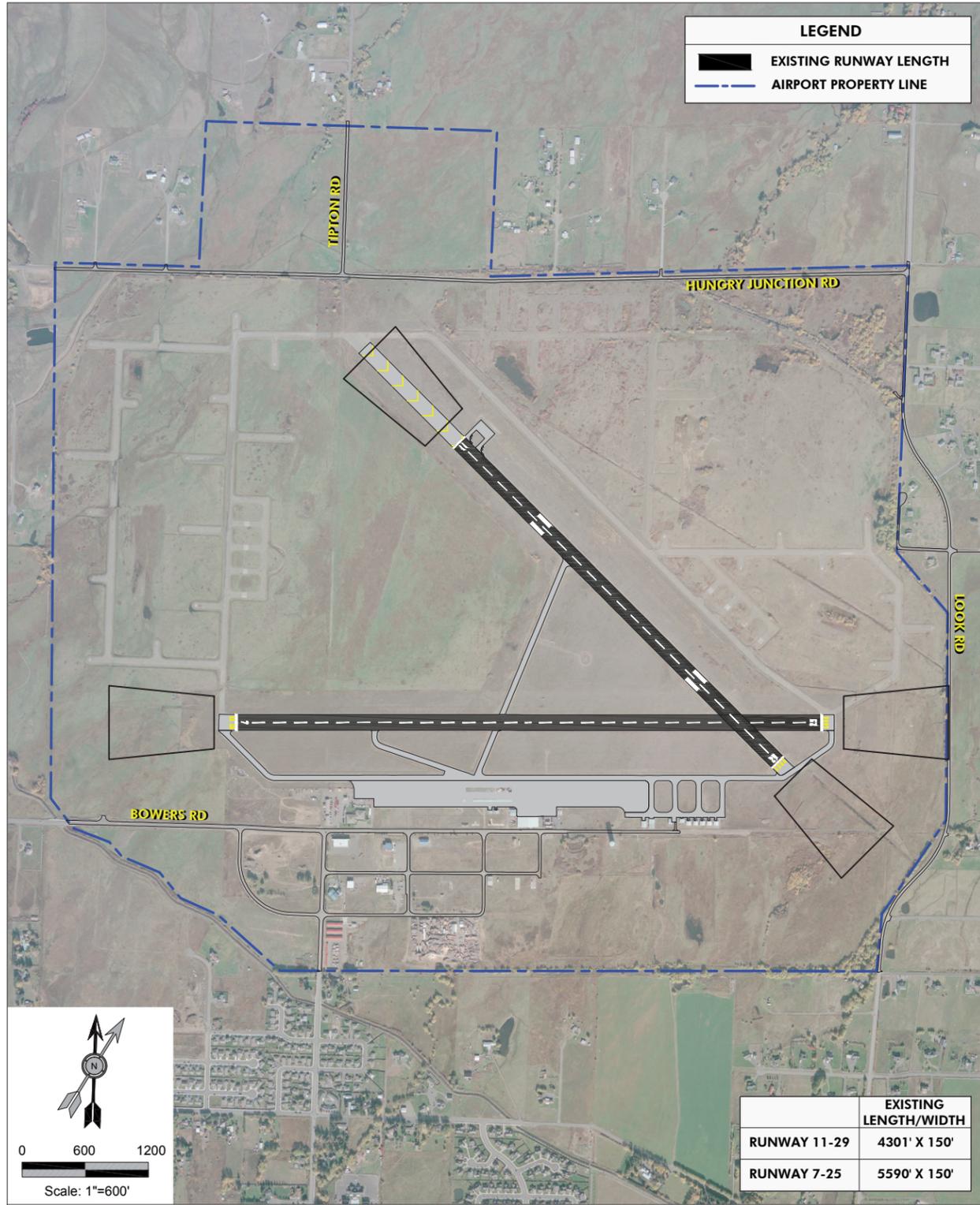


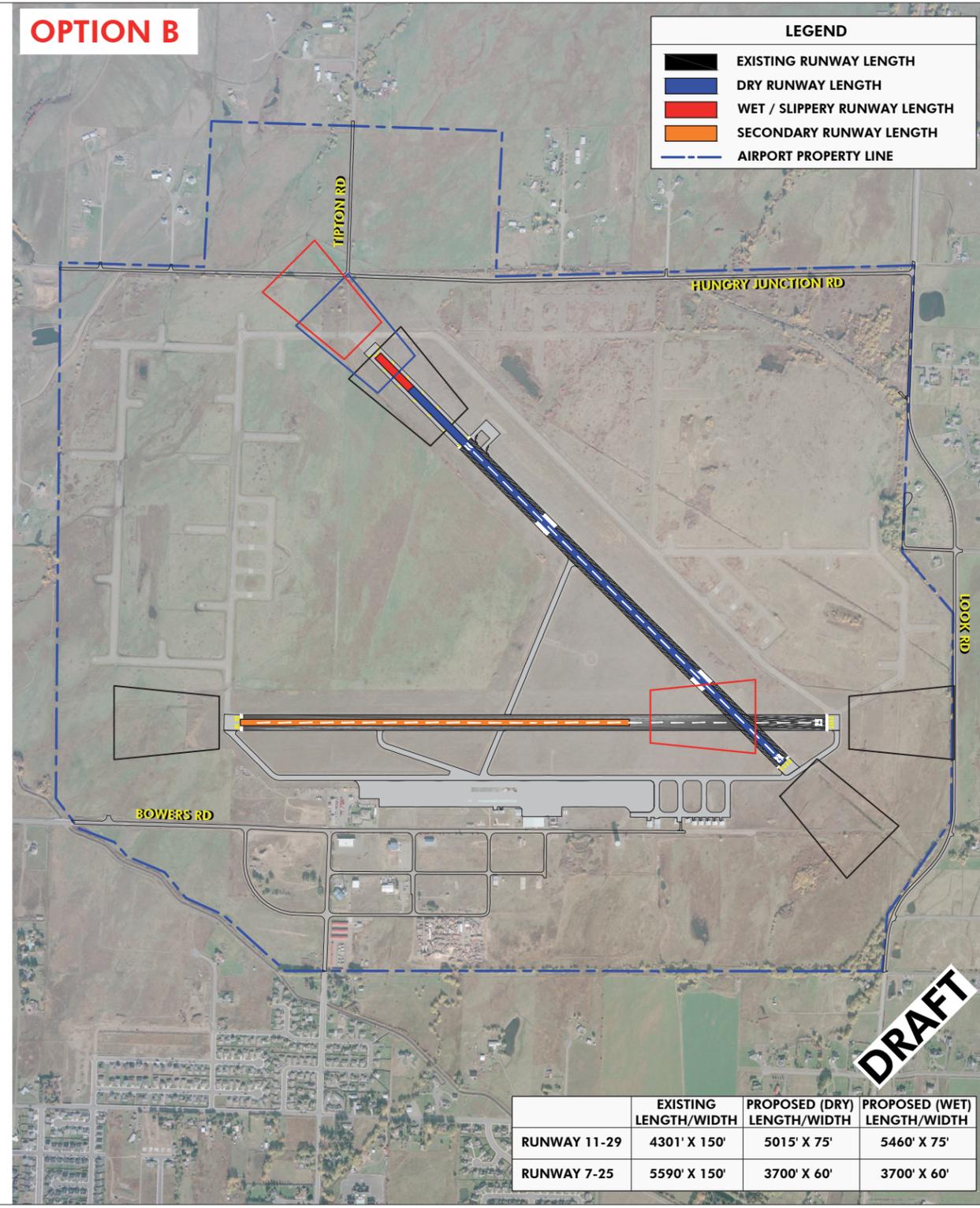
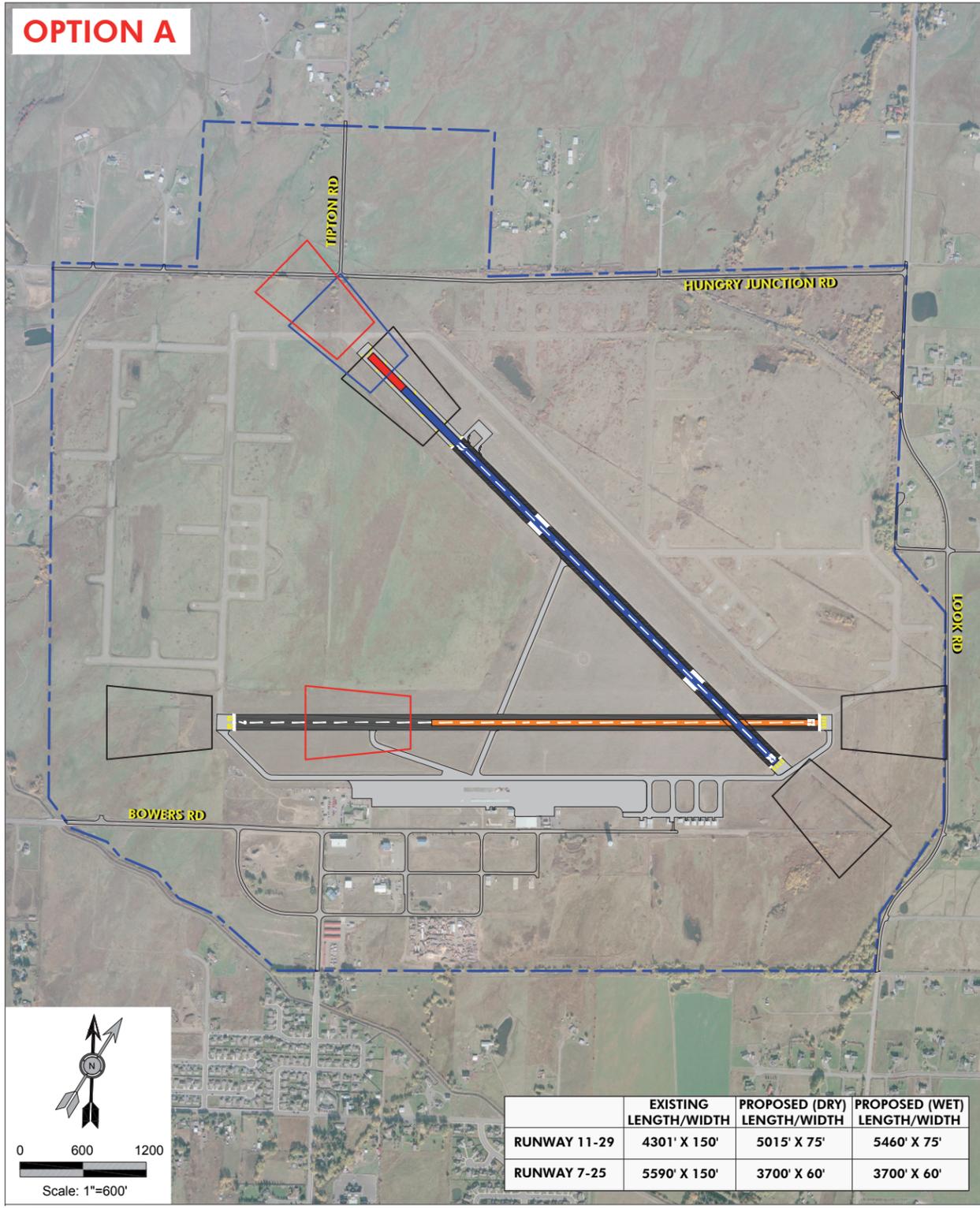
TABLE 6-1: COMPARISON OF ALTERNATIVES

AIRSIDE ALTERNATIVES	1	2	3	4	5	6	7	8
	YES/NO							
Meets Primary Runway Length for Dry Runway (5,015 feet)	No	Yes						
Meets Primary Runway Length for Wet Runway (5,460 feet)	No	Yes	No	No	Yes	No	Yes	Yes
Requires Crosswind Runway (FAA eligible)	No	No	No	No	Yes	No	Yes	Yes
Eliminates Runway Intersection	No/ Yes*	Yes/ No						
Meets RPZ Policy for Incompatible Land Uses (Roads in RPZs, Property Control)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Requires a Road Realignment to Clear RPZ	No	No	No	No	Yes	No	No	No
Accommodates Larger RPZ (3/4-mile Approach Visibility) with FAA RPZ Policy	No	No	No	No	No	Yes	No	No
Requires a Displaced Threshold & Declared Distances	No	No	No	No	No	Yes	No	No
Requires Construction of Parallel Taxiway	No	Yes	Yes	Yes	Yes	Yes	No	No

* Yes – if Runway 7/25 is closed permanently

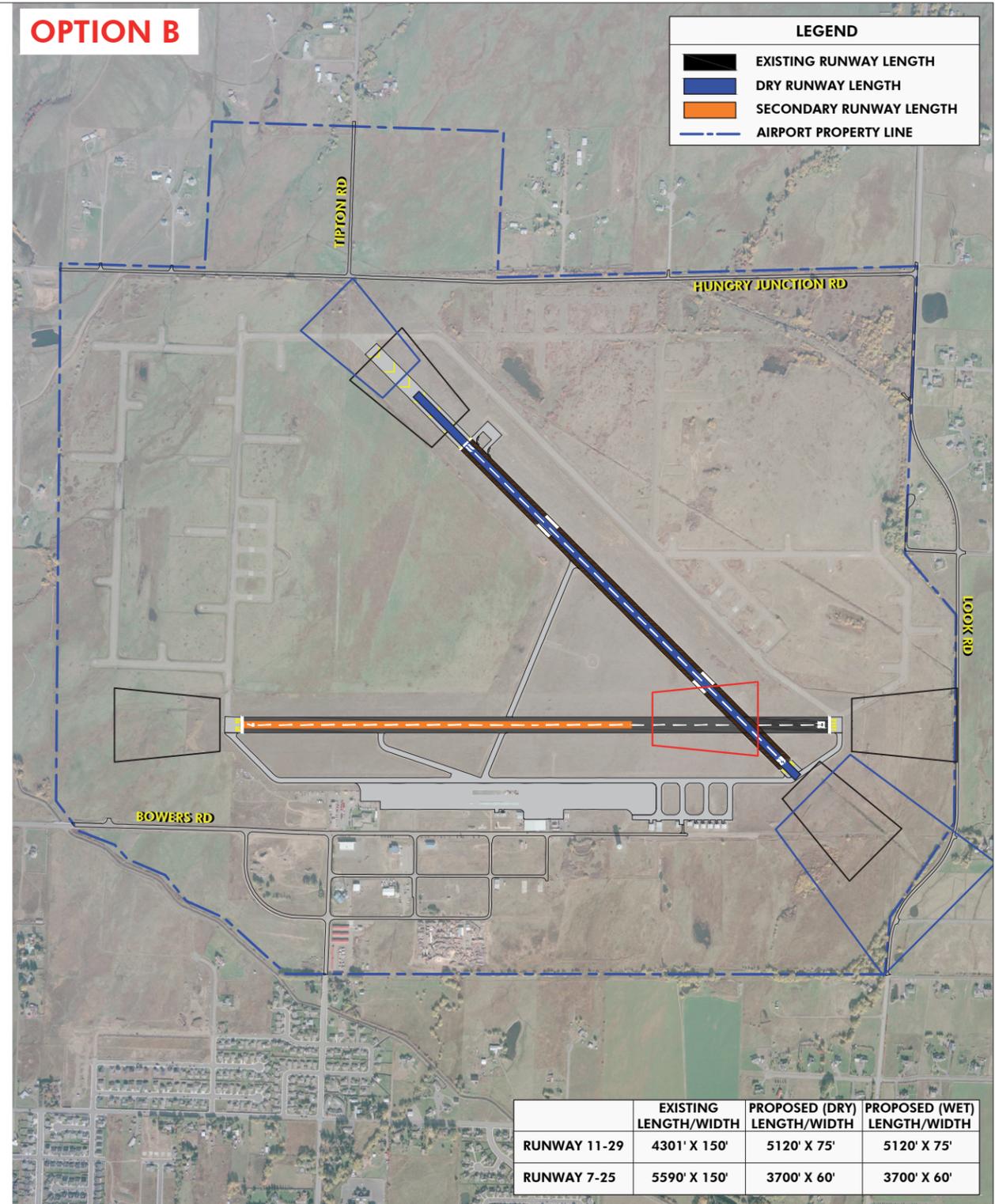
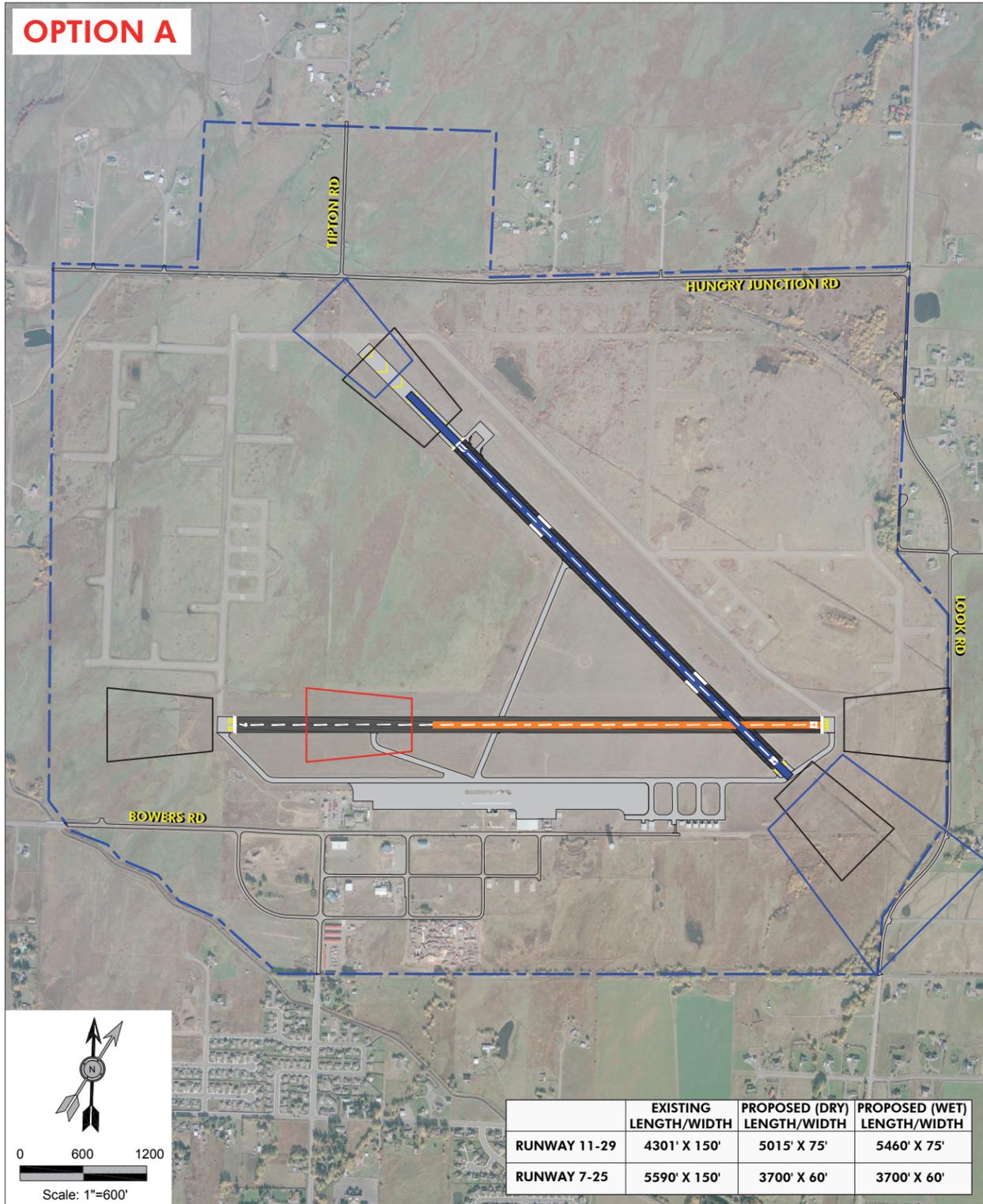
Preliminary project cost estimates were created for each alternative for use in comparing the alternatives. The cost estimates were later refined for the preferred airside and landside alternatives and included in the Capital Improvement Plan (CIP). The preliminary engineering cost estimates and analysis are included in Appendix E.





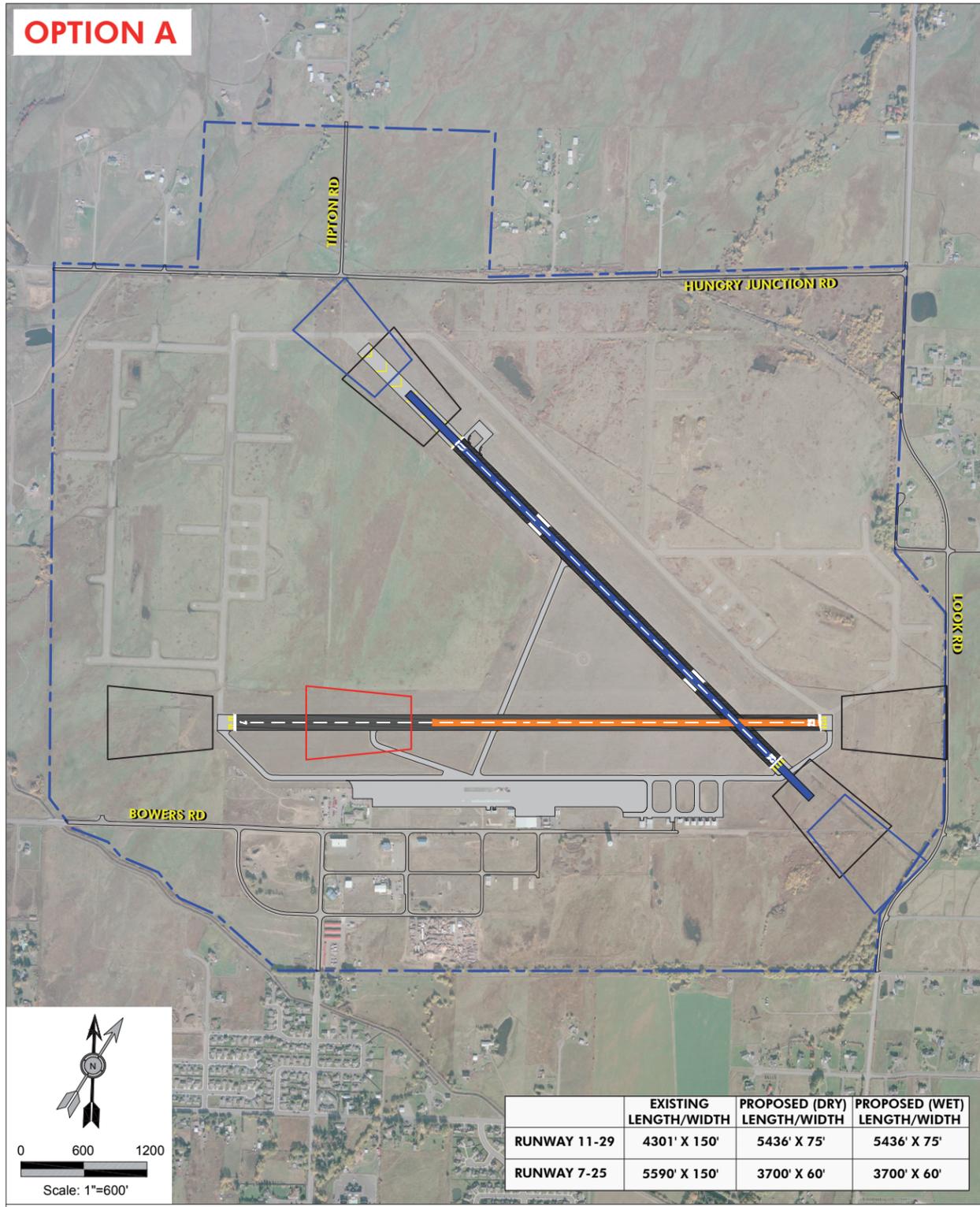
DRAFT

PRELIMINARY AIRSIDE ALTERNATIVE 2
FIGURE 6.4

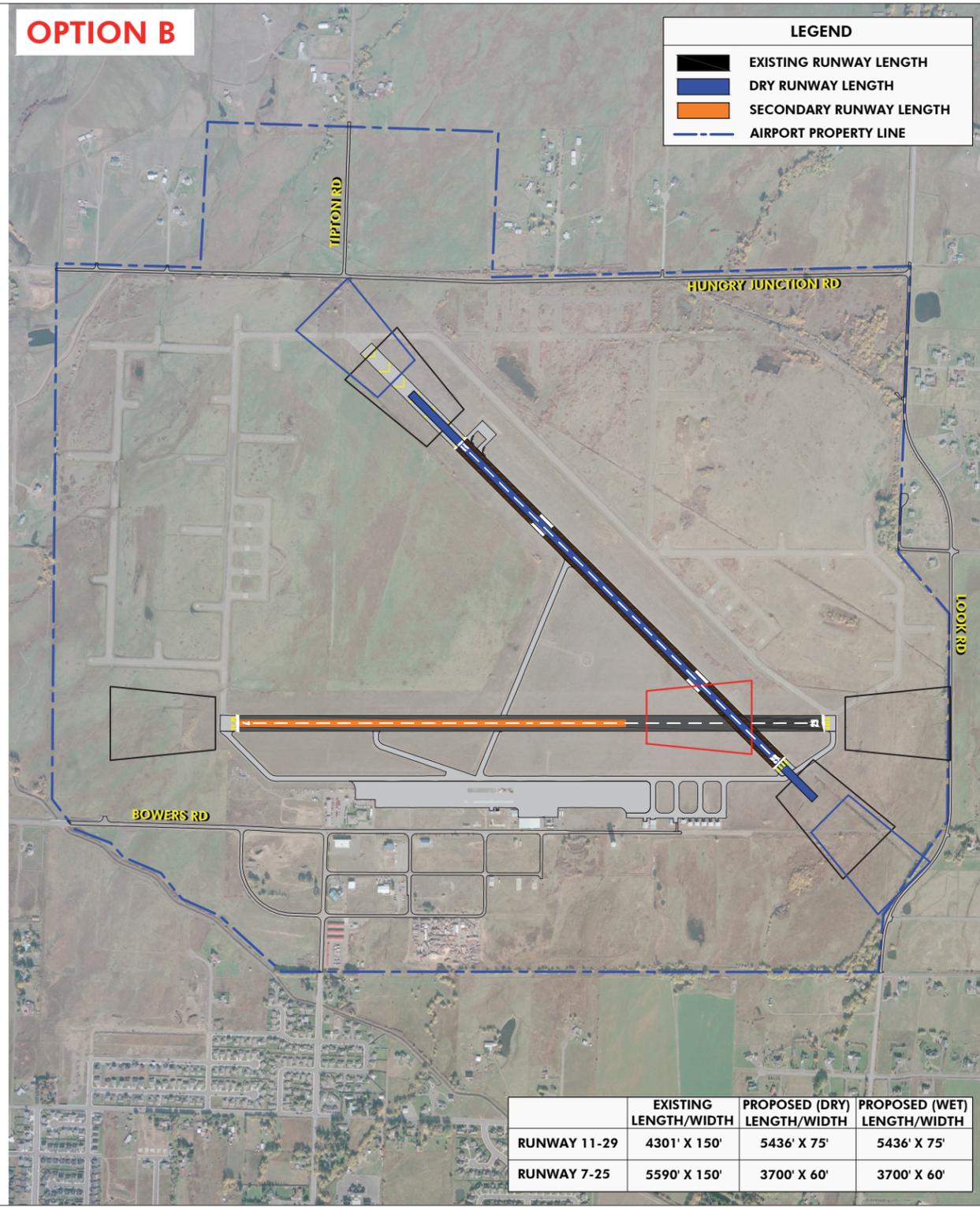


PRELIMINARY AIRSIDE ALTERNATIVE 3
FIGURE 6.5

OPTION A

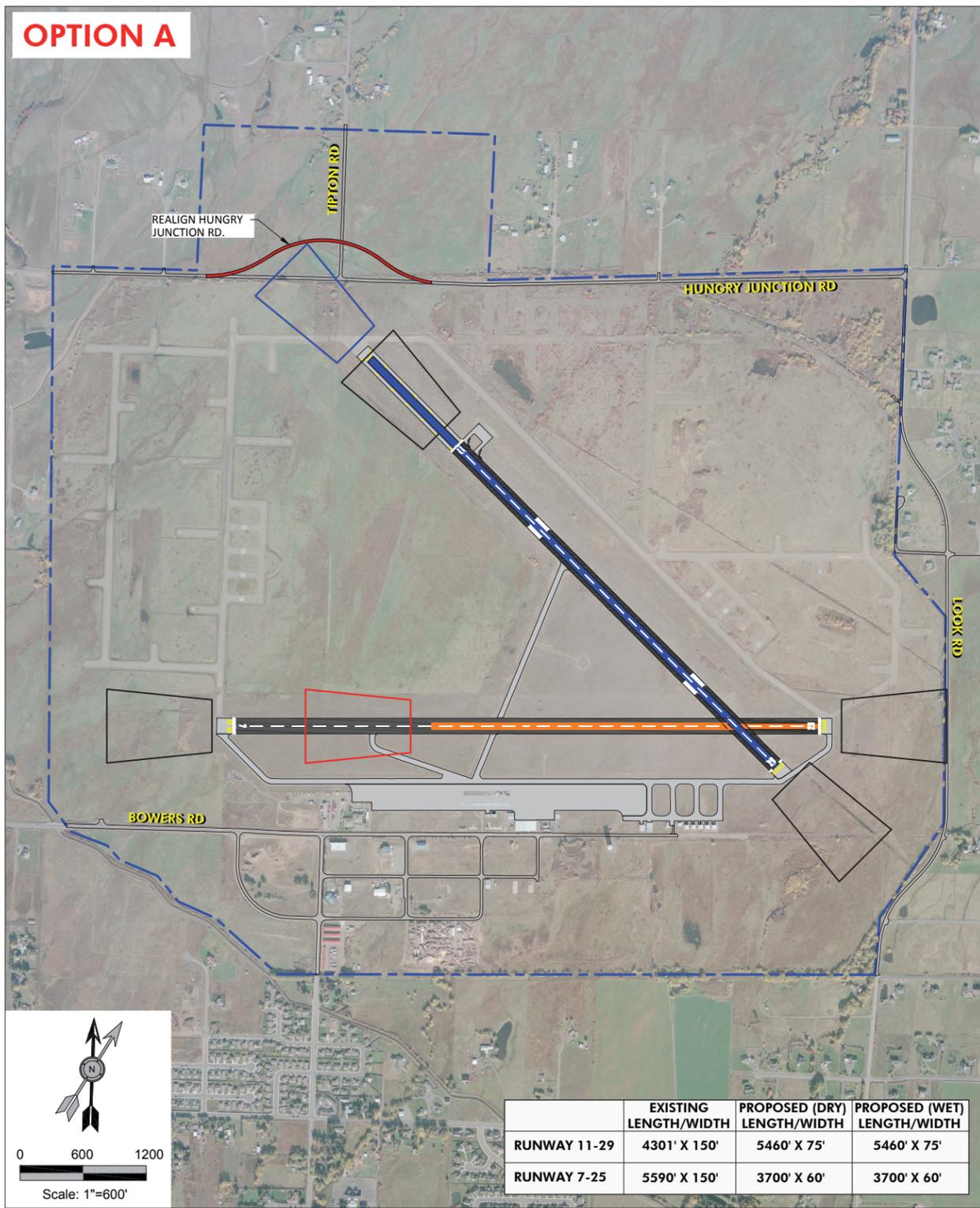


OPTION B



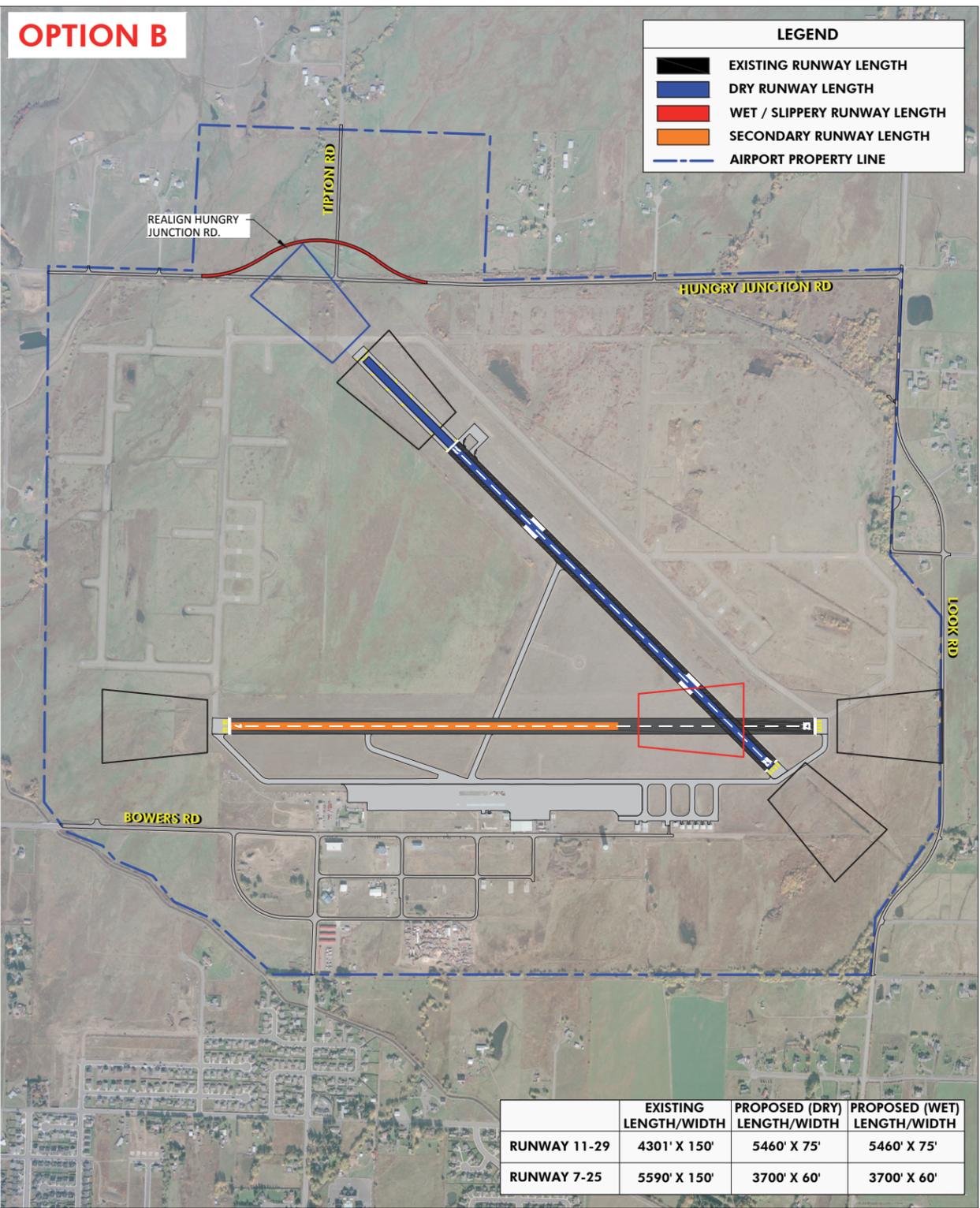
PRELIMINARY AIRSIDE ALTERNATIVE 4
FIGURE 6.6

OPTION A



	EXISTING LENGTH/WIDTH	PROPOSED (DRY) LENGTH/WIDTH	PROPOSED (WET) LENGTH/WIDTH
RUNWAY 11-29	4301' X 150'	5460' X 75'	5460' X 75'
RUNWAY 7-25	5590' X 150'	3700' X 60'	3700' X 60'

OPTION B

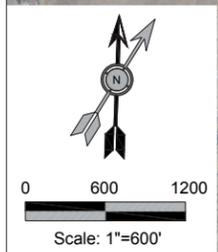
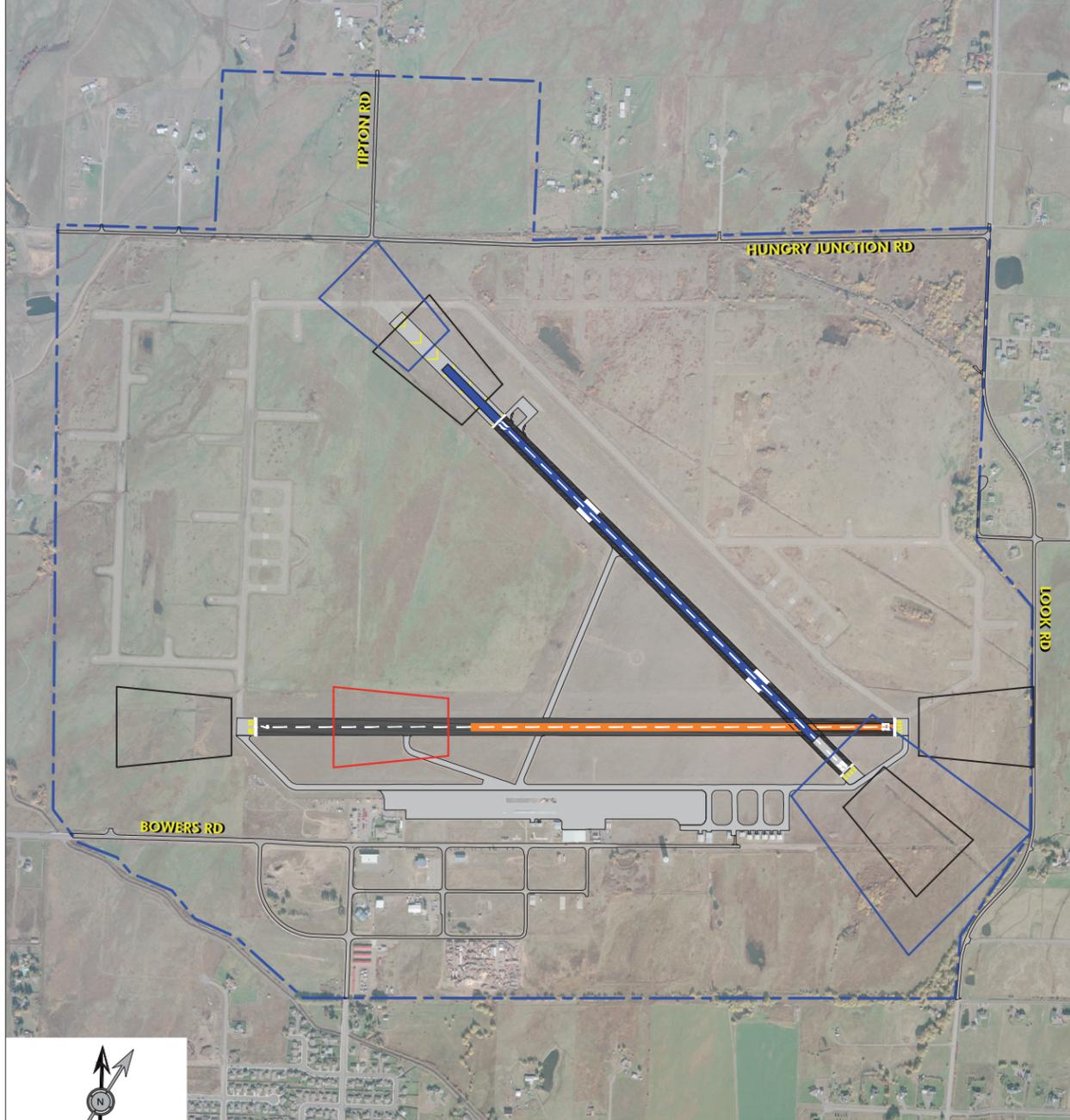


LEGEND

- EXISTING RUNWAY LENGTH
- DRY RUNWAY LENGTH
- WET / SLIPPERY RUNWAY LENGTH
- SECONDARY RUNWAY LENGTH
- AIRPORT PROPERTY LINE

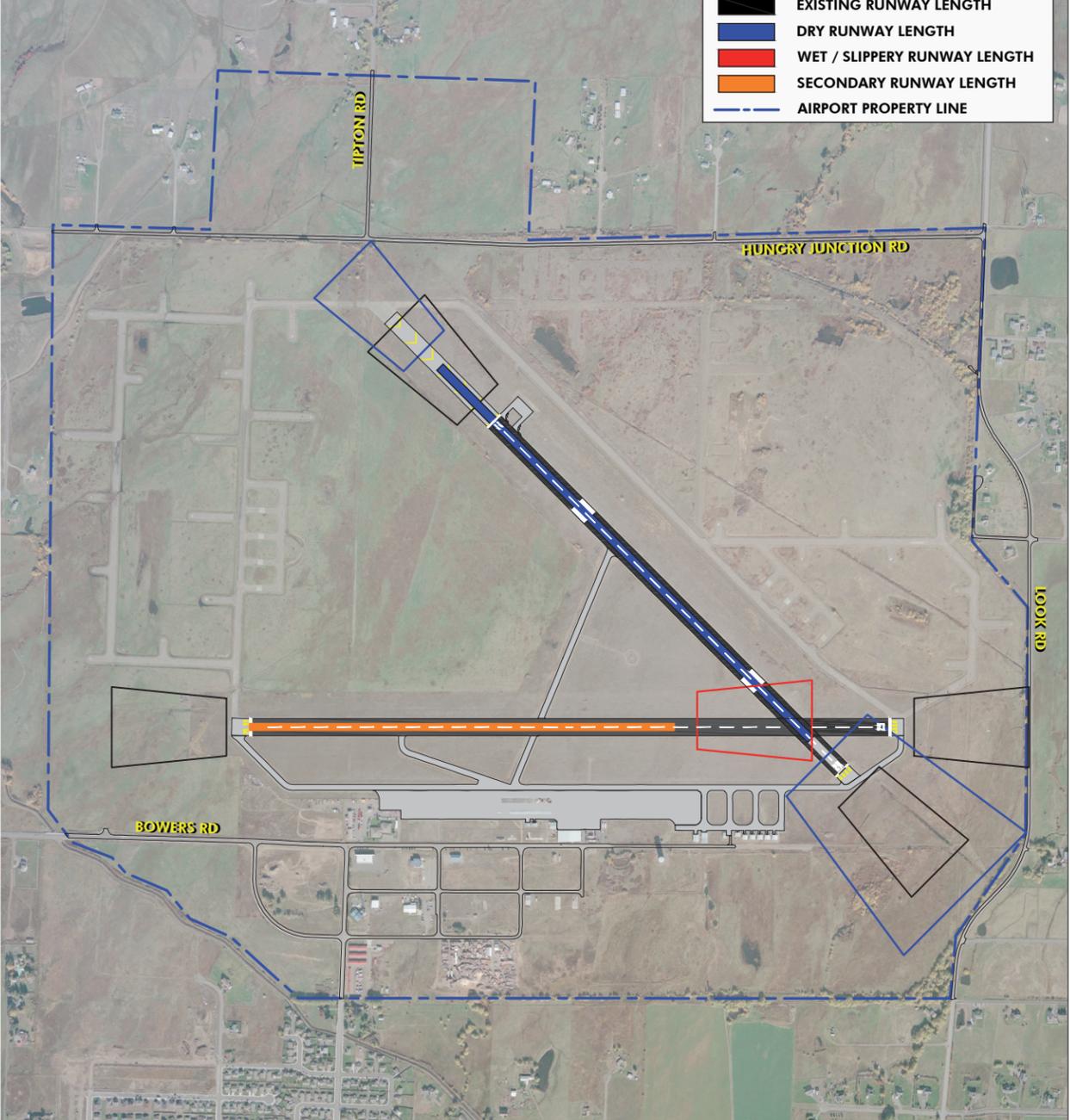
	EXISTING LENGTH/WIDTH	PROPOSED (DRY) LENGTH/WIDTH	PROPOSED (WET) LENGTH/WIDTH
RUNWAY 11-29	4301' X 150'	5460' X 75'	5460' X 75'
RUNWAY 7-25	5590' X 150'	3700' X 60'	3700' X 60'

OPTION A



	EXISTING LENGTH/WIDTH	PROPOSED (DRY) LENGTH/WIDTH	PROPOSED (WET) LENGTH/WIDTH
RUNWAY 11-29	4301' X 150'	4571' X 75'	4571' X 75'
RUNWAY 7-25	5590' X 150'	3700' X 60'	3700' X 60'

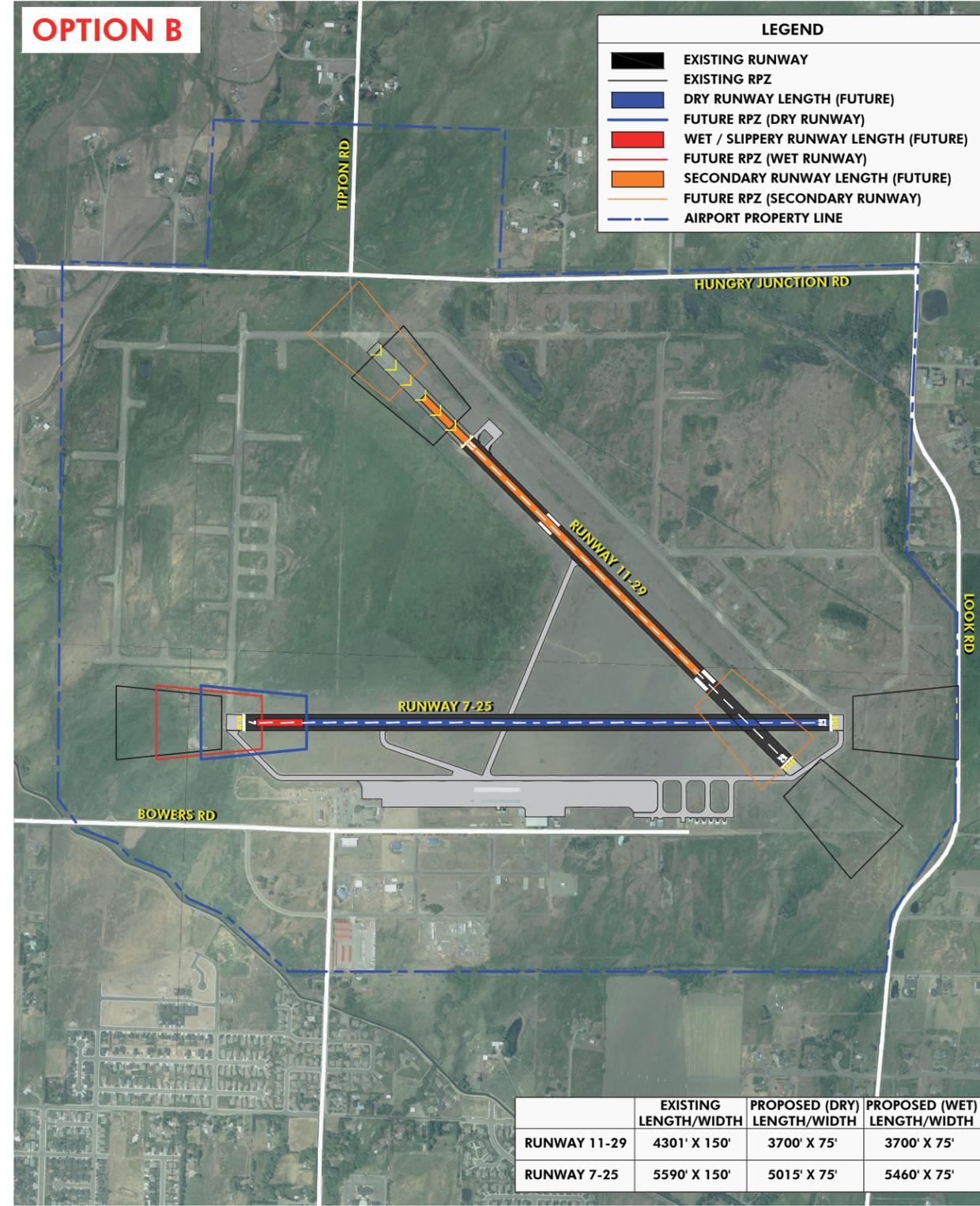
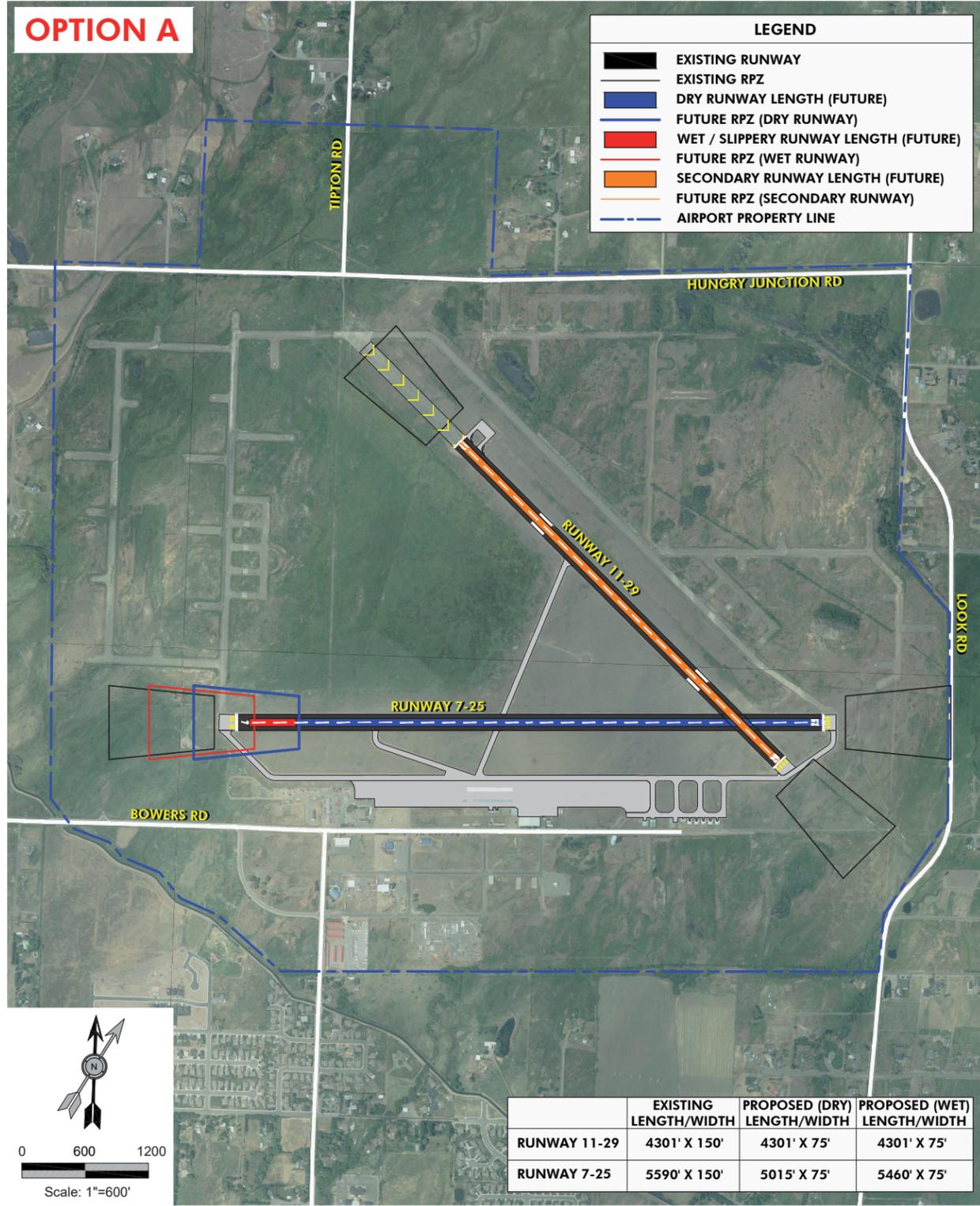
OPTION B



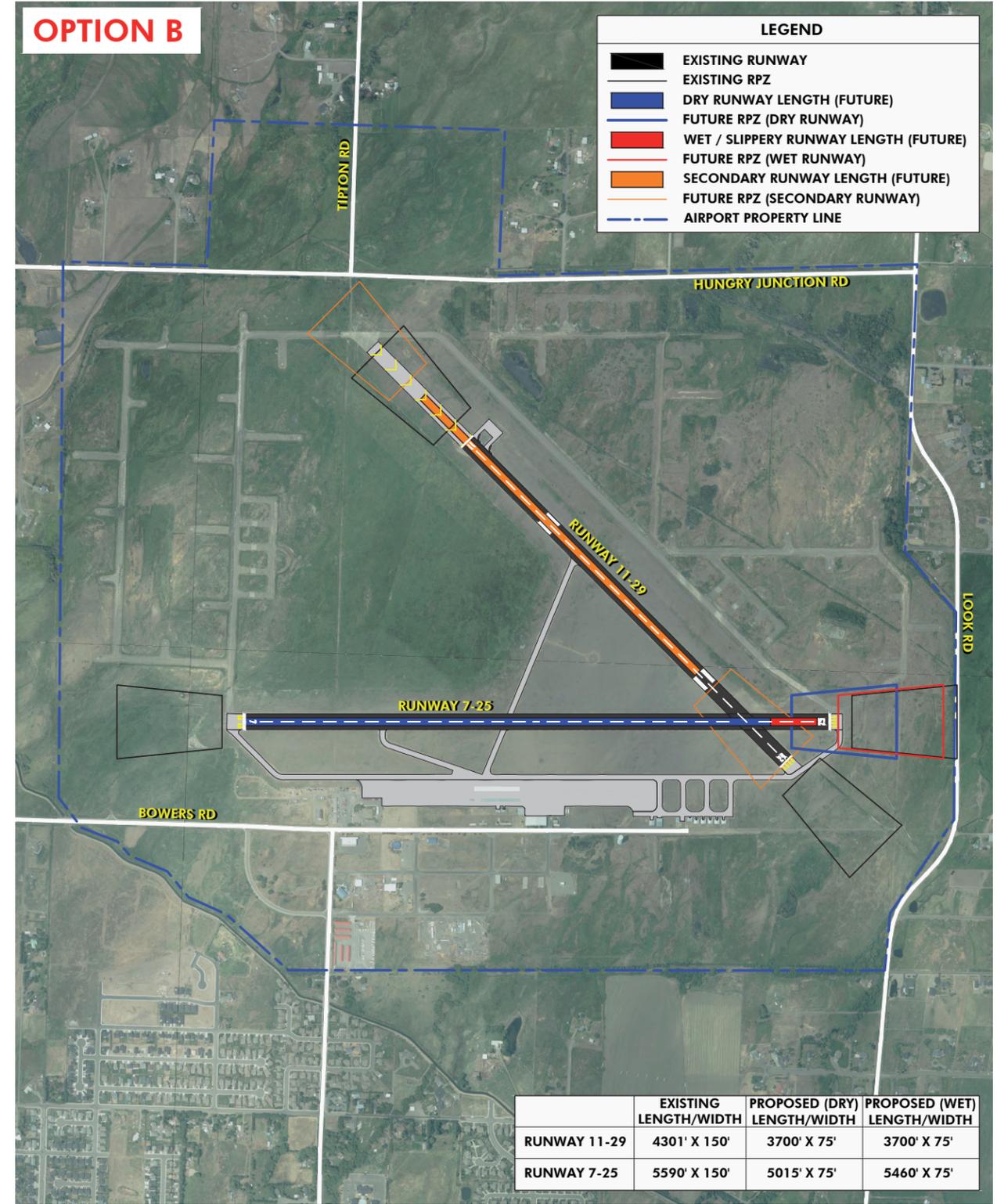
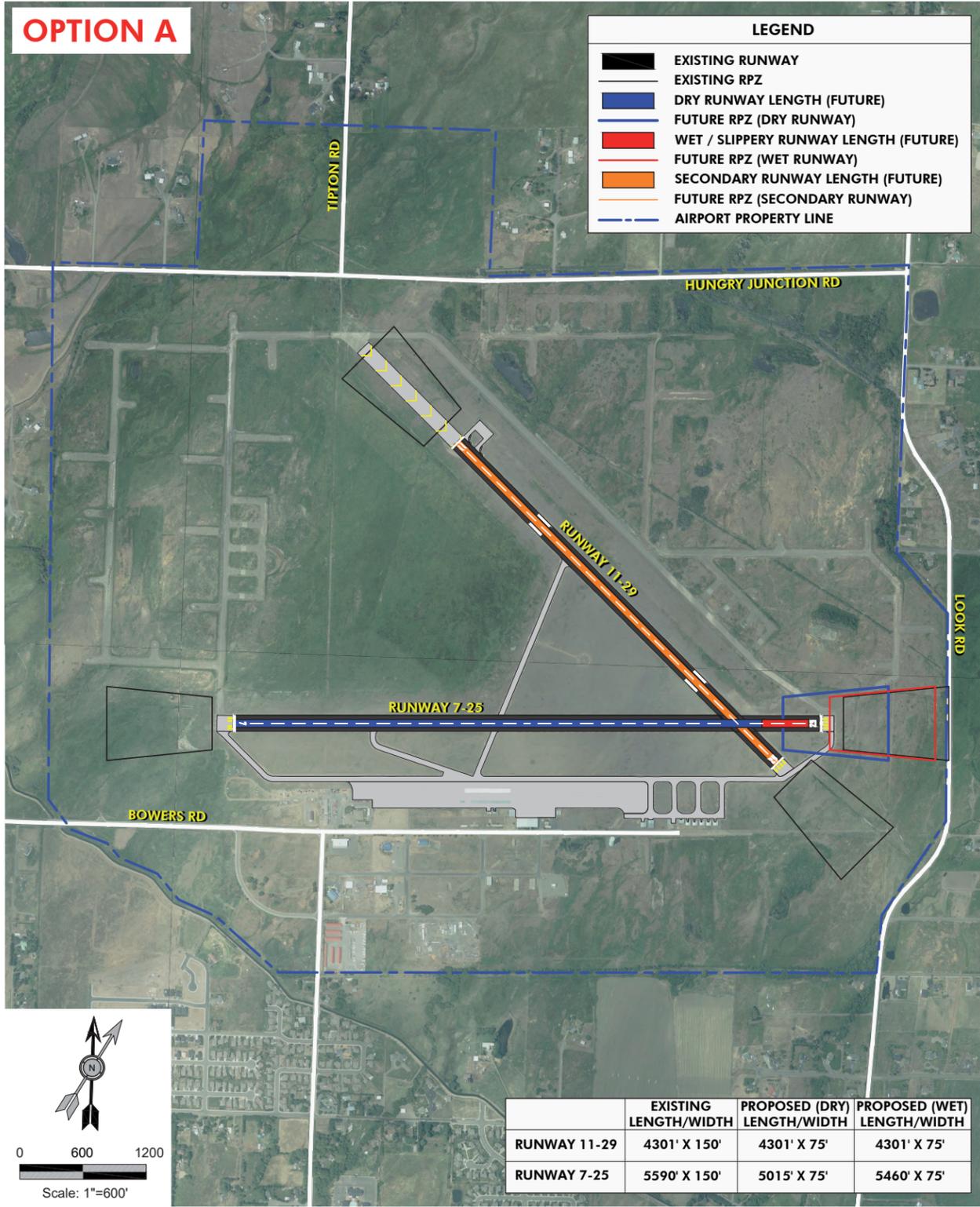
LEGEND

- EXISTING RUNWAY LENGTH
- DRY RUNWAY LENGTH
- WET / SLIPPERY RUNWAY LENGTH
- SECONDARY RUNWAY LENGTH
- AIRPORT PROPERTY LINE

	EXISTING LENGTH/WIDTH	PROPOSED (DRY) LENGTH/WIDTH	PROPOSED (WET) LENGTH/WIDTH
RUNWAY 11-29	4301' X 150'	4571' X 75'	4571' X 75'
RUNWAY 7-25	5590' X 150'	3700' X 60'	3700' X 60'



PRELIMINARY AIRSIDE ALTERNATIVE 7
FIGURE 6.9



PRELIMINARY AIRSIDE ALTERNATIVE 8
FIGURE 6.10



Part 2 - Landside Development Alternatives

The preliminary landside alternatives address facility requirements related to aircraft parking aprons, aircraft hangars, and support facilities.

As noted in the Inventory chapter, all existing landside facilities at Bowers Field are located on the south side of the runway-taxiway system, in the area identified as the “south flight line.” The preliminary landside development alternatives divide the south flight line into two sections—east and west of the main hangar, along the south side of Taxiway Bravo. The **west landside alternative** focuses on the area between the large FBO hangar and the DNR lease area. The **east landside alternative** focuses on the area between the large FBO hangar and the east end of the flight line. Two options are presented for each alternative to provide variety in facility configurations.

LANDSIDE ALTERNATIVE 1 (WEST)

The primary theme in this alternative is to accommodate future hangar development in the west area, with public use aircraft parking located on the main apron (east of the FBO apron). Landside alternative 1 is depicted in **Figure 6-11**.

Large Tenant Lease Areas

The proposed improvements are compatible with the existing lease boundaries for Central Washington University (CWU) and the Washington Department of Natural Resources (DNR). The current use of the west apron for flight school aircraft parking may continue within CWU’s lease area. Expansion of aviation-related facilities within these lease areas is anticipated within the current twenty-year planning period, but is dependent on tenant needs and resources.

A conceptual aviation technology building (actual scale) is depicted within the CWU lease area to demonstrate the overall capabilities of the site. The building depicted is the actual University of Alaska Anchorage (UAA) Aviation Technology Center located on Merrill Field in Anchorage. The UAA building includes hangar space, aircraft maintenance facilities, classrooms, labs, office space, and support areas. This concept indicates that the existing CWU lease located north of Bowers Road is sufficient to accommodate a large building, aircraft parking, and vehicle parking.

Expansion of DNR helicopter parking pads is depicted along the existing flight line, west of the two existing parking pads. The expanded helicopter parking directly abuts the south edge of Taxiway Bravo. Maintaining Taxiway Bravo is recommended to provide access to the west landside area, regardless of the status of Runway 7/25. DNR has indicated a need to expand their helicopter parking capabilities and has space within its current lease area to accommodate a significant expansion. DNR and contractor



helicopters are routinely parked on the apron located within the CWU lease during fire season when operations levels are high. Expanding helicopter parking within the DNR lease is expected to accommodate the peak demand levels at the facility.

Facility Development Options A and B

The proposed development in **Option A** is configured to accommodate small aircraft and uses ADG I taxilane design standards. Hangar door openings 50 feet or less are planned, which is consistent with small aircraft use (wingspans up to 49 feet). The proposed development in **Option B** is configured to accommodate a combination of large and small aircraft, and uses ADG II taxilane design standards for most of the development. Aircraft with wingspans up to 79 feet can be accommodated within the portions of the development with ADG II taxilane access. Large hangars may contain multiple units or a single large floor area. Large hangars may have door openings greater than 79 feet, but taxilane access would be restricted to the upper wingspan limit (79 feet) of ADG II.

Both options provide a non-aeronautical building site located adjacent to the southeast corner of the CWU lease. The development of the site may be complimentary to future CWU development or independent. The non-aeronautical site does not have direct access to the aircraft apron or adjacent taxilanes, although it is recommended as an aviation-related use based on its proximity to the flight line and its location on the north side of Bowers Road. Both options provide vehicle parking located adjacent to new hangars and the non-aeronautical building site, on the north side of Bowers Road.

Key features of Option A and B are summarized below:

Option A

- 2 T-hangars (20 units; 8 reserve units);
- The reconfigured hangar development provides standard ADG I taxilane object free area (OFA) clearances (79 feet) for all new taxilanes;
- The proposed configuration shifts the hangars to the west to accommodate east and west taxilane connections to Taxiway Bravo within the development;
- The existing vehicle gate located west of the main apron is maintained;
- New vehicle parking is located near the southeast end of the T-hangar development and adjacent to the small conventional hangars;
- A non-aeronautical use building site with vehicle parking is located adjacent the southeast corner of the CWU lease area; and



- Existing fencing would be relocated (north of existing sidewalk).

Option B

- 4 large conventional hangars (building footprints may vary) located along the southern edge of the development;
- 1 T-hangar—approximately 19 units located within the apron area;
- 1 small conventional hangar located within the apron area;
- The hangar development provides standard ADG II taxilane object free area (OFA) clearances (115 feet) for the major taxilanes;
- The taxilane between the existing (Carrera) and future T-hangar provides standard ADG I taxilane object free area (OFA) clearance (79 feet);
- The proposed configuration shifts the new hangars to the west to accommodate east and west taxilane connections to Taxiway Bravo within the development;
- The existing vehicle gate located west of the main apron is maintained;
- New vehicle parking is located along the entire southern edge of the development;
- A non-aeronautical use/commercial building site with vehicle parking is located adjacent the southeast corner of the CWU lease area; and
- Existing fencing would be relocated to accommodate new development.

A note about redevelopment:

Both options assume the existing county-owned T-hangar and three existing small conventional hangars located south and west of the county T-hangar will be relocated. As noted in the facility requirements chapter, the taxilane object free area (OFA) clearances associated with these hangars do not meet FAA standards. Reconfiguration of the taxilanes and the adjacent hangars is recommended.

It is assumed that the affected hangars will reach the end of their useful lives within the current twenty-year planning period, which provides an opportunity to redevelop the site to accommodate future hangar demand. It is noted that the proposed new development is flexible and can be modified as needed, to accommodate the existing hangars until they are removed/relocated. The development of new hangars may be phased over time, based on demand. This will allow phased development of new taxilanes and relocation of individual hangars based on specific factors such as remaining lease term and building condition.



LANDSIDE ALTERNATIVE 2 (EAST)

The primary theme in this alternative is to accommodate future hangar development, address apron taxilane clearance issues, and provide for additional aircraft parking. The east landside area is identified to accommodate future hangar and aircraft parking development on the current Airport Layout Plan (ALP). This evaluation follows a similar path, although some changes in facility configurations are proposed. Landside Alternative 2 is depicted in **Figure 6-12**.

The east landside area is divided into two sections—the main apron and undeveloped area to the south; and the east row of hangars and three undeveloped cutouts located between the hangar row and Taxiway Bravo.

A 35-foot building restriction line (BRL) for Runway 11/29 is maintained in this area based on the potential future upgrade to $\frac{3}{4}$ -mile instrument approach visibility minimums. Vehicle parking is located adjacent to hangar clusters, adjacent to Bowers Road.

The proposed construction of an aircraft hold area at the end of Runway 29 may require eliminating the connection between the eastern-most hangar taxilane and Taxiway Bravo (depending on the selected hold area and threshold configuration).

Main Apron Taxilanes

Both options depict a recommended reconfiguration of the main apron taxilanes to meet ADG II standards. The reconfiguration includes the taxilanes located at east end of the tiedown apron and in the middle section of the apron. These taxilane reconfigurations are in part driven by the current construction of a new large hangar (identified as “Mitchell Hangar Site”) adjacent to the southeast corner of the apron that can accommodate ADG II aircraft. Providing ADG II taxilane access to this hangar will create two unconnected sections of ADG II taxilane at the east and west ends of the apron. The reconfiguration of the taxilane in the middle of the apron connects these parts of the apron and provides a clear taxi path between the FBO apron, fueling area, and business aircraft parking positions and the east end of the apron, without requiring ADG II aircraft to use Taxiway Bravo.

The expansion of the taxilane object free area (OFA) from 79 feet to 115 feet required to meet ADG II standards will eliminate six existing tiedowns. Other existing tiedowns located near the west end of the apron would be eliminated in the future to accommodate hangar development. Additional aircraft tiedowns are planned in both options. The eastern section of Bowers Road is planned for upgrade (same roadway/sidewalk configuration as the existing improved sections).



Facility Development Options A and B

Option A locates new small conventional hangar rows south of main tiedown apron, with three (ADG I) north-south taxilane connections to the apron. 16 small hangars are depicted in this area. Infill sites for several new hangars are also located within the existing east hangar area. Vehicle parking is located adjacent to hangar clusters, adjacent to Bowers Road.

Two of the unpaved cutouts located east of the tiedown apron are identified as future aircraft tiedown apron. As depicted, the expanded apron would provide an additional 24 small airplane tiedowns, which may be phased based on demand. The tiedowns will accommodate new demand and mitigate the loss of existing tiedowns due to apron reconfiguration noted earlier. The first cutout provides 9 additional tiedowns based on the clearances of the adjacent taxilanes. As depicted, development within the second cutout eliminates the adjacent north-south section of taxilane between the east hangar row and Taxiway Bravo and provides 15 additional tiedowns (9 tiedowns if the short taxilane is maintained). Development of 6 small hangars is depicted in the east hangar row and the eastern-most unpaved cutout.

Option B locates new large multi-unit hangars south of main tiedown apron and concentrates new development of small hangars in the east hangar row (infill) and in the unpaved cutouts north of the hangar row. The large hangars are typical of multi-unit conventional hangars designed to accommodate larger aircraft. The hangars are configured with uniform north wall placement, which reflects the required ADG II taxilane clearances in the middle section of the apron. Additional pavement will be required from the southern edge of the apron to the north walls of the hangars. Alternatively, the western large hangar could be positioned forward of the eastern hangar to reduce additional apron pavement. Vehicle parking is located adjacent to the hangars, adjacent to Bowers Road.

Small hangar development is located east of the main apron, including three (infill) hangar sites in the existing east hangar row and 11 small hangars are depicted in the unpaved cutouts north of the east hangar row. The western unpaved cutout located is identified as future aircraft tiedown apron with 9 additional tiedowns.

Key features of Option A and B are summarized below:

Option A

- Main apron ADG II taxilane reconfiguration (eliminates 11 existing tiedowns at full development);
- Phased tiedown apron expansion:
 - Phase 1 – 9 small airplane tiedowns (western unpaved cutout);
 - Phase 2 – 15 small airplane tiedowns (middle unpaved cutout);
- Small hangar rows located south of main apron:



- 3 north-south ADG I taxilanes serving six hangar rows;
- 16 small conventional hangars (east/west facing doors);
- Vehicle parking adjacent to hangars;
- Small conventional hangars in east unpaved cutout (3 depicted); and
- Infill development - 3 small conventional hangars in east hangar row.

Option B

- Main apron ADG II taxilane reconfiguration (eliminates 11 existing tiedowns at full development);
 - Tiedown apron expansion (9 small airplane tiedowns in western unpaved cutout);
- Large (multi-unit) hangars located south of main apron:
 - 2 large conventional hangars (north facing doors);
 - Typical 3 or 4-unit hangars with interior bays and common roof;
 - Vehicle parking adjacent to hangars;
- Small conventional hangars in east unpaved cutout (3 depicted); and
- Infill development - 3 small conventional hangars in east hangar row.

Environmental Conditions

As noted in Chapter 5 Environmental Assessment, there are several listed hazardous materials and cleanup sites in the vicinity of the proposed improvements shown in the east and west landside alternatives. Prior to development of sites with a previous history of hazardous materials and/or cleanup, it is recommended that a Phase I Environmental Site Assessment (ESA) be conducted to ascertain site history. If the Phase I ESA indicates the potential presence of contamination, site sampling may need to be conducted to confirm the presence and concentration of any contaminants that may be present. Additionally, if contaminants are found, coordination with Washington Department of Ecology would be conducted to determine further action.

A portion of the future parallel taxiway for Runway 11/29 goes through an area identified as potential wetlands on the National Wetland Inventory (NWI). It is noted that the NWI only identifies potential wetlands and a wetland delineation study is required to determine if wetlands are present, which would establish US Army Corps of Engineers 404 permit and other critical area permits.

There is also a potential wetland area adjacent to Runway 7/25. During removal of the existing runway pavement and construction of the new runway section, wetlands in that area should be avoided wherever possible, otherwise applicable permits will be required.

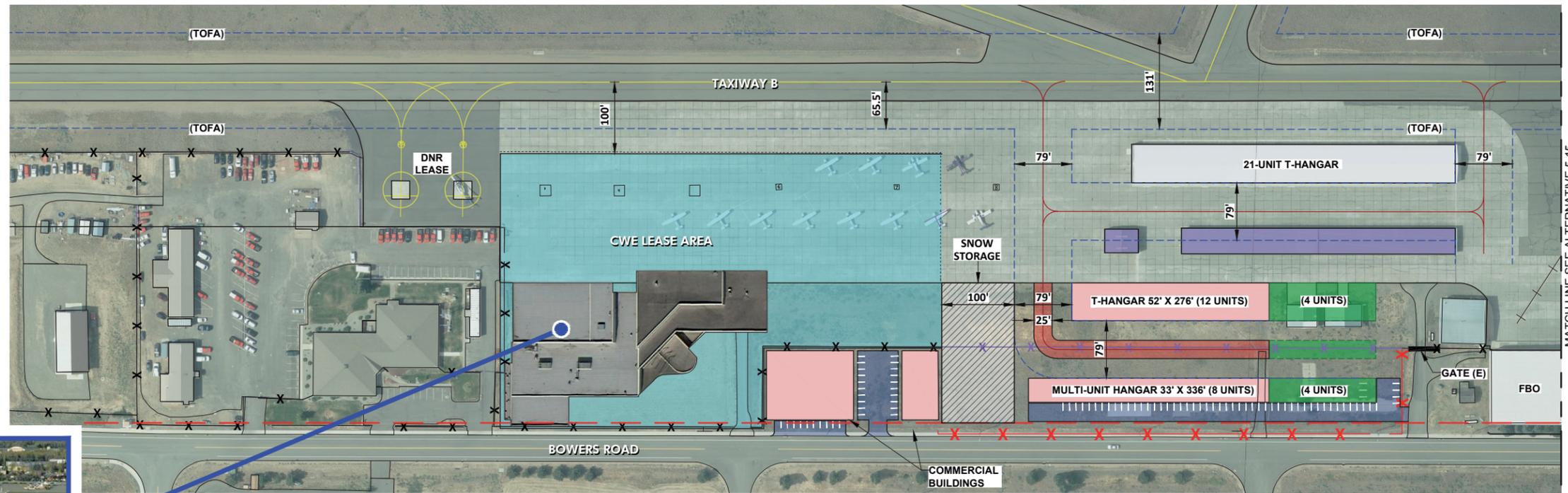
Figure 6-12 – West Landside Alternative

LEGEND	
BUILDING (EXISTING)	
BUILDING (FUTURE)	
AIRFIELD PAVEMENT (FUTURE)	
CWU LEASE AREA	
TO BE REMOVED	
VEHICLE PARKING (FUTURE)	
TAXIWAY (RESERVE)	
BUILDING (RESERVE)	
SNOW STORAGE (FUTURE)	
FENCE (EXISTING)	
FENCE (FUTURE)	
TAXIWAY OBJECT FREE AREA (TOFA)	

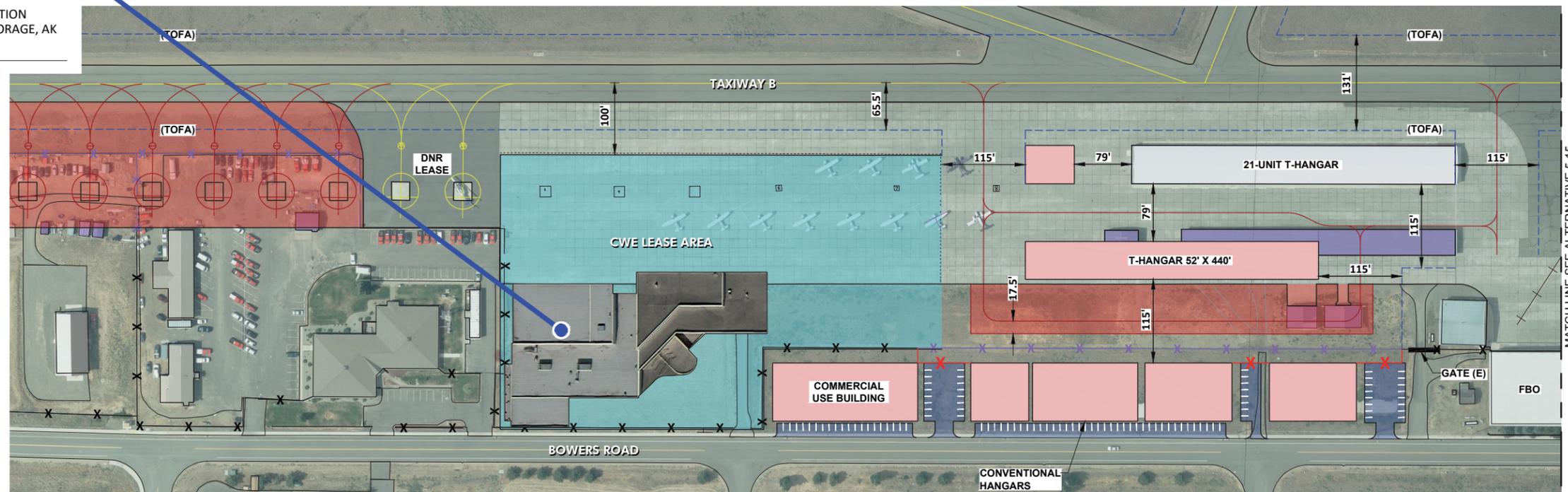
- | KEY FEATURES | |
|--------------|--------------------------------------|
| • | COMMERCIAL HANGAR AREA |
| • | LARGE CONVENTIONAL HANGARS |
| • | VEHICLE PARKING & ACCESS |
| • | EXISTING LONG TERM LEASES UNAFFECTED |



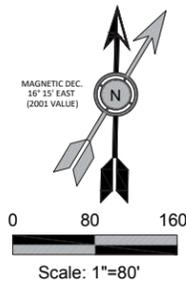
UNIVERSITY OF ALASKA ANCHORAGE AVIATION TECHNOLOGY BUILDING, MERRILL FIELD, ANCHORAGE, AK (EXAMPLE OF CONCEPT)



OPTION A



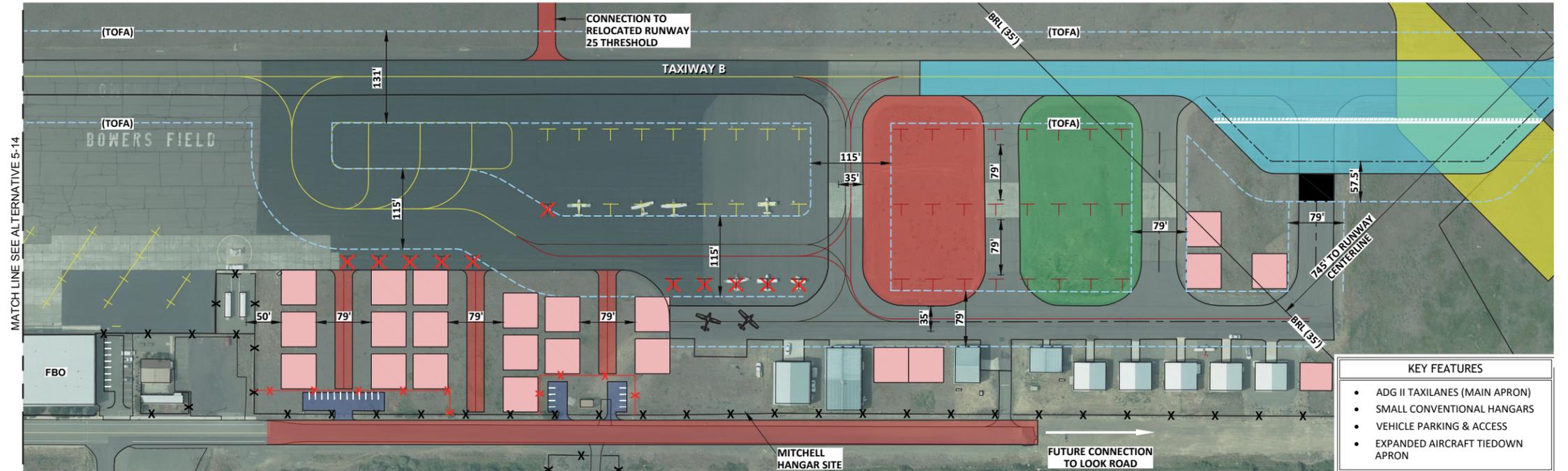
OPTION B



MATCH LINE SEE ALTERNATIVE 5-15

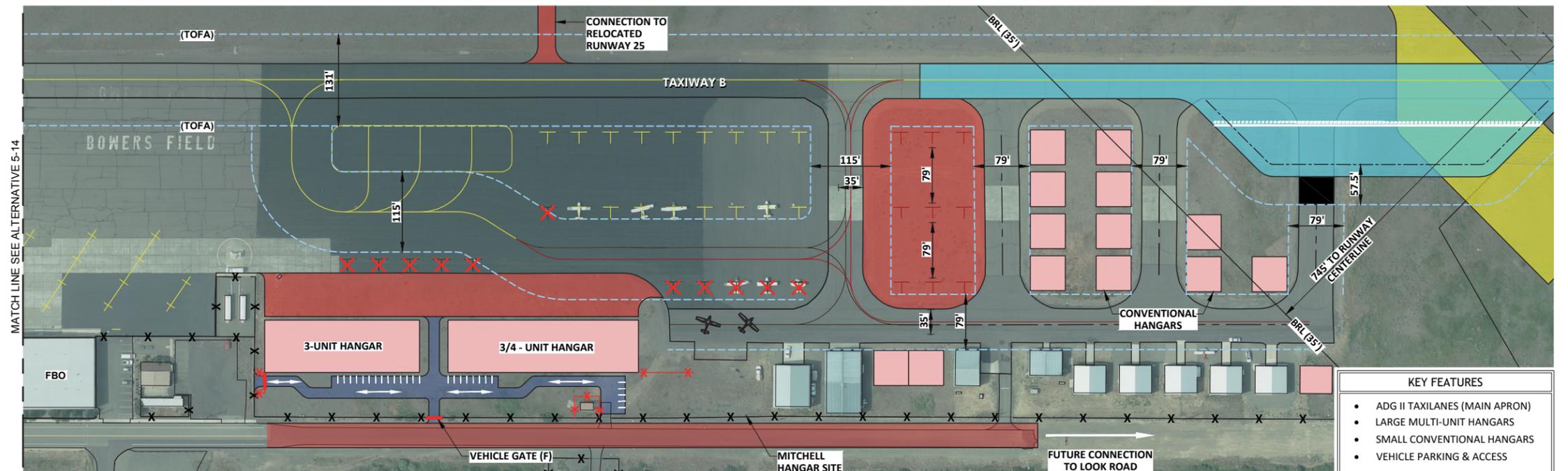
MATCH LINE SEE ALTERNATIVE 5-15

LEGEND	
BUILDING (E)	[Red outline]
BUILDING (F)	[Pink outline]
AIRFIELD PAVEMENT (PHASE I)	[Light blue fill]
AIRFIELD PAVEMENT (PHASE II)	[Light green fill]
VEHICLE PARKING (F)	[Blue fill]
TAXIWAY OPTION A	[Yellow outline]
TAXIWAY OPTION B	[Light blue outline]
TO BE REMOVED	[Dashed line]
FENCE (EXISTING)	[Black 'X' marks]
FENCE (FUTURE)	[Red 'X' marks]
TAXIWAY OBJECT FREE AREA (TOFA)	[Dashed blue line]
BUILDING RESTRICTION LINE (BRL)	[Black line]



- | KEY FEATURES |
|-----------------------------------|
| • ADG II TAXILANES (MAIN APRON) |
| • SMALL CONVENTIONAL HANGARS |
| • VEHICLE PARKING & ACCESS |
| • EXPANDED AIRCRAFT TIEDOWN APRON |

OPTION A



- | KEY FEATURES |
|---------------------------------|
| • ADG II TAXILANES (MAIN APRON) |
| • LARGE MULTI-UNIT HANGARS |
| • SMALL CONVENTIONAL HANGARS |
| • VEHICLE PARKING & ACCESS |

OPTION B

