



Chapter Four
Development Alternatives

CHAPTER 4 - DEVELOPMENT ALTERNATIVES

CHAPTER SUMMARY

This chapter evaluates a series of alternative solutions to satisfy the facility requirements explained in **Chapter 3 – Facility Requirements** for Ryan Airfield (RYN). The purpose of this chapter is to identify development alternatives that meet the current and anticipated future demands of the airfield. The process of defining and evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on alternative evaluation criteria and airport development goals. The process is structured to systematically evaluate options and provide the technical basis for arriving at a recommended conceptual development plan. Criteria used to evaluate development alternatives include:

- ▶ Performance requirements (ability to accommodate demand)
- ▶ Operational capabilities (specific to functional area)
- ▶ Land use compatibility
- ▶ Environmental impacts
- ▶ Stakeholder feedback
- ▶ Constructability

Various sets of improvement plans were developed for RYN’s airside and landside. The recommended conceptual development plan can be a combination of proposed improvement projects from similar categories. It will serve as a guide for capital improvement planning and as a base for the Airport Layout Plan (ALP). A summary of the recommended alternatives that comprise the recommended conceptual development Plan is included below. The analysis that led to the selection of these alternatives is described in this chapter.

- ▶ Airfield Development Alternative
 - ✓ The recommended alternative is a combination of improvement projects from various airfield developments shown in **Figures 4-4, 4-5, 4-23, and 4-26**:
 - Extend Runway 6R/24L by 2,797 feet to a runway length of 8,300 feet and a width of 100 feet. This project would occur as a multi-phased project. Phase-1 would include an 800-foot runway extension to the west, and Phase-2 would further extend the runway by an additional 1,997 feet.
 - Extend Taxiway B by 2,797 feet to resolve Federal Aviation Administration (FAA)-identified Hot Spot 1. This project would occur as a multi-phased project. Phase-1 would include an 800-foot taxiway extension to the west, and Phase-2 would further extend the taxiway by an additional 1,997 feet.
 - Relocate Runway 15/33 550 feet north and maintain the full runway length of 4,000 feet and the existing width of 75 feet.
 - Construct a new full-length parallel taxiway north of Runway 6L/24R.

- Eliminate multiple taxiway connectors that provide direct runway access from apron areas and have non-standard geometry.
- Develop property north of Runway 6L/24R for aeronautical and non-aeronautical purposes to include aircraft storage and a Maintenance, Repair, and Overhaul (MRO) operation.

▶ Airport Facility Improvements

- ✓ The recommended alternatives are a combination of improvement projects from various airport facility improvements shown in **Figures 4-9, 4-10, 4-12, and 4-17**:
 - Construct a joint-use fire station that serves both RYN and the local community east of Airport Drive and west of the Tucson Airport Authority (TAA) maintenance building.
 - Construct new administrative offices for TAA staff adjacent to the existing conference room.
 - Reconstruct the existing ATCT in its current location and increase the tower height to resolve an existing blind spot along Taxiway D near the approach end of Runway 33.

▶ Flight Schools/GA Facility Improvements

- ✓ The recommended alternatives shown in **Figures 4-19 and 4-21** identify a variety of improvements:
 - Develop property for a new Federal Aviation Regulation (FAR) Part 141 certified flight school east of Airport Drive that includes new hangars, tie-downs, helicopter parking and apron areas, maintenance and support facilities, a student dormitory, a school cafeteria, administrative space, and vehicle parking.
 - Develop property for an expanded FAR Part 61 certified flight school south of the existing flight training facility to include additional hangars, administrative space, and maintenance and support facilities.
 - Construct eight dedicated helicopter parking pads north of the existing Airport Traffic Control Tower (ATCT) apron.

▶ Airport Land Development

- ✓ The recommended alternative shown in **Figure 4-27** identifies a variety of landside improvements:
 - Develop airport property that maximizes aeronautical and non-aeronautical revenues through sensible airside and landside development.
 - Construct a frontage road that parallels Ajo Highway to connect the West, Airport, and East Quadrants.
 - Relocate the Pima County Waste Transfer facility to an acceptable location for the local community.
 - Construct roadways that provide efficient access to Ajo Highway, Postvale Road, Valencia Road, Kushmaul Road, and Continental Road.
 - Integrate access to RYN through a potential interchange for Interstate 11 (I-11) and Valencia Road.
 - Construct utility infrastructure to support airside and landside development.

INTRODUCTION

Various RYN facility alternatives are introduced in this chapter and are coupled with an associated analysis of each alternative. The outcome of the analysis is the selection of preferred development alternatives that formulate the recommended conceptual development Plan for the Master Plan. Once selected, the recommended conceptual development Plan, identified in **Figure 4-29**, becomes the basis for preparing the implementation plan (to be described in a subsequent chapter). The implementation plan includes phasing of improvements, expected capital costs, and key decision points where the Airport will reevaluate implementation assumptions prior to further development.

The chapter is organized as follows:

- ▶ Airport Development Objectives
- ▶ Alternatives Development Process
- ▶ Evaluation Categories
- ▶ Evaluation Process
- ▶ Airport Development Alternatives
- ▶ Recommended Conceptual Development Plan

AIRPORT DEVELOPMENT OBJECTIVES

Prior to developing and evaluating specific alternatives, the Airport's development objectives must be understood. Development objectives for RYN's Master Plan include:

- ▶ Maximize the safety and efficiency of aircraft operational areas to comply with FAA Advisory Circular (AC) 150/5300-13A.
- ▶ Accommodate future demand over the next 20 years and position the Airport to attract additional tenants and businesses.
- ▶ Increase revenue generation through aeronautical and non-aeronautical development.
- ▶ Develop facilities that are consistent with stakeholder and airport user needs.
- ▶ Develop facilities to be compatible with the environment.
- ▶ Develop facilities according to federal, state, and local regulations.

Development alternatives are considered for the airside and landside needs. Airside facilities include runways, taxiways, and support facilities. Landside facilities include the terminal area, vehicle parking areas, walkways, public access roads, and any other areas accessible to the public.

AIRSIDE PLANNING

Airside needs include:

- ▶ Identifying and analyzing existing and future capacity constraints, which include additional supporting taxiways, runway extensions, and vehicle access routes.
- ▶ Analyzing the ability of the Airport to meet design standards identified in AC 150/5300-13A.
- ▶ Increasing airfield efficiency through taxiway improvements.
- ▶ Developing a solution to mitigate FAA-identified Hot Spot 1.
- ▶ Identifying a location for helicopter parking pads.
- ▶ Identifying locations to develop FAR Part 61 and 141 flight schools.
- ▶ Identifying a location for new TAA administrative office space.
- ▶ Identifying a location for a new ATCT.
- ▶ Identifying a location for a new joint-use fire station to serve the Airport and local community.
- ▶ Identifying a location for aircraft storage and a future Maintenance, Repair and Overhaul (MRO) operation.

LANDSIDE PLANNING

Landside needs include:

- ▶ Maximizing the buildable property for aeronautical and non-aeronautical development.
- ▶ Identifying and analyze landside access and roadway networks to support future airport development.

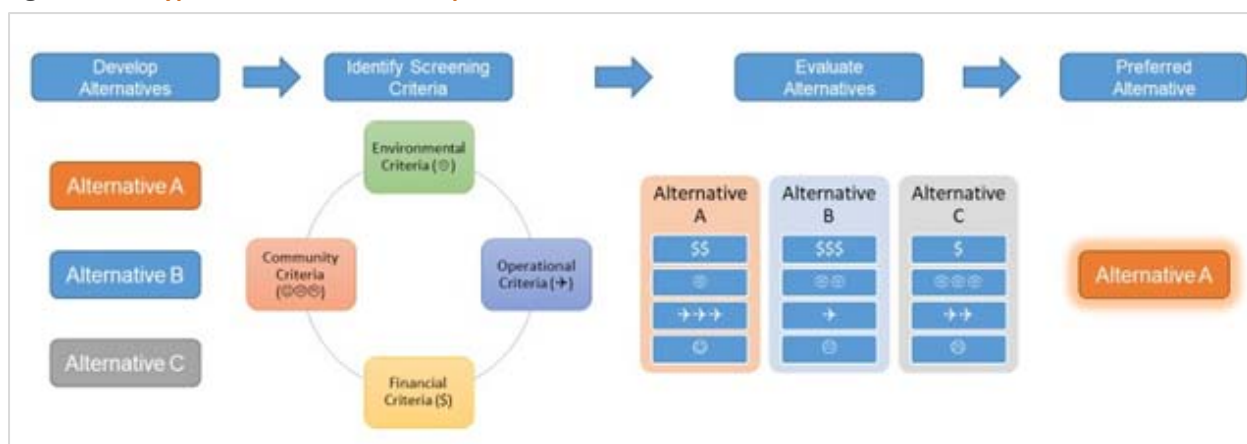
ALTERNATIVES DEVELOPMENT PROCESS

The framework for developing the alternatives was established in **Chapter 1 – Inventory**, **Chapter 2 – Aviation Activity Forecasts**, and **Chapter 3 – Facility Requirements**. The information contained in these three chapters guided the development of layouts that support the Airport’s ability to accommodate forecasted demand and to prepare a 20-year facility plan for the Airport. Developing the alternatives included examining these factors:

- ▶ FAA airport design standards
- ▶ Land development strategies
- ▶ Revenue-producing opportunities
- ▶ Aircraft operations
- ▶ Vehicular traffic and future roadway development
- ▶ Stakeholder Working Group (SWG) and Technical Advisory Committee (TAC) input

The typical alternatives development and evaluation process is illustrated in the following **Figure 4-1**.

Figure 4-1: Typical Alternatives Development Process



AIRPORT MASTER PLAN INPUT COMMITTEES

Throughout this planning process, public involvement and stakeholder outreach has been a continuous process involving education, listening, and collaboration. Stakeholder groups include the SWG, the TAC, the Airport Board and staff, elected officials, on- and off-airport businesses, and neighboring communities. These groups help shape the Master Plan into a document that reflects community goals and interests while satisfying FAA requirements for airport development. Feedback collected throughout the planning process allowed qualitative comparison of the alternatives.

EVALUATION CATEGORIES

The analysis of each alternative progressed through these evaluation categories based on the evaluation criteria developed and agreed upon during the initial scope of the Master Plan:

- ▶ Performance requirements (ability to accommodate demand)
- ▶ Operational capabilities (specific to functional area)
- ▶ Land use compatibility
- ▶ Environmental impacts
- ▶ Constructability

PERFORMANCE REQUIREMENTS

Evaluation by performance requirements gauges whether alternatives have the ability to support the demand identified in **Chapter 2 – Aviation Activity Forecasts** throughout the 20-year period. Alternatives aligned with the forecast if they provided the facilities necessary to meet the identified demand.

OPERATIONAL CAPABILITIES

Evaluation by operational capability gauges whether the alternatives satisfy the facility requirements for operations identified in **Chapter 3 – Facility Requirements**.

LAND USE COMPATIBILITY

This category evaluates alternatives based on compatible land use and the potential impacts to land or other environmental factors that can influence the success of an alternative.

ENVIRONMENTAL IMPACTS

This category evaluates whether alternatives are compatible with existing environmental assets so that an airport can develop in an environmentally sustainable manner. Impacts to these specific environmental elements were considered:

- ▶ Air quality
- ▶ Biological resources (including fish, wildlife, and plants)
- ▶ Climate
- ▶ Department of Transportation Act, Section 4(f)
- ▶ Farmland
- ▶ Hazardous materials, solid waste, and pollution prevention
- ▶ Historical, architectural, archaeological, and cultural resources
- ▶ Land use
- ▶ Natural resources and energy supply
- ▶ Noise and noise-compatible land use
- ▶ Socioeconomic, environmental justice, and children’s environmental health and safety risks
- ▶ Visual effects (light emissions and vision resources)
- ▶ Water resources (including floodplains, surface waters, groundwater)
- ▶ Wild and scenic rivers

Early identification of these environmental factors may help avoid impeding future development plans. The analysis is not intended to fulfill the environmental clearance requirements as defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act*. FAA Order 1050.1F requires the completion of more comprehensive environmental analyses to determine whether National Environmental Policy Act (NEPA) documentation and other processes must take place prior to actual construction beginning.

STAKEHOLDER FEEDBACK

Stakeholders had the opportunity to provide input on alternative development and evaluation through master plan committee meetings and public open house meetings with stakeholder groups, the Airport, and the FAA. Public and committee meetings took place on these dates:

- ▶ Airport Goals and Objectives Session – October 26, 2018
- ▶ TAA Staff Team Meeting – October 30, 2018
- ▶ TAA Executive Team Meeting – October 31, 2018
- ▶ TAA Board of Directors Meeting – December 5, 2018
- ▶ SWG Meeting #1 – February 21, 2019
- ▶ TAC Meeting #1 – February 21, 2019
- ▶ TAA Stakeholders Discussion – May 16, 2019
- ▶ TAA Non-Aeronautical Land Use Discussion – June 12, 2019
- ▶ TAA Alternatives Development Charrette – November 12, 2019
- ▶ SWG Meeting #2 – November 21, 2019
- ▶ TAC Meeting #2 – November 21, 2019
- ▶ Public Open House Meeting #1 – November 21, 2019
- ▶ TAA Board of Directors Meeting – March 4, 2020
- ▶ Public Open House Meeting #2 (Project Mailer) – June 25, 2020
- ▶ SWG Meeting #3 – June 26, 2020
- ▶ TAC Meeting #3 – June 26, 2020
- ▶ TAA Board of Directors Meeting – December 2, 2020
- ▶ SWG Meeting #4 – May 12, 2021
- ▶ TAC Meeting #4 – May 12, 2021
- ▶ Public Open House Meeting #3 – May 12, 2021

CONSTRUCTABILITY

This category evaluates how to implement alternatives in logical and practical phases. Improper timing and the sequence of construction can create delays, increase cost, and impact airport operations. Each alternative was examined to determine the degree that each alternative's construction would impact operations.

EVALUATION PROCESS

This section defines the process identified in FAA AC 150/5070-6B, *Airport Master Plans* (AC 150/5070-6B), to analyze alternatives and how it was applied to future improvements at RYN. The first task in the multi-step process was to develop multiple alternatives that lead to the selection of a preferred alternative. Note that the current FAA-

approved ALP for RYN identifies future improvements recommended in a prior master planning effort. The master planning process addresses new facility needs, but it also allows the components of the previous preferred alternative to be retained or modified if they meet current needs.

Airport development alternatives are created to respond to defined facility needs with the goal of identifying general preferences for both individual items and the overall concepts being presented. That strategy encourages the widest range of ideas to define the most effective facility development concept.

As elements of a preferred alternative emerge from this evaluation process, multiple stakeholders weigh in on elements of the various alternatives, which leads to consolidation into a preferred alternative. The emerging preferred alternative continues being refined as the Airport finalizes the remaining elements of the airport Master Plan. Throughout this process, public input and coordination with the SWG, TAC, FAA, and RYN staff help to shape the preferred alternative.

Once RYN selects the elements that form the preferred alternative, the Recommended Conceptual Development Plan is developed. Once the Recommended Conceptual Plan is developed, a detailed capital improvement program will be created that identifies and prioritizes the implementation of specific projects. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the Airport.

AIRPORT DEVELOPMENT ALTERNATIVES

The initial airport development alternatives are used to facilitate a discussion and evaluation of the most efficient and effective means to meet the facility needs of the Airport. The facility requirements identified in the previous chapter for a variety of airside, landside, and other development needs are organized here into several groups:

- ▶ Airfield development alternatives
- ▶ Airport facilities alternatives
- ▶ Flight school/GA alternatives
- ▶ Airport land development alternatives

The airport development alternatives described below are depicted in **Figures 4-2** through **4-4**.

AIRFIELD DEVELOPMENT ALTERNATIVES

Because all airport functions relate to and revolve around the basic runway layout, runway development alternatives are some of the most critical development needs. Specific airside development considerations include runway occupancy, runway length, taxiway design, and airport support facilities needed to support forecast use through the planning period and comply with FAA design standards. Specific development features proposed here are not necessarily exclusive to an individual alternative. Each alternative concept discussed below is a collection of features or components, many of which can be moved from alternative to alternative.

Airfield Development Alternative 1

This alternative, as shown in **Figure 4-2**, focuses on providing safe and efficient runways and taxiways for general aviation use. Layouts must enhance safety, be operationally efficient, improve circulation, increase capacity, and address needs identified in **Chapter 3 – Facility Requirements**. The first alternative extends Runway 6R/24L to the west by 800 feet (phase 1), then by an additional 1,997 feet west (phase 2), for a total runway length of 8,300 feet. This alternative also widens the primary runway to 100 feet for larger corporate aircraft. The runway extension does not require any land acquisition, nor does it require demolition of existing buildings. Finally, no commercial roads or highways will need to be removed or relocated. The proposed extension potentially solves FAA-identified Hot Spot 1, in which aircraft must taxi and hold on Runway 15/33 prior to positioning on Runway 6R/24L for takeoff. The proposed extension does not cross property lines, nor does it require demolition of existing buildings. No commercial roads or highways will need to be moved or relocated under this alternative.

This alternative also includes shortening the crosswind Runway 15/33 by 900 feet at the 33 end for a final length of 3,100 feet. As shown in **Chapter 3 – Facility Requirements**, primarily light, single-engine aircraft use this runway, meaning the resulting runway length is adequate. Reducing the length shifts the Runway 33 Runway Protection Zone (RPZ) north, effectively removing an incompatible land use (Ajo Highway). The RPZ shift also allows room for a frontage road that would run parallel to Ajo Highway, outside of the RPZ, that connects the West Quadrant and Airport Quadrant to improve access for non-aeronautical and aeronautical development.

Extending Runway 6R/24L and reducing the length of 15/33 requires improvements to the airfield's taxiway system. An extension of Taxiway B on the west end is necessary to connect to Runway 6R's new threshold location. Further improvements to the airfield are necessary to increase access and circulation through new connectors and taxiway segments as a result of the extension of Runway 6R/24L and shortening of Runway 15/33. In addition, these improvements must comply with updated FAA design standards that recommend crossing taxiways be on the outer two-thirds of a runway to reduce runway incursion hazards, eliminate taxiways that provide direct access to runways from aircraft apron areas, and address taxiway connectors that do not meet current geometry guidelines.

Advantages of this alternative:

- ▶ Extends Runway 6R/24L by 2,797 feet to a runway length of 8,300 feet and a width of 100 feet. This project would occur as a multi-phased project. Phase 1 would include an 800-foot runway extension to the west, and Phase 2 would further extend the runway by an additional 1,997 feet.
- ▶ Corrects direct access to a runway from an apron by an aircraft and non-standard taxiway designs.
- ▶ Eliminates FAA-identified Hot Spot 1 at the intersection of Runway 6R threshold and Runway 15/33.
- ▶ Extends Runway 6R/24L to 8,300 feet long supports a long-term objective of the Airport for larger D-II aircraft operations.
- ▶ Reduces runway occupancy and increases efficiency by constructing additional exit taxiways.
- ▶ Reduces the potential for high-energy collisions on runways and achieves airfield compliance with the latest FAA design criteria by relocating taxiways outside of the middle third of the runway (between Runway 6L/24R and 6R/24L).

- ▶ Allows for the construction of a frontage road, parallel to Ajo Highway, connecting the West Quadrant with the Airport Quadrant to improve access for non-aeronautical and aeronautical development by reducing the runway length of Runway 15/33 by 900 feet.
- ▶ Eliminates an incompatible land use within the approach end of Runway 33's approach-end RPZ by reducing the runway length of Runway 15/33 by 900 feet.

Disadvantages of this alternative:

- ▶ Limits larger, faster aircraft from utilizing the crosswind runway by reducing the runway length of Runway 15/33 by 900 feet.
- ▶ Requires construction to occur in a known floodplain and requires a variety of permits and mitigation measures to Extend Runway 6R/24L to 8,300 feet.
- ▶ Requires the extension of Runway 6R/24L to 8,300 feet to occur as a multi-phased project.

Airfield Development Alternative 2

This alternative, as shown in **Figure 4-3**, has several similarities to Alternative 1. Runway 6R/24L is extended to the west by 800 feet (phase 1), then by an additional 1,997 feet west (phase 2), for a total runway length of 8,300 feet. The runway is also widened to 100 feet for larger corporate aircraft. The runway extension occurs on Airport-owned property, does not require demolition of existing building, and does not relocate any roads or highways. The phased runway extension provides a potential solution to FAA-identified Hot Spot 1.

This alternative differs from Alternative 1 because Runway 15/33 retains its existing length of 4,000 feet and remains in its current location. Since primarily light, single-engine aircraft use this runway, the current length is sufficient. Preserving the runway in its current condition (location and length) also retains the incompatible land use associated with Runway 33's RPZ. This does not allow for a frontage road to be built and limits connectivity and access to non-aeronautical and aeronautical development.

Extending Runway 6R/24L requires improvements to the airfield's taxiway system. An extension of Taxiway B on the west end is necessary to connect to Runway 6R's new threshold location. Further improvements to the airfield are necessary to increase access and circulation through new connectors and taxiway segments as a result of the extension of Runway 6R/24L. In addition, these improvements must comply with updated FAA design standards that recommend crossing taxiways be on the outer two-thirds of a runway to reduce runway incursion hazards, eliminate taxiways that provide direct access to runways from aircraft apron areas, and address taxiway connectors that do not meet current geometry guidelines.

Advantages of this alternative:

- ▶ Corrects direct access to a runway from an apron by an aircraft and non-standard taxiway designs.
- ▶ Eliminates FAA-identified Hot Spot 1 at the intersection of Runway 6R threshold and Runway 15/33.
- ▶ Supports multiple users by retaining Runway 15/33's current location and its full runway length of 4,000 feet.

- ▶ Extends Runway 6R/24L by 2,797 feet to a runway length of 8,300 feet and a width of 100 feet. This project would occur as a multi-phased project. Phase 1 would include an 800-foot runway extension to the west, and Phase 2 would further extend the runway by an additional 1,997 feet.
- ▶ Supports a long-term objective of the Airport for larger D-II aircraft operations by extending Runway 6R/24L to 8,300 feet long.
- ▶ Reduces runway occupancy and increases efficiency by constructing additional exit taxiways.
- ▶ Reduces the potential for high-energy collisions on runways and achieves airfield compliance with the latest FAA design criteria by relocating taxiways outside of the middle third of the runway (between Runway 6L/24R and 6R/24L).

Disadvantages of this alternative:

- ▶ Retains an incompatible land use associated with approach end of Runway 33's RPZ and Ajo Highway.
- ▶ Requires construction to occur in a known floodplain and requires a variety of permits and mitigation measures to extend Runway 6R/24L to 8,300 feet.
- ▶ Requires the extension of Runway 6R/24L to 8,300 feet to occur as a multi-phased project.
- ▶ Reduces connectivity and access to nonaeronautical and aeronautical development areas.

Airfield Development Alternative 3

The third alternative, as shown in **Figure 4-4**, extends Runway 6R/24L is extended to the west by 800 feet (phase 1), then by an additional 1,997 feet west (phase 2), for a total runway length of 8,300 feet. The runway is also widened to 100 feet for larger corporate aircraft. The runway extension occurs on Airport-owned property, does not require demolition of existing buildings, and does not relocate any roads or highways. The phased runway extension provides a potential solution to FAA-identified Hot Spot 1. This alternative also shifts Runway 15/33 north by 550 feet and allows the runway to remain at 4,000 feet in total length. The runway shift allows for a frontage road to run parallel to Ajo Highway, outside of the RPZ, that connects the West Quadrant and Airport Quadrant to improve access for non-aeronautical and aeronautical development.

The extension of 6R/24L and northerly shift of 15/33 requires improving the airfield's taxiway system. The shift of Runway 15/33 requires the northerly extension of Taxiway D along with the relocation of Taxiway D1 and D3 to adequately service the runway. An extension of Taxiway B to the west is necessary in order to meet the relocated Runway 6R threshold. Due to the extension of Runway 6R/24L, the section of Taxiway A from Runway 15/33 to the end of Runway 6L is eliminated. A new parallel taxiway will be added north of Runway 6L/24R. Taxiway connectors A1 and A5 will be extended south to connect to Runways 6/24 and Taxiway B. Existing taxiway connectors A2, A4, B2, and B4 will be removed.

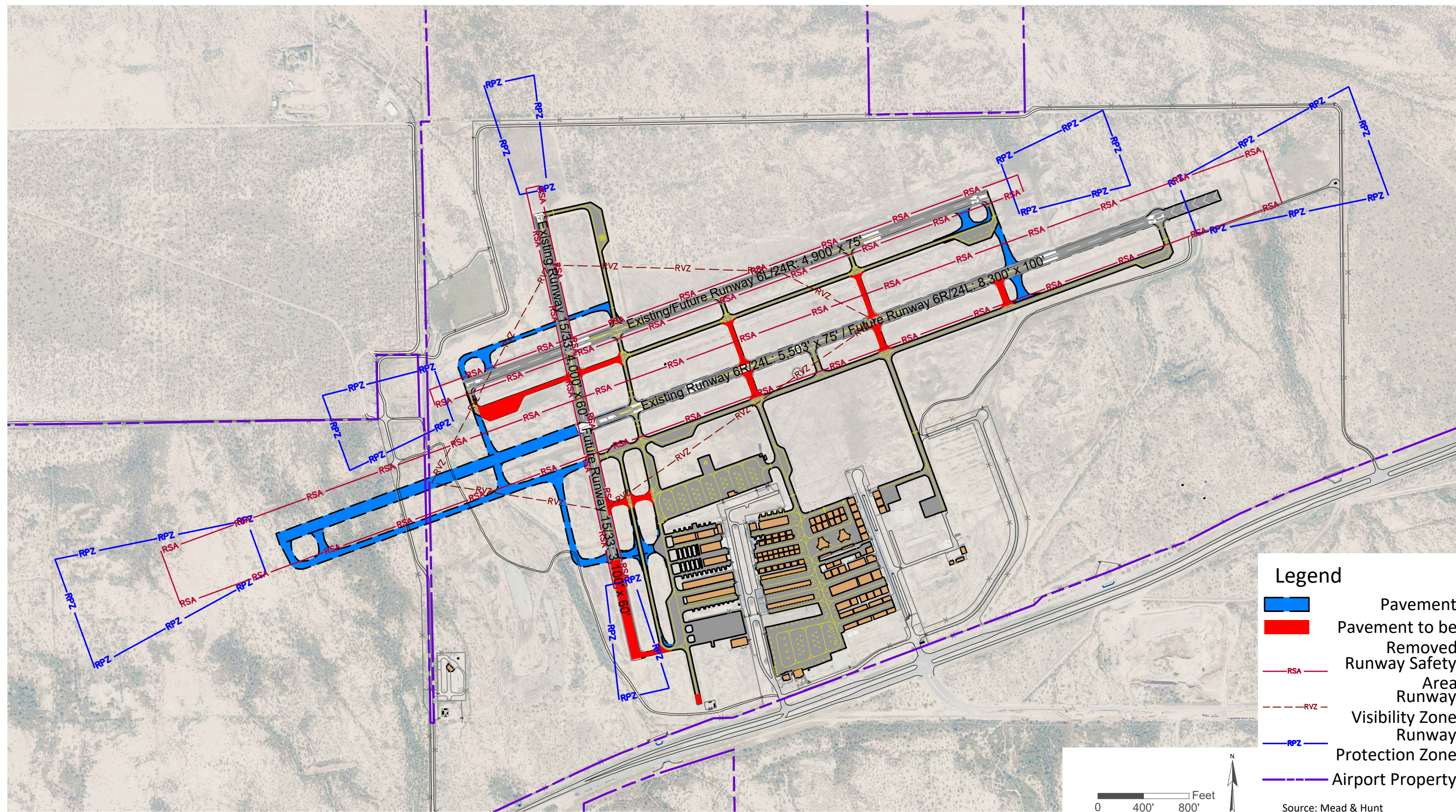
The primary objective of Alternative 3 is to extend Runway 6R/24L to 8,300 feet, retain Runway 15/33's current runway length of 4,000 feet, remove the incompatible land use within the Runway 33 RPZ, eliminate the FAA-identified Hot Spot 1, create a frontage road parallel to Ajo Highway that connects the West Quadrant to the Airport Quadrant for improved access to non-aeronautical and aeronautical development, and comply with the most current FAA design criteria for all runways and taxiways at RYN.

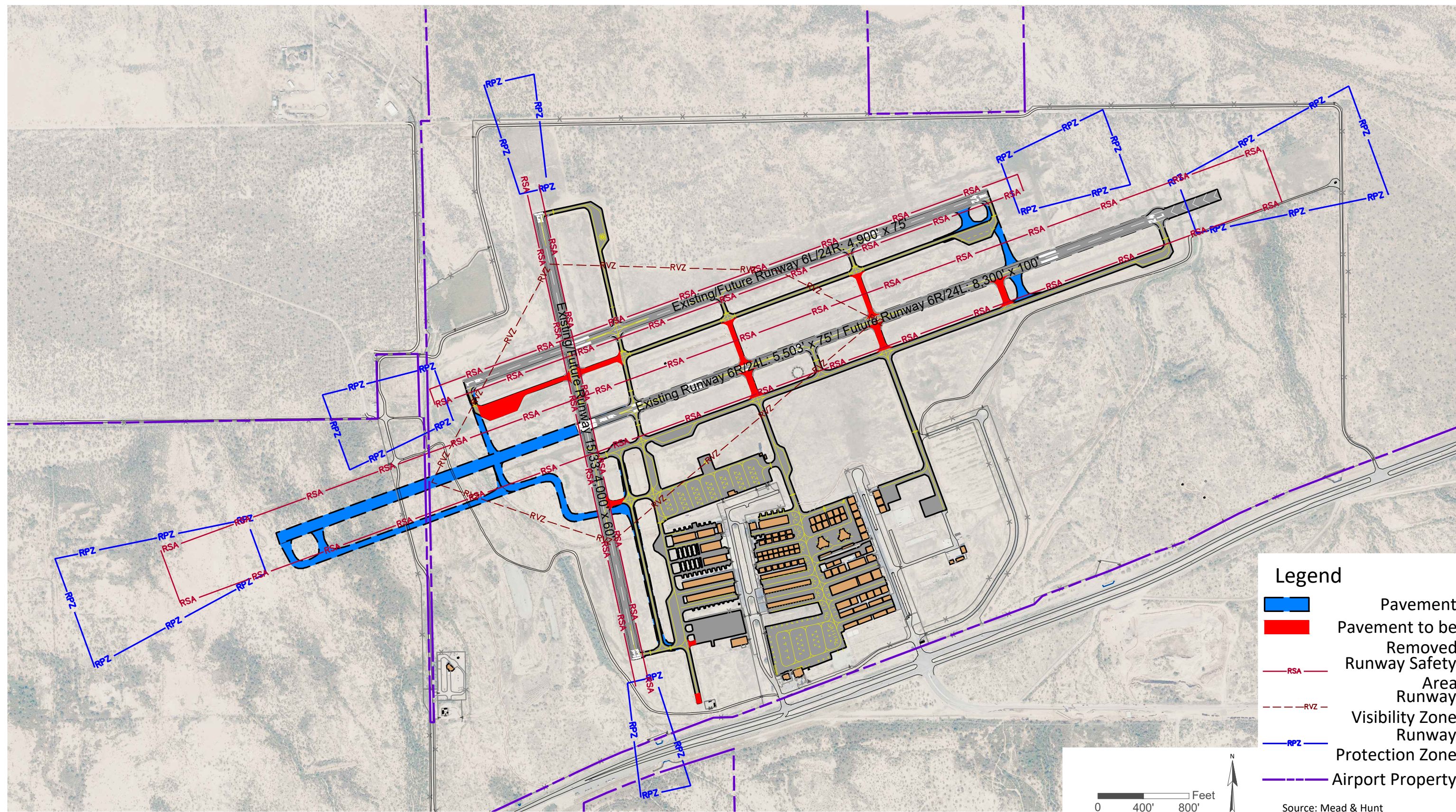
Advantages of this alternative:

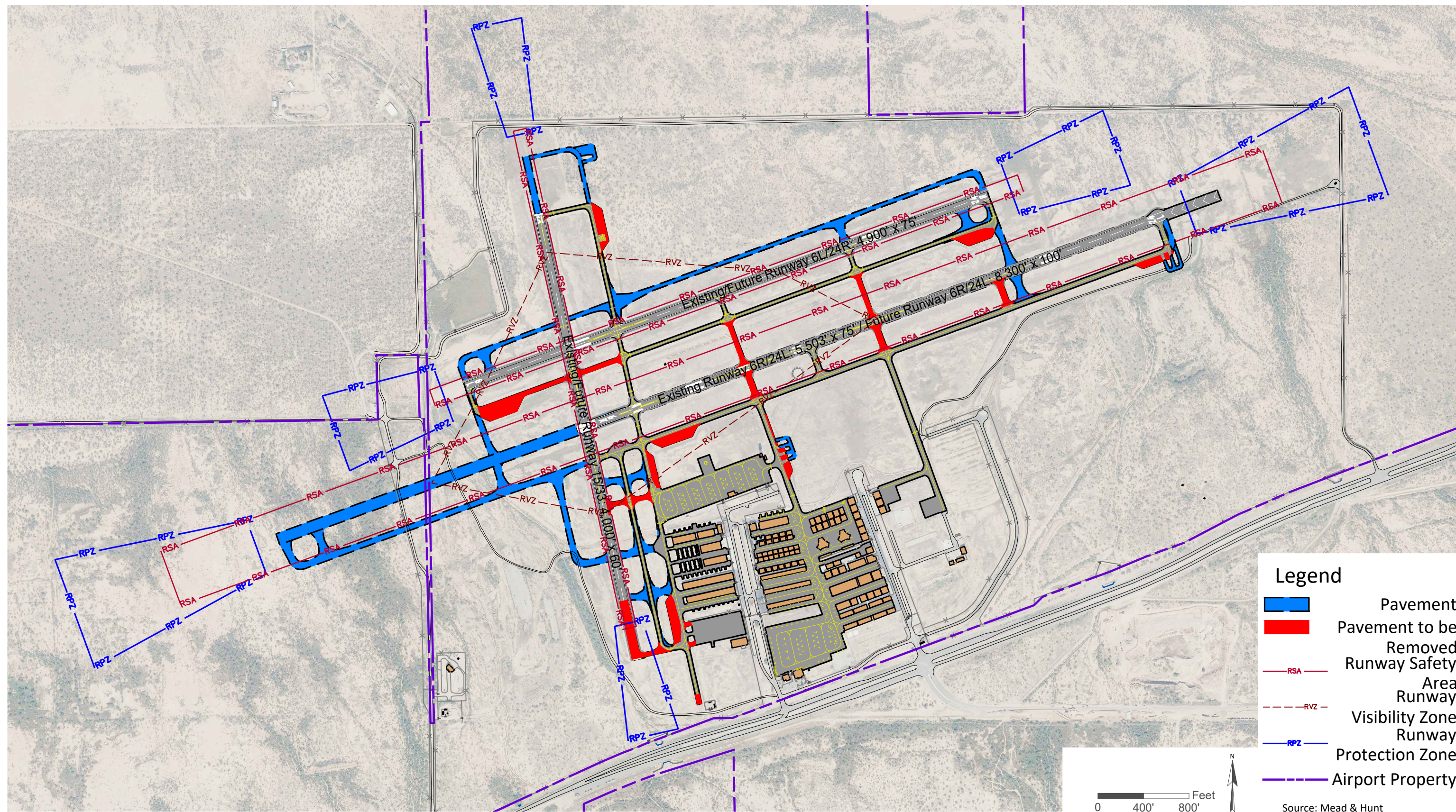
- ▶ Corrects direct access to a runway from an apron by an aircraft and non-standard taxiway designs.
- ▶ Extends Runway 6R/24L by 2,797 feet to a runway length of 8,300 feet and a width of 100 feet. This project would occur as a multi-phased project. Phase-1 would include an 800-foot runway extension to the west, and Phase-2 would further extend the runway by an additional 1,997 feet.
- ▶ Supports a long-term objective of the Airport for larger D-II aircraft operations by extending Runway 6R/24L to 8,300 feet long.
- ▶ Eliminates FAA-identified Hot Spot 1 at the intersection of the Runway 6R threshold and Runway 15/33.
- ▶ Allows for the construction of a frontage road, parallel to Ajo Highway, connecting the West Quadrant with the Airport Quadrant to improve access for non-aeronautical and aeronautical development by shifting Runway 15/33 550 feet north.
- ▶ Eliminates an incompatible land use within the approach end of Runway 33's approach end RPZ by shifting Runway 15/33 to the north by 550 feet.
- ▶ Reduces runway occupancy and increases efficiency by constructing additional exit taxiways.
- ▶ Reduces the potential for high-energy collisions on runways and achieves airfield compliance with the latest FAA design criteria by relocating taxiways outside of the middle third of the runway (between Runway 6L/24R and 6R/24L).

Disadvantages of this alternative:

- ▶ Requires construction to occur in a known floodplain and requires a variety of permits and mitigation measures to extend Runway 6R/24L to 8,300 feet.
- ▶ Requires the extension of Runway 6R/24L to 8,300 feet to occur as a multi-phased project.







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Summary Evaluation of Airfield Development Alternatives

Table 4-1 presents an evaluation of the various alternatives for the airfield at RYN. Alternative 3 was selected as the preferred alternative due to the westerly extension of Runway 6R/24L to 8,300 feet and widening to 100 feet to support long-term use by corporate jet aircraft, shifting Runway 15/33 north by 550 feet, retaining the runway's full length of 4,000 feet, eliminating FAA-identified Hot Spot 1, eliminating Runway 33's RPZ incompatible land use, increased connectivity and access for non-aeronautical and aeronautical development through a new frontage road parallel to Ajo Highway, and improvements to the airfield that comply with the most current FAA design standards.

Table 4-1: Summary Evaluation Matrix of Airfield Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Description of Improvement	Extend Runway 6R/24L west to 8,300' and reduce Runway 15/33 900' at the Runway 33 end	Extend Runway 6R/24L west to 8,300' and Runway 15/33 remains at 4,000' in current location	Extend Runway 6R/24L west to 8,300' and shift the entire Runway 15/33 north by 550'
PERFORMANCE REQUIREMENTS			
Runway Length Requirements	Serves forecasted fleet mix	Serves forecasted fleet mix	Serves forecasted fleet mix
Runway Width Requirements	Meets existing B-II and long-term D-II standards	Meets existing B-II and long-term D-II standards	Meets existing B-II and long-term D-II standards
Serves Forecasted Demand	Yes	Yes	Yes
OPERATIONAL CAPABILITIES			
Aircraft with Higher Operating Weights and Range	Increased potential with 6R/24L extension and widening; Limits use of Runway 15/33 due to reduction in length	Increased potential with 6R/24L extension and widening	Increased potential with 6R/24L extension and widening
NAVAIDS	Relocation required	Relocation required	Relocation required
Runway Protection Zone Conflicts	None	Ajo Highway and Runway 33 RPZ	None
Increases Potential for Development	Yes	Yes	Yes
Resolves 150/5300-13A Deficiencies	Yes	Yes	Yes
LAND USE COMPATABILITY			
Impact to On-Airport Property	Increases potential for non-aeronautical and aeronautical development	Limits connectivity for non-aeronautical and aeronautical development	Increases potential for non-aeronautical and aeronautical development
Impact to Off-Airport Property	No	No	No
ENVIRONMENTAL IMPACT POTENTIAL			
Increases Impervious Pavement	Yes	Yes	Yes
Landfill Impact	No	No	No
Floodplain Impact	Extending Runway 6R/24L and the supporting airfield improvements would require permits and mitigation measures	Extending Runway 6R/24L and the supporting airfield improvements would require permits and mitigation measures	Extending Runway 6R/24L and the supporting airfield improvements would require permits and mitigation measures
CONSTRUCTABILITY			
Impact to Airport Operations	Medium	Low	Low
ALTERNATIVES EVALUATION			
DETERMINATION	NOT FAVORABLE	NOT FAVORABLE	FAVORABLE

MAINTENANCE, REPAIR, AND OVERHAUL (MRO) FACILITY ALTERNATIVES

Maintenance, Repair, and Overhaul (MRO) facilities perform various levels of maintenance activities on aircraft for the military, commercial airlines, air cargo carriers, and general aviation. Maintenance activities include performing major repair, maintenance, and modification services on an aircraft's airframe, engines, avionics, or other components. MRO facilities attract businesses, increase airport revenue, and create jobs for the local community. The need for MRO facilities is likely to increase in the future due to the continued growth in aviation, and the following alternatives present various options in developing property at RYN for an MRO facility.

MRO Facility Alternative 1

This alternative, as shown in **Figure 4-5**, involves the construction of an MRO facility on vacant TAA owned property north of Runway 6L/24R and east of Runway 15/33. The proposed site can accommodate a 122,500-square-foot administration and hangar facility; 189 employee vehicle parking stalls; aircraft hardstand positions for 13 ERJ-195, 9 A321-200NEO, and 14 B737-800 aircraft; 4 ADG-III taxilanes; a new parallel taxiway north of Runway 6L/24R; and a repaved access road to access the facilities. The RPZs and RSAs for Runway 15/33 and Runway 6L/24R need to remain clear of development in addition to the 600-foot radius for the compass rose clear zone on the adjacent taxiway.

Advantages of this alternative:

- ▶ Develops a greenfield site in the north quadrant of the Airport.
- ▶ Includes a 122,500-square-foot administration and hangar facility, 189 employee parking stalls, and hardstands for 13 ERJ-195, 9 A321-NEO, and 14 B737-800 aircraft types.
- ▶ Provides diversified job opportunities for the surrounding community.
- ▶ Increases aeronautical development and revenue opportunities for the Airport.

Disadvantages of this alternative:

- ▶ Larger aircraft may have a difficult time operating on a 75-foot-wide runway and 35-foot-wide taxiway.
- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ Local community perceives an MRO facility as an aircraft chop shop.
- ▶ Significant infrastructure improvements are required for the north quadrant of the Airport to be viable.

MRO Facility Alternative 2

This alternative, as shown in **Figure 4-6**, is similar to the previous alternative as it involves developing TAA-owned property north of Runway 6L/24R and east of Runway 15/33. The proposed site can accommodate a 95,000-square-foot maintenance hangar and administration building; 182 employee vehicle parking stalls; aircraft hardstand positions for 15 ERJ-195, 18 A321-200NEO, and 14 B737-800 aircraft; 4 ADG-III taxilanes; a new parallel taxiway north of Runway 6L/24R; and a repaved access road to access the facilities.

The RPZs and RSAs for Runway 15/33 and Runway 6L/24R need to remain clear of development in addition to the 600-foot radius for the compass rose clear zone on the adjacent taxiway.

Advantages of this alternative:

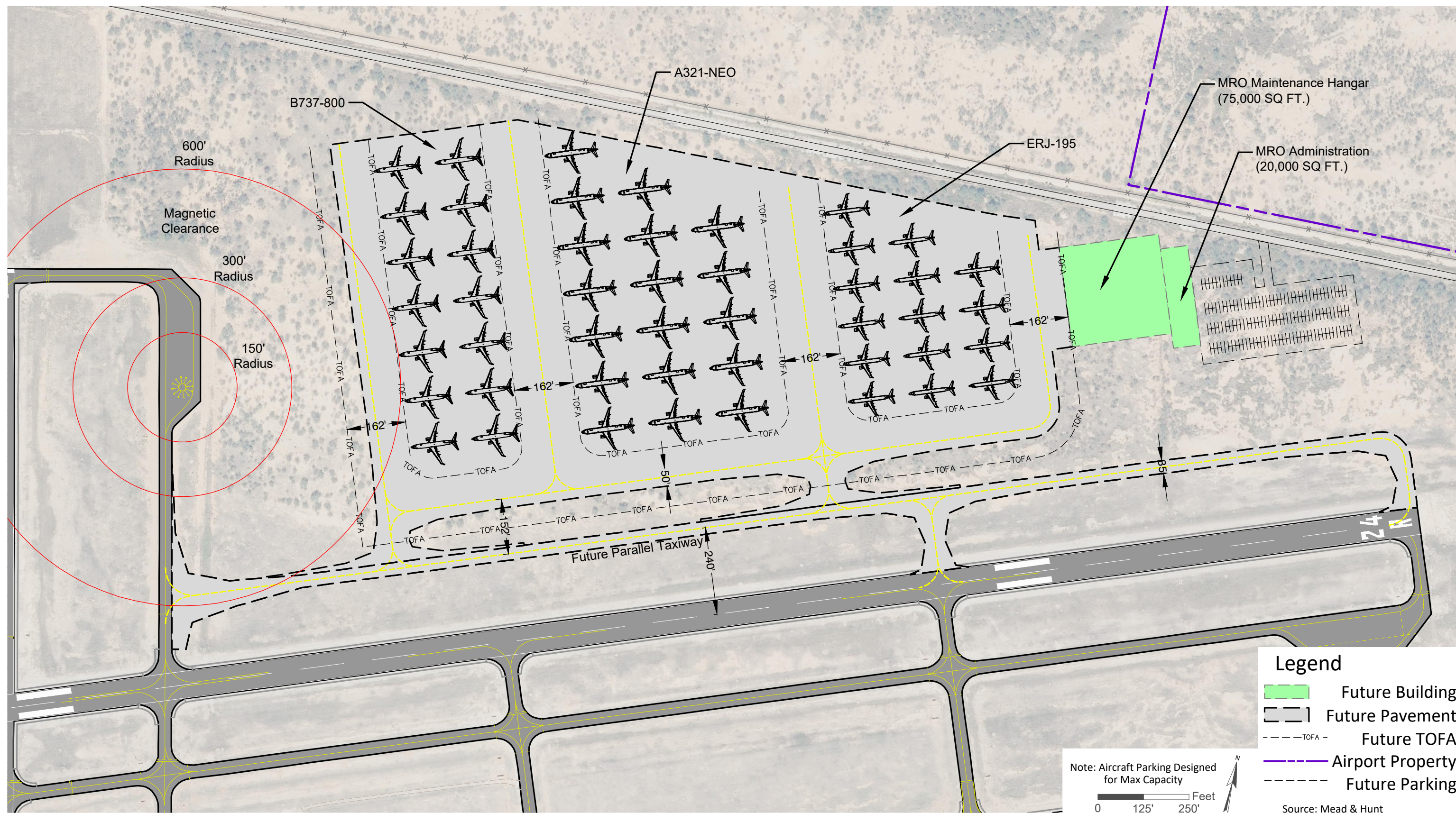
- ▶ Develops a greenfield site in the north quadrant of the Airport.
- ▶ Includes a 95,000-square-foot administration and hangar facility, 182 employee parking stalls, and hardstands for 13 ERJ-195, 9 A321-NEO, and 14 B737-800 aircraft types.
- ▶ Provides diversified job opportunities for the surrounding community.
- ▶ Increases aeronautical development and revenue opportunities for the Airport.

Disadvantages of this alternative:

- ▶ Larger aircraft may have a difficult time operating on a 75-foot-wide runway and 35-foot-wide taxiway.
- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ Local community perceives an MRO facility as an aircraft chop shop .
- ▶ Significant infrastructure improvements are required for the north quadrant of the Airport to be viable.



Maintenance, Repair, and Overhaul - Alternative 1
Figure 4-5



Summary Evaluation of MRO Facility Alternatives

Table 4-2 presents an evaluation of the various MRO alternatives at RYN. Alternative 1 is the preferred alternative due to the larger hangar and administrative building, number and types of aircraft hardstand positions, and a more efficient placement of facilities within the site.

Table 4-2: Summary Evaluation Matrix of MRO Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Construction of an MRO Facility and supporting improvements in the North Quadrant	Construction of an MRO Facility and supporting improvements in the North Quadrant
OPERATIONAL CAPABILITIES		
Airfield Impacts	New taxiway parallel taxiway north of Runway 6L/24R; aircraft apron area, hangar, and administrative building; and four new ADG-III taxilanes	New taxiway parallel taxiway north of Runway 6L/24R; aircraft apron area, hangar, and administrative building; and four new ADG-III taxilanes
Site Characteristics	122,500-square-foot administration and hangar facility, 189 employee parking stalls, and hardstands for 13 ERJ-195, 9 A321-NEO, and 14 B737-800 aircraft types	95,000-square-foot administration and hangar facility, 182 employee parking stalls, and hardstands for 13 ERJ-195, 9 A321-NEO, and 14 B737-800 aircraft types
Runway Protection Zone Conflicts	None	None
Compatible with Existing / Future Facilities	Yes	Yes
Secure Location	Yes	Yes
LAND USE COMPATABILITY		
Impact to On-Airport Property	Development in north quadrant requires multiple permits and mitigation measures	Development in north quadrant requires multiple permits and mitigation measures
Impact to Off-Airport Property	Connectivity to existing roadway network required to provide access to the proposed facilities	Connectivity to existing roadway network required to provide access to the proposed facilities
Relocation of Existing Facilities Required	No	No
ENVIRONMENTAL IMPACT POTENTIAL		
Increases Impervious Pavement	Yes	Yes
Floodplain Impact	Development in this quadrant would require permits and mitigation measures	Development in this quadrant would require permits and mitigation measures
Landfill Impact	None	None
CONSTRUCTABILITY		
Impact to Airport Operations	Minimal	Minimal
ALTERNATIVES EVALUATION		
DETERMINATION	FAVORABLE	NEUTRAL

AIRPORT FACILITIES ALTERNATIVES

This section develops and evaluates alternatives for the addition of a joint-use airport and community fire station, TAA administration building, and the relocation or improvement of the existing ATCT on airport property. Aviation support facilities are necessary to serve existing users but also encourage growth in aviation-related activities. The addition of a joint-use fire station and improved ATCT are intended to provide for the highest level of safety by responding to emergencies either on airport or in the local community and to eliminate blind spots on the airfield where ATCT controllers cannot see aircraft operating on the taxiway. TAA has also identified the need to have dedicated TAA administrative personnel at RYN.

Airport and Community Fire Station Alternatives

RYN is not a FAR Part 139 certificated airport; therefore, the Airport is not required to have aircraft rescue and firefighting (ARFF) equipment and personnel onsite. The TAA has a mutual aid agreement with the Drexel Heights Fire Department to respond to emergencies at RYN, and support can also be provided from the ARFF at Tucson International Airport (TUS) if necessary. It is recommended that a new 7,700-square-foot joint-use airport and community fire station be constructed at RYN in response to planned development at the Airport. The building must remain clear of all FAR Part 77 surfaces and not impact FAA ATCT line of site. Three potential locations were identified for the joint-use airport and community fire station, and each alternative is described below.

Airport and Community Fire Station Alternative Site 1

Alternative 1, as shown in **Figure 4-7**, involves the construction of a joint-use airport and community fire station near the intersection of Airfield Drive and Valencia Road. The proposed fire station is on airport property, allowing for easy access to the runways, hangars, airport offices and businesses, and Ajo Highway. Constructing a joint-use airport and community fire station at this location would benefit the Airport, its tenants, and surrounding communities. The proposed location of the joint-use airport and community fire station would not impact FAR Part 77 surfaces or impact the existing ATCT line of site to the airfield.

Advantages of this alternative:

- ▶ The addition of a fire station with dedicated staffing increases the safety of airfield operations.
- ▶ A joint-use airport and community fire station could assist in attracting future airport development.
- ▶ A joint-use airport and community fire station improves response times to emergencies at RYN and surrounding communities.
- ▶ Proposed location is close to airport facilities, runways, and taxiways and has easy access to Ajo Highway.

Disadvantages of this alternative:

- ▶ The joint-use airport and community fire station is not dedicated solely to RYN.
- ▶ Development of this facility requires a joint-use agreement or memorandum of understanding to provide services.
- ▶ The joint-use airport and community fire station is a non-revenue-producing facility.
- ▶ A joint-use airport and community fire station's building and fire equipment is not eligible for FAA funding.

Airport and Community Fire Station Alternative Site 2

The second alternative, as shown in **Figure 4-8**, involves the construction of a joint-use airport and community fire station adjacent to Runway 15/33 near Taxiway D and South Aviator Lane. This location does not provide good access to the signalized intersection of Airport Drive and Valencia Road and requires emergency response vehicles to either use an existing frontage road to get to the intersection or use a right turn only lane to access Ajo Highway from South Aviator Lane. The proposed location is also located on a prime aeronautical and non-aeronautical revenue-producing parcel. The proposed location of the joint-use airport and community fire station would not impact FAR Part 77 surfaces or impact the existing ATCT line of site to the airfield.

Advantages of this alternative:

- ▶ The addition of a fire station with dedicated staffing increases the safety of airfield operations.
- ▶ A joint-use airport and community fire station could assist in attracting future non-aeronautical and aeronautical development.
- ▶ A joint-use airport and community fire station improves response times to emergencies at RYN and surrounding communities.

Disadvantages of this alternative:

- ▶ The proposed location requires the realignment of the perimeter fence near South Aviator Lane.
- ▶ The proposed location does not provide easy access to Ajo Highway.
- ▶ The joint-use airport and community fire station is not dedicated solely to RYN.
- ▶ Development of this facility requires a joint-use agreement or memorandum of understanding to provide services.
- ▶ The joint-use airport and community fire station is a non-revenue producing facility.
- ▶ A joint-use airport and community fire station's building and fire equipment is not eligible for FAA funding.
- ▶ The proposed location is located on a prime aeronautical and non-aeronautical revenue-producing parcel.
- ▶ The proposed location is does not provide easy access to Ajo Highway.

Airport and Community Fire Station Alternative Site 3

The third alternative, as shown in **Figure 4-9**, involves the construction of a joint-use airport and community fire station near the existing TAA maintenance facility east of Airfield Drive. This location allows for quick and easy access to the airfield in the event of an emergency. The location can be reached by exiting Ajo Highway at Airfield Drive and continuing for approximately a quarter mile. This location is next to the maintenance facilities, the main apron area, and in close proximity to the runways and taxiways. Similar to the previous alternatives, this location places first responders where they can more quickly respond to an emergency. The proposed location of the joint-use airport and community fire station would not impact FAR Part 77 surfaces or impact the existing ATCT line of site to the airfield.

Advantages of this alternative:

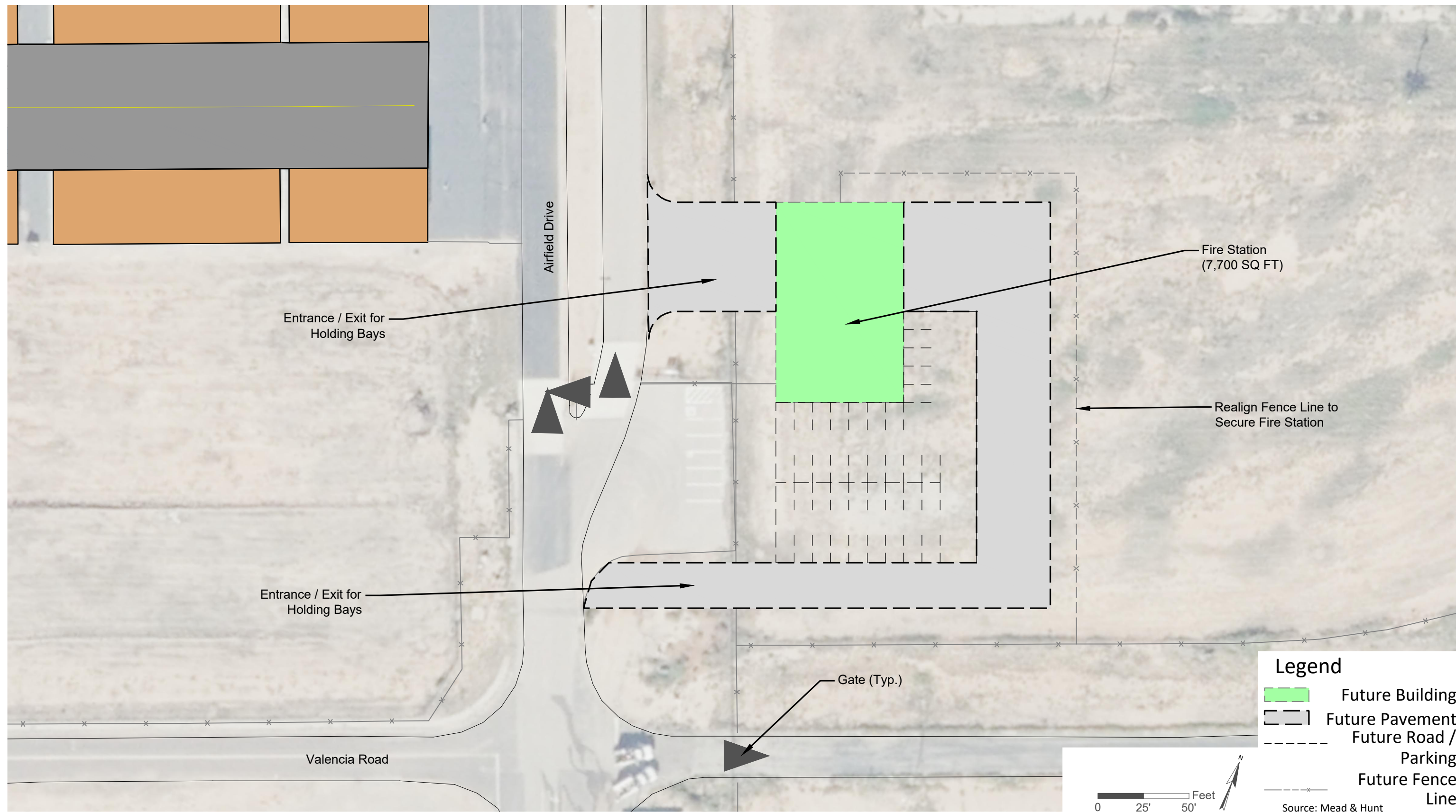
- ▶ A joint-use airport and community fire station improves response times to emergencies at RYN and surrounding communities.
- ▶ Proposed location is close to airport facilities, runways, and taxiways and has easy access to Ajo Highway.
- ▶ The addition of a fire station with dedicated staffing increases the safety of airfield operations.
- ▶ A joint-use airport and community fire station could assist in attracting future non-aeronautical and aeronautical development.
- ▶ The proposed location is close to the maintenance facilities, runways, taxiways, and Ajo Highway, enabling a quicker response time.

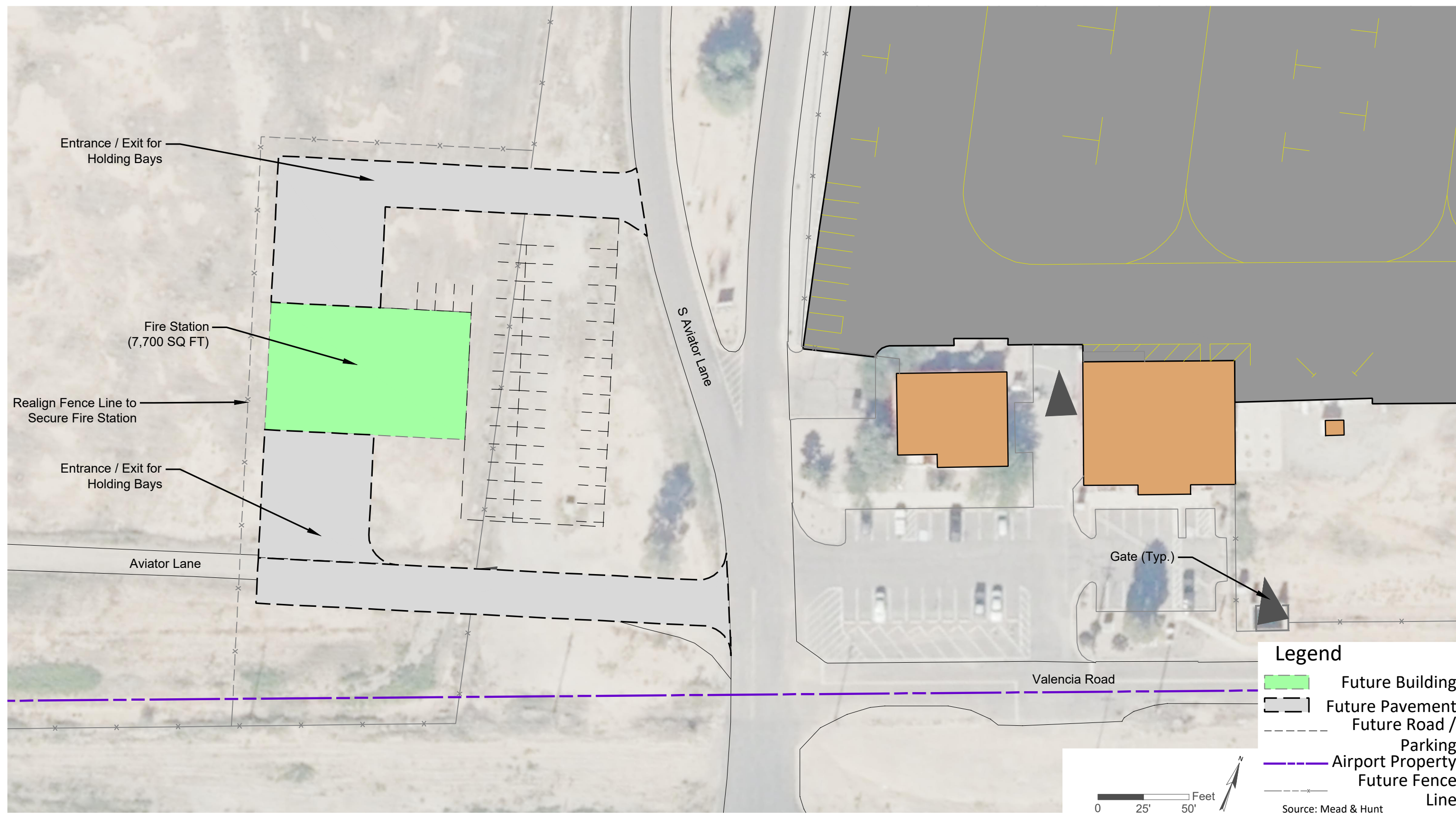
Disadvantages of this alternative:

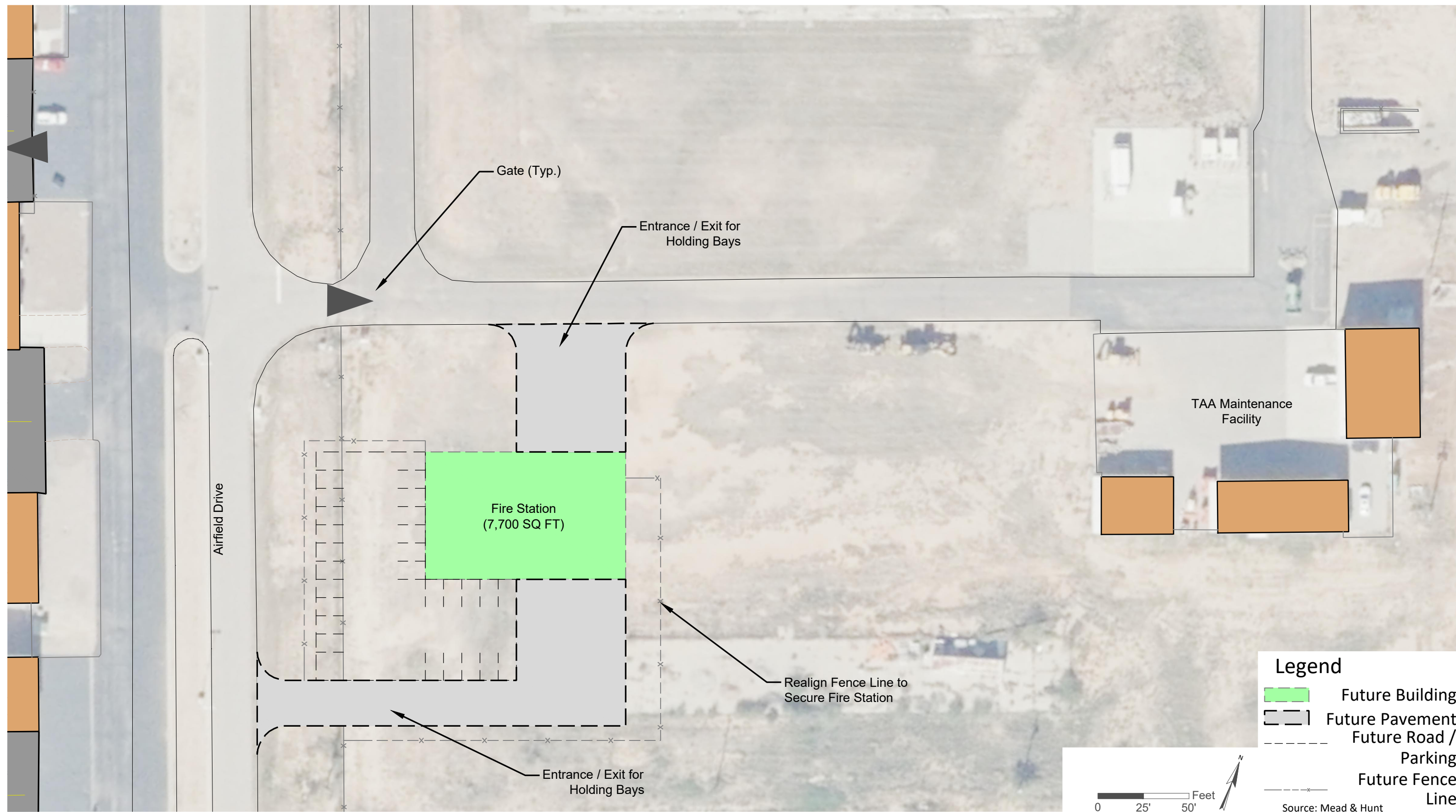
- ▶ The proposed location requires the realignment of the perimeter fence near the intersection of Airfield Drive and West Airstrip Road.
- ▶ The joint-use airport and community fire station is not dedicated solely to RYN.
- ▶ Development of this facility requires a joint-use agreement or memorandum of understanding to provide services.
- ▶ The joint-use airport and community fire station is a non-revenue-producing facility.
- ▶ A joint-use airport and community fire station's building and fire equipment is not eligible for FAA funding.

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Summary Evaluation of Airport and Community Fire Station Alternatives

Table 4-3 presents an evaluation of the various alternatives for the Airport and Community Fire Station at RYN. Alternative 3 is the preferred alternative as the location of the site provides good access to respond to emergencies at RYN and in the local community.

Table 4-3: Summary Evaluation Matrix of Airport and Community Fire Station Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Description of Improvements	Construct Fire Station at the Entrance of Airfield Drive	Construct Fire Station on South Aviator Lane, Across from Richie’s Cafe	Construct Fire Station on West Airstrip Road
PERFORMANCE REQUIREMENTS			
Expansion Capabilities	There is room to build and expand		
OPERATIONAL CAPABILITIES			
Airfield Operability and Access	Good ingress and egress to respond to airfield and local community emergencies	Poor ingress and egress to local community and distance to primary runways	Good ingress and egress to respond to airfield and local community emergencies
Airfield Impacts	Minimal	Minimal	Minimal
LAND USE COMPATABILITY			
Impacts to Airport Property Use	Located on a site that could be used for revenue producing non-aeronautical development	Located on a site that could be used for revenue producing aeronautical development	Adjacent to other existing TAA facilities for development of a "TAA building campus"
ENVIRONMENTAL IMPACT POTENTIAL			
Increases Impervious Pavement	Yes	Yes	Yes
Property Acquisition/ Easement	No	No	No
Floodplain Impact	No	No	No
Landfill Impact	No	No	No
CONSTRUCTABILITY			
Impact to Airport Operations	Minimal	Minimal	Minimal
ALTERNATIVES EVALUATION			
DETERMINATION	NOT FAVORABLE	NOT FAVORABLE	FAVORABLE

TAA Administrative Building Alternatives

TUS and RYN are both owned by the City of Tucson and operated by the TAA. The majority of the administrative responsibilities for RYN are managed by employees who are located at TUS. As RYN continues to grow, TAA has identified the need to have dedicated staff at RYN. This would result in improved tenant relationships, better daily operations, enhanced property management, and greater efficiency among TAA staff who have to travel back and forth from TUS to RYN to handle daily responsibilities. The following alternatives present three options for dedicated administrative office space at RYN.

TAA Administrative Building Alternative 1

This alternative, as shown in **Figure 4-10**, involves the construction of 2,000 square feet of dedicated administrative office space, four employee vehicle parking stalls, and ten public parking stalls on vacant land next to Velocity Air and the executive hangars on Airfield Drive. The administrative building would be constructed on the east side of the property near the existing TAA maintenance buildings. Airport employees can access this location through Ajo Highway and Airfield Drive.

Advantages of this alternative:

- ▶ Proposed location is on a greenfield site.
- ▶ Provides dedicated administrative office space for TAA staff assigned to RYN.

Disadvantages of this alternative:

- ▶ Perimeter fencing is required to secure the administrative building.
- ▶ Proposed location could potentially support a revenue-producing function vs. a non-revenue-producing function.
- ▶ An additional parking lot connecting Valencia Road and the administration building would be required.

TAA Administrative Building Alternative 2

This alternative, as shown in **Figure 4-11**, involves the construction of 2,000 square feet of dedicated administrative office space, four employee vehicle parking stalls, and ten public parking stalls on vacant land next to the existing TAA maintenance building. Airport employees can access this location through Ajo Highway and Airfield Drive.

Advantages of this alternative:

- ▶ Proposed location is on a greenfield site.
- ▶ Provides dedicated administrative office space for TAA staff assigned to RYN.
- ▶ Proposed location begins to develop an “administrative campus” for TAA facilities.

Disadvantages of this alternative:

- ▶ Perimeter fencing is required to secure the administrative building.

- ▶ Proposed location could potentially support a revenue-producing function vs. a non-revenue-producing function.

TAA Administrative Building Alternative 3

Alternative 3, as shown in **Figure 4-12**, involves the construction of 2,000 square feet of dedicated administrative office space, four employee vehicle parking stalls, and ten public parking stalls north of W Valencia Rd next to Richie's Café and the conference room/pilot lounge building. Airport employees can access this location through Ajo Highway and Valencia Road or through South Aviator Land and Valencia Road. The site would also have direct access to the airfield.

Advantages of this alternative:

- ▶ Provides dedicated administrative office space for TAA staff assigned to RYN.
- ▶ The location offers easy access to adjacent conference room and pilot lounge.
- ▶ This location is easily accessible to both the Ajo Highway corridor and airfield facilities.
- ▶ Proposed location begins to develop an "administrative campus" for TAA facilities.

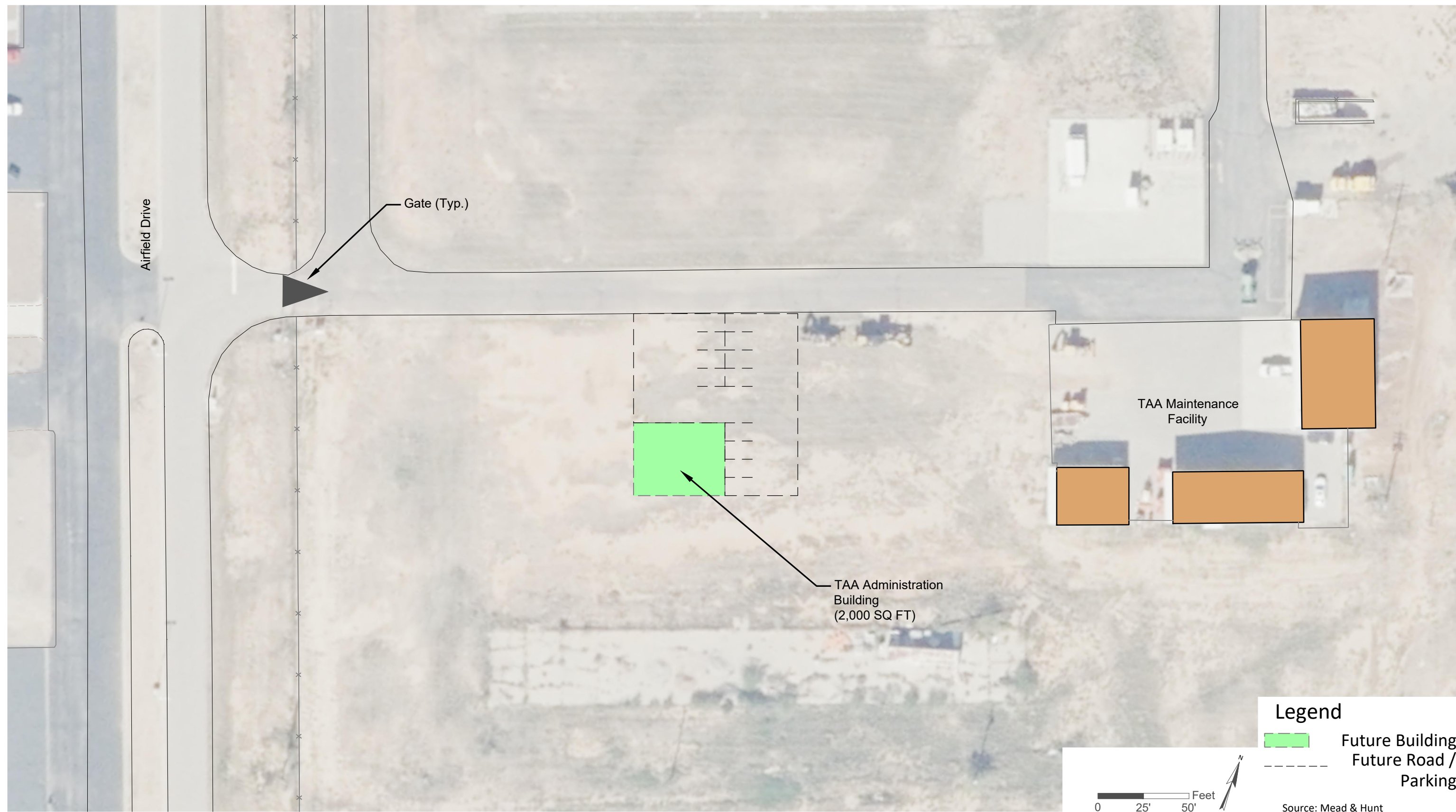
Disadvantages of this alternative:

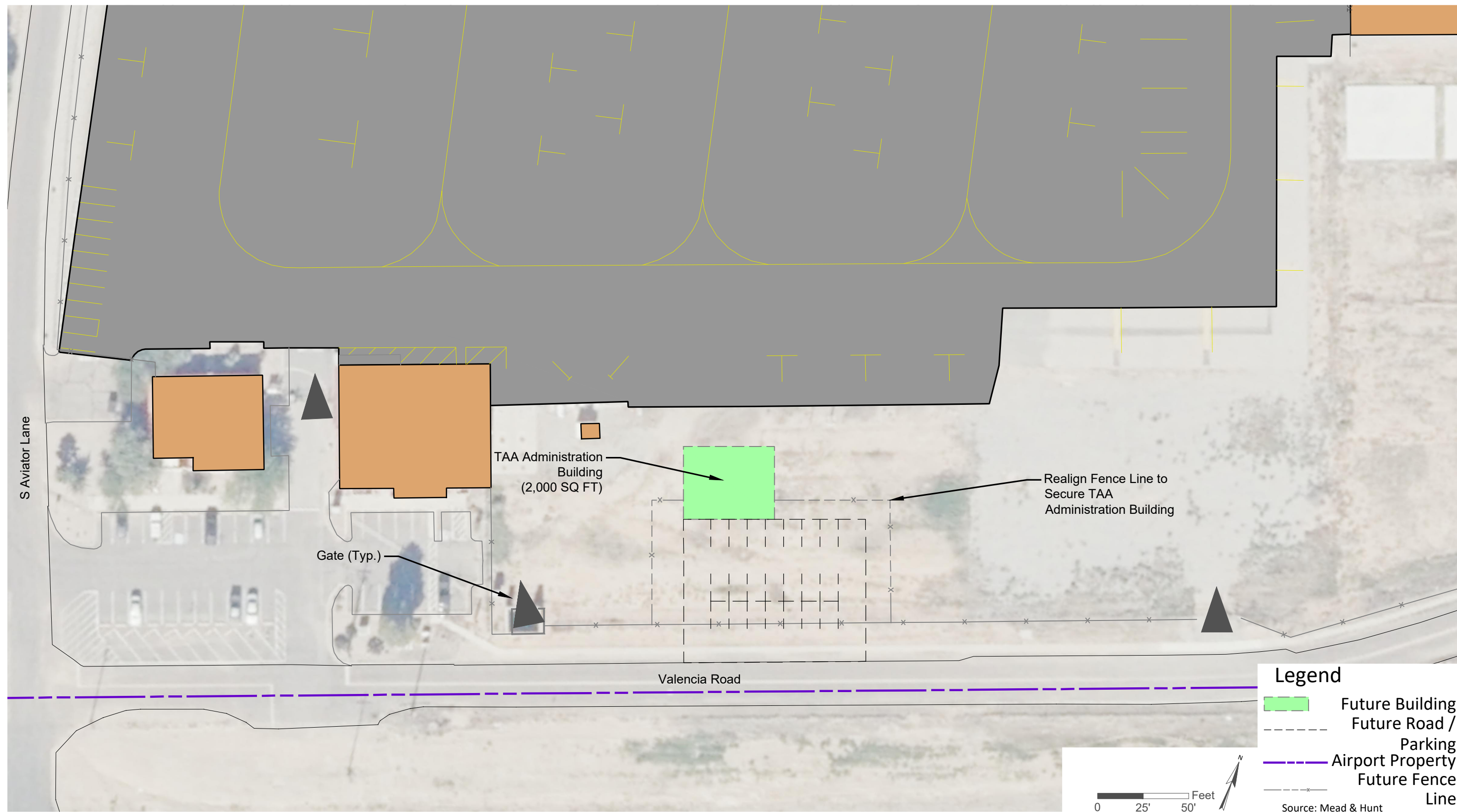
- ▶ Perimeter fencing is required to secure the administrative building.
- ▶ Requires improvements to the existing septic system and leach field.
- ▶ An additional parking lot connecting Valencia Road and the administration building would be required.

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Summary Evaluation of TAA Administrative Building Alternatives

Table 4-4 presents an evaluation of the various alternatives for the TAA Administrative Building at RYN. Alternative 3 is the preferred alternative due to its location and airfield access.

Table 4-4: Summary Evaluation Matrix of TAA Administration Building Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Description of Improvement	Construct a TAA Administrative Building Near Velocity Air on Airfield Drive	Construct a TAA Administrative Building Near the TAA Maintenance Facilities on West Airstrip Road	Construct a TAA Administrative Building adjacent to the Existing Conference Room and Pilot Lounge
PERFORMANCE REQUIREMENTS			
Expansion Capabilities	Yes	Yes	Yes
OPERATIONAL CAPABILITIES			
Operability and Access	Good ingress and egress for TAA employees and visitors	Good ingress and egress for TAA employees and visitors	Good ingress and egress for TAA employees and visitors
Secure Location	Yes	Yes	Yes
LAND USE COMPATABILITY			
Impact to On-Airport Property	Adjacent to other existing TAA facilities for development of a "TAA building campus"	Adjacent to other existing TAA facilities for development of a "TAA building campus"	Located adjacent to a site that has an existing conference room specific for TAA use
Impact to Off-Airport Property	None	None	None
ENVIRONMENTAL IMPACT POTENTIAL			
Increases Impervious Pavement	Yes	Yes	Yes
Landfill Impact	No	No	No
Floodplain Impact	No	No	No
CONSTRUCTABILITY			
Impact to Airport Operations	Minimal	Minimal	Minimal
ALTERNATIVES EVALUATION			
DETERMINATION	NEUTRAL	NEUTRAL	FAVORABLE

Airport Traffic Control Tower (ATCT) Alternatives

RYN's Airport Traffic Control Tower (ATCT) is part of the FAA Contract Tower program, operated by Serco Management Services (SERCO), and owned by TAA. The ATCT is located in the northeast corner of the north aircraft parking apron. The tower cab is 65 feet above ground level with the offices and break area below the main cab. The current location provides a clear line of sight to all runways; however, there is an existing blind spot due to the existing hangars along a segment of Taxiway D. This creates safety concerns for taxiing aircraft along that segment of Taxiway D. In addition, the existing ATCT does not have the necessary physical space to accommodate any new equipment or controller amenities. As recommended in **Chapter 3 – Facility Requirements**, there is a need for the ATCT to have an increased cab height or to be relocated to a position with clear lines of sight to all runways and taxiways. The following alternatives present five options for a new ATCT location.

ATCT Facility Alternative 1

This alternative, as shown in **Figure 4-13**, involves the demolition of the existing ATCT facility and constructing a new ATCT facility nearly 250 feet north of the existing tower, closer to Taxiway B, and south of the Taxiway B taxiway object free area. The cab height of the ATCT will need to be increased to eliminate any blind spots created by existing buildings and hangars along Taxiway D.

Advantages of this alternative:

- ▶ Proposed location eliminates the blind spot on Taxiway D by increasing cab height.
- ▶ Increased cab height accounts for future development and will eliminate all airfield blind spots for the ATCT controllers.
- ▶ Proposed location does not require a change in the daily routine of SERCO staff.
- ▶ Construction of the new ATCT does not require a temporary ATCT.

Disadvantages of this alternative:

- ▶ Proposed location is not supported by SERCO.
- ▶ Proposed location could potentially support a revenue-producing function vs. a non-revenue-producing function.
- ▶ Relocating or increasing the cab height of an ATCT requires a siting study as outlined in FAA Order 6480.6B, *Airport Traffic Control Tower Siting Process*.

ATCT Facility Alternative 2

This alternative, as shown in **Figure 4-14**, involves the demolition of the existing ATCT facility and construction of a new ATCT facility on the north side of the airfield property northeast of the intersection of Runway 6L/24R and Taxiway D. The cab height of the ATCT will need to be increased to eliminate any blind spots created by existing buildings and hangars and account for future development at the Airport. The proposed location will need to incorporate FAR Part 77 surfaces from Runway 6L/24R, which will limit the height of the ATCT cab.

Advantages of this alternative:

- ▶ Proposed location eliminates the blind spot on Taxiway D by relocating and increasing the cab height.
- ▶ Increased cab height accounts for future development and will eliminate all airfield blind spots for the ATCT controllers.
- ▶ Construction of the new ATCT does not require a temporary ATCT.

Disadvantages of this alternative:

- ▶ Proposed location requires the construction of new and extensive access roadway network.
- ▶ Proposed location would require a change in the daily routine of SERCO staff.
- ▶ ATCT cab height is limited by FAR Part 77 surfaces associated with Runway 6L/24R.
- ▶ Proposed location could potentially support a revenue-producing function vs. a non-revenue-producing function.
- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ Relocating or increasing the cab height of an ATCT requires a siting study as outlined in FAA Order 6480.6B, *Airport Traffic Control Tower Siting Process*.

ATCT Facility Alternative 3

This alternative, as shown in **Figure 4-15**, involves the demolition of the existing ATCT facility and the construction of a new ATCT facility on the north side of the airfield property northwest of the intersection of Runway 6L/24R and Runway 15/33. The proposed location will need to incorporate FAR Part 77 surfaces from Runway 6L/24R and Runway 15/33, which will limit the height of the ATCT cab.

Advantages of this alternative:

- ▶ Proposed location eliminates the blind spot on Taxiway D by relocating and increasing the cab height.
- ▶ Increased cab height accounts for future development and will eliminate all airfield blind spots for the ATCT controllers.
- ▶ Construction of the new ATCT does not require a temporary ATCT.

Disadvantages of this alternative:

- ▶ Proposed location would require a change in the daily routine of SERCO staff.
- ▶ This location will require construction of a new access roadway that does not transgress Runway 6L's RPZ.
- ▶ ATCT cab height is limited by FAR Part 77 surfaces associated with Runway 6L/24R and Runway 15/33.
- ▶ Relocating or increasing the cab height of an ATCT requires a siting study as outlined in FAA Order 6480.6B, *Airport Traffic Control Tower Siting Process*.

ATCT Facility Alternative 4

This alternative, as shown in **Figure 4-16**, involves the demolition of the existing ATCT facility and the construction of a new ATCT at the intersection of the main tie down area and Taxiway D. Relocating the ATCT west of the current location removes blind spots associated with the hangars along Taxiway D. The cab height of the ATCT will need to be increased to eliminate any new blind spots created by existing buildings and hangars.

Advantages of this alternative:

- ▶ Proposed location eliminates the blind spot on Taxiway D by relocating and increasing cab height.
- ▶ Increased cab height accounts for future development and will eliminate all airfield blind spots for the ATCT controllers.
- ▶ Construction of the new ATCT does not require a temporary ATCT.

Disadvantages of this alternative:

- ▶ This location will require construction of new access roadway.
- ▶ Proposed location would require a change in the daily routine of SERCO staff.
- ▶ Proposed location could potentially support a revenue-producing function vs. a non-revenue-producing function.
- ▶ Relocating or increasing the cab height of an ATCT requires a siting study as outlined in FAA Order 6480.6B, *Airport Traffic Control Tower Siting Process*.

ATCT Facility Alternative 5

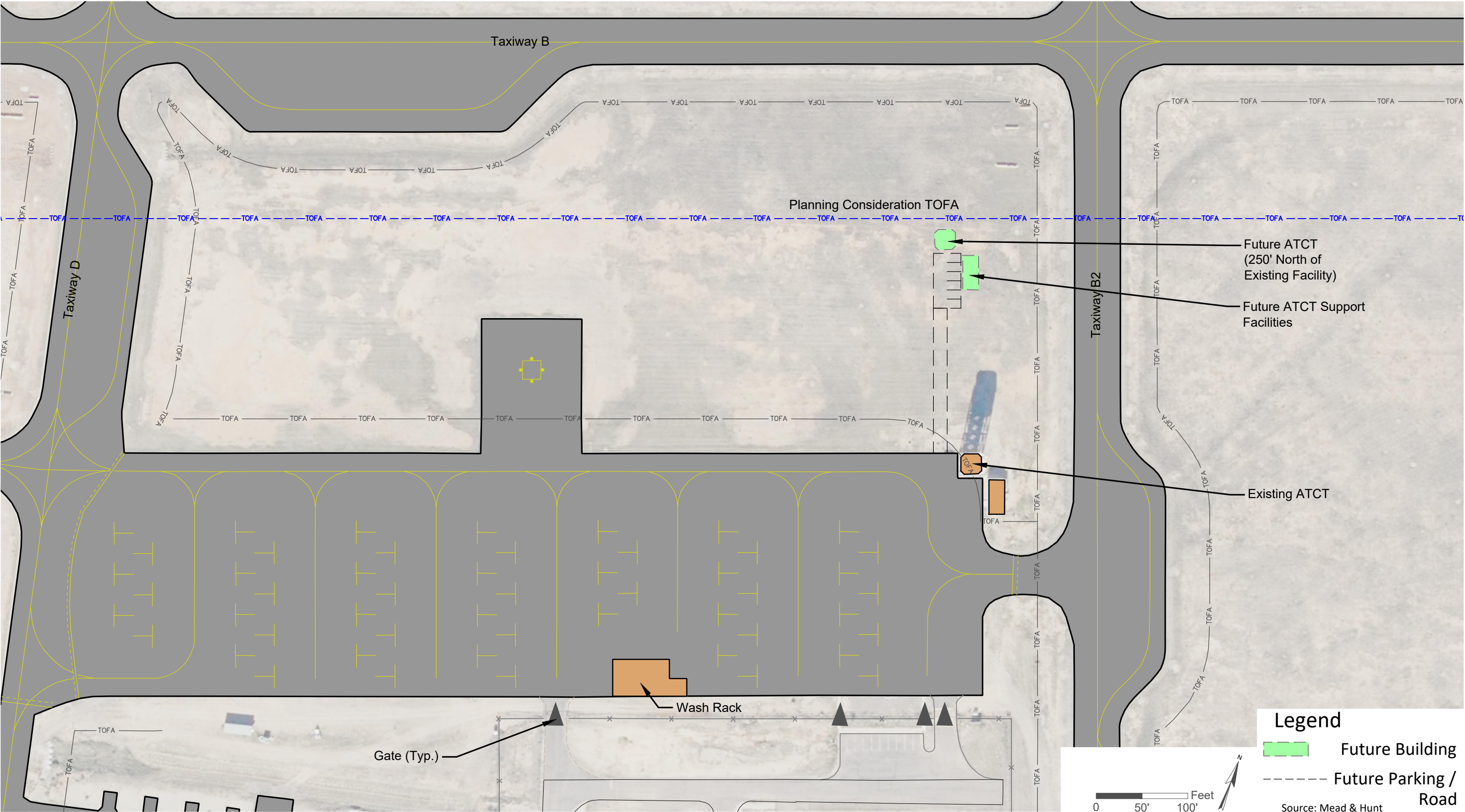
This alternative, as shown in **Figure 4-17**, involves the construction of a temporary ATCT, demolition of the existing ATCT, and construction of a new ATCT in the current ATCT location. The temporary facility would be located directly adjacent to the existing ATCT, allowing for the construction of an ATCT with increased height to provide a clear line of sight to the entire airfield. The cab height of the ATCT will need to be increased to eliminate existing blind spots and account for future development to ensure no new blind spots are created.

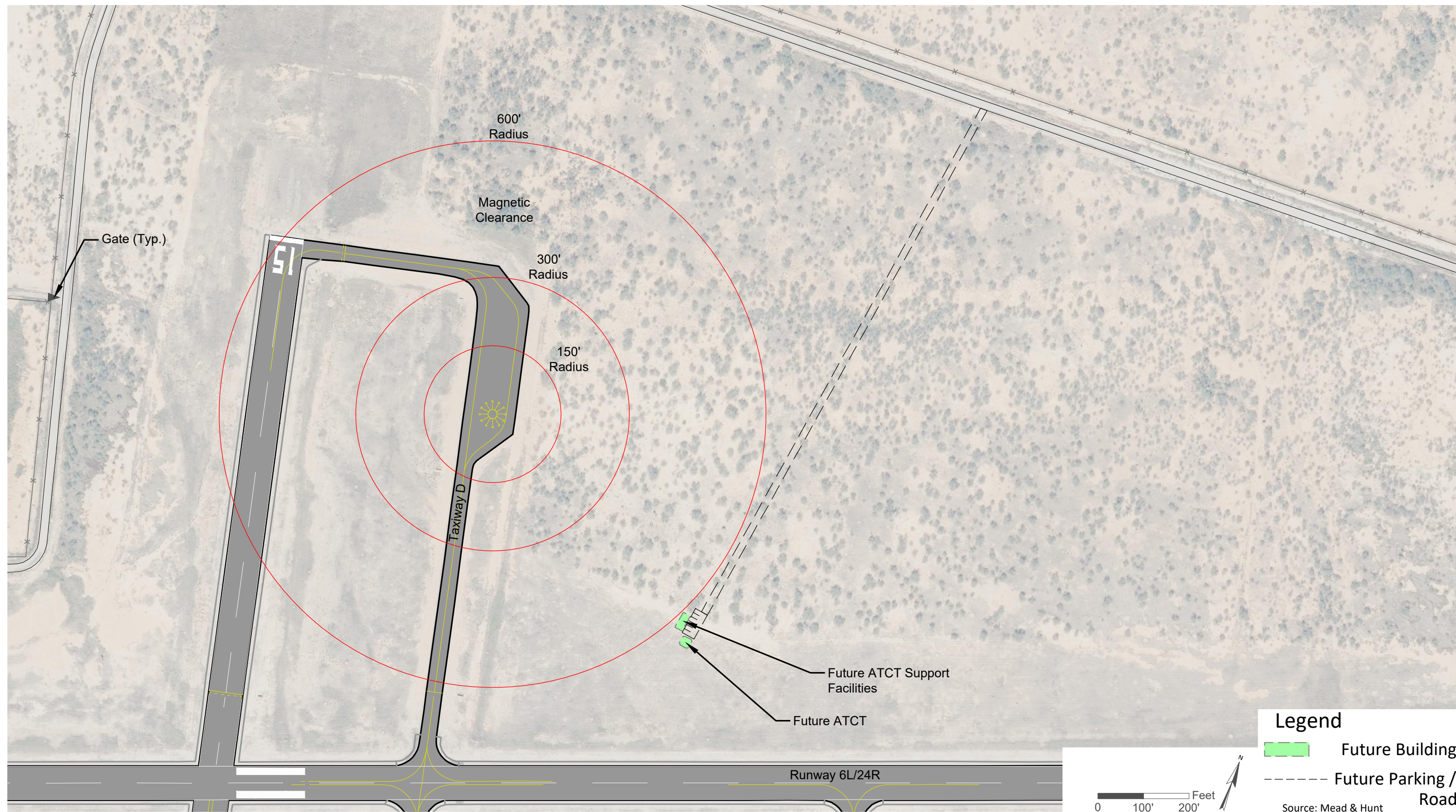
Advantages of this alternative:

- ▶ Proposed location is supported by SERCO.
- ▶ Proposed location eliminates the blind spot on Taxiway D by increasing the cab height and locating the ATCT in its current location.
- ▶ Increased cab height accounts for future development and will eliminate all airfield blind spots for the ATCT controllers.

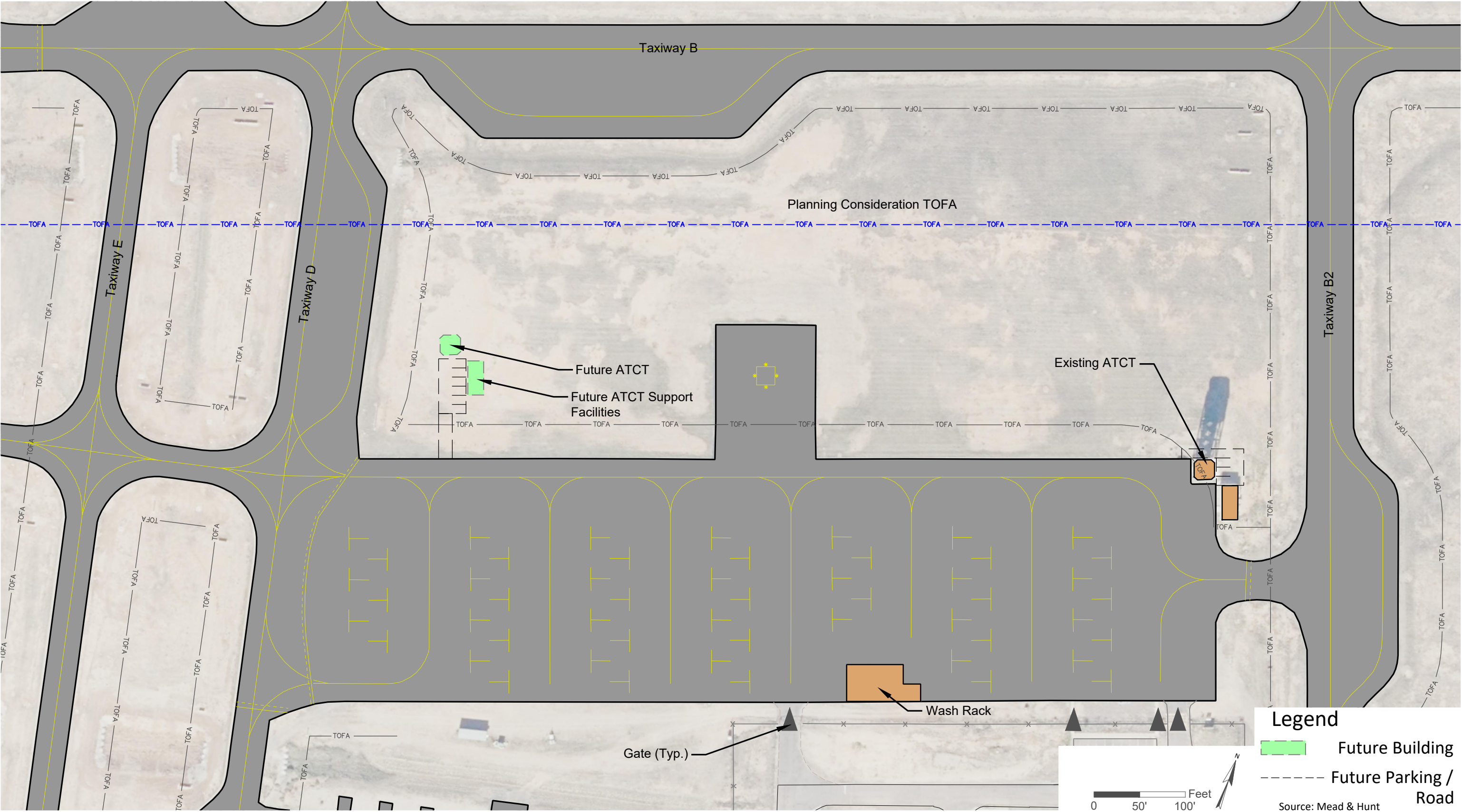
Disadvantages of this alternative:

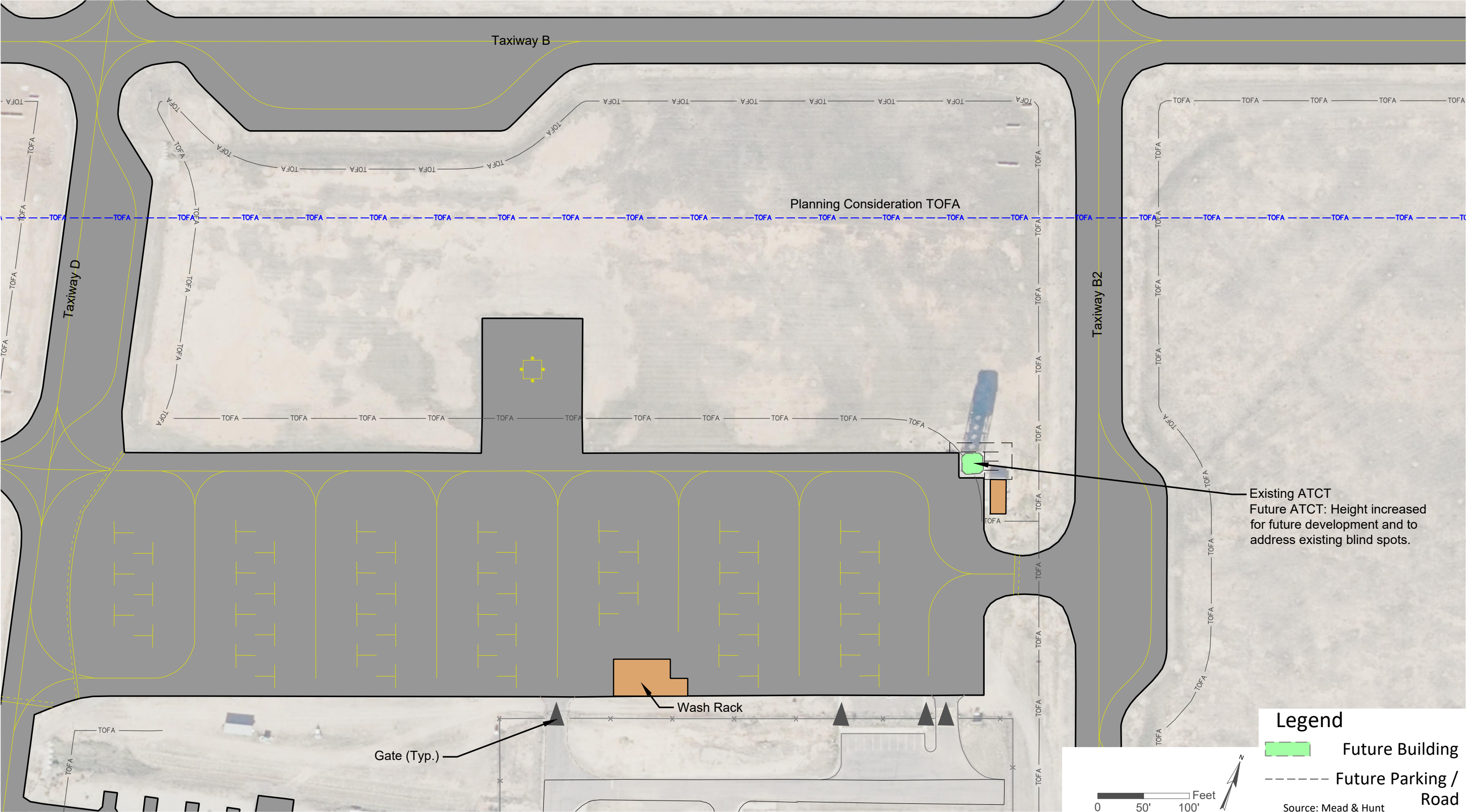
- ▶ This alternative requires a temporary ATCT during construction.
- ▶ Relocating or increasing the cab height of an ATCT requires a siting study as outlined in FAA Order 6480.6B, *Airport Traffic Control Tower Siting Process*.











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Summary Evaluation of ATCT Facility Alternatives

Table 4-5 presents an evaluation of the various alternatives for the ATCT facility at RYN. Alternative 5 is the preferred alternative due to its optimal location for ATCT controllers to view the existing airfield and proposed long-term improvements. The new ATCT would increase the space necessary to accommodate new equipment and controller amenities. A follow-on study that addresses the ATCT siting process will be required as outlined in FAA Order 6480.6B, *Airport Traffic Control Tower Siting Process*.

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Table 4-5: Summary Evaluation Matrix of ATCT Facility Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5
Description of Improvement	Construct new ATCT 250' north of existing ATCT at the intersection of Taxiway B2 and Taxiway B	Construct new ATCT east of Taxiway D and north of Runway 6L/24R	Construct new ATCT west of Runway 15/33 and north of Runway 6L/24R	Construct new ATCT west of the existing ATCT, east of Taxiway D, and north of the existing tower apron	Reconstruct the existing ATCT at its existing location with an increased cab height
PERFORMANCE REQUIREMENTS					
ATCT Cab Height	Minimal impact by FAR Part 77 to address existing and future development	Moderate impact by FAR Part 77 surfaces from Runway 15/33 and Runway 6L/24R	Moderate impact by FAR Part 77 surfaces from Runway 15/33 and Runway 6L/24R	Moderate impact by FAR Part 77 surfaces from Runway 15/33	Minimal impact by FAR Part 77 to address existing and future development
Secure Location	Yes	Yes	Yes	Yes	Yes
OPERATIONAL CAPABILITIES					
ATCT Controller Visibility of the Airfield	ATCT cab height not limited by FAR Part 77 surfaces to address existing and future development that may create visual impacts for controllers	ATCT cab height limited by FAR Part 77 surfaces to address existing and future development that may create visual impacts for controllers	ATCT cab height limited by FAR Part 77 surfaces to address existing and future development that may create visual impacts for controllers	ATCT cab height limited by FAR Part 77 surfaces to address existing and future development that may create visual impacts for controllers	ATCT cab height not limited by FAR Part 77 surfaces to address existing and future development that may create visual impacts for controllers
Site Access / Vehicle Parking	Location requires new access road and vehicle parking lot	Location requires new access road and vehicle parking lot	Location requires new access road and vehicle parking lot	Location requires new access road and vehicle parking lot	Location utilizes existing access road and vehicle parking lot
FAA / SERCO Acceptance	Site requires FAA siting process as outlined in FAA Order 6480.6B - Airport Traffic Control Tower Siting Process	Site requires FAA siting process as outlined in FAA Order 6480.6B - Airport Traffic Control Tower Siting Process	Site requires FAA siting process as outlined in FAA Order 6480.6B - Airport Traffic Control Tower Siting Process	Site requires FAA siting process as outlined in FAA Order 6480.6B - Airport Traffic Control Tower Siting Process	Site requires FAA siting process as outlined in FAA Order 6480.6B - Airport Traffic Control Tower Siting Process
LAND USE COMPATABILITY					
Impact to On-Airport Property	Develops an aeronautical revenue producing site for a non-revenue producing function	Develops an aeronautical revenue producing site for a non-revenue producing function	Develops an aeronautical revenue producing site for a non-revenue producing function	Develops an aeronautical revenue producing site for a non-revenue producing function	Temporary ATCT required during construction activities
Impact to Off-Airport Property	No	No	No	No	No

Chapter 4 - Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5
ENVIRONMENTAL IMPACT POTENTIAL					
Increases Impervious Pavement	Yes	Yes	Yes	Yes	Yes
Landfill Impact	No	No	No	No	No
Floodplain Impact	No	Yes	Yes	No	No
CONSTRUCTABILITY					
Impact to Airport Operations	Minimal	Minimal	Minimal	Minimal	Moderate impact as site requires construction of a temporary ATCT, access road and vehicle parking lot
ALTERNATIVES EVALUATION					
DETERMINATION	NEUTRAL	NOT FAVORABLE	NOT FAVORABLE	NOT FAVORABLE	FAVORABLE



FLIGHT SCHOOL/GENERAL AVIATION ALTERNATIVES

This section develops alternative concepts for a new FAR Part 141 flight school and a FAR Part 61 flight school. Flight schools operating under FAR Part 141 must seek and maintain FAA approval for its training curriculum, syllabus, and lesson plans, creating a more structured or “institutional” flight training environment. Flight schools operating under FAR Part 61 are local flight schools that train students one-on-one and are not career-oriented flight academies; they have a less stringent training environment and allow more flexibility to change the training program as the instructor sees fit. The alternatives described below are based on the forecasted increase in operational demand. The Part 141 flight school alternatives all contain:

- ▶ T-Hangars
- ▶ Apron parking spots
- ▶ Three helicopter parking spots
- ▶ Flight school support facilities
- ▶ Dormitories
- ▶ Cafeteria
- ▶ Vehicle parking for students, staff, and visitors

It is presumed that the flight schools will fuel their own aircraft.

Institutional Flight School (FAR Part 141) Alternatives

FAR Part 141 Alternative 1

This alternative, as shown in **Figure 4-18**, involves the construction of a Part 141 flight school north of Airfield Drive and between Taxiway B2 and B4 on the south side of Taxiway B. Airfield Drive would be extended 125 feet to the north to meet the new facilities and the existing service road would be realigned to meet the operational demand. The proposed apron has three helicopter parking positions, 24 tie downs, and 36 t-hangars on the north side of the apron between Taxiway B2 and B4. The site also has a 15,000-square-foot aircraft maintenance hangar, a 5,000-square-foot administration building, 2,500 square feet of support facilities, a 2,000-square-foot cafeteria, a 6,000-square-foot dormitory, and 60 vehicle parking stalls. The proposed location is considered a greenfield site, and construction would have minimal impact to normal airport operations. The flight school would be located on Airfield Drive.

Advantages of this alternative:

- ▶ Development is located on a greenfield site and construction would minimally impact airport operations.
- ▶ Dual taxiway access for the ingress and egress of aircraft from the apron to Taxiway B.
- ▶ Proposed location develops a parcel located in the center of the airfield with airside and landside connectivity.
- ▶ Exiting location of the ATCT has good line of site to proposed facilities.

Disadvantages of this alternative:

- ▶ Proposed location has significant water drainage issues.
- ▶ Increased vehicle traffic on Airfield Drive.
- ▶ Development requires a realigned airport service road.
- ▶ Airfield congestion may increase due to the number of flight operations associated with a flight school.

FAR Part 141 Alternative 2

This alternative, as shown in **Figure 4-19**, involves the construction of three helicopter parking positions, 24 tie downs, 36 t-hangars, 15,000-square-foot aircraft maintenance hangar, a 5,000-square-foot administration building, 2,500 square feet of support facilities, a 2,000-square-foot cafeteria, a 6,000-square-foot dormitory, and 60 vehicle parking stalls east of Taxiway B4 north of the existing TAA maintenance facilities. The proposed location is considered a greenfield site and construction would have minimal impact to normal operations. The flight school would be located on West Airstrip Road via Airfield Drive and Ajo Highway.

Advantages of this alternative:

- ▶ Development is located on a greenfield site and construction would minimally impact airport operations.
- ▶ Multiple taxiway access for the ingress and egress of aircraft from the apron to Taxiway B4.
- ▶ Proposed location develops a parcel located on the east side of the Airport that could result in further non-aeronautical and aeronautical development in the area.
- ▶ Vehicle access to the flight school via Airfield Drive and Ajo Highway limits congestion on the Airport's internal roadway network.
- ▶ Proposed location is in an area that has secured the necessary permits and implemented mitigation measures to minimize floodplain impacts.

Disadvantages of this alternative:

- ▶ Development requires a realigned airport service road.
- ▶ Proposed location would require increasing the ATCT cab height to ensure the ATCT controller can view the entire airfield.
- ▶ Airfield congestion may increase due to the number of flight operations associated with a flight school.

FAR Part 141 Alternative 3

This alternative, as shown in **Figure 4-20**, involves the construction of three helicopter parking positions, 24 tie downs, 36 t-hangars, 15,000-square-foot aircraft maintenance hangar, a 5,000-square-foot administration building, 2,500 square feet of support facilities, a 2,000-square-foot cafeteria, a 6,000-square-foot dormitory, and 60 vehicle parking stalls on a parcel west of Runway 15/33.

The proposed location requires the construction of a new taxiway to access Runway 15/33 and other airport facilities. The proposed location is considered a greenfield site, and construction would have minimal impact to normal operations. Vehicle access to the flight school would be provided via Aviator Lane and Ajo Highway.

Advantages of this alternative:

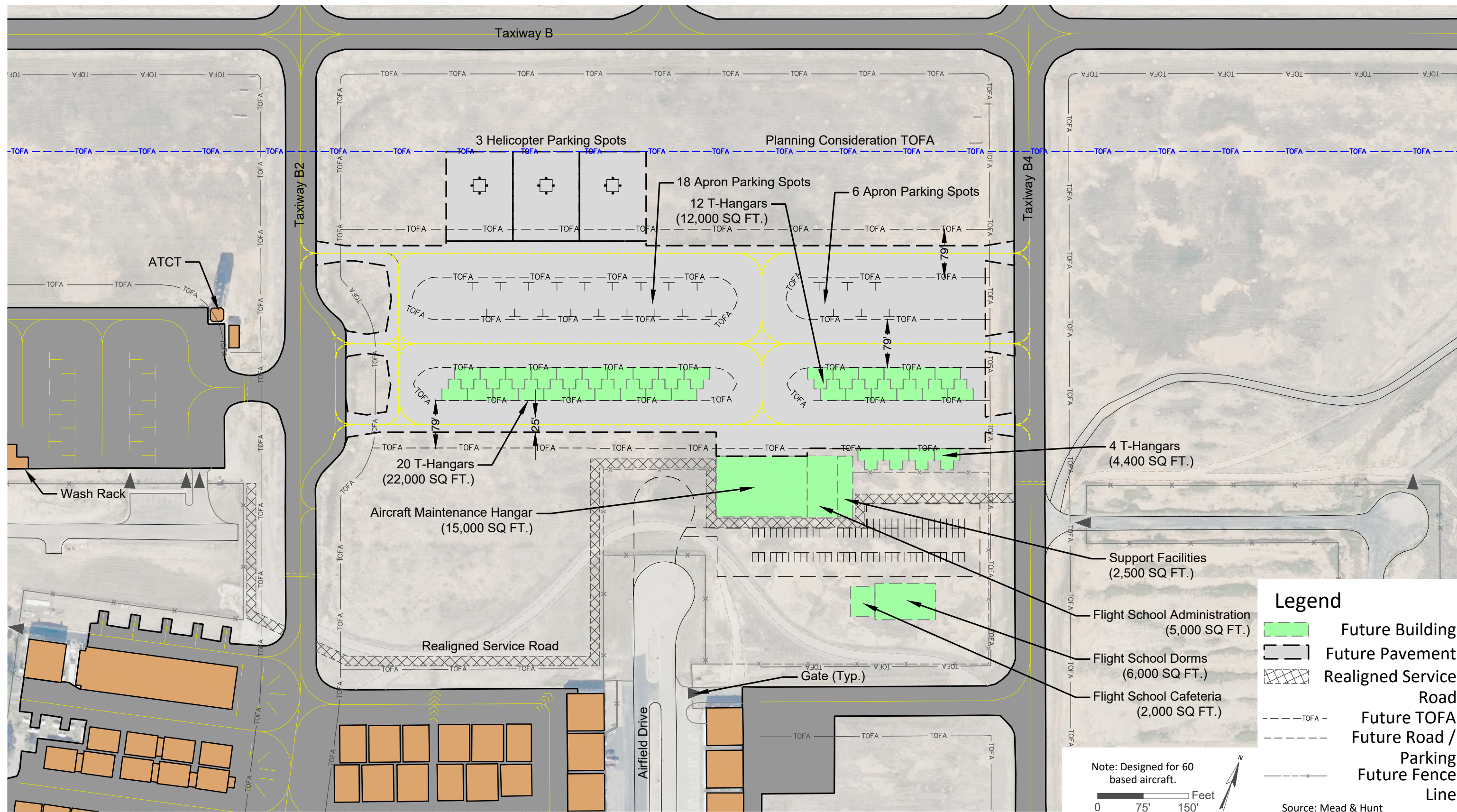
- ▶ Development is located on a greenfield site and construction would minimally impact airport operations.
- ▶ Proposed location separates normal GA aircraft from flight school operations.
- ▶ Vehicle access to the flight school via Aviator Lane and Ajo Highway limits congestion on the Airport's internal roadway network.

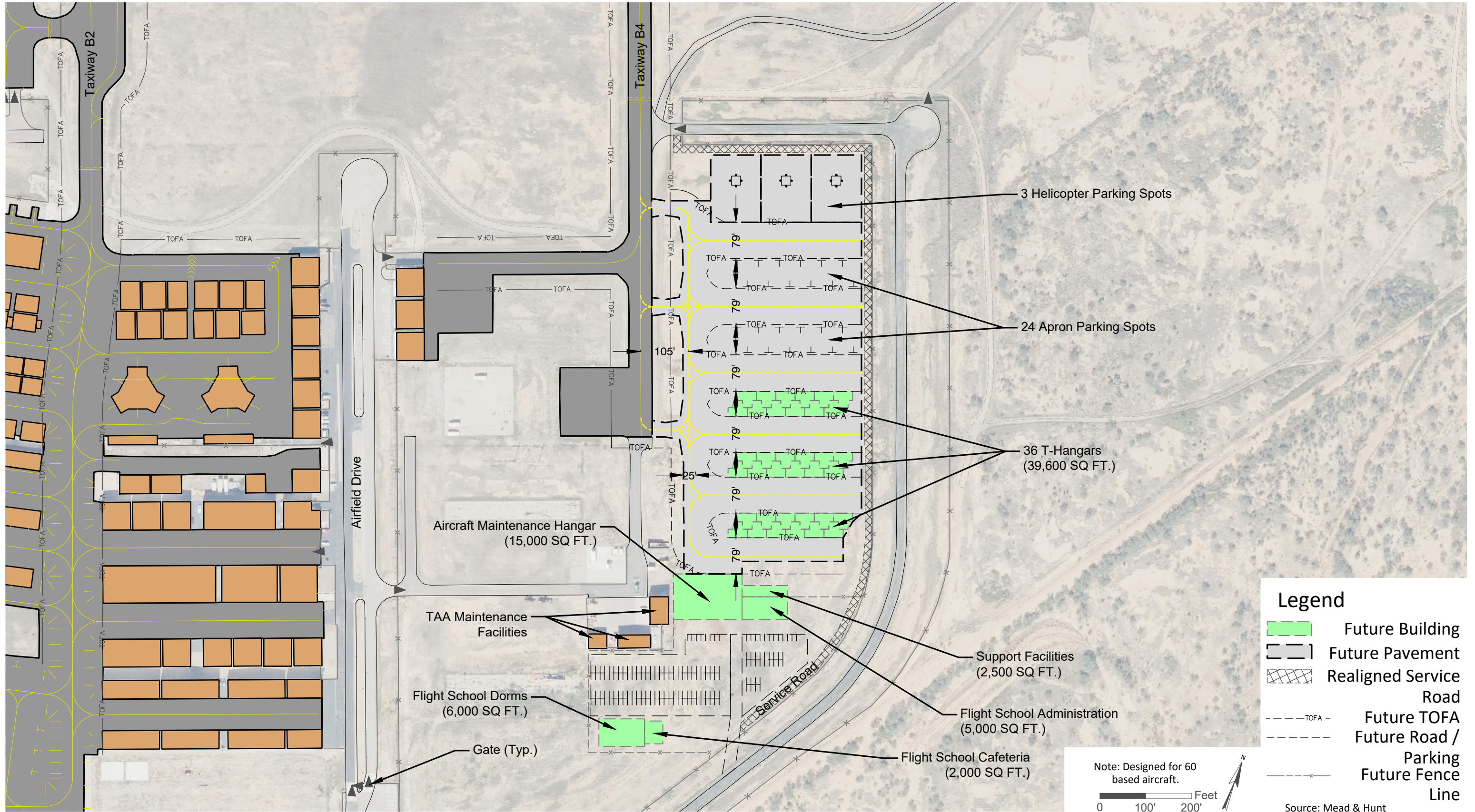
Disadvantages of this alternative:

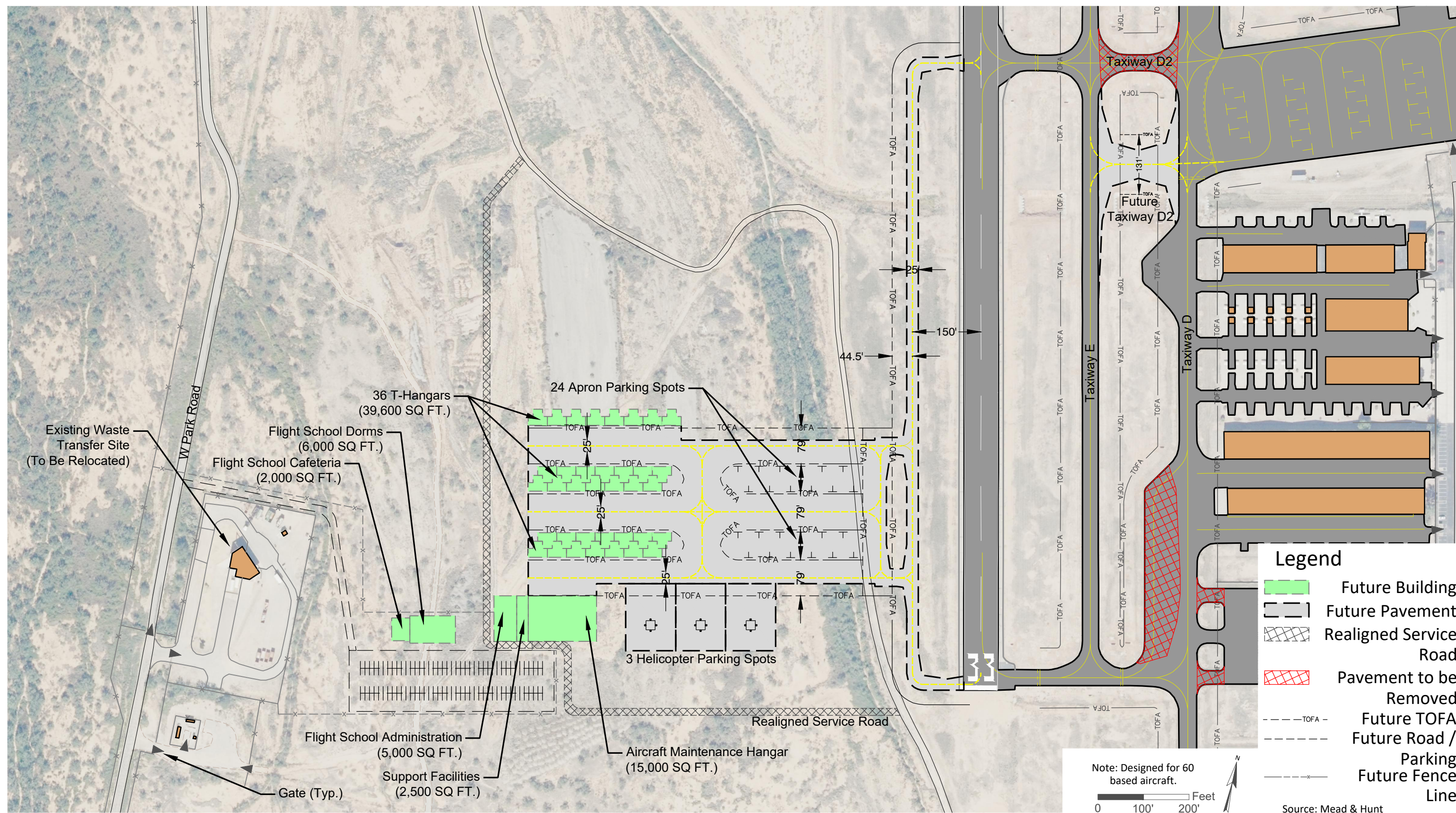
- ▶ Increased aircraft crossing Runway 15/33 from Taxiways D1 and D2 and taxiing to either Runway 6R/24L or Runway 6L/24R for departure.
- ▶ Development requires improved and realigned vehicle access roads.
- ▶ Proposed location would require increasing the ATCT cab height to ensure all ATCT controller blind spots are eliminated.
- ▶ Airfield congestion may increase due to the number of flight operations associated with a flight school.
- ▶ Construction would occur in a known floodplain and require a variety of permits and mitigation measures.

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Summary Evaluation of Institutional Flight School (FAR Part 141) Alternatives

Table 4-6 presents an evaluation of the various Institutional Flight School (FAR Part 141) Alternatives at RYN. Alternative 2 is the preferred alternative due to site accessibility and ease of construction.

Table 4-6: Summary Evaluation Matrix of Institutional Flight School (FAR Part 141) Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Description of Improvement	Construct an FAR Part 141 flight school between Taxiway B2 and B4	Construct an FAR Part 141 flight school east of Taxiway B4	Construct an FAR Part 141 flight school west of Runway 15/33
PERFORMANCE REQUIREMENTS			
Expansion Capabilities	Limited	Yes	Yes
OPERATIONAL CAPABILITIES			
Airfield Impacts	Site development requires a realigned service road	Requires expansion of existing Taxiway B4 for dual ingress and egress to the flight school apron	Requires a new parallel taxiway to Runway 15/33; Increased aircraft operations crossing Runway 15/33 to taxi to primary runway
Increases Potential for Development	Yes	Yes	Yes
LAND USE COMPATABILITY			
Impact to On-Airport Property	Further develops an aeronautical revenue producing site	Further develops an aeronautical revenue producing site	Develops a greenfield site
Impact to Off-Airport Property	No	No	No
ENVIRONMENTAL IMPACT POTENTIAL			
Increases Impervious Pavement	Yes	Yes	Yes
Landfill Impact	No	No	No
Floodplain Impact	No	No	Yes
CONSTRUCTABILITY			
Impact to Airport Operations	Minimal	Minimal	Minimal
ALTERNATIVES EVALUATION			
DETERMINATION	NEUTRAL	FAVORABLE	NON-FAVORABLE

Flight School (FAR Part 61) Alternatives

FAR Part 61 Alternative 1

This alternative, as shown in **Figure 4-21**, involves the construction of a FAR Part 61 flight school at RYN. The Airport previously had a FAR Part 61 flight school, and the TAA has preserved the former flight school's location and facilities. The former facilities included a 9,800-square-foot classroom and administration building, 15 aircraft tie-down positions on a 94,000-square-foot apron, and 45 common-use vehicle parking stalls. Alternative 1 involves the renovation of those facilities in addition to the construction of a new 15,000-square-foot maintenance hangar, a 2,500-square-foot support facility, 25 new t-hangars, new asphalt pavement, the elimination of two taxiway connectors, and the removal of a segment of Taxiway D. The facilities can be reached airside via Taxiway D and landside via South Aviator Lane.

Advantages of this alternative:

- ▶ Proposed location separates normal GA aircraft from flight school operations.
- ▶ Proposed location provides for the renovation of existing facilities and has potential for future expansion.
- ▶ Renovating existing facilities can be a cost-effective alternative vs. new construction.
- ▶ Existing location is near the entrance of RYN, which helps promote the flight school.

Disadvantages of this alternative:

- ▶ Airfield congestion may increase due to the number of flight operations associated with a flight school.
- ▶ Increased aircraft operations along Taxiway D in a known blind spot may accelerate the need for a new ATCT with increased height.

FAR Part 61 Alternative 2

This alternative, as shown in **Figure 4-22**, involves the construction of a new FAR Part 61 flight school west of Runway 15/33 at RYN. The proposed facilities include a new 5,000-square-foot administration and classroom building, a 15,000-square-foot maintenance hangar, a 2,500-square-foot support facility, 24 aircraft tie-down positions, 16 aircraft t-hangars, and 116 vehicle parking stalls. The proposed location requires the construction of a new taxiway to access Runway 15/33 and other Airport facilities. The proposed location of the flight school requires the realignment of the existing service road and a new access road connecting to West Park Road.

Advantages of this alternative:

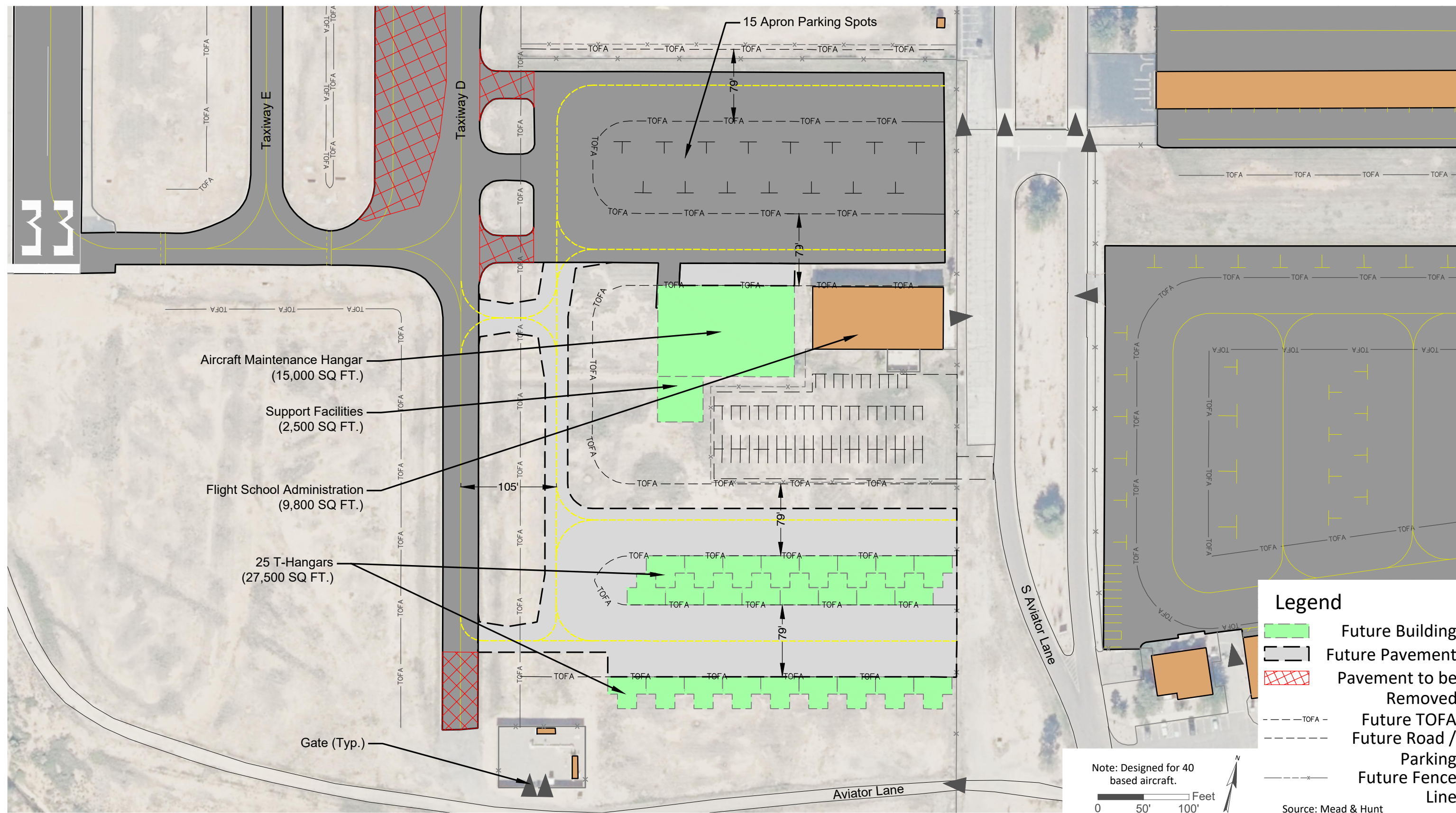
- ▶ Development is located on a greenfield site and construction would minimally impact airport operations.
- ▶ Proposed location separates normal GA aircraft from flight school operations.
- ▶ Vehicle access to the flight school via Aviator Lane and Ajo Highway limits congestion on the Airport's internal roadway network.

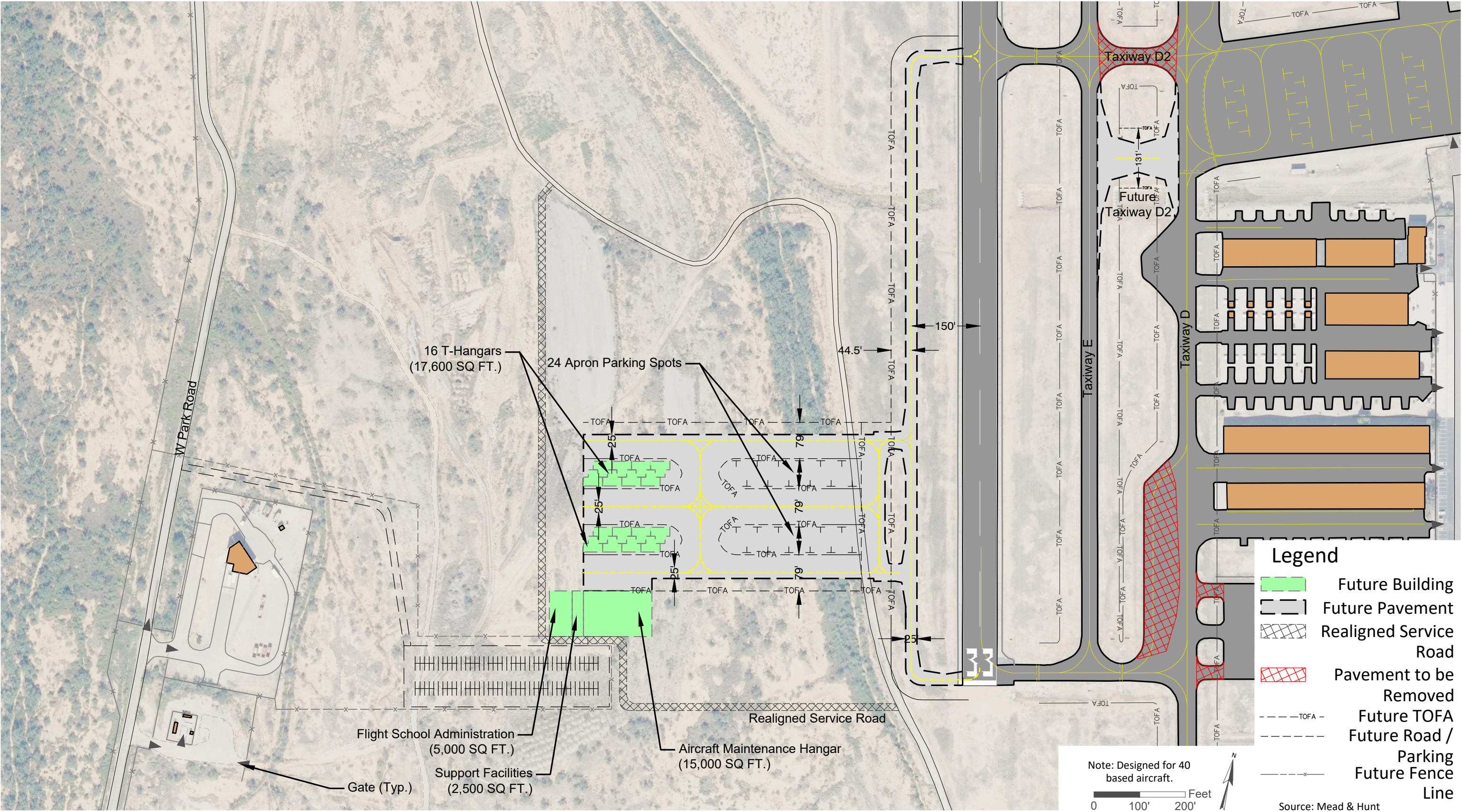
Disadvantages of this alternative:

- ▶ Increased aircraft crossing Runway 15/33 from Taxiways D1 and D2 and taxiing to either Runway 6R/24L or Runway 6L/24R for departure.
- ▶ Development requires improved and realigned vehicle access roads.
- ▶ Proposed location would accelerate the need to increase the ATCT cab height to ensure all ATCT controller blind spots are eliminated.
- ▶ Airfield congestion may increase due to the number of flight operations associated with a flight school.
- ▶ Construction would occur in a known floodplain and require a variety of permits and mitigation measures

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Summary Evaluation of Flight School (FAR Part 61) Alternatives

Table 4-7 presents an evaluation of the various Flight School (FAR Part 61) Alternatives at RYN. Alternative 1 is the preferred alternative due to the benefits of renovating existing facilities, accessibility, and potential for expansion.

Table 4-7: Summary Evaluation Matrix of Flight School (FAR Part 61) Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Expand the existing FAR Part 61 flight school	Construct a new FAR Part 61 flight school west of crosswind Runway 15/33 with a new parallel taxiway
PERFORMANCE REQUIREMENTS		
Expansion Capabilities	Yes	Yes
OPERATIONAL CAPABILITIES		
Airfield Impact	Comply with FAA AC 150/5300-13A design criteria for elimination of direct apron access to Runway 15/33	Requires a new parallel taxiway to Runway 15/33; Increased aircraft operations crossing Runway 15/33 to taxi to primary runway
Runway Protection Zone Conflicts	None	None
Increases Potential for Development	Yes	Yes
LAND USE COMPATABILITY		
Impacts to On-Airport Property	Further develops an aeronautical revenue producing site	Develops a greenfield site
Impact to Off-Airport Property	No	No
ENVIRONMENTAL IMPACT POTENTIAL		
Increases Impervious Pavement	Yes	Yes
Landfill Impact	No	No
Floodplain Impact	No	Development the west quadrant requires multiple permits and mitigation measures
CONSTRUCTABILITY		
Impact to Airport Operations	Minimal	Minimal
ALTERNATIVES EVALUATION		
DETERMINATION	FAVORABLE	NEUTRAL

Common Use Helicopter Parking Pad Alternatives

RYN experiences a large amount of law enforcement and military operations, primarily in the form of helicopters. These transient helicopter operations originate at various law enforcement facilities and military bases throughout southern Arizona and perform flight training exercises at RYN. It is estimated that 50 percent of flight operations at RYN are the result of flight training. Upon completion of their flight training, helicopters either return to their base or utilize an aircraft parking apron dedicated to fixed-wing aircraft. The single dedicated helicopter parking pad does not always support the number of helicopters utilizing the fixed-wing apron, requiring additional positions. The alternatives identified below describe the two alternatives for common-use helicopter pads at RYN.

Common Use Helicopter Parking Pad Alternative 1

This alternative, as shown in **Figure 4-23**, involves the reconfiguration the existing 110-by-145-foot parking pad and the construction of seven new 100-by-80-foot helicopter pads for a total of eight new 100-by-80-foot helicopter parking pads. These parking pads are located north of the existing tower apron, south of Taxiway B, east of Taxiway D, and west of Taxiway B2. Helicopters would access these new parking pads through approaching the active runway, performing a hover-taxi to either Taxiway D or Taxiway B2, and then utilizing the existing taxilane on the tower apron. These new parking pads are not dedicated landing pads, and they do not facilitate the development of a heliport at RYN. The reconfiguration and construction of the helicopter pads does not impact the tower apron. ATCT controllers have a good line of site to proposed facilities.

Advantages of this alternative:

- ▶ Dedicated parking positions separate helicopters from fixed-wing aircraft.
- ▶ Exiting location of the ATCT has good line of site to proposed facilities.
- ▶ Proposed location provides an increased level of safety to personnel on the tower apron by minimizing rotor wash exposure.
- ▶ Larger asphalt surface reduces the amount of dust and particulate generated from rotor wash on the undeveloped desert soil.

Disadvantages of this alternative:

- ▶ Proposed location limits revenue-producing development opportunities.
- ▶ Airfield congestion may increase due to the number of flight operations associated with helicopters.

Common Use Helicopter Parking Pad Alternative 2

Similar to the first alternative, the second alternative, as shown in **Figure 4-24**, involves the reconfiguration the existing 110-by-145-foot parking pad, the construction of seven new 100-by-80-foot helicopter pads, and a new 50-foot dedicated helicopter taxilane with a 60-foot hover area. Helicopters would access these new parking pads through approaching the active runway, performing a hover-taxi to Taxiway B2, and then utilizing the new taxilane. These new parking pads are not dedicated landing pads, and they do not facilitate the development of a heliport at RYN. The reconfiguration and construction of the helicopter pads and taxilane do not impact the tower apron. ATCT controllers have a good line of site to proposed facilities.

Advantages of this alternative:

- ▶ Dedicated parking positions separate helicopters from fixed-wing aircraft.
- ▶ Exiting location of the ATCT has good line of site to proposed facilities.
- ▶ Proposed location provides an increased level of safety to personnel on the tower apron by minimizing rotor wash exposure.
- ▶ Larger asphalt surface reduces the amount of dust and particulate generated from rotor wash on the undeveloped desert soil.

Disadvantages of this alternative:

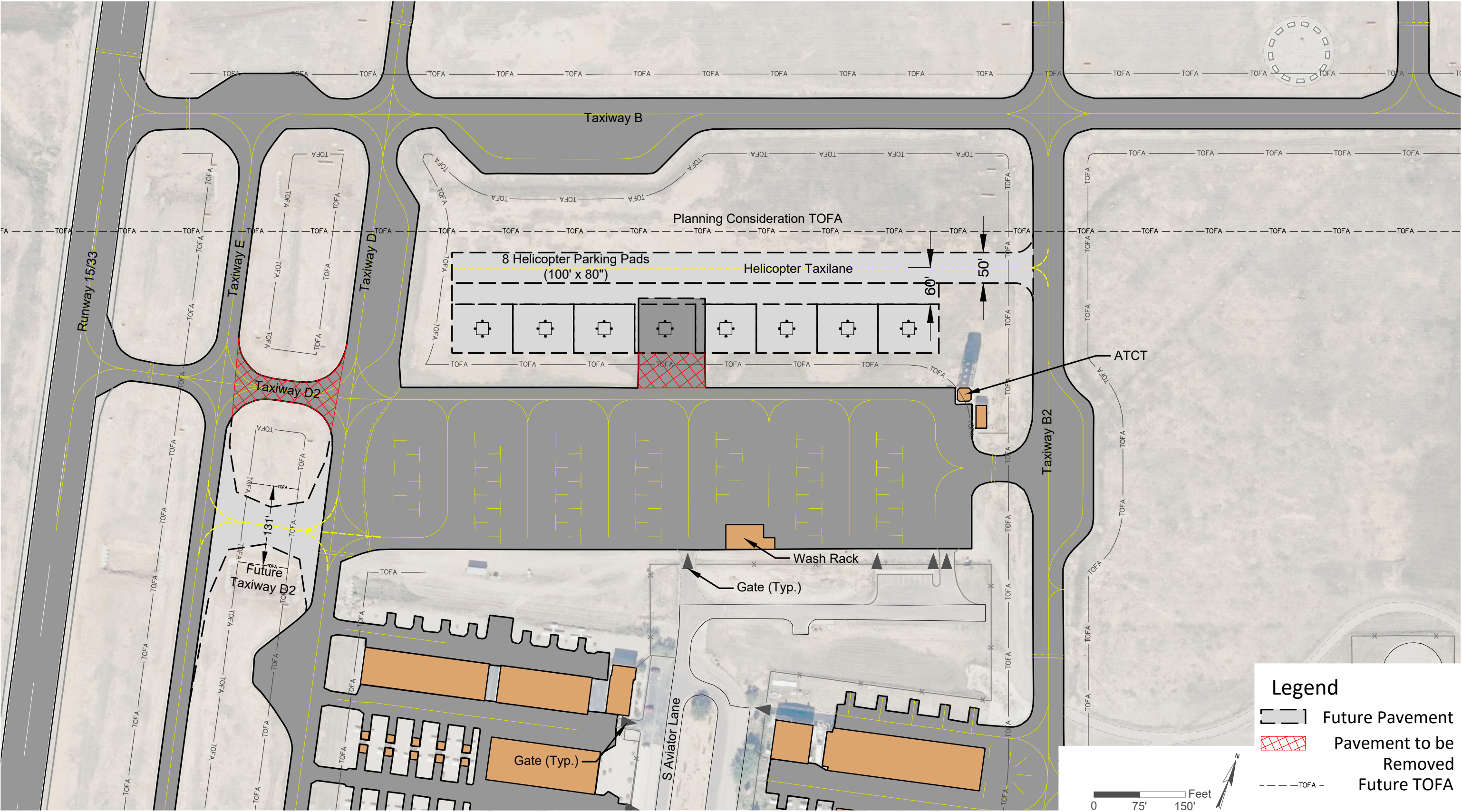
- ▶ Proposed location limits development opportunities north of the taxilane and south of Taxiway B.
- ▶ Site requires a larger amount of pavement than Alternative 1.
- ▶ Airfield congestion may increase due to the number of flight operations associated with helicopters.

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Common Use Helicopter Pads - Alternative 1
Figure 4-23



Summary Evaluation of the Common Use Helicopter Parking Pad Alternatives

Table 4-8 presents an evaluation of the various alternatives for a Common Use Helicopter Pad at RYN. Alternative 1 is the preferred alternative due to the use of an existing taxiway and minimizing the construction of additional airfield pavement.

Table 4-8: Summary Evaluation Matrix of Common Use Helicopter Parking Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Expansion of the existing common use helicopter parking pads north of the existing fixed-wing tie-down apron	Expansion of the existing common use helicopter parking pads and construction of a dedicated helicopter taxiway north of the existing fixed-wing tie-down apron
OPERATIONAL CAPABILITIES		
Airfield Impacts	Expands an existing parking pad	Expands an existing parking pad Constructs a new helicopter taxiway
Compatible with Existing / Future Facilities	Yes	Yes
Secure Location	Yes	Yes
LAND USE COMPATABILITY		
Impact to On-Airport Property	Separates helicopter and fixed-wing aircraft Further develops an aeronautical site that has revenue producing potential	Separates helicopter and fixed-wing aircraft Further develops an aeronautical site that has revenue producing potential
Impact to Off-Airport Property	No	No
Relocation of Existing Facilities Required	No	No
ENVIRONMENTAL IMPACT POTENTIAL		
Increases Impervious Pavement	Minimal	Moderate
Floodplain Impact	No	No
Landfill Impact	No	No
CONSTRUCTABILITY		
Impact to Airport Operations	Minimal	Minimal
ALTERNATIVES EVALUATION		
DETERMINATION	FAVORABLE	NEUTRAL

Aircraft Storage Alternatives

Aircraft storage and recycling operations typically use large open areas to receive, salvage components from, dismantle and recycle, or restore aircraft; these areas also have storage available for the long term. Aircraft storage and recycling facilities are growing more important and valuable as the demand for used parts increases. These types of operations increase an airport's revenue, provide diversified jobs to the local community, and increase the potential for associated development. This section proposes two alternatives for the development of aircraft storage facilities at RYN.

Aircraft Storage Alternative 1

This alternative, as shown in **Figure 4-25**, involves developing 47.6 acres of land for aircraft storage north of Runway 6L/24R. Much like the MRO alternatives, this alternative involves the clearing, grading, and compacting of land to support a non-asphalt aircraft parking apron. This alternative also proposes a new asphalt taxiway parallel to Runway 6L/24R with a connection to Taxiway D. A realigned service road will be required to access the site. The site would function as a non-dedicated area for aircraft storage where a variety of aircraft could be placed into storage as they are received without dedicated parking positions.

Advantages of this alternative:

- ▶ Develops a greenfield site in the north quadrant of the Airport.
- ▶ Provides diversified job opportunities for the surrounding community.
- ▶ Increases aeronautical development and revenue opportunities for the Airport.
- ▶ Site can accommodate a wide variety of aircraft for long-term storage.

Disadvantages of this alternative:

- ▶ The proposed location is difficult to access.
- ▶ No dedicated aircraft parking positions.
- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ The local community perceives aircraft storage facilities and recycling operations as aircraft chop shops.
- ▶ Larger aircraft may have a difficult time operating on a 75-foot-wide runway and 35-foot-wide taxiway.
- ▶ Significant infrastructure improvements are required for the north quadrant of the Airport to be viable.

Aircraft Storage Alternative 2

This alternative, as shown in **Figure 4-26**, involves developing 47.6 acres of land for aircraft storage north of Runway 6L/24R. Unlike the previous alternative, this alternative includes 30 new 130-by-120-foot parking pads for aircrafts storage, a paved taxilane with dual ingress and egress for aircraft, a new asphalt taxiway parallel to Runway 6L/24R with a connection to Taxiway D, and realigned service roads will be required to access the site. This creates a more organized and efficient site for aircraft parking and storage.

Advantages of this alternative:

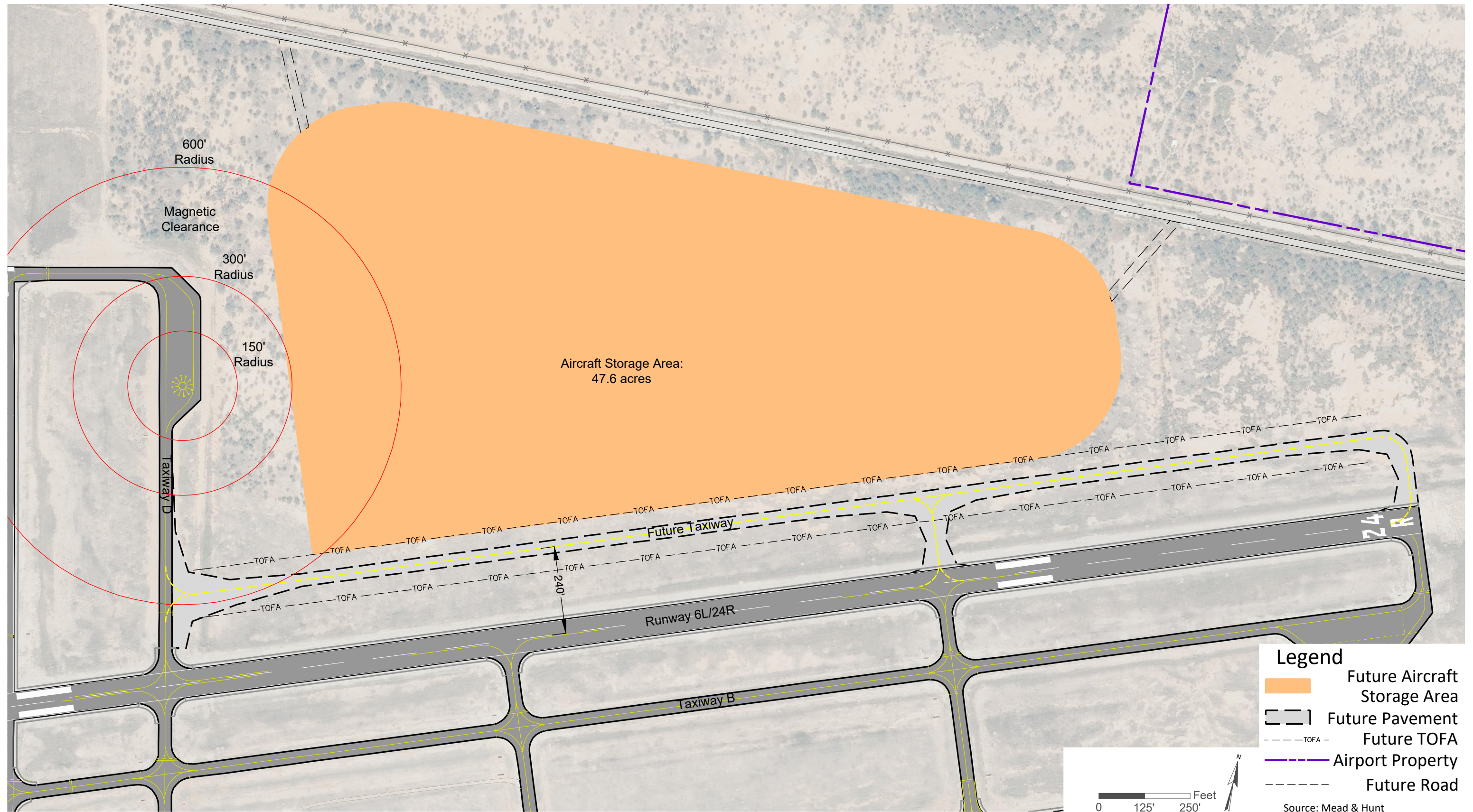
- ▶ Develops a greenfield site in the north quadrant of the Airport.
- ▶ Aircraft parking is organized and efficient.
- ▶ Provides diversified job opportunities for the surrounding community.
- ▶ Increases aeronautical development and revenue opportunities for the Airport.
- ▶ Initial development phase for an MRO type of operation.

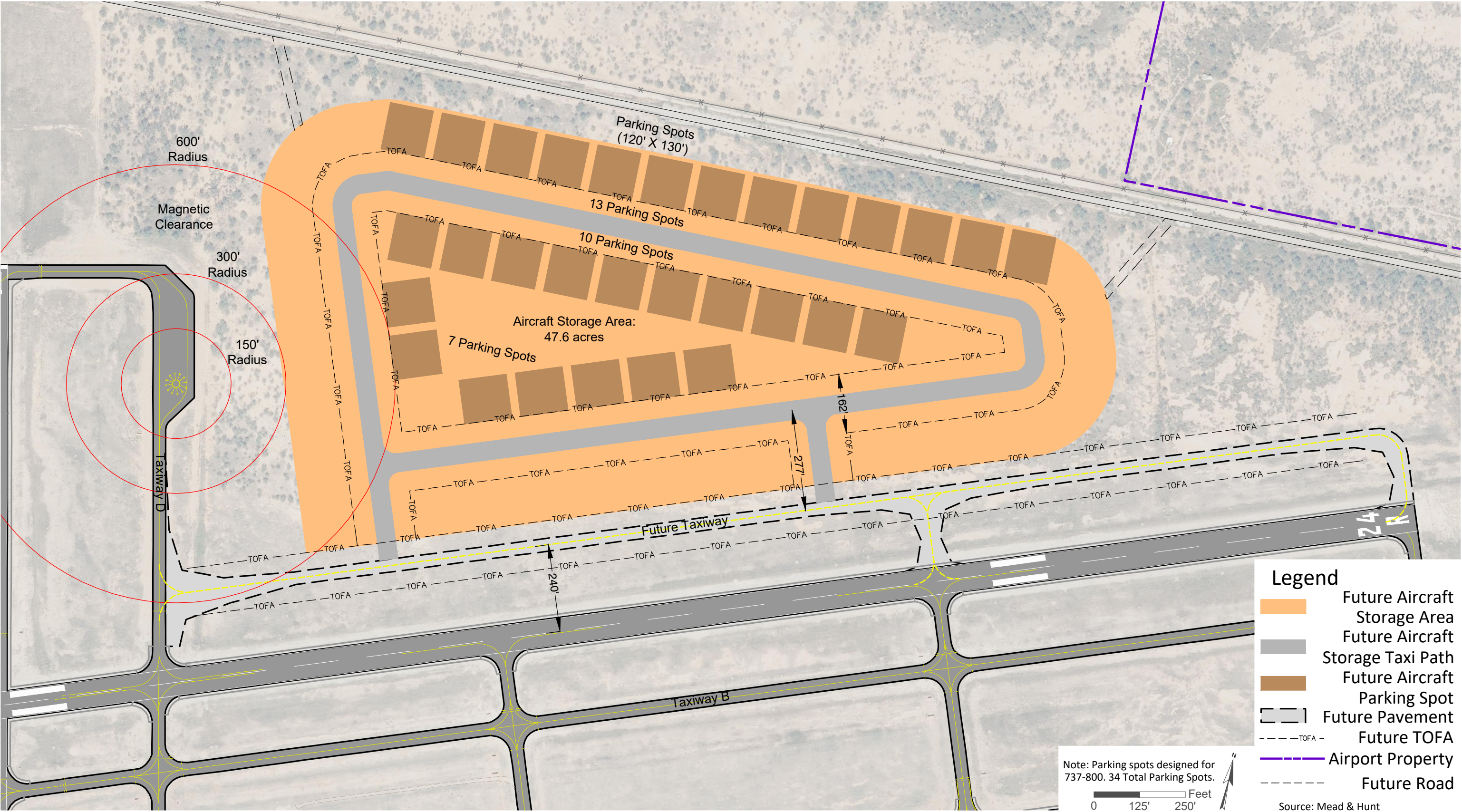
Disadvantages of this alternative:

- ▶ The proposed location is difficult to access.
- ▶ Larger aircraft may have a difficult time operating on a 75-foot-wide runway and 35-foot-wide taxiway.
- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ The local community perceives aircraft storage facilities and recycling operations as aircraft chop shops.
- ▶ Significant infrastructure improvements are required for the north quadrant of the Airport to be viable.

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Summary Evaluation of Aircraft Storage Alternatives

Table 4-9 presents an evaluation of the various Aircraft Storage Alternatives at RYN. Alternative 2 is the preferred alternative due to the functionality of the site.

Table 4-9: Summary Evaluation Matrix of Aircraft Storage Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	Development of North Property for Aircraft Storage	Development of North Property, paved taxilane, and 30 paved aircraft parking positions
OPERATIONAL CAPABILITIES		
Airfield Impacts	Would require a new taxiway connecting to Runway 6L/24R	Would require a new taxiway connecting to Runway 6L/24R
Runway Protection Zone Conflicts	None	None
Compatible with Existing / Future Facilities	Yes	Yes
Secure Location	Yes	Yes
LAND USE COMPATABILITY		
Impact to On-Airport Property	Increased operations to the north side	Increased operations to the north side
Impact to Off-Airport Property	None	None
Relocation of Existing Facilities Required	No	No
ENVIRONMENTAL IMPACT POTENTIAL		
Increases Impervious Pavement	Yes	Yes
Floodplain Impact	Development the north quadrant requires multiple permits and mitigation measures	Development the north quadrant requires multiple permits and mitigation measures
Landfill Impact	No	No
CONSTRUCTABILITY		
Impact to Airport Operations	Minimal	Minimal
ALTERNATIVES EVALUATION		
DETERMINATION	NEUTRAL	FAVORABLE

AIRPORT LAND DEVELOPMENT ALTERNATIVES

The economic benefits generated from an airport's commercial, industrial, and aviation-related tenants provide substantial revenues and employment opportunities for the surrounding communities. Thus, it is in the Airport's best interest to develop aeronautical and non-aeronautical uses to promote financial stability. Development around the Airport will diversify revenue streams and promote compatible development. Multiple areas to the east, west, and south of the Airport were analyzed to examine their development potential.

The non-aeronautical alternatives for the Airport focus on the development of new urban design based on the connectivity of surrounding properties, Ajo Highway, and the future I-11 corridor (**Figures 4-27 and 4-28**).

Airport Land Development Alternative 1

Alternative 1, as shown in **Figure 4-27**, is based on a new urban design focused on connectivity and visibility relative to Ajo Highway. A single design character along with Aviator Lane and Valencia Road unite two areas of RYN: west side and east side of crosswind Runway 15/33. Both areas are oriented toward Ajo Highway with five proposed signalized primary entries and seven additional full-turn, non-signalized secondary entrances. While both areas share Ajo Highway, both take on differing characters relative to the land use and development being proposed.

The west area land uses and design focus on the impact of the future I-11 corridor that may be located just west of RYN. This corridor will be one of the legs of the CANAMEX Corridor that was originally envisioned by the North American Free Trade Agreement. This corridor increases the potential for significant commerce, tourism, and international trade in this area. With this corridor being in such proximity to RYN, the primary focus for land uses and development is for employment and industrial uses geared toward the development, manufacturing, and transportation of goods and services between Mexico, the United States, and Canada. Secondary uses would include commercial properties that will primarily support the non-residential uses within the airfield area and some of the future I-11 traffic. Tertiary uses would include some entertainment properties that use large, warehouse-type structures, including indoor athletic facilities and general indoor entertainment, to support the surrounding community. Development in this area requires the relocation of the existing waste transfer site to an area outside of the West, Airport, and East Quadrants.

The east area land uses and design focus on the surrounding community and adjacent University of Arizona property. The primary focus for land uses and development is for educational uses in the development of professionals in the aeronautical and aerospace industries. This may include flight schools, operations and maintenance training, community colleges, and/or a satellite campus for a university. The secondary land uses may also focus on education, but in the medical service and research industries. The proximity of the land to the airport and the University of Arizona property presents opportunities to target medical tourism, for example, a teaching and research hospital that would take advantage of the adjacent airport, perhaps specializing in organ transplants.

Tertiary land uses for this area would include commercial and office uses that would service the uses within the airfield area as well as the surrounding community, such as medical offices, lifestyle commercial area, entertainment, hotels, and restaurants.

Alternative 1, with its focus on Ajo Highway, provides greater connectivity for all areas of RYN, including those aviation uses further from the highway. This higher level of connectivity also produces a very flexible plan. With the amount of connections and the spacing of these connections, the ability to create a variety of parcel sizes is greater. This will allow for greater diversity in land uses and a higher value for the land. This also creates greater flexibility in phasing the development and not having to invest too much in infrastructure to bring a particular parcel to market when there is a demand for it.

Advantages of this alternative:

- ▶ Design focused on connectivity and visibility to local roadway network vs. an internal spine road.
- ▶ Proposed development to support local community interests.
- ▶ Provides diversified job opportunities for the surrounding community.
- ▶ Traditional site plan that develops parcels to support large scale development opportunities.
- ▶ Location of the potential I-11 corridor alignment and access to Ajo Highway to further support development.

Disadvantages of this alternative:

- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ Relocation of the waste transfer site to another location outside of the West, Airport, and East Quadrants is required.

Airport Land Development Alternative 2

Alternative 2, as shown in **Figure 4-28**, is based on a traditional curvilinear design and is focused internally on a central spine road. This single spine road that ties into Aviator Lane and Valencia Road unites two areas of RYN: west of Runway 15/33 and east of it. Both areas are proposed to have limited connectivity to Ajo Highway with six signalized primary entries and one additional full-turn, non-signalized secondary entrance. The land uses for both areas will focus internally on the spine road and the connector roads between Ajo Highway and the spine road; however, each area is proposed to have differing primary market focuses.

As with Alternative 1, the west area land uses and design focus on the impact of the future I-11 corridor, one of the legs of the CANAMEX Corridor originally envisioned by the North American Free Trade Agreement. This corridor increases the potential for significant commerce, tourism, and international trade here. With such proximity to the west area of RYN, the primary focus for land uses and development is for employment and industrial uses geared toward the development, manufacturing, and transportation of goods and services between the United States, Canada, and Mexico. Secondary uses would include commercial uses that will primarily support the non-residential uses within the RYN area and some of the future I-11 traffic. Tertiary uses would include some entertainment uses that use large warehouse type structures, including indoor athletic facilities and general indoor entertainment, to support the surrounding community. Development in this area requires the relocation of the existing waste transfer site to an area outside of the West, Airport, and East Quadrants.

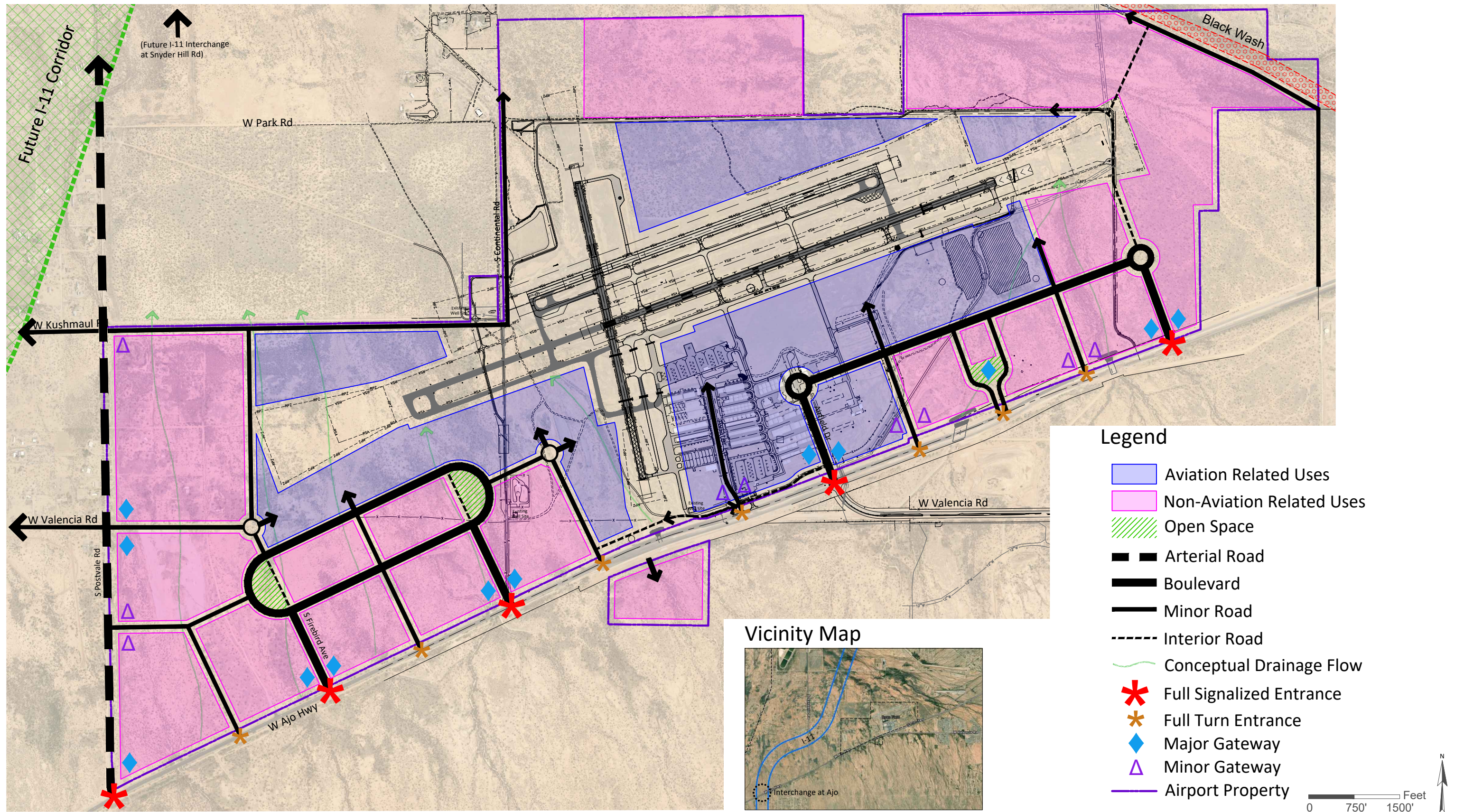
The east area land uses and design focus on education and adjacent University of Arizona property. The primary focus for land uses and development is for educational uses that train professionals in the aeronautical and aerospace industries. This would include flight schools, operations and maintenance training, community colleges, and/or a satellite campus for a university. The secondary land uses would also focus on education, but in the medical service and research industries. Opportunities to target medical tourism are available with the proximity of the airport and the University of Arizona land. This could take on the form of developing a teaching and research hospital that would take advantage of the adjacent airport, such as specializing organ transplants. Tertiary land uses for this area would include commercial and office uses that would service both the uses within the RYN area as well as the surrounding community, such as medical offices, lifestyle commercial area, entertainment, hotels, and restaurants.

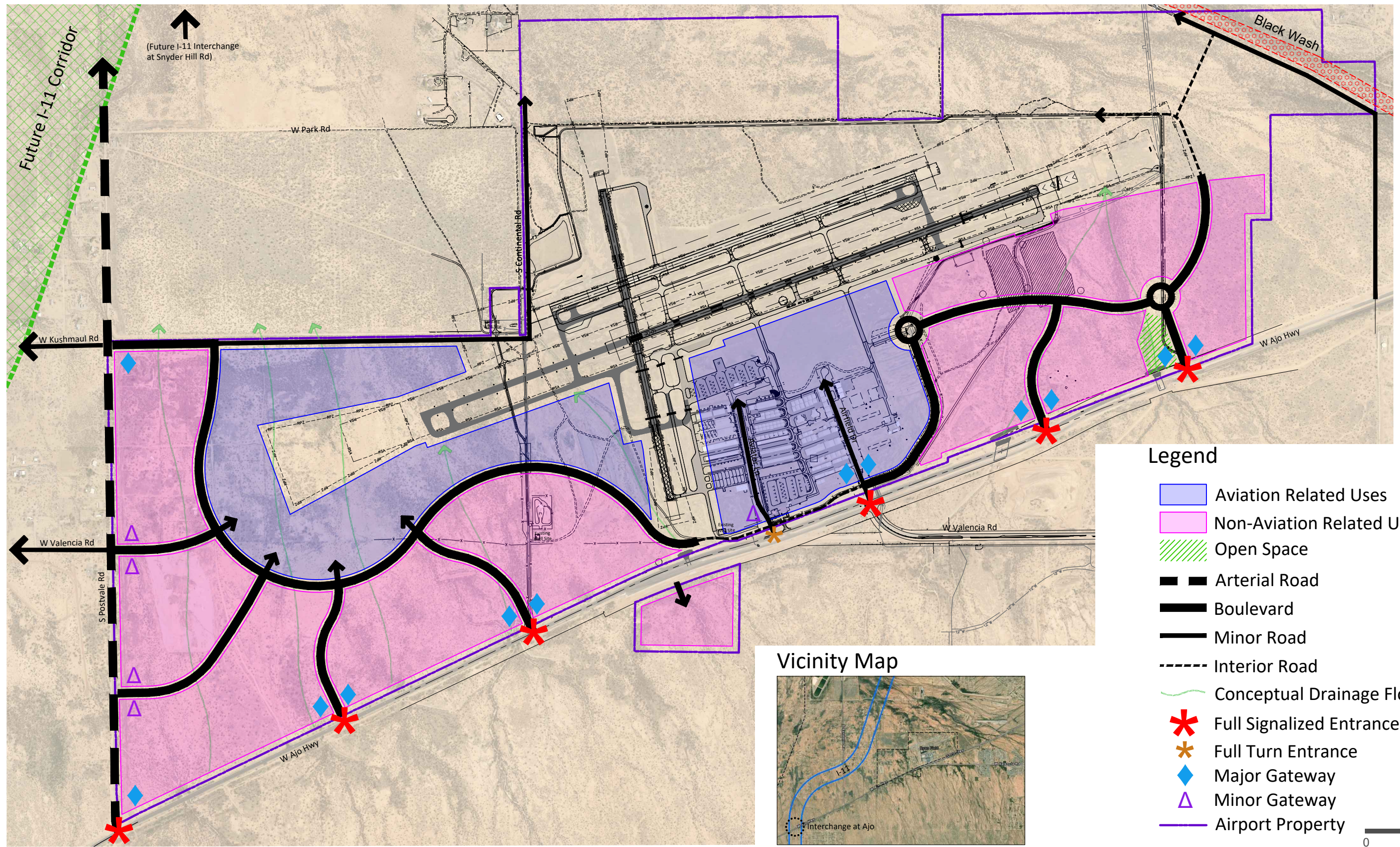
Advantages of this alternative:

- ▶ Design focused on an internal spine road vs. connectivity and visibility to local roadway network.
- ▶ Proposed development to support local community interests.
- ▶ Provides diversified job opportunities for the surrounding community.
- ▶ Non-traditional site plan develops parcels in a new urbanist manner to create less “grid-system” development.
- ▶ Location of the potential I-11 corridor alignment and access to Ajo Highway to further support development.

Disadvantages of this alternative:

- ▶ Proposed development is in a known floodplain and requires a variety of permits and mitigation measures.
- ▶ Relocation of the waste transfer site to another location outside of the West, Airport, and East Quadrants is required.
- ▶ Non-traditional site plan does not maximize parcel development as effectively as a traditional site plan.

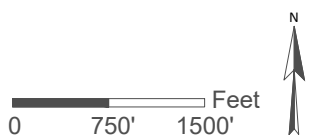
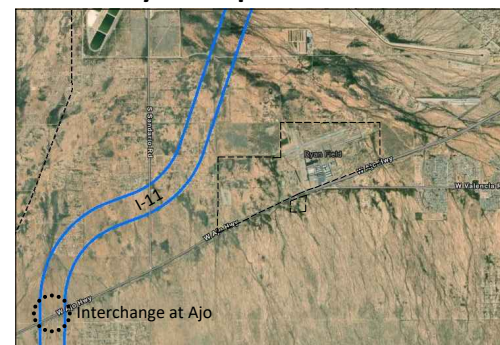




Legend

- Aviation Related Uses
- Non-Aviation Related Uses
- Open Space
- Arterial Road
- Boulevard
- Minor Road
- Interior Road
- Conceptual Drainage Flow
- Full Signalized Entrance
- Full Turn Entrance
- Major Gateway
- Minor Gateway
- Airport Property

Vicinity Map



Summary Evaluation of Airport Land Development Alternatives

Table 4-10 presents an evaluation of the various alternatives for Airport Land Development at RYN. Alternative 1 is the preferred alternative as the proposed layout of the non-aeronautical roadway network supports improved access to and from the local roadway networks, logically separates non-aeronautical development parcels in a manner that developers prefer, and maximizes development opportunities for a variety of uses.

Table 4-10: Summary Evaluation Matrix of Airport Land Development Alternatives

IMPACT CATEGORY	ALTERNATIVE 1	ALTERNATIVE 2
Description of Improvement	New Urban design focused on connectivity and visibility on Ajo Highway	Traditional curvilinear design focused internally on a central spine road
PERFORMANCE REQUIREMENTS		
Project Phasing	High	Moderate
Flexibility in land area take downs (parcel sizes)	High	Minimal
Responds to Future I-11 Connections	High	Moderate
Increases marketability for Development	High	Moderate
OPERATIONAL CAPABILITIES		
Airfield Impact	None	None
Runway Protection Zone Conflicts	None	None
Incorporation of existing airport facilities into the rest of the property	High	Moderate
LAND USE COMPATABILITY		
Impacts to On-Airport Property	Relocation of the existing waste transfer station	Relocation of the existing waste transfer station
Variety of land uses	High	Moderate
Ability to respond to land development market conditions	High	Moderate
Flexibility in the amount of aeronautical land area that can be provided	High	Moderate
Allows for future incorporation of adjacent property to the northwest	High	High
Allows for future incorporation of adjacent property to the east	High	Moderate
ENVIRONMENTAL IMPACT POTENTIAL		
Responds to existing environmental conditions	Moderate	Moderate
Required roadway/spine infrastructure for future development	Moderate	Minimal
Landfill Impact	Minimal	Moderate
Impact to existing drainage and riparian corridors	High (negative)	High (negative)
Impact to current/proposed infrastructure	Moderate	Minimal
Floodplain Impact	High (negative)	High (negative)
STAKEHOLDER FEEDBACK		
Positive impact to the surrounding community	High	Moderate
Considers Stakeholder Feedback	High	High
Addresses Stakeholder Concerns	High	Moderate
CONSTRUCTABILITY		
Impact to Airport Operations	Moderate	Minimal
ALTERNATIVES EVALUATION		
DETERMINATION	FAVORABLE	NOT FAVORABLE

RECOMENDED CONCEPTUAL DEVELOPMENT PLAN

The recommended conceptual development plan outlines the proposed development and facility improvements that will not only meet the forecasted demand presented in **Chapter 2 – Aviation Activity Forecasts** and mitigate the deficiencies presented in **Chapter 3 – Facility Requirements**, but ultimately support competitiveness and financial viability for the Airport. These improvement alternatives are recommended:

Airfield Development Improvements

- ▶ Extend Runway 6R/24L by 2,797 feet to a runway length of 8,300 feet and a width of 100 feet. This project would occur as a multi-phased project. Phase 1 would include an 800-foot runway extension to the west, and Phase 2 would further extend the runway by an additional 1,997 feet.
- ▶ Extend Taxiway B by 2,797 feet to resolve Federal Aviation Administration (FAA)-identified Hot Spot 1. This project would occur as a multi-phased project. Phase 1 would include an 800-foot taxiway extension to the west, and Phase 2 would further extend the taxiway by an additional 1,997 feet.
- ▶ Relocate Runway 15/33 north by 550 feet and maintain the full runway length of 4,000 feet and the existing width of 75 feet.
- ▶ Construct a new full-length parallel taxiway north of Runway 6L/24R.
- ▶ Eliminate multiple taxiway connectors that provide aircraft direct runway access from apron areas and have non-standard geometry.
- ▶ Develop property north of Runway 6L/24R for aeronautical and non-aeronautical purposes to include aircraft storage and an MRO operation.

Airport Facility Improvements

- ▶ Construct a joint-use fire station that serves both the Airport and local community east of Airport Drive and west of the TAA maintenance building.
- ▶ Construct new administrative offices for TAA staff adjacent to the existing conference room.
- ▶ Reconstruct the existing ATCT in its current location and increase the tower height to resolve an existing blind spot along Taxiway D near the approach end of Runway 33.

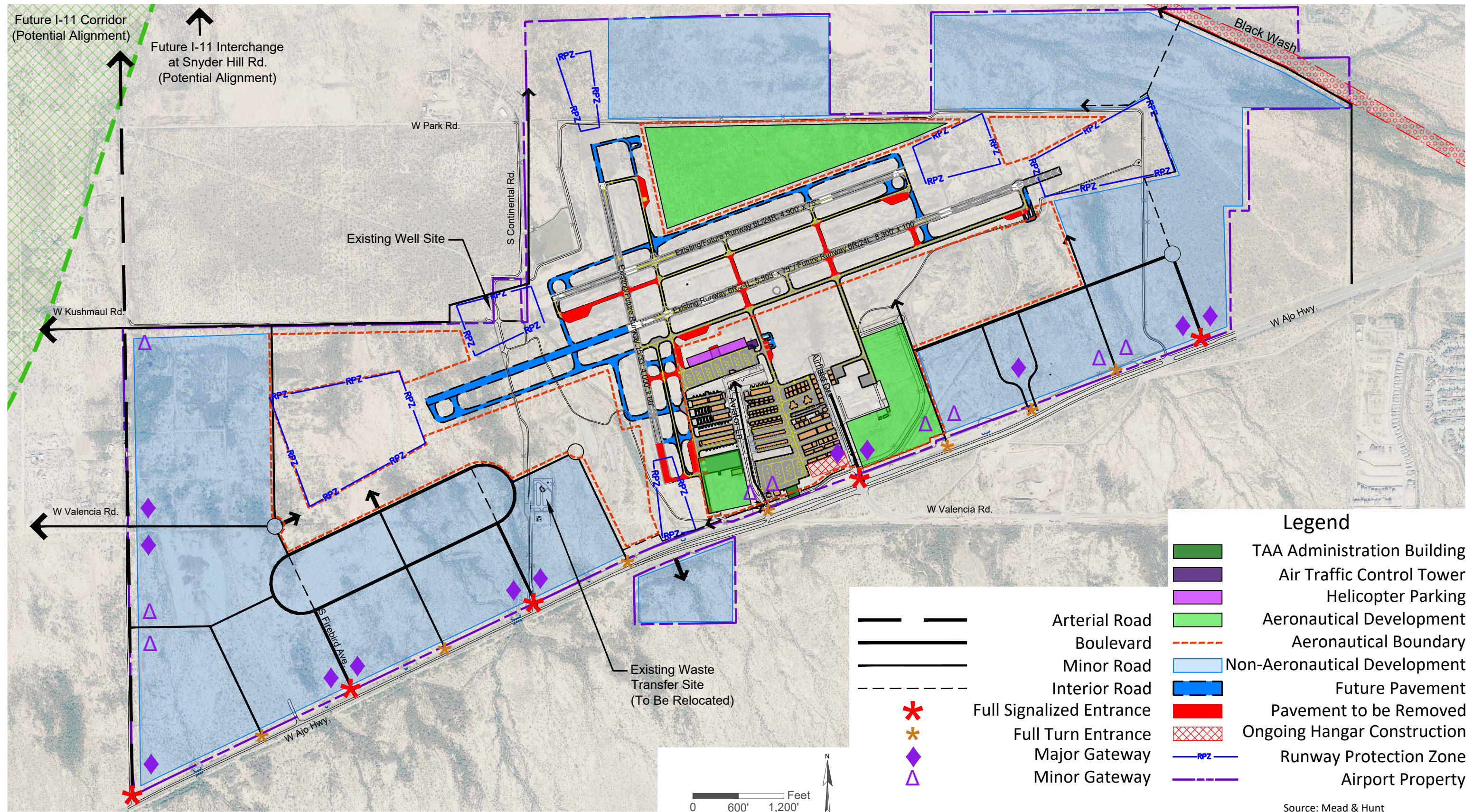
Flight Schools/GA Facility Improvements

- ▶ Develop property for a new FAR Part 141 certified flight school east of Airport Drive that includes new hangars, tie-downs, helicopter parking and apron areas, maintenance and support facilities, a student dormitory, a school cafeteria, administrative space, and vehicle parking.
- ▶ Develop property for an expanded FAR Part 61 certified flight school south of the existing flight training facility to include additional hangars, administrative space, and maintenance and support facilities.
- ▶ Construct eight dedicated helicopter parking pads north of the existing ATCT apron.

Airport Land Development Improvements

- ▶ Develop airport property that maximizes aeronautical and non-aeronautical revenues through sensible airside and landside development.
- ▶ Construct a frontage road that parallels Ajo Highway to connect the West, Airport, and East Quadrants.
- ▶ Relocate the Pima County Waste Transfer facility to an acceptable location for the local community.
- ▶ Construct roadways that provide signalized and efficient access to Ajo Highway, Postvale Road, Valencia Road, Kushmaul Road, and Continental Road.
- ▶ Integrate access to the Airport through a potential interchange for I-11 and Valencia Road.
- ▶ Construct utility infrastructure to support airside and landside development.

The Airport's Preferred Conceptual Development Plan, as shown in **Figure 4-29**, will successfully satisfy the Airport's needs through 2038. A list of projects, their capital costs, and the associated environmental documentation requirements will be incorporated into the subsequent **Facilities Implementation and Financial Feasibility Chapter**. An ALP will be developed to identify the airport layout options through the end of the planning period in 2038.



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