

Saratoga County Airport

AIRPORT MASTER PLAN UPDATE DRAFT CHAPTER 6 ALTERNATIVES

Prepared for:

SARATOGA COUNTY DEPARTMENT OF PUBLIC WORKS



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Chapter 6

Alternatives

6.0. INTRODUCTION

The Alternatives chapter assesses the recommended facility improvements identified in Chapter 5, *Demand Capacity and Facility Requirements*, against a set of evaluation factors to determine if the recommended developments do indeed enhance the efficiency of the Airport, while meeting future demand and minimizing environmental and community impacts. The evaluating factors used to compare development options were selected based on specific considerations associated with Saratoga County Airport.

The identification and evaluation of the Airport development alternatives are outlined in the following sections:

- Summary of Airport Facility Requirements
- Development Constraints
- Airside Alternatives
 - Runways
 - Taxiways
 - Gliders
- Landside Alternatives

6.1. SUMMARY OF AIRPORT FACILITY REQUIREMENTS

The previous chapters have identified and quantified the necessary improvements that should be addressed at Saratoga County Airport over the 20-year planning period. The following is a summary of the key Airport facility requirements as discussed in Chapter 5, *Demand Capacity and Facility Requirements*:

- Extend Runway 5-23 by 801 feet in length for a total length of 5,500 feet
- Obtain land use control (easement or fee) where it is lacking in all Runway Protection Zones (RPZs)
- Remove obstructions to maintain current approaches and improve minimums where feasible
- Provide full-parallel taxiway to Runway 5-23
- Provide expanded and more flexible glider staging areas to better segregate powered and non-powered aircraft
- Increase conventional hangar space by 8,000 square feet
- Provide 6 additional T-hangar units
- Expand transient aircraft parking by 57,987 square feet to accommodate seasonal peak demand.
- Provide an additional 10,000 gallon Jet-A tank

Potential alternatives that could meet the Airport's current and future needs will be presented. The no-build alternative, which consists of maintaining the existing facilities as is with no additions or expansions, will also be considered. The no build alternative assumes that

maintenance and other activities (e.g. obstruction removal) will occur to maintain a safe and efficient operating environment. The build alternatives will then be evaluated based on a uniform set of criteria for the airside and landside elements.

6.2. DEVELOPMENT CONSTRAINTS

There are several constraints associated with the potential development at Saratoga County Airport. The key constraints considered during the formulation of the development alternatives are described below:

Endangered Species Habitat: As previously described in Chapter 4, *Environmental Overview*, the Airport has endangered species habitat present in the grasslands surrounding the runways and taxiways. As such, Saratoga County Airport has essentially been divided into two areas, "Known Habitat Area" and "Exempt Area." Development in the Known Habitat Area is strictly regulated under Federal and State law, while the Exempt Area is not. Operations and management activities within the Known Habitat Area are also strictly regulated under an informal agreement between Saratoga County, the New York State Department of Environmental Conservation (NYSDEC), and the United States Fish and Wildlife Service (USFWS). Any development project located within the Known Habitat Area will require consultation with both NYSDEC and USFWS. Special permitting and mitigation would be required for the implementation of any feasible alternative, and may incur additional costs. These costs were not included in the estimates provided for each alternative.

Glider Operations: Chapter 5, *Facility Requirements*, highlighted the capacity issues regarding the glider operations. Two glider clubs operate at Saratoga County Airport through three seasons of the year, typically March through November. Glider activity at General Aviation Airports usually occur on turf areas to the side of the paved runways or runway system, thus separating powered and non-powered aircraft. However, because the turf surfaces at Saratoga are protected habitat areas of the Karner Blue Butterfly, gliders must stage, launch, land, and recover on the paved runway surfaces. This leads to a reduction in Airport capacity and delayed aircraft operations, particularly as peak glider operations coincide annually with Track Season. Consequently, the *Facility Requirements* chapter recommended evaluating alternatives to segregate powered and non-powered aircraft operations.

Track Season: Saratoga County Airport's unique operating trends were discussed in Chapter 3, *Forecasts of Aviation Activity*. The Saratoga Race Course in Saratoga Springs attracts a large influx of people every year to view and partake in horse racing activities and gambling. Many of these visitors arrive by private aircraft. The track's season is from mid-July until Labor Day. During that six-week period, there is a major influx of corporate jet and turboprop activity, which accounted for 53% of the annual activity in 2012. Prior years have similar activity levels. Accommodating this increased demand requires consideration for aircraft parking, fueling, and the glider operations, which occur simultaneously.

Surrounding Land Use: Residential and/or commercial land uses exist on all sides of the airfield. These include single-family residential neighborhoods, condominium and apartment complexes, commercial structures such as banks and supermarkets, and a new medical building off the end of Runway 32. There are also vacant areas surrounding the Airport, for which there is presently no purposeful land use.

Stormwater Management: Substantial changes in the amount of impervious pavement area at the Airport, such as the construction of new aprons or taxiways, will affect stormwater

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management efforts. However, the impacts from any increases in impervious surfaces can be mitigated through proper grading and drainage systems.

6.3. AIRSIDE ALTERNATIVES

In this section, various ways to meet the airside needs of Saratoga County Airport will be developed and evaluated. As noted in Chapter 5, *Demand Capacity and Facility Requirements*, airside facility alternatives will include potential improvements to runways, taxiways, and approach surfaces. Several alternatives are presented.

Saratoga County has a long-standing obstruction removal program, which focuses on land use acquisition/easement and object height restriction for portions of the Runway Protection Zones not currently under the County's control. Continuation of this program is needed to maintain existing facilities and approach procedures. For purposes of this alternatives analysis, it was assumed that the obstruction removal and land use control program would continue unabated for all alternatives and all runways, including the No Build alternative. The alternatives analysis only considers additional obstruction removal and land use control needed beyond what is required to maintain existing conditions.

6.3.1. Airside Alternative Evaluation Criteria

A set of evaluation criteria was developed to provide consistent assessments of each alternative throughout the review process. The evaluation factors assess both the quantitative as well and qualitative factors for each criterion as follows:

- **Facility Requirements:** Does the alternative meet the existing and future needs of the Airport and is the alternative feasible for implementation?
- **Environmental Impact:** What are the potential environmental impacts associated with implementation of the alternative? Does the alternative avoid or minimize and mitigate environmental impacts?
- **FAA Standards:** Does the alternative meet the design standards of FAA Advisory Circular 150/5300-13A, *Airport Design*, and provide clear surfaces associated with Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace*, (FAR Part 77 Surfaces) to the maximum extent feasible?
- **Land Use Compatibility:** Is the alternative compatible with on-Airport and off-Airport patterns of land use?
- **Development Costs:** Does the alternative have reasonable development costs in comparison to other alternatives that achieve the same goal?
- **Operational Flexibility:** To what extent does this alternative allow flexibility from an operational standpoint?

6.3.2. Runway Alternatives Considered and Dismissed

The following potential alternatives were considered and dismissed prior to the detailed development of airside alternatives. These alternatives are described below:

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- **Extending Runway 5**

Extension of the Runway 5 approach end to provide all or part of the proposed 801 foot extension was considered. Existing Airport property includes sufficient room to accommodate the extension, however, the required Runway Safety Area, Runway Object Free Area, and Runway Protection Zone would extend off Airport property. Extension of Runway 5 would require realignment or severing of Geyser Road and acquisition of extensive residential areas to provide a standard Safety Area, Object Free Area, and Protection Zone. As such, the extension of Runway 5 is not a practical alternative at this time and was dismissed from further consideration.

6.3.3. Runway 5-23 Alternatives Identification

The following runway alternatives have been developed to meet the Runway 5-23 facility requirements at Saratoga County Airport:

- **Runway 5-23 Alternative 1:**
 - Runway 5-23 remains the same in length, width, location, and orientation (No-Build).
- **Runway 5-23 Alternative 2:**
 - Extend Runway 23 by 801' to a length of 5,500 feet and maintain its existing landing threshold.
- **Runway 5-23 Alternative 3:**
 - Extend Runway 23 by 301' to a length of 5,000 feet and maintain its existing landing threshold.

6.3.4. Runway 5-23 Alternative 1 (No-Build)

The No-Build alternative retains the current runway and makes no improvements. Runway 5-23 would remain at 4,699 feet in length and 100 feet in width. The existing layout of this alternative is depicted in Figure 6-1. Runway 5-23 Alternative 1 was evaluated as follows:

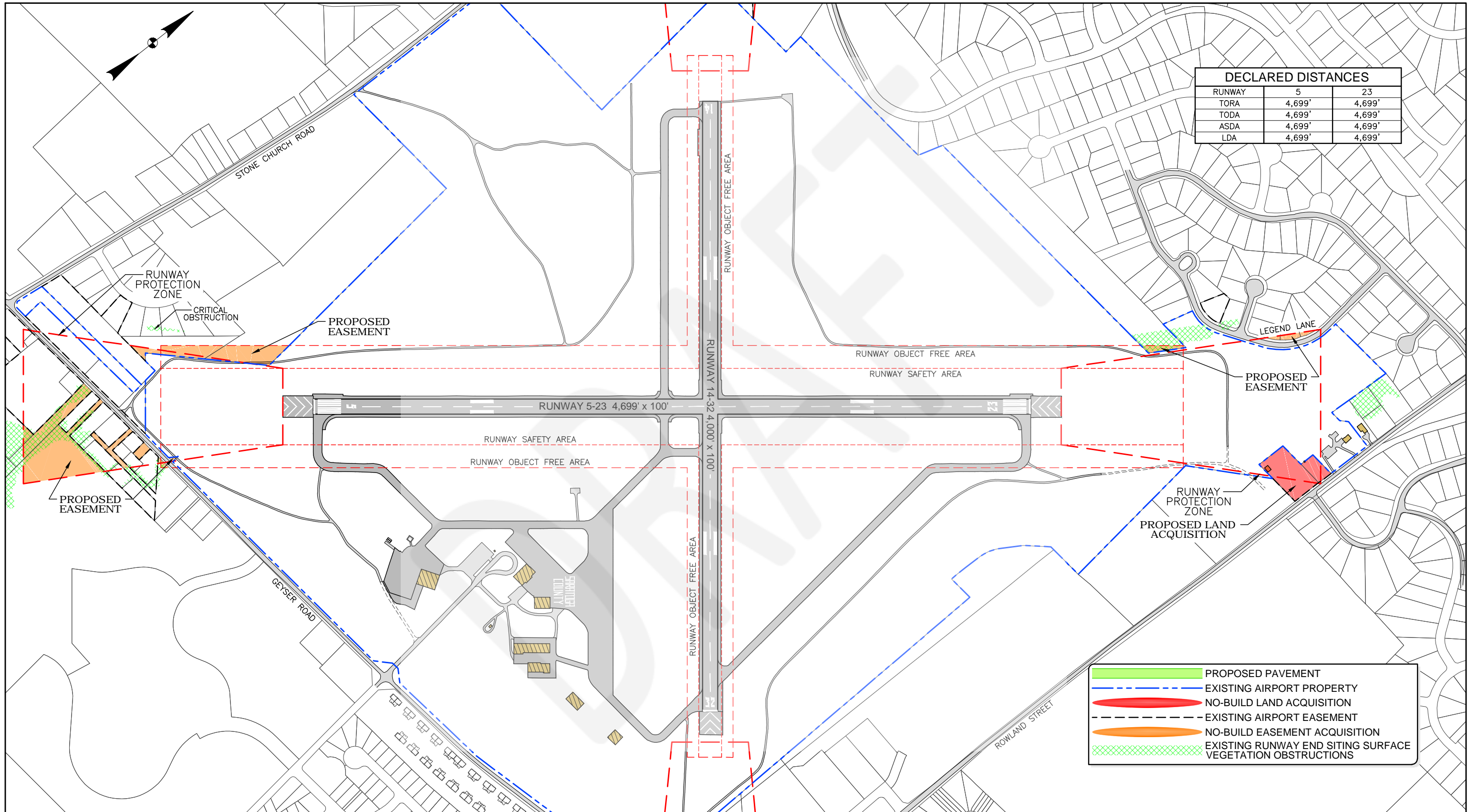
- **Facility Requirements:** The No-Build alternative for Runway 5-23 does not meet the projected needs of the Airport. Consequently, this option could result in lost revenue as aircraft would continue to experience weight restrictions and could not operate at the Airport during poor weather conditions. These aircraft could be forced to carry less passengers and/or fuel, or utilize other Airports in the region.

However, even if the No-Build is selected, there are minimum standards, which must be addressed in order to bring the existing runway into compliance. The actions required to meet those standards are as follows:

- **RW 5 ROFA:**
 - Easement acquisition for portions of two (2) parcels adjacent to Airport access road and portions three (3) parcels along Geyser Road .
- **RW 5 RPZ:**
 - Easement acquisition for portions of five (5) parcels south of Geyser Road.

RUNWAY 5-23 - ALTERNATIVE 1 - NO BUILD

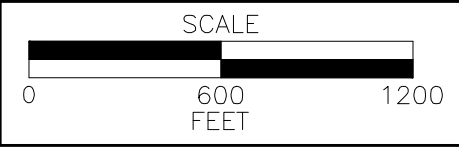
FIGURE 6-1



DECLARED DISTANCES		
RUNWAY	5	23
TORA	4,699'	4,699'
TODA	4,699'	4,699'
ASDA	4,699'	4,699'
LDA	4,699'	4,699'

	PROPOSED PAVEMENT
	EXISTING AIRPORT PROPERTY
	NO-BUILD LAND ACQUISITION
	EXISTING AIRPORT EASEMENT
	NO-BUILD EASEMENT ACQUISITION
	EXISTING RUNWAY END SITING SURFACE VEGETATION OBSTRUCTIONS

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- **RW 23 ROFA:**
 - Easement acquisition for a portion of one (1) parcel on the north side.
- **RW 23 RPZ:**
 - Easement acquisition for portions of three (3) parcels along Legend Land.
 - Property acquisition for two (2) parcels along Rowland Street.

These action items are incorporated into each of the Runway 5-23 alternatives, indicating that any additional development requirements are incremental to those, which are currently needed.

- **Environmental Impact:** No environmental impacts are associated with this alternative.
- **FAA Standards:** The current runway dimensions, RSA, and OFA are in compliance with FAA standards and the No-Build alternative would allow the airfield to continue to meet this criteria.
- **Land Use Compatibility:** This alternative does not address existing land use incompatibility within in the RPZs to Runway 5-23. However, if the proposed easement and land acquisitions are implemented successfully, the No-Build would provide land use compatibility per RPZ standards.
- **Development Costs:** The estimated cost to bring Runway 5-23 into compliance with minimum standards is \$560,000.
- **Operational Flexibility:** Runway 5-23 Alternative 1 limits the operational flexibility of the Airport by restricting the size and type of aircraft that are able to utilize the 4,699' runway in either dry or wet/contaminated conditions. This in turn could negatively impact the direct (fuel sales, parking fees, etc.) and indirect economic benefits (spending at local businesses) provided to the community through use of the Saratoga County Airport, especially during the summer race season when about one quarter of the Airport's aircraft operations occur.

6.3.5. Runway 5-23 Alternative 2 (Extend 801' to a length of 5,500 feet)

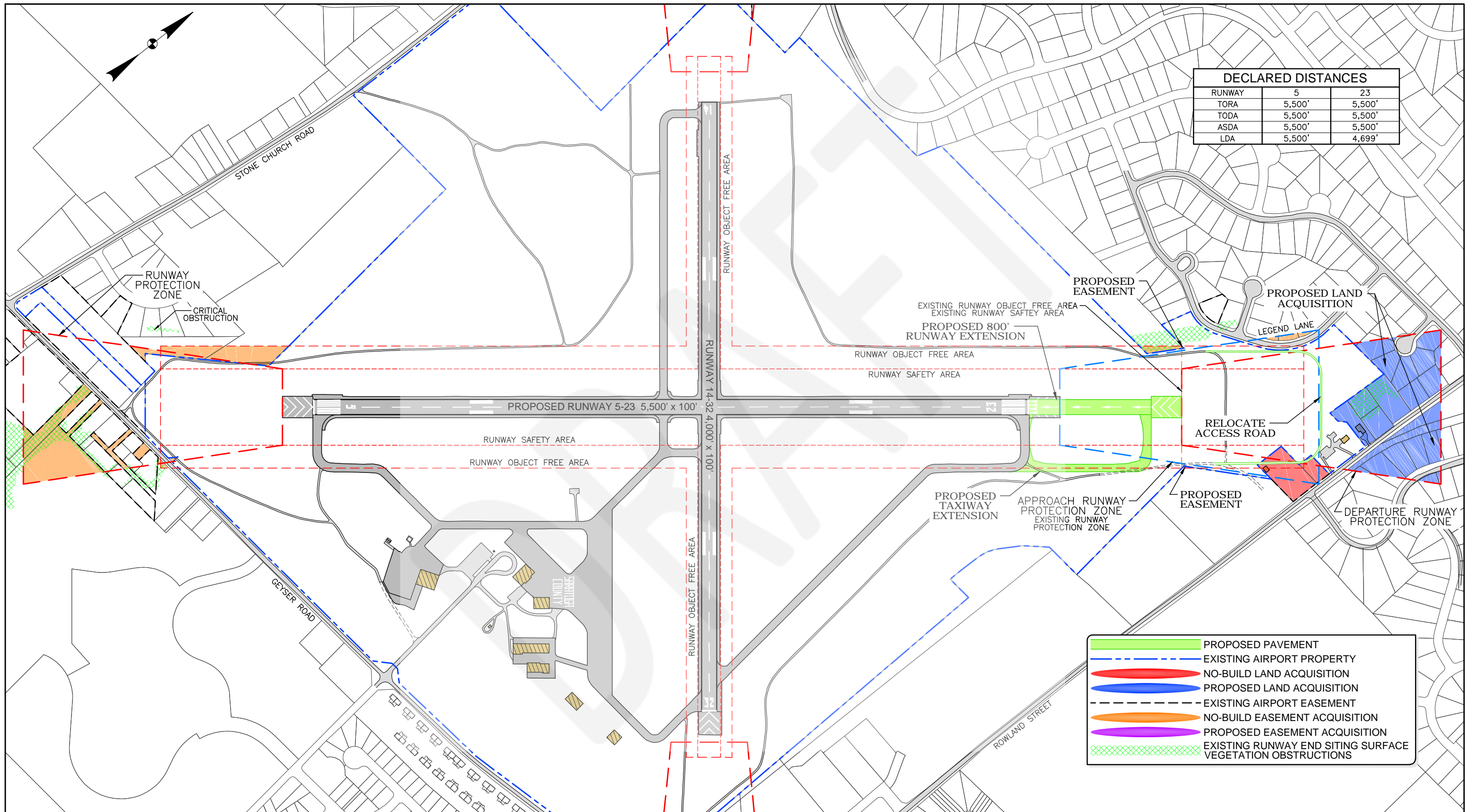
Runway 5-23 Alternative 2 considers extending the Runway 23 end 801 feet to a total length of 5,500 feet. This alternative is shown in Figure 6-2.

Key considerations of this alternative are listed below:

- **801 foot Extension of Runway 23:** The Runway 23 approach end would be extended by 801 feet for an ultimate primary runway length of 5,500 feet; however, the existing landing threshold would remain in place to avoid the need for additional obstruction removal. The extension would provide additional length for departures. Landings would be unchanged.
- **Install New Blast Pad:** The proposed extended runway end will require the inclusion of a new blast pad located prior to the beginning of the runway, similar to the one currently in place.

RUNWAY 5-23 - ALTERNATIVE 2

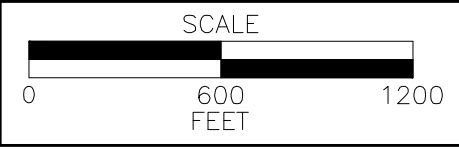
FIGURE 6-2



DECLARED DISTANCES		
RUNWAY	5	23
TORA	5,500'	5,500'
TODA	5,500'	5,500'
ASDA	5,500'	5,500'
LDA	5,500'	4,699'

	PROPOSED PAVEMENT
	EXISTING AIRPORT PROPERTY
	NO-BUILD LAND ACQUISITION
	PROPOSED LAND ACQUISITION
	EXISTING AIRPORT EASEMENT
	NO-BUILD EASEMENT ACQUISITION
	PROPOSED EASEMENT ACQUISITION
	EXISTING RUNWAY END SITING SURFACE VEGETATION OBSTRUCTIONS

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- **Relocation of Connector Taxiway:** The portion of Taxiway D that connects to the end of Runway 23 will have to be adjusted in accordance with the new runway end; however, the existing connector could remain in place to serve as a staging area for gliders utilizing Runway 23.
- **Approach Surfaces/Obstruction Analysis and Removal:** The existing landing threshold will remain in its current location, there will be no additional obstructions to the approach surfaces associated with the Runway 23 landing threshold.
- **Relocate Existing Lighting and NAVAIDS:** The Runway End Identifier Lights (REILs) will be relocated to the new runway end. The Precision Approach Path Indicator (PAPI) installed on Runway 23 will remain in their current location, as they are associated with the existing landing threshold.
- **Relocate Access Road:** The proposed runway extension will cause the existing access road off the end of Runway 23 to be encompassed by the new Runway Safety Area (RSA) that extends beyond the runway threshold. Consequently, the Airport's access road will need to be moved outside the parameters of the proposed RSA to meet FAA compliance.
- **RSA, OFA, and RPZ:** The extension would require a corresponding shift of the Runway End 23 RSA, OFA, and RPZ to meet FAA design standards. The RSA would remain on existing Airport property; however, the OFA would require a small portion of a parcel located on the south side along the Airport access road to be acquired.

With the retention of the current landing threshold, FAA design standards require an approach and departure RPZ. The approach RPZ is identical to the No-Build RPZ and has the same land use control deficiencies. However, the departure RPZ would be located 200 feet beyond the new runway end. In addition to new tree obstructions, this RPZ captures 22 new residential properties, Rowland Street, and several residential streets servicing the homes in this area. Current FAA RPZ guidance identifies new residential properties within an RPZ as a prohibited use. As such, the acquisition of the 22 properties is recommended under this alternative to protect people and property on the ground and to meet current RPZ land use guidance. Also, while Rowland Street is a central thoroughfare, its relocation should be considered with regard to RPZ compliance.

The RSA, OFA, and RPZ requirements for Alternative 2 are summarized below. Again, these action items are in addition to those stipulated under the No-Build.

- RW 23 RSA:** No easements or acquisitions
- RW 23 OFA:** Portion of one (1) parcel for easement
- RW 23 RPZ:** Twenty three (23) parcels for acquisition;
Relocation of Legend Lane and Rowland Street;
Tree clearing

The evaluation of this alternative is as follows:

- **Facility Requirements:** Runway 5-23 Alternative 2 meets the recommended length of 5,500 feet. This increased runway distance would allow the Airport to meet most of the runway length requirements identified in the *Facility Requirements* chapter. Specifically,

the Takeoff Distance Available (TODA), Takeoff Run Available (TORA) and Accelerate/Stop Distance Available (ASDA) would increase in both directions, while the Landing Distance Available (LDA) would increase when landing Runway 5, but remain the same with the current threshold unchanged for Runway 23. Overall, this alternative significantly improves operational safety by allowing the mid-sized and large corporate jets to operate with minimal or no weight penalties while also providing additional landing length needed during poor weather and wet runway conditions.

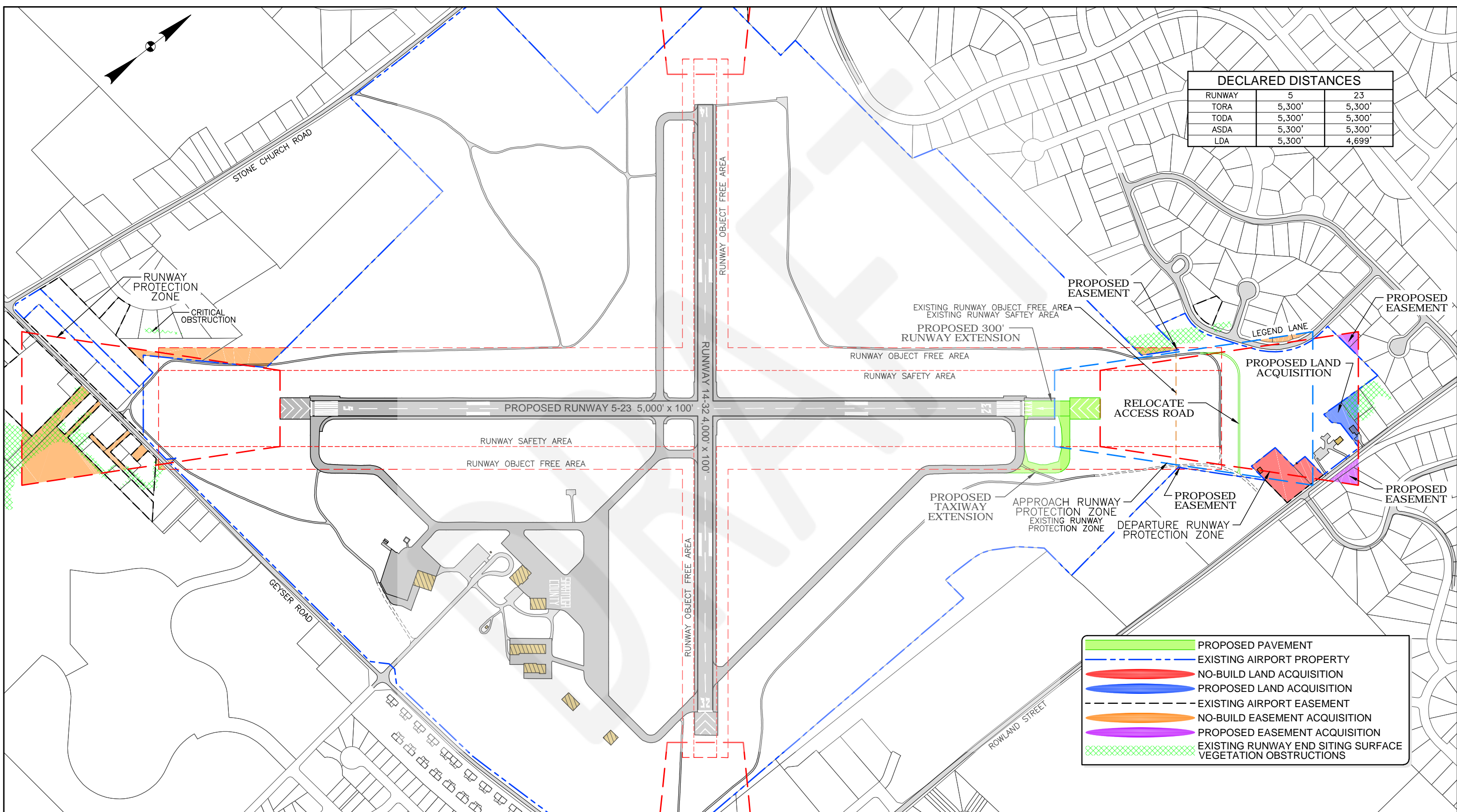
- **Environmental Impact:** The proposed runway, blast pad, and taxiway extension would have 3.55 acres of direct habitat impacts. Temporary impacts associated with construction and minor grading of the RSA are not included in this estimate.
- **FAA Standards:** Runway 5-23 Alternative 2 would meet the design criteria of FAA Advisory Circular 150/5300-13A and no modification of standards would be necessary. Of importance, the proposed runway extension would shift the departure RPZ further west toward the residential areas. Acquisition of 22 residential properties, along with obstacle clearing, is required to comply with FAA RPZ requirements.
- **Land Use Compatibility:** Aircraft departing Runway 23 would begin their takeoff roll 801 feet closer to nearby residences. Noise levels are not expected to exceed 65 DNL, which would be a noise impact as defined by FAA. However, noise levels at residences near the approach end of Runway 23 would be higher than the other Runway 23 alternatives. Finally, as previously mentioned, the shifting RPZ areas would capture 22 new properties, which would be need to be acquired in fee or through easements to maintain RPZ land use requirements.
- **Development Costs:** The estimated cost for this alternative is \$5,980,000.
- **Operational Flexibility:** The 801 foot extension would increase operational flexibility in terms of better meeting the performance needs of corporate aircraft and enhancing safety during poor weather wet runway conditions. Also, by maintaining the connector taxiway to the existing threshold, glider operations would be separated from those of the powered aircraft, thus facilitating better operational efficiency, capacity and safety. The additional operational safety will allow aircraft to operate more efficiently and in turn lead to greater economic benefits for the community through additional fuel purchases, aircraft parking fees and passenger spending in the region.

6.3.6. Runway 5-23 Alternative 3 (Extend 301' to a length of 5,000 feet)

The third alternative to Runway 5-23 considers extending Runway 23 by 301 feet for a total of 5,000 feet. While this alternative does not meet facility requirements, Alternative 2 incurs extensive land acquisition and substantial tree clearing. Alternative 3 was developed in an effort to reduce the amount of land acquisition and tree clearing required for a runway extension, yet still accommodate aircraft requiring longer runway length. Based on aircraft performance charts provided in Chapter 5, *Facility Requirements*, as well as industry trends citing aircraft insurance restrictions and standard company operating procedures, it was determined that 5,000 feet of runway can sufficiently meet the majority of aircraft needs at Saratoga County Airport. This alternative is illustrated in Figure 6-3 and includes many of the same elements to be considered in Alternative 2.

RUNWAY 5-23 - ALTERNATIVE 3

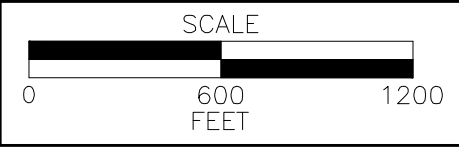
FIGURE 6-3



DECLARED DISTANCES		
RUNWAY	5	23
TORA	5,300'	5,300'
TODA	5,300'	5,300'
ASDA	5,300'	5,300'
LDA	5,300'	4,699'

	PROPOSED PAVEMENT
	EXISTING AIRPORT PROPERTY
	NO-BUILD LAND ACQUISITION
	PROPOSED LAND ACQUISITION
	EXISTING AIRPORT EASEMENT
	NO-BUILD EASEMENT ACQUISITION
	PROPOSED EASEMENT ACQUISITION
	EXISTING RUNWAY END SITING SURFACE VEGETATION OBSTRUCTIONS

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Key considerations of this alternative are listed below:

- **301 foot Extension of Runway 23:** Extend Runway 23 by a length of 301 feet for an ultimate primary runway length of 5,000 feet. The existing threshold would remain in place to avoid additional tree obstruction removal.
- **Install New Blast Pad:** The proposed extended runway end will require the inclusion of a new blast pad located prior to the beginning of the runway, similar to the one currently in place.
- **Relocation of Connector Taxiway:** The portion of Taxiway D that connects to the end of Runway 23 will have to be adjusted in accordance with the new runway end; however, the existing connector could remain in place to serve as a staging area for gliders utilizing Runway 23.
- **Approach Surfaces/Obstruction Analysis and Removal:** The existing landing threshold will remain in its current location, there will be no additional obstructions to the approach surfaces associated with the Runway 23 landing threshold.
- **Relocate Existing Lights and NAVAIDS:** The Runway End Identifier Lights (REILs) will be relocated to the new runway end. The Precision Approach Path Indicator (PAPI) installed on Runway 23 will remain in their current location, as they are associated with the existing landing threshold for Runway 23, which will remain the same.
- **Relocate Access Road:** The proposed runway extension will cause the existing access road off the end of Runway 23 to be encompassed by the new RSA and OFA that extend beyond the new runway end. Consequently, the Airport's access road will need to be moved outside the parameters of the proposed RSA and OFA to meet FAA compliance.
- **RSA, OFA and RPZ:** The extension would require a corresponding shift of the Runway End 23 RSA, OFA, and RPZ to meet FAA design standards. Both the RSA and OFA would remain on Airport property, and no additional easements or acquisitions would be necessary for these.

With the retention of the current landing threshold, FAA design standards require an approach and departure RPZ. The approach RPZ is identical to the No-Build RPZ and remains on Airport property. However, the departure RPZ would be located 200 feet beyond the new runway end, and encompasses eight new residential properties. Avigation easements will be required for six properties captured at the corners of the RPZ, while the remaining two parcels are proposed for acquisition given their alignment with the runway centerline.

The RSA, OFA, and RPZ requirements for Alternative 3 are summarized below. Again, these action items are in addition to those stipulated under the No-Build.

- RW 23 RSA:** No easements or acquisitions
- RW 23 OFA:** No easements or acquisitions
- RW 23 RPZ:** Portions of Seven (7) parcels for easement;
Three (3) parcels for acquisition



The evaluation of this alternative is as follows:

- **Facility Requirements:** Similar to Runway 5-23 Alternative 2, the increased runway distance provided in Runway 5-23 Alternative 3 would allow the Airport to meet some, but not all, of the runway length requirements identified in the *Facility Requirements* chapter. Specifically, the TODA, TORA, and ASDA would increase to 5,000 feet, along with the LDA on approach to Runway 5. However, the LDA on approach to Runway 23 would remain 4,700 feet unchanged.

This development option would also address the separation of powered and non-powered aircraft along the Runway 23 end, as the existing connector taxiway would remain in place to be used as a glider staging area. Overall, this alternative provides an opportunity for more aircraft to operate without weight penalties and offers operational safety improvements.

- **Environmental Impact:** The 301 foot extension of the runway and associated taxiway will directly affect 1.82 acres of habitat. Temporary impacts associated with construction and minor grading of the RSA are not included in this estimate.
- **FAA Standards:** Runway 5-23 Alternative 3 would meet the design criteria of FAA Advisory Circular 150/5300-13A and no modification of standards would be necessary. However, the proposed runway extension would slightly shift the departure RPZ further west toward the residential areas. Easement or acquisition of eight (8) residential properties, along with obstacle clearing, is required to comply with FAA RPZ requirements.
- **Land Use Compatibility:** Noise impacts associated with landings on Runway 23 would not change as the present location of the Runway 23 threshold is retained. However, this alternative does incur a slight increase in noise impacts related to aircraft taking off from Runway 23. The noise will not exceed 65 DNL, which the FAA uses to define noise impacts; however, takeoffs will begin approximately 301 feet closer to those homes. Still, given that the distance to the homes does not increase as appreciably as Alternative 2, the changes should not substantially affect the residential properties off the Runway 23 end, especially when compared to the 801 foot extension. Finally, as previously mentioned, the shifting RPZ areas would capture eight new properties, which would be acquired in fee or easement to maintain RPZ land use requirements.
- **Development Costs:** The estimated cost for this alternative is \$1,980,000.
- **Operational Flexibility:** This alternative would allow Saratoga County Airport to achieve a 5,000 foot runway. This runway length would increase operational flexibility in terms of better meeting the performance needs of corporate aircraft and complying with corporate aircraft insurance requirements, which often mandate a 5,000 foot runway. However, weight restrictions and limitations associated with wet runway landing requirements would remain. Those restrictions could include the exclusion of certain pilots from operating on the runway due to experience level or other insurance induced operating restrictions, to name a few. Although these conditions remain, the additional 301 feet of length would further enhance operations and safety of aircraft operating at the Airport overall. The additional operational safety will allow aircraft to operate more efficiently

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and in turn lead to greater economic benefits for the community through additional fuel purchases, aircraft parking fees and passenger spending in the region.

6.3.7. Runway 5-23 Alternatives Summary

The description of runway alternatives included an evaluation based on six criteria: 1) the ability of the alternative to meet the identified facility requirements, 2) potential environmental impacts, 3) the ability to meet FAA standards, 4) land use compatibility, 5) estimated development costs, and 6) development flexibility. Table 6-1 summarizes the above analysis.

Table 6-1 - Summary of Runway 5-23 Alternatives

Alternative	RWY 5-23 Alt 1 (No Build)	RWY 5-23 Alt 2 (Extend by 801')	RWY 5-23 Alt 3 (Extend by 301')
Facility Requirements	No	Yes	Partial – Enhances runway length.
Environmental Impacts	None	3.55 Acres of Habitat	1.82 Acres of Habitat
FAA Standards	Yes – assumes ongoing land acquisition to comply with RPZ and ROFA standards	Yes	Yes
Land Use Compatibility	Compatible if RPZ action items implemented Easement acquisition for portions of 14 parcels, Acquisition in fee for 2 parcels	Increased noise levels near RW 23 Easement acquisition over all or portions of 24 parcels ¹	Slightly increased noise levels near RW 23 Acquisition of easements over portions of 7 parcels; Acquisition in fee for 3 parcels. ¹
Development Cost	\$560,000	\$5,980,000 ²	\$1,980,000 ²
Operational Flexibility	Minimum (most weight penalties)	Maximum (least weight penalties)	Moderate (some weight penalties)

¹Land and Easement Acquisition identified for the build alternatives is in addition to the acquisitions identified for the No Build alternative.

²Development Costs identified for the build alternatives are in addition to the costs identified for the No Build alternative, and do not include costs for environmental permitting or mitigation.

6.3.8. Runway 14-32 Alternative Identification

The alternatives developed specific to Runway 14-32 at Saratoga County Airport are as follows:

- **Runway 14-32 Alternative 1 (No-Build)**
 - The runway would remain in its present state, with no changes to its length, width, location, or orientation.
- **Runway 14-32 Alternative 2 (Displaced Thresholds)**

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- This alternative would displace the landing thresholds at each runway end to achieve a standard RPZ and mitigate obstructions to the approach surfaces. The Runway 14 threshold would be displaced 1,460 feet and the Runway 32 threshold would be displaced by 770 feet.

6.3.9. Runway 14-32 Alternative 1 (No-Build)

Under Runway 14-32 Alternative 1 (No-Build), no major modifications would be made to the length, width, location, or orientation of the runway. The No-Build alternative can be seen in Figure 6-4. Recent changes to the FAA's RPZ land use policy are considered in this alternative. If the No-Build is selected, there are still minimum standards, which must be addressed in order to bring the existing runway RPZs into compliance. The actions required to meet those standards are incorporated into both Runway 14-32 Alternatives and are as follows:

- **RW 14 RPZ:**
 - Easement acquisition for portions of two (2) parcels along Acland Boulevard and Stone Church Road.
- **RW 32 RPZ:**
 - Easement acquisition for portions of four (4) parcels adjacent to the Airport access road.

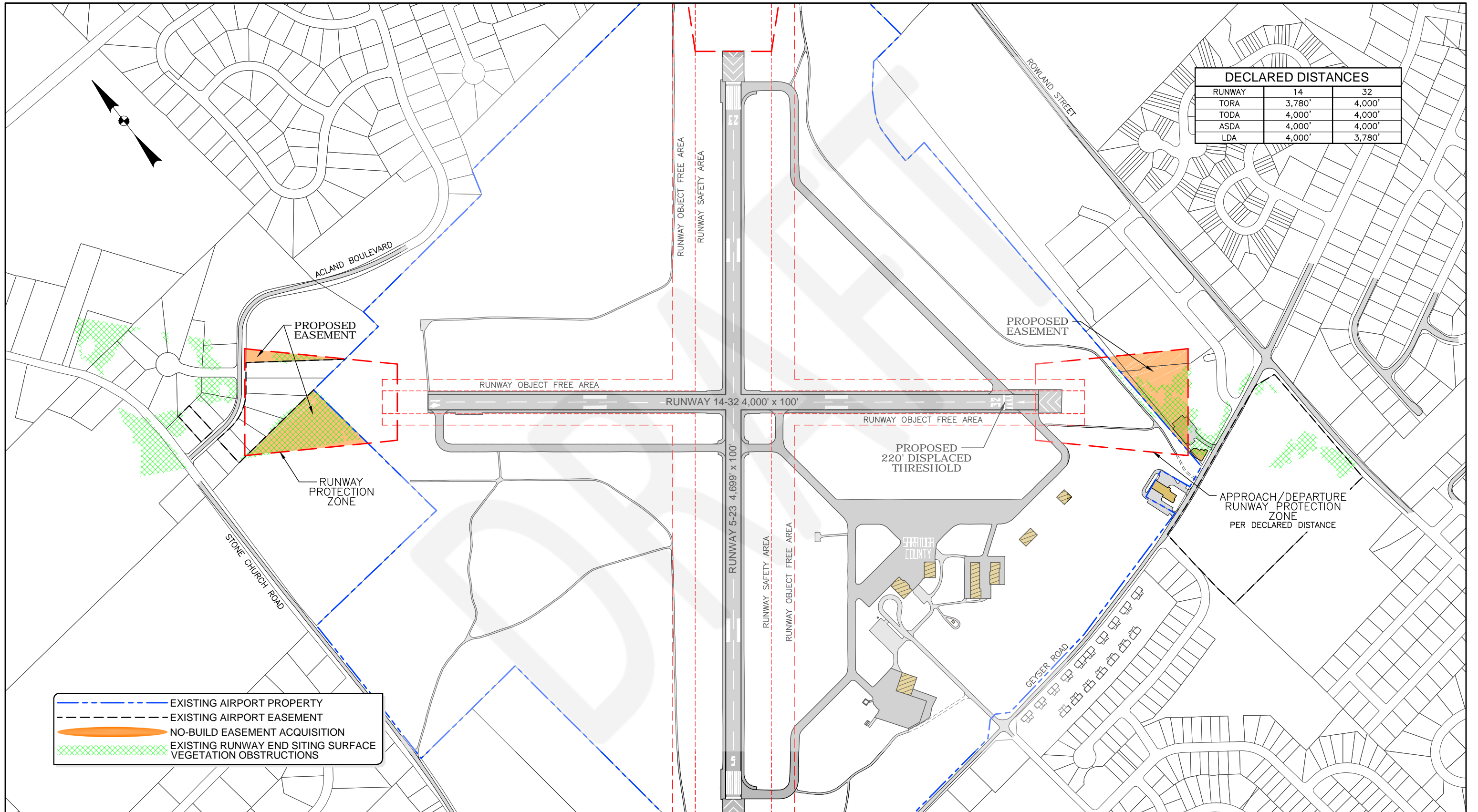
On the Runway 32 end, a new medical building was constructed in Fall of 2013, after the RPZ land use policy was enacted. A portion of the building and the associated parking lot are located within the Runway 32 RPZ. Per the revised RPZ land use policy, the building is a prohibited use, and for purposes of this analysis, it was assumed that this new incompatible land use would need to be addressed in the near term, as part of the No-Build alternative. This new building cannot practicably be relocated outside of the RPZ; therefore, the declared distance methodology was used to address the incompatible land use. Implementation of declared distances would place the building outside of the RPZ, and is considered part of the No Build alternative. Further coordination with the FAA is required to determine if the parking lot is an acceptable land use in the RPZ. If the FAA determines that the parking lot is not acceptable in the RPZ, the threshold would need to be relocated by 325 feet. In addition, an easement acquisition over that portion of the property is recommended to ensure future compliance with the RPZ policies.

This alternative was assessed as follows:

- **Facility Requirements:** The No-Build alternative for Runway 14-32 results in reduced landing length available for aircraft arriving on Runway 32 and departing Runway 14. As such, this alternative does not fully meet the identified facility requirements for Runway 14-32.
- **FAA Standards:** The alternative meets FAA standards by adjusting the Runway 32 RPZ through the declared distanced methodology to meet current policy.
- **Environmental Impact:** There are no environmental impacts associated with the No-Build alternative for Runway 14-32.

RUNWAY 14-32 - ALTERNATIVE 1 - NO BUILD

FIGURE 6-4



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- **Land Use Compatibility:** The land use compatibility of the No-Build alternative is conditional upon the Airport's ability to attain the aviation easement over the medical building property off the Runway 32 end.
- **Development Costs:** The total estimated cost for the No-Build is \$503,000, of which \$333,000 is estimated for RPZ easements.
- **Operational Flexibility:** This alternative would impair the operational flexibility of Saratoga County Airport. The loss of 220 feet in Take Off Run Available (TORA) for Runway 14 and Landing Distance Available for Runway 32 places a greater restriction on the types of aircraft that are able to utilize Runway 14-32, particularly during strong crosswind conditions and/or with wet runway surfaces. The largest effect will be on the larger twin aircraft (piston or turboprop) and the smaller jet aircraft that use the runway currently. The effect will be especially prominent during the six-week track season during the summer due to the significant influx of aircraft operations.

6.3.10. Runway 14-32 Alternative 2

The second alternative for Runway 14-32 proposes displacing the thresholds on both Runway 14 and Runway 32. Figure 6-5 depicts this alternative. This alternative is based upon the assumption that the off Airport tree obstructions cannot be mitigated over time and the County is unable to get the appropriate easements to remove the trees.

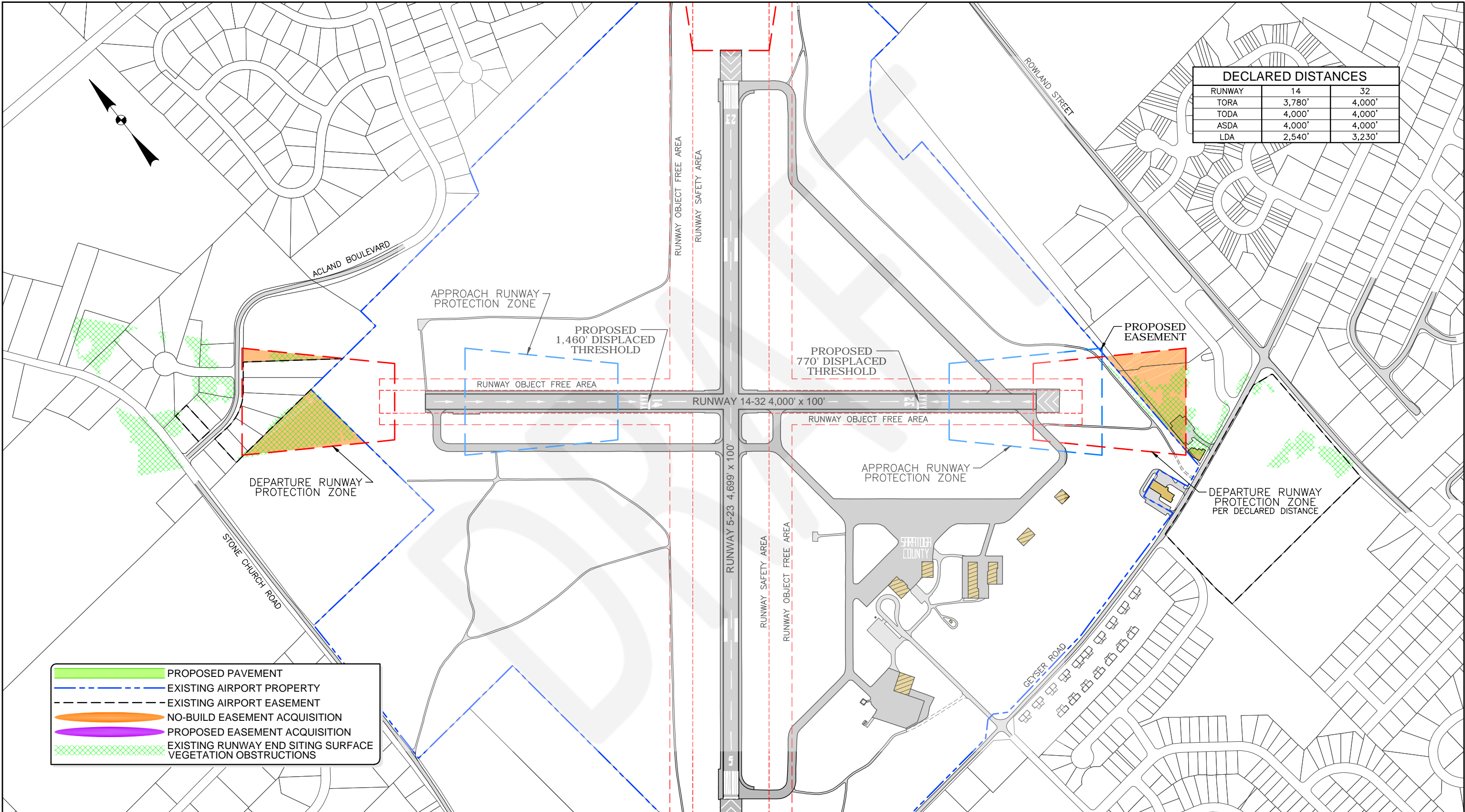
Using the Runway Siting Surfaces for either runway end, clearing the tallest obstructions in the approach would require displacing the Runway 14 threshold by 1,460 feet and the Runway 32 threshold by 770 feet. This would adjust the approach RPZs relative to each modified landing threshold. The departure RPZs for both Runway 14 and Runway 32 would remain the same, as the physical runway ends would not be altered.

This alternative was evaluated as follows:

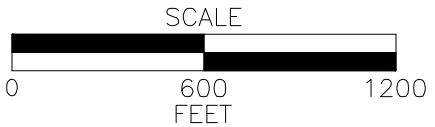
- **Facility Requirements:** The runway would not meet facility requirements. Significant displacements of either runway threshold are required to clear obstructions in the approaches to the runway. This affects the available landing distance, thereby restricting a number of high performance piston and turbine (turboprop or jet) aircraft from using the runway during dry conditions, or eliminating the use altogether when the runway is wet. This alternative would not meet facility requirements outlined in Chapter 5, *Facility Requirements*.
- **Environmental Impact:** The action evaluated in this alternative deals only with the displacement of the runway thresholds. As such, since runway markings would be the only modification under this option, no environmental impact is foreseen with Runway 14-32 Alternative 2.
- **FAA Standards:** Although all FAA airfield design standards are met under this alternative, aircraft operational requirements for landing are significantly impacted with the displaced threshold, especially for the larger twin turboprop and small jet aircraft. The FAA's Advisory Circular 150/5325-4B recommends reviewing aircraft manufacturers' data to determine takeoff and landing requirements for aircraft.

RUNWAY 14-32 - ALTERNATIVE 2

FIGURE 6-5



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The data for landing lengths for various aircraft, including wet runway conditions, indicated that the proposed runway displacements on either runway end would not meet aircraft landing length requirements identified by the manufacturer. As such, FAA standards for landing lengths cannot be met by this alternative.

- **Land Use Compatibility:** There are no on- or off-Airport land use compatibility issues associated with this alternative.
- **Development Costs:** The total estimated cost for Runway 14-32 Alternative 2 is \$780,000, of which \$330,000 is estimated for RPZ easements.
- **Operational Flexibility:** This development option will substantially influence aircraft operations at Saratoga County Airport, as the displaced landing thresholds would result in significantly decreased landing distance on Runway 14-32. For aircraft on approach to Runway 14, the LDA would be 2,540 feet. Aircraft approaching Runway 32 would have 3,230 feet in length available for landing. These landing distances essentially relegate the runway to serving only small single or light twin-engine airplanes, especially under strong crosswind conditions favoring this runway or wet runway surfaces. Some larger aircraft would be forced to divert to an alternate Airport under these conditions.

6.3.11. Summary of Runway 14-32 Alternatives

The description of runway alternatives included an evaluation based on six criteria: 1) the ability of the alternative to meet the identified facility requirements, 2) potential environmental impacts, 3) the ability to meet FAA standards, 4) land use compatibility, 5) estimated development costs, and 6) development flexibility. Table 6-2 summarizes the above analysis.

Table 6-2 - Summary of Runway 14-32 Alternatives

Alternative	RWY 14-32 Alt 1 (No Build)	RWY 14-32 Alt 2 (Displace Thresholds)
Facility Requirements	No	No
Environmental Impacts	None	None
FAA Standards	Yes, use of declared distance and pending easement acquisition	No
Land Use Compatibility	Yes	Yes
Development Cost	\$503,000	780,000
Operational Flexibility	Decreases due to reduced LDA and TORA for certain operations	Substantially decreases due to reduced LDA

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6.3.12. Taxiway Alternative Identification

The following taxiway alternatives have been developed to meet the taxiway facility requirements at Saratoga County Airport:

- **Taxiway Alternative 1 (No-Build)**
 - Taxiways remain the same in length, width, location, and orientation (No-Build).
- **Taxiway Alternative 2 (Partial-Parallel)**
 - Construct a partial-parallel taxiway to Runway 5-23 with a width of 50 feet and a runway-taxiway centerline separation of 400 feet.
 - Taxiway D to be abandoned in place and designated not for use. Portions of the pavement will remain available for glider staging and maneuvering.
- **Taxiway Alternative 3 (Full-Parallel)**
 - Construct a full-parallel taxiway to Runway 5-23 with a width of 50 feet and a runway-taxiway centerline separation of 400 feet.
 - Taxiway D to be abandoned in place and designated not for use. Portions of the pavement will remain available for glider staging and maneuvering.

6.3.13. Taxiway Alternative 1 (No-Build)

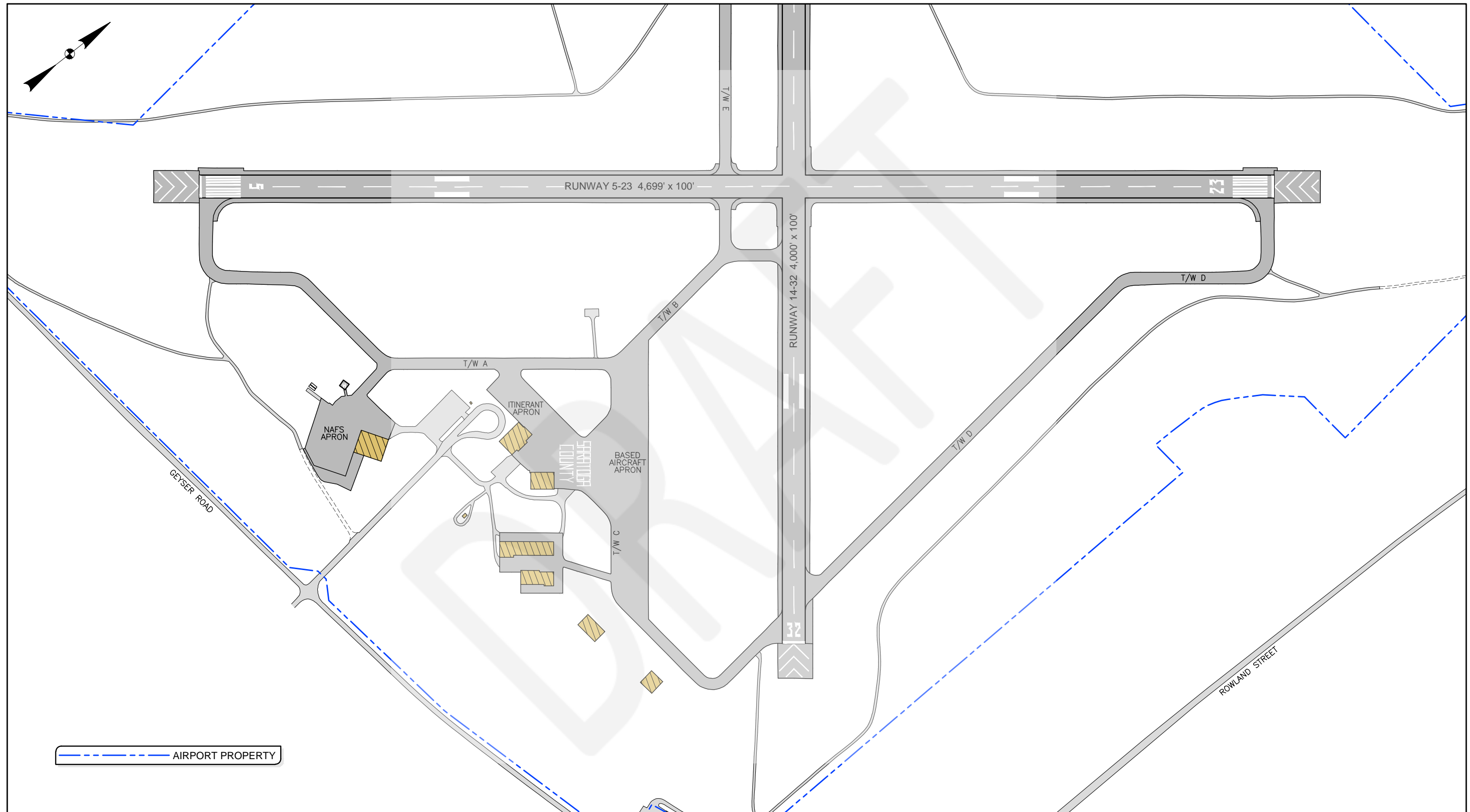
The existing taxiway system serves both runways and provides access to all four runway ends. However, the taxiway system serving Runway 5-23 (Taxiways A, C, and D) requires a long taxi distance to get to the terminal area and is not considered a parallel taxiway given its current configuration. Additionally, when gliders are towed to or from their hangars and the departing runway, this can create conflicts with powered aircraft that cannot directly access the runway ends due to limited maneuverability afforded by the current taxiway system. In certain cases, aircraft will back taxi to the active runway in order to avoid the taxiway congestion, thus increasing their time on the runway and reducing the overall capacity of the runway system. Under the No-Build, no changes are made to the taxiway system; the taxiways will remain the same in length, width, location, and orientation. The existing layout of this alternative is shown in Figure 6-6.

This alternative was evaluated as follows:

- **Facility Requirements:** Taxiway Alternative 1 does not meet the existing or future needs of the Airport, as it fails to provide separation between powered and non-powered aircraft. Additionally, the No-Build alternative would not satisfy the recommended facility requirements regarding a parallel taxiway to Runway 5-23 as described in Chapter 5, *Facility Requirements*.
- **Environmental Impact:** There are no environmental impacts associated with this alternative.
- **FAA Standards:** According to the new taxiway guidelines in Advisory Circular 150/5300-13A, it is recommended that the existing taxiway system at Saratoga County Airport include a parallel taxiway to comply with FAA standards for runways with instrument approaches. However, the present taxiway system cannot efficiently operate as a true parallel taxiway.

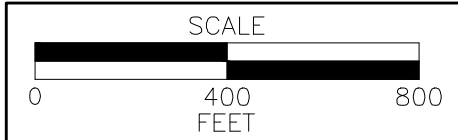
TAXIWAY ALTERNATIVE 1 - NO BUILD

FIGURE 6-6



--- AIRPORT PROPERTY

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- **Land Use Compatibility:** Existing patterns of land use would remain both on and off-Airport property.
- **Development Costs:** There are no design or construction costs associated with Taxiway Alternative 1.
- **Operational Flexibility:** This choice limits the operational flexibility of the Airport due to the congestion related to both powered and non-powered aircraft operating on the same runways and taxiways.

6.3.14. Taxiway Alternative 2 (Partial-Parallel)

Taxiway Alternative 2 proposes a partial-parallel taxiway on the southeasterly side of Runway 5-23. This alternative is detailed in Figure 6-7. This alternative would provide a partial parallel taxiway beginning at Taxiway B, crossing Runway 32 and continuing to Taxiway D, which connects to Runway 23 end. This option offers a bypass option if gliders are on Taxiway C or D and cannot be moved. Aircraft can bypass Taxiway C and D altogether to get to Runway 23, which is the most used runway end. This option would also abandon Taxiway D in place. The ends would be turned into staging for gliders to use, avoiding the need to stage on turf areas.

Implementation of Taxiway Alternative 2 would require the following actions:

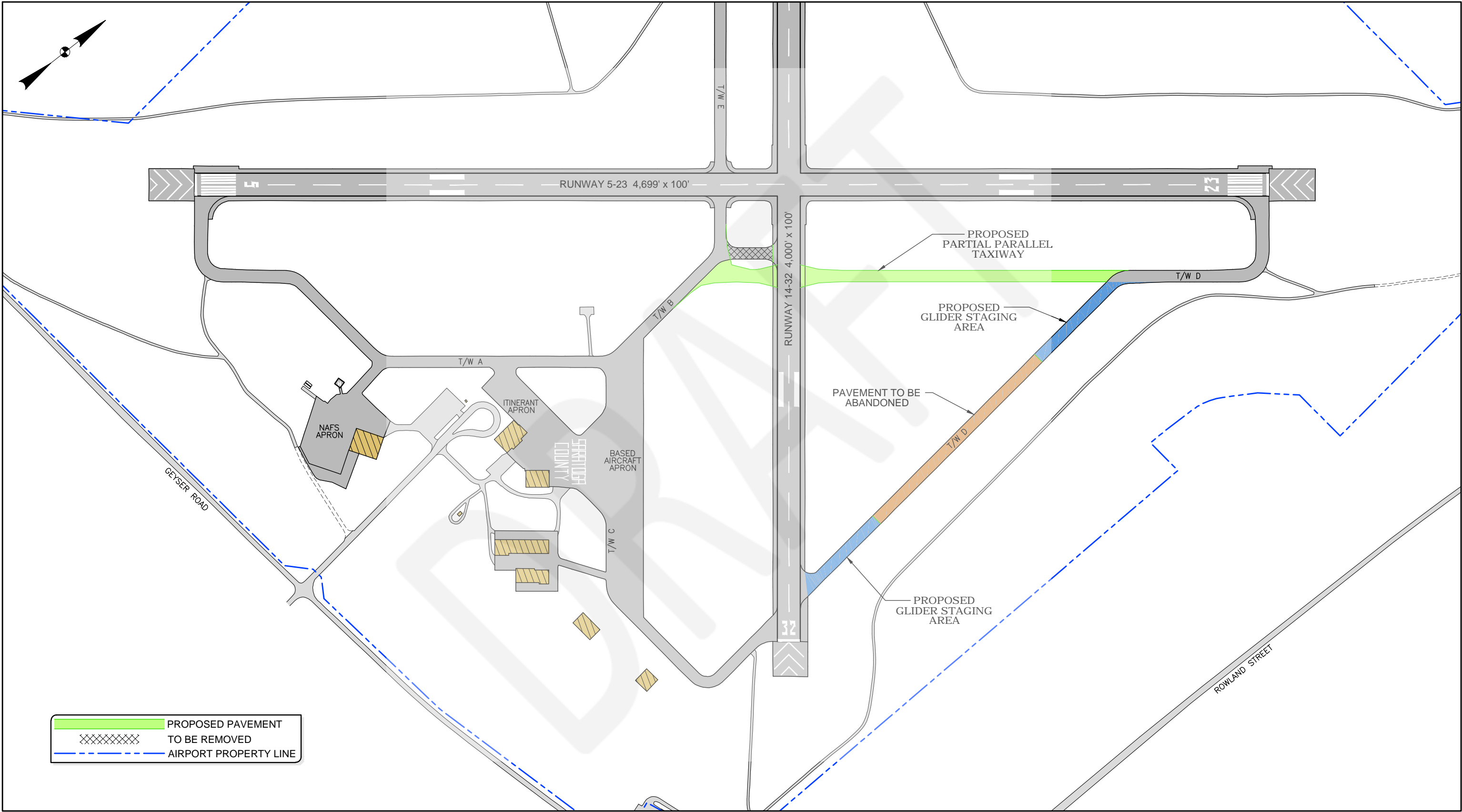
- **Construct Partial-Parallel Taxiway to Runway 5-23:** The taxiway connects with the existing portion of Taxiway D near Runway 23 and intersects with Runway 14-32 where Taxiway B is located presently. The partial-parallel taxiway would be 50 feet wide and have a runway-to-taxiway centerline separation of 400 feet. If one of the runway extension alternatives is implemented, the taxiway should be extended to the new runway end.
- **Install Medium Intensity Taxiway Edge Lighting (MITL):** MITLs will be installed on all taxiways to provide guidance to pilots taxiing at the Airport during poor weather conditions or at night.
- **Install Taxiway Signage:** Taxiway signage will be installed in conjunction with the construction and removal of related taxiways at the Airport.
- **Abandon Taxiway D in Place:** With the construction of a partial-parallel taxiway, Taxiway D will no longer be needed, and consequently should be abandoned in place. The abandoned pavement will be used by gliders as staging or recovery area for operations on Runway 32 or 23.

This alternative was evaluated as follows:

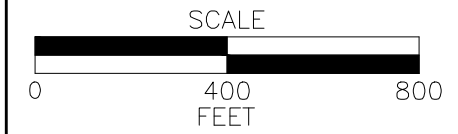
- **Facility Requirements:** Taxiway Alternative 2 provides an efficient taxiway system that would allow independent operations by powered aircraft and gliders, thus meeting the needs identified in Chapter 5, *Facility Requirements*.

TAXIWAY ALTERNATIVE 2

FIGURE 6-7



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- **Environmental Impact:** This alternative will affect approximately 2.11 acres of Karner Blue Butterfly habitat. Temporary impacts associated with construction are not included in this estimate. However, , since the partial-parallel taxiway reduces the overall taxi distance and alleviates potential congestion associated with gliders on the taxiway, this alternative reduces the overall exhaust emissions generated by aircraft.
- **FAA Standards:** As proposed, Taxiway Alternative 2 adheres to FAA design standards related to a width of 50 feet and a taxiway to runway centerline separation of 400 feet, which exceeds the required separation standard. Taxiway Safety Areas (TSA), Taxiway Object Free Areas (TOFA) standards are also met under this alternative.
- **Land Use Compatibility:** The partial-parallel alternative is compatible with existing on-Airport land use. The development option employs use of the existing taxiway system south of Runway 14-32, and suggests the abandonment of those portions, which will become redundant north of Runway 14-32 (Taxiway D). Also, this option provides the ability to segment future taxiway construction into phases.
- **Development Costs:** The overall cost of this alternative is estimated at \$1,320,000.
- **Operational Flexibility:** This alternative eliminates the need to back-taxi on the runways, thus allowing for considerably enhanced flexibility from an operational standpoint. Taxiway Alternative 2 also provides opportunity to adapt to future changes and developments at the Airport.

6.3.15. Taxiway Alternative 3 (Full-Parallel)

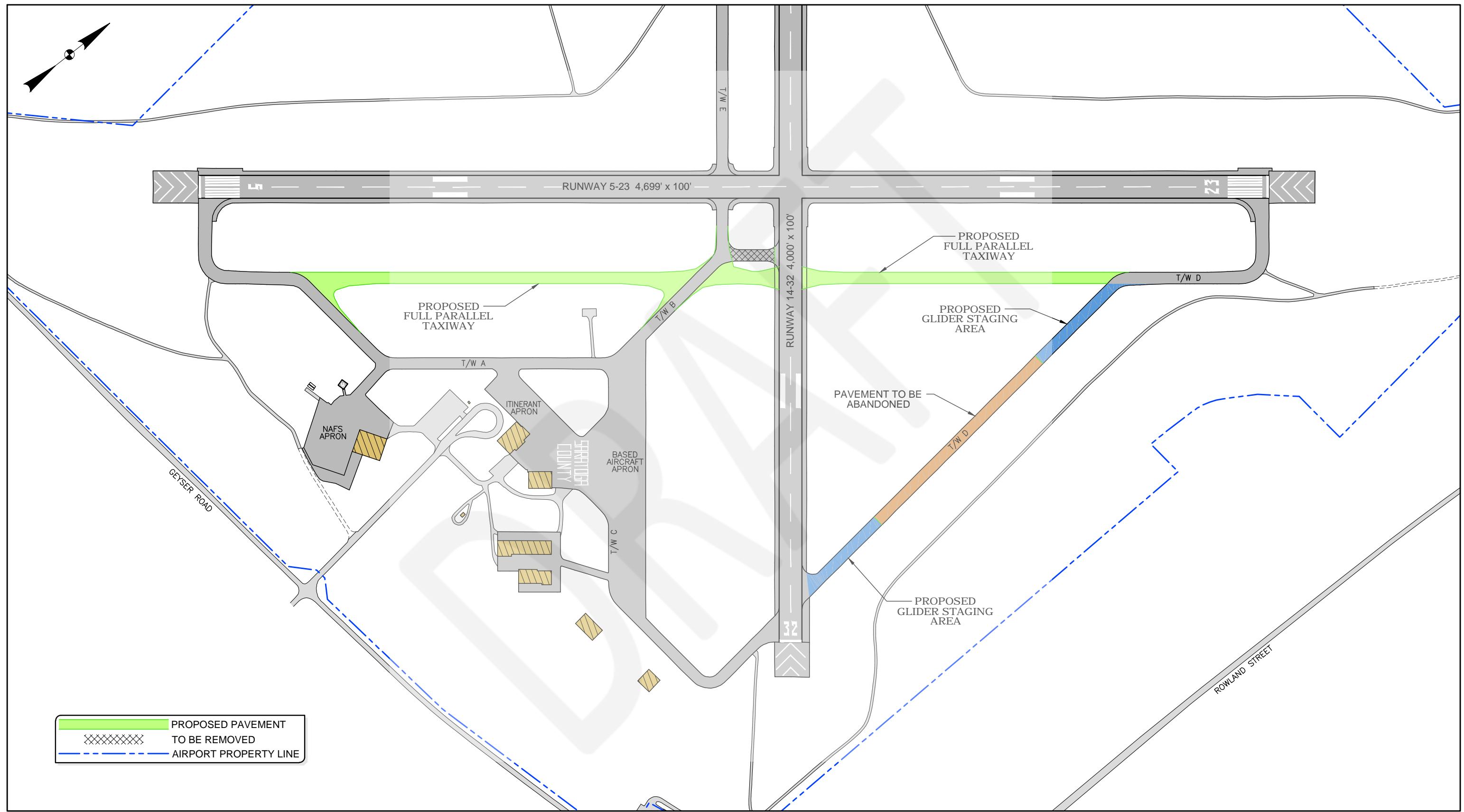
This alternative includes many of the same features as Taxiway Alternative 2, except that the proposed taxiway would be a full parallel that spans the entire length of Runway 5-23. The taxiway would continue the taxiway form Alternative 2 from Taxiway B to connect with Taxiway A at the Runway End 5. This alternative is depicted in Figure 6-8.

The following actions are necessary for implementation of Taxiway Alternative 3:

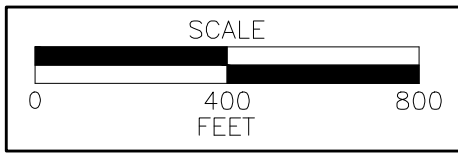
- **Construct Full-Parallel Taxiway to Runway 23:** The full-parallel taxiway will connect with the existing portion of Taxiway D along the end of Runway 23 and that of Taxiway B, which can be found near the intersection of the Airport's two runways. The full parallel would also connect to Taxiway A located adjacent to the Runway 5 end. The taxiway would be 50 feet wide and have a runway-to-taxiway centerline separation of 400 feet. If one of the runway extension alternatives is implemented, the taxiway should be extended to the new runway end.
- **Install MITL:** MITLs will be installed on the parallel taxiway to provide guidance to pilots taxiing at the Airport during poor weather conditions or at night.
- **Install Taxiway Signage:** Taxiway signage will be installed in conjunction with the construction and removal of related taxiways at the Airport.

TAXIWAY ALTERNATIVE 3

FIGURE 6-8



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- **Abandon Taxiway D in Place:** With the construction of a full-parallel taxiway, Taxiway D will no longer be needed, and consequently should be abandoned in place once the construction of the full-parallel taxiway has been completed. The abandoned pavement will be used for staging of glider operations near Runways 23 and 32.

The assessment of this alternative is as follows:

- **Facility Requirements:** Taxiway Alternative 3 addresses the congestion and separation issues by allowing powered aircraft to circumvent the existing intersection between Runway 32 and Taxiway D. The segment of the proposed taxiway between existing Taxiways A and B is redundant to the existing taxiway system in this portion of the Airport, providing little operational benefit.
- **Environmental Impact:** The planned location of the full parallel affects 4.5 acres of Known Habitat Area of the Karner Blue Butterfly. Temporary impacts associated with construction are not included in this estimate. Special permitting and mitigation would be necessary for this alternative to be implemented. Obtaining environmental regulatory approvals for the redundant section (see above) is expected to be difficult given the limited operational benefit. As part of the project, the stub taxiway connecting Taxiway B to Runway 32 will be removed, reducing the overall pavement requirement of this alternative. Finally, this alternative decreases the overall emissions generated by aircraft as the full-parallel taxiway reduces taxi distance and alleviates congestion associated with gliders on the taxiway.
- **FAA Standards:** As proposed, Taxiway Alternative 3 adheres to the FAA design standards related to the width of 50 feet and a taxiway to runway centerline separation of 400 feet, which exceeds the required separation standard. Taxiway Safety Areas (TSA), Taxiway Object Free Areas (TOFA) standards are also met under this alternative.
- **Land Use Compatibility:** The full-parallel taxiway alternative is compatible with existing on-Airport land uses.
- **Development Costs:** The overall cost of this alternative is estimated at \$2,580,000.
- **Operational Flexibility:** By reducing the need to back-taxi, this alternative allows for considerably enhanced flexibility from an operational standpoint, and provides opportunity to adapt to future changes and developments at the Airport. However, the redundant portion of the taxiway imposes additional maintenance and snow removal burden on the County for little benefit.

6.3.16. Taxiway Alternatives Summary

The descriptions of the taxiway alternatives have included an evaluation based on six criteria: 1) the ability of the alternative to meet the identified facility requirements, 2) potential environmental impacts, 3) the ability to meet FAA standards, 4) land use compatibility, 5) estimated development costs, and 6) development flexibility. Table 6-3 summarizes the above analysis.

Table 6-3 - Summary of Taxiway Alternatives

Alternative	Taxiway Alt 1 (No Build)	Taxiway Alt 2 (Partial-Parallel)	Taxiway Alt 3 (Full-Parallel)
Facility Requirements	No	Yes	Yes
Environmental Impacts	None	2.11 acres of butterfly habitat	4.5 acres of butterfly habitat
FAA Standards	No	Yes	Yes
Land Use Compatibility	No Change	Compatible	Compatible
Development Cost	\$0	\$1,320,00*	\$2,580,00*
Operational Flexibility	None	Improved	Improved; Increases pavement maintenance requirements for little benefit compared to Alt 2.

* This cost does not include permitting and habitat mitigation, which are likely to be substantial.

6.3.17. Glider Runway Alternatives

The following glider runway alternatives were developed to facilitate glider operations at Saratoga County Airport:

- **Glider Alternative 1 (No-Build)**
 - There would be no modifications made to the airfield with regard to a separate glider landing area.
- **Glider Alternative 2**
 - This alternative would provide for a gliders-only turf landing area parallel to Runway 14-32.

6.3.18. Glider Alternative 1 (No-Build)

Glider Alternative 1 suggests that no modifications be made to Saratoga County Airport with regard to separate glider staging and landing areas. This is considered the No-Build alternative and can be seen in Figure 6-1, the existing Airport layout. Gliders would continue to operate on Runway 32 when Runway 5-23 is the primary runway. There will be times, however, when the winds will require the gliders and powered aircraft to operate on Runway 5-23 simultaneously, which will reduce the overall capacity of the runway.

The No-Build glider alternative was assessed as follows:

- **Facility Requirements:** The previous chapter, *Demand Capacity and Facility Requirements*, discussed the operational issues related to non-powered aircraft (gliders) and powered aircraft operating simultaneously at the Airport, particularly with concern to

delays and congestion around the intersection of Runway 32 and Taxiway C. Glider Alternative 1 does not provide a turf landing area for the separation of powered and non-powered aircraft. However, both Taxiway “build” alternatives provide improved glider staging areas in close proximity to Runways 23 and 32 and reduce congestion at the Runway 32/Taxiway C intersection. Implementation of either of the taxiway build alternatives would address most of the operational issues related to gliders.

- **Environmental Impact:** There are no environmental impacts associated with Glider Alternative 1.
- **FAA Standards:** Since glider operations at Saratoga County Airport are currently in compliance with FAA standards, no changes would be incurred under the No-Build glider alternative.
- **Land Use Compatibility:** There are no changes proposed to the existing Airport layout that would cause incompatible land use.
- **Development Costs:** No development costs are associated with Glider Alternative 1.
- **Operational Flexibility:** The No-Build glider alternative does not increase operational flexibility due to the lack of a separate turf landing area. Thus, the gliders must operate at all times on paved areas as they do today, except for emergency landings on the designated landing areas. As noted previously, implementation of either of the taxiway “build” alternatives, largely addresses the operational needs of the gliders.

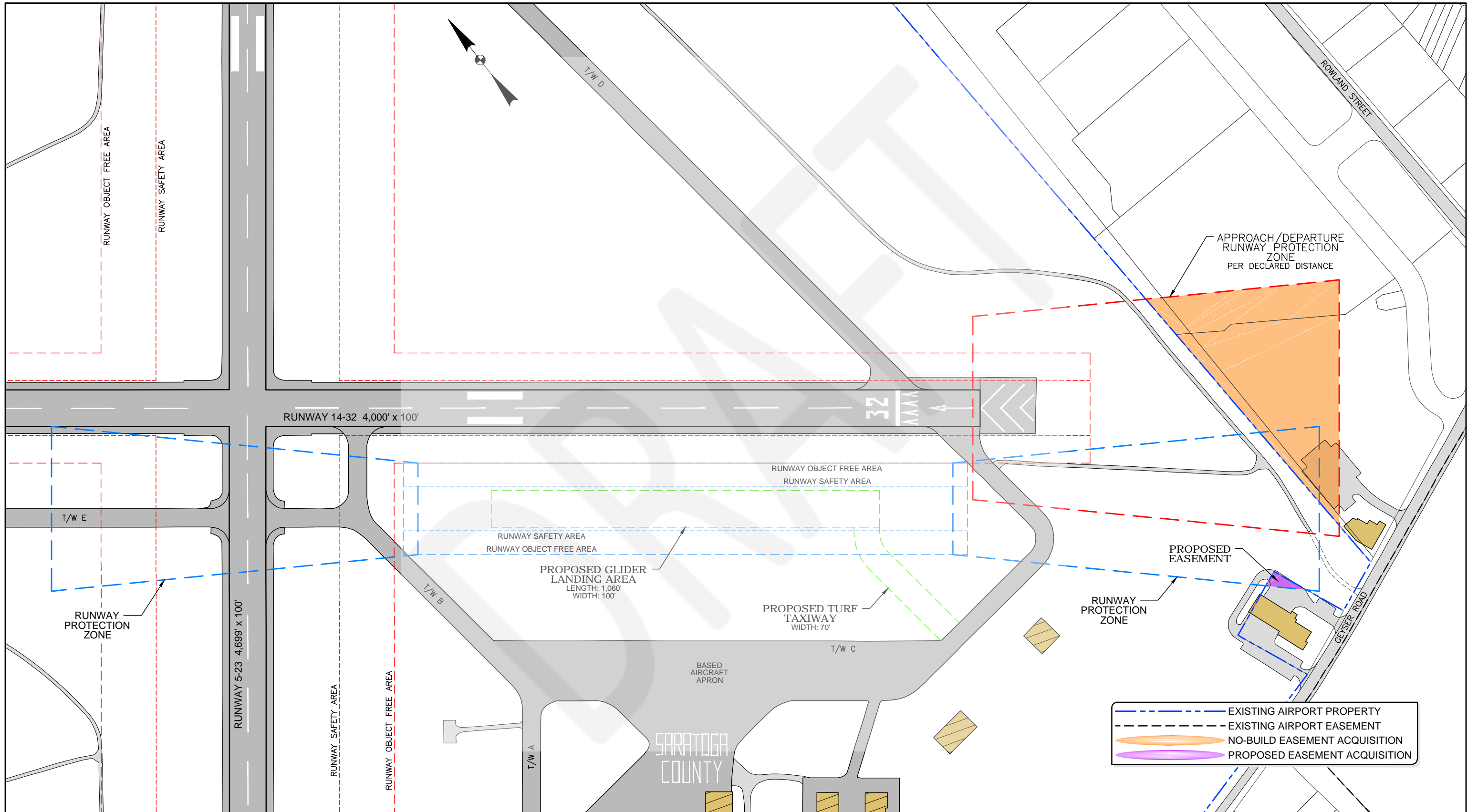
6.3.19. Glider Alternative 2

The second glider runway alternative proposes designating a portion of turf area to serve as an operating area for non-powered aircraft. The turf area could be used for takeoffs and landings, and would be located parallel to Runway 32 given the gliders’ tendency to favor that runway. The turf runway would be required to comply with FAA design standards for RSAs, OFAs, and RPZs for Runway Design Group A-1. As such, the maximum length of the turf runway is approximately 1,060 feet. Additionally, a 70-foot wide turf taxiway would be implemented to provide the tow airplanes and gliders access to the turf runway via Taxiway C.

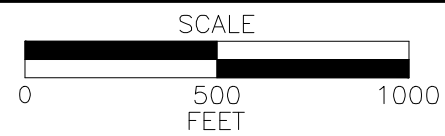
Glider Alternative 2 is illustrated in Figure 6-9 and was evaluated as follows:

- **Facility Requirements:** Glider Alternative 2 would provide separation between the powered and non-powered aircraft by allowing the gliders to operate in the turf area independently from the powered aircraft. As noted previously, implementation of either taxiway alternative would largely address most of the glider operational issues, precluding the need for the turf runway. Nevertheless, a turf runway as described here is desirable for its convenient location to the two based glider hangars, access to and from the runway would not require gliders to be towed on the paved taxiways, thus eliminating the potential for gliders to block powered aircraft on the taxiways. However, the proposed length of the turf area is insufficient to accommodate aircraft taking off with a glider in tow; therefore, its utility is limited.

GLIDER RUNWAY ALTERNATIVE 2



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- **Environmental Impact:** For purposes of this analysis, it was assumed that the implementation of the turf landing area, safety area, and object free area, as well as the turf taxiway would be considered impacts to 9.4 acres of Karner Blue Butterfly habitat. Given the very limited utility of the turf runway as described above, the regulatory review process for this alternative is expected to be rigorous.
- **FAA Standards:** This alternative meets the standards for turf runway and incorporates the proper RSAs, OFA, and RPZ. However, the separation of the turf runway to Runway 32 is based upon abutting the OFA for each runway, and as such, further discussion with the FAA will be required. Additionally, FAA involvement would be warranted to officially recognize the new turf strip for the purpose of Airport diagrams, Airport Facility Directory (AFD) information, approach plates, and subject to grant assurances. Finally, initial analyses show that with the proposed length and siting of the turf landing area, portions of the RPZ along the Runway 32 end will be off Airport property and do not fall within any Airport easements. This would require additional land or easement acquisition.
- **Land Use Compatibility:** This alternative meets on-Airport land uses; however, as the RPZ goes off Airport, easement or land acquisition is required to provide off-Airport land use compatibility.
- **Development Costs:** The estimated cost for this alternative is \$375,000, of which \$25,000 is estimated for the RPZ easement. However, this does not include the costs of environmental permitting and habitat mitigation, which are likely to be substantial.
- **Operational Flexibility:** As discussed under the Facility Requirements criterion, this option would allow for reduction in capacity delays and congestion.

6.3.20. Summary of Glider Alternatives

The descriptions of the glider alternatives have included an evaluation based on six criteria: 1) the ability of the alternative to meet the identified facility requirements, 2) potential environmental impacts, 3) the ability to meet FAA standards, 4) land use compatibility, 5) estimated development costs, and 6) development flexibility. Table 6-4 summarizes the above analysis.

Table 6-4 - Summary of Glider Alternatives

Alternative	Glider Alt 1 (No Build)	Glider Alt 2 (Landing Area)
Facility Requirements	No	No
Environmental Impacts	None	Significant (9.4 acres of butterfly habitat)
FAA Standards	No Change	RPZ off property
Land Use Compatibility	No Change	RPZ acquisition
Development Cost	None	\$375,000 plus permits and mitigation
Operational Flexibility	No Separation	Provides Separation; Minimizes glider activities on paved airfield surfaces

6.4. LANDSIDE ALTERNATIVES

This portion of the report examines the future placement of, and relationships between, existing and future landside facilities at the Airport. The landside alternatives will be compatible with the preferred airside alternative identified in the previous section. Several of the constraints mentioned in Section 6.2 limit the area available for future landside development.

In planning for landside facilities, an important consideration is the relationship between the activity centers of an Airport. An activity center is an area in which a certain type of activity occurs, such as aircraft fueling, equipment maintenance, or glider staging. As an Airport grows and activity increases, the smooth functioning of these activity centers and the relationships between them become increasingly important. With this in mind, three landside alternatives were developed. Elements that were considered in each alternative are as follows:

- Conventional Hangars:** The *Facility Requirements* chapter recommended the replacement of the existing maintenance hangar, as well as the construction of an additional 8,000 square foot conventional hangar to meet future storage demands. The existing maintenance hangar would continue to be used for major airframe and power plant repairs on turbine and jet aircraft, including avionics installation and repairs, while the additional conventional hangar is intended for future storage of corporate or GA aircraft. Apron space equal to the area of the hangars is recommended to allow for the parking and maneuvering of aircraft.
- T-Hangars:** T-hangars are typically a flexible and cost-effective way for an Airport operator to meet the aircraft storage needs of its customers. The previous chapter denoted a need for a 6-unit T-hanger to satisfy demand throughout the 20-year planning period.

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- **Apron Development:** Given the differences in operational requirements the Airport experiences during Track Season, there are distinct times of the year when the Airport has significant surplus apron space and instances when there are discernible deficiencies. It was suggested in the *Facility Requirements* that an additional 57,987 square feet of itinerant aircraft apron be provided to meet future demand.
- **Fuel Farm:** It was recommended that the Saratoga County Airport install a second 10,000 gallon Jet-A fuel tank and reconfigure the tanker truck access to facilitate access that is more efficient by delivery trucks.
- **Area Reserved for Non-Aviation Development:** In view of Chapter 3, *Forecasts of Aviation Activity*, and Chapter 5, *Demand Capacity and Facility Requirements*, it is evident that the existing amount of land far exceeds that which will be required to fulfill the projected aviation demand at Saratoga County Airport. Since the additional land will not be needed for aviation use, it is recommended that a portion of the airfield be released for non-aviation development. The proposed land release is located on the southeastern part of the airfield along Geyser Road, from which there is no airside access. The area maximizes the road frontage for development and is approximately 6 acres in size.

6.4.1. Landside Alternative Evaluation Criteria

A set of evaluation criteria was developed to provide consistent assessments of each landside alternative throughout the review process. The criteria are defined below:

- **Land Use Compatibility:** Is the alternative compatible with on-Airport and off-Airport patterns of land use?
- **Environmental Impact:** What are the potential environmental impacts associated with implementation of the alternative? Does the alternative avoid or minimize and mitigate environmental impacts?
- **Potential for Expansion:** Does this alternative have the ability to accommodate future unanticipated expansion? This criterion recognizes the fact that location decisions made in the present will influence future Airport development for many years to come. Planning shall consider future development needs beyond the Facility Requirements of the current planning period.
- **Operational Efficiency:** Will this alternative contribute to the development of a smoothly functioning Airport with efficient movement of aircraft? This criterion will consider whether the alternative makes the best and most efficient use of Airport facilities.
- **Revenue Generation Capability:** Does the alternative afford opportunities for Airport Management to increase revenue generation thereby improving the overall competitiveness and cost-effectiveness of the Airport?
- **Development Costs:** Does the alternative have reasonable development costs in comparison to other alternatives that achieve the same goal?

The next sections present the alternatives for the landside facilities.

6.4.2. Landside Alternative 1 (No-Build)

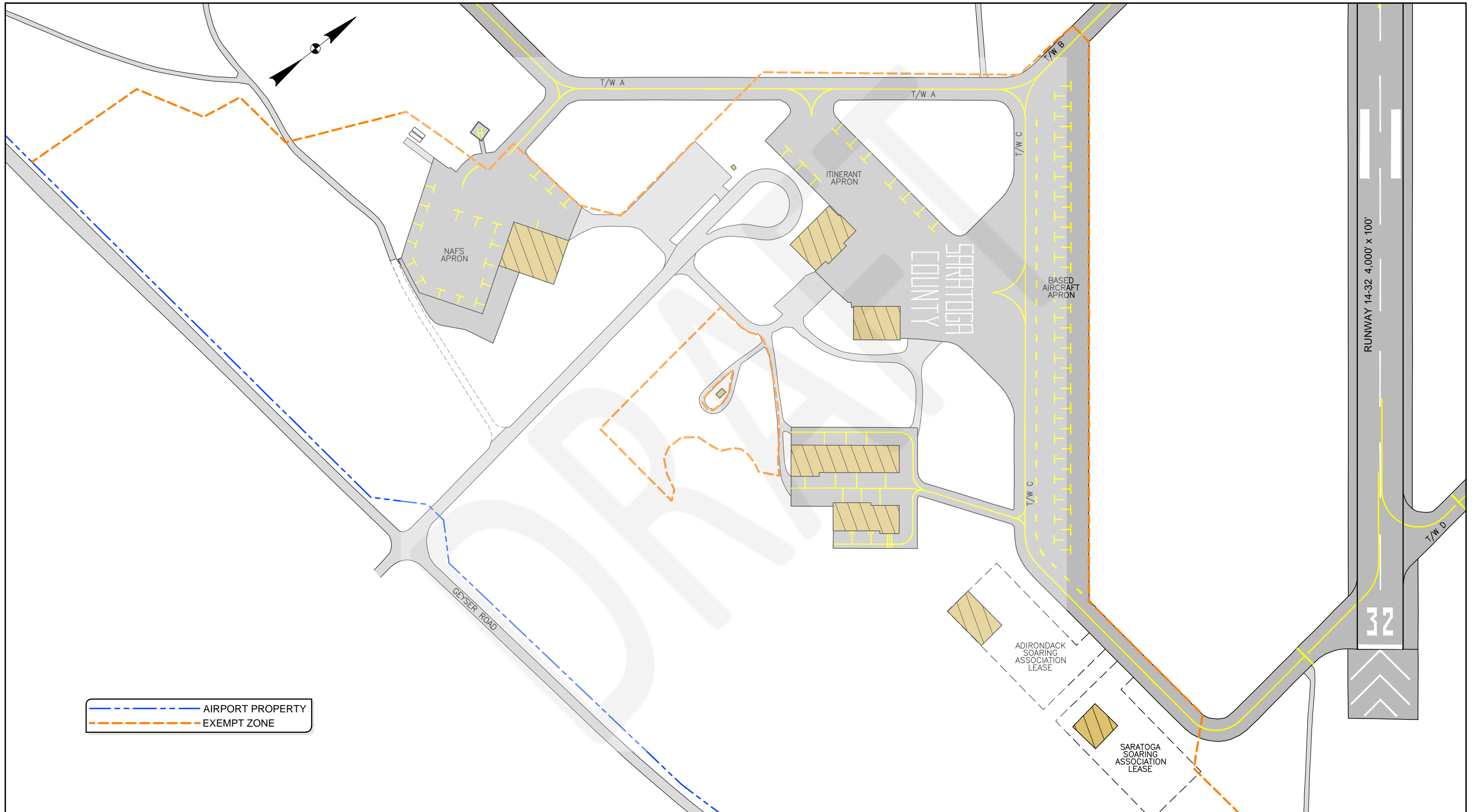
Landside Alternative 1 represents the No-Build option. This alternative purports maintaining the existing landside facilities in their current configuration, without change to any of the hangars, aprons, facilities, etc., and without reserving space for future aviation or non-aviation development. The existing Airport layout can be seen in Figure 6-10.

The evaluation of this alternative is as follows:

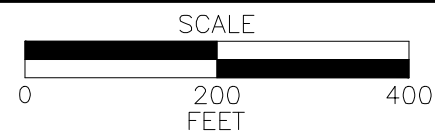
- **Land Use Compatibility:** This option allows Airport development to remain compatible with adjacent and nearby patterns of land use, as there would be no changes. However, without setting aside land for future aviation and non-aviation development, future development has the potential to become incompatible with future land uses that develop around the airfield.
- **Environmental Impact:** There are no environmental impacts associated with this alternative.
- **Potential for Expansion:** This alternative possesses maximum potential for future aviation development as no changes to the existing layout are made. The potential for non-aviation development would be hindered by the lack of a designated area under the No-Build.
- **Operational Efficiency:** The No-Build option currently does not meet the operational efficiency levels required for the present amount of Airport operations. Additionally, as Airport operations are forecast to increase with regional economic development, the operational capabilities and capacity of this landside configuration will quickly be exceeded without additional Airport development during the planning period, leading to congestion and delays.
- **Revenue Generation Capability:** Landside Alternative 1 does not improve the overall competitiveness of the Airport, nor does it provide additional opportunities for increased revenue generation without added development. Selection of this alternative could result in negative economic and operational impacts as aircraft owners, pilots, and passengers could choose to utilize other Airports as a result of the deficient landside development.
- **Development Costs:** There would be no development costs associated with the No-Build alternative.

LANDSIDE ALTERNATIVE 1 - NO BUILD

FIGURE 6-10



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6.4.3. Landside Alternative 2

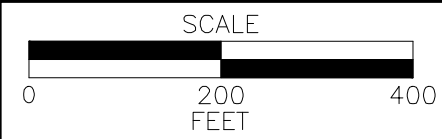
Landside Alternative 2 recommends placing the new 6-unit T-hanger to the south of the existing units, where the wooded area begins. The unpaved area northeast of the existing T-hangers would be constructed into an itinerant aircraft apron, providing 57,987 square feet of additional apron space. The new 8,000 square foot conventional hangar will be located adjacent to the North American Flight Services (NAFS) hangar closest to the existing fuel farm. The increase in hangar footage will require a corollary amount of additional apron area as well. This alternative recommends placing the required 10,000 gallon Jet-A fuel tank across from the existing tanks, on the opposite side of the pull-in area to the fuel farm. A turn-around will be installed, enabling the fuel trucks to drive around the other/south side of the proposed tanks. Finally, this option allocates portions of the landside area at Saratoga County Airport for future aviation and non-aviation development. These areas have the ability to be sectioned off into numerous parcels, while providing both airside access and roadway frontage. This alternative is illustrated in Figure 6-11.

This alternative was evaluated in the following manner:

- **Land Use Compatibility:** This alternative remains aligned with the patterns of land use both on and off the Airport. The proposed development is located within the Exempt Area of the property, and the planned elements allow access to and from both the airside movement areas and the landside road and parking network.
- **Environmental Impact:** Landside Alternative 2 has no environmental impacts. Development occurs in an exempt area as defined by State and Federal regulatory agencies and does not affect the Karner Blue Butterfly habitat. There will be an increase in impervious pavement area due to the construction of the buildings, apron, and fuel farm turn-around. This can be mitigated through proper grading and drainage design.
- **Potential for Expansion:** This alternative accommodates future unanticipated expansion. Because the proposed developments are located within the immediate vicinity of existing landside features, there is significant potential for expansion given the remaining areas available for use allocated for such purposes.
- **Operational Efficiency:** Landside Alternative 2 contributes to the efficient movement of aircraft; however, the planned placement of the T-hanger units is located somewhat far from the activity center – FBO, fuel, parking – of the Airport. Similarly, the site of the proposed hangar storage is located away from the main aprons.
- **Revenue Generation Capability:** This alternative offers opportunities for the Saratoga County Airport to increase revenue generation through the creation of more hangar units available for lease, additional maintenance space to perform aircraft services, greater fuel supply to be sold, and land to be developed. Overall, Landside Alternative 2 improves the competitiveness and cost-effectiveness of the Airport.
- **Development Costs:** The development cost for this alternative is estimated at \$3,580,000. The costs for hangars, T-hangers, and some apron areas would be the responsibility of third party entities under this alternative.

LANDSIDE ALTERNATIVE 2

FIGURE 6-11



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6.4.4. Landside Alternative 3

As seen in Figure 6-12, Landside Alternative 3 places the 6-unit T-hangar north of the existing units that are just south of the eastern North American Flight Services (NAFS) hangar. The unpaved area northeast of the existing T-hangars would be constructed into an itinerant aircraft apron, providing 57,987 square feet of additional apron space. The new 8,000 square foot conventional hangar will be located adjacent to the existing NAFS maintenance hangar that is to be replaced. The increase in hangar footage will require a corollary amount of additional apron area. This alternative recommends placing the required 10,000 gallon Jet-A fuel tank next to the existing tanks along the pull-in area to the fuel farm. A turn-around will be installed for the pull-in area, allowing the fuel trucks to head away from the Known Habitat Area and alleviating the inefficiency of backing-up. Finally, this option also suggests allocating portions of the landside area at Saratoga County Airport for future aviation and non-aviation development identical to Landside Alternative 2.

This assessment of this alternative is as follows:

- **Land Use Compatibility:** This alternative remains aligned with the patterns of land use both on and off the Airport. The proposed development is located within the Exempt Area of the property, and the planned elements allow access to and from both the airside movement areas and the landside road and parking network.
- **Environmental Impact:** The proposed development is in the exempt area and would have no impacts to the Karner Blue Butterfly habitat. There will be an increase in impervious pavement area due to the construction of the buildings, apron, and fuel farm turn-around, which can be mitigated through proper grading and drainage design.
- **Potential for Expansion:** This alternative has the ability to accommodate future unanticipated expansion. Because the proposed developments are located within the immediate vicinity of existing landside features, there is still significant potential for expansion given the remaining areas available for use allocated for such purposes.
- **Operational Efficiency:** By maintaining a cohesive layout with the placement of the T-hangars and proposed storage hangar, Landside Alternative 3 does contribute to the efficient movement of aircraft and seems to make economical use of the existing and future Airport facilities.
- **Revenue Generation Capability:** This alternative offers opportunities for the Saratoga County Airport to increase revenue generation through the creation of more hangar units available for lease, additional maintenance space to perform aircraft services, greater fuel supply to be sold, and land available for development. Overall, Landside Alternative 3 improves the competitiveness and cost-effectiveness of the Airport.
- **Development Costs:** The development cost for this alternative is estimated at \$3,760,000. The costs for hangars, T-hangars, and some apron areas would be the responsibility of third party entities under this alternative.

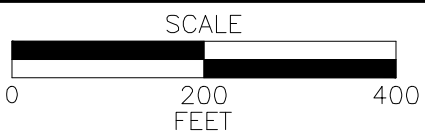
LANDSIDE ALTERNATIVE 3

FIGURE 6-12



- PROPOSED BUILDING
- PROPOSED PAVEMENT
- PROPOSED GROUND VEHICLE PAVEMENT
- AIRPORT PROPERTY
- EXEMPT ZONE

**SARATOGA
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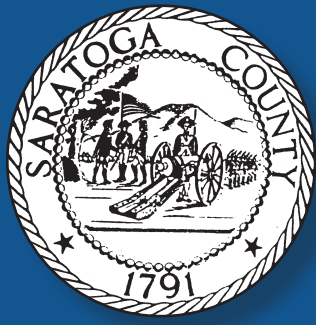
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6.4.5. Landside Alternative Summary

The description of landside alternatives has included an evaluation based on six criteria: 1) land use compatibility, 2) potential environmental impacts, 3) potential for expansion, 4) operational efficiency, 5) revenue generation capability, and 6) development costs. Table 6-5 summarizes the advantages and disadvantages from the above analysis.

Table 6-5 - Summary of Landside Alternatives

Alternative	Landside Alt 1 (No Build)	Landside Alt 2	Landside Alt 3
Land Use Compatibility	Compatible with Existing Use	Compatible with Existing Use	Compatible with Existing Use
Environmental Impacts	None	None	None
Potential for Expansion	Aviation Use Only	Aviation and Non-Aviation Potential	Aviation and Non-Aviation Potential
Operational Efficiency	Poor	Better	Best
Revenue Generation Capability	None	Competitive Aviation and Non-Aviation	Competitive Aviation and Non-Aviation
Development Costs	\$0	\$3,580,000	\$3,760,000



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