CHAPTER FOUR

DEVELOPMENT ALTERNATIVES

In the previous chapter, aviation facilities required to satisfy airside and landside demand through the long-term planning period of the master plan were identified. In addition, various Federal Aviation Administration (FAA) standards were discussed that apply to airfield design. The next step in the planning process is to evaluate reasonable ways in which these facilities can be provided and the design standards can be met. The purpose of this chapter is to formulate and examine rational development alternatives that address the short-, intermediate-, and long-term planning horizon levels. Because there are a multitude of possibilities and combinations, it is necessary to focus on those opportunities which have the greatest potential for success. Each alternative provides a differing approach to meet existing and future facility needs, and these layouts are presented for purposes of evaluation and discussion.

Some airports become constrained due to limited availability of space, while others may be constrained due to adjacent land use development. Careful consideration should be given to the layout of future facilities and impacts to potential airfield improvements at Payson Municipal Airport (PAN). Proper planning at this time can ensure the long-term viability of the airport for aviation and economic growth.

The primary goal of this planning process is to develop a feasible plan for meeting applicable safety design standards and the needs resulting from the projected market demand over the next 20 years. The plan of action should be developed in a manner that is consistent with the future goals and objectives of the Town of Payson, airport users, the local community, and the surrounding region, all of whom have a vested interest in the development and operation of PAN.



The goal is to develop an underlying rationale that supports the final recommended concept. Through this process, an evaluation of the highest and best uses of airport property will be made, while also weighing local development goals, efficiency, physical and environmental factors, capacity, and appropriate safety design standards.

The alternatives presented in this chapter have been formulated as potential means to meet the overall program objectives for the airport in a balanced manner. Through coordination with the Town of Payson, airport management, the Planning Advisory Committee (PAC), and the public, an alternative (or combination thereof) will be refined and modified as necessary into a recommended development concept. Therefore, the planning considerations and alternatives presented in this chapter can be considered a beginning point in the evolution of a recommended concept for the future of PAN.

PLANNING OBJECTIVES

A set of basic planning objectives has been established to guide the alternatives development process. It is the goal of this master planning effort to produce a development plan for the airport that addresses forecast aviation demand and meets FAA design standards to the greatest degree possible. As owner and operator, the Town of Payson provides the overall guidance for the operation and development of the airport. It is of primary concern that PAN is marketed, developed, and operated for the betterment of the community and its users. The following basic planning principles and objectives will be utilized as general guidelines during this planning effort:

- To develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations;
- To preserve and protect public and private investments in existing airport facilities;
- To provide a means for the airport to grow as dictated by demand;
- To establish a plan to ensure the long-term viability of the airport and promote compatible land uses surrounding the airport;
- To develop a facility that is readily responsive to the changing needs of all aviation users;
- To be reflective and supportive of the long-term planning efforts currently applicable to the region;
- To develop a facility with a focus on self-sufficiency in both operational and developmental cost recovery; and,
- To ensure that future development is environmentally compatible.

REVIEW OF PREVIOUS AIRPORT PLANS

The previous master plan for PAN was completed in 2009. More recently, the Airport Layout Plan (ALP) was updated in 2013 and 2021 to reflect as-built conditions at the airport. The existing ALP includes the following primary recommendations:

- Maintain Runway 6-24 at 5,504 feet long by 75 feet wide.
- Relocation of Taxiway A to conform with FAA design standards for runway-to-taxiway separation for Runway Design Code (RDC) B-II-5000.
- Additional landside development in the form of apron pavement and hangars.

The analysis presented in this chapter will revisit some of the recommendations presented on the ALP drawing as well as in the previous master plan, along with new development options to meet the existing/ultimate Airport Reference Code (ARC) and RDC outlined in the previous chapters. Since completion of the last plan, the FAA has made significant modifications to design standards, as outlined in the previous chapter. As such, some of the previous plan's elements may be carried over to this master plan and others may be changed and/or removed from further consideration.

NO ACTION/NON-DEVELOPMENT ALTERNATIVES

The Town of Payson is charged with managing the airport for the economic betterment of the community and region. In some cases, alternatives may include a no action option; however, for PAN, this would effectively reduce the quality of services being provided to the public, affect the aviation facility's ability to meet FAA design standards, and impact the region's ability to support aviation needs. The ramifications of a no action alternative extend into impacts on the economic well-being of the region. An analysis of the economic benefit of the airport which was completed in 2021 found that PAN generates $10.9 million dollars in total economic impact and more than 80 jobs. If facilities are not maintained and improved so that the airport provides a pleasant experience for the visitor or business traveler, or if delays become unacceptable, then activity and business may shift elsewhere. The no action alternative is also inconsistent with the primary long-term goals of the FAA and Arizona Department of Transportation – Aeronautics Group (ADOT), which is to enhance local and interstate commerce. Therefore, a no action alternative is not considered further in this master plan.

Likewise, this study will not consider the relocation of services to another airport or development of a new airport site. The development of a new facility such as PAN is a very complex and expensive option. A new site would require greater land area, duplication of investment in facilities, installation of supporting infrastructure that is already available at the existing site, and greater potential for negative impacts to natural, biological, and cultural resources.

The purpose of this study is to examine aviation needs at PAN over the course of the next 20 years. Therefore, this master plan will examine the needs of the existing airport and will present a program of needed capital improvement projects to cover the scope of the plan. The airport is a lucrative business, transportation utility, and economic asset for the region. It can accommodate existing and future demand and should be developed accordingly to support the interests of local residents and businesses which rely upon it. Ultimately, the final decision regarding pursuing development rests with the Town of Payson, the FAA, and ADOT on an individual project basis. The analysis to follow considers airside and landside development alternatives which take into account an array of facility demands, including safety, capacity, access, and efficiency.

AIRSIDE ALTERNATIVES

The development alternatives are categorized into two functional areas: airside and landside. The airside relates to runways, taxiways, navigational aids, lighting and marking aids, etc., which require the greatest commitment of land area to meet the physical layout of an airport as well as the required airfield safety standards. The design of the airfield also defines minimum set-back distances from the runway and object clearance standards; these criteria are defined first to ensure that the fundamental needs of PAN are met. The landside includes terminal services, hangars, and aircraft parking aprons, as well as utilization of remaining property to provide revenue support for the airport and to benefit the economic development and well-being of the regional area.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined individually, and then coordinated as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors must be evaluated to determine if the investment in PAN will meet the needs of the surrounding area, both during and beyond the planning period of this study.

AIRSIDE CONSIDERATIONS

Airside planning considerations generally relate to airport elements that contribute to the safe and efficient transition of aircraft and passengers from air transportation to the landside facilities at the airport. Planning must factor and balance many airside items, including meeting FAA design parameters of the established design aircraft, instrument approach capability, airfield capacity, runway length, taxiway layouts, and pavement strengths. Each of these elements for PAN was analyzed in the previous chapter. The alternatives to follow will examine airside improvement opportunities to meet design standards and/or capacity constraints. A summary of the primary airside planning issues to be considered in this alternatives analysis is listed below.

Airside Planning Considerations
1. Meet ultimate RDC B-I(Small)-5000 standards on Runway 6-24
2. Analyze extension of Runway 6-24 to better accommodate turbine aircraft
3. Mitigate non-standard conditions in safety areas (runway safety area [RSA], runway object free area [ROFA], and runway protection zone [RPZ])
4. Corrective measures for non-standard taxiway geometry (direct access via Taxiway A3)
5. Upgrade to PAPI-4 on both runway ends
6. Straight-in instrument approach to Runway 24
7. Relocate helipad (H1)

Consideration #1 – Meet RDC B-I(Small)-5000 Design Standards

As detailed in Chapter Two, the critical aircraft analysis concluded that Runway 6-24 should meet Runway Design Code (RDC) B-I(Small)-5000 design standards in the ultimate condition. Currently, the runway

is categorized as B-I(Small)-5000. While growth in operations and based aircraft by larger, more demanding aircraft – including turboprops and jets – is anticipated to occur, operations by these aircraft are not expected to exceed 500 annually. Therefore, it is prudent to continue to plan the airport to meet RDC B-I(Small)-5000 design standards throughout the planning period.

Consideration #2 – Runway 6-24 Extension

Runway 6-24 is currently 5,504 feet long and 75 feet wide. The existing width exceeds RDC B-I(Small)-5000 design standards. As discussed in the previous chapter, the extra width provides an additional safety margin and should be maintained if feasible, with the understanding that the FAA may not participate in funding maintenance projects for the additional width. Regarding the potential for a runway extension, the runway length analysis in the previous chapter illustrated that some turbine operators are weight-restricted or unable to operate on the existing runway length, especially during hot weather. Past planning (i.e., the 1998 Master Plan) at the airport has included an extension to Runway 6-24, though the 2009 Master Plan did not carry the extension plan forward. Based on the data presented in the runway length calculation in the previous chapter, extension options will again be analyzed in the airside alternatives to follow. These options will carefully weigh the cost-benefit of extending the runway when considering existing constraining factors, including existing development off both runway ends, and how these features could potentially be impacted if an extension were to be planned.

Consideration #3 – Mitigate Non-standard Conditions in Safety Areas

The existing RSA and ROFA are non-standard and contain obstructions. At the Runway 24 end, the RSA is obstructed by vegetation. This vegetation also obstructs the ROFA, as does a portion of the airport's perimeter fencing. The RSA also does not meet the FAA's longitudinal gradient standards, which call for the first 200 feet of the RSA to have a grade between 0 and 3.0 percent, with any slope being downward from the end. A maximum allowable negative grade is 5.0 percent. The existing RSA grade west of Runway 6 meets FAA design standards, but the RSA slopes away from the Runway 24 threshold at a longitudinal gradient that exceeds the FAA's allowable tolerance. The alternatives to follow will include proposals to grade/fill the RSA to conform to FAA design standards. In terms of RPZ incompatibilities, portions of both RPZs are unowned and contain potentially incompatible land uses, including public roadways and structures. The alternatives to follow will explore options to mitigate these non-standard conditions within the safety areas.

Consideration #4 – Corrective Measures for Non-standard Taxiway Geometry

Direct Access

FAA taxiway geometry design standards recommend offsetting taxiway connections between aprons and runways to mitigate the potential for pilots who are unfamiliar with the airport layout to unintentionally taxi directly onto a runway, resulting in a runway incursion. Taxiway A3 allows for direct access to the runway from Charlie ramp and is, therefore, a non-standard design. The airside alternatives

present options for eliminating the direct access point and forcing pilots to make turns, which increases a pilot's situational awareness.

Consideration #5 – Visual Aids

Both runway ends are equipped with two-light precision approach path indicator (PAPI-2) systems. A four-light PAPI (PAPI-4) is recommended for airports serving jet aircraft operations. As PAN currently serves and is anticipated to be utilized more frequently by jets, PAPI-4s are recommended for each runway end. Runway end identifier lights (REILs) are recommended for runway ends not served by a more sophisticated approach light system. As no such system is planned to be added to either runway end at PAN, the REILs are planned to remain throughout the planning period. The alternative exhibits to follow each reflect upgrading the PAPI-2s to PAPI-4s and maintaining the existing REILs.

Consideration #6 – Instrument Approach Procedures

PAN is currently equipped with a circling global positioning system (GPS-A) instrument approach procedure that is available for daytime use only. This approach provides for area navigation (RNAV) and has visibility minimums down to 1-mile for Category A and B aircraft, two miles for Category C aircraft, and three miles for Category D aircraft.

Airport management and town officials have expressed an interest in the implementation of a straight-in GPS approach to Runway 24. The alternatives to follow will include the addition of a GPS approach with visibility minimums not lower than 1-mile. For comparison purposes, **Figure 4A** depicts the RPZ associated with this approach, as well as a GPS approach with minimums below 1-mile but not lower than ¾-mile. As described previously in Chapter Three, the approach visibility minimums serving a particular runway end help dictate the size of the RPZ. Currently, the RPZ associated with Runway 24 measures 1,000 feet (length) by 250 feet (inner width) by 450 feet (outer width). If a straight-in instrument approach with visibility minimums not lower than 1-mile is implemented, the size of the RPZ will remain the same, as seen on the left side of **Figure 4A**. However, visibility minimums below 1-mile but not lower than ¾-mile would increase the size of the RPZ, with the approach RPZ dimensions measuring 1,700 feet (length) by 1,000 feet (inner width) by 1,510 feet (outer width). As can be seen on the right side of the graphic, the ¾-mile RPZ encompasses a much larger area, with approximately 47.3 acres of uncontrolled property and additional incompatible land uses introduced into the RPZ. As such, it is most prudent to plan for a GPS approach to Runway 24 with visibility minimums not lower than 1-mile.

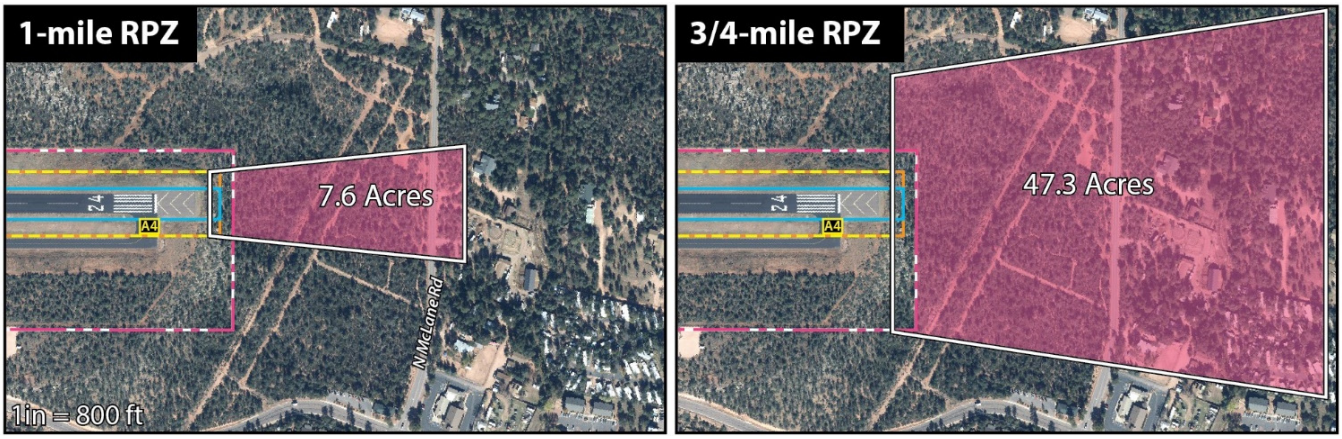


Figure 4A – RPZ Comparison for 1-mile and ¾-mile Visibility Minimums

Consideration #7 – Relocate Helipad (H1)

As outlined in the previous chapter, there is a desire locally to potentially relocate H1. The helipad is currently located immediately adjacent to a high-traffic area (Delta ramp) and contributes to congestion in this area. The alternatives to follow will evaluate different areas on the airport for a helicopter parking area.

AIRSIDE ALTERNATIVE 1

Depicted on **Exhibit 4A**, Airside Alternative 1 focuses primarily on bringing the safety areas associated with Runway 6-24 into compliance with FAA standards while maintaining the runway at its current dimensions (5,504 feet long by 75 feet wide). While the Facility Requirements chapter identified a potential need for a longer runway, maintaining the existing length is an important scenario to consider because an extension to the runway is not a certainty. A runway extension requires justification to the FAA to be eligible for funding through the Airport Improvement Program (AIP). Justification typically involves documentation of at least 500 annual operations by operators and aircraft expressing a need for the additional runway. An environmental assessment (EA) process would also need to be completed, along with public outreach. If justification for a runway extension is not achieved for several years (or ever), a contingency airfield plan should be available. Additionally, local appetite for an extension may be small, given the constraining factors (i.e., existing development and terrain challenges) and expense of such a project.

Airside Alternative 1 illustrates an option that would bring Runway 6-24 into compliance with FAA design standards as they relate to the RSA and ROFA on the east end. As shown on Inset 1, the alternative proposes removal of the obstructions within these safety areas, which includes removing vegetation in both the RSA and ROFA and relocating a portion of the airport's perimeter fencing outside the ROFA. The RSA is also proposed to be graded and filled to conform to FAA design standards for longitudinal gradient within the RSA.

As described previously, the RPZs off each runway end also contain potentially incompatible land uses, with public roads traversing both and a building located within the Runway 6 RPZ. Portions of both RPZs are also uncontrolled. The FAA prefers property within an RPZ to be owned by the airport sponsor, or land use controls to be implemented via an avigation easement, and for the area to remain free of land uses that attract people (such as homes, businesses, roads, etc.); however, this is not a requirement. Recent guidance states that it is the airport sponsor's responsibility to allow or not allow a particular land use within an RPZ. As such, Airside Alternative 1 does not reflect any modifications that would result in a change to the size or location of the RPZs, or to the land uses within them. It does, however, propose avigation easements over the unowned portions of the RPZs to protect these areas from future development that could be incompatible with aeronautical activity.

Other features of Airside Alternative 1 include:

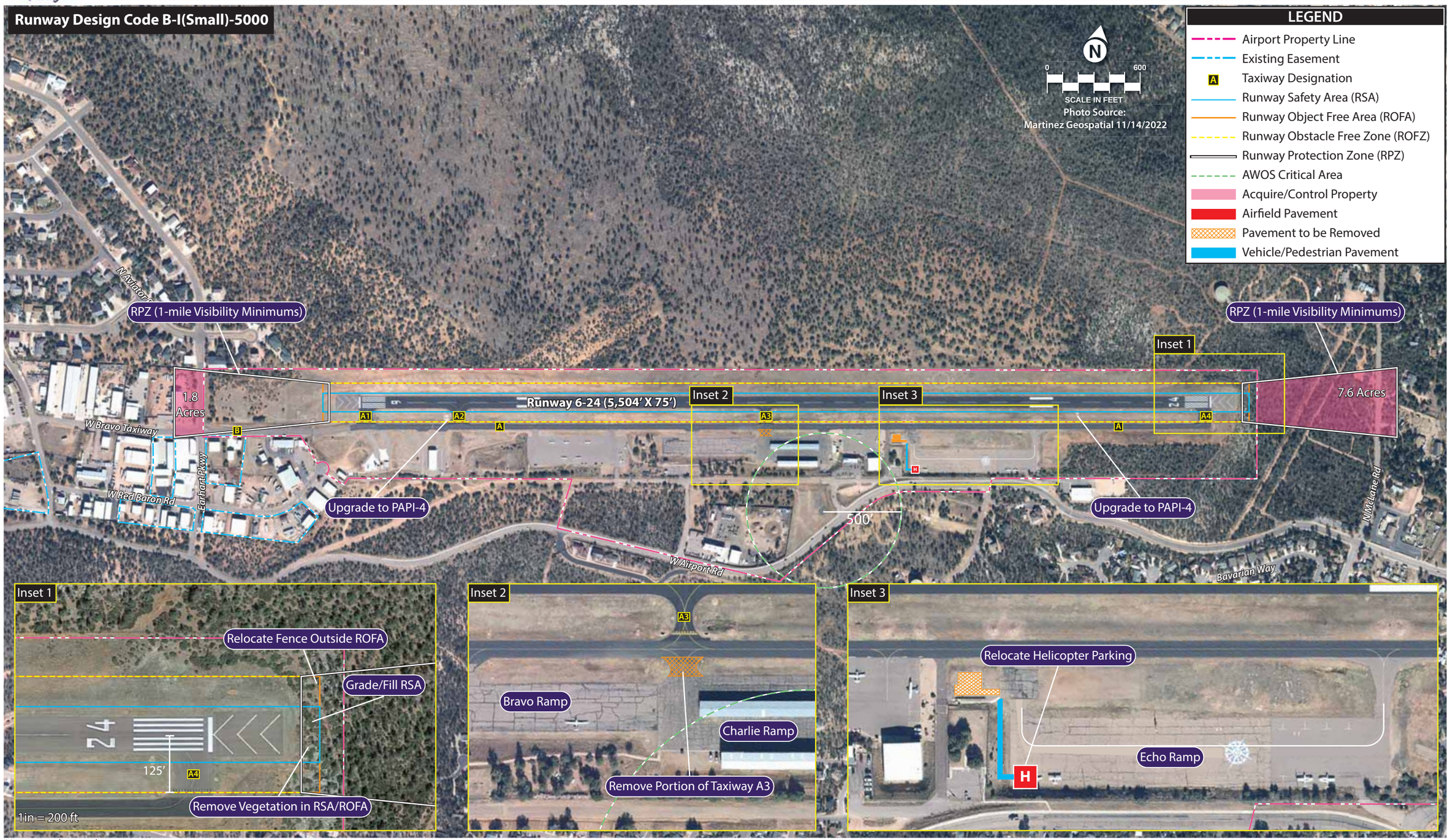
1. Closure of a portion of Taxiway A3 to mitigate the direct access from Charlie ramp to Runway 6-24. As seen on Inset 2, the section of pavement connecting the ramp to Taxiway A is proposed to be removed. Pilots accessing Bravo or Charlie ramps would instead use the connectors at the ends of these aprons.
2. The helipad is proposed to be relocated from the existing site near Delta ramp and the observation area to a new location on the southwest corner of Echo ramp. In this location, the helicopter parking area will be farther from the busy Delta ramp and access road/gate while still providing helicopter pilots with reasonable access to the restaurant and airport office. Under this alternative, it would be assumed that helicopters could sidestep from the parallel taxiway when transitioning to the helicopter parking area. As such, approach and departure surfaces associated with the helicopter parking area would not apply as they do with a typical helipad. Locating the helicopter parking area in this location would require the taxilane centerline on Echo ramp to be relocated approximately 15 feet north to meet Airplane Design Group (ADG) I standards for the taxilane object free area (TLOFA). A new pedestrian walkway is proposed to connect to the existing sidewalk for helicopter pilots to access Delta ramp.
3. The PAPI-2s at each runway end are proposed to be upgraded to PAPI-4s.

AIRSIDE ALTERNATIVE 2

Depicted on **Exhibit 4B**, Airside Alternative 2 is similar to Airside Alternative 1 in proposing changes to mitigate obstructions in the RSA and ROFA on the east side of the airfield (see Inset 1). This alternative also presents an option for a 500-foot extension to Runway 6-24, bringing the total runway length to 6,004 feet. As shown in the exhibit, the extension is proposed entirely for the Runway 6 end, given the flatter nature of the terrain on the west side. However, it should be noted that an extension of this length would result in penetrations to the Code of Federal Regulations (CFR) Part 77 primary surface[1]. As depicted on the exhibit within Inset 2, a building located in the industrial park would penetrate the primary

[1] The CFR Part 77 primary surface for Runway 6-24 is 500 feet wide, centered on the runway, and extends 200 feet beyond the end of the runway. The primary surface must be kept clear of all objects, except those required for aircraft operations or navigation.

Runway Design Code B-I(Small)-5000



*Acreages depicted are approximate

Runway Design Code B-I(Small)-5000

Airside Alternative 2 - Option A

Inset 1

Relocate Fence Outside ROFA

Grade/Fill RSA

Remove Vegetation in RSA/ROFA

1in = 200 ft

Inset 2

Primary Surface Penetration

Inset 3

Bravo Ramp

Charlie Ramp

Remove Portion of Taxiway A3; Construct Offset Connector

Inset 4

Relocate Helicopter Parking

Echo Ramp

LEGEND

- Airport Property Line
- Existing Easement
- Taxiway Designation
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- AWOS Critical Area
- 500' Primary Surface
- Acquire/Control Property
- Airfield Pavement
- Pavement to be Removed
- Vehicle/Pedestrian Pavement

RPZ (1-mile Visibility Minimums)

Relocate REILs

Inset 2

500' Extension

6.2 Acres

Runway 6-24 (5,504' X 75')

Ultimate (6,004' x 75)

7.6 Acres

RPZ (1-mile Visibility Minimums)

N McLane

W Bravo Taxiway

Relocate Access Gate

W Red Baron Rd

Earhart Pkwy

Relocate/Upgrade to PAPI-4

Inset 3

Inset 4

500'

Inset 1

Upgrade to PAPI-4

0 600

SCALE IN FEET

Photo Source: Martinez Geospatial 11/14/2022

Airside Alternative 2 - Option B

TORA, TODA, ASDA - 6,004

LDA - 5,504

1.8 Acres

Runway 6-24 (5,504' X 75') Ultimate (6,004' x 75)

7.6 Acres

W Bravo Taxiway

500' Displaced Threshold

TORA - 5,504

W Red Baron Rd

Earhart Pkwy

TODA, ASDA, LDA - 6,004

500'

DECLARED DISTANCES

	Runway	
	6	24
TORA	6,004'	5,504'
TODA	6,004'	6,004'
ASDA	6,004'	6,004'
LDA	5,504'	6,004'

*Acreages depicted are approximate

surface (shown in green shading). In order to achieve a 500-foot runway extension, modifications to the building would likely be necessary to keep the primary surface clear.

Under this alternative, the existing blast pad on Runway 6 is planned to be converted into usable runway pavement, with a new 60-foot-long by 80-foot-wide blast pad[2] constructed at the end of the extended runway.

Actions related to the runway extension include:

- Extension of Taxiway A and construction of a new threshold connector
- Removal of existing Taxiway A1 pavement
- Closure of a portion of Taxiway B pavement
- Relocation of the access gate on Taxiway B
- Removal of vegetation that would obstruct the RSA and ROFA west of extended Runway 6
- Relocation of REILs and PAPIs serving Runway 6

Due to the proposed runway extension, the RPZ serving Runway 6 is shifted farther west, encompassing a larger area of uncontrolled property (approximately 6.2 acres) and additional buildings within the Sky Park Industrial Park. Option A, shown on the top half of **Exhibit 4B**, does not depict any changes that would alter the RPZ or any of the structures within it. As such, if Option A were to be pursued, further coordination with the FAA would be necessary to ensure that these land uses would be permitted to remain within the relocated RPZ.

Option B, on the lower half of the exhibit, depicts a plan that would allow for the runway extension while maintaining the Runway 6 RPZ in its existing location (i.e., no additional land area would be uncontrolled, and no additional structures would be located within the RPZ). This would be achieved by displacing the Runway 6 threshold 500 feet and applying declared distances. Declared distances are used to define the effective runway length for landing and takeoff when a standard safety area cannot be achieved. The declared distances include:

- Takeoff Run Available (TORA) – the runway length declared available and suitable for the ground run of an aircraft taking off (factors in the positioning of the departure RPZ);
- Takeoff Distance Available (TODA) – the TORA plus the length of any remaining runway or clear-way beyond the far end of the TORA; the full length of the TODA may need to be reduced because of obstacles in the departure area;
- Accelerate-Stop Distance Available (ASDA) – the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting a takeoff (factors in the length of RSA/ROFA beyond the runway end); and

[2] Blast pad dimensions are based upon RDC B-I(Small)-5000 standards.

- Landing Distance Available (LDA) – the runway length declared available and suitable for landing an aircraft (factors in the length of RSA/ROFA beyond the runway end and the positioning of the approach RPZ).

With a 500-foot displaced threshold on Runway 6, the resulting declared distances are:

	Runway 6	Runway 24
TORA	6,004′	5,504′
TODA	6,004′	6,004′
ASDA	6,004′	6,004′
LDA	5,504′	6,004′

This alternative allows for the current runway length of 5,504 feet, at a minimum, to be available for all operations. The drawback to the implementation of declared distances is that it reduces usable runway during certain operations. While takeoff operations from Runway 6 would have the full 6,004 feet of pavement to utilize, landing operations to Runway 6 would be reduced to 5,504 feet (the existing runway length) in order to maintain the approach RPZ in its existing location. Operations on Runway 24 would also be impacted, with pilots taking off from Runway 24 having a reduced TORA of 5,504 feet in order to maintain the departure RPZ in its existing location. TODA is set upon the departure surface and may be reduced if there are obstacles within this surface. This is not ideal, given that the majority of aircraft taking off at PAN utilize Runway 24, and under this option, the extension would not benefit them.

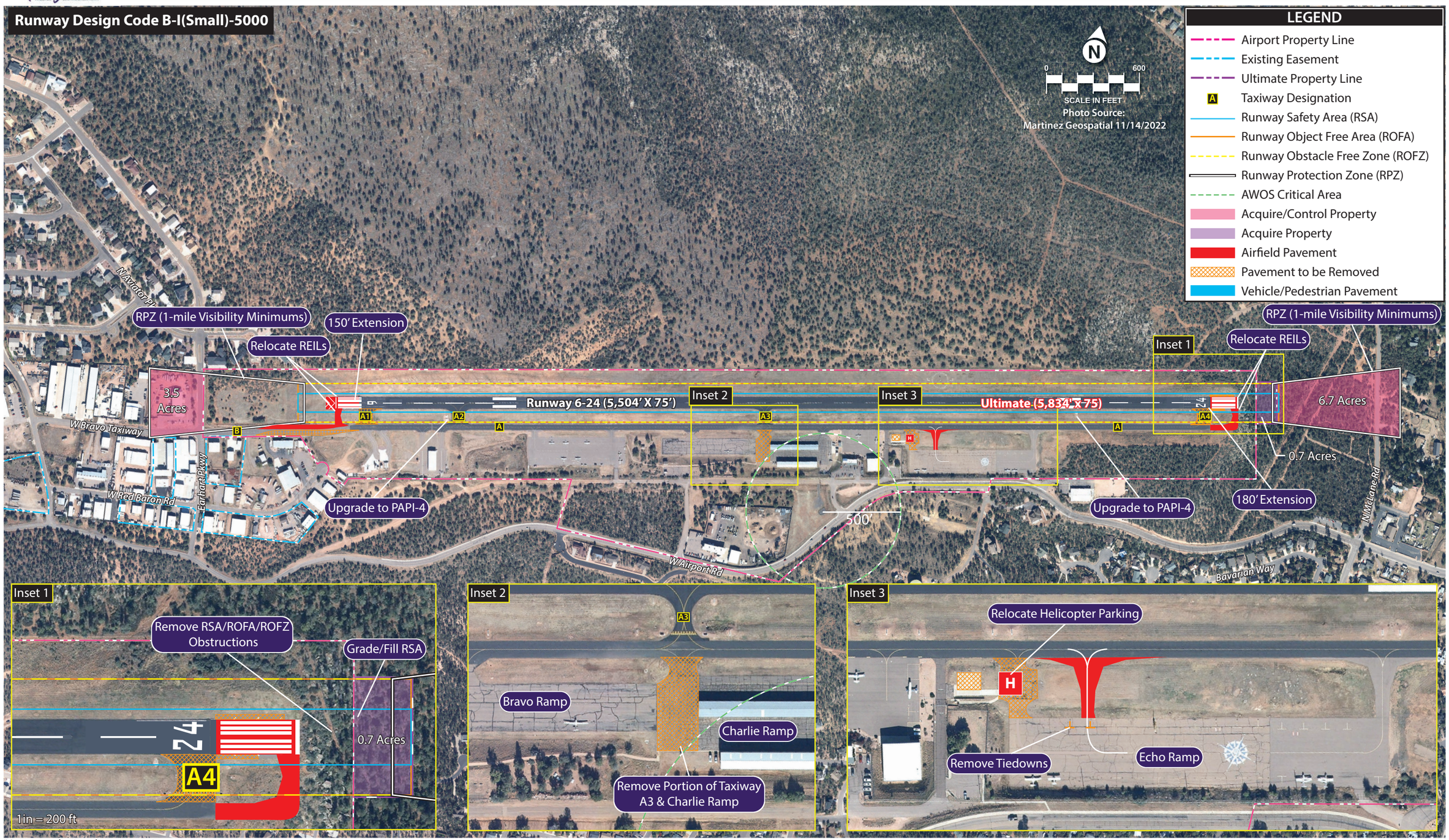
Additional features of Airside Alternative 2 include:

1. Removal of vegetation and fencing that would obstruct the RSA, ROFA, and ROFZ east of Runway 24, and grading of the RSA off Runway 24.
2. Closure of a portion of Taxiway A3 to mitigate the direct access from Charlie ramp to Runway 6-24. Rather than closing the southern portion of Taxiway A3, as was presented in Alternative 1, Alternative 2 illustrates a different option that would eliminate the direct access point. Under this alternative, the north portion of Taxiway A3 is closed/removed, and a new connector taxiway between the runway and Taxiway A is proposed approximately 250 feet to the west.
3. Relocation of the helipad farther away from Taxiway A and Delta ramp, similar to the first alternative. This alternative depicts an option to close and remove the existing helipad pavement and construct a new helicopter parking area approximately 500 feet east of the existing helipad, with a new walkway and a new taxilane to Echo ramp constructed.
4. Upgrading of the PAPI-2s at each runway end to PAPI-4s.

AIRSIDE ALTERNATIVE 3

Airside Alternative 3 is presented on **Exhibit 4C**. Like the previous alternative, this option also evaluates an extension to Runway 6-24, but takes a different approach. Under this alternative, the proposed

Runway Design Code B-I(Small)-5000



*Acreages depicted are approximate

This page intentionally left blank

extension is limited to 330 feet, bringing the ultimate runway length to 5,834 feet, with the extension split between the two runway ends. Splitting the extension between both runways reduces the impact to the Runway 6 RPZ and would not introduce new structures into it or require the implementation of declared distances to artificially remove buildings from the RPZ. The primary surface also remains clear with this option.

As presented on the exhibit, the runway extension and connected actions include the following:

1. Construction of a 150-foot extension to Runway 6 with a new blast pad measuring 60 feet long by 80 feet wide.
2. Extension of Taxiway A to the west and construction of a new threshold connector to Runway 6.
3. Removal of existing Taxiway A1 pavement.
4. Construction of a 180-foot extension to Runway 24, with the existing blast pad converted to runway pavement. Due to the elevation change at this end of this runway and costs associated with grading/fill, a new blast pad is not proposed to be constructed for this runway end.
5. Extension of Taxiway A to the east and construction of a new threshold connector to Runway 24.
6. Closure of a portion of Taxiway B pavement.
7. Removal of vegetation and fencing that would obstruct the RSA, ROFA, and ROFZ east of extended Runway 24; grading of the RSA east of Runway 24, which would require fill to build up the safety areas to meet proper gradient standards.
8. Relocation of REILs serving both runway ends and upgrade of PAPI-2s to PAPI-4s.

Additional features of Airside Alternative 3 include:

1. The direct access from Charlie ramp is planned to be mitigated by closing the west portion of the ramp and the southern portion of Taxiway A3 (see Inset 2). This would effectively disconnect Bravo and Charlie ramps and eliminate the central access point to Taxiway A, but could allow for additional landside development (i.e., hangar expansion and vehicle parking). This will be presented later in the Landside Alternatives.
2. The existing helipad is proposed to be closed and the pavement removed. A new helicopter parking area is planned approximately 100 feet to the east, on the site of the existing west taxilane to Echo ramp (see Inset 3). This location moves the helicopter activity farther from Delta ramp and the access road/gate but would require the construction of a new taxilane from Taxiway A to Echo ramp. It would also necessitate the removal of two tie-down positions on the northwest corner of the apron.

AIRSIDE SUMMARY

The sections above outlined three planning considerations for the airfield at PAN. The primary issues on the airside are mitigating non-standard safety areas at both runway ends, addressing non-standard

taxiway geometry, and evaluating runway extension options. The runway extension/threshold displacement considerations will likely be the most impactful to both the public and the aviation community. For this reason, it is vital that the PAC, airport/town management, and the public offer their feedback so that the best course of action is selected.

LANDSIDE ALTERNATIVES

Generally, landside issues are related to those facilities necessary or desired for the safe and efficient parking and storage of aircraft, movement of pilots and passengers to and from aircraft, airport support facilities, and overall revenue support functions. To maximize airport efficiency, it is important to locate facilities together when they are intended to serve similar functions. The best approach to landside facility planning is to consider the development like a community, where land use planning is the guide. For airports, the land use guide in the terminal area should generally be dictated by aviation activity levels. Consideration will also be given to non-aviation uses that can provide additional revenue support to the airport and support economic development for the region.

LANDSIDE CONSIDERATIONS

Landside planning considerations, summarized below, will focus on strategies following a philosophy of separating activity levels. Potential landside facility development at PAN is focused entirely on the south side of airport property where existing facilities (airport operations building, hangars, etc.) are already located. This includes property located between West Airport Road and Airport Access Road, which is currently undeveloped except for use as the Town Yard. The alternatives to follow will consider different development options for this portion of airport property.

Landside Planning Considerations
1. Consider the Building Restriction Line (BRL) when planning vertical infrastructure
2. Consider the topographical constraints on and around airport property
3. Increase aircraft storage capacity
4. Expand aircraft parking apron and add additional marked aircraft and helicopter parking
5. Construct a dedicated terminal building
6. Consider appropriate aviation- and non-aviation-related uses for the future development of vacant property, or release of property

Consideration #1 – Building Restriction Line (BRL)

The BRL identifies suitable building area locations on the airport. It encompasses the RPZs, the object free area (OFA), navigational aid critical areas, areas required for terminal instrument procedures, and other areas necessary for meeting airport line-of-sight criteria. Two primary factors contribute to the determination of the BRL: type of runway (“utility” or “other-than-utility”) and the capability of the instrument approaches. Runway 6-24 is considered an other-than-utility, non-precision instrument

runway with visibility minimums not lower than 1-mile. The BRL is the product of CFR Part 77 transitional surface clearance requirements, which stipulate that no object be located in the primary surface, which is defined as being 500 feet wide for non-precision instrument runways with visibility minimums greater than ¾-mile. From the primary surface, the transitional surface extends outward at a slope of one vertical foot to every seven horizontal feet.

At PAN, the 35-foot BRL for Runway 6-24 is set at 495 feet from the runway centerline, and the 25-foot BRL is set at 425 feet from the centerline. Presently, all landside facilities are located within the BRL, with the nearest structure located approximately 250 feet from the runway centerline. While these buildings are located within the BRL, this does not necessarily mean there are penetrations to Part 77 surfaces. **It should be clearly stated that the BRL is not a standard, but rather a guideline to use when planning vertical infrastructure on the airport.** The FAA may require structures inside the BRL to be equipped with obstruction lights.

Consideration #2 – Airport Topography

As shown on **Exhibit 4D**, there are notable grade changes on and in the vicinity of the airport property. The exhibit depicts grade changes of 10 feet in yellow lines, with blue lines representing grade changes of two feet. As reported by airport management, the soil quality and condition also present challenges for development, as does poor drainage on the south side. When considering the construction of new pavement and buildings on the landside, it is important to factor in these topographical constraints that may impact the feasibility of construction (i.e., additional costs associated with earthwork, drainage, etc.). The alternatives to follow consider unconstrained growth/construction scenarios which maximize the use of existing airport property as much as possible, with the understanding that some projects may be deemed infeasible due to engineering challenges owing to topographical constraints.

Consideration #3 – Hangars

Hangar occupancy at PAN stands at 100 percent, with approximately 20 people on a waiting list for hangar space as of early 2023. With clear demand for additional hangar capacity at the airport, the landside alternatives will consider areas for the development of various hangar styles, including small aircraft facilities, executive/conventional hangars, and service/maintenance hangars. These areas are further defined below.

- **Small aircraft facilities** typically consist of T-hangars/T-shades. These facilities often experience lower levels of activity and, as such, can be located away from the primary apron areas in more remote locations on the airport. Limited utility services are needed for these areas. The airport currently has approximately 17,000 square feet (sf) of T-hangar storage space, with an additional 31,200 sf projected to be needed by the end of the 20-year planning period.
- **Executive/conventional hangars** consist primarily of clear span hangars with no interior supporting structure. Executive hangars are typically less than 10,000 sf and can accommodate small

aviation businesses, one larger aircraft, or multiple smaller aircraft, while conventional hangars can range in size from 10,000 sf to 20,000 sf. Both of these hangar types typically require all utilities and segregated roadway access. PAN has approximately 9,400 sf of executive hangar space and no conventional hangar space. An additional 23,000 sf of executive/conventional hangar capacity is estimated to be needed by the end of the planning period.

- **Service/maintenance hangars** house businesses that offer services such as aircraft maintenance, line service, aircraft manufacturing, and aircraft fueling. High levels of activity can be concentrated around these hangars, necessitating adequate apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system for transient aircraft. Utility services and vehicle parking areas are needed for these types of facilities. Currently, PAN has about 6,300 sf of service/maintenance hangar space available, with an additional 6,200 sf anticipated to be needed by the end of the planning period.

Consideration #4 – Aprons and Marked Aircraft Parking

PAN has approximately 36,500 square yards (sy) of apron space for aircraft parking and circulation, with 77 marked parking positions for fixed-wing aircraft and one helicopter parking pad. Based on projected growth in based aircraft and transient operations, an additional 20,800 sy of apron capacity is needed over the next 20 years. Since apron space is typically co-located with hangar facilities, the landside alternatives assume areas of hangar development will also include apron space. The available parking for fixed-wing aircraft is considered adequate over the planning period; however, the alternatives to follow will depict marked aircraft parking on aprons where appropriate. As noted, the helicopter parking area is proposed to be relocated, and three options were presented previously with the airside alternatives. The landside alternatives carry these options forward and include additional helicopter parking pads to accommodate projected growth in this operational category.

Consideration #5 – Terminal Building

Operations at PAN are projected to continue to increase over the course of the next 20 years. As operations grow, so will the need for a dedicated terminal building, which could include passenger and pilot lounges, flight planning areas, a kitchen, restrooms, airport management offices, and storage space. The existing airport operations building is already undersized and offers limited services to transient pilots. In order to accommodate current needs and anticipated growth – as well as to remain competitive with other general aviation airports in the region – consideration should be given to developing a new, modern terminal building with all appropriate amenities. The airport and its terminal services are a very important link to the entire region, whether for business or pleasure. Consideration to aesthetics should be given high priority in all public areas, as the terminal will serve as the first impression a visitor may have of the community.

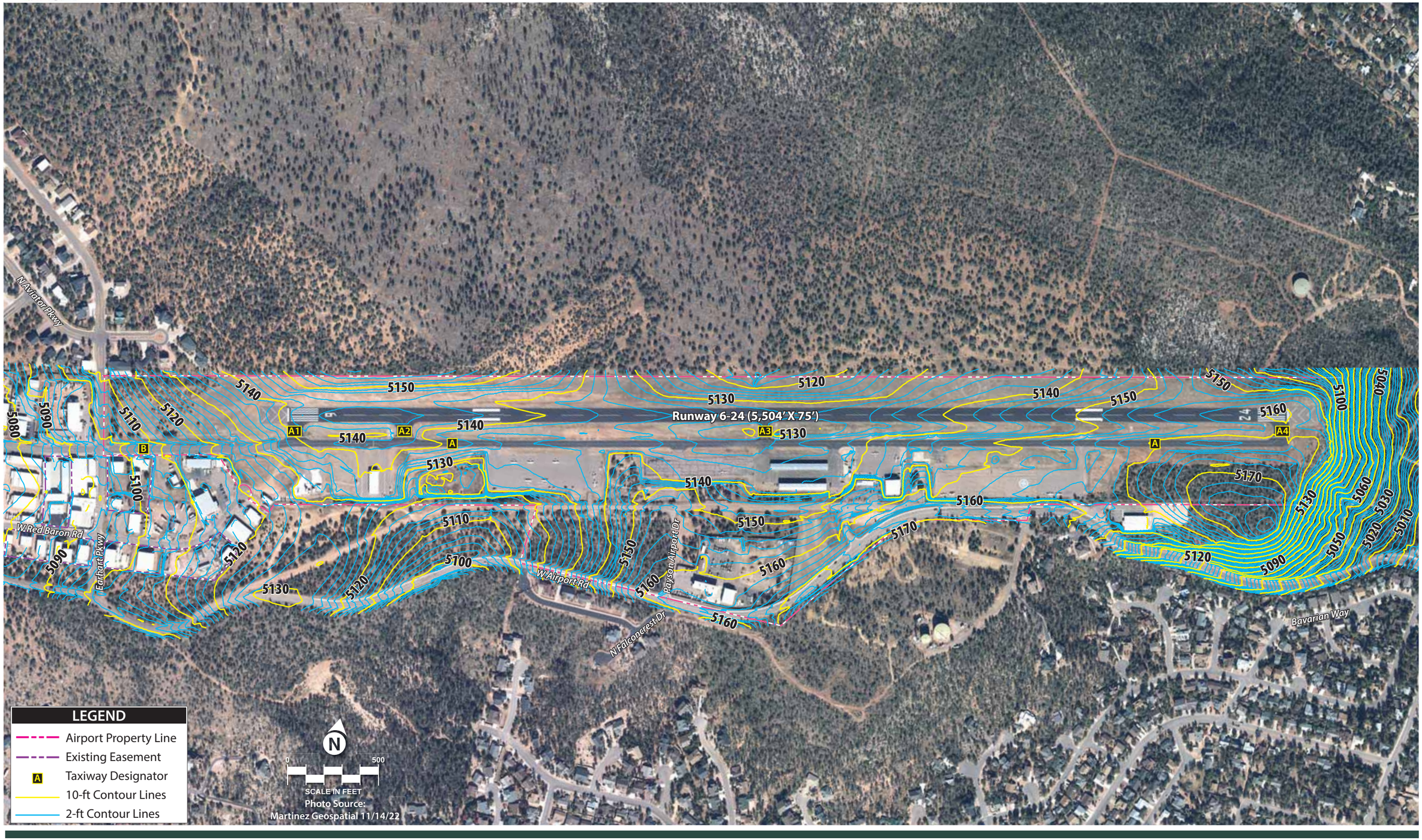


Exhibit 4D
GROUND CONTOURS

This page intentionally left blank

Consideration #6 – Land Development/Release

The landside alternatives present development and redevelopment areas on the airport for aviation-related and non-aviation related uses, considering highest and best use potential. Aviation-related uses are typically reserved for property with direct access to the airfield. For property that is segregated from the airfield, an airport could consider non-aviation related development. The FAA typically requires airports to receive approval through a land-use release to lease airport-owned land for non-aviation related purposes. The FAA stipulates that all land with reasonable airside access should be used or reserved for aviation purposes.

As mentioned, the Town Yard is located on airport property. This area is used by the Town of Payson for municipal services that include storage of vehicles, equipment, and materials. The alternatives to follow depict different options for developing this area or maintaining it in its current location. If the town elects to maintain the Town Yard on the airport, coordination with the FAA should be undertaken. Generally, airport property is subject to Airport Improvement Program (AIP) grant assurances; therefore, if the sponsor were to opt to release the property, they would need to request a release of federal obligations for this property by the FAA. Once a release of federal obligation is issued by the FAA, the town would be able to lease this area for non-aviation use. The FAA *Reauthorization Act of 2018*, Section 163, changed how the FAA's Office of Airports staff reviews and considers the release of airport property for non-aviation uses. The section focuses the FAA's review and approval of Airport Layout Plans (ALPs) to those portions of the ALP which materially impact the safe and efficient operation of airports, the safety of people and property on the ground adjacent to the airport, and the value of prior federal investments to a significant extent. In effect, this new guidance is intended to ease the process of gaining FAA approval of land releases.

One factor to consider is the location of the automated weather observation system (AWOS) located adjacent to the Town Yard. The AWOS has a 500-foot critical area which should be kept free of structures that could interfere with the sensors. Currently, there are no structures located within the Town Yard that would obstruct the AWOS critical area; however, if the Town of Payson opts to release this property and lease it for municipal purposes, language should be included within the lease which restricts the height of any objects within the AWOS critical area.

LANDSIDE ALTERNATIVES

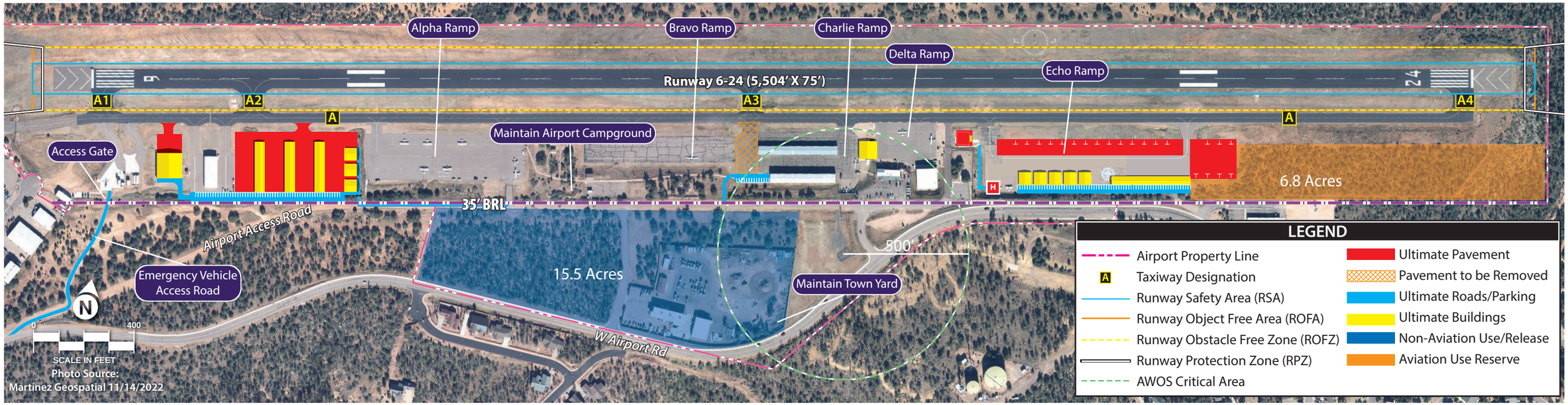
The following sections describe a series of landside alternatives as they relate to considerations detailed above. Three alternatives have been prepared to illustrate potential development plans aimed at meeting the needs of general aviation through the long-term planning period and – in some cases – beyond. It should be noted that the alternatives presented are not the only reasonable options for development. In some cases, a portion of one alternative could be intermixed with another, or some development concepts could be replaced with others. The overall intent of this exercise is to outline basic development concepts to spur collaboration for a final recommended plan. The final recommended plan serves as a guide for the airport, which will aid the Town of Payson in the strategic planning of airport property. Many times, airport operators change their plans to meet the needs of specific users. The goal in

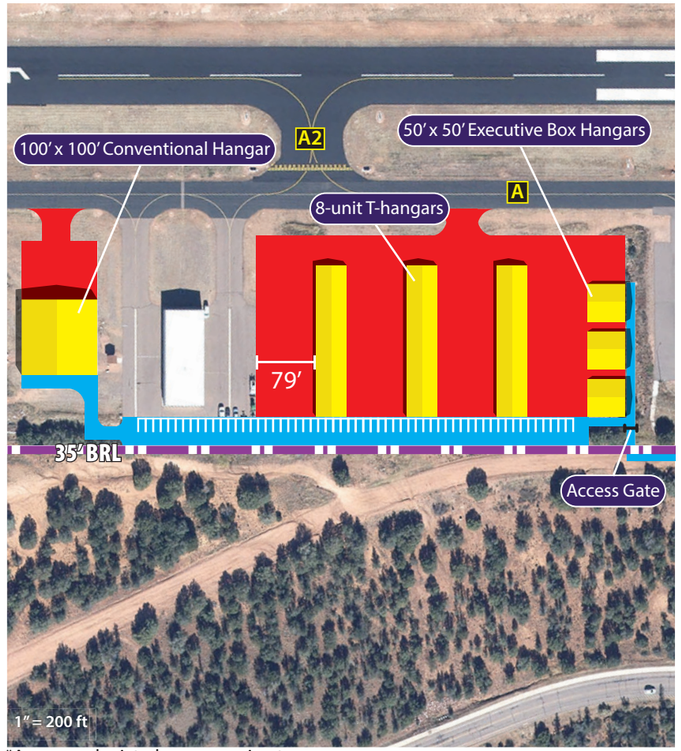
analyzing landside development alternatives is to focus future development so that airport property can be maximized and aviation activity can be protected.

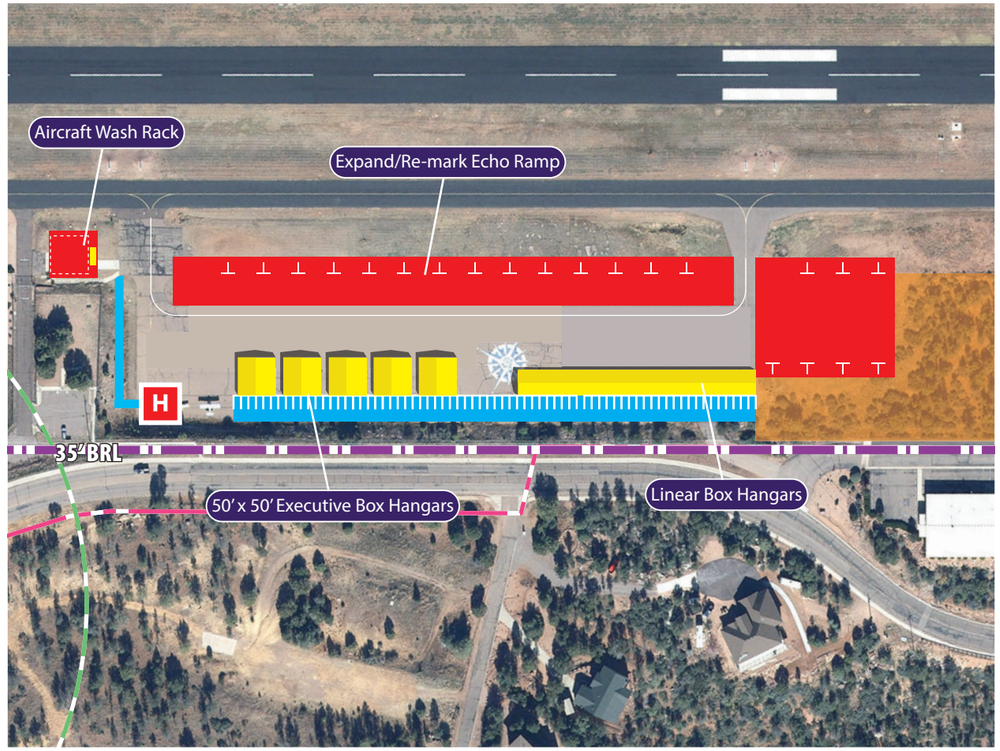
LANDSIDE ALTERNATIVE 1

Depicted on **Exhibit 4E**, Landside Alternative 1 focuses primarily on expansion of small aircraft storage facilities, with additional ramp and aircraft parking. Moving from west to east, the features of Landside Alternative 1 include the following:

1. A gated access road for emergency vehicle use is proposed. This depiction is conceptual in nature but could be sited to extend from West Airport Road, with a new paved roadway connecting to the air ambulance apron.
2. A 100' by 100' executive hangar and apron are proposed east of the fuel farm. Ideally, this hangar would house an aviation-related business, such as an aircraft maintenance provider, a small flight training operation, or an aerial tour company.
3. Three new T-hangars are proposed immediately west of Alpha ramp. As depicted, these are eight-unit T-hangars separated by 79 feet, in accordance with airplane design group (ADG) I standards for taxilane object free area (TLOFA). On the east side of the proposed development, three 50' by 50' executive box hangars are proposed. Access to this area, as well as to the proposed conventional hangar previously detailed, would be provided from Airport Access Road, with dedicated parking for tenants and visitors. It should be noted that the terrain and ground condition make this area a challenge to develop; however, its location adjacent to the parallel taxiway and greater airside environment is attractive for aeronautical development.
4. The airport campground is proposed to remain in its existing location.
5. Improved access to the existing hangars located on Charlie ramp is proposed, with the intent to separate aircraft and vehicle traffic. A new road extending from Airport Access Road is proposed, with a parking area for tenants. This could be achieved with the removal of a portion of pavement on the west side of Charlie ramp (shown previously on **Exhibit 4C**).
6. A new, 5,000-sf terminal building is proposed on the site of the existing airport operations office and adjacent storage buildings. As mentioned previously, a terminal of this size could provide a variety of pilot services (such as a lounge, flight planning room, and kitchen/restrooms) as well as office and storage space for use by airport staff. Public access to the proposed terminal would be limited to arriving/departing pilots and pedestrian traffic, as vehicle access to this site would be limited to those with a gate code.
7. An aircraft wash rack is proposed on the existing helicopter parking pad.
8. Echo ramp is proposed to be developed with hangar facilities on the south side, accessible from West Airport Road. This includes approximately 10,500 sf of linear box hangars, as well as five 50' by 50' executive hangars. An expansion to the north side of the ramp is planned, with new







*Acreages depicted are approximate

This page intentionally left blank

pavement markings including a relocated taxilane centerline and aircraft parking. Echo ramp is also proposed to be extended to the east to provide additional aircraft parking positions.

9. Options for both aviation-use and non-aviation reserve property are also depicted. A 6.8-acre parcel located east of Echo ramp along the flightline should be reserved for future aeronautical development, if/when the need arises. South of Airport Access Road, the 15.5-acre portion of airport property shown in blue shading on **Exhibit 4E** is proposed for potential release for non-aeronautical uses. A portion of this property is already used for Town Yard operations, and this alternative considers maintaining this use in its present location. As stated previously, if the town elects to do this, coordination with the FAA should be initiated to release this property through Section 163.

In all, Landside Alternative 1 proposes 64,500 sf of new hangar facilities, with 34,500 sf in the form of T-hangars and linear box hangars, and 30,000 sf of executive and conventional style hangars. Approximately 7,750 sy of aircraft parking apron space is also proposed under this alternative.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2 is depicted on **Exhibit 4F**. This option again evaluates the development potential on the south side of the airfield, but also includes an aviation development option south of Airport Access Road. The features of Landside Alternative 2 include the following:

1. A gated access road for emergency vehicle use is proposed to extend from the existing cul-de-sac at the north end of West Red Baron Road to the air ambulance facilities.
2. Two 50’ by 50’ executive hangars are proposed in the vacant area east of the fuel tanks, with a vehicle access road extending from Airport Access Road.
3. Alpha ramp is proposed to be expanded to the west, with additional parking for both fixed-wing aircraft and helicopters. As depicted, four 75’ by 75’ executive hangars are proposed along the south side of the expanded apron, with vehicle access and a dedicated tenant/visitor parking area.
4. The airport campground is proposed to remain in its existing location.
5. A new taxilane extending south from Charlie ramp is proposed to provide access to a hangar development area north of the Town Yard. This area is envisioned to support a new apron fronting five 50’ by 50’ executive hangars. In order to develop this area, a portion of Airport Access Road would be closed to allow for the construction of new airfield pavement, and the existing perimeter fencing would need to be reconfigured, with additional fencing installed to secure this area.
6. Additional linear box hangars are proposed on Charlie ramp, adjacent to existing hangars on the south side of the apron. A new vehicle access road and parking area are also proposed at the rear of the box hangars to serve tenants in this area.
7. Like Landside Alternative 1, a 5,000-sf terminal building is proposed to better accommodate current and future airport users. This alternative considers a different location, however, with the

proposed terminal building located on the observation area site. This area is relatively flat and is accessible to vehicles from the existing parking lot.

8. A T-hangar complex, with three five-unit T-hangars, is proposed east of Echo ramp, as depicted on the exhibit.
9. A 5.4-acre area on the southeast side of airport property is proposed for aviation-use reserve, similar to the first alternative. Landside Alternative 2 also proposes portions of the airport's property to be designated for non-aeronautical use, including two parcels on the north side of West Airport Road, one sized approximately 7.1 acres and the other 3.5 acres. Included within the 3.5-acre parcel is the Town Yard, which should be released from federal obligation through Section 163 if it is maintained in this location, as proposed on **Exhibit 4F**.

Landside Alternative 2 proposes 63,020 sf of new hangar facilities, with 20,520 sf in the form of T-hangars and linear box hangars, and 42,500 sf of executive and conventional style hangars. In terms of aircraft parking apron space, approximately 11,700 sy of new pavement is proposed in Landside Alterative 2.

LANDSIDE ALTERNATIVE 3

Depicted on **Exhibit 4G**, Landside Alternative 3 considers an expanded development scenario along the flightline, with the area south of Airport Access Road reserved for future aviation development. Beginning on the west side, the features of Landside Alternative 3 include the following:

1. An access road extending from Airport Access Road is proposed to provide access to air ambulance facilities as well as to existing and future tenants.
2. A five-unit T-hangar is proposed east of the fuel tanks, with a connector taxilane providing access to Taxiway A.
3. A new apron area is proposed which could support seven 50' by 50' executive box hangars, as well as marked parking for fixed-wing aircraft.
4. While previous alternatives have maintained the airport campground in its existing location, Landside Alternative 3 proposes relocation of the campground facilities (restrooms, fire rings, picnic tables, etc.) to the undeveloped area immediately to the south. Moving the campground could open up a valuable development area along the flightline; however, if this alternative were to be pursued, the Town of Payson should coordinate with the FAA/ADOT to ensure that there would be no violation of grant assurances which may be attached to the campground. Relocation of the campground would also require closure of a portion of Airport Access Road and installation/relocation of perimeter fencing to secure the area.
5. A new 5,000-sf terminal building and T-hangars are proposed on the existing campground site. If this area were to be redeveloped for landside facilities as depicted, the apron and taxilanes could support a new terminal building on the west end and two six-unit T-hangars on the eastern portion of the expanded area. Additional helicopter parking is also proposed adjacent to the terminal building. A vehicle access road and parking lot are planned for the terminal, with the roadway

Alpha Ramp
Bravo Ramp
Charlie Ramp
Delta Ramp
Echo Ramp
Runway 6-24 (5,504' X 75')
A1
A2
A3
A4
A
Access Gate
Maintain Airport Campground
35' BRL
Emergency Vehicle Access Road
Airport Access Road
7.1 Acres
3.5 Acres
5.4 Acres
300'
W Airport Rd
Maintain Town Yard
N
0
400
SCALE IN FEET
Photo Source:
Martinez Geospatial 11/14/2022

LEGEND

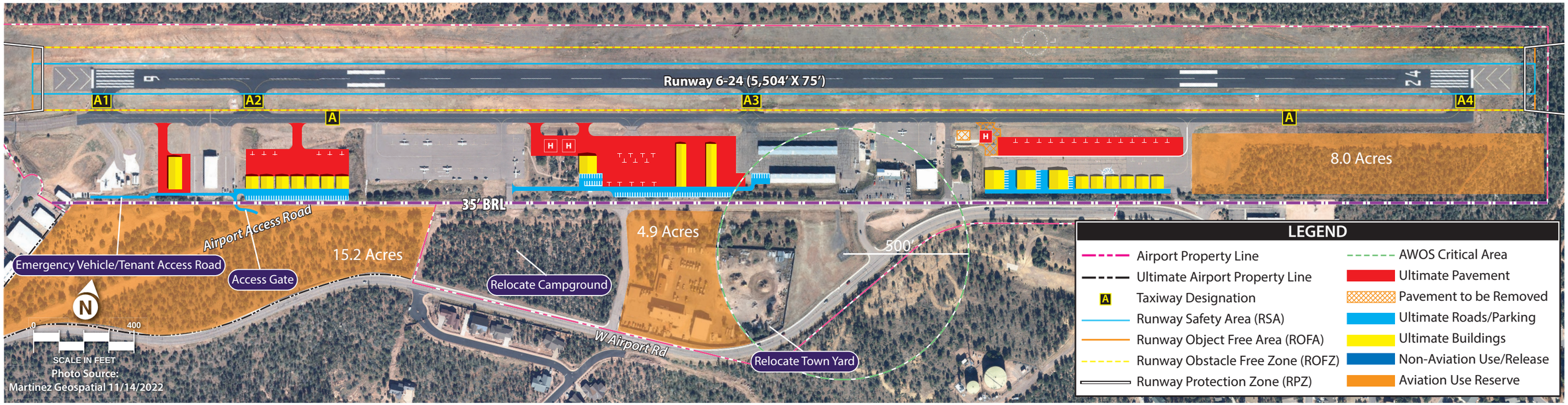
- Airport Property Line
- Taxiway Designation
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- AWOS Critical Area
- Ultimate Pavement
- Pavement to be Removed
- Ultimate Roads/Parking
- Ultimate Buildings
- Non-Aviation Use/Release
- Aviation Use Reserve

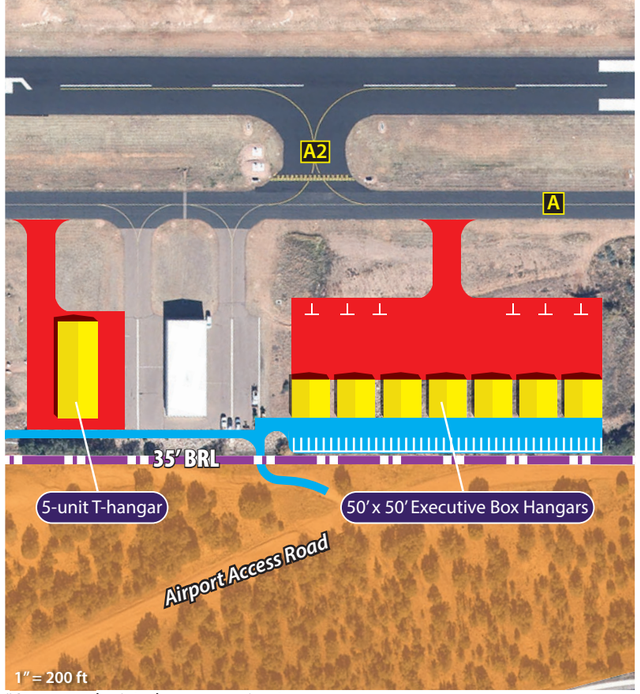
Expand Alpha Ramp
50' x 50' Executive Hangars
75' x 75' Executive Hangars
1" = 200 ft

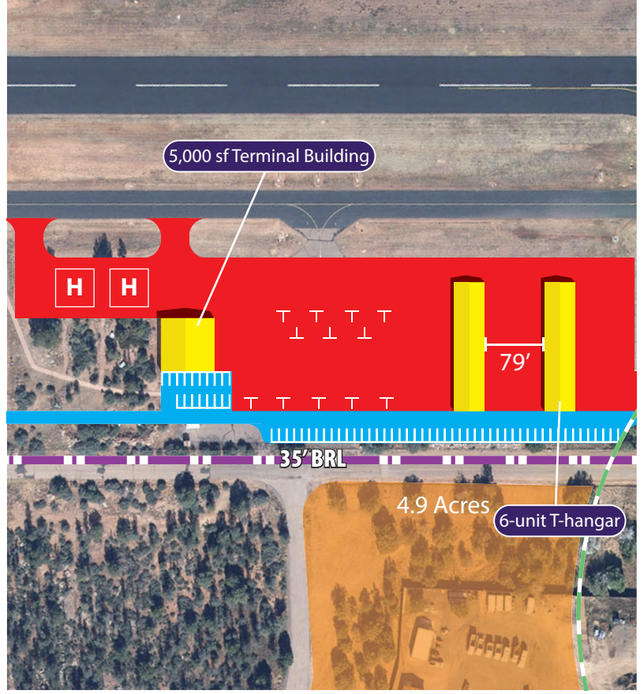
Extend Perimeter Fencing
50' x 50' Executive Box Hangars
Box Hangar Expansion
5,000 sf Terminal Building

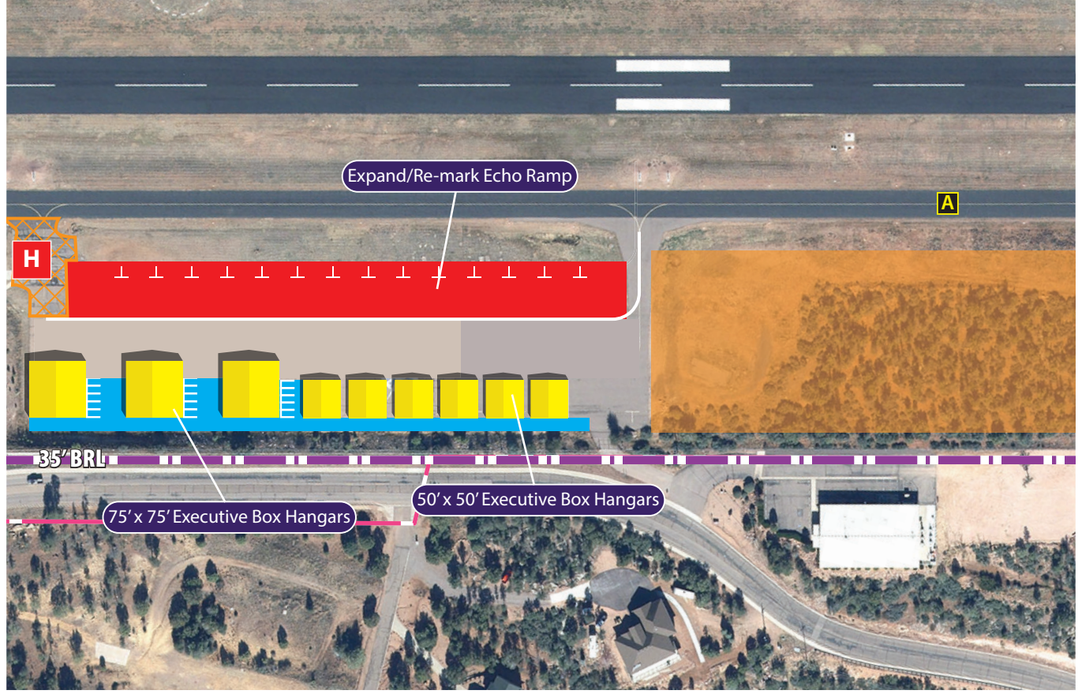
5-unit T-hangars
79'

*Acreages depicted are approximate









*Acreages depicted are approximate

extending east to provide access to tenants of the proposed T-hangars as well as the Charlie ramp tenants. A smaller parking lot is proposed adjacent to Charlie ramp.

6. Under this alternative, the Town Yard is proposed to be relocated and this area reverted to aviation use. The 4.9-acre property could be held in reserve for future development, should the need arise.
7. Echo ramp is proposed to be expanded to the north, with the southern portion of the ramp re-purposed for hangar development. The alternative proposes three 75' by 75' executive hangars on the ramp's west end, with six 50' by 50' executive hangars on the central and east sides. Vehicle access and parking are also proposed.
8. Approximately 8.0 acres of undeveloped property on the airport's east side is proposed to be reserved for future aviation use.
9. A 15.2-acre parcel adjacent to airport property on the southwest side is proposed for acquisition to support future aviation development. Past planning studies have considered purchasing this property, in part to support the previously planned relocation of Taxiway A, which would have required a shift of existing landside facilities to the south. While relocation of Taxiway A is not considered as part of this master plan, it is still worthwhile to evaluate this area for potential airport expansion in the future, as well as to provide an additional buffer between aviation activities and non-aeronautical development.

In all, Landside Alternative 3 proposes 69,675 sf of new hangar facilities, with 20,300 sf in the form of T-hangars and linear box hangars, and 49,375 sf of executive and conventional style hangars. Approximately 5,900 sy of new apron pavement is proposed.

LANDSIDE SUMMARY

The landside alternatives presented look to accommodate an array of aviation activities that either currently occur or could be expected to occur at PAN in the future. There is demand for new facilities at PAN now, and airport/town management will need to determine how to develop the property in an organized and thoughtful way. It is beneficial to provide a long-term vision for the airport for future generations, and each of the development options considers a long-term vision that would, in some cases, extend beyond the 20-year scope of this master plan. **Table 4A** summarizes the various capacities of hangars and apron space proposed in each alternative.

Table 4A | Landside Alternative Facility Capacities

	T-Hangar/Linear Box Hangars (sf)	Executive/Conventional Hangars (sf)	Apron Space (sy)
Landside Alternative 1	34,500	30,000	7,750
Landside Alternative 2	20,520	42,500	11,700
Landside Alternative 3	20,300	49,375	5,900

Source: Coffman Associates analysis

SUMMARY

This chapter is intended to present an analysis of various options which may be considered for specific airport elements. The need for alternatives is typically spurred by projections of aviation demand growth and/or by the need to resolve non-standard airport elements. FAA design standards are frequently updated with the intent of improving the safety and efficiency of aircraft movements on and around airports, which can lead to certain pavement geometries that previously qualified as standard now being classified as non-standard.

Several development alternatives related to both the airside and the landside have been presented. On the airside, the major considerations involve resolving non-standard safety area conditions, extending Runway 6-24, and improving airfield geometry to meet proper taxiway design standards. For the landside, alternatives were presented to consider additional aviation development on the south side of the airport, including a portion of airport property that is currently cut off from the airfield.

The next step in the master plan development process is to arrive at a recommended development concept. The participation of the PAC and the public will be important considerations. Additional consultation with the FAA and ADOT may also be required. Once a consolidated development plan is identified, a 20-year capital improvement program, including a list of prioritized projects tied to aviation demand and/or necessity, will be presented. Finally, a financial analysis will be presented to identify potential funding sources and to show airport/town management what local funds will be necessary to implement the plan.