5. Alternatives Analysis

This chapter uses the facility requirements data to develop alternatives to meet the projected development needs at VRB. The alternatives considered must meet the aviation demand — by PAL, where applicable — and FAA design standards. In an alternatives analysis, the existing condition, also known as a no-build condition, is an alternative that should be considered. While graphics depicting the existing condition may not be included in this chapter, the development alternatives identified will be compared against the no-build condition as part of the evaluation.

Improvements, especially to the taxiway system, were identified in the previously approved ALP. These previously recommended improvements, which have not been constructed, will be evaluated to ensure they continue to meet FAA design standards and projected VRB user needs, as identified in the facility requirements. If the previously preferred alternative still meets these criteria, a full range of alternatives will not be developed for that facility; rather, the recommended alternative will be confirmed.

As identified in the facility requirements, the based aircraft are projected to grow to more than 300 from approximately 200 aircraft. The annual operations are projected to increase to more than 300,000, surpassing the pre-COVID-19 peak, and the annual enplaned passengers are projected to grow to more than 50,000. In this chapter, alternatives to meet VRB's development needs during the 20-year planning period are identified and evaluated for a variety of factors. The conceptual development alternatives are evaluated based on the goals and objectives identified for the airport master plan. They will be evaluated for operational performance, best planning practices, and environmental and fiscal factors. In particular, they will be evaluated for:

- Ease of operations
- Conformance to best practices for safety and security
- Conformance to the intent of FAA design standards and other appropriate planning guidelines
- Providing highest and best on- and off-airport land use
- Allowing for forecast growth throughout the planning period and beyond, as applicable
- Balance between functional area and types of users
- Providing flexibility to adjust to unforeseen changes
- Ability to meet airport sponsor's vision
- Conformance with appropriate local, regional, and state transportation plans and other applicable plans, developments of regional impact, or zoning
- Technical feasibility
- Social and political feasibility
- Ability to meet users' needs
- Minimizing or ability to mitigate environmental impacts
- Financial feasibility for implementation

Not all factors will apply to all alternatives. Only those applicable to an alternative are described in its evaluation. In this chapter, unless required to evaluate the alternatives, the financial feasibility will be considered at a macro level, e.g., if the alternative is financially feasible. Development cost estimates will not be prepared for every alternative. As part of the implementation plan, the probable development cost estimates will be prepared for the recommended development. The environmental overview chapter provides additional details on VRB's environmental setting that was used to evaluate the alternatives.

The alternatives are developed and evaluated with a primary focus on the airfield, then facilities that require airfield access. After identifying the areas required to support the high demand for aeronautical development, the remaining areas will be evaluated to support nonaeronautical facilities. Nonaeronautical facilities provide additional revenue streams for VRB to support the aeronautical functions. The facility requirements identified for each airfield and airside feature will be identified at the start of the analysis for that section.

To meet the aviation demands at VRB throughout the course of the 20-year planning horizon, this chapter focuses on alternatives for:

- Airfield: runway and taxiway systems and navaids and airfield support infrastructure, including:
  - Runway 12R/30L widening
  - Potential for lower instrument approach minimums on the instrument runways
  - Improvements to eliminate the use of declared distances on runways 12R/30L and 4/22
  - Potential extension of Runway 4/22
  - Improving the taxiway system to meet the latest FAA design standards
  - Additional parallel taxiway extensions and connectors to maximize utility of the runways
- Accommodating emerging aircraft technologies
- Airside commercial service, including:
  - Terminal building expansion
  - Auto parking expansion
  - Improved pedestrian access to the terminal
- GA hangar facilities, including improvements to maximize available development areas
- Other auto parking and utility improvements
- Nonaeronautical development opportunities

This chapter focuses on alternatives that could change the geometry of facilities on the airfield. For any facilities that will remain unchanged, while not accessed in the alternatives, recommendations for keeping them in good operational condition through maintenance, rehabilitation, reconstruction, or replacement will be incorporated as part of the implementation plan.

While this chapter will recommend alternatives to meet the facility requirements, an important step in the alternatives analysis process is to present these alternatives to airport staff, tenants, the public, and other agencies for input. This input will be incorporated to form the recommended development plan.

5.1. Runway System

The facility requirements chapter identified potential improvements to the runways at VRB. Each of these runway improvements is discussed in the following sections.

Runway system facility requirements

- Improve Runway 12R/30L for ARC C-III aircraft with MTOW > 150,000 pounds.
- Evaluate the feasibility of instrument approaches with less than a 3/4-mile visibility on Runway 12R/30L and a 7/8-mile visibility on Runway 4/22.
- Evaluate the feasibility of eliminating the use of declared distances on runways 12R/30L and 4/22.
- Extend Runway 4/22 to at least 5,000 feet and up to 5,700 feet to better serve the critical aircraft.
- Resolve runways 4/22 and 12L/30R overlapping RSAs.
- Minimize aircraft parked in RVZ when the ATCT is closed.

The facility requirements chapter identified a different critical aircraft for each of the runways at VRB. **Table 5.1** lists the key design standards applicable to each runway.

TABLE 5.1: EXISTING AND FUTURE RUNWAY DESIGN STANDARDS

Runway	Critical Aircraft	Runway Length x Length	RSA	ROFA	RPZ
12R/30L Existing	C-III Airbus 220-300	7,314' x 100'	1,000' beyond end, 600' before landing, 500' wide	1,000' beyond end, 600' before landing, 800' wide	1,000' inner width, 1,510' outer width, 1,700' length
12R/30L Future	D-III Gulfstream G650	7,314' x 150'	1,000' beyond end, 600' before landing, 500' wide	1,000' beyond end, 600' before landing, 800' wide	Up to 1,000' inner width, 1,750' outer width, 2,500' length
4/22 Existing	D-II Gulfstream G450	4,974' x 100'	1,000' beyond end, 600' before landing, 500' wide	1,000' beyond end, 600' before landing, 800' wide	500' inner width, 1,010' outer width, 1,700' length
4/22 Future	D-II Gulfstream G450	5,000' to 5,700' x 100'	1,000' beyond end, 600' before landing, 500' wide	1,000' beyond end, 600' before landing, 800' wide	500' inner width, 1,010' outer width, 1,700'; length
12L/30R Existing and Future	B-II Small Aircraft King Air B200	At least existing 3,504' x 75'	300' beyond end, 300' before landing, 150' wide	300' beyond end, 300' before landing, 500' wide	250' inner width, 450' outer width, 1,000' length

Sources: VRB Airport Master Plan: Forecast Chapter, prepared by ESA, 2023; FAA AC 150/5300-13B.

Runway 12R/30L

Runway Width

Runway 12R/30L is the primary runway at VRB. This runway is 7,314 feet long by 100 feet wide, with 20-foot-wide shoulders and blast pads that are 200 feet long by 140 feet wide. The existing critical aircraft is an Airbus A220-300, which has a MTOW of 156,000 pounds. Per AC150/5300-13B, runways that have a critical aircraft with an MTOW greater than 150,000 pounds should be 150 feet wide with shoulders that are 25 feet wide and a runway blast pad that is 200 feet wide and long. The existing runway length meets the operational needs; therefore, no changes to the runway length are recommended.

There is space available on VRB to widen Runway 12R/30L and make the shoulders and blast pad improvements to meet the FAA design standards for aircraft with an MTOW greater than 150,000 pounds. Therefore, the future development plans should consider increasing the runway width to 150 feet. If widened, the runway should be widened on each side to maintain the runway centerline to parallel centerline separation with the appropriate shoulders and blast pad improvements. The need to widen the runway is triggered by the operations of the Airbus A220-300, which has a maximum takeoff weight of 156,000 pounds, slightly more than the 150,000 pounds trigger for an increased runway width. The Airbus A220-300 is operating on Runway 12R/30L and can continue to operate on this runway until it is improved.

Runway 12R/30L Width Recommendation

It is recommended to widen Runway 12R/30L to 150 feet wide, widen the shoulders to 25 feet wide (beyond the wider runway), and enlarge the blast pads to 200 feet long and wide. The Airbus A220-300 has been operating regularly at VRB for approximately seven months. A longer history of regular operations by aircraft with an MTOW of more than 150,000 pounds should be present before investing in widening the runway. Runway 12R/30L was rehabilitated in 2022. The runway widening could be planned to coincide with a future Runway 12R/30L paving project or runway lighting project to avoid disturbing the infrastructure before it has met is useful life.

Potential Improvements to Instrument Approach

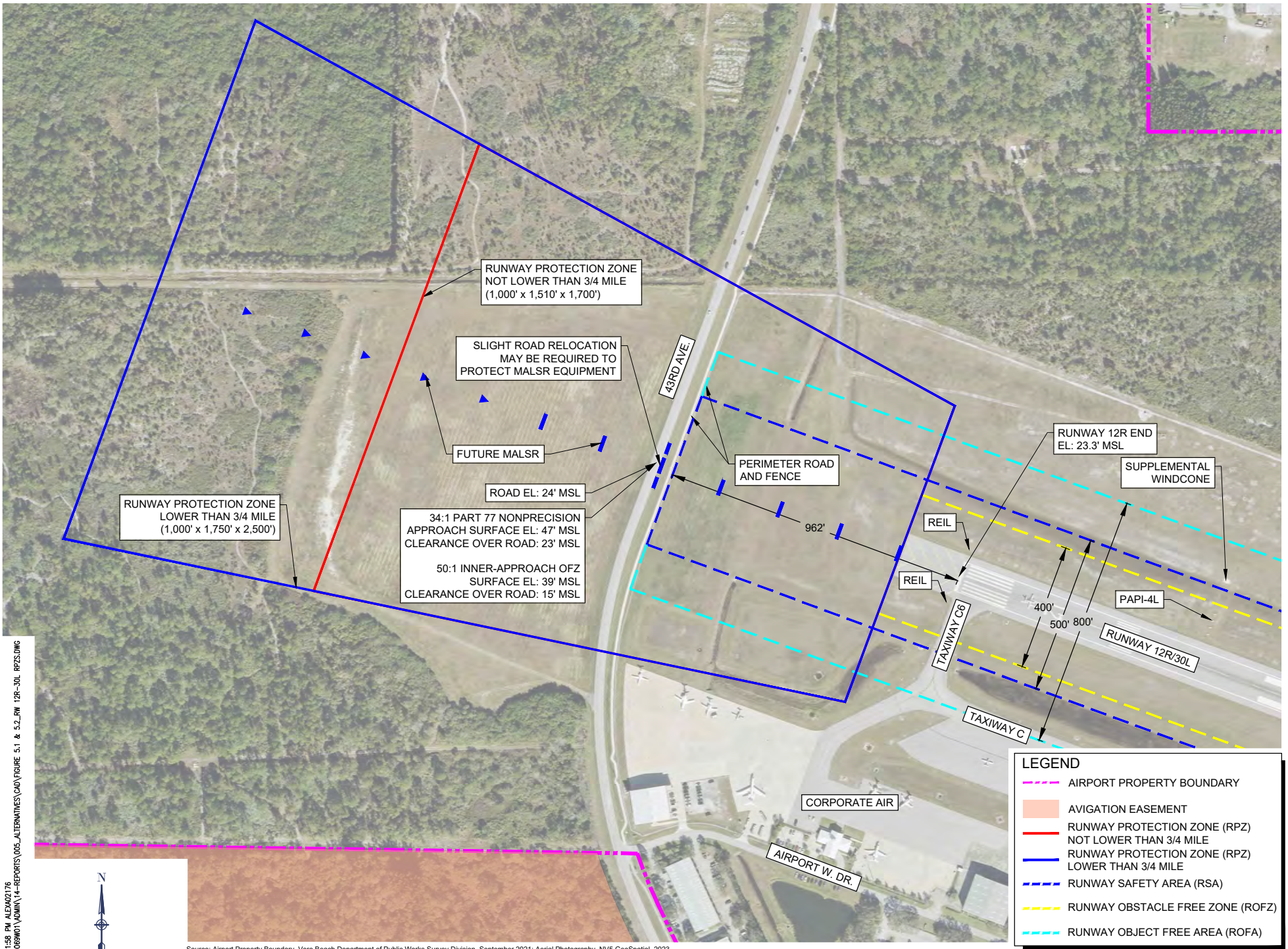
There are three criteria that must be considered for instrument approaches: Part 77, FAA AC 150/5300-13B design standards, and TERPS. An airport should strive to meet Part 77 surfaces. The airport needs to meet the design standards, and the FAA will use TERPS to design the instrument approach and missed approach and establish the appropriate minimums.

Both ends of Runway 12R/30L have an LPV approach, with visibility minimums of 3/4 of a mile. Each runway end has a Part 77 nonprecision approach surface with a 34:1 slope and an RPZ with visibility minimums of not lower than 3/4 of a mile, with dimensions of 1,000 feet by 1,510 feet by 1,700 feet. With ongoing commercial service operations, the potential to improve each runway end to an approach with visibility minimums that are lower than 3/4 of a mile using GPS (similar capability to a precision approach) was evaluated to maximize the accessibility of VRB.

An LPV approach, even with lower minimums, is still classified as an approach with vertical guidance, not a precision approach. Therefore, the Part 77 precision approach surface with a slope of 34:1 is unchanged. However, the dimension of the RPZ increases to 1,000 feet by 1,750 feet by 2,500 feet. *FAA AC 150/5190-4B: Airport Land Use Compatibility Planning* identifies that RPZs should be clear of incompatible objects and land use. 43rd Avenue is within the RPZ for Runway 12R. Public roads are an incompatible land use and should be avoided within an RPZ to the extent feasible, especially if not an existing condition. Establishing an approach with a visibility that is lower than 3/4 of a mile on Runway 12R would be a change to the runway, and the FAA will require an RPZ analysis and that removing the land use of a road in an RPZ be considered, as discussed in the upcoming section on Runway 12R/30L declared distances.

Figure 5.1 shows the larger RPZ for an approach with lower-than-3/4-mile visibility on the Runway 12R end would remain within the airport property boundary; therefore, no additional aviation easements would be required. With 3/4-mile visibility minimums, Runway 12R/30L already supports a 1,000-foot-wide primary surface, so there would be no change to the primary surface for a precision approach.

To facilitate an approach with lower-than-3/4-mile visibility, at least a medium intensity approach lighting system with sequenced runway alignment indicator lights (MALSR) would be required. A MALSR extends 2,400 feet from the runway end and consists of enhanced threshold lighting, light bars, and strobe lights extending into the RPZ. This system could be installed within airport-owned property. With airline service, the ability to provide lower minimums could be a benefit to the operations. Instrument approach minimums below 3/4 of a mile would require a larger RPZ, plus the associated costs of MALSR installation and operation and a potential road relocation.



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GRAPHIC SCALE IN FEET

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 1:58 PM ALEXA02176
I:\20JOBS\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.1 & 5.2_RW 12R-30L RPZS.DWG

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	INSTRUMENT APPROACH IMPROVEMENTS RUNWAY 12R	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.1

Runway 12R Instrument Approach Recommendation

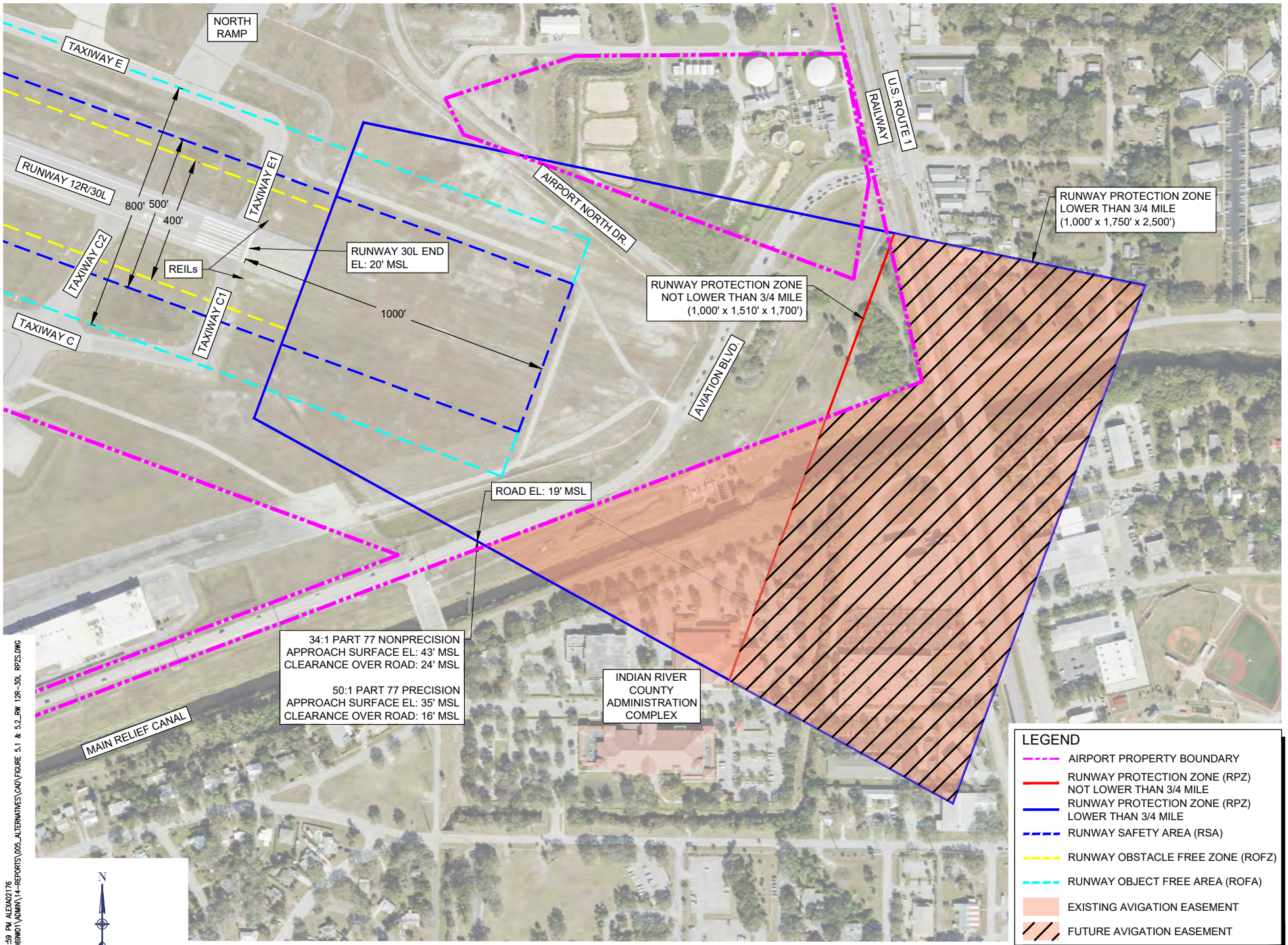
While the no-build condition of 3/4-mile visibility minimums can continue to serve VRB, VRB has space on airport property to install an approach lighting system and support a precision approach on Runway 12R. Therefore, it is recommended to install an approach lighting system for reduced visibility minimums on Runway 12R to support commercial operations and enhance the safety of the airport during instrument approach procedures. This improvement is anticipated to require relocating 43rd Avenue. As part of the implementation plan that will be prepared for this master plan, the investment to lower the instrument approach minimums to Runway 12R should be evaluated further to determine the recommended triggers and/or timing. VRB should also consult with the FAA to identify the potential controlling object for an approach with visibility that is lower than 3/4 of a mile if other obstacle removals are needed to obtain the lowest minimums.

Figure 5.2 shows that the larger RPZ on the Runway 30L end would extend beyond the airport property boundary, which would introduce additional incompatible land use, including an additional roads and buildings, and would require approximately 28 acres of additional avigation easements to protect the RPZ. Steps to reduce the incompatible development would also need to be considered.

Runway 30L Instrument Approach Recommendation

With the extensive development off the end of Runway 30L, the cost to mitigate the incompatible land use would be extensive and have significant off-airport impacts due to the locations of roads, railroads, and buildings. The cost of mitigating incompatible land use within the larger RPZ for a lower visibility approach would not outweigh the benefit of an improved instrument approach. Therefore, to avoid additional incompatible land use in the Runway 30L RPZ and potential impacts on the area adjacent to the airport, the no-build condition of an instrument approach with 3/4 of a mile of visibility is recommended on Runway 30L.

Airlines also need to plan for one-engine inoperable conditions on a departure. For domestic operations, this is defined by the FAA as the obstacle accountability area (OAA). The slope in the OAA is best approximated by 62.5:1 from the end of the TORA. While not required to be cleared as part of FAA design standards, objects within this surface will be reviewed as part of the approach surface analysis during the preparation of the ALP to identify any improvements to maximize the available runway length for airline operations.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 1:59 PM ALEXA02176
I:\20JOBS\20A00690\01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.1 & 5.2_RW 12R-30L RPZS.DWG

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	INSTRUMENT APPROACH IMPROVEMENTS RUNWAY 30L	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.2

Runway 12R/30L Declared Distance Improvements

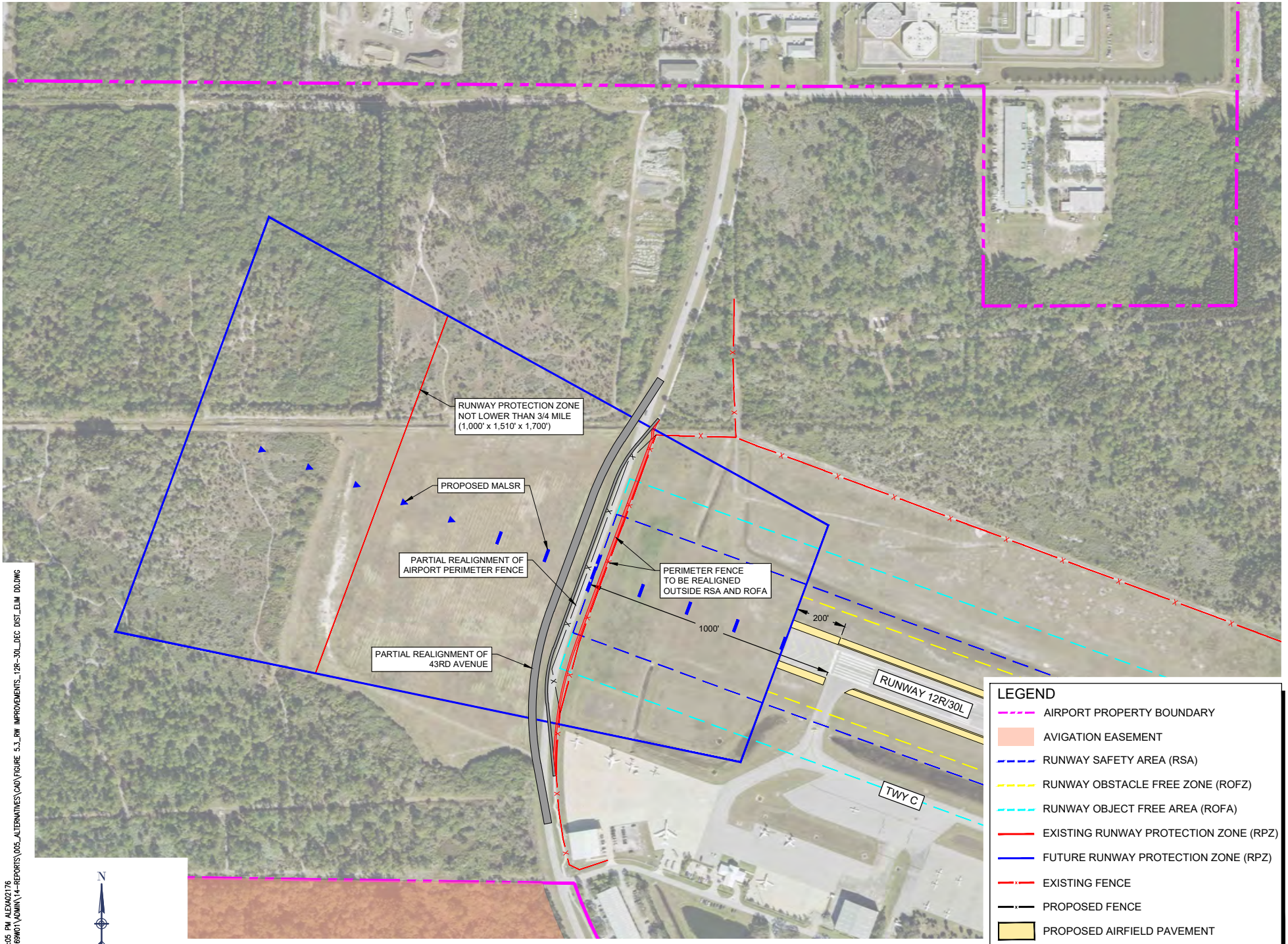
ARC C/D-III standards require that the RSA and ROFA extend 1,000 feet beyond the takeoff end of the runway. At the time of this airport master plan, declared distances are published for Runway 12R/30L. These declared distances are in place due to the perimeter road and fence, which are within 1,000 feet of the physical end of Runway 12R. Declared distances of 7,276 feet are implemented on Runway 30L for accelerate-stop distance available (ASDA) and landing distance available (LDA) operations. By shortening the available runway length for the Runway 30L ASDA and LDA, the declared distances provide aircraft taking off and landing on Runway 30L a 1,000-foot RSA beyond the Runway 12R end. While the use of declared distances provides a safe operating environment by meeting FAA design standards, the potential to recapture the runway length through improvements to eliminate declared distances should be evaluated.

Figure 5.3 shows the minimum realignment of 43rd Avenue and the airport perimeter road and fence to provide the standard 1,000-foot RSA beyond the physical end of Runway 12R. Relocating the airport perimeter road and fence would require a partial realignment of 43rd Avenue. The community is planning improvements to 43rd Avenue to accommodate growing development in the vicinity of the airport. The airport owns land that could accommodate the realignment of 43rd Avenue off the end of Runway 12R. VRB should work with the community to incorporate realigning 43rd Avenue as part of any future improvement plans to allow for the realignment the airport perimeter road and fence to eliminate the declared distances. Moving 43rd Avenue farther from the end of Runway 12R would also increase the margin of safety on Runway 12R/30L.

As discussed above, it is recommended that VRB preserve the space to provide an instrument approach on Runway 12R. **Figure 5.4** shows a relocation of 43rd Avenue outside the limits of a precision approach RPZ and within airport property. The speed limit on 43rd Avenue is 35 mph. It should be feasible to design the relocated 43rd Avenue to maintain that speed limit; however, the travel distance will increase from 3,500 feet to approximately 6,600 feet.

Runway 12R/30L Declared Distances Recommendation

VRB should work with the community such that, at a minimum, the slight realignment of 43rd Avenue would be included as part of the next improvement project on 43rd Avenue to eliminate the declared distances on Runway 12R/30L. Space should be preserved and coordination initiated to determine whether the community would accept a potentially larger relocation of 43rd Avenue around the RPZ to enable VRB to accommodate an approach with lower than 3/4 of a mile of visibility on Runway 12R and remove an incompatible land use from the RPZ.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	POTENTIAL IMPROVEMENTS TO RUNWAY 12R/30L DECLARED DISTANCES	DRAWN BY: JA CHECKED BY: SZ
			FIGURE 5.3

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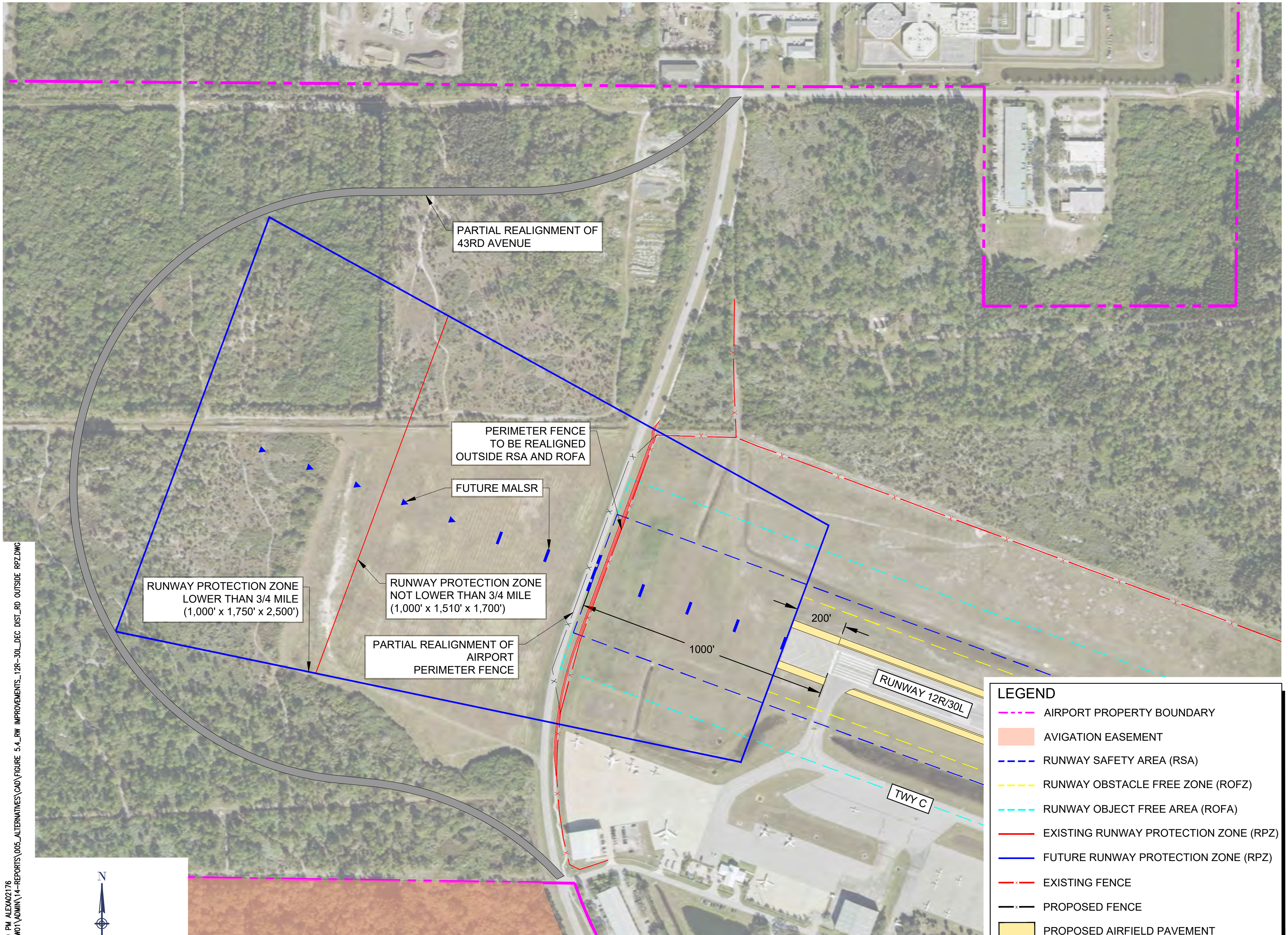
I:\20JOBS\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.3_RW IMPROVEMENTS_12R-30L_DEC DIST_ELIM DD.DWG



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

VERO BEACH REGIONAL AIRPORT · HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	43RD AVENUE REALIGNMENT OUTSIDE OF RUNWAY 12R RPZ - LOWER THAN 3/4 MILE	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.4

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I:\20JOBS\20A0069W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.4_RW IMPROVEMENTS_12R-30L_DEC DIST_RD OUTSIDE RPZ.DWG

Runway 4/22

Length and Instrument Approaches

Runway 4/22, known as the crosswind runway, is needed to provide crosswind coverage for the ARC A-I to B-II aircraft operating at VRB, including corporate jets and smaller GA traffic. However, Runway 4/22 is also used by larger aircraft able to operate on its 4,974-foot length and 100-foot width. The existing Runway 4/22 critical aircraft is ARC C-II, and the future critical aircraft is ARC D-II. The ARC C-II and D-II standards are generally the same. Because the runway length is 4,974 feet, there are operational constraints on some larger operators when using Runway 4/22. As identified in the facility requirements, at least 5,000 feet and up to 5,700 feet should be provided on Runway 4/22 to meet the critical aircraft (ARC C/D-II) operating on this runway.

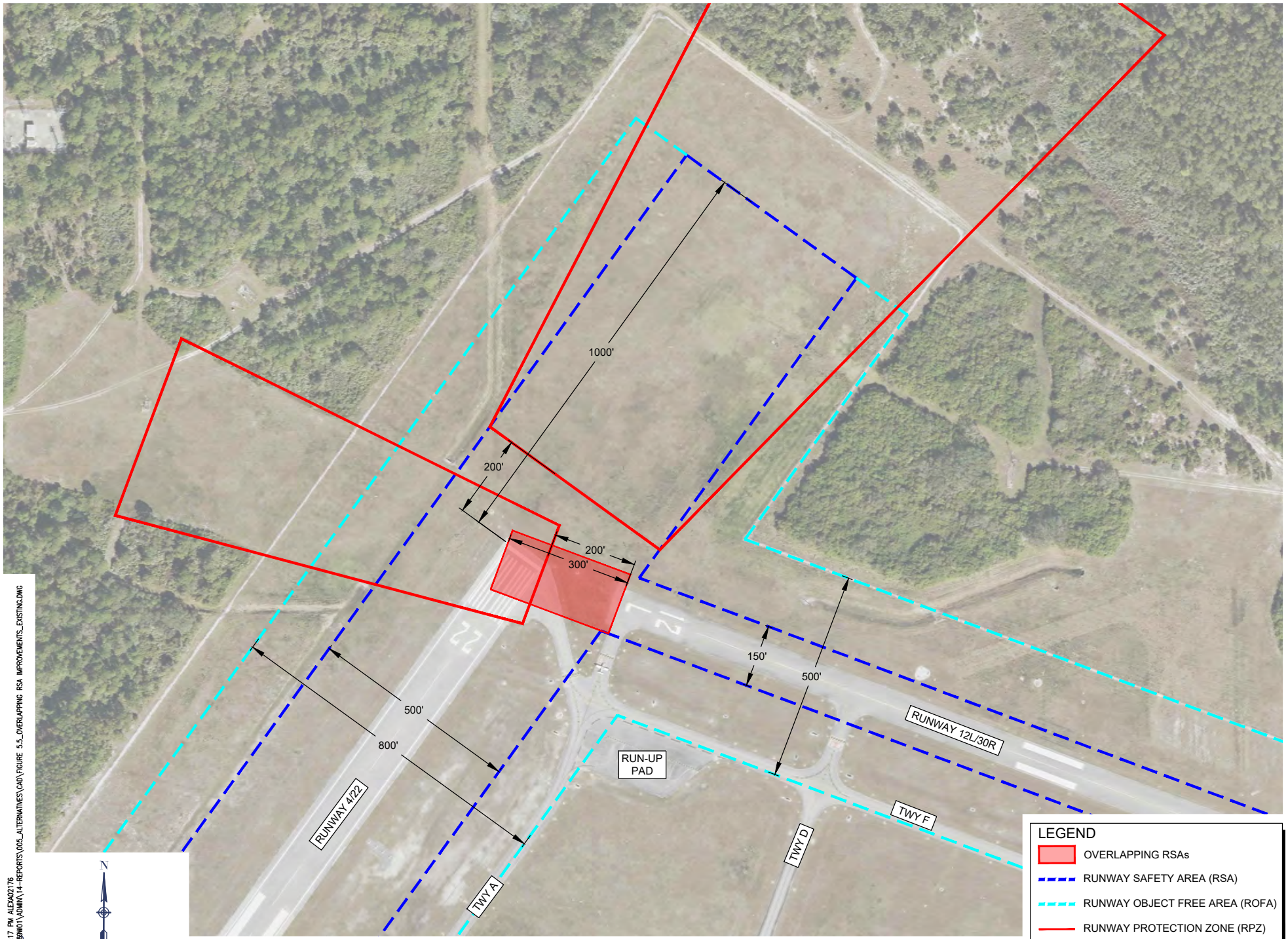
Resolve Overlapping RSAs

As identified in the facility requirements and shown on **Figure 5.5**, the RSA of runways 4/22 and 12L/30R overlap, and the end taxiway connector to Runway 22 is not at a standard 90-degree angle to the runway. Therefore, the potential alternatives for extending Runway 4/22 should also consider improvements to eliminate the overlapping RSAs and provide standard taxiway connectors. Three alternatives were identified to address extending Runway 4/22 and improving the taxiway connectors and reducing or eliminating the overlapping RSA. All the alternatives are within existing VRB property.

Alternative 1, depicted on **Figure 5.6,** extends Runway 4/22 to 5,300 feet, the minimum length to provide a standard connector to the end of Runway 22 from Taxiway A, with space to allow an aircraft to hold at the end of Runway 22 clear of Runway 12L. Also, as identified in the facility requirements chapter, extending Taxiway B the full length of Runway 4/22 should be considered, so it is included in this alternative and depicted in Figure 4.6. In this alternative, the nonstandard taxiway connectors are resolved; however, the overlapping RSAs remain.

Alternative 2, as depicted on **Figure 5.7,** builds on Alternative 1 but shortens the Runway 12L end by 339 feet to resolve the overlapping RSAs with the taxiway modification. Reducing the length of Runway 12L/30R allows sufficient space to protect for the full RSA of 300 feet beyond the Runway 12L end; however, this option reduces Runway 12L/30R to 3,165 feet long. Shortening Runway 12L/30R does not meet the minimum usable length, as identified in the facility requirements of 3,600 feet. Further, the flight schools that use this runway already have runway length limitations with aircraft such as the Piper Arrow and Seminole during touch-and-go training operations, and shortening the runway length would introduce additional operational limitations that would potentially impact airfield capacity.

Alternative 3, as depicted on **Figure 5.8**, extends the Runway 12L and 22 ends by 700 feet and 326 feet, respectively, eliminating the overlapping RSA without reducing the length of Runway 12L/30R. The extensions on both runway ends are the minimum length required to meet airfield design standards. These airfield design standards include the runway-to-taxiway centerline separation of 400 feet for the extension of future Taxiway B and for aircraft taxiing on the future Taxiway A extension to hold short and perpendicular at Runway 22. This alternative includes the extension of the parallel taxiways on each side of Runway 4/22 to enhance airfield access. This alternative resolves the overlapping RSAs and the operational needs to extend Runway 4/22 to at least 5,000 feet. The run-up pad near the end of Runway 12L is proposed to be expanded to the east to replace the portion within the realigned and extended Taxiway A.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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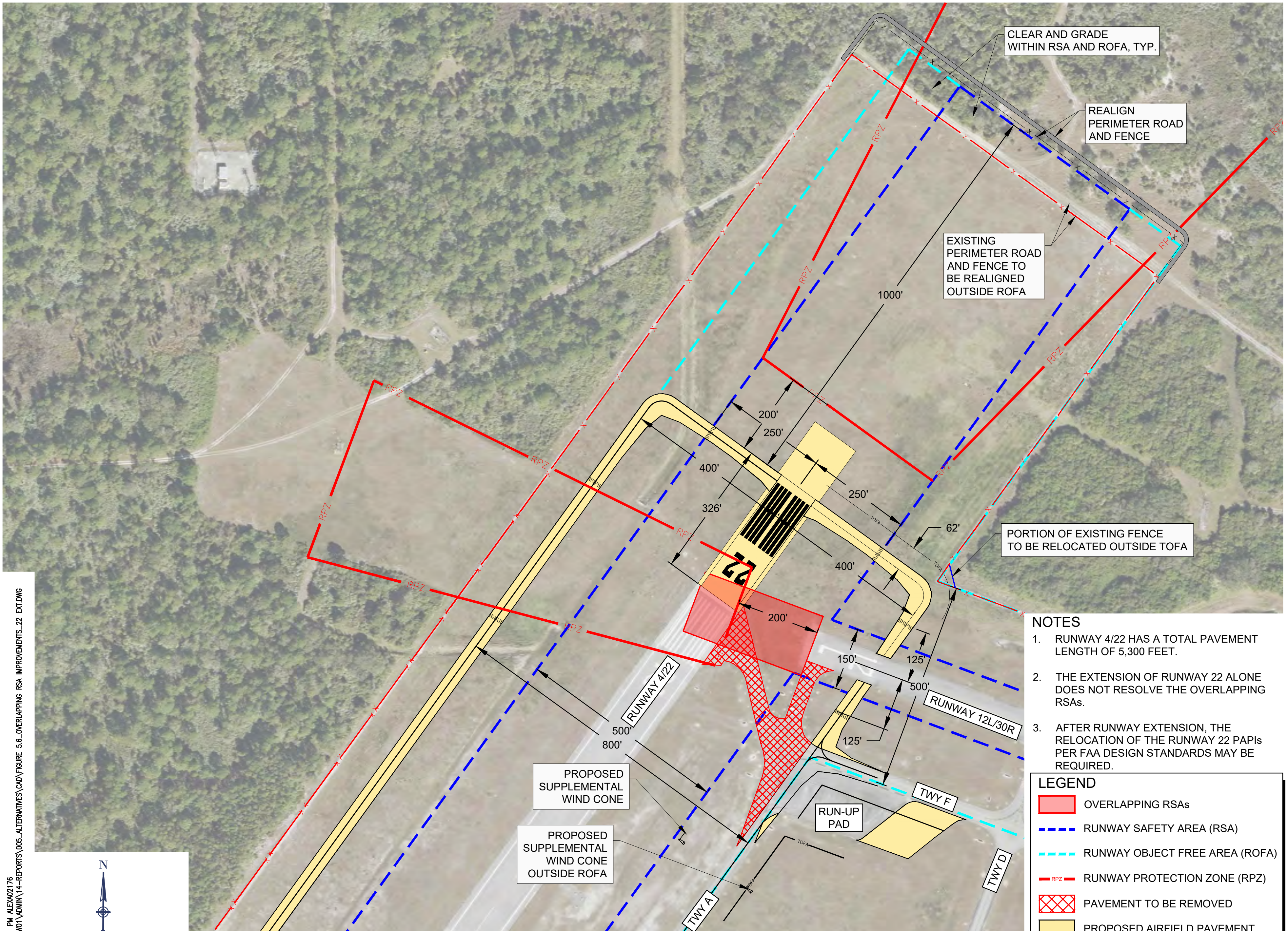
I:\20JOBS\20A0086W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.5_OVERLAPPING RSA IMPROVEMENTS_EXISTING.DWG

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	OVERLAPPING RSAs RUNWAYS 4/22 AND 12L/30R	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.5



NOTES

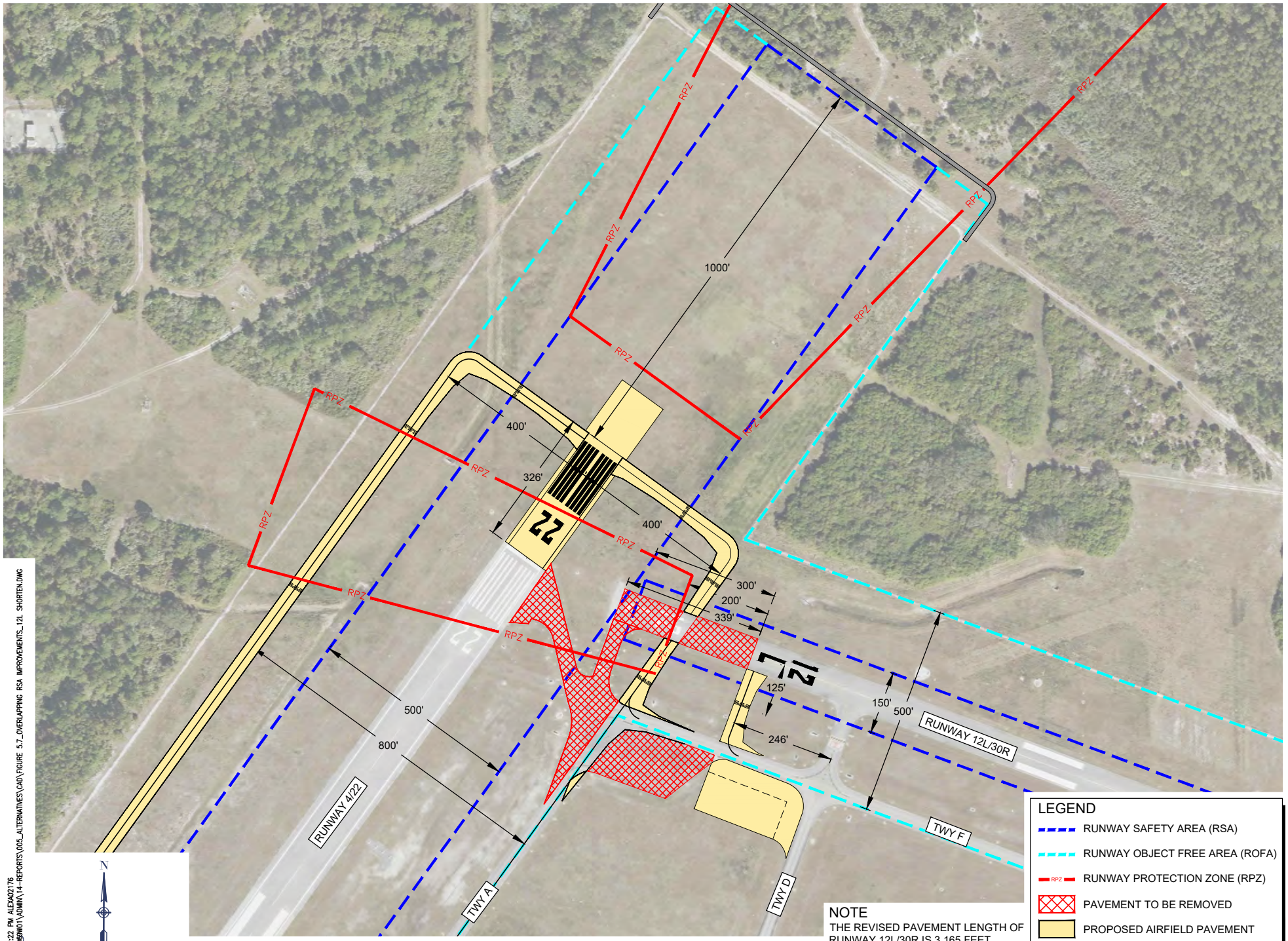
1. RUNWAY 4/22 HAS A TOTAL PAVEMENT LENGTH OF 5,300 FEET.
2. THE EXTENSION OF RUNWAY 22 ALONE DOES NOT RESOLVE THE OVERLAPPING RSAs.
3. AFTER RUNWAY EXTENSION, THE RELOCATION OF THE RUNWAY 22 PAPIs PER FAA DESIGN STANDARDS MAY BE REQUIRED.

LEGEND

- OVERLAPPING RSAs
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)
- RPZ RUNWAY PROTECTION ZONE (RPZ)
- PAVEMENT TO BE REMOVED
- PROPOSED AIRFIELD PAVEMENT

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	ALTERNATIVE 1 EXTEND RUNWAY 22 AND TAXIWAY GEOMETRY MODIFICATIONS	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.6



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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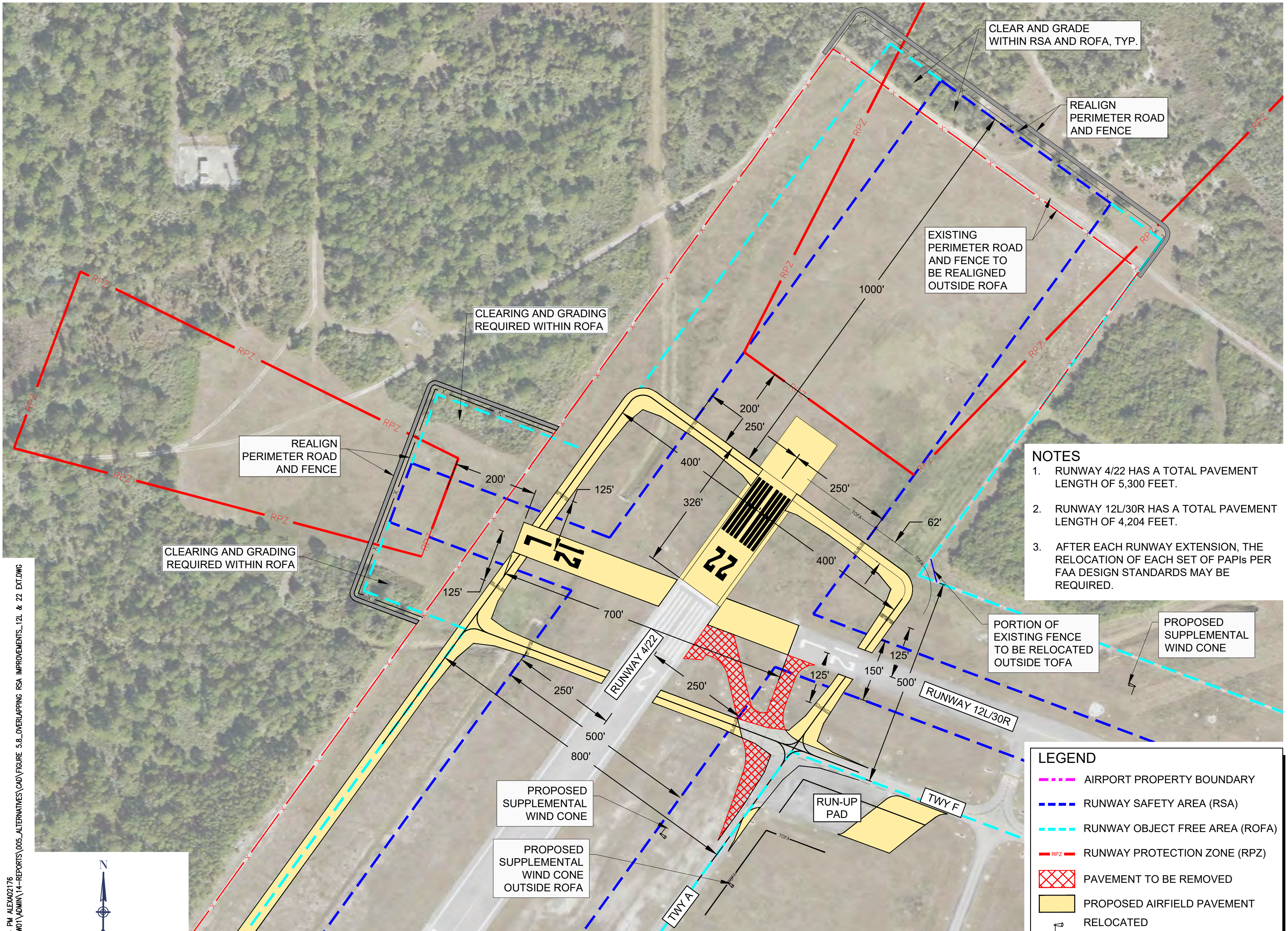
I:\20JOBS\20A00690W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.7_OVERLAPPING RSA IMPROVEMENTS_12L SHORTEN.DWG

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	ALTERNATIVE 2 SHORTEN RUNWAY 12L TO ELIMINATE OVERLAPPING RSAs	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.7



NOTES

1. RUNWAY 4/22 HAS A TOTAL PAVEMENT LENGTH OF 5,300 FEET.
2. RUNWAY 12L/30R HAS A TOTAL PAVEMENT LENGTH OF 4,204 FEET.
3. AFTER EACH RUNWAY EXTENSION, THE RELOCATION OF EACH SET OF PAPIs PER FAA DESIGN STANDARDS MAY BE REQUIRED.

LEGEND

- AIRPORT PROPERTY BOUNDARY
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)
- RUNWAY PROTECTION ZONE (RPZ)
- PAVEMENT TO BE REMOVED
- PROPOSED AIRFIELD PAVEMENT
- RELOCATED SUPPLEMENTAL WINDCONE

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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I:\20JOBS\20A0069\01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.8_OVERLAPPING RSA IMPROVEMENTS_12L & 22 EXT.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	ALTERNATIVE 3 EXTEND RUNWAY 22 AND 12L TO ELIMINATE OVERLAPPING RSAs	DRAWN BY: JA / CHECKED BY: SZ	FIGURE 5.8

Maximum Runway 22 Extension

As previously shown in Figure 5.6, extending the Runway 22 end 326 feet for a total length of 5,300 feet is the minimum runway extension necessary to comply with FAA airfield design standards of holding aircraft perpendicular to the runway. The facility requirements identified the need to extend Runway 4/22 up to 5,700 feet for the critical aircraft. **Figure 5.9** depicts the extension of Runway 22 for a total runway length of 5,700 feet. At this length, the Runway 22 RPZ remains within airport property while providing standard taxiway connectors and resolving the overlapping RSAs. The perimeter road and fence beyond the Runway 22 end would require relocation to provide the full 1,000-foot RSA. This would also require the relocation of the Runway 22 PAPIs to comply with the FAA siting standards for the distance from the runway threshold. The supplemental wind cone on the Runway 22 end needs to be replaced, as detailed in the navaids section, so it can be located such that the supplemental wind cone would comply with FAA design standards for the extended runway. Clearing and grading would be required within the RSA and ROFA. Also, the extension of Runway 22 would shift the runway approach surfaces farther north, so it is likely that removing trees or other obstructions will be needed. This will be further analyzed in the ALP.

The commercial airline operator indicated that to consider using the crosswind runway, the runway would need to be approximately 6,000 feet long. Because 5,700 feet is the maximum length within the airport's property, the critical aircraft for an extension of Runway 4/22 would remain ARC C/D-II.

Runway 4/22 Extension and Overlapping RSA Alternatives Recommendation

The taxiway geometry in the no-build condition does not meet the latest FAA design standards. Therefore, the no-build condition is not acceptable, and the taxiway configuration should be modified to meet FAA design standards. Only alternatives 2 and 3 meet FAA design standards. The overlapping RSAs remain in Alternative 1; therefore, Alternative 1 has been eliminated from consideration.

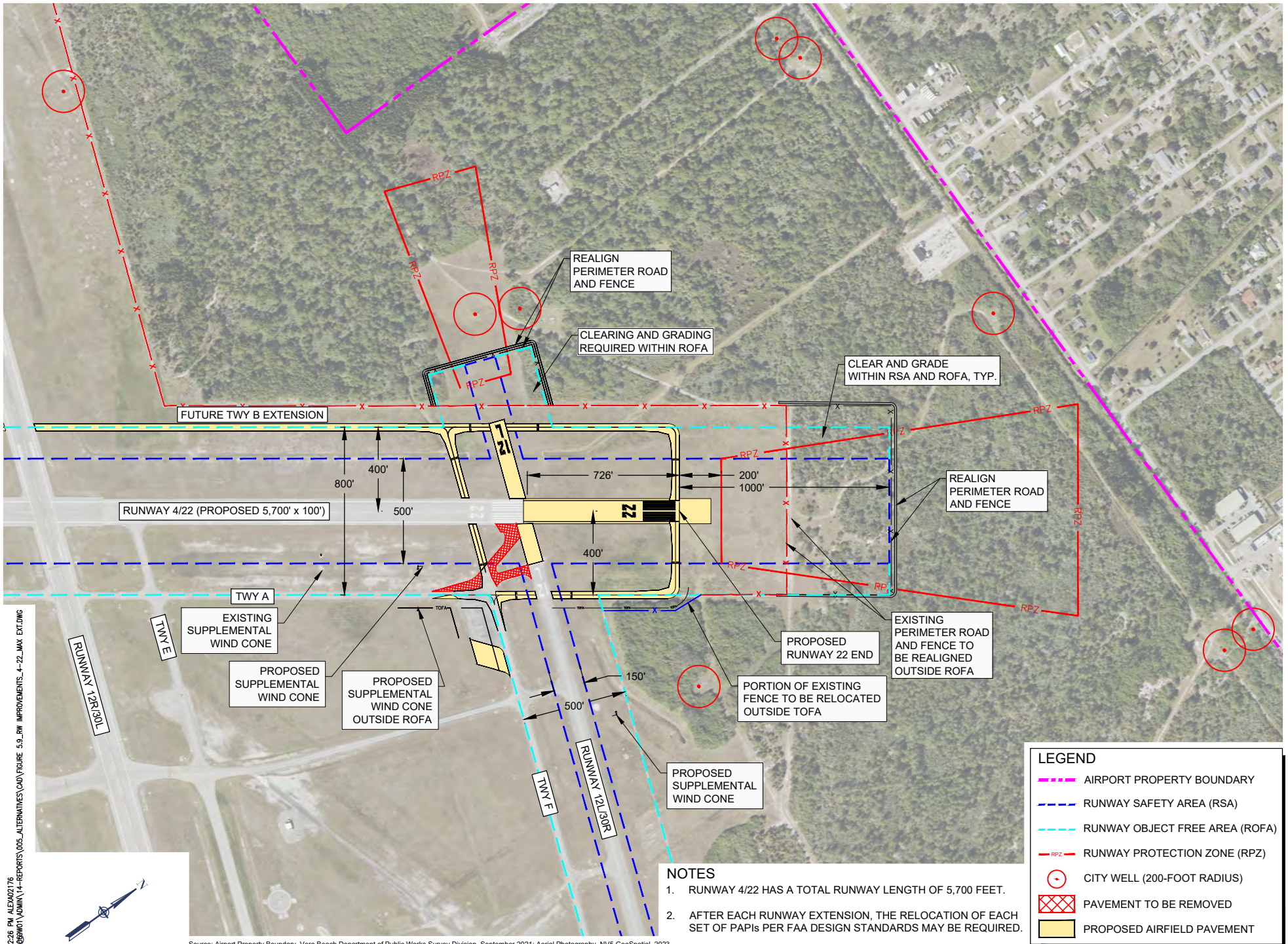
Alternative 2 does not meet the facility requirement of maintaining at least the existing length on Runway 12L/30R; therefore, it is not recommended. Alternative 3 is recommended because it meets FAA design standards and all operational facility requirements and provides the flexibility to extend Taxiway B the full length of an extended Runway 4/22, with a runway centerline to taxiway centerline separation of 400 feet.

It is recommended that Runway 22 be extended at least 326 feet and Runway 12L be extended 700 feet to resolve the overlapping RSAs and provide standard taxiway connectors. This would increase Runway 12L/30R to 4,204 feet and Runway 4/22 to 5,300 feet. These runway extension improvements would eliminate the overlapping RSAs and increase the overall length of Runway 4/22 to reduce limitations on business jet operations on this runway.

The ability to extend Runway 4/22 up to 5,700 feet is recommended, so this alternative should be preserved for ultimate airfield development. Any extension to Runway 22 would require an obstruction analysis and removing any obstructions to the approach to maximize the utility of the additional runway length.

Runway 4/22 Instrument Approach Improvements

Consideration was given to improving the instrument approaches to Runway 4/22 to lower the visibility minimums to as low as or lower than 3/4 of a mile. Because of the location of the existing development on the west side of Runway 4/22, this runway cannot support the 1,000-foot-wide primary surface needed for visibility minimums as low as or lower than 3/4 of a mile. Therefore, the instrument approach visibility minimums for Runway 4/22 should be maintained at 7/8 of a mile or higher.



LEGEND

- AIRPORT PROPERTY BOUNDARY
- RUNWAY SAFETY AREA (RSA)
- RUNWAY OBJECT FREE AREA (ROFA)
- RUNWAY PROTECTION ZONE (RPZ)
- CITY WELL (200-FOOT RADIUS)
- PAVEMENT TO BE REMOVED
- PROPOSED AIRFIELD PAVEMENT

NOTES

1. RUNWAY 4/22 HAS A TOTAL RUNWAY LENGTH OF 5,700 FEET.
2. AFTER EACH RUNWAY EXTENSION, THE RELOCATION OF EACH SET OF PAPIs PER FAA DESIGN STANDARDS MAY BE REQUIRED.

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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GRAPHIC SCALE IN FEET

VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

EXTENSION OF RUNWAY 22 TO 5,700 FEET

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.9

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I:\20JOBS\20A0089W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.9_RW IMPROVEMENTS_4-22_MAX EXT.DWG

An airport should own or have an interest in all the land within the RPZ to control the land use. A portion of the Runway 4 RPZ extends off airport property over county-owned property. A large portion of the RPZ is protected by an easement. There is one building within the easement area. However, the Runway 4 RPZ size has increased due to instrument approach improvements since this easement was acquired. VRB should pursue the acquiring additional property interest or at least an easement to protect the larger Runway 4 RPZ. VRB should also pursue acquiring the rights to remove the building within the RPZ.

Runway 4/22 Instrument Approach Improvement Recommendation

The existing development along Runway 4/22 precludes the ability to meet the wider primary surface for instrument approach minimums as low as or lower than 3/4 of a mile. Therefore, the instrument approach visibility minimums for Runway 4/22 are recommended to be maintained at no lower than 7/8 of a mile. It is recommended that VRB pursue acquiring an easement for the larger RPZ over this county-owned property. Also, VRB should pursue acquiring the rights to remove the building within the RPZ.

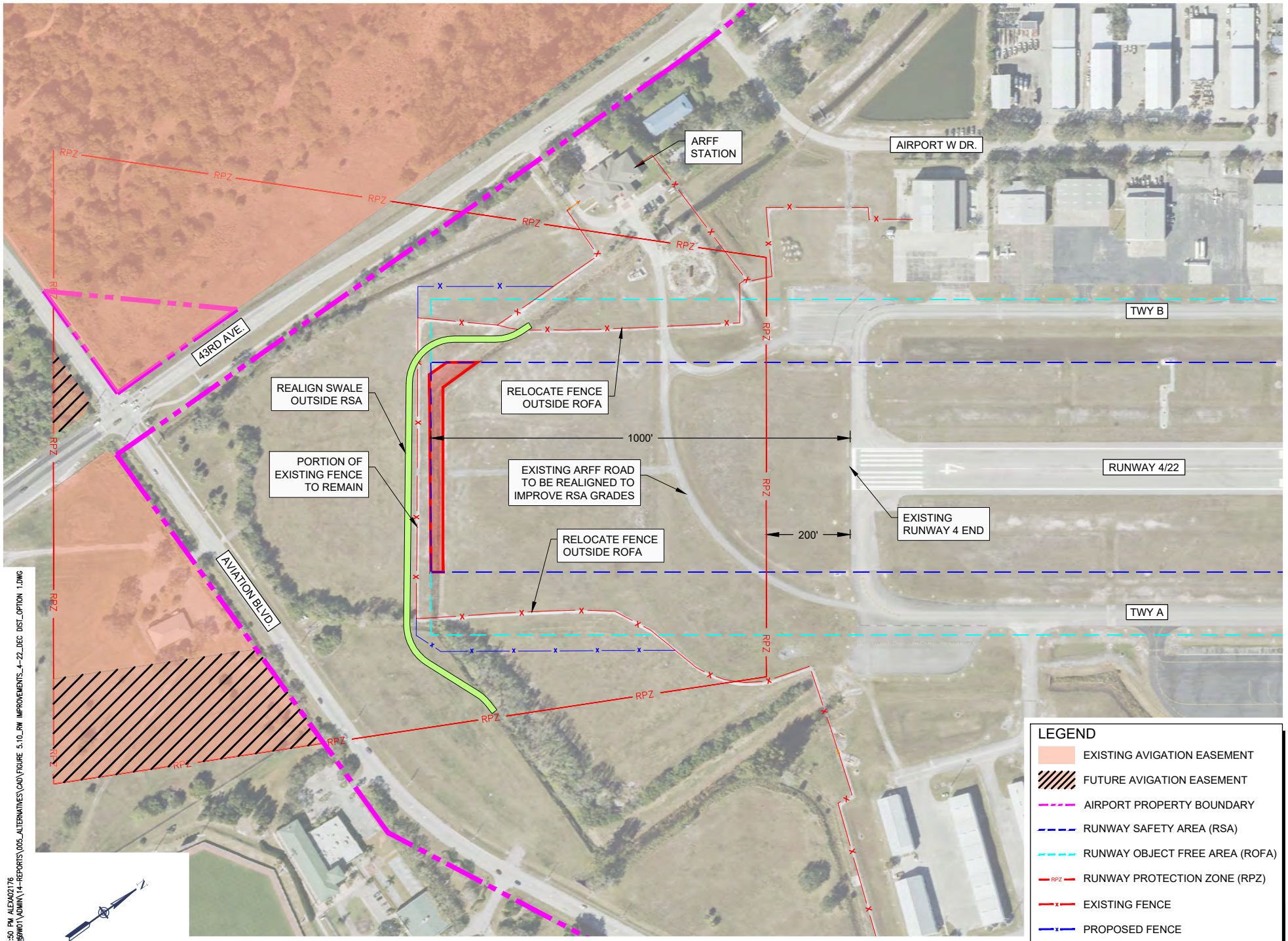
Runway 4/22 Declared Distance Improvements

ARC C/D-II design standards require that the RSA and ROFA extend 1,000 feet beyond the takeoff end of the runway. At the time of this airport master plan, declared distances are published for Runway 4/22. These declared distances are in place due to a drainage swale within 1,000 feet of the physical Runway 4 end. Declared distances of 4,945 feet are implemented on the Runway 22 ASDA and LDA operations to provide a 1,000-foot RSA beyond the declared end of Runway 4 for aircraft taking off and landing on Runway 22. Two alternatives were evaluated to eliminate the declared distances for Runway 22 ASDA and LDA operations.

Alternative 1, shown on **Figure 5.10**, depicts maintaining the location of the Runway 4 end and relocating the drainage swale outside the RSA and ROFA. Portions of the fence on the east and west side of the runway would also be relocated outside the ROFA. Realigning the drainage swale outside the fence would allow easier access for maintenance and assist in keeping wildlife outside the fence. The ARFF access road connecting the station to the airfield passes within the Runway 4 ROFA. As part of this alternative, the overall RSA grades would be improved, including modifications to the ARFF access road. Any changes to the ARFF road would still allow the emergency team to meet the FAA's response time requirements. This alternative does not change the location of the RPZ. The roads within the RPZ would remain. This alternative does not change the runway, so the location of the roads with the RPZ should continue to be acceptable for FAA compliance purposes.

Alternative 2, shown on **Figure 5.11**, relocates the Runway 4 end to the northeast by 29 feet. This relocation would shorten the runway so that the drainage swale is outside the RSA and ROFA. While it would eliminate the declared distances, unless there is a corresponding extension on the other end, it would shorten the overall runway length for all operations instead of just the Runway 22 ASDA and LDA. In addition, this runway end relocation would require the runway to be remarked, the runway end and edge lights to be relocated, guidance signs to be relocated, and taxiway end connectors to be modified. While this alternative moves the RPZ 29 feet to the north, the roads will remain within the RPZ. Because there is a need for additional length on Runway 4/22, reducing the runway length does not meet the facility requirement recommendations.

An extension of the Runway 22 end would be a change to the runway. Therefore, consideration needs to be given to eliminating the roads within the Runway 4 RPZ. The Runway 4 end would need to shift 1,172 feet so that 43rd Avenue would be outside the Runway 4 RPZ. The shift of the RPZ would impact existing development, introducing additional incompatible land use along Taxiway B and decreasing the overall Runway 4/22 length to 3,802 feet.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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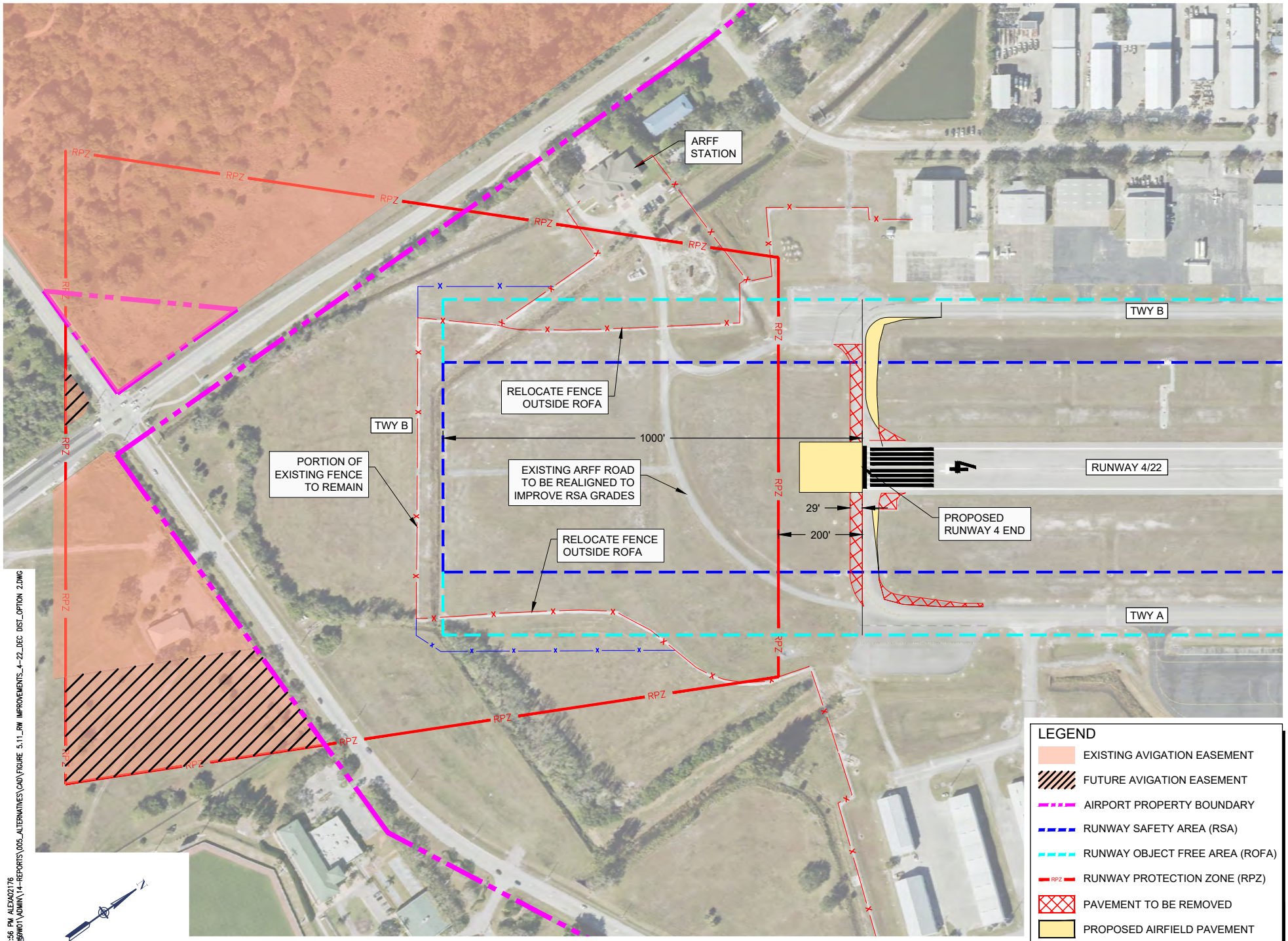
AUG 12, 2024 2:50 PM ALEXA02176
I:\2020BS\2020BSWO1\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.10_RW IMPROVEMENTS_4-22_DEC DIST_OPTION 1.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	ALTERNATIVE 1 RUNWAY 4/22 POTENTIAL DECLARED DISTANCES IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.10



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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GRAPHIC SCALE IN FEET

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	ALTERNATIVE 2 RUNWAY 4/22 POTENTIAL DECLARED DISTANCES IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.11

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I:\20JOBS\20A00860W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.11_RW IMPROVEMENTS_4-22_DEC DIST_OPTION 2.DWG

Therefore, shifting Runway 4/22 to the north to remove the roads is not feasible. The maximum shift of Runway 4/22 without impacting on-airport development is 100 feet, as depicted on **Figure 5.12**. This shift does not remove any roads.

Runway 4/22 Declared Distances Recommendation

The no-build condition meets FAA design standards and can remain. However, to maximize the use of the existing runway pavement, Alternative 1 is recommended. Alternative 1 maintains the length and enhances the margin of safety by relocating the drainage swale outside the RSA.

Runway 12L/30R

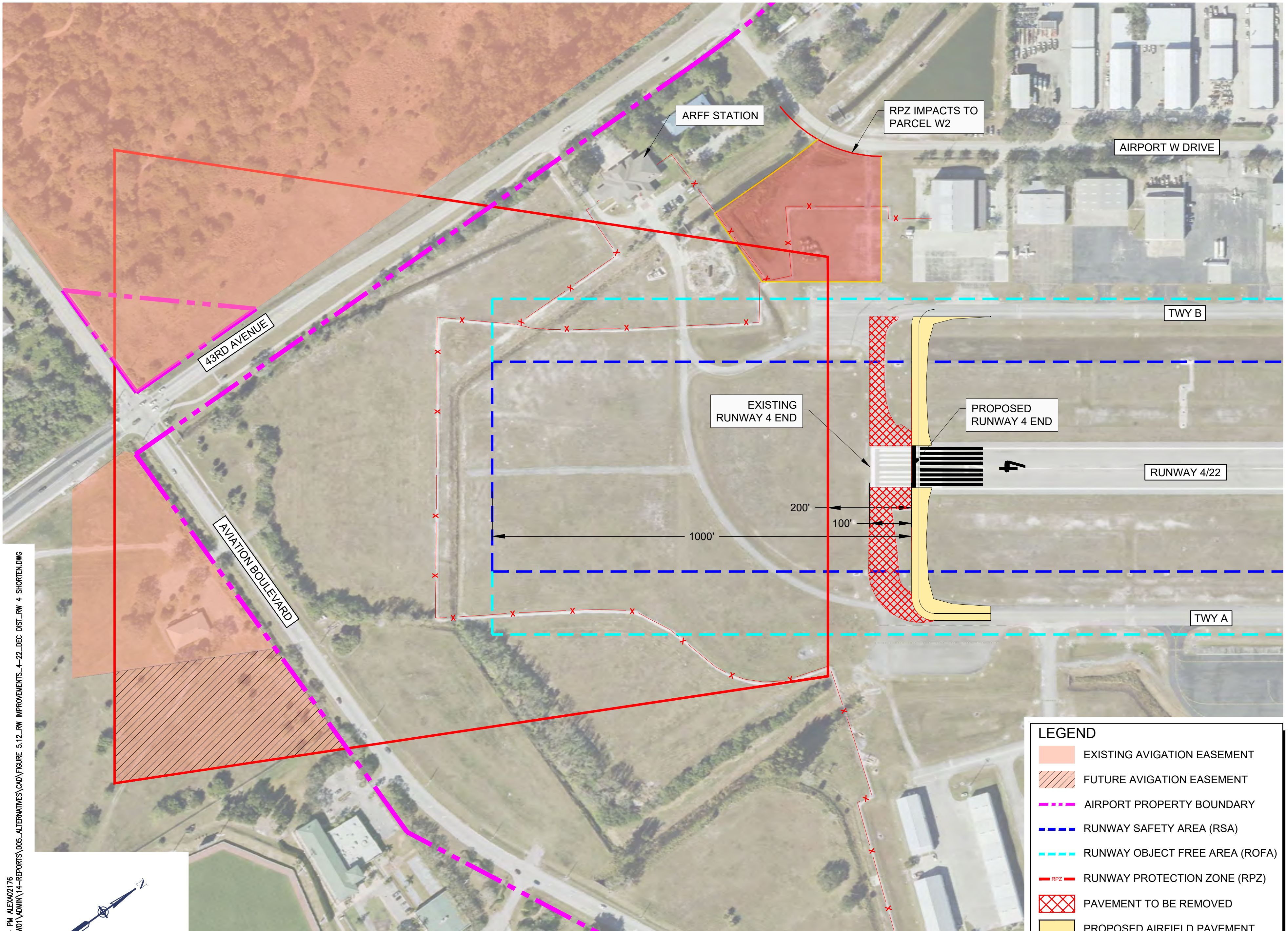
Runway 12L/30R is a secondary runway, critical to providing operational capacity at VRB. It serves as a parallel runway to the primary runway. This runway is 3,504 feet long by 75 feet wide. Based on the critical aircraft for Runway 12L/30R of a King Air 200, the length and width of the runway is sufficient, but no reduction in length is acceptable. Although the runway length is sufficient for existing and forecasted operations, future runway length improvements are recommended to mitigate the overlapping RSAs, as discussed for Runway 4/22. The extension to Runway 12L/30R to mitigate the overlapping RSAs would provide an additional margin of safety for twin-engine aircraft operating on this runway.

Runway Visibility Zone Improvements

With a part-time ATCT, there are runway visibility zones (RVZ) around the intersection of runways or extended runway centerlines to allow pilots a clear line of sight to see other aircraft on the intersecting runway. The facility requirements identified that there are aircraft and helicopter parking positions within the RVZ of runways 12R/30L and 4/22. These parking positions are within the leasehold of the flight schools.

RVZ Improvement Recommendation

The no-build condition results in aircraft parking within the RVZ when the tower is closed. Steps should be taken to eliminate or at least reduce aircraft parking within the RVZ. Until the leases can be modified and/or other parking areas developed, the airport staff should work with the flight schools to keep these parking positions vacant, when feasible, outside the ATCT operating hours by first using other parking positions within their leasehold.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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I:\20JOBS\20A0069W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.12_RW IMPROVEMENTS_4-22_DEC DIST_RW 4 SHORTEN.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	RUNWAY 4/22 SHIFT 100 FEET TO THE NORTH	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.12

5.2. Taxiway System

The facility requirements chapter identified potential improvements to the taxiways at VRB. Each improvement is discussed in the following sections. The goal is to identify improvements to the taxiway system to meet the latest FAA design standards while maintaining operational safety and efficiency.

Taxiway system facility requirements

- Establish a standard taxiway connector to Runway 22 (as discussed previously).
- Establish alphanumeric names on taxiway end connectors.
- Eliminate direct apron-to-runway taxiway connectors.
- Improve an FAA-identified hot spot where Taxiway C crosses Runway 4/22.
- Provide a bypass taxiway at each end of Runway 12R/30L.

Table 5.2 identifies the taxiway design standards for VRB that will be used to assess taxiway alternatives.

TABLE 5.2: SUMMARY OF TAXIWAY DESIGN STANDARDS RUNWAY

Runway	Taxiway Design Group (TDG)		Taxiway Width
	Existing	Future	
Runway 12R/30L	TDG 3		50 feet
Runway 4/22	TDG 2A		35 feet
Runway 12L/30R	TDG 2A		35 feet

Sources: VRB Airport Master Plan: Forecast Chapter, prepared by ESA, 2023; FAA AC 150/5300-13B.

Figure 5.13 shows the potential taxiway improvements from the previously approved ALP that have not been implemented and are being reviewed for continued applicability. Each potential improvement will be discussed with its applicable taxiway in the following sections.

Taxiway A

Taxiway A is a full-length parallel taxiway on the east side of Runway 4/22. Taxiway A varies in width from 35 feet to 50 feet, which meets TDG 2A standards of 35 feet wide. North of Taxiway A1, Taxiway A has a runway centerline to taxiway centerline separation of 400 feet. The portion of Taxiway A south of Taxiway A1 has a runway to taxiway centerline separation of 350 feet. This separation meets ADG-II standards with visibility minimums not lower than 3/4 of a mile. However, a 350-foot separation limits the use of this portion of Taxiway A to ADG-II aircraft. Because there is an existing apron along the portion of Taxiway A with the 350-foot separation and it meets ADG II standards for the critical aircraft using Runway 4/22, the existing condition could be acceptable. Even though realigning the southern portion of Taxiway A with a 400-foot separation would impact an apron and aircraft parking positions, the advantages and disadvantages of realigning Taxiway A should be discussed further as part of evaluating all the alternatives. Considerations include the potential use of this portion of taxiway by larger aircraft compared to the construction cost and impacts to other facilities. The potential realignment of Taxiway A is depicted on **Figure 5.14**. Whether or not the separation is increased for the southern portion of Taxiway A, maintaining the other portion at a 400-foot separation provides maximum flexibility.

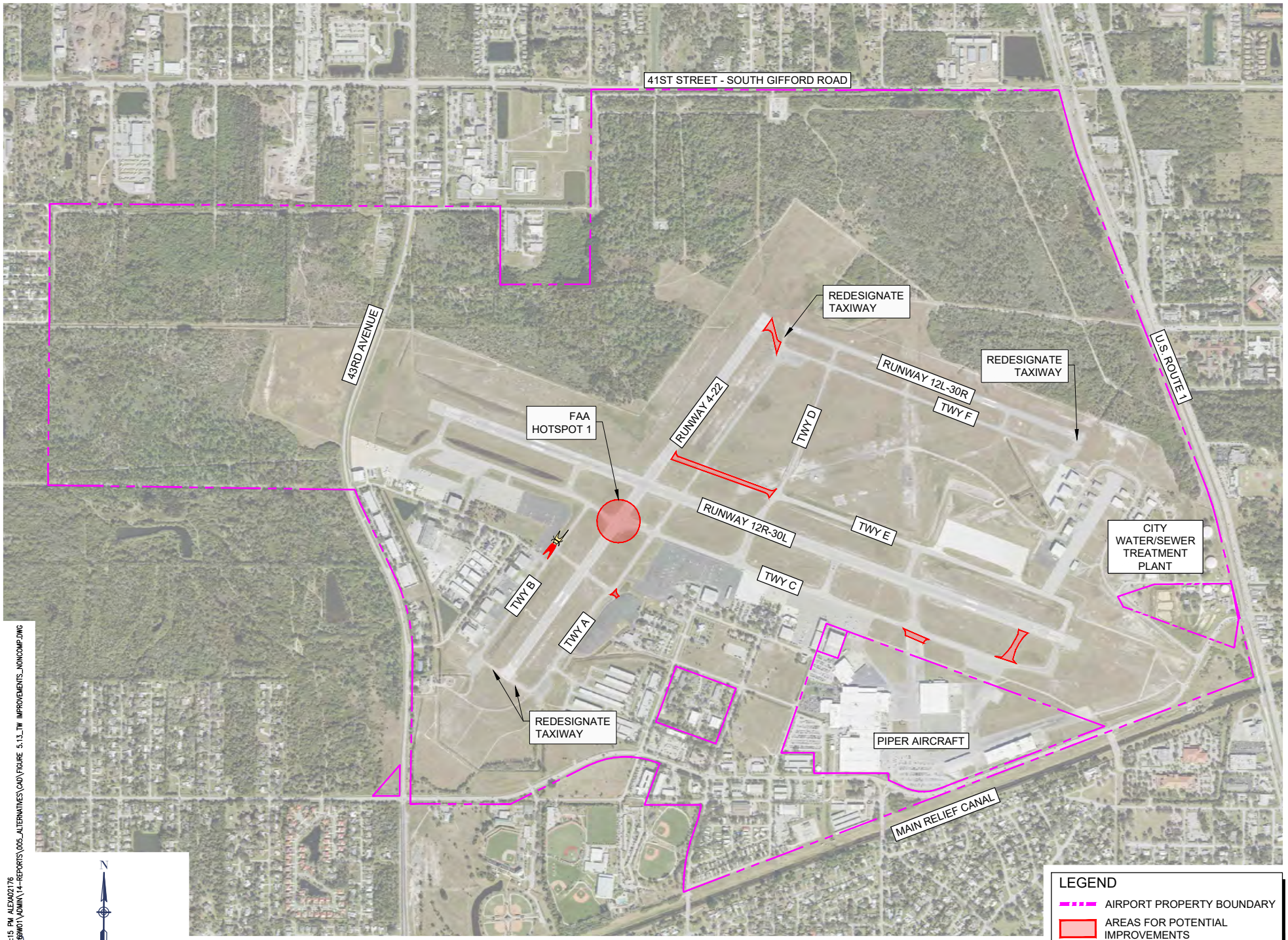
Taxiway A1 comprises two portions and provides direct apron-to-runway access. One portion is between Taxiway A and Runway 4/22. The other is a small stub connector between Taxiway A and the Skyborne Airline Academy south apron. One of the two segments should be relocated to eliminate the direct runway-to-taxiway connection. The previous ALP recommended relocating the smaller stub connector between Taxiway A and the Skyborne Airline Academy south apron, as depicted on Figure 5.14.

Taxiway A2 connects at the Runway 22 end at an angle other than 90 degrees. This taxiway connector reconfiguration would be addressed when mitigating the overlapping RSAs between runways 4/22 and 12L/30R, as detailed in the Runway 4/22 section.

The taxiway end connector at the Runway 4 end is designated as Taxiway A. Redesignating it to align with FAA standards for alphanumeric numbering for connector taxiways should be considered, as described in the facility requirements chapter. The other connecting taxiways would be redesignated as needed to support this change.

Taxiway A Recommendations

The no-build condition for taxiways A1 and A2 and the end connector designation do not meet the latest FAA design standards. Therefore, it is recommended to relocate the stub connector between Taxiway A and the Skyborne Airline Academy to remove the direct apron-to-runway connection. Relocating this portion is the lowest-cost solution because it is the shorter segment. As discussed previously, runways 4/22 and 12L/30R are recommended to be extended to allow for the construction of standard taxiway end connectors that are 90 degrees to runway centerline. The Taxiway A connector at the end of Runway 4 should be redesignated to Taxiway A1 to align with FAA standards, and the other connectors should be renamed to support this change. As part of renaming the taxiway connector, the text on the guidance sign at the connector will need to be updated. This update, as with any guidance sign updates, should be coordinated to occur with other improvements to the taxiway in the same area. Further consideration should be given to the potential benefits of relocating the portion of Taxiway A with a 350-foot runway centerline to taxiway centerline separation.

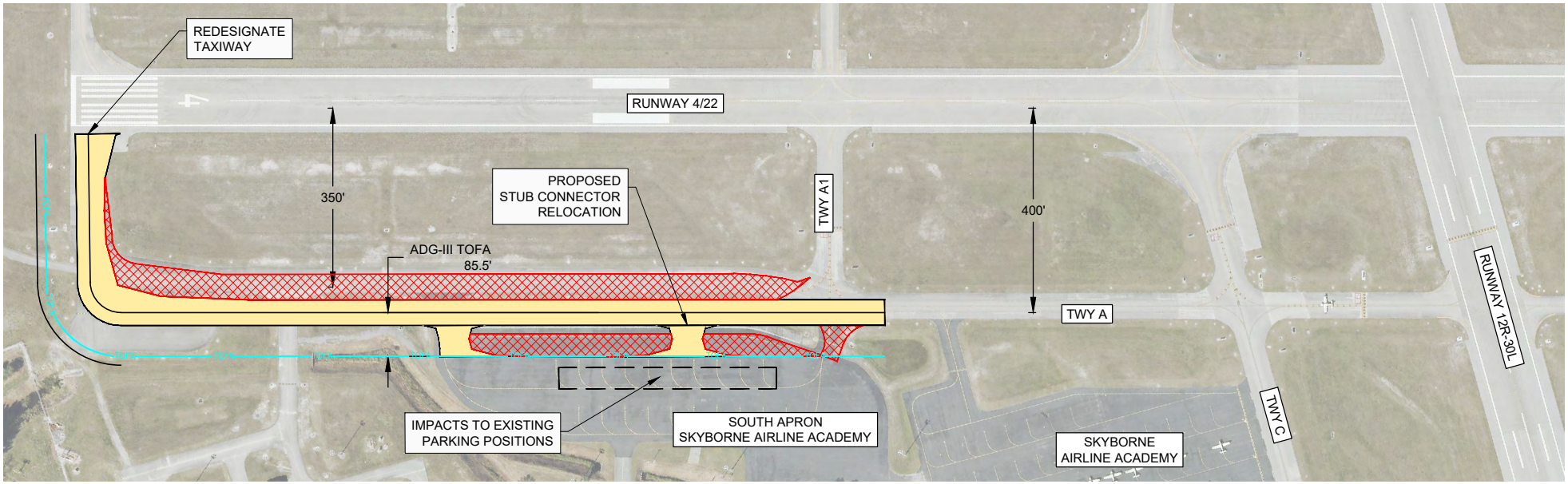


Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 3:15 PM ALEXA02176
I:\20JOBS\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.13_TW IMPROVEMENTS_NONCOMP.DWG

VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN	PREVIOUS ALP RECOMMENDED TAXIWAY IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.13



LEGEND
- AIRPORT PROPERTY BOUNDARY
- PROPOSED AIRFIELD PAVEMENT
- PAVEMENT TO BE REMOVED

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GRAPHIC SCALE IN FEET

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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I:\20JOBS\20A0088W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.14_TW IMPROVEMENTS_TW A.DWG

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	TAXIWAY A IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ FIGURE 5.14

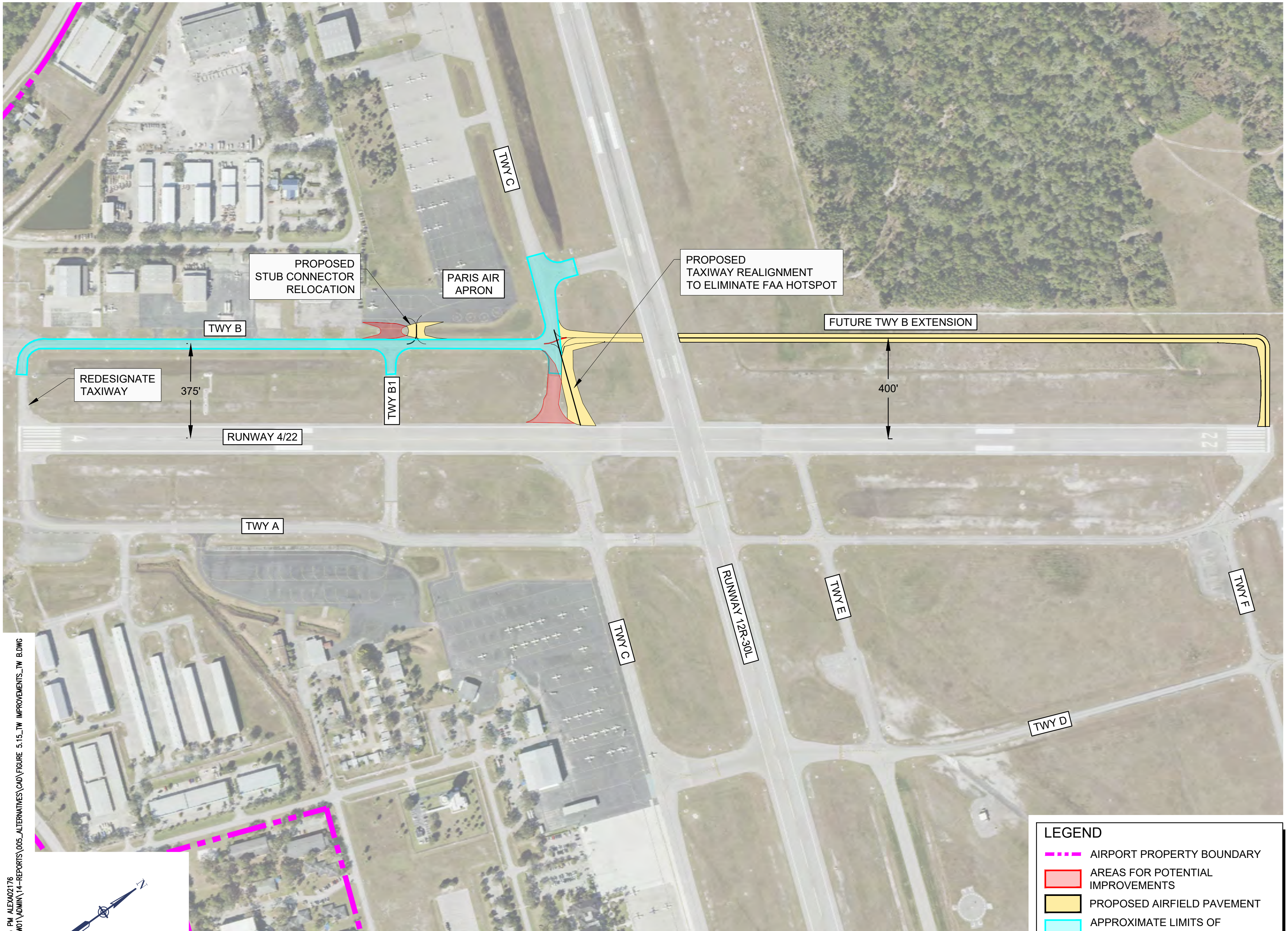
Taxiway B

Taxiway B is a partial parallel taxiway on the west side of Runway 4/22. The taxiway is 35 feet wide and meets TDG 2A standards. It has 375 feet for its runway centerline to taxiway centerline separation. This exceeds ARC C/D-II standards but is short of ARC III standards.

At the time of this airport master plan, an ongoing project to rehabilitate Taxiway B includes relocating the stub connector at Taxiway B1 to eliminate the direct runway-to-apron access. It also includes adding runway guard lights at the hold lines on Taxiway C on each side of Runway4/22. **Figure 5.15** shows the relocation of the stub connector and the approximate limits of the rehabilitation.

VRB has undeveloped land west of Runway 4/22 and north of Runway 12R/30L. As this area is developed, extending Taxiway B 2,600 feet to the end of Runway 22 should be considered to minimize runway crossings and increase taxiway efficiency and airfield circulation. Because Taxiway B south of Runway 12R/30L has a 375-foot separation, the extended taxiway could be built with the same separation or the standard ARC C/D-II or C-D-III separation. Extending Taxiway B with the same separation would avoid a jog in the taxiway. Extending Taxiway B with a 300-foot separation would provide maximum space for future airside development but limit the use of the taxiway to ADG-II aircraft and create a jog in the taxiway. Extending Taxiway B with a 400-foot separation would lessen the jog in the taxiway and allow up to ADG-III aircraft to use the parallel taxiway. As such, the 400-foot separation would provide the most flexibility and, therefore, efficiency to taxiway movements at VRB.

The taxiway end connector at Runway 4 is designated as Taxiway B. Consideration should be given to redesignating it to align with FAA standards, with the other connecting taxiways renamed to allow for this redesignation.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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GRAPHIC SCALE IN FEET

AUG 12, 2024 3:25 PM ALEXA02176
I:\20JOBS\20A0069\01 ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.15_TW IMPROVEMENTS_TW B.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	TAXIWAY B IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.15

Taxiway B Recommendations

With undeveloped land that could accommodate up to ADG-II aircraft adjacent to where Taxiway B, Taxiway B should be extended and constructed with an FAA-standard runway centerline to taxiway centerline separation of 400 feet. In addition to being a standard separation distance, taxiing from a portion of a 375-foot separation to a 400-foot separation minimizes the change, compared to a change to a 300-foot separation.

It is recommended that the Taxiway B end connector at Runway 4 be redesignated and the other taxiway connectors renamed to align with FAA design standards. A future end connector at Runway 22 would also have an alphanumeric designation.

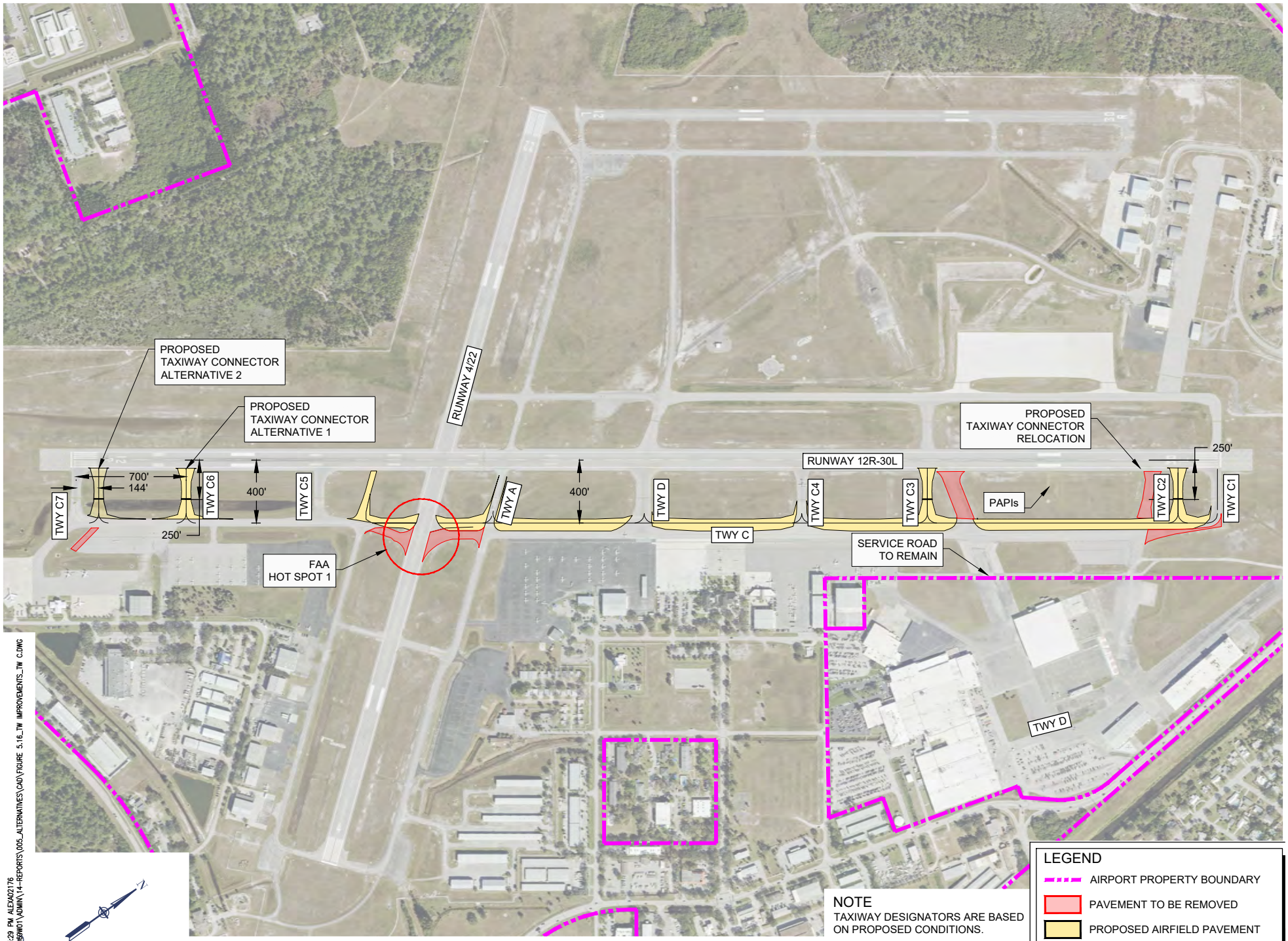
Taxiway C

Taxiway C is a full-length parallel taxiway on the south side of Runway 12R/30L. The taxiway is 50 feet wide and meets TDG 3 standards. Taxiway C varies from a 400-foot to a 475-foot runway centerline to taxiway centerline separation. The 400-foot runway to taxiway centerline separation meets ADG III standards and would support an approach with less than 3/4 of a mile of visibility. Taxiway C jogs to change separation at Runway 4/22, which is an FAA hot spot. To eliminate the jog in Taxiway C, Taxiway C should be realigned to the standard 400-foot separation for the entire length. This shift would improve the FAA-identified hot spot, where the taxiway separation from the runway changes, and provide the potential to develop additional apron space around the terminal area. **Figure 5.16** shows the potential improvement to Taxiway C. As part of relocating Taxiway C, the portion of Taxiway C from taxiways C1 and C2 would be realigned to be parallel to Runway 12R/30L.

Taxiway C1 is an end connector at Runway 30L, and the corner of the taxiway is squared. Per FAA standards, taxiway end connectors should be rounded to differentiate between a runway and taxiway. Consideration should be given to improving the no-build condition to meet the latest FAA design standards.

Taxiway C2 connects with Runway 30L at an angle other than 90 degrees and provides direct runway-to-apron access from Piper Aircraft. It is used by ATC as a bypass taxiway to allow aircraft to continue to depart Runway 30L if an aircraft is holding on Taxiway C1.

To eliminate the direct runway-to-apron access, Taxiway C2 should be relocated. The relocated Taxiway C2 should be 90 degrees to the runway centerline and relocated east of the hold pad to avoid a direct apron-to-runway connection, while positioning it to continue to serve an end bypass taxiway. The relocation of Taxiway C2 needs to meet the standards for parallel taxiway centerline to parallel taxiway centerline separation. The standard taxiway centerline to taxiway centerline separation is 144.5 feet for ADG III, 207 feet for ADG-IV, and 249 feet for ADG-V. The critical aircraft for Runway 12R/30L is ARC C/D-III. However, the runway centerline to taxiway centerline separation can serve larger aircraft. Therefore, in case of occasional use by larger aircraft, increasing the taxiway centerline to taxiway centerline separation up to 249 feet should be considered. Because the length of the taxiway will not change, only its location, there should be no cost difference to increase the separation between the two connecting taxiways. As part of relocating Taxiway C2, some stormwater modifications will be needed because there is a dry detention between taxiways C1 and C2. This stormwater detention could be shifted to the other side of the relocated Taxiway C2 to maintain the capacity.



NOTE
TAXIWAY DESIGNATORS ARE BASED ON PROPOSED CONDITIONS.

LEGEND
- AIRPORT PROPERTY BOUNDARY
- PAVEMENT TO BE REMOVED
- PROPOSED AIRFIELD PAVEMENT

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	TAXIWAY C IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ FIGURE 5.16

AUG 12, 2024 3:29 PM ALEXA02176
I:\20J08S\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.16_TW IMPROVEMENTS_TW C.DWG

If an aircraft is holding at the end of Runway 12R, such as for an instrument flight plan clearance, no bypass taxiway is available. To help reduce departure delays behind a holding aircraft, a bypass taxiway should be constructed near the end of Runway 12R. With the location of the hold pad at the end of Runway 12R, this taxiway would need to be east of the hold pad, or the hold pad would need to be modified or removed to avoid a direct apron-to-runway connection. To maintain the hold pad, the bypass taxiway would need to be approximately 700 feet from the end connector to avoid a direct runway connection. This exceeds the minimum separation for up to ADG-V aircraft. It would provide a shorter runway length, which would be adequate for all the training operations at VRB. Larger aircraft using the bypass taxiway would need to back-taxi if they need the entire runway length. To locate the bypass taxiway close to the end of Runway 12R, the hold pad would be shortened to avoid a direct runway connection. Any taxiway connector near the end of Runway 12R would require modifications to the drainage swale between Taxiway C and Runway 12R/30L.

Where there are large expanses of pavement, such as an apron adjacent to connector taxiways, the FAA allows green “islands” to be painted on the pavement so pilots can taxi around the island, which necessitates a turn between the apron and runway. Green islands are in place at taxiways C4 and D south of Taxiway C. This no-build condition meets FAA standards, so no changes are needed.

Taxiway C Recommendations

To improve the FAA-identified hot spot and maximize the space south of Taxiway C, a portion of Taxiway C with the larger separation, east of Taxiway B, should be relocated to have a runway-to-taxiway separation of 400 feet.

To meet FAA design standards and help landing pilots differentiate between the runway and taxiway end, the end of Taxiway C1 should be rounded. The change could occur when Taxiway C1 is rehabilitated or when Taxiway C is realigned to 400-foot separation. To eliminate the direct runway-to-apron access, Taxiway C2 should be relocated to have at least a 249-foot taxiway centerline to taxiway centerline separation from Taxiway C1.

With the projected increasing operations at VRB, a bypass taxiway should be developed near the end of Runway 12R. This would allow ATC to route departing aircraft around a holding aircraft to maximize the capacity of the runway. To preserve the hold pad that is used for engine run-ups by training aircraft, the bypass taxiway should be located east of the hold pad, with the appropriate stormwater modifications.

Taxiway D

Taxiway D provides crossfield access from the Skyborne apron south of Runway 12R/30L to runways 12L, 30R, and 22 on the north side of the airfield. The portion of Taxiway D between Taxiway C and Runway 12R/30L is 75 feet wide, and Taxiway D north of Runway 12R/30L is 35 feet wide, which meets TDG 2A standards. Taxiway D is primarily used for access to Runway 12L/30R, an ARC B-II small runway. Therefore, no changes to Taxiway D are needed.

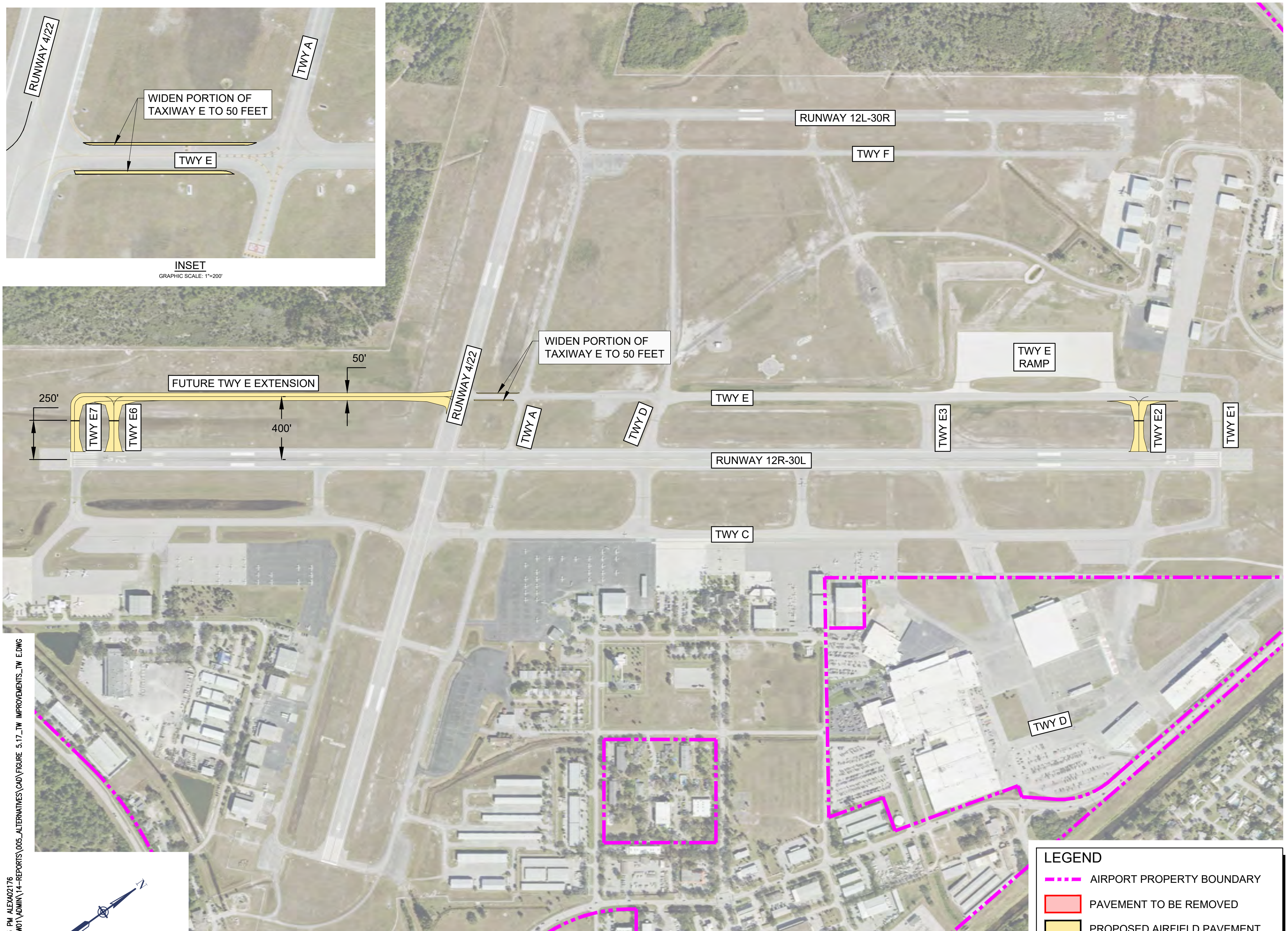
Taxiway E

Taxiway E is a partial parallel taxiway on the north side of Runway 12R/30L. Taxiway E has 400-foot separation runway centerline to taxiway centerline, meeting FAA design standards for ARC C/D-III aircraft. This taxiway is 50 feet wide from the Runway 30L end to Taxiway D. However, west of Taxiway D to Runway 4/22, Taxiway E is 40 feet wide. Because Taxiway E serves the primary runway, it should be able to accommodate TDG-3 aircraft, which require 50-foot-wide taxiways. Therefore, as shown on **Figure 5.17,** to meet TDG 3 standards, the portion of Taxiway E west of Taxiway D to Runway 4/22 should be widened to 50 feet. Widening this portion of Taxiway E would provide more routes for aircraft to access the ongoing development north of Runway 12R/30L, increasing the efficiency of the airfield.

Additional hangar development is ongoing north of Runway 12R/30L. To avoid crossing Runway 12R/30L for these aircraft to reach the end of Runway 12R and to increase taxiway efficiency and airfield circulation, extending Taxiway E 2,400 feet to the Runway 12R end, maintaining a runway to taxiway centerline separation of 400 feet for ADG-III aircraft, should be considered. This taxiway extension could serve future development in the undeveloped area north of Runway 12R/30L and west of Runway 4/22. If development on the north side is warranted in the future, bypass taxiways similar to those on Taxiway C could be developed on Taxiway E.

Taxiway E Recommendations

To meet FAA design standards, Taxiway E between Taxiway D and Runway 4/22 should be widened to 50 feet. It is also recommended to extend Taxiway E the full length of Runway 12R/30L. This extension would increase the margin of safety for airside development north of Runway 12R/30L by providing access to both ends of Runway 12R/30L without crossing the runway. It would minimize aircraft taxiing across Runway 12R/30L, maximizing the capacity of the runway for takeoffs and landings.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 3:33 PM ALEXA02176
I:\20JOBS\20A0669\01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.17_TW IMPROVEMENTS_TW E.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	TAXIWAY E IMPROVEMENTS	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.17

Taxiway F

Taxiway F is a full-length parallel taxiway on the south side of Runway 12L/30R. This taxiway has a 240-foot runway centerline to taxiway centerline separation, meeting ARC B-II small standards. This taxiway is 35 feet wide and meets TDG 2A standards. At the time of the airport master plan, both taxiway end connectors are designated Taxiway F. To align with FAA standards, the end connectors should be redesignated with alphanumeric names.

Unless there is development proposed for the north side of Runway 12L/30R as part of the airside alternatives, Taxiway F provides sufficient access for Runway 12L/30R, and an additional parallel taxiway would not be needed on the north side.

Taxiway F Recommendations

The Taxiway F end connectors should be redesignated and existing taxiways F1 and F2 should be redesignated, as needed, to align with FAA design standards.

Engine Run-Up Pads

With the high level of training at VRB, there are engine run-up pads near each runway end on at least one side. FAA AC 150/5300-13B recommends locating engine run-up areas away from parking positions, gate areas, and buildings, as well as locating them to minimize exposure to engine exhaust and noise.

Engine Run-Up Pad Recommendations

If the location of the run-up pads does not conflict with access to the airfield, they should remain. Access through a run-up pad to the parallel taxiway should be avoided. If it cannot be avoided, the run-up pad should be modified or removed. If any run-up pad needs to be removed to support airside development, VRB should work with the tenants to designate alternate run-up locations to avoid aircraft blocking the taxiway to conduct an engine run-up.

Taxiway Lighting

All taxiways are equipped with MITLs and are LED. Some airfield signs have been upgraded to LED; however, the remaining incandescent signs should be upgraded to LED in future lighting projects. Updating a sign to LED should be coordinated with renaming connector taxiways.

5.3. Navaids and Weather Equipment

Rotating Beacon

The rotating beacon is on the north side of Runway 12L/30R. It is accessed via an unpaved road and surrounded by dense vegetation, which causes difficulty to access and maintain. Relocating the rotating beacon to an area more accessible for routine maintenance has been identified as a need. Per FAA AC 150/5300-13B, an airport beacon should be within 5,000 feet of all runways, be above surrounding objects, and avoid interference with pilots' or ATCT controllers' vision. To avoid the potential of the flashing beacon being visible in the ATCT, sites with the areas southeast of the runways were avoided. An airport beacon is not considered fixed by function, so it needs to be clear of all runway and Part 77 design surfaces. **Figure 5.18** shows potential sites that would have minimal visual impacts to ATCT staff and pilots. The ongoing development at VRB is depicted on Figure 5.18, and these areas are not available for the relocation of the rotating beacon. The ATCT also requested that the beacon is not located on top of the tower due to maintenance considerations.

Potential Site 1 locates the rotating beacon north of Runway 12L/30R. The site is in an area clear of vegetation and can be accessed by the airfield perimeter road.

Potential Site 2 locates the rotating beacon to west of the airfield, near the Paris Air ramp. This location is within the Paris Air leasehold and could impact future development.

Potential Site 3 is along 43rd Avenue. It would be near an access point from 43rd Avenue. The height of the surrounding vegetation would need to be checked and potentially reduced. Its location would need to be coordinated with any future development plan to avoid impacts. Power would also need to be extended to this site.

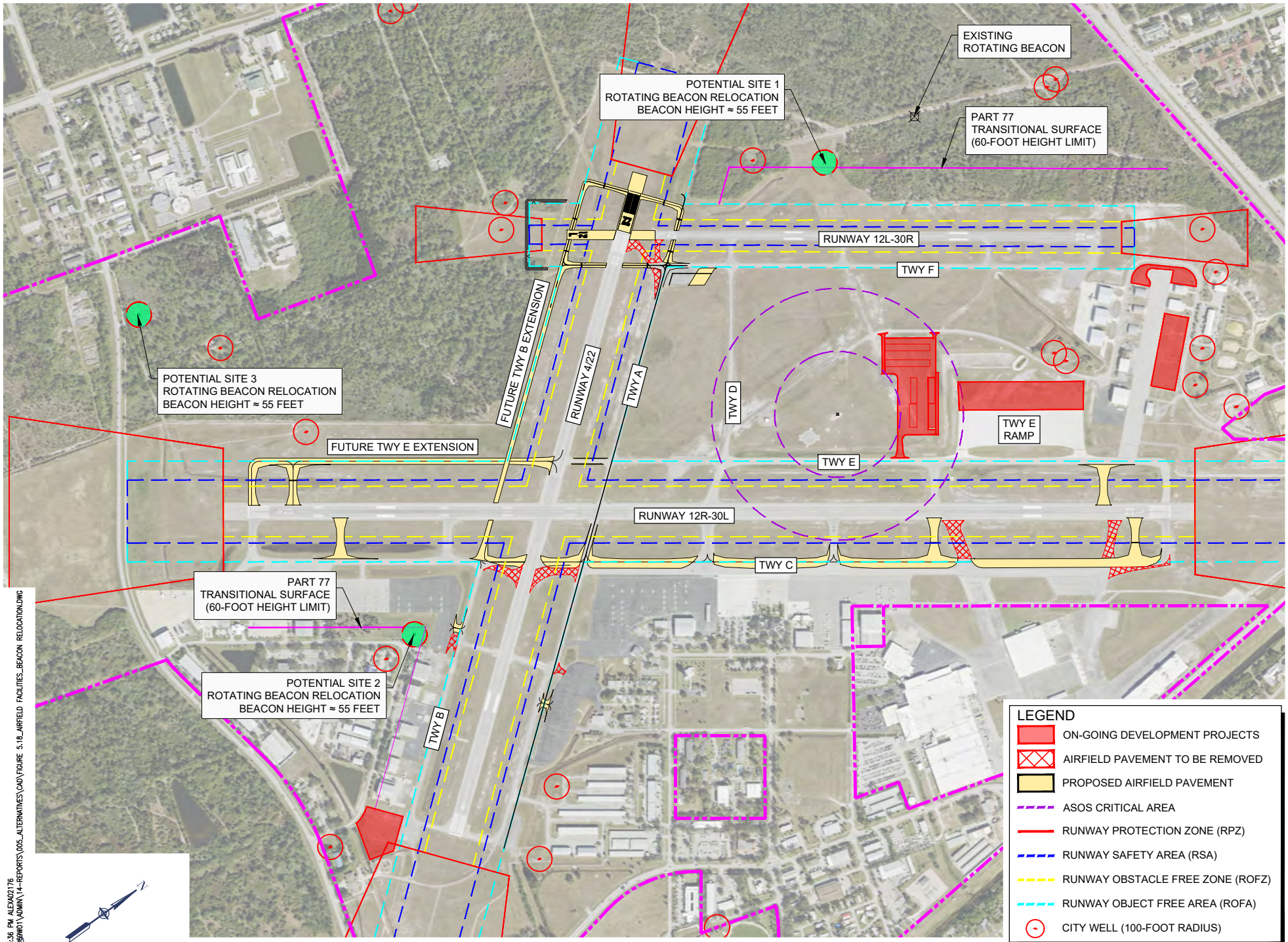
Rotating Beacon Recommendation

The no-build alternative for relocating the beacon is not considered feasible, because it does not address the difficulty accessing the site for maintenance. To improve the ease of maintaining the beacon, the rotating beacon should be relocated to Site 1 to provide better accessibility while minimizing visual impacts for controllers and pilots. Site 3 would also be a viable alternative if power is provided to the site.

ASOS

The ASOS is in the midfield, east of Taxiway D and north of Taxiway E. The midfield area is prime for hangar development, with utilities already in place. However, due to the height-restrictive critical areas around the ASOS and the ATCT's line of sight to Runway 12L/30R, future development in the midfield area is limited. The ATCT's line of sight will not change, but the relocation of the ASOS could open developable areas.

The ASOS is a National Weather Service (NWS)-owned system. VRB would need to work with the NWS to relocate the ASOS. If the NWS is not willing to relocate the ASOS, VRB could consider installing an AWOS that provides the same function but is airport-owned. The NWS siting criteria are not publicly available. Therefore, the relocation of the ASOS was evaluated per FAA Order 6560.20C. For airports with visual and/or nonprecision runways, the preferred siting area is adjacent to the primary runway, 1,000 feet to 3,000 feet from the threshold and 500 feet to 1,000 feet perpendicular from the runway centerline, with the critical areas clear. For an airport with a precision runway, the location is a minimum of 750 feet not to exceed 1,000 feet from the runway centerline. If the wind sensor site is above this, the minimum separation is increased by 7 feet for every foot the sensor site elevation is above the runway elevation. Each sensor in the system has its own specified clearances, but the most restrictive is the wind sensor. All obstructions must be at least 15 feet lower than the height of the wind sensor that is 30 to 33 feet above the average ground height within a 500-foot radius, and they must be at least 10 feet lower than the sensor where the radius is 500 feet to 1,000 feet. The ASOS location should not be subject to jet blast from engine run-ups or taxiing. A relocated ASOS should remain clear of the RVZ. There is an FAA stand-alone weather sensors system collocated with the ASOS that serves as a backup system for the ASOS. It should be relocated with the ASOS.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 3:36 PM ALEXA02176
I:\20JOBS\20A00860W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.18_AIRFIELD FACILITIES_BEACON RELOCATION.DWG

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	SITES FOR ROTATING BEACON RELOCATION	DRAWN BY: JA CHECKED BY: SZ
			FIGURE 5.18

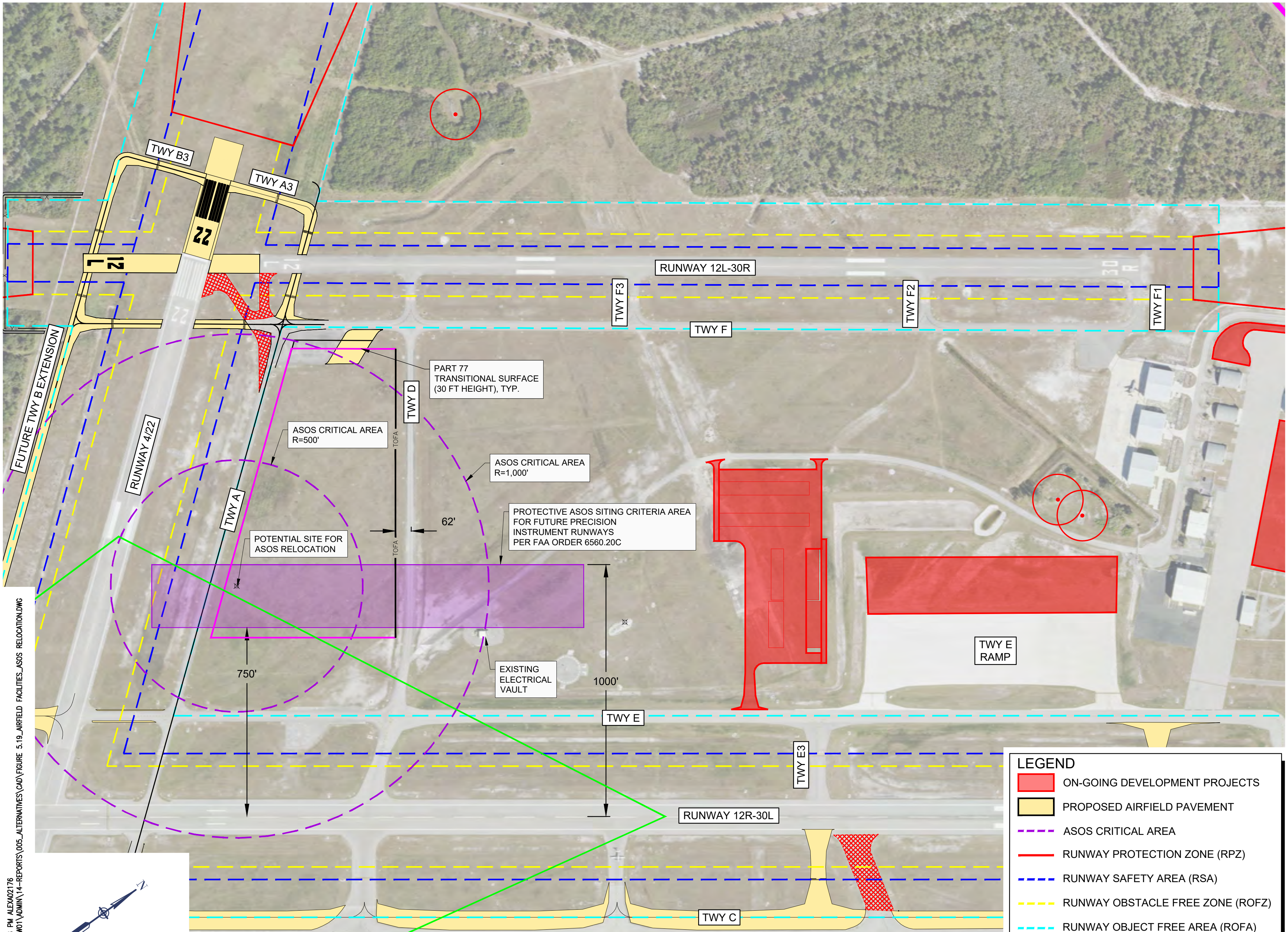
There are three alternatives for the ASOS. The first is no-build and keep the ASOS in its existing location. However, without the relocation of the ASOS, VRB has little to no remaining developable airside area without utility improvements.

The second alternative is between taxiways A and D. The space between taxiways A and D is limited to future aeronautical development due to height restrictions but could accommodate the ASOS while providing sufficient clearance for the wind sensor, as depicted on **Figure 5.19**.

The third option is to locate the ASOS northwest of runways 12R/30L and 4/22 in the undeveloped area. Relocating the ASOS to this area would require tree clearing and would impact future development opportunities.

ASOS Recommendation

The no-build condition of keeping the ASOS in its existing location does not provide the highest and best use of VRB property. Further, relocating the ASOS northwest of runways 12R/30L and 4/22 would limit future development and not provide the highest and best use of VRB property. Relocating the ASOS between taxiways A and D meets the siting criteria and makes good use of an area that cannot be used for airside development. Therefore, relocating the ASOS between taxiways A and D is recommended.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 3:38 PM ALEXA02176
I:\20JOBS\20A0069W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.19_AIRFIELD FACILITIES_ASOS RELOCATION.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	SITE FOR ASOS RELOCATION	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.19

Segmented Circle and Wind Cones

VRB is equipped with a primary lighted wind cone and segmented circle north of Taxiway E and east of Taxiway D. To provide the best use and flexibility for future midfield development, the relocation of the segmented circle and lighted wind cone is suggested. Due to height restrictions for future development and to maintain a clear RVZ, a potential future site would be in between Taxiways A and D. Because the segmented circle and lighted wind cone is visual navaid, it would be fixed by function with the RVZ.

There are also six supplemental wind cones, two for each runway, on the left side of the runways. During the inventory data collection, the supplemental wind cones for runways 12R/30L, 12L/30R, and 4 were operational, and no changes are needed. However, the supplemental wind cone at the Runway 22 end needs to be replaced. Before it is replaced, it should be evaluated to identify the most appropriate long-term location.

Appendix A in FAA AC 150/5340-30J: Design and Installation Details for Airport Visual Aids requires that the supplemental wind cone be 1,000 feet (plus or minus 500 feet) from the runway end. A location is proposed 500 feet from the existing Runway 22 end and 1,226 feet from the end of Runway 22 if it is extended to 5,700 feet. As long as the Runway 22 end does not shift to the southwest, the proposed supplemental wind cone location along the length of the runway should meet FAA design standard for the existing and future Runway 22. This Runway 22 supplemental wind cone is outside the RSA. The FAA allows the supplemental wind cone to be within the ROFA if there are no other feasible alternatives and they are on a frangible mount. The wind cones at VRB are outside the RSA but typically within the ROFA due to surrounding development that would limit a pilot's view. Whenever a wind cone is being replaced or relocated, the feasibility of moving it outside the ROFA should be assessed.

Locating the Runway 22 supplemental wind cone outside the ROFA was considered, but this would require it to be located east of Taxiway A. In this location, aircraft on Taxiway A, Runway 12L/30R, or the run-up pad near the end of Runway 12L could block the view of the wind cone for a landing pilot. The wooded area on the west side of Runway 4/22, which could block wind, precludes a supplemental wind cone location on the west side of the runway.

Runway 4/22 Supplemental Wind Cone Recommendation

Because the Runway 22 supplemental wind cone is not operational, there is not a no-build option. The supplemental wind cone should be located to serve the existing length and any future extension of Runway 22. The recommended location is between Runway 4/22 and Taxiway A. This recommended supplemental wind cone was considered and shown on the alternative concepts for Runways 4/22 and 12L/30R in figures 5.6 to 5.8.

The FAA requested consideration of the relocation of the Runway 4 supplemental wind cone. It is outside the RSA but within the ROFA. Because of the location of the parallel taxiway and surrounding development, to provide a clear line of sight to the wind cone for approaching pilots, the best location is the existing location between Runway 4/22 and Taxiway B, outside the RSA but within the ROFA.

Compass Calibration Pad

A compass calibration pad is at VRB. With Piper Aircraft using VRB to test new aircraft, the compass calibration pad is an important asset. The compass calibration pad is west of Taxiway D along the south edge of Taxiway E, within the Runway 12R/30L ROFA. It should be relocated outside the ROFA to keep aircraft outside the ROFA when using the pad. FAA AC 150/5300-13B provides guidance on the preferred locations of a compass calibration pad. The center of the pad should be located[30]:

- A minimum of 600 feet from magnetic objects, e.g., parking lots, busy roads, railroad tracks, high-voltage electrical transmission lines, or cables carrying direct current
- A minimum of 300 feet from buildings, fuel lines, and electrical or communication cable conduits, if they contain magnetic materials
- A minimum of 150 feet from runway and taxiway light bases, airfield signs, ducts, and grates for drainage, if they contain iron, steel, or ferrous materials
- Clear of any critical area for electronic navaid facilities
- Not penetrate the OFZ, safety areas, OFAs, etc.

A potential site meeting these criteria was identified, as depicted on **Figure 5.20.** This potential site is east of Taxiway A, near the existing run-up pad south of Runway 12L. This location complies with the preferred location guidance in FAA AC 150/5300-13B. The potential relocation site is a minimum of 600 feet from the electrical vault and the potential relocated ASOS site. This area is also limited to future aeronautical development due to height restriction limitations. While there are no known electrical cables in this area, a magnetic survey should be conducted to verify that the potential location is suitable for the pad or modify it to allow it to be suitable. The compass calibration pad is used primarily by ADG-II aircraft, so its location along Taxiway A that serves ADG-II aircraft would be acceptable.

Compass Calibration Pad Recommendation

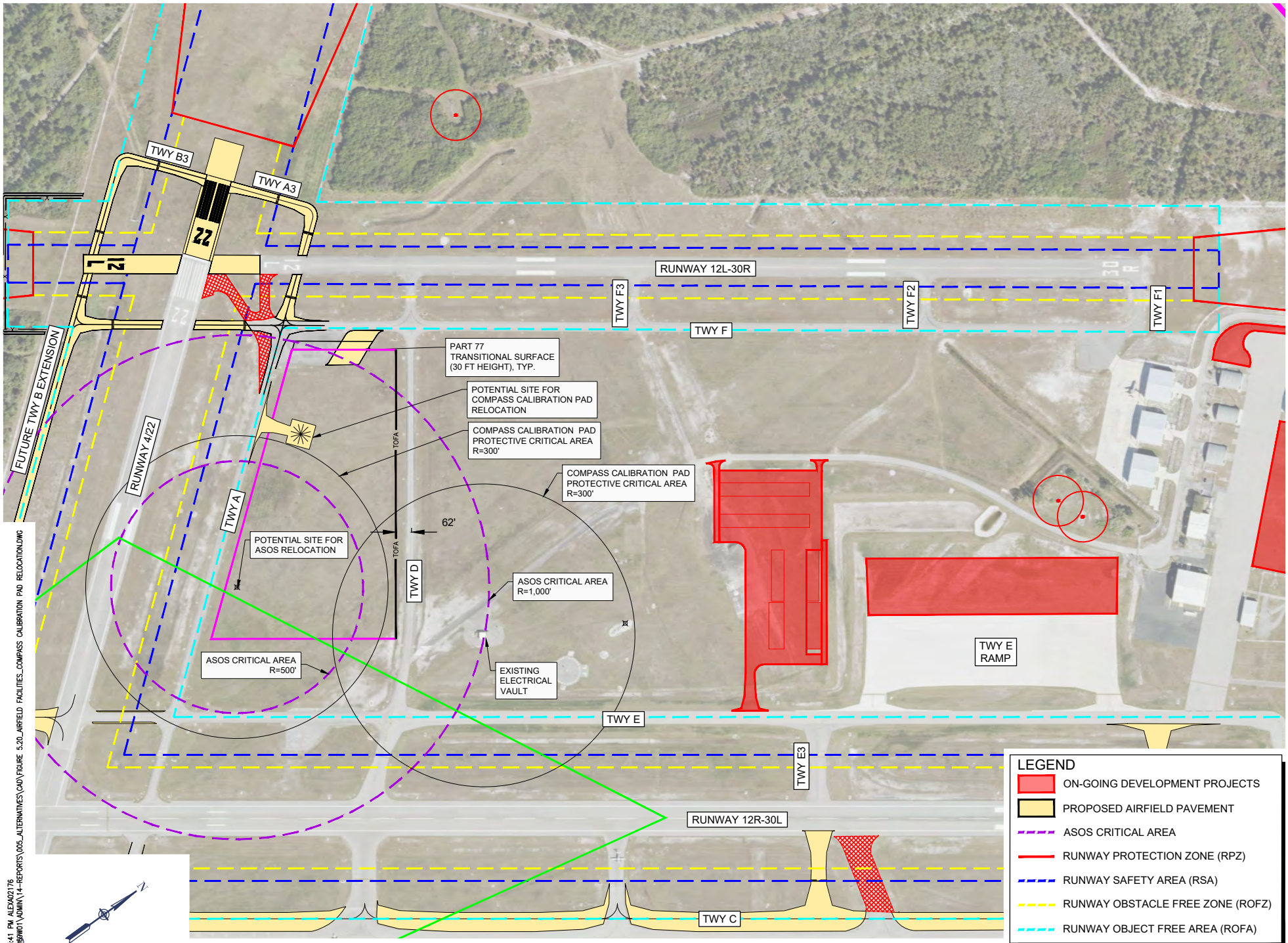
With the use of the compass pad by new aircraft and others needing a compass calibration pad, it is recommended to provide a compass calibration pad at VRB. The no-build condition of maintaining the compass calibration pad in its existing condition is not acceptable, as its location within the Runway 12L/30R ROFA for ARC C-III aircraft does not meet FAA design standards. Only one feasible location was identified with existing taxiway access. This location is along Taxiway A, as depicted on Figure 5.20.

5.4. Other Airfield Support Infrastructure

Electrical Vault

The electrical vault is considered to be in good condition and has adequate space. Standard useful life upgrades should be considered, particularly when upgrading lighting to LED.

[30] FAA AC 150/5300-13B, dated March 31, 2022.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 3:41 PM ALEXA0176
I:\20JOBS\20A00860W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.20_AIRFIELD FACILITIES_COMPASS CALIBRATION PAD RELOCATION.DWG

VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

SITE FOR COMPASS CALIBRATION PAD RELOCATION

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.20

5.5. Emerging Technology

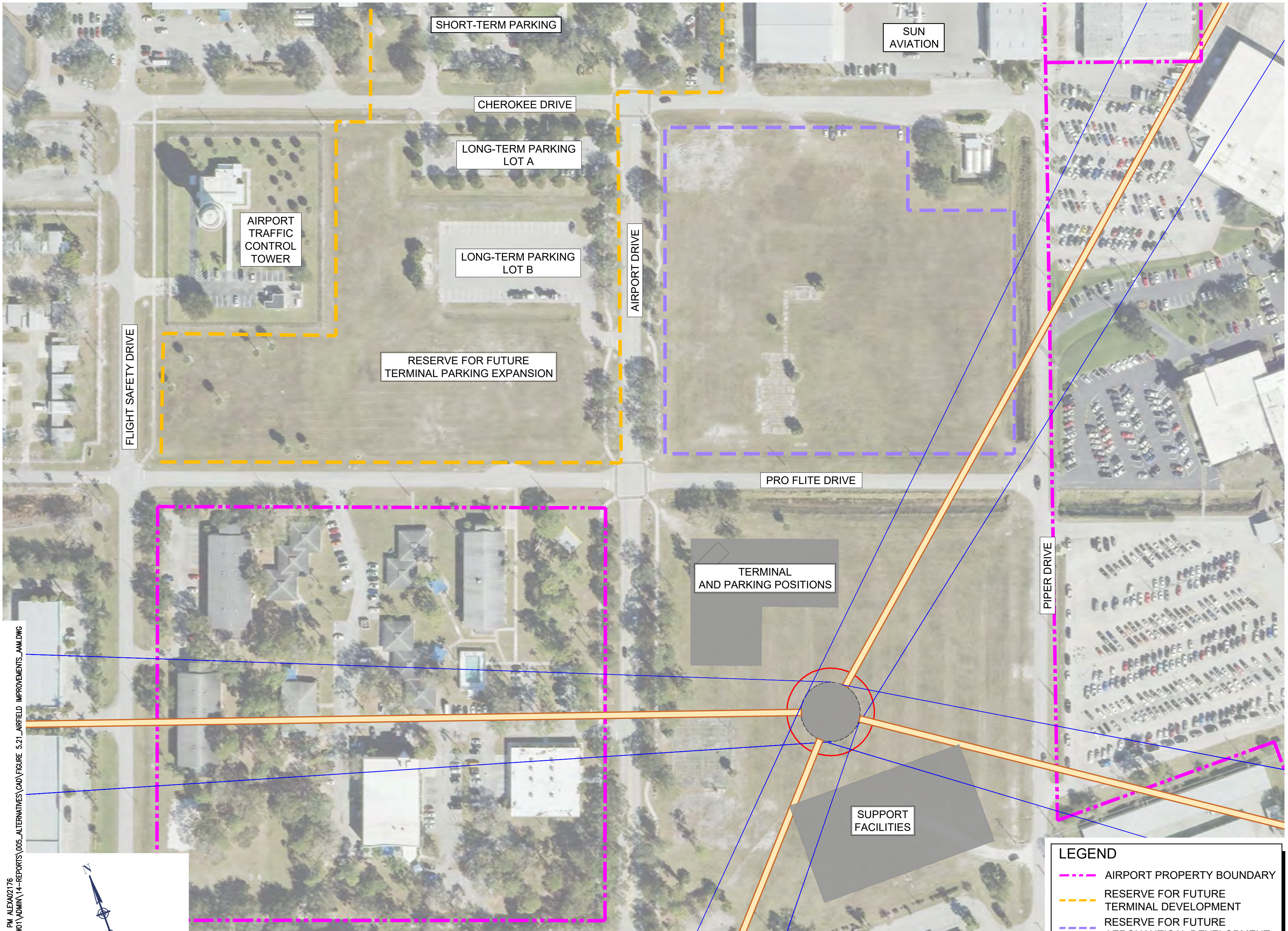
Multiple companies are working to develop electric vertical takeoff and landing aircraft (eVTOL). Companies are also working to prepare infrastructure to support these AAM aircraft. In September 2022, the FAA released *Engineering Brief 105: Vertiport Design* to set forth interim guidance for airport sponsors and vertiport developers. The FAA has indicated it anticipates releasing a vertiport design advisory circular in the next 24 months and is working to develop a review and approval process for proposed vertiports. An important step for an airport to prepare to serve eVTOL or other new-energy-source vehicles is to include the proposed infrastructure in its ALP.

VRB has a letter of intent with a vertiport developer. The location of the proposed vertiport, subject to FAA and city approvals, is southeast of the terminal between Airport, Pro Flite, and Piper drives. The conceptual layout of the vertiport and approach surfaces is depicted on **Figure 5.21**. This location allows for pedestrian access via existing sidewalks to the passenger terminal. It is also within proximity to electrical service to support the anticipated operations and charging needs of eVTOL aircraft.

All the aircraft fueling at VRB is provided by the FBOs. In addition to the proposed privately developed vertiport, electric vehicle chargers for aircraft may also be developed by the FBOs. The commercial service facilities should consider including provisions to be able to support electric ground service equipment. As part of the parking lot expansion, VRB may also wish to consider installing electric automobile charging stations. The ground vehicle-related facilities will be considered further in the related sections that follow.

5.6. Airfield Perimeter Road

To provide access to all areas of the airfield without using surrounding public roads, an extension of the perimeter road system on the north side of the airport is needed. A perimeter road is also to be used to facilitate monitoring the perimeter security fence. Taking into account the recommended airfield improvements, a location for extending a perimeter fence to the northern portion of the airfield is depicted with the preferred airfield development on **Figure 5.22**.



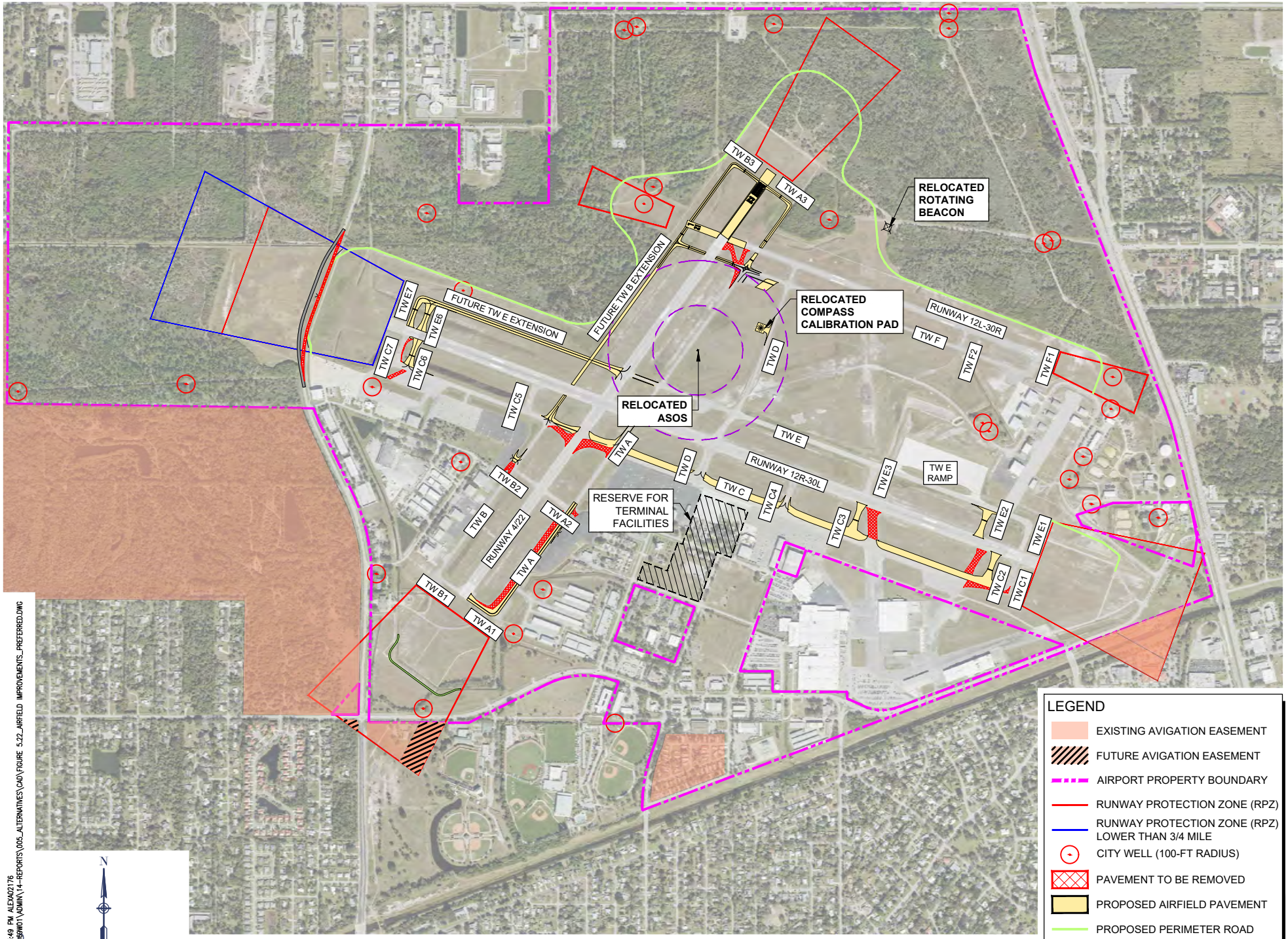
Source: Aerial Photography, NV5 GeoSpatial, 2023.

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	CONCEPTUAL VERTIPORT LAYOUT	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.21

5.7. Preferred Airfield Improvements

Figure 5.22 depicts an overview of the preferred airfield improvements and airfield support facilities at VRB. These recommended airfield improvements include:

- Relocate 43rd Avenue and the perimeter road and fence to eliminate the use of declared distances on Runway 12R/30L.
- Pursue approach minimums of 1/2 a mile on Runway 12R with the installation of the MALSR and obstruction mitigation.
- Extend the Runway 22 end up to 726 feet.
- Relocate the drainage swale and fence and RSA improvements to eliminate the need for declared distances on Runway 4/22.
- Extend Taxiway B the full length of Runway 4/22 with a 400-foot runway centerline to taxiway centerline separation and pavement at least 35 feet wide.
- Widen Taxiway E from 40 feet to 50 feet between Taxiway D and Runway 4/22.
- Extend Taxiway E the full length of Runway 12R/30L with a 400-foot runway centerline to taxiway centerline separation and pavement 50 feet wide.
- Realign Taxiway C for a 400-foot runway centerline to taxiway centerline separation the entire length.
- Modify Taxiway A1 to eliminate the direct apron-to-runway connection.
- Modify Taxiway C2 to eliminate the direct apron-to-runway connection and provide a standard 90-degree connector.
- Add a bypass taxiway from Taxiway C at the Runway 12R end.
- Rename taxiway end connectors and others as needed to support this change.
- Relocate the airfield rotating beacon, ASOS, and compass calibration pad.
- Work with the flight schools to minimize aircraft parking in RVZ.
- Extend perimeter road on north side of airfield.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 3:49 PM ALEXA02176
I:\20JOBS\20A00860W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.22_AIRFIELD IMPROVEMENTS_PREFERRED.DWG

VERO BEACH REGIONAL AIRPORT MASTER PLAN

PREFERRED AIRFIELD IMPROVEMENTS

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.22

5.8. Airside Development

The facility requirements chapter identified the need for additional airside facilities to support commercial service and general aviation operations. Using the recommended airfield development as the future airfield for planning purposes, areas for potential airside development are identified.

Ongoing Development Projects

At the time of this airport master plan, VRB has several areas committed to development projects that are in various stages of planning, design, and construction. For the purpose of identifying areas for potential development, these areas are considered not available. However, the ongoing development, including hangars, will be considered when identifying the additional square footage needed to support the facility requirements.

Environmental Considerations

The 2015 City of Vero Beach Comprehensive Plan identified areas on the north and northwest side of the airport as conservation. Through this master plan, those areas are being reviewed for any potential recommended updates to the comprehensive plan. Therefore, they are being considered for potential development, subject to environmental considerations.

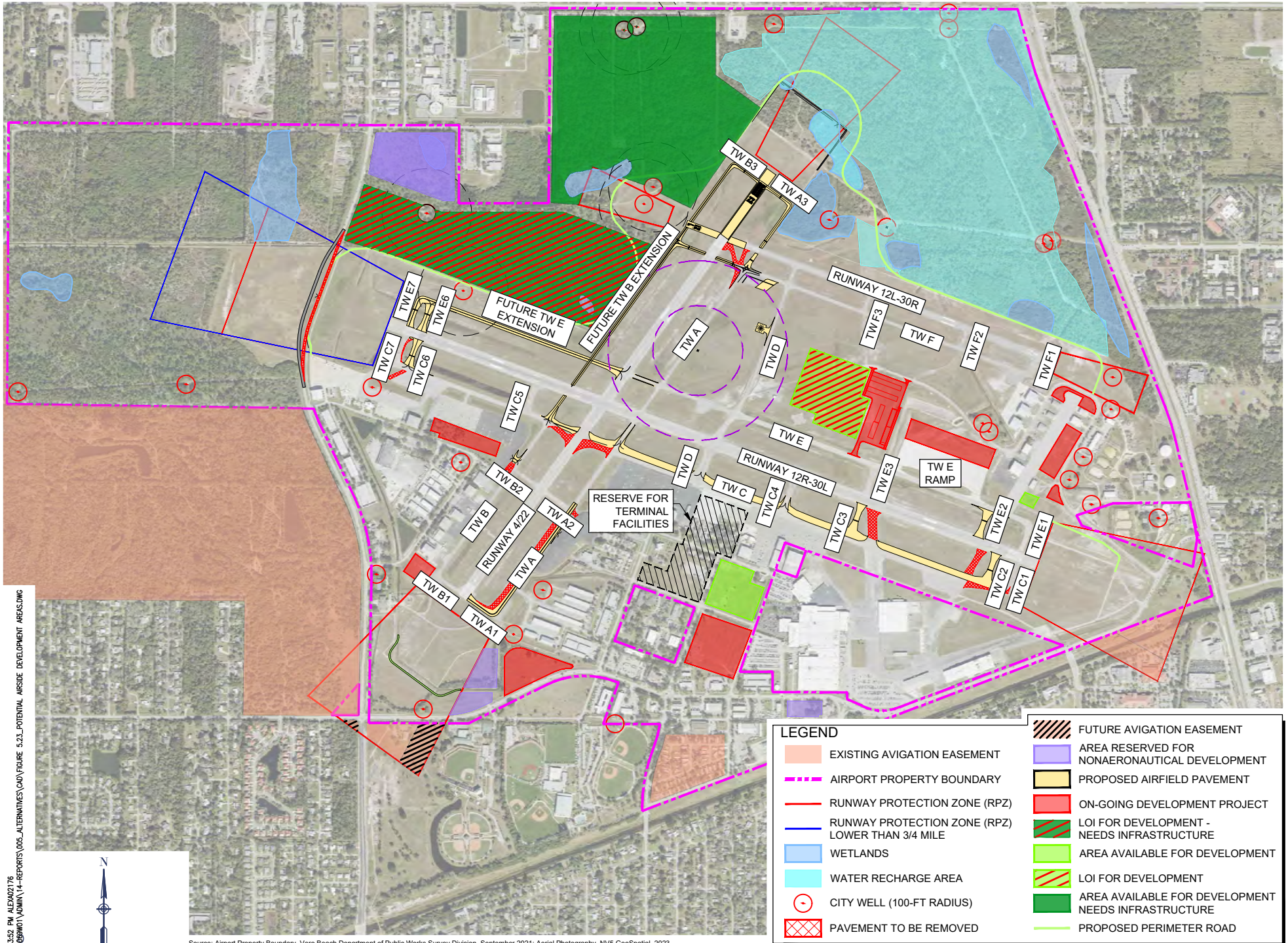
As identified in the environmental overview chapter, there are wetlands and city wells that require a protective area in the undeveloped areas that should be avoided. There is a 100-foot-radius lease around each of the water wells on VRB. The state has established wellhead protection areas that extend a 500-foot radius from the water well to protect the ground water supplies from contamination.

The northeast portion of the airport is part of the water (aquifer) recharge area. The environmental overview identified that VRB is within the range of threatened and endangered species, including the gopher tortoise, scrub jay, and snail kite. The 2016 VRB Habitat Conservation Plan identified 174 acres of suitable Florida scrub jay habitat. At the time of the conservation plan, it was anticipated that any development on VRB would be within the existing airport operations area or already improved lots. Prior to development in undeveloped areas, additional environmental analysis, including potential field studies for species, will be required.

Any development at VRB must have adequate stormwater management. There is a stormwater master plan ongoing concurrent with this airport master plan. Data is being shared between the two master plans. After the recommended development plan is identified for the airport master plan, it will be coordinated with the stormwater master plan to identify areas for the stormwater detention that will be needed to support the planned infrastructure.

Figure 5.23 shows the preferred airfield development, ongoing development projects, and mapped environmentally sensitive areas to identify areas to accommodate potential airside development. VRB has been focused on developing already improved areas first, so there is limited improved, uncommitted area remaining. However, there are undeveloped areas that may be suitable for development. Because there are undeveloped areas, redeveloping areas with existing infrastructure was not considered for this analysis.

With the water recharge area northeast of the runways, this area should remain undeveloped, at least until all other developable areas on the airport have been used. Therefore, accommodating airside development, beyond what can be met in the already improved areas, will focus on the northwest area.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 3:52 PM ALEXA02176
I:\20JOBS\20A0088WO1\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.23_POTENTIAL AIRSIDE DEVELOPMENT AREAS.DWG

VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

POTENTIAL AIRSIDE DEVELOPMENT AREAS

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.23

5.9. Commercial Service Facilities

The commercial service facilities at VRB are centered around the terminal building. Therefore, the area that will be reserved for future commercial service facilities is considered before the general aviation facilities, which have more flexibility in their location on VRB.

The passenger terminal areas needed to provide a higher level of service and support overlapping flights were included in the facility requirements chapter. In addition, the terminal building improvements being designed for construction in 2024 were summarized. While the 2024 improvements will increase the current passenger terminal facilities by 50%, once they are complete there are very few, if any, options to further improve or expand the terminal building.

The facility requirements chapter also addressed the short- and long-term automobile parking areas of the passenger terminal. It documented a prior study that showed additional automobile parking spaces were needed. The demand for more spaces was based on a maximum of 10 commercial service flights per week, which started occurring in September 2023. Published schedules show this frequency increasing to 14 flights per week in October 2023 and 17 flights per week in November 2023.

Considering the developed areas of VRB before opening the undeveloped areas, the reasonable alternative to provide additional terminal building and automobile parking improvements would be adjacent to the existing facilities. **Figure 5.24** depicts the existing terminal facilities and outlines the areas that need to be reserved to provide future commercial service facilities.

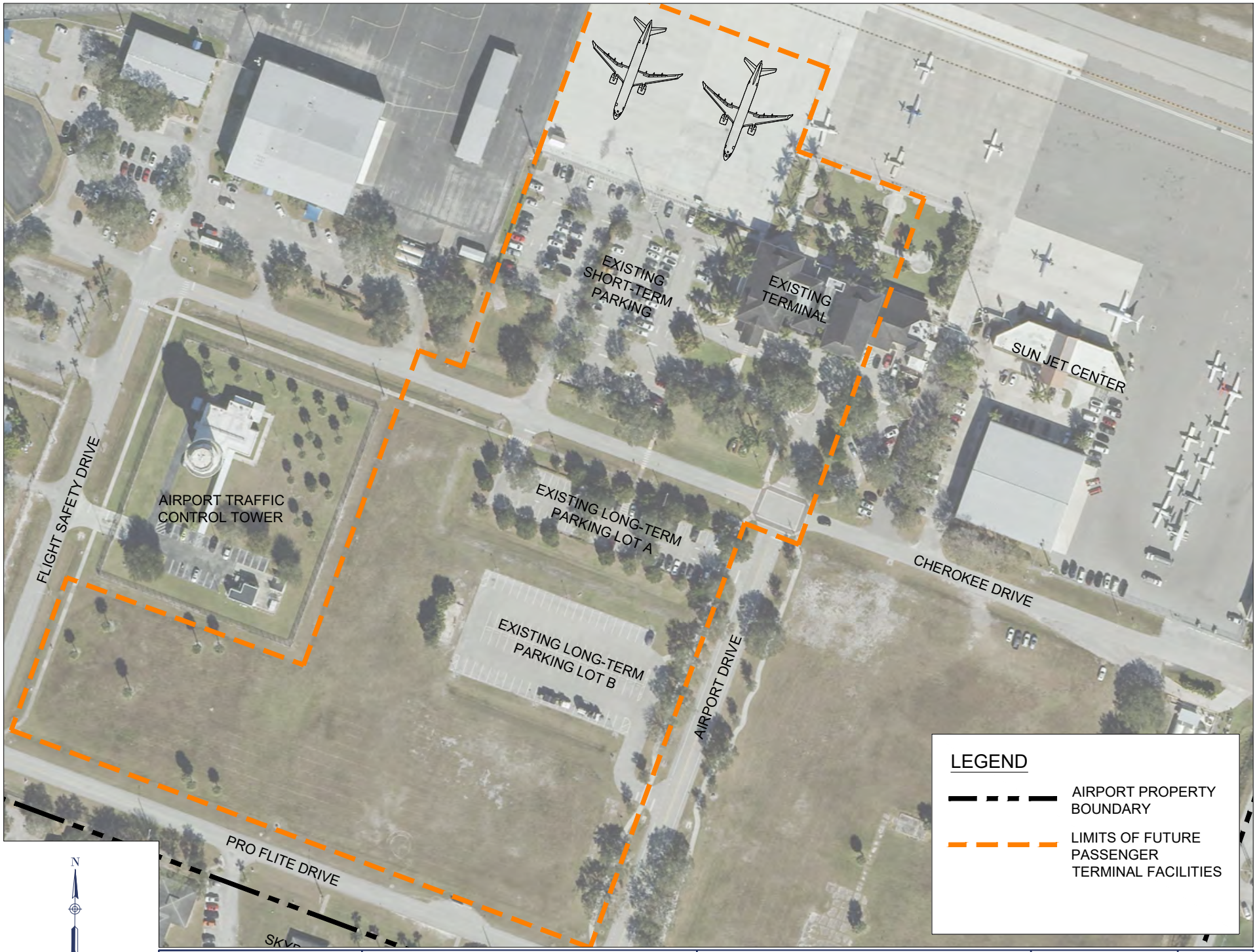
Concept for Future Terminal Building Space

The facility requirements established that 12,430 square feet of terminal space are required to support overlapping flights. **Figure 5.25** illustrates a general concept for a 12,430-square-foot terminal building northwest of the existing terminal. The building footprint shown would be for a single-story structure, because it is not envisioned that a new terminal would require a second level. Furthermore, any new facility should be as simple as possible to provide flexibility for other uses, should the demand for passenger service at VRB change in the future.

A new 12,430-square-foot facility also enables the existing terminal building to remain operational during construction. Once complete, the existing terminal building might continue to support passenger service, or the space could be reconfigured for another use. This will depend on whether passenger service is expected to exceed the capabilities of the new 12,430-square-foot facility. Such growth would justify an updated projection of commercial service activity and a more detailed terminal area planning program.

Expansion of Passenger Terminal Automobile Parking

Figure 5.25 also demonstrates the potential to expand the automobile parking lots south of Cherokee Drive. The prior parking study identified a need for an additional 150 to 200 spaces. Given the current airline schedules, the immediate need is closer to the 200-space estimate. Additional spaces will be required in the future, especially given that some short-term spaces will be lost if a new terminal building is constructed. It is also worth noting that as the passenger airline options and frequencies increase, the average length of stay for those using the long-term parking may also change. For these reasons, Figure 5.25 illustrates how the surface lots could be expanded to accommodate demand beyond that projected, even for a high-growth passenger scenario. Finally, it should be



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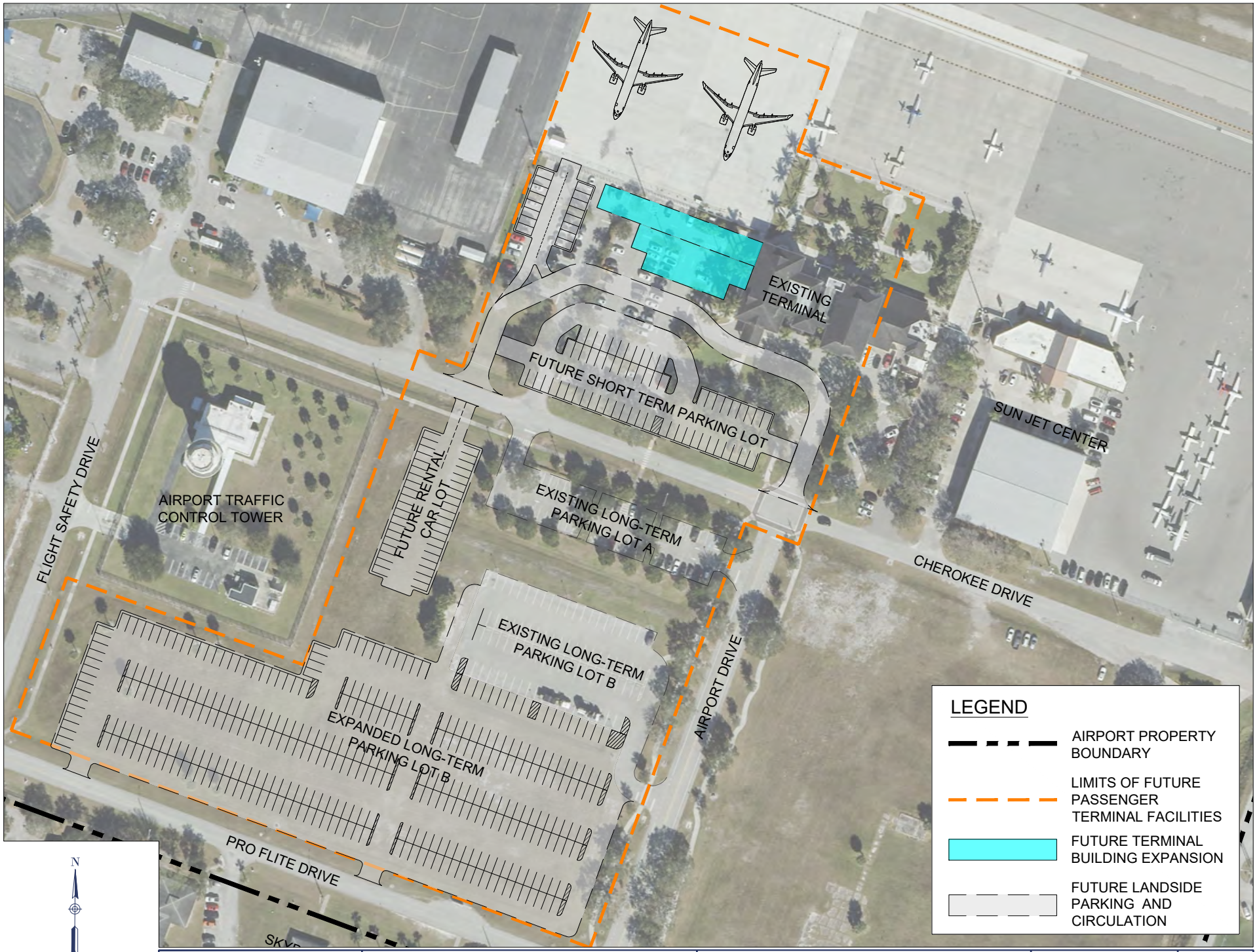
C:\USERS\JHALISKY\DOCUMENTS\AVIATION PLANNING\AIRPORTS\VRB\05 GRAPHICS-GIS-MODELING\DRAWINGS\VRB MP - FIGURE 4A.DWG

ESA	VERO BEACH REGIONAL AIRPORT MASTER PLAN	EXISTING PASSENGER TERMINAL FACILITIES	DRAWN BY: JJH CHECKED BY: DJD	FIGURE 5.24



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C:\USERS\JHAUSKY\DOCUMENTS\AVIATION PLANNING\AIRPORTS\VRB\05 GRAPHICS-GIS-MODELING\DRAWINGS\VRB MP - FIGURE 4.8.DWG

ESA	VERO BEACH REGIONAL AIRPORT MASTER PLAN	CONCEPT OF FUTURE PASSENGER TERMINAL FACILITIES	DRAWN BY: JJH CHECKED BY: DJD	FIGURE 5.25

noted that airport management has the option of closing a portion of Cherokee Drive to the west of Airport Drive to enhance the margin of safety for pedestrian traffic.

Based on the commercial service enplanement forecast, as included in the aviation forecast chapter, the area around the existing terminal should be sufficient to accommodate the project demand.

Commercial Service Facilities Recommendation

The existing areas around the terminal should be sufficient to accommodate the passenger enplanements, as projected in the aviation forecasts. Therefore, the area west and south of the existing terminal should be reserved for commercial passenger terminal and auto parking expansion. A detailed layout of these facilities should be developed in a future terminal area plan. To maximize the use of the available space, more detailed planning should occur as part of the planning and design of these facilities. The detailed planning would include provisions for ground service equipment, network transportation companies, and taxi and other ground transportation, as well as Americans with Disabilities Act and other access accommodations. Any terminal facilities should be planned to meet the customer service expectations set for VRB.

5.10. General Aviation Facilities

This section analyzes potential areas to support the demand for the future development of GA facilities. The analysis to determine the future development uses the baseline and projected 20-year forecast of based aircraft at VRB, compared to the facilities available that were identified in the facility requirements chapter. VRB is a complex airport with a dynamic GA presence, with operations by business jets and smaller GA aircraft, in addition to two active flight schools. Flight schools generally use single-engine aircraft that are tied down on their ramp when not in use. Therefore, the single-engine aircraft associated with both flight schools were omitted from the hangar demand calculations. VRB also provides commercial service operations; however, these aircraft do not require hangars at VRB are not included in the calculations for future GA facility development. The following sections provide additional information on the future GA facilities' development.

Aircraft Hangar Development

There are various types and sizes of hangars at VRB to accommodate the demand by based aircraft. As identified in the forecast chapter, the existing hangar occupancy on the airport is 100%. There are few, if any, nonflight, school-based aircraft that are tied down, with owners desiring protection for their aircraft. Any tied-down based aircraft are typically short-term waiting for hangar space. It is assumed that all future based aircraft, except for the single-engine aircraft used for flight training, would require a hangar. The Piper aircraft being manufactured are also excluded from the hangar calculations, because they are located on Piper Aircraft property. Based on the forecast demand, the future GA development alternatives identified in this section assume that the increase in nonflight, school-based aircraft over the 20-year planning period would be stored in hangars.

T-Hangar Development

VRB has two sizes of T-hangars: small (1,034 square feet) and medium (1,296 square feet). Generally, T-hangars are used to store single-engine, piston-powered aircraft. For planning purposes, it has been assumed that T-hangars would be desired to store future single-engine aircraft at VRB. The facility requirements identified the need for 70 additional T-hangars to meet the demand over the 20-year planning period. At the time of this airport master plan, ongoing hangar development projects in the midfield area and adjacent to the north ramp will provide an additional 32 T-hangars and 10 box hangars, respectively. With 32 T-hangars being developed, space for an

additional 38 T-hangars needs to be identified. The 32 planned T-hangars would meet the project demand through the intermediate PAL for single-engine aircraft.

Small Box Hangar Development

Generally, small box hangars at airports accommodate small, multiengine, piston-powered aircraft. For the purposes of this airport master plan, because multiple GA aircraft can be stored together in a large hangar, the additional space is identified in the square footage needed. The facility requirements identified the need for approximately 45,000 square feet for multiengine aircraft and 18,000 square feet for rotorcraft, for a total of 63,000 square feet. At the time of this airport master plan, several ongoing hangar development projects in the midfield area and adjacent to the north ramp provide 20,460 square feet, 18,432 square feet, and 15,900 square feet, respectively. These developments provide approximately 54,792 square feet of small hangar space, which almost meets the additional square footage needed through the long-term PAL for multiengine and rotorcraft. Approximately 8,200 square feet of additional small box hangar space is needed to meet the long-term PAL.

Large Box Hangar Development

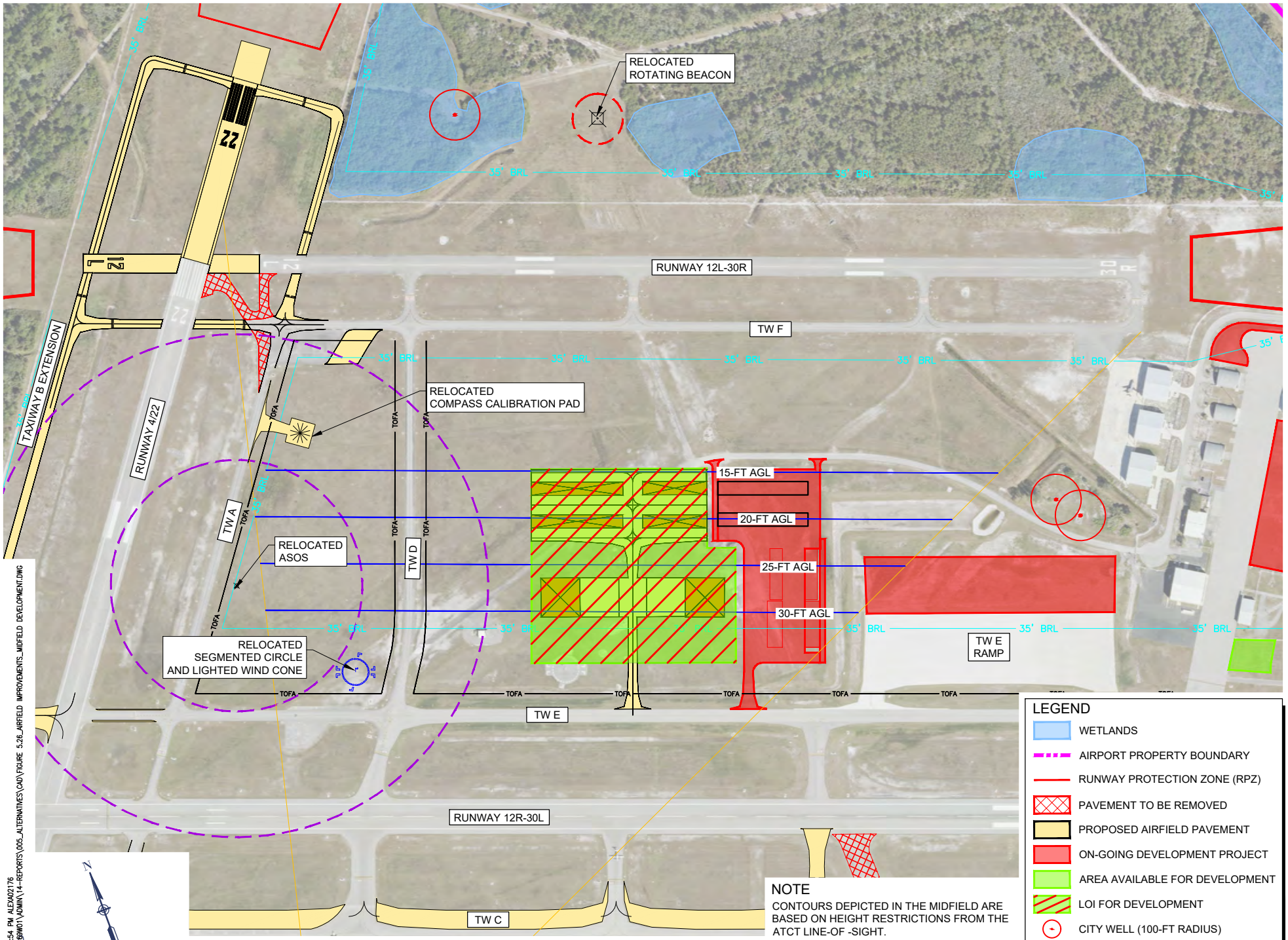
Generally, large box hangars at airports accommodate business jets. For the purposes of this airport master plan, because multiple GA aircraft can be stored together in a large hangar, the additional space is identified in the square footage needed. The facility requirements identified the need for approximately 184,600 additional square feet of large hangar space. At the time of this airport master plan, an ongoing hangar development project adjacent to the Taxiway E ramp will provide six large box hangars, for a total 86,500 square feet. These planned large box hangars would meet the project demand through the short-term and into the intermediate-term PAL. Therefore, an additional 98,100 square feet should be reserved for large-box hangar development to fully accommodate the intermediate- and long-term PAL.

5.11. Development Areas Available for GA Facilities

Figure 5.23 identified the area potentially available for airside facilities. As described above, the area west and south of the existing terminal should be reserved for commercial service facilities. If the ASOS is relocated, some additional midfield development can occur. If a portion of Cherokee Drive is closed, a connection to the airfield could be established between Sun Aviation and the parcel to the south that contains its fuel farm.

Figure 5.26 shows the potential midfield development area with the relocation of the ASOS with a hangar development concept. This area is approximately 560,000 square feet. Due to height restrictions from the ATCT LOS, T-hangar development is best suited farthest north, leaving the area closer to Taxiway E for box hangars.

Approximately 5,000 square feet is needed per T-hangar to protect for a T-hangar and associated pavement with ADG-I TLOFA. Therefore, to meet the demand for 38 additional T-hangars, approximately 190,000 square feet is needed. The remaining area could accommodate up to two large box hangars or some small box hangars. Recent hangar development at VRB has been done with private investment. Therefore, the exact layout of this area would be determined by the developer. The conceptual layouts are shown to identify a sufficient area to meet the projected needs.



LEGEND

- WETLANDS
- AIRPORT PROPERTY BOUNDARY
- RUNWAY PROTECTION ZONE (RPZ)
- PAVEMENT TO BE REMOVED
- PROPOSED AIRFIELD PAVEMENT
- ON-GOING DEVELOPMENT PROJECT
- AREA AVAILABLE FOR DEVELOPMENT
- LOI FOR DEVELOPMENT
- CITY WELL (100-FT RADIUS)

NOTE

CONTOURS DEPICTED IN THE MIDFIELD ARE BASED ON HEIGHT RESTRICTIONS FROM THE ATCT LINE-OF -SIGHT.

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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GRAPHIC SCALE IN FEET

VERO BEACH REGIONAL AIRPORT
MASTER PLAN

MIDFIELD DEVELOPMENT AREAS
WITH ASOS RELOCATION

DRAWN BY: JA
CHECKED BY: SZ

FIGURE
5.26

AUG 12, 2024 3:54 PM ALEXA02176
I:\20JOBS\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.26_AIRFIELD IMPROVEMENTS_MIDFIELD DEVELOPMENT.DWG

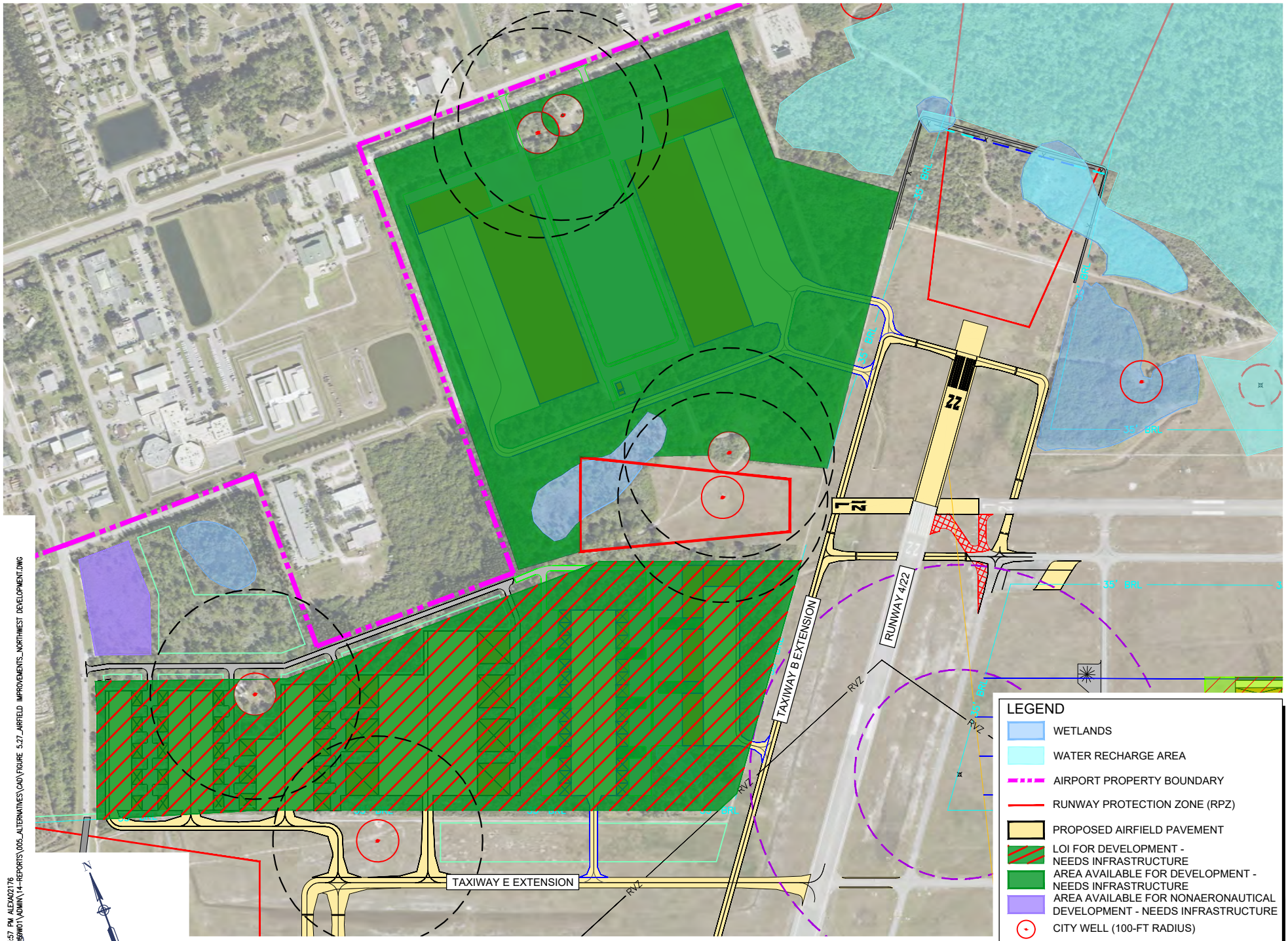
Thus, to meet the future facility requirements, development areas beyond the improved areas are required. The two largest undeveloped areas on VRB with potential airfield access are northwest of the runways and northeast of the runways. As identified previously, there are several environmental considerations in the northeast area. Therefore, the northwest area has been assessed.

The area northwest of the runways has the potential for direct access to the primary or crosswind runway. Any development in this area would need to maintain the appropriate setback from the water wells and comply with the requirements of Florida Administrative Code Section 62-521.400, which regulates the location of hazardous material storage around the wells. The wetlands in this area should be avoided and, if not, mitigation will be required. Further environmental study, including an assessment of endangered species, would be needed before pursuing development in this area, which would also require tree removal.

To meet the demand of the 98,100 square feet needed for large box hangars, options to open the northwest area for development, as needed, should be considered. Opening the northwest area for development will require at least a portion of the Taxiway E extension to be constructed. Utilities will also need to be extended to the area. The appropriate stormwater management will need to accompany any new impervious areas. **Figure 5.27** shows a potential development option for the northwest quadrant. While only a portion of this area northwest of the runway is needed to support airside development during the planning period, it is recommended that the entire area that could have airside access be reserved for aviation-related development, even if beyond the planning period. As with the small box hangars, because the recent hangar facilities at VRB have been privately developed, the northwest layouts are conceptual as a guide.

GA Facility Recommendation

If the ASOS is relocated, the midfield area could accommodate the short-term GA development needed. To accommodate the GA facility need for the full planning period, the northwest portion of VRB should be opened for development. The development will need to be planned around the water wells and, if possible, the wetlands. With the environmental considerations in the northeast portion of the airfield, the entire northwest portion should be reserved for aviation development. VRB should work with the city to update the city's comprehensive plan classification of the northwest portion of the airport to allow for development.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 3:57 PM ALEXA02176
I:\20JOBS\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.27_AIRFIELD IMPROVEMENTS_NORTHWEST DEVELOPMENT.DWG

VERO BEACH REGIONAL AIRPORT
MASTER PLAN

POTENTIAL NORTHWEST
DEVELOPMENT OPTION

DRAWN BY: JA
CHECKED BY: SZ

FIGURE
5.27

5.12. Other Airport Support Facilities

Aircraft Rescue and Firefighting

Should operational demand require the need to increase to ARFF Index C, potential site locations on the airfield should be evaluated. These potential site locations should comply to design standards found in FAA AC 150/5300-13B and FAR Part 77 imaginary surfaces. The proposed sites should also allow for emergency response times to comply with the FAA requirements for ARFF vehicles to reach the furthest commercial service runway in under three minutes. Two options were evaluated that could meet these requirements.

Site for Future ARFF Station – Option 1

Option 1 is located near the midfield the north side of Taxiway E and east of Taxiway D as depicted on **Figure 5.28**. This option allows the ARFF station to remain outside the future ASOS critical area. The station height is assumed to be approximately 25 to 30 feet tall which would provide the necessary clearance to the FAR Part 77 transitional surfaces from Runway 12R/30L. The centralized location on the airfield provides efficient airfield access. Utilities are readily available in this area. Landside access would be from the existing midfield service road; however an extension of the road would be required to the proposed site.

Site for Future ARFF Station – Option 2

Option 2 is in the northwest quadrant of the airport as depicted on **Figure 5.29**. This option remains clear of the FAR Part 77 transitional surface and the FAA AC 150/5300-13B design standards. Landside access would be via 43rd Ave. The future landside access road from 43rd Ave should be constructed to protect for future aeronautical development in this area. Whereas Option 1 has available utilities and airfield and landside access, additional development is required prior to the development if Option 2. The extension of existing utilities would be required to the area, as well as the extension of Taxiway B north of Runway 12R/30L.

ARFF Station Recommendation

With the available utilities and existing access, the Option 1 site is recommended as it provides the most flexibility on the timing of development with less site development costs.

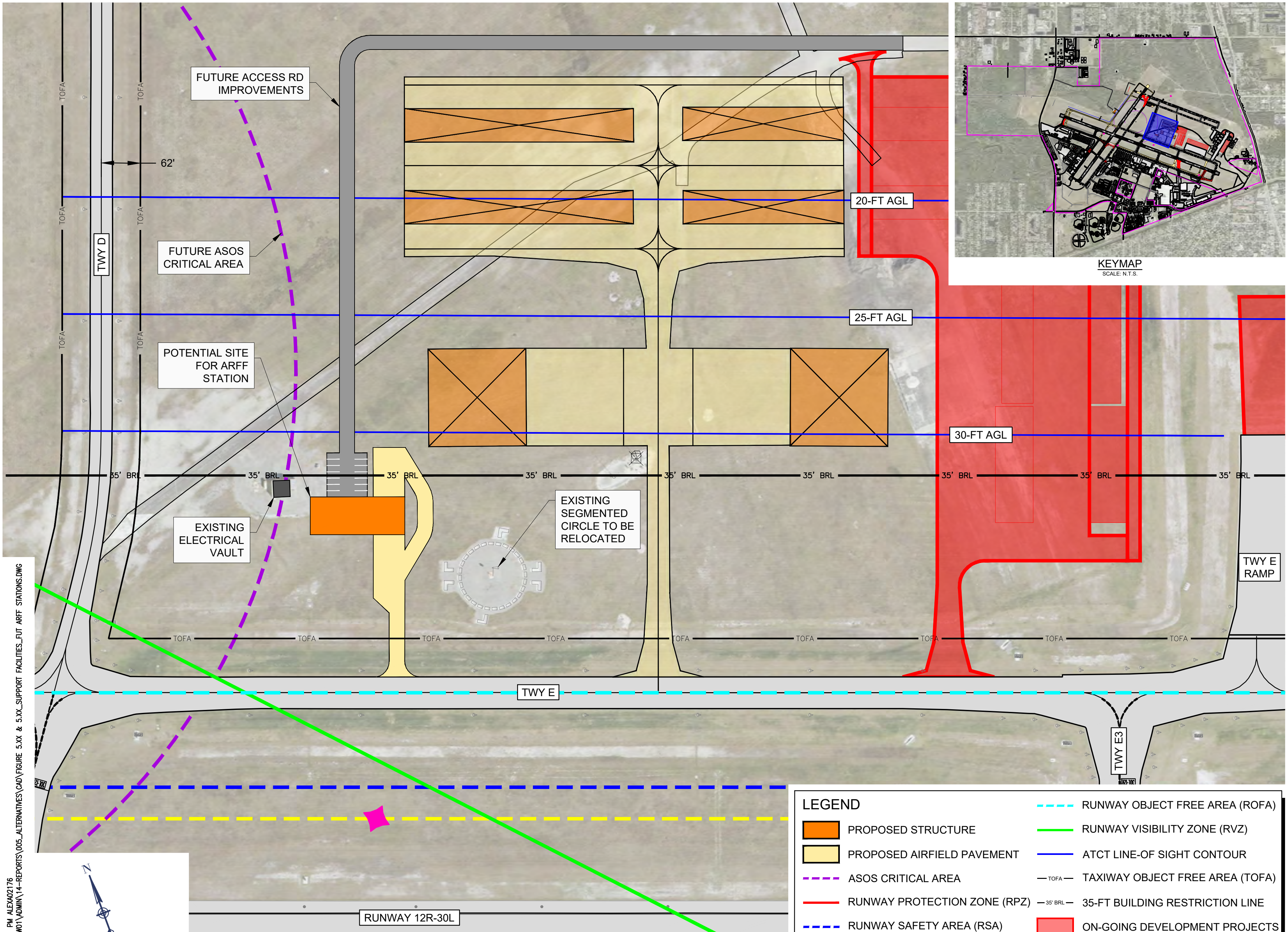
Airport Operations Facility

The airport operations facility is in the southwest quadrant of the airport, east of the Runway 4 end. During the inventory site visit, the need for additional storage space for operations equipment was identified, and any additional space was preferred to be located near the existing facility. There is limited space in the existing airport operations area due to a stormwater detention area south of the operations facility and north of the T-hangars. Therefore, other areas of the airport were considered. A potential supplemental operations facility along the north ramp was considered. However, parcels in this area have the potential for airside access and there are potential sites for aeronautical development.

While access from the maintenance facility to the airfield is needed, it can be via an access road and does not need direct access to a taxiway. Therefore, a site near the Option 1 ARFF location was considered. This would group airfield support facilities and the maintenance facility could be planned such that is ties into the ARFF access to the airfield. This site also put the additional maintenance facility near areas of the airport that are expected to be developed. **Figure 5.30** the proposed additional airport operations facility location.

Airport Operations Recommendation

A site near the proposed ARFF station in the midfield area should be reserved for an airport operations facility.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

ARFF STATION - OPTION 1

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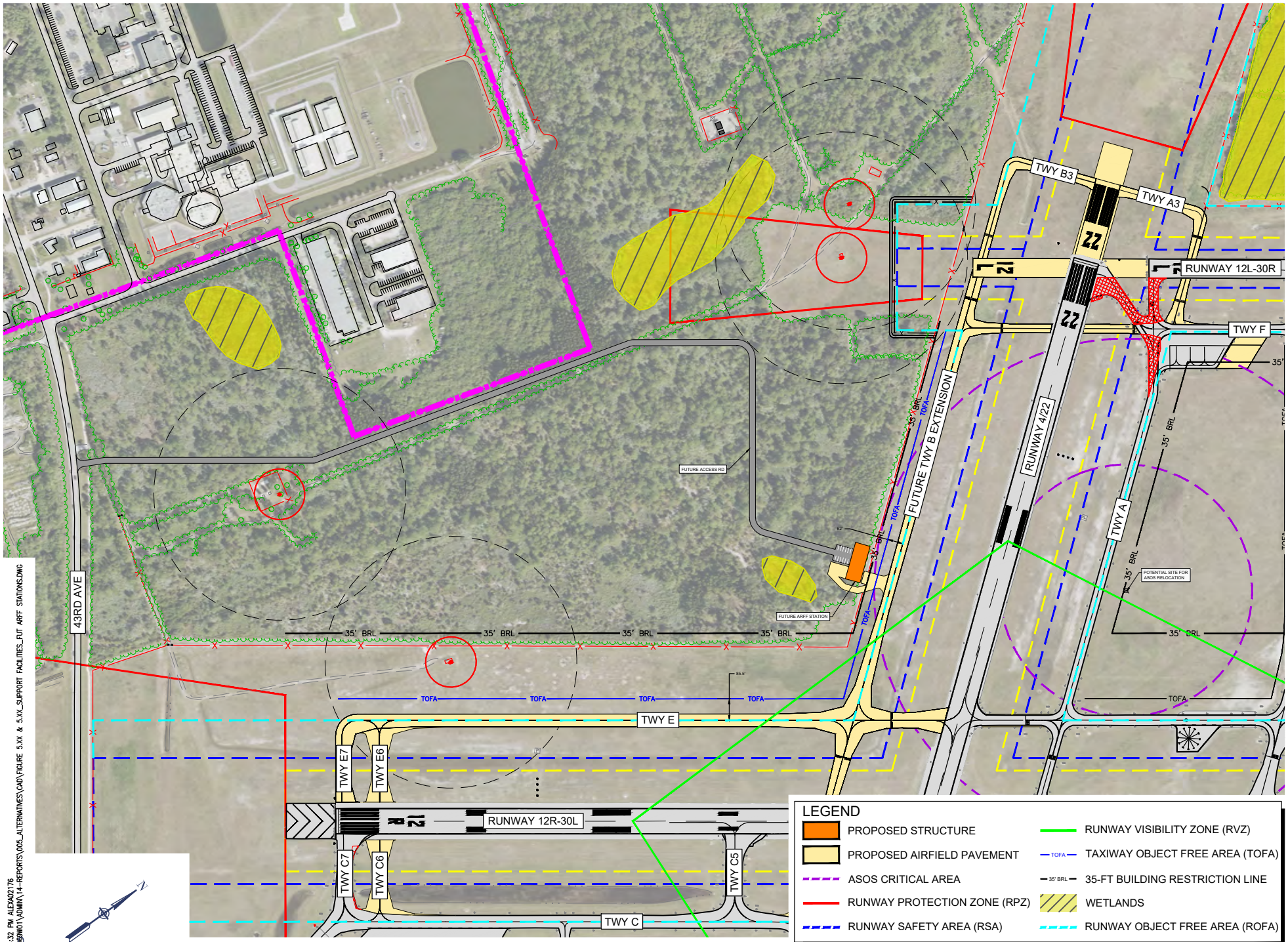
FIGURE 5.28



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 4:32 PM ALEXA02176
I:\20JOBS\20A00690W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.XX & 5.XX_SUPPORT FACILITIES_FUT ARFF STATIONS.DWG

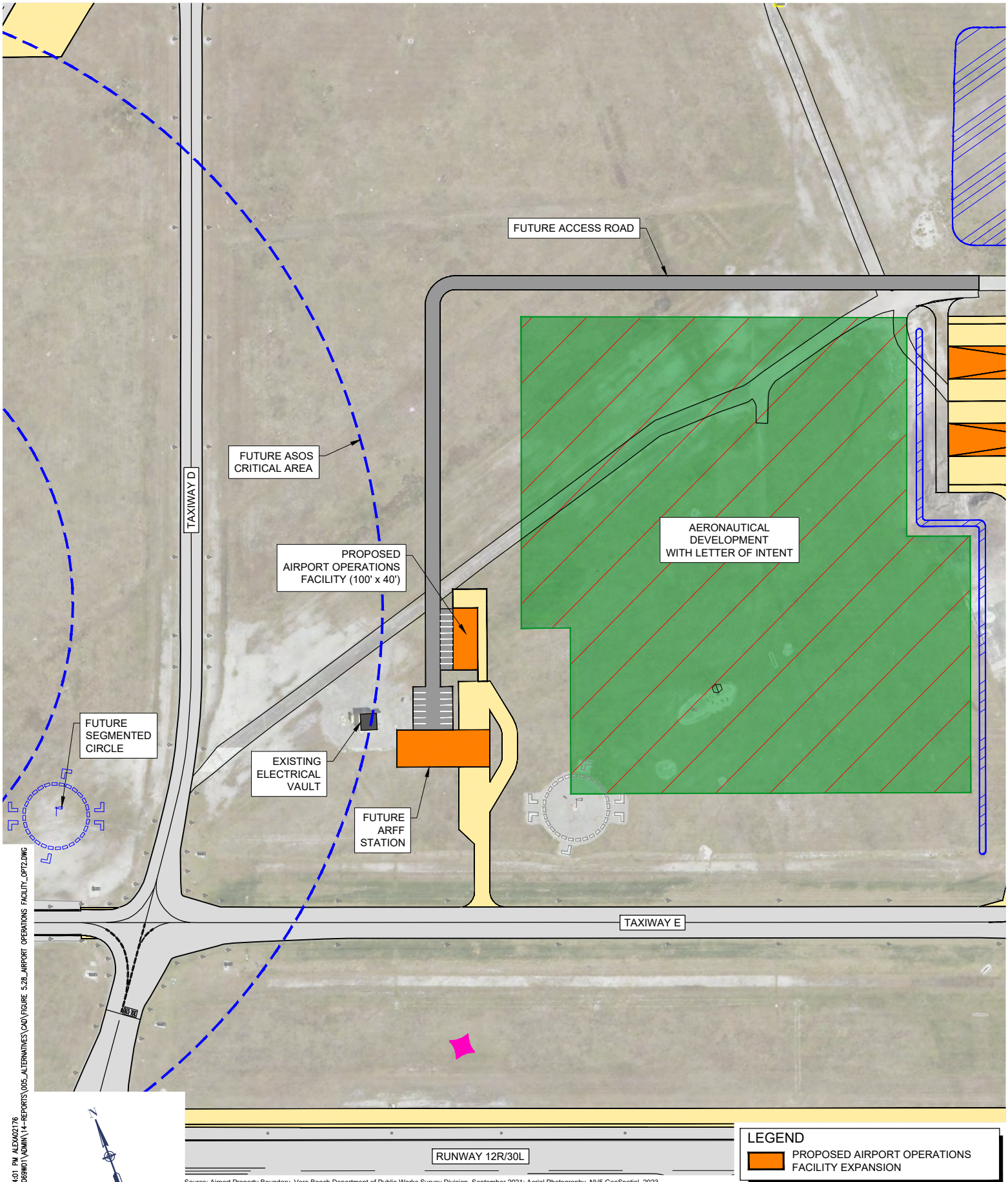
VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

ARFF STATION - OPTION 2

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.29



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

VERO BEACH | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	AIRPORT OPERATIONS FACILITY EXPANSION	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.30

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I:\20JOBS\20A00699\01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.28_AIRPORT OPERATIONS FACILITY_OPT2.DWG

Fuel Farms

At the time of this airport master plan, all fuel farms are in good working condition and meet airport needs. All the fuel farms are operated by private entities. No requests to reserve additional areas for fuel farms were received from tenants during the inventory process. There is a move toward unleaded Avgas. As this occurs, entities providing aircraft fueling may add an unleaded fuel, either as an additional option or as a future replacement for the current Avgas. Unless VRB receives a request for additional space to accommodate unleaded fuel, no changes to the fuel farms are recommended.

Perimeter Fence and Security Gates

The perimeter fence on the north side of the airfield along the tree line was upgraded to 10 feet high. This included 2 feet below ground, 7 feet above ground and 1 foot of three-strand barbed wire on top. It is desired to upgrade the existing perimeter fence on the south side of the airport similar to the improvements completed to the north side to help prevent wildlife access.

In addition to security gates, security cameras should be considered to provide additional security to the airport facilities and T-hangars.

Perimeter Fence and Security Gate Recommendations

To enhance the safety of the airport by improving the access and wildlife control, upgrades to the 10-foot-high perimeter fence on the south side of the airport are recommended. In addition, security camera improvements are recommended. At a minimum, a camera at the security gate off Flight Safety Drive is needed. Additional security cameras to see taxilanes between the T-hangars would also be beneficial to monitoring operations at VRB.

5.13. Landside Facilities

Vehicle Ground Access

At the time of this airport master plan, an ongoing PD&E study evaluated improvements to the intersection of State Road 5/U.S. 1 and Aviation Boulevard. This intersection is within the Runway 30L RPZ. However, to avoid impacts to airport operations, the PD&E study has eliminated all alternatives that included an overpass or underpass. VRB should continue to work with FDOT, such that any improvements would be located farther from the existing runway end than the existing roadways.

The community also plans to improve Airport Boulevard. As depicted on **Figure 5.31**, portions of Aviation Boulevard are in city-owned right of way and portions are owned by the airport. VRB pursued a release of the right of way to the city for improvements to the intersection of Aviation Boulevard and 43rd Avenue. However, because the section was within the Runway 4 RPZ, and some of the improvements were closer to the end of the runway, the FAA denied this land release request. Road improvements, subject to FAA review, could be acceptable, providing VRB retains property ownership. Any road improvements within an RPZ should at least be farther from the runway than the existing road. Therefore, any future improvements in this area should at least be farther from the end of the runway than the existing road and will require an FAA RPZ analysis. It should be recognized that right-of-way ownership may influence the potential funding sources for improvements.

Vehicle Ground Access Recommendation

VRB should continue to monitor and work closely with the owners of the roads surrounding the airport to protect the airport and airspace.

Pedestrian Access

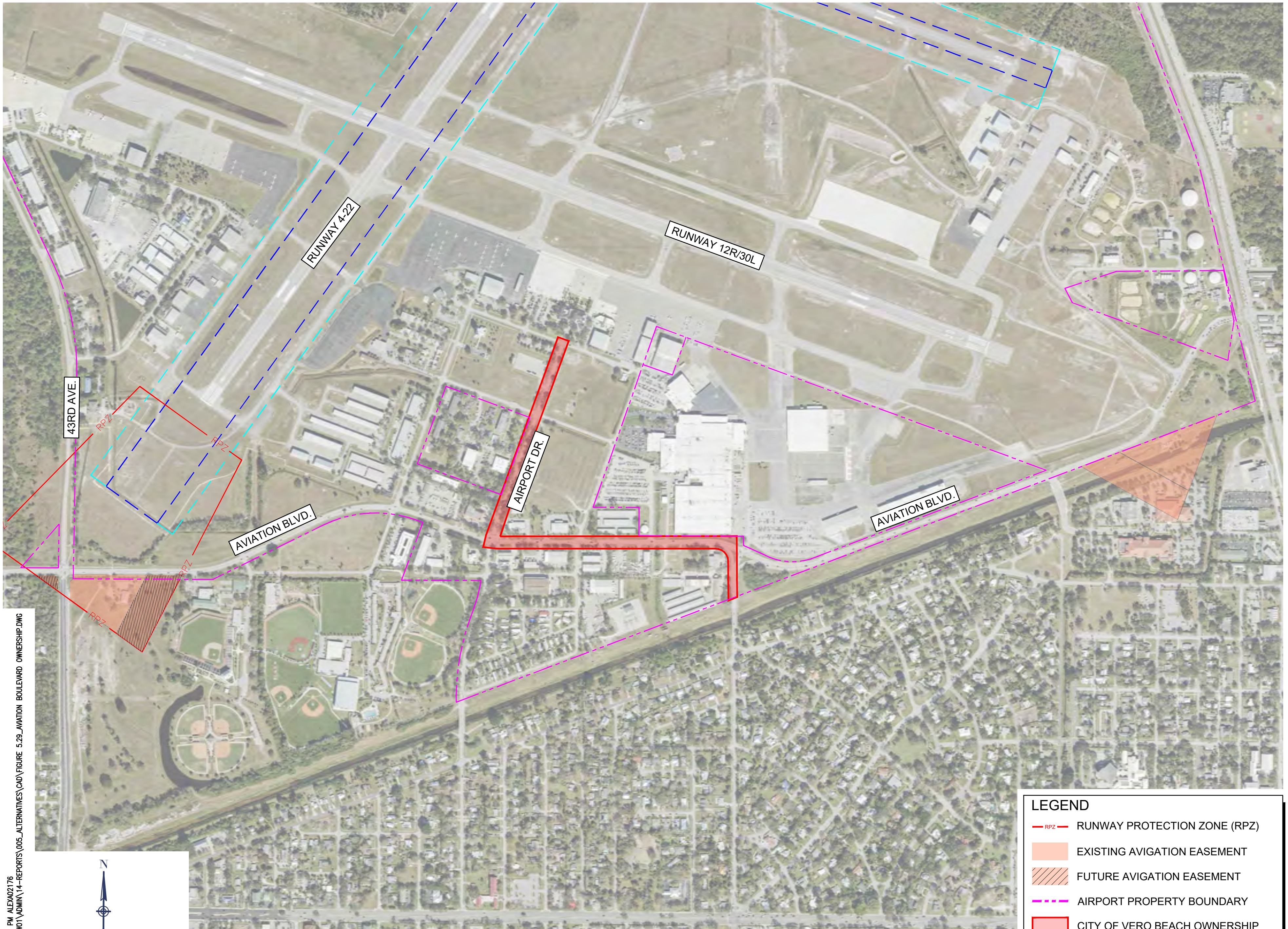
With the initiation of commercial service operations, automobile parking and passenger drop-off has increased. Pedestrian access improvements, such as lighted crosswalks and signs, should be considered during future landside improvement projects.

As mentioned in the commercial service facility section, the closure of a portion of Cherokee Drive, at least to through traffic, could occur to improve pedestrian flow to the terminal. As depicted on **Figure 5.32**, there are sidewalks along Airport Drive from the terminal to Dodger Road and along a portion of Airport Boulevard from Airport Drive to the entrance to Piper Aircraft east of Piper Drive.

VRB is in the process of adding parking and pedestrian access along Dodger Road, as shown on **Figure 5.33**. This parking will be used by patrons of nonaeronautical businesses in this area. The pedestrian access provides a connection between the terminal and nonaeronautical businesses, which include food and beverage, in this area.

Pedestrian Access Recommendation

VRB should consider closing Cherokee Drive between Airport Drive and Skyborne to through traffic to improve the pedestrian access from expanded future auto parking to the terminal.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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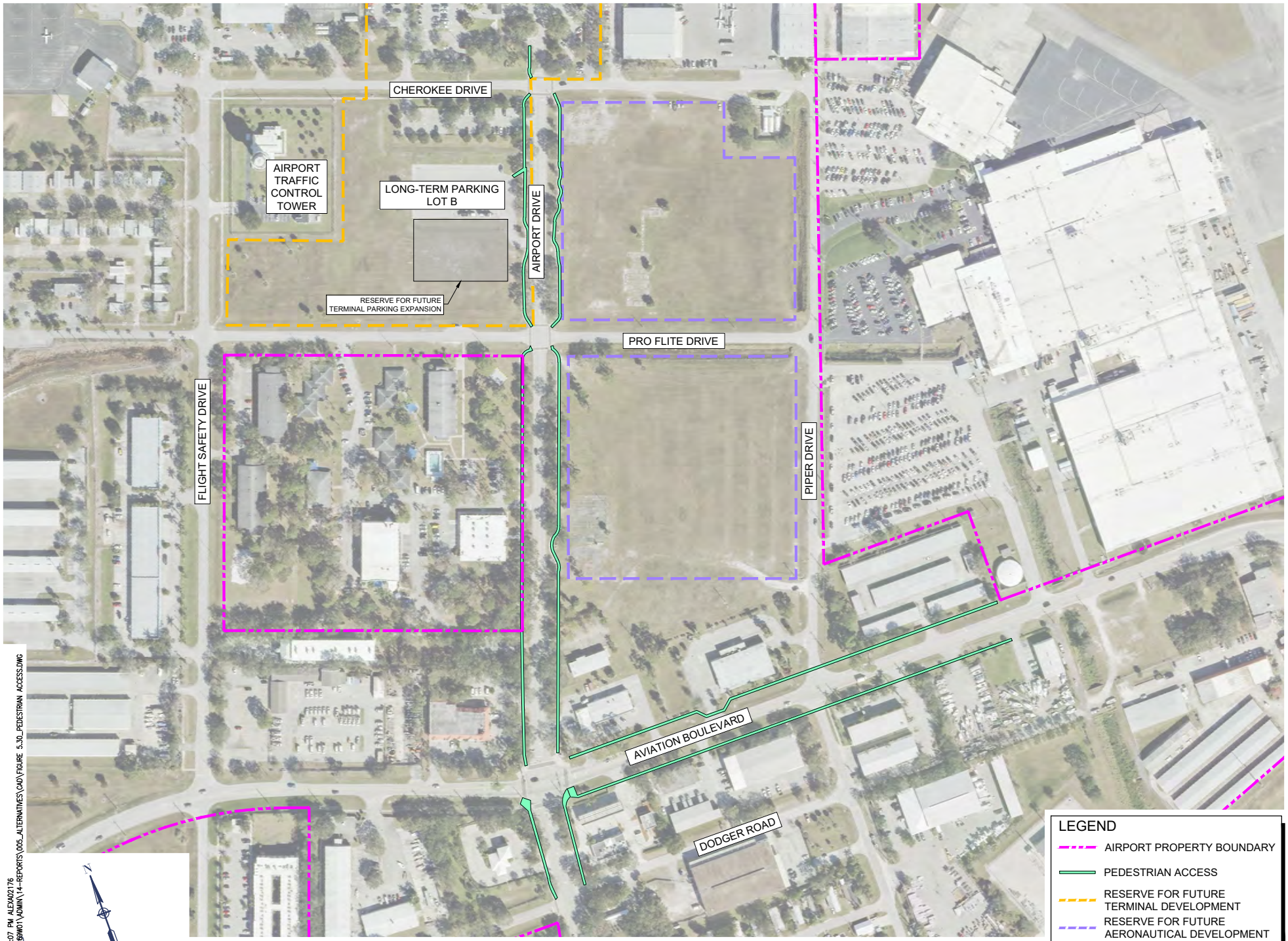
I:\20JOBS\20A0659\01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.29_AVIATION BOULEVARD OWNERSHIP.DWG

VERO BEACH REGIONAL AIRPORT | HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	AVIATION BOULEVARD OWNERSHIP	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.31



Source: Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 4:07 PM ALEXA02176
I:\20JOBS\20A0086W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.30_PEDESTRIAN ACCESS.DWG

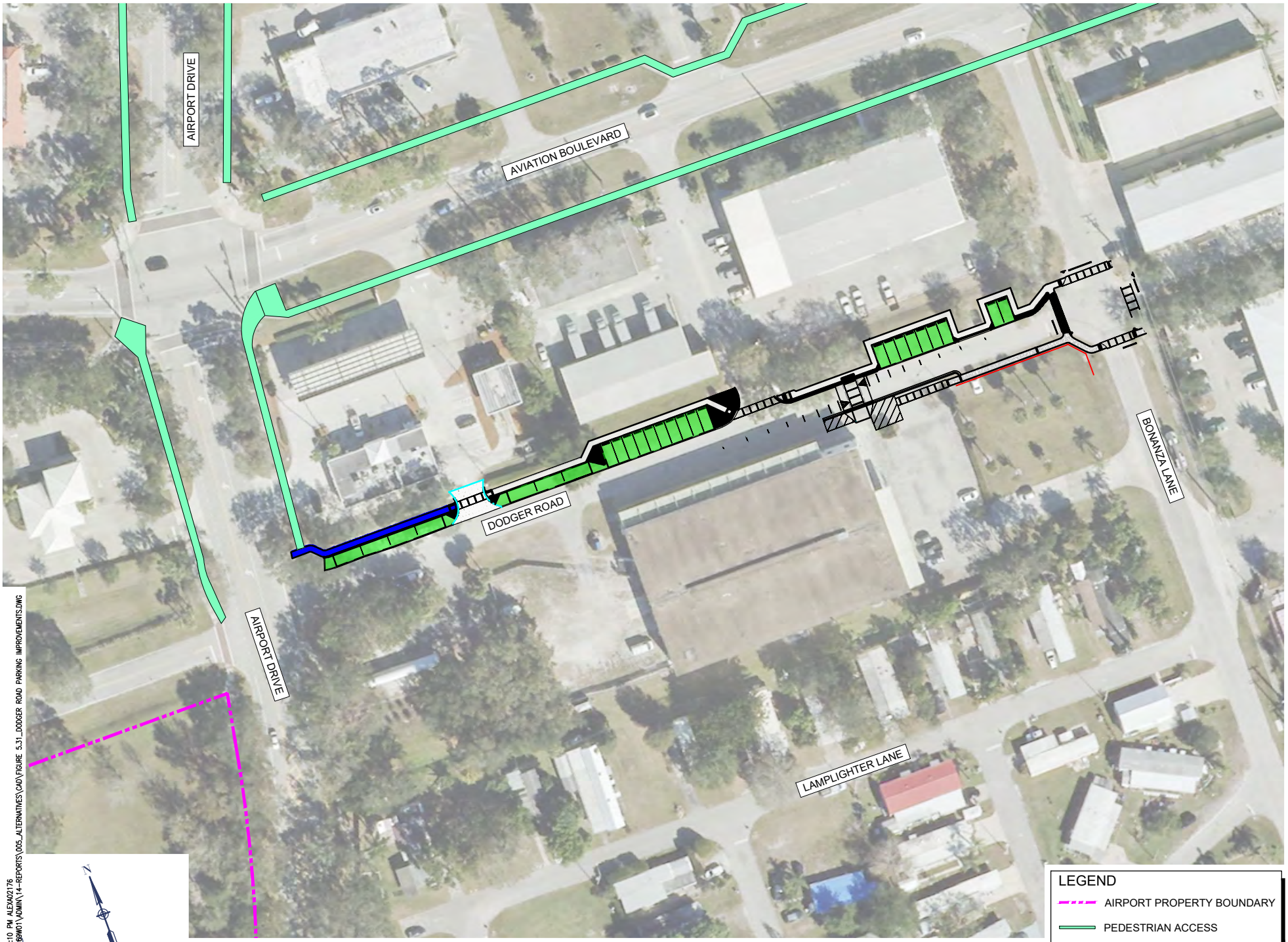
VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

PEDESTRIAN ACCESS

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.32



Source: Aerial Photography, NV5 GeoSpatial, 2023.

AUG 12, 2024 4:10 PM ALEXA02176
I:\20JOBS\20A00869W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.31_DODGER ROAD PARKING IMPROVEMENTS.DWG

VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN

DODGER ROAD PARKING IMPROVEMENTS

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.33

Automobile Parking – FBOs and Flight Schools

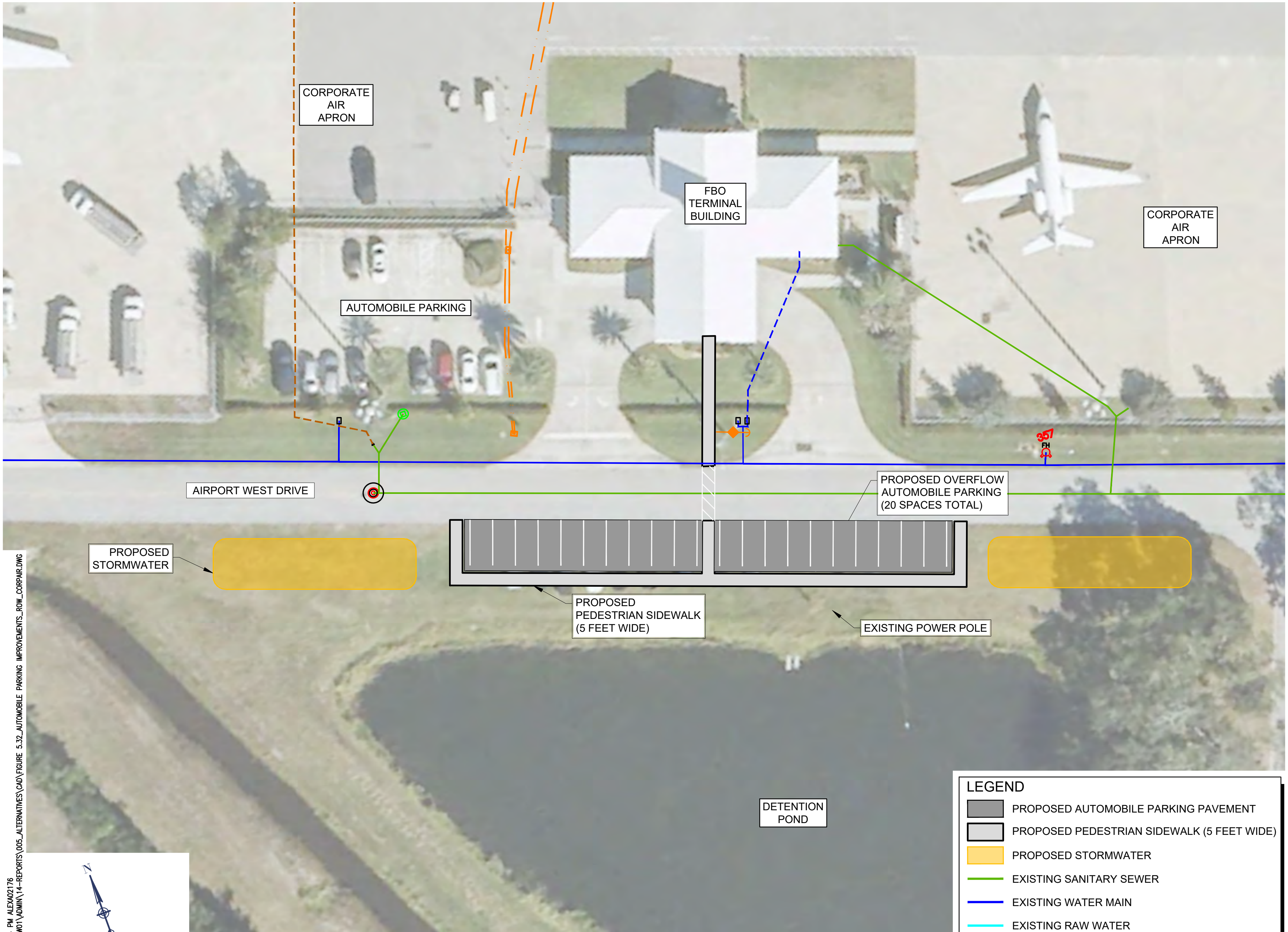
Corporate Air provides automobile parking for employees and visitors adjacent to the FBO terminal building. However, a grass area across from the FBO terminal building adjacent to Airport West Drive is used as overflow parking. **Figure 5.34** shows the area used for automobile parking overflow parking. Because of the proximity of the retention pond, grading improvements may be required. If the overflow area is paved, appropriate stormwater management should be included. Consideration may also be given to improving this area for regular parking use but without an impervious surface. Overflow student parking also occurs at Paris Air along Airport West Drive, outside its designated auto parking areas. **Figure5.35** shows additional right-of-way paved parking that could be developed to support tenants in this area.

Sun Aviation provides automobile parking for employees and visitors adjacent to the FBO terminal building. The existing automobile parking area provides adequate space.

Hertz car rental has a counter in the Sun Aviation terminal. Its rental cars overflow to a grass area south of Sun Aviation. Avis car rental has a facility in the terminal. **Figure 5.36** depicts the use of the parcel south of Sun Aviation (Parcel 6) for a consolidated rental cars parking location and support facilities, and additional automobile parking for Piper Aircraft.

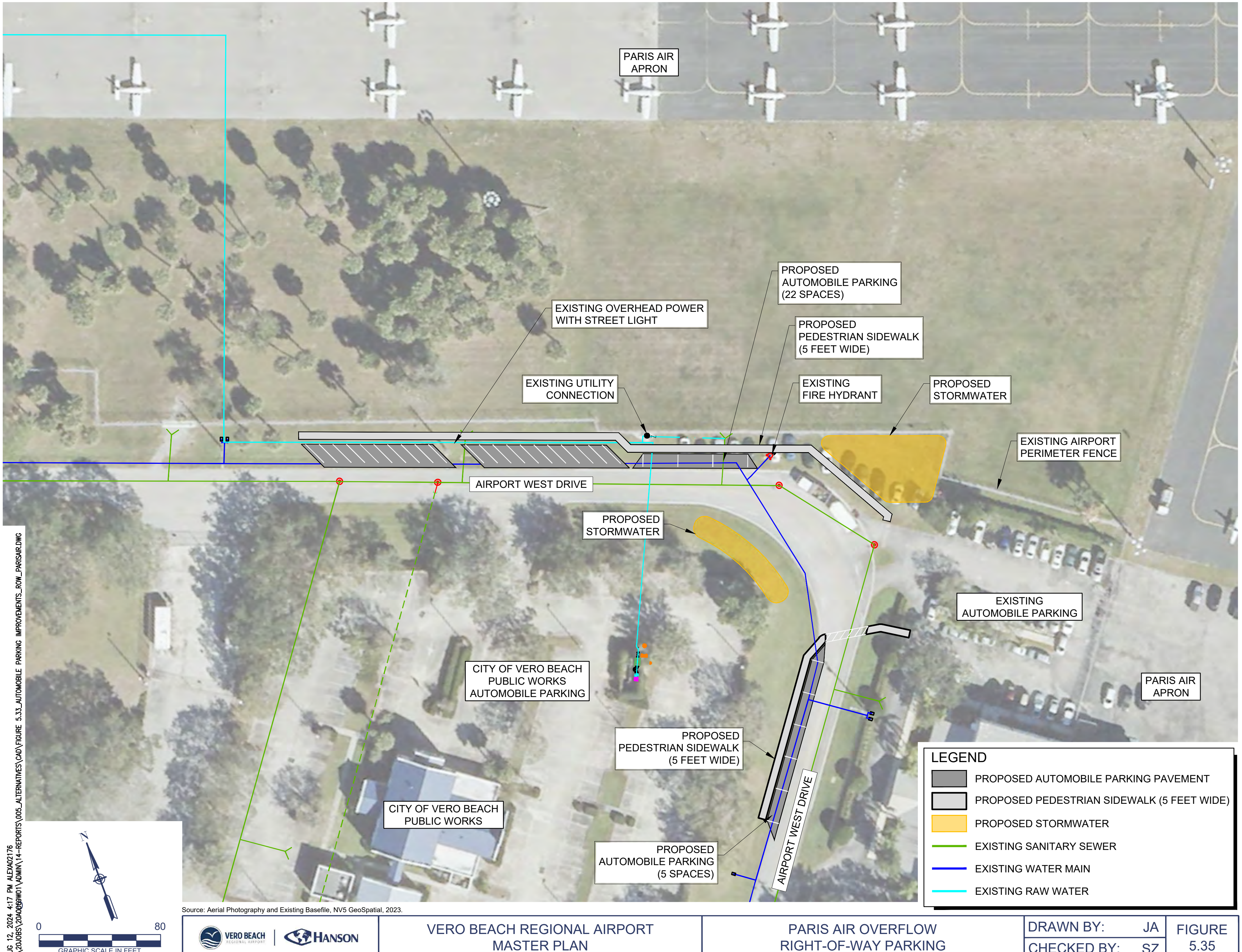
Automobile Parking – FBOs Recommendation

VRB should work with the FBOs and flight schools to allow for sufficient parking and the necessary improvements within the existing or an expanded leasehold.



Source: Aerial Photography, NV5 GeoSpatial, 2023.

VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	CORPORATE AIR OVERFLOW RIGHT-OF-WAY PARKING	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.34


PARIS AIR APRON
PROPOSED AUTOMOBILE PARKING (22 SPACES)
EXISTING OVERHEAD POWER WITH STREET LIGHT
PROPOSED PEDESTRIAN SIDEWALK (5 FEET WIDE)
EXISTING UTILITY CONNECTION
EXISTING FIRE HYDRANT
PROPOSED STORMWATER
EXISTING AIRPORT PERIMETER FENCE
AIRPORT WEST DRIVE
PROPOSED STORMWATER
EXISTING AUTOMOBILE PARKING
CITY OF VERO BEACH PUBLIC WORKS AUTOMOBILE PARKING
PARIS AIR APRON
PROPOSED PEDESTRIAN SIDEWALK (5 FEET WIDE)
CITY OF VERO BEACH PUBLIC WORKS
PROPOSED AUTOMOBILE PARKING (5 SPACES)
AIRPORT WEST DRIVE
LEGEND
PROPOSED AUTOMOBILE PARKING PAVEMENT
PROPOSED PEDESTRIAN SIDEWALK (5 FEET WIDE)
PROPOSED STORMWATER
EXISTING SANITARY SEWER
EXISTING WATER MAIN
EXISTING RAW WATER
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Source: Aerial Photography and Existing Basefile, NV5 GeoSpatial, 2023.

VERO BEACH REGIONAL AIRPORT MASTER PLAN

PARIS AIR OVERFLOW RIGHT-OF-WAY PARKING

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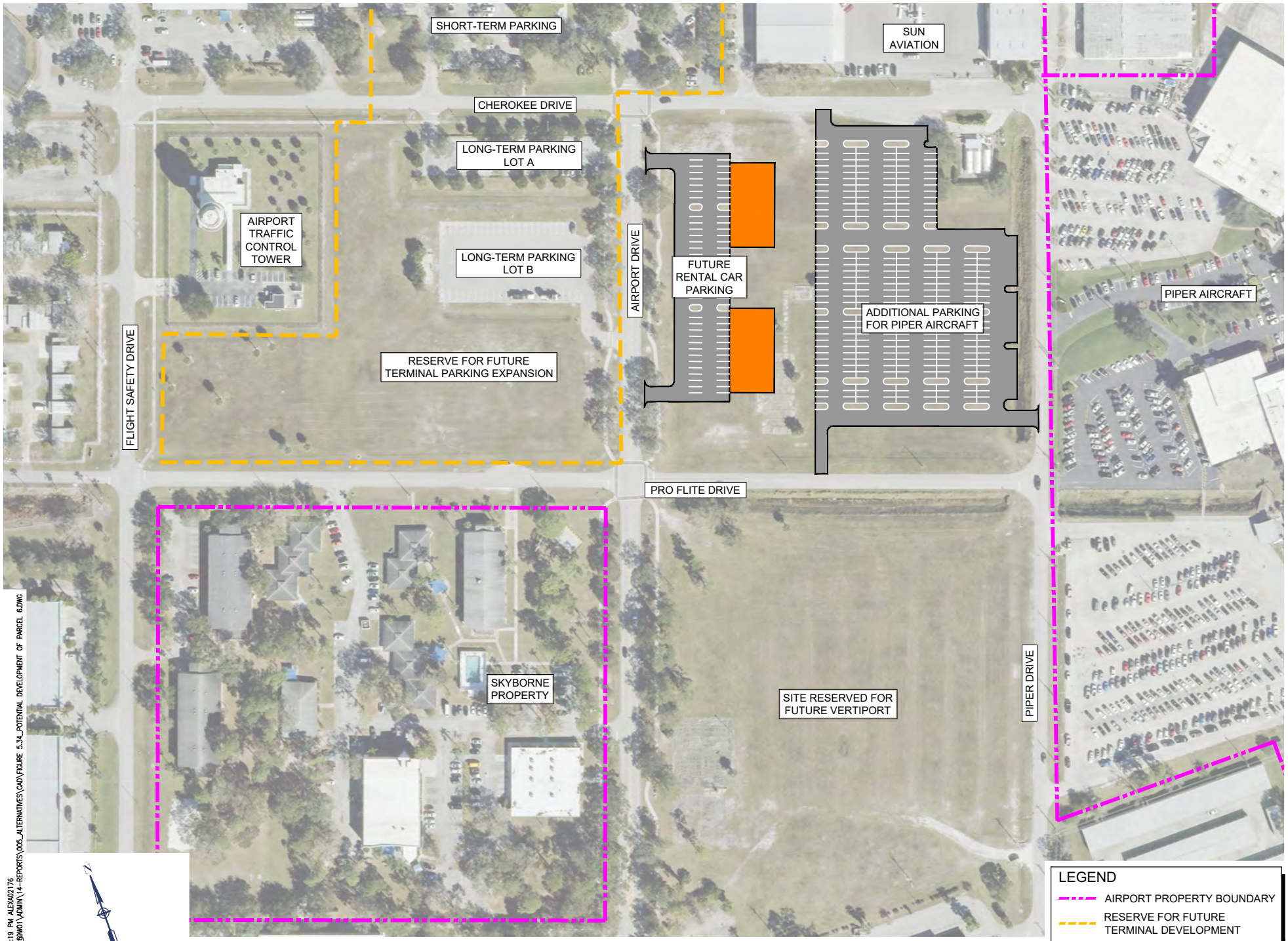
CHECKED BY: SZ

FIGURE 5.35



Source: Aerial Photography, NV5 GeoSpatial, 2023.

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AUG 12, 2024 4:19 PM ALEXA02176
I:\20JOBS\20A00860W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.34_POTENTIAL DEVELOPMENT OF PARCEL 6.DWG

VERO BEACH REGIONAL AIRPORT | HANSON

VERO BEACH REGIONAL AIRPORT MASTER PLAN	POTENTIAL DEVELOPMENT ON PARCEL 6	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.36

5.14. Nonaeronautical Development

After identifying areas to meet the high aeronautical development demand, any remaining areas and those without potential airfield access could be considered for nonaeronautical use, as shown on **Figure 5.37**. Nonaeronautical development has the potential to provide airports additional revenue to diversify the revenue stream and help support airport operations. The primary area that could be opened for nonaeronautical development is west of 43rd Avenue outside of the RPZ. Any development in this area should keep a buffer between the nonaeronautical use and surrounding land use. Access and utilities would be needed to open this area for development. As a surplus property airport, the federal government has an interest in the land, so environmental documentation and any associated studies will be required to open this area for development, as further addressed in the environmental overview chapter.

Nonaeronautical Development Recommendation

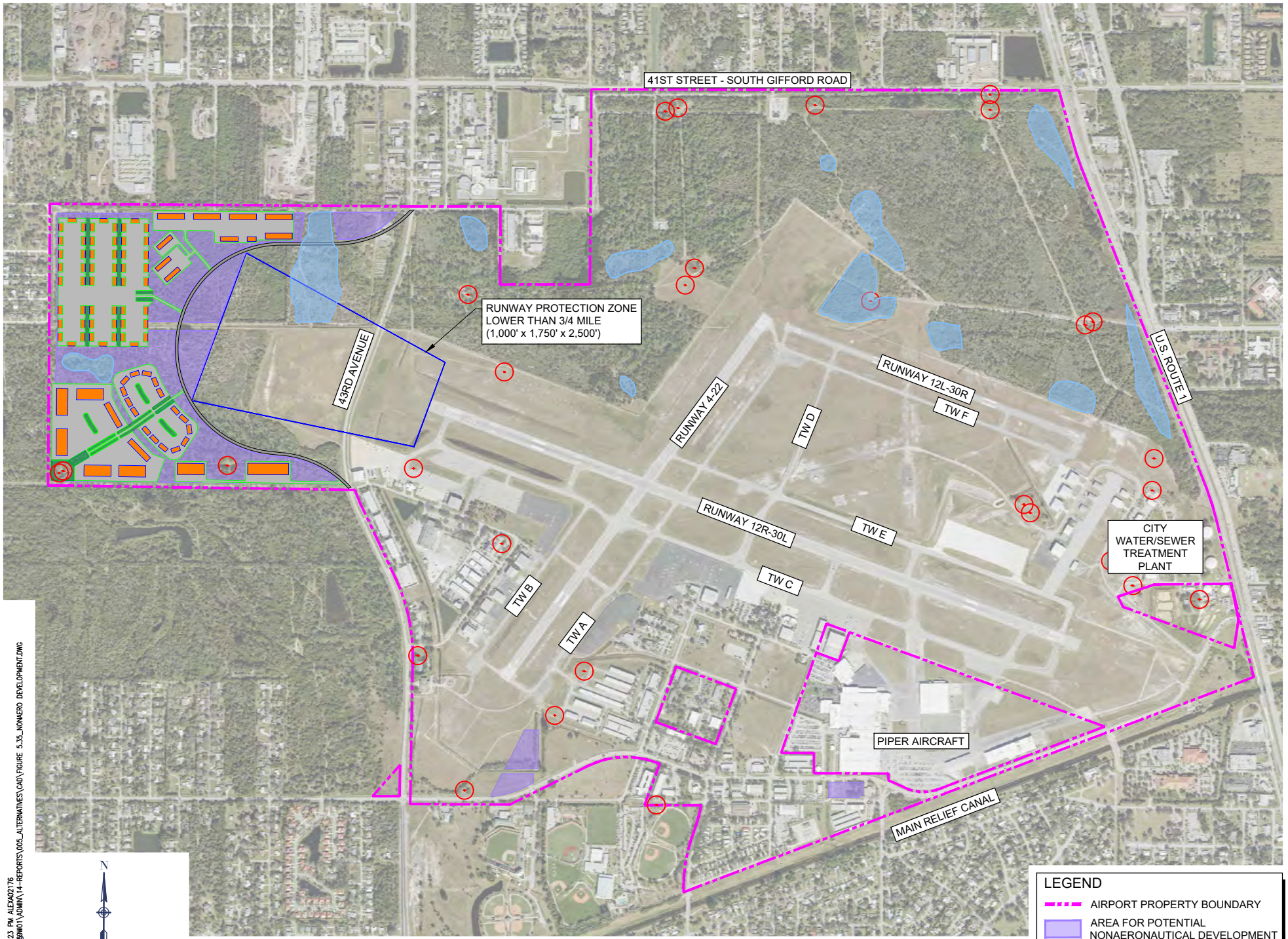
VRB should work with the city to update the city's comprehensive plan to allow for the development of airport property west of 43rd Avenue.

5.15. Utility Improvements

Once the preferred alternatives are identified for the future aeronautical and nonaeronautical development, utility upgrades to support the development will be identified so they can be considered as part of the development costs. In addition to the utilities to support VRB development, the city has identified the need to install a water main from the water plant to 43rd Avenue to support development west of the airport. Consideration should be given to a utility corridor for this water main in the vicinity of and parallel to Taxiway E, outside the TSA and preferably outside the TOFA. The location would provide the most direct route across the airport. This water main could also be used to support development in the northwest portion of the airport and airport property west of 43rd Avenue.

Utility Recommendation

The implementation planning should include the costs of any utility upgrades to open undeveloped areas on VRB for development. A utility corridor should be planned, with the appropriate lease, to provide a route from the water plant to 43rd Avenue for a new line that is needed to support development west of VRB. Utility costs for any relocations to accommodate proposed development should also be included in the implementation planning.



LEGEND

- AIRPORT PROPERTY BOUNDARY
- AREA FOR POTENTIAL NONAERONAUTICAL DEVELOPMENT

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GRAPHIC SCALE IN FEET

Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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I:\20JOBS\20A0086W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.35_NONAERO DEVELOPMENT.DWG

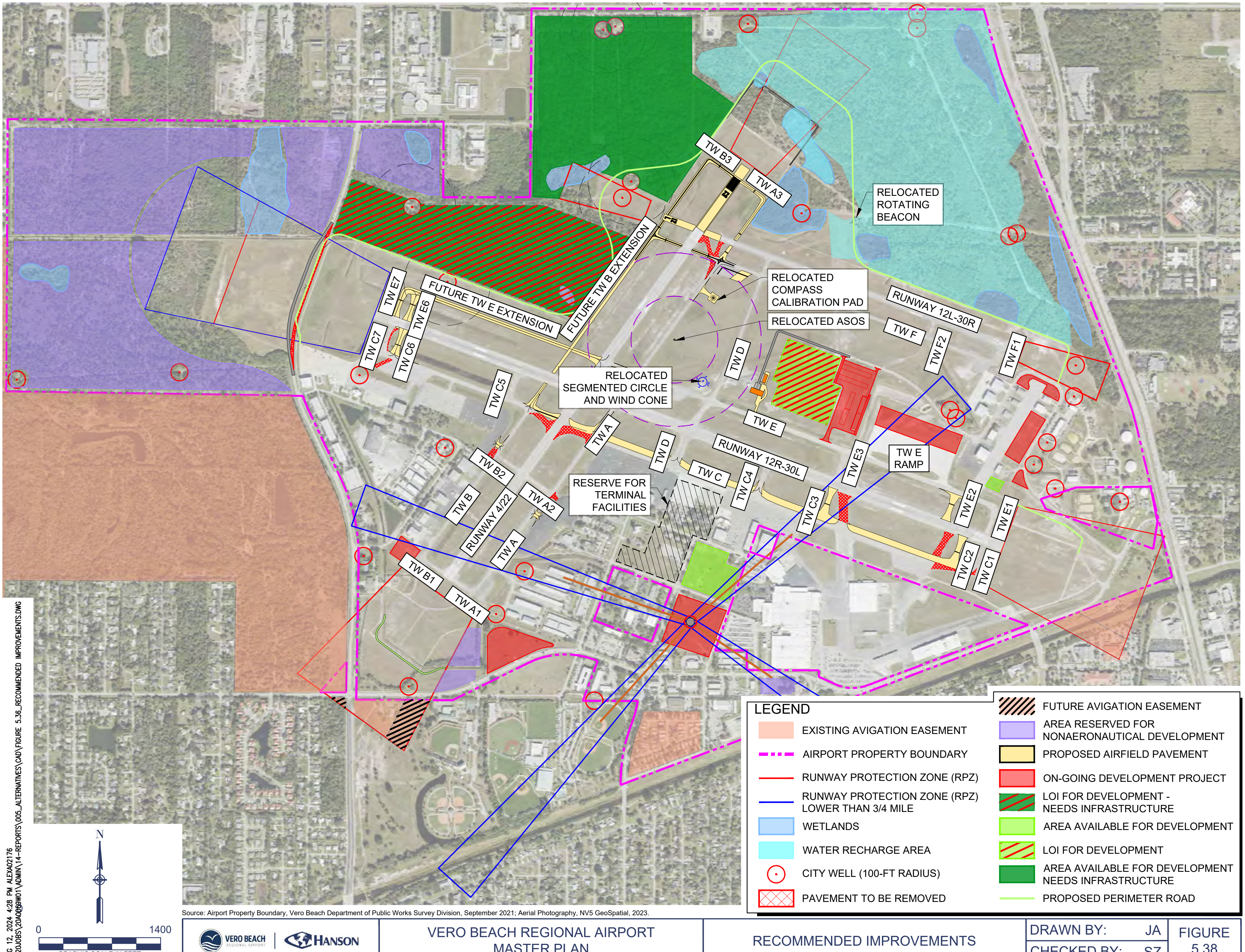
VERO BEACH REGIONAL AIRPORT / HANSON	VERO BEACH REGIONAL AIRPORT MASTER PLAN	AREAS FOR POTENTIAL NONAERONAUTICAL DEVELOPMENT	DRAWN BY: JA CHECKED BY: SZ	FIGURE 5.37

5.16. Recommended Development Plan

This chapter details potential and recommended alternatives for the airfield: runway and taxiway systems and navaids and airfield support infrastructure, emerging aircraft technologies, commercial service facilities, GA hangar facilities, other auto parking and utility improvements and nonaeronautical development opportunities. **Figure 5.38** summarizes the recommended alternatives that are listed below. The next step to finalize the recommended development plan is to obtain airport staff, tenant, and public input.

The recommended improvements identified through this alternative analysis include:

- Relocate 43rd Avenue and the perimeter road and fence to eliminate the use of declared distances on Runway 12R/30L.
- Pursue approach minimums of 1/2 a mile on Runway 12R with the installation of the MALSR and obstruction mitigation.
- Extend to the Runway 22 end up to 726 feet.
- Relocate the drainage swale and fence and RSA improvements to eliminate the need for declared distances on Runway 4/22.
- Extend Taxiway B the full length of Runway 4/22 with a 400-foot runway centerline to taxiway centerline separation and pavement at least 35 feet wide.
- Widen Taxiway E from 40 feet to 50 feet between Taxiway D and Runway 4/22.
- Extend Taxiway E the full length of Runway 12R/30L with a 400-foot runway centerline to taxiway centerline separation and pavement 50 feet wide.
- Realign Taxiway C for a 400-foot runway centerline to taxiway centerline separation the entire length.
- Modify Taxiway A1 to eliminate the direct apron-to-runway connection.
- Modify Taxiway C2 to eliminate the direct apron-to-runway connection and provide a standard 90-degree connector.
- Add a bypass taxiway from Taxiway C at the Runway 12R end.
- Rename taxiway end connectors and others as needed to support this change.
- Relocate the airfield rotating beacon, ASOS, and compass calibration pad.
- Work with the flight schools to minimize aircraft parking in RVZ.
- Reserve an area west and south of the terminal for commercial service facilities and prepare a terminal area plan.
- Reserve the midfield area opened by the ASOS relocation for T-hangar and box hangar development.
- Reserve the northwest portion of airport for general aviation facility development, an initial step to open the area for development.
- Work with the city to update its comprehensive plan to reclassify the northwest portion of airport and airport property west of 43rd Avenue for development.
- Reserve Parcel 10B along the north ramp for a supplemental airport operations facility.
- Upgrade the perimeter fence on the south side of airfield and add security cameras.
- Work with the city and county to plan upgrades to roads around the airport perimeter without impact to the airport.
- Consider closing Cherokee Drive between Airport Drive and Skyborne to improve the terminal area pedestrian access.
- Work with FBOs to allow sufficient parking and necessary improvements in leaseholds.



Source: Airport Property Boundary, Vero Beach Department of Public Works Survey Division, September 2021; Aerial Photography, NV5 GeoSpatial, 2023.

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I:\20JOBS\20A0659W01\ADMIN\14-REPORTS\005_ALTERNATIVES\CAD\FIGURE 5.36_RECOMMENDED IMPROVEMENTS.DWG

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VERO BEACH REGIONAL AIRPORT MASTER PLAN

RECOMMENDED IMPROVEMENTS

DRAWN BY: JA
CHECKED BY: SZ

FIGURE 5.38