Final

Concept, Feasibility, and Mobility Report

SR 417 (Seminole Expressway) to Orlando Sanford International Airport Connector Concept, Feasibility, and Mobility Study

CFX Project Number: 417-246

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CENTRAL FLORIDA EXPRESSWAY AUTHORITY

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Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
CF&M	Concept, Feasibility, and Mobility
CFX	Central Florida Expressway Authority
CR	county road
CRAS	Cultural Resource Assessment Survey
CST	construction
EBL	eastbound left
ESA	Endangered and Threatened Species Act
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FE	federally endangered
FEMA	Federal Emergency Management Agency
FLUCCS	Florida Land Use Cover Classification System
FNAI	Florida Natural Areas Inventory Tracking List
FT	Federally Designated Threatened and State-listed
FTE	Florida's Turnpike Enterprise
FWC	Florida Fish and Wildlife Conservation Commission
GIS	geographic information system
I-4	Interstate 4
IPaC	Information for Planning and Consultation (online tool)
LEP	limited English proficiency
MP	mile post
mph	mile(s) per hour
MSE	Mechanically Stabilized Earth
N/A	not applicable
NBL	northbound left
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTP	notice to proceed
NWI	National Wetlands Inventory
PC	Point of Curve
PD&E	Project Development and Environment

PE	preliminary engineering
PI	point of intersection
PT	point of tangent
ROW	right-of-way
SBL	southbound left
SFB	Orlando Sanford International Airport
SHPO	State Historic Preservation Officer
SJRWMD	St. Johns River Water Management District
SR 417	State Road 417
ST	State-designated Threatened
Sta.	Station
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBL	westbound left

1. Project Introduction

1.1 Project Description

The Concept, Feasibility, and Mobility Study for the State Road 417 (Seminole Expressway) to Orlando Sanford International Airport Connector was initiated by the Central Florida Expressway Authority in August 2022 to develop and evaluate transportation alternatives to provide direct access from SR 417 to the Orlando Sanford International Airport (also known as SFB by their International Air Transport Association Airport Code). The goal of the project is to identify options for better connectivity and ease anticipated future traffic growth in the area, as well as provide a direct connection from SR 417 to the airport. This CF&M Study evaluates the feasibility of a new expressway connection from SR 417 to SFB and alternative mobility programs within the project corridor, including multimodal and intermodal facilities.

The objective of the CF&M Study is to evaluate the feasibility of each mobility option based on engineering, traffic, economic and environmental evaluations and to determine if the project is feasible. This study includes the evaluation of the physical, natural, social and cultural environment, right-of-way considerations and cost estimates, as well as the following goals:

- Identify transportation mobility options
- Enhance direct access to the Orlando Sanford International Airport
- Enhance mobility for the area's growing population and economy
- Provide consistency with local plans and policies
- Promote regional connectivity
- Fulfill the recommendation of Seminole Board of County Commissioners to re-evaluate this corridor

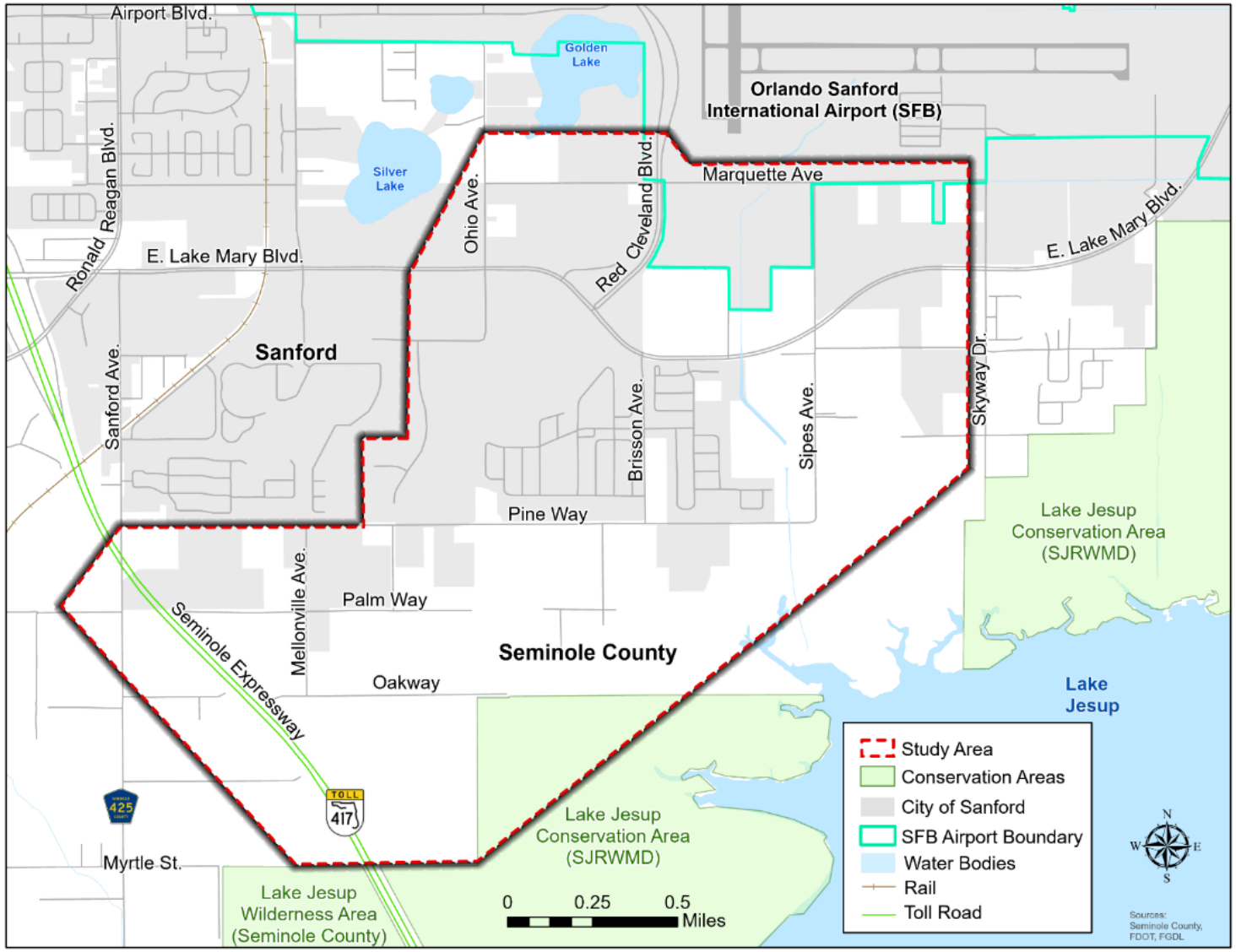
1.2 Purpose of Report

The purpose of this report is to document the alternative mobility program development and evaluation effort for the SR 417 (Seminole Expressway) to Orlando Sanford International Airport Connector. Specifically, this report addresses the documentation of the purpose and need for the project; existing conditions within the study area; traffic considerations; design criteria; mobility alternatives evaluation; anticipated effects to the natural, human and physical environment; and stakeholder involvement as well as an evaluation of the feasibility and viability of the proposed project.

1.3 Project Location

The project is located within Seminole County and consists of a potential expressway connection from SR 417 in the vicinity of the Seminole Toll Plaza northeastward to East Lake Mary Boulevard at or near the entrance to SFB at Red Cleveland Boulevard. The study area begins approximately 0.75 mile south of the Seminole Toll Plaza (Mile Post 47) on SR 417. The southern boundary travels east then northeast toward west of Skyway Drive, where it then travels north to Marquette Avenue. The northern boundary travels west along Marquette Avenue to Ohio Avenue then extends approximately 2,000 feet southwest to East Lake Mary Boulevard. The western boundary extends from East Lake Mary Boulevard due south to Pine Way, then west along Pine Way to County Road 425/South Sanford Avenue. The boundary then extends southwest where it crosses SR 417 approximately 0.75 mile north of the Seminole Toll Plaza and continues 1,000 feet west of SR 417, traveling south to connect back to MP 47. Figure 1-1 provides the project location map.

Figure 1-1. Project Location Map



1.4 Previous Studies

An earlier study completed in 2007 by the Orlando-Orange County Expressway Authority (now CFX) indicated there was a need to improve access to the airport; however, at the time, it was determined the project was not financially feasible. In 2021, the Seminole Board of County Commissioners requested that CFX conduct another feasibility study to develop and evaluate transportation options for travelers needing a more direct route between SR 417 and the airport.

1.5 Surrounding Projects

Several additional projects are planned within and/or adjacent to the study area by other agencies. Surrounding projects include the widening of SR 417 from six to eight lanes, from north of SR 434 to south of Airport Boulevard. This project is documented in the Florida Department of Transportation's *Five Year Work Program* and MetroPlan Orlando's 2045 *Metropolitan Transportation Plan Cost Feasible Plan* (adopted December 9, 2020, revised March 9, 2022), with construction funding planned in years 2026 through 2030.

The FDOT *Five Year Work Program* (Fiscal Years 2023-2027) also includes additional projects along SR 417 within the study area, which include projects for All Electronic Tolling, Resurfacing and Safety Improvements. At the time of this report, the All Electronic Tolling project only has funding for the Project Development and Environment Study phase. Additionally, the SR 417 resurfacing and safety improvements projects (Project ID 440292-1 and 440292-2) were under construction as of July 2023.

MetroPlan Orlando's 2045 *Metropolitan Transportation Plan Cost Feasible Plan* (adopted December 9, 2020, revised March 9, 2022) also includes several unfunded projects within or adjacent to the study area. These projects include a new shared-use path along East Lake Mary Boulevard from US 17-92 to Red Cleveland Boulevard, the widening of Airport Boulevard to four lanes from SR 417 to Airline Avenue, and operational/safety projects along Pine Way and Sipes Avenue.

Seminole County's Capital Improvement Projects identified within the study area include the resurfacing/rehabilitation of Red Cleveland Boulevard from East Lake Mary Boulevard to Marquette Avenue. Table 1-1 further summarizes projects identified within and adjacent to the study area.

Table 1-1. Surrounding Projects

Project ID	Roadway	From	To	Description	Future Phase
FDOT Five Year Work Program					
437952-1	SR 417 (Seminole Expressway	North of SR 434	South of Airport Boulevard	Widen from four to eight lanes	PE - Funded 2025
437301-7	SR 417 (Seminole Expressway)	Seminole/Orange County line	Towne Center Boulevard	All Electronic Tolling	PD&E – Funded 2022
440292-1	SR 417 (Seminole Expressway)	North of SR 434	South of Airport Boulevard	Resurfacing	NTP – 11/19/2021 Under Construction
440292-2	SR 417 (Seminole Expressway)	North of SR 434	South of Airport Boulevard	Safety Improvements (guardrail)	NTP – 11/19/2021 Under Construction

Table 1-1. Surrounding Projects

Project ID	Roadway	From	To	Description	Future Phase
MetroPlan Orlando's Cost Feasible Projects					
1012	SR 417	SR 434	Lake Mary Boulevard/ CR 427	Widen from six to eight lanes	PD&E – Funded 2020/2025 PE – Funded 2026/2030 CST – Funded 2026/2030
5051	East Lake Mary Boulevard	US 17-92	Red Cleveland Boulevard	Shared Use Path	PE, ROW, CST - Unfunded
9130	Airport Boulevard	SR 417	Airline Avenue	Widen 2 to 4 lanes	PD&E, PE, ROW, CST - Unfunded
3185	Pine Way	Bloom Lane	Sipes Avenue	Operational/Safety	PE, ROW, CST - Unfunded
3181	Sipes Avenue	Pine Way	North of Eagle View Cv.	Operational/Safety	PE, ROW, CST - Unfunded
Seminole County Capital Improvement Projects					
02107059	Red Cleveland Boulevard	East Lake Mary Boulevard	Marquette Avenue	Resurfacing/Rehabilitation	2023

CR = count road

CST = construction

NTP = notice to proceed

PD&E = project development and environment

PE = preliminary engineering

2. Purpose and Need

The purpose of the proposed SR 417 (Seminole Expressway) to Orlando Sanford International Airport Connector is to provide a direct, limited access connection between SR 417 and SFB to provide better connectivity and accommodate future traffic growth in the area. The primary access to the airport is along East Lake Mary Boulevard via Red Cleveland Boulevard, which extends north from the airport entrance to the airport terminal. A proposed connector would provide a limited access connection directly to SFB from SR 417, thereby reducing the demand along East Lake Mary Boulevard and improving travel time for all users. The proposed improvements are to 1) enhance regional connectivity, 2) accommodate transportation demand, 3) provide needed capacity, 4) improve safety, 5) support modal connectivity and 6) serve social and economic growth.

2.1 Regional Connectivity

SFB is a designated Strategic Intermodal System Strategic Growth Commercial Service Airport. SR 417 serves as a SIS Highway Corridor providing regional connectivity west of the airport and connects to two designated SIS Strategic Growth Highway Connectors: East Lake Mary Boulevard between SR 417 and Red Cleveland Boulevard and Red Cleveland Boulevard between East Lake Mary Boulevard and Airport Boulevard. Airport passengers using East Lake Mary Boulevard are intermixed with local, non-airport traffic. For example, northbound SR 417 traffic exiting the interchange at Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard, travel though three signalized intersections within 0.3 mile of the SR 417 northbound off-ramp, impeding traffic flow and increasing travel time for airport users. In addition to the designated SIS route, airport access to the passenger terminal is also provided via Airport Boulevard from SR 46/Sanford Avenue.

Results from traffic analyses conducted for this study are summarized throughout this section and are presented in a memorandum titled *SR 417 to Orlando Sanford International Airport Connector Concept Traffic Analysis Memorandum* (CDM Smith 2023).

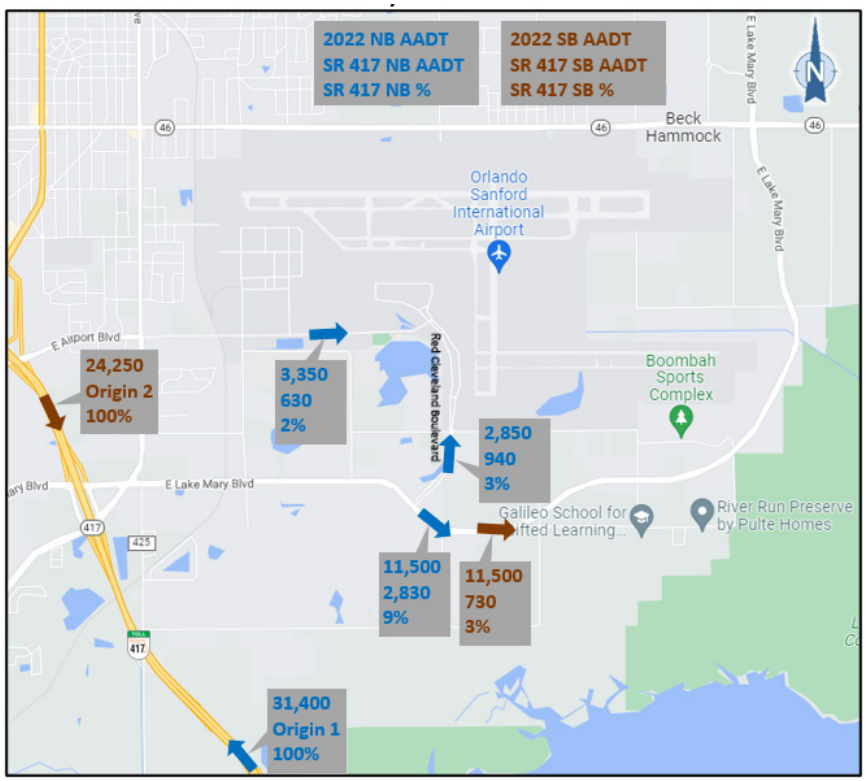
A desktop travel time analysis was conducted to compare travel times between the existing route from SR 417 northbound to SFB via East Lake Mary Boulevard and the proposed connector to SFB. Both routes started on northbound SR 417 at the Lake Jesup mainline toll plaza and terminated at the SFB terminal building. The analysis found that the proposed connector could reduce the travel distance by 28% and reduce travel time to SFB by as much as 51% during the PM peak period. In addition, travel time savings are expected to be higher in future conditions when traffic demand is anticipated to increase, and congestion worsens at the SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange. A direct connection from SR 417 to SFB is expected to enhance regional connectivity by improving access to the airport, increasing mobility options and providing enhanced system linkage between the SIS facilities.

2.2 Anticipated Transportation Demand

As part of the traffic analysis, an origin and destination evaluation was performed to identify travel patterns for trips originating from SR 417 south and north of the Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange to the SFB terminal, using data from StreetLight Data, Inc. Review of the one-way 2022 Average Annual Daily Traffic indicates that 5% of the trips from northbound SR 417 access the airport terminal through either Airport Boulevard (2%) and Red Cleveland Boulevard (3%), while 9% continue travel on East Lake Mary Boulevard, east of Red Cleveland Boulevard. Origin and destination data indicate that no trips from southbound SR 417 enter the airport terminal but that 3% of the trips continue on East Lake Mary Boulevard, east of Red Cleveland Boulevard. Figure 2-1 presents the distribution of SR 417 northbound and southbound 2022 One-Way Average Annual Daily Traffic to

the subject destinations. It is expected that 17% (or 4,400 vehicles per day one-way) of northbound and southbound SR 417 trips would potentially be diverted to the proposed connector if it was in place in year 2022.

Figure 2-1. SR 417 One-Way 2022 Annual Average Daily Traffic Distribution



Based on the traffic analysis, the Annual Average Daily Traffic along SR 417, south of the Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange, is anticipated to increase from 61,150 in year 2022 to 118,100 by 2050 (93% increase). In addition, AADT at the SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange ramps to/from the south is anticipated to increase from 17,750 to 33,100 by 2050 (87% increase). The analysis also indicates that the proposed connector could potentially divert as much as 51% (17,000 AADT) of traffic in year 2050 from the SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange ramps to/from the south, thereby reducing congestion and improving operations at the existing interchange.

The traffic analysis also indicates that AADT along East Lake Mary Boulevard, west of Red Cleveland Boulevard, is anticipated to increase from 23,800 to 36,500 by 2050 (53% increase). However, the analysis indicates that the proposed connector is anticipated to reduce traffic demand along this segment of East Lake Mary Boulevard, by as much as 46% (or 17,000 AADT) in 2050. East of Red Cleveland Boulevard, the AADT along East Lake Mary Boulevard is anticipated to increase from 23,000 in 2022 to 35,400 in 2050 (54% increase). The proposed connector is also anticipated to divert 3,800 trips from Airport Boulevard, east of Sanford Avenue, as well as 17,000 trips from Ronald Reagan Boulevard (CR 427), south of Lake Mary Boulevard, in 2050.

As documented in the *2021 Airport Master Plan Update* for SFB, passenger enplanements in 2017 were 1,436,224. The plan also forecasts passenger enplanements to nearly double to 2,747,325 by 2037, further indicating that traffic demand along East Lake Mary Boulevard and Red Cleveland Boulevard is

likely to increase in future years. The plan also notes that the air freight tonnage through the airport in 2017 totaled 332 tons, with an expected increase to 1,671 tons by the year 2037 (WS Atkins, Inc. 2021). The FDOT Florida Traffic Online website indicates that the 2021 Average Annual Daily Truck Traffic along Airport Boulevard is 274 or 6% of total traffic, and 2860 or 13% along East Lake Mary Boulevard (FDOT n.d.). Based on the forecasted increase in air freight tonnage through the airport, it is anticipated that truck traffic will also increase.

2.3 Capacity

The existing traffic demand (2022) analysis shows that westbound East Lake Mary Boulevard (west of Red Cleveland Boulevard) experiences a Level of Service D Volume to Capacity ratio of 0.8 during the AM peak hour, which increases to 0.9 east of Red Cleveland Boulevard. The existing traffic operations analysis also indicates extended delays and long queues during peak periods at the SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange. The adjacent intersections at East Lake Mary Boulevard at Ronald Reagan Boulevard (CR 427) and Sanford Avenue (CR 425) also operate unacceptably and impact operations at the interchange. Congestion mostly occurs along the facilities approaching and within the interchange footprint including the SR 417 northbound off-ramp, East Lake Mary Boulevard and Ronald Reagan Boulevard (CR 427). Providing additional capacity with a direct connection from SR 417 to the airport is anticipated to alleviate congestion at the existing interchange.

Review of the future 2050 No-Action analysis indicates that the Volume to LOS D Maximum Service Volumes ratio during the PM Peak Hours at SR 417 for the northbound exit ramp at the Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange is 1.0. The future 2050 Build analysis indicates that the proposed connector is expected to divert northbound traffic away from the interchange and reduce the Volume to LOS D MSV ratio to 0.5 in 2050, and further indicates that the proposed connector could reduce traffic along the following arterial segments:

- Lake Mary Boulevard, west of Red Cleveland Boulevard
- Airport Boulevard, east of Sanford Avenue
- CR 427, south of Lake Mary Boulevard

The future 2050 No-Action analysis indicates the Volume to LOS D MSV ratios at these arterial segments are expected to be between 1.1 to 1.2. However, the future 2050 Build analysis indicates that the Volume to LOS D MSV ratios is expected to be reduced to between 0.6 and 0.9.

The future 2050 No-Action analysis indicates that the westbound through movements for the East Lake Mary Boulevard and Red Cleveland Boulevard intersection are expected to operate at LOS F during the AM peak period. However, the future 2050 Build indicates that the overall operations are expected to operate at an LOS E during the AM peak period. Because of the existing constrained capacity and expected increase in traffic volumes, additional capacity is anticipated to be needed for satisfactory traffic operations in future years.

2.4 Safety

Because of the three signalized intersections within 0.3 mile of the SR 417 northbound off-ramp, traffic at the SR 417 northbound off-ramp occasionally backs up onto the SR 417 mainline, impacting safety and operations along SR 417. The proposed connector would divert traffic from the SR 417 and Ronald Reagan Boulevard (CR 427) and Lake Mary Boulevard interchange, thereby enhancing safety and operations at the interchange.

2.5 Modal Connectivity

The U.S. Department of Transportation Federal Aviation Administration *National Plan of Integrated Airport Systems 2023-2027* published September 30, 2022, designates SFB as a Small Hub, Primary Commercial Service airport facility. Primary Commercial Service airports are publicly owned airports that receive scheduled air carrier service with 10,000 or more passenger boardings per year. Small Hub airports are defined as accounting for 0.05% and 0.25% of total U.S. passengers. The *2021 Airport Master Plan Update* for SFB forecasts enplanements to increase 91%, and air freight tonnage to increase 400% by the year 2037. The proposed connector is anticipated to support mobility to other modes of travel at SFB.

2.6 Social Demand

According to the *University of Florida's Bureau of Economics and Business Research Florida Population: 2020 Census Summary*, Seminole County's population grew from 422,718 in 2010 to 470,856 in 2020, or 11.4%. The BEBR data also showed that the city of Sanford experienced a 14% increase in population over the same period (BEBR 2021). Further, BEBR estimates that Seminole County's population is projected to grow approximately 21% by the year 2050 (BEBR 2022).

Land use in the area is primarily comprised of residential, agricultural and undeveloped lands. However, a review of planned developments in the study area shows that the region is undergoing extensive land use changes, resulting in increased traffic generators. As of July 2023, the city of Sanford's Building Division Online Permitting Service noted there are 10 residential, commercial and industrial planned developments in the study area (city of Sanford 2023). These planned developments account for 55% of the undeveloped lands in the study area, or 349 acres of 637 acres of undeveloped lands. Of the planned developments, five are residential developments, which are expected to create an additional 849 single-family houses and townhomes in the study area. As a result, local traffic along East Lake Mary Boulevard and surrounding roadways is expected to increase. The proposed connector is expected to divert traffic from East Lake Mary Boulevard, providing local traffic with increased mobility to and from the existing and planned development in the area.

3. Existing Conditions

3.1 Existing Roadway Network

The study area roadway network consists of an expressway, principal arterials, minor arterials and minor collector facilities as well as local roads. The following subsections describe some of the existing conditions of the expressway, as well as arterials and collectors. Existing traffic conditions are not included in this report and are documented as part of a separate report, the SR 417 to Orlando Sanford International Airport Connector Concept Traffic Analysis Memorandum (CDM Smith 2023).

3.1.1 Functional Classification and Maintaining Agency

The major roadway within the study is SR 417 (Seminole Expressway). SR 417 is a major north/south corridor for commercial and private transportation. It is a 55-mile-long toll road operated by CFX and Florida's Turnpike Enterprise and traverses three counties (Osceola, Orange and Seminole). CFX operates 33 miles of SR 417 in Orange County, while FTE operates 17.5 miles in Seminole County and the remaining 4.5 miles between Orange and Osceola counties. SR 417 is classified as an urban principal arterial (expressway), and a Strategic Intermodal System corridor. It is also part of the Florida Department of Transportation State Highway System and is a hurricane evacuation route. FTE owns and operates the segment of SR 417 within the study area.

The functional classifications for the arterial and collector facilities within the study area were identified using the FDOT District 5 2010 Urban Boundary and Federal Functional Classification map for Seminole County (FDOT 2014). The maintaining agencies for each roadway were identified using the FDOT MyFlorida Transportation Map (FDOT n.d.) and Seminole County Roads Maintenance Map (Seminole County n.d.). Existing functional classifications and maintaining agencies of the roadways within the project study area are listed in Table 3-1.

Table 3-1. Existing Roadways Functional Classifications and Maintaining Agency

Name of Roadway	Maintaining Agency	Functional Classification	Primary Direction	Number of Lanes
SR 417	Florida's Turnpike Enterprise	Principal Arterial-Expressway	North-South	4
East Lake Mary Boulevard	Seminole County	Principal Arterial- Other	East-West	4
CR 425/ South Sanford Avenue	Seminole County	Minor Collector	North-South	2
Red Cleveland Boulevard	Seminole County	Minor Arterial	North-South	4

3.1.2 Access Management Classification

The only roadway within the study area that falls under the FDOT access management guidelines is SR 417. The access management classification for SR 417 was identified using the FDOT Access Management geographic information system files (FDOT n.d.). The local government-maintained roads were classified according to the FDOT *Access Management Guidebook* (FDOT 2019). The Seminole County Comprehensive Plan (Transportation Element) implementation of the State Access Management Program and the control of access connections to the State Highway System are consistent with the

FDOT Access Management guidelines and are coordinated with FDOT through the County's access permitting process (Seminole County 2022). Table 3-2 lists the existing access management classifications for the roads within the study area.

Table 3-2. Access Management Classifications

Roadway	Access Management Classification
SR 417	1 - Freeway
East Lake Mary Boulevard	3 - Restrictive with 660-foot Connection Spacing
CR 425/South Sanford Avenue	4 - Non-Restrictive with 2,640-foot Signal Spacing
Red Cleveland Boulevard	3 - Restrictive with 660-foot Connection Spacing

3.1.3 Context Classification

The only roadway within the study area that falls under the FDOT Context Classification guidelines is SR 417. The context classification for SR 417 was identified using the FDOT Straight-Line Diagram and the existing SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]).

The local government-maintained roads were also classified according to the *FDOT Context Classification Guide* (July 2020). Table 3-3 summarizes the context classifications for the study area facilities.

Table 3-3. Context Classifications

Roadway	Context Classification
SR 417	Not Applicable (Limited Access Facility)
East Lake Mary Boulevard	C3C[a]
CR 425/South Sanford Avenue	C3R[a]
Red Cleveland Boulevard	C3C[a]

[a] Determined for non-State Highway System roadways

3.2 Existing Roadway Characteristics

3.2.1 Typical Sections

Typical sections were determined using the FDOT Straight Line Diagram, SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]), the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137), Google Earth and field reviews.

3.2.1.1 SR 417

The existing typical section of SR 417 is a four-lane divided roadway with a maximum median width of 78 feet. The northbound direction consists of two 12-foot-wide travel lanes and an 8-foot-wide inside shoulder (4 feet unpaved). In the southbound direction, there are two 12-foot-wide travel lanes, a 10-foot-wide inside shoulder (4 feet of which are paved with double-faced guardrail), an 8-foot-wide outside shoulder with shoulder gutter, and 4 feet of miscellaneous pavement with guardrail.

The existing typical section for the bridges that cross CR 425/South Sanford Avenue are both four-lane divided roadways with two 12-foot-wide travel lanes in each direction, 10-foot-wide outside shoulders with 32-inch-tall F-shape traffic railings, and 6-foot-wide inside shoulders with 32-inch-tall F-shape traffic railings.

The Metroplan Orlando *2045 Metroplan Transportation Plan Cost Feasible Plan* (adopted December 9, 2020, revised March 9, 2022) shows SR 417 to be widened to eight lanes from SR 434 to Lake Mary Boulevard (refer to Table 3-24). The future widening is the No-Build condition that is assumed to be existing for any future project development and environment study for the airport connector. This CF&M project assumes the No-Build condition for SR 417 of eight lanes.

3.2.1.2 East Lake Mary Boulevard

East Lake Mary Boulevard is a four-lane divided roadway with 12-foot-wide travel lanes. Adjacent to the outside lanes are 4-foot-wide designated bike lanes. Sidewalks are present along both sides of the roadway. Along the south side of the roadway, the sidewalk width varies between 5 and 8 feet, while the sidewalk width along the north is consistently 5 feet. Type E curb and gutter is present along the median, and Type F is present along the outside edge of the bike lanes. The raised median width varies between 22 feet and 29.5 feet and includes sod and landscaping.

3.2.1.3 Red Cleveland Boulevard

Red Cleveland Boulevard is a four-lane divided roadway with two 12-foot-wide travel lanes in each direction. Adjacent to the outside lanes are 4-foot-wide undesignated bike lanes. Both sides of the roadway include 5-foot-wide sidewalks. Type E curb and gutter is present along the median, and Type F is present along the outside edge of the bike lanes. The raised median width varies between 35 and 44 feet.

3.2.1.4 CR 425/South Sanford Avenue

CR 425/South Sanford Avenue is a two-lane undivided roadway, with one 10-foot-wide travel lane in each direction. There are no pedestrian or bicycle facilities along the roadway within the study area. Adjacent to the outside travel lanes is unpaved shoulder. Drainage swales are typically present along both sides of the travel lanes.

3.2.2 Interchanges, Intersections and Signalization

Intersection and signalization information was collected using the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137), Google Earth and field reviews. Table 3-4 summarizes the intersections and signalization along East Lake Mary Boulevard and Red Cleveland Boulevard.

Table 3-4. Interchanges, Intersections and Signalization

Roadway	Intersection Type	Intersection Control	Turn Lanes (Left-Turn Directions)	Crosswalks
SR 417				
Lake Mary Boulevard	Half diamond interchange	Signalized	Three-Way Left-Turn Lanes (NBL, WBL, SBL)	East/West
Ronald Reagan Boulevard	Half diamond interchange	Signalized	Four-Way Left-Turn Lanes (EBL, SBL, NBL, WBL)	East/West

Table 3-4. Interchanges, Intersections and Signalization

Roadway	Intersection Type	Intersection Control	Turn Lanes (Left-Turn Directions)	Crosswalks
East Lake Mary Boulevard				
Ohio Avenue (north)/ Slivervista (south)	Four-leg	Four-Way Signalized	Three-Way Left-Turn Lanes (WBL, EBL, SBL)	East/West
Skyraider Court	Three-leg (southbound)	One-Way Stop	Two-Way Left-Turn Lanes (EBL, SBL)	East/West
Red Cleveland Boulevard	Three-leg (southbound)	Three-Way Signalized	Two-Way Left-Turn Lanes (EBL, SBL)	East/West & North/South
Brisson Avenue South	Three-leg (northbound)	Three-Way Signalized	Three-Way Left-Turn Lanes (EBL, WBL, NBL)	East/West
Night Heron Drive	Two-leg (northbound)	One-Way Stop	Right Turn Only	East/West
Laura Avenue	Three-leg (southbound)	One-Way Stop	Three-Way Left-Turn Lanes (EBL, WBL, SBL)	None
Sipes Avenue	Four-leg	Two-Way Stop	Four-Way Left-Turn Lanes (NBL, EBL, SBL, WBL)	East/West
Skyway Drive	Four-leg	Four-Way Signalized	Four-Way Left-Turn Lanes (NBL, EBL, SBL, WBL)	East/West
Red Cleveland Boulevard				
Marquette Avenue	Four-leg	Two-Way Stop	Four-Way Left-Turn Lanes (SBL, WBL, NBL)	None

EBL = eastbound left

NBL = northbound left

SBL = southbound left

WBL = westbound left

3.2.3 Design Speed and Posted Speed

The design and posted speed limits were determined using the SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]), the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137), Google Earth and field reviews. Table 3-5 summarizes the design and posted speed limits.

Table 3-5. Design Speed and Posted Speed

Roadway	Design Speed (mph)	Posted Speed (mph)
SR 417	70	70
East Lake Mary Boulevard	50	50
Red Cleveland Boulevard	50	40
CR 425/South Sanford Avenue	40 [a]	35

[a] Assumed 5 mph greater than posted speed limit

3.2.4 Right-of-Way

The existing ROW widths were determined using the SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]), the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137), Google Earth and field reviews. Table 3-6 summarizes the existing ROW along SR 417, East Lake Mary Boulevard and Red Cleveland Boulevard.

Table 3-6. Existing Roadway ROW Widths

Roadway		Total ROW Width
From	**To**	
SR 417		
North of Sanford Avenue	North of Lake Jesup	300 feet
East Lake Mary Boulevard		
Ohio Avenue	Red Cleveland Road	130 feet
Red Cleveland Boulevard	Laura Avenue	Varies 143.5 feet to 170 feet
Laura Avenue	Skyway Drive	135 feet
Red Cleveland Boulevard		
East Lake Mary Boulevard	Marquette Avenue	135 feet (minimum)

3.2.5 Border Width

Based on the SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]), the existing border width along SR 417 from mile marker 46.073 to mile marker 47.140 is a minimum of 94 feet on both sides of the roadway.

Based on the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137), the existing border width along East Lake Mary Boulevard is a minimum of 31 feet to the south and 21 feet to the north.

3.2.6 Pavement Conditions

A 2018 Pavement Survey and Evaluation Report found that the pavement conditions within the study ranged from “Poor” to “Good” based on visual observation (Tierra 2018). A summary of the survey report determined that the existing mainline pavement along SR 417 ranged from poor to good condition, with visible alligator cracking observed.

A Pavement Survey and Evaluation Report was completed for SR 417 as part of the pavement design package for the resurfacing project (FPID 440292-1-52-01). The evaluation found that the pavement conditions along SR 417 mainline in the study area ranged from poor to good based on visual observation (Tierra 2018), with visible cracking observed. Based on Google Earth and field reviews, pavement conditions along East Lake Mary Boulevard, CR 425/South Sanford Avenue and Red Cleveland Boulevard are good.

3.2.7 Horizontal Alignment

Table 3-7 summarizes the existing horizontal alignment and curves within the project limits. The alignment information is based on a review of the alignment from the SLD, SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]), and the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137).

Table 3-7. Horizontal Curves

Roadway	Point of Intersection	Design Speed (mph)	Limits	Deflection (Degrees, Minutes, Seconds)	Radius (feet)	Length of Curve (feet)	Degree of Curve (Degrees, Minutes, Seconds)
SR 417	MP 9.809	70	PC = MP 9.600 PT = MP 10.015	16°30’00”	7639	2,191.20	0°45’00”
	MP 10.655	70	PC = MP 10.412 PT = MP 10.890	25°15’00”	5730	2,523.84	1°00’00”
East Lake Mary Boulevard	Sta. 77+62.86	50	PC=Sta. 73+20.00 PT=Sta. 81+53.46	47°55’27”	996.45	833.46	5°45’00”
	Sta. 95+99.58	50	PC=Sta. 91+55.51 PT=Sta. 99+91.00	48°02’27”	996.45	835.49	5°45’00”
Red Cleveland Boulevard	Sta. 23+94.24	50	PC=Sta. 18+86.00 PT=Sta. 28+42.74	47°50’13”	1145.92	956.74	5°00’00”

PC = point of curve

PI = point of intersection

PT = point of tangent

Sta. = station

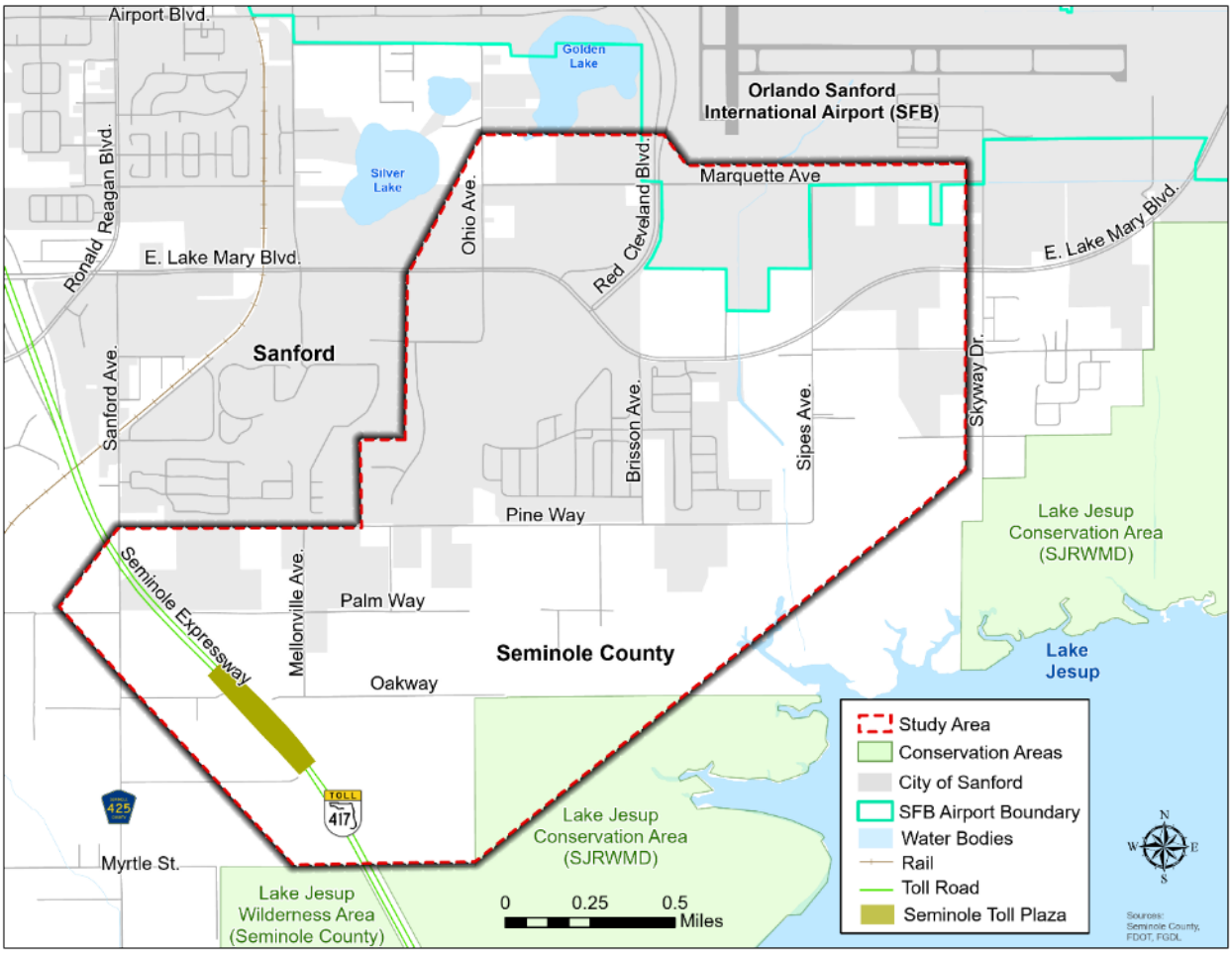
3.2.8 Vertical Alignment

Topographic survey was not readily available for the evaluation of existing vertical alignment geometries.

3.2.9 Seminole Toll Plaza

The Seminole Expressway and Southern Connector Toll 417 is located approximately 1.5 miles north of Lake Jesup (MP 9.000 on SLD) and owned and operated by Florida’s Turnpike Enterprise. The Seminole Toll Plaza is an open-road tolling gantry which collects tolls via an electronic transponder while allowing vehicles to travel at the posted speed. Figure 3-1 shows the Seminole Toll Plaza Location within the study area.

Figure 3-1. Seminole Toll Plaza Location Map



3.2.10 Structures

Information related to structures was determined using the SR 417 Resurfacing Project Plans (FPID 440292-1-52-01 [FY 2021]), the East Lake Mary Boulevard Plans of Proposed Roadway Construction from September 2002 (Seminole County Public Works Department PS-0137), FDOT Florida Bridge Information 2022, 4th Quarter (FDOT 2022b) and field reviews. There are two existing bridges and one bridge culvert within the project study area.

SR 417 traverses over CR 425/South Sanford Avenue with two separate bridges. Bridge No. 770043 carries southbound SR 417 over CR 425/South Sanford Avenue and Bridge No. 770044 carries northbound SR 417 over CR 425/South Sanford Avenue. While the bridge inspection reports were not readily available, the FDOT Florida Bridge Information did not note any structural deficiencies or that they were functionally obsolete. The Sufficiency Rating and Health Index of both bridges were greater than 90%.

During field reviews, a bridge concrete box culvert was encountered on East Lake Mary Boulevard. The culvert is located approximately 200 feet east of Laura Avenue and conveys water along the Naval Canal/Phelps Creek. A bridge number was not found on the structure, and no records of the bridge culvert are documented in the FDOT Florida Bridge Information data. However, the bridge culvert is identified in the East Lake Mary Boulevard Construction Plans from September 2002 (Seminole County

Public Works Department PS-0137) as X-4. The bridge culvert is a triple barrel culvert that spans 33.75 feet and is 6 feet high. According to the construction plans, the length of the bridge box culvert is approximately 130 feet.

Tables 3-8 and 3-9 summarize existing bridge conditions and existing bridge characteristics, respectively.

Table 3-8. Existing Bridge Conditions

Bridge No.	Mile Marker Station	Route Carried	Bridge Over	Direction	Sufficiency Rating	Health Index	Last Inspection Date	Year Built
FDOT No. 770043	MP 10.64 to 10.67 (48.3)	SR 417	Sanford Avenue	Southbound	96.1	98.2	1/3/2022	1993
FDOT No. 770044	MP 10.67 to 10.73 (48.3)	SR 417	Sanford Avenue	Northbound	94.4	97.8	1/3/2022	1993
Seminole County No. X-4	Sta 111+81.00	East Lake Mary Boulevard	Naval Canal/Phelps Creek	Eastbound & Westbound	Unknown	Unknown	Unknown	2006

3.3 Geotechnical Data

The study area is delineated on the U.S. Geological Survey Casselberry, Sanford, Osteen and Oviedo, Florida, quadrangle maps depicted on Figure 3-2. The USGS quadrangle maps indicate gently sloping topography with typical natural grades decreasing from approximately 50 feet National Geodetic Vertical Datum in the northwest to 5 feet NGVD in the southeast near Lake Jesup. The USGS quadrangle maps also indicate former citrus groves in the northern portion of the project area along with several well locations in the southern portion.

Table 3-10 summarizes the Natural Resources Conservation Service soil units identified in the study area (NRCS n.d.).

3.3.1 Soil and Groundwater

Figure 3-3 shows excerpts of the NRCS Web Soil Survey highlighting the study area. The shallow soils depicted on the Web Soil Survey maps are predominantly poorly drained fine sands with varying silt content (AASHTO Soil Classifications A-3, A-2-4) to approximately 6.5 feet deep. However, several soils include sandy loam to sandy clay loam (AASHTO Soil Classifications A-2-6, A-4, A-6) from approximately 2.5 feet to 6.5 feet below ground surface.

Seasonal high groundwater level estimates for the majority of the soils are within 2 feet of the ground surface; several listed soils have up to 2 feet of standing water during the wet season. A few soil types (in the north-central portion of the study area) are reported with seasonal high groundwater ranging between 2 and 6 feet deep.

The sandy soils are generally suitable for roadway construction and are classified by FDOT as Select material. Shallow groundwater can impact roadway grades and stormwater pond site selection, design and construction. These challenges will have to be addressed during potential future design and construction phases of the project, as recommended. Soils with shallow groundwater are highlighted in blue on Figure 3-3.

Table 3-9. Existing Bridge Characteristics

Bridge No.	Bridge Location	No. of Spans	Max. Span (feet)	Total Bridge Length (feet)	Deck Width (feet)	No. of Lanes	Min. Vertical Clearance (feet)	Superstructure Type	Substructure Type	Inventory Rating (Tons)	Operating Rating (Tons)	Deficiencies (Functional/ Structural)
FDOT No. 770043	SR 417	1	133.5	133.5	43'-1" (40'-0" between gutters)	2	16.83	AASHTO (Type Unknown) Prestressed Concrete Beams	Unknown – substructure behind MSE wall, assumed pile bent	Unknown	41.8	N/A
FDOT No. 770044	SR 417	1	137.5	137.5	43'-1" (40'-0" between gutters)	2	17.33	AASHTO (Type Unknown) Prestressed Concrete Beams	Unknown – substructure behind MSE wall, assumed pile bent	Unknown	38.3	N/A
Seminole County No. X-4	Naval Canal/ Phelps Creek	3 barrels	10	33.75	N/A	5	N/A	Concrete Box Culvert	N/A	Unknown	Unknown	Unknown

AASHTO = American Association of State Highway and Transportation Officials

MSE = Mechanically Stabilized Earth

N/A = Not Applicable

Figure 3-2. U.S. Geological Survey Quadrangle Map

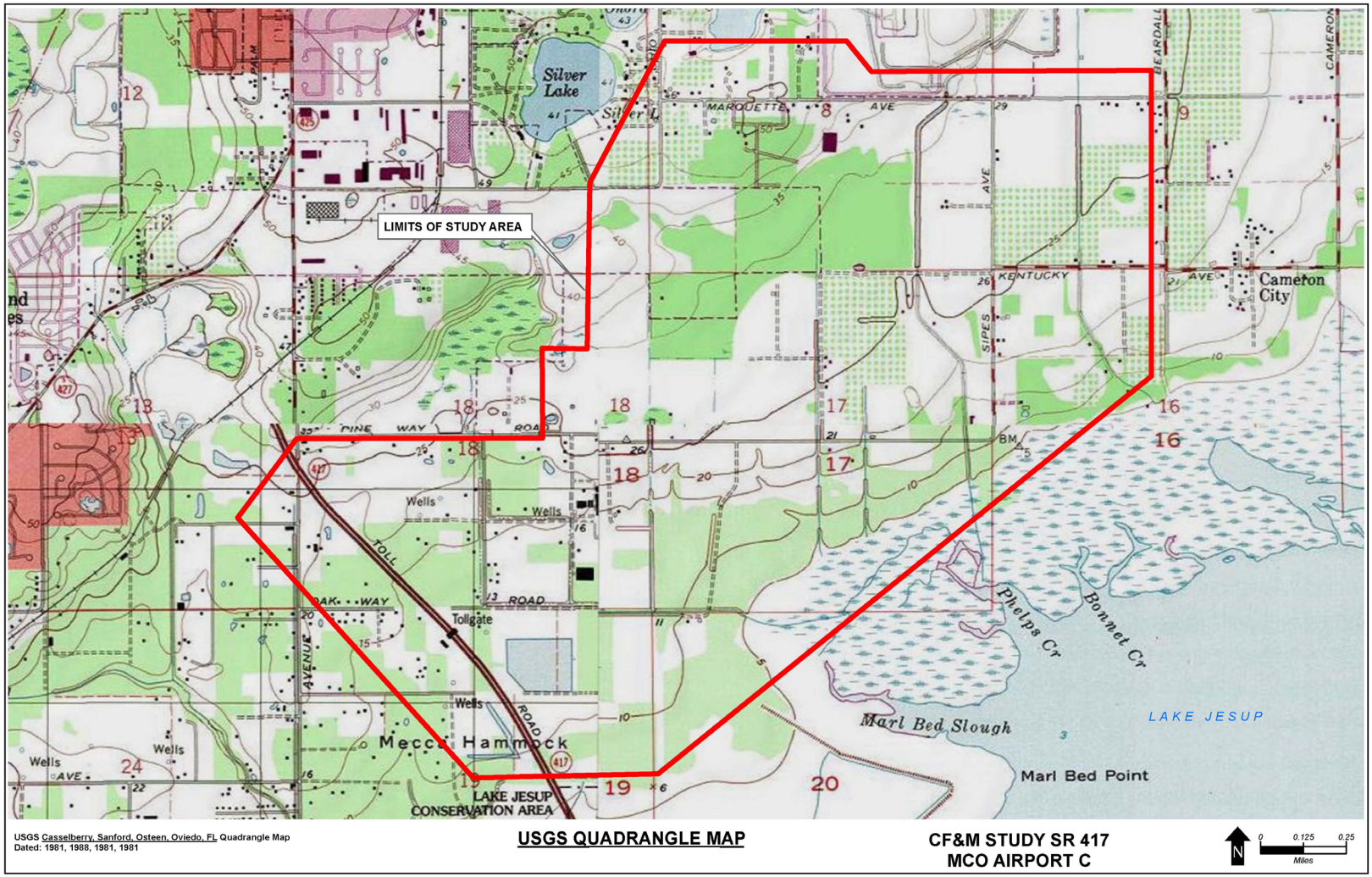


Table 3-10. Seminole County NRCS Soil Units Summary

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	AASHTO Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)	Hydrologic Group
9	Basinger and Delray fine sands						
	Basinger	0–5 5–30 30–50 50–80	Fine sand Sand, fine sand Sand, fine sand Sand, fine sand	SP SP-SM, SP SP-SM, SP SP-SM, SP	A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-3	0.0–1.0	A/D
	Delray	0–12 12–50 50–80	Fine sand Fine sand, sand Sandy loam, fine sandy loam, sandy clay loam	SC-SM, SP-SM, SM SP-SM SC-SM, SC, SM	A-2-4, A-3 A-2-4, A-3 A-2-4, A-2-6	0.0–0.5	A/D
10	Basinger, Samsula and Hontoon soils, depressional						
	Basinger	0–6 6–18 18–35 35–80	Mucky fine sand Sand, fine sand Sand, fine sand Sand, fine sand	SP-SM, SP SP-SM, SP SP-SM, SP SP-SM, SP	A-2-4, A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-3	+2.0–0.0	A/D
	Hontoon	0–80	Muck	PT	A-8	+2.0–0.0	A/D
	Samsula	0–30 30–80	Muck Sand, fine sand, loamy sand	PT SP-SM, SM, SP	A-8 A-2-4, A-3	+2.0–0.0	A/D
11	Basinger and Smyrna fine sands, depressional						
	Basinger	0–5 5–15 15–25 25–80	Mucky fine sand Sand, fine sand Sand, fine sand Sand, fine sand	SP-SM, SP SP-SM, SP SP-SM, SP SP-SM, SP	A-2-4, A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-3	+2.0–0.0	A/D
	Smyrna	0–2 2–15 15–25 25–80	Fine sand Sand, fine sand Sand, fine sand, loamy fine sand Sand, fine sand	SP-SM, SP SP-SM, SP SP-SM, SM SP-SM, SP	A-2-4, A-3 A-3 A-2-4, A-3 A-3	+2.0–0.0	A/D
13	EauGallie and Immokalee fine sands						
	EauGallie	0–6	Fine sand	SP-SM, SP	A-3	0.5–1.5	A/D

Table 3-10. Seminole County NRCS Soil Units Summary

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	AASHTO Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)	Hydrologic Group
		6–18 18–30 30–45 45–64 64–80	Fine sand Sand, fine sand Sand, fine sand Sandy loam, fine sandy loam, sandy clay loam Sand, loamy sand loamy fine sand	SP-SM, SP SP-SM, SM SP-SM, SP SC-SM, SC, SM SP-SM, SM	A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-2-6 A-2-4, A-3		
	Immokalee	0–4 4–42 42–62 62–80	Fine sand Fine sand, sand Fine sand, sand Fine sand, sand	SP-SM, SP SP-SM, SP SP-SM, SM SP-SM, SP	A-3 A-3 A-2-4, A-3 A-3	0.5–1.5	A/D
15	Felda and Manatee mucky fine sands, depressional						
	Felda	0–4 4–28 28–36 36–46 46–80	Mucky fine sand Fine sand, sand Sandy clay loam, fine sandy loam, sandy loam Loamy sand, sand, fine sand Fine sand, sand	SP-SM, SP SP-SM, SP SC-SM, SC, SM SP-SM, SP SP-SM, SP	A-3 A-3 A-2-4, A-2-6 A-2-4, A-3 A-3	+2.0–0.0	A/D
	Manatee	0–14 14–19 19–33 33–50 50–80	Mucky fine sand Loamy sand, sandy loam Fine sandy loam, sandy loam, loamy fine sand Fine sandy loam, sandy loam, loamy fine sand Fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM SC-SM, SC, SM SC-SM, SC, SM SC-SM, SC, SM SC-SM, SC, SM	A-2-4, A-3 A-2-4 A-2-4 A-2-4 A-2-4	+2.0–0.0	A/D

Table 3-10. Seminole County NRCS Soil Units Summary

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	AASHTO Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)	Hydrologic Group
19	Manatee, Floridana and Holopaw soils, frequently flooded						
	Manatee, flooded	0–10 10–33 33–52 52–80	Fine sand Loamy sand, sandy loam Sandy clay loam, sandy loam, loamy fine sand Fine sandy loam, sandy loam, loamy fine sand	SP-SM, SM SC-SM, SC, SM SC-SM, SC, SM SC-SM, SC, SM	A-2-4, A-3 A-2-4 A-2-4 A-2-4	0.0–0.5	B/D
	Floridana, flooded	0–18 18–29 29–80	Mucky fine sand Fine sand, sand Sandy loam, fine sandy loam, sandy clay loam	SP-SM, SM SP-SM, SP SC-SM, SC	A-2-4, A-3 A-3 A-2-4, A-2-6	0.0–0.5	C/D
	Holopaw, flooded	0–6 6–50 50–80	Fine sand Fine sand Fine sandy loam, sandy clay loam	SP-SM, SP SP-SM, SP SC-SM, SC, SM	A-3 A-3 A-2-4, A-2-6	0.0–1.0	A/D
20	Myakka and EauGallie fine sands						
	Myakka	0–5 5–28 28–45 45–80	Fine sand Sand, fine sand Sand, fine sand, loamy fine sand Sand, fine sand	SP-SM, SP SP-SM, SP SP-SM, SM SP-SM, SP	A-3 A-3 A-2-4, A-3 A-3	0.5–1.5	A/D
	EauGallie	0–5 5–18 18–30 30–41 41–60 60–80	Fine sand Fine sand Sand, fine sand Sand fine sand Sandy loam, fine sandy loam, sandy clay loam	SP-SM, SP SP-SM, SP SP-SM, SM SP-SM, SP SC-SM, SC, SM SP-SM, SM	A-3 A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-2-6 A-2-4, A-3	0.5–1.5	A/D

Table 3-10. Seminole County NRCS Soil Units Summary

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	AASHTO Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)	Hydrologic Group
			Sand, loamy sand, loamy fine sand				
22	Nittaw muck, occasionally flooded	0–2 2–10 10–60 60–80	Muck Sandy loam, fine sand, mucky fine sand Sandy clay, clay Sandy loam, fine sand, fine sandy loam	PT SP-SM, SM CH, CL SC-SM, SP-SM, SM, SP	A-8 A-2-4, A-3 A-7 A-2-4, A-3	0.0–0.5	C/D
23	Nittaw, Okeelanta and Basinger soils, frequently flooded						
	Nittaw, flooded	0–4 4–9 9–80	Muck Sand, fine sand, mucky fine sand Sandy clay, clay	PT SP-SM, SM CH, CL	A-8 A-2-4, A-3 A-7	0.0–0.5	C/D
	Okeelanta, flooded	0–42 42–80	Muck Fine sand, sand, loamy sand	PT SP-SM, SM, SP	A-8 A-2-4, A-3	0.0–0.5	A/D
	Basinger, flooded	0–4 4–22 22–38 38–80	Fine sand Fine sand Sand, fine sand Sand, fine sand	SP SP SP-SM, SP SP-SM, SP	A-3 A-3 A-2-4, A-3 A-2-4, A-3	0.0–0.5	A/D
24	Paola–St. Lucie sands, 0 to 5% slopes						
	Paola	0–3 3–25 25–80	Sand Sand, fine sand Sand, fine sand	SP SP SP	A-3 A-3 A-3	<6	A
	St. Lucie	0–2 2–80	Sand Sand, fine sand	SP SP	A-3 A-3	<6	A
25	Pineda–Pineda, wet fine sand, 0 to 2% slopes						
	Pineda	0–1 1–5 5–36 36–54	Fine sand Fine sand Fine sand	SP-SM, SM SP-SM, SM SP-SM, SM SC-SM, CL, SC	A-2-4, A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-4,	0.5–1.5	A/D

Table 3-10. Seminole County NRCS Soil Units Summary

Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	AASHTO Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)	Hydrologic Group
		54–80	Fine sandy loam, sandy clay loam Fine sand, sand	SP-SM, SM	A-6 A-2-4, A-3		
	Pineda, wet	0–1 1–5 5–36 36–54 54–80	Fine sand Fine sand Fine sand Sandy clay loam, fine sandy loam Fine sand, sand	SP-SM, SM SP-SM, SM SP-SM, SM SC-SM, CL, SC SP-SM, SM	A-2-4, A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-4, A-6 A-2-4, A-3	+1.0–0.0	A/D
26	Udorthents, excavated	0–7 7–80	Fine sand Sand, fine sand	SP-SM, SP SP-SM, SP	A-3 A-3	3.5–6.0	A
27	Pomello fine sand, 0 to 5% slopes	0–4 4–55 55–67 67–80	Fine sand Fine sand Fine sand Fine sand	SP-SM SP-SM SP-SM SP-SM	A-3 A-3 A-2-4 A-2-4, A-3	2.0–3.5	A
29	St. Johns and EauGallie fine sands						
	St. Johns	0–12 12–22 22–54 54–80	Fine sand Sand, fine sand Sand, fine sand, loamy fine sand Sand, fine sand	SP-SM, SP SP-SM, SP SP-SM, SM SP-SM, SP	A-3 A-3 A-2-4, A-3 A-3	0.5–1.5	B/D
	EauGallie	0–3 3–16 16–35 35–38 38–72 72–80	Fine sand Fine sand Sand, fine sand Sand, fine sand Sandy loam, fine sandy loam, sandy clay loam Sand, loamy sand, loamy fine sand	SP-SM, SP SP-SM, SP SP-SM, SM SP-SM, SP SC-SM, SC, SM SP-SM, SM	A-3 A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-2-6 A-2-4, A-3	0.5–1.6	B/D
31	Tavares–Millhopper fine sands, 0 to 5% slopes						
	Tavares	0–6	Fine sand	SP-SM, SM	A-2-4, A-3	3.5–6.0	A

Table 3-10. Seminole County NRCS Soil Units Summary

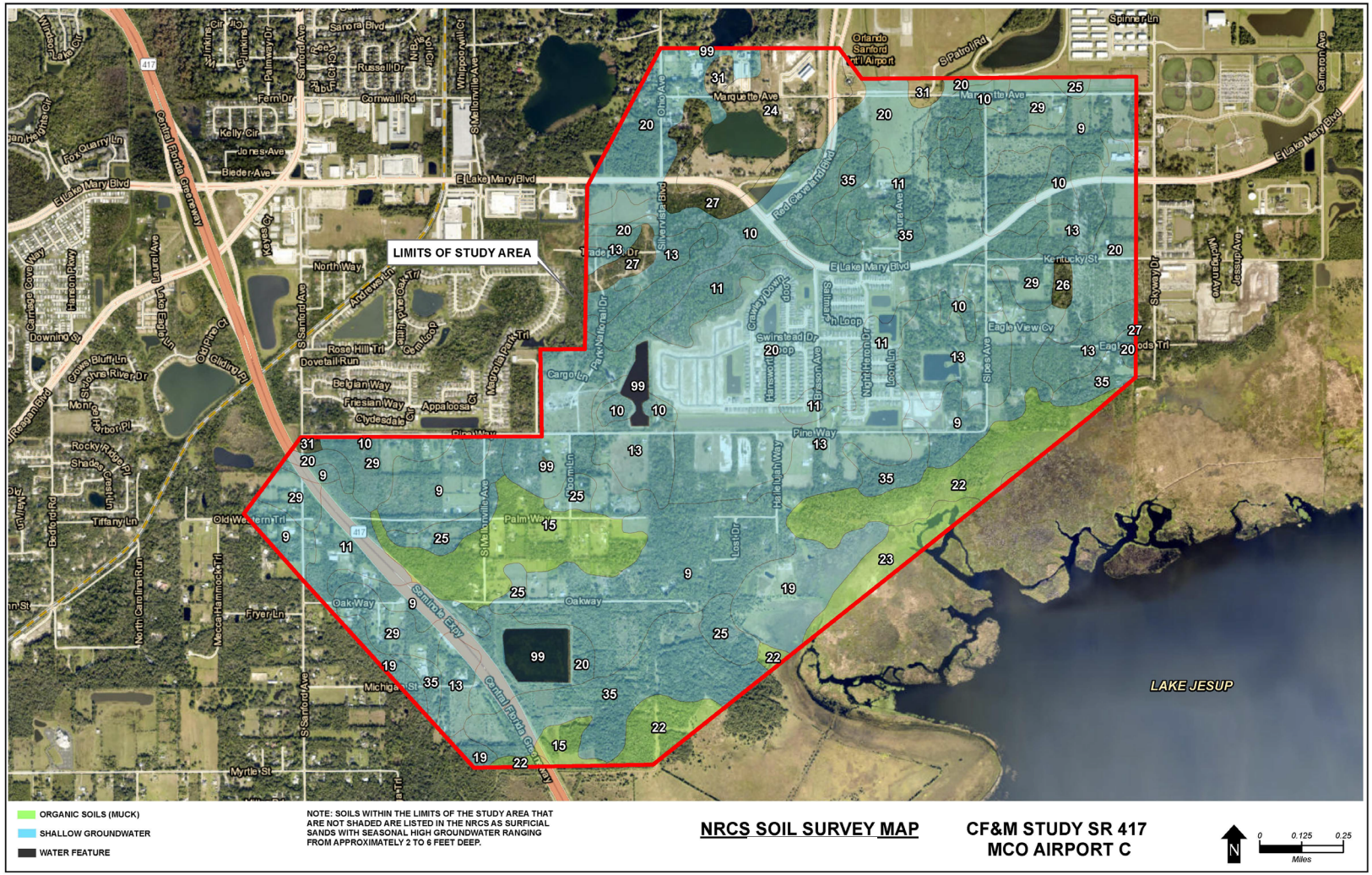
Unit No.	Soil Name	Depth (inches)	Soil Description	Unified Soil Classification Symbol	AASHTO Soil Classification Symbol	Depth to Seasonal High Groundwater (feet)	Hydrologic Group
		6–80	Fine sand, sand	SP-SM, SM	A-2-4, A-3		
	Millhopper	0–6 6–64 64–76 76–80	Fine sand Fine sand, sand Sandy loam, fine sandy loam, sandy clay loam Sandy loam, fine sandy loam, sandy clay loam	SP-SM, SM SP-SM, SM SC-SM, CL, SM CL, SC, SM	A-2-4, A-3 A-2-4, A-3 A-2-4, A-4, A-6 A-2-4, A-6	3.5–5.0	A
35	Wabasso fine sand, 0 to 2% slopes	0–4 4–16 16–28 28–32 32–48 48–80	Fine sand Fine sand Fine sand Fine sand Fine sandy loam, sandy clay loam Fine sandy loam, loamy fine sand, fine sand	SP-SM, SM SP-SM, SM SP-SM, SM SP-SM, SM SC-SM, CL, SC SM	A-2-4, A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-3 A-2-4, A-4, A-6 A-2-4, A-4	0.5–1.5	A/D
99	Water	--	--	--	--	--	--

3.3.2 Muck and Water Features

The study area includes portions of wetlands associated with Lake Jesup and smaller water features. Wetlands typically contain organic soil (muck) and standing water during the wet season. The water features are also likely to have muck at the lake or pond bottom. The surficial muck layer is typically a few feet thick, but relic sinkholes within lakes and wetlands can be filled with muck deposits more than 100 feet deep. Muck-filled relic sinkholes, if present, pose a significant geotechnical challenge to project development and should be avoided when possible.

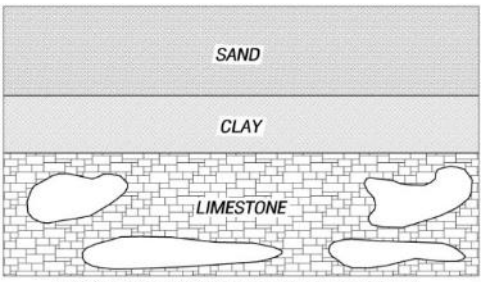
Muck is classified as A-8 in the AASHTO Soil Classification system and has severe limitations for roadway construction. It is generally unsuitable for embankment support and typically requires removal and replacement with engineered fill. Total muck removal, or treatment by means of soil surcharge, is typically required to provide adequate support for roadway embankments. Muck and water features indicated in the NRCS map are highlighted in green and black, respectively, on Figure 3-3.

Figure 3-3. NRCS Soil Survey Map

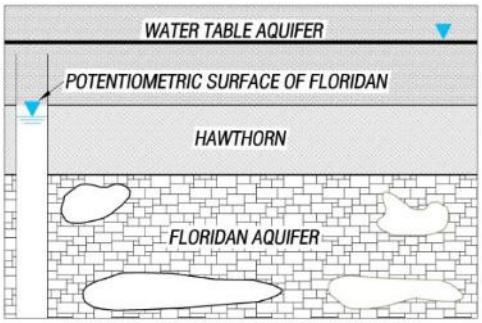


3.3.3 Regional Geology and Sinkhole Risk

Because of its prevalent geology, referred to as karst, Central Florida is prone to the formation of sinkholes, or large, circular depressions created by local subsidence of the ground surface. The nature and relationship of the three sedimentary layers typical of Central Florida geology cause sinkholes. The deepest, or basement, layer is a massive, cavernous limestone formation known as the Floridan aquifer. The Floridan aquifer limestone is overlain by a silty or clayey sand, clay, phosphate and limestone aquitard (or flow-retarding layer) ranging in thickness from nearly absent to greater than 100 feet and locally referred to as the Hawthorn Group (Hawthorn).



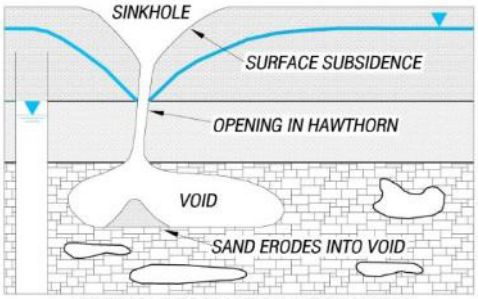
KARST GEOLOGY OF CENTRAL FLORIDA



CENTRAL FLORIDA AQUIFER SYSTEMS

The Hawthorn is in turn overlain by a 10- to 70-foot-thick surficial layer of sand, bearing the water table aquifer. The likelihood of sinkhole occurrence at a given site within the region is determined by the relationship among these three layers, specifically by the water- (and soil-) transmitting capacity of the Hawthorn at that location.

The water table aquifer is comprised of Recent and Pleistocene sands and is separated from the Eocene limestone of the Floridan aquifer by the Miocene sands, clays and limestone of the Hawthorn. Because the thickness and consistency of the Hawthorn is variable across Central Florida, the likelihood of groundwater flow from the upper to the lower aquifer (known as aquifer recharge) will also vary by geographical location. In areas where the Hawthorn is absent, water table groundwater (and associated sands) can flow downward to cavities within the limestone aquifer, like sand through an hourglass, recharging the Floridan aquifer and sometimes causing the formation of surface sinkholes. This process of subsurface erosion associated with recharging the Floridan aquifer is known as raveling. Thus, in Central Florida, areas of effective groundwater recharge to the Floridan aquifer have a higher potential for the formation of surface sinkholes.



SINKHOLE FORMATION MECHANISM

No method of geological, geotechnical or geophysical exploration is known that can accurately predict the occurrence of sinkholes. It is common geotechnical practice in Central Florida to make a qualitative prediction of sinkhole risk on the basis of local geological conditions in the vicinity of a particular site.

Based on review of the U.S. Geological Survey map (Recharge and Discharge Areas of the Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida), the project area is located in an area of no recharge, indicating a low risk of sinkhole occurrence (USGS 1984). Therefore, it appears the relative risk of sinkhole formation across the study area is low compared to the overall risk across Central Florida.

3.3.4 Subsurface Drainage

The majority of soils present within the study area are generally identified by NRCS as a dual hydrologic soil group A/D; however, Group D is the predominant soils group. Group A soils identify well-drained areas and Group D soils represent poorly drained areas. Group A soils possess low runoff potential because of their sandy, permeable nature. Group D soils have high runoff potential because of a shallow groundwater table and/or impervious near-surface silt, clay or organic fines. Group A soils can be conducive to stormwater infiltration and design of dry retention ponds. Group D soils indicate poor infiltration characteristics and are more conducive to the design of wet detention ponds. Knowledge of geotechnical conditions within the study area, as well as published sources of geotechnical data, will be used to identify soil/groundwater conditions that could impact feasibility of the concept alternatives.

3.3.5 Potentiometric Surface

According to the FDEP September 2017 Upper Floridan Aquifer Potentiometric Surface map, the potentiometric surface of the Floridan Aquifer increases from approximately 23 to 27 feet NAVD east to west across the study area. Because natural ground surface elevations in the study area are in some cases lower than the potentiometric surface, artesian flow conditions can be expected. The USGS quadrangle maps indicate there are wells located in the southwest portion of the study area. These artesian wells were likely used to provide water for cattle grazing north of Lake Jesup. Artesian conditions create limitations for certain types of deep foundations (for example, drilled shafts). For this reason, drilled shafts are not a preferred deep foundation alternative in areas with artesian ground-water conditions.

3.4 Water Resources

The project study area is within the Lake Jesup Basin, which is in the Middle St. Johns River Basin and within the jurisdiction of the St. Johns River Water Management District. The Lake Jesup Basin discharges into Lake Jesup, which ultimately outfalls to the north into the St. Johns River. Figure 3-4 shows the waterways within the study area limits.

3.4.1 Surface Water

Stormwater runoff within the study area generally drains into existing ponds and/or roadside ditches/ swales before discharging into Lake Jesup. Other waterbodies in the study area include the Navy Canal/ Phelps Creek and Chub Creek. Golden Lake and Silver Lake are adjacent to the study area to the north. Bridge crossings and culverts within the project limits are noted in Section 2.2.10, Structures.

There are four FDEP Water Body Identification numbers in the study area. Three waterbodies are verified impaired: Navy Canal/Phelps Creek (WBID 2982) for fecal coliform, Six Mile Creek (WBID 2984) for fecal coliform and Chub Creek (WBID 2985) for dissolved oxygen and fecal coliform. The other waterbody, Lake Jesup (WBID 2981), has been delisted from the impaired waterbodies list. Table 3-11 summarizes the impaired and delisted impaired waters within the study area. Within the study area, six total maximum daily load parameters of concern were identified and are presented in Table 3-11. Designated use of the surface waters identified are for fish consumption, recreation, propagation and maintenance of a healthy and well-balanced population. There are no Outstanding Florida Waters or Outstanding Florida Springs within the project study area.

Figure 3-4. Waterways within the Study Area

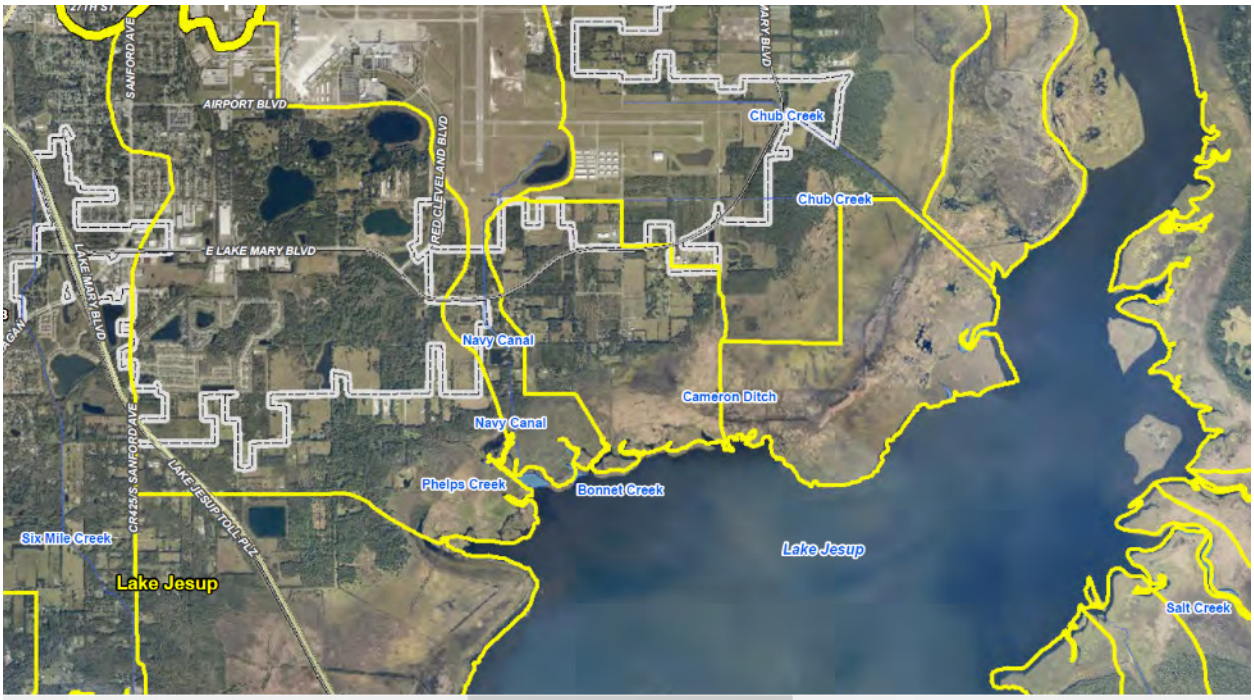


Table 3-11. Verified Impaired and Delisted Impaired Waters Within the Project Study Area

Group Name	Planning Unit	Water Segment Name	Water body Type	WBID	Water Class	TMDL Parameter(s)	Impaired Water Body
Middle St. Johns	Lake Jesup	Lake Jesup	Lake	2981	3F	Nutrients	No/Delisted
						Un-ionized Ammonia	No/Delisted
		Chub Creek	Stream	2985		Iron	No/Delisted
						Nutrients (Chlorophyll *a*)	No/Delisted
						Dissolved Oxygen	Yes
						Fecal Coliform	Yes
		Navy Canal/Phelps Creek		2982		Fecal Coliform	Yes
		Six Mile Creek		2984		Fecal Coliform	Yes

Source:
Florida Department of Environmental Protection: https://floridadep.gov/dear/watershed-assessment-section/content/assessment-lists
Florida Department of Environmental Protection Geospatial Open Data: https://geodata.dep.state.fl.us/datasets/d3bb23dc9507422a86c95eb5efc964c9/explore?location=28.718807%2C-81.245195%2C13.08

3.4.2 Drainage

The study area has a relatively flat topography with a high surface water table that primarily flows southeast toward Lake Jesup. A topographic map of the study area is shown on Figure 3-2. Land use in the developed portions of the study area consists mainly of roadways and residential properties. The undeveloped portions of the study area consist of undeveloped parcels, existing wet ponds, agricultural land, and SJRWMD conservation easements. Section 3.6.1 identifies the existing land use in the project study area.

Existing drainage along Lake Mary Boulevard and its major cross street Red Cleveland Boulevard consists of closed curb inlet systems that outfall into multiple existing permitted stormwater treatment ponds. Most of these previously permitted ponds outfall into creeks that drain southward toward Lake Jesup. According to the East Lake Mary Boulevard Construction Plans, the Navy Canal/Phelps Creek flows south through the existing bridge box culvert, noted in Section 3.2.10. The other cross streets along Lake Mary Boulevard within the study area are primarily open drainage with ditches/swales and also outfall into creeks that drain southward toward Lake Jesup. The existing drainage along SR 417 consists of both open and closed drainage systems. The open systems include roadside ditches and linear treatment swales that outfall into surrounding wetlands and creeks before ultimately discharging into Lake Jesup. The closed systems include barrier wall inlets and shoulder gutter inlets that convey stormwater runoff into the existing permitted ponds, by the toll plaza, and discharge into Lake Jesup. According to the FDEP *Basin Management Action Plan* for the Lake Jesup surrounding areas, there is an unfunded project titled, Pine Way Baffle Box, by the city of Sanford. The intent of this project is to install a second-generation baffle box adjacent to Pine Way to reduce total nitrogen by 490 pounds per year and total phosphorus by 43 lbs/year (FDEP 2019). Coordination with Seminole County, SJRWMD, the city of Sanford and FDEP is part of this CF&M Study to further understand this project and the water quality improvement goals within the study area.

3.4.3 Permits

There are new and pending developments in the study area including the recently built Wyndham Preserve (constructed 2018), Kensington Reserve (constructed 2019), Concorde (permitting approved) and Kentucky Square (permitting pending) that include wet ponds and drainage systems that are contained within the developments. Section 3.6.5 includes a detailed discussion of the planned developments within the study area. Table 3-12 documents the permits within the study area from the SJRWMD Regulator Permit Search website (SJRWMD n.d.).

Table 3-12. SJRWMD and FDEP Permits

Permit No.	Description	Year Issued	Expiration Date
110906-7	Brisson West residential development	11/3/2017	11/3/2017
22290-12	Stormwater management system for Concorde	6/22/2021	6/22/2026
65100-1	Baker's Crossing Subdivision stormwater	11/8/2000	11/8/2005
98555-1	Doan Acres residential development	10/27/2005	10/27/2010
110908-1	Pineway Estates Subdivision wet detention pond	2/29/2008	2/28/2013
110906-8	Brisson East residential development	12/12/2017	4/30/2119
181400-1	Skylar Crest Townhomes stormwater management system	5/9/2022	5/9/2027

Table 3-12. SJRWMD and FDEP Permits

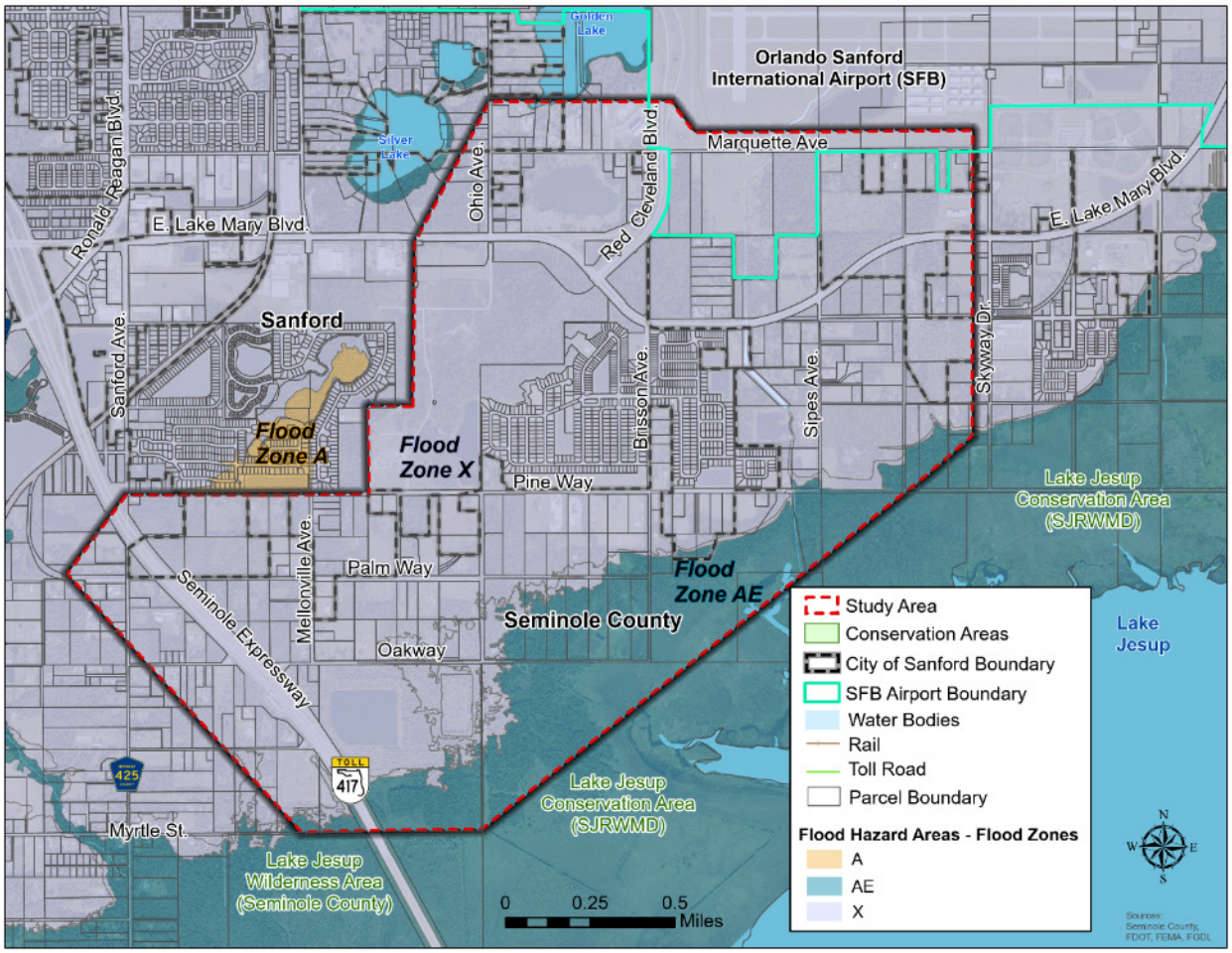
Permit No.	Description	Year Issued	Expiration Date
22496-4	East Lake Mary Boulevard Segment IIB roadway construction	4/8/2003	4/8/2008
22496-5	East Lake Mary Boulevard Segment I construction	11/12/2002	11/12/2007
22290-13	Concorde (Sylvestri Lakes) Residential development	11/4/2021	6/22/2026
22192-30	Orlando-Sanford International Airport Stormwater Master Plan	1/10/2006	1/10/2026
22367-1	Marquette Shores Borrow Pit wet detention lake system	2/9/1993	2/9/1998
59-0274533-055-EM	SR 417 (Seminole Expressway) widening from Aloma Avenue (SR 426) to SR 434	6/17/2016	5/18/2021
59-0274533-004-EI	SR 417 (Seminole Expressway) Widening from Aloma Avenue (SR 426) to SR 434	5/19/2016	5/18/2021
59-0274533-005-EM	SR 417 (Seminole Expressway) Widening from Aloma Avenue (SR 426) to SR 434 (Modification of 59-0274533-01-EI)	6/17/2016	5/18/2021
ERP59-0274533-002-EI	Seminole Expressway Widening (SR 417-Orange/Seminole County Line north to Lake Jesup	4/27/2010	4/27/2015
MS59-1733339	Seminole County, between State Road 426 and I-4 stormwater/surface water management system	5/31/1991	5/31/1996

3.4.4 Floodplains

According to the Federal Emergency Management Agency's Flood Insurance Rate Maps for Seminole County (Community Panel Numbers FM12117C0070F, FM12117C0090F, FM12117C0160F and FM12117C0180F) dated September 28, 2007, there are 100-year floodplains within the study area. The FEMA maps indicate that the floodplains are Zone X and Zone AE. Most of the study area lies in floodplain area Zone X, which are areas of minimal flooding, while Zone AE are areas that have a determined base flood elevation of 9 feet and are located in the vicinity of Lake Jesup. There are no regulatory floodways within the study area. Figure 3-5 presents the 100-year floodplains within the study area.

Seminole County Stormwater Master Plan identified a small area along Mellonville Avenue that was prone to flooding because of a series of undersized driveway culverts. Additionally, flooding in the area was attributed to the existing tailwater near the lake. The study recommended constructing a pond to the east of Mellonville Avenue and south of Pine Way to alleviate flooding concerns (CH2M 2018). Additionally, Seminole County has recently initiated the development of a Watershed Management Plan (or Drainage Basin Study) for the Lake Jesup Drainage Basin to evaluate opportunities to alleviate existing flooding and improve water quality. Coordination with Seminole County, the city of Sanford, SJRWMD and FDEP is part of this Study to document regional mitigation efforts related to the flooding and road overtopping for this area.

Figure 3-5. FEMA Floodplain Areas



3.5 Natural Environment

3.5.1 Wetlands

A preliminary assessment of wetlands and surface waters was conducted within the study area using the U.S. Fish and Wildlife Service's National Wetland Inventory Geographic Information Systems datasets and 2014 SJRWMD Florida Land Use, Cover, and Forms Classification System mapping. According to NWI, the study area contains expanses of Freshwater Forested/Shrub Wetland with Freshwater Emergent Wetland being the next most prevalent wetland habitat. The NWI dataset was averaged and summarized to include wetland categories shown in Table 3-13. Figure 3-6 depicts the areas mapped as wetlands according to NWI data.

Table 3-13. NWI Wetlands in the Study Area

NWI Wetland Type	Acres
Lake	1
Riverine	10
Freshwater Pond	75

Table 3-13. NWI Wetlands in the Study Area

NWI Wetland Type	Acres
Freshwater Emergent Wetland	170
Freshwater Forested/Shrub Wetland	390
Averaged Total	**646**

Waters of the United States, including wetlands, are regulated at the state and federal level. FDEP began the public rulemaking process of assuming the federal dredge and fill permitting program under Section 404 of the federal Clean Water Act within certain waters. The rulemaking process was completed on July 21, 2020. Through this process, Chapter 62-331 of the Florida Administrative Code, titled "State 404 Program," was created to assume requirements of federal law not already addressed by the existing Environmental Resource Program permitting. Along with minor changes to the ERP rules in Chapter 62-330 FAC, State assumption of the 404 program provides a permitting procedure where both federal and state requirements are addressed by state permits. The State 404 Program is a separate program from the existing ERP program, and projects within state-assumed waters require both an ERP and a State 404 Program authorization. The State 404 Program is responsible for overseeing federal permitting for any project proposing dredge or fill activities within state assumed waters including linear transportation projects. The U.S. Environmental Protection Agency approved Florida's program on December 17, 2020, thereby making the State 404 Program effective on December 22, 2020. The study area occurs outside of the U.S. Army Corps of Engineers retained waters area (except for a small area connected to Lake Jesup) and, therefore, a Section 404 wetland impact permit submittal for a project within the vast majority of the study area would be processed by FDEP under the State 404 program. If final design is completed for a preferred alternative, the project will likely require an individual permit under Chapter 62-330.054 FAC from the SJRWMD.

Detailed, qualitative field reviews have not yet been conducted within the study area; however, based on aerial interpretation and limited field reconnaissance, it is anticipated that wetlands within the study area are medium to high quality because of the large intact wetland systems that are hydrologically connected. Although the area is experiencing commercial and residential development, there are several undeveloped parcels within the study area. Improved pastures and horse farms may have altered the overall characteristics of wetlands over time because of horse and cattle intrusion, ditching and influx of nuisance vegetation.

CFX conducted two Environmental Advisory Group meetings during this project. A summary of those meetings is available on the project website. Other agencies, including the U.S. Fish and Wildlife Service, FDEP and the Florida Fish and Wildlife Conservation Commission will still review and comment on wetland permitting and potential effects to protected wildlife species in any potential future project phases.

Figure 3-6. National Wetlands Inventory Map

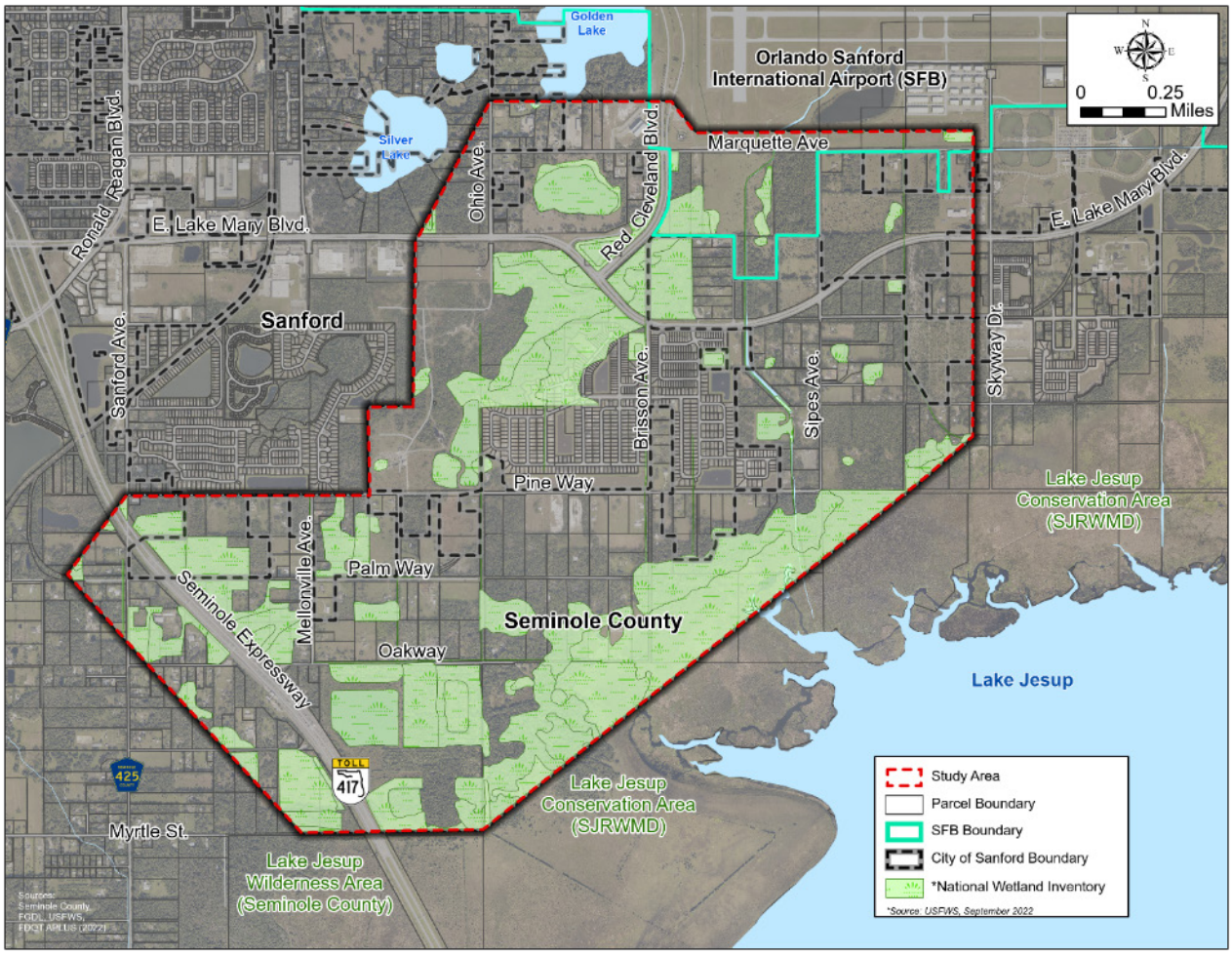


Figure 3-7 depicts the publicly available SJRWMD FLUCFCS land use types within the study area. Mixed hardwood Wetlands (FLUCFCS 6170) are the dominant FLUCFCS wetland type. Table 3-14 lists the averaged and summarized SJRWMD FLUCFCS dataset.

Figure 3-7. SJRWMD Florida Land Use, Cover and Forms Classification Land Use Types

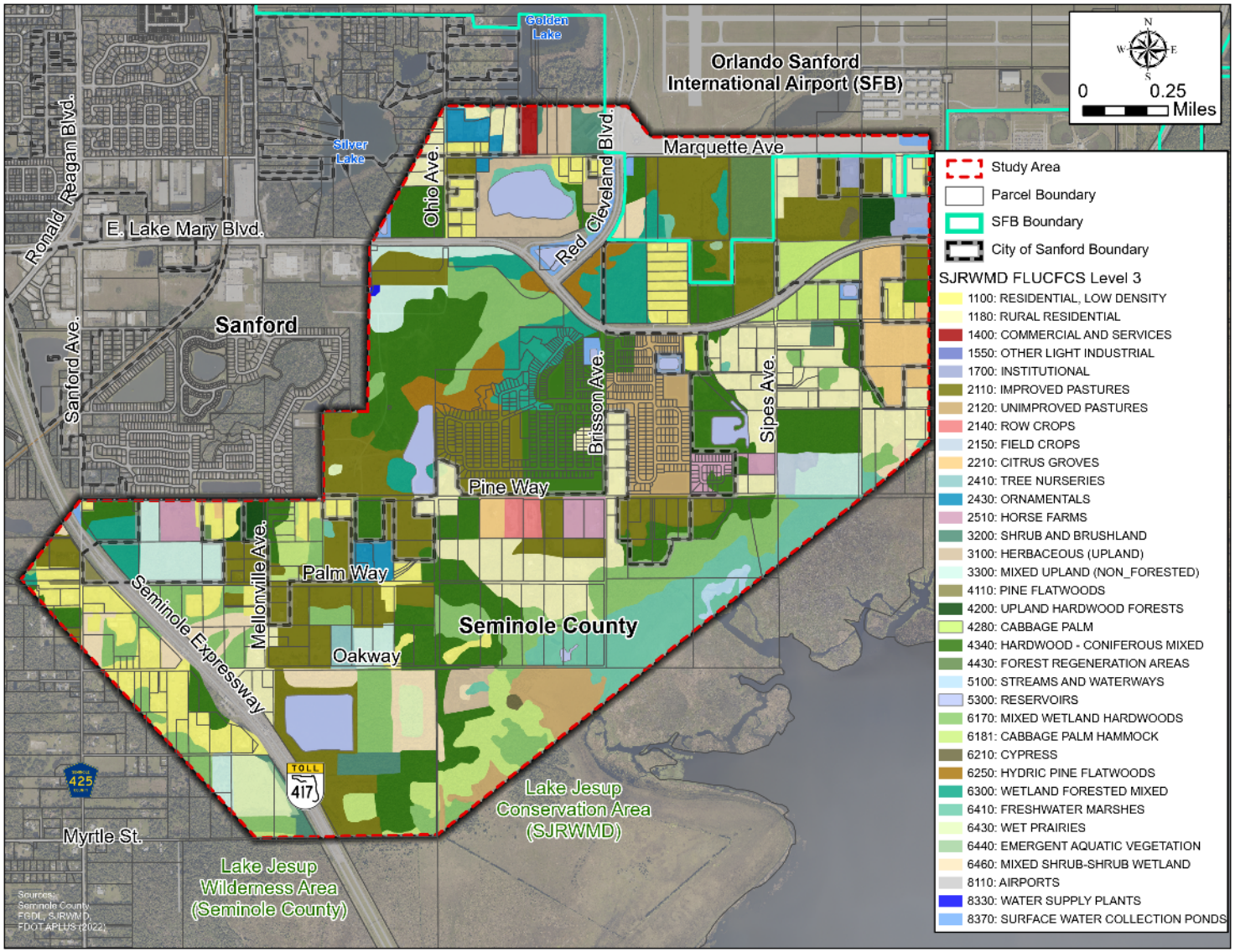


Table 3-14. FLUCFCS in the Study Area

FLUCFCS Code	FLUCFCS Description	Acres
1100	RESIDENTIAL, LOW DENSITY - LESS THAN 2 DWELLING UNITS/ACRE	139
1180	RURAL RESIDENTIAL	199
1400	COMMERCIAL AND SERVICES	5
1550	OTHER LIGHT INDUSTRIAL	<1
1700	INSTITUTIONAL	11
2110	IMPROVED PASTURES	314
2120	UNIMPROVED PASTURES	84
2140	ROW CROPS	9
2150	FIELD CROPS	6
2210	CITRUS GROVES	47
2410	TREE NURSERIES	6
2430	ORNAMENTALS	20
2510	HORSE FARMS	30
3100	HERBACEOUS UPLAND (NON-FORESTED)	44
3200	SHRUB AND BRUSHLAND	24
3300	MIXED UPLAND (NON-FORESTED)	69
4110	PINE FLATWOODS	3
4200	UPLAND HARDWOOD	14
4280	CABBAGE PALM	32
4340	UPLAND MIXED CONIFEROUS/HARDWOOD	336
4430	FOREST REGENERATION	22
5100	STREAMS AND WATERWAYS	5
5300	RESERVOIRS - PITS, PONDS, DAMMED SYSTEMS	61
6170	MIXED HARDWOOD WETLAND	185
6181	CABBAGE PALM HAMMOCK	47
6210	CYPRESS	3
6250	HYDRIC PINE FLATWOODS	29
6300	MIXED FORESTED WETLAND	83
6410	FRESHWATER MARSH	91
6430	WET PRAIRIES	23
6440	EMERGENT AQUATIC VEGETATION	2

Table 3-14. FLUCFCS in the Study Area

FLUCFCS Code	FLUCFCS Description	Acres
6460	MIXED SCRUB-SHRUB WETLAND	46
8110	AIRPORTS	36
8140	ROADS (FOUR-LANE DIVIDED WITH MEDIANS)	88
8330	WATER SUPPLY PLANTS	<1
8370	SURFACE WATER COLLECTION BASINS	17
	Averaged Total	**2,132**

3.5.2 Wildlife and Habitat Areas

The USFWS and FWC have authority to provide comments and recommendations concerning protected species. The study area was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with 50 *Code of Federal Regulations*, Part 402 of the Endangered Species Act of 1973, as amended and the Florida Endangered and Threatened Species Act, Section 379.2291, Florida Statutes. Section 7 of the ESA requires federal agencies to ensure that activities do not have a detrimental effect on the continued existence of listed species or their habitats. For some species, USFWS has designated consultation areas or critical habitat. If actions may affect state or federally listed species or critical habitats, then coordination with USFWS and FWC will be required.

Literature reviews, agency database searches, and a cursory field review of potential habitat areas were conducted to identify state and federally protected species occurring or potentially occurring within the project study area. The NRCS soil surveys of Seminole County, recent aerial imagery (2021) and SJRWMD land use/land cover mapping was reviewed to determine habitat types occurring within and adjacent to the project corridor.

Information sources and databases reviewed for the project include the following:

- Florida Natural Areas Inventory protected plant and animal species lists (current)
- NRCS soil surveys of Seminole County (current)
- Florida Fish and Wildlife Conservation Commission Eagle Nesting Dataset (updated February 21, 2023)
- Audubon Florida EagleWatch Nest Map locator (2021–2022 nesting season)
- USFWS Consultation Areas and Critical Habitat Maps (varying dates)
- USFWS–Central Florida wood stork core foraging areas (15-mile radius) (2019)
- Species specific: Sand skink (*Neoseps reynoldsi*): USFWS 2020 and UF/FGDL 2020, Scrub-jay: USFWS 2013 and FWC 1993, Wood stork (*Mycteria americana*): USFWS wood stork core foraging areas 2019, RCW: FWC 2005, Everglade snail kite (*Rostrhamus sociabilis plumbeus*): USFWS 2019
- FWC Gopher Tortoise (*Gopherus polyphemus*) Permitting Guidelines (April 2008, Revised July 2020)

The study area lies within the USFWS Consultation Area for the Audubon's crested caracara (*Polyborus plancus audubonii*), Everglade snail kite, Florida scrub-jay (*Aphelocoma coerulescens*) and the West Indian manatee (*Trichechus manatus*). Additionally, the USFWS Information for Planning and Consultation online tool identifies the following federally listed species with reasonable potential to occur in the study area: eastern black rail (*Laterallus jamaicensis jamaicensis*), wood stork, and the

eastern indigo snake (*Drymarchon corais couperi*). The IPaC also identified the candidate insect species monarch butterfly (*Danaus plexippus*) and the federally endangered plants pygmy fringe-tree (*Chionanthus pygmaeus*) and Okeechobee gourd (*Cucurbita okeechobeensis* ssp).

A review of the USFWS Critical Habitat Mapper and IPaC confirms there is no USFWS-designated critical habitat within the study area.

Biologists performed general field review surveys on September 13, 2022, and again on May 2, 2023, to identify the potential for state and or federally listed species and suitable habitat to occur in the study area. Field reviews consisted of vehicular and pedestrian surveys through natural areas and altered habitats with the potential to support protected species. In the absence of physical evidence of a protected species, evaluation of the appropriate habitat along with regional occurrence data was conducted to determine the likelihood of a species being present. Attempts were made to document the various bald eagle nests identified to occur in the study area. No bald eagle nests were observed during the limited field review, however, nest status information based on coordination with Audubon is provided below. Additional information related to potential protected wildlife involvement is described in Table 3-15. Information related to protected wildlife observations is shown on Figure 3-8.

Based on the review of available data sources described herein and field reconnaissance of the study area, a list of the state and federally listed species with the potential to occur within the study area is summarized in Table 3-15. Definitions of the likelihood of species presence/habitat proximity are provided are as follows:

- **None** – Species has been documented in Seminole County but because of absence of suitable habitat could not be naturally present within the project corridor.
- **Low** – Species with a low likelihood of occurrence within the project area are defined as those species that are known to occur in Seminole County or the bio-region, but preferred habitat is limited in the project area or the species is rare.
- **Medium** – Species with a moderate likelihood for occurrence are those species known to occur in Seminole or nearby counties and for which suitable habitat is well represented in the project area, but no observations or positive indications exist to verify presence.
- **High** – Species with a high likelihood for occurrence are suspected within the project area based on known ranges and existence of sufficient preferred habitat in the area, are known to occur adjacent to the project or have been previously observed or documented in the vicinity.

3.5.2.1 Federally Protected Wildlife

Florida Scrub-Jay (*Aphelocoma coerulescens*)

The Florida scrub-jay is designated as threatened by the USFWS and the project falls within the consultation area for the species. According to available GIS data, the nearest Florida scrub-jay observation was documented approximately 5.6 miles northeast of the study area and is recorded by the Florida Natural Areas Inventory Tracking List as observed in 1981. There are no recent documented observations within 8 miles of the study area.

Optimal scrub-jay habitat occurs on scrub ridges with well-drained to excessively well-drained soils that have scrubby oaks 3 to 9 feet in height, interspersed with 10% to 50% unvegetated sandy openings and a sand pine (*Pinus clausa*) canopy of less than 20%. The species has been documented in suboptimal habitats such as those fragmented by residential developments. Only one group of scrub-jays is documented to remain in Seminole County and Environmental Science Associates biologists manage this scrub-jay group in scrub habitat at the Seminole County's Yankee Lake Regional Water Treatment Facility. The project footprint does not contain optimal or suboptimal habitat for the Florida scrub-jay.

No Florida scrub-jays were observed during preliminary field reviews; species-specific surveys per USFWS survey protocols have not been performed.

Table 3-15. Potential Listed Species and Likelihood of Occurrence

Species	Common Name	FWC	USFWS	Habitat	Probability of Species Presence or Occurrence
Reptiles					
Drymarchon corais couperi	Eastern indigo snake	FT	T	Hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp	Medium
Gopherus polyphemus	Gopher tortoise	T	--	Old field, sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood	High
Lampropeltis extenuate	Short-tailed snake	T	--	Open, sandy soils that are well drained	Medium
Pituophis melanoleucus mugitus	Florida pine snake	T	--	Well-drained, sandy open area or longleaf pine forests, sandhills	Low
Birds					
Antigone canadensis pratensis	Florida sandhill crane	T	--	Basin marsh, depression marsh, dry prairies, marl prairie, pastures, human-altered suburban landscapes	High/Observed
Aphelocoma coerulescens	Florida scrub-jay	FT	T	Relict dune ecosystems or scrub on well drained to excessively well drained sandy soils	Low
Athene cunicularia floridana	Florida burrowing owl	T	--	Native prairies and cleared areas with short groundcover	Medium
Egretta caerulea	Little blue heron	T	--	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	High
Egretta rufescens	Reddish egret	T	--	Open, marine tidal flats and shorelines with little vegetation	Low
Egretta tricolor	Tricolored heron	T	--	Cypress domes, scrub cypress, freshwater marshes and sloughs, and sawgrass marshes	Medium
Falco sparverius paulus	Southeastern American kestrel	T	--	Sandhill, mesic flatwoods, ruderal, dry prairie	Medium
Haliaeetus leucocephalus	Bald eagle	--	*	Forests, estuarine, lacustrine, riverine, tidal marsh, tidal swamp	High
Laterallus jamaicensis	Eastern black rail	FT	T	Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps	Low

Table 3-15. Potential Listed Species and Likelihood of Occurrence

Species	Common Name	FWC	USFWS	Habitat	Probability of Species Presence or Occurrence
Mycteria americana	Wood stork	FT	T	Estuarine tidal swamps/marshes, lacustrine, seepage stream, ditches, ruderal	Medium
Platalea ajaja	Roseate spoonbill	T	--	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	High
Polyborus plancus audubonii	Audubon's crested caracara	FT	T	Wet prairies with cabbage palms	Low
Rostrhamus sociabilis plumbeus	Everglade snail kite	FE	E	Lowland freshwater marshes and littoral shelves of lakes	Medium
Mammals					
Trichechus manatus	West Indian manatee	FT	T	Estuarine, riverine, tidal marsh, tidal swamp	Low
Ursus americanus floridanus	Florida black bear	**	--	Forests and forested wetlands, bayheads	High
Insects					
Danaus plexippus	Monarch butterfly	--	C	Obligate to milkweed plants	Low
Plants					
Chionanthus pygmaeus	Pygmy Fringe-tree	FE	E	Sandhill, scrub	Low
Cucurbita okeechobeensis ssp	Okeechobee Gourd	FE	E	River basins and lake edges	Low

Sources:

USFWS = U.S. Fish and Wildlife Service status, Official lists of Threatened and Endangered species, 50 CFR 17.11 (USFWS n.d.)

Florida Fish and Wildlife Conservation Commission. 2016. Florida's Imperiled Species Management Plan. Tallahassee, Florida

FWC = Florida's Endangered and Threatened Species, Updated December 2018.

USFWS ECOS = Environmental Conservation Online System (USFWS n.d.)

FNAI = Florida Natural Areas Inventory Tracking List http://www.fnai.org/bioticssearch.cfm accessed September 2022

Notes:

In accordance with Florida Administrative Code (FAC) Title 68A-27.0012, Procedures for Listing and Removing Species from Florida's Endangered and Threatened Species List, federally endangered or threatened species under the Endangered Species Act will be listed by the FWC by their federal designation.

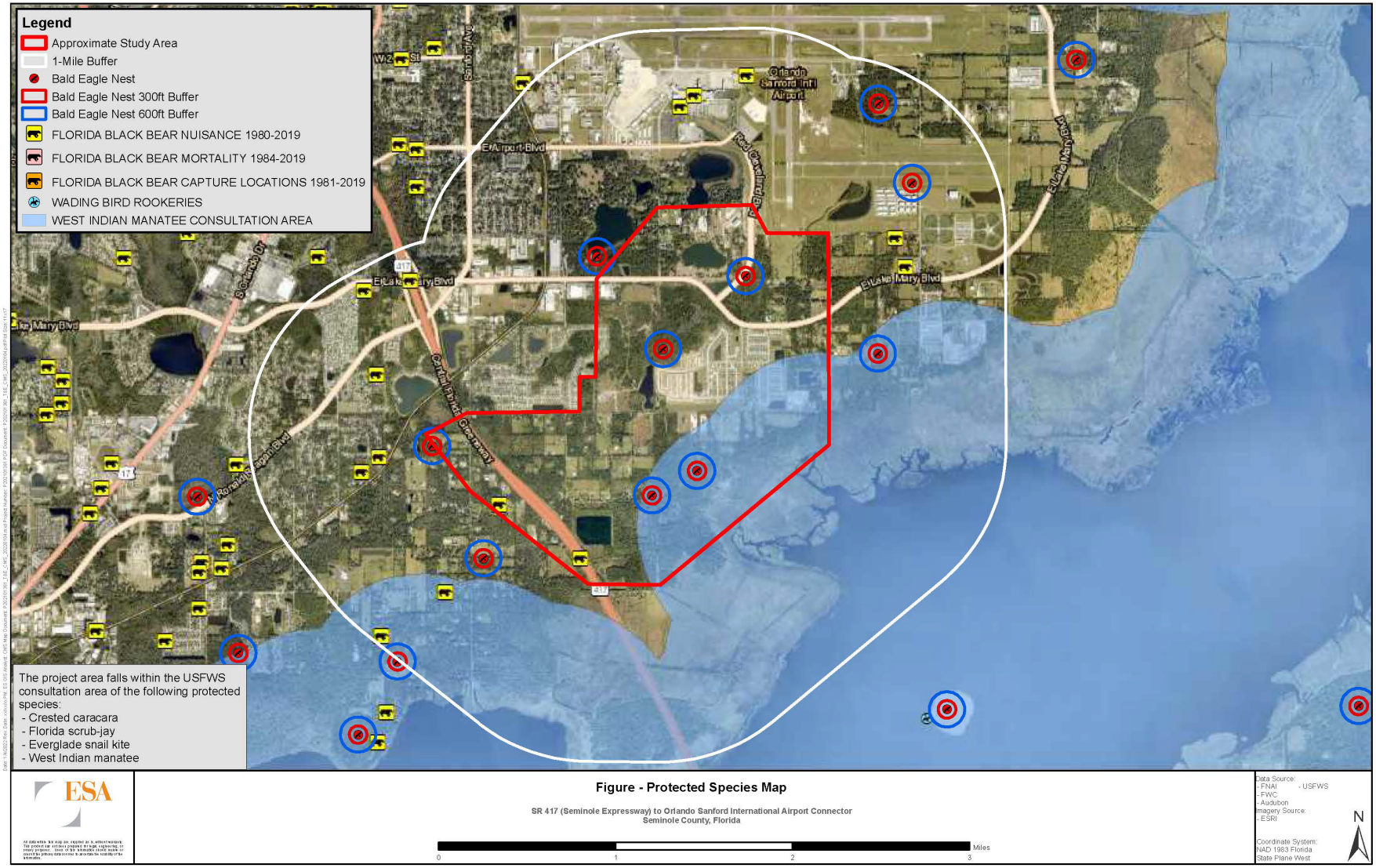
*The bald eagle is afforded federal protection through the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

**The Florida black bear is no longer listed as threatened; however, it is protected under the FAC 68A-4.009 Florida Black Bear Conservation

Key:

E = endangered, T = threatened, C = candidate for listing, FE = federally endangered, FT = federally threatened

Figure 3-8. Protected Species



Eastern Indigo Snake (*Drymarchon corais couperi*)

The eastern indigo snake is designated as threatened by the USFWS. This species may inhabit a variety of natural areas including forested uplands and wetlands as well as wet and dry prairies. There is suitable habitat within and adjacent to the study area, although there are highly developed residential areas within the study area that may limit its occurrence. Projects that have suitable habitat, potential snake refugia, and impact less than 25 acres of xeric habitat supporting less than 25 active/inactive gopher tortoise burrows will be conditioned to use the USFWS *Standard Protection Measures For the Eastern Indigo Snake* during future site preparation and project construction (USFWS 2013).

Eastern Black Rail (*Laterallus jamaicensis jamaicensis*)

The eastern black rail is a federally threatened species. It is a small, secretive marsh bird that occurs in salt, brackish and freshwater marshes, pond borders, wet meadows and grassy swamps. Some appropriate habitat is located within the study area associated with Lake Jesup.

Wood Stork (*Mycteria americana*)

The wood stork is listed as threatened by the USFWS. Wood storks are known to use freshwater marshes, swamps, lagoons, ponds, flooded fields, depressions in marshes and brackish wetlands, open pine-cypress wetlands and artificial wetlands (that is, ditches, canals and stormwater retention ponds). Wood storks are typically colonial nesters and construct their nests in medium to tall trees located within wetlands or on islands. Wood storks are known to forage within a large area, up to 40 miles, from the colony.

For Central Florida, the USFWS has defined the core foraging area for a wood stork colony as the area within a 15-mile radius from the colony location. The study area is outside of core foraging area of any known wood stork colony. As defined by the USFWS, wood stork suitable foraging habitat includes wetlands and surface waters that have areas of water that are relatively calm, uncluttered by dense thickets of aquatic vegetation, and have permanent or seasonal water depth between 2 and 15 inches.

Wood storks are likely to use the project area for foraging purposes of habitat that exists within wetlands and surface waters in and outside of the study area. No wood storks are known to have nested in the study area. Impacts to wood stork suitable foraging habitat, including swales, ditches and pond edges in the ROW, will be evaluated and replaced in-kind or mitigated in conjunction with wetland habitats during design and permitting, if deemed necessary. Mitigation may be approached through replacement of stormwater management systems and/or purchase of appropriate wetland mitigation bank credits to satisfy mitigation requirements.

Audubon's Crested Caracara (*Polyborus plancus audubonii*)

The Audubon's crested caracara is listed as threatened by the USFWS. The study area falls within the extreme northern edge of the species' consultation area. Ideal caracara habitat consists of mixtures of wet prairies with cabbage palms (*Sabal palmetto*), wooded areas with saw palmetto (*Serenoa repens*), cypress (*Taxodium* spp.), scrub oak (*Quercus inopina*) ecosystems, and open pasturelands. As caracaras sometimes forage on carrion, they are somewhat adapted to non-natural areas and opportunistically feed on roadkill. Cabbage palms are the preferred nesting location for the caracara. No caracara nests have been documented within the study area, however, potential habitat for the crested caracara is present within the study area. Surveys would be required to determine presence or absence of caracara nests and coordination with USFWS may be required to address impacts to the crested caracara if nesting is observed.

Everglade Snail Kite (*Rostrhamus sociabilis plumbeus*)

The Everglade snail kite is a subspecies of snail kite that is designated by the USFWS as endangered, and the project area falls within the consultation area for the species. No evidence of the species was observed during field surveys. The nearest documented nest observation is 28 miles south of the study area and was documented during 2011 surveys. Everglade snail kites have diets that specialize on the Florida apple snail (*Pomacea paludosa*). This prey item inhabits surface waters of central and south Florida like the canals and stormwater ponds present in the study area. These areas provide suboptimal, loosely vegetated foraging habitat for the species; therefore, the project contains suitable foraging habitat of low quality. Foraging and nesting habitat that consists of large, shallow marshes supporting the apple snail potentially exists along the eastern side of the study area associated with Lake Jesup.

West Indian Manatee (*Trichechus manatus*)

The Florida manatee is listed as threatened by USFWS and FWC. Manatees inhabit coastal waters, bays, rivers and occasionally lakes. Manatees require warm-water refugia, such as springs or cooling effluent, during cold weather events. Sheltered coves are important to the manatee for feeding, resting and calving. The study area is within the USFWS consultation area for the species. No sightings or mortalities have been documented in the study area. However, potential habitat for the manatee is present in Lake Jesup on the southeastern side of the study area.

Monarch Butterfly (*Danaus plexippus*)

The monarch butterfly is a candidate species for potential listing by the USFWS. Candidate species receive no statutory protection under the Endangered Species Act. The USFWS encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the Endangered Species Act. Monarchs lay their eggs on obligate milkweed host plants (primarily *Asclepias* spp.) during the breeding season, which could be all year in some geographic areas.

Pygmy Fringe-Tree (*Chionanthus pygmaeus*)

The federally endangered pygmy fringe-tree is a shrub or small tree, usually less than 10 feet tall that produces flowers with four narrow petals in showy white, fragrant clusters. It occurs primarily in scrub as well as high pineland, dry hammocks and sandhills primarily on the Lake Wales Ridge. It may form thickets with evergreen scrub oaks and shrubs. Land clearing for citrus and residential development has resulted in significant loss of potential habitat for the pygmy fringe-tree.

Okeechobee Gourd (*Cucurbita okeechobeensis* ssp.)

The federally endangered Okeechobee gourd is a climbing vine with leaves that have irregular serrate margins with five to seven angular, shallow lobes. Overall, the leaf blades are heart or kidney-shaped. Young leaves are covered with downy hair. The bell-shaped flowers are cream-colored and the fruit is approximately 3 inches wide, hard, inedible, round, smooth and waxy; it is light green with pale stripes when mature. It was once abundant in the mucky soils of the lower Kissimmee River basin but is now only known from a few sites around Lake Okeechobee and along the St. Johns River.

3.5.2.2 State-Protected Wildlife Species

Florida Sandhill Crane (*Antigone canadensis pratensis*)

The Florida sandhill crane is listed as threatened by the FWC. Nesting habitat consists of shallow, vegetated freshwater marshes. Cranes will construct nests on fairly isolated rafts of vegetation to limit

access by predators. The Florida sandhill crane forages on insects, small vertebrates and plant matter in prairies, pastures and also maintained roadside edges. Potential nesting and foraging habitat for the sandhill crane exists within the study area and multiple sandhill cranes were observed in several areas within the study area during a field review. Pre-construction surveys would be required to determine presence or absence of sandhill crane nests. Coordination with FWC may be required to address impacts to the Florida sandhill crane if nesting is observed.

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is designated by the FWC as threatened. The nearest recorded observation occurred 16.2 miles west of the study area in 1989. Natural habitats include dry prairies and sandhill; however, burrowing owls can also inhabit urban and ruderal areas such as pastures, agricultural lands and parks. Potential habitat for the burrowing owl is present within the study area. Surveys would be required to determine presence or absence of Florida burrowing owl burrows. Coordination with FWC may be required to address impacts to the Florida burrowing owl, if burrows are observed.

Southeastern American Kestrel (*Falco spaverius paulus*)

The southeastern American kestrel is listed by the FWC as threatened. This kestrel species inhabits sandhills, mesic flatwoods and open pastures; nests in cavities of dead trees or utility poles that are not surrounded by tall vegetation; and is commonly observed perched on power lines in rural to suburban areas. Suboptimal but potentially suitable ruderal open areas that may provide foraging habitat for the species occur within the study area. Appropriate cavity trees or poles for nesting may also be found within the project footprint; however, no individuals were observed during field surveys. Potential habitat for the kestrel is present within the study area. Surveys would be required to determine presence or absence of southeastern American kestrel nest cavities. Coordination with FWC may be required to address impacts to this specie, if nesting cavities are observed.

Gopher Tortoise (*Gopherus polyphemus*)

The gopher tortoise is listed by the FWC as threatened. Gopher tortoise burrows provide habitat for many commensal species. Ideal habitats include xeric areas with sandy soils and open canopy with low groundcover. The gopher tortoise feeds primarily on new shoots of grasses and broad-leaf herbs, but may also consume mushrooms, fleshy fruit and some animal matter. Appropriate habitat exists for the gopher tortoise; however, no individuals or burrows were observed during preliminary field reviews. A comprehensive gopher tortoise burrow survey in accordance with FWC guidelines would be required prior to construction.

Short-tailed Snake (*Lampropeltis extenuate*)

The short-tailed snake is listed by the FWC as threatened. Ideal habitat for the species consists of open, sandy soils that are well-drained. Canopy cover should be moderate to open longleaf pine and xeric oak sandhills. The short-tailed snake is fossorial (adapted for living underground), which makes observations difficult. They are only found from the Suwannee River south to Highlands County. There is limited suboptimal habitat within the study area.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake is listed by the FWC as threatened. Ideal habitat for the species consists of open, sandy soils that are well drained. Canopy cover should be moderate to open and longleaf pine or other softwoods are ideal. The Florida pine snake is also considered a gopher tortoise commensal species. The nearest documented Florida pine snake observations include one located approximately 1.9 miles

northwest in 1936. The next nearest pine snake observations are also historic, occurring in the 1930s, 1950s and 1970s. There is limited habitat within the study area and surrounding area.

Wading Birds

Wading birds such as the little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), tricolored heron (*Egretta tricolor*) and roseate spoonbill (*Platalea ajaja*) are listed by the FWC as threatened and are afforded some levels of federal protection by the Migratory Bird Treaty Act (16 U.S.C. 703-712). Though no state-listed wading birds were observed in the study area during field surveys, it is likely these species forage within wetlands, stormwater facilities and surface waters within the project area. Nesting habitat for these wading birds would consist of relatively isolated islands of shrubs and trees out of the reach of predators, such as raccoons. Coordination with FWC may be required to address impacts to protected wading birds, depending on the potential alignments.

3.5.2.3 Protected Non-Listed Wildlife Species

Bald Eagle (*Haliaeetus leucocephalus*)

This species receives federal protection under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Bald eagle nests are generally built high in pine trees, with the nest being used year after year by the same pair. The nests are typically located near lakes, marshes or coastlines where foraging habitat is available. Based on the Audubon EagleWatch 2021–2022 data, six bald eagle nests have been identified within the study area or just outside of the study area, but within a 660-foot buffer. The study team coordinated with Audubon EagleWatch in January and May 2023 and obtained the following nest status information:

- SE025 occurs north of Oakway Road. Audubon reported it as occupied during the 2021 season. – this nest is active and is believed to have chicks present in 2023.
- SE026 is located adjacent to new development occurring off of Swinstead Drive. Residents of Kensington Reserve have confirmed in March 2023 that the location of nest SE026 is in the woods between Lake Mary Boulevard and the house community. They confirmed that the nest location on the EagleWatch map is fairly accurate. The nest is active with at least one large eaglet present, per photos provided by a resident to Audubon.
- SE028 occurs along Eagle View Cove. This nest has grown difficult to view due to foliage growth. Bald eagles have been seen in the area but Audubon does not think they are using this nest and likely have an alternate nest that they have not found yet.
- SE078 occurs along Red Cleveland Boulevard. The eagle pair at this nest is exhibiting incubation behaviors.
- SE049 occurs north of Old Western Trail. This nest is active and is believed to have chicks present.
- An eagle nest not included in the Audubon EagleWatch program was identified through coordination with the public. The nest is located just south of Palm Way and was field-verified in May 2023 as an active nest.

Additional field surveys should be conducted during future eagle nesting seasons, and once future potential alignments have been determined, to assess for activity/occupancy and address potential impacts.

Florida Black Bear (*Ursus americanus floridanus*)

The Florida black bear is no longer listed as a threatened species by the FWC. Although it was removed from the state list of protected species in August 2012, it is still protected through the FAC 68A-4.009 titled *Florida Black Bear Conservation*. The FWC's bear mapping unit indicates black bear mortalities have occurred outside of the study area. Nuisance Florida black bears have been documented within the study area. No signs of Florida black bears were observed within the study area during field reviews.

3.5.3 Essential Fish Habitat

A review of the National Marine Fisheries Service essential fish habitat GIS data and literature was conducted and no EFH or Habitat Areas of Particular Concern were noted.

3.5.4 Conservation and Mitigation Areas

Considering the project area's proximity to Lake Jesup Conservation Area (including approximately 90 acres in the study area) and Lake Jesup Wilderness Area, a variety of natural resources including environmentally sensitive lands, wetlands and conservation lands are present. The Lake Jesup Conservation Area is located within the southeast portion of the study area and is state-owned conservation land managed by the SJRWMD. The southwestern end of the project study area borders the Lake Jesup Wilderness Area, which is part of the Seminole County Natural Lands Program.

One of the future project challenges will be to avoid wetlands and mitigate wetland impacts, as much of the undeveloped land in the study area is wetlands under regulatory conservation easement. Any impacts to existing regulatory conservation easements may require amendment approval from the SJRWMD and additional mitigation to offset the previous mitigation. Amendments may include modifying previously permitted actions under the USACE Section 404 permit, which is now under the FDEP State 404 program. A second wetland mitigation option is purchasing credits from a mitigation bank (discussed in more detail in Section 7.1.6). Collaborative approaches with state and county owners of lands already in conservation may need to be accomplished to determine if there are 1) any hydrologic restoration needs that could provide wetland mitigation credits and/or 2) if there are any 'missing link' parcels in the watershed that could be purchased, restored and placed under regulatory conservation easement.

3.5.5 Special Designations or Natural Features

Publicly available data was reviewed for additional areas with special designations or natural features that have not already been described and no additional resources were identified.

3.6 Social Environment

3.6.1 Existing Land Use

Based on Seminole County's existing land use GIS data, a majority of the study area is comprised of residential, agricultural and undeveloped land (Seminole County n.d.). In addition, SFB property within the study area totals approximately 117.5 acres (5.5 % of study area), while managed environmental lands equals approximately 133.8 acres (6.3 % of study area). It should be noted that approximately 55% of undeveloped land in the study area is planned for future developments. Table 3-16 summarizes the existing land use. Figure 3-9 presents the existing land use map.

Table 3-16. Existing Land Use within Study Area

Land Use Type	Total Acres	Percent of Study Area
Residential	627.1	29.5%
Commercial/Office	7.0	0.3%
Industrial	4.1	0.2%
Agricultural	329.7	15.5%
Institutional	17.1	0.8%
Managed Environmental Lands	133.8	6.3%
Public	66.5	3.1%
Undeveloped	636.8	29.9%
SFB Property	117.5	5.5%
No Data	187.7	8.8%
Total	2127.4	100.0%

3.6.2 Community and Neighborhood Features

Table 3-17 and Figure 3-9 show community facilities identified within a 500-foot buffer area of influence surrounding the study area.

In addition to SFB, eight community focal points were identified within the study area. Other major community focal points in the study area are public recreational facilities. Boombah Sports Complex is located just east of the study area on Lake Mary Boulevard, and two trailheads are located on the south and east side of the study area at Lake Jesup Wilderness Area and Lake Jesup Conservation Area, respectively. Other community features include two churches, a charter school serving children from pre-kindergarten through middle school and a reserve center for the U.S. Army.

Figure 3-9. Existing Land Use

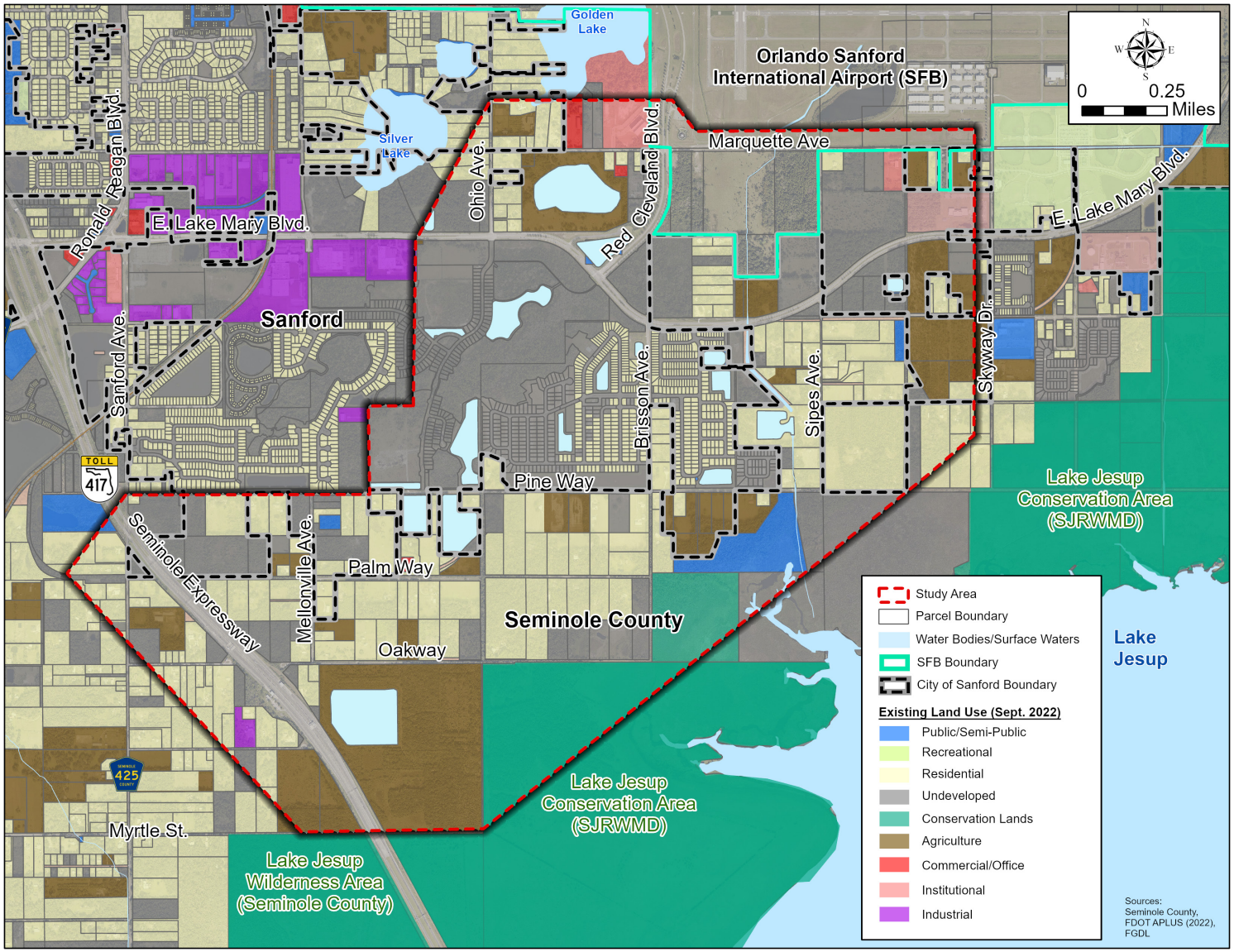


Table 3-17. Community Facilities

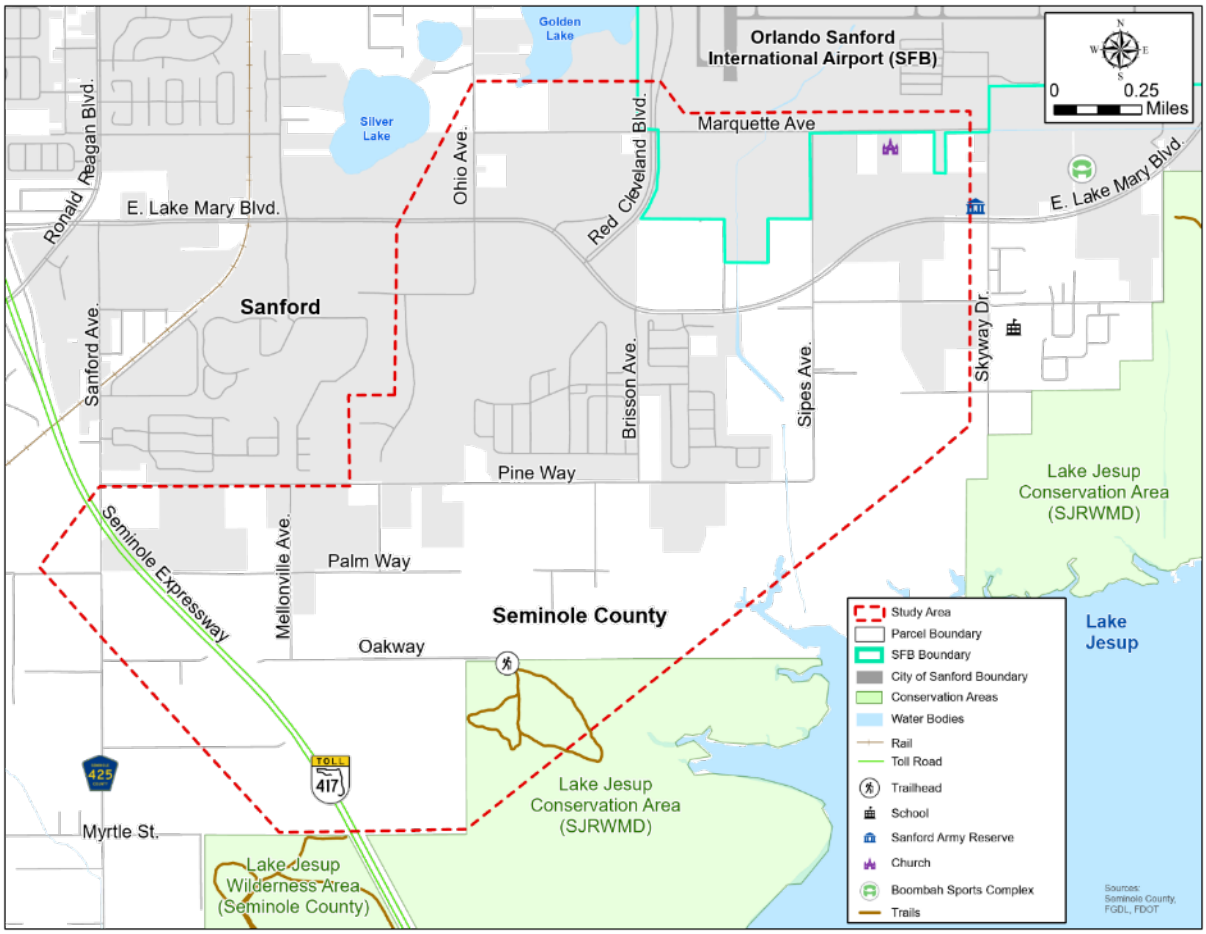
Site Name	Location	Jurisdiction	Type of Facility
Orlando Sanford International Airport	1200 Red Cleveland Blvd., Sanford, FL 32773	city of Sanford	Multimodal Transport Hub
Sanford Army Reserve Center	3566 Skyway Dr., Sanford, FL 32773	city of Sanford	Government Facility
Mount Zion Missionary Baptist Church	2004 Sipes Ave S., Sanford, FL 32773	Seminole County	Religious Facility
Iglesia Christiana Bethel	2999 Marquette Ave, Sanford, FL 32773	city of Sanford	Religious Facility
Galileo School for Gifted Learning–Skyway Campus	3755 Skyway Dr., Sanford, FL 32773	Seminole County	School
Boombah Sports Complex	3450 E Lake Mary Blvd., Sanford, FL 32773	city of Sanford	Recreational Facility
Marl Bed Flats Tract Trailhead	1799 Oakway, Sanford, FL 32773	Seminole County	Recreational Facility
Lake Jesup Conservation Area North Cameron Tract Trailhead	3823-3919 Cameron Ave, Sanford, FL 32773	Seminole County	Recreational Facility

3.6.3 Demographics Characteristics

The socioeconomic characteristics of the population near the study area were examined to ensure the project does not involve disproportionately high or adverse potential effects to impact minority and low-income populations. Demographic data was collected from the American Community Survey (ACS) 2020 Five-Year Estimates primarily at the *Census Block Group* level. Where this granularity was unavailable, *Census Tract* data was collected. The study area is bifurcated by two block groups, 12117021000.1 (northern) and 1211702100.2 (southern), which comprise Census Tract 210 in Seminole County. Table 3-18 compares various population characteristics of Seminole County and the study area, while Table 3-19 focuses on household characteristics.

Compared to Seminole County (27%), the study area has a larger proportion (45%) of minority (non-White) population groups, primarily individuals identifying as *Asian* or *Two or More Races*. However, the study area has a smaller proportion of Hispanic individuals than Seminole County. The median age of the study area (38.5 years) is slightly lower than Seminole County's median age (41.1). Approximately 12% of the study area's population is 65 years and older, which is less than the Seminole County average. There were no Spanish limited English proficiency households within the study area, and a similar proportion of Indo-European LEP households compared to the Seminole County average. However, approximately 6.7% of households in the study area are Asian LEP households, which is higher than the Seminole County average (0.5%). Upon further investigation, there are nearly 300 Vietnamese-speaking individuals older than 5 years who speak English "less than very well," comprising 7% of the study area population.

Figure 3-10. Existing Community Facilities



The employment rate for civilians in the labor force aged 16 and older is comparable between the study area (96%) and Seminole County (95%). The study area has a smaller percentage of individuals below the poverty level (5%) than Seminole County (10%). The median household income for the study area is also higher than Seminole County's median household income. The proportion of households with no vehicle available was nearly identical across the study area and Seminole County.

Table 3-18. Population Characteristics

	Seminole County, FL		Study Area (2 Block Groups)		1170210001 (Northern Block Group)		1170210002 (Southern Block Group)	
	#	%	#	%	#	%	#	%
Total Population[ab]	466,695	--	4,579	100%	2,744	--	1,835	--
Race[a]								
White	339,282	72.7%	2,537	55.4%	973	35.5%	1,564	85.2%
Black or African American	55,780	12.0%	602	13.1%	583	21.2%	19	1.0%
American Indian and Alaska Native	1,120	0.2%	38	0.8%	38	1.4%	--	0.0%
Asian	22,063	4.7%	624	13.6%	492	17.9%	132	7.2%
Native Hawaiian and Other Pacific Islander	209	0.0%	5	0.1%	5	0.2%	--	0.0%
Some Other Race	21,650	4.6%	65	1.4%	65	2.4%	--	0.0%
Two or More Races	26,591	5.7%	708	15.5%	588	21.4%	120	6.5%
Ethnicity[ab]								
Hispanic or Latino (of any race)	102,310	21.9%	542	11.8%	303	11.0%	239	13.0%
Not Hispanic or Latino	364,385	78.1%	4,037	88.2%	2,441	89.0%	1,596	87.0%
Median Age[ab]	**41.1**	**--**	**38.5**	**--**	**33.5**	**--**	**43.4**	**--**
Elderly Population (65 years and older)[a]	72,481	15.5%	562	12.3%	255	9.3%	307	16.7%
Persons in Civilian Labor Force[ab]	**251,761**	**--**	**2,350**	**--**	**1,581**	**--**	**769**	**--**
Employed	240,266	95.4%	2,263	96.3%	1,525	96.5%	738	96.0%
Unemployed	11,495	4.6%	87	3.7%	56	3.5%	31	4.0%
Persons Below Poverty Level[ab]	**45,273**	**9.8%**	**226**	**4.9%**	**177**	**6.5%**	**49**	**2.7%**

[a] ACS 2020 Five Year Estimates: Block Group.

[b] ACS 2020 Five Year Estimates: Census Tract.

Table 3-19. Household Characteristics

	Seminole County, FL		Study Area (2 Block Groups)		1170210001 (Northern Block Group)		1170210002 (Southern Block Group)	
	#	%	#	%	#	%	#	%
Housing Units	**192,073**	--	**1,710**	--	**1,067**	--	**643**	--
Occupied	178,094	92.7%	1,542	90.2%	929	87.1%	613	95.3%
Vacant	13,979	7.3%	168	9.8%	138	12.9%	30	4.7%
Total Households[a]	**178,094**	--	**1,542**	--	**929**	--	**613**	--
Owner-Occupied	117,211	65.8%	1,208	78.3%	664	71.5%	544	88.7%
Renter-Occupied	60,883	34.2%	334	21.7%	265	28.5%	69	11.3%
Average Household Size[b]	**2.63**	--	**2.97**	--	**2.97**	--	**2.97**	--
Median Household Income[a]	$73,214.67	--	$84,315.50	--	$76,801.00	--	$91,830.00	--
Households with Limited English Proficiency[a]								
Spanish LEP	4,224	2.4%	--	0.0%	--	0.0%	--	0.0%
Indo-European LEP	677	0.4%	11	0.7%	11	1.2%	--	0.0%
Asian LEP	641	0.5%	81	6.7%	76	8.2%	5	0.8%
Houses with No Vehicle Available	**6,455**	**3.6%**	**51**	**3.3%**	**51**	**5.5%**	**--**	**0.0%**

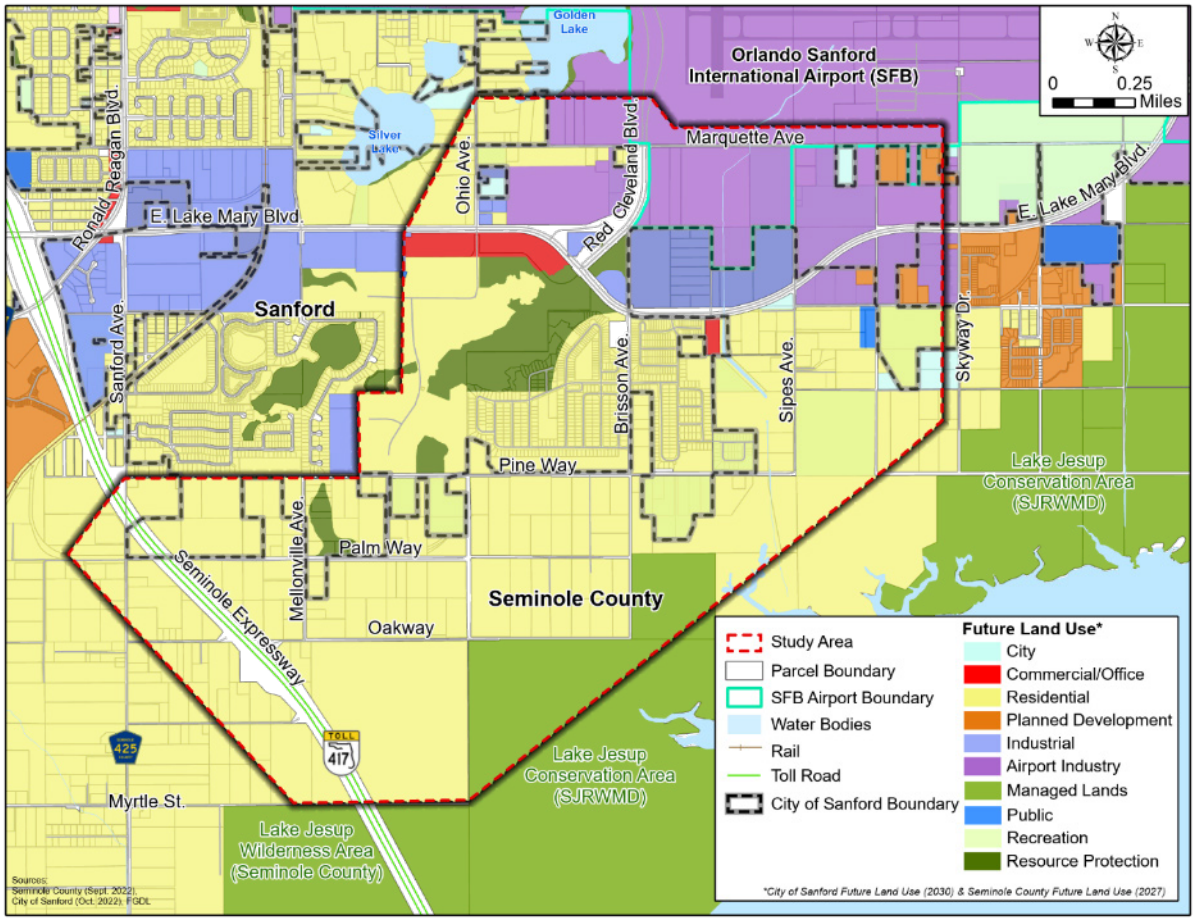
[a] ACS 2020 Five Year Estimates: Block Group.

[b] ACS 2020 Five Year Estimates: Census Tract

3.6.4 Future Land Use

Future Land Use within the study area was determined based on the Seminole County's 2027 Future Land Use data and the city of Sanford's 2030 Future Land Use data. Figure 3-11 presents the Future Land Use map. The majority of the future land use within the study area is residential and is anticipated to not change. The commercial/office and industrial land uses along East Lake Mary Boulevard within the study area are undeveloped land. However, multiple commercial and industrial developments are planned.

Figure 3-11. Future Land Use Map



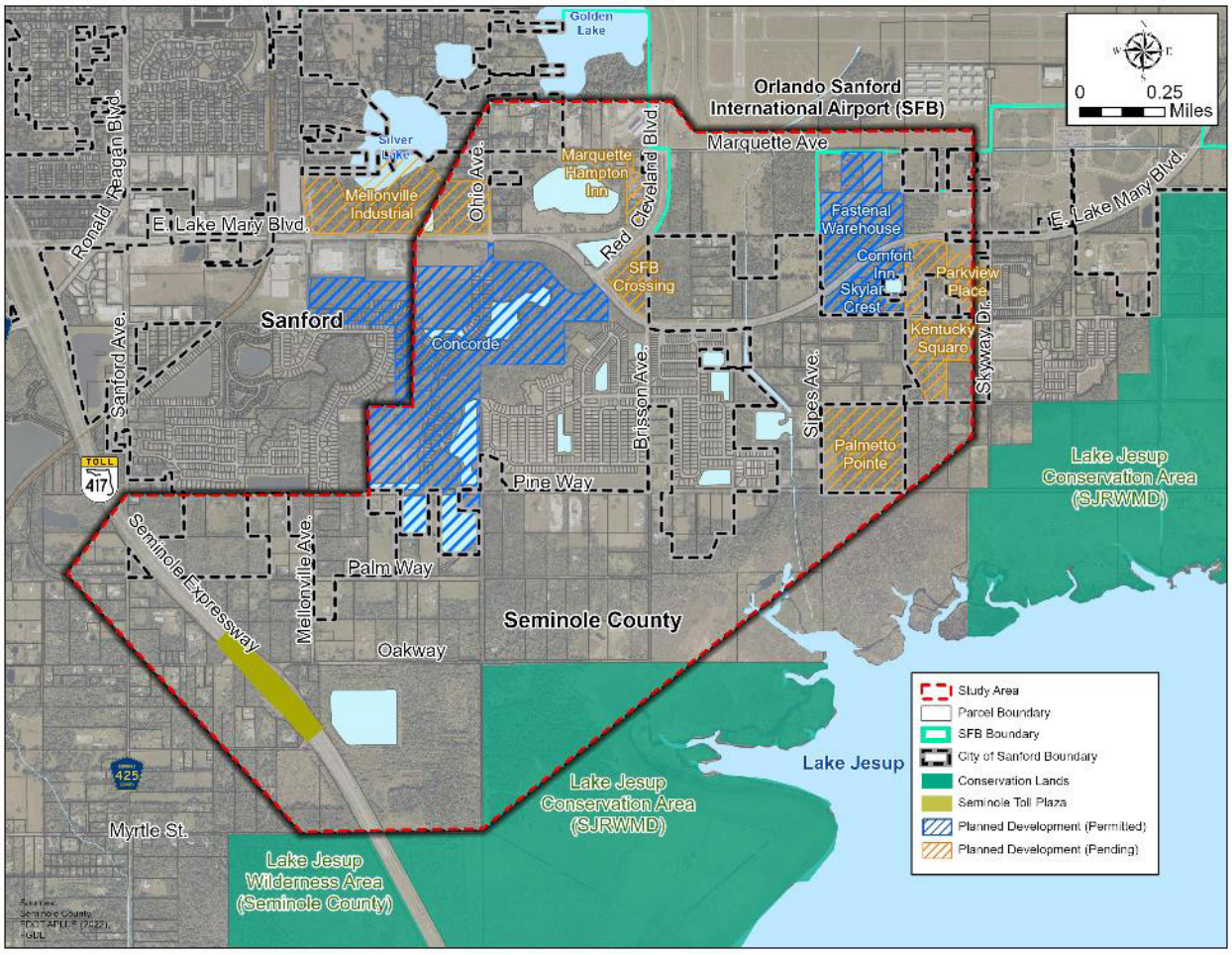
3.6.5 Planned Developments

There are several planned development projects within the study area and are summarized in Table 3-20. Figure 3-12 presents the planned developments within and adjacent to the study area. The following subsections provide further details on each planned development.

Table 3-20. Planned Developments

Development Name	Owner	Location	Description	Permitting
Comfort Inn	Airsan Investments, LLC	SE Quadrant–East Lake Mary Boulevard and Sipes Avenue, Sanford FL	Mixed-use	Site Development Permit (city of Sanford) Approved 3/7/2022
Concorde	DR Horton	2401 E. Lake Mary Blvd., Sanford, FL	Residential	Site Development Permit (city of Sanford) Approved 7/22/2021
Mellonville Industrial	Mellonville Holdings, LLC	2100 E. Lake Mary Blvd., Sanford, FL	Industrial	Comprehensive Plan Amendment (city of Sanford) Approved 7/5/2022
Palmetto Pointe	AMH Development, LLC	3981 Sipes Ave., Sanford, FL	Residential	Property annexed by the city of Sanford on 05/9/2022 Development/ Engineering/ Site Plan (city of Sanford) pending approval
SFB Crossing	Red Cleveland Partners, LLC	171 Red Cleveland Blvd., Sanford, FL	Planned Development	Planned Development Rezone (city of Sanford) Approved 1/10/2022
Marquette Hampton Inn	Palmetto Property Partners, LLC	2247 Marquette Ave., Sanford, FL	Mixed-Use	Development/ Engineering/ Site Plan (city of Sanford) Pending
Skylar Crest	Pulte Homes Company, LLC	3100 Kentucky St., Sanford, FL	Planned Development	Site Development Permit (city of Sanford) Approved 9/22/2022
Parkview Place	DP & DP Inc, Takvorian Properties, LLC	3600 Skyway Dr., Sanford, FL	Planned Development	Planned Development Rezone (city of Sanford) Approved 2/9/2022
Kentucky Square	LS-LCF CA LLC	3700 Kentucky St., Sanford, FL	Planned Development	Planned Development Rezone (city of Sanford) Approved 3/3/2022
Fastenal Warehouse	Fastenal Co.	2915 Marquette Ave., Sanford, FL	Industrial	Planning and Zoning Compliance Review Awaiting hearing
Silver Lakes Industrial Park	Safari Investments	100 Silvervista Blvd., Sanford, FL	Commercial/ Industrial	Development/ Engineering/ Site Plan (city of Sanford) Pending

Figure 3-12. Planned Developments



3.6.5.1 City of Sanford

Comfort Inn

A Comfort Inn is a planned hotel development under construction on the southeast quadrant of East Lake Mary Boulevard and Sipes Avenue in Sanford, Florida. The master site plan includes:

- 110 hotel rooms
- Total of 48,312 square feet of hotel rooms
- Four levels
- Landscape and irrigation

Concorde

Concorde is a planned residential development located at 2401 E. Lake Mary Blvd. in Sanford, Florida. As of April 2023, the site development permit has been approved, and the site development work is underway. The master site plan includes:

- 214 acres total site area
- 421 single-family lots
- Two new access roads to East Lake Mary Boulevard

- Approximately 73 acres of SJRWMD Regulatory Conservation Easements
- Six retention ponds

Mellonville Industrial

Mellonville Industrial is a proposed industrial development located at the northeast corner of East Lake Mary Boulevard and Mellonville Avenue. The site development permit is not approved. The master site plan includes:

- Five buildings (total of 564,400 square feet)
- Parking infrastructure
- Proposal of two dry retention ponds

Palmetto Pointe

A planned residential development is located at 3981 Sipes Avenue in Sanford, Florida. The property was annexed by the city of Sanford on May 9, 2022. As of April 2023, the site development permit has not been approved. The master site plan includes:

- 39.76 acres total site area
- 100 single-family lots
- 4.83 acres stormwater pond

SFB Crossing

SFB Crossing is a planned mixed-use project consisting of retail and other commercial services, located at 171 Red Cleveland Blvd. in Sanford, Florida. The site development permit has not been approved. The master site plan includes:

- 9.35 acres total site area
- Gas station, retail and parking
- Various proposed uses including:
  - Public/semi-public
  - Commercial
  - Transient lodging/entertainment
  - Miscellaneous businesses and services

Marquette Hampton Inn

The Marquette Hampton Inn is a mixed-use planned development located at 2247 Marquette Ave. in Sanford, Florida. The associated site development permit is pending, as of April 2023. The master site plan includes:

- 6.4 acres total site area
- 104 hotel rooms
- Up to three additional developments on property may include restaurants, banks and/or convenience stores

Skylar Crest

Skylar Crest is a proposed townhome development located at 3100 Kentucky St. in Sanford, Florida. The associated site development was approved September 22, 2022. The master site plan includes:

- 14.69 acres total site area

- 94 townhome units

Parkview Place

Parkview Place is a proposed townhome development with an additional commercial outparcel located at 3600 Skyway Dr.in Sanford, Florida. The site development permit has not been approved. The master site plan includes:

- 14.94 acres total site area
- 85 units
- One commercial outparcel

Kentucky Square

Kentucky Square is a planned development of single-family residential lots located at 3700 Kentucky St. in Sanford, Florida. The site development permit has not been approved. The master site plan includes:

- 149 single-family residential lots
- Two commercial outparcels with associated open space
- Stormwater ponds

Fastenal Warehouse

The Fastenal Warehouse is a planned industrial development project that is located at 2915 Marquette Ave. in Sanford, Florida. The site development permit was approved on February 23, 2023. The master site plan includes:

- 37.08 acres total site area
- 316,000 square feet of office/warehouse space

Silver Lakes Industrial Park

The Silver Lake Industrial Park is a planned industrial/commercial development project that is located at 100 Silvervista Boulevard in Sanford, Florida. As of April 2023, the site development permit has not been approved. The master site plan includes:

- Infrastructure for future outparcels (spine road and stormwater/sewer utilities)

3.6.5.2 Seminole County

As of November 2022, no planned developments are proposed within Seminole County's jurisdiction based on a review of permit applications (Seminole County 2021a).

3.6.6 Mobility and Multimodal Features

3.6.6.1 Transit Facilities

A desktop review of Central Florida Regional Transportation Authority's (also known as LYNX) existing and planned services within and adjacent to the study area was conducted. Based on LYNX's existing transit routes and stops, there is no existing LYNX bus service within the study area.

As of October 2022, LYNX was undergoing a major update to their 10-year Transit Development Plan. Therefore, this study reviewed the previously completed *LYNX Vision 2030* (adopted October 2011), which is used to guide transit development in the region through the year 2030. According to the 2011 plan, an Express Bus route from the University of Central Florida to the city of Sanford was identified as

a need in 2030. This proposed route would generally run from UCF, along SR 434 to SR 417 and then to the city of Sanford.

In January 2021, LYNX developed the *Seminole County Transit Plan*, which identified three future services within the study area: two fixed-route services and one NeighborLink flex service. One proposed fixed-route service is a regional express service that runs from the Lake Mary SunRail Station to UCF generally along SR 417. The other proposed fixed-route service is a local stop route running from the Lake Mary SunRail Station to SFB via East Lake Mary Boulevard, US 17-92 and Airport Boulevard. The proposed NeighborLink flex service offers service from the Seminole Centre Superstop to points in East Sanford, including SFB (CTG 2021).

3.6.6.2 Freight and Intermodal Centers

According to FDOT's Interactive Strategic Intermodal System Map (FDOT n.d.), several Strategic Intermodal System facilities are within the study area, including SR 417 and two Strategic Growth Highway Connectors: East Lake Mary Boulevard from SR 417 to Red Cleveland Boulevard and Red Cleveland Boulevard from East Lake Mary Boulevard to Airport Boulevard. In addition, the SFB airport is designated as a Strategic Intermodal System Strategic Growth Commercial Service Airport.

The SFB property is located in the northern portion of the study area and serves as a freight and intermodal facility for the region. Roadway access into the airport is provided by Red Cleveland Boulevard via East Lake Mary Boulevard, Airport Boulevard and Wylly Avenue via Sanford Avenue.

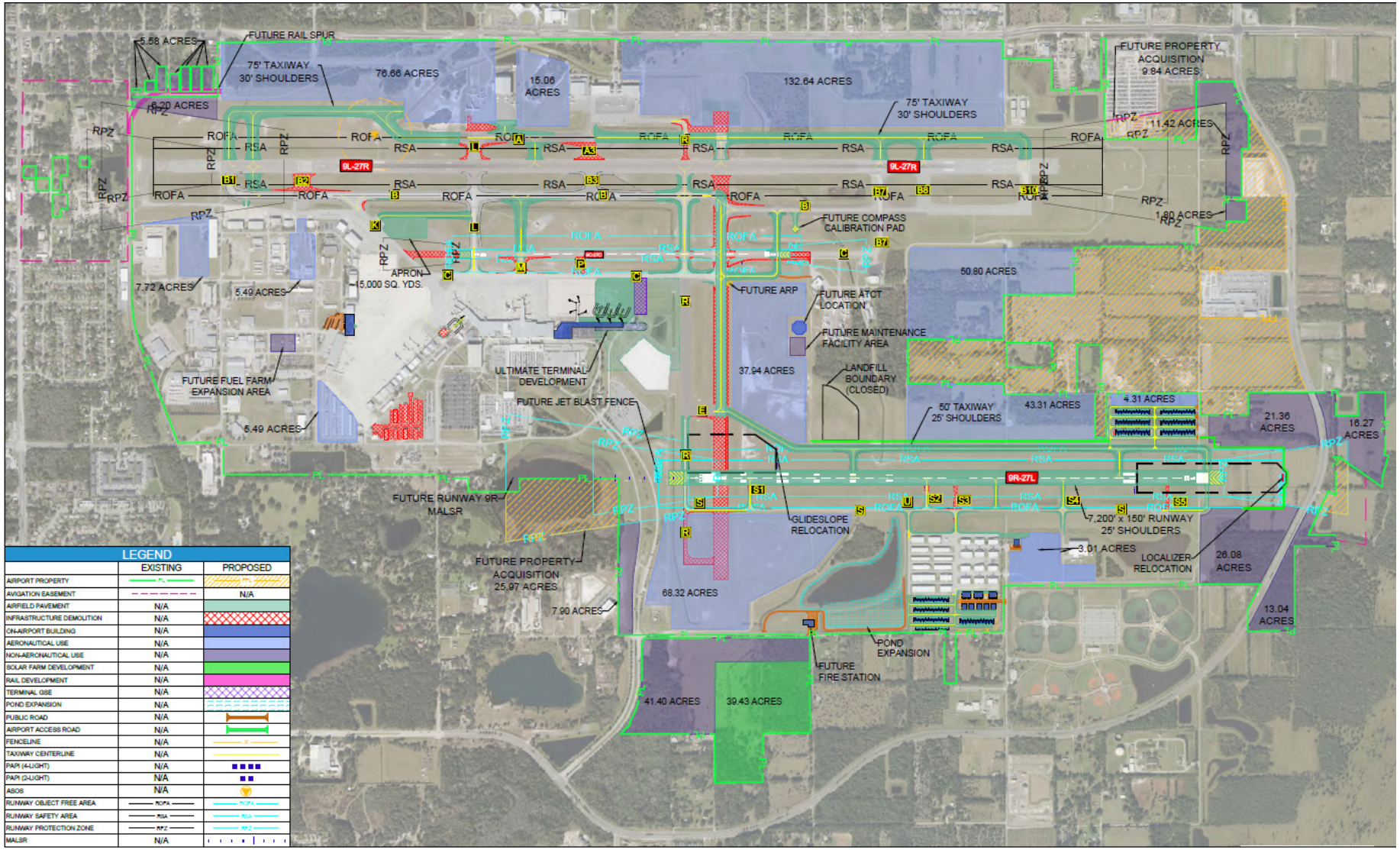
According to the *2021 Airport Master Plan Update*, passenger enplanements in 2017 equaled 1,436,224. The plan also forecasted passenger enplanements to increase to 2,747,325 by the year 2037. In addition, the *2021 Airport Master Plan Update* also documented the existing and forecasted air freight tonnages through SFB. In 2017, air freight through SFB totaled 332 tons, with an expected increase to 1,671 by the year 2037. Air freight includes items such as perishables (for example, food), cars, mechanical parts, electrical equipment and so forth (WS Atkins 2021).

To plan for potential growth in passenger enplanements and air freight, the *2021 Master Plan Update* documents the preferred future property acquisition for ancillary facility modifications and support facility modifications. The preferred development alternative includes expanding the southern SFB property boundary south along the eastern side of Red Cleveland Boulevard toward East Lake Mary Boulevard. The southern expansion includes 41.4 acres for non-aeronautical use and 39.43 acres for a solar farm development. Although additional acres for the SFB Airport's Runway Protection Zone were identified as a preferred property acquisition in the *2021 Master Plan Update*, the future RPZs do not encroach into the study area. The preferred future property acquisitions to accommodate the forecasted growth is summarized as follows:

- Required Runway Protection Zones: 39.67 acres
- Solar Farm Development: 39.43 acres
- Airport Expansion: 186.23 acres
- Total Property Acquisition: 225.90 acres

Figure 3-13 presents the *2021 Airport Master Plan Update's* Preferred Development Alternative.

Figure 3-13. *2021 Airport Master Plan* Preferred Development Alternative



Source: *2021 Airport Master Plan Update* (WS Atkins 2021)

3.6.6.3 Pedestrian and Bicycle Facilities

Within the study area, contiguous 5-foot-wide sidewalks are present on both the north and south sides of East Lake Mary Boulevard. However, just east of Ohio Avenue, the sidewalk on the south side of East Lake Mary Boulevard transitions to the 8-foot-wide multi-use Lake Mary Pathway trail. Sidewalks are also present along many of the cross streets that intersect with East Lake Mary Boulevard.

In addition, the Marl Beds Flat Trailhead and Trail is located within the Lake Jesup Conservation Area in the southern portion of the study area, at the eastern terminus of Oakway. The trail entrance contains undesignated parking for vehicles and is accessible only by Oakway. The trail is open to the public Monday through Sunday from 6 a.m. to 8 p.m.

Figure 3-14 presents the existing pedestrian and bicycle facilities in and around the study area. It should be noted that Figure 3-14 presents only the sidewalks along East Lake Mary Boulevard and the cross streets that intersect with East Lake Mary Boulevard; neighborhood sidewalks are not shown.

3.6.7 Aesthetic Features

Most of the study area consists of either large-acre single-family residences or single-family subdivisions. Several commercial and subdivision developments are planned in the northern portion of the study area along East Lake Mary Boulevard. In addition, the northern portion of the study area contains the southern property boundary of the SFB property. The southeast portion of the study area contains the Lake Jesup Conservation Area, while SR 417 is within the southwestern portion. Viewsheds throughout the study area are generally restricted by developments or vegetation.

3.6.8 Farmlands

GIS data produced in 2018 by the University of Florida (that used the U.S. Department of Agriculture's NRCS soils data) were compared with the SJRWMD's Florida Land Use, Cover, and Forms Classification System designations. These data were further compared to the existing land use verified through field reviews conducted in September 2022. The analysis shows the study area contains a total of 43.43 acres of prime farmland. Most of the prime farmlands (72.69 %) are designated as improved pastures. When compared to the overall study area, prime farmlands accounts for 2.04 % of the study area. Table 3-21 summarizes the amount and type of prime farmlands in the study area. The prime farmlands are also presented in Figure 3-15.

Table 3-21. Prime Farmland Land Use Types

Prime Farmland - FLUCCS Level 3 Land Use	Acres	Percent of Prime Lands	Percent of Study Area
Improved Pastures	31.57	72.69%	1.48%
Tree Nurseries	4.85	11.16%	0.23%
Field Crops	3.79	8.72%	0.18%
Horse Farms	3.23	7.44%	0.15%
Total	43.43	100.00%	2.04%

Figure 3-14. Existing Pedestrian and Bicycle Facilities

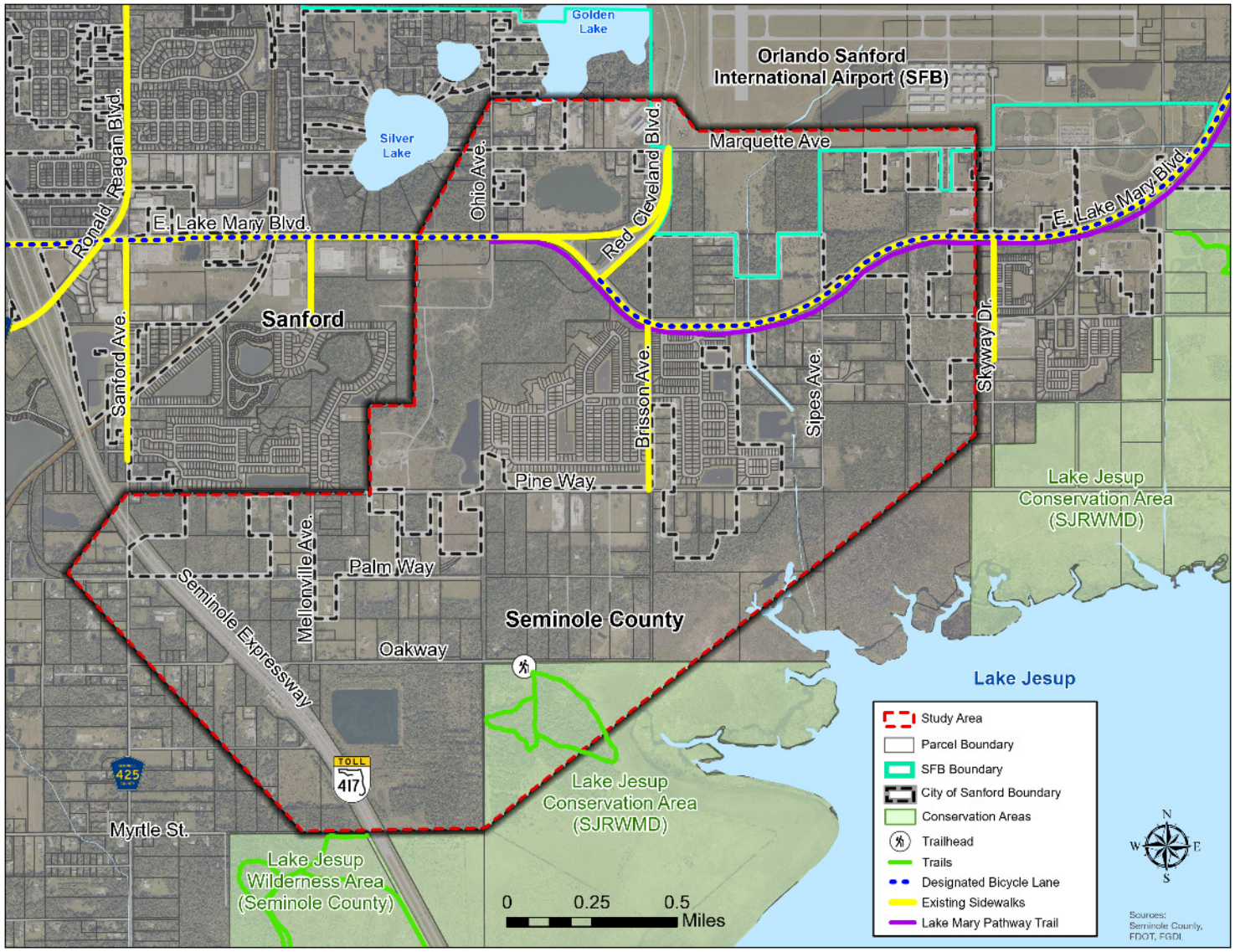
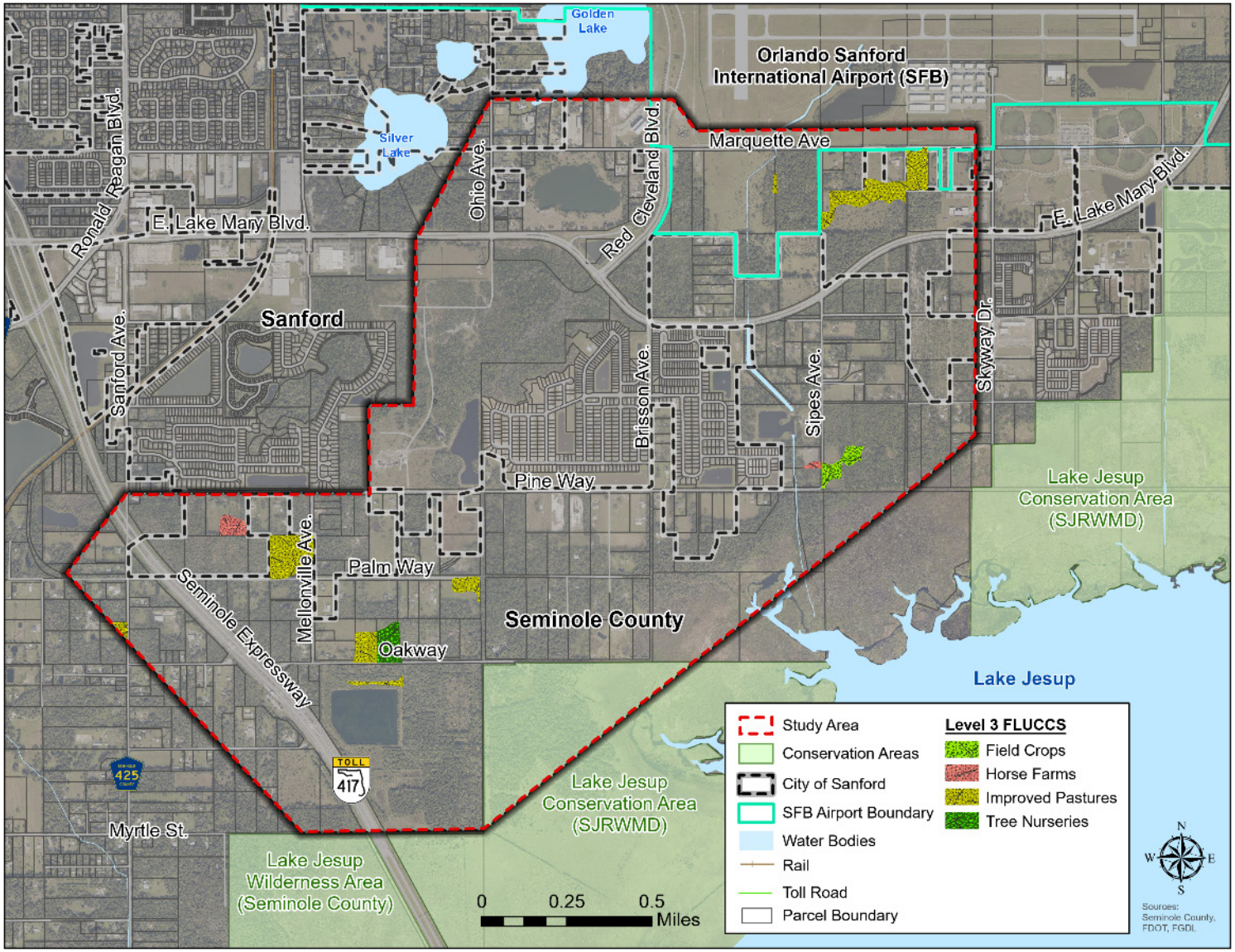


Figure 3-15. Existing Farmlands



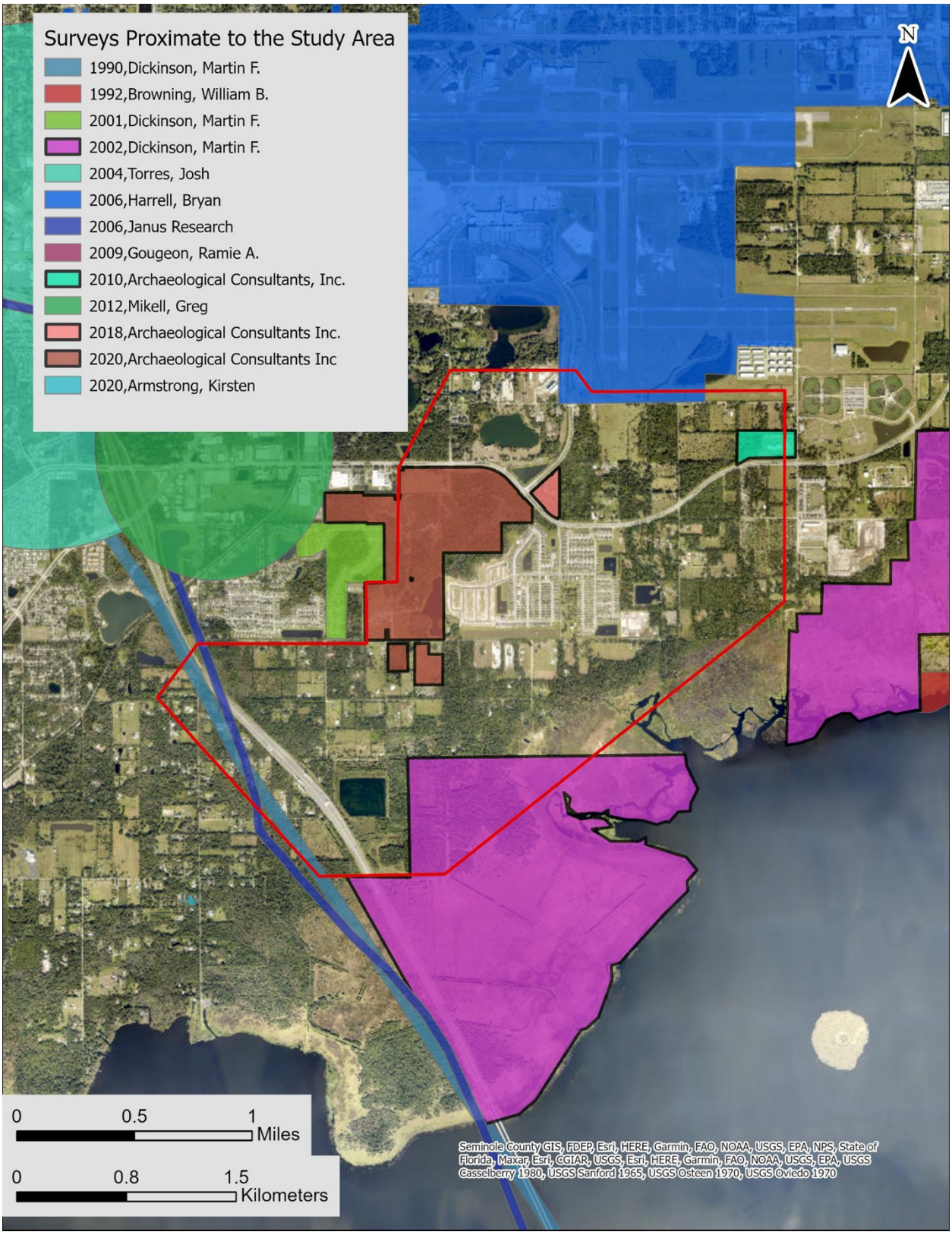
3.6.9 Cultural Resources

A review of pertinent archaeological and historical literature, records and other documents and data pertaining to the general area was conducted. The focus of this analysis was to ascertain the types of cultural resources known in the project vicinity and the potential for the occurrence of yet unrecorded resources. Research included a review of the National Register of Historic Places and the Florida Master Site Files (September 2022); an examination the Seminole County Property Appraiser's data (Seminole County n.d.); soil survey information, plats, field notes and tract book records (State of Florida 1846, 1849, n.d.); and historic aerial photographs on file with the Publication of Archival Library and Museum Materials (USDA 1957a, 1957b, 1972), regional prehistories, histories, site location predictive models and relevant Cultural Resource Assessment Survey reports and manuscripts. Table 3-22 lists the CRAS projects conducted within 1 mile of the project study area, and Figure 3-16 demonstrates the location of the survey. The majority of the project study area has not been systematically surveyed.

Table 3-22. CRAS Projects Conducted Within 1 Mile of the Project Study Area

Reference	Project Title	Manuscript No.
SouthArc 1990	Archaeological survey and assessment Seminole County Expressway Authority Eastern Beltway Corridor	2310
Browning 1992	Cultural Resource Assessment Survey of Proposed 1700+ Acre Wetlands Mitigation Site, Seminole County, Florida	3382
Ellis Archaeology 1994	Cultural Resources Study of Seminole County, Florida: Historic and Architectural Resources, Volume II	3889
SouthArc 2001	Cultural Resource Assessment, Magnolia Park P.D. Seminole County, Florida	6884
SouthArc 2002	Cultural Resources Survey and Assessment, Lake Jesup Aquatic Habitat Enhancement Project, Seminole County, FL	7232
SouthArc 2004	Cultural Resource Survey for the Sanford South D&S Cell Tower in Seminole County, Florida (FL-3060B)	10620
SEARCH 2006	Cultural Resource Assessment Survey of State Road 46 from SR 15/600 to SR 415 Seminole County, Florida	12630
Janus Research 2007	Cultural Resource Assessment Survey of the Seminole Expressway (SR 417) Widening PD&E Study from the Orange County Line (MP38) to the Rinehart Road Interchange (MP54), Seminole County	14468
Panamerican Consultants 2009	An Archaeological and Historical Survey of the 10127427 - South Sanford Tower, Seminole County, Florida FCC Form 620	16672
ACI 2010	Cultural Resource Assessment Survey, 3566 Beardall Avenue, Sanford, Seminole County, Florida	17879

Figure 3-16. CRAS Projects Conducted Within 1 Mile of the Project Study Area



3.6.9.1 Archaeological

The archaeological background research indicated that one archaeological site is recorded within 0.5 mile of the study area. This site, 8SE01769, is a campsite recorded during a survey of Magnolia Park (SouthArc 2001), just northwest of the project study area. It was determined not eligible for listing in the NRHP by the State Historic Preservation Officer. No other historic or prehistoric archaeological sites have been recorded either within or near the project study area.

Based on the information gathered during a review of previously recorded sites and location criteria, including elevation, soil drainage characteristics and proximity to freshwater, there is a pattern favoring the relatively better-drained terrain near a permanent or semi-permanent source of potable water including rivers, creeks and freshwater marshes. Upland sites well removed from potable water are rare. In the pine flatwoods, sites tend to be located on ridges and knolls near a freshwater source. It should be noted that the settlement patterns noted above could not be applied to sites of the Paleoindian and Early Archaic periods, which precede the onset of modern environmental conditions. Given these known patterns of aboriginal settlement, the project area was considered to have a varied probability for archaeological site occurrence with the high areas of probability located on better drained soils and rises adjacent to lakes. The moderate areas of probability are located along contour lines not far from wetlands, and the low areas are on low elevations with very poorly drained and depressional soils. Research suggests that the most likely type of aboriginal site would be an artifact or lithic scatter.

Background research also suggested a low potential for the discovery of 19th century and earlier archaeological sites within the study area. There is a portion of a historic trail that traverses the northeast portion of the project study area but given the disturbance of the area, no evidence of it would be expected during a field survey.

3.6.9.2 Historical

Historic/architectural background research indicated that two historic resources (8SE02162 and 8SE02202) were previously recorded within the project study area (refer to Figure 3-17). These historic resources include the Orlando Sanford International Airport resource group (8SE02162) and a circa-1951 Masonry Vernacular style building (8SE02202) located at 4258 Sanford Ave. Only the southern boundary of the Orlando Sanford International Airport resource group (8SE02162) is located within the northern boundary of the study area. This resource group (8SE02162) was first recorded during a 2006 Cultural Resource Assessment Survey of State Road 46 from SR 15/600 to SR 415, Seminole County, Florida conducted by Southeastern Archaeological Research, Inc. in 2006 (SEARCH 2006; Survey No. 12630). During this survey, three known historic resources were considered contributing resources to the resource group. These include two buildings, Building 37 (8SE01727) and Building 117 (the old Gasoline Service Station [8SE01728]), and the runways (not assigned Florida Master Site File numbers). None of the associated resources are located within the study area. In 2006, the SHPO evaluated the resource group as having insufficient information to make a determination of eligibility. The resource was updated in 2015 during the Cultural Resource Assessment Survey Update State Road 46 from Mellonville Avenue to State Road 415, Seminole County, Florida, at which time, the resource group was determined ineligible for listing in the NRHP by the SHPO (SEARCH 2015; Survey No. 22257).

While no historic resources associated with the Orlando Sanford International Airport resource group (8SE02162) are located within the project study area, the Naval Air Station Sanford Memorial Park is located at the northeast intersection of Red Cleveland Boulevard and Marquette Avenue along the northern edge of the study area. This non-historic memorial was opened in 2003 to commemorate the Navy servicemen who served at the NAS Sanford (Burel 2011). NAS Sanford was commissioned in November 1942 to serve as a training facility for naval aviation during WWII and was later decommis-

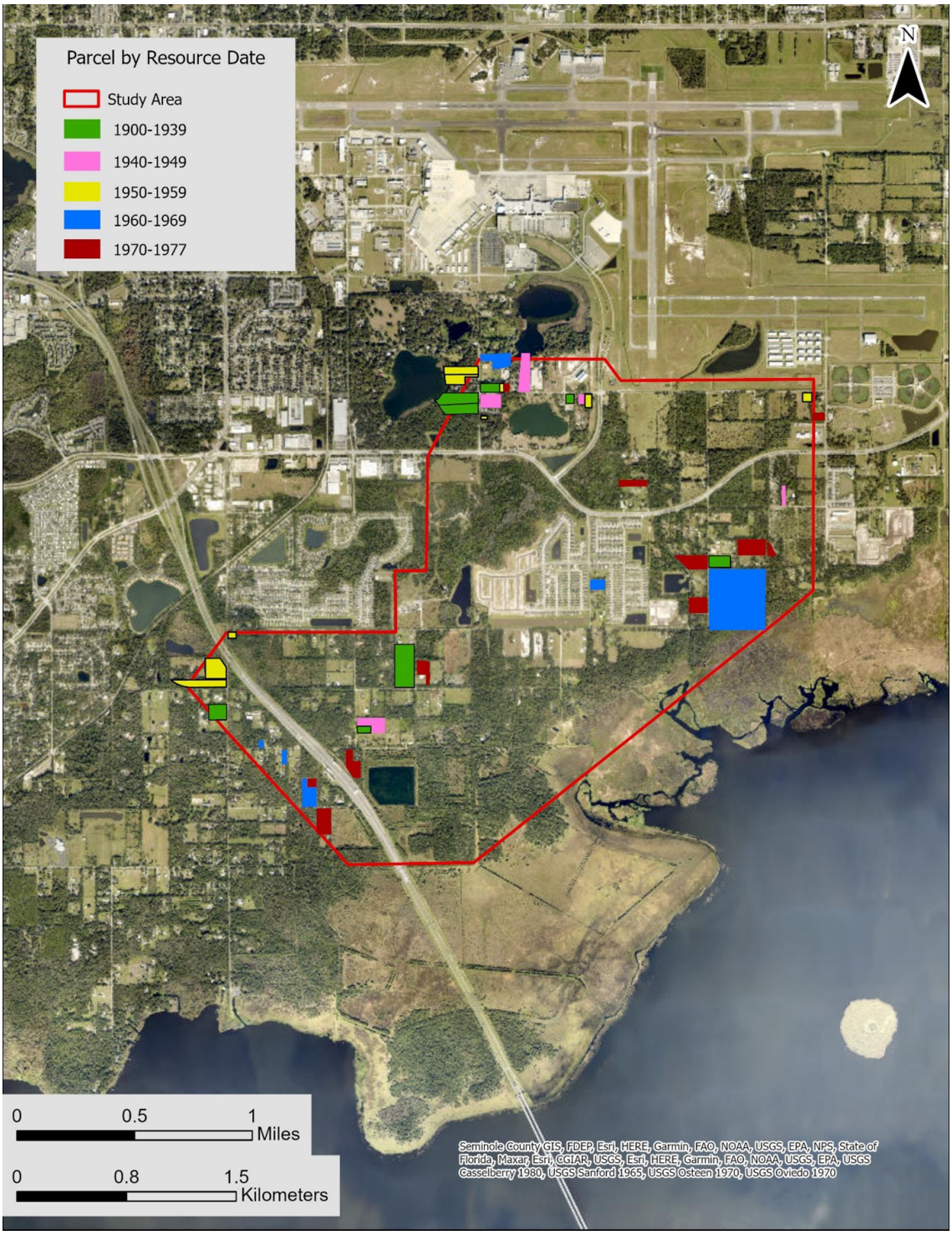
sioned in 1946. The station was recommissioned a few years later in 1950 to aid in the Korean War. The city of Sanford acquired the station following its closure in 1968 and the property was then managed by Commander J.S. "Red" Cleveland – the namesake of the adjacent road (Burel 2011). The name of the airport changed multiple times over the years and is now known as the Orlando Sanford International Airport.

In addition, a circa-1951 Masonry Vernacular style building (8SE02202) located at 4258 Sanford Ave. was recorded within the western edge of the study area during the Cultural Resource Assessment Survey of the Seminole Expressway (SR 417) Widening PD&E Study from the Orange County Line (MP38) to the Rhinehart Road Interchange (MP54), Seminole County, Florida conducted by Janus Research in 2007. The building was determined ineligible for listing in the NRHP by the SHPO (Janus Research 2007; Survey No. 14468).

A review of the historic aerial photographs revealed a low potential for historic resources within the project study area. Around 1957, the vast majority of the land within the project study area was undeveloped wetlands or utilized for agricultural purposes such as pasture or groves (USDA 1957a, 1957b). While SFB existed in 1957, only the southernmost boundary of the airport is located in the study area and no contributing resources are present. Several minor roads provided access throughout the area but major routes such as East Lake Mary Boulevard and SR 417 had not yet been constructed. Residential development was minimal. Development in the study area remained limited overall throughout the 1970s and 1980s (USDA 1972; FDOT 1980). The study area reached the current configuration during the early 1990s with the completion of SR 417 in the western portion of the project study area by circa 1995, the construction of East Lake Mary Boulevard and Red Cleveland Boulevard in the north between circa 2003 and 2006 and a major residential development south of East Lake Mary Boulevard which began in circa 2017 (FDOT 1995; Google n.d.). The southern portion of the project study area remains relatively wooded and undeveloped.

A review of the Seminole County Property Appraiser data and historic aerial photographs suggested approximately 35 historic resources (45 years of age or older) are located within the study area (Seminole County n.d.). A field survey will be necessary for proper identification and evaluation of each historic resource within the proposed corridor Area of Potential Effects (to be set prior to field work) as part of any future PD&E phase. The Area of Potential Effects is defined in 36 CFR Part §800.16(d) as the "geographic area or areas within which an undertaking may directly or indirectly [visual/audible/ atmospheric] cause alterations in the character or use of historic properties, if any such properties exist." The suggested build date is taken from the Seminole County Property Appraiser and is not always accurate. It will be important to conduct a field survey for proper identification and evaluation. Figure 3-17 provides a summary of a desktop analysis for newly identified historic resources in the study area.

Figure 3-17. Newly Identified Historic Resources (Desktop) Within the Project Study Area



3.6.10 Transportation Plans

A review of transportation plans and relevant studies was completed to identify potential changes relevant to this study. Plans reviewed include:

East Central Florida 2060 Plan (East Central Florida Regional Planning Council 2011)

MetroPlan Orlando *2045 Metropolitan Transportation Plan Cost Feasible Plan* (MetroPlan Orlando 2022)

CFX *Visioning + 2040 Master Plan* (CFX 2016)

CFX *2045 Master Plan Projects Map* (CFX 2022)

Seminole County 2040 Transportation Plan (Seminole County 2018)

Seminole County Capital Improvement Program (Seminole County 2021b)

Seminole County Trails Master Plan (Seminole County 2021c)

East Lake Mary Small Area Study (Seminole County 2021d)

3.6.10.1 East Central Florida 2060 Plan

The *East Central Florida 2060 Plan* (adopted, November 16, 2011) is a strategic policy plan developed by the East Central Florida Regional Planning Council to help guide local decision making throughout the region. Based on a review of the plan, there are no projects or studies that would affect this study.

3.6.10.2 MetroPlan Orlando 2045 Metropolitan Transportation Plan

MetroPlan Orlando' *2045 Metropolitan Transportation Plan Cost Feasible Plan* (adopted December 9, 2020, revised March 9, 2022) includes several funded and unfunded needs within and adjacent to the study area. Table 3-23 summarizes both funded and unfunded cost feasible projects within and adjacent to the project study area.

Table 3-23. MetroPlan Orlando's Cost Feasible Projects Within and Adjacent to the Study Area

MTP ID	Roadway	From	To	Description	Future Phase
1012	SR 417	SR 434	Lake Mary Boulevard/CR 427	Widen from 6 to 8 lanes	PD&E – Funded 2020/2025 PE – Funded 2026/2030 CST – Funded 2026/2030
5051	E Lake Mary Boulevard	US 17-92	Red Cleveland Boulevard	Shared Use Path	PE, ROW, CST - Unfunded
9130	Airport Boulevard	SR 417	Airline Avenue	Widen 2 to 4 lanes	PD&E, PE, ROW, CST - Unfunded
3185	Pine Way	Bloom Ln.	Sipes Avenue	Operational/Safety	PE, ROW, CST - Unfunded
3181	Sipes Avenue	Pine Way	North of Eagle View Cv.	Operational/Safety	PE, ROW, CST - Unfunded

PD&E = project development and environment

PE = preliminary engineering

ROW = right of way

CST = construction

3.6.10.3 Seminole County 2040 Transportation Plan

As of October 2022, Seminole County was in the process of updating their long-range transportation plan. However, the previously completed *2040 Transportation Plan* (Seminole County 2018) was reviewed to identify potential improvements within the study area. The *2040 Transportation Plan* only identified one potential improvement by year 2030, which includes a 12-foot-wide asphalt shared-use trail along East Lake Mary Boulevard from US 17-92 to Ohio Avenue.

3.6.10.4 CFX 2040 Master Plan

CFX's *2045 Master Plan Projects Map* was adopted in December 2022. Therefore, this study relied on the previously published *Visioning + 2040 Master Plan* (approved, May 2016), as well as the recently adopted Projects Map, to identify system expansion and roadway improvements that may affect this study. In addition, CFX's *Five-Year Work Plan* (adopted, May 12, 2022) was reviewed. This study is included in CFX's corridor alignment and system expansion projects for fiscal years 2023-2027, as presented in Figure 3-18.

3.6.10.5 Seminole County Capital Improvement Program

According to Seminole County's 5-Year Capital Improvement Program (2021), one capital improvement project is programmed to occur within the study area. A resurfacing project along Red Cleveland Boulevard from East Lake Mary Boulevard to Marquette Avenue is programmed for fiscal year 2023. Table 3-24 summarizes the capital improvement projects.

Table 3-24. Existing Seminole County Capital Improvement Projects Within the Study Area

CIP Number	Roadway	From	To	Description	Year Funded
02107059	Red Cleveland Boulevard	East Lake Mary Boulevard	Marquette Avenue	Resurfacing/Rehabilitation	2022

3.6.10.6 Seminole County Trails Master Plan

The *Seminole County Trails Master Plan* (2021c) identified one proposed improvement within the study area. The improvement includes a 9.3-mile-long, 8-foot-wide concrete pathway (Lake Mary Pathway) from Red Cleveland Boulevard to US 17-92 (west of the study area). Additional features proposed as part of this improvement include shade trees, rest areas and wayfinding signs. The estimated cost to implement this proposed pathway is approximately $2.8 million.

The *Trails Master Plan* also identified the Boombah Sport Complex Loop Trail as a potential need. Although outside the study area, the proposed trail would be located within the Boombah Sports Complex at the northeast corner of East Lake Mary Boulevard and Skyway Drive. The trail would consist of a 1.2-mile-long loop with a 12- to 14-foot-wide multipurpose path that would be located along 0.7 mile of East Lake Mary Boulevard and traverse the park. The estimated cost to implement the trail is approximately $500,000.

3.6.10.7 FDOT 5-Year Work Program

The FDOT's 5-Year Work Program (adopted July 1, 2022) includes three programmed improvements along portions of SR 417 that are within the study area. Widening of SR 417 from four to eight lanes (Financial Project Identification No. 437952-1) is programmed for preliminary engineering in fiscal year 2025, with ROW acquisition scheduled to occur in fiscal year 2026. This project is not yet funded for construction.

In addition, a resurfacing and safety improvement project is under construction along SR 417 from north of SR 434 to south of Airport Boulevard (FPID: 440292-1/2). Table 3-25 summarizes FDOT's programmed improvements in the study area.

Table 3-25. FDOT 5-Year Work Program Projects

FPID	Roadway	From	To	Description	Future Phase
437952-1	SR 417 (Seminole Expressway	North of SR 434	South of Airport Boulevard	Widen from four to eight lanes	PE - Funded 2025
437301-7	SR 417 (Seminole Expressway)	Seminole/Orange County line	Towne Center Boulevard	All Electronic Tolling	PD&E – Funded 2022
440292-1	SR 417 (Seminole Expressway)	North of SR 434	South of Airport Boulevard	Resurfacing	NTP – 11/19/2021 CST Complete - Early 2023
440292-2	SR 417 (Seminole Expressway)	North of SR 434	South of Airport Boulevard	Safety Improvements (guardrail)	NTP – 11/19/2021 CST Complete - Early 2023

PD&E = project development and environment

PE = preliminary engineering

CST = construction

NTP = notice to proceed

3.6.10.8 East Lake Mary Small Area Study

The *East Lake Mary Boulevard Small Area Study* is an outset of a Joint Planning Agreement between the city of Sanford and Seminole County (2015). The purpose of the study was to develop a long-range plan that guides future development and growth in the area. The East Lake Mary Boulevard Small Area Study area is a 5-mile-long section of East Lake Mary Boulevard between Mellonville Avenue (southern and western limits) to north of SR 46 (northern and eastern limits). Figure 3-19 presents that study's boundary.

Figure 3-18. CFX's System Expansion Map
Source: CFX Five-Year Work Plan 2023-2027

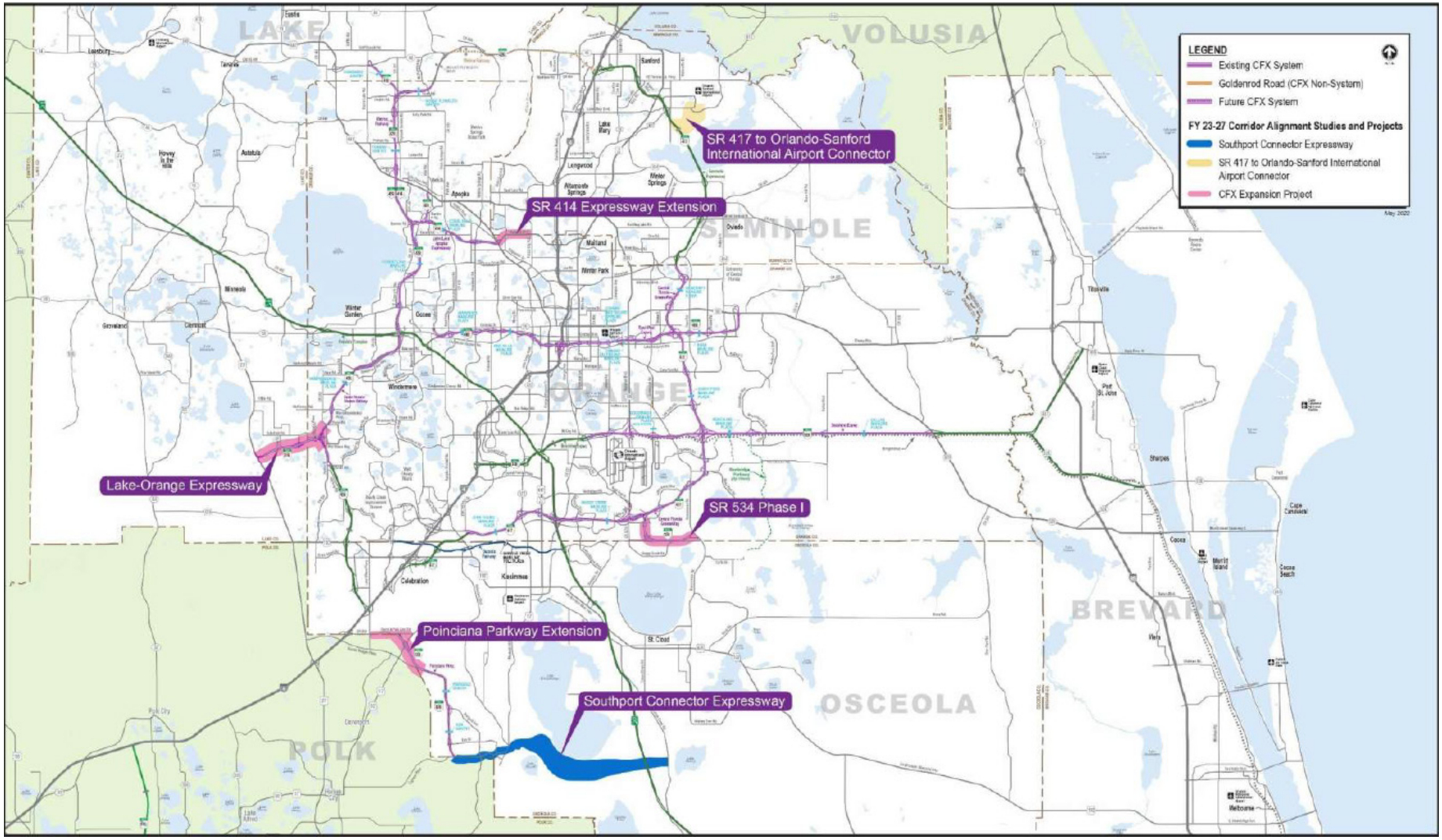
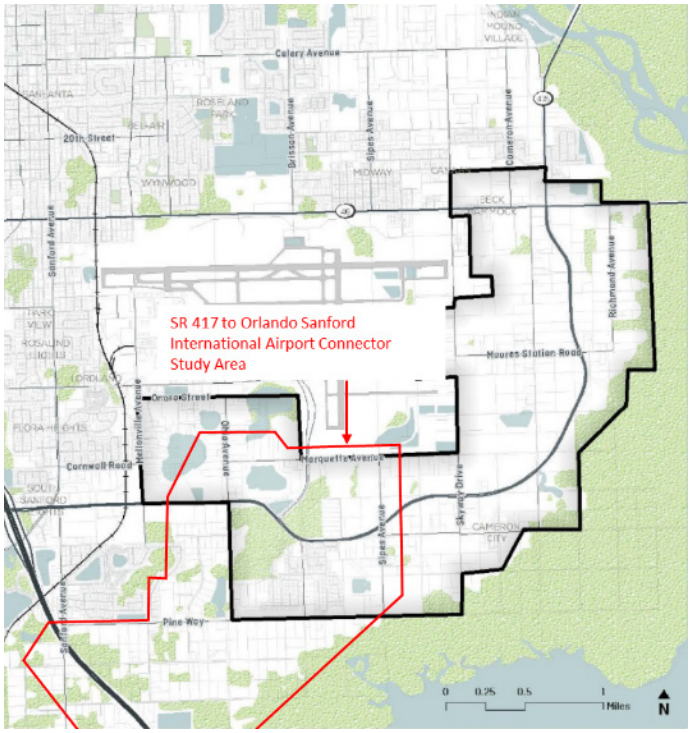


Figure 3-19. East Lake Mary Boulevard Small Area Study Boundary



Recommendations made as a result of the East Lake Mary Boulevard Small Area Study are documented in the study's *Strategic Action Plan* (Seminole County 2021d). Table 3-26 provides recommendations that occur within the study's boundary.

Table 3-26. Recommended Improvements from the East Lake Mary Boulevard Small Area Study

No.	Recommended Improvement	Estimated Cost	Planning Period		
			Less than 5 years	5 to 10 years	10+ years
AE-1	Provide operational improvements at the Red Cleveland Boulevard/Marquette Avenue intersection (traffic signal and button activated crosswalk.	$25,000 - $250,000	X		
AE-2	Add sidewalk on Marquette Avenue between Red Cleveland Boulevard and the Ohio Avenue Transitional District.	$22,000		X	
SA-2	Add sidewalk on Marquette Avenue between Red Cleveland Boulevard and Skyway Drive.	$147,000		X	
MU-2	Expand the Red Trail (Marl Beds Flat Trail) into a larger passive park with upgraded and additional trails, wildlife viewing areas and open areas for casual play.	To be determined	X		
MU-3	Add additional trails through the Lake Jesup Conservation Area. Connect to the Lake Jesup Wilderness Area if possible.	To be determined		X	X

Table 3-26. Recommended Improvements from the East Lake Mary Boulevard Small Area Study

No.	Recommended Improvement	Estimated Cost	Planning Period		
			Less than 5 years	5 to 10 years	10+ years
RC-3	Add pedestrian-scale lighting along East Lake Mary Boulevard.	$500,000/mile	X	X	
RC-4	Add street trees along East Lake Mary Boulevard.	$100,000/mile	X	X	X
RC-5	Add bike lane markings and signage along East Lake Mary Boulevard.	$2,500/mile	X		

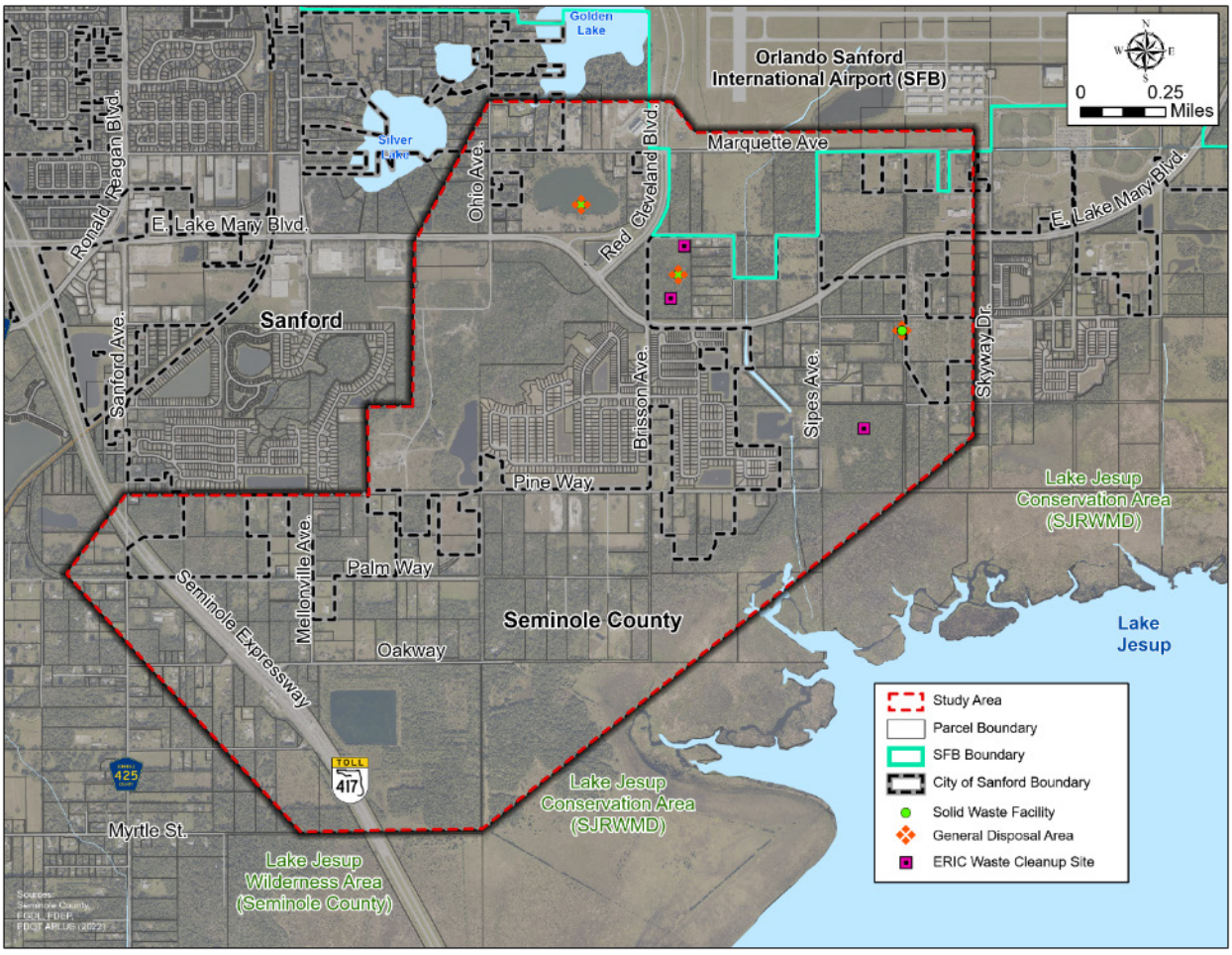
3.7 Contamination

The majority of the Study Area is comprised of rural homesteads, agricultural sites, and conservation land. Based on historical aerial photography, agricultural land use within the Study Area has included citrus groves (<50 acres) and pasture. The northern portion of the Study Area encompasses a portion of SFB land. Commercial development is present along Lake Mary Boulevard in the northwestern portion of the Study Area.

Utilizing Google Earth, FDEP's OCULUS database, and FDEP's Map Direct website, the following potential contamination concerns were identified within the Study Area. These sites will need to be considered in the further evaluation of alignment alternatives in a future PD&E study:

- Brisson Road Landfill & Brisson Ave East (FDEP Facility IDs ERIC_8881 & ERIC_5591) – this site is located at the NE corner of East Lake Mary Boulevard and Red Cleveland Boulevard. The site is a +/- 20 acre abandoned landfill. A soil and groundwater investigation conducted by USEPA in 2002 identified numerous contaminants and the site was recommended for CERCLA action. There is no record of any further environmental assessment of this site since 2002.
- Marquette Shores Borrow Pit C&D (FDEP Facility ID 27164) – this site is located at the NW corner of East Lake Mary Boulevard and Red Cleveland Boulevard. This site was a borrow pit and was used for construction & demolition (C&D) disposal in the 1990s.
- Kentucky Square and Kentucky Avenue Dump (FDEP Facility IDs ERIC_11200 & 87854, respectively) – these sites are located on the west side of Skyway Drive, north and south of Kentucky Street. This site is currently being developed by a home builder. Alleged illegal dumping was investigated at this site in 2001. Contamination from arsenic is currently being assessed by the developer and remediation is yet to be determined. Figure 3-20 presents the potential contamination sites within the study area.

Figure 3-20. Potential Contamination Sites



3.8 Utilities

The existing utility facilities include electric, gas, water, sewer and communications. A Sunshine811 ticket was created on September 7, 2022, to determine the major utilities along or crossing the existing ROW. Table 3-27 lists the existing utilities in the study area.

Table 3-27. Existing Utilities

Utility	Contact Information	Utility Type
AT&T/Distribution	Dino Farruggio (561) 683-2729	Telephone
Central Florida Expressway Authority	Carnot Evans (321) 354 9757	ITS Fiber Optic
Charter Communications	John Smith (407) 532 8520	Cable Access Television, Fiber Optic, Telephone
City of Sanford Public Works	Richard Blake (407) 688 5101	Storm Water

Table 3-27. Existing Utilities

Utility	Contact Information	Utility Type
City of Sanford Utilities Dept	Richard Blake (407) 688 5101	Sewer, Water
FL Public Utilities	Colin Dunn (386) 785 4554	Gas
Florida Power and Light - Seminole	Joel Bray (386) 586 6403	Electric
Seminole County	Paul Zimmerman (407) 665 2040	Reclaimed Water, Sewer, Water
Seminole County Traffic Engineering	Keith Brown (321) 377 2405	Fiber
Traffic Engineering and Maintenance–Florida's Turnpike Enterprise	Kevin McCaffrey (813) 620 3983 X320	Communication Lines, Electric, Fiber

Source: Sunshine One Call https://www.sunshine811.com/

3.9 Railroads

There are no railroads within the study area.

4. Traffic Considerations

4.1 Existing Traffic

Field observations and a desktop review of existing traffic conditions was conducted within the study area. As shown on Figures 4-1 and 4-2, there is existing congestion within the SR 417 and CR 427/Lake Mary Boulevard interchange footprint. The adjacent intersections on Lake Mary Boulevard at CR 427 and Sanford Avenue also operate unacceptably and impact operations at the interchange. During the morning commute, the main congestion occurs along East Lake Mary Boulevard in the westbound direction approaching the interchange. In the evening, congestion occurs primarily at the SR 417 and CR 427/Lake Mary Boulevard northbound off-ramp, where queues sporadically back up to the SR 417 mainline. The queues are primarily caused by unacceptable operations at the off-ramp and downstream intersections on East Lake Mary Boulevard. For example, northbound SR 417 traffic exiting the interchange at Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard are required to travel through three signalized intersections within 0.3 mile of the SR 417 northbound off-ramp, impeding traffic flow and increasing travel time for users. FTE has programmed turn-lane improvements at the interchange and adjacent intersections to improve operations in the near term. FTE also has long-term plans to add capacity at the interchange.

Figure 4-1. 2022 AM Peak Period Traffic Conditions – Google Speed

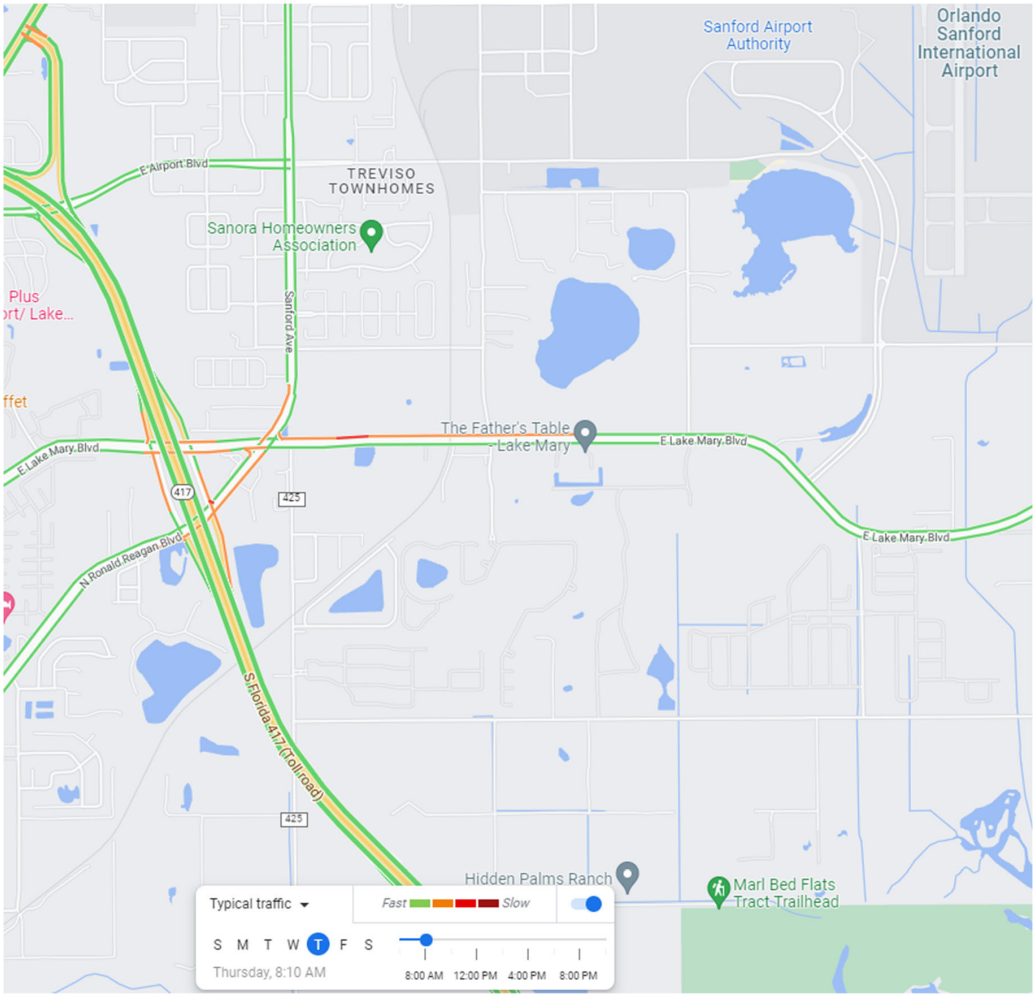
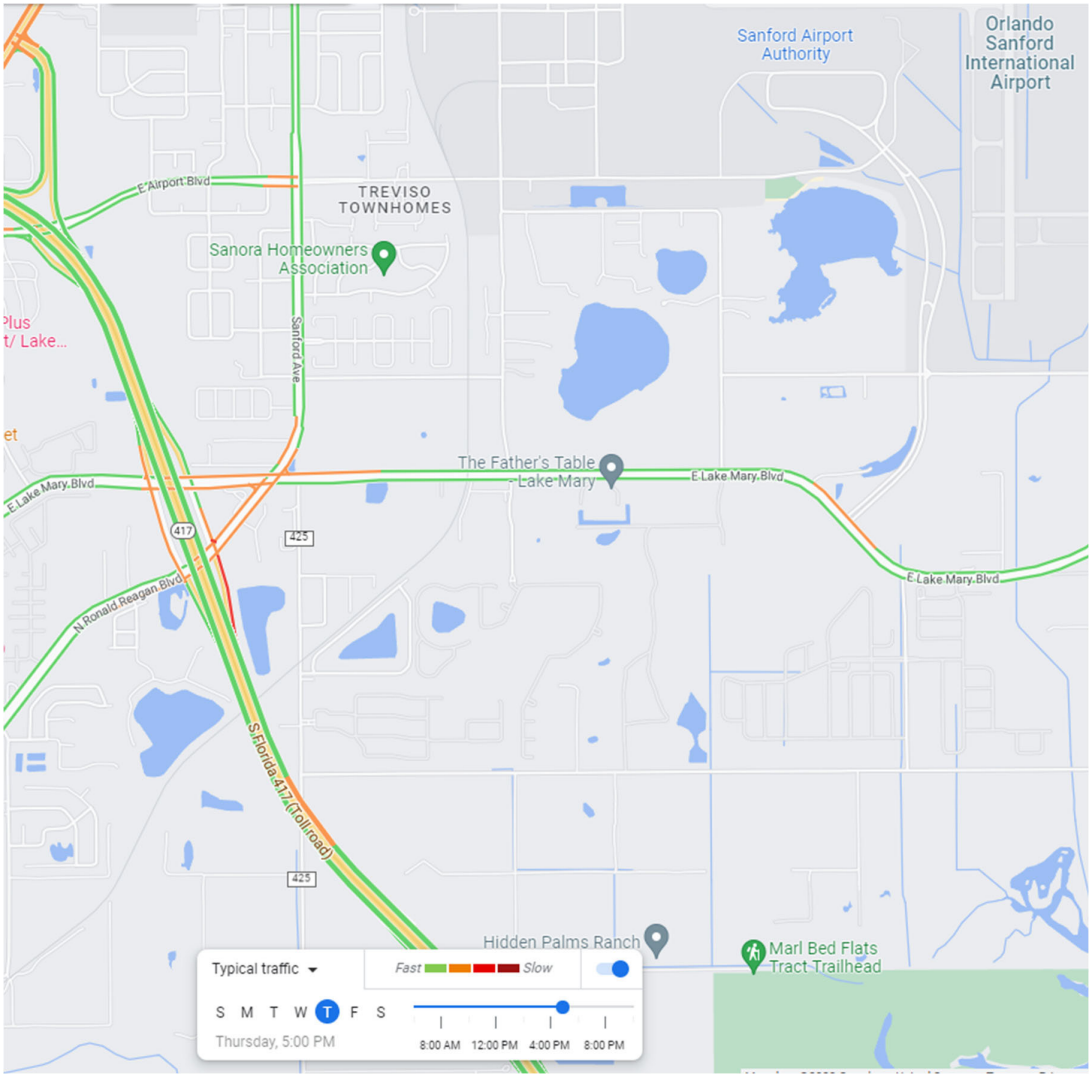


Figure 4-2. 2022 PM Peak Period Traffic Conditions – Google Speed



4.1.1 Roadway Operational Conditions

Table 4-1 summarizes the 2022 existing traffic and volume to LOS D MSV ratios. The roadway segments and ramps within the area of interest had a volume to LOS D MSV ratio of 0.9 or less in 2022. However, this analysis does not consider operations at the intersections, which are usually the initial points of failure for arterials, and as previously noted congestion exists at the interchange.

The intersection LOS and delays were evaluated in both the AM and PM Peak Hours. The results indicated that at the East Lake Mary Boulevard and Red Cleveland Boulevard intersection, all movements operate at an acceptable LOS D or better. Additionally, the intersection of Red Cleveland Boulevard and Marquette Avenue operate at an LOS B or better. The analyses are summarized in Table 4-2.

Table 4-1. 2022 Traffic and Volume to LOS D MSV Ratios

Location	No. of Lanes per Direction	Two-Way AADT	AM Peak Hour		PM Peak Hour		Volume to LOS D MSV Ratios			
							AM Peak Hour		PM Peak Hour	
SR 417			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
At Airport Blvd. (ramps to and from the south)	1/2	6,450	250	299	294	340	0.1	0.1	0.2	0.1
Mainline – South of Airport Boulevard	2 + 1 Aux	50,100	2,027	2,022	2,464	2,506	0.4	0.4	0.5	0.5
At CR 427/East Lake Mary Boulevard (ramps to and from the north)	1	6,700	251	321	224	369	0.1	0.2	0.1	0.2
At CR 427/East Lake Mary Boulevard (ramps to and from the south)	1	17,750	777	782	682	918	0.4	0.4	0.4	0.5
At Lake Jesup Mainline Toll Plaza	2	61,150	2,553	2,483	2,921	3,055	0.7	0.7	0.8	0.8
At SR 434 (ramps to and from the north)	1	8,850	304	533	548	294	0.2	0.3	0.3	0.2
East Lake Mary Boulevard			**EB**	**WB**	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
West of Red Cleveland Boulevard	2	23,800	898	1,618	1,430	780	0.5	0.8	0.7	0.4
East of Red Cleveland Boulevard	2	23,000	898	1,696	1,428	688	0.5	***0.9***	0.7	0.3
Red Cleveland Boulevard			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
North of East Lake Mary Boulevard	2	5,200	171	250	315	226	0.1	0.1	0.2	0.1
Airport Boulevard			**EB**	**WB**	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
East of Sanford Avenue	1	6,700	248	242	237	377	0.3	0.3	0.3	0.5
CR 427			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
South of Lake Mary Boulevard	2	28,350	1,434	1,107	981	1,478	0.7	0.6	0.5	0.8

Notes:

AADT and peak hour volumes based on days of week and peak periods with highest demand

Values shaded indicate peak hour directional volumes

Freeway Mainline & Arterials Ratios in Volume to LOS D MSV

Ramps Ratios in Volume to Capacity LOS E

Bold & italic values indicate roadway is approaching or exceeding capacity

Table 4-2. 2022 Existing AM and PM Peak Hour Intersection LOS/Delay (sec)

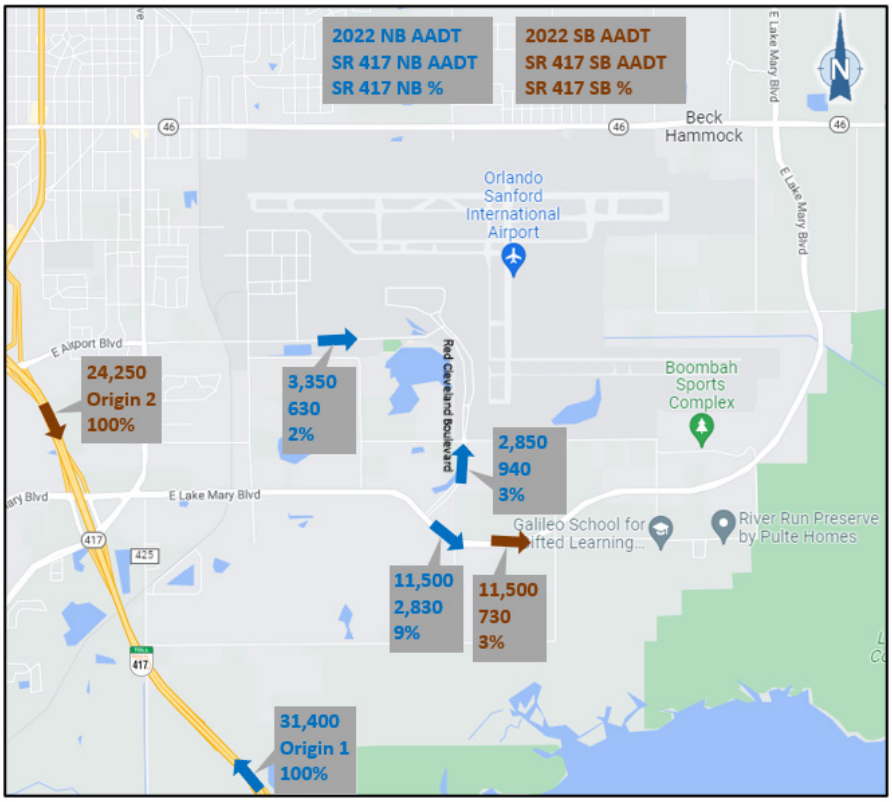
Intersection	Approach	Movement	LOS	Delay (Seconds)	Maximum Queue Length (Feet)*
			AM (PM)	AM (PM)	AM (PM)
Lake Mary Boulevard and Red Cleveland Boulevard (Signalized)	Eastbound	Left	D (C)	43.3 (34.7)	107 (128)
		Through	A (A)	4.9 (8.9)	148 (208)
		Right	-	-	-
	Westbound	Left	-	-	-
		Through	C (B)	20.3 (16.2)	334 (176)
		Right	A (A)	3.4 (3.8)	87 (70)
	Northbound	Left	-	-	-
		Through	-	-	-
		Right	-	-	-
	Southbound	Left	D (D)	47.6 (37.2)	143 (181)
		Through	-	-	-
		Right	C (A)	21.8 (3.5)	78 (107)
	Overall Intersection		***B (B)***	***16.7 (13.3)***	
Red Cleveland Boulevard and Marquette Avenue (Unsignalized)	Eastbound	Left	B (B)	13.3 (11.9)	67 (69)
		Through	B (B)	13.3 (11.9)	67 (69)
		Right	B (B)	13.3 (11.9)	67 (69)
	Westbound	Left	B (B)	11.5 (11.3)	61 (52)
		Through	B (B)	11.5 (11.3)	61 (52)
		Right	B (B)	11.5 (11.3)	72 (66)
	Northbound	Left	A (A)	7.6 (8.0)	35 (43)
		Through	A (A)	0.0 (0.0)	-
		Right	A (A)	0.0 (0.0)	-
	Southbound	Left	A (A)	7.9 (7.9)	50 (44)
		Through	A (A)	0.0 (0.0)	-
		Right	A (A)	0.0 (0.0)	-
	Overall Intersection		***B (B)***	***13.3 (11.9)***	-

*SimTraffic maximum queue length

4.1.2 Origin-Destination Evaluation

StreetLight data were used to identify travel patterns for trips originating from SR 417 south and north of the CR 427/Lake Mary Boulevard interchange to the airport passenger terminal and East Lake Mary Boulevard east of Red Cleveland Boulevard. The purpose of the analysis was to estimate the amount of traffic that could potentially be diverted to the proposed connector. Figure 4-3 presents the 2022 one-way AADT distribution of SR 417 northbound and southbound to various destinations. The SR 417 northbound data indicate that 630 daily trips (2%) and 940 (3%) daily trips are made to the airport terminal through Airport Boulevard and Red Cleveland Boulevard, respectively, while an estimated 2,830 trips (9%) continue east on East Lake Mary Boulevard east of Red Cleveland Boulevard. Evaluation of the SR 417 southbound StreetLight data indicates zero trips to the airport via Red Cleveland Boulevard. However, 730 (3%) daily trips from SR 417 southbound are estimated to continue east on East Lake Mary Boulevard east of Red Cleveland Boulevard.

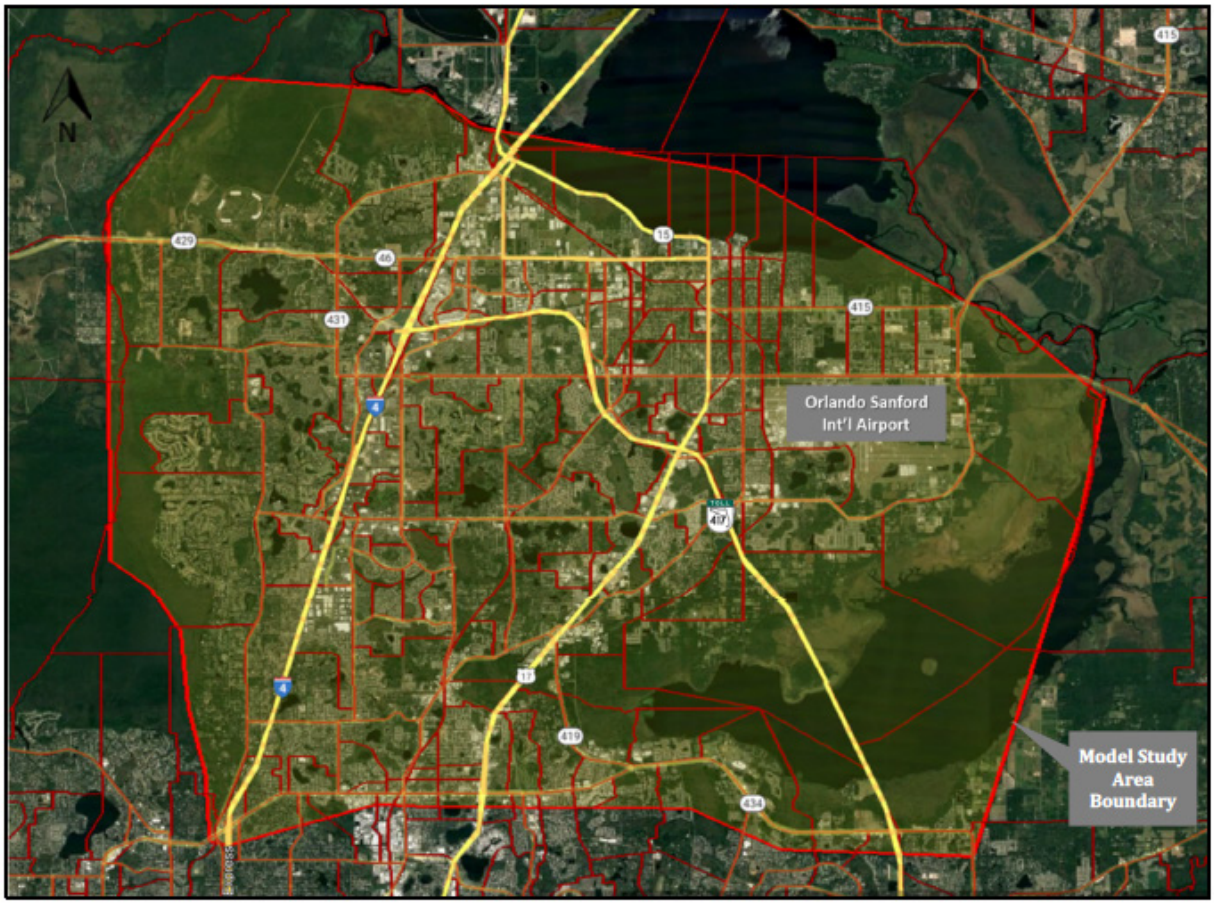
Figure 4-3. SR 417 One-Way 2022 AADT Distribution



4.2 Travel Demand Modeling

The FDOT District 5 Central Florida Regional Planning Model, Version 7, was used as the basis for this study. The CFRPM v7 has a base year of 2015 and a horizon year of 2045 with interim years of 2020, 2025, 2030, 2035, and 2040. A project-specific travel demand model with a 2021 base year was created for the project. Figure 4-4 shows the model study area.

Figure 4-4. Project-Specific Model Study Area



4.2.1 2021 Base Year Model Validation

The 2020 highway network was used in the development of the 2021 base year model. The 2021 socioeconomic data were created by interpolating 2020 and 2025 data sets. The highway network and SE data were reviewed for 2021 conditions using Google maps within the study area and updated where applicable. Other 2020 model input files were also reviewed and updated accordingly.

4.2.2 Model Study Boundary

Several steps were taken to enhance validation of the project-specific model for the study area to ensure it was replicating observed data in the base year. Model link volumes were compared with observed counts and updates made where applicable. The model Volume Delay Function curves were reviewed specifically for network links 90-99 (tolled expressways). Adjustments were made along the SR 417 mainline from SR 434 to north of East Lake Mary Boulevard and at the SR 434 and East Lake Mary Boulevard ramps. The adjustments allowed the 2021 model volumes to better represent observed data.

4.3 2030 Opening and 2045 Horizon Year Models

The opening and horizon model traffic forecast years for the project were 2030 and 2045, respectively. The design year of 2050 forecasts were estimated through extrapolation. The 2030 and 2045 future year models retained all the updates and enhancements from the 2021 base year model with additional adjustments to SE data and highway network to represent future improvements in the study area.

4.3.1 Socioeconomic Forecasts

Because this was the first application of the CFRPM v7 by CFX, SE data forecasts were reviewed and compared with the forecasts used in the CFX 3.0 Model and with forecasts from other state and national economists. The CFX 3.0 Model's data sets were estimated and forecasted by independent economist, PFM (formerly Fishkind & Associates) for Lake, Orange and Osceola counties.

The 2045 county population control totals from CFRPM v7 were compared against PFM's and the BEBR forecasts. The analysis showed that the CFRPM v7 population forecasts were generally consistent with PFM's and BEBR's medium forecasts. Specifically, the differences were small for counties within and around the study area (Orange, Osceola and Seminole). Similarly, a comparison of 2045 county employment control totals from CFRPM v7 with PFM and Woods and Poole forecasts generally showed a close correlation.

Future SE data sets were further reviewed and updated where applicable for the traffic analysis zone in the study area to ensure proper allocation that would directly impact the project. The SE data forecasts were reviewed for potential future development based on acreage and land uses. The review was supplemented with an assessment of active developments within the city of Sanford and Seminole County.

4.3.2 Future Year Highway Networks

The 2025 and 2045 future year networks in the study area were also reviewed for area and facility types, speeds, number of lanes and capacities, specifically the CFX and FTE facilities. The network changes in the base year network were carried over to the future year networks for consistency.

The future year networks in the CFRPM v7 model contain the transportation improvements identified in the CFX, FDOT/FTE and county work programs as well as the improvements included in the cost feasible plan from MetroPlan Orlando's *2045 Metropolitan Transportation Plan*. The model future year networks were updated to include the following programmed improvements identified in the CFX and FTE plans:

1) SR 417 from SR 528 to SR 408 – widen to eight lanes
2) SR 417 from International Drive to SR 528 – widen to eight lanes
3) SR 528 from I-4 to McCoy Road – widen to eight lanes
4) SR 408 from Kirkman Road to I-4 – widen to eight lanes
5) SR 429 from I-4 to Seidel Road – widen to eight lanes
6) SR 538 Extension from CR 532 to I-4 – new four-lane expressway

4.3.3 Tolls

Future year toll rates in the project model reflect current toll amounts and agency policies concerning future toll rate adjustments. For the proposed connector alternatives, the toll rate was set at $0.18 per mile in 2019 dollars consistent with the toll rate established for all projects under CF&M studies. Toll rates were escalated at 1.5% per year according to CFX's Customer First Toll Policy. Tolls were applied to each alternative with one assumed gantry location along the connector and operating as an all-electronic facility.

5. Design Criteria

5.1 Roadway Design Standards

Table 5-1. Roadway Design Standards

Design Element	Design Standard	Source
Design Year	2045	- Scope of Services
Design Vehicle	WB-62FL/WB-67	AASHTO 2004, Pg. 18 FDM Part 2, Sect. 201.5
Design Speed **Limited Access Facilities** Rural & Urban Urbanized **Arterials and Collectors** C1 Natural C2 Rural C2T Rural Town C3 Suburban C4 Urban General C5 Urban Center C6 Urban Core **Ramps** Directional Loop	 70 mph 50-70 mph 55-70 mph 55-70 mph 25-45 mph 35-55 mph 30-45 mph 25-35 mph 25-30 mph 50 mph 30 mph	 FDM Part 2, Tbl. 201.4.1 FDM Part 2, Sect. 201.4.1.1
Lane Widths Freeway Ramp 1-lane 2-lane Turning Roadway Arterial Collector/Service Road Bicycle Rural/Urban	 12-ft 15-ft 24-ft Case dependent 10-12-ft 10-12-ft 7-ft	 FDM Part 2, Sect. 211.2 FDM Part 2, Sect. 211.2.1 FDM Part 2, Tbl 211.2.1 FDM Part 2, Tbl. 210.2.1 FDM Part 2, Sect. 223.2.1.1
Cross Slope (lanes 1-way) Roadway 2-lane (2) 3-lane (3) 4-lane (4) 4-lane (4) – DS = ≥65 mph Bridge Section Max. Lane "Roll-over" DS ≥ 35 mph DS < 35 mph	 -0.02 ft/ft (2) -0.02 ft/ft (2), -0.03 ft/ft (1) +0.02 ft/ft (2)(1), -0.02 ft/ft (2), -0.03 (2)(1) -0.02 ft/ft (2), -0.03 (2) -0.02 (typical, uniform, no slope break, straight-line rate) 4.0% 5.0% (between through lane & aux. lane) 6.0% (between through lane & aux. lane)	 FDM Part 2, Fig. 210.2.1, 211.2.1 FDM Part 2 Sect. 210.2.4, 211.2.2 FDM Part 2, Fig. 210.2.1, 211.2.1 FDM Part 2, Tbl. 210.2.2, 211.2.2
Median Width Freeway DS ≥ 60 mph DS < 60 mph All, with barrier Arterial & Collector DS ≥ 45 mph ≥ 50 mph DS < 45 mph <50 mph	 60 to (64-ft*) 40-ft 26-ft (with barrier) 22-ft, 30- 40-ft 40-ft , 15.5-22-ft	FDM Part 2, Tbl. 210.3.1, 211.3.1
Shoulder Width (lanes 1-way)	Total (ft): Outside / Left; Paved (ft): Outside / Left	FDM Part 2, Tbl. 210.4.1, 211.4.1

Design Element	Design Standard				Source
Freeway					Fig 211.4.1, 211.4.2, 210.4.2, 210.4.3
3-lane or more	12	12	10	10	
2-lane	12	8	10	4	
Ramp					
1-lane	6	6	4	2	
2-lane	10	8	8	4	
Aux. Lane	12	N/A 8	10	N/A 4	
Arterial & Collector (Norm. volume)					
2-lane divided	10	8	5	0	
2-lane undivided	10	N/A 8	5	N/A 0	
Service Road, 2-Lane, 2-Way, Undivided	10	10	5	5	
Shoulder Cross Slope	0.06	0.05	-	-	FDM Part 2, Sect. 210.4.1, 211.4.2
Max. Shoulder "Roll-over"	7.0%	7.0%	-	-	Fig 210.4.2, 211.4.1
Bridge section (lanes 1-way)					FDM Part 2, 260.3, Fig 260.1.1, 260.1.2
2-lane	10	6	-	-	
3-lane or more	10	10	-	-	
1-lane ramp	6	6	-	-	
2-lane ramp	10	6	-	-	
Service Road, 2-Lane, 2-Way, Undivided	10	10	-	-	

Border Width			FDM Part 2, Sect. 211.6
Freeway	94-ft, (94-ft desirable)		- *(CFX Policy)* [3]
Ramp			
DS = 60 mph Urban	94-ft, (L.O.C. plus 10-ft as minimum)		
Arterial/Collector			
DS = 45 mph ≥50	40-ft (if ≥50)		
DS = 45 mph 40	33-ft		
Arterial/Collector (Curb & Gutter)			FDM Part 2, Sect 210.7, Tbl 210.7.1
C1 Natural	35-ft		
C2 Rural	35-ft		
C2T Rural Town	12-ft		
C3 Suburban	12-ft		
C4 Urban General	12-ft		
C5 Urban Center	12-ft		
C6 Urban Core	14-ft		

	Fill Height (ft)	Rat	
Roadside Slopes			FDM Part 2, Tbl. 215.2.3
Front Slope	0.0-5	1:6	
	5-10	1:6 to CZ & 1:4	
	10-20	1:6 to CZ & 1:3	
	>20	1:2 with guardrail *(Use 10-ft bench at half the height of fill)*	- *(CFX Policy)*[3] *Use 1:3 slopes, avoid 1:2 slopes except where as necessary*
Front slope (curb & gutter)	All	1:2 not flatter than 1:6	
Back slope	All	1:4 or 1:3 w/ standard width trap ditch & 1:6 front slope	
Back slope (curb & gutter)		1:2 not flatter than 1:6	
Transverse slope	All	1:10 or flatter (freeway/interstate)	
Transverse slope (curb and gutter)	All	1:4	

	Max. Grade	Max Change in	
Max. Grade / Max. Change in Grade		(70 mph/60 mph)	FDM Part 2, Tbl. 210.10.1, 210.10.2, 211.9.1
Freeway (Rural/Urban)	3.0%	0.20% / 0.40%	

Design Element	Design Standard		Source
Ramp			
Directional	5.0%	0.60%	
Loop	7.0%	1.00%	
Arterial			
C1 Natural	4.0%	0.50%	
C2 Rural	4.0%	0.50%	
C2T Rural Town	8.0%	1.00%	
C3 Suburban	7.0%	0.90%	
C4 Urban General	8.0%	1.00%	
C5 Urban Center	8.0%	1.00%	
C6 Urban Core	8.0%	1.00%	
Min. Grade Curb & Gutter	0.3%	-	FDM Part 2, Sect. 210.10.1.1
Minimum Stopping Sight Distance (Grades 2.0%)	Dsgn. Speed (mph)	Distance (ft)	FDM 210.11.1
	70	730	
	60	570	
	55	495	
	50	425	
	45	360	
	30	200	
Decision Sight Distance (Per avoidance maneuver)	Dsgn. Speed (mph)	Distance (ft)	-AASHTO Exh. 3-3
	70	780-1445	
	60	610-1280	
	55	535-1135	
	50	465-1030	
	45	395-930	
	30	220-620	
Horizontal Curve Length	V = Design Speed		FDM Part 2, Tbl 211.7.1
Freeway	30V (desirable)		
Others	15V (min.)		
Max. Curvature (Degree of Curve)			FDM Part 2, Tbl 210.9.1, 210.9.2
Freeway			
DS = 70 mph Rural	3° 30' 00"		
DS = 60 mph Urban	5° 15' 00"		
Arterial			
DS = 55 mph Rural	6° 30' 00"		
DS = 45 mph Urban	8° 15' 00"		
Collector			
DS = 45 mph Frontage Road	8° 15' 00"		
DS = 50 mph Service Road	8° 15' 00"		
Ramp			
DS = 50 mph Directional	8° 15' 00"		
DS = 30 mph Loop	24° 45' 00"		
Superelevation Transition			FDM Part 2, Sect. 210.9
Tangent	80% (50% min.)		*- (CFX Policy)*
Curve	20% (50% min.)		
Spirals	*(Curves <1°30' 00" do not use spirals)*		
Superelevation Transition Rates			FDM Part 2, Tbl. 210.9.3
$e_{max} = 0.10$			
2-lane	1:200 (45-50 mph)		- Design Standards Ind. No. 510, 511
	1:225 (55-60 mph)		- AASHTO Exh. 3-28
	1:250 (65-70 mph)		
3-lane	1:150 (45-50 mph)		
	1:170 (55-60 mph)		
	1:190 (65-70 mph)		
4-lane or more	1:100 (25-35 mph)		
	1:125 (40 mph)		
$e_{max} = 0.05$ (all lanes)	1:150 (45 mph)		
Vertical Curves	Dsgn. Speed (mph)	K-value Crest	K-value Sag	FDM Part 2, Tbl 211.9.2 - AASHTO Exh. 3-72 (crest), 3-75 (sag)
Length , L = KA	70	401	181	

Design Element	Design Standard			Source
Mainline	60	245	136	- *CFX Policy*[3]
	55	185	115	
	50	136	96	
	45	98 N/A	79 N/A	*Note: FDOT K-values for "ALL OTHER FACILITIES" are desirable*
	30	31 N/A	37 N/A	
Ramps	70	401	181	
	60	245	136	
	50	136	96	
	45	98	79	
	30	31	37	
Minimum Lengths	Crest	Sag		FDM Part 2, Tbl 211.9.3
Freeway				
DS = 70 mph Rural	1000-ft	800-ft	*Crest = 1800-ft within	
DS = 60 mph Urban	1000-ft	800-ft	interchange	
Arterial				
DS = 55 mph Rural	350-ft	250-ft		
DS = 45 mph Urban	135-ft	135-ft		
Collector				
DS = 45 mph Frontage Road	135-ft	135-ft		
DS = 50 mph Service Road	300-ft	200-ft		
Ramp				
DS = 50 mph Directional	300-ft	200-ft		
DS = 30 mph Loop	90-ft	90-ft		
Lane Drop Taper	L = WS (DS = 45 mph) L = $WS^2/60$ (DS ≤ 40 mph) 50:1 min, 70:1 desirable (freeways)			- Design Standards Ind. No. 525, 526 - AASHTO Pg. 818
Clear Zone	Travel Lanes	Auxiliary Lanes		
Freeway DS = 70 mph Rural DS = 60 mph Urban	36-ft	24-ft		FDM Part 2, Sect. 210, 211, 215 FDM Tbl 215.2.1
Arterial DS = 55 mph Rural	30-ft 4-ft (Curb & Gutter)	18-ft		
DS = 45 mph Urban	24-ft 4-ft (Curb & Gutter)	14-ft		
Collector DS = 45 mph Frontage Road	24-ft	14-ft		
DS = 50 mph Service Road	24-ft	14-ft		
Ramp DS = 50 mph Directional 1 to 2-lane	18-ft	8-ft		
DS = 30 mph Loop 1 to 2-lane	6-ft	6-ft		
Vertical Clearance Over Roadway Over Railroad Sign over Roadway Over Water	16'-6" FDM 16.5 23'-6" FDM 23.5 17'-6" FDM 17.5 12'-0" min. FDM 12'-0"			FDM 260.6 FDM Overhead Sign 210.10.3 FDM Waterway 260.8.1
Limited Access Limits Rural Urban Crossroad overpass/no interchange	300-ft min. 100-ft min 200-ft			FDM Part 2, Sect. 211.15.

Source: https://www.cfxway.com/cfx-design-guidelines/

Ramp Operations

- 2,000 feet between entrance and exit terminals – full freeways
- 600 feet between exit and entrance terminals
- Entrance Ramp Taper of 900 feet (one – convergence)
- Exit Ramp Taper of 550 feet (three – divergence)

Right-of-way

- 10 feet from back of walls or limit of construction
- 2 feet from back of sidewalk on frontage roads
- Drainage and construction easements as required
- 94 feet from ramp or mainline traveled way desirable for limited access ROW.
- Limited access ROW limits per Index 450

5.2 Drainage Design Standards

SR 417 (Seminole Expressway) to Orlando Sanford International Airport Connector basins are open basins located within Seminole County. The criteria used for design is set by CFX, SJRWMD, FDEP, FDOT, FAA, Seminole County and the city of Sanford. The most stringent criteria will govern the design. The following resources were used to develop these criteria:

- SJRWMD ERP Applicant's Handbook, Volumes I and II, June 2018
- FDOT Drainage Manual, January 2023
- FDOT Drainage Design Guide, January 2023
- FDOT Design Manual, January 2023
- NRCS Urban Hydrology for Small Watersheds – TR-55, June 1986
- FAA Hazardous Wildlife Attractants on or near Airports, February 2020

5.2.1 Pond Design

5.2.1.1 Peak Runoff Rates

- Calculated using SCS Runoff Curve Number Method

5.2.1.2 Attenuation Criteria (SJRWMD)

- The post-development peak discharge rate must not exceed the pre-development peak rate of discharge for the mean annual 24-hour storm (if new construction area is greater than 50% impervious).
- The post-development peak discharge rate must not exceed the pre-development peak rate of discharge for the 25-year frequency, 24-hour duration storm.

5.2.1.3 Treatment Volume Criteria (SJRWMD)

Water Quality Wet Detention: provide volume for the greater of:

- First 1 inch of runoff from the project area
- 2.5 inches of runoff over the impervious area

Water Quality Dry Retention: provide volume for the greater of:

- Offline Dry Retention
  - 0.5 inch runoff from project area
  - 1.25 inches runoff from directly connected impervious area

- On-Line Dry Retention
  - Additional 0.5 inch runoff from project area over the volume specified for offline treatment

5.2.1.4 Nutrient Reduction Criteria

- Basin Management Action Plan – Lake Jesup:
  - Net reduction of 16.7% of Total Nitrogen (TN) and 45.5% of Total Phosphorus (TP) discharging into the lake from the project area

5.2.1.5 Control Devices/Bleed-down (SJRWMD)

- Discharge of half of the required treatment volume within 24 to 30 hours
- Devices greater than 6 square inches cross-sectional area, 2 inch minimum dimension

5.2.1.6 Permanent Pool Volume (SJRWMD)

- Permanent pool shall be sized to provide at least a 14-day average residence time during the wet season (June to October).
- At least 30% of pond surface area shall consist of littoral zone. Alternatively, increase permanent pool volume to provide a 21-day residence time.
- Maximum 12-foot depth at control elevation and mean depth between 2 and 8 feet.

5.2.1.7 Pond Configuration

- Length-to-width ratio must be at least 2:1 to minimize short circuiting (SJRWMD).
- Side slopes no steeper than 1:4 (vertical to horizontal) from top of bank to a minimum depth of 2 feet below the control elevation (SJRWMD).
- 20-foot-wide maintenance easement provided beyond control elevation and connect to a public road (FDOT).
- Maintenance berms: provide a minimum 20 feet of horizontal clearance between the top edge of the control elevation and the ROW line. Provide at least 15 feet adjacent to the pond at a slope of 1:8 (V:H) or flatter, with back slopes no steeper than 1:3. Create the inside edge of the maintenance berm to have a minimum radius of 30 feet toward the pond (FDOT).
- Pond must be designed so that the average pond side slope measured between the control elevation and 2 feet below the control elevation is no steeper than 1:3 (V:H) (SJRWMD).
- Design high water levels shall meet base clearance requirements of 3 feet for mainline and 1 foot for ramps for a period of greater than 24 hours (FDOT).
- 1 foot of freeboard between design high water level and the minimum berm elevation (FDOT).

5.2.1.8 Floodplain Impacts and Compensation

- A system may not cause a net reduction in flood storage within a 10-year floodplain except for structures elevated on pilings or traversing works. Traversing works, works or other structures shall cause no more than a 1-foot increase in the 100-year flood elevation immediately upstream and no more than one-tenth of a foot increase in the 100-year flood elevation 500 feet upstream. A system will not cause a net reduction in flood storage within a 10-year floodplain if compensating storage is provided outside the 10-year floodplain (SJRWMD).

- No net encroachment into the floodplain, between the average wet season water table and that encompassed by the 100-year event. Compensating storage will be provided for the impacts.
- FEMA FIRM maps for the study area are noted in Section 3.4.4.

5.2.1.9 Cross Drains

The maximum allowable headwater for design flood frequency is at or below the edge of the shoulder.

5.2.1.9.1 Peak Runoff Rates

1. Basins 0 to 600 Acres: Rational Method – IDF Curves Zone 7
2. Basins 600+ Acres: USGS Regression Equations – Florida Region 3
3. Watershed model may be used with the approval of CFX

5.2.1.9.2 Design Frequency

- High Use or Essential Highway: 50-Year Storm
- FEMA regulated Floodplains: 100-Year Storm
  - No regulated floodways
  - Show no adverse impacts to Zone A floodplains

5.2.1.10 Unregulated Canal Criteria (FDOT)

- The minimum vertical clearance must be between the design flood stage and low member of a bridge is 2 feet. No drift clearance required for box culverts.
- If navigable, the minimum vertical clearance that must be provided is 6 feet above the Normal High Water. This could also require a U.S. Coast Guard permit.

6. Mobility Alternatives

6.1 No-Action Alternative

The No-Build Alternative assumes that the proposed connector does not exist in the design year 2050. Travel demand would be accommodated by the existing and planned regional roadway network. The future year daily traffic was modeled for each alternative including the No-Build Alternative. Tables 6-1 and 6-2 summarize the No-Build 2030 opening and 2050 design year, respectively, traffic and volume to LOS D MSV ratios.

In 2030 the No-Build SR 417 mainline segments and ramps are expected to operate at acceptable Volume to LOS D MSV ratios. SR 417 was assumed to be widened to eight lanes to the south of East Lake Mary Boulevard and six lanes to the north by 2030. During the AM Peak Hour, the westbound East Lake Mary Boulevard, both east and west of Red Cleveland Boulevard are approaching capacity with a Volume to LOS D MSV ratio estimated at 0.9. Additionally, northbound CR 427 (South of East Lake Mary Boulevard) during the PM Peak Hour is also approaching capacity with a Volume to LOS D MSV ratio estimated at 0.9.

In 2050 the SR 417 mainline is expected to have a Volume to LOS D MSV ratio of 0.8 during all travel periods. During the PM Peak Hour, the Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange northbound exit ramp expected ratio is 1.0. Additionally, the Volume to LOS D MSV Peak Hour ratios at several arterial segments (Lake Mary Boulevard, west of Red Cleveland Boulevard; Airport Boulevard, east of Sanford Avenue; and CR 427, south of Lake Mary Boulevard) are expected to be as high as 0.9 to 1.2.

6.1.1 No-Build Alternative Intersections Operations Analysis

A future No-Build analysis was conducted for the Red Cleveland Boulevard intersections at East Lake Mary Boulevard and Marquette Avenue using the 2030 and 2050 design hour volumes from Tables 6-1 and 6-2, respectively, to verify operations in the opening and design years. The existing lane geometry at the two intersections was assumed. The results indicate that all movements are expected to operate at an acceptable LOS D or better at the East Lake Mary Boulevard/Red Cleveland Boulevard intersection and LOS C or better at the Red Cleveland Boulevard/Marquette Avenue intersection in 2030.

In the 2050 design year, the No-Build analysis indicates that the overall AM Peak Hour operations at the East Lake Mary Boulevard/Red Cleveland Boulevard intersection are unacceptable (LOS E). In the PM, all movements are expected to operate at LOS D or better, except for the southbound left turn which is anticipated to operate at LOS E. All movements would operate at LOS D or better in 2050 at the Red Cleveland Boulevard/Marquette Avenue intersection.

Table 6-1. 2030 No-Build Traffic and Volume to LOS D MSV Ratios

Location	No. of Lanes per Direction	Two-Way AADT	AM Peak Hour		PM Peak Hour		Volume to LOS D MSV Ratios			
							AM Peak Hour		PM Peak Hour	
SR 417			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
At Airport Blvd. (ramps to and from the south)	1/2	8,000	330	390	360	420	0.2	0.1	0.2	0.1
Mainline – South of Airport Boulevard	3 + 1 Aux	64,300	3,440	3,400	3,420	3,420	0.5	0.5	0.5	0.5
At CR 427/East Lake Mary Boulevard (ramps to and from the north)	1	9,000	380	510	360	520	0.2	0.3	0.2	0.3
At CR 427/East Lake Mary Boulevard (ramps to and from the south)	1	22,100	1,080	1,090	920	1,240	0.6	0.6	0.5	0.7
At Lake Jesup Mainline Toll Plaza	4	77,400	4,140	3,980	3,980	4,140	0.5	0.5	0.5	0.5
At SR 434 (ramps to and from the north)	1	10,800	370	660	660	370	0.2	0.4	0.4	0.2
East Lake Mary Boulevard			**EB**	**WB**	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
West of Red Cleveland Boulevard	2	27,400	1,020	1,760	1,560	850	0.5	***0.9***	0.8	0.4
East of Red Cleveland Boulevard	2	26,500	980	1,840	1,550	750	0.5	***0.9***	0.8	0.4
Red Cleveland Boulevard			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
North of East Lake Mary Boulevard	2	6,500	210	330	370	280	0.1	0.2	0.2	0.1
Airport Boulevard			**EB**	**WB**	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
East of Sanford Avenue	1	9,300	340	330	320	510	0.5	0.4	0.4	0.7
CR 427			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
South of Lake Mary Boulevard	2	32,000	1,630	1,250	1,110	1,680	0.8	0.6	0.6	***0.9***

Notes:

AADT and peak hour volumes based on days of week and peak periods with highest demand

Values shaded indicate peak hour directional volumes

Freeway Mainline & Arterials Ratios in Volume to LOS D MSV

Ramps Ratios in Volume to Capacity LOS E

Bold & italic values indicate roadway is approaching or exceeding capacity

Table 6-2. 2050 No-Build Traffic and Volume to LOS D MSV Ratios

Location	No. of Lanes per Direction	Two-Way AADT	AM Peak Hour		PM Peak Hour		Volume to LOS D MSV Ratios			
							AM Peak Hour		PM Peak Hour	
SR 417			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
At Airport Blvd. (ramps to and from the south)	1/2	12,000	500	590	540	640	0.3	0.2	0.3	0.2
Mainline – South of Airport Boulevard	3 + 1 Aux	99,800	5,320	5,280	5,290	5,320	0.8	0.8	0.8	0.8
At CR 427/East Lake Mary Boulevard (ramps to and from the north)	1	14,800	620	830	590	860	0.3	0.4	0.3	0.5
At CR 427/East Lake Mary Boulevard (ramps to and from south)	1	33,100	1,620	1,630	1,380	1,860	***0.9***	0.9	0.7	***1.0***
At Lake Jesup Mainline Toll Plaza	4	118,100	6,320	6,080	6,080	6,320	0.8	0.8	0.8	0.8
At SR 434 (ramps to and from the north)	1	15,900	540	970	970	540	0.3	0.5	0.5	0.3
East Lake Mary Boulevard			**EB**	**WB**	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
West of Red Cleveland Boulevard	2	36,500	1,210	2,110	1,870	1,020	0.6	***1.1***	***0.9***	0.5
East of Red Cleveland Boulevard	2	35,400	1,170	2,210	1,860	900	0.6	***1.1***	***0.9***	0.5
Red Cleveland Boulevard			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
North of East Lake Mary Boulevard	2	9,800	310	450	520	410	0.2	0.2	0.3	0.2
Airport Boulevard			**EB**	**WB**	**EB**	**WB**	**EB**	**WB**	**EB**	**WB**
East of Sanford Avenue	1	15,800	570	560	550	870	0.8	0.8	0.7	***1.2***
CR 427			**SB**	**NB**	**SB**	**NB**	**SB**	**NB**	**SB**	**NB**
South of Lake Mary Boulevard	2	41,000	2,080	1,610	1,430	2,140	***1.1***	0.8	0.7	***1.1***

Notes:

AADT and peak hour volumes based on days of week and peak periods with highest demand

Values shaded indicate peak hour directional volumes

Freeway Mainline & Arterials Ratios in Volume to LOS D MSV

Ramps Ratios in Volume to Capacity LOS E

Bold & italic values indicate roadway is approaching or exceeding capacity

6.2 Projected Design Year Traffic – 2050 Design Year

Future traffic projections were also developed using the updated CFRPM v7 for the 2050 design year. The modeling analysis indicates that most traffic on the proposed connector would be diverted from the SR 417 and CR 427/East Lake Mary Boulevard interchange ramps to/from the south, improving operations at the ramp terminals and adjacent intersections. The connector is also expected to attract trips between regions south of Lake Jesup close to SR 417 and areas northeast of the airport and Osteen that would otherwise use Airport Boulevard, Sanford Avenue, US 17-92, SR 46 or other routes. The proposed connector would also reduce future traffic along East Lake Mary Boulevard, west of Red Cleveland Boulevard; Airport Boulevard, east of Sanford Avenue; and CR 427, south of East Lake Mary Boulevard. However, traffic would increase along East Lake Mary Boulevard, east of Red Cleveland Boulevard and on Red Cleveland Boulevard, north of Lake Mary Boulevard. Table 6-3 presents the estimated 2050 traffic volume (AADT) of the Build and No-Build Alternatives and the traffic that would be diverted (added or subtracted) from the existing surrounding facilities as a result of the proposed connector.

Table 6-3. 2050 Build and No-Build Alternatives Two-Way AADT and Impacts

Location	No-Build AADT	Build AADT	Difference (Build - No-Build)
SR 417			
At Airport Boulevard (ramps to and from the south)	12,000	9,300	-2,700
Mainline – South of Airport Boulevard	99,800	97,100	-2,700
At CR 427/East Lake Mary Boulevard (ramps to and from the north)	14,800	14,800	0
At CR 427/East Lake Mary Boulevard (ramps to and from the south)	33,100	16,100	-17,000
Mainline – South CR 427/East Lake Mary Boulevard	118,100	98,400	-19,700
Proposed Connector	N/A	24,800	24,800
At Lake Jesup Mainline Toll Plaza	118,100	123,200	5,100
At SR 434 (ramps to and from the north)	15,900	17,600	1,700
East Lake Mary Boulevard			
West of Red Cleveland Boulevard	36,500	19,500	-17,000
East of Red Cleveland Boulevard	35,400	43,200	7,800
Red Cleveland Boulevard			
North of East Lake Mary Boulevard	9,800	13,600	3,800
Airport Boulevard			
East of Sanford Avenue	15,800	12,000	-3,800
CR 427			
South of Lake Mary Boulevard	41000	24000	-17,000

6.3 Transit, Intermodal, and Multimodal Alternatives

6.3.1 CFX Multimodal Policy

Potential multimodal improvements were identified and reviewed for consistency with the CFX Multimodal Policy that states:

> *Fund or partner on multimodal initiatives where revenue generated from the investment equals the project cost or where toll user benefits are equal to or exceed the project cost. Candidate projects must comply with CFX's Master Bond Resolution and CFX's enabling legislation.*

This policy recognizes two types of multimodal initiatives:

1. Projects with direct benefits to CFX toll users – "Cost Equals User Benefits"
2. Projects meeting financial or revenue tests but not of direct benefit to CFX toll users – "Cost Equals Revenue"

6.3.2 Potential Multimodal Improvements

This project maintained consistency with the CFX Master Plan to identify potential multimodal and intermodal opportunities with regional partners. Regional coordination with the Sanford Airport Authority and other transportation agencies was initiated to identify potential changes in the regional network. No existing or planned connections from LYNX or SunRail to the airport were identified during the study, and no transit envelope is planned along SR 417. A passenger rail envelope is not planned in the area; however, the proposed connector would not preclude future rail connections. Further, the proposed connector will not impact existing transit (LYNX) connectivity.

The proposed connector would provide connections to Red Cleveland Boulevard as well as planned and existing intermodal centers within and around SFB. It is recommended to review potential park-and-ride locations by assessing the undeveloped properties within SFB. Undeveloped lands around the southern end of SFB are quickly being developed and the options for intermodal facilities outside of SFB are dwindling. It is further recommended to plan for and accommodate future autonomous shuttle service (for example, Beep) along East Lake Mary Boulevard for future multimodal connections to and from SFB.

6.4 Tolled Limited-Access Alternatives

Constructing a tolled limited-access expressway is a potentially viable response to the project purpose and need.

6.5 Corridor Development Process

6.5.1 Development of New Corridors

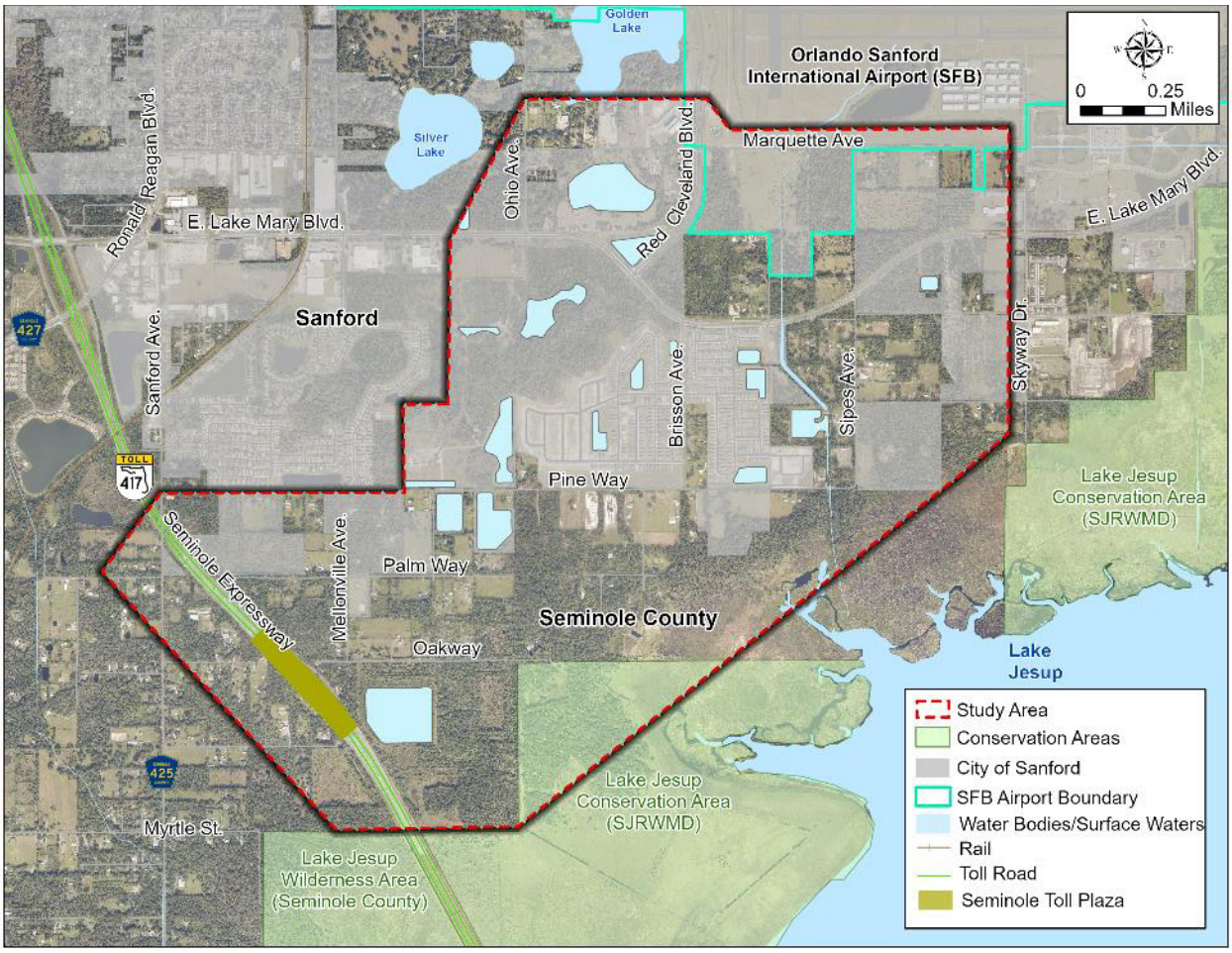
The process for identifying alternative corridors for evaluation consists of the following:

- Prepare a base map of the study area
- Prepare constraints maps to identify social, natural and physical constraints
- Develop the corridor typical section
- Identify reasonable corridor alignments that 1) conform to CFX design criteria and 2) minimize impacts to the social and natural environment and physical constraints

6.5.2 Base Map Development

A base map was prepared for the study area, depicting the existing road network, existing property boundaries, existing municipal boundaries, and environmental features (refer to Figure 6-1).

Figure 6-1. Study Area Base Map



6.5.3 Environmental Constraint Maps

Sociocultural and natural environmental constraint maps were developed to help identify and refine corridors to minimize impacts to environmental features. Publicly available GIS data were used to identify locations with environmentally sensitive resources that occur within and around the study area.

The environmental constraint maps were also used to help identify potential impacts resulting from the different proposed alignments. Environmental impacts were determined through review of literature and GIS data. GIS data was collected from various sources including: the Florida Geographical Data Library, SJRWMD, FNAI, FDEP, FEMA, USFWS, FWC, city of Sanford and Seminole County sources. Figures 6-2 and 6-3 present the sociocultural and natural environmental constraint maps, respectively, developed for this study.

Figure 6-2. Sociocultural Environmental Constraint Map

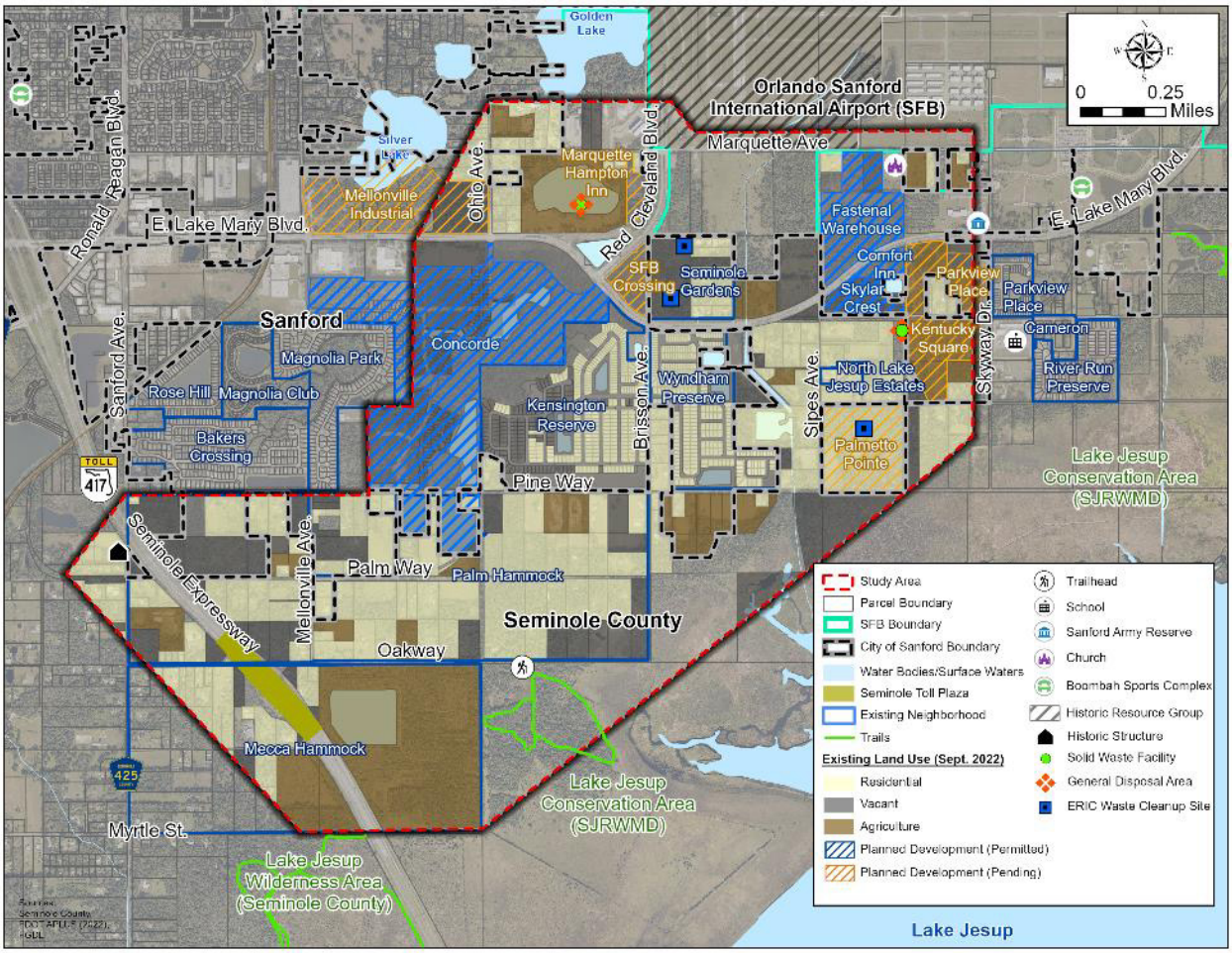
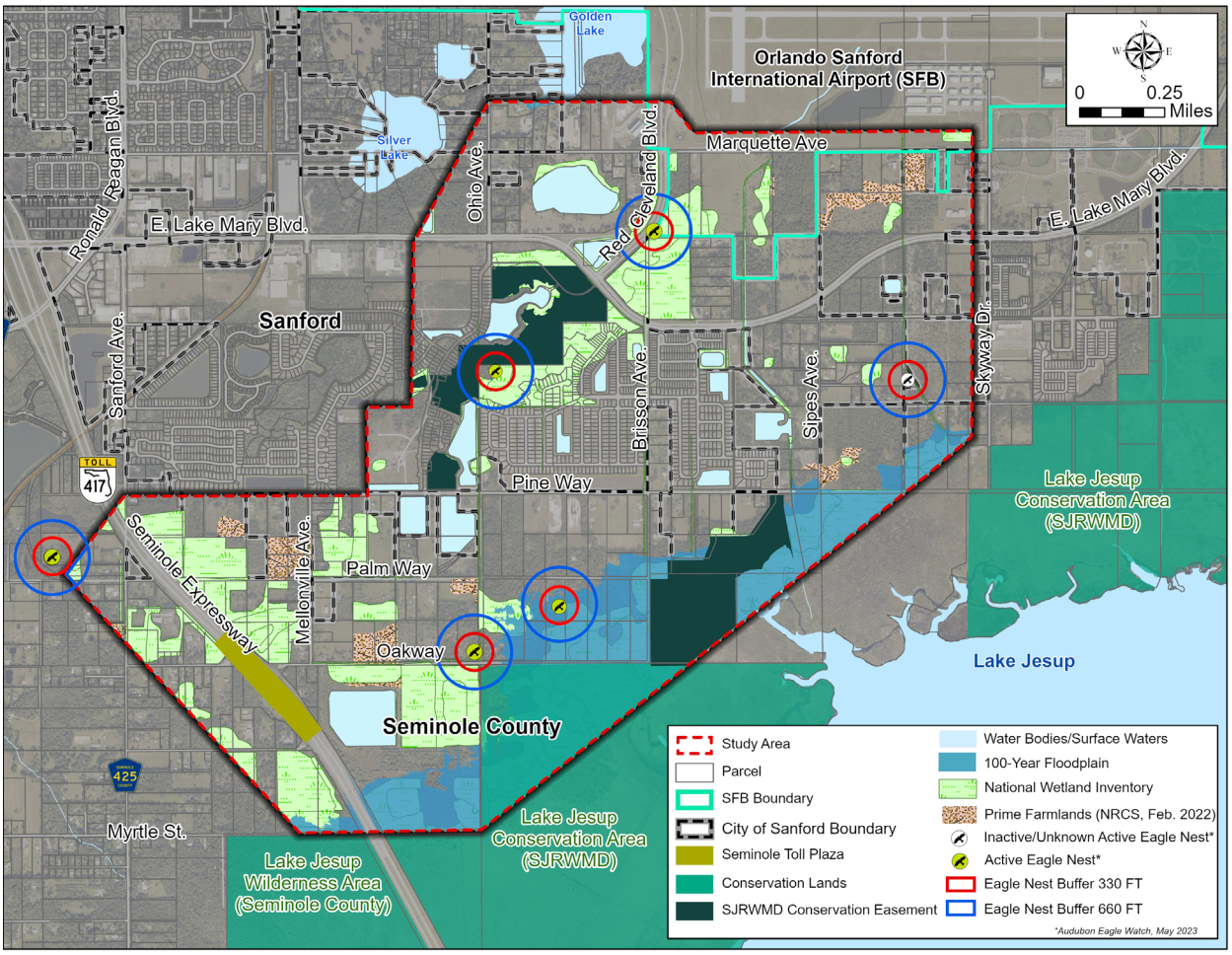


Figure 6-3. Natural Environmental Constraint Map



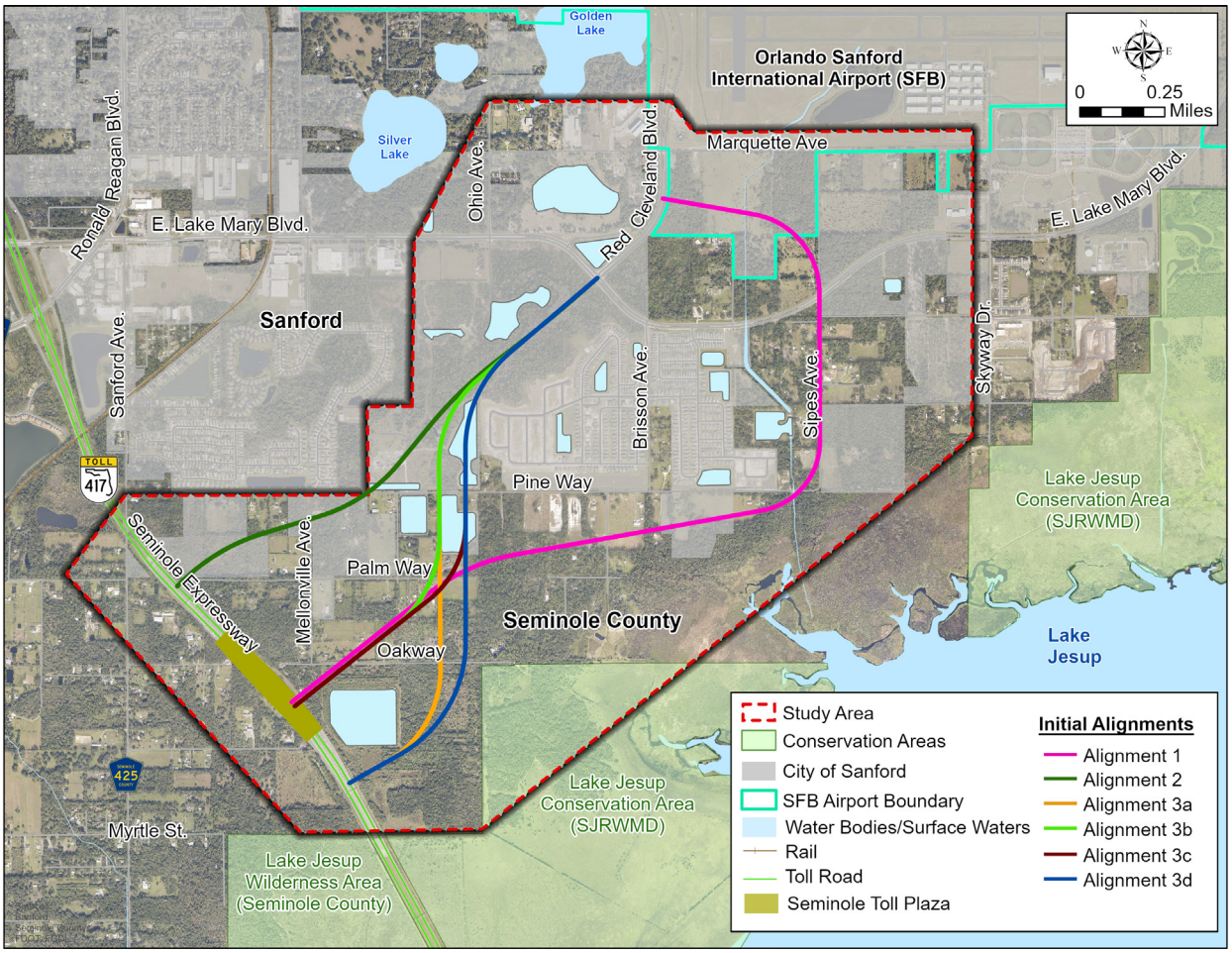
6.6 Corridor Narrative

6.6.1 Alignments 1 through 3

Based on the previous planning studies, current development plans, and social and environmental constraints, alternative alignments were developed that conform to CFX design criteria. The alignments were evaluated based on their ability to meet the purpose and need for the project and provide improved traffic operations on East Lake Mary Boulevard and the existing SR 417 and Ronald Reagan Boulevard (CR 427) and Red Cleveland Blvd. interchange. This study anticipates the Seminole Toll Plaza along SR 417 would be converted to an all-electronic tolling system by the time project construction begins. The toll gantry is assumed to be relocated to the south of any feasible connector.

Six alignments were initially developed: Alignments 1, 2, 3a, 3b, 3c and 3d. Figure 6-4 presents a map of the initial alignments developed.

Figure 6-4. Initial Alignments Map



Alignment 1 was developed to avoid impacts to existing or permitted high-density residential developments and to minimize impacts to regulatory conservation easements. However, it increases travel time and results in impacts to low-density residential areas and the airport property.

Alignment 2 was developed as the shortest, most direct connection to the airport. However, this alignment impacts existing and permitted residential areas. Additionally, the interchange associated with this initial alignment is close to the existing SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange to the north and would likely affect traffic operations along SR 417.

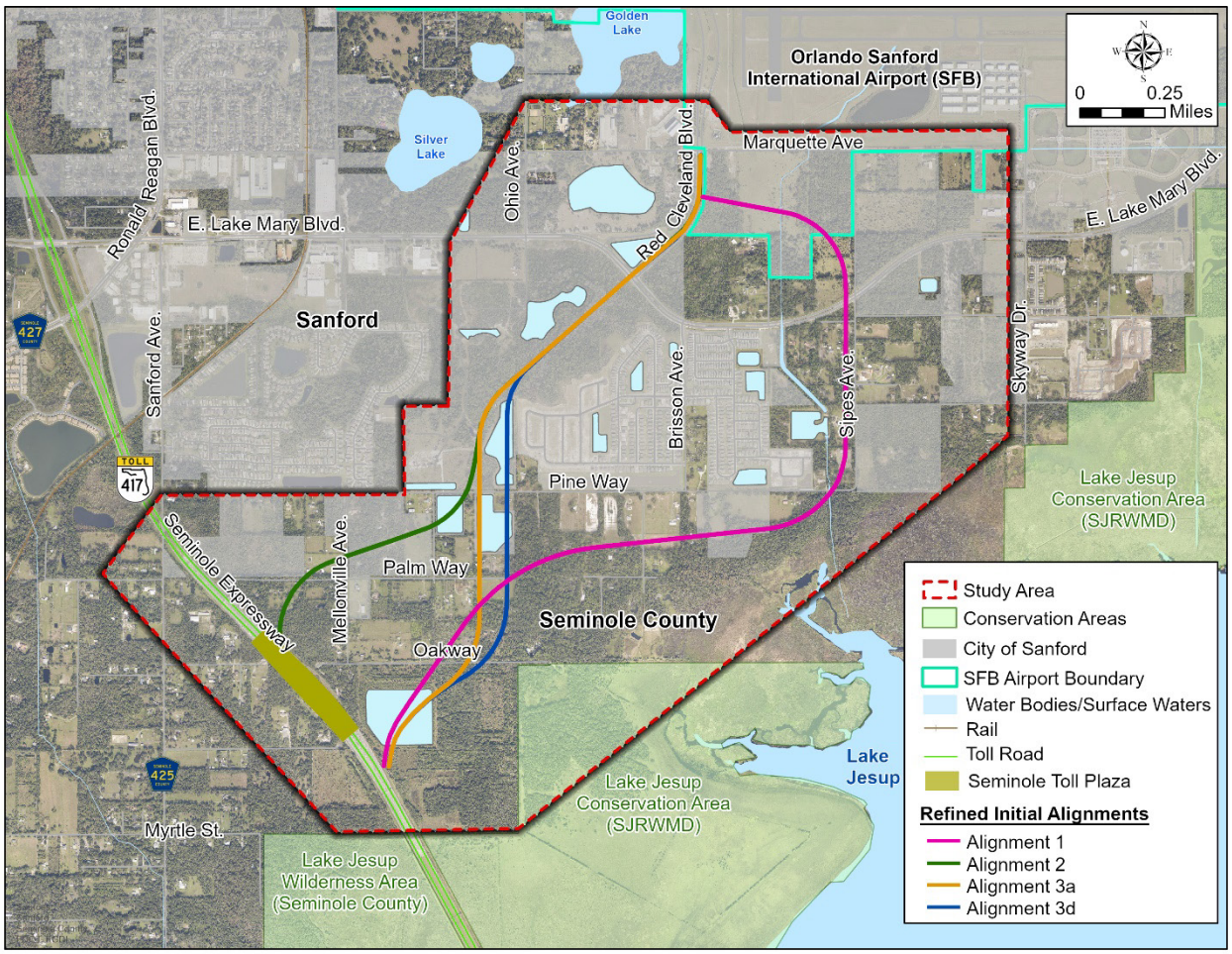
Alignments 3a and 3b were developed to connect directly to East Lake Mary Boulevard/Red Cleveland Boulevard and to increase the interchange spacing from the existing SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange. The origin points along SR 417 were located south of the Seminole Toll Plaza for Alignment 3a and within the Seminole Toll Plaza footprint for Alignment 3b. Located north of an interchange with SR 417 and the proposed connector, Alignments 3a and 3b followed the same alignment from north of Palm Way to the terminus at Red Cleveland Boulevard.

To minimize impacts to existing and permitted residential areas, Alignments 3c and 3d were developed as refinements of Alignments 3b and 3a, respectively. Alignments 3c and 3d were developed to avoid impacts to future residential parcels but require elevated sections over the existing stormwater management area for the Concorde Planned Development (north of Pine Way).

Following input from the Environmental Advisory Group, Project Advisory Group and the Environmental Stewardship Committee, these alignments were further refined to accommodate interchange concepts, address engineering criteria, improve traffic operations and minimize environmental impacts. Once SR 417 interchange concepts were developed and evaluated, the alignments were further refined to address engineering criteria for horizontal and vertical alignments. Alignments 3b and 3c were eliminated from further study because the interchange concept development resulted in a similar interchange footprint as Alignments 3a and 3d to avoid impacts to conservation lands and to address engineering criteria.

Figure 6-5 presents the four refined alignments for Alignments 1, 2, 3a and 3d. Appendix A presents the concept plans for each alignment.

Figure 6-5. Refined Alignments for Alignments 1 Through 3



6.6.1.1 Alignment Location

Alignments 1, 3a and 3d begin at a proposed SR 417 interchange located south of the existing toll plaza. This location minimizes proximity to the existing SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange and improves future traffic operations.

Alignment 1 continues in the north-east direction along the west side of Sipes Avenue before connecting to East Lake Mary Boulevard and terminating at Red Cleveland Boulevard. Alignment 1 was refined to address interchange connectivity and a horizonal alignment that minimized residential impacts.

Alignments 3a and 3d continue north from the proposed SR 417 interchange ultimately connecting to Red Cleveland Boulevard just north of East Lake Mary Boulevard. The terminus at SR 417 was developed to avoid impacts to the conservation lands to the south. Based on permitted site plans, Alignment 3a impacts approximately 18 proposed homes in the southeast corner of the Concorde Planned Development. Alignment 3d was developed to avoid these homes and is located to the east of Alignment 3a and would be elevated over the stormwater management area north of Pine Way. Alignments 3a and 3d follow the same alignment north of the stormwater management area and impact SJRWMD conservation lands.

Alignment 2 originates at a proposed interchange at the Seminole Toll Plaza and continues in a northerly direction connecting to East Lake Mary Boulevard and terminating at Red Cleveland Boulevard. Alignment 2 was refined by moving the origin point at SR 417 farther south of the Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange to improve traffic operations and interchange spacing and to address engineering criteria.

6.6.1.2 Proposed Interchanges

The locations for the proposed interchanges to accommodate the refined alignments are presented in Figures 6-6, 6-7 and 6-8.

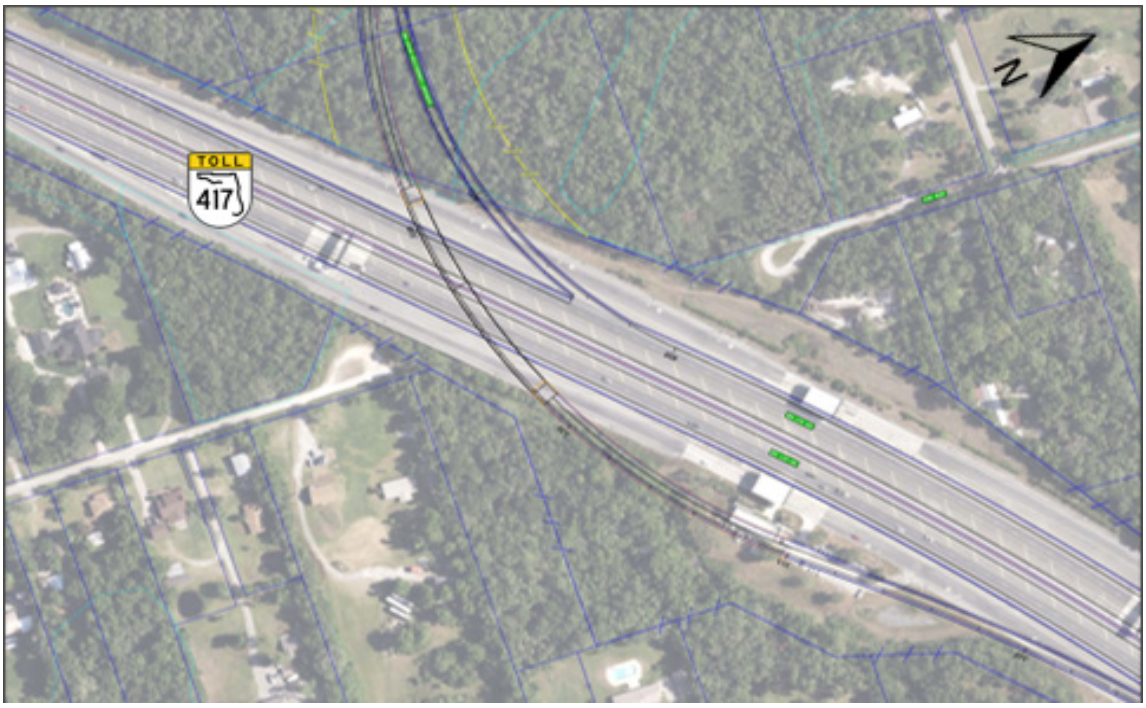
Figure 6-6 shows a rendering of a proposed interchange at East Lake Mary Boulevard that would allow for full access to East Lake Mary Boulevard and Red Cleveland Boulevard while maintaining the existing local access to the intersection. This interchange would be proposed for Alignments 2, 3a and 3d. Motorists would be able to access the southbound proposed connector from Red Cleveland Boulevard or East Lake Mary Boulevard. Existing sidewalks and pedestrian facilities along East Lake Mary Boulevard and Red Cleveland Boulevard would remain. For Alignment 1, a partial interchange at East Lake Mary Boulevard is proposed with ramps to/from the south based on traffic needs. Alignment 1 terminates at the intersection with Red Cleveland Boulevard. Alignment 1 is shown on the concept plans in Appendix A.

Figures 6-7 and 6-8 show the proposed interchanges at SR 417 for Alignments 1, 3a and 3d, which are located south of the Seminole Toll Plaza and include ramps to and from the south of SR 417. The interchange at SR 417 for Alignment 2 begins at the Seminole Toll Plaza and also includes ramps to and from the south of SR 417. FTE has advised this section of SR 417 will be converted to all-electronic tolling, which would reduce the ROW impacts resulting from this interchange location.

Figure 6-6. Proposed Interchange at East Lake Mary Boulevard

Figure 6-7. SR 417 Interchange for Alignments 1/3a/3d

Figure 6-8. SR 417 Interchange for Alignment 2



6.6.1.3 Proposed Intersections

The proposed intersection shown in Figure 6-6 is a signalized intersection.

6.6.2 Proposed Typical Sections

Figure 6-9 is the existing East Lake Mary Boulevard typical section, which is a four-lane divided facility. It includes pedestrian and bicycle facilities as well as a shared-use path to the south designated as the Lake Mary Pathway.

Figure 6-10 is a two-lane typical section that is expected to provide adequate capacity through the year 2050 to accommodate anticipated future traffic. However, adequate ROW for a potential future expansion of one lane in each direction, resulting in a four-lane facility, was assumed. With a reduced ROW width, this typical section also minimizes ROW needs, reduces impacts and cost and provides flexibility for future expansion. The typical section being considered would be developed with a design speed of 45 mph and would be elevated over existing roadways to maintain existing access. Appendix B presents the typical sections developed for this study.

Figure 6-9. East Lake Mary Boulevard Existing Typical Section

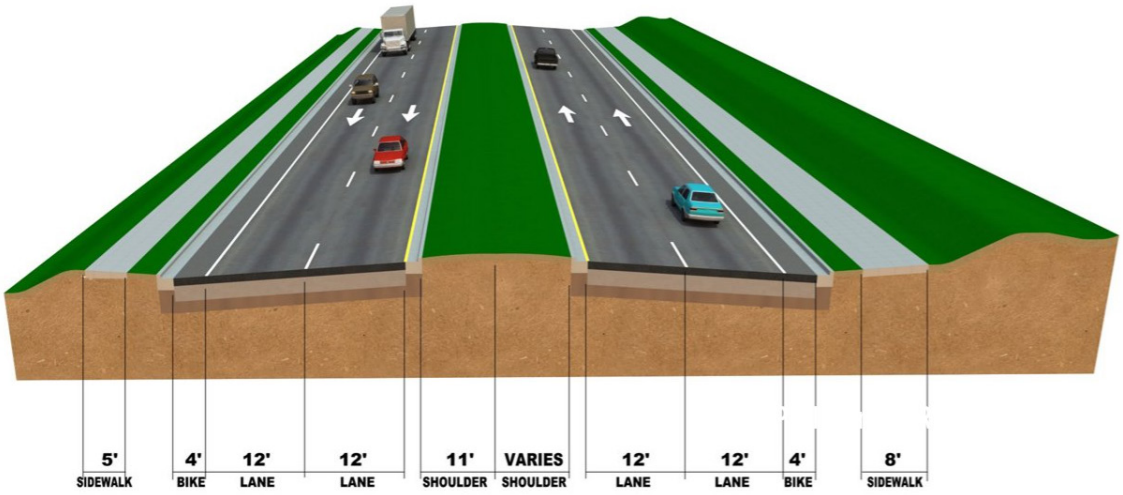
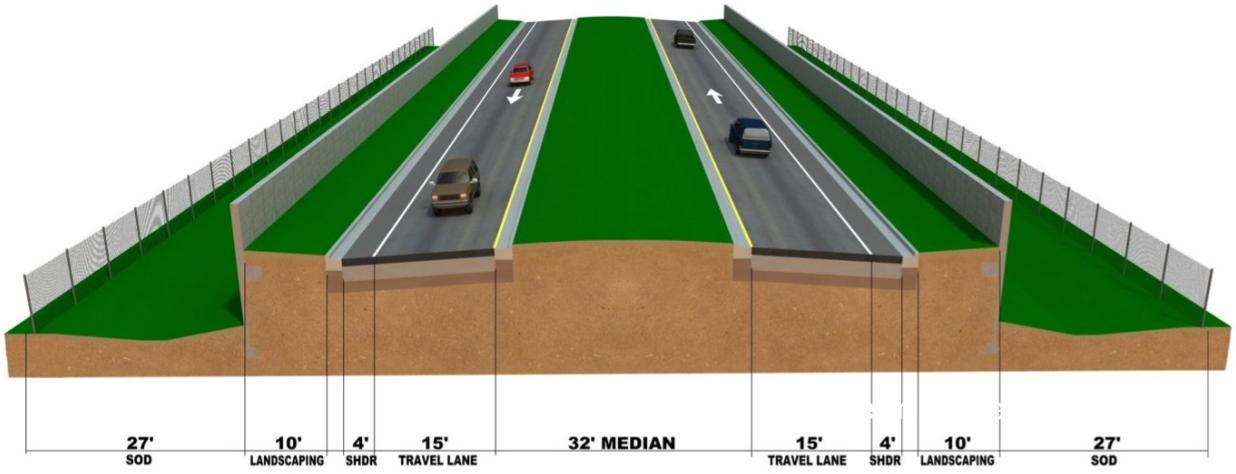


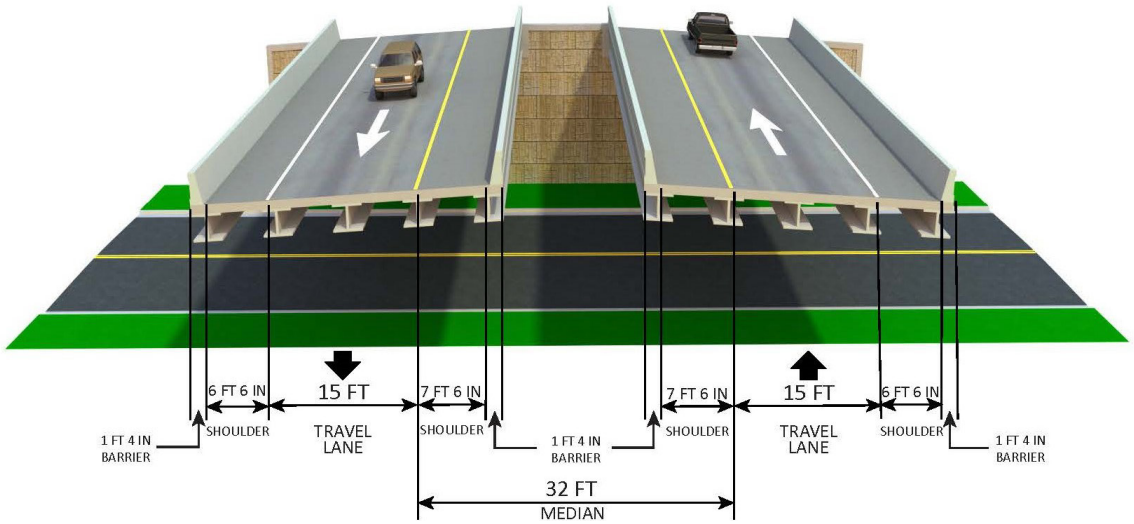
Figure 6-10. Proposed Connector Typical Section (Two-Lane)



6.6.3 Proposed Structures

Bridges are proposed to span the existing local roadways including Mellonville Avenue, Oakway, Palm Way, Pine Way and East Lake Mary Boulevard. Excluding the interchanges, each alignment would include two to three bridges. The bridges are proposed as dual bridges. It is important to note that Alignment 3d would span the existing retention pond, located on the southern end of the Concorde Planned Development, and north of Pine Way approximately 1,500 feet. Figure 6-11 presents the two-lane bridge typical section over local roadway crossings that span less than 500 feet.

Figure 6-11. Proposed Connector Bridge Typical Section (Two-Lane Bridge)



6.6.4 Drainage and Stormwater Considerations

Preliminary stormwater management facility and floodplain impacts and compensation considerations were identified based on the proposed connector Alignment 3d, which results in the most acres of impacts to existing surface waters and floodplains. The stormwater management considerations also assumed that any bridge typical sections included would be designed with impervious surfaces from outside edge of roadway to the opposite outside edge of the roadway (that is, there is no open median).

The stormwater ponds for Alignment 3d were sized to accommodate 16.5 acres of net additional impervious area. The total required treatment volume is 7.70 acre-feet, based on 1 inch of runoff over the total basin area(s). The total treatment volume also accounts for 0.02 ac-ft to compensate for impacts to existing pond, Tract P-7. The proposed improvements are estimated to impact 2 acres of floodplain and compensation volume can be provided (cup-for-cup approach) by proposed linear swales within each basin. The proposed connector and study area was divided into two basins, which resulted in a total required pond area of 13.6 acres. Based on the criteria outlined in Section 5.2, the project could meet or exceed stormwater needs by using wet detention ponds in both basins. Wet detention ponds identified for the proposed connector would also be able to meet the current Total Maximum Daily Load, as outlined in the Basin Management Action Plan for Lake Jesup. The summary of required volumes and required pond area for each basin is provided in Table 6-4.

Table 6-4. Alignment 3d Alternative Pond Sizing Summary

Basin	Required Attenuation Volume (ac-ft)	Required Treatment Volume (ac-ft)	Required Floodplain Compensation Area (acres)	Total Required Pond Volume (ac-ft)	Required Pond Area (acres)
1	1.34	2.85	0.0	4.19	4.1
2	0.64	4.85	2.0	5.50	9.5

7. Anticipated Affects

7.1 Natural Environment

This section addresses potential adverse effects to natural resources that may result from the proposed alignments. Potential effects to protected species and habitats, wetlands, surface waters and public/ conservation lands were evaluated for both the study area and alignments. Preliminary field reviews of the study area were conducted based on initial proposed alignments. Available literature and GIS data were used to estimate potential effects and identify anticipated regulatory agency coordination needs and were applied to the current proposed alignments.

7.1.1 Water Resources

The 2014 SJRWMD FLUCFCS and USFWS NWI GIS databases were used to identify wetlands and surface waters within the study area. Surface waters were identified as natural lakes, canals/creeks, stormwater management systems or other reservoirs (such as the large borrow pit in the southwest portion of the study area). Wetlands were identified as either non-forested or forested (which included shrub habitat) for the purposes of determining potential mitigation requirements.

7.1.1.1 Surface Waters

All study alignments would result in direct impacts to surface waters including stormwater management areas and other reservoirs. There could also be potential conflicts with study area canals/creeks. Table 7-1 summarizes the anticipated surface water impacts for the proposed alignments. The greatest potential for surface water impacts is associated with Alignments 3a and 3d as they traverse the large borrow pit on the west side of SR 417 near the toll plaza. Impacts to vegetated areas associated with natural lakes and canals/creeks may require mitigation.

Table 7-1. Surface Water Impacts by Alignment

Alignment	Natural Lakes (acres)	Stormwater Management Areas (acres)	Other Reservoirs (acres)	Canals/Creeks Conflicts (no. of conflicts)	Total Acres
1	0	0	7	2	7
2	0	3	0	0	3
3a	0	3	10	0	13
3d	0	8	10	0	18

7.1.2 Groundwater

Stormwater management facilities would be required for the proposed connector. Facilities would be designed and constructed in accordance with SJRWMD, FDEP, FDOT and FAA rules and regulations. With implementation of these guidelines, the effects on groundwater from the project is expected to be minimal.

7.1.2.1 Stormwater

Stormwater management facilities will be an integral part of the planned roadway infrastructure. Section 6.6.4 documents drainage and stormwater considerations for the proposed connector.

7.1.2.2 Floodplains

According to FEMA Flood Insurance Rate Maps for Seminole County, the study area lies in the 100-year floodplain, within Zones A, AE and X. Within the study area, the 100-year FEMA flood level ranges from 9 feet (NAVD) at Lake Jesup to 45 feet (NAVD) at Lake Onora. Table 7-2 provides the acreage of 100-year floodplain impacts by alignment. Note that impacts are to Flood Zone AE only.

Table 7-2. 100-Year Floodplain Impacts by Alignment

FEMA FIRM Flood Zones – Impacts in Acres			
Alignment	**Zone A**	**Zone AE**	**Total**
1	0	2	2
2	0	0	0
3A	0	2	2
3D	0	2	2

7.1.2.3 Wetlands

Wetlands were identified within the study area using the 2014 SJRWMD FLUCFCS data, 2013 NWI data and aerial photography (Figure 3-6). The wetland classifications are based on hydric soils, vegetation, and site hydrology and in accordance with the regulatory definitions of the USEPA and USACE for administering the permitting program under Section 404 of the Clean Water Act. The act states, “Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

The proposed connector would potentially impact forested wetlands systems composed of mixed hardwoods, hydric pine flatwoods, cabbage palm hammocks and willow/elderberry habitats. Non-forested systems include treeless hydric savannas, freshwater marshes, emergent aquatic vegetation and wet prairies. Alignment 1 has the lowest potential wetland impacts (7 acres), while Alignment 2 has the highest total wetland impacts (19 acres).

An estimate of Uniform Mitigation Assessment Method credits was developed to determine the number of credits needed to support cost estimates. It was assumed that every acre of impacted wetland equates to 0.8 UMAM Functional Loss. Therefore, each acre of impacted wetland was multiplied by 0.8 to estimate 1 UMAM credit. Wetland delineations, UMAM analysis of wetland function and routine determination of credit availability and pricing will be required to determine actual wetland mitigation costs. Table 7-3 summarizes the anticipated wetland impacts for each alignment, by forested and non-forested (herbaceous) systems, as well as the anticipated number of UMAM credits.

Table 7-3. Approximate Wetland Impacts and Estimated Mitigation Cost for Each Alignment

Alignment	Forested Wetland (Acres)	Non-forested (Acres)	Total Wetland Impacts (Acres)	Anticipated UMAM Credits
1	4	3	7	4.9
2	16	3	19	13.3
3a	16	<1 (0.3)	17	11.9
3d	15	1	16	11.2

7.1.3 Farmlands

As documented in Section 3.6.8, prime farmlands in the study area are primarily designated as improved pastures prime farmlands (72.69%). Of the total 43.43 acres of prime farmlands in the study area, the proposed alignments are anticipated to impact between less than 1 acre and 3 acres. Table 7-4 summarizes the anticipated impacts to prime farmlands by alignment.

Table 7-4. Approximate Prime Farmland Impacts for Each Alternative

Alignment	Improved Pastures (acres)	Tree Nurseries (acres)	Horse Farms (acres)	Total Prime Farmland Impacts (acres)
1	<2 (1.7)	<1 (0.09)	<1 (0.3)	2
2	3	0	0	3
3a	<1 (0.1)	0	0	<1
3d	1	0	0	1

7.1.4 Threatened and Endangered Species

Publicly available GIS data and published information was reviewed to identify the potential for threatened or endangered species to occur within the study area (refer to Figure 3-8). Involvement of other environmentally sensitive resources such as consultation areas, critical habitats, and EFH were also reviewed and documented.

Habitats within the study area have the potential to support state and federally listed species. The study area lies within the USFWS Consultation Area for the Audubon's crested caracara, Everglade snail kite, Florida scrub-jay and the West Indian manatee. All proposed alternatives traverse areas of pastures and wetlands, both of which have the potential to support state and federally protected species. Additionally, upland habitats include shrub/brushland, and upland mixed conifers/hardwoods that may provide habitat suitable for Eastern indigo snake, Florida pine snake, Florida scrub-jay, gopher tortoise, southeastern American kestrel and burrowing owl. There is no USFWS-designated critical habitat or EFH within the study area. Five bald eagle nests have the potential involvement within the various alternative alignments. Florida black bear (protected under Rule 68A-4.009, FAC) roadway mortalities are documented to have occurred outside of the study area; however, nuisance bears occur within the project area.

For this study, protected species protection designations, such as consultation areas, are assumed to be uniform across the study area. Areas identified as potential suitable habitat for protected species reflect an assumption of uniform quality and availability for assessment purposes. Potential uniform distribution of species within an associated habitat type is also assumed (that is, 1 acre of suitable caracara habitat is assumed to reflect the same quality of habitat, regardless of its location within the overall project study area).

To quantify listed species impacts, three representative species were chosen based on habitat requirements identified in conservation guidelines. Potential suitable habitat for each species was identified using the land use/land cover dataset (FLUCFCS) obtained from the SJRWMD for Seminole County. Table 7-5 presents suitable habitat for the selected representative species and includes the federally protected Audubon's crested caracara and bald eagle and the state-listed gopher tortoise.

Table 7-5. Suitable Habitat for State and Federally Protected Species

Species Name	Status	Suitable Habitat Based on FLUCFCS Mapping
Audubon's Crested Caracara	FT	2110, 2120, 2410, 2510, 3100, 3200, 3300, 4280, 6181, 6430
Bald Eagle	*	4110, 4200, 4340, 5100
Gopher Tortoise	ST	2110, 2120, 2210, 2510, 3200, 3300, 4110, 4280, 4340, 4430

FT – Federally Threatened

ST – State Threatened

* Afforded federal protection through the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

Alignment 1 has a medium cumulative potential for impacts to protected species habitat. This alignment is within the 660-foot-wide secondary protection zone for bald eagle nest SE078, located north of East Lake Mary Boulevard along Red Cleveland Boulevard. The alignment crosses several large areas of improved, unimproved and wooded pasture that have the potential to support nesting and foraging habitat for the Audubon's crested caracara and gopher tortoise.

Alignment 2 has a medium cumulative potential for impacts to protected species habitat. This alignment would have direct involvement with two bald eagle nests (SE078 and SE026) located in the regulatory conservation easement west of Kensington Reserve. This alignment also crosses large areas of improved, unimproved and wooded pasture that have the potential to support nesting and foraging habitat for the Audubon's crested caracara and gopher tortoise. Alignment 2 also has the highest value for potential wetland impacts.

Alignment 3a has a medium cumulative potential for impacts to protected species habitat. This alignment would have direct involvement with two bald eagle nests (SE078 and SE026) and is within the 660-foot-wide secondary protection zone of nest SE025, north of Oakway. This alignment also crosses portions of improved, unimproved and wooded pasture that have the potential to support nesting and foraging habitat for the Audubon's crested caracara and gopher tortoise. This alternative has the second highest value for potential wetland impacts.

Alignment 3b has a medium cumulative potential for impacts to protected species habitat. This alignment would have direct involvement with three bald eagle nests (SE078, SE026, and SE025) and crosses portions of improved, unimproved and wooded pasture that have the potential to support nesting and foraging habitat for the Audubon's crested caracara and gopher tortoise.

Each alignment was evaluated for its potential to impact the selected protected species. Table 7-6 summarizes potential impacts to suitable habitat for each representative species, including species that

may occur across multiple habitat types, are commensal species or are considered to be habitat generalists, such as the Eastern indigo snake, wood stork or Florida sandhill crane. These species were not included in the comparison but may occur within the alignment corridors. Table 7-7 summarizes potential overall habitats impacts to federally and state listed species by alignment.

Table 7-6. Potential Impacts to Selected Protected Species by Alignment

Species Name (impact)	Alignment 1	Alignment 2	Alignment 3a	Alignment 3b
Audubon's Crested Caracara (acres of habitat)	26	6	15	14
Bald Eagle (direct nest impact)	1	2	3	3
Gopher Tortoise (acres of habitat)	36	16	21	25

Table 7-7. Potential Overall Impacts to Protected Species Habitat by Alignment

Protected Species	Alignment 1	Alignment 2	Alignment 3a	Alignment 3b
Potential Habitat - Federal Listed Species (acres of impact)	47	34	37	58
Potential Habitat - State-Listed Species (acres of impact)	40	32	27	58

To support potential mitigation costs for impacts to protected species, area of habitat use was estimated for each selected species. While much of the habitat within the project study area may be suitable and has the potential to support a protected species, it is unlikely that 100% of a suitable habitat is occupied by a specific species. Audubon's crested caracara suitable habitat was calculated using an adjustment factor of 0.2 to capture the difference between occupied habitat versus suitable habitat. Habitat use for the gopher tortoise is based on an assumed potential occupancy of one gopher tortoise per acre. This assumption is based in part on brief field observations and an overall lack of observed gopher tortoise burrows in September 2022. A bald eagle nest direct/incidental take is factored "as is" per direct take of known nests within each alignment. Table 7-8 summarizes potential mitigation for selected species.

Because wetland mitigation typically offsets the impacts to wetland-dependent species, it is assumed impacts to wetland-dependent species will be accounted for with wetland mitigation (that is, wood stork and Florida sandhill crane).

Table 7-8. Potential Mitigation for Selected Protected Species by Alignment

Species Name (mitigation)	Alignment 1	Alignment 2	Alignment 3a	Alignment 3b
Audubon's Crested Caracara (acres of habitat for mitigation)	5.2	1.2	3	2.8
Bald Eagle (direct/incidental nest takes)	0	2	2	3

Species Name (mitigation)	Alignment 1	Alignment 2	Alignment 3a	Alignment 3b
Gopher Tortoise (number of relocations)	36	16	21	25

7.1.5 Essential Fish Habitat

No EFH has been identified within the project study area. If necessary, an analysis to confirm this determination will be made during subsequent project development studies.

7.1.6 Conservation and Mitigation Areas

According to the FNAI Florida Conservation Lands GIS and SJRWMD permitting databases, there are five areas identified as regulatory conservation easements or mitigation lands within the study area. Table 7-9 presents the regulatory conservation easements within the study area. Table 7-10 provides the acreage of impacts to these regulatory conservation easements per alignment. Figure 7-1 presents the location of conservation easements or mitigation lands within the study area.

Table 7-9. Regulatory Conservation Easements within the Study Area

Permit Number	Grantor	Grantee	Deed Type	Acres
4-117-0151GM10	Seminole County	SJRWMD	Grant or Dedication of Easement	35.8
4-117-21900-9	The Ryland Group, Inc.	SJRWMD	Grant or Dedication of Easement	24.1
22290-1	Sanford Industrial Park, Inc.	SJRWMD	Conservation Easement	0.8
22290-1	Sanford Industrial Park, Inc.	SJRWMD	Conservation Easement	50.5
22290-1	Sanford Industrial Park, Inc.	SJRWMD	Conservation Easement	5.7

Table 7-10. Potential Regulatory Conservation Easement Impacts per Alignment

Conservation Easement Grantor	Alignment 1	Alignment 2	Alignment 3a	Alignment 3b
The Ryland Group, Inc. (acres)	2	0	0	0
Sanford Industrial Park, Inc. (acres)	0	14	14	10

Mitigation banks are required to have regulatory conservation easements with the state of Florida or the federal government identified as the easement holders; therefore, mitigation banks are classified as public lands in the database.

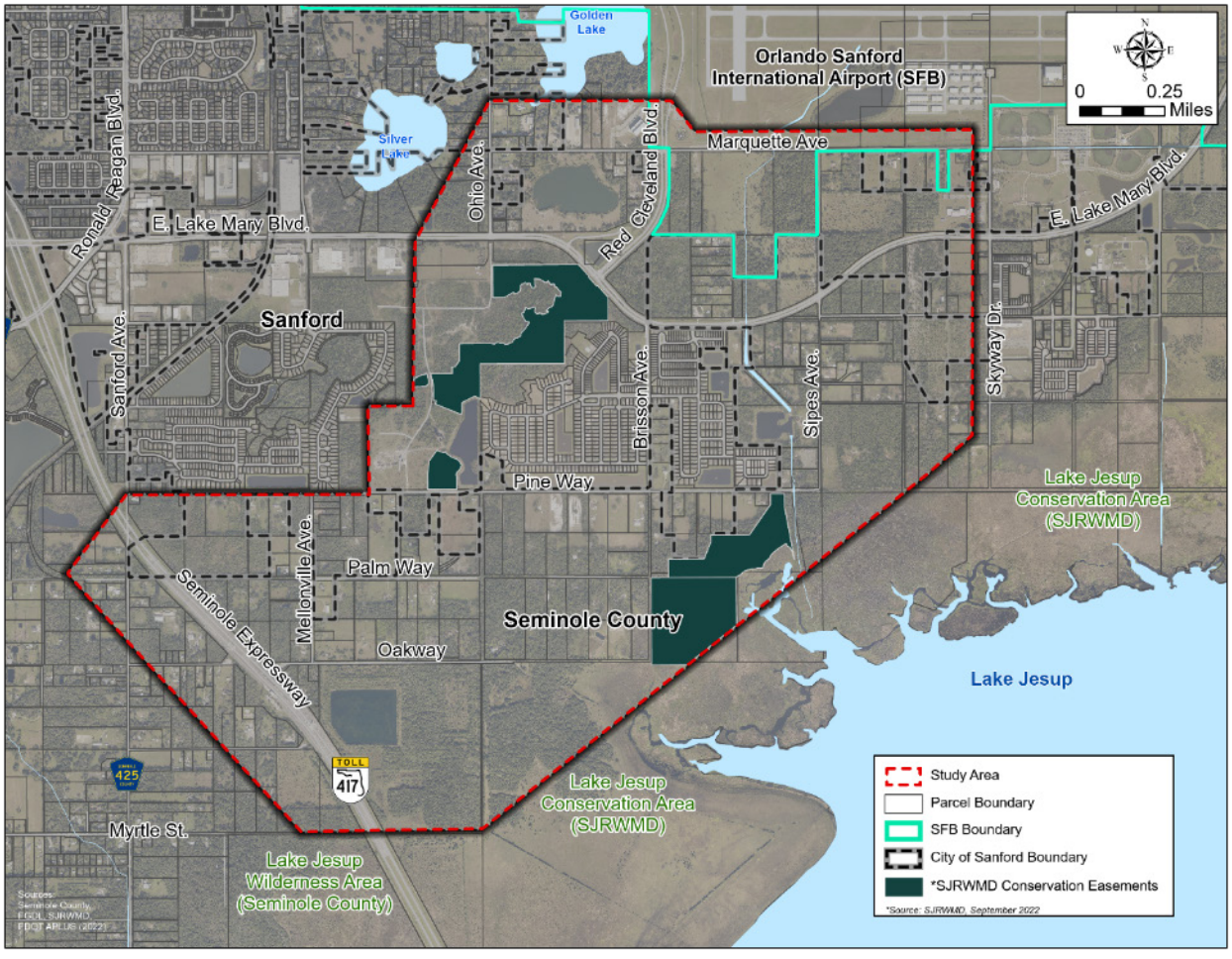
Based on the review of the SJRWMD and USACE Regulatory In-lieu Fee and Bank Information Tracking System databases, five mitigation banks are potentially available to service the study area. All of these mitigation banks are permitted via SJRWMD. The USACE RIBITS database provides available credits based on habitat type. These mitigation banks are listed in Table 7-11 and credits represent existing availability. The specific mitigation approach would need to be determined during future phases of the project and requires direct coordination with SJRWMD.

Table 7-11. Mitigation Banks and Potentially Available Credits Servicing the Study Area

Bank Name	Bank Permit Number	Credit Classification	Available Credits	Last Transaction
FARMTON	4-127-76185-4	Palustrine	4522.546	7/6/2022
TM-ECON, PHASES I-III	4-095-84310-3	Palustrine	404.163	3/3/2022
TM-ECON, PHASE IV	4-095-84310-4	Palustrine	393.836	5/24/2021
EAST CENTRAL	4-117-56433-1	Palustrine	0.27	5/17/2019
COLBERT CAMERON	4-127-23136-1	Palustrine	259.04	4/6/2022

Source: USACE RIBITS Accessed 9/26/22
https://ribits.ops.usace.army.mil/ords/f?p=107:158:4320295270527::NO

Figure 7-1. SJRWMD Regulatory Conservation Easements



7.1.7 Anticipated Permits

State and federal agencies regulate construction and maintenance activities via numerous environmental laws and regulations. Environmental programs have been established by these agencies to conserve, protect, manage and control the air, land, water and natural resources of the state or the

United States. The following text presents potential anticipated permit involvement from various state and federal agencies for the proposed connector.

7.1.7.1 Section 404 Dredge and Fill Permit

Under Section 404 of the Clean Water Act, in Florida and 47 other states, a permit must be obtained from the USACE for activities that discharge dredge and fill materials into a water of the United States. Additionally, in Florida, works and activities typically require an ERP permit from FDEP or one of the state's five water management districts (Part IV of F.S. Ch. 373 and Rule 62-330 of the FAC). FDEP estimated there was significant overlap in the federal Section 404 permit and state ERP permit, with as many as 85% of projects requiring a permit from each agency for the same activity. The goal of state assumption of the federal Section 404 permitting program is to provide a streamlined permitting procedure to address both federal and state requirements, while maintaining at least the same level of environmental protection as the federal program. As part of the assumption process, FDEP worked with USEPA, USACE and other agencies on memorandums of agreement and memorandums of understanding and also adopted 62-331 FAC, with an incorporated State 404 Program Applicant's Handbook, setting forth the rules for the State 404 program, including provisions to meet federal requirements.

The State 404 Program applies to any project proposing dredge or fill activities within state assumed waters and is a separate permit and discrete process from ERP. This program does not apply to waters defined as "retained waters", for which Section 404 Clean Water Act permits and Section 10 Rivers and Harbors Act permits will continue to be reviewed and issued by USACE. The proposed alternatives do not fall within the retained waters area and will therefore fall under the State 404 Program.

7.1.7.2 Biological Opinion/Incidental Take Permit

The Endangered Species Act of 1973, as amended, requires all federal agencies to conserve endangered and threatened species and use their authorities to further the purposes of the ESA. Section 7(a)(2) of the ESA is the mechanism by which federal agencies ensure the action they take, including those they fund or authorize (that is, federal permit), do not jeopardize the existence of any listed species. When a federal action "is likely to adversely affect" a listed endangered or threatened species, the lead federal agency submits a request to USFWS for formal consultation. USFWS prepares a Biological Opinion on whether the proposed activity will jeopardize the continued existence of a listed species. The nexus for this process occurs during Section 404 Dredge and Fill permitting if jurisdictional Waters of the United States are impacted by the proposed project. Otherwise, an incidental take permit is necessary under Section 10(a)(1)(8) of the ESA for impacts to federally listed species without a nexus to a federal action. Under this scenario, a Habitat Conservation Plan is required as part of an ITP from the USFWS.

The proposed project will potentially require ESA Section 7 consultation for impacts to the Eastern indigo snake, wood stork, Audubon's crested caracara, Florida scrub-jay, Eastern black rail and Everglade snail kite. A consultation will result in either a Biological Opinion or a consultation letter from the USFWS. This process will be coordinated during the permitting phase and a nexus determination will need to be accomplished, as the project is under the FDEP State 404 program.

7.1.7.3 FWC Incidental Take Permit/Gopher Tortoise Relocation Permit

The FWC issues permits for state designated threatened species, some non-listed species and some federally listed species. Permits are required for activities that may cause take, as defined in the Rule 68A-27.001(4), FAC, as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to

attempt to engage in such conduct." The FWC issues an ITP for take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity.

The proposed project will potentially require coordination with FWC for the issuance of an ITP for impacts to southeastern American kestrel, Florida sandhill crane, gopher tortoise conservation permit and nest removal permit for burrowing owl and other bird species.

7.1.7.4 NPDES Permit

The Clean Water Act authorizes the National Pollutant Discharge Elimination System permit program to control water pollution by regulating point sources discharging pollutants into Waters of the United States. The USEPA has delegated authority to implement the NPDES program to FDEP. An NPDES permit is required because the proposed project will disturb more than 1 acre of land and the stormwater runoff will discharge to waters of the state. A Stormwater Pollution Prevention Plan is required as part of the NPDES permit and is implemented during construction. The Stormwater Pollution Prevention Plan is developed to prevent erosion where construction activities occur, to prevent pollutants from mixing with stormwater and to prevent pollutants from being discharged by trapping them onsite before they can affect receiving waters. The applicant must submit a Notice of Intent with FDEP at least 2 days prior to the commencement of construction. Impacts from the proposed project alternatives are expected to require an NPDES permit to allow stormwater runoff to discharge to waters of the state.

7.1.7.5 Environmental Resource Program Permit

FDEP and Florida's five water management districts implemented the Environmental Resource Program to govern certain regulated activities. The proposed project is located within the jurisdiction of the SJRWMD. SJRWMD requires an ERP permit when construction of any project results in the creation or modification of a surface water management system or impacts to jurisdictional wetlands. The ERP permitting process depends on the size of the project and this project is likely to require an Individual Permit if it progresses to the design phase.

7.2 Social Environment

7.2.1 Community and Neighborhood Features

7.2.1.1 Right-of-Way

ROW acquisition will be needed for each alignment alternative; a summary of the ROW acquisition needs is presented in Table 7-12. As shown in the table, Alignment 1 requires the most ROW acquisition (62 acres) because of its length. Alignment 2 has the smallest ROW acquisition need at 42 acres. Alignments 3a and 3d require 50 acres and 58 acres, respectively.

For Alignments 2, 3a and 3d, a part of the total ROW acquisition will be needed from the Concorde development immediately south of the intersection of East Lake Mary Boulevard with Red Cleveland Boulevard.

Table 7-12. ROW Acquisition Needs

	Alignment			
	1	**2**	**3A**	**3D**
Total ROW Area Needed (acres) (not including proposed ponds)	62	42	50	58

Potential Permitted Development Impacts (acres)	0	5	6	11

7.2.1.2 Parcel Impacts

A breakdown of the potential parcel impacts for each alignment alternative is shown in Table 7-13.

Table 7-13. Summary of Potential Parcel Impacts

Potential Parcel Impacts	Alignment			
	1	**2**	**3a**	**3d**
Existing Residential Parcels	26	13	5	5
Planned Residential Parcels	0	18	18	0
Total Residential Parcels	**26**	**31**	**23**	**5**
Existing Non-Residential Parcels	17	2	5	5
Planned Non-Residential Parcels	0	8	8	6
Total Non-Residential Parcels	**17**	**10**	**13**	**11**
Total Parcels Impacted	**43**	**41**	**36**	**16**

7.2.1.3 Special Populations

Special Populations are defined as groups of people who exhibit unique mental, physical or social needs that distinguish them from the general population. The demographic analysis of the study area showed that approximately 6.7% of households in the study area are Asian Limited English Proficiency households. No other significant indicator of a special population within the study area was found. As such, all four of the alignment alternatives are expected to have a low impact on any special populations.

7.2.1.4 Community Facilities

None of the alignment alternatives are projected to have any conflict with any parks, recreational facilities or trails in the study area.

Alignment 1 conflicts with one community facility, as the northern end of the alignment passes 1,600 feet inside the runway buffer zone for SFB. Alignments 2, 3a and 3d have no conflicts with any community facilities inside the study area.

7.2.1.5 Community Cohesion Effects

Based on the locations of the alignments and the number of residential parcels that will be impacted by each alignment, Alignments 3a and 3d are projected to have a medium negative impact of community cohesion as no communities will be split and the alignment will impact planned residential on the edge of the proposed Concorde development adjacent to Kensington Reserve. Alignments 1 and 2 are projected to have a high negative impact on community cohesion because of the higher number of impacts to existing residential neighborhoods and planned development, respectively.

7.2.2 Cultural Resources

Should this project advance to the PD&E study phase, a systematic archaeological and cultural resources field survey is recommended to document additional cultural resources within any potential alignment's ROW. The fieldwork should meet the requirements set forth in Chapters 267, 373 and 872.05, Florida Statutes, as revised; Part 2, Chapter 8 ("Archaeological and Historical Resources") of the FDOT Project Development and Environment Manual (FDOT 2020); the standards and guidelines contained in the Cultural Resource Management Standards and Operational Manual: Module 3 (FDHR 2003); and Chapter 1A-46, FAC, as well as any other federal regulations for determining possible effects on historic properties listed, or eligible for listing in the NRHP, or otherwise of historical, architectural or archaeological value.

7.2.2.1 Archaeological

Background research suggested a low potential for the discovery of 19th century and earlier archaeological sites within the study area. There is a portion of a historic trail that traverses the northeast portion of the project study area but given the disturbance of the area, no evidence of it would be expected during a field survey. Based on desktop analysis and review of known archaeological resources, none of the alignments are anticipated to impact any archaeological resources.

7.2.2.2 Historical

The historic findings during the desktop analysis discovered approximately 37 historic resources (two previously recorded, 35 newly identified) located within the study area. Both previously recorded historic resources were determined ineligible for listing in the NRHP by the SHPO.

The proposed alignment alternatives were evaluated for potential impacts to historic resources. One known historic structure and one historic linear resource could potentially be impacted by Alignment 1, as these fall within the proposed ROW. The historic structure is associated with a building constructed circa 1965, which is located on the east side of Sipes Avenue. The historic linear resource was also constructed circa 1965 and is also located along Sipes Avenue.

The suggested construction dates for newly documented historic resources are derived from the Seminole County Property Appraiser and is not always accurate. It will be important to conduct a field survey for proper identification and evaluation. A field survey will be necessary for proper identification and evaluation of each historic resource. Table 7-14 summarizes potential cultural resource impacts associated with the proposed alignments.

Table 7-14. Potential Effects to Historical Resources by Alignment

Cultural Environment	Alignment				Notes
	1	2	3A	3D	
Potential impacts to known Historic Resources	1	0	0	0	ca. 1965 building located within Alignment 1 ROW
Potential impacts Historic Linear Resources (Canals, Highways, Railroads)	1	0	0	0	ca. 1965 canal/ditch located within Alignment 1 ROW
Potential impacts to known Archaeological Resources	0	0	0	0	

7.2.2.3 Contamination

A discussion of the identified potential contamination sites within the study area is contained in Section 3.7. The following summarizes potential contamination impacts for each proposed alignment.

- No direct contamination impacts were identified for Alignment 1. However, the Kentucky Avenue Dump (ERIC Cleanup Site) and the Brisson Road Dump (ERIC Cleanup Site) is less than 2,000 feet east and 800 feet west, respectively, of Alignment 1.
- No direct contamination impacts were identified for Alignment 2. However, the Brisson Road Dump (ERIC Cleanup Site) and Marquette Shores Borrow Pit is less than 1 mile east and 1 mile west, respectively, of Alignment 2.
- No direct contamination impacts were identified for Alignment 3a. However, the Brisson Road Dump (ERIC Cleanup Site) and Marquette Shores Borrow Pit is less than 1 feet northwest and 1,000 feet southeast, respectively, of Alignment 3a.
- No direct contamination impacts were identified for Alignment 3d. However, the Brisson Road Dump (ERIC Cleanup Site) and Marquette Shores Borrow Pit is less than 1 feet northwest and 1,000 feet southeast, respectively, of Alignment 3d.

Once a final alignment is selected, further investigation of one or more of these sites may be necessary to evaluate the cost and potential impact to the design, ROW acquisition and construction of the project.

7.3 Geotechnical

As noted in Section 3.3, the study area can exhibit artesian groundwater flow conditions that would affect deep excavations or drilled shafts for any proposed alignment. In addition, flowing wells used by farmers for irrigation are shown throughout the study area on the USGS quadrangle map (Figure 3-2), but mostly in the western portion of the area of interest. Geotechnical considerations for each alignment are provided in the following text.

7.3.1 Alignment 1 Geotechnical Considerations

- Crosses two depressional areas (at the southern terminus and on the south side of Palm Way) that can exhibit up to 2 feet of standing water during the wet season and may include mucky fine sand
- Shallow seasonal high groundwater levels along the entire alignment, generally ranging between ground surface and 1.5 feet deep
- Existing pond crossing between Oak Way and Michigan Street that will require fill for embankment or a bridge

7.3.2 Alignment 2 Geotechnical Considerations

- Crosses two depressional areas: at the southern terminus near SR 417 and a long section extending from Pine Way to north of East Lake Mary Boulevard. These areas exhibit up to 2 feet of standing water during the wet season and may include mucky fine sand to muck.
- Shallow seasonal high groundwater levels along the entire alignment, generally ranging between 0.5 and 1.5 feet deep.

7.3.3 Alignment 3a Geotechnical Considerations

- Crosses three depressional areas: at the southern terminus at SR 417, the area between Oak Way and Palm Way and a long section extending from Pine Way to north of East Lake Mary Boulevard. These areas are listed as exhibiting up to 2 feet of standing water during the wet season and may include mucky fine sand to muck.
- Shallow seasonal high groundwater levels along the entire alignment, generally ranging between 0.5 and 1.5 feet deep.
- Existing pond crossing between Oak Way and Michigan Street, just east of SR 417, that will require fill for embankment or a bridge.

7.3.4 Alignment 3d Geotechnical Considerations

- Crosses three depressional areas: at the southern terminus at SR 417, the area south of Palm Way and a long section extending from Pine Way to north of East Lake Mary Boulevard. These areas are listed in the NRCS as exhibiting up to 2 feet of standing water during the wet season and may include mucky fine sand to muck.
- Shallow seasonal high groundwater levels along the entire alignment, generally ranging between 0.5 and 1.5 feet deep.
- Two pond crossings: the first one between Oak Way and Michigan Street and the other north of Pine Way, both of which will require fill for embankment or a bridge.

7.4 Utilities

Existing and planned utilities that may be affected by the proposed alignments and potential impacts to utilities are summarized in this section.

Because of the nature of the existing conditions throughout the study area, it is anticipated that the corridor alignments will impact several utility facilities. The existing utility facilities include electric, gas, water, sewer and communications. A Sunshine811 ticket was created on September 7, 2022, to determine the major utilities along or crossing the existing ROW. Existing utilities are summarized in Section 3.8.

During the project design, mitigation measures should be taken to avoid conflicts with existing utilities wherever possible to minimize costs to the project. If impacts are unavoidable, design alternatives would be reviewed for relocation of impacted facilities to eliminate conflicts with the new improvements, to minimize disruptions of service and to provide adequate accessibility for future maintenance.

7.4.1 Alignment 1 Potential Utility Impacts

- Alignment crosses city of Sanford 12-inch-diameter water main (polyvinyl chloride/ductile iron) at Sipes Avenue.
- Alignment crosses city of Sanford 8-inch-diameter water main (PVC/DI) at Sipes Avenue.
- Alignment crosses existing Florida Power & Light overhead electric (7.6 kilovolts) at Sipes Avenue.
- Alignment crosses existing Bellsouth Telecommunications overhead telephone (ALAW 25) at Sipes Avenue.
- Alignment crosses existing Time Warner Communications overhead cable TV at Sipes Avenue.

- Alignment crosses overhead electric at Oakway, 1,300 feet east of South Mellonville Avenue.
- Alignment crosses overhead electric at Hallelujah Way, 500 feet north of Palm Way.

7.4.2 Alignment 2 Potential Utility Impacts

- Alignment crosses overhead electric at South Mellonville Avenue, 300 feet north of Palm Way.
- Alignment crosses overhead electric at Pine Way, 500 feet east of Bloom Lane.

7.4.3 Alignment 3a Potential Utility Impacts

- Alignment crosses overhead electric at Oakway, 1,800 feet east of South Mellonville Avenue.
- Alignment crosses overhead electric at Palm Way, 700 feet East of Bloom Lane.
- Alignment crosses overhead electric at Pine Way, 650 feet East of Bloom Lane.

7.4.4 Alignment 3d Potential Utility Impacts

- Alignment crosses overhead electric at Pine Way, 1,100 feet east of Bloom Lane.

8. Stakeholder Involvement

8.1 Introduction

Public involvement is an integral part of this CF&M Study and was crucial in aiding the evaluation and refinement of alignments. This study provided multiple opportunities for stakeholder engagement and input.

A Public Involvement Plan was developed at the onset of the study to guide and maintain continuous and meaningful public and stakeholder engagement throughout the process. The PIP included study kick-off activities, Environmental Advisory Group and Project Advisory Group meetings, Environmental Stewardship Committee meetings, a public meeting, and several coordination meetings with local agencies and stakeholders.

Kick-off activities for this study included the development of a study webpage on the www.cfxway.com website, as well as sending kick-off letters and study factsheets to elected/appointed officials and over 1300 property owners in and around the study area. The following sections summarize the public involvement and stakeholder engagement completed as part of this study.

8.2 Stakeholder Coordination and Meetings

8.2.1 Environmental Advisory Group

An Environmental Advisory Group was established to assist in providing input on potential environmental impacts documented in the evaluation of the project alternatives. The EAG informs the project team of local knowledge, issues and concerns within the project area.

Two EAG meetings were held for this study. Invitations for the first EAG meeting were emailed to representatives from environmental agencies, stakeholders, and community groups, and other government agencies on December 21, 2022. An advertisement was also published in the Florida Administrative Register on December 28, 2022. Invitations for the second EAG meeting were emailed to representatives on April 19, 2023. The meeting was also advertised in the Florida Administrative Register on April 20, 2023.

The first EAG meeting was held virtually on January 25, 2023, from 9:30 a.m. to 11:30 a.m. The meeting included a presentation of the study's background, goals and objectives, schedule, potential constraints, and initial alignments. The presentation was followed by an open discussion. A summary of input received from the EAG is summarized as follows:

- Minimize proximity to Lake Jesup Conservation Area
- Avoid/Minimize impacts to SJRWMD regulatory conservation easements
- Review potential future wildlife connectivity
- Identify potential conservation mitigation opportunities
- Minimize wetland involvement at SR 417 interchange and consider elevated structures
- Avoid floodplain involvement and increased flooding
- Improve water quality

- Provide adequate stormwater management facilities and protect water resources
- Further evaluate Alignment 2

The second EAG meeting was held virtually on May 17, 2023, from 9:30 a.m. to 11:30 a.m. The meeting included a presentation of the study's background, goals and objectives, schedule, potential constraints, refined alignments, and potential impacts. The presentation was followed by an open discussion. A summary of input received from the EAG is summarized as follows:

- Recommendation to evaluate an elevated limited-access highway along East Lake Mary Boulevard
- Identify vacant lands as undeveloped lands
- Minimize impacts to undeveloped lands neat Lake Jesup Conservation Areas
- Individual EAG representative recommendations to avoid Alignment 3D due to habitat impacts and avoid Alignment 2 due to proximity to natural systems along Lake Jesup
- Support for corridors that have the least impact to the natural environment
- Continue coordination with undeveloped landowners and SJRWMD for mitigation opportunities near Lake Jesup Conservation Areas

8.2.2 Project Advisory Group

A Project Advisory Group was established to assist in providing input regarding the evaluation of the project alternatives and mobility analysis; and also informs the project team of local knowledge, issues and concerns.

Two PAG meetings were held for this study. Invitations for the first PAG meeting were emailed to representatives from environmental agencies, stakeholders, and community groups, and other government agencies on December 21, 2022. An advertisement was also published in the Florida Administrative Register on December 28, 2022. Invitations for the second PAG meeting were emailed to representatives on April 19, 2023. The second PAG meeting was also advertised in the Florida Administrative Register on April 20, 2023.

The first PAG meeting was held virtually on January 25, 2023, from 1:30 p.m. to 3:30 p.m. The meeting included a presentation of the study's background, goals and objectives, schedule, potential constraints, and initial alignments. The presentation was followed by an open discussion. A summary of input received from the PAG is summarized as follows:

- Ensure consistency with Orland-Sanford International Airport's development plan
- Provided support for the project
- Maintain design consistency for system to system connections
- Verify ongoing and planned projects in the area for consistency

The second PAG meeting was held May 17, 2023, from 1:30 p.m. to 3:30 p.m. The meeting included a presentation of the study's background, goals and objectives, schedule, potential constraints, refined alignments, and potential impacts. The presentation was followed by an open discussion. A summary of input received from the PAG is summarized as follows:

- Continued coordination with Florida's Turnpike Enterprise regarding toll gantries and traffic

- Continued coordination with Sanford Airport Authority regarding potential impacts to the Runway Protection Zone

8.2.3 Environmental Stewardship Committee

The CFX Environmental Stewardship Committee's primary function is to assist the CFX Board in fulfilling its responsibilities by providing oversight and guidance for the protection of the natural environment through conservation and sustainable practices. The ESC meets as required to review projects and programs designed to support the responsible use and protection of the natural environment and provide guidance to CFX staff and consultants. A presentation to the ESC was held on February 23, 2023, on the alignments considered and environmental involvement. The ESC provided input on the purpose and need that was incorporated into this report and requested further consideration for an elevated alignment along East lake Mary Boulevard prior to recommending an alignment. The analysis of an elevated alignment will be incorporated into any further PD&E study.

8.2.4 Local Government Agencies and Officials

Several coordination meetings were held with local government agencies and officials to provide input regarding the development and refinement of the project alternatives, as well as to inform the project team of local knowledge, issues and concerns. The following sections summarize meetings that occurred with local government agencies and officials as part of this study.

8.2.4.1 Seminole County

During the study, two separate meetings with Seminole County officials were held in addition to County attendance at both EAG and PAG meetings. The first meeting was held virtually on December 6, 2022, and included Seminole County's Public Works and Planning and Development division staff. Additionally, a presentation to the Seminole County's Board of County Commissioners was held on March 24, 2023. Seminole County's Public Works and Planning and Development staff were also included in regularly occurring progress meetings to receive study updates and provide input.

8.2.4.2 City of Sanford

During the study, two separate meetings with the City of Sanford were held in addition to City attendance at both PAG meetings. The first meeting was held virtually on May 1, 2023, and included Sanford Planning and Development Services staff. At that meeting, an update regarding the study's status, refined alignments, constraints, and planned or permitted developments in the study area was discussed and input on study area constraints was included in the study. Additionally, a presentation to the City of Sanford's City Commission was held on May 8, 2023.

8.2.4.3 Sanford Airport Authority

A coordination meeting with the Sanford Airport Authority was held virtually on February 10, 2023, to provide an update regarding the study's status, refined alignments, constraints, and to discuss any potential feedback on the alignments. Also, a presentation to the Sanford Airport Authority Board was held on June 6, 2023, to provide a study update. The SAA Board noted extensive support for the project based on the need for improved airport connectivity to support future socioeconomic development.

8.2.4.4 Florida's Turnpike Enterprise

A coordination meeting with Florida's Turnpike Enterprise was held virtually on November 29, 2022, to review the study's status, existing and future traffic, potential alternatives, toll considerations, and any potential FTE projects that could affect this study. Representatives for FTE were also included as members of both PAG meetings.

8.3 Public Involvement

Public involvement is an integral part of the Concept, Feasibility and Mobility assessment process and multiple opportunities for participation have been provided during this study. A Public Involvement Plan was developed to assist in the exchange of information between CFX and concerned residents, organizations, and private groups (residential/business/special interest). The public involvement techniques utilized throughout this study allowed for an open exchange between CFX and the public to help ensure that the study reflects the values and needs of the communities it is designed to benefit

Study kick-off activities included setting up a study webpage on the CFX website to engage the public in study activities. Kick-off letters were sent to 1,384 property owners and tenants in the study area, as well as to more than 55 state and local elected and appointed officials in September 2022 announcing the study. Brief summaries of the public meeting, media coverage and public comments are discussed in the following sections. Further details on public involvement activities for this study are documented as part of a separate report, the S*R 417 to Orlando Sanford International Airport Connector Comments and Coordination Report* (Quest Corporation of America 2023)

8.3.1 Public Meeting

A hybrid public information meeting was held on June 20, 2023, to provide the public an opportunity to view the study information and express their views concerning the location, conceptual design, and potential environmental impacts of the proposed improvements. The hybrid public information meeting included two options for interested parties to attend, either in-person or virtually. The in-person meeting occurred at the Millennium Middle School (2330 East State Road 46, Sanford FL, 32771) from 5:30 p.m. to 7:30 p.m., and consisted of an informal open house in the school's cafeteria where participants could view displays, watch a looped video presentation, submit comments, and discuss comments or questions with the study team representatives. A simultaneous virtual session was hosted from 6:00 p.m. to 7:30 p.m. through an online meeting platform, GoTo Webinar. Participants were able to view a presentation about the study, discuss comments or questions with the study team representatives and submit comments through the platform's chat box.

The Public Information Meeting invitations letters were mailed on Tuesday, May 23, 2023, to 1,352 property owners and tenants in the study area, as well as 83 people who asked to be added to the study's mailing list. Invitations were also emailed to 30 elected officials and their aides, 15 local, regional, state, and federal agency representatives, and 175 other interested parties. The public meeting was advertised with legal ads in the Sanford Herald on June 4, 2023, and June 11, 2023, and a press release was distributed to 54 media contacts on June 5, 2023. Details of the Public Information Meeting were also posted on the study webpage and at CFX Headquarters.

Approximately 200 individuals attended the in-person meeting at Millennium Middle School, while 70 individuals attended the virtual meeting. Further details on the Public Information Meeting are

documented as part of a separate report, the *SR 417 to Orlando Sanford International Airport Connector Comments and Coordination Report* (Quest Corporation of America 2023).

8.3.2 Summary of Public Comments

Seventy-eight individuals provided comments at the hybrid public meeting, or within the 10-day comment period. Those 78 individuals provided a total of 120 written comments, which included multiple comments from the same participants. Fifty-five written comments were received at the in-person meeting, while 54 comments were received during the virtual meeting. The eight remaining comments were received during the public comment period that followed the public information meeting.

Those comments expressing concerns about the proposed connector were analyzed and categorized by major topics of concern. The following summarizes those concerns and the number of comments received regarding each topic:

Table 8-1. Summary of Public Information Meeting Comments by Topics of Concern

Major Topics of Concern	Number of Comments
Noise concerns/impacts to quality of life	44
Wildlife/crossings	39
East Lake Mary Boulevard concerns/suggestions	33
Proximity of potential alignments to properties	31
Increasing development/population growth	30
Impacts to property values	28
Notes: *Several comments received may represent multiple topics of concern*	

Further details on the public comments received during this study are documented as part of a separate report, the *SR 417 to Orlando Sanford International Airport Connector Comments and Coordination Report* (Quest Corporation of America 2023).

8.3.3 Project Website

Information regarding this study's progress was maintained on this study's website page (https://www.cfxway.com/agency-information/plans-studies/project-studies/concept-studies-sr-417-to-orlando-sanford-international-airport-connector/) for the public to review and provide input. The webpage was updated with the latest corridor exhibits, schedules, handouts, presentations, meeting notices and summaries, photos, and news releases. Information from the EAG and PAG meetings and public meeting also were posted on the webpages. An electronic comment form was also available on the webpage.

8.4 Media Coverage

The Public Involvement Program included the strategy of using the media to help share information and meeting notices about the concept study. This study is to serve as a foundation for

future studies in this area. As such, there was extensive media interest in the study. Further details on the media coverage are documented as part of a separate report, the SR 417 to Orlando Sanford International Airport Connector Comments and Coordination Report (Quest Corporation of America 2023). The following summarizes the local and regional media coverage that occurred during this study.

- November 14, 2022; Spectrum News 13
- December 15, 2023; City of Sanford Podcast (iHeart Radio)
- December 21, 2022; Spectrum News 13
- January 31, 2023; Spectrum News 13
- May 9, 2023; Orlando Sentinel
- May 10, 2023; WFTV 9
- May 16, 2023; WESH 2 News
- May 16, 2023; Spectrum News 13
- May 19, 2023; WKMG News 6
- June 7, 2023: Orlando Business Journal
- June 19, 2023: WFTV 9
- June 20, 2023: Spectrum News 13
- June 20, 2023: WKMG News 6

9. Feasibility and Viability of the Proposed Project

9.1 Benefits of the Proposed Project

The proposed connector addresses the project needs, as outlined in Section 2, by providing enhanced regional connectivity, accommodating traffic demand, adding needed capacity, improving safety, achieving consistency with transportation plans, supporting modal connectivity and serving social and economic growth.

9.2 Regional Connectivity

A network of regional transportation facilities provides regional connectivity that is important to the state's economy and mobility. The proposed connector would provide enhanced regional connectivity between designated SIS facilities: SFB and SR 417, as well East Lake Mary Boulevard between SR 417 and Red Cleveland Boulevard and Red Cleveland Boulevard between East Lake Mary Boulevard and Airport Boulevard. When complete, the proposed connector could reduce the travel time by as much as 50% in the PM Peak Period to SFB, with travel time savings expected to be even higher in the future when traffic demand and congestion are anticipated to increase at the SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange. A direct connection from SR 417 to SFB would enhance regional connectivity by improving access to the airport, increasing mobility options and providing enhanced system linkage between the SIS facilities.

9.3 Anticipated Transportation Demand

Transportation demand is expected to increase in the area. SFB is projected to serve 2.7 million passengers by 2037, an increase of 91%. In addition, there are 10 planned developments intended for the study area. The planned developments include residential, commercial and industrial land uses, and account for 55% of the undeveloped lands in the study area, potentially creating an additional 849 dwelling units. As a result, local traffic along East Lake Mary Boulevard and surrounding roadways is expected to increase. The proposed connector is anticipated to divert 3,800 trips from Airport Boulevard, east of Sanford Avenue, as well as 17,000 trips from Ronald Reagan Boulevard (CR 427), south of Lake Mary Boulevard, in 2050. The proposed connector would also reduce traffic demand along segments of East Lake Mary Boulevard.

9.4 Capacity

Existing traffic operations at the SR 417 and Ronald Reagan Boulevard (CR 427) and East Lake Mary Boulevard interchange includes extended delays and long queues during peak periods. The adjacent intersections at East Lake Mary Boulevard at Ronald Reagan Boulevard (CR 427) and Sanford Avenue (CR 425) also operate unacceptably and impact operations at the interchange. Congestion mostly occurs along the facilities approaching and within the interchange footprint including the SR 417 northbound off-ramp, East Lake Mary Boulevard and Ronald Reagan Boulevard (CR 427). Because of the existing constrained capacity and expected increase in traffic volumes, the proposed connector would provide the additional capacity needed for satisfactory traffic operations in future years.

9.5 Safety

Traffic at the SR 417 northbound off-ramp occasionally backs up onto the SR 417 mainline, mostly because of the signalized intersections near the SR 417 northbound off-ramp. These traffic failures impact safety and operations along SR 417. The proposed connector would divert traffic from the interchange and enhance safety and operations.

9.6 Modal Connectivity

SFB forecasts enplanements to increase 91%, and air freight tonnage to increase 400% by the year 2037. The proposed connector would support mobility to other modes of travel at SFB.

9.7 Social Demand

As noted previously, BEBR estimates that Seminole County's population is projected to grow approximately 21% by the year 2050. Land use in the region is also undergoing extensive changes, with planned developments accounting for nearly 55% of the undeveloped lands in the study area, or 349 acres. Local traffic along East Lake Mary Boulevard and surrounding roadways is expected to increase. The proposed connector would divert traffic from East Lake Mary Boulevard, providing local traffic with increased mobility to and from the existing and planned developments in the area.

9.8 Consistency with Transportation Plans

The proposed connector is identified in the CFX Five-Year Work Plan (FY 2023 - FY2027) as a study. Should the connector be considered feasible as a result of this study, updates to relevant transportation plans, including MetroPlan and the FDOT Work Program will be coordinated during the PD&E phase.

9.9 Potential Controversy of the Proposed Project

Feedback from stakeholders, local and regional agencies, and elected appointed officials was generally supportive of the project. However, environmental agency stakeholders generally opposed a corridor on new location and its related environmental impacts and recommended an elevated corridor along East Lake Mary Boulevard as part of any future studies. Additionally, the majority of the feedback received from the public was in opposition of the proposed connector. Most of the negative comments provided by the public were regarding concerns about proximity to existing residential developments, noise and impacts to quality of life, impacts to wildlife and habitat fragmentation, proximity to existing and permitted residential properties, and potential impacts to property values.

9.10 Estimated Project Costs

Table 9-1 summarizes the projected cost for each alternative and are in 2023 dollars. Mainline project costs include roadway and bridge construction, drainage, maintenance of traffic, erosion control, mobilization, signing, pavement marking, signalization and lighting, utility relocations, aesthetic allowance and contingencies. Estimates of wetland and surface water mitigation cost are based on a conservative price of $450,000 per UMAM credit. Estimates of regulatory conservation easement mitigation cost are based on a conservative price of $450,000 per acre of required mitigation and assume that 80% of the impacts require mitigation. Therefore, each acre of impacted regulatory conservation easement was multiplied by 0.8 and then multiplied by $450,000. Mitigation for Audubon's Crested Caracara were based on the USFWS 1,500-meter nest protection buffer and a $30,000 per nest/incidental take. Bald eagle mitigation was based on $30,000 per nest/incidental take. Gopher tortoise mitigation assumes a mitigation fee of $6,000 per tortoise. Mitigation costs do not include permit application and fees for species relocation and follow-up monitoring.

Table 9-1. Proposed Connector Summary of Preliminary Project Costs

Cost Element	Alignment 1	Alignment 2	Alignment 3a	Alignment 3d
Mainline Project Costs	$82,700,000	$79,200,000	$82,700,000	$102,900,000
Engineering / Administration / Legal	$19,900,000	$19,000,000	$19,800,000	$24,700,000
Toll Equipment	$1,100,000	$1,100,000	$1,100,000	$1,100,000
Right-of-Way	$43,900,000	$32,100,000	$33,600,000	$15,500,000
Wetland Mitigation	$4,500,000	$7,300,000	$10,700,000	$12,700,000
Species Habitat Mitigation	$400,000	$200,000	$300,000	$300,000
Regulatory Conservation Easement Mitigation	$700,000	$5,000,000	$5,000,000	$3,600,000
Total	$153,200,000	$143,900,000	$153,200,000	$160,800,000

9.11 Alternative Evaluation Matrix

An alternative comparison matrix is provided in Table 9-4. This matrix provides a comparison of the various information and effects of all the alternatives evaluated.

Table 9-4. Alternatives Evaluation Matrix

Evaluation Criteria	Unit of Measure	Alternatives			
		1	2	3a	3d
Design					
Alternative Length	Miles	3.1	2.4	2.5	2.5
Right-of-Way Width	Feet	150	150	150	150-200
Projected 2050 Traffic Volume	Daily Vehicles	18,400	24,800	24,800	24,800
Preliminary Total Project Cost	2022 Dollars	$153 Million	$144 Million	$153 Million	$161 Million
Social					
Right-of-Way Area Needed (not including proposed ponds)	Total Acres	**62**	**42**	**50**	**58**
Potential Permitted Development Impacts	*Acres*	*0*	*5*	*6*	*11*
Potential Residential Parcels Affected	Total Parcels	**26**	**31**	**23**	**5**
Existing	*Parcels*	*26*	*13*	*5*	*5*
Planned	*Parcels*	*0*	*18*	*18*	*0*
Potential Non-Residential Parcels Affected	Total Parcels	**17**	**10**	**13**	**11**
Existing	*Parcels*	*17*	*2*	*5*	*5*
Planned	*Parcels*	*0*	*8*	*8*	*6*
Community Facilities	No. of Conflicts	1[a]	0	0	0
Parks and Recreational Facilities (public and private)	No. of Conflicts	0	0	0	0

Table 9-4. Alternatives Evaluation Matrix

Evaluation Criteria	Unit of Measure	Alternatives			
		1	2	3a	3d
Trails	No. of Conflicts	0	0	0	0
Community Cohesion Effects	High/Med/Low	High	High	Med	Med
Socio-Economic Impacts to Special Populations	High/Med/Low	Low	Low	Low	Low
Prime Farmland	Acres	2	3	< 1	1
Cultural Environment					
Proximity to Public Recreation Lands and Wildlife Management Areas[d]	Feet	0	2500	400	400
Public Recreation Lands and Wildlife Management Areas Impacted	Y/N	N	N	N	N
Potential Known Historic Resources	No. of Resources	1[b]	0	0	0
Potential Known Historic Linear Resources (Canals/Highways/Railroads)	No. of Resources	1[c]	0	0	0
Potential Known Archaeological Resources	No. of Resources	0	0	0	0
Natural Environment					
Potential Regulatory Conservation Easement Impacts (SJRWMD)	Acres	2	14	14	10
Potential Surface Water Impacts	Total Acres	7	3	13	18
Natural Lakes	*Acres*	*0*	*0*	*0*	*0*
Stormwater Management Areas	*Acres*	*0*	*3*	*3*	*8*
Other Reservoirs	*Acres*	*7*	*0*	*10*	*10*
Canals/Creeks	*No. of Conflicts*	*2*	*0*	*0*	*0*
Flood Hazard Area Impacts (100 Year Floodplain)	Acres	2	0	2	2
Wetlands	Total Acres	7	19	17	16
Forested	*Acres*	*4*	*16*	*16*	*15*
Non-forested	*Acres*	*3*	*3*	*1*	*1*
Potential Habitat - Federal Listed Species	Acres	47	34	37	58
Potential Habitat - State-Listed Species	Acres	40	32	27	58
Potential Bald Eagle Nest	No. of Conflicts	1	2	3	3
Potential Species Impacts (composite rating)	High/Med/ Low	Medium[g]	Medium[g]	Medium[g]	Medium[g]
Mitigation Banks	Acres	0	0	0	0
Florida Forever Lands	Acres	0	0	0	0
Florida Wildlife Corridors	Acres	0	0	0	0
Physical					

Table 9-4. Alternatives Evaluation Matrix

Evaluation Criteria	Unit of Measure	Alternatives			
		1	2	3a	3d
Major Utility Conflicts - Existing[h]	No. of Conflicts	7	2	3	1
Contamination Sites & Facilities (Medium and High Risk Sites)	No. of Conflicts	0	0	0	0
Railroad Involvement	No. of Conflicts	0	0	0	0

[a] Sanford Airport Authority RPZ
[b] ca. 1965 building located within alignment
[c] ca. 1965 canal/ditch located within alignment
[d] Nearest edge of pavement to nearest Public Lands boundary
[e] Nearest Edge of ROW line to nearest edge of 100-Year Floodplain boundary
[f] Alignments 1, 3a and 3d fall within the 100-Year Floodplain. Alignment 2 is approximately 630 feet from nearest edge of 100-year floodplain boundary.
[g] Medium because of eagle nest involvement
[h] Utility Impacts consist of overhead electric, overhead CATV/telephone, 12-inch-diameter water main (E. Lake Mary Blvd.), and 8-inch-diameter water main (East Lake Mary Boulevard)

9.12 CFX Financial Viability Criteria

Based on the high-level, conceptual nature of this study, the financial viability of the alternatives was performed. As the project moves forward in subsequent studies, detailed analyses will be completed.

9.13 Findings of the Concept, Feasibility, & Mobility Study

The purpose of this Concept, Feasibility, and Mobility report is to determine if the identified alternatives are feasible from an engineering and environmental standpoint and viable from a financial standpoint. Regarding engineering and environmental issues, no “fatal flaws” have been observed. The viability analysis to determine if the toll revenue over 30 years covers at least 50% of the project costs was completed. While the financial viability of the project did not meet CFX’s criteria, some alternatives were close to the 50% threshold. Advancing the project to a PD&E study would allow for evaluation of a grade separated facility along East Lake Mary Boulevard, as well as refinement of the project alternatives and costs. Therefore, the project may be financially viable upon completion of a PD&E study.

On August 10, 2023, the study team presented the results of the study to the CFX Board and recommended to advance the project to a PD&E study. The CFX Board accepted the findings for the Concept, Feasibility, and Mobility Study of the SR 417 to Orlando Sanford International Airport Connector and approved the project to advance to a PD&E study phase for further analysis.

During the PD&E study phase, all four of the refined alignments will be carried forward for further analysis, along with the No Build Alternative. Additionally, based on ESC and EAG input, an elevated limited-access alternative along East Lake Mary Boulevard will be analyzed as part of the PD&E study.

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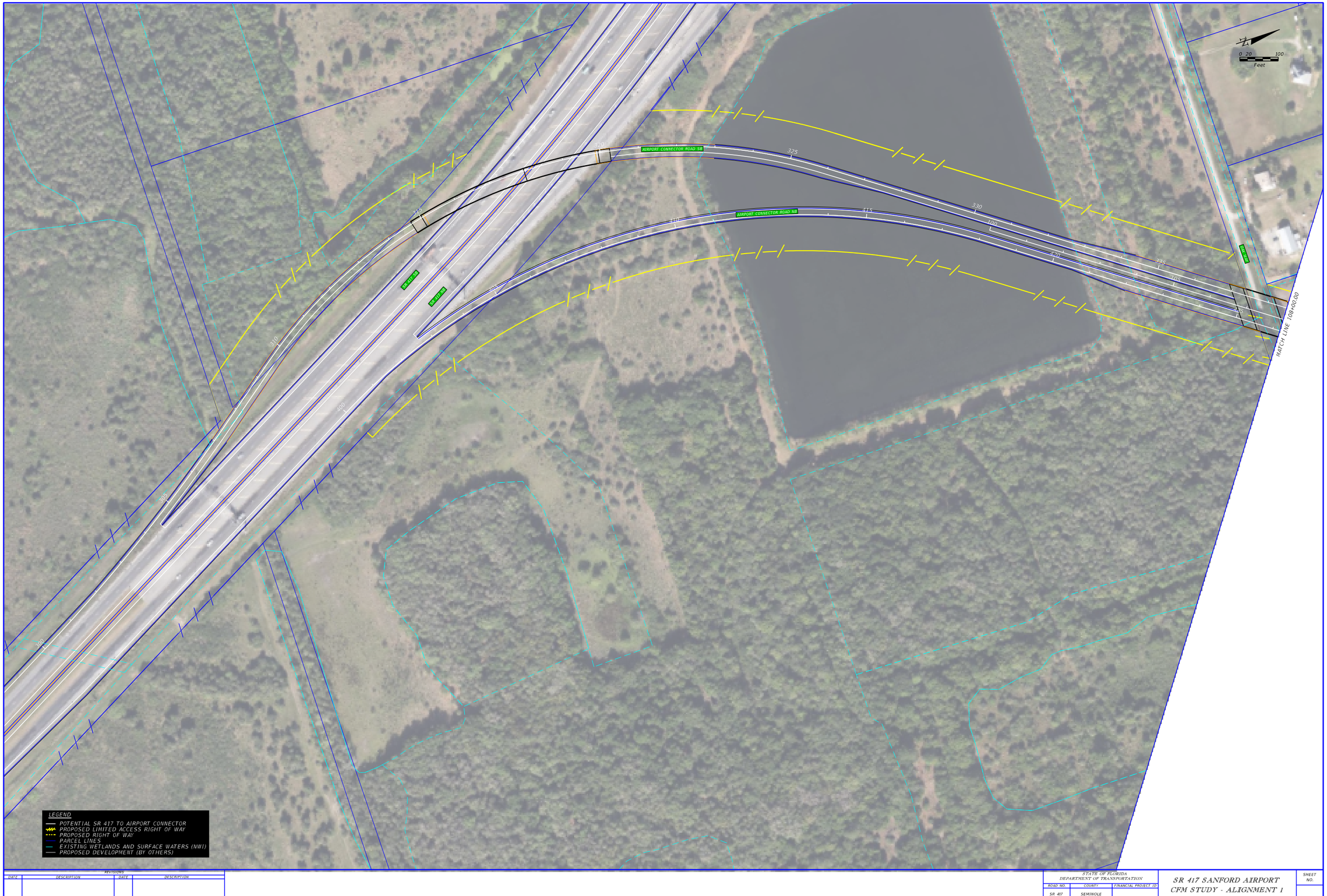
Appendix A
Concept Plans



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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 417	SEMINOLE	

SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 1

SHEET NO.

LEGEND

- POTENTIAL SR 417 TO AIRPORT CONNECTOR
- PROPOSED LIMITED ACCESS RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PARCEL LINES
- EXISTING WETLANDS AND SURFACE WATERS (NWI)
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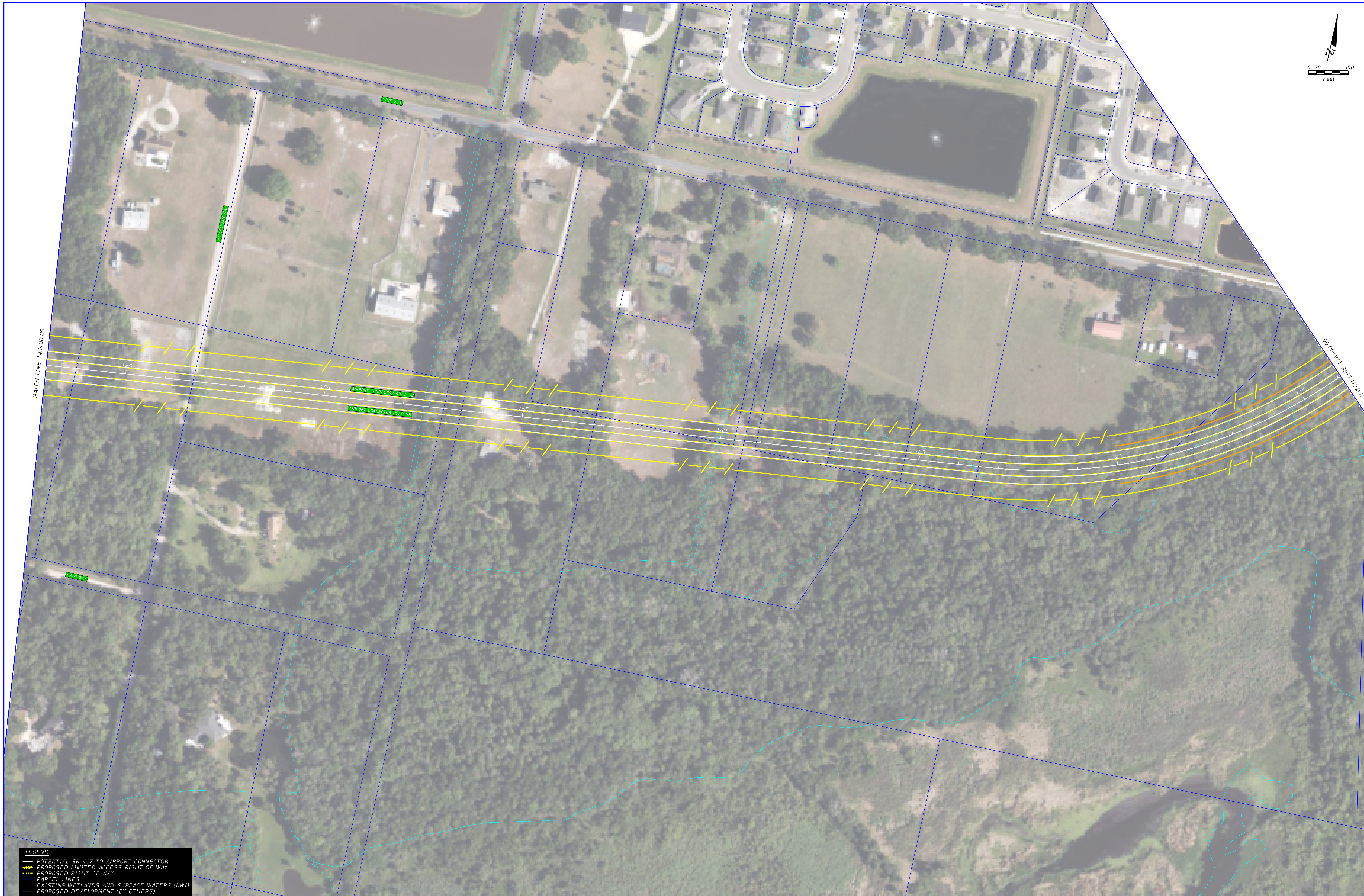

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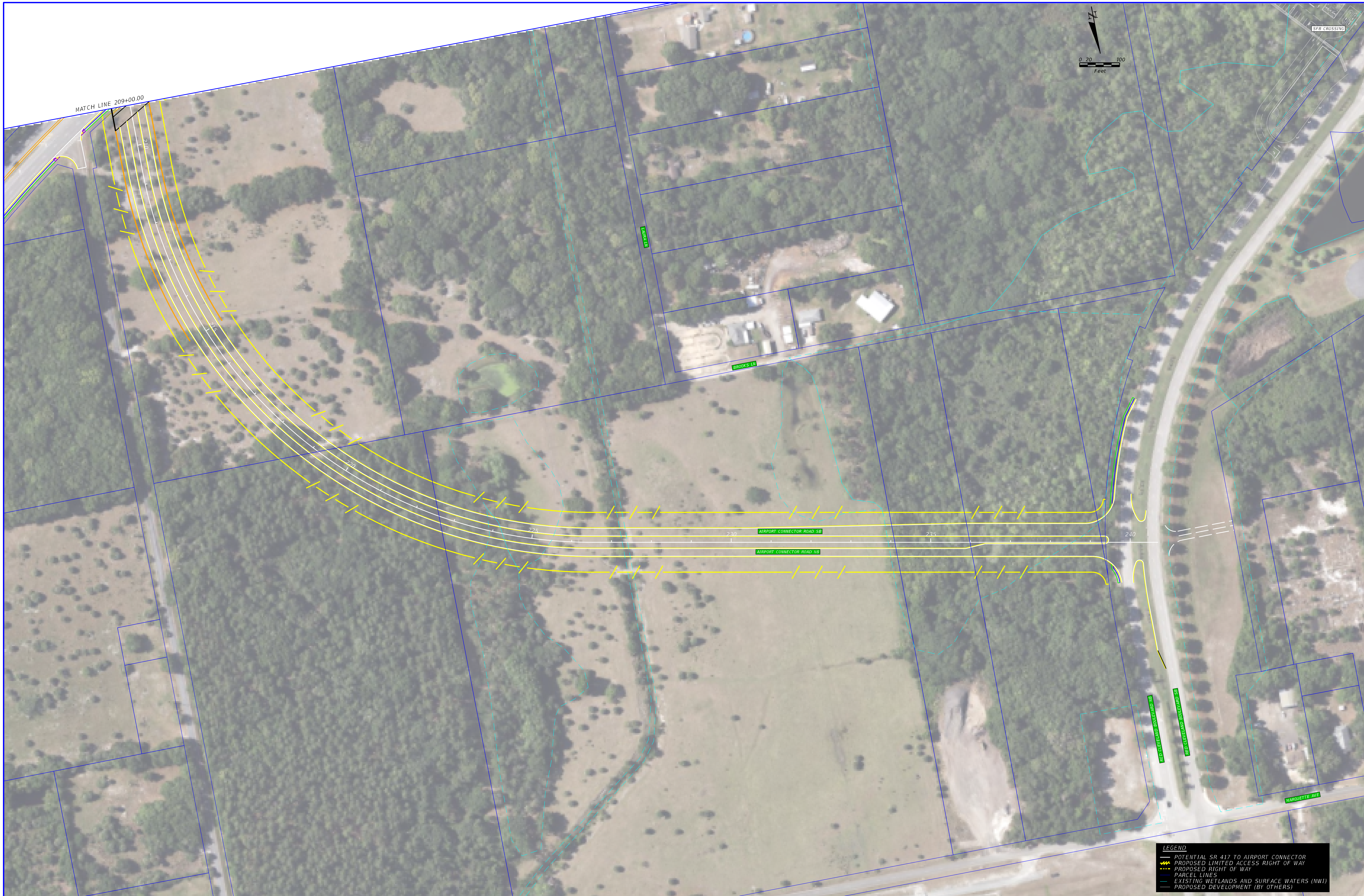

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SR 417 SANFORD AIRPORT
CFM STUDY - ALIGNMENT 1

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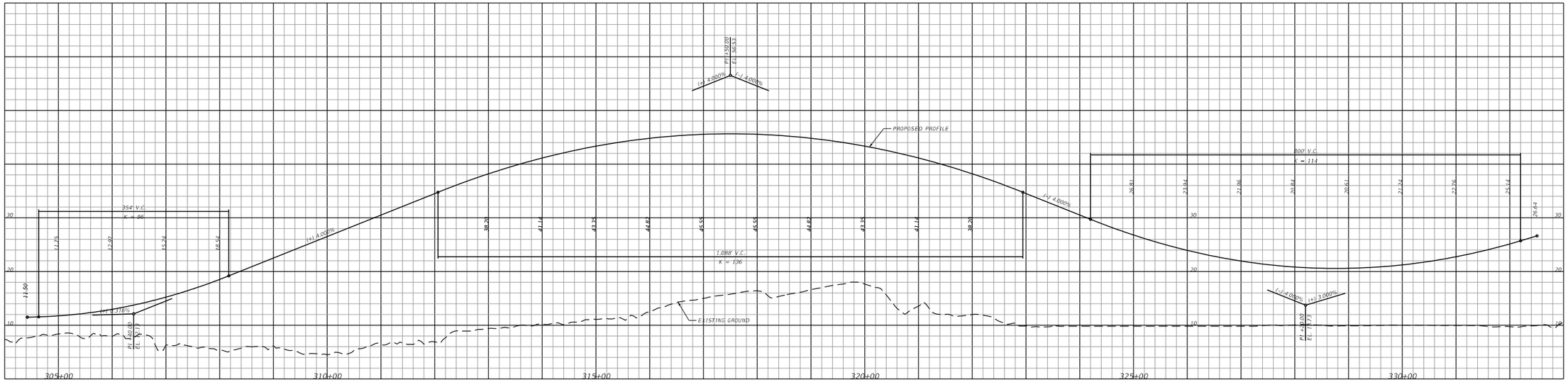

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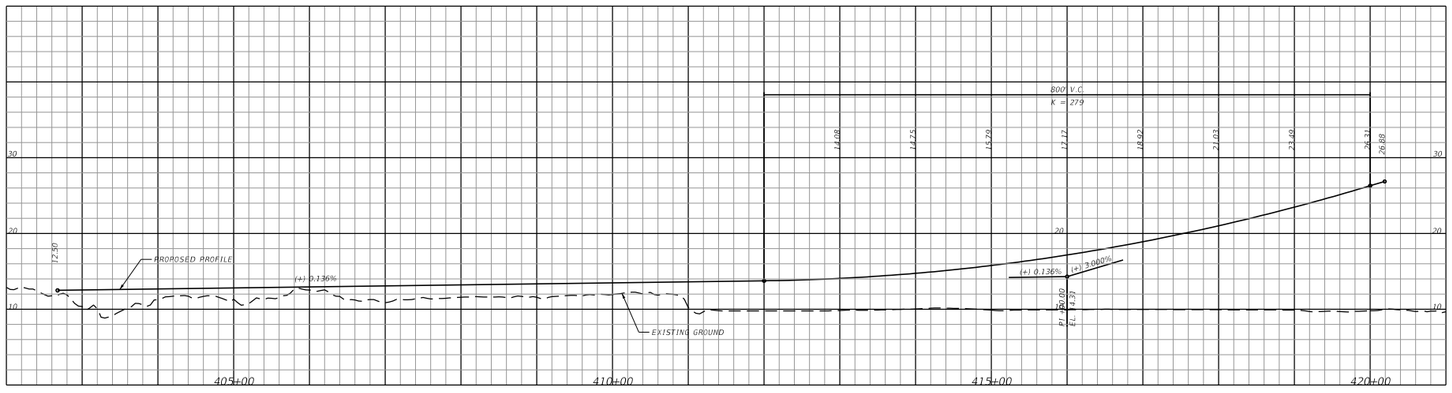

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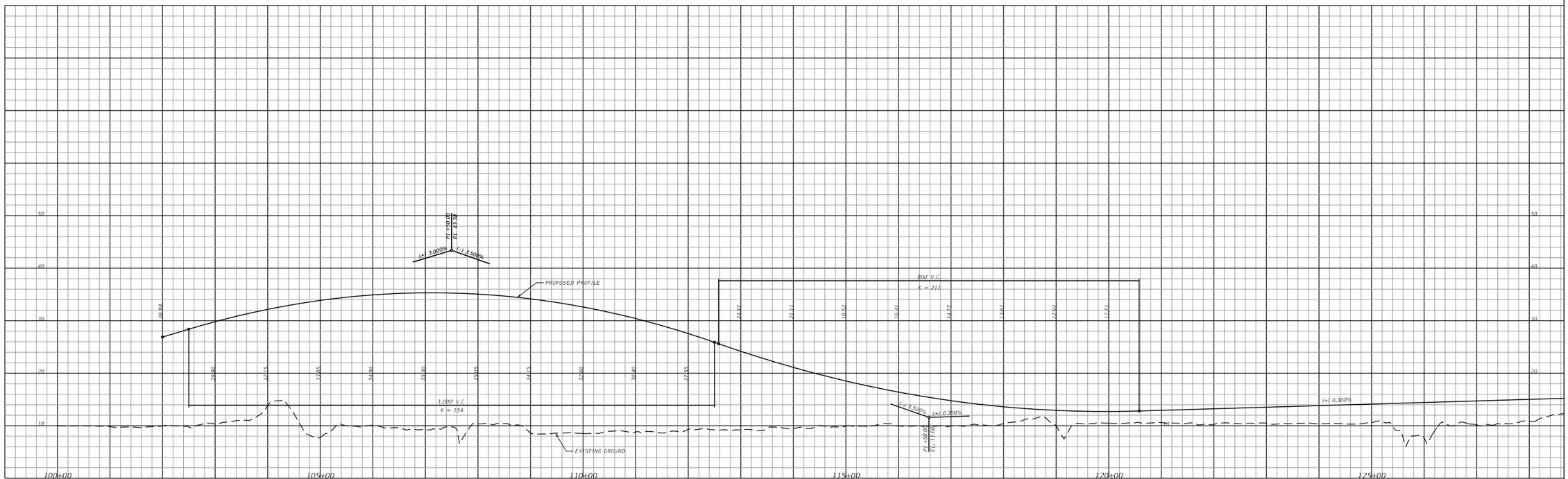

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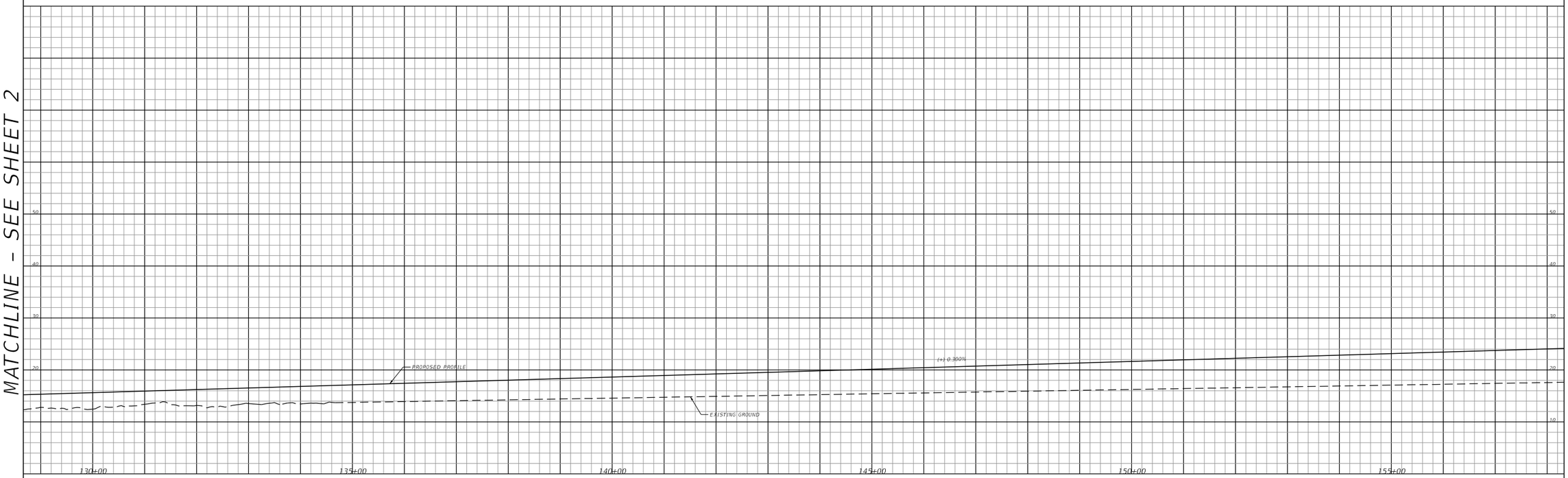

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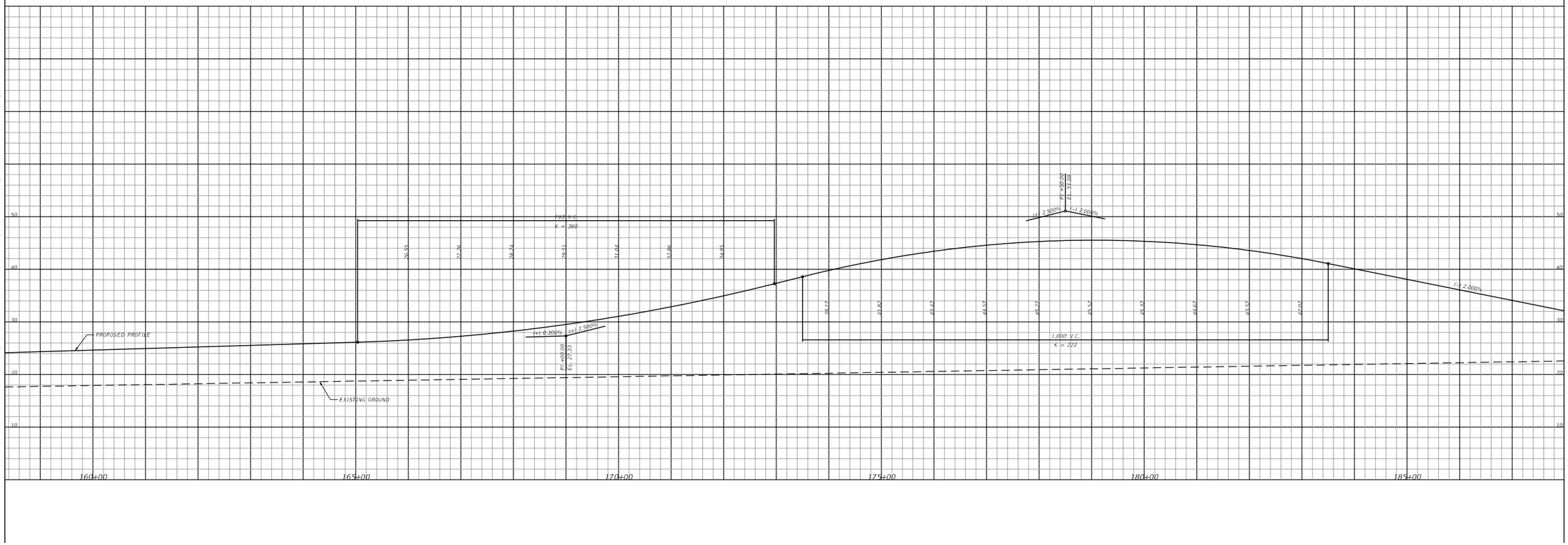

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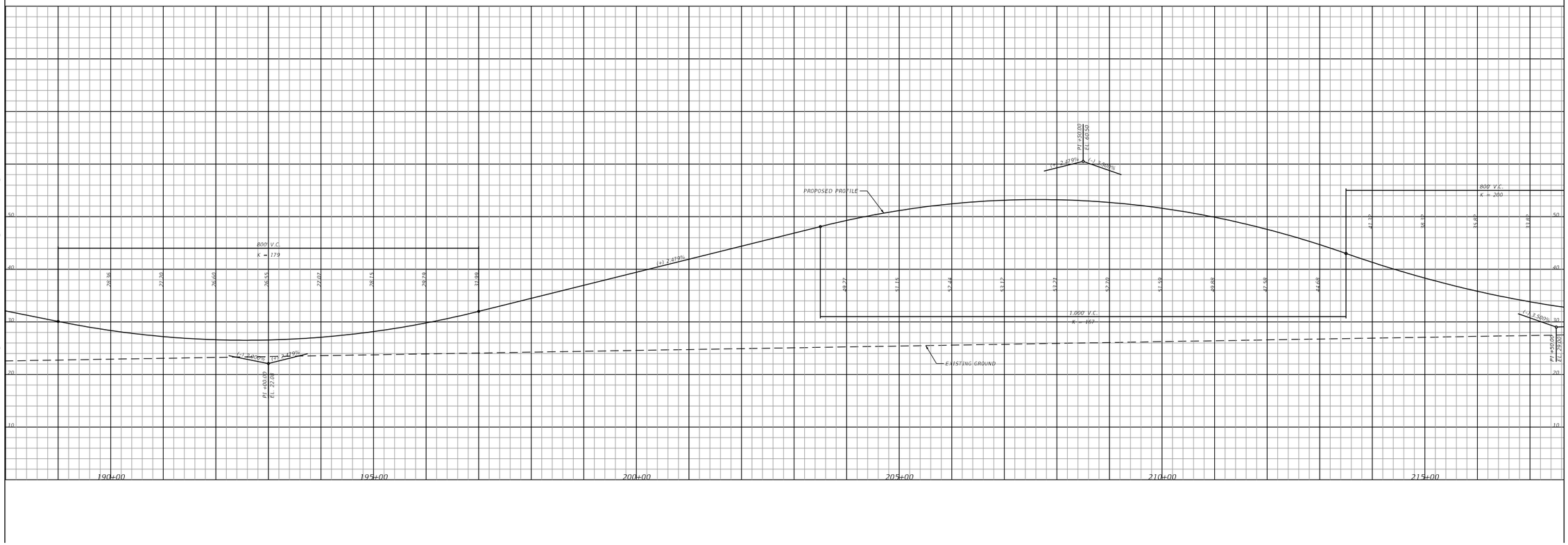

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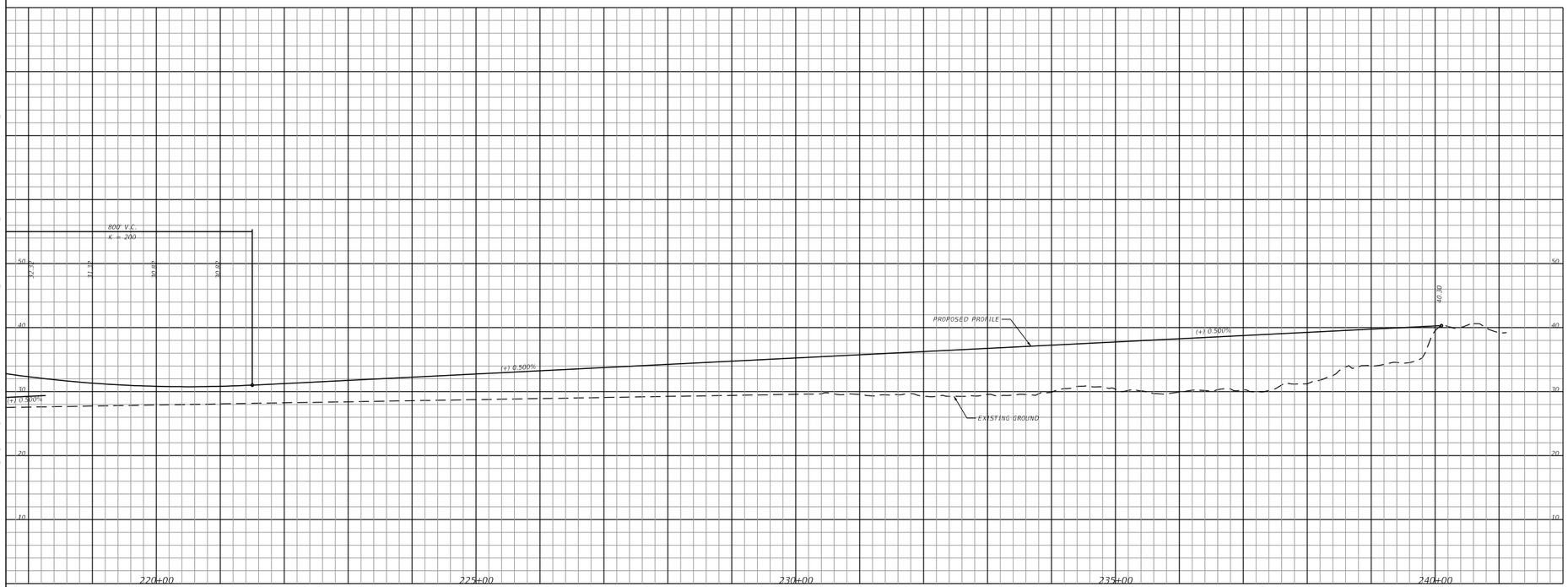

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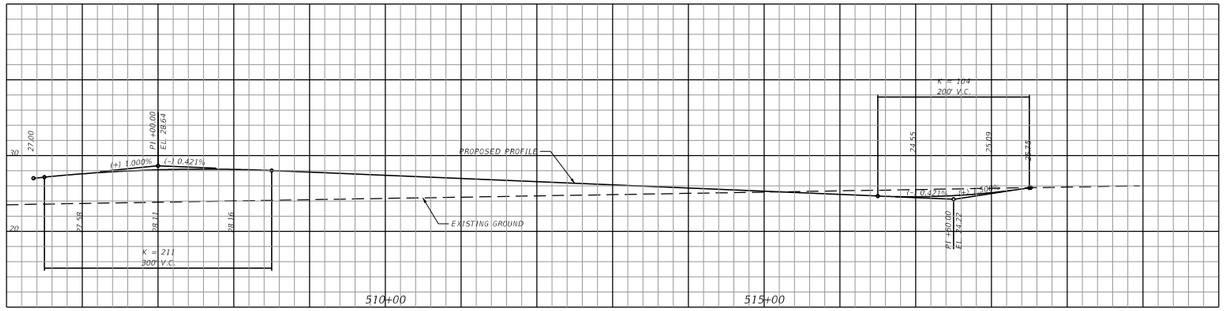

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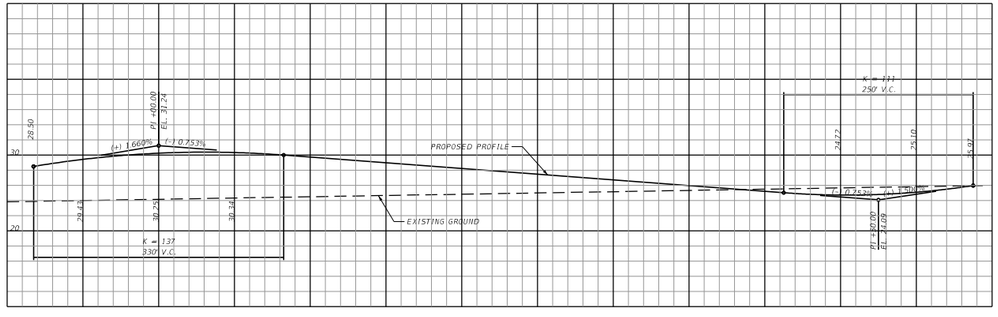

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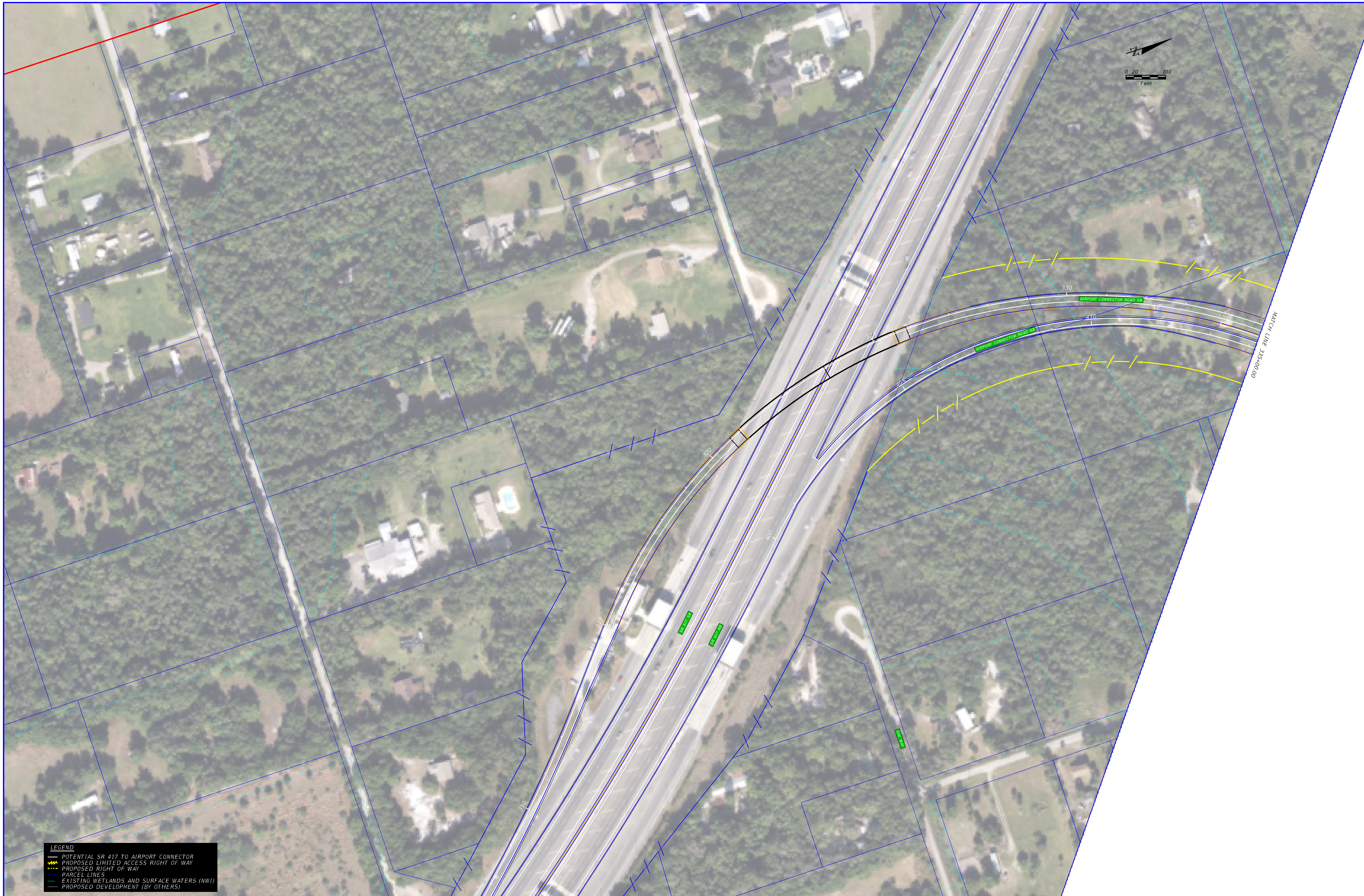

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CRAWLEY DOWN LOOP

NORTHERN BOULEVARD

SOUTHERN BOULEVARD

NORTHERN BOULEVARD

SOUTHERN BOULEVARD

LEGEND

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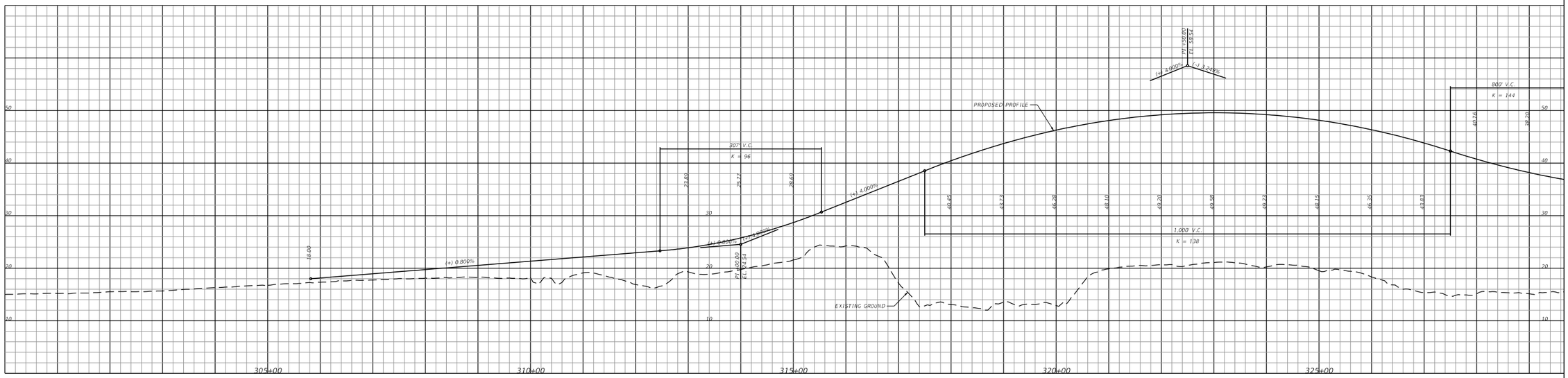

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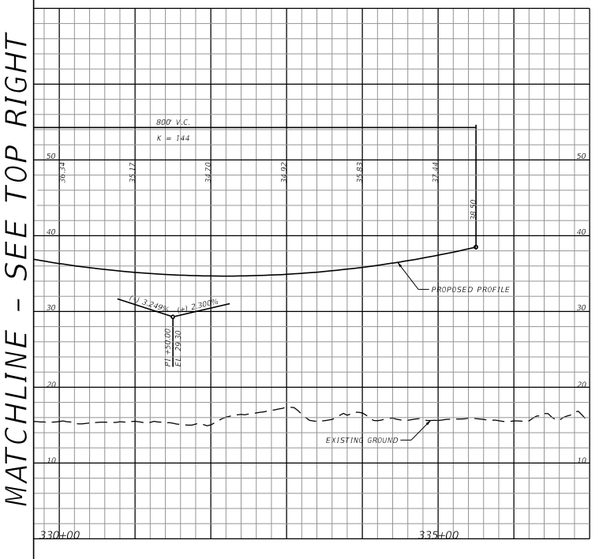

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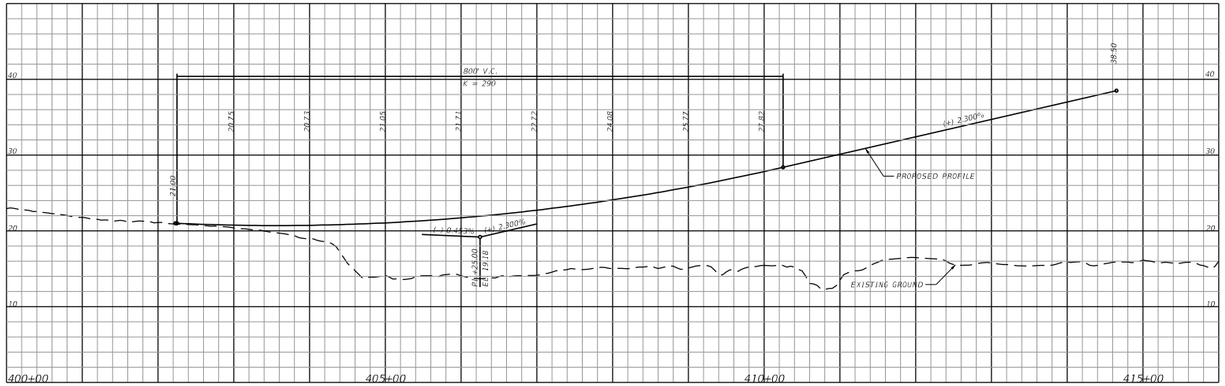

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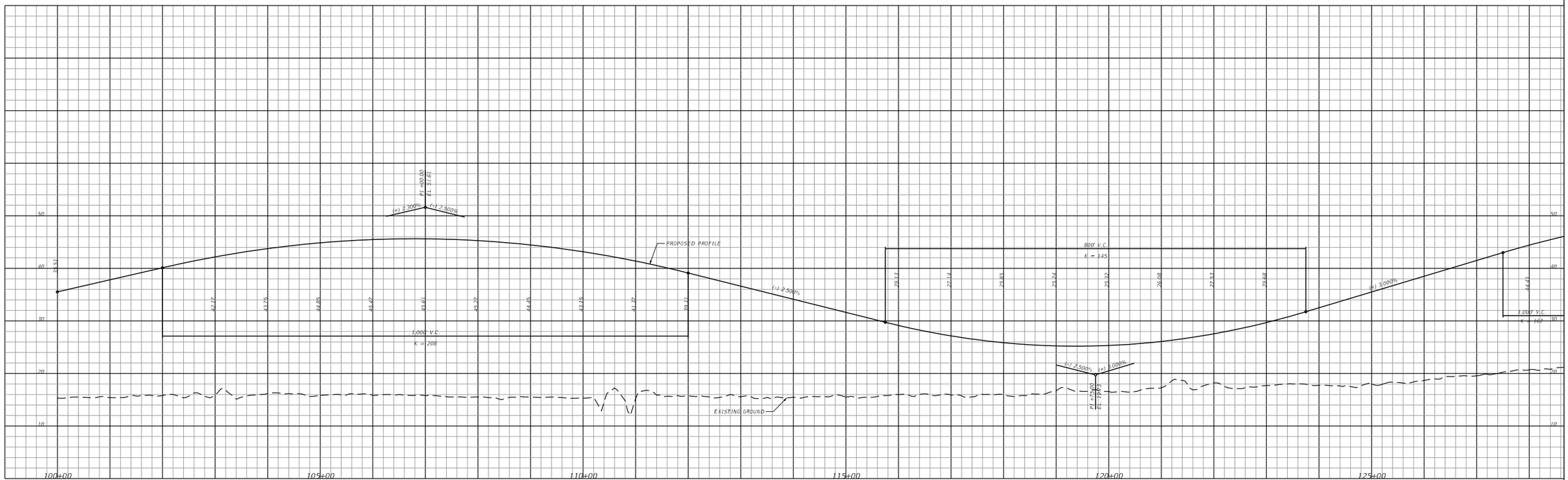

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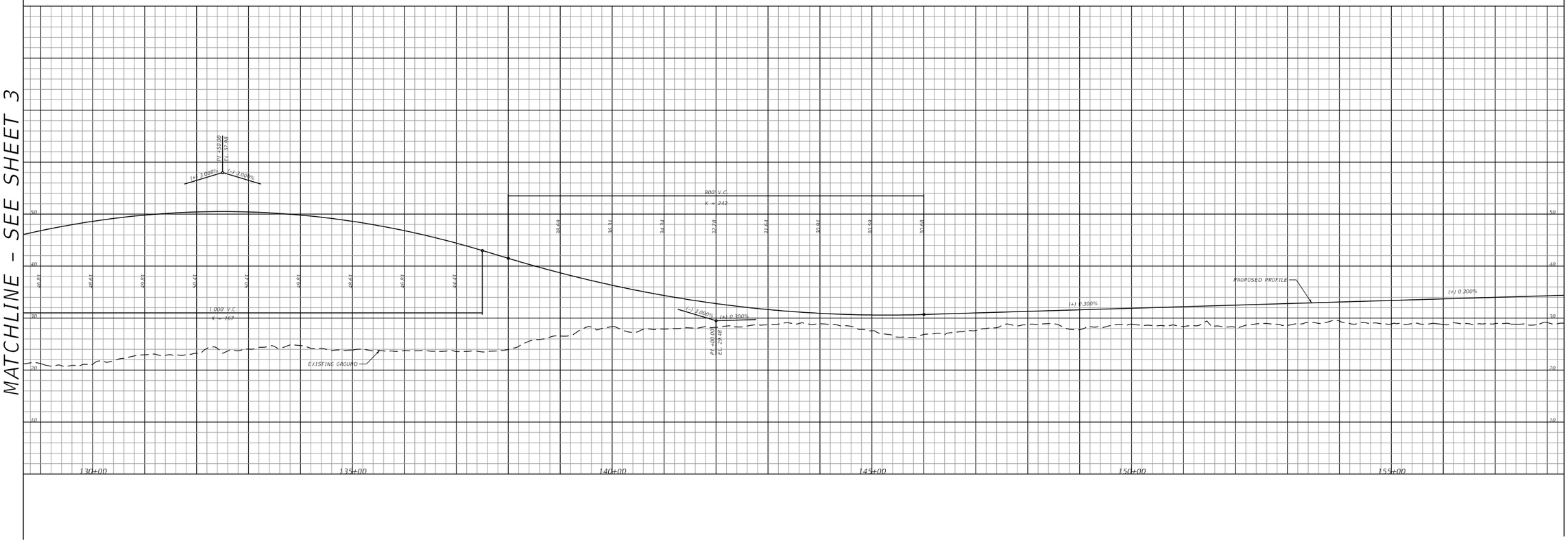

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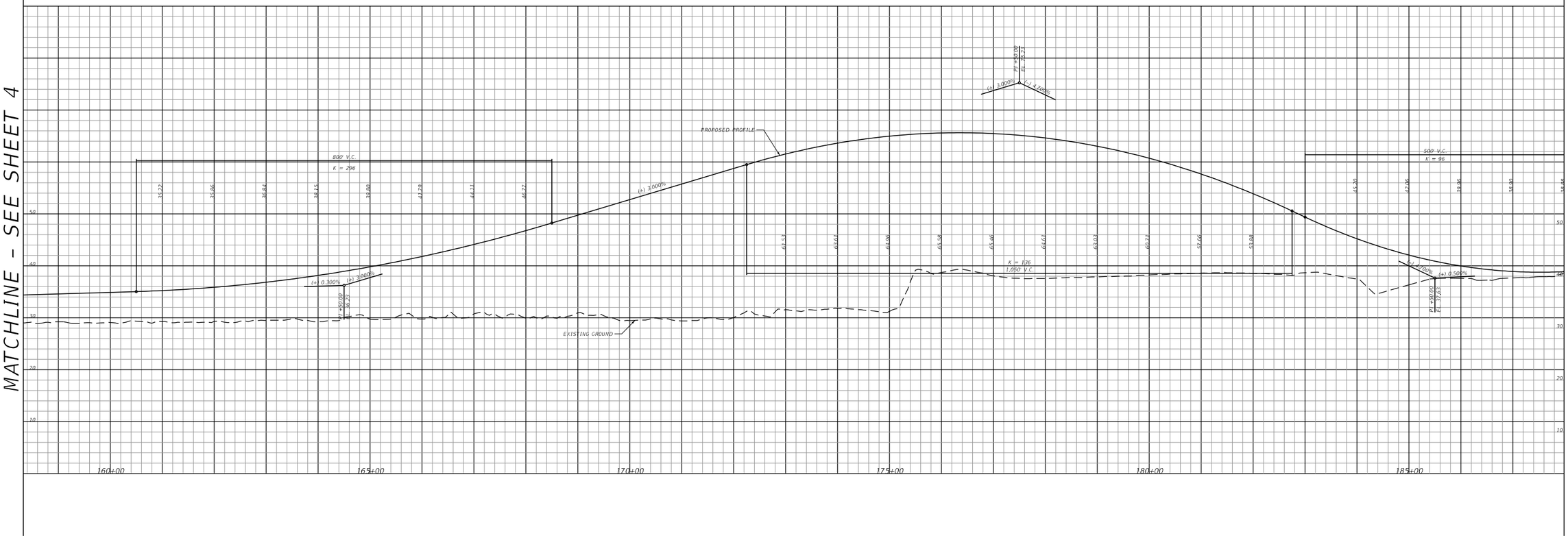

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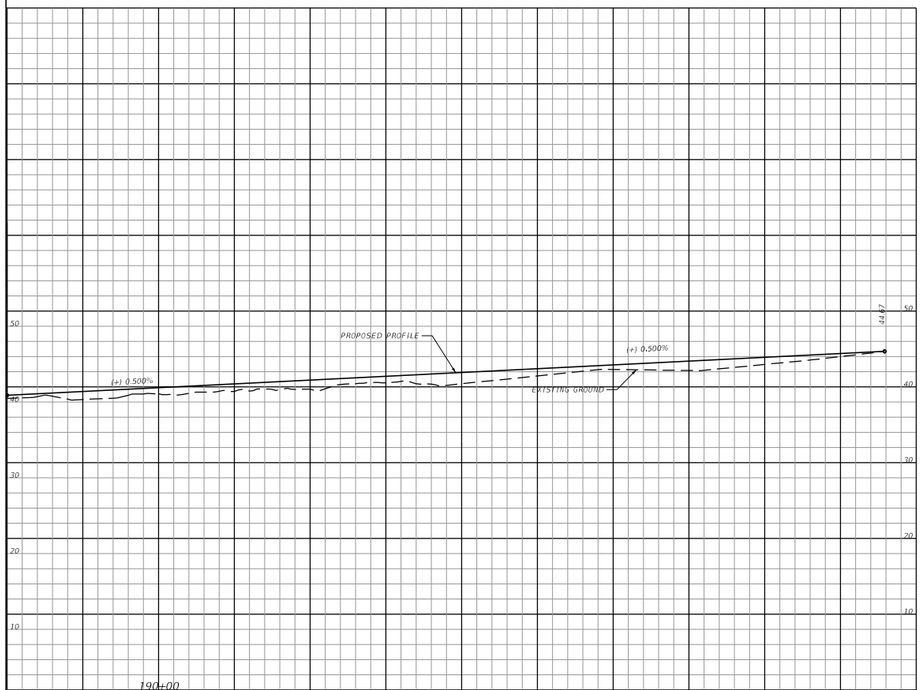

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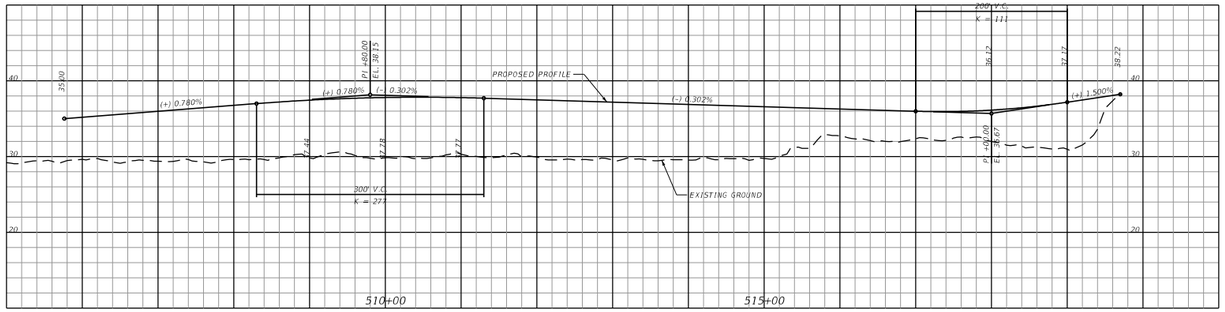

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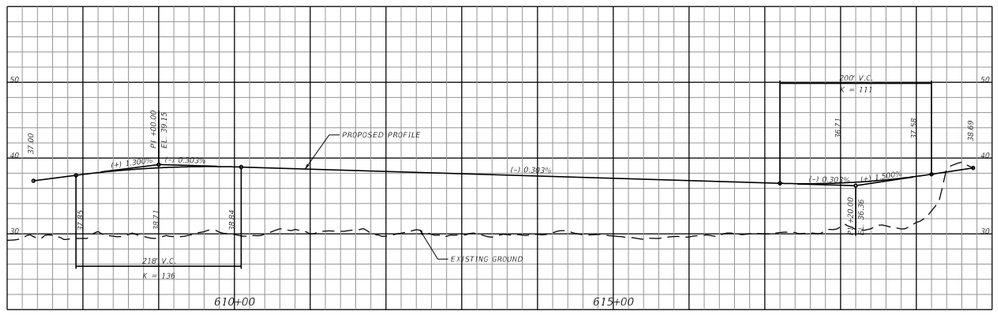

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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			7

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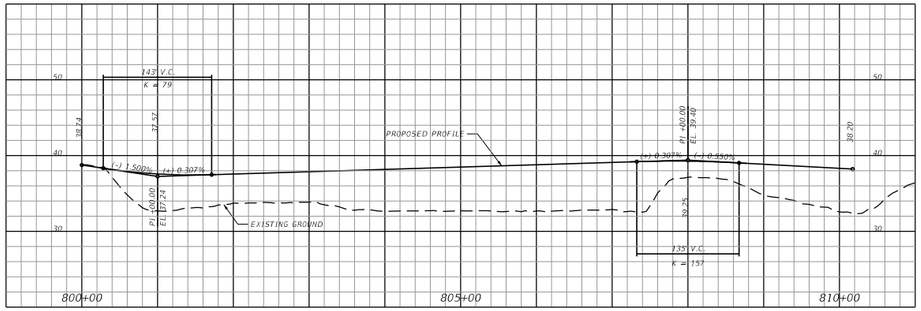
FAC NOTE

LAKE MARY BLVD. SB OFF RAMP PROFILE



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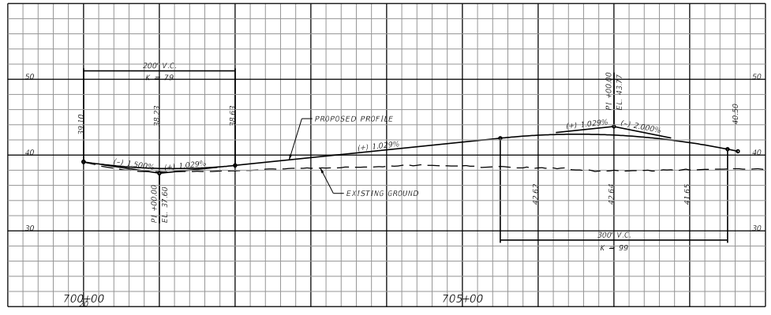

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 2	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			8

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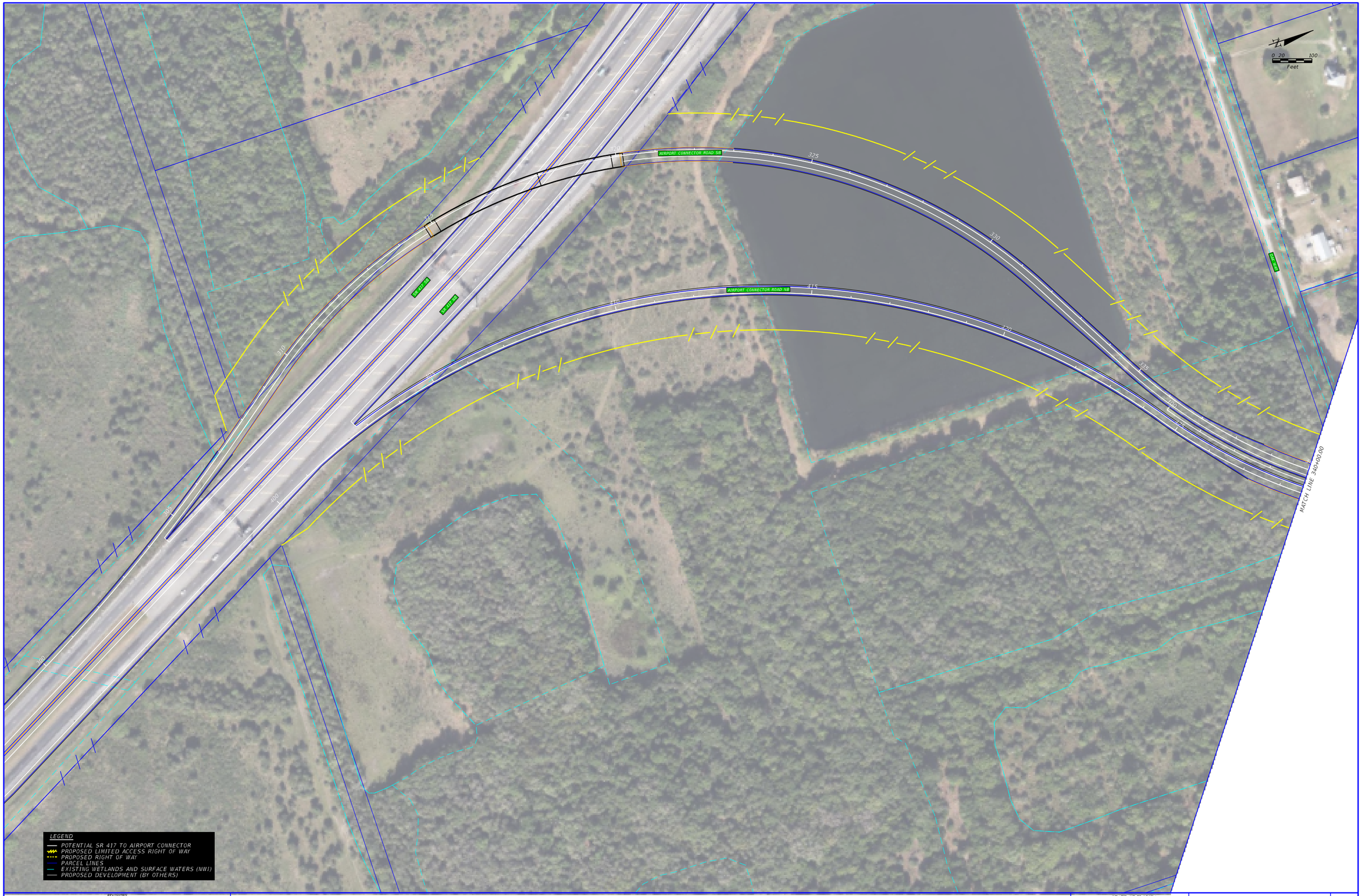
FAC NOTE



REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 417	SEMINOLE	

SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A

SHEET NO.

Tylor.Branch@jacobs.com

6/22/2023 11:17:32 AM Roll Plot 1

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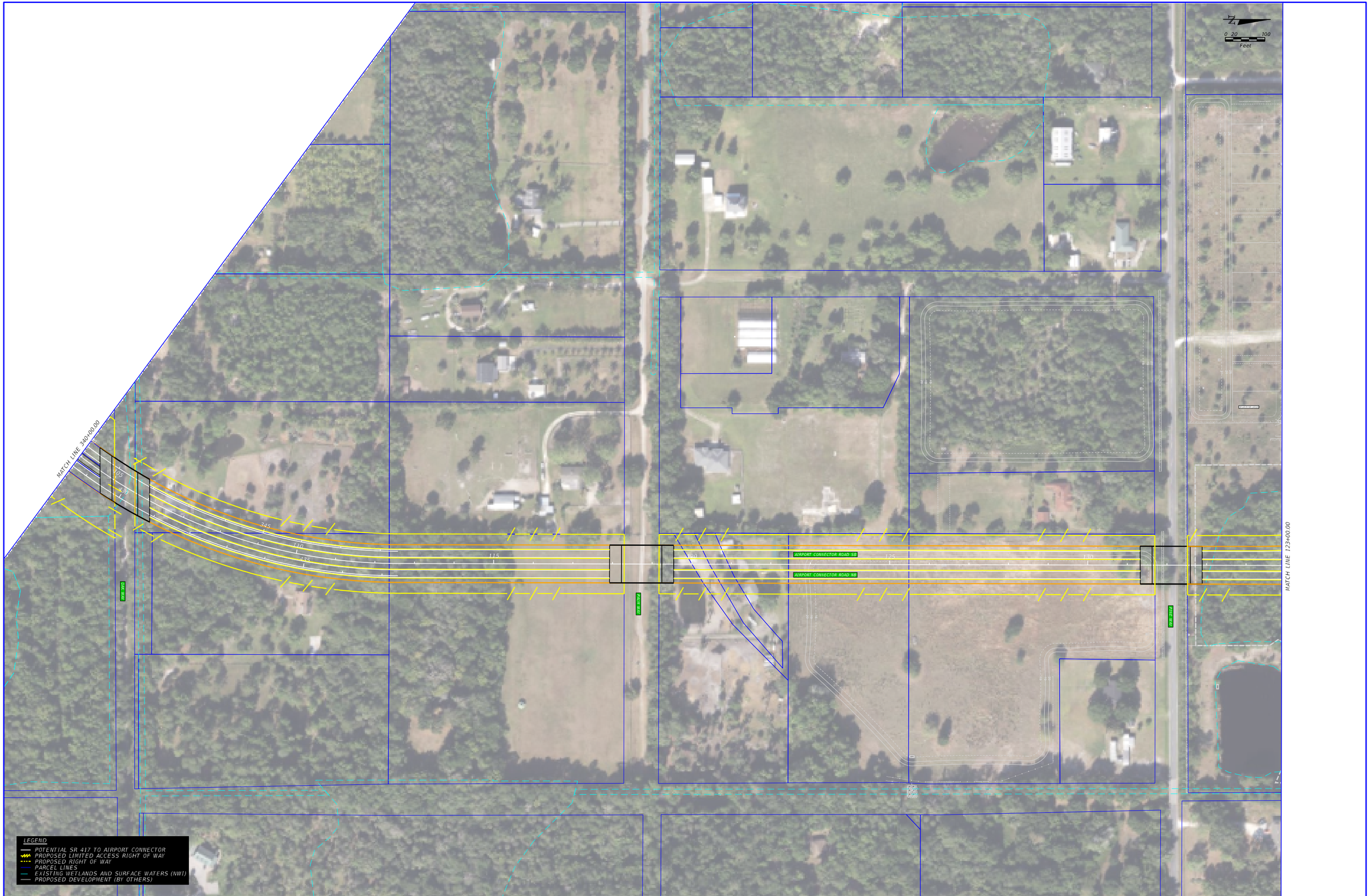

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 417	SEMINOLE	

SR 417 SANFORD AIRPORT
CFM STUDY - ALIGNMENT 3A

SHEET NO.

Tylor.Branch@jacobs.com

6/27/2023 11:32:09 AM Roll Plot 2

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LEGEND

- POTENTIAL SR 417 TO AIRPORT CONNECTOR
- PROPOSED LIMITED ACCESS RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PARCEL LINES
- EXISTING WETLANDS AND SURFACE WATERS (NWI)
- PROPOSED DEVELOPMENT (BY OTHERS)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A	SHEET NO.
ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
SR 417	SEMINOLE			


0 20 100
Feet
ORLANDO SANFORD
INTERNATIONAL AIRPORT (SFB)
SYLVESTRI LAKES
MATCH LINE 155+00.00
SB OFF-RAMP
AIRPORT CONNECTOR ROAD SB
AIRPORT CONNECTOR ROAD NB
NB ON-RAMP
805
810
815
820
710
715
720
EAST LAKE MARY BOULEVARD SB
EAST LAKE MARY BOULEVARD NB
RED CLEVELAND BOULEVARD SB
RED CLEVELAND BOULEVARD NB
SFB CROSSING
CRAWLEY DOWN LOOP
LEGEND
POTENTIAL SR 417 TO AIRPORT CONNECTOR
PROPOSED LIMITED ACCESS RIGHT OF WAY
PROPOSED RIGHT OF WAY
PARCEL LINES
EXISTING WETLANDS AND SURFACE WATERS (NWI)
PROPOSED DEVELOPMENT (BY OTHERS)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 417	SEMINOLE	

SR 417 SANFORD AIRPORT
CFM STUDY - ALIGNMENT 3A

SHEET NO.

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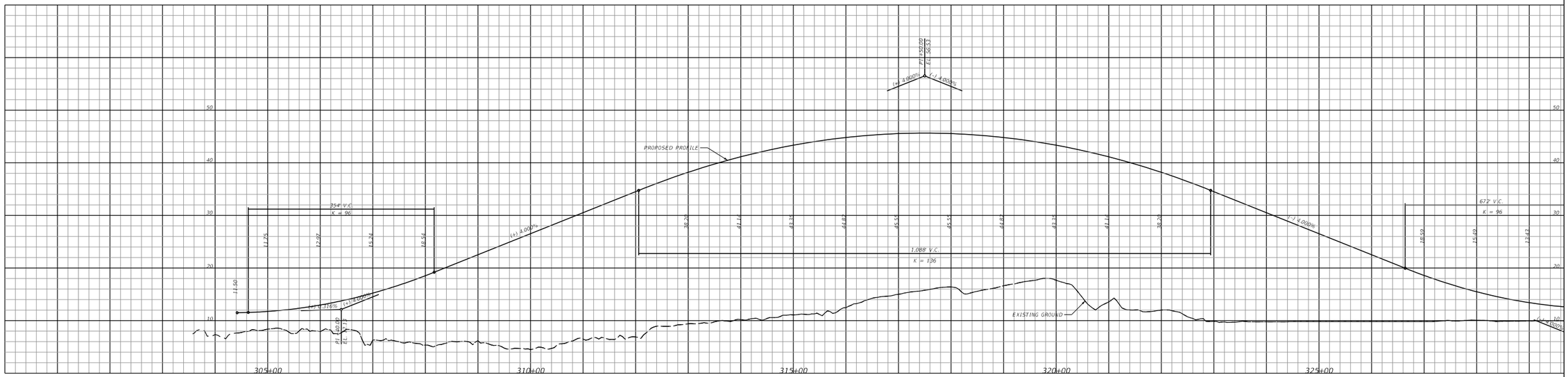
SR 417 SOUTHBOUND ON RAMP PROFILE



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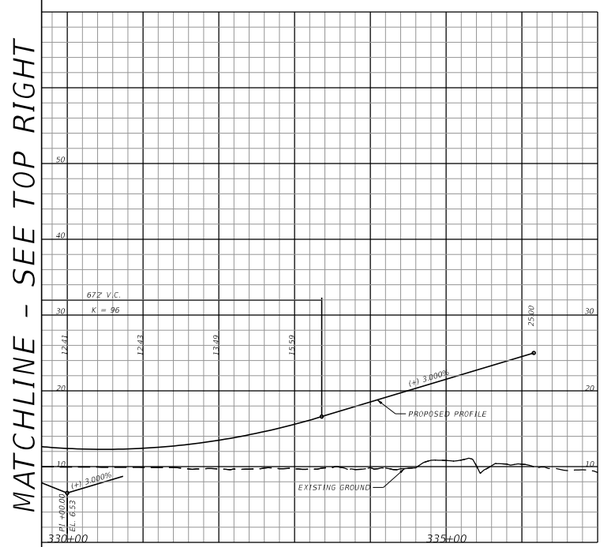

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			1

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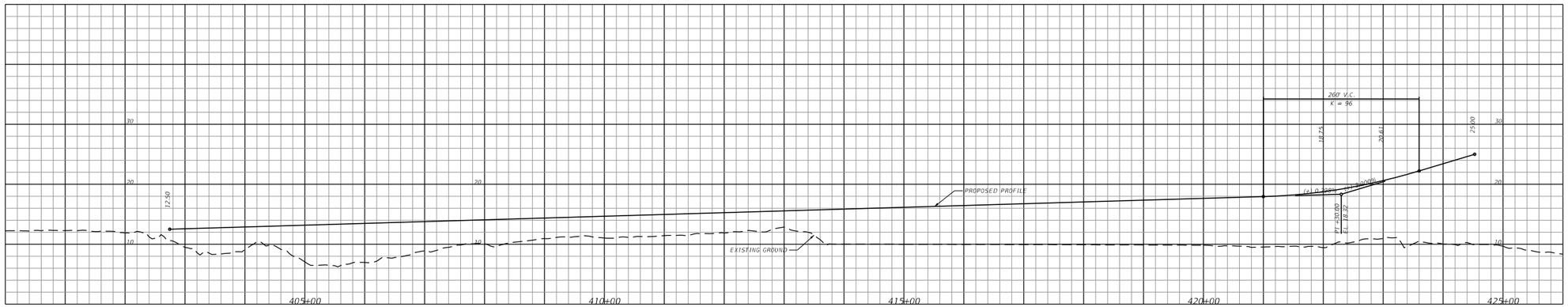
FAC NOTE

SR 417 NORTHBOUND ON RAMP PROFILE



REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			2

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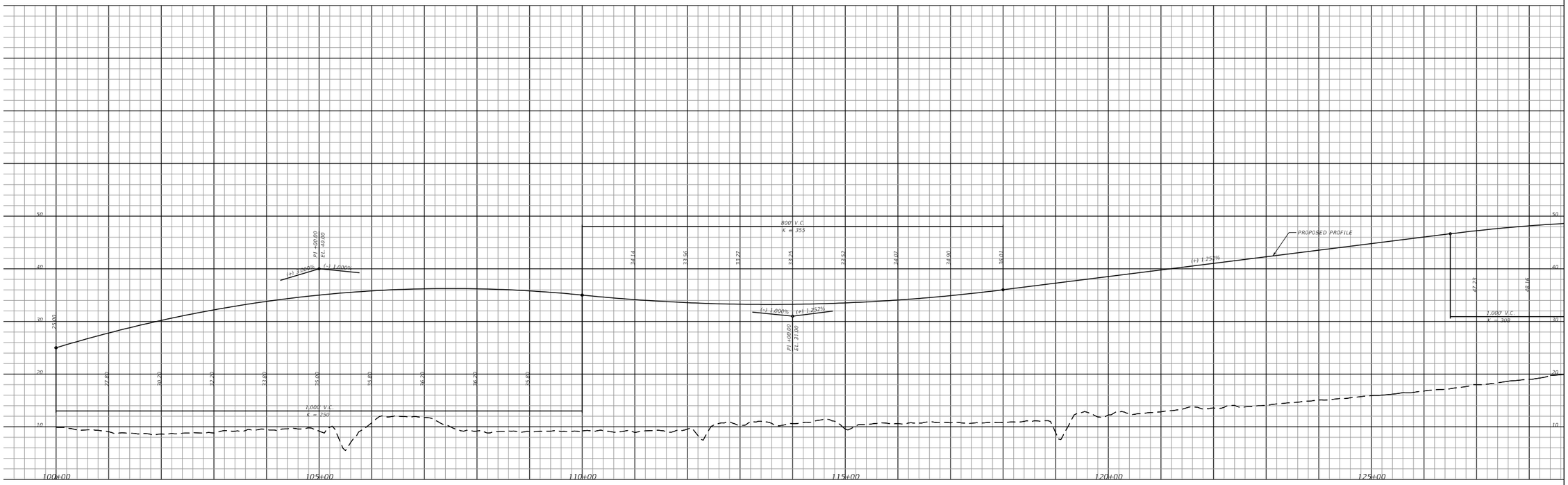
FAC NOTE

AIRPORT CONNECTOR ROAD PROFILE



MATCHLINE - SEE SHEET 4

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			3

FAC NOTE

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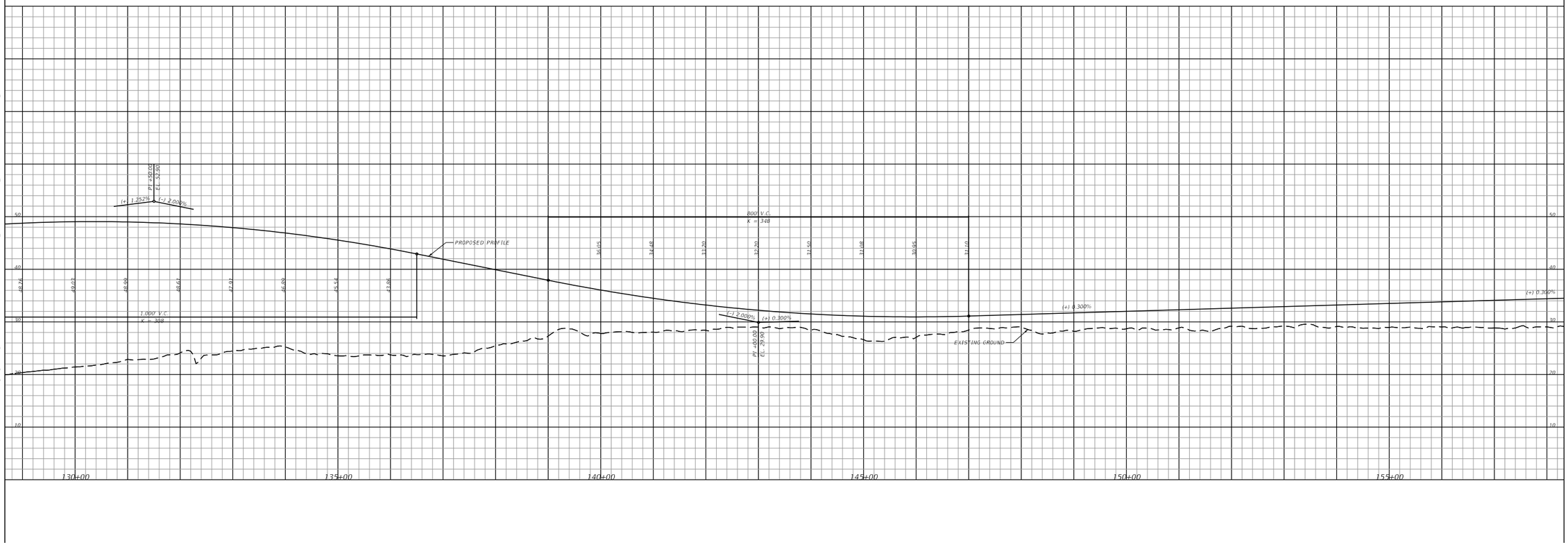

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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			4

FAC NOTE

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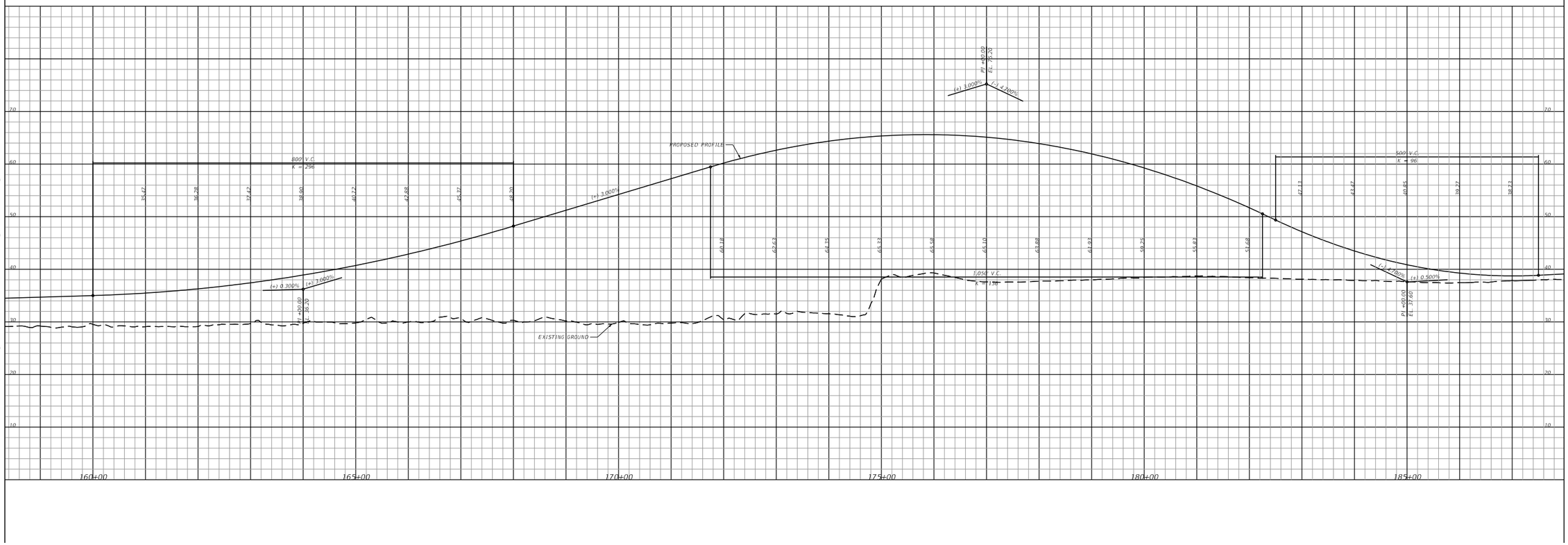
AIRPORT CONNECTOR ROAD PROFILE

MATCHLINE - SEE SHEET 4

MATCHLINE - SEE SHEET 6



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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			5

FAC NOTE

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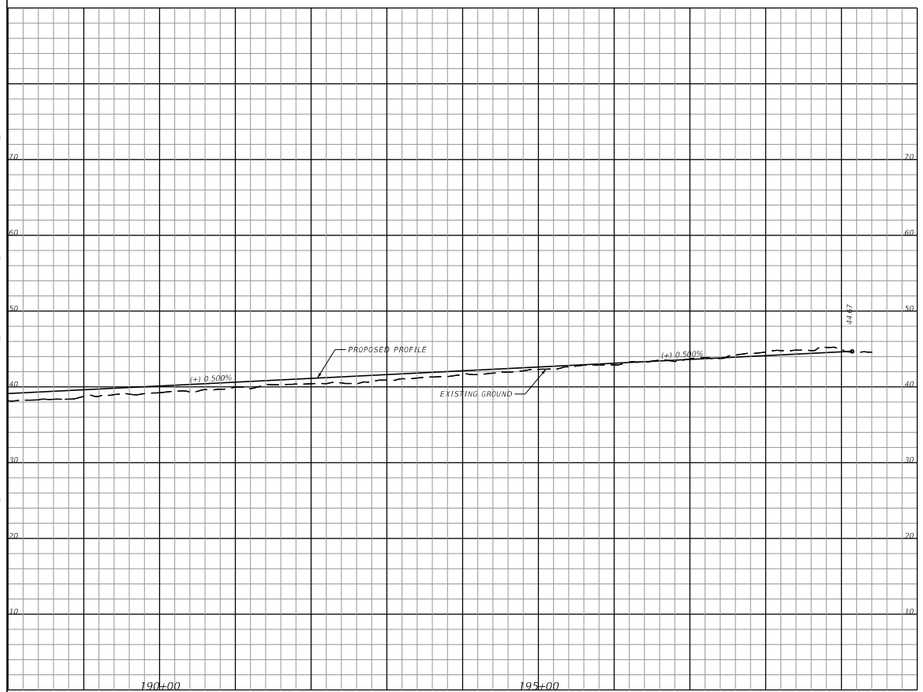
AIRPORT CONNECTOR ROAD PROFILE



MATCHLINE - SEE SHEET 5

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			6

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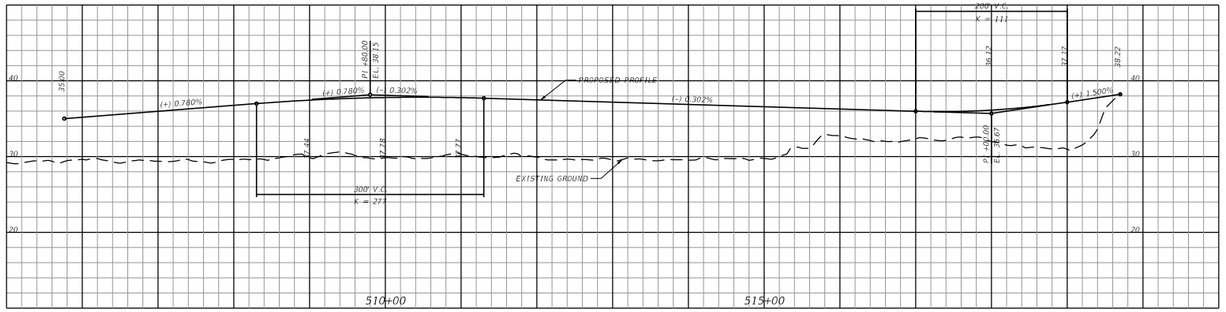
FAC NOTE

LAKE MARY BLVD. SB ON RAMP PROFILE



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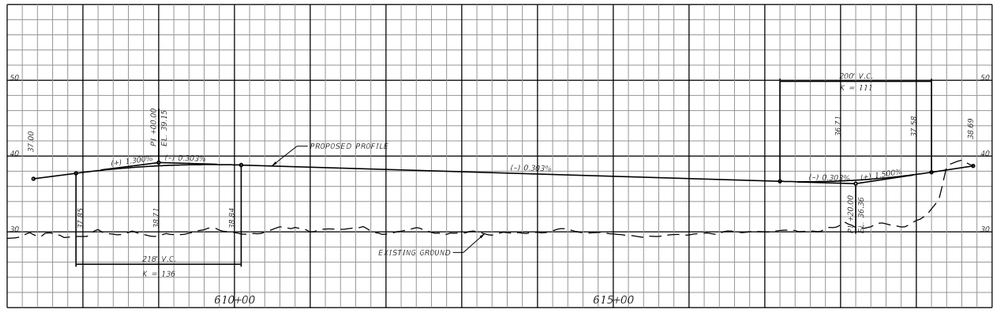

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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			7

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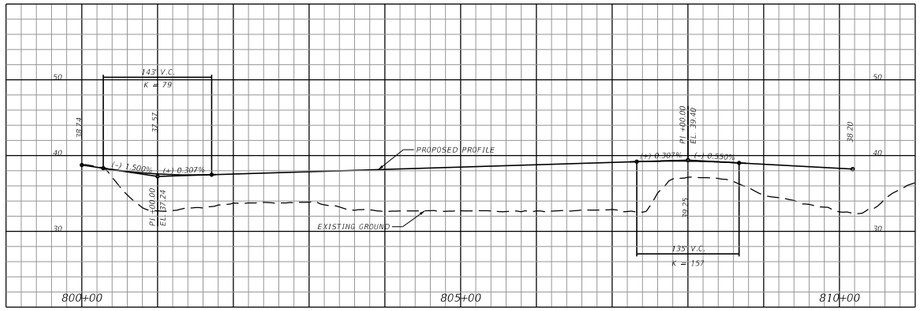
FAC NOTE

LAKE MARY BLVD. SB OFF RAMP PROFILE



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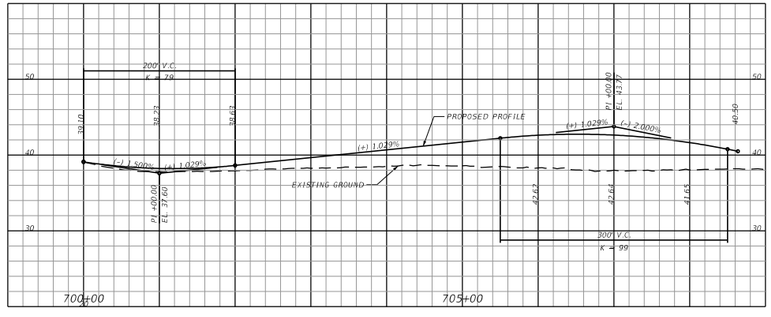

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3A	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			8

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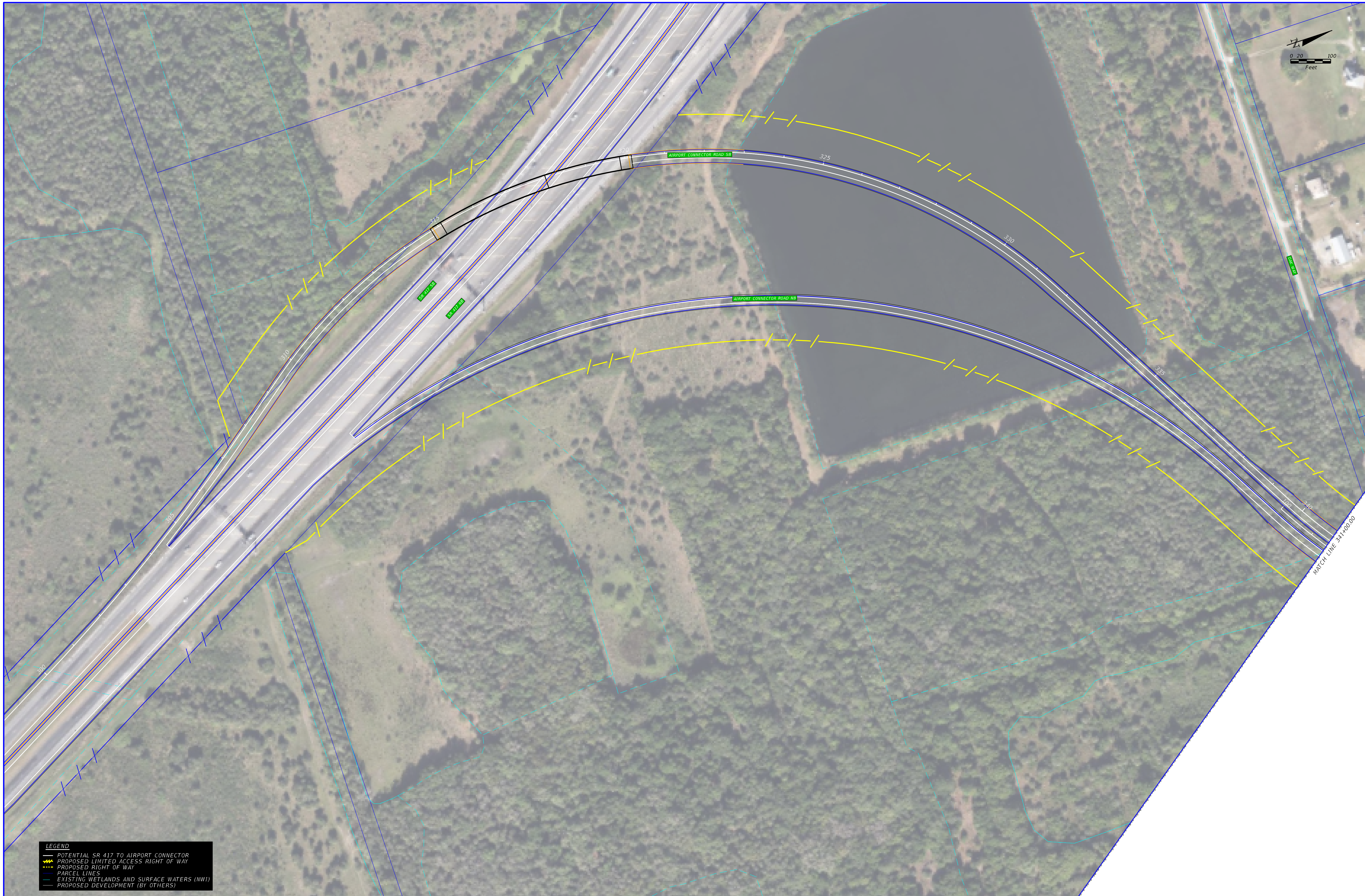
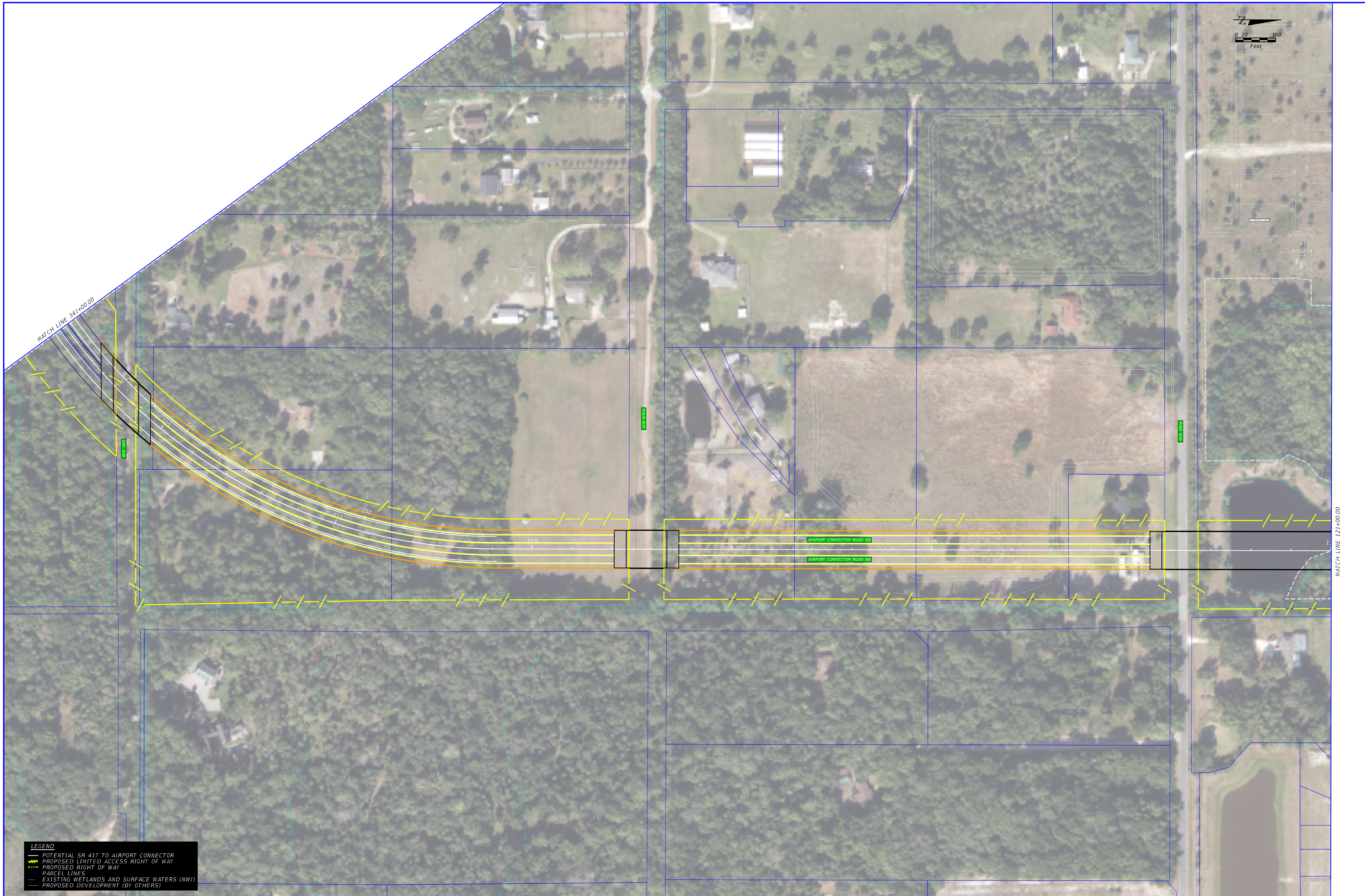


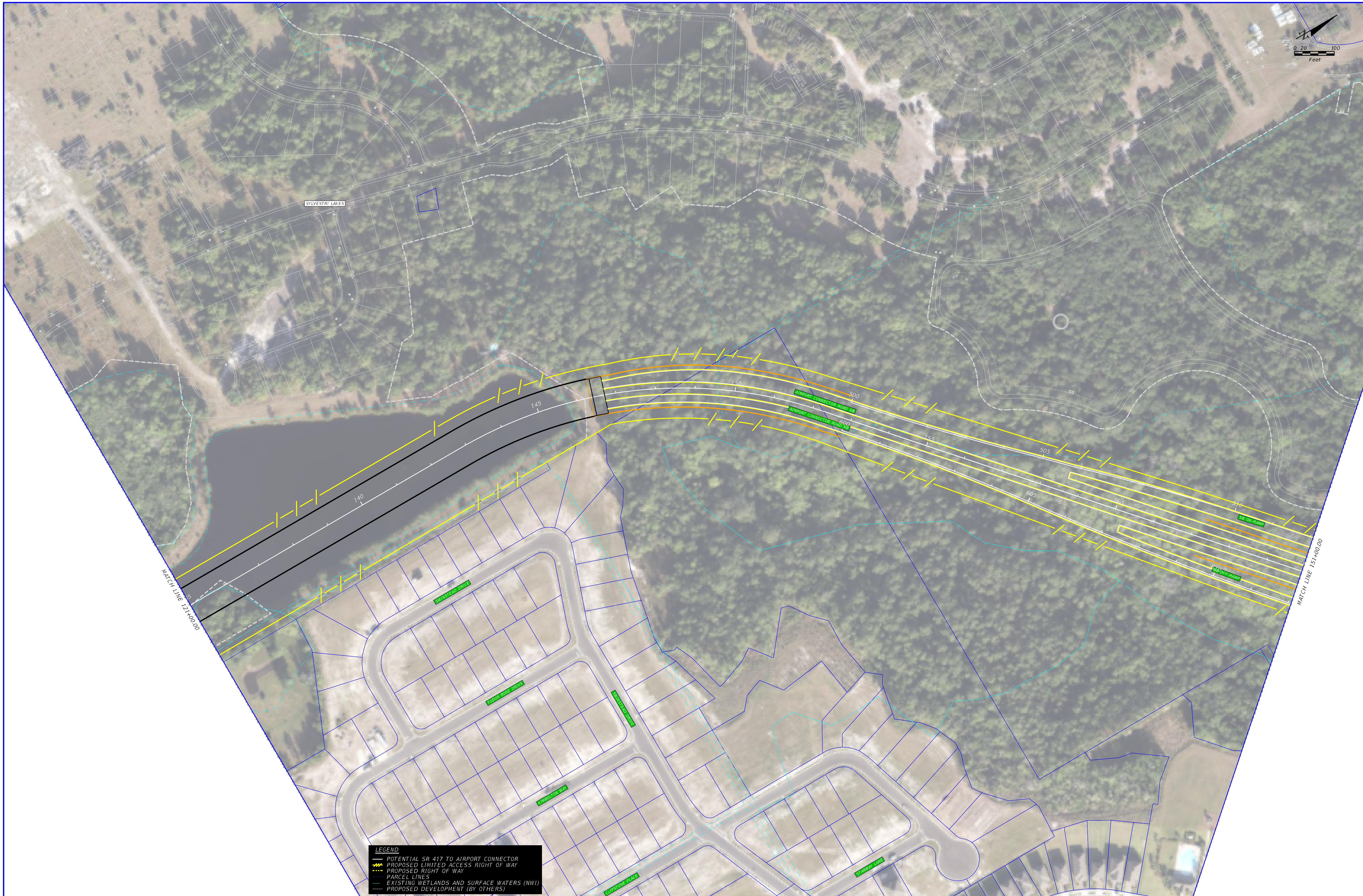
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
SR 417	SEMINOLE			



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
SR 417	SEMINOLE			



LEGEND

- POTENTIAL SR 417 TO AIRPORT CONNECTOR
- PROPOSED LIMITED ACCESS RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- PARCEL LINES
- EXISTING WETLANDS AND SURFACE WATERS (NWI)
- PROPOSED DEVELOPMENT (BY OTHERS)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 417	SEMINOLE	

SR 417 SANFORD AIRPORT
CFM STUDY - ALIGNMENT 3D

SHEET NO.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

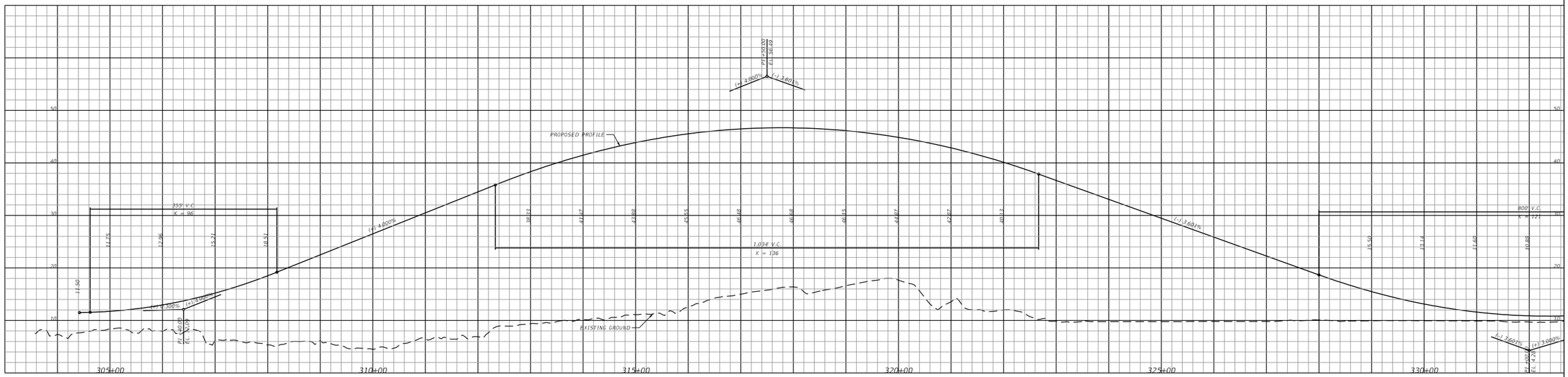
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 417	SEMINOLE	

SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D

SHEET NO.

SR 417 SOUTHBOUND ON RAMP PROFILE



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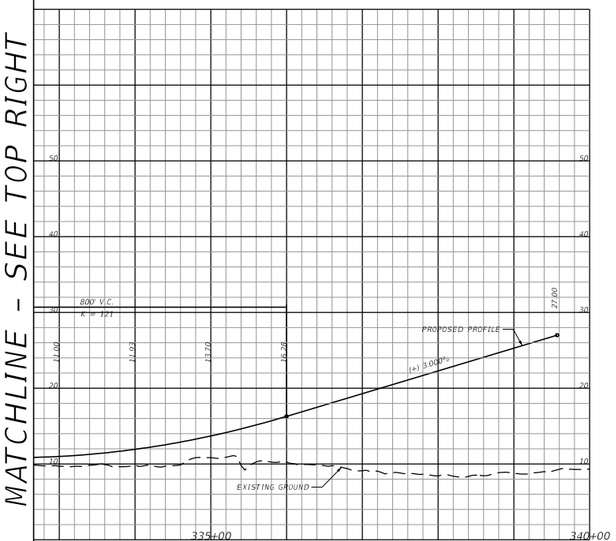

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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			1

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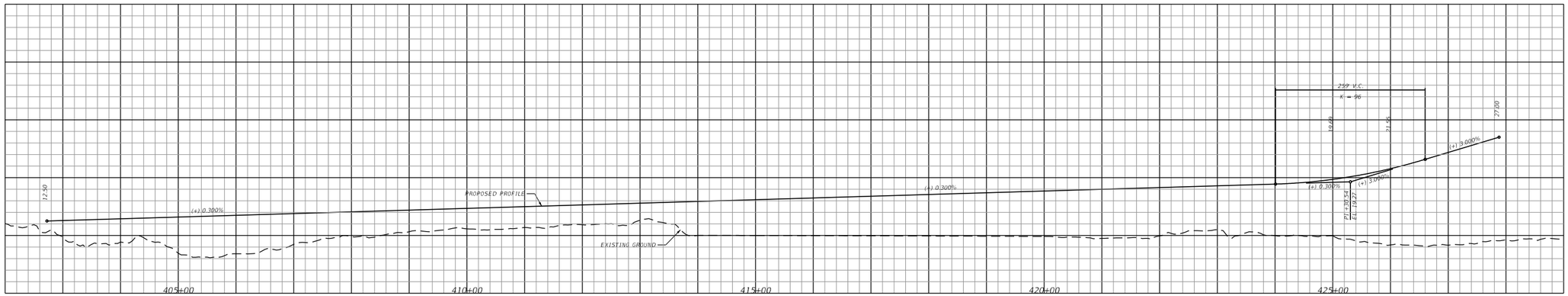
FAC NOTE

SR 417 NORTHBOUND ON RAMP PROFILE



REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			2

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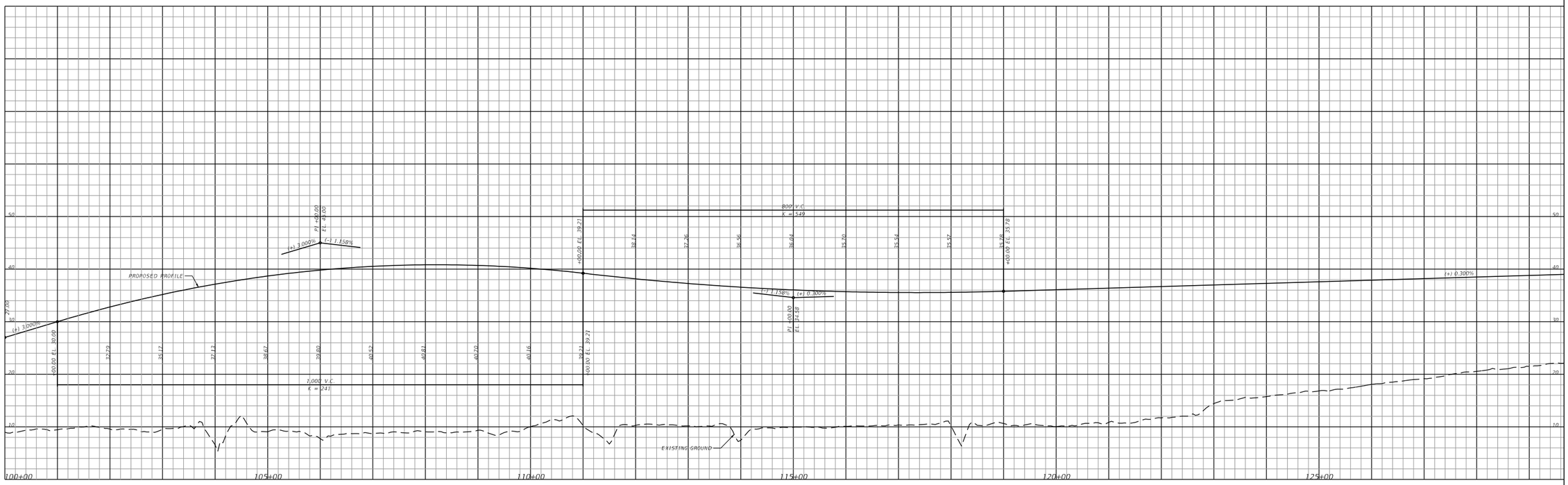
FAC NOTE

AIRPORT CONNECTOR ROAD PROFILE



MATCHLINE - SEE SHEET 4

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			3

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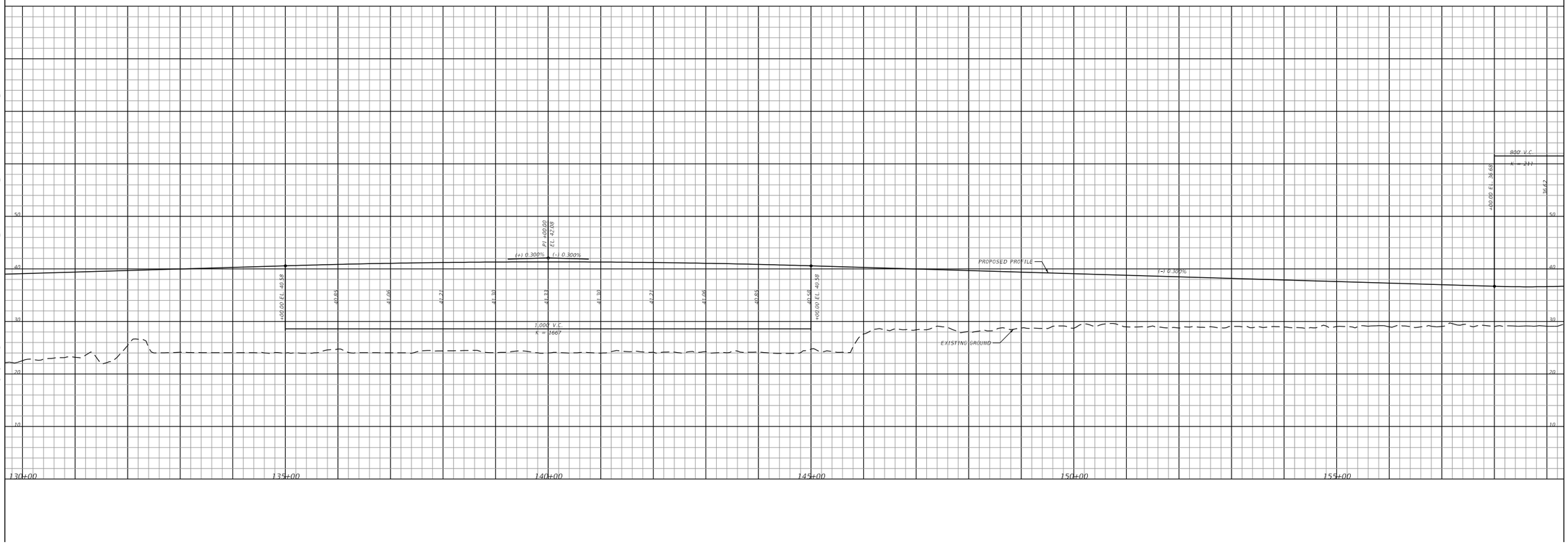
FAC NOTE

AIRPORT CONNECTOR ROAD PROFILE



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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			4

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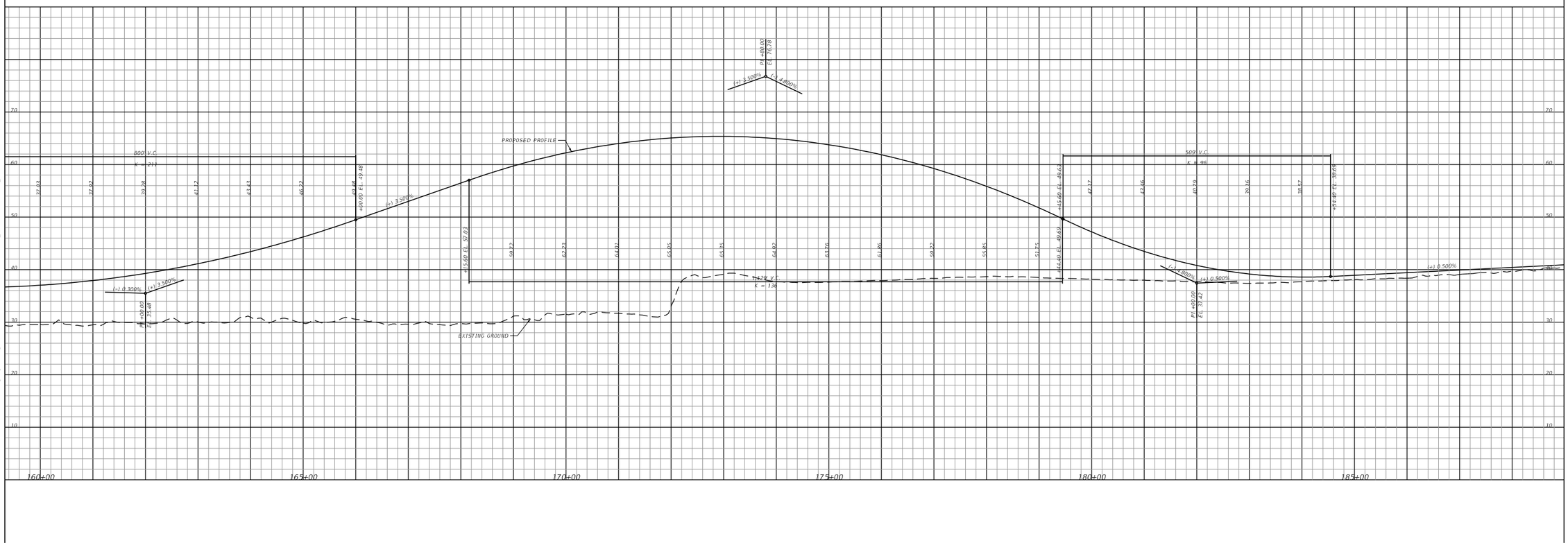
FAC NOTE

AIRPORT CONNECTOR ROAD PROFILE



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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			5

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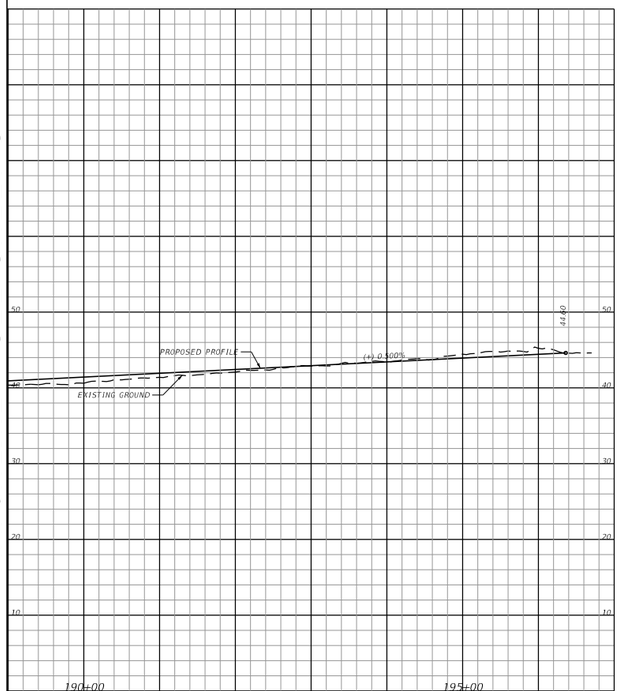
FAC NOTE

AIRPORT CONNECTOR ROAD PROFILE



MATCHLINE - SEE SHEET 5

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			6

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FAC NOTE

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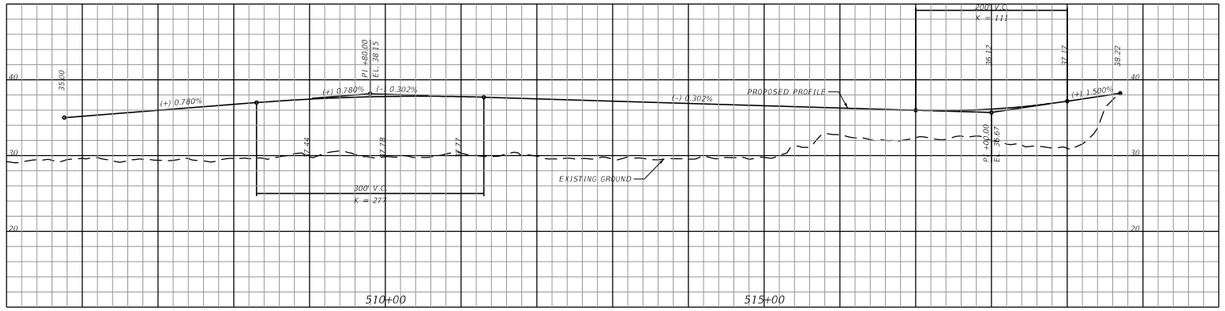

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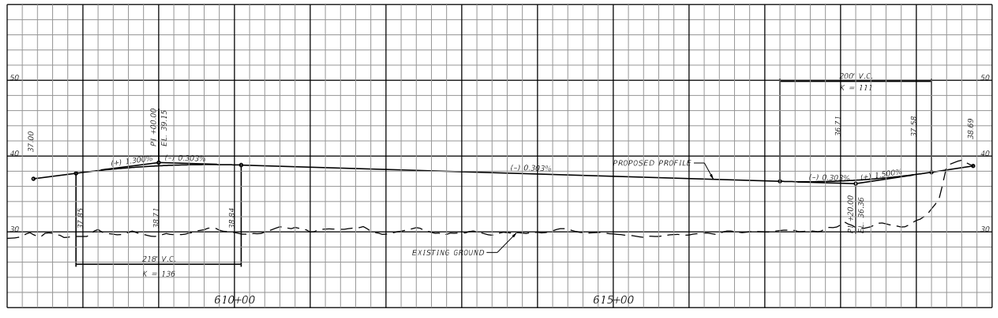

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			7

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FAC NOTE

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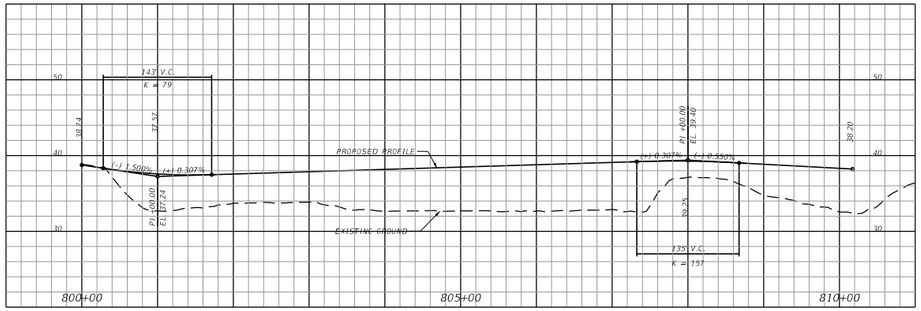

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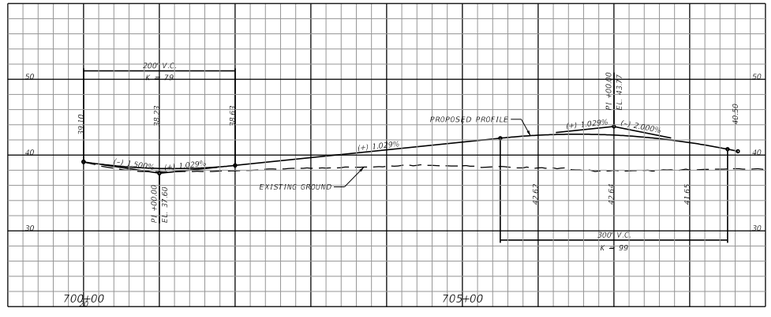

REVISIONS				PROFESSIONAL TYPE	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 417 SANFORD AIRPORT CFM STUDY - ALIGNMENT 3D	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 417	SEMINOLE			8

5/11/2023 1:05:06 PM Tylor.Branch@jacobs.com
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FAC NOTE

Appendix B
Typical Section Package

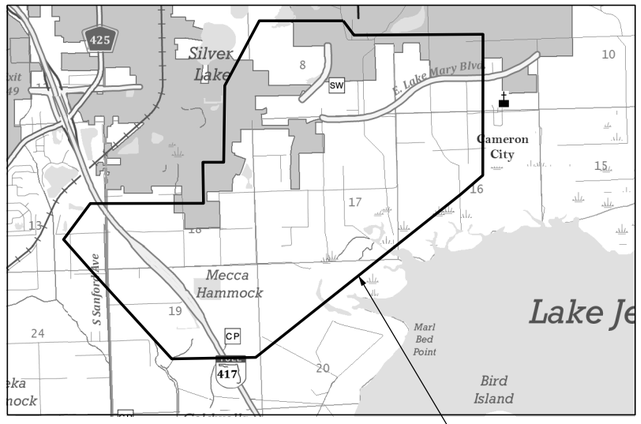
STATE OF FLORIDA

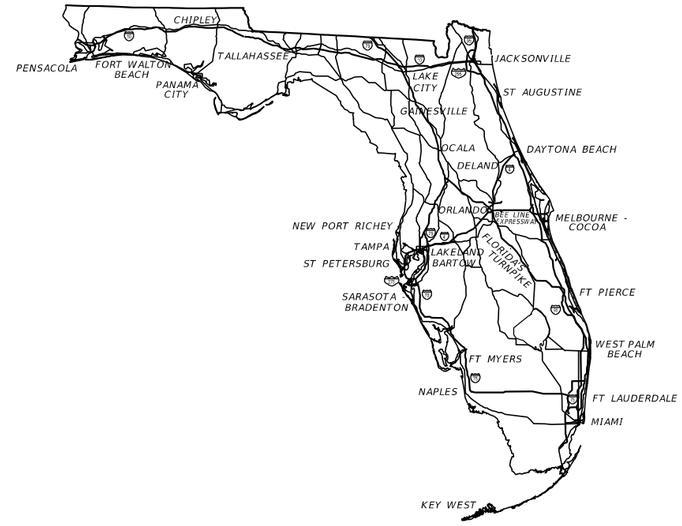
CENTRAL FLORIDA EXPRESSWAY AUTHORITY

TYPICAL SECTION PACKAGE

SR 417 (SEMINOLE EXPRESSWAY) TO ORLANDO SANFORD INTERNATIONAL AIRPORT CONNECTOR CONCEPT, FEASIBILITY, AND MOBILITY STUDY

SEMINOLE COUNTY





STUDY BOUNDARY

APPROVED BY:

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

INDEX OF SHEETS

SHEET NO	SHEET DESCRIPTION

SHEET NO. 1

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( ) C1 : NATURAL
( ) C2 : RURAL
( ) C2T : RURAL TOWN
( ) C3R : SUBURBAN RES.
( ) C3C : SUBURBAN COMM.
( ) C4 : URBAN GENERAL
( ) C5 : URBAN CENTER
( ) C6 : URBAN CORE
(X) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

( ) INTERSTATE
( ) FREEWAY/EXPWY.
(X) PRINCIPAL ARTERIAL
( ) MINOR ARTERIAL
( ) MAJOR COLLECTOR
( ) MINOR COLLECTOR
( ) LOCAL

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
( ) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

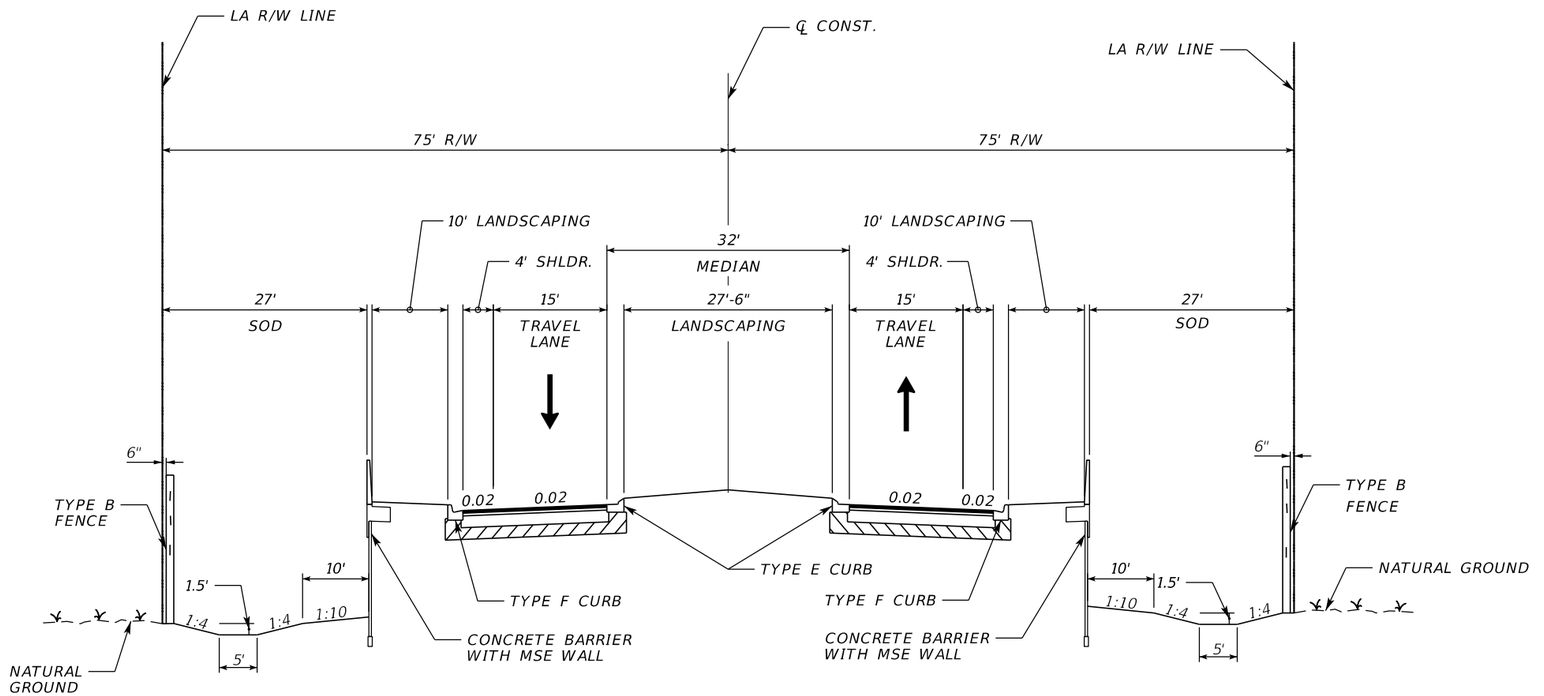
(X) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 01



OPTION 1 - AIRPORT CONNECTOR (PROPOSED TWO-LANE TYPICAL SECTION)

DESIGN SPEED 45 MPH
POSTED SPEED 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
	2

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
(X)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( )	NATIONAL HIGHWAY SYSTEM
( )	STRATEGIC INTERMODAL SYSTEM
( )	STATE HIGHWAY SYSTEM
(X)	OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

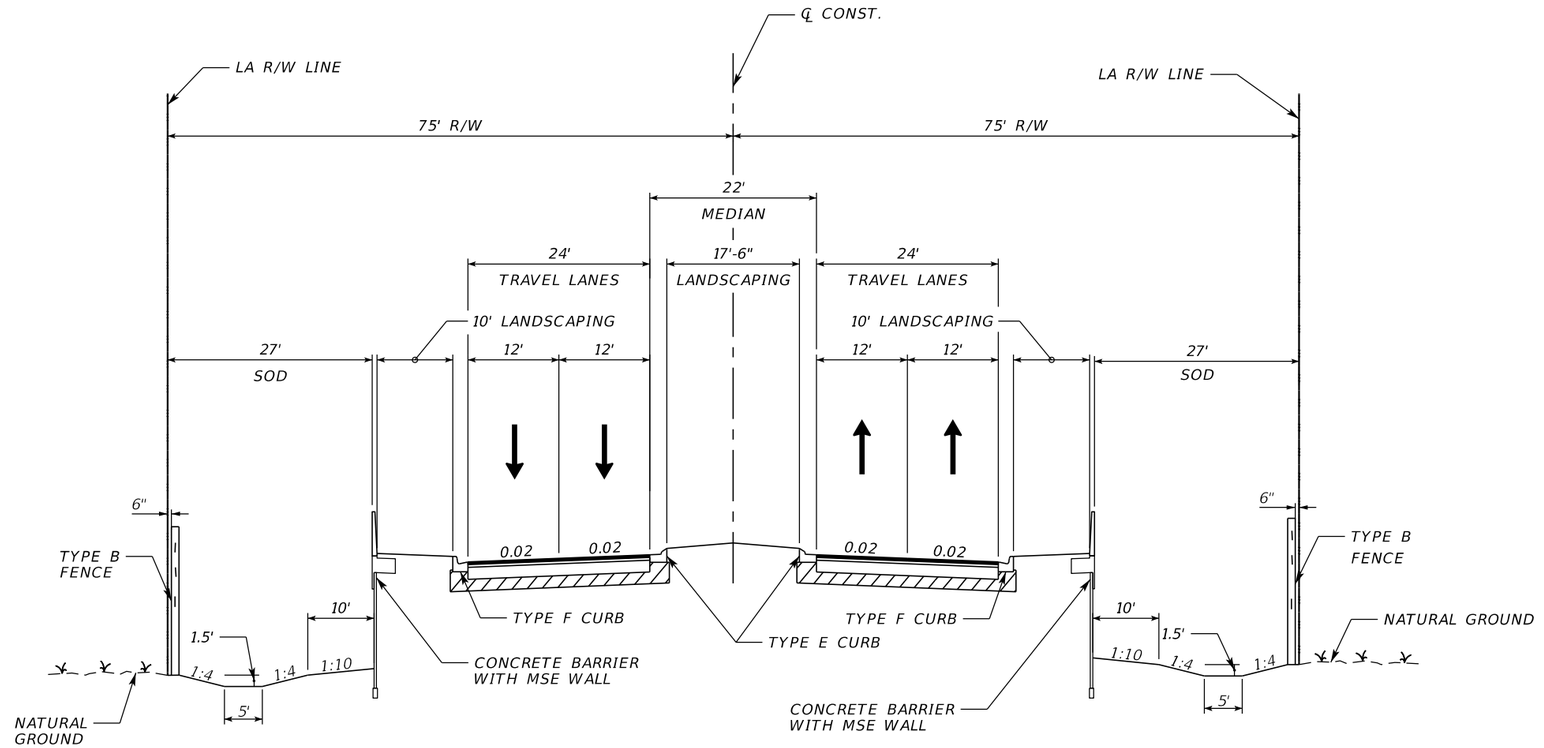
(X)	1 - FREEWAY
( )	2 - RESTRICTIVE w/Service Roads
( )	3 - RESTRICTIVE w/660 ft. Connection Spacing
( )	4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( )	5 - RESTRICTIVE w/440 ft. Connection Spacing
( )	6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( )	7 - BOTH MEDIAN TYPES

CRITERIA

(X)	NEW CONSTRUCTION / RECONSTRUCTION
( )	RESURFACING (LA FACILITIES)
( )	RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 02



OPTION 2 - AIRPORT CONNECTOR (FUTURE FOUR-LANE TYPICAL SECTION)

DESIGN SPEED 45 MPH
POSTED SPEED 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
	3

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
(X)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(X)	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( )	NATIONAL HIGHWAY SYSTEM
( )	STRATEGIC INTERMODAL SYSTEM
( )	STATE HIGHWAY SYSTEM
(X)	OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

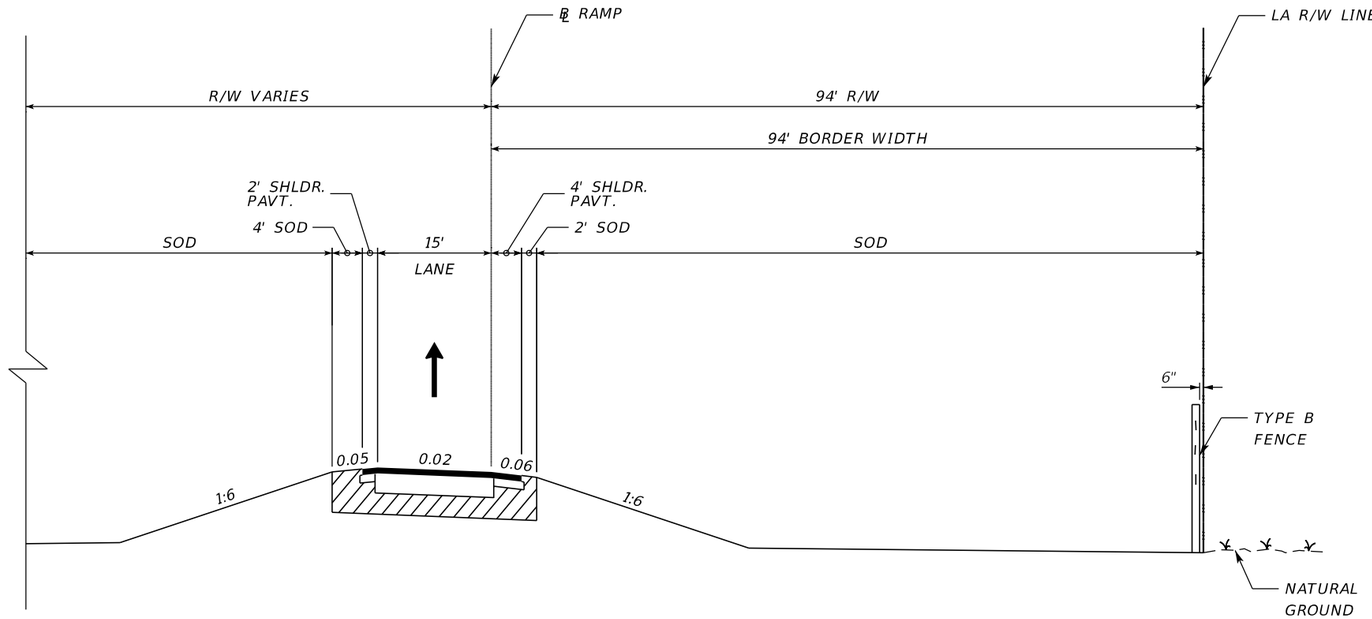
(X)	1 - FREEWAY
( )	2 - RESTRICTIVE w/Service Roads
( )	3 - RESTRICTIVE w/660 ft. Connection Spacing
( )	4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( )	5 - RESTRICTIVE w/440 ft. Connection Spacing
( )	6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( )	7 - BOTH MEDIAN TYPES

CRITERIA

(X)	NEW CONSTRUCTION / RECONSTRUCTION
( )	RESURFACING (LA FACILITIES)
( )	RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 03



SR 417 INTERCHANGE RAMP TYPICAL SECTION

DESIGN SPEED 50 MPH

FINANCIAL PROJECT ID	SHEET NO.
	4

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
(X)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( )	NATIONAL HIGHWAY SYSTEM
( )	STRATEGIC INTERMODAL SYSTEM
( )	STATE HIGHWAY SYSTEM
(X)	OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

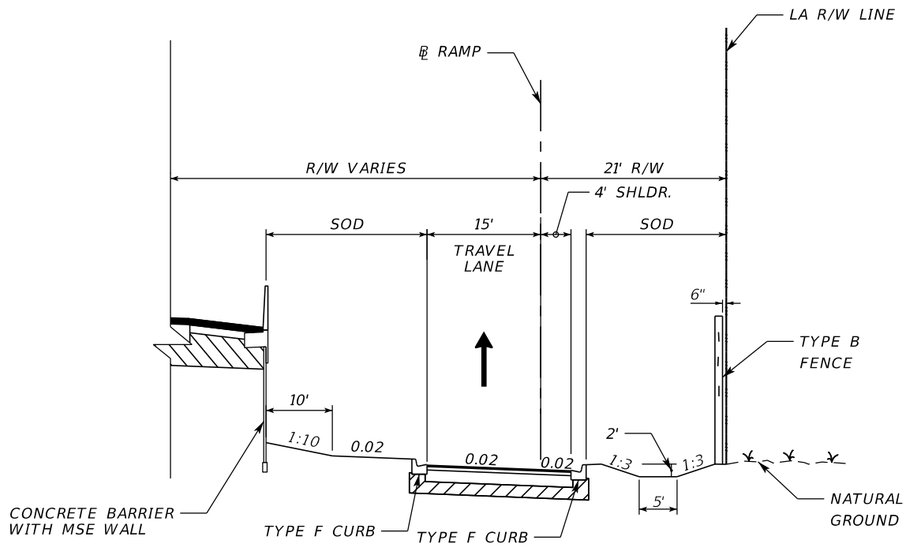
(X)	1 - FREEWAY
( )	2 - RESTRICTIVE w/Service Roads
( )	3 - RESTRICTIVE w/660 ft. Connection Spacing
( )	4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( )	5 - RESTRICTIVE w/440 ft. Connection Spacing
( )	6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( )	7 - BOTH MEDIAN TYPES

CRITERIA

(X)	NEW CONSTRUCTION / RECONSTRUCTION
( )	RESURFACING (LA FACILITIES)
( )	RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 04



RED CLEVELAND BLVD. INTERCHANGE RAMP TYPICAL SECTION (SOUTH OF EAST LAKE MARY BLVD.)

DESIGN SPEED 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
	5

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
(X)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

( )	NATIONAL HIGHWAY SYSTEM
( )	STRATEGIC INTERMODAL SYSTEM
( )	STATE HIGHWAY SYSTEM
(X)	OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

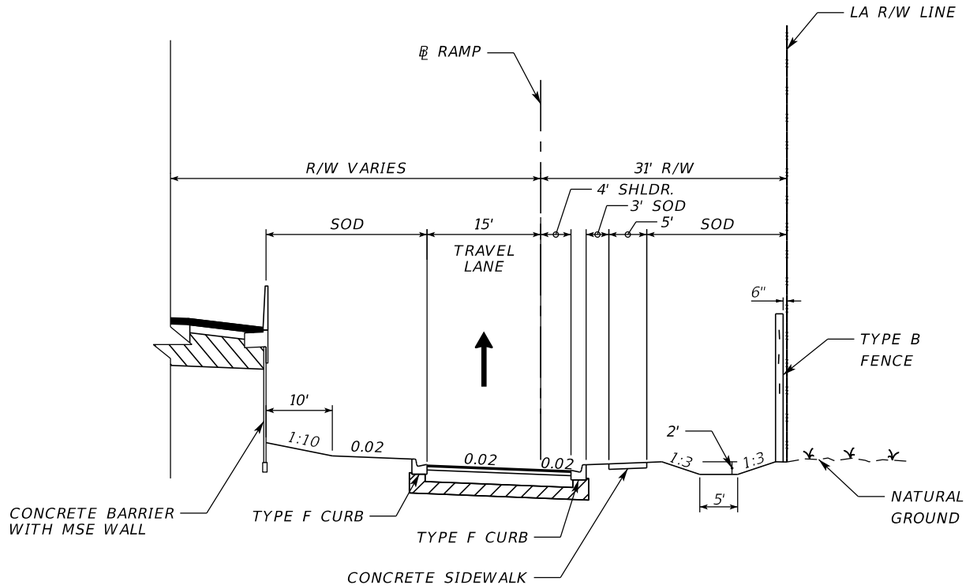
(X)	1 - FREEWAY
( )	2 - RESTRICTIVE w/Service Roads
( )	3 - RESTRICTIVE w/660 ft. Connection Spacing
( )	4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( )	5 - RESTRICTIVE w/440 ft. Connection Spacing
( )	6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( )	7 - BOTH MEDIAN TYPES

CRITERIA

(X)	NEW CONSTRUCTION / RECONSTRUCTION
( )	RESURFACING (LA FACILITIES)
( )	RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 05



RED CLEVELAND BLVD. INTERCHANGE RAMP TYPICAL SECTION (NORTH OF EAST LAKE MARY BLVD.)

DESIGN SPEED 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
	6

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	( )	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
( )	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
(X)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
(X)	PRINCIPAL ARTERIAL	( )	LOCAL
( )	MINOR ARTERIAL		

HIGHWAY SYSTEM

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- ( ) STATE HIGHWAY SYSTEM
- (X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

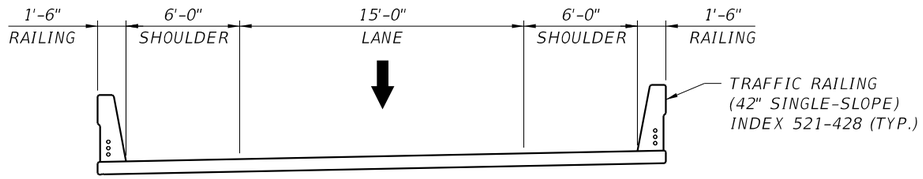
- (X) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- ( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- ( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 06



AIRPORT CONNECTOR ONE LANE RAMP BRIDGE TYPICAL SECTION

DESIGN SPEED 50 MPH

FINANCIAL PROJECT ID	SHEET NO.
	7

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( ) C1 : NATURAL
( ) C2 : RURAL
( ) C2T : RURAL TOWN
( ) C3R : SUBURBAN RES.
( ) C3C : SUBURBAN COMM.
( ) C4 : URBAN GENERAL
( ) C5 : URBAN CENTER
( ) C6 : URBAN CORE
(X) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

( ) INTERSTATE
( ) FREEWAY/EXPWY.
(X) PRINCIPAL ARTERIAL
( ) MINOR ARTERIAL
( ) MAJOR COLLECTOR
( ) MINOR COLLECTOR
( ) LOCAL

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
( ) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

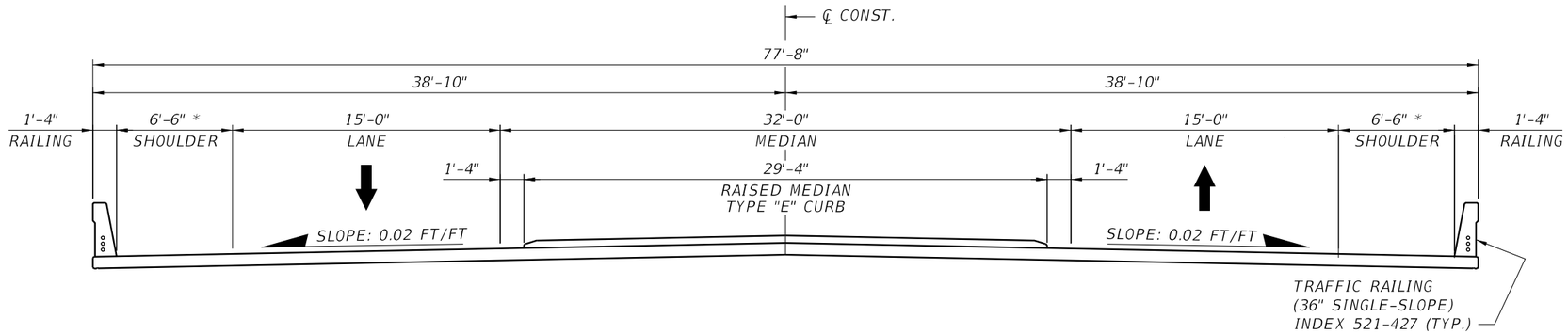
(X) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 07



OPTION 1 - AIRPORT CONNECTOR (PROPOSED TWO-LANE TYPICAL BRIDGE SECTION) (SINGLE BRIDGE)

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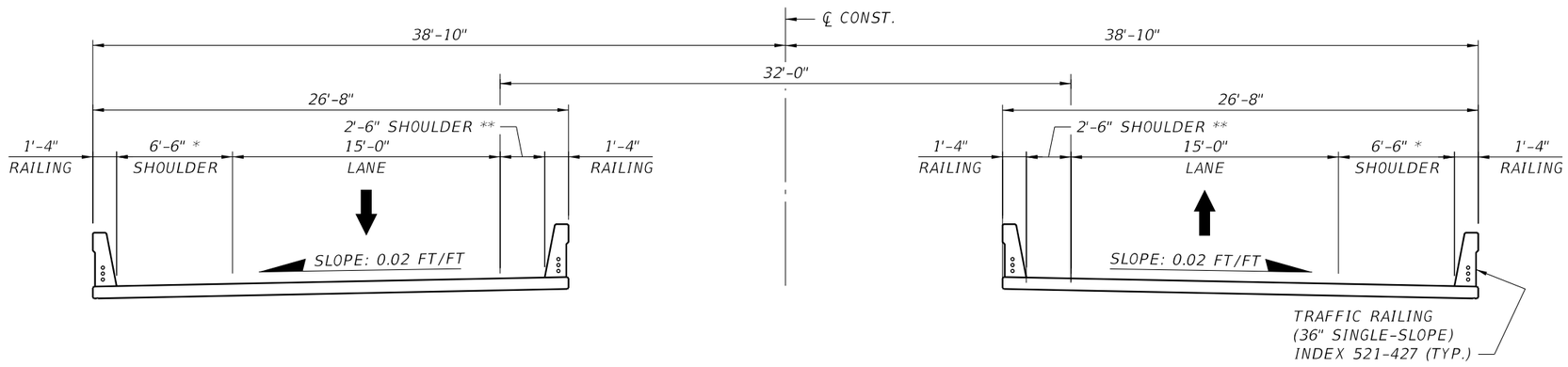
POSTED SPEED 45 MPH



OPTION 1 - AIRPORT CONNECTOR (PROPOSED TWO-LANE TYPICAL BRIDGE SECTION) (DUAL BRIDGES)

DESIGN SPEED 45 MPH
POSTED SPEED 45 MPH

* 8'-0" FOR BRIDGES 500' OR LONGER.
** 6'-0" FOR BRIDGES 500' OR LONGER.

FINANCIAL PROJECT ID	SHEET NO.
	8

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

( ) C1 : NATURAL
( ) C2 : RURAL
( ) C2T : RURAL TOWN
( ) C3R : SUBURBAN RES.
( ) C3C : SUBURBAN COMM.
( ) C4 : URBAN GENERAL
( ) C5 : URBAN CENTER
( ) C6 : URBAN CORE
(X) N/A : L.A. FACILITY

FUNCTIONAL CLASSIFICATION

( ) INTERSTATE
( ) FREEWAY/EXPWY.
(X) PRINCIPAL ARTERIAL
( ) MINOR ARTERIAL
( ) MAJOR COLLECTOR
( ) MINOR COLLECTOR
( ) LOCAL

HIGHWAY SYSTEM

( ) NATIONAL HIGHWAY SYSTEM
( ) STRATEGIC INTERMODAL SYSTEM
( ) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

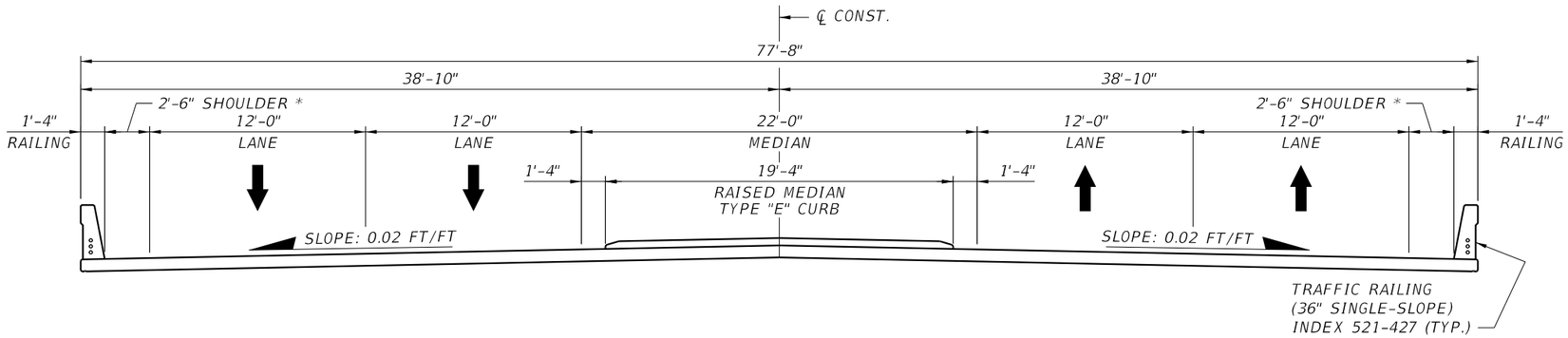
(X) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RESURFACING (LA FACILITIES)
( ) RRR (ARTERIALS & COLLECTORS)

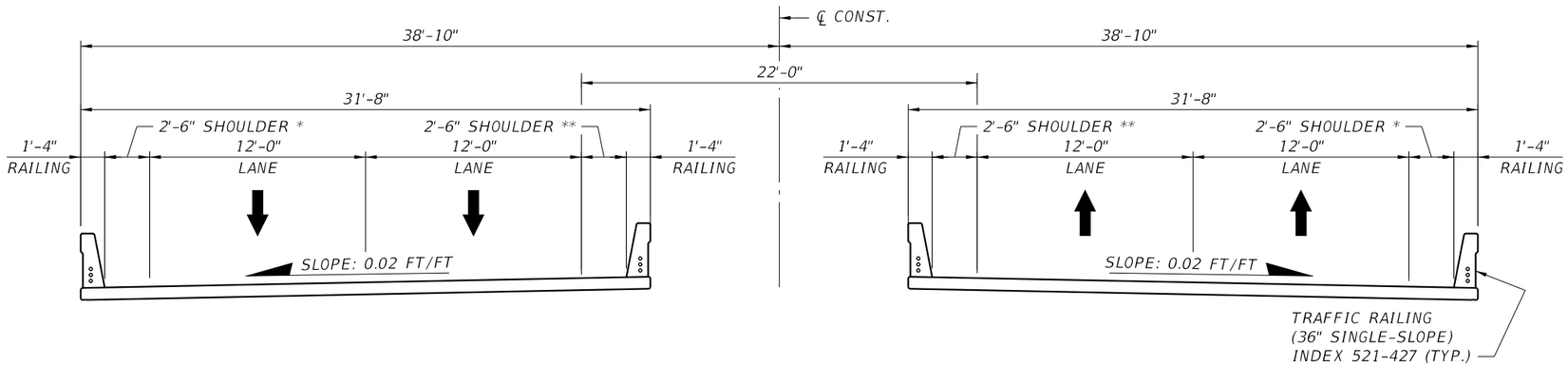
POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 08



OPTION 2 - AIRPORT CONNECTOR (FUTURE FOUR-LANE TYPICAL BRIDGE SECTION) (SINGLE BRIDGE)

DESIGN SPEED 45 MPH
POSTED SPEED 45 MPH



OPTION 2 - AIRPORT CONNECTOR (FUTURE FOUR-LANE TYPICAL BRIDGE SECTION) (DUAL BRIDGES)

DESIGN SPEED 45 MPH
POSTED SPEED 45 MPH

* 8'-0" FOR BRIDGES 500' OR LONGER.
** 6'-0" FOR BRIDGES 500' OR LONGER.

FINANCIAL PROJECT ID	SHEET NO.
	9

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