



CHAPTER 4

AIRPORT DEVELOPMENT ALTERNATIVES

In the previous chapter, the 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) and Wisconsin Department of Transportation (WisDOT) – Bureau of Aeronautics (BOA) standards were discussed that apply to airfield design and landside opportunities. The next step in the planning process is to evaluate reasonable ways to provide appropriate facilities that meet FAA and/or BOA design standards, can handle forecasted demand, and address the goals and objectives of Sawyer County's aviation community. The purpose of this chapter is to formulate and examine rational development alternatives that address the short-, intermediate-, and long-term planning horizon demand levels. As there are a multitude of possibilities and combinations of development options, it is necessary to focus these efforts on opportunities that have the greatest potential for success. Each alternative provides a different approach to meet existing and future facility needs as defined by demand, and are presented for purposes of evaluation and discussion. Alternatives generally serve as the opening salvo in the formulation of a recommended long term airport development plan. It is important to understand that these alternatives are just options until a final plan is developed.

Some airports become constrained due to limited 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 Sawyer County Airport (HYR). Proper planning at this time can ensure the long-term viability of the airport for aviation and economic growth. While it is in the long-term economic interest of the County to explore all development opportunities to meet local/regional demand, it is also a direct requirement due to historical agreements and commitments made with the FAA upon issuance of federal grants in aid.

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 existing and projected market demand over the next 20 years. This chapter will outline several reasonable alternatives so that a plan of action can be developed in a manner that is consistent with the future goals and objectives of Sawyer County, airport users, the local community, and the surrounding region, all of whom have a vested interest in the development and operation of HYR.

The intent of this chapter and its analysis is to develop an underlying rationale that supports the final recommended development concept to be presented in the following chapter. This process will evaluate the best uses of airport property 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 Sawyer County, airport management, the Planning Advisory Committee (PAC), and the public, a refinement of the various alternatives will be transformed into a singular recommended development concept. Therefore, the planning considerations and alternatives presented in this chapter can be considered a starting point in the evolution of the recommended development concept for the future of HYR.

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 and/or BOA design standards to the greatest degree possible. As the owner with responsibility for the airport's operation, Sawyer County provides the overall guidance for the daily and long-term development of the airport. It is of primary concern that HYR is marketed, developed, and operated for the betterment of the community it serves and those who use it. 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 do what is possible and practical to 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.

NO ACTION/NON-DEVELOPMENT ALTERNATIVES

Sawyer County is charged with the overall development and management of HYR for the economic betterment of the community and region. This charge is both a local responsibility and a federal assurance due to obligations of previously accepted grants-in-aid utilized to improve the airport. In some planning efforts, alternatives may seriously consider the no action, or do-nothing option. For HYR, however, 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. 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 BOA, which is to enhance local and interstate commerce. As previously noted, the acceptance and use of state and federal grants carry an obligation, called grant assurances, that requires the County to maintain and allow for the improvement of HYR 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 County to breach these obligations and could create associated legal actions. Therefore, a no action alternative is not considered a reasonable or viable alternative to pursue and will not be considered further.

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 HYR is a very complex and expensive option. A new site would require greater land area, duplicate the investment in facilities, require the installation of supporting infrastructure that is already available at the existing site, and have a greater potential for negative impacts to natural, biological, and cultural resources.

The purpose of this study is to examine aviation needs at HYR over the course of the next 20 years. This master plan will, therefore, examine the needs of the existing airport and 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 Sawyer County, the FAA, and BOA on an individual project basis. The analysis to follow considers airside and landside development alternatives which consider 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 and 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 HYR are met. The landside portion 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. Thus, 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 HYR 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 HYR 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. Improve primary Runway 3-21 from existing RDC B-II-4000 to full C-II-4000 standards with options to ultimately meet RDC D-III-4000.
2. Meet ultimate RDC A-I(Small)-VIS standards on Turf Runway 16-34.
3. Analyze options to extend primary Runway 3-21 to better accommodate increased operations by more demanding turbine aircraft.
4. Mitigate for upgraded safety areas (runway safety area [RSA], runway object free area [ROFA], and runway protection zone [RPZ]).
5. Analyze options to increase runway to parallel taxiway dimensions to meet RDC D-III-4000 design standards.
6. Consider options to improve instrument approach minimums for Runway 3.
7. Consider property acquisition, as needed, and environmental factors for all alternative measures.

Consideration #1 – Improve Primary Runway 3-21 from Existing RDC B-II-4000 to full C-II-4000/D-III Design Standards

As detailed in Chapter Two, the critical aircraft analysis concluded that Runway 3-21 should meet Runway Design Code (RDC) B-II-4000 design standards, but transition to C-II-4000 in the short term. Ultimately, the runway could need to meet RDC D-III-4000 standards if based and transient users operate from larger aircraft platforms on a more regular basis. While many operations already utilize these larger aircraft, the total annual operations have not yet hit the critical aircraft threshold of 500 annually. It is believed that these operations will exceed the threshold in the future and, as a result, the runway should be planned to meet the higher design standard.

Major Standards Changing as RDC C/D-III is realized:

- RSA increases in size to 500 feet wide by 1000 feet beyond each runway end.
- ROFA increases in size to be 800 feet wide by 1,000 feet beyond each runway end.
- BRL – Primary surface increases to be 1,000 feet wide to accommodate precision instrument Runway 21 at ½ mile visibility (the 20' BRL will be shown on landside exhibits).
- RPZ for Runway 21 increases in size to meet ½-mile visibility minimums while Runway 3 RPPZ will increase based on ultimate not lower than ¾-mile visibility minimums.
- Parallel Taxiway separation requirement increases to be 400 feet (centerline to centerline)
- TOFA increases to 158 feet wide, centered on the taxiway.

Consideration #2 – Meet RDC A-I(Small)-5000 Design Standards for Turf Runway 16-34

Turf Runway 16-34 provides a valuable resource for the small aircraft that use it, and it should be maintained through the planning period. Alternatives will be considered to allow for the turf runway's long-term continuance. The runways' current dimensions are adequate and should be maintained throughout the planning period as local resources allow.

Consideration #3 – Analyze Options to Extend Primary Runway 3-21 to Better Accommodate Increased Operations by More Demanding Turbine Aircraft

Runway 3-21 is currently 5,002 feet long and 100 feet wide. The runway's current length meets the needs of most existing users, but can be taxing on some, especially during hot days when jet engines require additional runway length. The existing width exceeds RDC B-II-4000 design standards. As discussed in the previous chapter, the extra width provides an additional safety margin and should be maintained, especially as the airport transitions to ARC C/D-II/III standards. A 100-foot-wide runway is the RDC C/D-II/III design standard and puts the County ahead of actual need.

Regarding the need for a runway extension, the runway length analysis in the previous chapter illustrated that several turbine operators are currently, and will become, increasingly weight-restricted or unable to operate on the existing runway length, particularly during hot weather. 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 benefit of extending the runway when considering existing constraining factors.

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

The existing RSA and ROFA are currently within design requirements for RDC B-II-4000. The planned transition to meet increased demand by aircraft in approach categories C and D will substantially increase the size of all safety areas. The increased RDC C/D-II/III RSA and OFA will contain obstructions, such as vegetation, the localizer antenna, and the main apron, as detailed in the previous chapter. In terms of RPZ incompatibilities, portions of future potential RPZs for Runway 3 could contain incompatible uses. The alternatives to follow will explore options to mitigate these non-standard conditions within the safety areas.

Consideration #5 - Analyze Options to Increase Runway 3-21 Parallel Taxiway A Separation Distance to Meet RDC D-III-4000 Design Standards

The ultimate design target being considered for primary Runway 3-21 is RDC D-III-4000. This would include top-end business jets, such as many of the larger Gulfstream models. The partial parallel Taxiway A is currently separated from Runway 3-21 by 300 feet, which meets up to RDC C-II-4000 standards. The ultimate target would be consideration of a shift to D-III standards.

Consideration #6 – 6. Consider options to improve instrument approach minimums for Runway 3

HYR is currently served by three published instrument approach procedures. Runway 21 has the instrument landing system (glideslope and localizer antenna with medium intensity approach lighting system [MALSR]), while global positioning system (GPS) approaches serve both runways. Runway 21 visibility minimums are not lower than $\frac{3}{4}$ -mile, whereas Runway 3 minimums are not lower than one mile.

There has been an expressed interest in lowering the Runway 21 visibility minimums to Category I (not lower than $\frac{1}{2}$ -mile visibility minimums) and for Runway 3 to not lower than $\frac{3}{4}$ -mile visibility minimums. As described previously in Chapter Three, the approach visibility minimums serving a particular runway end help dictate the size of the RPZ. Currently, the RDC B-II-5000 RPZ associated with Runway 3 measures 1,000 feet (length) by 500 feet (inner width) by 700 feet (outer width). A straight-in instrument approach with visibility minimums below 1-mile, but not lower than $\frac{3}{4}$ -mile, would increase the size of the RPZ significantly, with the approach RPZ dimensions measuring 1,700 feet in length, 1,000 feet for the inner width and 1,510 feet for the outer width. For Runway 21, the RPZ would balloon to 2,500 feet in length and have a 1,000-foot inner width and a 1,750-foot outer width.

Consideration #7 – Consider Property Acquisition as Needed and Environmental Factors for All Alternative Measures.

Some alternatives will require property for the protection of airspace and safety areas as defined above. These alternatives could utilize tools such as fee simple acquisition or minimal easement options. Moreover, the surrounding area is encompassed by several zones delineated as federally recognized wetlands. These areas are identified on the alternatives and, if encumbered, would require some level of mitigation measures.

AIRSIDE ALTERNATIVE 1

Depicted on **Exhibit 4A**, Airside Alternative 1 focuses primarily on bringing the safety areas associated with Runway 3-21 into compliance with FAA standards while also offering the maximum extension to the north feasible to keep the Runway 21 RPZ on airport-owned property (fee and easement). This option would provide a 500-foot extension of the runway and add a blast pad to both runway ends to meet ultimate RDC D-III-2500 standards. As a result, primary Runway 3-21 would be 5,502 feet long by 100 feet wide, and the Runway 21 RPZ would increase in size as discussed earlier to support full CAT I visibility minimums.

It should be reiterated that 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 the expense of such a project.

As depicted, the alternative would encompass all of the enlarged Runway 21 RPZ; however, the Runway 3 RPZ would not be similarly simple to achieve. As shown on Exhibit 4A, the Runway 3 end considers 3 RPZ dimensions. The smallest RPZ is the existing one for RDC B-II-4000 and is fully contained on airport property. The next two larger RPZ's would contain residential housing units for both the RDC C/D-III-5000 (not lower than one mile) and the C/D-II/III-4000 (not lower than $\frac{3}{4}$ -mile visibility minimums) standards. In short, once the airport transitions to approach category C, the RPZ would expand to encompass residential uses. Residential uses in an RPZ are generally not favored by the FAA and could require some mitigation measures. For this alternative the mitigation measures for removing residential uses within the Runway 3 RPZ could include:

- Fee simple acquisition of property under Federal acquisition and relocation processes.
- Land use zoning changes for property in the RPZ as practical/feasible to minimize congregation of people in the RPZs.
- Using declared distances via displacing the landing threshold for Runway 3 by a minimum of 200 feet for RDC C-II-5000 or as much as 1,100 feet to the north for RDC C-II-4000, thereby shortening Runway 3 landing distance available to 4,402 feet under this alternative.

Airside Alternative 1 illustrates an option that would bring Runway 3-21 into compliance with FAA design standards as they relate to the RSA and ROFA. As shown, the alternative proposes removal of the obstructions within these safety areas, including the removal of 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. The larger ROFA will extend onto the main parking apron as shown. As a result, more than half of the apron would no longer be usable for parking, only circulation.

Finally, the alternative shows relocating Taxiway A to be separated from Runway 3-21 by 400 feet, and the addition of midfield exit taxiways (B and C) to improve airfield capacity and operational flow. Taxiway B would require a "no taxi island" as it would directly connect the runway to an apron. As shown on **Exhibit 4A**, the island would simply be green paint on the apron.

Ancillary accommodations for the alternative would include:

- Relocation/modification of the glideslope antenna on Runway 21.
- Relocation of the precision approach path indicator (PAPI) on Runway 21.
- Relocation of the medium intensity approach lighting system with runway alignment lights (MALSR) for Runway 21.
- Relocate the localizer south out of the RSA/ROFA as shown.
- Relocation of the automated surface observation system (ASOS) weather antenna array as shown.
- Grade and remove vegetation within the RSA and ROFA and mitigate wetlands impacted.

AIRSIDE ALTERNATIVE 2

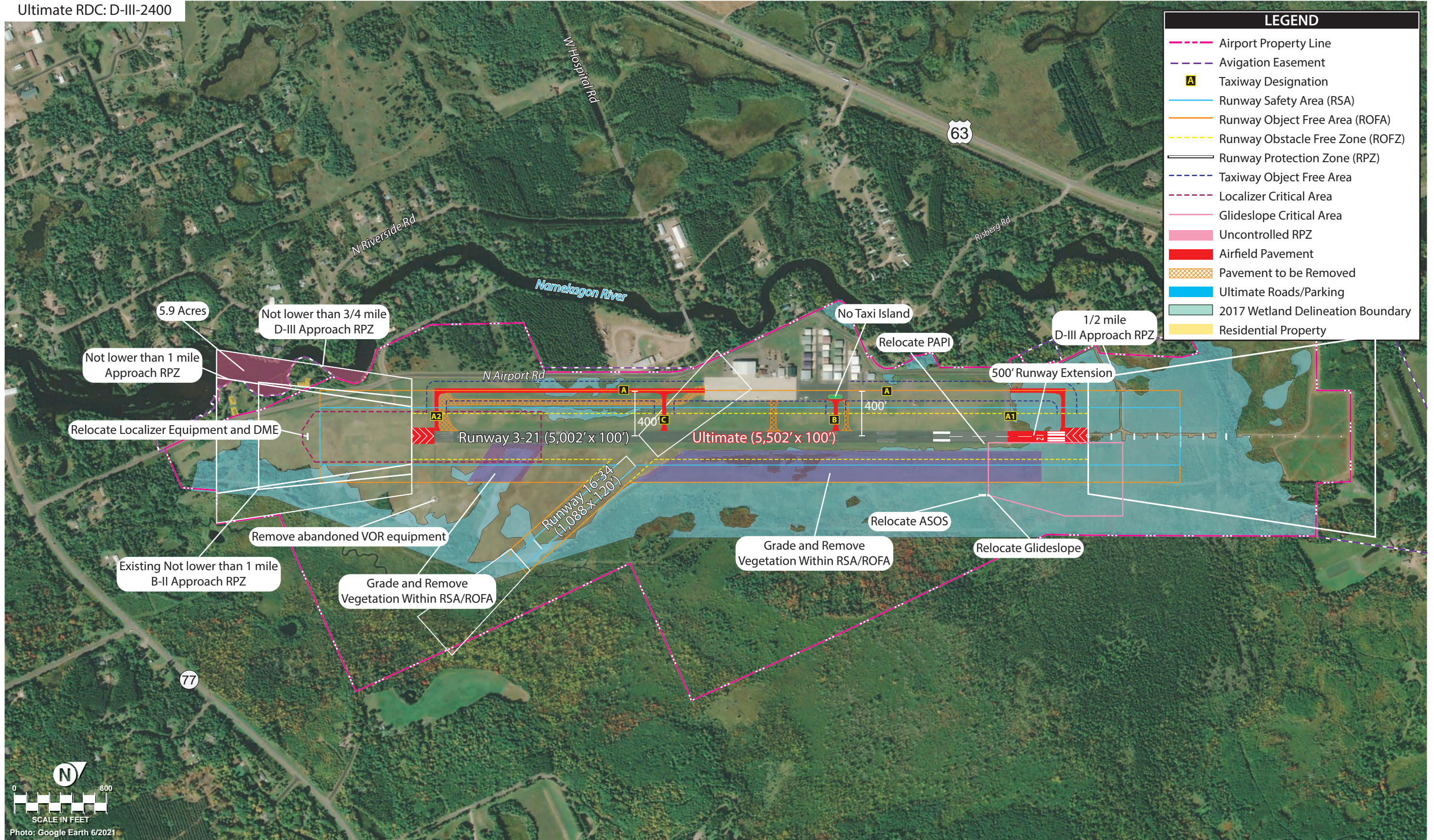
Depicted on **Exhibit 4B**, Airside Alternative 2 considers a more significant approach to meeting Runway 3-21 length and design standard increases. As shown on the exhibit, the proposal would be a newly constructed runway 200 feet east of the current runway. The easterly shift would not provide a longer runway but would provide a greater runway-to-parallel-taxiway separation of 400 feet. As a result, the existing terminal area would not be impacted by the shift to RDC C/D-II/III's larger ROFA, and the apron could actually be expanded. The proposal would meet design standards while also shifting operational movements away from local residences to the west. In fact, two of the residences that would be potentially within the RPZ under Alternative 1 would not be in the RPZs for this option.

The construction of a shifted runway would require complete closure of the airport while under construction and would impact a large portion of the wetlands to the east of the current runway. While the airport has property to the east, additional property acquisition could be required to meet both runway ends' RPZ.

Actions related to the runway extension include:

- Extension of full-length parallel Taxiway A and construction of two new hold aprons.
- Removal of existing Runway 3-21 pavement and some of the existing Taxiway A.
- Relocation of the MALSR, glideslope antenna, and localizer antenna.

Ultimate RDC: D-III-2400



- Relocation of both PAPIs.
- Relocation of ASOS.
- Mitigate two residential units within the RDC C/D-II/III-4000 RPZ for Runway 3.
- Clear, grade, and remove vegetation that would obstruct the Runway 3-21 RSA and ROFA.

AIRSIDE ALTERNATIVE 3

Airside Alternative 3 is presented on **Exhibit 4C**. This third alternative is an expanded version of the previous one. In fact, it could be the result of a “next step” if Alternative 2 was selected and implemented. This option proposes a 200-foot easterly shift of the runway as well as an extension to Runway 3-21. As shown, the shifted runway would be 6,002 feet long and located 200 feet east. The previous alternative presented the option to construct two large RDC C/D-III holding aprons, while this alternative uses bypass taxiways at each runway end in lieu of holding aprons. The bypass taxiways allow aircraft ready to depart the option to go without having to wait for aircraft running up or holding for departure clearances.

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

1. Construction of a full-length parallel taxiway 400 feet separated from the new runway.
2. Six exit taxiways, including two “bypass” taxiways at each runway instead of the holding aprons presented in the previous alternative.
3. Removal of existing Runway 3-21.
4. Relocation of all associated approach aids and ILS equipment as with the previous alternative.
5. Mitigate two residential units within the RDC C/D-II/III-4000 RPZ for Runway 3.
6. Closure of a portion of Taxiway B pavement.
7. Removal of vegetation and fencing that would obstruct the RSA, ROFA, and ROFZ to the east, as well as grading of the RSA east of Runway 3-21 and mitigation of wetlands as required.

AIRSIDE ALTERNATIVE 4

The final airside alternative is illustrated on **Exhibit 4D**. This option is the most aggressive of all presented as it proposes utilize existing Runway 3-21 as a parallel taxiway. The new runway would be constructed 400 feet east of the current runway. The most important results of this alternative would be the following:

- Greater development opportunities in the existing terminal area (further developed and shown in Landside Alternative 4 presented later in this chapter) due to an easterly shift of both the runway and parallel taxiway.
- Would remove all residences from the RDC C/D-II/III-5000 RPZ for Runway 3; however, two residential units would remain the RDC C/D-II/III-4000 RPZ as shown. This alternative would present the first residential encumbrance to the CAT I RPZ for Runway 21.

- Most of the airfield would be located in the delineated wetlands, which would require mitigation measures.
- Relocation of all navigation equipment similar to all previous alternatives.

Alternative 4 would provide many benefits with associated drawbacks. This alternative would achieve and even exceed several goals for meeting airfield needs and safety standards. Moreover, it would offer the greatest separation from landside facilities so that greater space would be available for hangar developments to be further outlined later in this chapter. The major drawbacks for this alternative include it being both the highest cost and the highest impact to wetlands.

AIRSIDE SUMMARY

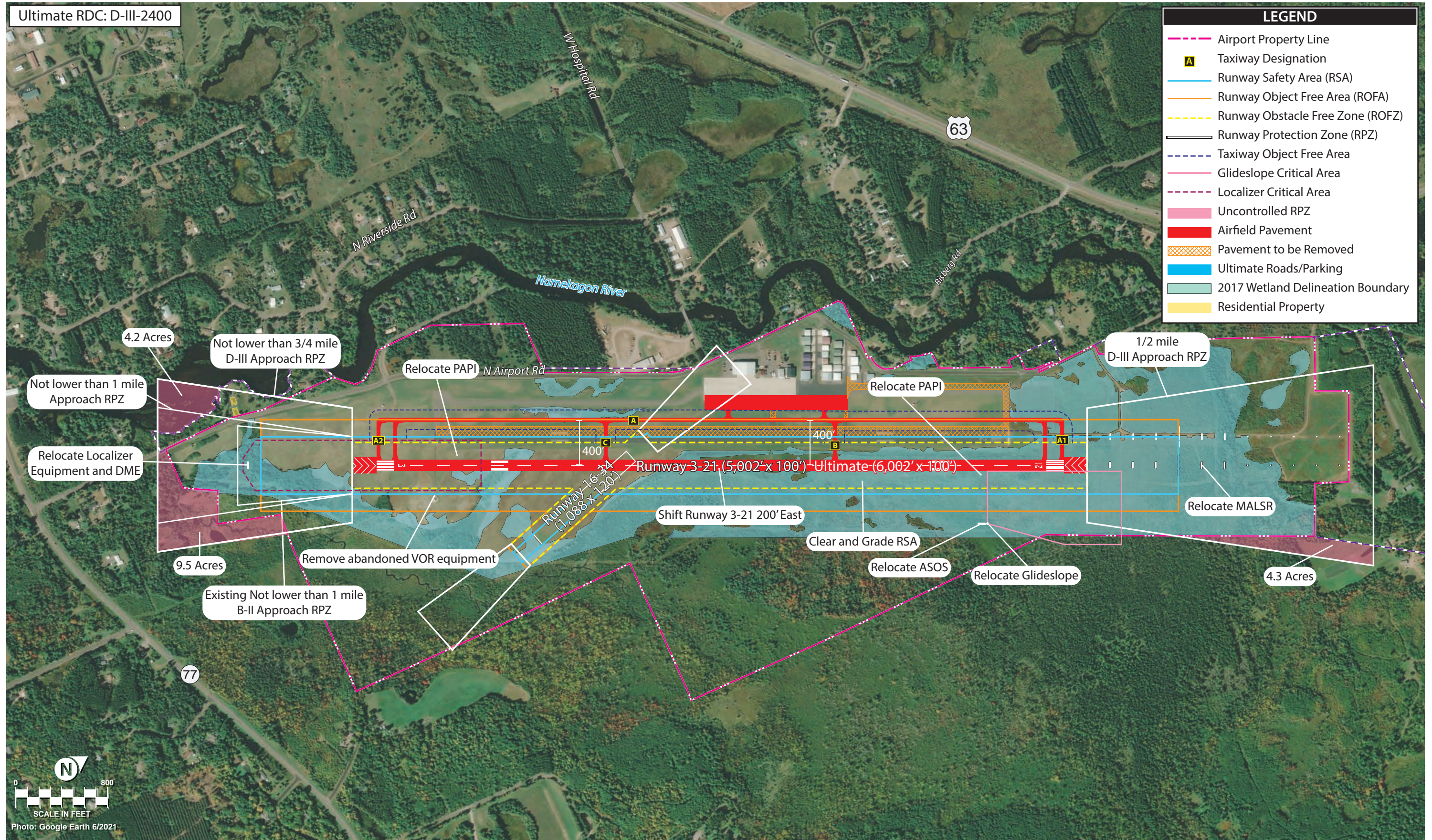
The above sections outlined three planning considerations for the airfield at HYR. The primary issues on the airside center around meeting the likely shift of the type of aircraft used at the airport. HYR currently supports substantial corporate aircraft activity, including the full array of business jets in the market today. In fact, one of the airport's current tenants recently purchased a larger business jet that could be the starting point of the runway transitioning to RDC C/D-II/III standards. Each alternative provided solutions to meet increased standard safety areas at both runway ends, addressed non-standard taxiway geometry, and evaluated runway extension options.

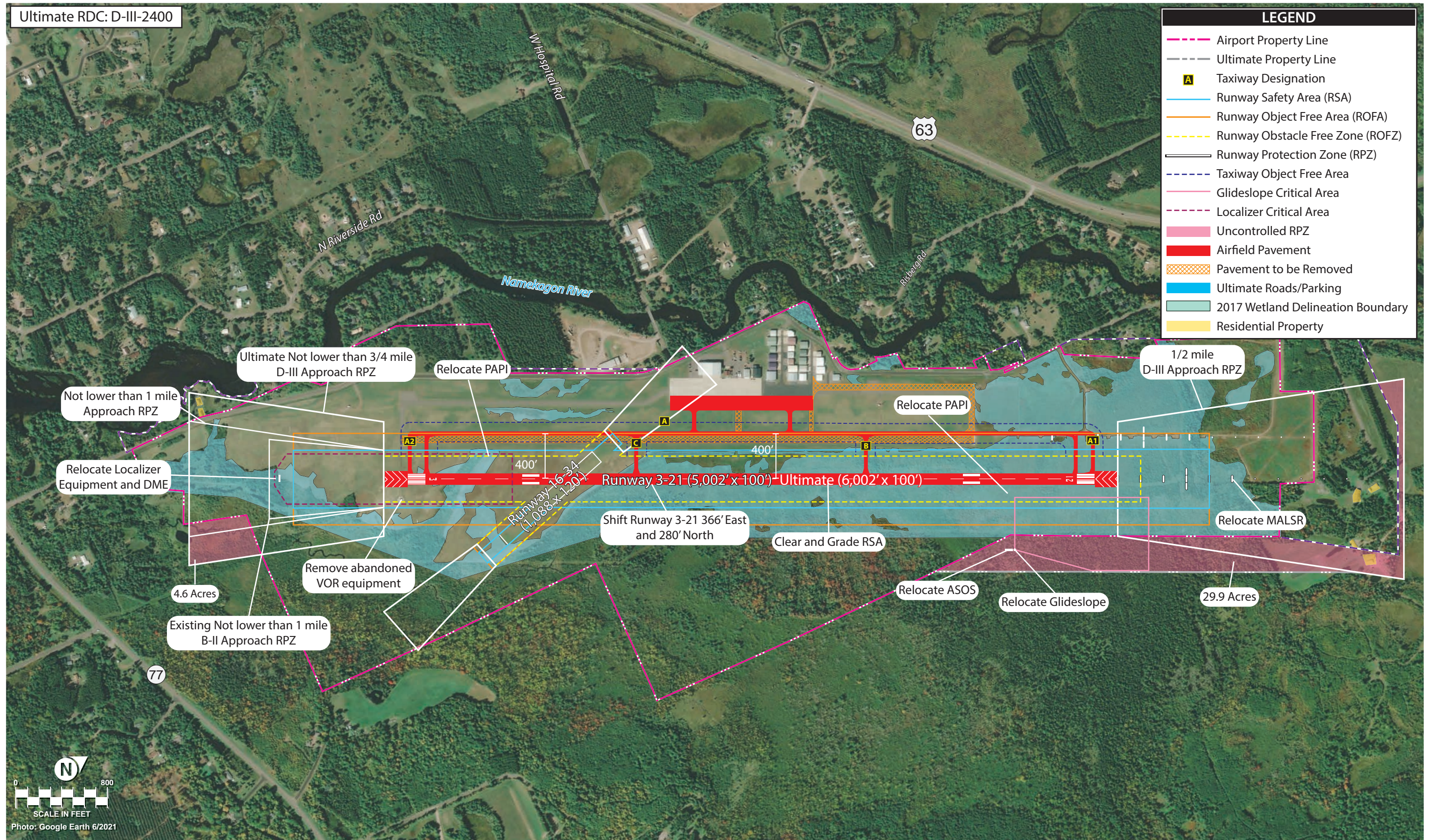
Each airfield alternative was presented in an effort to promote future airport development in response to aviation demand. The intent was to provide a variety of options to offer both increased runway length as well as improved runway safety areas. The first alternative was a minimal approach which would not fully offer the runway length needed for all long-term operations; while the fourth alternative is an attempt to provide all needs including a 6,000-foot-long runway and safety areas. Each alternative contains environmental issues including incompatible land uses (residential homes) and/or wetland mitigation. While costs have yet to be developed, it is quite clear that the alternative will likely follow with the first being the least expensive and the last the most. There remain alternative derivatives of each of the four alternatives presented, and those can be investigated further if those presented are not selected.

The airfield development options will likely be the most impactful to both the public and the aviation community. For this reason, it is vital that the PAC, airport/county management, and the public offer their feedback so that the best course of action is chosen. Environmental factors such as wetland mitigation and property acquisition will be a factor as will other considerations such as the airport's capability of meeting user needs. The next chapter will detail the recommended airfield development concept as well as the environmental overview related to it. A capital plan will also follow that outlines the probable costs for development.

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 and maximizing limited airport property. All of the existing landside development is on the west side of Runway 3-21. There is a very limited amount of property left for future landside development due to the hard constraints of the airfield (runway/taxiway/apron) and Airport Road to the west. Runway 3-21 is located relatively close to landside development, as historic improvements were based on RDC B-II design with limited instrument approach procedures. Future land use planning must consider and factor in the realistic opportunity for the airport to transition to approach category C and/or D with long-term wingspan design for ADG III.

Landside Planning Considerations

1. Consider the Building Restriction Line (BRL) when planning vertical infrastructure.
2. Consider the airfield and safety area constraints.
3. Increase aircraft storage capacity.
4. Construct a new enlarged general aviation terminal building.

Consideration #1 – Building Restriction Line (BRL)

The BRL is an airspace tool intended to identify 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 3-21 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 HYR, the 20-foot BRL for Runway 3-21 is currently set at 645 feet from the runway centerline due to the availability of the instrument landing system. Presently, many landside facilities are located within the BRL. 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 in several alternatives will be given to improving the runway separation from the existing terminal area, which will create greater space to develop and better meet clearances for airport buildings.

Consideration #2 – Consider Safety Area Constraints

The BRL is one of the primary concerns related to airfield operations and close proximity of landside facilities. Others include those standards that increase in size as the RDC shifts to C/D-II/III. The primary concerns for landside facility planning include the increased ROFA, runway/taxiway separation, TOFA, and aircraft parking limit (proximity to runway). Basically stated, the current terminal area and most of the hangar facilities and terminal building will become significantly constrained as the transition occurs. As noted, the apron will be halved and not useable for large aircraft storage, and the parallel taxiway location will prohibit any significant hangar development going forward. The increased TOFA will also reduce existing available spaces to develop. Several airside alternatives included shifting the runway to the east to provide greater separation from the existing landside area, thereby increasing existing development area opportunities in the future. The landside alternatives utilize the idea of shifting the runway to examine those opportunities.

Consideration #3 – Hangars

Hangar occupancy at HYR stands at 100 percent, with several 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. In the previous chapter, two (2) 8-unit T hangar facilities were identified as required to meet long term demand.
- **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. Analysis in the previous chapter indicated that future hangar needs would be 15,800 square feet of executive box hangars (e.g., five [5] 60x60 hangars) and 15,800 square feet of conventional hangar (e.g., one [1] 200x100 hangar).
- **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.

Consideration #4 – Terminal Building

Operations at HYR are projected to continue to increase over the course of the next 20 years. As operations grow, so will the need for a larger, more modern, dedicated terminal building, which could include passenger and pilot lounges, flight planning areas, a kitchen, restrooms, airport management offices, and storage space. The existing building is aged and can be undersized during peak periods. It also 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. The previous chapter indicated a need for a minimum of 3,300 square feet of space, likely to be larger to offer the amenities needed to support the high level of corporate operations.

LANDSIDE ALTERNATIVES

The following sections describe three landside alternatives as they relate to the considerations detailed above. They 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. For example, a portion of one alternative could be intermixed with another, or some development concepts could be replaced with others. Many times, airport operators change their plans to meet the needs of specific users. The overall intent of this exercise is to outline basic development concepts to spur collaboration for a final recommended plan that will serve as a guide for the airport and aid Sawyer County in the strategic planning of airport property. 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 on shifting most future development to the east with the assumption that Runway 3-21 will not be shifted. This landside concept could pair with Airside Alternative 1 and includes:

1. A new access road for vehicles with security gate. This depiction is conceptual in nature but could be sited to extend from the west (Airport Road), with a new paved roadway connecting to the new east side development area.
2. A 200' by 125' conventional hangar and 12 60' by 60' executive hangars with ample apron. 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. Two new T-hangars on the southern portion of the east area. 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). 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 this area is encumbered by wetlands that could require mitigation.
4. A new, 3,300-sf terminal building and associated parking lot with ~50 spaces in the existing terminal area as shown on the exhibit. 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.
5. A new fuel farm, as fueling vehicles are typically not allowed to cross runways and/or navigate on public roads. Thus, this alternative provides for the new farm.

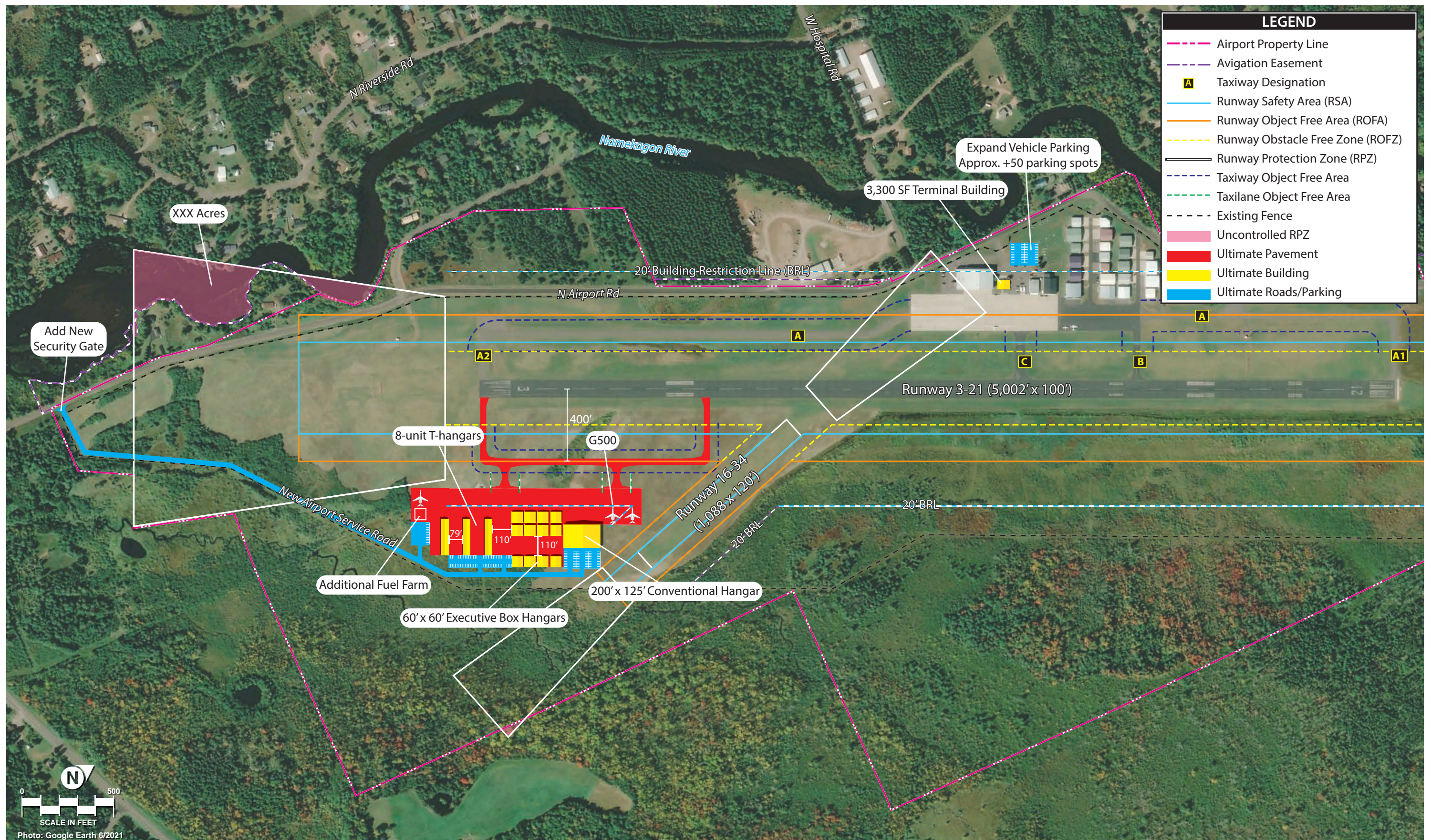
Landside Alternative 2

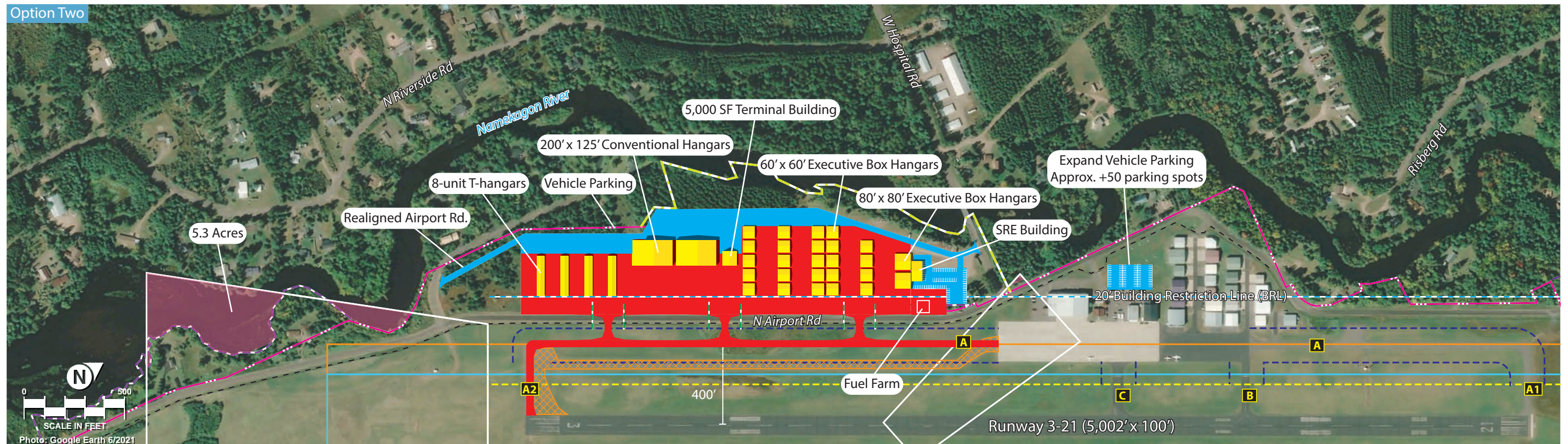
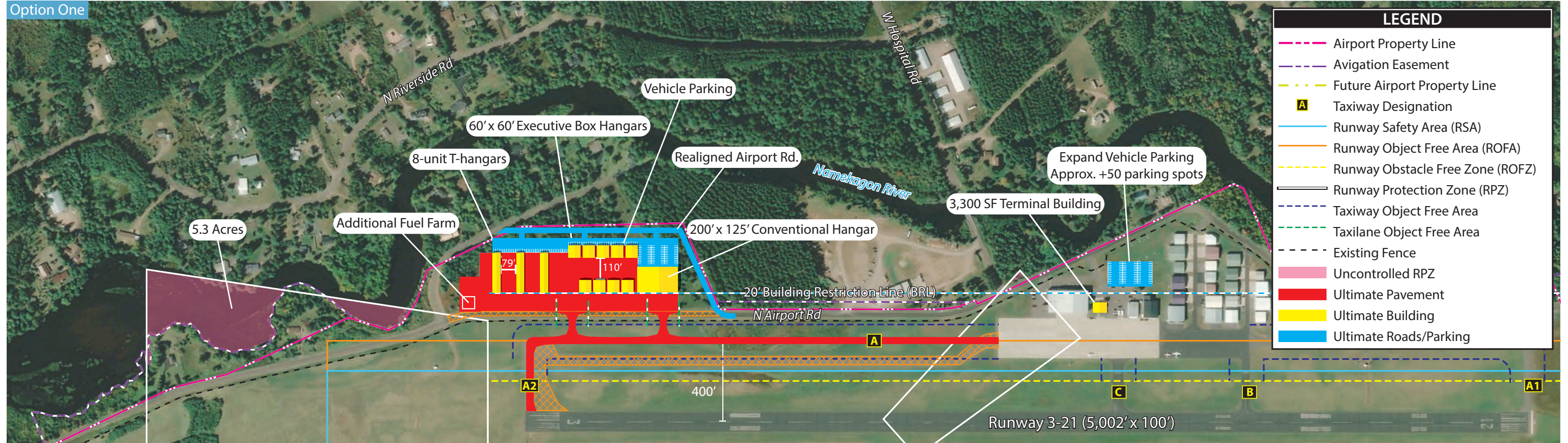
Landside Alternative 2 is depicted on **Exhibit 4F**. This option again evaluates the development potential with the limitation of the Runway 3-21's close proximity to the existing terminal area. This alternative differs from the previous in that it proposes future development on the west side of Runway 3-21, south of all existing development. This alternative features two individual development options, with Option 1 being the minimal and Option 2 the maximal development within the proposed area. The features of Landside Alternative 2 include the following:

1. Both Options consider realignment of Airport Road around the westerly expanded airport terminal area.
2. Option One would be encompassed entirely on existing airport property, whereas Option Two would require additional property acquisition.
3. The primary difference between Option One and Two is the size of development, with Option One offering less future development opportunity. As shown, Option One includes one large conventional hangar, nine executive hangars, and three (3) 8-unit T-hangars. Option Two is larger and offers the opportunity for two large conventional hangars, 24 executive hangars measuring 60' by 60', two (2) 80' by 80' executive hangars, a relocated fuel farm, and a new snow removal equipment (SRE) building.

Landside Alternative 3

Depicted on **Exhibit 4G**, Landside Alternative 3 considers the development opportunities if the runway were shifted 200 feet east as detailed in Airside Alternative 3. Features of Landside Alternative 3 include the following:







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1. The shifted runway would allow for the easterly expansion of the apron, as well as the extension of the existing terminal area north as shown on **Exhibit 4G**. As a result, the greater apron depth would be better suited to meet the parking and circulation needs of large corporate jet operators.
2. The construction of a 3,300-sf terminal building is shown with an enlarged parking lot.
3. The alternative would support additional hangar development to include one or more larger conventional hangars, four (4) 60' by 60' executive hangars, two (2) four-unit T-hangar buildings, and an SRE building, as depicted on the exhibit.

The primary benefit of this alternative would be the continued cohesion of the existing terminal area with expansion both north and east to meet future demand. The primary cost of this alternative would be the shifted runway and new parallel taxiway required to implement the proposal.

Landside Alternative 4

Depicted on **Exhibit 4H**, Landside Alternative 4 considers the development opportunities if the runway were shifted to the east, as detailed in Airside Alternative 4, and utilizing the existing Runway 3-21 pavement as a parallel taxiway. This alternative would offer the greatest opportunity for future landside development. The increased distance from the runway centerline to the terminal area would provide the opportunity to use the areas both north and south of the existing terminal area in the future. This option would not only meet the needs of the demand projected in this study but would also provide for needs decades beyond. Features of Landside Alternative 4 include the following:

1. The shifted runway would allow for the easterly expansion of the apron as well as the extension of the existing terminal area north as shown on **Exhibit 4H**. As a result, the greater apron depth would be better suited to meet the parking and circulation needs of large corporate jet operators.
2. The construction of a terminal building could be done as with previous alternatives or in conjunction with one of the large conventional hangars, which would give the FBO/Airport Manager the opportunity to house in both.
3. This alternative would support additional hangar development to include five or more larger conventional hangars, 58 60' by 60' executive hangars (or a mix of executive hangars and T-hangars), and an SRE building, all depicted on the exhibit.

Similar to Landside Alternative 3, the primary benefit of this alternative would be the continued cohesion of the existing terminal area with expansion north, south, and east to meet — and even far exceed — future demand presented in the planning process. It would firmly establish the long-term viability of the Sawyer County Airport. The primary costs of this alternative would be the shifted runway and new parallel taxiway, along with potential wetland impacts.

LANDSIDE SUMMARY

The landside alternatives presented above look to accommodate an array of aviation activities that either currently, or could be expected, to occur at HYR in the future. There is demand for new facilities at HYR now, and county 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. These alternatives only serve as the opening discussion for the development of a long-term plan. Obviously, each alternative is based on certain assumptions and those assumptions can and will dictate the resultant plan. Alternatives 1 and 2 could be done with less cost and impact, and not require the shift of Runway 3-21. Alternatives 3 and 4, however, better situate the airport to serve in the projected role of RDC C/D-III.

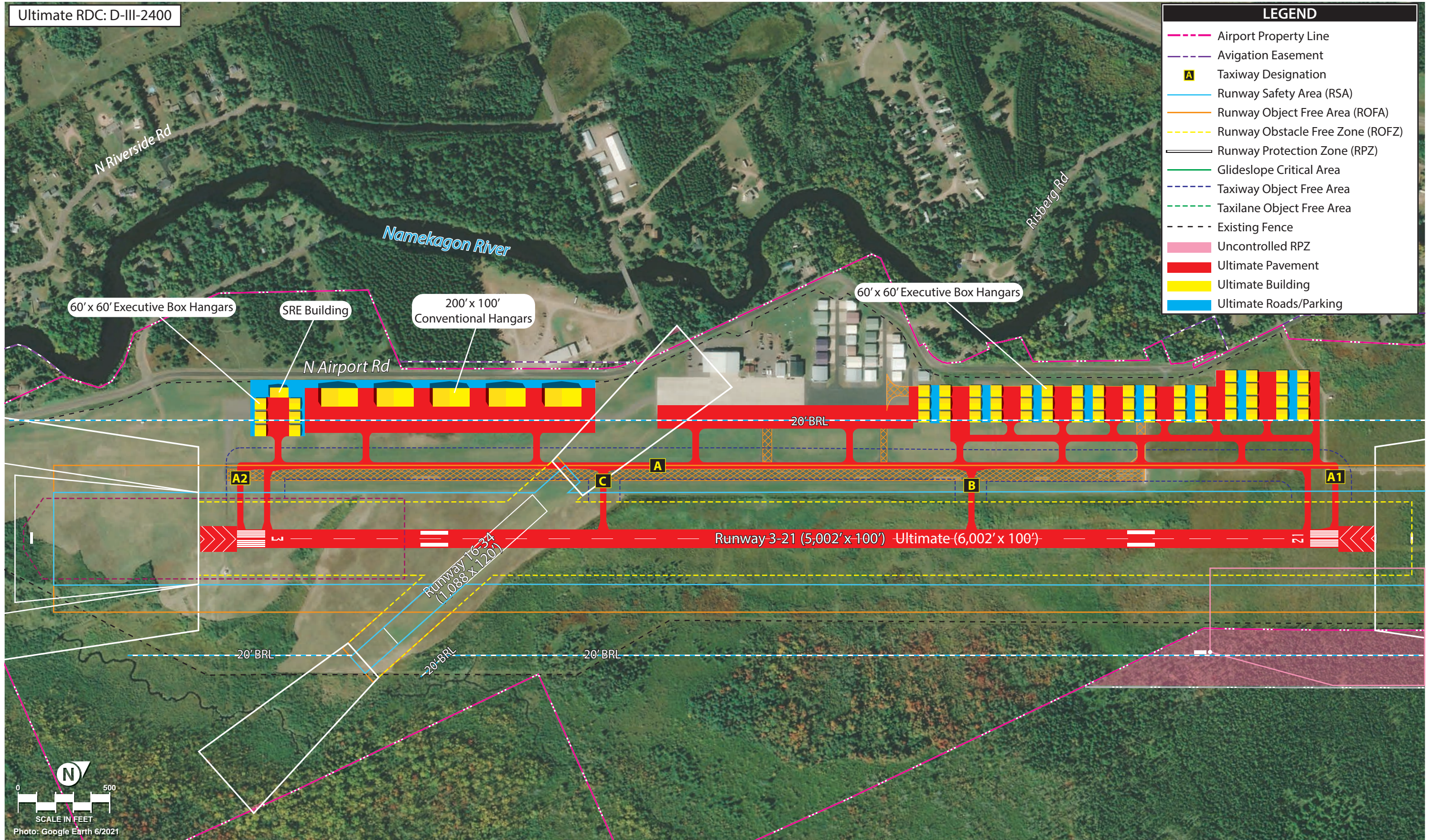
SUMMARY

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 providing for the potential demand shift to RDC C/D-III design standards and all that entails. For the landside, the alternatives had to consider additional aviation development within a very constrained environment. These alternatives serve to open the dialogue and will lead to the selection of a recommended development concept.

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 an important consideration. Additional consultation with the FAA and BOA 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 county leaders how the capital plan could be funded and/or financed.

Ultimate RDC: D-III-2400



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