CHAPTER D

Existing Airport Site Alternatives

1. Introduction

This chapter presents alternatives and recommendations for airport development and improvement at the existing Friedman Memorial Airport (SUN or "the Airport") site over the next 20 years. The result is a conceptual development plan that illustrates the recommended layout of future airport facilities. Several types of alternatives are considered, including alternatives that are achievable within the existing site footprint and those that involve expansion of the existing site.

These alternatives focus on accommodating air traffic control tower (ATCT) requirements, passenger terminal area facilities, general aviation facilities, and compliance with FAA standards. Not all existing and/or forecasted demand associated with the dual path planning thresholds identified at the end of the previous chapter can be fully accommodated at the existing site, and will be considered in Chapter E, *Siting Evaluation for Replacement Airport*.

Note: The approval of this planning document by the Friedman Memorial Airport Authority (FMAA) does not constitute final approval of any of the improvements shown. This is a planning document showing potential improvements that may be necessary in the future, depending on demand at the Airport and appropriate project justification. Implementation of specific projects shall not occur without specific approval of the FMAA, in accordance with the Friedman Memorial Airport Joint Powers Agreement as amended, or a successor document.

Key Terms

Definitions for several key terms used in this chapter are provided below. **Appendix A**, *Glossary of Terms*, provides definitions for technical terminology and acronyms used in this Master Plan.

Airport Facilities Terminal Integration Laboratory (AFTIL) – An FAA facility that can simulate potential ATCT sites in a realistic ATCT tower cab (i.e. control room), using airfield siting photographs and aircraft simulations. By combining all aspects of ATCT operations in one simulation facility, a much more complete evaluation of potential ATCT sites can be accomplished.

Remain Overnight (RON) – Remain overnight aircraft are parked at an airport overnight, typically because they are scheduled for departure during the first few hours of the next day. If there are more RON aircraft than the number of active gates, aircraft may be double-parked if the situation allows, or parked remotely and towed to the gate for departure.

Safety Risk Management (SRM) – The FAA Safety Management System (SMS) requires that SRM assessments be performed on proposed changes to the National Airspace System (NAS) that have potential safety impacts. An SRM process is conducted after an initial Air Traffic Control Tower (ATCT) siting analysis. Each siting criterion is reviewed for potential hazards, and the hazards identified for each site are assessed and mitigated to an acceptable level of risk to satisfy SMS requirements.

Terminal Instrument Procedures (TERPS) – Procedures for instrument flight operations to and from civil and military airports. FAA Order 8260.3B, *United States Standard for Terminal Instrument Procedures (TERPS)* contains criteria used to formulate, review, approve, and publish the procedures.

1.1. Planning Assumptions

Based on input received from the FMAA, stakeholders, Airport management, and the Federal Aviation Administration (FAA), several basic assumptions have been established for this chapter to direct planning for development of the existing Airport site.

Assumption One: Compliance. The Airport will be developed and operated in a manner that is consistent with local ordinances and plans, federal and state statutes, federal grant assurances, and FAA regulations.

Assumption Two: Service. The Airport will continue to accommodate commercial passenger activity with a high level of customer service, along with general aviation activity.

Assumption Three: Economic Growth. The Airport should complement and enhance on-airport and off-airport regional economic development activities in accordance with the economic growth goals of the Airport and local community.

Assumption Four: Planning Thresholds. The dual path planning thresholds identified at the end of Chapter C represent the major needs of the Airport for the next 20 years and thus form the basis of the development alternatives.

Assumption Five: Design Aircraft. The current C-III design aircraft for Runway 13/31 will not change during the 20-year planning period.

Assumption Six: Use of Existing Property. Future development should strive to make most efficient use of land within the existing boundary.

Assumption Seven: Flexibility. Land acquisition at the existing site and airport relocation both remain options to be studied within the context of the Master Plan, in addition to finding workable solutions within the existing site boundary.

Assumption Eight: Land Acquisition. In keeping with the January 2013 "Talking Points Moving Forward", this chapter considers elements of the 2013 *Airport Alternatives Technical Analysis*, Alternative 7, in order to determine land acquisition and other requirements related to lost capacity resulting from the recent Runway Safety Area (RSA) improvements.

Assumption Nine: Land Use Compatibility. Proposed development should complement off-airport development and land uses to the maximum extent possible, to ensure the continued compatibility of the airport environs with the daily operations of the Airport, while recognizing that the Airport is an existing land use.

Assumption Ten: Runway Length. Additional runway length cannot be provided within the current Airport boundary, and the FMAA does not wish to examine extension of the runway and associated land acquisition for reasons of land use compatibility and safety.

Assumption Eleven: Passenger Terminal. Relocation of the passenger terminal area/terminal building will not be considered by this Master Plan.

Assumption Twelve: State Highway 75. The alternatives do not consider relocation of Highway 75.

Assumption Thirteen: Snow Storage and Stormwater Drainage. Alternatives that would add impervious surface at the Airport would have an impact on stormwater and snow storage requirements. If only the minimum required land acquisition is provided for some alternatives, there may not be sufficient space to provide conventional stormwater drainage and snow removal practices. This chapter assumes that design details for stormwater drainage and snow storage would be determined during the engineering design stage.

1.2. Planning Goals

Accompanying these assumptions are several goals that have been established for purposes of directing the plan. The goals listed below are consistent with the Airport's mission statement, Blaine County's Guiding Principles, and the City of Hailey's Guiding Principles.

Goal One: Provide Blaine County and the traveling public with a safe and reliable aviation facility that supports community needs and economic growth, and addresses community impacts.

Goal Two: Accommodate a variety of activities, ranging from small general aviation users to commercial airlines, to the extent deemed necessary and prudent by the FMAA.

Goal Three: Plan and develop future infrastructure improvements that meet federal design and safety standards and are based on necessity rather than convenience.

Goal Four: Minimize environmental impacts associated with proposed development.

Goal Five: Plan and work towards a replacement airport as the long-term solution for resolving constraints associated with the existing Airport site.

1.3. Alternatives Analysis Approach

With the above goals in mind, development alternatives were identified for meeting the Airport's long-term needs. Alternatives are sorted into specific facility categories that may require or benefit from improvements at the existing Airport site during the 20-year planning period, as identified in Chapter C. These facility categories include the following:

1. **Air Traffic Control Tower**
2. **Passenger Terminal Area Facilities**
   a. Terminal Building
   b. Commercial Apron
   c. Automobile Parking
3. **General Aviation Facilities**
4. **Compliance with FAA Standards**

For each facility category, the following alternatives are identified. Where applicable, it is noted whether the alternative is designed to recapture facilities lost as a result of the RSA improvements, or to accommodate forecasted demand.

"No Action" Alternatives. These alternatives consider the implications of not making improvements to facilities during the planning period.

Existing Site Footprint Alternatives. These alternatives identify options for meeting long-term needs within the existing site footprint, in most cases at the expense of other existing facilities.

Existing Site Expansion Alternatives. These alternatives identify options for meeting long-term needs by expanding outside the existing Airport footprint.

Following discussion of the "no action" and existing site alternatives in this chapter, a *Siting Evaluation for Replacement Airport* will be presented in Chapter E. The re-evaluation will identify the benefits of relocating the Airport to meet long-term needs, and re-evaluate the replacement sites identified in the Environmental Impact Statement (EIS) in light of current circumstances.

Note: Alternatives presented in this chapter assume as "existing conditions" all improvement projects that are completed, in-progress, or scheduled for implementation as of this writing. That is inclusive of the entire Runway Safety Area (RSA) and Terminal Area Improvements Project, which is reflected on the most recent update to the Airport Layout Plan (ALP) completed in 2014. The existing conditions also assume construction of the future ("ultimate") buildings illustrated on the previous ALP.

2. Air Traffic Control Tower

The recently approved Modification of Standards (MOS) related to the Airport's Runway Object Free Area (ROFA) is conditioned on removal of the existing Air Traffic Control Tower (ATCT) located on the east side of the runway and within the ROFA, by 2023. The FAA has stated that SUN must have an ATCT in order to retain commercial passenger air service. A major goal of the Master Plan is to identify a future site for the ATCT that is compliant with FAA design standards and is an optimal location with relation to existing and planned future development.

The existing ATCT is currently deficient in terms of technology, cab height, and location to support the existing and future role of the Airport. Multiple sites were analyzed based on FAR Part 77 criteria, sight distance and shadowing effects, orientation and glare, and physical consideration such as infrastructure development, zoning, security, access, topography, general location, and facility construction costs. Three of the sites are recommended for further analysis. The ATCT alternatives are presented and analyzed in the following sections:

- **Identification of Viable ATCT Sites**
- **Tier One Siting Analysis: Visibility Performance and Construction Cost**
- **Tier Two Siting Analysis: Other Considerations**
- **Next Steps: FAA Siting Process**

2.1. Identification of Viable ATCT Sites

The 2004 *Friedman Memorial Airport Concept and Budget (C&B) Report* identified eight potential ATCT locations, referred to by this Master Plan as C&B 1-8. Sites that are no longer viable due to development and airport design standard changes since 2004 are noted in **Table D1**. Three of the C&B sites remain viable and are referred to by this Master Plan by the new site numbers 1, 2, and 3 as identified in the table.

Two additional viable sites were selected for review and analysis, referred to by this Master Plan as Sites 4 and 5. The sites were selected after a review of the 2014 SUN Airport Layout Plan and recent MOS documentation. The selected sites are described in **Table D2**. The locations of all five viable ATCT sites are shown in **Figure D1**. It is important to note that the sites identified are generalized and that the actual site could be in the general vicinity of the site shown in Figure D1. The future ATCT might also be incorporated into another existing or future structure; for example, the ATCT could be connected to the passenger terminal building.

Table D1 **2004 ATCT STUDY SITES**

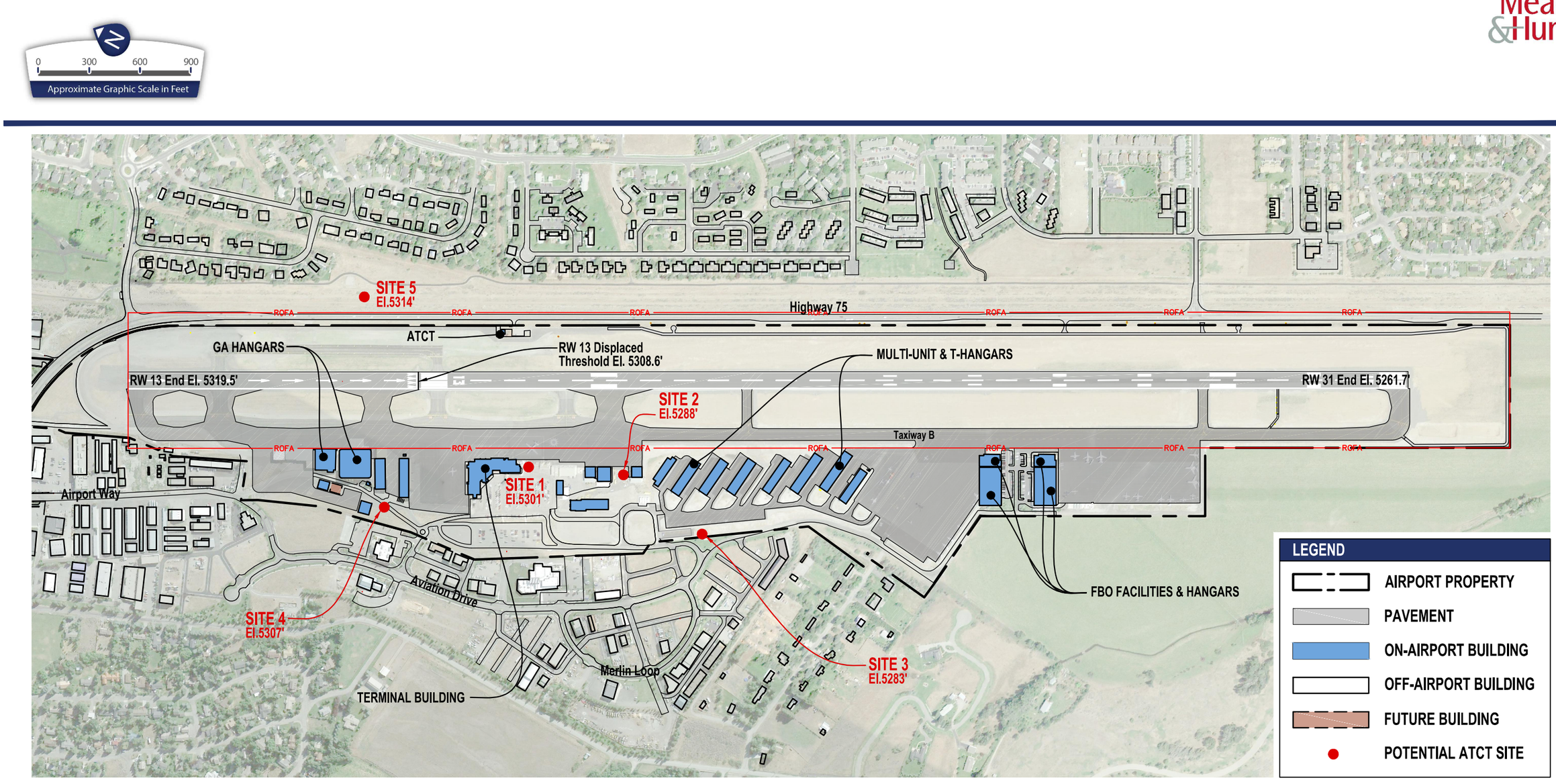
Site	Location	Viable	Reasoning for Viability Assessment	New Site Number
C&B 1	North of the passenger terminal building	No	Located on the relocated commercial service ramp	---
C&B 2	Adjacent to the passenger terminal building, to the south	Yes	Outside the TOFA, could be incorporated into the passenger terminal building	1
C&B 3	South of the passenger terminal building, on the site of the old Administration building.	No	Inside the TSA and TOFA for the new bypass taxiway	---
C&B 4	South of the passenger terminal approximately 600 feet, between hangars	Yes	Located on undeveloped land, and land not slated for development	2
C&B 5A	On a triangle of undeveloped land, south of the terminal and north of the T-hangars	No	Site access, located between the 25 foot and 30 foot Building Restriction Line, and inside the ROFA	---
C&B 5B	On a triangle of undeveloped land, south of the terminal and north of the T-hangars	No	Inside the ROFA	---
C&B 6	Adjacent to the future ARFF/SRE building	No	Access and incorporation into the ARFF/SRE would be challenging	---
C&B 7	Adjacent to Aviation Drive, and future GA tie-downs	Yes	Located on undeveloped land, and land not slated for development	3
C&B 8	The current ATCT site	No	Inside the ROFA	---

SOURCE: 2004 Friedman Memorial Airport Concept and Budget Report.

Table D2 **ADDITIONAL VIABLE ATCT SITES**

Site	Location	Justification
4	Northwest of the Commercial Apron	Direct oversight of the Commercial Apron, outside the ROFA
5*	East of Highway 75, in the Right-of-Way	Outside the ROFA, access to the highway, away from the Missed Approach Procedure to Runway 31

SOURCE: Mead & Hunt, T-O Engineers
*** Site 5 would require land acquisition.**



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D1 **Air Traffic Control Site Options**

2.2. Tier One Siting Analysis: Visibility Performance and Construction Cost

An initial screening of the sites was conducted utilizing the FAA's Air Traffic Control Visibility Analysis Tool to determine required tower heights and associated construction cost. To utilize the online Visibility Tool, a number of parameters need to be calculated for each site, including the ground elevation at the site, the ground elevation at the Key Point(s), and the Site to the Key Point distance. A Key Point is defined as a spot on the surface of the airport that is of interest, such as runway end or taxiway intersection. For the purpose of this analysis, the Key Point for each site is either end of Runway 13/31. The Tier One Siting Analysis for the five viable ATCT sites includes the following components:

- **Line of Sight (LOS) Angle of Incidence Analysis**
- **Object Discrimination Analysis**
- **Unobstructed View Analysis**
- **Two-Point Lateral Discrimination Analysis**
- **Construction Cost Estimate**

2.2.1. LOS Angle of Incidence Analysis

The lower an ATCT site's ground elevation, the taller the ATCT has to be to achieve the same Line of Sight (LOS) Angle of Incidence for each runway end. For each site, the Key Point varies depending upon the ground height of the site and the ATCT height needed to achieve the ideal Angle of Incidence. The minimum threshold value of 0.80 degrees is the minimum LOS slant angle required to perform the ATCT specialists' duties, and represents the minimum LOS Angle of Incidence for observing the Key Point. The ATCT observer's eye height was determined according to Draft FAA Order 6480.4B *Airport Traffic Control Tower Siting Process*, which defines the observer's eye height as five feet above the floor of the tower cab (i.e. control room). Order 6480.4B also indicates that when siting an ATCT, 25 feet should be added from the observer's eye height to the top of the structure.

2.2.2. Object Discrimination Analysis

The FAA Air Traffic Control Visibility Tool evaluates controller object discrimination based on three criteria, *Detection*, *Recognition*, and *Identification*. The minimum passing thresholds for these criteria are based on an FAA assessment of 195 ATCTs throughout the country. The FAA tool generates a probability percentage for each criterion, and determines whether the probability percentage is within the passing limits.

Detection is defined as the controller's ability to notice the presence of an object without regard to the class, type, or model; the observer knows something is present but cannot recognize or identify the object. The *Detection* criterion has a minimum passing threshold of 95.5%. *Recognition* is defined as the ability to discriminate a class of objects – such as a class of aircraft, for example, single engine general aviation aircraft – and has a minimum passing threshold of 11.5%. *Identification* is defined as the ability to specify the object – such as a Dodge Caravan or Cessna 172 – and has a minimum passing threshold of 0.91%.

2.2.3. Unobstructed View Analysis

Additional review was conducted utilizing topographic data, structural heights, and visualization tools such as Computer-Aided Design and Drafting (CADD) software. This additional review calculated the minimum air traffic controller eye height to see all movement surfaces on the Airport.

FAA Order 6480.4B and Advisory Circular 150/5300-13A, *Airport Design*, Change 1, state that an ATCT must have a clear LOS to all traffic patterns, the final approaches to all runways, all runway structural pavement, and other operational surfaces controlled by the ATCT. A clear LOS to taxilane centerlines is desirable, as operational surfaces that do not have an unobstructed LOS will be designated as non-movement areas through a Letter Of Agreement (LOA) with the Airport.

2.2.4. Two-Point Lateral Discrimination Analysis

A two-point lateral discrimination analysis was performed to assess whether the observer would have sufficient ability to laterally discriminate between two critical points of the airport surface operations. In the case of SUN, the two points would be two aircraft situated at the end of the runway and parallel taxiway, respectively, at the same end of the airfield. Consideration must be given to laterally separating the observer's viewing angle between the two points by 0.13 degrees (8 minutes) or greater.

2.2.5. Construction Cost Estimate

To estimate construction cost for each viable ATCT site, an analysis of 34 FAA Contract ATCTs was conducted utilizing the Construction Data Base maintained by the American Association of Airport Executives (AAAE) and the U.S. Contract Tower Association. The 34 ATCTs analyzed were constructed between 2003 and 2013, with an average height of 72 feet, at an average total cost of $2.8 million, translating to a cost per vertical foot of approximately $40,000. This cost per vertical foot was utilized to determine a construction cost estimate for each ATCT site; however it is important to note that these cost estimates do not take into account site-specific considerations.

2.2.6. Tier One Siting Analysis Summary

Utilizing the information derived from the analysis outlined above, an ATCT matrix was developed with key critical data inputs and results for the five viable sites, shown in **Table D3**. The table is based on the Site Comparison Chart found in FAA Order 6480.4B, Appendix B. The ATCT site selection process requires that at a minimum, three recommended operationally viable sites must be identified for further modeling and simulation.

Based on this analysis, Sites 3 and 4 may be ruled out due to their required tower heights and higher construction costs, as well as their relatively lower scores for the Visibility Performance Analysis items.

Table D3 **TIER ONE ATCT SITING ANALYSIS**

Item	1	2	3	4	5
Site Location on Airport (Lat/Long)	43° 30' 22.28" N 114° 18' 0.98" W	43° 30' 17.43" N 114° 17' 57.10" W	43° 30' 16.76" N 114° 17' 59.24" W	43° 30' 27.80" N 114° 18' 10.26" W	43° 30' 35.82" N 114° 17' 57.44" W
Site Elevation (AMSL)[1]	5,301 FT	5,288 FT	5,283 FT	5,307 FT	5,314 FT
Tower Cab (Control Room) Floor Height (AGL)	47 FT	68 FT	237 FT	118 FT	29 FT
Controller Eye Height (AGL)[2]	52 FT	73 FT	242 FT	123 FT	34 FT
Total Tower Height (AGL)	77 FT	98 FT	267 FT	148 FT	59 FT
Environmental Issues	None Known	None Known	None Known	None Known	None Known
ATCT Potential Impacts to Existing and Future NAVAIDS	None Known	None Known	None Known	None Known	None Known
Part 77 Impacts (Transitional Surface Penetration)	+37 FT	+53 FT	+174 FT	+78 FT	+24 FT
Construction Cost Estimate ($65K per vertical foot)	$5.0 Million	$6.4 Million	$17.4 Million	$9.6 Million	$3.8 Million
Access to ATCT Site	Via Parking Lot	Via New Road	Via Airport Cir.	Via Airport Access Road	Via Highway 75
Key Point	Runway 13 End	Runway 13 End	Runway 13 End	Runway 31 End	Runway 31 End
Distance	2,398 FT	2,956 FT	3,479 FT	6,113 FT	6,211 FT
Elevation (AMSL)	5,308.6 FT	5,308.6 FT	5,308.6 FT	5,261.9 FT	5,261.9 FT
Visibility Performance Analysis					
Object Discrimination Analysis	Pass	Pass	Pass	Pass	Pass
Detection: Threshold > 95.5%	100%	99.9%	99.9%	98.9%	98.8%
Recognition: Threshold > 11.5%	95.7%	90.7%	84.0%	33.2%	30.5%
Identification: Threshold > 0.91%	62.6%	41.7%	29.0%	3.6%	3.2%
LOS Angle of Incidence, Minimum = 0.80 degrees[3]	0.80 degrees	0.80 degrees	3.56 degrees	1.58 degrees	0.80 degrees
2-Point Lateral Discrimination (0.13 degrees or greater)	7 degrees (RW 13 & Parallel TW); 3 degrees (RW 31 & Parallel TW)	6 degrees (RW 13 & Parallel TW); 4 degrees (RW 31 & Parallel TW)	5 degrees (RW 13 & Parallel TW); 4 degrees (RW 31 & Parallel TW)	10 degrees (RW 13 & Parallel TW); 3 degrees (RW 31 & Parallel TW)	12 degrees (RW 13 & Parallel TW); 3 degrees (RW 31 & Parallel TW)
ATCT Orientation, Primary Operations View Direction	South/East	South/East	South/East	South	South

SOURCE: Mead & Hunt, T-O Engineers

NOTE: [1] Determined utilizing 2014 AGIS Data

[2] Calculated based on LOS angle of incidence analysis and/or ability to see all movement areas (runway and taxiways).

[3] Where angle of incidence is greater than 0.80 degrees, tower height was determined based on clear LOS to all movement areas.

2.3. Tier Two Siting Analysis: Other Considerations

The remaining three sites (Sites 1, 2, and 5) are analyzed further in this section based on other important siting considerations. In selecting a preferred site for an ATCT, consideration must be given other requirements, including required land, ATCT orientation, weather impacts, security, access, and local zoning, as described below.

2.3.1. Land

According to AC 150/5300-13A, an ideal ATCT site will provide between three and seven acres of land, to meet security requirements and accommodate current and future building needs, including employee parking. ATCT sites on existing Airport property are preferred by the FMAA, and efficient use of available sites should be considered, including the potential for incorporating the future ATCT into existing facilities. Of the three remaining sites, Site 5 is the only site that would require land acquisition. Furthermore, Site 5 is located within a public road and electrical power line right-of-way, which would complicate construction at this site.

2.3.2. Orientation and Glare

Consideration should be given to direct sun glare, indirect sun glare off natural and manmade surfaces, night-time lighting glare, external light sources, and thermal distortion. Ideally the primary operational view for controllers should face north, or alternatively east, west, or south, with the orientation preference being in that order in the northern hemisphere. In areas where snow accumulates on the ground, such as SUN, a southern orientation should be avoided. All three remaining sites require a southern orientation; however this will be difficult to avoid at SUN given the predominance of takeoffs to and landings from the south.

2.3.3. Weather

Utilizing weather data collected for the Master Plan, consideration was given to local weather phenomena that could potentially impair visibility. The required ATCT height at all three remaining sites is below the limits of the instrument approach minimums at SUN, and therefore local weather phenomena such as fog will affect total airport operations prior to affecting ATCT operations.

2.3.4. Security

The FAA Safety Management System (SMS) requires that Safety Risk Management (SRM) assessments be performed on proposed changes to the National Airspace System (NAS) that have potential safety impacts. An SRM process will be conducted at a later planning stage in which each siting criterion will be reviewed for potential hazards. The hazards identified for each location will be assessed and mitigated to an acceptable level of risk to satisfy SMS requirements. In addition, access to the ATCT must avoid crossing areas of aircraft operations, and should avoid roads or bridges subject to closures due to high traffic volume, flash floods, snow, landslides, falling rocks or other hazards.

2.3.5. Local Zoning

ATCT development must meet local zoning ordinances and building codes, which regulate building height, setbacks, and other design elements. The Airport is within the City of Hailey Airport (A) zoning district. The City Zoning Ordinance does not set specific height or setback requirements for the Airport district. Instead, the Ordinance states that the requirements are "subject to FAA regulations and 14 CFR, Chapter 1, Subchapter E, Part 77, *Objects Affecting Navigable Airspace*, as amended" (Section 5.4, District Use Matrix, page 8).

The area south of the Airport is in unincorporated Blaine County in the Residential/Agricultural (R-5) zoning district. The County Code states that the maximum building height in zone R-5 is 35 feet, with exemptions for barns, silos, and windmills. The County Code also states that the minimum front yard setback along State Highway 75 is 100 feet, 50 feet for other major roads, and 25 feet for minor roads.

Identifying the final ATCT site will require coordination with the City of Hailey and/or Blaine County to ensure that the ATCT will meet local codes, or that variances are obtained if necessary. Under Part 77, all three tower sites would be considered penetrations to the transitional surface. If one of these replacement tower sites were identified on the ALP, the FAA must conduct an airspace study to determine whether the penetration would be allowed.

2.4. FAA Siting Process, Next Steps, and Conclusion

This Master Plan does not include the entire FAA siting process, but rather provides a preliminary assessment of potential alternative ATCT sites. Based on the analysis above, the ATCT site alternatives that are most feasible and acceptable to the FMAA are Sites 1 and 2. These sites should be carried forward into the FAA ATCT siting process as described below.

The next step in the siting process is to conduct an SRM assessment for the preferred ATCT site in compliance with the FAA SMS Manual. The SRM process ensures that safety-related changes are documented; hazards are identified; risks are assessed and analyzed; medium and high risks are tracked to resolution; high risks are mitigated to an acceptable level; medium risks are mitigated if possible; the effectiveness of the risk mitigation strategies are assessed; and the performance of the change is monitored throughout its lifecycle. At least two trips to the FAA Airport Facilities Terminal Integration Laboratory (AFTIL) are required for each ATCT siting study. The first trip utilizes the AFTIL modeling and simulation capabilities for initial siting. At a minimum, three preferred sites should be identified for analysis on the first trip. The second trip to AFTIL is meant for cab size mock-up and equipment layout, mullion evaluation (a mullion is a vertical element that forms a division between units of a window; placement can affect visibility from the tower), site recommendation, and validation. If the Airport Sponsor attends the trips to the AFTIL, a staff member from the FAA Airports District Office (ADO) is encouraged to attend as well.

3. Passenger Terminal Area Facilities

The following sections present "No Action," Existing Site Footprint, and Existing Site Expansion Alternatives for the following passenger terminal area facilities:

- **Terminal Building**
- **Commercial Apron**
- **Automobile Parking**

3.1. "No Action" Alternative

The Airport could become less desirable for passengers if no action is taken to meet increased demand over the next 20 years. Passengers may choose other airports in the region if SUN cannot provide a sufficiently positive passenger experience. It could also become difficult to secure new commercial service if the terminal area cannot accommodate additional aircraft parking. The No-Action Alternatives for individual passenger terminal area facilities are described in more detail below.

3.1.1. Terminal Building

If no further action were taken to improve the terminal building in the future, it would continue to function but passenger convenience would suffer, with congestion beginning around forecast year 2024. Beyond 2024, increased passenger leakage could occur, especially if the terminal building cannot comfortably accommodate peak hour passenger needs.

The previous chapter discussed the functionality of the terminal post-2015 expansion in the context of the four main terminal components: secure holdroom, security screening check point, baggage claim, and ticketing. The latter three components are expected to reach capacity around forecast year 2024, while the secure holdroom would be very close to reaching capacity by 2034 if forecasted enplanements materialize. Additionally, a significant unforeseen change in the future commercial fleet mix and flight schedule could strain the terminal building overall sooner than expected.

Positive Qualities of this Alternative

- **Existing terminal building provides sufficient space to accommodate the current air service schedule, with some instances of congestion and delay depending on flight schedules.**
- **No construction cost or disruption to facilities or operations.**

Negative Qualities of this Alternative

- **Limited flexibility to accommodate expanding commercial service or changes in flight schedules.**
- **Space and wait times would become increasingly strained over time, leading to negative effects on the passenger experience and possible leakage to other airports.**

3.1.2. Commercial Apron

The commercial apron can currently accommodate three regional commercial aircraft, and is at capacity during peak seasons during remain overnight (RON) operations. A "no action" approach would limit future capacity to near-current levels, with towing and staggered departures providing limited ability to expand air service options

for residents and visitors. The "no action" approach also limits aircraft parking options in unusual situations, such as if four commercial aircraft had to be accommodated at the same time due to mechanical issues.

If no action were taken to provide additional commercial apron, the Airport's ability to flexibly accommodate growing air service and potential larger aircraft would be jeopardized. Towing commercial aircraft to the general aviation aprons for RON operations would be an option, as would staggering departures to properly accommodate the aircraft on the apron and passengers in the secure holdroom. These options would not be as efficient as providing a larger apron near the terminal building.

The existing commercial apron capacity is illustrated in **Figure D2**. The existing apron allows for three aircraft boarding positions.

Positive Qualities of this Alternative

- **Sufficient aircraft parking is provided to accommodate the current air service schedule as of June 2015.**
- **No construction cost or disruption to facilities/operations.**

Negative Qualities of this Alternative

- **Limited flexibility to accommodate additional service or changes in flight schedules.**

3.1.3. Automobile Parking

Parking availability for both passenger vehicles and rental cars is currently strained. If no action were taken to create additional passenger parking, parking capacity is expected to become increasingly strained within the next five to ten years. Rental car companies could experience the same increasing constraints, especially with competing demand for passenger parking. The paved area south of the two passenger parking lots is currently used for rental car parking; however, the area was recently reduced by nearly half to provide a foundation for the airport operations building and an access road for Airport vehicles. Automobile parking is typically an important part of the passenger experience. Over time, limited parking space would hurt the passenger experience and cause passengers to use another airport.

Positive Qualities of this Alternative

- **Current parking facilities provide sufficient vehicle parking to accommodate existing demand the majority of the time.**
- **No construction cost or disruption to facilities/operations.**

Negative Qualities of this Alternative

- **Visitor and rental car parking would become increasingly strained over time, leading to negative effects on the passenger experience and possible leakage to other airports.**

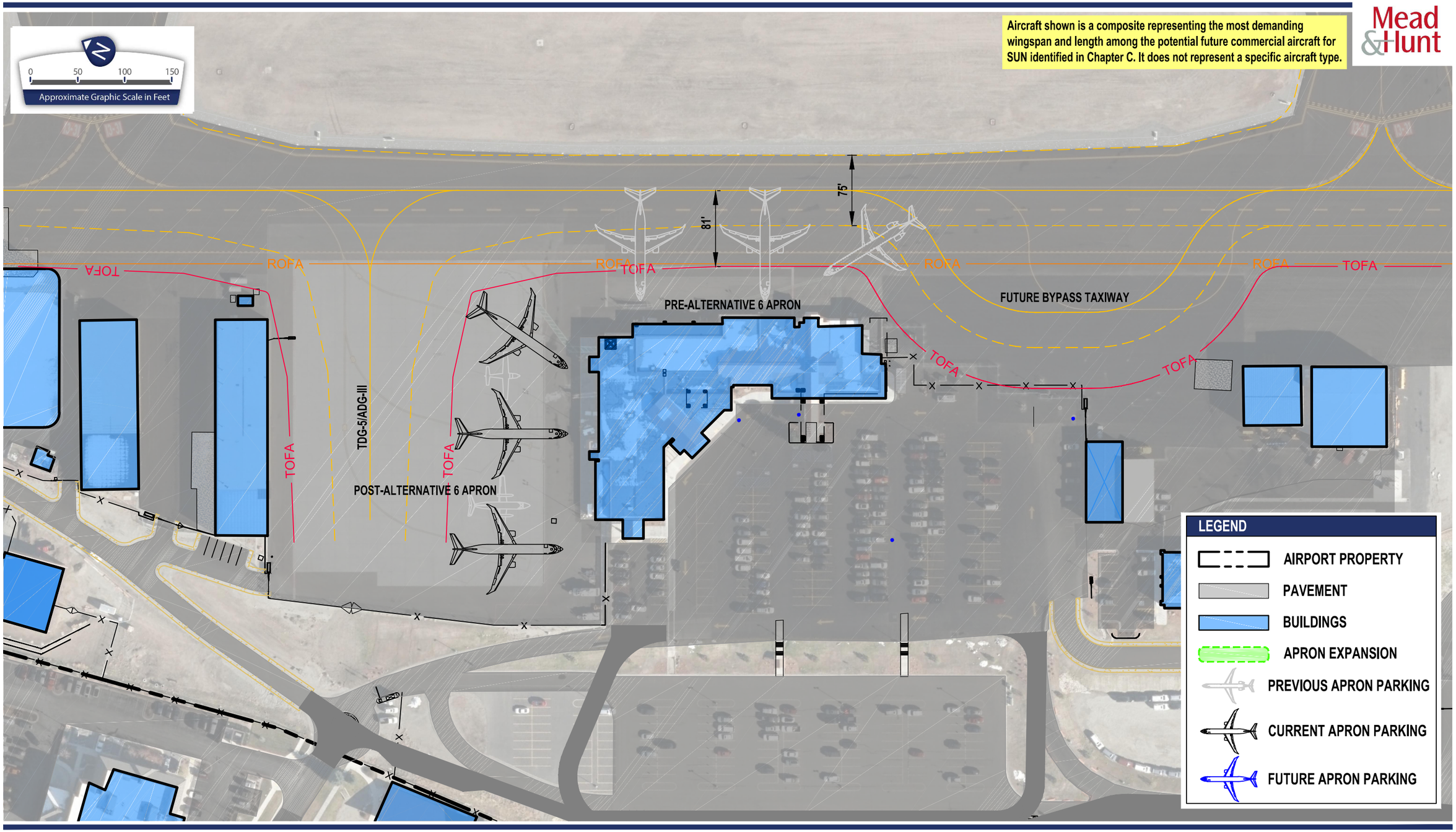


FIGURE D2 **Passenger Terminal Area - No-Action Alternative**

3.2. Existing Site Footprint Alternatives

3.2.1. Terminal Building

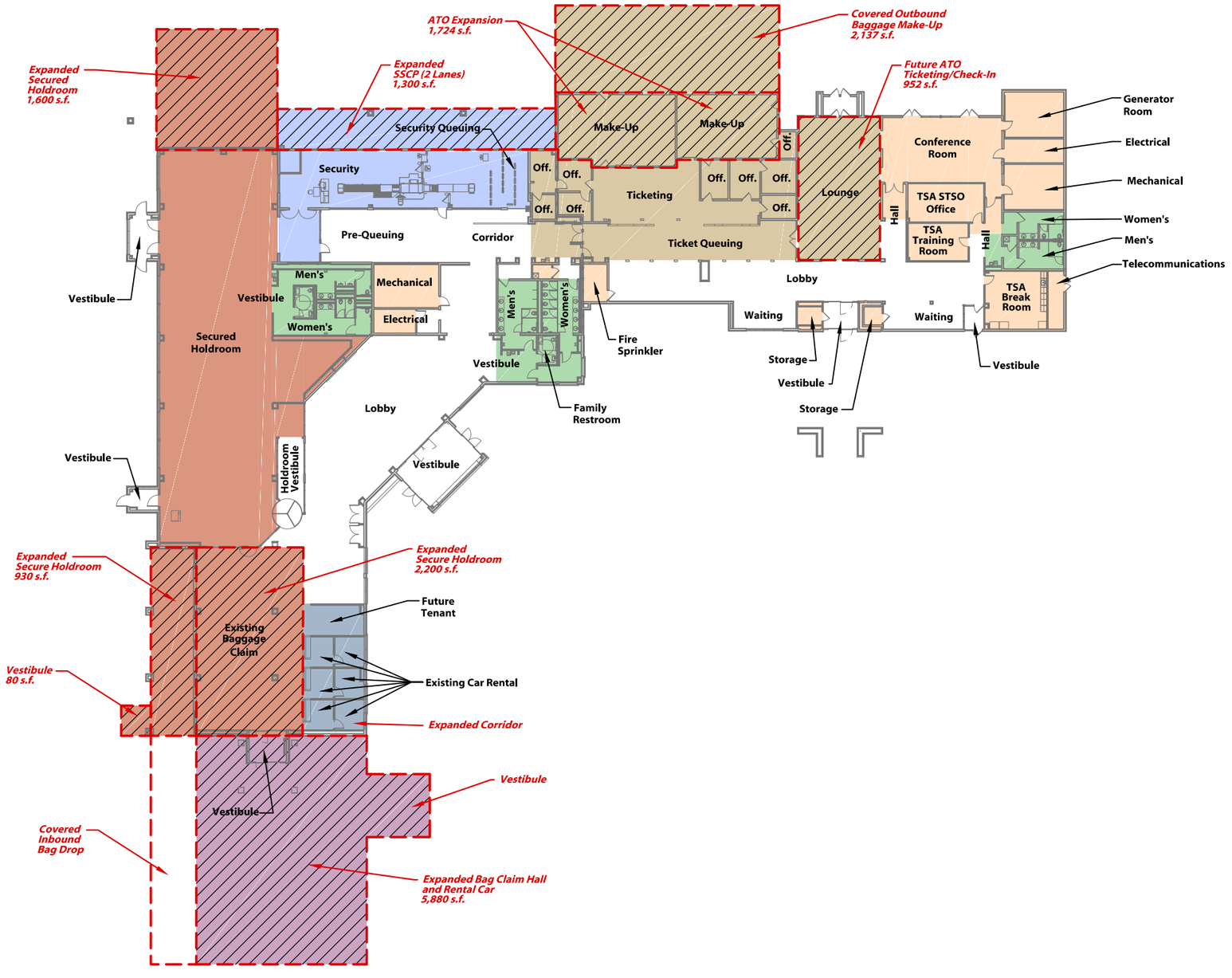
The terminal expansion built for the Runway Safety Area (RSA) improvements was designed to allow for modest growth through the 20-year planning period. It was also designed within a budget that encompassed more than just terminal expansion and renovation and, as such, limited what could be achieved. The current terminal layout can support three peak hour flights and would be strained at four peak hour flights. Terminal expansion would likely be required above four peak hour flights.

The terminal building expansion/renovation options presented in this section offer a means to accommodate forecast growth and peak demand tied to the unique character of operations at SUN.

Relocating the terminal building and associated facilities is not feasible within the existing Airport boundary. Therefore, the only option for improving the long-term function of the terminal building is to further expand the current building and maximize the utilization of available space.

Options for additional expansion of the terminal building footprint or renovation within existing space constraints are illustrated in **Figure D3**. As individual separate projects, they allow flexibility to enhance one or more terminal building components depending on need. Options for terminal building expansion are listed below based on space category; options affecting more than one category are duplicated.

- **Ticketing/Outbound Baggage**
  - Convert existing lounge to future airline ticketing office (ATO) ticketing/check-in
  - Convert existing baggage make-up areas (i.e. baggage handling and organizing areas located directly behind the ticket counters) to ATO space
  - Construct covered outbound baggage make-up area on east side of building
- **Public Waiting/Queuing**
  - Convert existing lounge to future ATO ticketing/check-in
- **Security Screening Checkpoint**
  - Expand security screening checkpoint (SSCP) on east side of building – construct second security lane
- **Secure Holdroom**
  - Convert existing baggage claim to secured holdroom
  - Expand secured holdroom to the east
- **Baggage Claim**
  - Expand baggage claim hall and rental car space off west end of building
- **Rental Car**
  - Expand baggage claim hall and rental car space off west end of building



LEGEND

- Holdroom
- Security
- Baggage Claim
- Rental Car
- Ticketing/Outbound Baggage
- Public Restrooms
- Support/Administration
- Public Waiting/Queuing
- Future Expansion/Reconfiguration

Legend colors depict ultimate function.

0 20 40 60

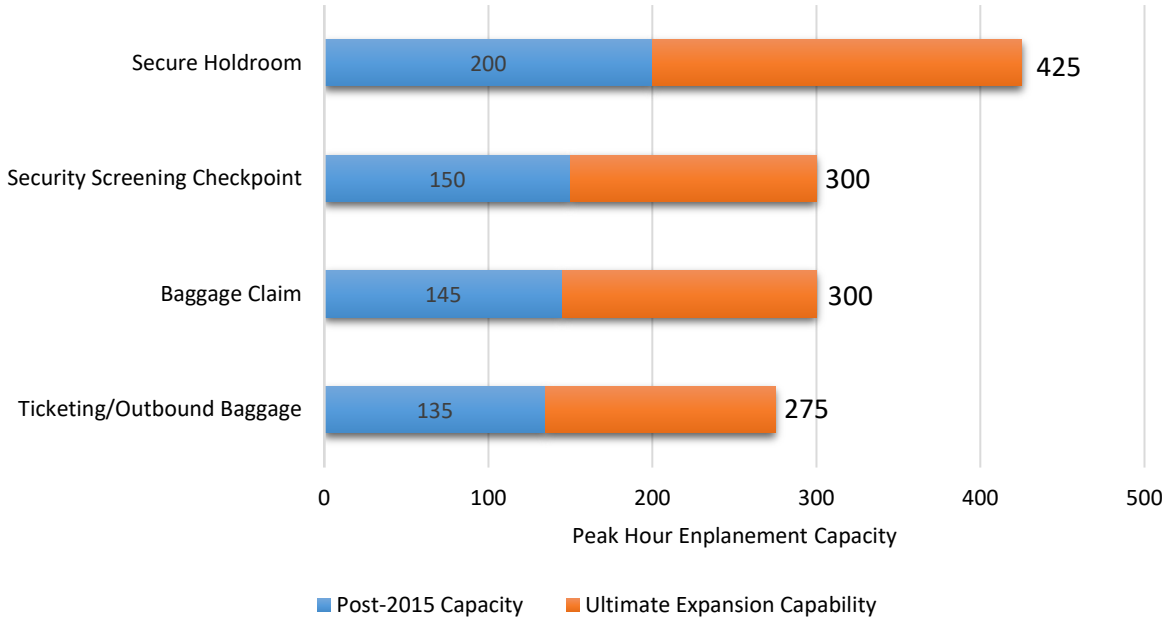
Approximate Graphic Scale in Feet

NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D3 **Terminal Building Expansion Options**

Approximate terminal building capacity increases resulting from the expansion/renovation options shown in **Figure D3** are presented by functional component in **Chart D1**. As shown in this chart, the expansion/renovation options are expected to provide adequate capacity throughout the 20-year planning period, as estimated capacity exceeds the 2034 peak hour enplanement forecast of 192 enplaned passengers in all functional areas.

Chart D1 **ADDITIONAL TERMINAL BUILDING COMPONENT CAPACITY**



SOURCE: **Mead & Hunt analysis.**

Development of additional ATO space, covered outbound baggage make-up space, a second security screening lane, and expanded secured holdroom on the east side would accommodate a more mature flight schedule built around both the early morning and evening peaks in which flights are scheduled on the shoulders of the peak hour. This larger population would have to clear pre-departure processing (i.e., ticketing and security screening), to enter the secure holdroom, the only available space to house a larger population, until their flights depart. Commercial apron capacity limits the number of departures within the peak hour, and therefore apron expansion will likely be required prior to building expansion.

3.2.2. Commercial Apron

Two long-term alternatives for commercial apron expansion have been identified within the existing airport boundary. Commercial Apron Alternatives 1 and 2 are illustrated in **Figures D4** and **D5**.

Commercial Apron Alternative 1 – Expand Apron West and Add South Staging Area. This alternative involves expanding the apron west to accommodate one additional aircraft parking position and creating a staging area at the south end of the terminal area where two RON aircraft could be stored. A tug would be used to tow the

commercial aircraft to and from the staging area. This would allow for more efficient use of the available terminal parking positions, as RON aircraft would not be towed back to the terminal until a short time prior to boarding. However, three hangars located immediately west of the proposed staging area may need to be removed and/or relocated to provide adequate maneuvering space and wingtip clearance for staging aircraft.

Expansion of the apron to the west would impact the existing circular access road arrangement. Under this alternative, traffic could be rerouted in a loop pattern around the existing long-term parking area with both entry and exit via Airport Circle on the south side of the long-term lot.

Positive Qualities of this Alternative

- **Adds a fourth aircraft parking position adjacent to the terminal building.**
- **Defines a potential aircraft staging area near the terminal building.**
- **With its six aircraft parking positions, this alternative meets all peak aircraft parking scenarios defined in Table C10 of the Facility Requirements chapter, with the exception of the Long-term Peak Scenario #2 (seven aircraft parking positions).**

Negative Qualities of this Alternative

- **Impacts to circular access road and temporary delays/disruption to traffic flow during construction.**
- **May require removal and/or relocation of three GA hangars.**
- **Potential loss of automobile parking**

Commercial Apron Alternative 2 – Expand Apron North and West. This alternative includes apron expansion to the west similar to that shown for Commercial Apron Alternative 1, in order to accommodate one additional aircraft parking position. It would also include apron expansion to the north to accommodate up to three more parking positions. Expansion to the north would require removal of the two general aviation hangars immediately north of the existing apron. The north parking positions would likely be only RON positions; however, identification of safe walkway access to allow ground boarding of passengers could be studied.

Expansion of the apron to the west would impact the existing circular access road arrangement. This alternative could use the same traffic pattern described under Commercial Apron Alternative 1.

Positive Qualities of this Alternative

- **Adds a fourth aircraft parking position near the terminal building, as well as three parking positions immediately to the north.**
- **With its seven parking positions, this alternative fully meets all peak aircraft parking scenarios defined in Table C10 of the Facility Requirements chapter.**

Negative Qualities of this Alternative

- **Requires removal and/or relocation of two GA hangars.**
- **Impacts to circular access road and temporary delays/disruption to traffic flow during construction.**
- **Potential loss of automobile parking**

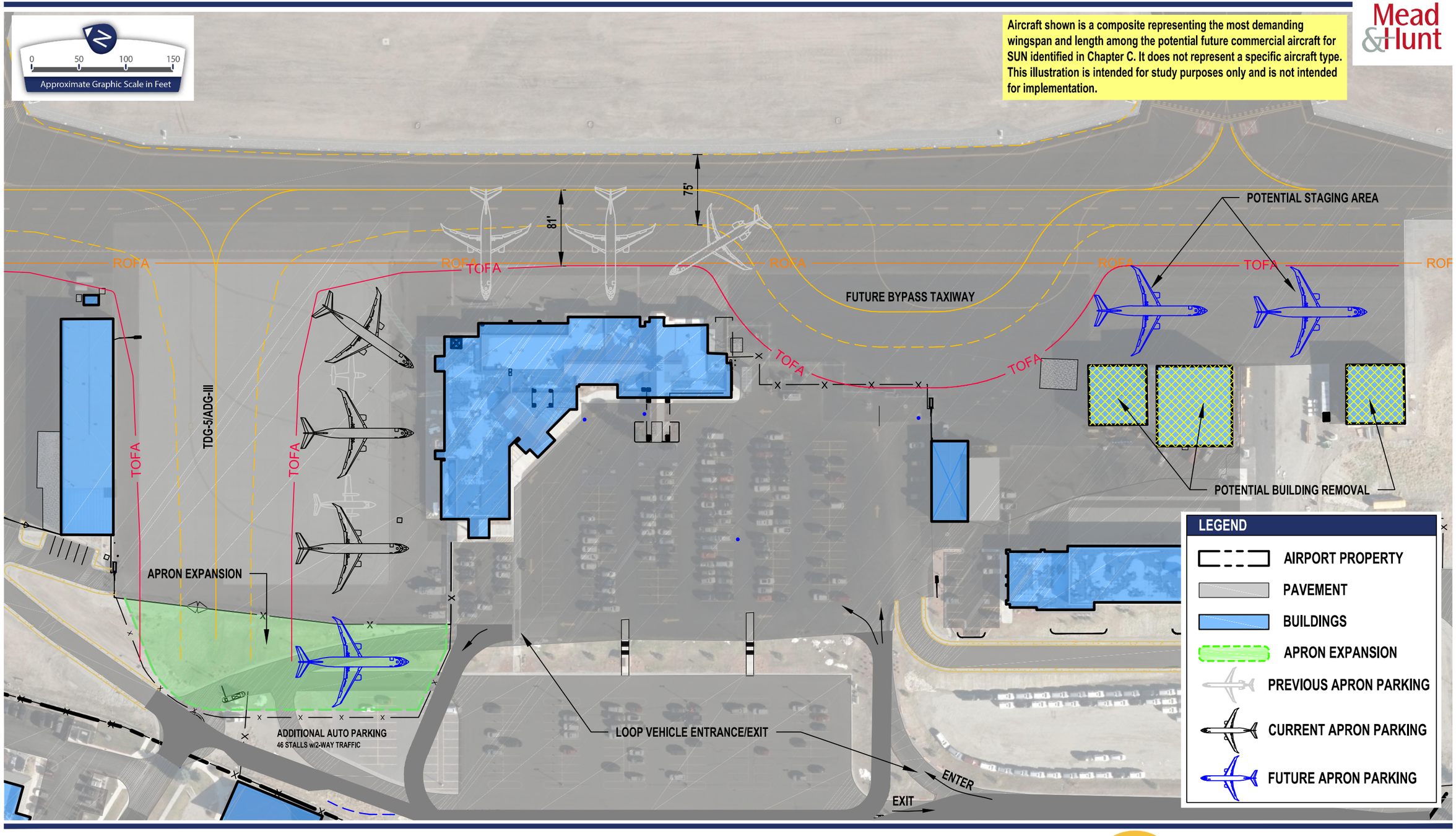


FIGURE D4 **Alternative 1 – Expand Apron West and Add South Staging Area**

Aircraft shown is a composite representing the most demanding wingspan and length among the potential future commercial aircraft for SUN identified in Chapter C. It does not represent a specific aircraft type. This illustration is intended for study purposes only and is not intended for implementation.
This aircraft parking arrangement would accommodate the most demanding reasonably foreseeable aircraft parking scenario within the 20-year planning period.

0 50 100 150
Approximate Graphic Scale in Feet

TOFA
ROFA
EXISTING BUILDING TO BE REMOVED
TDG-5/ADG-III
81'
75'
FUTURE BYPASS TAXIWAY
APRON EXPANSION
ADDITIONAL AUTO PARKING
46 STALLS w/2-WAY TRAFFIC
LOOP VEHICLE ENTRANCE/EXIT
ENTER
EXIT

LEGEND
- AIRPORT PROPERTY
- PAVEMENT
- BUILDINGS
- APRON EXPANSION
- PREVIOUS APRON PARKING
- CURRENT APRON PARKING
- FUTURE APRON PARKING

FIGURE D5 **Alternative 2 - Expand Apron North & West**

3.2.3. Automobile Parking

Automobile parking expansion options are limited within the existing Airport boundary. Two alternatives have been identified for partially meeting future parking needs within the existing boundary. The Automobile Parking Alternatives are shown in **Figure D6** (Alternative 3 is described in a subsequent section).

Automobile Parking Alternative 1. Construct a parking structure over existing long-term parking and/or the rental car staging area. The parking structure could be either a single- or multi-deck structure. This alternative would increase available parking without the need to acquire land. However, it would also be expensive, would limit future options for other use of that land, and could block views to and from the west from the terminal building.

Positive Qualities of this Alternative

- **Provides a long-term parking solution on existing Airport property.**
- **Eliminates the need to acquire land for parking or convert other facilities to parking.**
- **Potential to charge higher parking fees for covered parking.**

Negative Qualities of this Alternative

- **High cost of construction.**
- **Potential visual impacts to view to and from terminal building.**

Automobile Parking Alternative 2. Convert existing rental car staging area to visitor parking. This would add approximately 107 passenger parking spaces, which would meet 28% of projected 20-year increase in demand. However, rental car staging activities would need to be relocated off-Airport under this alternative.

Positive Qualities of this Alternative

- **Provides a parking solution on existing Airport property.**
- **Eliminates the need to acquire land for parking.**
- **Relatively lower cost of construction to pave existing gravel lot.**

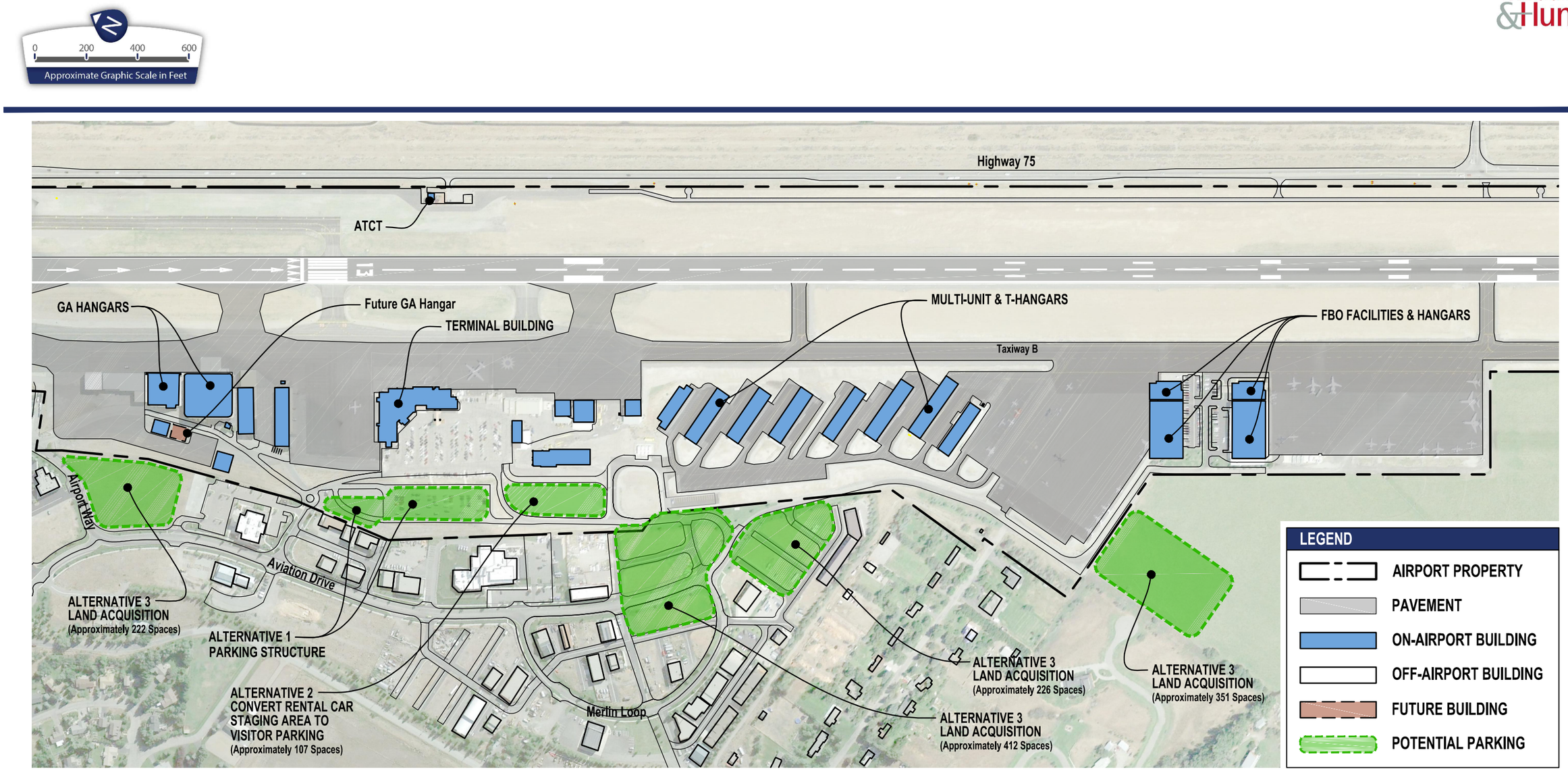
Negative Qualities of this Alternative

- **Requires relocation of rental car staging.**
- **Would meet a smaller percentage of forecasted demand than Alternative 1.**

3.3. Existing Site Expansion Alternatives

3.3.1. Terminal Building

Assuming that the terminal building will remain in its existing location throughout the 20-year planning period, there are no expansion options that would make logical use of acquired land, as it is not close enough to the Airport boundary. Therefore, no alternatives were developed for expansion of the terminal building in conjunction with land acquisition. However, expansion of the existing terminal building may displace automobile parking that would need to be replaced elsewhere.



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D6 **Automobile Parking Alternatives**

3.3.2. Commercial Apron

Commercial apron alternatives discussed in Section 3.2.2 are possible within the existing airport property and provide sufficient space for additional commercial aircraft parking without the need to consider land acquisition. Thus, no alternatives were developed for expansion of the commercial apron in conjunction with land acquisition. However, expansion of the existing commercial apron may displace automobile parking, ground access, and hangars that should be replaced elsewhere.

3.3.3. Automobile Parking

Automobile Parking Alternative 3. This alternative would involve acquiring adjacent land for parking space. Several possibilities are illustrated in **Figure D6**. The area west of the FBO and general aviation aprons is well-suited for expanding vehicle parking; land acquisition for parking west of the terminal area was also considered, as shown in the figure. The distance of potential parking areas from the terminal building may be inconvenient for passengers, but would not inconvenience passengers or rental car companies to the same degree as an overall parking shortage associated with the No Action alternative. Depending on distance, a shuttle between the parking area and the terminal could be established to improve passenger convenience. Alternatively, the Airport could arrange for shuttle service to offsite parking. The Airport could consider partnering with a private company to provide the offsite parking or leasing land for the purpose. The number of additional parking spaces that could be created via land acquisition options identified in **Figure D6** ranges from 222 to 412 spaces, which would meet 59% to 109% of projected 20-year demand for additional parking.

Positive Qualities of this Alternative

- **Provides a long-term parking solution.**
- **Depending on the land acquired, could meet a significant percentage of forecasted demand.**

Negative Qualities of this Alternative

- **Requires land acquisition.**
- **Distance of some options from the terminal building could inconvenience passengers and rental car companies.**

3.4. Passenger Terminal Area Alternatives: Conclusions

Based on the preceding analysis and input from the FMAA, the following are depicted as future options on the 20-year Conceptual Development Plan presented at the end of this chapter:

- **The long-term terminal building expansion/renovation concept, as proposed in Section 3.2.1 and shown in Figure D3. This concept could be achieved without significant impacts on surrounding uses; however, any automobile parking displaced by this concept would need to be replaced elsewhere.**
- **The long-term commercial aircraft parking apron Alternative 2, Expand Apron North and West, as proposed in Section 3.2.2 and shown in Figure D5. Based on feedback from the FMAA, this concept is preferable to towing aircraft to remote staging locations as proposed by Alternative 1. Any general aviation hangars, automobile parking, and/or access roads displaced by this alternative would need to be replaced elsewhere.**
- **The potential parking structure locations identified in Section 3.2.3, as well as the surface lot expansion options within the Airport West business park. The financial feasibility of these parking options will be considered in a subsequent chapter of the Master Plan. The FMAA desires to control of all future parking facilities, primarily to retain any potential increases in this important revenue stream.**

4. General Aviation Facilities

Based on the general aviation (GA) apron analysis in Chapter C, an estimated 150,000 square feet of GA apron space would be required to recapture what was lost as a result of the 2015 RSA improvements. An additional 225,000 square feet would be required over and above that to meet forecasted 20-year demand. Projected apron space needs are related to the peak event operations forecasts presented in Chapter B. The ratio of jet operations to total annual operations at SUN is increasing and expected to continue increasing. In addition, jet operations conduct approximately 90% of peak event GA and air taxi operations. Jets typically require more space than other aircraft, and many GA and air taxi jet aircraft operators at SUN are expected to transition to larger jet aircraft such as the Bombardier Global Express 7000 (104' wingspan) during the 20-year planning period. The increasing average GA aircraft size translates into greater apron space needs over time, and this trend was accounted for in the apron space estimates.

There is currently approximately 198,950 square feet of GA hangar space at the Airport. The Airport experienced a net loss in GA hangar space of 14,500 square feet as a result of the RSA improvements. Assuming that necessary hangar space per based aircraft remains constant, the Airport will need an additional 78,700 square feet of GA hangar space over and above the 14,500 square feet lost to meet 20-year forecast demand.

The following sections present "No Action", Existing Site Footprint, and Existing Site Expansion Alternatives for GA apron and hangar space.

4.1. "No Action" Alternative

If no action were taken to improve GA facilities, an increasing shortage of hangars and parking apron is expected based on forecasted demand. Due to the recent loss of apron resulting from the RSA improvements, when there is not sufficient space available to store aircraft during peak events, pilots are likely to drop off passengers, fly toanother airport to park the aircraft, and then fly back at a later date to pick up the passengers. This creates additional operations, noise, and other environmental impacts over areas north and south of the Airport, which is likely to increase if no action were taken. The Airport would also lose potential revenue generated from additional GA apron space. Space constraints could also increase the risk of accidents and provide insufficient space for maintenance and other services.

Construction of no new GA hangars would cause the Airport to lose potential hangar lease revenue and be unable to meet future demand.

Positive Qualities of this Alternative

- **No construction cost or disruption to facilities or operations.**

Negative Qualities of this Alternative

- **Existing peak period GA apron and hangar space shortages will increase over time.**
- **Continued space constraints will lead to increased passenger drop-offs and resulting aircraft operations, noise, and environmental impacts north and south of the Airport during peak times.**

4.2. Existing Site Footprint Alternatives

Construction of new GA facilities within the existing Airport boundary would have to take place at the expense of other facilities. There are a few future hangars identified on the most recent Airport Layout Plan (ALP) accessible from the air cargo/Bureau of Land Management (BLM) apron north of the terminal area.

Beyond these facilities identified on the ALP, if more hangars were constructed, it would occur at the expense of GA apron or some other facility. Conversely, if more GA apron were constructed, it would necessarily be at the expense of hangars or other facilities.

4.3. Existing Site Expansion Alternatives

Four development alternatives for GA facilities that would be possible with land acquisition are described below. The alternatives could be phased, if desired. The GA Facilities Alternatives are illustrated in **Figures D7**, **D8**, **D9**, and **D10**.

GA Facilities Alternative 1 – Recapture (West). Construct GA facilities sufficient to recapture those removed for the 2015 RSA improvements and Commercial Apron Alternative 2. These facilities would include a 30,000 SF hangar development area, a new GA automobile parking area that could also be used for rental car storage/staging, and 150,000 SF of additional GA apron. The facilities would be located west of the existing FBO area and GA aprons.

Positive Qualities of this Alternative

- **Provides the opportunity to regain the facilities and space lost due to the RSA improvements.**
- **Limits the amount of land acquired by focusing only on replacement of removed facilities.**
- **Concentrates development close to the FBO building and other GA facilities.**

Negative Qualities of this Alternative

- **Requires land acquisition.**
- **Moves Airport activity closer to residential areas.**
- **Impacts current landowner's pivot irrigation system.**

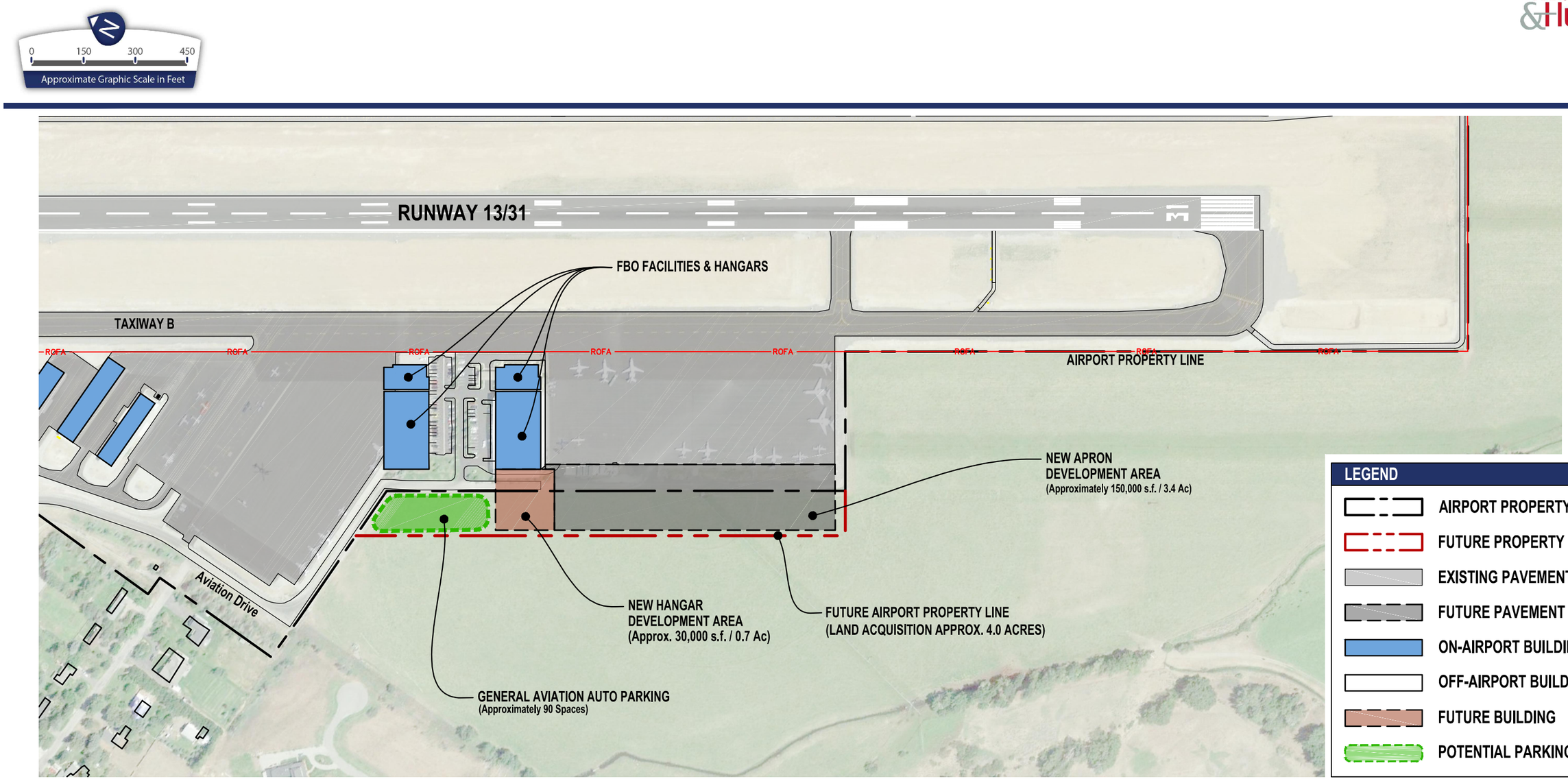
GA Facilities Alternative 2 – Recapture (South). Construct GA facilities sufficient to recapture those removed for the 2015 RSA improvements and Commercial Apron Alternative 2. Similarly to Alternative 1, these facilities would include a 30,000 SF hangar development area, a new GA automobile parking area that could also be used for rental car storage/staging, and 150,000 SF of additional apron. The facilities would be located south of the existing south GA apron.

Positive Qualities of this Alternative

- **Provides the opportunity to regain the facilities and space lost due to the RSA improvements.**
- **Limits the amount of land acquired by focusing only on replacement of removed facilities.**
- **Does not impact current landowner's pivot irrigation system.**
- **Extends GA facilities to the south without extending into the Runway 31 approach/departure area.**

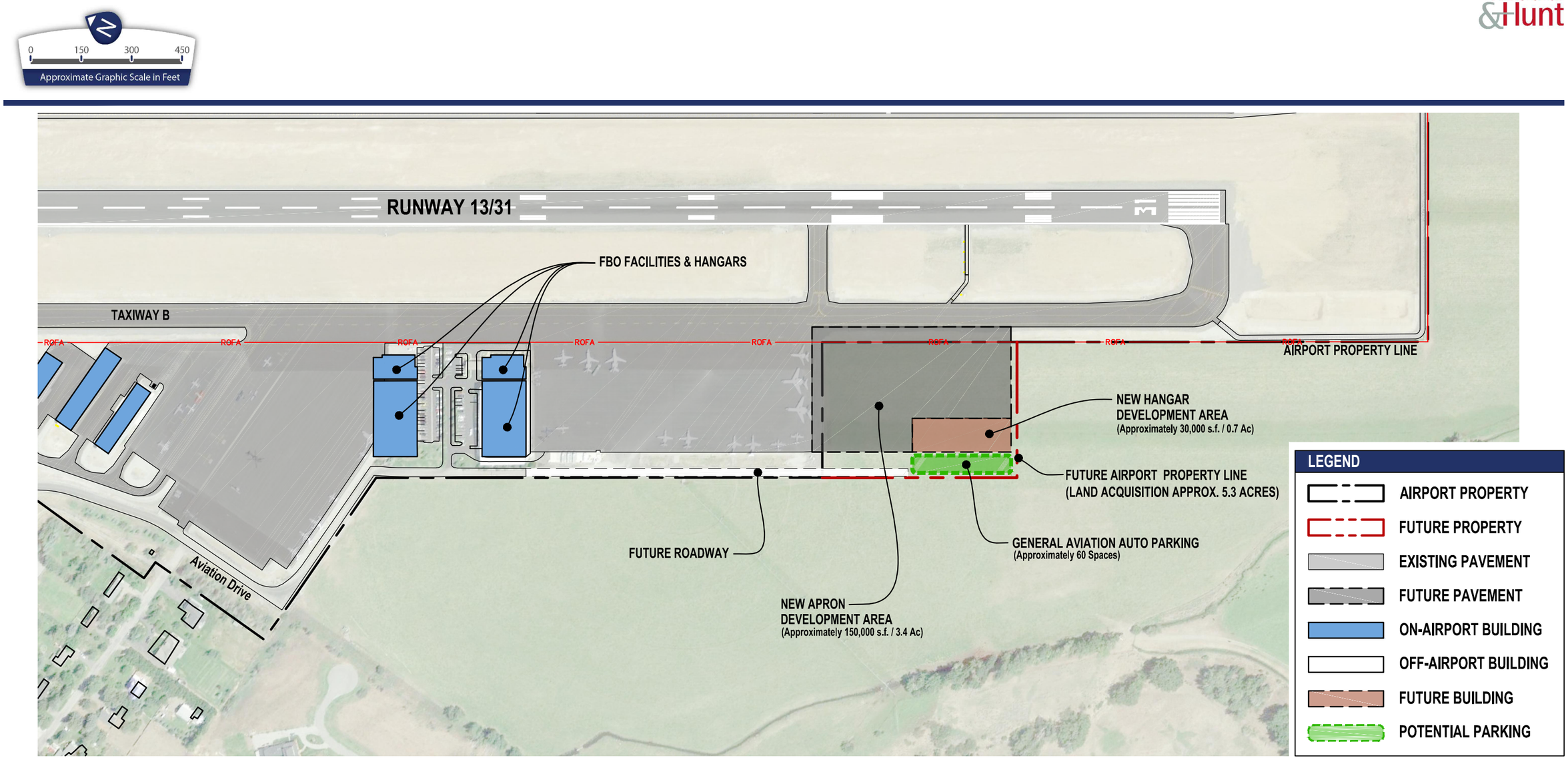
Negative Qualities of this Alternative

- **Requires land acquisition.**
- **Development is located farther from existing GA facilities to the north than Alternative 1.**



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D7 **General Aviation Alternative 1 - Recapture (West)**



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D8 **General Aviation Alternative 2 - Recapture (South)**

GA Facilities Alternative 3 – Forecast Demand. Construct GA facilities west of the FBO and GA aprons sufficient to meet 20-year forecast demand for GA apron and apron space. This alternative would add a total of 400,000 SF of apron space, along with a 100,000 SF hangar development area and GA automobile parking.

Positive Qualities of this Alternative

- **Meets 20-year forecast demand for GA hangars and apron, which would significantly reduce congestion during peak events.**
- **Concentrates development close to the FBO building and other GA facilities.**

Negative Qualities of this Alternative

- **Requires land acquisition.**
- **Moves Airport activity closer to residential areas.**
- **Impacts current landowner's pivot irrigation system.**

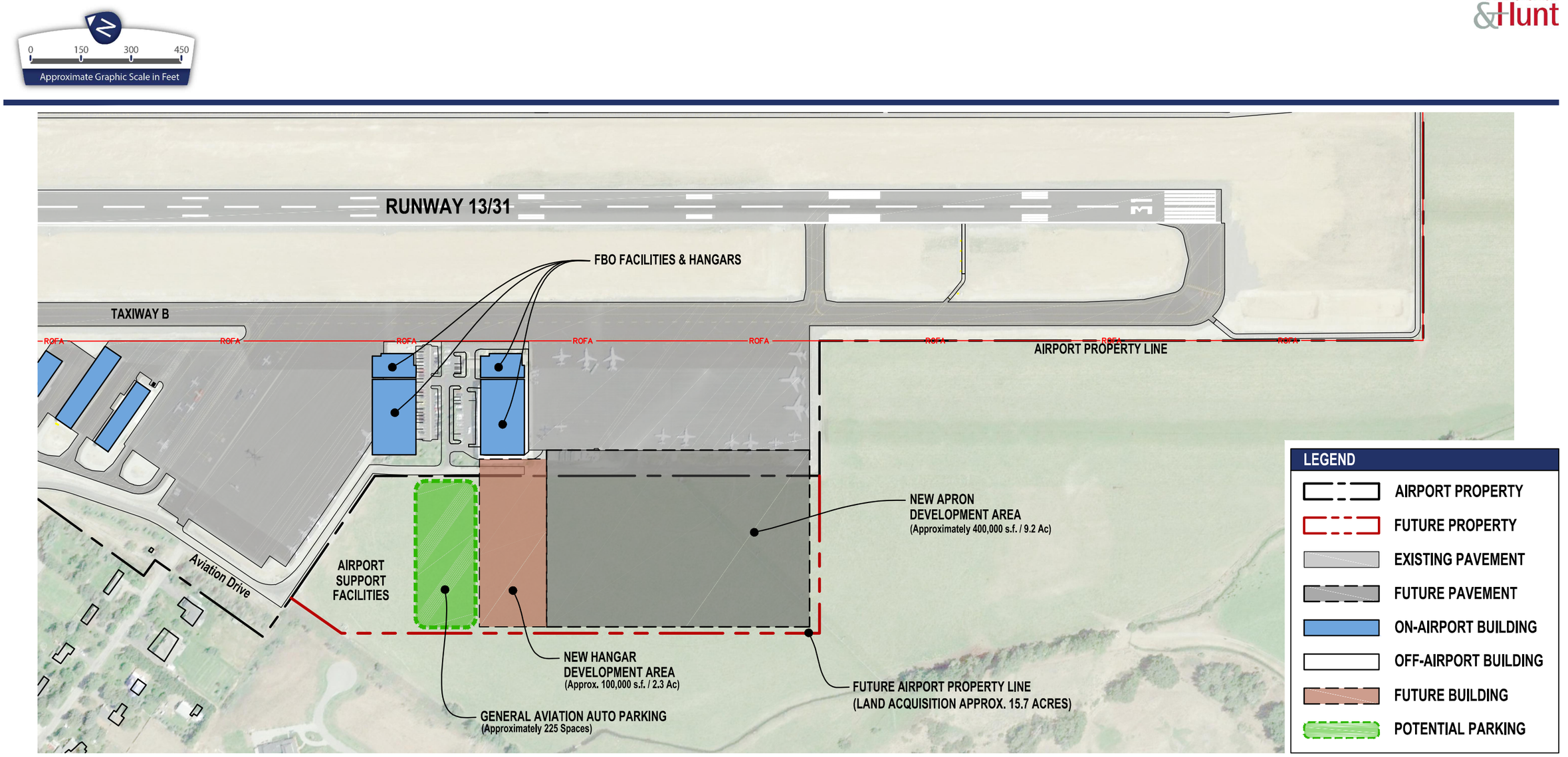
GA Facilities Alternative 4 – Maximum South Development. Construct GA facilities south of the existing south GA apron. The facilities would extend as far south as possible, without affecting the Runway 31 approach/departure area. Alternative 4 would provide 310,000 SF of additional apron space and a 60,000 SF hangar development area, which would more than replace facilities removed due to the RSA improvements, but would fall short of meeting 20-year forecast demand.

Positive Qualities of this Alternative

- **Meets approximately 83% of 20-year forecast demand for GA apron, significantly reducing congestion during peak events.**
- **Meets approximately 65% of 20-year forecast demand for GA hangars.**
- **Does not impact current landowner's pivot irrigation system.**

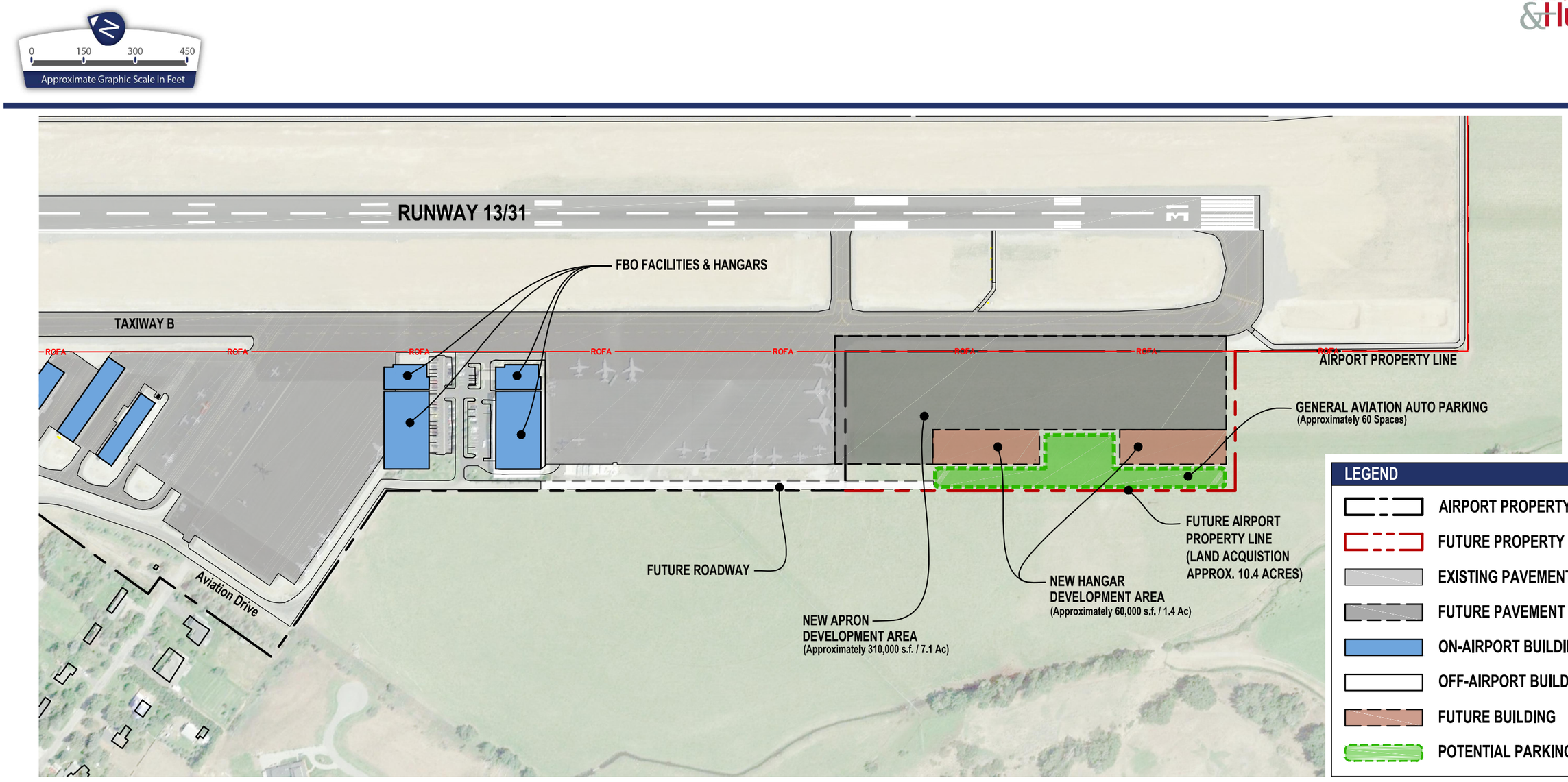
Negative Qualities of this Alternative

- **Requires land acquisition.**
- **Development is located farther from existing GA facilities to the north than Alternative 3.**



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D9 **General Aviation Alternative 3 - Forecast Demand**



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D10 **General Aviation Alternative 4 - Maximum South Development**

4.4. General Aviation Alternatives: Conclusions

Table D4 summarizes the positive and negative qualities of the GA Facilities Alternatives.

Table D4 **GA ALTERNATIVES COMPARISON MATRIX**

Qualities	GA No Action Alternative	GA Alternative 1	GA Alternative 2	GA Alternative 3	GA Alternative 4
Recaptures facilities and space lost due to RSA improvements?	No	Yes	Yes	Yes	Yes
Meets 20-year forecast demand for GA hangars and apron?	No	No	No	Yes	No
Requires land acquisition?	No	Yes	Yes	Yes	Yes
Impacts current landowner's pivot irrigation system?	No	Yes	No	Yes	No
Distance from FBO building and other existing GA facilities	N/A	Closer	Farther	Closer	Farther
Distance from residential areas	No change	Closer	No change	Closer	No change

SOURCE: **Mead & Hunt, Inc.**

The following conclusions regarding future GA improvements were identified by the preceding analysis:

- **Land acquisition will be required if additional GA hangars and/or aircraft parking area is to be accommodated.**
- **The primary consideration regarding provision of space for new GA facilities revolves around replacing hangars and aircraft parking that was lost as a result of the RSA improvements.**
- **Secondarily, it is also important to consider replacing hangars lost as a result of other Master Plan alternatives, such as the hangars displaced by the preferred commercial aircraft parking apron concept.**
- **Finally, the Airport should consider the potential for reserving space for additional GA facilities to allow the Airport to better accommodate forecast demand.**

Based on the preceding analysis and input from the FMAA, GA Facilities Alternative 4, *Maximum South Development*, will be depicted on the 20-year Conceptual Development Plan at the end of this chapter. This alternative was selected because it is more compatible with neighboring land uses and has more desirable features from an operational standpoint, when compared to Alternatives 1 and 3. This concept could be implemented in phases to 1) replace capacity lost as a result of the RSA improvements, 2) replace capacity lost as a result of other Master Plan alternatives, and 3) accommodate increased demand.

5. Compliance with FAA Standards

FAA protection and separation standards are met through six FAA Modifications of Standards (MOSs) recently approved by FAA. The MOSs stipulated specific airfield improvements while imposing restrictions on aircraft types and operating procedures. The stipulations essentially limit use of the Airport to aircraft less than 95,000 pounds gross weight, and with wingspans less than 100 feet (unless an FAA-approved operational procedure is put into place to mitigate impacts related to wingspans greater than 100 feet). The MOSs are described in detail in Chapters A and C.

5.1. "No Action" Alternative

If one or more of the MOSs were invalidated and the Airport took no action, the Airport would be at risk of closing temporarily until the MOS(s) could be met. It is unlikely that the MOS(s) could be met in such an event, as they were approved because the Airport could not meet those standards within its existing boundary and surrounding physical constraints. The expected consequence of taking no action following invalidated MOSs would be that the runway would be unable to accommodate the current and potential future regional commercial service aircraft identified in Chapter C. To remain open, use of the Airport could be restricted to much smaller aircraft whose design standards could be fully met within the current Airport boundary.

Positive Qualities of this Alternative

- **The Airport could potentially remain operational long-term (albeit restricted to smaller aircraft) without funding large-scale and expensive construction projects necessary to meet standard(s).**
- **Avoids public controversy if major airport expansion was needed to meet standard(s).**

Negative Qualities of this Alternative

- **Risk of Airport closure or restriction of Airport to smaller aircraft.**

5.2. Existing Site Footprint Alternatives

If one or more MOSs were invalidated, fully meeting design standards could require removal and/or relocation of a number of facilities, depending on the MOS in question. However, there is insufficient space within the boundary to relocate these facilities. The 2013 *Airport Alternatives Technical Analysis* concluded that many standards cannot be met within the existing site footprint without unacceptable consequences. For each MOS, it is stated below whether the standard could technically be met within the existing site boundary, even if it requires removal of other facilities.

- **MOS 1 – Runway Centerline to Parallel Taxiway Centerline.** To meet this standard, Taxiway B would need to be shifted an additional 80 feet to the west. This standard cannot be met within the existing boundary and would require land acquisition as well as removal and/or relocation of hangars, the terminal building, the FBO, and aircraft parking.

- **MOS 2 – Parallel Taxiway Object Free Area (TOFA) Width.** To meet this standard, the TOFA would need to be 26 feet wider than allowed under the MOS. This standard cannot be met within the existing boundary and would require land acquisition. Portions of facilities west of Taxiway B within the TOFA would need to be removed and/or relocated including automobile parking, aircraft parking, and hangars.
- **MOS 3 – Runway Object Free Area (ROFA) Width.** MOS 3 allows several structures to remain in the ROFA, including State Highway 75, perimeter fence, and off-Airport buildings. Meeting the standard would require removal and/or relocation of the objects allowed within the ROFA by the MOS. This standard cannot be met within the existing boundary because land would need to be acquired in order to move the perimeter fence outside of the ROFA and acquire the off-Airport buildings/land in question.
- **MOS 4 – Runway Safety Area (RSA) Grading.** MOS 4 allows the existing RSA transverse grades of 0% to 1%, while the standard is 1.5% to 3%. RSA grading standards are designed to prevent water accumulation. According to the MOS, the existing RSA drains extremely well, with no accumulation of surface water. Re-grading of the RSA would not require removal of any airport buildings or facilities. However, it would require closure of the runway for an extended period of time. Meeting the RSA transverse grade requirement is estimated to cost $5,000,000.
- **MOS 5 – Runway Centerline to Aircraft Parking Area.** To meet this standard, existing aircraft parking areas would need to be shifted to the west by 100 feet. This standard could be met within the existing boundary, but would require removal of a significant amount of aircraft parking that would be within the separation area.
- **MOS 8 – Taxiway Width.** MOS 8 allows a parallel taxiway width of 50 feet plus 10 foot paved shoulders, while the standard width is 75 feet with taxiway edge safety margin of 15 feet. This standard could be met within the existing boundary, but may require shifting Taxiway B to the west to prevent aircraft wingtip penetration of the RSA. However, it would require removal and/or relocation of facilities affected by widening and/or shifting of the taxiway.

Table D5 summarizes which design standards could technically be met within the existing site footprint, in the event that one or more of the MOSs were invalidated.

Table D5 **EXISTING SITE FOOTPRINT MOS ALTERNATIVES COMPARISON MATRIX**

Modification of Standard	Could be Met Within Existing Boundary?
MOS 1	No
MOS 2	No
MOS 3	No
MOS 4	Yes
MOS 5	Yes
MOS 8	Yes

SOURCE: **Mead & Hunt, Inc.**

5.3. Existing Site Expansion Alternatives

It would be possible to fully meet design standards at the existing Airport site if land acquisition were considered. However, some standards would require removal of Airport buildings. It is important to note that shifting airside and landside facilities either to the east or west as part of meeting a single standard could affect the necessary steps for meeting other standards if other MOSs were also invalidated. The 2013 *Airport Alternatives Technical Analysis* documents community opposition to relocation of Highway 75 and any operational changes that would result in impacts to off-Airport land uses.

- **MOS 1 – Runway Centerline to Parallel Taxiway Centerline.** With site expansion, this standard could be met by shifting Taxiway B the required additional distance to the west. This would require shift to the west of facilities including hangars, the FBO, and aprons to construct the shifted taxiway and maintain proper separation. Land could be acquired on the west side of the Airport to relocate facilities displaced by the shift of Taxiway B.
- **MOS 2 – Parallel Taxiway Object Free Area (TOFA) Width.** Similar to MOS 1, alternatives for meeting the standard TOFA width using land acquisition would consist of shifting facilities to the west and making use of acquired land to accommodate displaced facilities.
- **MOS 3 – Runway Object Free Area (ROFA) Width.** Removal of the structures currently allowed in the ROFA by the MOS would be dependent upon land acquisition. Expansion of the boundary would allow additional space to relocate the perimeter fence and to acquire the off airport buildings/land within the ROFA.
- **MOS 4 – Runway Safety Area (RSA) Grading.** Re-grading of the existing RSA could be accomplished within the existing boundary and would not require land acquisition.
- **MOS 5 – Runway Centerline to Aircraft Parking Area.** Meeting this standard could technically be accomplished within the existing boundary. However, it would not be ideal due to the need to remove aircraft parking. Acquiring land would provide space to relocate the lost facilities.
- **MOS 8 – Taxiway Width.** This standard could be met within the existing boundary, but may require shifting Taxiway B to the west to prevent aircraft wingtip penetration of the RSA. Alternatively, a taxiway that meets standards could be constructed on the east side, which could require land acquisition.

5.4. Runway Protection Zones & Approach Surfaces

As noted in Chapter C, Section 3.1.2, portions of the runway protection zones (RPZs) beyond either end of Runway 13/31 are outside the current airport property boundary. According to the FAA's latest guidance on land uses within an RPZ, "airport owner control over the RPZ land is emphasized to achieve the desired protection of people and property on the ground." The guidance further states that, "although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses."

Also noted in Chapter C, Section 3.4, there are currently numerous penetrations to the various approach, departure, and threshold siting surfaces for Runway 13/31. Some of these penetrations have been mitigated by displacing the Runway 13 threshold, installing obstruction lighting, and/or removing man-made and natural objects. However, the Airport has approach and departure procedures that are negatively impacted by these surface penetrations.

There is a large area of agricultural land on Flying Hat Ranch south of the Airport that is within the Runway 31 RPZ and has numerous existing mature cottonwood trees that penetrate various Runway 31 imaginary airspace surfaces. This area is currently controlled by a temporary avigation license and right of entry agreement between the Airport and the property owner. This agreement will expire on May 1, 2017.

To comply with current FAA guidance, this Master Plan recommends land acquisition, creation of perpetual easements, or other lawful measures, for the area south of the Airport, to protect the Airport from potential encroachment by incompatible land uses and approach/departure obstructions. Removal of the cottonwood trees in this area is also recommended to provide clearer approaches and departures. This may require additional land acquisition beyond what is contained within the RPZ. The actual lot lines of the property to be acquired will be dependent upon negotiations with the land owner.

5.5. FAA Standard Compliance Alternatives: Conclusions

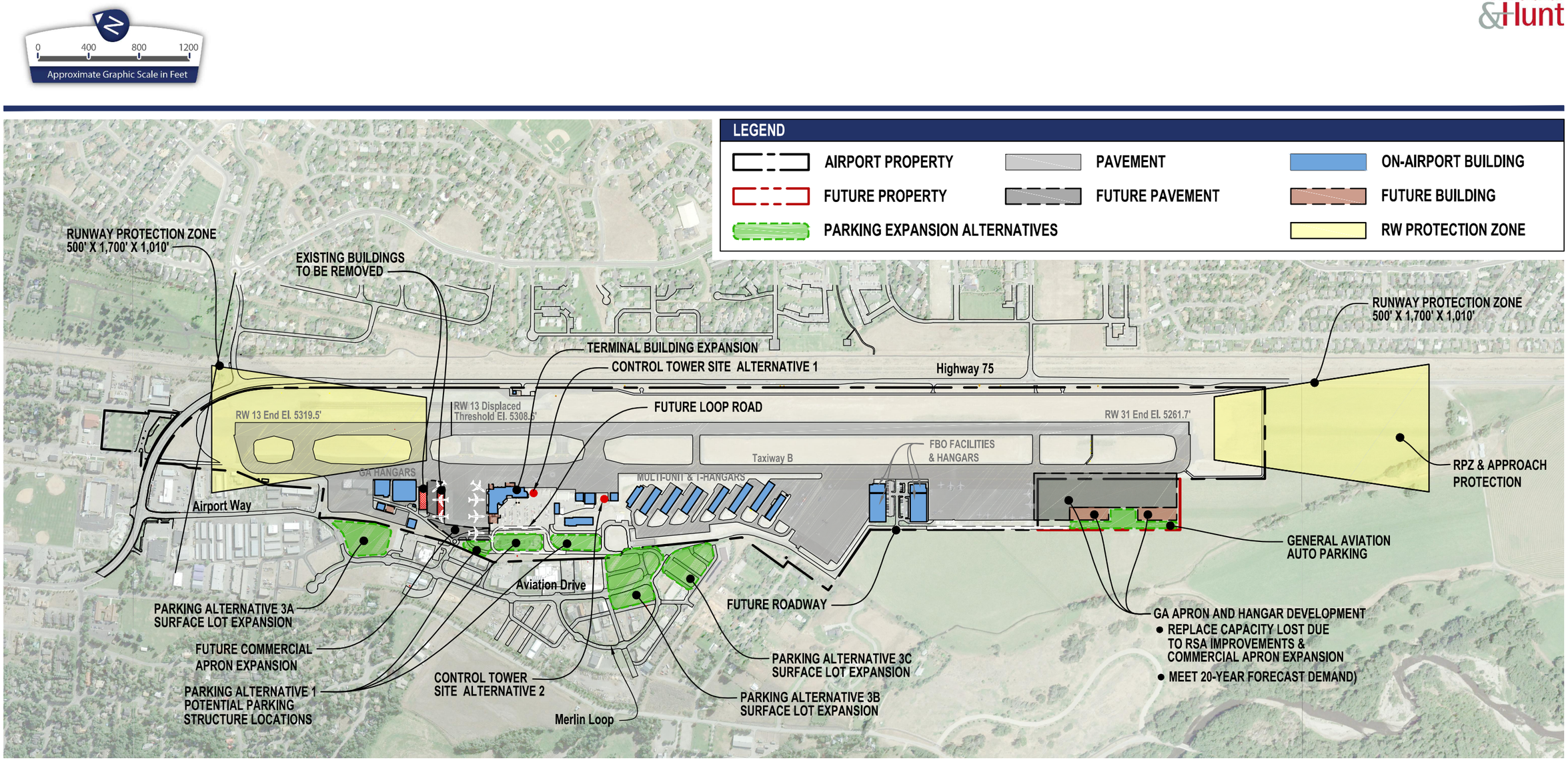
By definition, if any of the existing MOS could be easily resolved at the existing Airport site, no "modification" would have been necessary or granted by the FAA. Therefore, the loss of approval for continued use of a "modification" would have significant financial, operational, and/or physical Airport footprint impacts.

6. Alternatives Summary

As at many land-challenged airports like SUN, there are likely to be tradeoffs regarding on-Airport land use and decisions about potential land acquisition. Previous FMAA planning and engineering decisions have guided the preparation of this chapter. Thus, no significant runway improvement projects have been analyzed, nor have significant land acquisition alternatives been introduced for projects that might be deemed conveniences and not necessities. This analysis recognizes that expansion will only be considered for facilities that are deemed necessary by the FMAA.

As demands from commercial passenger service and general aviation operators increase, Friedman Memorial Airport is expected to cease functioning efficiently at some point in the future. This would likely be the result of a combination of factors and not just one factor that triggers the need to relocate the Wood River Valley's primary aviation facility to a new site. The next chapter of this "dual path" Master Plan focuses on a re-evaluation of potential replacement airport sites.

The 20-year Conceptual Development Plan presented in **Figure D11** depicts those alternatives deemed most feasible and preferred by the FMAA for meeting future facility needs, as described in this chapter. Financial and phasing considerations for these concepts will be evaluated in a subsequent chapter of this Master Plan.



NOTE: This illustration is intended for study purposes only and is not intended for implementation.

FIGURE D11 **Conceptual Development Plan**