

Chapter Four Alternatives



Methow Valley State Airport
Airport Layout Plan Update

CHAPTER FOUR

AIRPORT DEVELOPMENT ALTERNATIVES

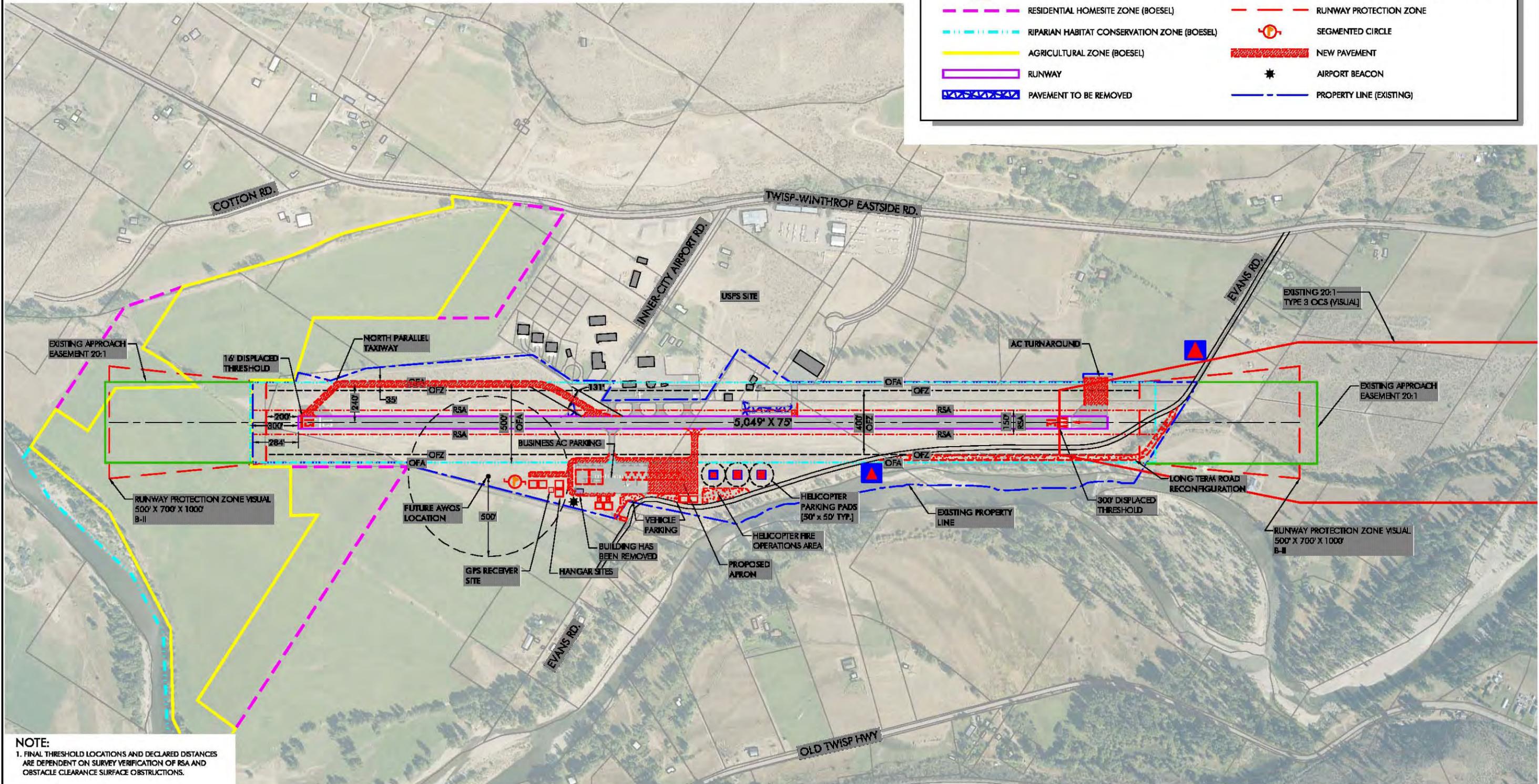
The evaluation of development options for Methow Valley State Airport is intended to address FAA airport design standards, safety and facility needs (runway, taxiway, lighting, aircraft parking, hangars, etc.). Based on these needs, a set of preliminary runway-taxiway and landside development alternatives was developed to address the specific facility requirements as outlined in Chapter Three. The preliminary alternatives are described later in the chapter, following the summary of the preferred alternative presented below. The preferred alternative is the product of extensive coordination among stakeholders and refinement of specific facility improvements in the months following presentation of the preliminary alternatives in local meetings. The reader should note that the preliminary alternatives contained in this chapter are in their original form and are intended to document the process that was used to create the preferred alternative.

SUMMARY OF PREFERRED ALTERNATIVE (As Approved By WSDOT July 1, 2009)

The preferred development alternative selected for Methow Valley State Airport is depicted in **Figure 4-1**.

A preliminary preferred alternative (see **Figure 4-6** at the end of the chapter) for the Airport Layout Plan Update was presented at a public meeting in Winthrop on May 20, 2009. The Aviation Division established a 30-day public review and comment period for the preliminary preferred alternative. During this period, the Aviation Division continued the coordination efforts with local stakeholders and the FAA. Based on comments provided by airport users, neighbors, and other members of the public, and the ongoing project coordination, additional refinements were made that led to the final preferred alternative.

	TRAFFIC WARNING SIGNAL/SIGN		EXISTING VISUAL APPROACH EASEMENT (20:1)
	RESIDENTIAL HOMESITE ZONE (BOESEL)		RUNWAY PROTECTION ZONE
	RIPARIAN HABITAT CONSERVATION ZONE (BOESEL)		SEGMENTED CIRCLE
	AGRICULTURAL ZONE (BOESEL)		NEW PAVEMENT
	RUNWAY		AIRPORT BEACON
	PAVEMENT TO BE REMOVED		PROPERTY LINE (EXISTING)



NOTE:
 1. FINAL THRESHOLD LOCATIONS AND DECLARED DISTANCES ARE DEPENDENT ON SURVEY VERIFICATION OF RSA AND OBSTACLE CLEARANCE SURFACE OBSTRUCTIONS.

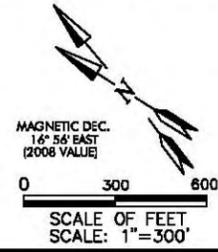


PHOTO SOURCE: BERGMAN PHOTOGRAPHIC SERVICES INC. (8-08)



METHOW VALLEY STATE AIRPORT PREFERRED ALTERNATIVE

FIGURE NO.
4-1

The primary elements of the preferred alternative are listed below:

No Extension of Runway 13/31. The existing runway will be reconfigured as needed through the use of declared distances to compensate for nonstandard conditions at the runway ends. A minor reduction in useable runway length for aircraft landing and/or takeoff is required through the use of declared distances.

No Impact on Adjacent Farmland. The preferred alternative does not involve property acquisition and does not affect current use of adjacent farm lands. The previous proposal to route a new dirt roadway around the northern perimeter of the farmland has been eliminated. The existing approach easements for both ends of the runway will remain unchanged.

No Property Acquisition Required for Planned Development. The preferred alternative does not require property acquisition since all planned airfield or roadway improvements are contained within existing airport property. However, in the event that nearby property owners are interested in selling land, the Aviation Division will consider each situation individually based on the potential use and benefit to the airport.

Evans Road Will Not Be Closed. Changes in the existing runway configuration are planned to allow Evans Road to remain in place. The installation of traffic warning signals or signs on the roadway is planned to increase driver awareness to runway operations and low flying aircraft. A project to realign a small section of Evans Road away from the south runway end (within airport property) is recommended as a long term improvement which would allow some of the runway reconfigurations to be eliminated.

North Cascades Smokejumper Base. The existing USFS facilities will remain in place through a modification to FAA standards. Long term options for USFS facility expansion or reconfiguration may provide an opportunity to address runway clearances.

Parallel Taxiway. A partial length parallel taxiway is recommended on the east side of Runway 13/31, north of the USFS facilities. The taxiway will not require property acquisition. The taxiway is intended to reduce taxiing of aircraft on the active runway.

Aircraft Parking and Hangar Facilities. The existing facilities on the west side of Runway 13/31 will be improved to optimize the use of limited developable areas within airport property. The existing aircraft apron and taxilanes will be reconfigured to meet FAA design standards and to increase efficiency for small airplane and business aircraft parking. A limited number of small hangar sites will be available for lease adjacent to the aircraft apron. Three helicopter parking pads and a fire operations area are planned south of the expanded aircraft apron. Improvements in vehicle access and parking are also recommended.

Automated Weather Observation System (AWOS). A site on the west side of the runway has been identified to locate a future FAA-funded AWOS on airport property. The addition of a publicly owned weather observation system will ensure that on-site weather data will remain available to users, including medevac helicopters and fixed wing aircraft operating in the Methow Valley.

Related FAQ /Answers (items that appear on the preferred alternative):

What is a Runway Protection Zone?

A Runway Protection Zone (RPZ) is a defined area on the ground that is intended to protect the area near the ends of a runway from incompatible objects and activities. The function of an RPZ is to enhance the protection of people and property on the ground. Activities within RPZs are often controlled through the use of easements when the property is not owned by an airport. The RPZ boundary generally coincides with the inner portion of the runway approach surface. The measures taken to keep the RPZ free of incompatible objects and activities also protect the airspace surface that extends overhead. Both ends of Runway 13/31 have existing approach easements that were acquired for the areas in the vicinity of the RPZs (see below).

What is an Approach Easement?

An approach easement involves the protection of the airspace (sometimes called avigation easements) that is associated with the inner portion of the approach to a runway end. The easement will limit the height of structures or other objects (trees, etc.) to avoid penetrating the airspace, but does not affect the underlying zoning of the land area. Both ends of Runway 13/31 have approach easements that were acquired many years ago by WSDOT that are based on 20:1 visual approach slopes.

What is an AWOS Clear Area?

The 500-foot radius that surrounds an AWOS is an FAA-defined clearing standard that is intended to protect the weather system from development that could adversely affect accuracy and performance. Portions of AWOS clear areas that extend beyond airport property should be protected through an easement if possible or through a site specific design that elevates the wind sensors above any nearby structures.

What are Declared Distances?

Declared distances are when specific useable runway dimensions are “declared” to be less than the full runway length. The declared distance concept provides for reduced useable runway lengths for some aircraft operations (takeoff and/or landing) based on specific site constraints that prevent conventional runway designs. For example, the standard cleared and graded area beyond each end of Runway 13/31 would extend 300 feet beyond each end of the 5,049-foot runway. Since both ends are limited by physical features (road) or property ownership, the use of declared distances, in

conjunction with runway reconfiguration (e.g., displaced thresholds) will provide a comparable level of safety with less than full runway length. The declared distance dimensions for Runway 13/31 will be published in airport facility directories to ensure that pilots are aware of the runway configuration.

What is a Displaced Threshold?

When a runway threshold (the landing point for aircraft) is located at a point other than at the end of a runway, it may be “displaced.” A displaced threshold changes the configuration within the runway, but does not reduce the overall length of the runway.

For Runway 13/31 displaced threshold are planned for both ends based in part on the configuration of the clear areas beyond the runway ends and for obstruction clearance over vehicles traveling on Evans Road.

Overview of Alternatives Evaluation Process

It is anticipated that the cost of upgrading or expanding existing airport facilities to meet FAA standards and to accommodate demand-related items will involve considerable financial resources. There are two financial scenarios available to the airport sponsor. (1) The airport sponsor may determine that it wants to upgrade the airfield facilities to following FAA design standards per the ALP and is willing to commit to fund the matching grant share for these improvements. The FAA will assign the maximum annual non-primary entitlement funds to the airport. Though other Airport Improvement Program (AIP) grant funds may be available, these will likely not be used at Methow Valley State, except for higher priority safety work, as determined by the FAA. (2) The airport sponsor may determine that upgrading the airfield facilities to meet FAA standards is too difficult or costly – not financially realistic at this time. The airport owner could potentially enter into a “maintenance only” mode using reduced non-primary entitlement funds for small maintenance projects.

The Airport Capital Improvement Plan (ACIP) should be considered a work in progress. The airport sponsor should work closely with FAA and WSDOT Aviation in both the development and implementation of the ACIP. The airport sponsor may refine its project list and financial plan based on receiving only non-primary entitlements. A reasonable approach, at this time, may include an “airport maintenance” program that preserves airfield pavement and other eligible projects such as lighting, signage, marking and lighting to meet RSA and obstruction removal requirements. This assumes FAA concurrence with an airport “maintenance only program” whereby the airport sponsor’s budget for AIP eligible projects is limited to nonprimary entitlement (NPE) only.

It should also be recognized that selection of a preferred alternative that addresses FAA standards conformance does not necessarily guarantee that adequate funding will be available to complete all projects. However, creating a viable plan that addresses FAA design standards and larger scale facility upgrades in a systematic manner through the 20-year planning period, while also supporting the airport's ability to expand on its existing user base, can provide tangible benefits in both safety and airport financial stability.

PRELIMINARY DEVELOPMENT ALTERNATIVES

For the purposes of evaluating runway configuration needs, three preliminary development options are presented for consideration. A fourth option (no action) also exists, in which the airport would essentially maintain existing facilities without performing facility upgrades or expansion to address future demand ("maintenance only" option).

The runway configurations presented in the preliminary alternatives will enable the majority of FAA airport design standards to be met while minimizing existing obstructions to FAR Part 77 airspace surfaces. The following items are among the FAA's highest priorities to enhance airport safety:

- **Clear Approaches to Runway Ends** – Unobstructed approaches (FAR Part 77 or through use of FAA Alternative Threshold Siting Criteria)
- **Runway Safety Area (RSA)** - Standard dimensions, surface gradient, surface condition (no objects > 3" above grade unless frangible) along the sides and beyond the ends of the runway
- **Obstacle Free Zone (OFZ)** – Standard dimensions without physical obstructions along the sides and beyond the ends of the runway
- **Primary Surface** – Unobstructed flat surface along the sides and beyond the ends of the runway
- **Object Free Area (OFA)** - Standard dimensions without physical obstructions along the sides and beyond the ends of the runway

In addition to runway and taxiway configurations, options for future landside development areas will provide adequate clearances from the runway-taxiway system, its protected areas and the associated airspace surrounding the runway. The current practice of off-airport development (also referred to as "through-the-fence" access) is not supported by the FAA, and no off-airport aviation use facilities will be developed beyond those previously approved by WSDOT Aviation.

The landside components include the following:

- Aircraft Apron (tiedown, fueling area reserve)

- Helicopter Parking
- Hangar Sites
- Taxiway and Taxilane Access to Apron and Hangars
- Vehicle Access and Parking

The preliminary development alternatives are described with graphic depictions (**Figures 4-2 through 4-5**) provided to illustrate the key elements of each alternative. A summary of planning-level costs for the preliminary alternatives is presented in **Tables 4-1 and 4-2**. At this stage of the evaluation process, the costs are very rough; additional refinement will be performed as needed through the alternatives evaluation process.

The preliminary alternatives are intended to facilitate a discussion and evaluation about the best path for the airport to meet FAA standards and meet the facility needs of the airport. As noted in the Facility Requirements analysis, the existing runway system does not meet several FAA clearance standards, particularly at the south end of Runway 13/31 (Evans Road). A primary focus of the alternatives evaluation is to identify the potential improvement options that may be available to improve the facility and meet FAA safety standards.

Since the existing airport site has a relatively small land base, most of the options being considered would require acquisition of property in order to accommodate the required safety areas associated with the runway or to develop landside facilities (aircraft parking, hangars, etc.). The evaluation of the preliminary options is intended to be objective, and as such no formal efforts were made to seek pre-approval of any particular concept from adjacent property owners. The open evaluation process will enable individual interests to be defined and the level of support and technical feasibility of each option will be determined. This input will be used to continue refining the development options, working toward a preferred alternative.

Runway Option A (see **Figure 4-2**) addresses the current non-standard clearance between the south end of the runway and Evans Road by shifting the runway to the north approximately 1,200 feet and eliminating approximately 1,900 feet of existing runway at the south end. The reconfigured runway length is approximately 4,260 feet. A displaced threshold (approximately 277 feet) would be required for Runway 31 to provide clearance over vehicles traveling on Evans Road. The location of the north end of the reconfigured runway is limited by the Methow River and a riparian habitat conservation zone (based on the runway object free area and runway safety that extends beyond the runway end).

Primary benefits include:

- No change in existing surface access (Evans Road) for the airport and adjacent properties located west of the airport.

Primary impacts include:

- Reduction in current runway length and airport function
- Increased cost for runway construction/reconfiguration (compared to Option B)
- Increased property acquisition requirements (compared to Option B)

Runway Option B (see **Figure 4-3**) addresses the current non-standard clearance between the south end of the runway and Evans Road by closing the section of road that conflicts with the protected areas of the runway. Access to the properties located south of the runway would not be affected. Access to the west side of the airport and adjacent private parcels is provided by extending a new access road from nearby existing highways.

Four conceptual roadway alignments are depicted, extending from the Twisp-Winthrop Eastside Road (west options) or Old Twisp Highway Road South (west option). The west option requires a two-lane bridge to cross the Methow River. All of the options require property acquisition (assumed to be a 50-foot roadway right of way). The evaluation of potential road options is also affected by the proposed landside options that involve acquisition of property to develop future aircraft parking apron and hangar facilities. The eastside road options offer different connecting points (to existing roads), but have the same alignment beyond the north end of the runway to meet approach clearance requirements.

The south end of Runway 13/31 is reconfigured to meet the FAA standard for runway safety area (currently limited by the river channel and Evans Road). A minor extension at the north end of the runway compensates for the loss of runway at the south end. The reconfigured runway length is approximately 5,012 feet.

Primary benefits include:

- No reduction in existing runway capabilities or airport function
- Lower costs for runway construction/reconfiguration (compared to Option A)
- Reduced property acquisition requirements (compared to Option A)

Primary impacts include:

- Property acquisition requirements and cost to accommodate new roadways
- Larger number of property owners affected (1+ mile of road right of way)
- Bridge option (cost)

Runway Option C (see **Figure 4-4**) addresses the current non-standard clearances between the ends of the runway and the airport property ownership by reducing the length of Runway 13/31 to

contain the most critical surfaces within airport property. No changes in existing surface access are required and no additional roadway access is required.

The south end of Runway 13/31 is reconfigured to meet the FAA standard for runway object free area (currently limited by Evans Road). A minor reduction at the north end of the runway is also required to conform to the object free area standard. The reconfigured runway length is approximately 2,943 feet. A displaced threshold for Runway 31 similar to Option A would also be required.

Primary benefits include:

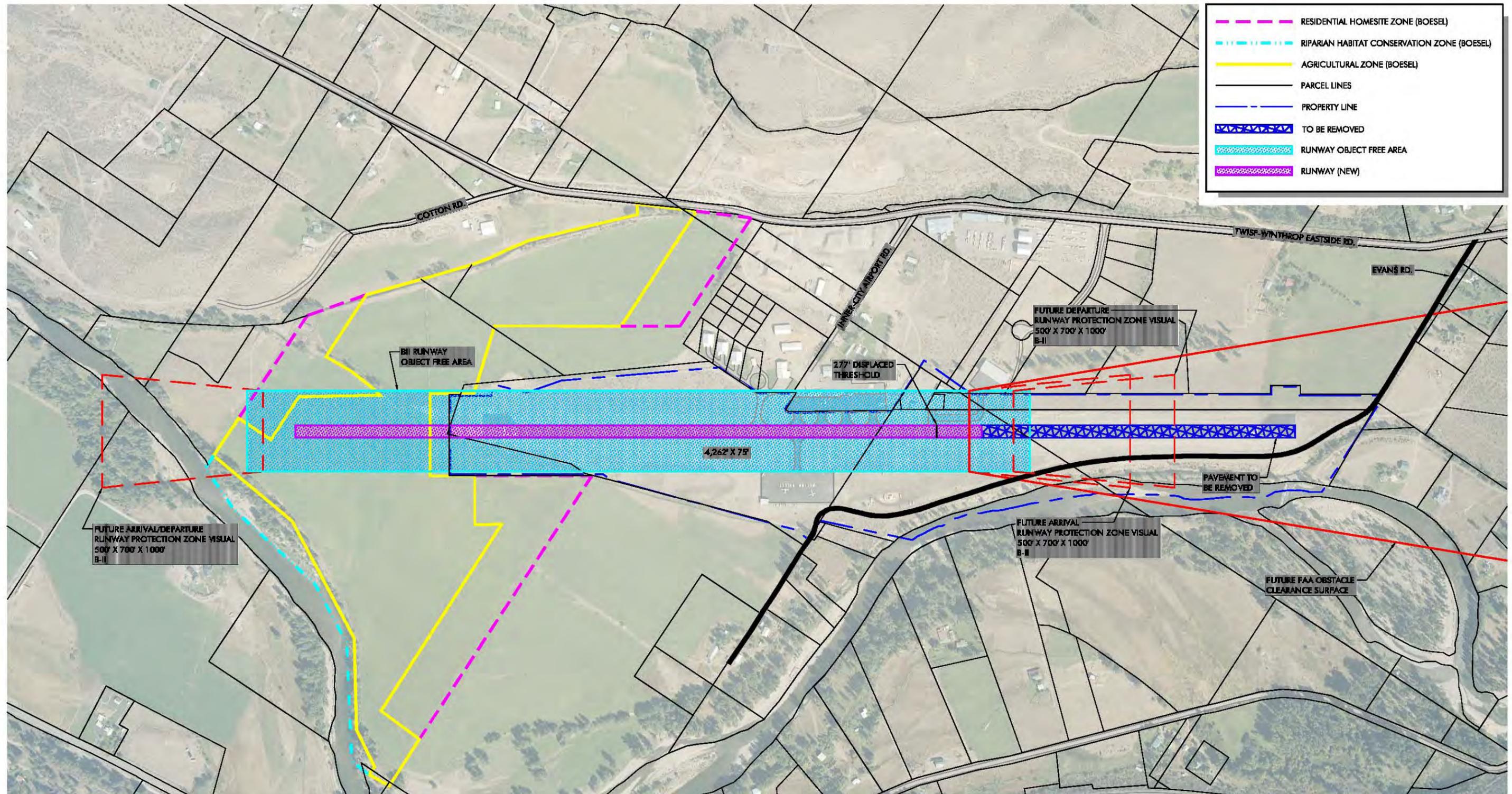
- No property acquisition requirements
- No changes in existing surface access roadways

Primary impacts include:

- Significant reduction in existing runway capabilities or airport function
- May require downgrade in airport design category (ADG I)
- Adversely affects USFS Smokejumper Base Operations
- Could limit FAA funding for improvements (Maintenance Only Airport)

Landside Options

Three conceptual landside options (see **Figure 4-5**) identify potential development of aircraft parking apron and hangar areas. As noted in earlier analyses, the existing developable landside areas on the west side of the runway are limited and may be further reduced by development of a west parallel taxiway. The locations identified in the figure illustrate the functional placement of these facilities in relation to the runway-taxiway system. Each of the three areas requires property acquisition and new surface access. East and west side parallel taxiways are depicted based on standard ADG II runway separation requirements. Relocation of existing hangars and other facilities on the east side of the runway is needed to accommodate a full-length taxiway. The aircraft apron would provide light aircraft tiedowns, large aircraft parking, and a fueling area. Hangar development areas are located at the rear of the parking apron. Actual property acquisition requirements (acreage) to be determined based on specific configuration of facilities.



- - - RESIDENTIAL HOMESITE ZONE (BOESEL)
- - - RIPARIAN HABITAT CONSERVATION ZONE (BOESEL)
- AGRICULTURAL ZONE (BOESEL)
- PARCEL LINES
- - - PROPERTY LINE
- ▨ TO BE REMOVED
- ▨ RUNWAY OBJECT FREE AREA
- ▨ RUNWAY (NEW)

OPTION A

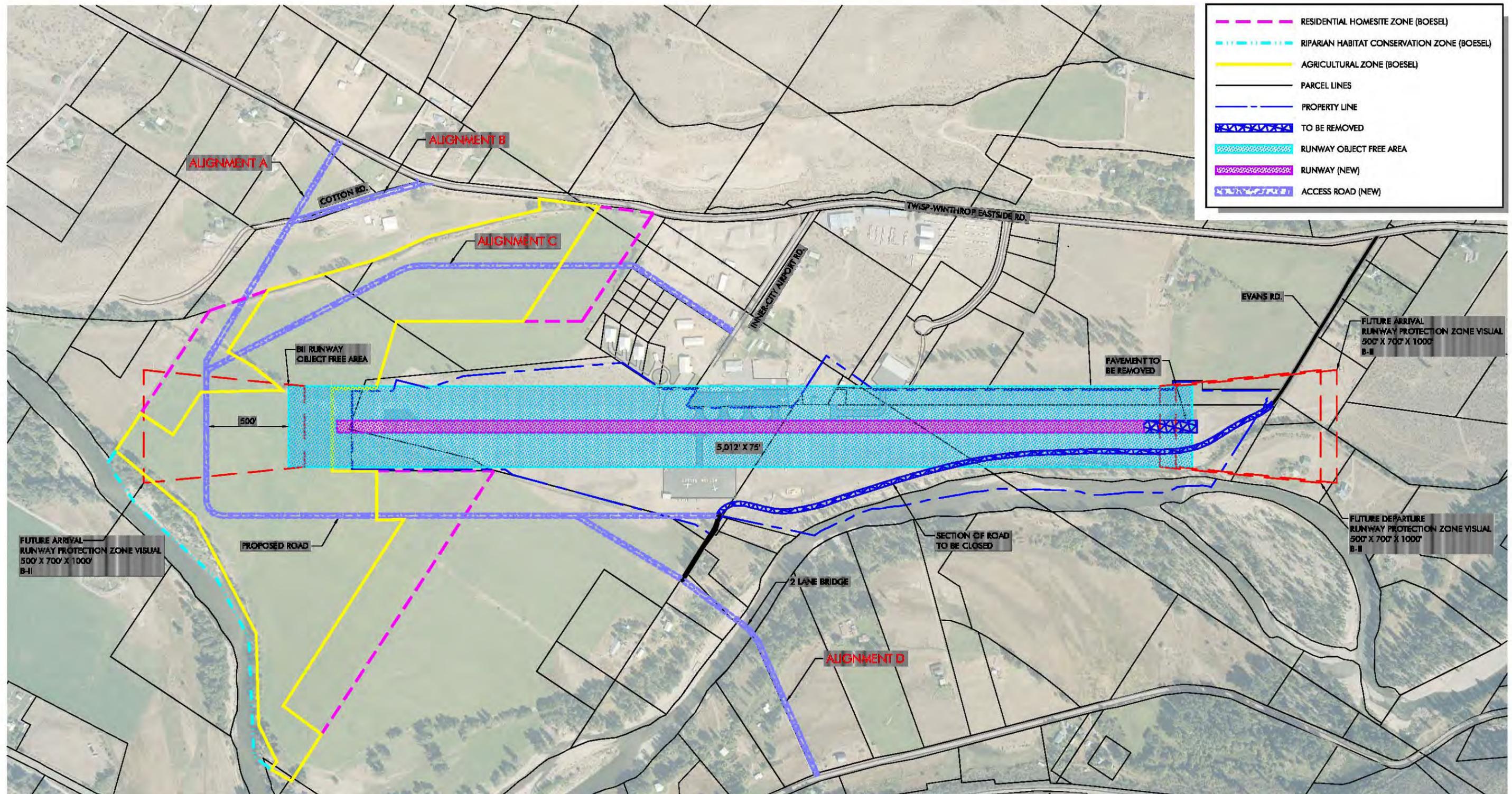
MAGNETIC DEC.
16° 56' EAST
(2008 VALUE)

0 300 600
SCALE OF FEET
SCALE: 1"=300'

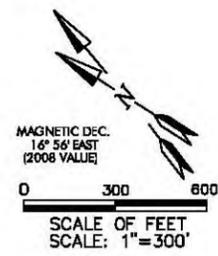


**METHOW VALLEY STATE AIRPORT
RUNWAY OPTION A**

FIGURE NO.
4-2

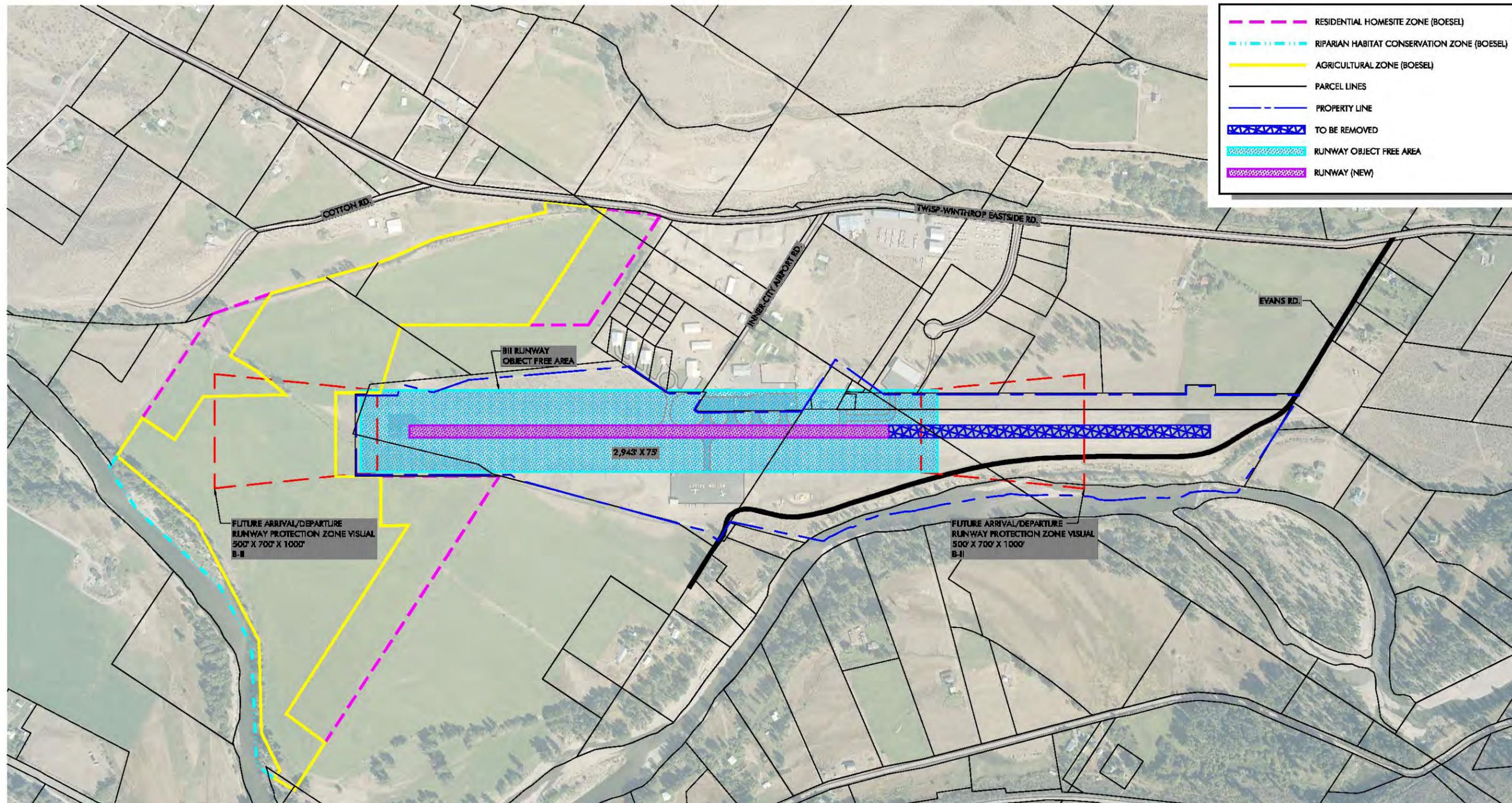


OPTION B

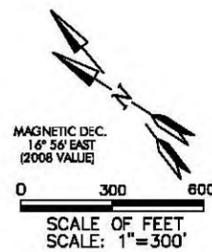


**METHOW VALLEY STATE AIRPORT
RUNWAY OPTION B**

FIGURE NO.
4-3



OPTION C



**METHOW VALLEY STATE AIRPORT
RUNWAY OPTION C**

FIGURE NO.

4-4

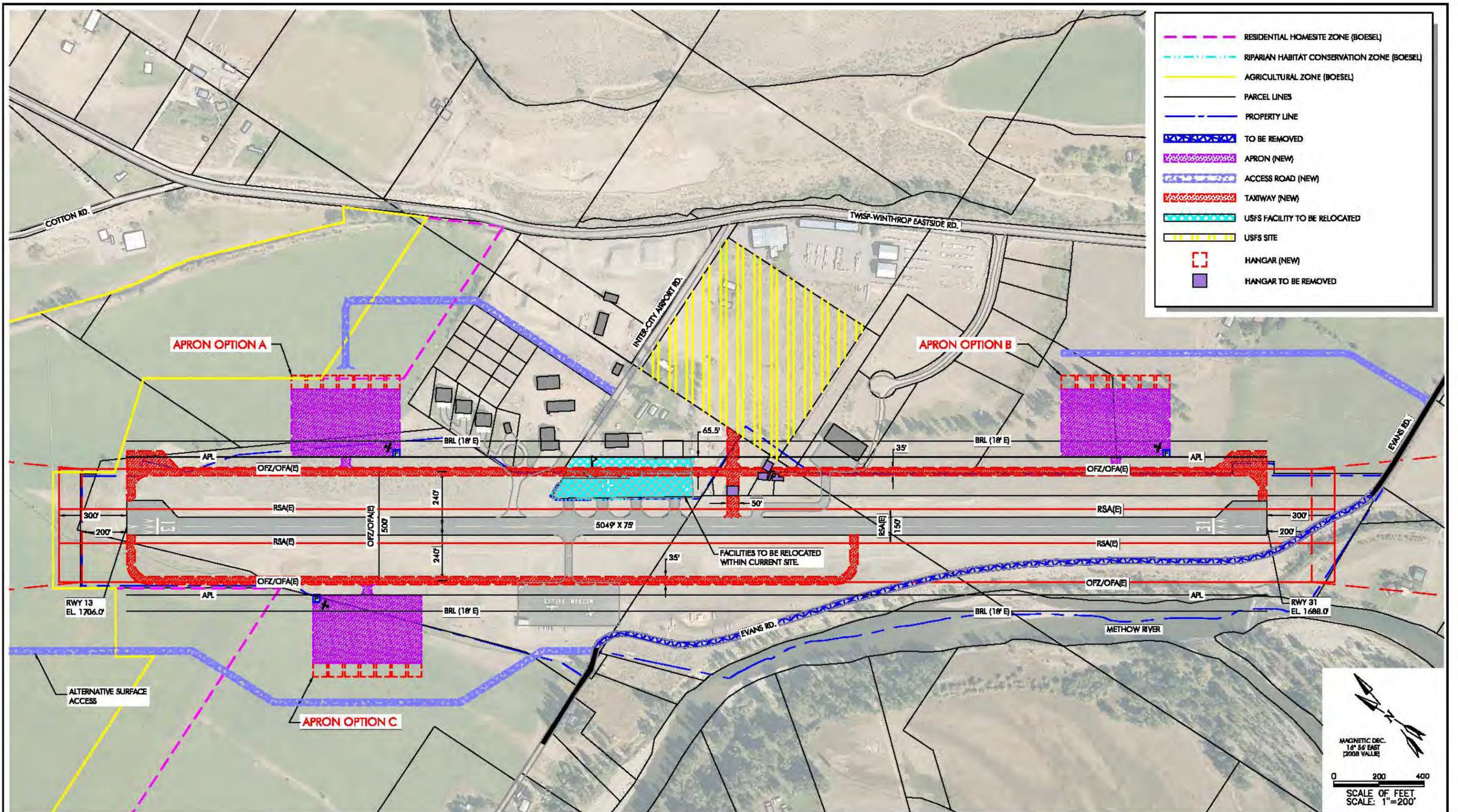


PHOTO SOURCE: BERGMAN PHOTOGRAPHIC SERVICES INC. (8-08)



METHOW VALLEY STATE AIRPORT
LANDSIDE OPTIONS

FIGURE NO.

4-5

TABLE 4-1: COMPARISON OF PLANNING LEVEL COST ELEMENTS (RUNWAY)

Project Elements	Runway Option A (Runway Shift)	Runway Option B (Road Relocation Options)	Runway Option C (No Road Changes or Property Acquisition)
Runway Improvements (Extension, Shift or Pavement Removal Cost); Lighting	\$1,450,000	\$350,000	\$500,000
Roadway Improvements	--	\$600,000 to \$10 M (Bridge Option)	--
Property Acquisition	\$1,040,000	\$300,000 - \$540,000	--
Subtotal	\$2,490,000	\$1,250,000 to 10,900,000	\$500,000
40% Contingency, Engineering, Environmental and Sales Tax	\$996,000	\$500,000 to \$4,360,000	\$200,000
Total	\$3,486,000	\$1,750,000 (no Bridge) to \$15,900,000 (Bridge)	\$700,000

**TABLE 4-2: COMPARISON OF PLANNING LEVEL COST ELEMENTS
(PARALLEL TAXIWAY)**

Project Elements	West Parallel Taxiway Option (3,200' x 35')	East Parallel Taxiway Option (5,049' x 35')
Taxiway Improvements	\$1,400,000	\$2,200,000
Subtotal	\$1,400,000	\$2,200,000
40% Contingency, Engineering, Environmental and Sales Tax	\$560,000	\$880,000
Total	\$1,960,000	\$3,080,000

PRELIMINARY PREFERRED ALTERNATIVE

The two primary objectives of the preliminary preferred alternative (see **Figure 4-6**) are to maintain existing airport capabilities and meet FAA safety standards. The proposed method used to meet these objectives is to close a section of Evans Road and extend the road around the north side of the airport to connect with the Twisp-Winthrop Eastside Road. This would allow the existing Runway 13/31 to meet FAA safety standards without requiring any property acquisition for runway improvements. No runway extension is proposed in the preliminary preferred alternative. In order to meet FAA standards, the length of the runway is reduced slightly, from 5,049 feet to 5,030 feet.

Based on the specific input provided by Mr. Craig Boesel about his farming activities and irrigation system requirements, earlier options that extended the runway or roadways through the middle of the farmland north of the runway—were eliminated from consideration. The proposed gravel roadway in this option would be extended along the outer perimeter of the farmland, which is intended to reduce the impact on farmland and to avoid interfering with the three pivot irrigation systems currently in use by Mr. Boesel. The conceptual roadway alignment also avoids the riparian habitat conservation zone easement on the Boesel property.

The conceptual roadway alignment is shown to connect to the existing Cotton Road, although a more refined analysis of property ownership and county road design requirements will be required prior to selection of a final alignment and construction. The realigned roadway is intended to maintain access to the west side of the airport, and to properties located west of the airport that are currently served by Evans Road. The roadway would also provide surface access to developable portions of the Boesel property that are not currently served by a county road.

Improvements to accommodate a limited amount of aircraft parking and hangar construction are proposed within existing airport property on the west side of the runway. Helicopter parking pads are also proposed for the west side of the runway to support fire related operational missions and to provide itinerant helicopter parking.

A parallel taxiway is proposed for the east side of the runway to separate taxiing aircraft from aircraft operating on the runway.

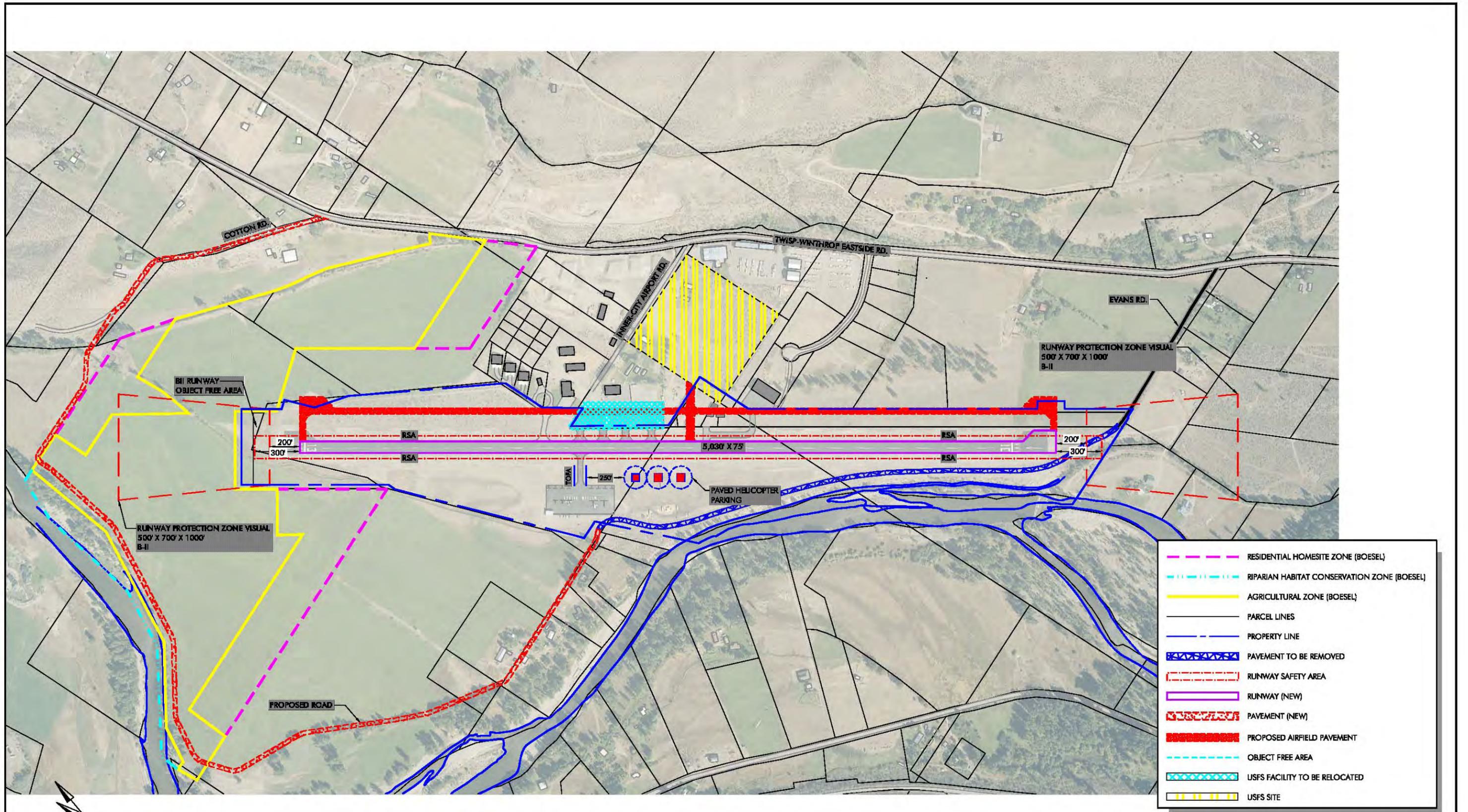
Some existing USFS facilities located adjacent to the runway are proposed for relocation in the future, within the existing USFS site.

The preliminary preferred alternative does not include property acquisition for runway improvements, or future development of aircraft parking or hangar development. Although property acquisition is not an element of the preliminary preferred alternative for airfield facilities, the WSDOT Aviation Division will consider proposals from adjacent land owners with an interest in

selling land. Some adjacent land areas have the potential to accommodate long-term airport related development; other parcels could be used to buffer the airport from nearby residential development.

Note:

See **Page 4-1** for a description of the Final Preferred Alternative that was created based on the review and comment provided through the public review process. **Figure 4-1** depicts the elements of the Final Preferred Alternative.



MAGNETIC DEC.
16° 56' EAST
(2008 VALUE)

0 300 600
SCALE OF FEET
SCALE: 1"=300'

PHOTO SOURCE: BERGMAN PHOTOGRAPHIC SERVICES INC. (8-08)



METHOW VALLEY STATE AIRPORT PRELIMINARY PREFERRED ALTERNATIVE

FIGURE NO.

4-6