PHILLIPSBURG
Municipal Airport

Chapter 4
Airport 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 design standards 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 that 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 the impacts of potential airfield improvements at Phillipsburg Municipal Airport (PHG). 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 that result 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 City of Phillipsburg, airport users, the local community, and the surrounding region, all of which have a vested interest in the development and operation of PHG.

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 City of Phillipsburg, airport management, the planning advisory committee (PAC), and the public, an alternative (or combination of alternatives) 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 PHG.

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 City of Phillipsburg provides the overall guidance for the operation and development of the airport. It is of primary concern that PHG 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:

- Develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations
- Preserve and protect public and private investments in existing airport facilities
- Provide a means for the airport to grow, as dictated by demand
- Establish a plan to ensure the long-term viability of the airport and promote compatible land uses surrounding the airport
- Develop a facility that is responsive to the changing needs of all aviation users
- Reflect and support the long-term planning efforts that are currently applicable to the region
- Develop a facility with a focus on self-sufficiency in both operational and developmental cost recovery
- Ensure future development is environmentally compatible

REVIEW OF PREVIOUS AIRPORT PLANS

At PHG, an Airport Layout Plan & Narrative report was completed in 2008. More recently, the airport layout plan (ALP) was updated in 2020 to reflect an extension to Runway 13-31, which was completed in 2023 and brought the total runway length to 5,101 feet. In addition to the runway extension, the ALP currently on file includes the following primary recommendations:

- Increase the width of Runway 13-31 from 60 feet to 75 feet
- Construct a full-length parallel taxiway to serve Runway 13-31
- Pave turf Runway 3-21 and extend it from 2,600 feet to 3,200 feet; reduce the runway width from 150 feet to 60 feet (Note: Turf Runway 3-21 was shortened in 2023 to 1,755 feet to shift the runway visibility zone [RVZ] off the aircraft parking apron)
- Relocation of the automated weather observing system (AWOS) to remove it from the ultimate RVZ
- 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 and in the previous planning study, along with new development options to meet each runway's existing/ultimate runway design code (RDC) outlined in the previous chapters. Since the completion of the last plan, the FAA has made 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 or removed from further consideration.

NO-ACTION/NON-DEVELOPMENT ALTERNATIVES

The City of Phillipsburg is charged with managing the airport for the economic improvement of the community and region. In some cases, alternatives may include a no-action option; however, for PHG, 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 would extend into impacts on the economic well-being of the region. If facilities are not maintained and improved so 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 goal of the FAA, which is to maintain a safe and effective facility that is compatible with the surrounding environment. Additionally, the City of Phillipsburg has accepted approximately $5.4 million in federal and state grants since 2000. The acceptance and use of state and federal grants carry an obligation, called grant assurances, which requires the City of Phillipsburg to maintain and allow for the improvement of PHG as needed to serve local and regional demand. Other significant considerations are previous investments and outstanding contractual agreements with all airport tenants and users. Not continuing active management and development of the airport would require the city to breach these obligations and could create associated legal actions; therefore, a no-action alternative is not considered further in this master plan.

This study will not consider the relocation of services to another airport or the development of a new airport site. The development of a new facility like PHG 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 PHG 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 more than a transportation utility; it is an 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 that rely upon it. Ultimately, the final decision regarding pursuing development rests with the City of Phillipsburg, the FAA, and the Kansas Department of Transportation (KDOT) – Division of Aviation on an individual project basis. The following analysis considers airside and landside development alternatives that take into account an array of facility demands, including safety, capacity, access, and efficiency.

AIRSIDE ALTERNATIVES

The development alternatives to follow are categorized into two functional areas: airside and landside. Airside considerations relate 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 and the required airfield safety standards. The design of the airfield also defines minimum setback distances from the runway and object clearance standards; these criteria are defined first to ensure that the fundamental needs of PHG are met. Landside considerations include 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. As such, 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 these factors must be evaluated to determine if the investment in PHG 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 PHG 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 included as follows.

Airside Planning Considerations
1. Meet ultimate design standards on primary Runway 13-31 (RDC B-II-5000)
2. Maintain current length on primary Runway 13-31
3. Consider options for the ultimate disposition of crosswind Runway 3-21
4. Mitigate non-standard issues within the safety areas
5. Improve taxiway system to meet FAA standards and enhance safety on the airfield
6. Visual approach aid upgrades
7. Lighting and signage upgrades

Consideration #1 – Meet Ultimate Design Standards on Primary Runway 13-31

The critical aircraft analysis in Chapter Two concluded that primary Runway 13-31 should meet RDC B-II-5000 design standards in the ultimate condition. The runway is currently categorized as RDC B-I-5000; however, due to anticipated growth in operations and based aircraft by larger, more demanding aircraft, including turboprops and jets, it is prudent to plan facilities to accommodate these users. A transition to this higher design code corresponds to larger safety areas and increased runway width. Alternative design considerations for Runway 13-31 will be presented under ultimate RDC B-II-5000 standards.

Per the FAA's Central Region, the current funding climate is limited to only allocated (non-primary entitlement [NPE]) funds for new pavement construction, which would include widening the primary runway to meet B-II design standards. As this project would potentially need to be funded, in part, through discretionary grants, it would likely not be considered for programming until a full-depth reconstruction of Runway 13-31 is necessary. In 2022, the runway was reported to have a pavement condition index (PCI) of 70,[1] which is in the range for general maintenance projects (i.e., crack sealing). A full-depth reconstruction is not anticipated to be needed for at least another 10-20 years, and possibly longer if regular maintenance is performed. As such, widening the runway would be considered a long-term project, the timing of which would likely need to correspond to a full-depth reconstruction. Additionally, the airfield environment would need to be re-examined at that time, with the most recent operational data evaluated to determine project eligibility and justification.

Consideration #2 – Maintain Current Length on Primary Runway 13-31

Analysis in Chapter Three determined that a length of 5,500 feet is recommended by the FAA to accommodate 75 percent of the business jet fleet at 60 percent useful load; however, the available 5,101 feet can accommodate most aircraft that currently use and are anticipated to use the airport in the future. Moreover, Runway 13-31 was recently extended from 4,500 feet to its current length of 5,101 feet, a significant undertaking in terms of construction costs, land acquisition, environmental analysis, and impacts to the surrounding road network. The airport sponsor has indicated that local support for an additional runway extension is minimal. For these reasons, none of the alternatives will evaluate extension options on the primary runway.

[1] KDOT Aviation 2022 Airport Pavement Management Plan

Consideration #3 – Ultimate Crosswind Runway Disposition

Analysis presented in the previous chapter concluded that a crosswind runway is eligible at PHG based on the wind coverage provided by primary Runway 13-31 (refer to Exhibit 3A). The primary runway does not provide at least 95 percent coverage until the 16-knot condition. When considering allowable crosswind components by RDC, PHG is eligible for a crosswind runway designed to B-II standards. Currently, crosswind turf Runway 3-21 measures 1,755 feet long by 140 feet wide and is limited to small aircraft exclusively. Chapter Two determined that the existing/ultimate RDC for Runway 3-21 is defined as A-I(Small)-VIS (visual approaches only); however, comprehensive planning should evaluate the potential for a longer crosswind runway to better serve airport users when wind conditions on the primary runway are not favorable. Additionally, the current orientation of turf Runway 3-21 limits landside development potential. For these reasons, two of the airside alternatives to follow will illustrate the potential for a realigned, longer crosswind runway that, when combined with primary Runway 13-31, provides at least 95 percent wind coverage.

Consideration #4 – Mitigate Non-standard Conditions in Safety Areas

The safety areas associated with Runway 13-31 generally meet FAA design standards in the existing B-I-5000 condition; however, in the ultimate B-II-5000 condition, a 2.2-acre portion of the runway object free area (ROFA) along the southwest side of the runway would extend beyond the airport's current boundary. Approximately 3.1 acres within the existing/ultimate runway protection zone (RPZ) associated with Runway 31 extends beyond airport property and encompasses Highway 183, which is a non-standard condition. For turf Runway 3-21, portions of the runway safety area (RSA), ROFA, runway obstacle free zone (ROFZ), and RPZ extend beyond the airport's southern boundary, as shown previously on Exhibit 3B. Lastly, the runway visibility zone (RVZ) is obstructed by the wind cone located south of the runways' intersection. The alternatives will examine various options for mitigating safety area deficiencies and obstructions.

Consideration #5 – Taxiway System Improvements

The taxiway system at PHG currently consists of a single connector taxiway extending from the terminal apron to primary Runway 13-31, connecting to the runway approximately 1,000 feet from the Runway 13 threshold. To access either runway end, pilots must back-taxi and turn around using the holding bays that serve Runways 13 and 31. This results in dual use of the runway (i.e., a runway used as a taxiway, and vice versa), which is not preferred by the FAA. The FAA also recommends modifications to taxiways that provide direct access from aircraft parking aprons to runways. Each of the alternatives to follow will consider the addition of a full-length parallel taxiway serving Runway 13-31, as well as various options to mitigate the direct access point that exists today.

Consideration #6 – Visual Approach Aid Upgrades

Both ends of primary Runway 13-31 are equipped with two-light precision approach path indicator (PAPI-2) systems and runway end identifier lights (REILs). A four-light PAPI (PAPI-4) is recommended for airports serving frequent turbine aircraft operations. As PHG is anticipated to be utilized more frequently by turboprops and jets, PAPI-4s are recommended for each runway end when the need arises.

Crosswind Runway 3-21 is not equipped with any visual approach aids. As mentioned, options for an improved crosswind runway will be presented, with visual approach aids (PAPI-2s and REILs) considered for a paved crosswind runway.

Consideration #7 – Lighting/Signage Upgrades

Airfield lighting at PHG consists of medium intensity runway lighting (MIRL) on primary Runway 13-31, with taxiway lighting limited to the intersections of the connector taxiways and runway. Edge reflectors are installed to further delineate taxiway pavement. There is no airfield signage. The alternatives to follow will include options for upgrading airfield lighting associated with the runways and taxiways, as well as installation of lighted signage on the airfield.

AIRSIDE ALTERNATIVE 1

Depicted on **Exhibit 4A**, Airside Alternative 1 considers several upgrades to the airfield to meet both existing and ultimate FAA design standards and improve safety and efficiency on the airfield. Primary Runway 13-31 is proposed to remain at its existing length of 5,101 feet; however, the width is proposed to be increased from 60 feet to 75 feet to meet ultimate B-II design standards.

Crosswind Runway 3-21 is proposed to remain in its current location and at its current dimensions of 1,755 feet long by 140 feet wide. Low intensity runway lighting (LIRL) or reflectors are also proposed to enhance the visibility of the turf runway.

In terms of safety areas, there are two areas proposed for fee simple acquisition. As detailed previously, a transition from B-I to B-II on Runway 13-31 results in larger safety area dimensions. The ROFA width increases from 400 feet wide to 500 feet wide, as centered on the runway. This results in a narrow sliver of the ultimate ROFA on the southwest side of the runway extending beyond the property line (approximately 2.2 acres). The FAA recommends that the ROFA be owned/controlled by the airport sponsor. As such, this land is proposed for acquisition to protect the ultimate ROFA, as indicated on **Exhibit 4A**. A similar situation exists with the safety areas on the south end of Runway 3-21. Approximately 0.6 acres of the existing/ultimate RSA, ROFA, and ROFZ are not owned by the airport and are proposed to be acquired, with obstructions removed as necessary.

Exhibit 4A also identifies portions of RPZ land not owned by the airport sponsor. This includes approximately 3.1 acres within the Runway 31 RPZ and 2.5 acres within the Runway 3 RPZ. The FAA prefers property within an RPZ to be owned by the airport sponsor, or land use controls implemented via planning/zoning or through 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 to the surrounding road network; however, the airport sponsor should consider acquisition (fee simple or protected by easement) over the non-airport-controlled portions of the RPZs to protect these areas from future development that could be incompatible with aeronautical activity.

Other proposed features of Airside Alternative 1 include:

1. Construction of a full-length parallel taxiway to serve Runway 13-31, enhancing safety and efficiency and eliminating the dual-use nature of the runway.

2. Removal of the existing connector taxiway from the terminal apron to the runway. While this taxiway currently serves as the only connection from the landside area to the runway, the proposed construction of a full-length parallel taxiway would provide an opportunity to close this connector and eliminate the direct access point.

3. Removal of the holding bay that served Runway 13 prior to its extension.

4. Construction of a new connector approximately 1,800 feet from the Runway 31 threshold.

5. Installation of MITL on all existing and proposed taxiway pavement.

6. Relocation of the lighted wind cone and segmented circle outside of the RVZ.

7. An upgrade of the PAPI-2 systems serving Runway 13-31 to PAPI-4s when dictated by need (i.e., increased jet operations).

8. Installation of LED-lighted airfield location and directional signage.

9. Acquire avigation easement over non-airport owned property within the AWOS critical area.

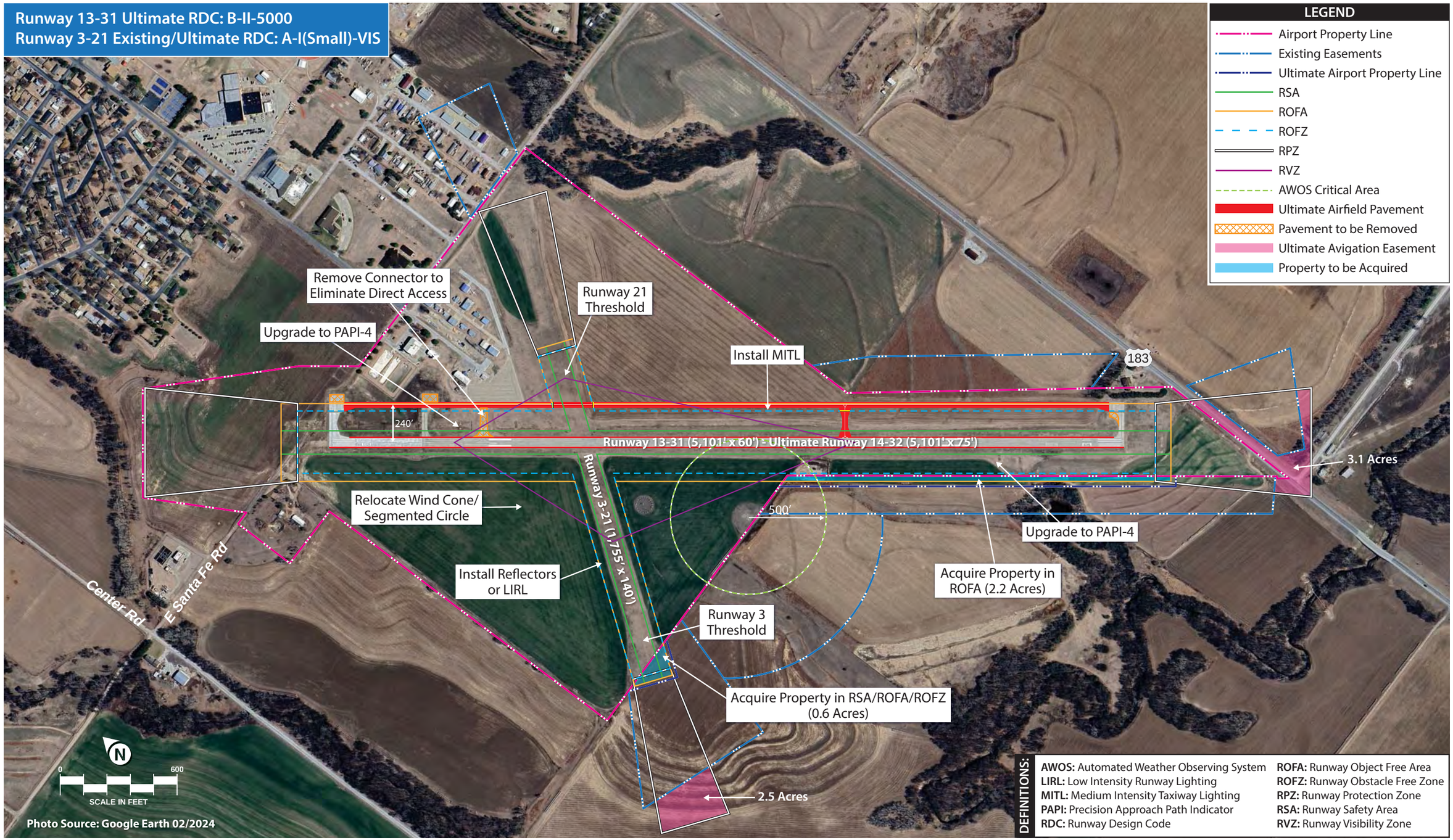
AIRSIDE ALTERNATIVE 2

Airside Alternative 2 considers a different approach for improving efficiency and safety on the airfield, while also promoting landside development (to be discussed in greater detail in the Landside Alternatives section). There are several similarities to Alternative 1 in terms of proposed improvements to the primary runway, with the primary difference being in regard to the crosswind runway.

As previously stated, PHG is eligible for a crosswind runway designed to B-II standards based on the available wind coverage provided by the primary runway. At its existing length of 1,755 feet, Runway 3-21 provides limited utility to airport users. As detailed in Chapter Three, a length of 3,900 feet is recommended to serve 95 percent of small airplanes with fewer than 10 seats. While it could potentially be feasible to extend the runway to the southwest, this would require land acquisition and environmental documentation, and the local appetite for such a project is minimal. A northeast extension to Runway 3-21 is not considered feasible. The Runway 21 threshold was recently relocated to its current site, effectively shortening the runway to its published length of 1,755 feet. This was done to shift the RVZ off the aircraft parking apron. An extension to the northeast would negate that effort and shift the RVZ back onto the apron, leading to potential obstructions within the RVZ.

For these reasons, other potential runway orientations were examined to determine if a different alignment may afford greater opportunity in terms of runway length and future development at the airport. **Exhibit 4B** depicts the optimal crosswind runway orientation based on each potential alignment.

Runway 13-31 Ultimate RDC: B-II-5000
Runway 3-21 Existing/Ultimate RDC: A-I(Small)-VIS



LEGEND

- Airport Property Line
- Existing Easements
- Ultimate Airport Property Line
- RSA
- ROFA
- ROFZ
- RPZ
- RVZ
- AWOS Critical Area
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Avigation Easement
- Property to be Acquired

DEFINITIONS:

AWOS: Automated Weather Observing System
LIRL: Low Intensity Runway Lighting
MITL: Medium Intensity Taxiway Lighting
PAPI: Precision Approach Path Indicator
RDC: Runway Design Code
ROFA: Runway Object Free Area
ROFZ: Runway Obstacle Free Zone
RPZ: Runway Protection Zone
RSA: Runway Safety Area
RVZ: Runway Visibility Zone

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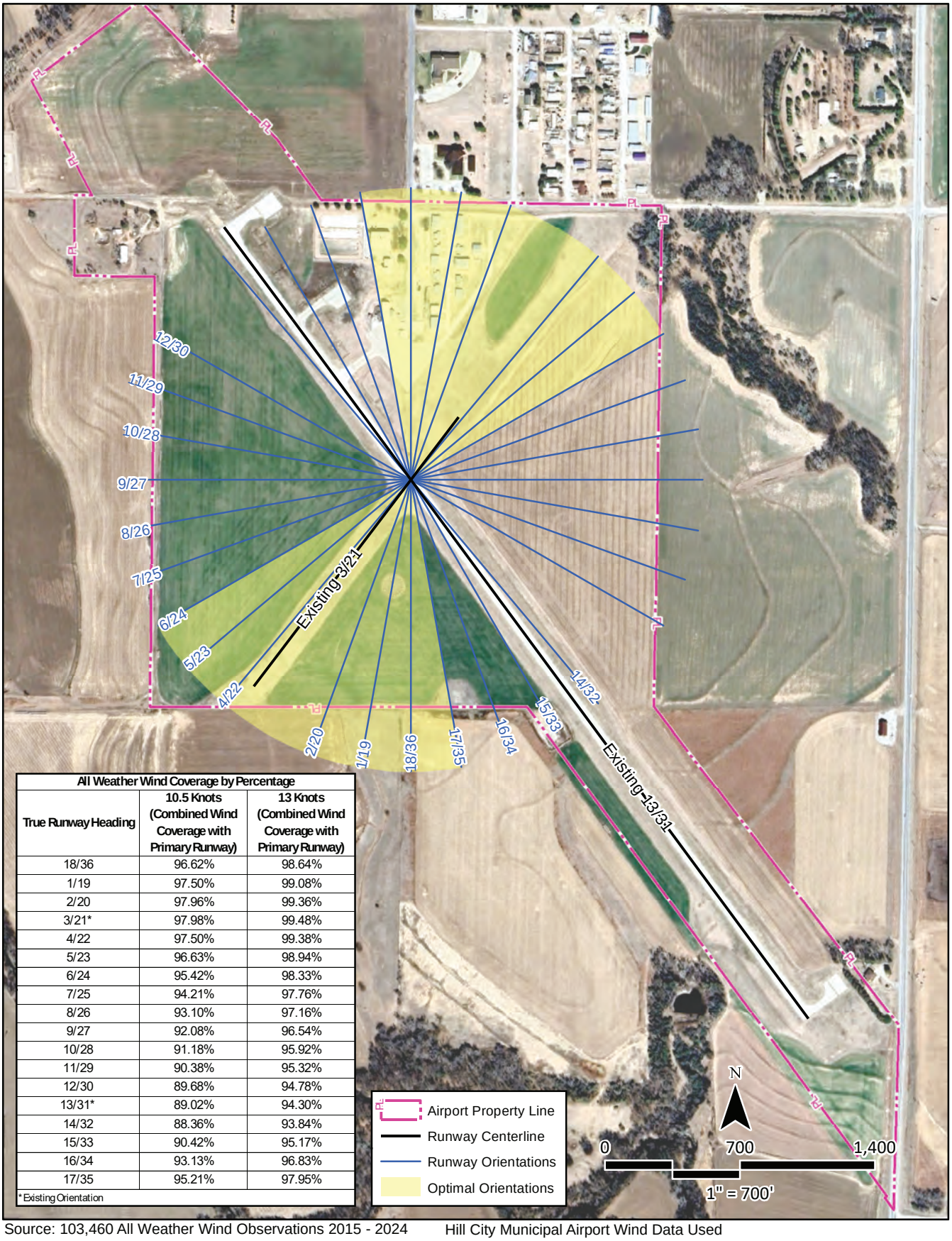


All Weather Wind Coverage by Percentage		
True Runway Heading	10.5 Knots (Combined Wind Coverage with Primary Runway)	13 Knots (Combined Wind Coverage with Primary Runway)
18/36	96.62%	98.64%
1/19	97.50%	99.08%
2/20	97.96%	99.36%
3/21*	97.98%	99.48%
4/22	97.50%	99.38%
5/23	96.63%	98.94%
6/24	95.42%	98.33%
7/25	94.21%	97.76%
8/26	93.10%	97.16%
9/27	92.08%	96.54%
10/28	91.18%	95.92%
11/29	90.38%	95.32%
12/30	89.68%	94.78%
13/31*	89.02%	94.30%
14/32	88.36%	93.84%
15/33	90.42%	95.17%
16/34	93.13%	96.83%
17/35	95.21%	97.95%

* Existing Orientation

Source: 103,460 All Weather Wind Observations 2015 - 2024 Hill City Municipal Airport Wind Data Used

Those orientations that provide at least 95 percent combined wind coverage with the primary runway are highlighted in yellow. Of these alignments, an orientation of 6-24 offers the greatest potential for achieving a longer runway while considering future landside development. This orientation provides 95.42 percent coverage in the 10.5-knot condition and greater than 98 percent coverage in 13 knots and higher.

Airside Alternative 2, shown on **Exhibit 4C**, depicts an option to decommission existing turf Runway 3-21 and construct a new turf runway, Runway 6-24, at a length of 2,340 feet and a width of 60 feet. This length is the maximum length achievable without the need to acquire adjacent property to protect the proposed runway's RSA/ROFA. While PHG is eligible for a crosswind runway meeting B-II design standards, the larger safety areas associated with this higher design code would result in a need for property acquisition or a shorter runway length, which would not offer much benefit beyond what is available today. As such, this alternative considers a continuation of the A-I(Small) design standards that are associated with the existing turf Runway 3-21. The runway is also proposed to be shifted farther to the east to ensure the RVZ remains off the aircraft parking apron. It should be noted that if a reorientation of the turf runway is pursued, it is likely that only NPE funds would be available for this project.

Additional proposed features of Airside Alternative 2 include:

1. Widen Runway 13-31 to 75 feet to meet ultimate B-II design standards.

2. Construction of a full-length parallel taxiway to serve Runway 13-31, enhancing safety and efficiency and eliminating the dual-use nature of the runway.

3. Acquisition of 2.2 acres within the ultimate ROFA associated with Runway 13-31. Property within the Runway 31 RPZ that is not controlled by the airport is also proposed to be acquired in fee or protected via easement.

4. Acquisition (fee simple or easement) of non-airport-controlled land within the RPZs associated with proposed turf Runway 6-24.

5. Inclusion of a no-taxi island on the terminal apron to mitigate the direct access points on the east apron areas. A no-taxi island is an area of either natural turf or artificial turf/paint that functions to force pilots to make a turn prior to entering the runway environment, thereby improving pilot situational awareness and reducing the risk of a runway incursion. Alternative 2 depicts a painted no-taxi island at the entrance to the existing connector taxiway.

6. Removal of the taxiway stub and holding bay that served Runway 31 prior to its extension.

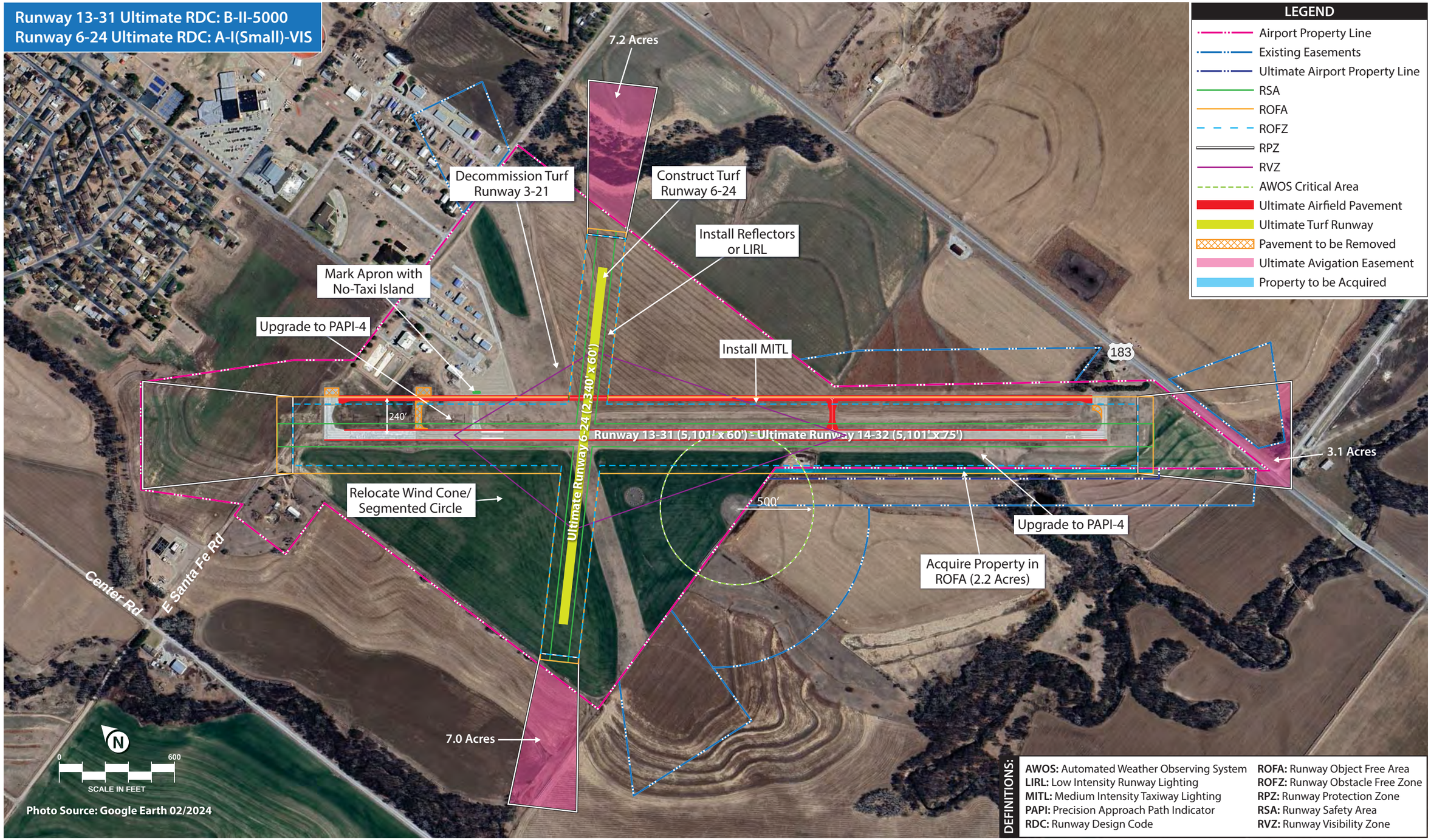
7. Construction of a new connector approximately 1,800 feet from the Runway 31 threshold.

8. Installation of MITL on all existing and proposed taxiway pavement.

9. Relocation of the lighted wind cone and segmented outside of the RVZ.

10. An upgrade of the PAPI-2 systems serving Runway 13-31 to PAPI-4s when dictated by need (i.e., increased jet operations).

Runway 13-31 Ultimate RDC: B-II-5000
Runway 6-24 Ultimate RDC: A-I(Small)-VIS



LEGEND

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- Ultimate Airport Property Line
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RSA: Runway Safety Area
RVZ: Runway Visibility Zone

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11. Installation of LIRL or reflectors on proposed turf Runway 6-24.

12. Installation of LED-lighted airfield location and directional signage.

13. Acquire avigation easement over non-airport owned property within the AWOS critical area.

AIRSIDE ALTERNATIVE 3

Airside Alternative 3 is presented on **Exhibit 4D**. Like Alternative 2, this option considers a realignment of the existing turf runway to provide a longer operating surface and greater opportunity in terms of potential landside development. The primary difference is that this option considers the potential for a paved crosswind runway meeting B-II design standards.

As mentioned previously, the airport is eligible for a B-II crosswind runway based on the available wind coverage afforded by primary Runway 13-31. Under this alternative, proposed crosswind Runway 6-24 would be constructed at a length of 3,900 feet, which would accommodate 95 percent of small aircraft with fewer than 10 passenger seats, and at a width of 75 feet in accordance with B-II standards.

As illustrated on the exhibit, property acquisition would be necessary to support the construction of the proposed crosswind runway, with approximately 21.0 acres of land within the Runway 6-24 RSA, ROFA, and ROFZ (4.7 acres to the east and 16.3 acres to the west). These areas would also require earthwork in terms of clearing and grading to meet the standards for each safety area.

In terms of the RPZs associated with proposed crosswind Runway 6-24, approximately 12.4 acres of RPZ land off each runway end is not controlled by the airport (shown in pink shading on **Exhibit 4D**). The proposed Runway 6 RPZ would also encompass Center Road. As public roads are generally considered to be incompatible within an RPZ, the alternative depicts an option to reroute Center Road outside of this safety area.

Additional proposed features of Airside Alternative 3 include:

1. Widen runway 13-31 to 75 feet to meet ultimate B-II design standards.

2. Construction of a full-length parallel taxiway to serve Runway 13-31, enhancing safety and efficiency and eliminating the dual-use nature of the runway.

3. Acquisition of 2.2 acres within the ultimate ROFA associated with Runway 13-31. Land within the Runway 31 RPZ (approximately 3.1 acres) that is not controlled by the airport is also proposed to be acquired in fee or protected via easement.

4. Removal of the existing connector taxiway from the terminal apron to the runway. While this taxiway currently serves as the only connection from the landside area to the runway, the proposed construction of a full-length parallel taxiway would provide an opportunity to close this connector and eliminate the direct access point.

5. Removal of the taxiway stub and holding bay that served Runway 31 prior to its extension.

6. Construction of a new connector approximately 1,800 feet from the Runway 31 threshold.
7. Decommissioning of existing turf Runway 3-21.
8. Construction of a parallel taxiway to serve proposed Runway 6-24, along with additional taxiway pavement to provide access to the apron.
9. Installation of MITL on all existing and proposed taxiway pavement.
10. Relocation of the lighted wind cone and segmented outside of the RVZ.
11. An upgrade of the PAPI-2 systems serving Runway 13-31 to PAPI-4s when dictated by need (i.e., increased jet operations).
12. Installation of PAPI-2s and REILs to serve proposed Runway 6-24.
13. Installation of LED-lighted airfield location and directional signage.
14. Removal of tiedowns located within the RVZ.
15. Acquire avigation easement over non-airport owned property within the RVZ and AWOS critical area.

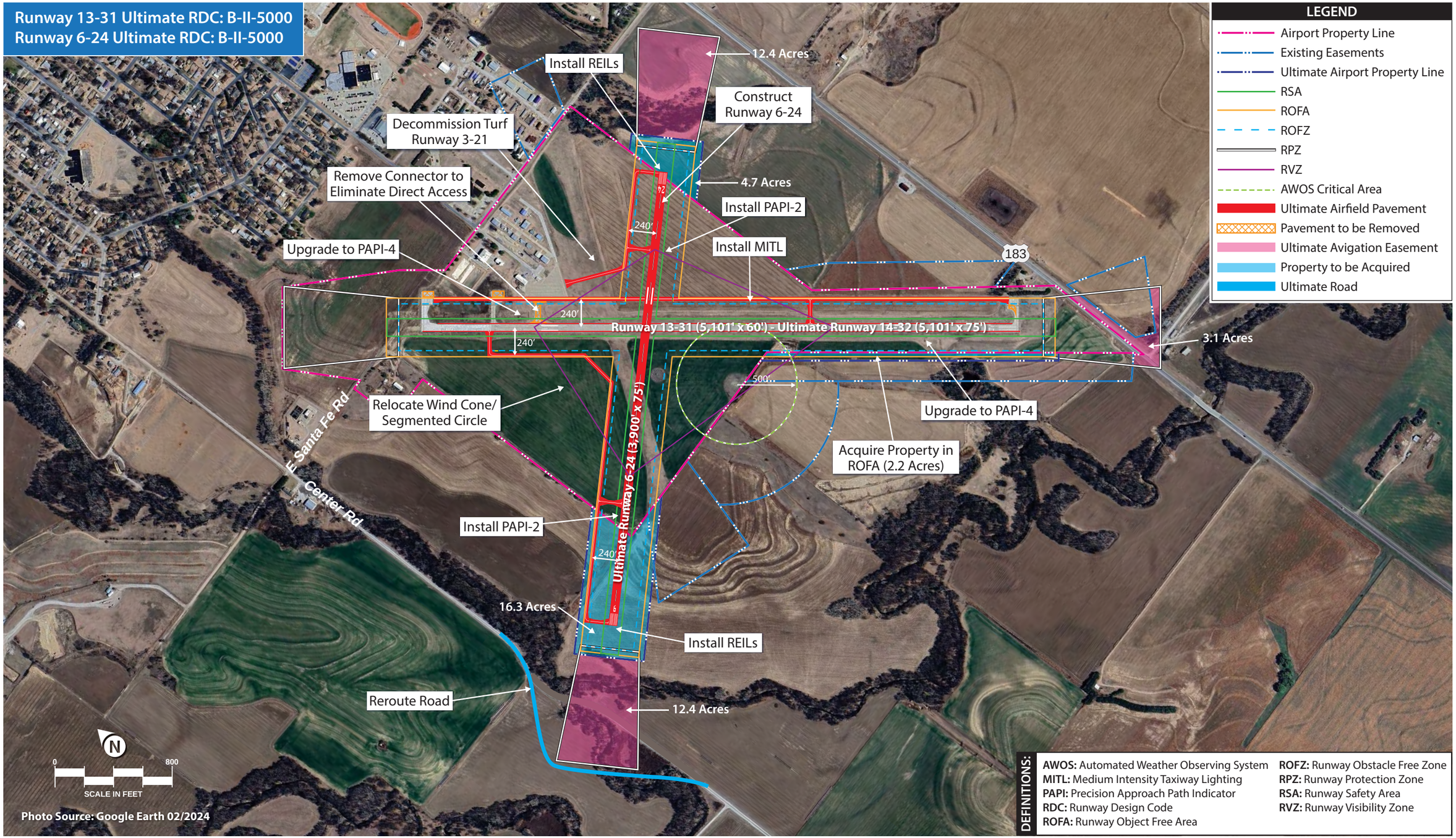
AIRSIDE ALTERNATIVE 4

Airside Alternative 4, depicted on **Exhibit 4E**, offers a final consideration to meet ultimate airfield design standards. Under this alternative, existing turf Runway 3-21 is proposed to be decommissioned, but no new crosswind runway is proposed. Rather, primary Runway 13-31 is widened to 100 feet. This exceeds the ultimate B-II width standard of 75 feet but corresponds to the next higher standard, which is an option for airports that are eligible for a crosswind runway but the inclusion of one is impractical or cost-prohibitive. According to FAA Advisory Circular (AC) 150/5300-13B, Change 2, Airport Design, "…it is acceptable to increase the width of the primary runway to the next standard width in lieu of providing a crosswind runway. The greater width allows for better operational tolerance to crosswinds."

As described previously, PHG is eligible for a crosswind runway designed to B-II standards. The existing crosswind, turf Runway 3-21, has limited utility and can accommodate small aircraft only. Moreover, in its current alignment, there are several constraining factors that limit expansion on both the airside and the landside. As such, this alternative is presented as an option to provide better crosswind coverage on the primary runway via increased width, with virtually no impact to surrounding properties. Other advantages of this alternative include the potential for landside development east and south of existing facilities, as the removal of the turf runway would allow for construction in areas that are currently not developable. Additionally, the RVZ would be eliminated, as it only applies when there is more than one runway. Thus, the wind cone would no longer be an obstruction and could remain in its existing location.

There are, however, some drawbacks that must be highlighted. As mentioned, the current funding climate is limited to only NPE funds for new pavement construction, and widening the primary runway would not be considered for programming until a full-depth reconstruction of Runway 13-31 is necessary

Runway 13-31 Ultimate RDC: B-II-5000
Runway 6-24 Ultimate RDC: B-II-5000



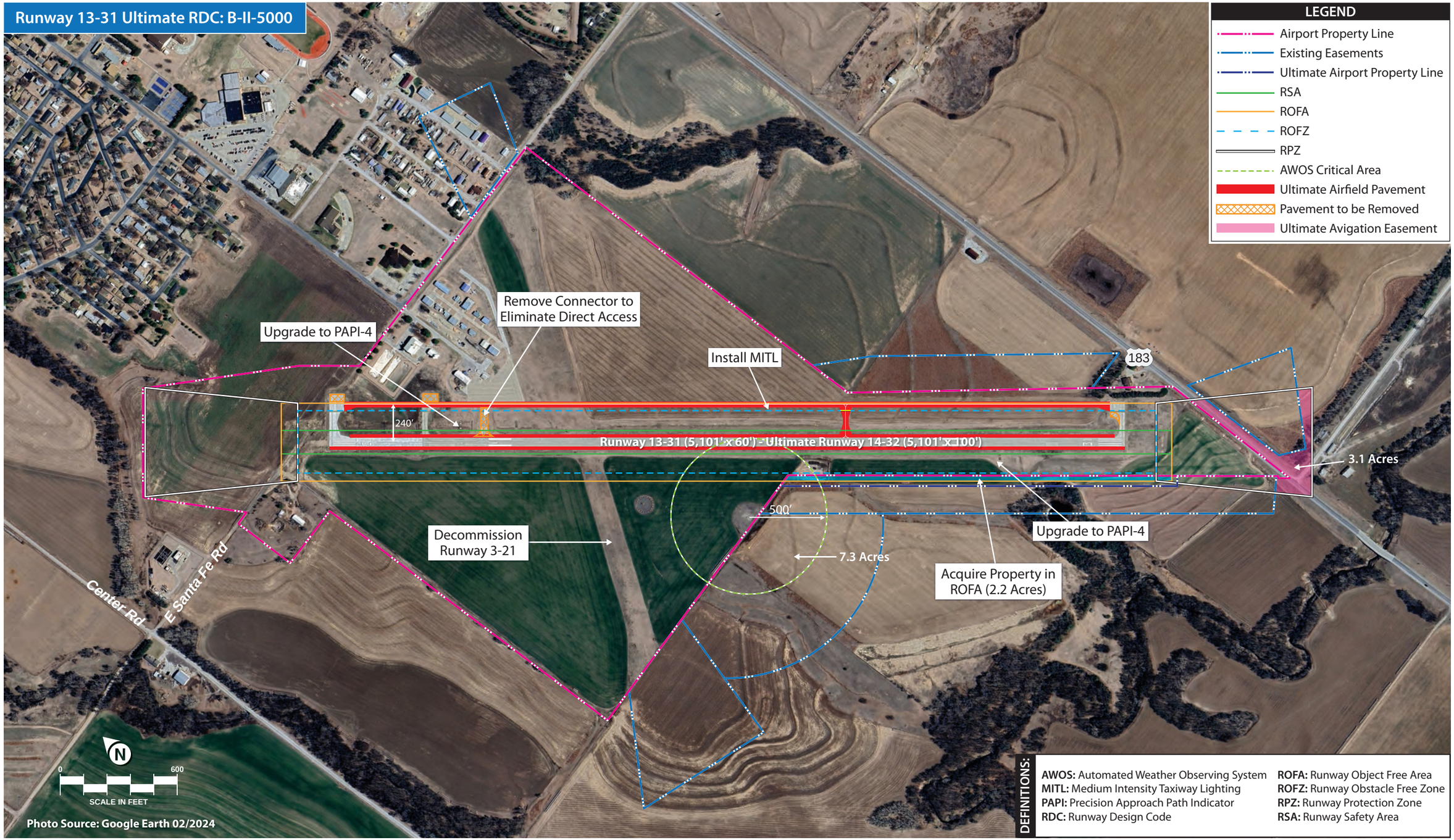
LEGEND

- Airport Property Line
- Existing Easements
- Ultimate Airport Property Line
- RSA
- ROFA
- ROFZ
- RPZ
- RVZ
- AWOS Critical Area
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Avigation Easement
- Property to be Acquired
- Ultimate Road

DEFINITIONS:

AWOS: Automated Weather Observing System
MITL: Medium Intensity Taxiway Lighting
PAPI: Precision Approach Path Indicator
RDC: Runway Design Code
ROFA: Runway Object Free Area
ROFZ: Runway Obstacle Free Zone
RPZ: Runway Protection Zone
RSA: Runway Safety Area
RVZ: Runway Visibility Zone

Runway 13-31 Ultimate RDC: B-II-5000



(estimated to be needed in 10-20 years, or potentially longer). As such, widening the runway to provide adequate wind coverage would be considered a long-term project, the timing of which would need to correspond to a full-depth reconstruction. Additionally, the airfield environment would need to be re-examined at that time, with the most recent wind coverage and operational data evaluated to determine project eligibility and justification.

Additional proposed features of Airside Alternative 4 include:

1. Construction of a full-length parallel taxiway to serve Runway 13-31, enhancing safety and efficiency and eliminating the dual-use nature of the runway.

2. Acquisition of 2.2 acres within the ultimate ROFA associated with Runway 13-31. Land within the Runway 31 RPZ (approximately 3.1 acres) that is not controlled by the airport is also proposed to be acquired in fee or protected via easement.

3. Removal of the existing connector taxiway from the terminal apron to the runway. While this taxiway currently serves as the only connection from the landside area to the runway, the proposed construction of a full-length parallel taxiway would provide an opportunity to close this connector and eliminate the direct access point.

4. Removal of the taxiway stub and holding bay that served Runway 31 prior to its extension.

5. Construction of a new connector approximately 1,800 feet from the Runway 31 threshold.

6. Installation of MITL on all existing and proposed taxiway pavement.

7. An upgrade of the PAPI-2 systems serving Runway 13-31 to PAPI-4s when dictated by need (i.e., increased jet operations).

8. Installation of LED-lighted airfield location and directional signage.

9. Acquire avigation easement over non-airport owned property within the RVZ and AWOS critical area.

AIRSIDE SUMMARY

The sections above outline four planning considerations for the airfield at Phillipsburg Municipal Airport. The primary issues on the airside are evaluating methods to meet ultimate airfield design standards, the future disposition of the crosswind runway, addressing non-standard taxiway geometry, and upgrading visual approach aids. The crosswind runway 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 and city management, and the public offer 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 should also be given to non-aviation uses that can provide additional revenue support to the airport and contribute to economic development for the region.

Landside planning considerations, summarized below, will focus on strategies following a philosophy of separating activity levels. Potential landside facility development at PHG is generally focused on the north side of the airport, where existing facilities (terminal, hangars, aircraft parking apron, etc.) are already located. Remaining portions of airport property have development potential for both aeronautical and non-aeronautical uses, which are shown on the alternative exhibits to follow.

Landside Planning Considerations
1. Consider the Building Restriction Line (BRL) when planning vertical infrastructure
2. Increase aircraft storage capacity
3. Expand aircraft parking apron and add additional marked aircraft parking
4. Relocation of fuel facilities
5. 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. The BRL is the product of Title 14 Code of Federal Regulations (CFR) Part 77 transitional surface clearance requirements, which stipulate that no object be located in the primary surface. Primary Runway 13-31 is considered an other-than-utility, non-precision instrument runway with visibility minimums greater than ¾-mile, while crosswind turf Runway 3-21 is a utility runway with visual approaches. The primary surface for Runway 13-31 is 500 feet wide, centered on the runway. For turf Runway 3-21, the primary surface is currently 250 feet wide. From the primary surface, the transitional surface extends outward at a slope of one vertical foot to every seven horizontal feet.

At PHG, the 35-foot BRL for Runway 13-31 is currently set at 495 feet from the runway centerline, and the 25-foot BRL is set at 425 feet from the centerline. For Runway 3-21, the 35-foot BRL is positioned 370 feet from the center of the runway, and the 25-foot BRL is set at 300 feet from center. Some of the landside facilities are located within the 25-foot BRL, including the terminal building and two hangars. This does not necessarily mean these structures penetrate Part 77 surfaces. If fact, 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 will request sufficient planning and airspace studies for any structures planned inside the BRL and may require marking and lighting.

Consideration #2 – Hangars

Hangar occupancy at PHG is at 100 percent, and there is a need for additional hangar capacity at the airport. As such, 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 and linear box hangars. 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 8,800 square feet (sf) of small aircraft storage space, with an additional 8,500 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. PHG has approximately 19,200 sf of executive hangar space and no conventional hangar space. An additional 6,000 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. PHG does not currently have a service/maintenance hangar; an estimated 3,800 sf are projected to be needed within this category by the end of the planning period. For planning purposes, the alternatives will depict a variety of hangar sizes that could support this type of aviation business.

Consideration #3 – Aprons and Marked Aircraft Parking

PHG has approximately 6,800 square yards (sy) of apron space for aircraft parking and circulation, with nine marked parking positions for fixed-wing aircraft. Based on projected growth in based aircraft and transient operations, an additional 500 sy of apron capacity is needed over the next 20 years. Because apron space is typically co-located with hangar facilities, the landside alternatives assume areas of hangar development will also include apron space. Additional marked aircraft parking is also projected to be needed, and the alternatives to follow will depict additional tiedowns.

Consideration #4 – Fuel Facilities

Fuel facilities at PHG consist of two 4,000-gallon tanks, with one storing 100LL and the other storing Jet A fuel. A self-serve fuel pump equipped with a credit card reader is located near the terminal building. In terms of capacity, the existing 4,000-gallon tanks are considered adequate through the planning period;

however, the fuel communication pedestal associated with the self-service pump is in need of replacement. As part of a long-term landside development plan, the alternatives will depict a reconfiguration of existing fueling facilities to improve circulation on the apron.

Consideration #5 – Land Development

The landside alternatives present development and redevelopment areas on the airport for aeronautical and non-aeronautical uses, considering the highest and best use potential of each area. Aeronautical uses are typically reserved for property with direct access to the airfield. The FAA stipulates that all land with reasonable airside access should be used or reserved for aviation purposes. For property that is segregated from the airfield, the airport could consider non-aeronautical development, following coordination with the FAA. Generally, airport property is subject to AIP grant assurances.

If the City of Phillipsburg wishes to pursue non-aeronautical development on airport property acquired with federal grants, they must coordinate with the FAA to request a land use change. If the FAA determines that the land is not needed for aeronautical purposes until a long-term condition is met, a land use change may be justified and granted for a short-term use. The proceeds derived from the land use change must be used exclusively for the benefit of the airport. They may not be used for a non-airport purpose, and they cannot be diverted to the airport sponsor's general fund or used for general economic development unrelated to the airport.

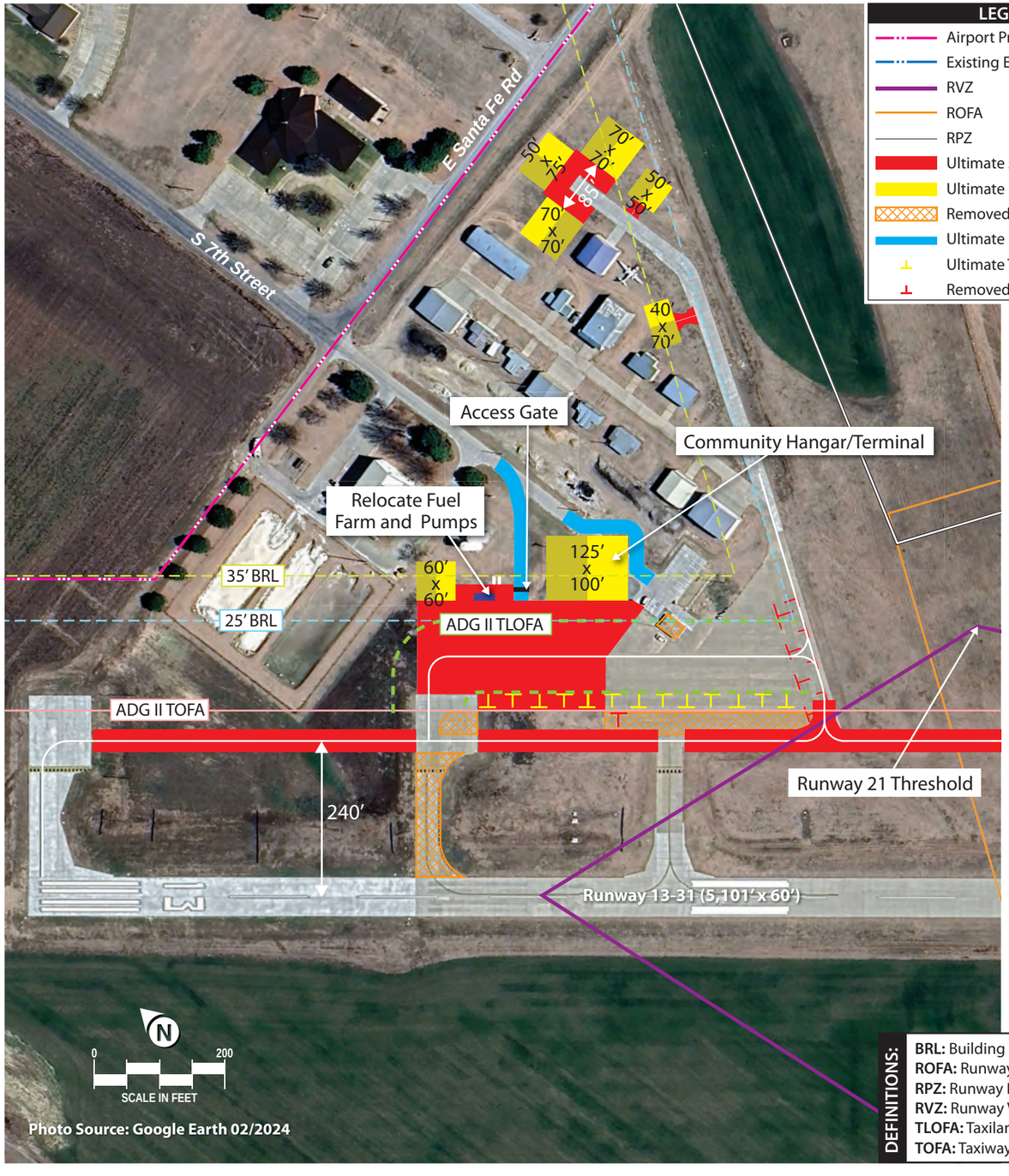
The following sections detail three landside alternatives as they relate to the considerations detailed above. Each alternative meets the landside needs outlined in the previous chapter, and in fact exceeds those needs in order to provide greater flexibility for long-range planning. The alternatives 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 City of Phillipsburg in the strategic planning of airport property. Airport operators often 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 4F**, Landside Alternative 1 focuses primarily on expansion of aircraft storage facilities, including redevelopment of the terminal area and relocation of fuel facilities. This alternative assumes the continued maintenance of crosswind turf Runway 3-21. A 25- and 35-foot BRL are also shown for planning purposes.

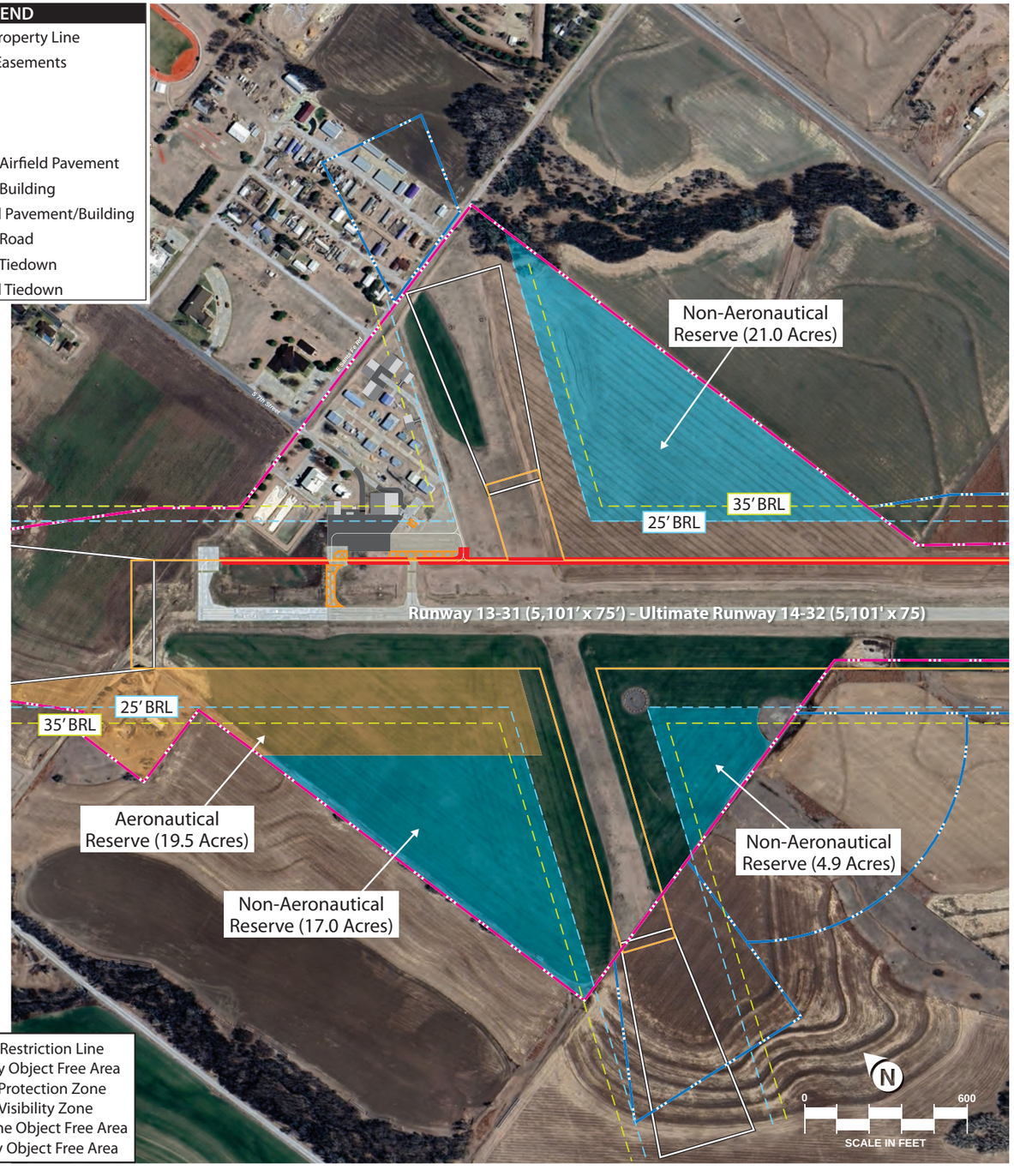
The features of Landside Alternative 1 include:

1. Expansion of the aircraft apron to the northwest to support a 125-foot by 100-foot community hangar, a 60-foot by 60-foot executive box hangar, and new fuel facilities. The community hangar is intended to provide storage space for transient operators, with a portion of the building used for terminal services. The existing terminal building is planned to be removed. Proposed fuel facilities include a self-service pump and aboveground storage tanks. A vehicle access road and security gate are also proposed.



LEGEND

- Airport Property Line
- Existing Easements
- RVZ
- ROFA
- RPZ
- Ultimate Airfield Pavement
- Ultimate Building
- Removed Pavement/Building
- Ultimate Road
- Ultimate Tiedown
- Removed Tiedown



DEFINITIONS:

BRL: Building Restriction Line
ROFA: Runway Object Free Area
RPZ: Runway Protection Zone
RVZ: Runway Visibility Zone
TLOFA: Taxilane Object Free Area
TOFA: Taxiway Object Free Area

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2. Construction of executive box hangars along the east taxilane. Runway 3-21 limits development to the east, when factoring in the runway's safety areas and Part 77 surfaces. New executive box hangars are proposed on the taxilane's west side, with two east side hangars located at the end of the taxilane to avoid penetrations to the transitional surface. Proposed hangars range in size from 2,500 sf to 4,900 sf.

3. Additional marked aircraft parking. The apron expansion and proposed parallel taxiway allow for a reconfiguration of the existing tiedowns that are located on the south and east sides of the existing apron, as well as the inclusion of additional aircraft parking. Currently, the apron can become congested when an aircraft is fueling and other aircraft are parked on the tiedowns located closest to the taxilane. In these instances, there may not be adequate wingtip clearance for taxiing aircraft entering or exiting the hangar area. As such, Landside Alternative 1 proposes removal of the existing tiedowns and installation of 13 new tiedowns along the southwestern edge of the apron.

4. Options for both aeronautical-use and non-aeronautical reserve property are depicted on the right side of **Exhibit 4F**. Approximately 19.5 acres south of Runway 13 are proposed to be reserved for future aeronautical uses, should the demand arise. Other, less accessible areas are proposed for non-aeronautical purposes. This includes approximately 21.0 acres north of Runway 13-31, and two additional parcels on the south side of the runway – one encompassing approximately 17.0 acres and another 4.9 acres.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2 is depicted on **Exhibit 4G** and considers a scenario in which turf Runway 3-21 is decommissioned and a new paved crosswind runway, Runway 6-24, is constructed (Airside Alternative 3). This orientation would allow for a larger expansion of the existing landside area, with more development proposed to the east along Santa Fe Drive. It should be noted that the alternative is based on the more restrictive B-II design for proposed Runway 6-24, which comes with larger safety areas and a wider primary surface than the turf Runway 6-24 option.

The proposed features of Landside Alternative 2 include:

1. Expansion of the aircraft apron to the northwest to support a 125-foot by 100-foot community hangar, a 60-foot by 60-foot executive box hangar, and new fuel facilities. The community hangar is intended to provide storage space for transient operators, with a portion of the building used for terminal services. The existing terminal building is planned to be removed. Proposed fuel facilities include a self-service pump and aboveground storage tanks. A vehicle access road and security gate are also proposed, along with a reconfiguration of the aircraft parking area.

2. Construction of executive box hangars and larger, conventional hangars along the existing east taxilane. With the proposed closure of turf Runway 3-21, additional hangars can be constructed in this area and along Santa Fe Road without impacting runway safety areas or Part 77 surfaces. The existing taxilane is proposed to be extended to accommodate two additional 60-foot by 60-foot hangars. Additional executive box hangars (60-foot by 60-foot) and conventional hangars (100-foot by 100-foot) are proposed to further develop vacant areas along the taxilane. An access road extending from Santa Fe Road is also proposed to better segregate vehicle and aircraft movements.

3. Development of a new hangar area east of the existing taxilane. This includes new apron and taxilane pavement to support executive box hangars, T-hangars, and a 150-foot by 125-foot conventional hangar. Airside access to this area would be provided via a taxiway connector extending from the parallel taxiway serving proposed Runway 6-24. Vehicle access and parking are also included.

4. Options for both aeronautical-use and non-aeronautical reserve property are depicted on the right side of **Exhibit 4G**. In terms of aeronautical reserve, approximately 5.3 acres near the existing landside area are proposed to be earmarked for future hangar development. An additional 20.6 acres south of Runway 13 are also proposed to be reserved for future aeronautical uses, should the demand arise. Other, less accessible areas are proposed for non-aeronautical purposes. This includes approximately 4.9 acres north of Runway 13-31 and 3.8 acres south of the proposed runway intersection.

LANDSIDE ALTERNATIVE 3

Landside Alternative 3 is depicted on **Exhibit 4H**. This alternative is based on Airside Alternative 4, which considers the closure of turf Runway 3-21 and widening of primary Runway 13-31 to 100 feet, with no option for a crosswind runway. This layout would provide maximal landside development opportunity, as development could occur along much of the flightline associated with Runway 13-31.

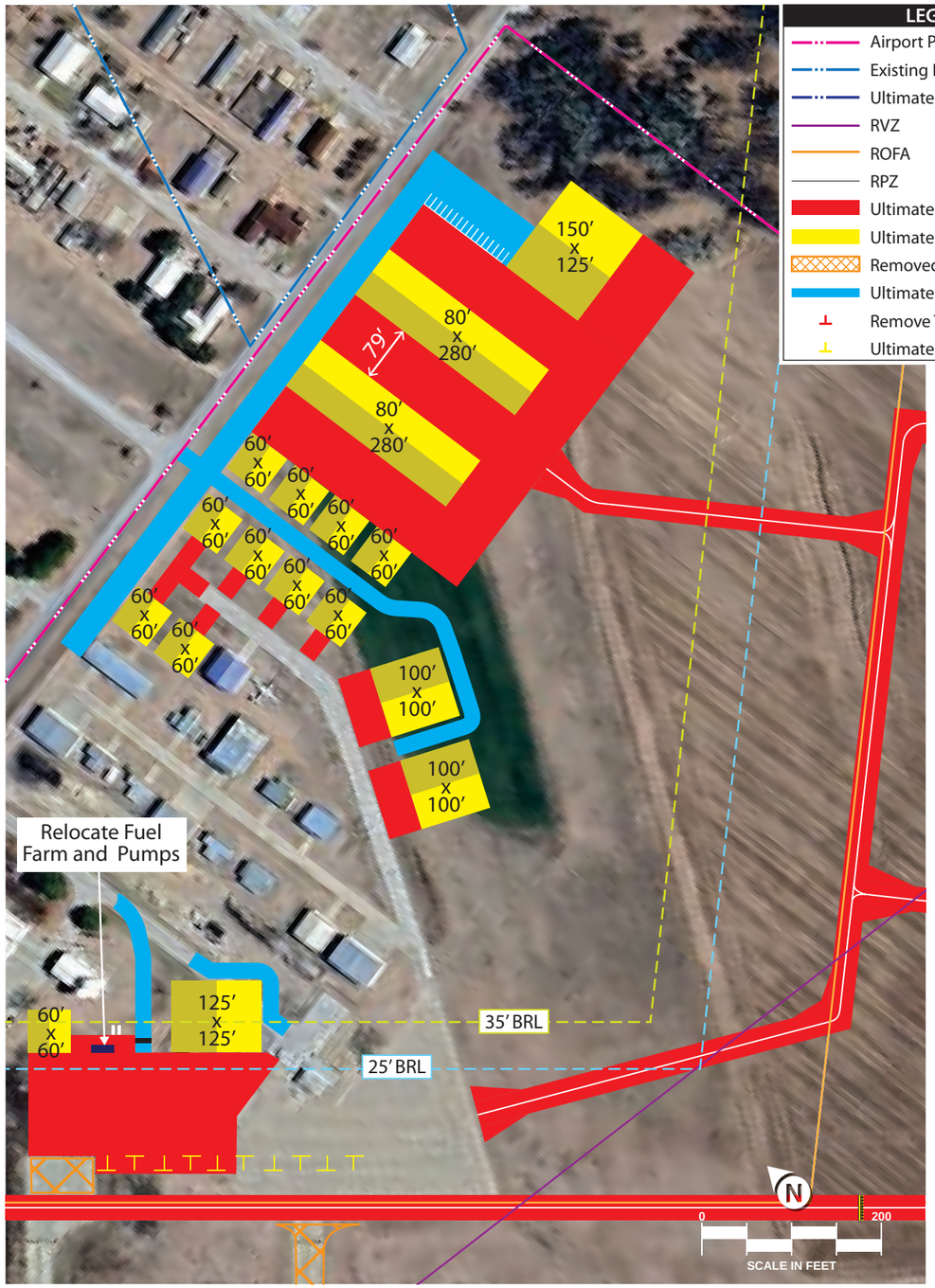
The proposed features of Landside Alternative 3 include:

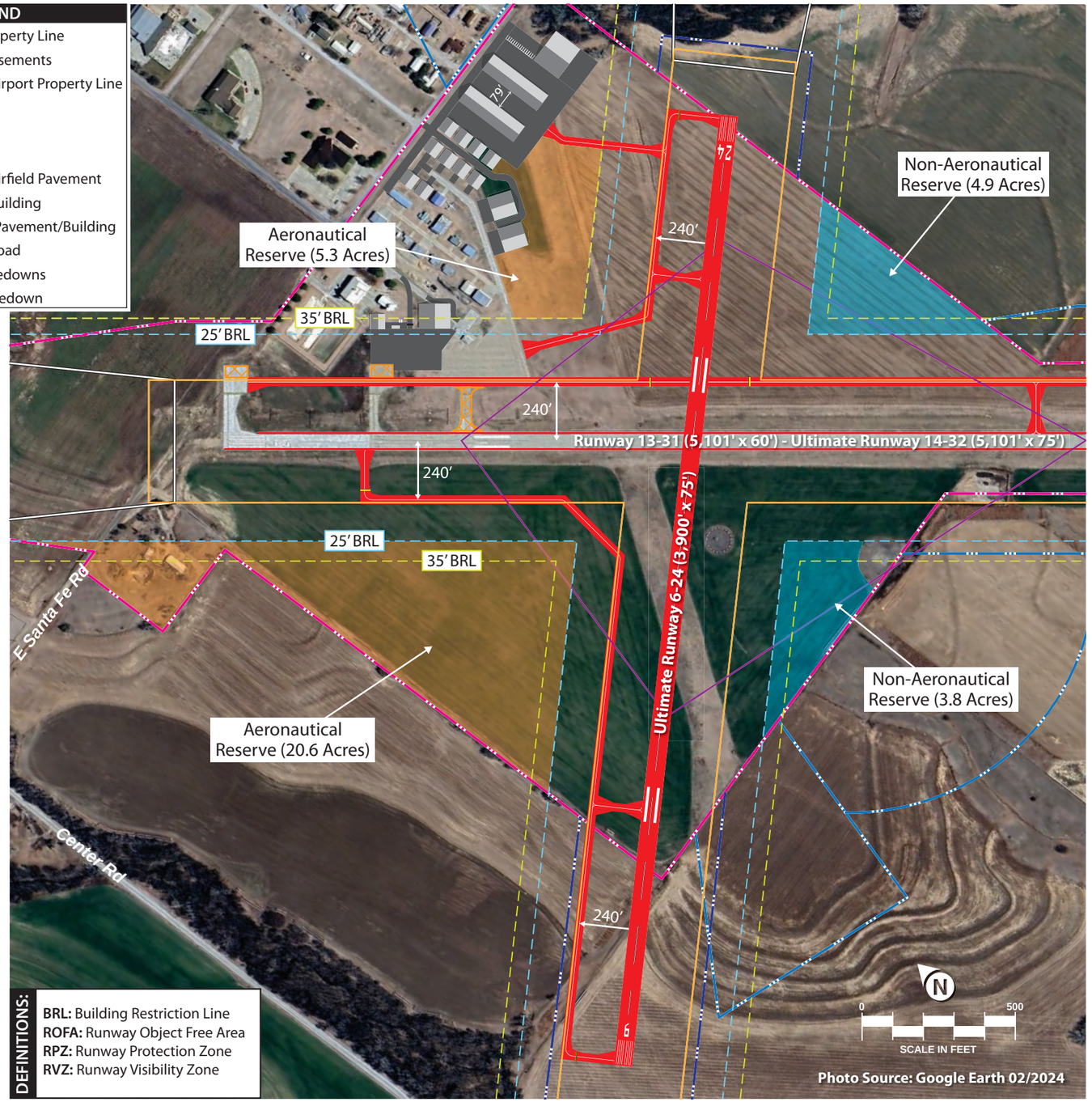
1. Expansion of the aircraft apron to the northwest to support a 125-foot by 100-foot community hangar, a 60-foot by 60-foot executive box hangar, and new fuel facilities. The community hangar is intended to provide storage space for transient operators, with a portion of the building used for terminal services. The existing terminal building is planned to be removed. Proposed fuel facilities include a self-service pump and aboveground storage tanks. A vehicle access road and security gate are also proposed, along with a reconfiguration of the aircraft parking area.

2. Construction of two 6-unit T-hangars on the east side of the existing taxilane.

3. Construction of a new apron supporting four conventional hangars, ranging in size from 100-foot by 100-foot to 125-foot by 125-foot. The apron is proposed to connect to the east side of the existing apron, with a new taxilane extending northeast to provide access to additional executive box hangars (80-foot by 80-foot). Vehicle access and parking are also proposed for all new hangar areas.

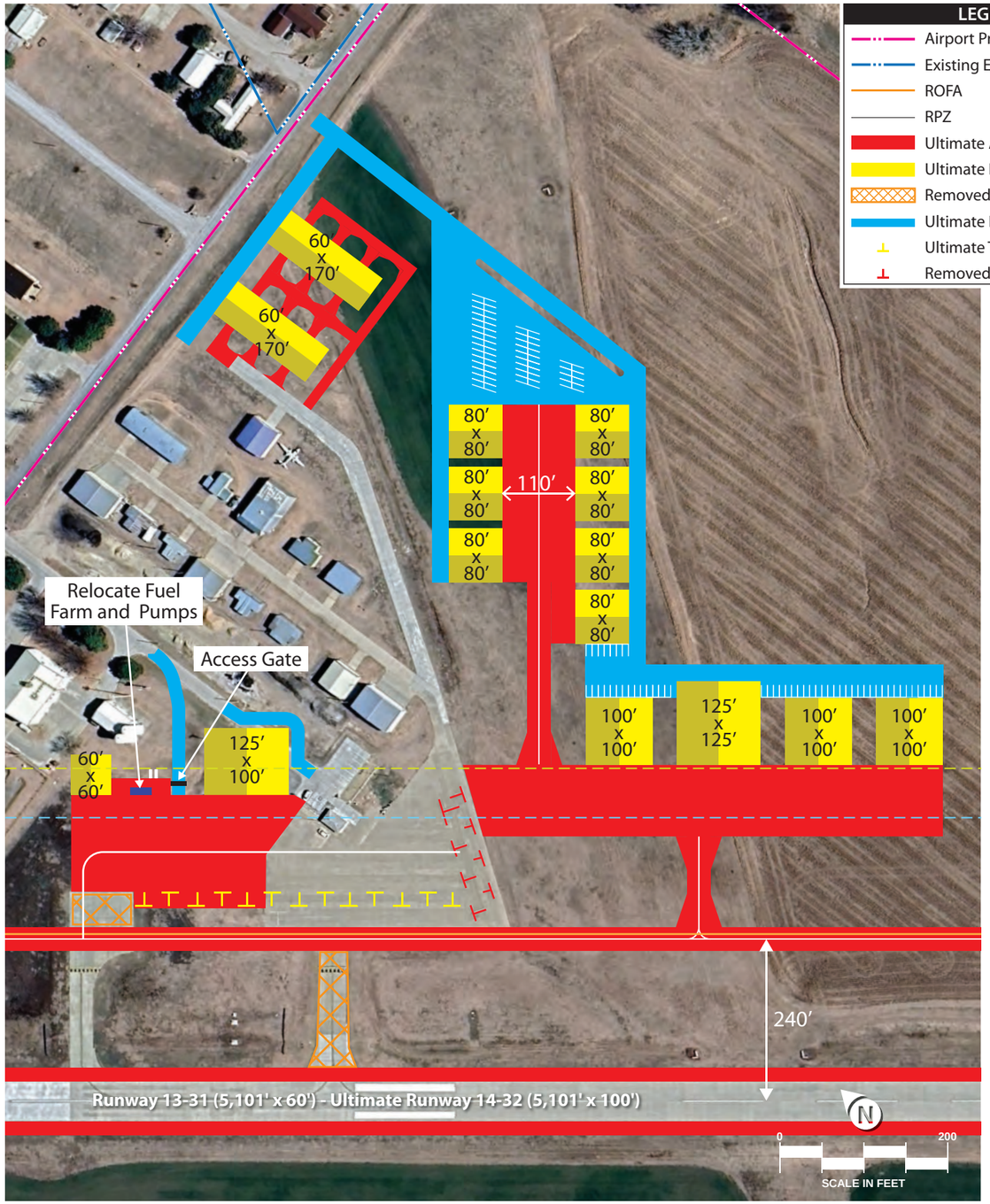
4. Options for both aeronautical-use and non-aeronautical reserve property are depicted on the right side of **Exhibit 4H**. In terms of aeronautical reserve, approximately 6.0 acres along the extended flight line are proposed to be earmarked for future hangar development. An additional 20.0 acres south of Runway 13 are also proposed to be reserved for future aeronautical uses, should the demand arise. Other, less accessible areas are proposed for non-aeronautical purposes. This includes approximately 22.6 acres north of Runway 13-31 and 40.7 acres south of the runway.





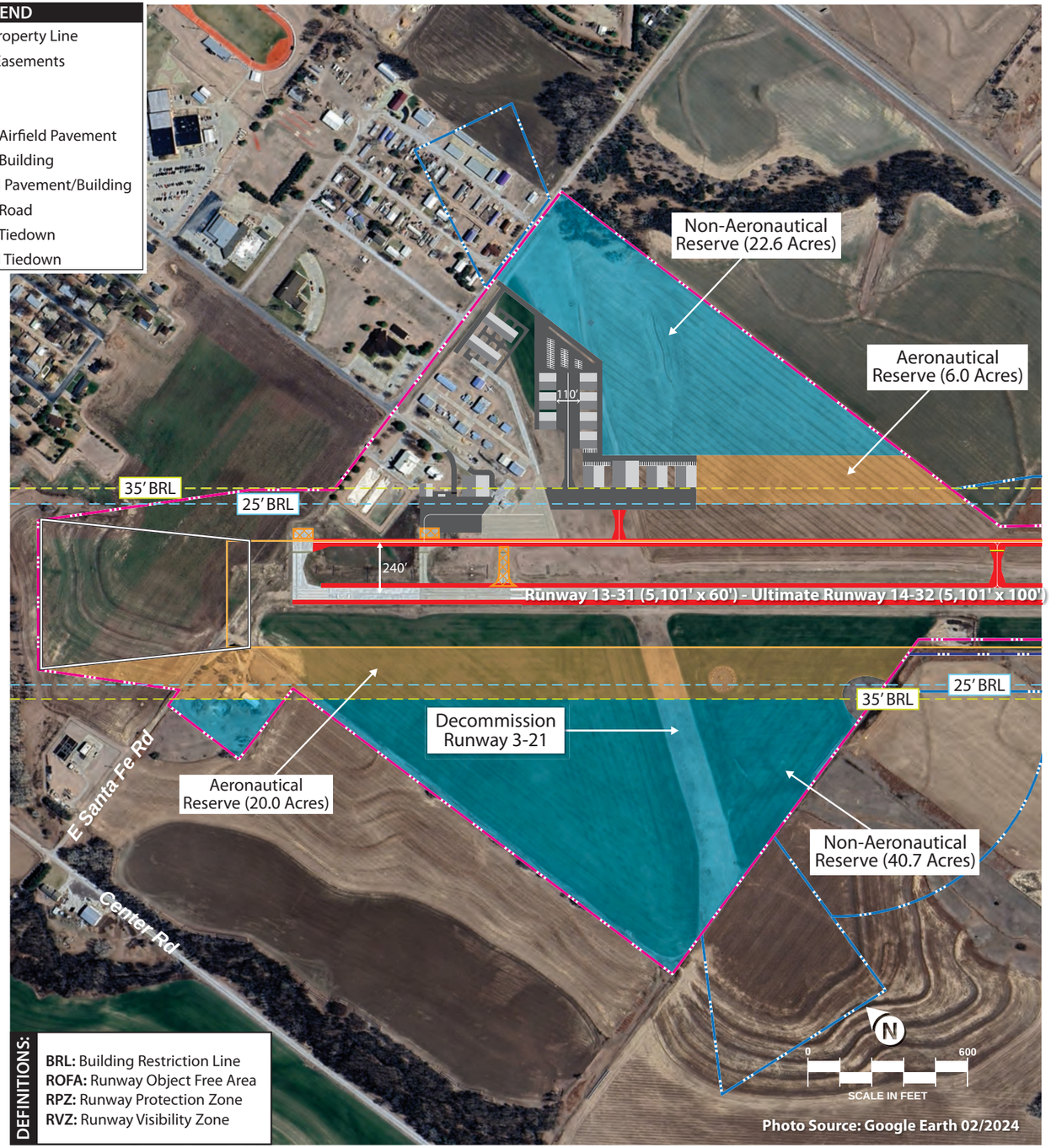
DEFINITIONS:

BRL: Building Restriction Line
ROFA: Runway Object Free Area
RPZ: Runway Protection Zone
RVZ: Runway Visibility Zone



LEGEND

- Airport Property Line
- Existing Easements
- ROFA
- RPZ
- Ultimate Airfield Pavement
- Ultimate Building
- Removed Pavement/Building
- Ultimate Road
- Ultimate Tiedown
- Removed Tiedown



DEFINITIONS:

BRL: Building Restriction Line
ROFA: Runway Object Free Area
RPZ: Runway Protection Zone
RVZ: Runway Visibility Zone

LANDSIDE SUMMARY

The landside alternatives presented are intended to accommodate an array of aviation activities that either currently occur at PHG or could be expected to occur in the future. There is current demand for new facilities at PHG, and airport and city 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.

SUMMARY

This chapter is intended to present an analysis of various options that 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 pavement geometries that previously qualified as standard becoming classified as non-standard.

Several development alternatives related to both the airside and the landside have been presented. For the airside, the major considerations involve meeting ultimate airfield design standards, the future disposition of the existing turf runway, addressing non-standard taxiway geometry, and upgrading visual approach aids. For the landside, alternatives were presented depicting additional hangar and apron development, with consideration given to the ultimate disposition of the crosswind runway.

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 KDOT 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 show airport/city management what local funds will be necessary to implement the plan.