Final Preliminary Engineering Report

for the

Prepared for:

Seminole County Contract No.: PS-5738-10/JVP
Financial Project ID: 240216-4-28-01
Federal Aid Project No.: TCSP-045-U
ETDM No.: 4972

June 2018

Final Preliminary Engineering Report

Project Name: SR 46 PD&E Study
Limits: East of SR 415 to CR 426, Seminole County
FPID: 240216-4-28-01
ETDM #4972
Federal Aid Project No.: TCSP-045-U
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The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FDOT and FHWA

This Preliminary Engineering Report contains detailed engineering information that fulfills the purpose and need for the SR 46 PD&E Study from east of SR 415 to CR 426 in Seminole County. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgment and experience.

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PE NUMBER: 54078

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SECTION 1.0 –PROJECT SUMMARY

This Preliminary Engineering Report contains detailed engineering information that fulfills the purpose and need for the SR 46 PD&E Study from east of SR 415 to CR 426 in Seminole County, Florida. Relevant project numbers related to this PD&E Study are as follows:

- ETDM Number: 4972
- Financial Project ID: 240216-4-28-01
- Federal Aid Project No.: TCSP-045-U

The proposed improvements involve the widening of SR 46 from a two-lane rural roadway to a four-lane divided facility. The purpose of the proposed improvements is to improve the mobility in the SR 46 corridor to accommodate future projected traffic demand in the Design Year (2045) safely and efficiently.

1.1 Commitments and Recommendations

- Options to minimize habitat impacts west and near the Lake Jesup Bridge as well as opportunities to improve habitat connectivity in those locations during permitting and design will be investigated.
- Roadway design and construction should not compromise the ability to access and manage conservation lands effectively.
- An osprey nest survey prior to construction will be conducted and all necessary permits will be obtained for nest removal, as necessary.
- Any culverts larger than eight inches in diameter will be grated to prevent manatee entrapment. The spacing between the bridge pilings will be at least 60 inches apart to allow for manatee movement in between the pilings.
- Barges will be equipped with fender systems that provide a minimum standoff distance of four feet between wharves, bulkheads and vessels moored together to prevent crushing manatees between the barges or between the barge and work site. All existing slow speed or no wake zones will apply to all work boats and barges associated with the construction.
- Consultation with USFWS will be initiated for the Florida manatee if dredging is deemed necessary for construction. There will be no blasting in manatee sensitive areas.
- Field surveys for gopher tortoise, Florida sandhill crane, and Florida burrowing owl will be accomplished prior to construction.
- Subsequent crested caracara surveys will be conducted during the design phase. If at that time survey reveals additional nests, then consultation with USFWS will be reinitiated.
- Inclusion of bat friendly structural components within or adjacent to the bridge during design and construction will be considered. Bat exclusions will be provided during construction as needed.
- Eagle nest surveys and agency coordination will be conducted during the design phase to determine whether a disturbance permit is necessary.
- Implementation of integrating wildlife-friendly components within culverts for small and meso-sized wildlife will be evaluated.

- The most recent USFWS *Standard Protection Measures for the Eastern Indigo Snake* will be adhered to during the construction of the proposed project.
- Coordination during design with the Mullet Lake Water Association regarding location of existing facilities will occur.

1.2 Description of Proposed Action

1.2.1 Project Description

SR 46 is an east-west arterial highway that extends from US 441 in Mount Dora (Lake County) to US 1 in Mims (Brevard County). The limits of this PD&E Study are from east of SR 415 in unincorporated Seminole County to CR 426 in Geneva, Florida, an unincorporated census-designated place, for a total length of approximately 7.4 miles (see Figure 1.1). SR 46 serves as a major evacuation route for residents of south Volusia and north Brevard Counties. The closest evacuation routes to SR 46 on I-95 are SR 44, 25 miles to the north and SR 50, eight miles to the south. Within the project limits, SR 46 is a two-lane rural principal arterial comprised of one 12-foot lane in each direction with six-foot shoulders (four-foot paved). Stormwater sheet flows off the roadway into roadside ditches (see Figure 1.2).

There is one bridge within the project limits (No. 770094), which spans Lake Jesup/St. Johns River. The bridge was built in 2009 and is 3,740 feet long. The bridge typical section consists of one 12-foot travel lane in each direction and 10-foot shoulders (see Figure 1.3).

The existing roadway is centered within 100 feet of right-of-way. There is a 3,200 foot segment of SR 46 just west of the bridge with an additional 27 feet of right-of-way on the north side of the roadway. In addition, the existing right-of-way varies at both bridge approaches. Existing right-of-way is illustrated in the Conceptual Design Plans (see Appendix A).

There are two signalized intersections within the project limits at SR 415 and at CR 426. SR 46 from Mellonville Road to east of SR 415 is under construction as of December 2017. The improvements maintain the full-width typical section for approximately 750 feet east of SR 415; therefore, this project does not propose any improvements to the signalized intersection of SR 46 with SR 415.

Figure 1.1 - Project Location Map

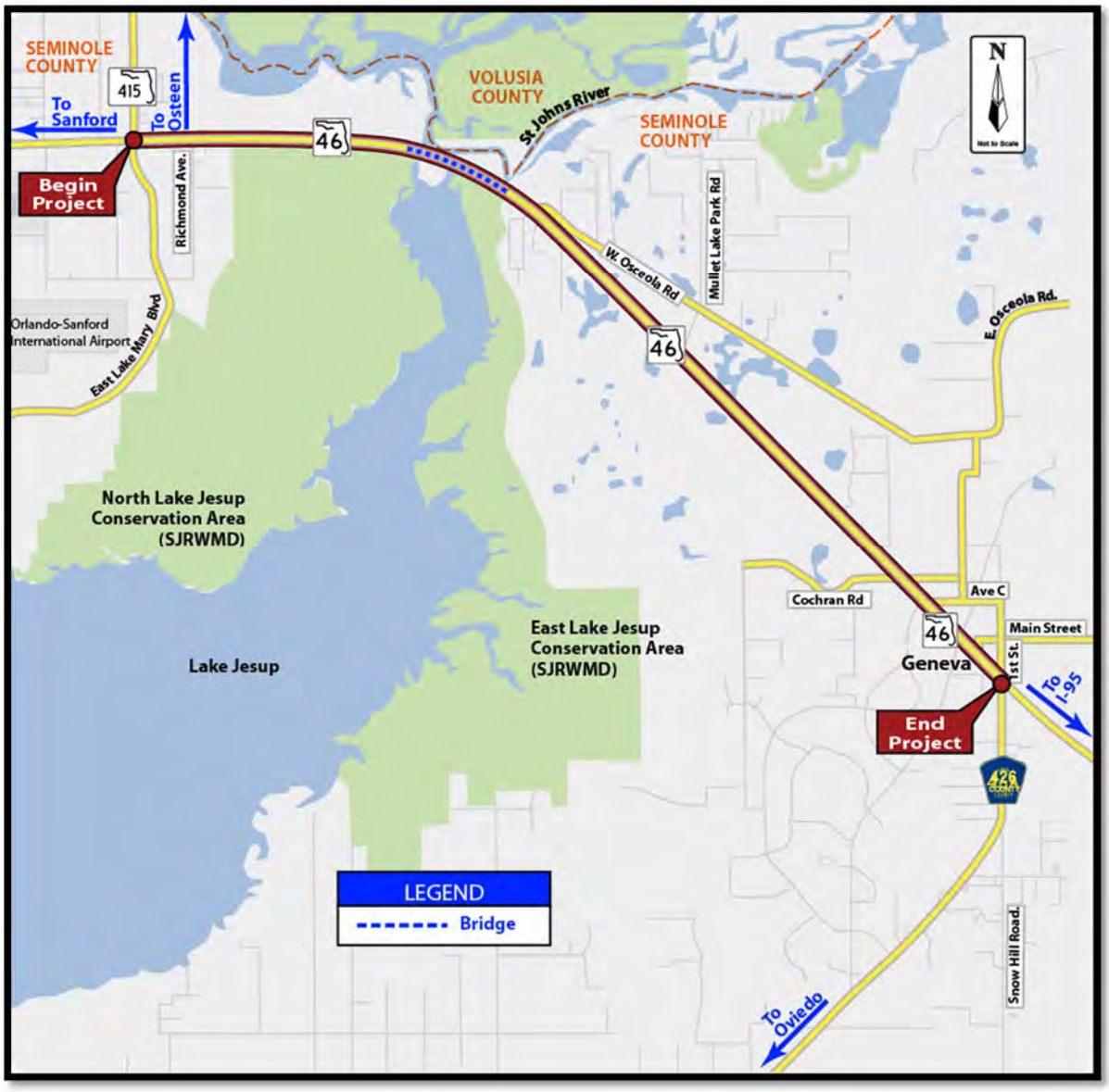


Figure 1.2 – Existing Typical Section

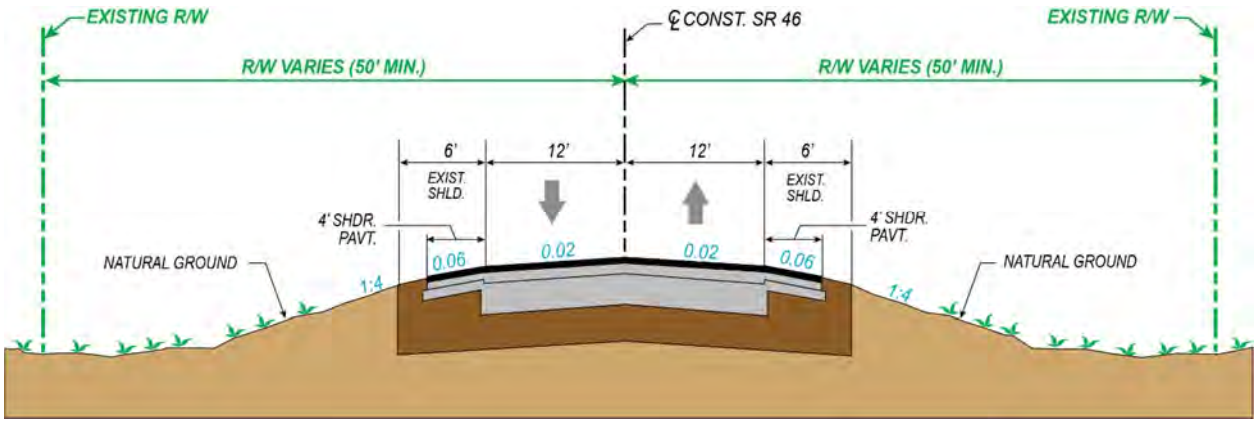
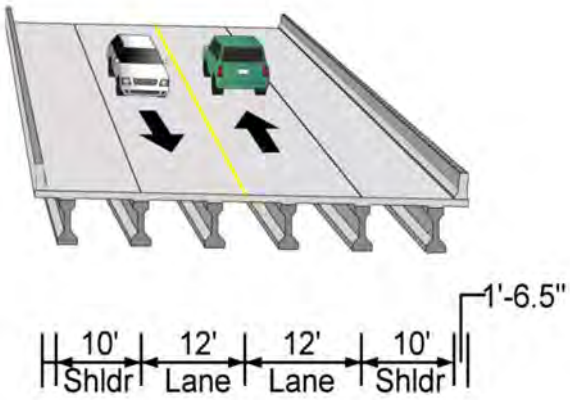


Figure 1.3 – Existing Bridge Typical Section



1.2.2 Project Purpose and Need

System Linkage

The western project terminus connects to SR 415, a four-lane divided facility. East Lake Mary Boulevard is a four-lane divided facility that intersects SR 46 at SR 415 and provides a direct connection to the Orlando-Sanford International Airport and the Seminole County Expressway (SR 417). The four-laning of SR 46 from Mellonville Road to SR 415 is under construction as of December 2017.

CR 426 at the eastern terminus of the project provides a direct connection to the City of Oviedo, a large residential suburb of Orlando, and SR 434, which provides access to the University of Central Florida. CR 426 is policy-constrained to two lanes by Seminole County and a safety improvement construction project (paved shoulders and other miscellaneous enhancements) was completed in 2016.

Capacity

The Florida Department of Transportation (FDOT) has classified the segment of SR 46 between SR 415 and Richmond Avenue as an urban principal arterial with a Level of Service (LOS) standard of D. East of Richmond Avenue, SR 46 is classified as a rural principal arterial with an LOS standard of C. Existing Annual Average Daily Traffic (AADT) volumes along SR 46 result in LOS D conditions on SR 46 from Osceola Road to Woodridge Drive. Increasing traffic volumes as identified in the *Design Traffic Technical Memorandum* (May 2012) and the *Traffic Forecast Update Report* (February 2017) are projected to result in *at capacity* and *over capacity* conditions by the Design Year (2045). Providing additional capacity on SR 46 within the project limits will ensure that future projected traffic can be accommodated safely and efficiently.

Safety

Crash records for the project corridor between just east of SR 415 and CR 426 from January 1, 2006 through May 31, 2012 were compiled and analyzed (the crash data does not include the intersection of SR 46 and SR 415 as the improvements to this intersection are included in the SR 46 widening project from Mellonville Road to SR 415). One hundred sixty-seven crashes were recorded during this time period on SR 46 from SR 415 to CR 426. The statewide annual crash rate for facilities similar to SR 46 (two-lane rural roadways) is 0.525 crashes per million vehicle miles travelled (C/MVM). The segment of SR 46 from SR 415 to CR 426 experienced a crash rate of 1.006 C/MVM, almost two times the statewide average.

In addition to crash rates higher than the statewide average, there have been six fatalities and 90 injuries during the analysis period. The majority of crashes occurred during daylight hours. Detailed information regarding crash data can be found in Section 2.12 of this report and in Section 3.5 of the *SR 46 Design Traffic Technical Memorandum* (May 2012) and *Revised Crash Analysis Letter* (September 2012).

In 2013, Seminole County performed a Safety Study of SR 46 that analyzed the crash data collected as part of the PD&E Study. The purpose of this study is to recommend interim improvements that can be implemented to increase the safety of SR 46 prior to construction of the ultimate capacity improvement. Results of the study are discussed in Section 5.2 – Transportation Systems Management and Operations (TSMO) Alternative. In May 2017 FDOT selected a contractor to construct safety improvements to SR 46 within the project limits of the PD&E Study and the project is under construction as of December 2017.

Planning Consistency

Consistent with FDOT's Efficient Transportation Decision Making (ETDM) process, the widening of SR 46 underwent both a planning and programming screen (ETDM #4972). The original planning screen, performed in 2005, analyzed the proposed improvements from SR 415 to the Seminole/Volusia County line at Lake Harney, a distance of 12.44 miles. The programming screen, completed in 2010, revised the western terminus to CR 426 to satisfy logical termini requirements, reducing the length of the project to 7.39 miles. All project ETDM

screenings are archived on the ETDM public web site at https://etdmpub.fla-etat.org/est/. The programming screen summary report is located in Appendix B.

This project is listed in the 2040 Long Range Transportation Plan (LRTP) for MetroPlan Orlando and is in the most recently adopted Cost Feasible Plan. The project is also contained within the Seminole County Comprehensive Plan and is ranked number 17 on MetroPlan Orlando's Orlando Urban Area FY 2022/23 – 2039/40 Prioritized Project List adopted on July 12, 2017.

The widening of SR 46 from two to four lanes is included in the FY 2017/2018 – 2021/22 Orlando Urban Area Transportation Improvement Program (TIP) (adopted July 12, 2017) with design funded in FY 2021/2022. Right of Way and Construction are unfunded. The project is also consistent with the FDOT State Transportation Improvement Plan (STIP).

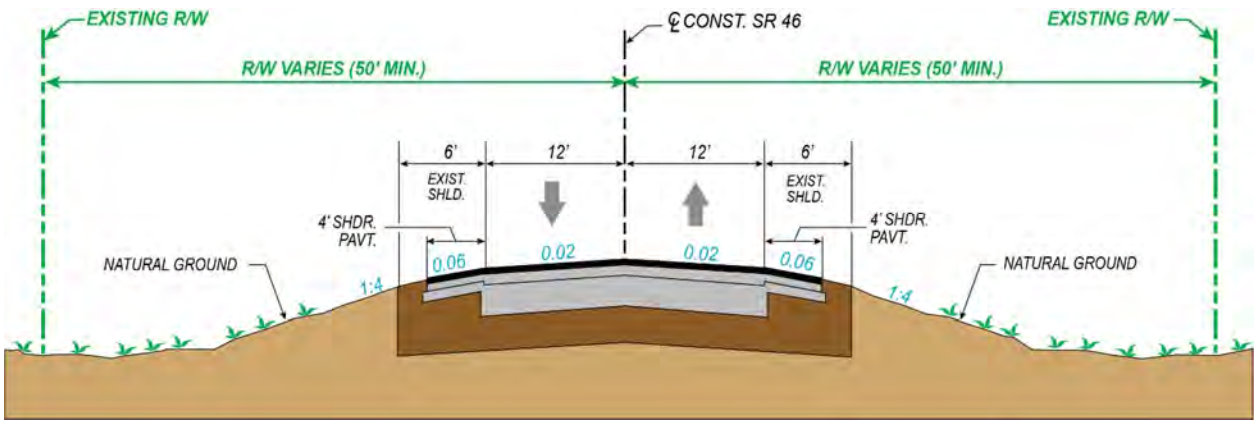
SECTION 2.0 – EXISTING CONDITIONS

The existing conditions in the study area were identified and evaluated by a review of as-built and available construction plans, study documents, coordination with advisory and regulatory agencies and field reconnaissance. The following sections discuss the existing roadway and bridge characteristics, traffic and crash data and environmental characteristics within the study area.

2.1 Typical Section

Within the project limits, SR 46 is a two-lane rural principal arterial comprised of one 12-foot lane in each direction with six-foot shoulders (four-foot paved). Stormwater sheet flows off the roadway into roadside ditches (see Figure 2.1). The existing roadway is centered within 100 feet of right-of-way. There is a 3,200 foot segment of SR 46 just west of the bridge with an additional 27 feet of right-of-way on the north side of the roadway. In addition, the existing right-of-way varies at both bridge approaches.

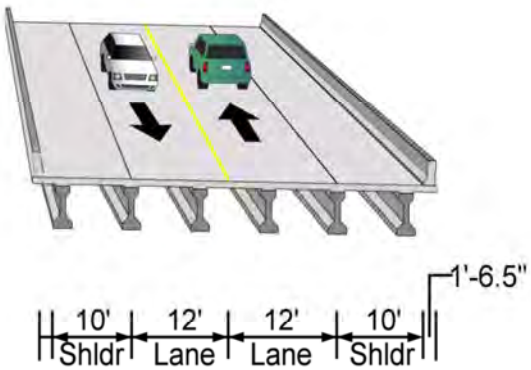
Figure 2.1 – Existing Typical Section



There is one bridge within the project limits (No. 770094), which spans Lake Jesup/St. Johns River. The bridge was built in 2009 and is 3,740 feet long. The bridge typical section consists of one 12-foot travel lane in each direction and 10-foot shoulders with standard one foot, six and one half inch barriers (see Figure 2.2).

The design speed of SR 46 is 60 mph. The posted speed limit is 45 mph from SR 415 to approximately 845 feet east of SR 415 and from Hart Road to CR 426. The remainder of the project limits is posted at 55 mph, including the bridge over Lake Jesup/St. Johns River.

Figure 2.2 – Existing Bridge Typical Section



2.2 Right-of-way

Existing right-of-way width is generally 100 feet, within which the roadway is centered. There is an additional 27 feet of right-of-way along the north side of SR 46 from approximately 3,200 feet west of the bridge to Old Geneva Road. Right-of-way varies from Old Geneva Road to Osceola Road. Details regarding existing right-of-way are depicted on the Conceptual Design Plans in Appendix A.

2.3 Classification

SR 46 is part of the State Highway System and is functionally classified as an Urban Principal Arterial – Other from SR 415 to Richmond Avenue and a Rural Principal Arterial – Other from Richmond Avenue to CR 426. It is not part of the Strategic Intermodal System (SIS). Just outside the project area, south of SR 46 and west of East Lake Mary Boulevard is the Orlando Sanford International Airport, an Emerging SIS Facility. East Lake Mary Boulevard is designated as a SIS facility from the entrance to Orlando Sanford International Airport to SR 417. SR 46 is designated Access Class 3 within the project limits.

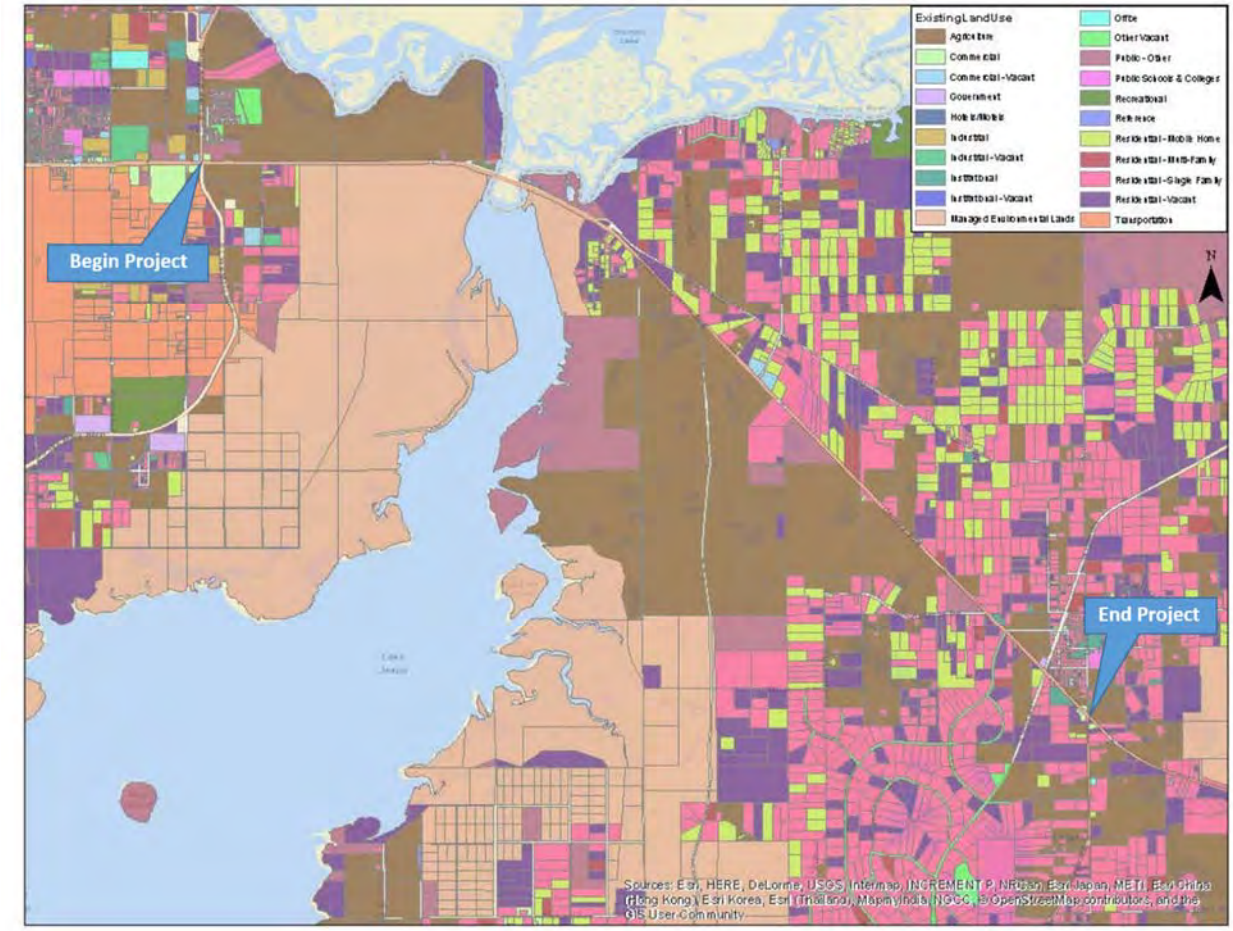
SR 46 is designated as an evacuation route by the Florida Division of Emergency Management.

2.4 Land Use

Existing land use along the project corridor east of the bridge is primarily single family residential development. The parcels owned by the City of Sanford (Site 10) east of the bridge and south of SR 46 are zoned agricultural. West of the bridge and north of SR 46, the Bergmann Tract land is zoned vacant (other). South of SR 46 west of the bridge the land is zoned

agricultural, residential and conservation. Commercial land uses are clustered around the intersections of SR 46 with SR 415 and CR 426. Existing land use is shown on Figure 2.3.

Figure 2.3 – Existing Land Use



Property lines are shown on the Conceptual Design Plans in Appendix A. Property owner data and addresses are contained within the Public Involvement Program, submitted separately.

2.5 Horizontal and Vertical Geometry

Horizontal Alignment

There are three horizontal curves within the project limits, listed in Table 2.1. All three curves are located in the area of the bridge over Lake Jesup/St. Johns River and Curve 2 is located entirely on the bridge. Curve data and stationing is listed directly from the 2010 As-Built plans from FPN 240163-1-52-01.

Table 2.1 – Existing Horizontal Curves

Curve #	Curve Data PC	PT	Degree of Curvature	Length (ft)	e	Δ	Design Speed
1	18+82.61	25+47.37	3.00	664.76	0.077	RT	60
2	45+37.56	62+38.45	0.30	1700.89	RC	RT	60
3	75+94.63	87+59.38	1.30	1164.75	0.043	RT	60

In addition to the curves, there are three horizontal deflections along SR 46 between SR 415 and CR 426. All three deflections are well below the 1° 00'00" maximum allowable deflection listed in Part 1, Chapter 2, Table 2.8.1a of FDOT's *Plans Preparation Manual*.

Vertical Alignment

There are 7 vertical deflections and 19 vertical curves within the project limits, as listed in Table 2.2. The K values of all vertical curves and the grade changes of all deflections are within standards for a facility with a 60 mph design speed, with the exception of the first three deflections, which are part of the design (FPN 240216-2-52-01) to widen SR 46 to a four-lane urban section from Mellonville Road to just east of SR 415. That project has a design speed of 45 mph.

Table 2.2 – Existing Vertical Curves

VPI #	Station	Type	K	A	Grade (%)	Design Speed (V)[1]
1	3+51.96	Def		0.7		45
					0.30	
2	6+01.96	Def		0.6985		45
					-0.40	
3	10+68.74	Def		0.6978		45
					0.30	
4	13+59.46	Def		0.6027		50
					-0.30	
5	30+46.96	Sag	966.7	0.3103		>70
					0.01	
6	84+06.96	Def		N/A		
					0.00	
7	93+55.43	Sag	179.6	2.784		65
					2.78	
8	104+36.96	Crest	263	3.6502		60
					-0.80	
9	112+71.96	Sag	528	0.5681		>70
					-0.30	
10	133+56.96	Crest	295.9	1.4195		60
					-1.81	
11	143+26.96	Sag	143.1	2.0966		60
					0.27	
12	157+38.50	Def		0.2387		65

VPI #	Station	Type	K	A	Grade (%)	Design Speed (V)[1]
					0.06	
13	172+83.96	Sag	3278.6	0.0915		>70
					0.23	
14	183+83.96	Crest	1294.1	0.2318		>70
					0.00	
15	240+83.96	Sag	975	0.3077		>70
					0.31	
16	263+58.96	Crest	1652.1	0.2421		>70
					0.66	
17	278+83.96	Crest	3050	0.0656		>70
					0.00	
18	295+83.96	Sag	2250	0.1333		>70
					0.13	
19	312+33.96	Sag	289.7	1.3808		70
					1.51	
20	320+83.96	Crest	1383	0.2169		>70
					1.30	
21	345+83.96	Crest	408.6	0.979		70
					0.32	
22	356+83.96	Crest	371.7	0.8071		65
					-0.49	
23	365+83.96	Sag	409.1	0.4889		>70
					0.00	
24	368+33.96	Crest	295.6	0.6765		60
					-0.68	
25	388+33.96	Crest	267.4	1.122		60
					-1.80	
26	394+83.96	Def		N/A		

[1]Design speed is based on K value for curves and maximum change in grade for deflections

2.6 Bicycle and Pedestrian Accommodations and Transit

There are no accommodations for pedestrians along SR 46 between SR 415 and CR 426. Although there are four-foot paved shoulders adjacent to the travel lanes, these are not sufficiently wide enough to function as undesignated bicycle lanes per current FDOT design criteria.

The Central Florida Regional Transportation Authority, commonly known as LYNX, does not operate any fixed route transit service within the project corridor.

2.7 Lighting

There is no roadway lighting of SR 46 within the project limits.

2.8 Intersections and Signalization

There are two signalized intersections with SR 46 within the project limits; at SR 415 and CR 426. The design plans for SR 46 from Mellonville Road to east of SR 415 are assumed to be an existing condition for the purposes of this PD&E Study. These plans provide for five lanes on both the eastbound and westbound approaches, which accommodate dual left-turn lanes, two through lanes and an exclusive right-turn lane. The southbound approach on SR 415 has a single left-turn lane to eastbound SR 46. Northbound East Lake Mary Boulevard traffic accesses eastbound SR 46 via a shared through-right turn lane.

The signalized intersection of SR 46 and CR 426 is skewed 43°31'. There is a shared through-right lane and a left-turn lane at each approach.

Old Geneva Road and Osceola Road are two major unsignalized intersections with dedicated left-turn lanes from SR 46 (both roadways are remnants of the original alignment of SR 46). Old Geneva Road, at the west approach to the bridge, provides access to Cameron Wight Park. Cameron Wight Park is used by boaters as a launch into Lake Jesup/St. Johns River and accommodates trucks with boat trailers.

Osceola Road, at the east end the bridge, is the main access to the Seminole County landfill and is the historic route to the community of Geneva. This intersection was relocated to the east as part of the Lake Jesup/St. Johns River Bridge design-build project (FPN 240163-1-52-01). Traffic turning from SR 46 to Osceola Road must navigate a tight 100-foot radius curve with a delta of 101°02'35". Analysis of traffic counts collected for this project indicate that a daily truck factor of 10% should be used for future traffic projections, due to the volume of garbage trucks accessing the Seminole County landfill located on Osceola Road in Geneva. Anecdotal evidence indicates that many of the trucks using this intersection consistently run over the curb and gutter and encroach on adjacent lanes due to the tight turning radius and large delta.

Other unsignalized intersections include:

- Richmond Avenue
- Mullet Lake Park Road
- Cochran Road
- Avenue C/Woodridge Drive
- Hart Road
- Oak Street/3rd Street

2.9 Structural and Operating Conditions of the Pavement

Pavement condition ratings for SR 46 were obtained from the *2010 FDOT Roadway Characteristics DVD*. The pavement conditions assessments are made by visual interpretation of the conditions of the road surface and are recorded according to milepost and which side of the roadway the condition is rated: left, right or center. Pavement condition ratings are assigned the following codes and corresponding descriptions:

0.0-1.0 – Very Poor: Virtually impassable. 75% or more deteriorated.
1.0-2.0 – Poor: Large potholes and deep cracks exist. Discomfort at slow speeds.
2.0-3.0 – Fair: Rutting, map cracking and extensive patching.
3.0-4.0 – Good: First class ride with only slight surface deterioration.
4.0-5.0 – Very Good: Only new or nearly new pavement.

The pavement surface and base conditions on SR 46 throughout the project corridor had survey ratings ranging between 3.7 and 5.0 which equates to good or very good conditions. Table 2.3 summarizes the pavement conditions within the project limits.

Table 2.3 – Existing Pavement Conditions

Begin MP	End MP	Lane	Pavement Condition Code
3.66 (SR 415)	3.8	L	5.0
3.66 (SR 415)	3.8	R	5.0
3.8	5.208	C	5.0
5.208	5.533	L	5.0
5.208	5.533	R	5.0
5.533	5.705	C	4.0
5.808	6.23	C	3.7
6.23	6.445	L	3.7
6.23	6.445	R	3.7
6.445	10.948	C	5.0
10.948	11.047 (CR 426)	L	5.0
10.948	11.047 (CR 426)	R	5.0

2.10 Drainage

SR 46 is located within the jurisdiction of the St. Johns River Water Management District (SJRWMD). According to the USGS quadrangle maps, the approximate ground surface elevation within the project limits range from as low as approximately +5 feet to high as approximately +75 feet. These elevations are based on 1929 National Geodetic Vertical Datum (NGVD). The project limits lie within the Middle St. Johns River Basin of which Lake Jesup is a tributary. The Middle St. Johns River Basin is considered an open basin that discharges to the St. Johns River, which is not designated as an Outstanding Florida Water (OFW); however, the Florida Department of Environmental Protection (FDEP) has adopted Total Maximum Daily Loads (TMDL) for both nitrogen and phosphorus for any basin discharging to the St. Johns River above Lake Monroe, Lake Jesup near St. Johns River, the St. Johns River above Lake Jesup, and the St. Johns River above Lake Harney. Also, 100-year floodplains are found within the project limits with the majority being located around the bridge over Lake Jesup.

In general, stormwater discharged from SR 46 is not treated within the project limits. The existing typical section of SR 46 is crowned and the travel lanes and outside shoulders slope to the outside into existing roadside ditches. The roadside ditches then convey the stormwater runoff to several existing cross drains. The cross drains then conveys the runoff into various wetland areas within the project limits, which ultimately discharge to the St. Johns River.

There are a total of 9 cross drains within the limits of this project. The width of these cross drains range from 18" reinforced concrete pipe (RCP) to double 8' X 3' concrete box culvert (CBC) (See Table 2.4). According to the FDOT Maintenance staff, all of the cross drains are in good physical condition; however, there are two locations where there are records of flooding on the downstream side of the cross drains. The first location is near CD-4, north of SR 46 and east of Mullet Lake Park Road. The FDOT Maintenance staff believes that the flooding problem in this area is due to the lack of positive drainage grading located through downstream private properties and the ultimate outfall of the conveyance system leading into the St. Johns River. The second location is near of CD-5, north of SR 46 and east of Mockingbird Lane. The FDOT Maintenance staff believes that the flooding problem in this area is due to the lack of positive drainage grading located within the downstream private property into which the cross drain discharges before entering the wetland located within this property. The FDOT Maintenance staff does not believe that the existing cross drains are undersized in these locations, but the problems exist due to the lack of positive drainage grading within downstream private properties and that the problems cannot be fixed without some type of drainage easement. The fact that the flooding occurs on the downstream side of the existing cross drains would indicate that the size of the existing cross drains are most likely not the cause of the flooding.

Table 2.4 – Summary of Existing Cross Drains

Structure No.	Station	Type	Size	Flow Line Left	Flow Line Right	Comments
CD-1	9+24	RCP	24"	12.56	10.72	Removed
CD-2	188+62	RCP w/ PVC Liner	24"	13.70	13.00	
CD-3	201+61	RCP w/ PVC Liner	24"	14.00	13.80	
CD-4	226+60	CBC	(2) 8'x3'	13.00	13.20	
CD-5	276+60	RCP w/ PVC Liner	(2) 24"	20.20	20.40	
CD-6	296+64	RCP w/ PVC Liner	24"	20.50	20.00	
CD-7	310+52	RCP w/ PVC Liner	24"	20.00	20.10	
CD-8	326+73	RCP w/ PVC Liner	24"	25.10	31.60	
CD-9	384+60	RCP w/ PVC Liner	18"	58.50	58.40	

Field investigation was also conducted for all the existing cross drains within the project limits. Field inspection revealed a discrepancy with the FDOT Straight Line Diagram of Road Inventory for CD-4. The inventory shows this cross drain as a double 8' X 2' CBC, but field measurements indicate this cross drain is actually a double 8' X 3' CBC. Several of the cross drains contain polyvinyl chloride (PVC) liners due to minor leaking at the joints according to the FDOT Maintenance staff. The FDOT Maintenance staff also stated that replacement of the existing cross drains should be examined to meet the design service life during the design phase of the project.

The existing cross drains were analyzed using FHWA's HY-8 program and the discharges were calculated using FDOT's velocity method. Detailed calculations for all existing cross drains can be found in the *SR 46 PD&E Location Hydraulics Report* (April 2014).

The only area with stormwater treatment is within the limits of the bridge replacement project over Lake Jesup, which was constructed in 2009. The new bridge and approaches are being treated by existing stormwater treatment wet detention Ponds 1 and 2. The ponds are located

west and east of the bridge, respectively. Stormwater runoff from the high point of the bridge to the west is collected and conveyed to existing Pond 1 by a series of shoulder gutter inlets and ditch bottom inlets. Stormwater runoff from the high point of the bridge to the east is collected and conveyed to existing Pond 2 by a series of bridge scuppers, shoulder gutter inlets, and ditch bottom inlets. The bridge scuppers are connected to fiber reinforced concrete pipes that hang beneath the south side of the bridge.

2.11 Existing Traffic Data

This section summarizes the analysis of traffic flow operating conditions for the existing base year (2011) at the major intersections and roadway segments along the project corridor. For more detailed analysis, refer to the *Final SR 46 Design Traffic Technical Memorandum* (May 2012) and the *Traffic Forecasts Update Report* (February 2017).

In analyzing the existing operating conditions of the intersections and roadway segments, traffic counts collected from the field during August and September 2011 were used along with the existing roadway and intersection geometry. The actual turning movement volumes collected in the field were used for the existing level of service (LOS) analysis for the intersection and roadway segments. Additional counts collected were collected in October 2013 to validate the original existing condition volumes and analyses. Additional counts were collected in May 2016 as part of the traffic forecast update to validate the traffic projections supporting the need for a capacity improvement.

The Existing Year intersection LOS analysis was performed using the signal timing data provided by Seminole County. The analysis was performed using Synchro Software (Version 7.0). In addition, the existing conditions arterial LOS analysis was performed by comparing the existing arterial traffic volumes against generalized peak hour direction service volumes obtained from FDOT *Quality/Level of Service Handbook* (2009)**.**

Traffic count information was used to develop existing traffic characteristics for the project corridor and the intersecting side streets. The truck factor for the peak condition was used in the existing intersection analysis. Directional split (D-measured) for the area roadways were derived based on the 72-hour classification and volume counts and the 24-hour volume counts. For the purpose of this study, p.m. peak hour volume counts and standard "K" factors were used to determine the daily traffic volumes for Old Geneva Road (north of SR 46) and Hart Road (north and south of SR 46).

The adjusted annual average daily traffic (AADT) volumes for the individual roadway segments are provided in Figures 2.4 and 2.5. Turning movement counts were obtained for the a.m. and p.m. peak hour conditions for the intersections. The actual year 2011 a.m. and p.m. peak hour turning movement volumes were adjusted using a seasonal adjustment factor of 1.01 obtained from the *2010 Florida Traffic Information (FTI)* DVD and are shown in Figures 2.6 and 2.7.

Figure 2.4 – Existing Year (2011) AADT (1 of 2)

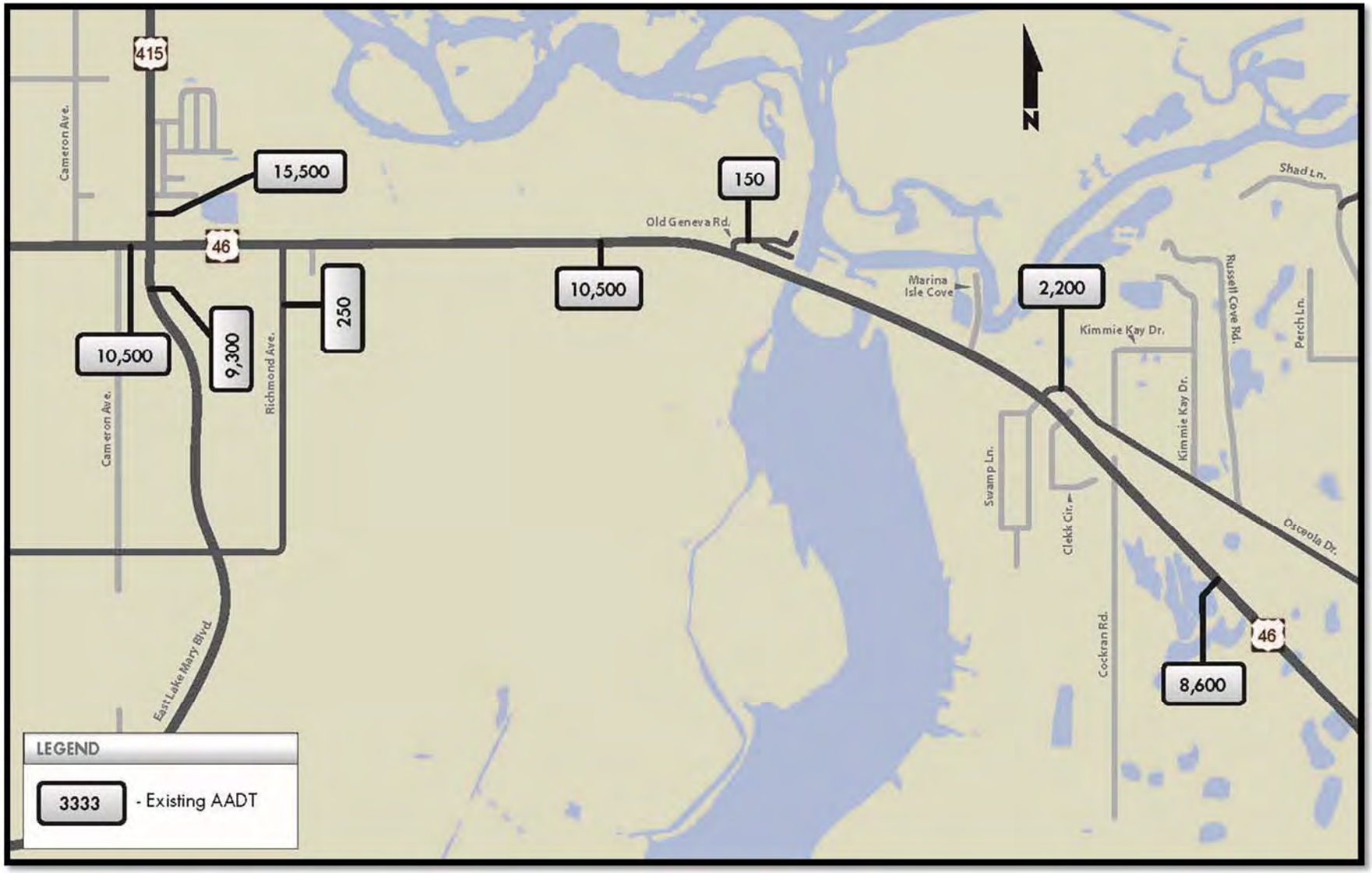


Figure 2.5 – Existing Year (2011) AADT (2 of 2)

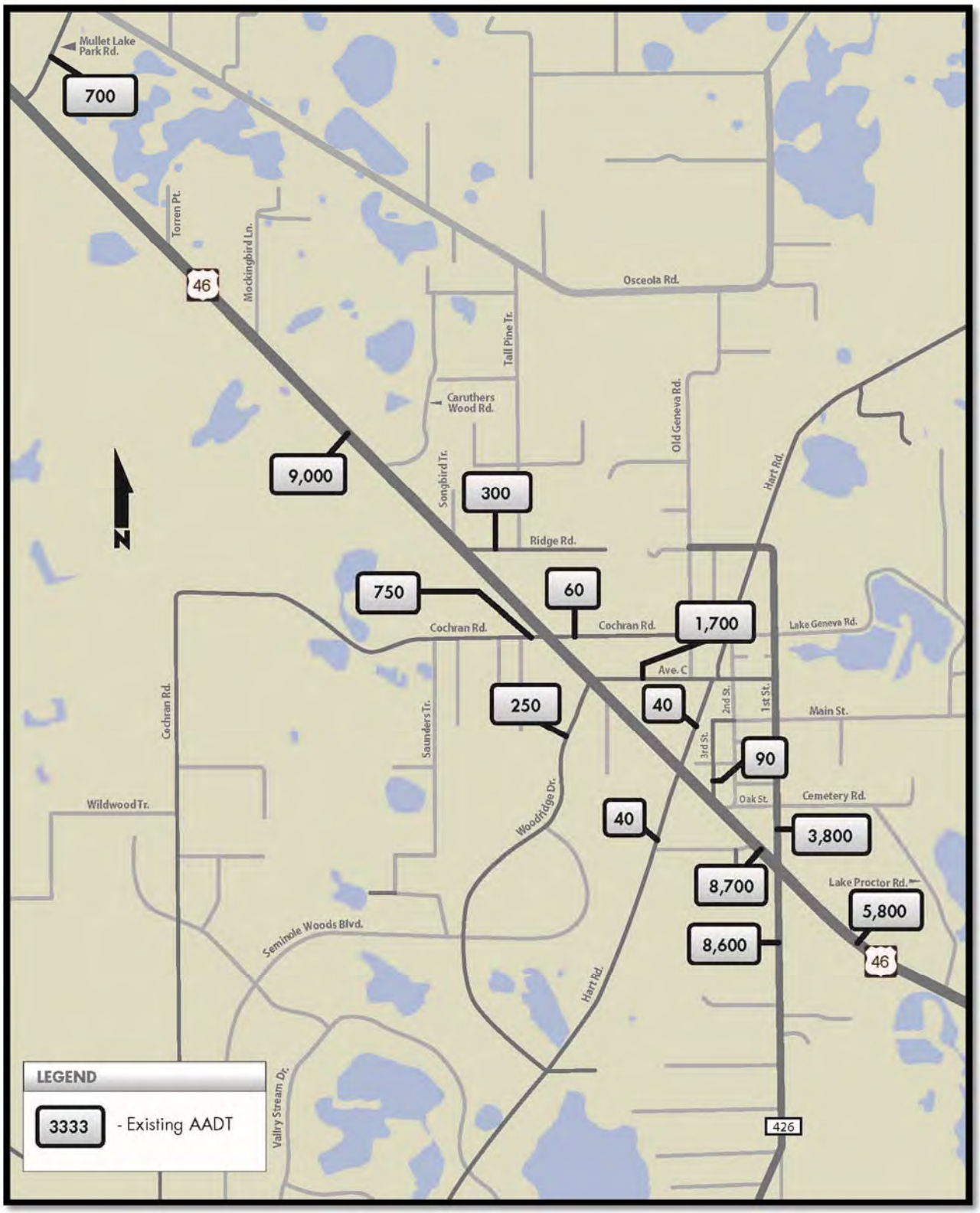


Figure 2.6 – Existing Year (2011) AM Peak and PM Peak Hour Turning Movement Volumes (1 of 2)

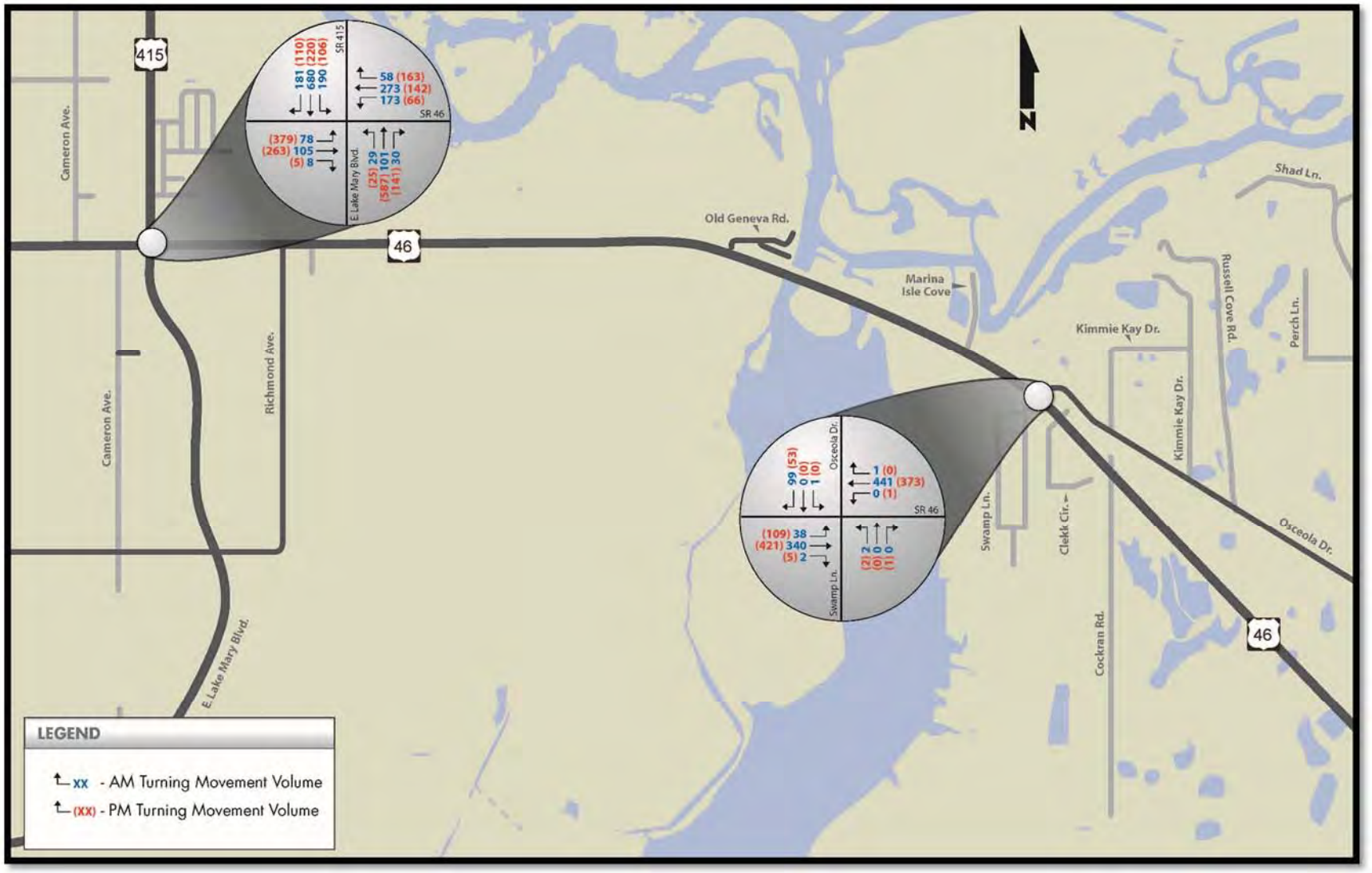
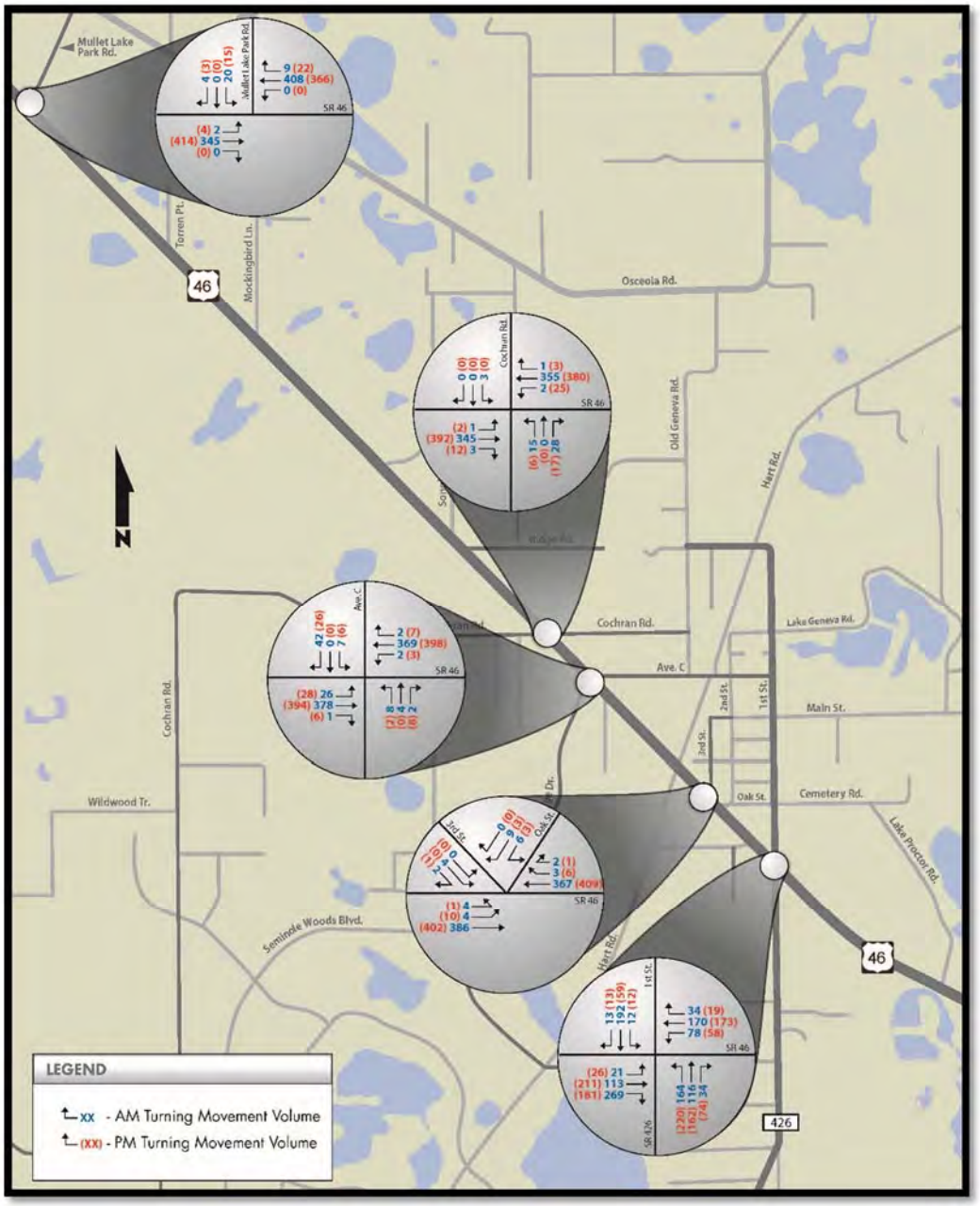


Figure 2.7 – Existing Year (2011) AM Peak and PM Peak Hour Turning Movement Volumes (2 of 2)



The Existing Year (2011) a.m. and p.m. peak hour turning movement volumes and intersection geometry were used to analyze the intersection Levels of Service (LOS). The signal timing data provided by the County was used in the intersection LOS analysis for the signalized intersections of SR 46 at SR 415 and CR 426. According to the *Highway Capacity Manual (HCM 2000*), an average control delay per vehicle from 55 seconds up to 80 seconds is considered an LOS E condition and beyond 80 seconds is considered an LOS F condition at a signalized intersection. A summary of the LOS analysis for the study intersections is included in Table 2.5.

Table 2.5 – Year 2011 Existing Intersection LOS Analysis Summary

Intersection (SR 46 @)	Traffic Control	Adopted LOS	AM Peak Hour		PM Peak Hour	
			Delay (sec/vehicle)	LOS	Delay (sec/vehicle)	LOS
SR 415	Signal	D	36.5	D	40.3	D
Osceola Rd	Stop	C	8.8/15.3	A/C	8.5/13.8	A/B
Mullet Lake Park Rd	Stop	C	0.1/17.3	A/C	0.1/17.5	A/C
Cochran Rd	Stop	C	0.1/18.1	A/C	0.8/13.4	A/B
Woodridge Rd/Ave C	Stop	C	8.3/18.9	A/C	8.3/13.4	A/B
3rd St/Oak St	Stop	C	0.2/15.3	A/C	0.3/14.7	A/B
CR 426	Signal	C	18.7	B	15.3	B

As shown in Table 2.5, during Existing Year (2011) a.m. and p.m. peak hour conditions, all the signalized and unsignalized intersections along the project corridor operate at or above the adopted LOS standard.

FDOT has classified the study segment along SR 46 between SR 415 and Richmond Avenue as an urban principal arterial (class 1) with an LOS standard of D. For the purpose of assessing the arterial LOS of this segment of SR 46, the generalized peak hour directional service volumes (in vehicles per hour, or vph) for LOS B through E were obtained from Table 7 of the *2009 FDOT Quality/Level of Service Handbook* and are shown below:

- LOS B – 510 vph
- LOS C – 820 vph
- LOS D – 880 vph
- LOS E – 880 vph

FDOT has classified the study segment along SR 46 between Richmond Avenue and CR 426 as a rural principal arterial with an LOS standard of C. For the purpose of assessing the arterial LOS of this segment of SR 46, the generalized peak hour directional service volumes for the LOS B through E were obtained from Table 9 of the *2009 FDOT Quality/Level of Service Handbook* and are shown below:

- LOS B – 240 vph
- LOS C – 430 vph
- LOS D – 740 vph
- LOS E – 1,480 vph

A summary of the LOS analysis for the arterial segments is included in Table 2.6.

Table 2.6 – Year 2011 Existing Arterial LOS Analysis Summary

Roadway Segment	Area Type	LOS Std.	Peak Hour/Peak Direction Volume (vph)	Arterial LOS
AM Peak (WB)				
East of CR 426	Rural	C	282	C
West of CR 426	Rural	C	347	C
Mullet Lake Park Rd. to Woodridge Dr.	Rural	C	419	C
Osceola Rd. to Mullet Lake Park Rd.	Rural	C	442	D
Richmond Ave. to Osceola Rd.	Rural	C	542	D
SR 415 to Richmond Ave.	Urban	D	504	B
West of SR 415	Urban	D	483	B
PM Peak (EB)				
West of SR 415	Urban	D	647	C
SR 415 to Richmond Ave.	Urban	D	510	C
Richmond Ave. to Osceola Rd.	Rural	C	535	D
Osceola Rd. to Mullet Lake Park Rd.	Rural	C	422	C
Mullet Lake Park Rd. to Woodridge Dr.	Rural	C	428	C
West of CR 426	Rural	C	418	C
East of CR 426	Rural	C	297	C

As shown in Table 2.6, SR 46 from SR 415 to CR 426 currently operates at an acceptable level of service during the a.m. peak and p.m. peak hours with the exception of the following two segments:

- SR 46 between Richmond Avenue and Mullet Lake Park Road operates at LOS D during the a.m. peak hour, and
- SR 46 between Richmond Avenue and Osceola Road, which operates at LOS of D during the p.m. peak hour.

2.12 Crash Data and Safety Analysis

Crash records for the project corridor between just east of SR 415 and CR 426 from January 1, 2006 through May 31, 2012 were compiled and analyzed (the crash data does not include the intersection of SR 46 and SR 415 as improvements to this intersection are included in the SR 46 widening project from Mellonville Road to SR 415). A total of 167 crashes were recorded during this time period on SR 46 from SR 415 to CR 426. The statewide annual crash rate for facilities similar to SR 46 (two lane rural roadways) is 0.525 crashes per million vehicle miles travelled (C/MVM). The segment of SR 46 from SR 415 to CR 426 experienced a crash rate of 1.006 C/MVM, almost two times the statewide average.

In addition to crash rates higher than the statewide average, there have been six fatalities and 90 injuries during the analysis period and property damage estimated at $1,094,215. The majority of crashes occurred during daylight hours. The majority of crashes (41% or 68 crashes) were rear-end, and 62% of the crashes occurred during daylight hours. Rear end crashes are indicative of congested conditions, where there is stop and go traffic, or a disparity in speed.

Detailed information regarding crash data can be found in Section 3.5 of the *SR 46 Design Traffic Technical Memorandum* (May 2012) and *Revised Crash Analysis Letter* (September 2012).

In response to public comments, Seminole County conducted a Safety Study of the corridor. The study resulted in a series of recommendations for additional turn lanes, shoulder widening and audible pavement markings in selected locations in the corridor. These improvements are currently under construction as of December 2017.

2.13 Utilities and Railroads

Utility information was obtained by establishing a design ticket with Sunshine One Call and receiving a list of agencies with facilities potentially located within the project limits. Each utility company was then contacted and asked to locate existing and proposed facilities on base maps. Table 2.7 summarizes the utility contact information; Table 2.8 summarizes the information received from the utilities, which can be found in the project files. Although no documentation has been located, representatives of Florida Power and Light have indicated that their facilities are within an easement. There are no railroad facilities within the project limits.

Table 2.7 – Utility Contact Information

Agency	Name	Address	City, State, Zip Code	Phone Number	Email Address
AT&T Florida	Rich Mindrum	450 North Goldenrod Rd	Orlando, FL 32807	(352) 371-5268	rx0819@att.com
Bright House Networks, LLC	Marvin Usry	3767 All American Blvd	Orlando, FL 32810	(407) 532-8509	marvin.usry@mybrighthouse.com
City of Sanford	Richard Blake	PO Box 1788	Sanford, FL 32773	(407) 688-5101	richard.blake@sanfordfl.gov
FPL Distribution	Rob Helfer	5910 E Highway 100	Palm Coast, FL 32164	(386) 586-6432	robert.helfer@fpl.com
FPL Transmission	Peter Washio	PO Box 14000	Juno Beach, FL 33408	(561) 904-3693	peter.h.washio@fpl.com
Level 3	ATTN: Relocations	1025 Eldorado Blvd 33A-518	Broomfield, CO 80021	-	level3.networkrelocations@level3.com
Mullet Lake Water Association	Bo Bowman	PO Box 1192	Geneva, FL 32732	(407) 349-2358	mulletlakewater@yahoo.com
Seminole County-Traffic	Charles Wetzel	140 Bush Loop	Sanford, FL 32773	(407) 665-5686	cwetzel@seminolecountyfl.gov

Table 2.8 – Existing Utilities

Utility Type	Owner	Relative to:	Transverse or Adjacent	Side	Location	Additional Info
Fiber Optic	AT&T	SR 46	Adjacent	North	SR 415 to western bridge approach over the St. Johns River	Buried
Fiber Optic	AT&T	Richmond Ave	Adjacent	East & West	Crosses under SR 46 and is located on the east and west sides of Richmond Ave	Buried
Fiber Optic	AT&T	SR 46	Adjacent	South	Richmond Ave to some point east of Richmond Ave	Overhead & Buried
Fiber Optic	AT&T	Old Geneva Rd	Adjacent	North & South	SR 46 to just east of Catfish Rd Crosses from north to south side of Old Geneva Rd halfway between SR 46 and Catfish Rd	Buried
Fiber Optic	AT&T	SR 46	Adjacent	North	St. Johns River Bridge	Conduit
Fiber Optic	AT&T	SR 46	Adjacent	North	From eastern bridge approach over the St. Johns River to Cochran Rd	Buried & Overhead
Fiber Optic	AT&T	Swamp Ln	Adjacent	East	Crosses under SR 46 for service to Swamp Ln	Buried
Fiber Optic	AT&T	Clekk Cir	Adjacent	East	Crosses over SR 46 for service to Clekk Cir	Overhead
Fiber Optic	AT&T	Mullet Lake Park Rd	Adjacent	East & West	Both sides of Mullet Lake Park Rd north from SR 46	Buried
Fiber Optic	AT&T	Mockingbird Ln	Adjacent	West	North from SR 46 for service to Mockingbird Ln	Overhead
Fiber Optic	AT&T	Ridge Rd	Adjacent	East	North from SR 46 for service to Ridge Rd	Buried
Fiber Optic	AT&T	Cochran Rd north of SR 46	Adjacent	East	North from SR 46 for service to Cochran Rd	Overhead
Fiber Optic	AT&T	Cochran Rd south of SR 46	Adjacent	East & West	South from SR 46 for service to Cochran Rd	Overhead (East) & Buried (West)
Fiber Optic	AT&T	SR 46	Adjacent	North	From Cochran Rd to CR 426	Buried
Fiber Optic	AT&T	SR 46	Adjacent	South	From Cochran Rd to CR 426	Overhead & Buried
Fiber Optic	AT&T	Woodridge Dr	Adjacent	East	South from SR 46 for service to Woodridge Dr	Buried
Fiber Optic	AT&T	Hart Rd north of SR 46	Adjacent	West	From SR 46 for service to Hart Rd and crosses under SR 46 to the south side	Buried
Fiber Optic	AT&T	Hart Rd south of SR 46	Adjacent	West	From SR 46 for service to Hart Rd	Overhead
Fiber Optic	AT&T	3rd St	Adjacent	West	From SR 46 for service to 3rd St Also crosses under SR 46 to south side	Buried
Fiber Optic	AT&T	Peacehill Pl	Adjacent	East	From SR 46 for service to Peacehill Pl	Buried

Utility Type	Owner	Relative to:	Transverse or Adjacent	Side	Location	Additional Info
Fiber Optic	AT&T	CR 426 north of SR 46	Adjacent	West	From SR 46 north for service on CR 426	Buried
Fiber Optic	AT&T	CR 426 north of SR 46	Adjacent	East	From SR 46 north for service on CR 426	Buried
Fiber Optic	AT&T	CR 426 south of SR 46	Adjacent	East	From SR 46 south for service on CR 426	Buried
Fiber Optic	Bright House	SR 46	Adjacent	North	From STA 0+00 to STA 22+00	Buried
Fiber Optic	Bright House	SR 46	Transverse	N/A	STA 22+00 crossing from north to south side of SR 46	Buried
Fiber Optic	Bright House	SR 46	Adjacent	South	STA 22+00 to STA 31+00	Buried
Fiber Optic	Bright House	SR 46	Adjacent	North & South	STA 150+00 to STA 154+00	Buried
Fiber Optic	Bright House	SR 46	Transverse	N/A	STA 154+00 crossing from south to north side of SR 46	Buried
Fiber Optic	Bright House	SR 46	Adjacent	North	STA 154+00 to STA 339+00	Overhead
Fiber Optic	Bright House	SR 46	Transverse	N/A	STA 339+00 crossing from north side to south side of SR 46	Buried
Fiber Optic	Bright House	SR 46	Adjacent	South	STA 364+00 to STA 383+00	Buried
Fiber Optic	Bright House	SR 46	Adjacent	South	STA 383+00 to STA 389+43	Overhead
Reclaimed Water	City of Sanford	SR 46	Adjacent	North	From SR 415 to eastern approach over the St. Johns River (Approximate STA 141+00). Attached to bridge.	20-inch
Reclaimed Water	City of Sanford	SR 46	Transverse	N/A	Approximate STA 141+00 crosses from north to south side of SR 46	20-inch
Reclaimed Water	City of Sanford	SR 46	Adjacent	South	From eastern approach over the St. Johns River (Approximate STA 141+00) to the City of Sanford Reclaimed Water Facility	20-inch
Electrical	FP&L Distribution	SR 46	Adjacent	North	From SR 415 diverging with SR 46 to continue along Osceola Rd (Underbuilt on FPL Transmission Poles)	Overhead 23 kV
Electrical	FP&L Distribution	SR 46	Adjacent	North	From Swamp Ln to Cochran Rd	Overhead 23kV
Electrical	FP&L Distribution	SR 46	Adjacent	South	From Cochran Rd to CR 426	Overhead 23kV
Electrical	FP&L Distribution	CR 426	Adjacent	East	CR 426 north and south of the intersection with SR 46	-

Utility Type	Owner	Relative to:	Transverse or Adjacent	Side	Location	Additional Info
Electrical	FP&L Distribution	SR 46	Transverse	N/A	Between Mullet Lake Park Rd and Torren Pt distribution line diverges from SR 46 and turns south	Buried in R/W and transitions to easement on private property 23 kV
Electrical	FP&L Transmission	SR 46	Adjacent	North	From SR 415, diverging from SR 46 to follow Osceola Rd	Overhead 115 kV
Fiber Optic	L3 Communications	SR 415	Adjacent	East	From SR 46 north along SR 415 (Crosses under SR 46 from west to head north on SR 415)	Buried
Water Main	Mullet Lake Water Association	SR 46	Adjacent	North	From Mullet Lake Park Rd to Mockingbird Ln	8-inch PVC
Water Main	Mullet Lake Water Association	SR 46	Transverse	N/A	Crosses under SR 46 from north to south side east of Mockingbird Ln	8-inch PVC
Water Main	Mullet Lake Water Association	SR 46	Adjacent	South	Mockingbird Ln to Cochran Rd	8-inch PVC
Water Main	Mullet Lake Water Association	Cochran Rd	Adjacent	West	Heads south on Cochran Rd to Water Plant	8-inch PVC
Fiber Optic	Seminole County Traffic Engineering	SR 415	Adjacent	East	From signal cabinet on NE corner to cabinet on SE corner of SR 415 and SR 46, continuing south to CR 427	-

2.14 Soils and Geotechnical Data

This section summarizes the soils and geotechnical data gathered in the *Draft Preliminary Roadway Soil Survey* (June 2012). The preliminary report evaluated the general subsurface conditions within the proposed retention pond and swale areas relative to the preliminary design and engineering phase of the project.

Geotechnical information reviewed for this report included the 1990 Soil Survey for Seminole County, Florida, as prepared by the U.S. Department of Agriculture Natural Resources Conservation Service.

The field exploration program consisted of 24 auger borings within the proposed swales and pond locations. Soil samples recovered were visually classified in the field and representative portions of the samples were transported to the laboratory in sealed sample jars for further classification and laboratory testing. In-field testing of the soil samples included measuring groundwater levels and conducting field permeability tests and double ring infiltration tests. Representative soil samples obtained during the field sampling operation were packaged and transferred to the laboratory for further visual examination and classification to obtain more accurate descriptions of the existing soil strata. The soil samples were visually classified in general accordance with the AASHTO Soil Classification System (ASTM D-3282). In addition, sieve analyses, organic content, Atterberg limits and natural moisture content tests were conducted on representative soil samples to aid in classification. The resulting soil descriptions and the results of the tests, where available, are shown on Table 2.9.

Table 2.9 – Pond Locations Soil Classifications

Pond	Boring No.	Approximate Location	Approximate Offset	Stratum No.	Approximate Depth	AASHTO Classification
A1	PB-2	45+00	600 Left	5	0-2	A-8
B1	PB-6	172+00	250 Left	4	10-14	A-7-6
C1	PB-7	236+00	300 Left	1	0-3	A-3
D1	PB-8	279+00	215 Left			
E2	PB-9	301+00	150 Right	1	8-9	
F2	PB-10	316+00	150 Right	2	3-4	A-8
G2	PB-11	329+00	200 Right	1	3-4	
H1	PB-12	398+25	145 Left	1	9-10	
FP 1	PB-1	20+00	1,750 Left	2	0-2	A-2-4
FP 2	PB-5	151+00	350 Left	3	3-8	A-2-4
Existing Pond 1	PB-3	86+55	300 Left	4	4-10	A-2-4
Existing Pond 2	PB-4	146+00	260 Left	3	13.5-15	A-2-4

The results of the geotechnical exploration indicated that the soil conditions encountered in the borings are acceptable for construction of the proposed roadway, in accordance with standard FDOT design and construction practices, except where plastic and organic soils (Strata 4 and 5) were encountered.

Organic muck (Stratum 5) was encountered in several of the borings. Results of the organic content tests conducted on retrieved samples indicated organic contents ranging between 3 and 11 percent. Strata 1, 2 and 3 soils encountered in the roadway borings are considered Select (reference Index 505 of FDOT Design Standards) for use as fill for roadway construction. Stratum 4 soils are considered plastic and should not be used in the subgrade portion of the road. Buried trash and debris (Stratum 6) was encountered in Boring PB-10 between approximate depths of 6 to 12 feet below the existing ground surface. Strata 5 and 6 materials are not suitable for use as foundation materials for the proposed roadway.

For the type of soils encountered at the field permeability test locations, it is noted that the silty fine sand, fine sand with clay and clayey fine sand (Strata 2, 3, and 4) underlying the relatively free-draining soils encountered in the stormwater ponds are anticipated to be more permeable than the fine sand and fine sand with silt soils (Stratum 1) as encountered in the borings.

The groundwater level was measured in the boreholes on the day drilled after stabilization of the downhole water level. The groundwater was encountered at depths that ranged between 3.5 and 15 feet below the existing ground surface. Estimated seasonal high groundwater levels, developed from the pond and swale borings, range from three to zero feet below the existing ground surface from SR 415 to just east of Mockingbird Lane (approximately Station 279+00) and from nine to six feet below the existing ground surface from just east of Mockingbird Lane to CR 426.

Existing soils within the project limits are shown on Figures 2.8 and 2.9. Table 2.10 lists the soils present in the project area and corresponds to the figures.

Table 2.10 – Existing Soils

Symbol	Soil Type
3	Arents, 0 to 5% slopes
9	Basinger and Delray fine sands
10	Basinger, Samsula and Hontoon soils, depressional
11	Basinger and Smyrna fine sands, depressional
12	Canova and Terra Ceia mucks
13	EauGallie and Immokalee fine sands
15	Felda and manatee mucky fine sands, depressional
16	Immokalee sand
17	Brighton, Samsula and Sanibel mucks
18	Malabar fine sand
19	Manatee, Floridana and Holopaw soils, frequently flooded
20	Myakka and EauGallie fine sands
21	Nittaw mucky fine sand, depressional
22	Nittaw muck, occasionally flooded
23	Nittaw, Okeelanta and Basinger soils, frequently flooded
25	Pineda fine sand
26	Udorthents, excavated
27	Pomello fine sand, 0 to 5% slopes
29	St. Johns and EauGallie fine sands
33	Terra Ceia muck, frequently flooded
35	Wabasso fine sand
99	Water

Figure 2.8 – Existing Soils (1 of 2)

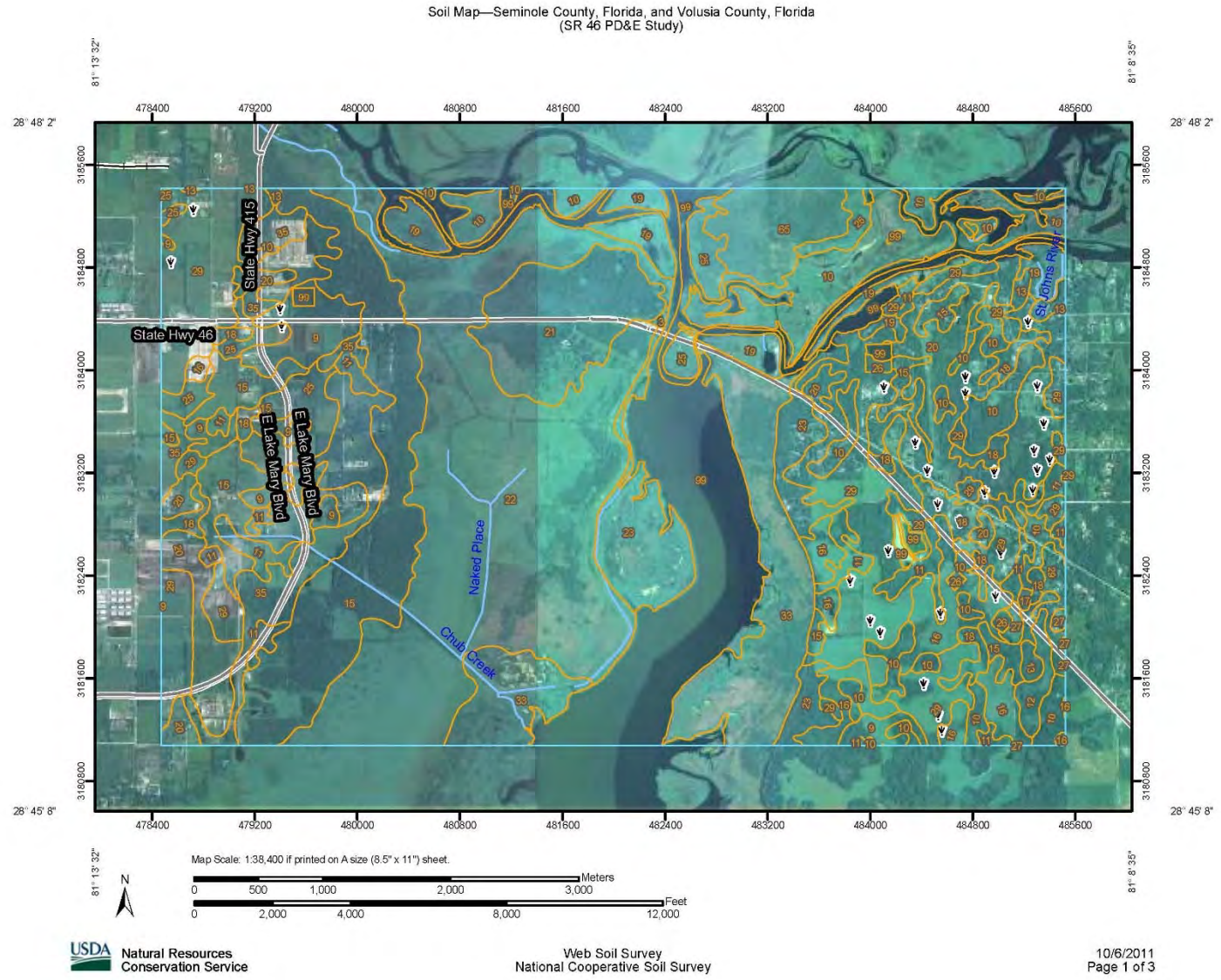
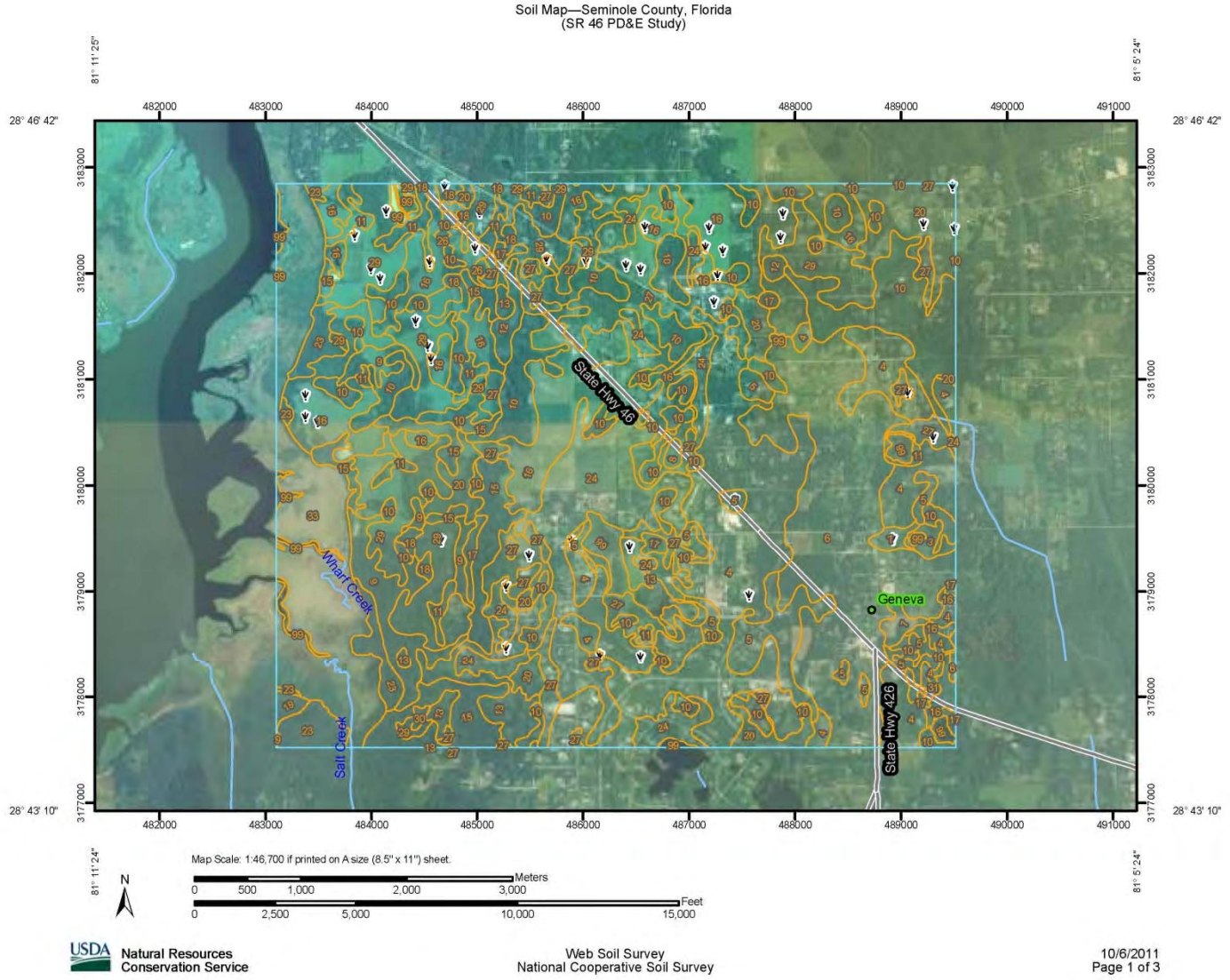


Figure 2.9 – Existing Soils (2 of 2)



2.15 Bridges

The bridge over Lake Jesup/St. Johns River was constructed in 2009, is in good condition and was designed for an HL-93 live load. It spans 3,740'-0", with a span configuration of 2 @ 106'-0½", 1 @ 113'-0", 7 @ 99'-0", 1 @ 96'-11", 1 @ 111'-0", 1 @ 96'-11", 1 @ 105'-7", 19 @ 105'-6" and 3 @ 102'-4". The superstructure's typical section provides two travel lanes and consists of 6- AASHTO Type IV girders, spaced at 8'-0", and an 8½" thick, 47'-1" wide slab, with 32" F-Shape Traffic Railings. All end bents and intermediate bents are perpendicular to the bridge's centerline except for Bents No. 12 and 13, which are skewed at 70°08'03" and 69°35'32", respectively. The substructure consists exclusively of pile bents.

The bridge spans three historic channels of the St. Johns River. Channel A (approximate Station 105+00) is the existing channel into Lake Jesup from the St. Johns River. Channel B, at approximately Station 114+00, follows the historic route of the St. Johns River. The channel was filled in during construction of the causeway, which was removed as part of the recent bridge construction. Channel C, an eastern channel from the St. Johns River to Lake Jesup filled in by previous river dredging projects, is located at approximately Station 135+00.

The existing bridge's geometry meets all current design criteria. The bridge's horizontal alignment is on an 11,459.156' curve from between Bents No. 13 and 14 to between Bents No. 28 and 29, and on a tangent elsewhere. The vertical alignment consists of three vertical curves: a 960' crest curve with grades of 2.784% and -0.799%, a 300' sag curve with grades of -0.799% and -0.300% and a 420' crest curve with grades of -0.300% and -1.806%. This horizontal and vertical geometry results in the following minimum horizontal and vertical clearances over the three channels:

- a 50-foot minimum horizontal and 25.9-foot minimum vertical clearance over Channel A,
- a 50-foot minimum horizontal and 24.3-foot minimum vertical clearance over Channel B, and
- A 50-foot minimum horizontal and 14.6-foot minimum vertical clearance over Channel C.

Per the ETDM Summary Report (Appendix B), the existing bridge is exempt from a Coast Guard bridge permit, which was the case for the existing bridge. However, the proposed bridge will match the navigational clearance of the existing structure.

SECTION 3.0 – DESIGN CONTROLS AND CRITERIA

Table 3.1 presents the roadway design criteria established for the proposed improvements. The design criteria are based on design parameters outlined in *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011), *Plans Preparation Manual, Volumes 1 and 2* (FDOT, 2017) and *Design Standards* (FDOT, 2017).

Table 3. 1 – Design Criteria

Design Element	Design Standard Urban Typical Section	Design Standard Suburban Typical Section	Design Standard Rural Typical Section	Sources
Roadway Classification	Urban Other Principal Arterial (west of Richmond Ave.) / Rural Principal Arterial – Other (east of Richmond Ave.)			Straight Line Diagrams
Design Vehicle	WB-62FL			PPM, Vol I, Section 1.12
Design Year	2045			Traffic Forecast Update Report
Design Speed	45 mph	55 mph	60 mph	Recommended, based on PPM Vol I, Table 1.9.1
Regulatory Speeds in Work Zones	Desirable – No more than 10 mph below posted speed Reduced – At a rate of 10 mph every 500’			Design Standards, Index 600, Sheet 4 of 13
Horizontal Alignment				
Maximum Curvature	8º15’	5º00’	5º15’	PPM, Vol I, Table 2.8.3
Maximum Deflection w/o Horizontal Curve	1º00’00”	0º45’00”		PPM, Vol I, Table 2.8.1a
Minimum Length of Horizontal Curve	15(V) = 675 ft Desirable 400 ft Minimum	15(V) = 825 ft Desirable 400 ft Minimum	15(V) = 900 ft Desirable 400 ft Minimum	PPM, Vol I, Table 2.8.2a
Maximum Deflection for Through Lanes within Intersections	3º00’	N/A		PPM, Vol I, Table 2.8.1b
Minimum Stopping Sight Distance	360 ft	495 ft	570 ft	PPM, Vol I, Table 2.7.1
Turn Lane Deceleration Length (including taper) (excluding queue length)	185 ft	350 ft	405 ft	Design Standards, Index 301
Turn Lane Taper	50 ft (single lane) 100 ft (double lane)			Design Standards, Index 301
Turning Radii	45 ft Min			AASHTO WB-62 Template
Vertical Alignment				
Maximum Profile Grade	5% Rural, 6% Urban	3% Rural, 5% Urban		PPM, Vol I, Table 2.6.1
Maximum Change in Grade w/o Vertical Curve	0.70%	0.50% (interpolated)	0.40%	PPM, Vol I, Table 2.6.2
Minimum Gutter Grade	0.30%	0.30%	N/A	PPM, Vol I, Table 2.6.4

Design Element	Design Standard Urban Typical Section	Design Standard Suburban Typical Section	Design Standard Rural Typical Section	Sources
Min. K Value for Crest Vertical Curve	98	185	245	PPM, Vol I, Table 2.8.5
Minimum Crest Vertical Curve Length	135 ft	350 ft	400 ft	PPM, Vol I, Table 2.8.5
Min. K Value for Sag Vertical Curve	79	115	136	PPM, Vol I, Table 2.8.6
Minimum Sag Vertical Curve Length	135 ft	250 ft	300 ft	PPM, Vol I, Table 2.8.6
Minimum Distances between VPI's	250 ft		N/A	PPM, Vol I, Table 2.6.4
Minimum Vertical Clearance	17.5 ft – Signage 17.5 ft – Signals Bridges: 2 ft above design flood stage (non-navigable)			PPM, Vol I, Table 2.10.2, Section 2.10.1
Cross Section				
Lane Width	11 ft – Urban Area 12 ft – Rural Area	12 ft		PPM, Vol 1, Table 2.1.1
Bicycle Lane Width	7 ft –Urban Area 5 ft – Rural Area	5 ft		PPM, Vol 1, Table 2.1.2
Median Width	22 ft (19.5 ft min)	30 ft	40 ft	PPM, Vol 1, Table 2.2.1 & Section 2.16.4
Inside Shoulder Width	N/A	4 ft	8 ft (full) 0 ft (paved)	PPM Vol I, Table 2.3.2, Normal Volume & Section 2.16.5
Outside Shoulder Width	N/A	6.5 ft	10 ft (full) 5 ft (paved)	PPM Vol I, Table 2.3.2, Normal Volume & Section 2.16.5
Minimum Bridge Shoulder Width	N/A	10' Min – Outside 6' Min – Inside		PPM, Vol I, Figure 2.11.1
Cross Slopes	0.02 – Lanes	0.02 – Lanes Inside Shoulder – 0.05 Outside Shoulder – 0.06		PPM, Vol I, Figure 2.1.1 and Table 2.3.2
Superelevation Transition Standard	Tangent 80% Curve 20%			PPM, Vol I, Section 2.9
Superelevation Transition Acceptable Range	Tangent 50-80% Curve 20-50%			PPM, Vol I, Section 2.9
Maximum Superelevation	5%	10%		PPM, Vol I, Section 2.9
Superelevation Transition Slope Rates	1:200	1:225		PPM, Vol I, Table 2.9.3
Maximum Lane "Roll-Over"	4%			PPM, Vol I, Figure 2.1.1
Sidewalk Width	5 ft (with 2' buffer strip); 6 ft if adjacent to curb		5 ft (with 2' buffer strip)	PPM, Vol I, Section 8.3.1
Sidewalk Cross Slope	2% Max	2% Max	2% Max	PPM, Vol I, Section 8.3.1

Design Element	Design Standard Urban Typical Section	Design Standard Suburban Typical Section	Design Standard Rural Typical Section	Sources
Sidewalk Grades	5% Max	5% Max	5% Max	PPM, Vol I, Section 8.3.1
Curb & Gutter	Type E – Inside Type F – Outside	Type E – Inside & Outside	N/A	Design Standards, Index 300, PPM Vol I, Section 2.16.2, & PPM Vol II, Chapter 6
Minimum Width of Clear Zone	N/A	30 ft	36 ft	PPM Vol I, Section 4.2.3, Table 4.2.1
Minimum Lateral Offset	4 ft	Outside Clear Zone	Outside Clear Zone	PPM Vol I, Section 4.2.4, Table 4.2.3
Recoverable Terrain	N/A	30 ft	36 ft	PPM, Vol I, Section 4.2.3, Table 4.2.1
Border Width	Travel Lanes - 14 ft Bike or Aux Lanes - 12 ft	35 ft	40 ft	PPM, Vol I, Tables 2.5.1 & 2.5.2, Section 2.16.7

SECTION 4.0 – ALTERNATIVES ANALYSIS

The analyses discussed in this section follow the project development process detailed in Part 1, Chapter 4 of FDOT's *PD&E Manual*. In addition to Build Alternatives, the PD&E Study examined the No-Build Alternative, the Transportation Systems Management and Operations (TSMO) Alternative and the Multi-Modal Alternative.

4.1 No-Build Alternative

The No-Build Alternative provides no improvements to SR 46 within the project limits. Other planned and programmed roadway projects identified in Metroplan Orlando's LRTP are assumed to be implemented. The absence of construction-related and short-term operational impacts associated with the Build Alternative is a benefit of the No-Build Alternative. Long-term benefits accrued from serving future traffic demands would not be realized with this alternative. Continued traffic growth on SR 46 will result in traffic volumes in excess of capacity, thereby increasing congestion. Distinct advantages and limitations associated with the No-Build Alternative are as follows:

Advantages

- No impedance to traffic flow during construction.
- No disruption to existing land uses because of construction activities.
- No right-of-way acquisition or relocations.
- No expenditure of funds for engineering design or construction.
- No impacts to the adjacent natural, physical, human and social environments.

Limitations

- Increase in traffic congestion and user cost associated with increased travel time due to excessive delay.
- Increase in carbon monoxide and other pollutants due to increased traffic congestion.
- Increase in maintenance costs due to roadway and structure deterioration.
- Increase in emergency vehicle response time.
- Increase in evacuation time during weather emergencies as a result of heavy congestion.
- Increase in crash potential because of increased congestion.
- Not compatible with the area's long range plans.
- No opportunity for potential additional mitigation to Lake Jesup/St. Johns River.

The No-Build Alternative remains a viable alternative through the Public Hearing phase of the project.

4.2 Transportation Systems Management and Operations (TSMO) Alternative

The TSMO Alternative investigates upgrades to SR 46 by improving high crash locations and segments, adding turn lanes, improving intersections and signalization, improving signing and pavement markings, park and ride facilities and Intelligent Transportation Systems (ITS). While

certain TSMO strategies such as dedicated right-and left-turn lanes may help to reduce the crash rate on SR 46, additional capacity is required to accommodate projected traffic volumes on SR 46 in the Design Year (2035) safely and efficiently. Sufficient capacity increases cannot be provided solely through the use of TSMO improvements. Intersection improvements are included in the Build Alternatives. The addition of a through lane in each direction will improve the safety of the roadway by separating through and turning traffic at unsignalized intersections.

In 2013, Seminole County performed a Safety Study of SR 46 analyzing the crash data collected as part of the PD&E Study. The purpose of this study was to recommend improvements that can be implemented to increase the safety on SR 46 prior to construction of the ultimate capacity improvement. Results of the safety study are discussed below.

Countermeasures were prioritized based on their expected benefit/cost ratios. The benefits were estimated in terms of the potential societal cost savings associated with crash reduction. Through the prioritization process, groups of countermeasures and their expected effectiveness were established as Tier I, Tier II, and Tier III as following:

- ***Tier I Countermeasures*** – it is recommended that Seminole County coordinate with FDOT to advance the Tier I projects to design and construction in the short-term (within three to five years). Table 4.1 lists recommended project countermeasures and their Crash Modification Factors (CMF) within Tier I.

- ***Tier II Countermeasures*** – it is recommended that Seminole County coordinate with FDOT to evaluate the feasibility of implementing Tier II projects in the medium-term (within five to seven years). The feasibility of Tier II projects will largely depend on the availability of funding for design and construction. Table 4.2 lists Tier II recommended project countermeasures and their CMFs.

- ***Tier III Countermeasures*** – these projects are appropriate for long-term implementation (seven to 10 years or more); however, if implemented in a long-term scenario, it is recommended that these projects be re-evaluated in the future to consider the effect of projects implemented in the interim timeframe and to consider the impacts to the potential long-term widening of SR 46. Table 4.3 lists Tier III recommended project countermeasures and their CMFs.

The expected project benefits were calculated for each of the recommended countermeasures for Tiers 1 – III and can be found in Tables 13 through 15 of the SR 46 Safety Study Report. The expected project benefit was calculated as the difference between the Present Worth of the No Build Crash Costs and the Present Worth of the Build Crash Costs. Planning level cost estimates were calculated for each potential countermeasures. Although the alternative projects are expected to have a design life of 20 years, a service life of 9 years was assumed to match the 9-year expected crash forecasts. Therefore, while the estimated construction costs were annualized over 20 years, only 9 years of cost were incorporated into the benefit-cost ratio calculations. Table 4.4 presents the overall project tiers' cost estimates, expected project benefits and average Benefit to Cost (B/C) Ratio.

Table 4.1 – Summary of Tier I Project Countermeasures

Location	Tier I Project Countermeasures	Project CMF
SR 415 to Richmond Avenue	• Install centerline rumble strips • Install shoulder rumble strips	74%
SR 46 & Richmond Avenue	• Install intersection warning signage • Provide an eastbound right-turn lane on SR 46 at Richmond Avenue	86%
Richmond Avenue to 0.25 miles west of Old Geneva Road	• Install centerline rumble strips • Install shoulder rumble strips	74%
0.25 mi west of Old Geneva Road to west end of Lake Jesup Bridge	• Install centerline rumble strips • Install shoulder rumble strips	74%
West end of Lake Jesup Bridge to Osceola Road	• Install "No Passing Zone" signage	N/A[1]
Osceola Road to Mullet Lake Park Road	• Install centerline rumble strips • Install shoulder rumble strips	74%
SR 46/Mullet Lake Park Road intersection	• Install intersection warning signage	N/A
Mullet Lake Park Road to Avenue C /Woodbridge Drive	• Install centerline rumble strips • Install shoulder rumble strips • Install intersection warning signage • Pave the gravel approach at Torren Point	74%
SR 46/Avenue C/Woodbridge Drive Intersection	• Install intersection warning signage • Provide a westbound left-turn lane on SR 46 at Woodbridge Drive	72%
Avenue C/Woodbridge Drive to CR 426	• Install centerline rumble strips • Install shoulder rumble strips • Install intersection warning signage • Install retroreflective tape on "Signal Ahead" sign pole • Install street name plaque at "Signal Ahead" sign	74%
SR 46/CR 426 intersection	• Relocate stop bars to improve sight distance for RTOR[2] • Upgrade intersection signage, internally illuminated signs	77%

[1]N/A denotes countermeasures that do not have well-established CMFs
[2]Right turn on red

Table 4.2 – Summary of Tier II Project Countermeasures

Location	Tier II Project Countermeasures	Project CMF
SR 415 to Richmond Avenue	• Widen paved shoulder from 4 to 5 feet	96%
SR 46/Richmond Avenue Intersection	• Widen minor road approach from 19 to 24 feet	N/A[1]
Richmond Avenue to 0.25 mi west of Old Geneva Road	• Widen paved shoulder from 4 to 5 feet	96%
0.25 mi west of Old Geneva Road to west end of Lake Jesup Bridge	• Widen paved shoulder from 4 to 5 feet	96%
SR 46/Old Geneva Road Intersection	• Install intersection lighting at Old Geneva Road	90%
SR 46/Osceola Road Intersection	• Install intersection lighting	90%
SR 46/Mullet Lake Park Road Intersection	• Install intersection lighting	90%
Mullet Lake Park Road to Ave C / Woodbridge Drive	• Widen paved shoulder from 4 to 5 feet	96%
	• Provide an eastbound right-turn lane on SR 46 at Cochran Road • Provide an eastbound left-turn lane on SR 46 at Cochran Road	62%
SR 46/Ave C Woodbridge Drive Intersection	• Install intersection lighting	90%
Ave C/Woodbridge Drive to CR 426	• Advanced signage: “Frequent Driveways Ahead” • Install flashing beacon at “Signal Ahead” sign • Narrow Lanes by Striping to 10.5 feet at speed reduction zone • Pave dirt approach at Peace Hill Drive • Pave dirt approaches at Hart Street/4th Street	N/A
SR 46/CR 426 Intersection	• Consider protected-permitted left turn phase for SR 46 as traffic volumes increase • Install intersection lighting	90%

[1]N/A denotes countermeasures that do not have well-established CMFs

Table 4.3 – Summary of Tier III Project Countermeasures

Location	Tier III Project Countermeasures	Project CMF
Osceola Road to Mullet Lake Park Road	• Widen paved shoulder from 4 to 5 feet	96%
Mullet Lake Park Road to Ave C / Woodbridge Drive	• Install a passing lane (3-lane section for 2 miles) • Increase distance to roadside features	75%
Ave C / Woodbridge Drive to CR 426	• Access management (Oak/3rd Street, east of Peace Hill Drive)	93%

Table 4.4 – Summary of Project Tiers Cost Estimates and Benefits

Project Tier	Total Project Cost Estimate	9-Year Project Cost	Expected Project Benefit	Average B/C Ratio
Tier I	$513,000	$281,000	$8,049,000	28.7
Tier II	$1,164,000	$636,000	$1,575,000	2.5
Tier III	$2,869,500	$1,570,000	$1,890,000	1.2

In May 2017 FDOT selected a contractor to construct safety improvements to SR 46 within the project limits of the PD&E Study. While these improvements are expected to improve safety incrementally along this segment of SR 46, crash rates can be expected to increase as congestion increases. In addition, widening SR 46 from two to four lanes is anticipated to reduce the overall crash rate within the project limits by reducing congestion. Widening will also provide an additional lane in each direction to accommodate disparate speeds of traffic.

4.3 Multi-Modal Alternative

The Central Florida Regional Transportation Authority (dba LYNX) does not operate any fixed or on-demand transit service routes on this section of SR 46. Therefore, there is no opportunity to develop alternatives to incorporate alternate modes of transportation.

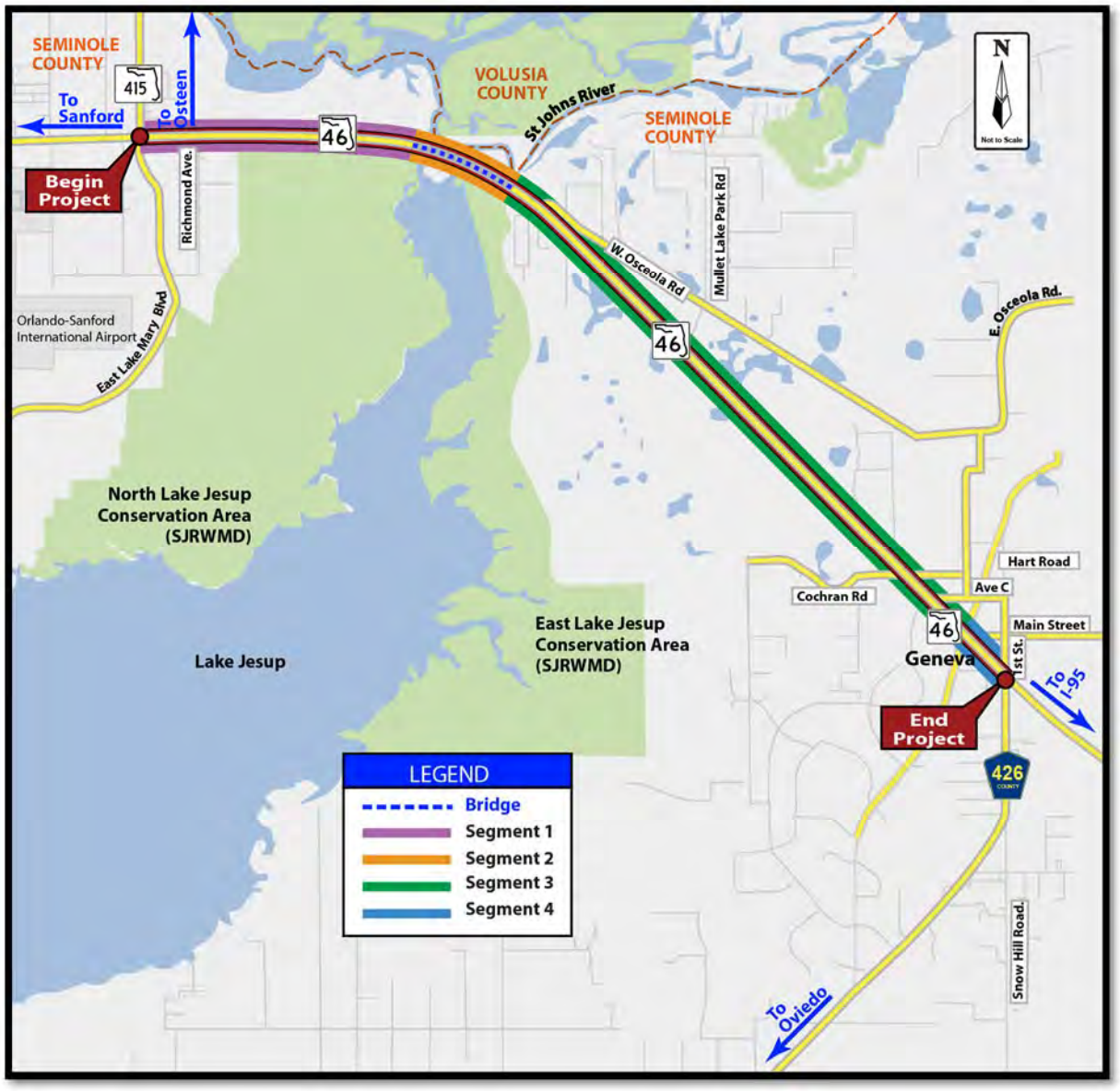
4.4 Build Alternatives

For the purposes of analyzing build alternatives, the project was split into four segments as follows:

- Segment 1 – SR 415 to the west end of the Lake Jesup/St. Johns River Bridge
- Segment 2 – The Lake Jesup/St. Johns River Bridge
- Segment 3 – The east end of the Lake Jesup/St. Johns River Bridge to Hart Road
- Segment 4 – Hart Road to CR 426

The project segments are shown on Figure 4.1

Figure 4.1 – Project Segments



4.4.1 Typical Sections

Two typical sections, rural and suburban, were analyzed for the widening of SR 46 between SR 415 and Hart Road. An urban typical section was analyzed for the widening of SR 46 from Hart Road to CR 426 due to the development located adjacent to the right-of-way in this segment of the corridor.

The rural typical section provides two 12-foot lanes in each direction with eight-foot (two-foot paved) inside shoulders and 10-foot (five-foot paved) outside shoulders, which also serve as bicycle lanes. A 40-foot median separates the travel lanes. Conveyance swales are provided on each side of the roadway within the 36-foot clear zone. The design speed of the rural typical section is 60 mph and it requires a minimum of 188 feet of right-of-way.

The suburban typical section provides two 12-foot lanes in each direction with four-foot inside shoulders and 6.5-foot outside shoulders, which also serve as bicycle lanes. A 30-foot median separates the travel lanes and type E curb and gutter is proposed on both the inside and outside edges of pavement in each direction. A 10-foot asphalt shared-use-path on the north side of the roadway and a five-foot concrete sidewalk on the south side of the roadway are located within the 30-foot clear zone. The design speed of the suburban typical section is 55 mph and it requires a minimum of 148 feet of right-of-way.

The urban typical section provides one 12-foot lane, one 11-foot lane and a four-foot designated bicycle lane in each direction. A 22-foot median separates the travel lanes with type E curb and gutter proposed on the inside edge of pavement and type F curb and gutter proposed on the outside edge of pavement. Within the 12-foot border width is an eight-foot concrete sidewalk on the north side of the roadway and a six-foot concrete sidewalk on the south side. The design speed of the suburban typical section is 45 mph and is contained within a minimum of 100 feet of right-of-way.

The initial analysis of the typical sections involved an analysis of widening to the north, widening to the south or maintain the existing centerline and widening to both the north and south. The initial analysis also evaluated maintaining the existing pavement as part of the widening and reconstructing the pavement. Nineteen typical sections were developed and analyzed (these initial typical sections can be found in Appendix C). The initial analysis included potential impacts involving right-of-way, relocations, overhead utilities, wetlands and floodplains. Also included in the analysis was a per mile cost for each typical section. The typical section evaluation matrix can also be found in Appendix C.

A focus of the initial typical section analysis was if the existing pavement could be maintained or if high groundwater would require a reconstruction of the existing roadway. The current roadway has not experienced any pavement failure due to high groundwater nor is there any anecdotal evidence of roadway flooding or ponding of water on the road surface. Estimated seasonal high groundwater levels, developed from limited geotechnical borings, range from three to zero feet below the existing ground surface from SR 415 to just east of Mockingbird Lane (approximately Station 279+00) and from nine to six feet below the existing ground surface from

just east of Mockingbird Lane to CR 426. The *Draft Preliminary Soil Survey* (June 2012) details the estimated seasonal high groundwater identified for this project.

The existing 1957 construction plans for the segment of SR 46 between SR 415 and the Lake Jesup/St. Johns River bridge (reconstruction of the original brick roadway) show a "water table" generally between one and three feet below the profile grade, with the exception of an approximately 900-foot segment of roadway originally built through a wetland area. Water tables east of the bridge to CR 426, taken from the original construction plans for a realignment of then-SR 44 (dated 1944), generally are approximately three feet below the profile grade from the bridge to approximately 1,500 feet west of Songbird Trail. East of this point the water table is not identified in the plans but is assumed to be much lower due to the rising topography of the surrounding area. This is consistent with the pond and swale borings taken as part of this PD&E Study.

Based on the available data regarding seasonal high groundwater tables, it was determined that the existing pavement could be retained as part of the widening of SR 46. For the rural typical section, the crowned section would be retained and milled and resurfaced with additional shoulder widening. The existing roadway would be milled, resurfaced and overbuilt to provide a constant 0.02 cross slope for the suburban typical section. The existing pavement will not be retained for the urban section to stay within the existing 100 feet of right-of-way.

After the initial typical section analysis, five typical sections were selected and presented at the Public Information Meeting on August 29, 2012:

- Suburban – Widen North
- Suburban – Widen South
- Rural – Widen North
- Rural – Widen South
- Urban – Center

These typical sections are presented in Figures 4.2 through 4.6.

Figure 4.2 – Suburban Typical Section – Widen to the North

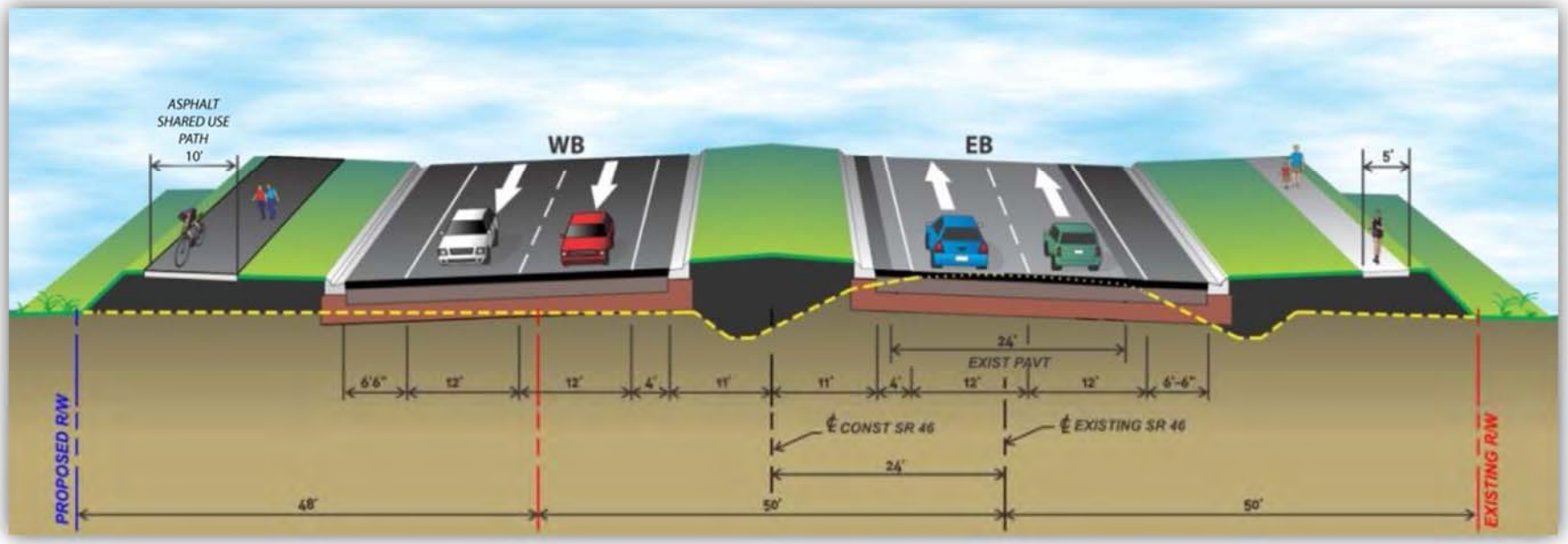


Figure 4.3 – Suburban Typical Section – Widen to the South

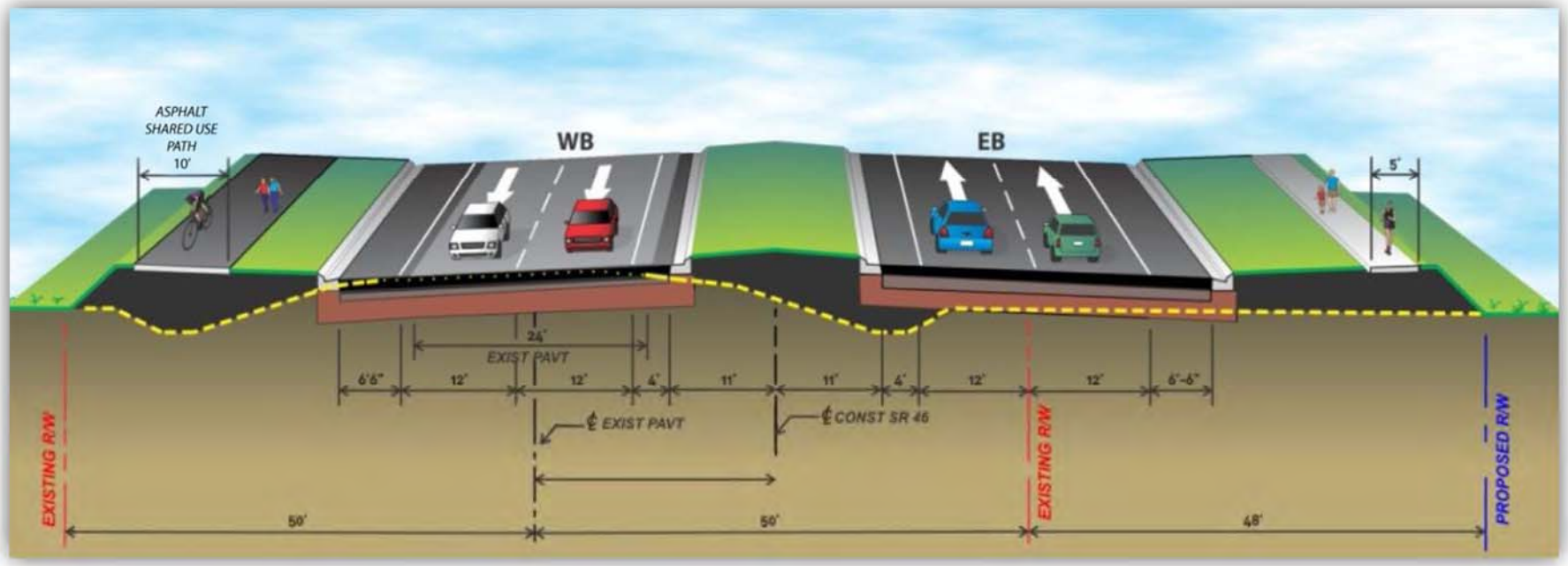


Figure 4.4 – Rural Typical Section – Widen to the North

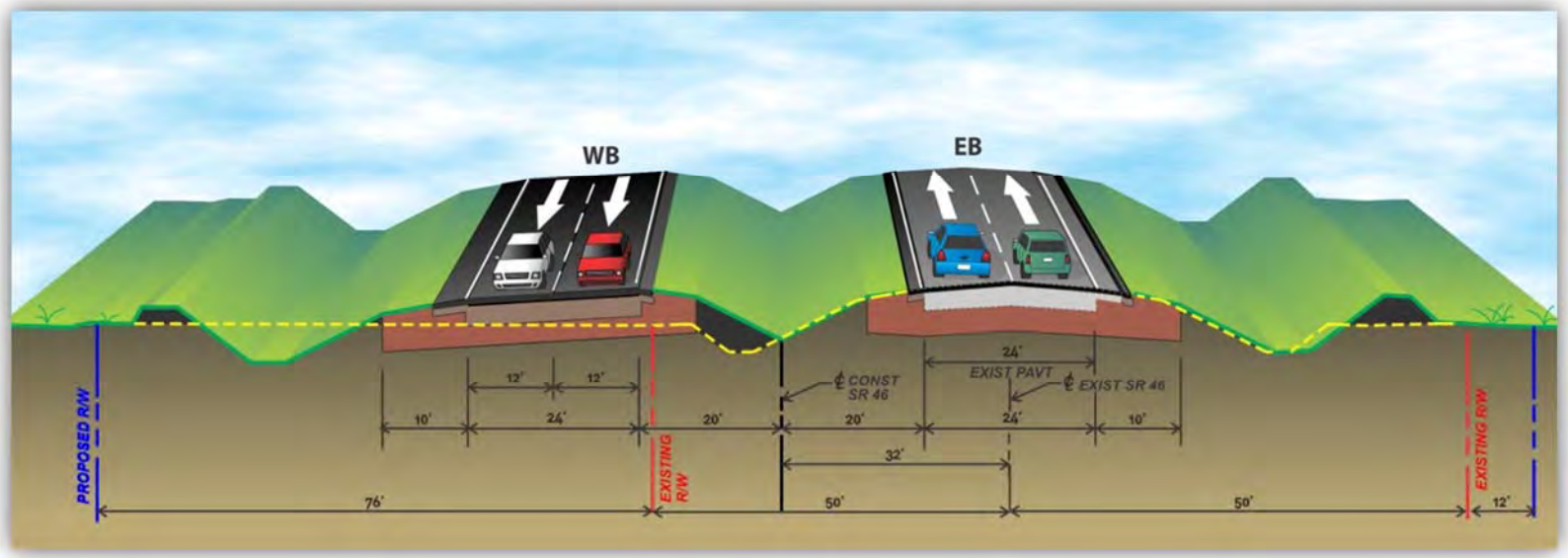


Figure 4.5 – Rural Typical Section – Widen to the South

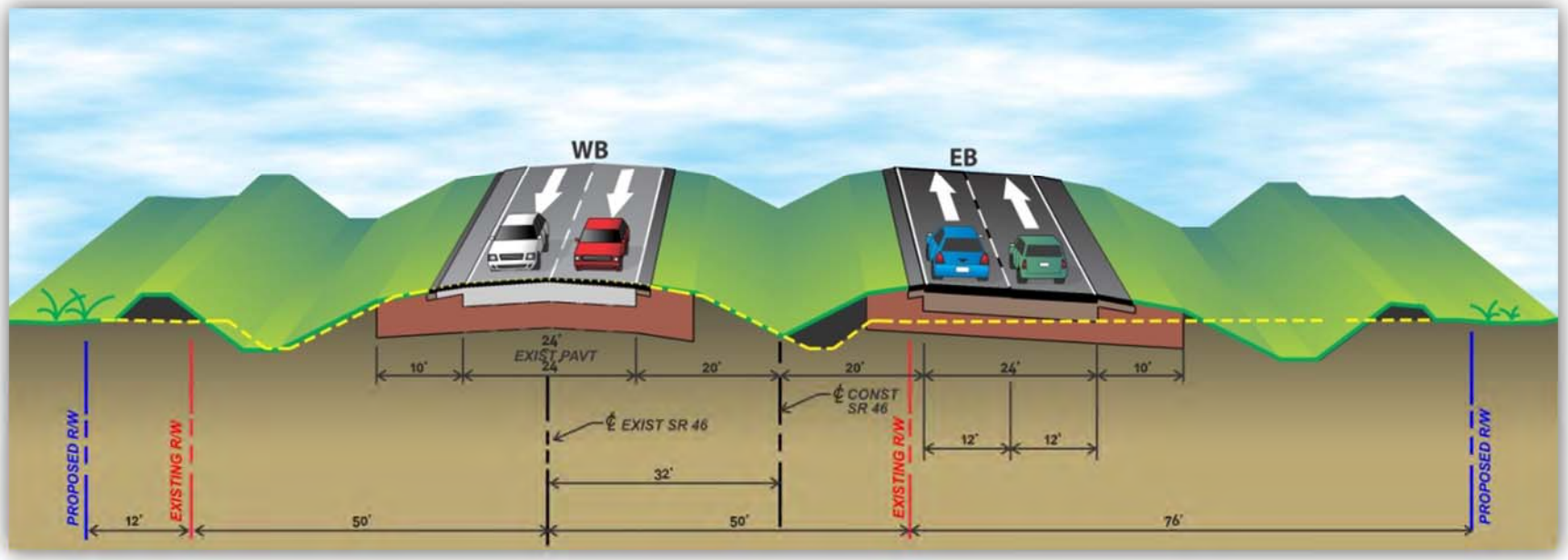
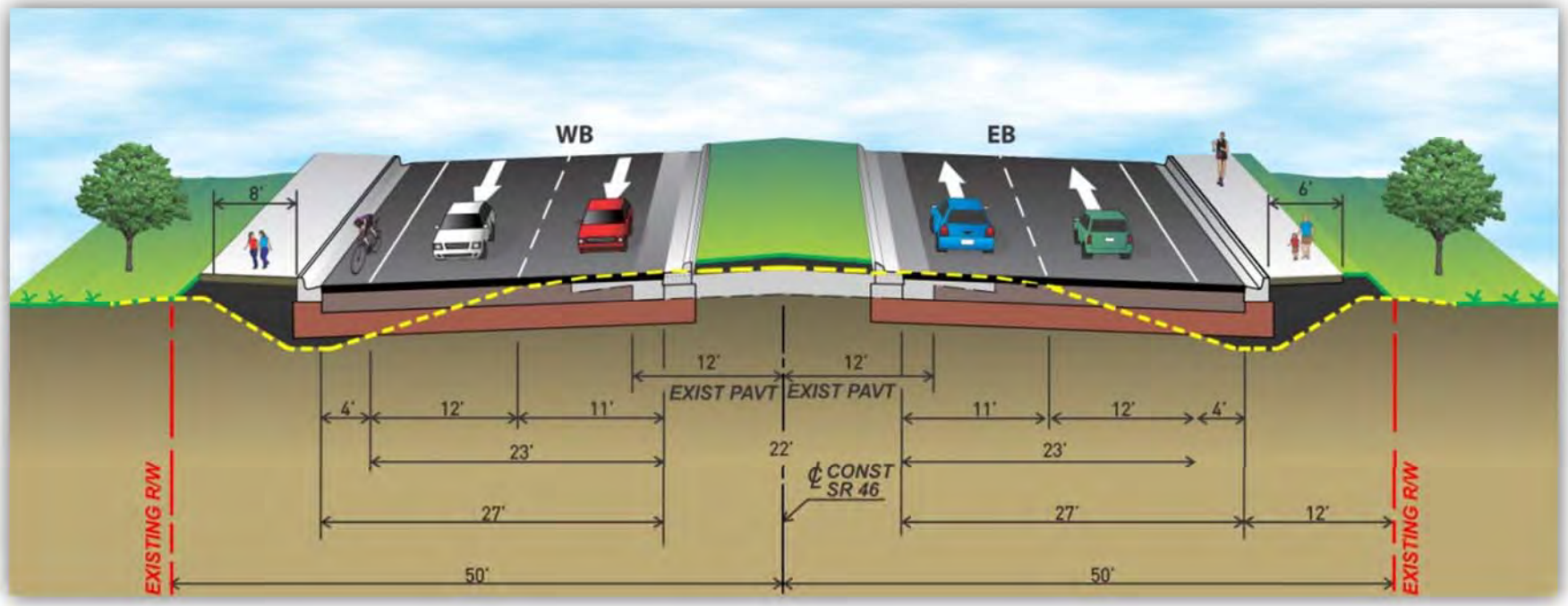


Figure 4.6 – Urban Typical Section – Centered Widening



Since the Public Information Meeting, design standards have been updated as noted in Section 3. For an urban typical section with a design speed of 45 mph or less, lane widths are reduced to 11 feet with buffered bike lanes of seven feet. This increases the full pavement width to 29 feet. In order to stay within the existing 100-foot right of way, the median can be reduced to 19.5 feet and border widths are reduced to 11.25 feet, which may require a design variation. The revised urban typical section from Hart Road to CR 426 is illustrated in Figure 4.7.

In addition to the roadway, two bridge typical sections were developed, one with a shared use path on the north side of SR 46 and one with no pedestrian accommodations. Figures 4.8 and 4.9 detail the two bridge typical sections.

Figure 4.7 – Revised Urban Typical Section – Centered Widening

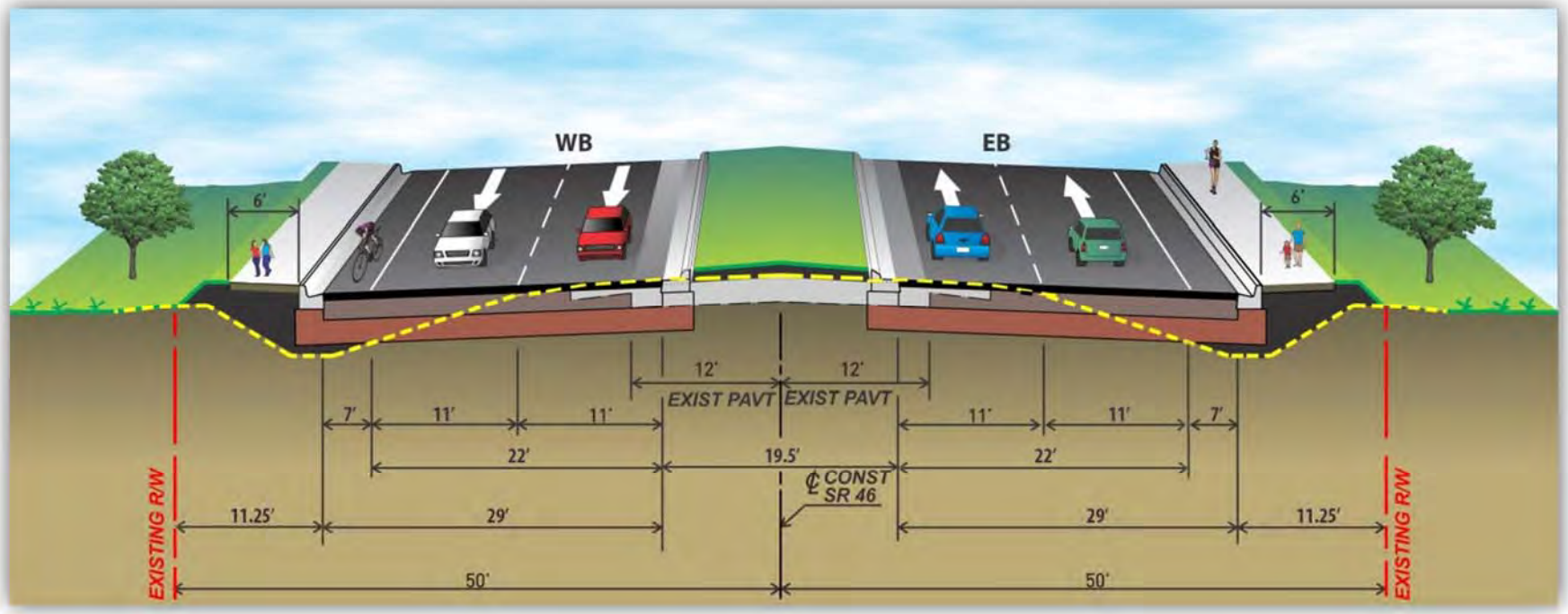


Figure 4.8 – Bridge Typical Section without Shared Use Path

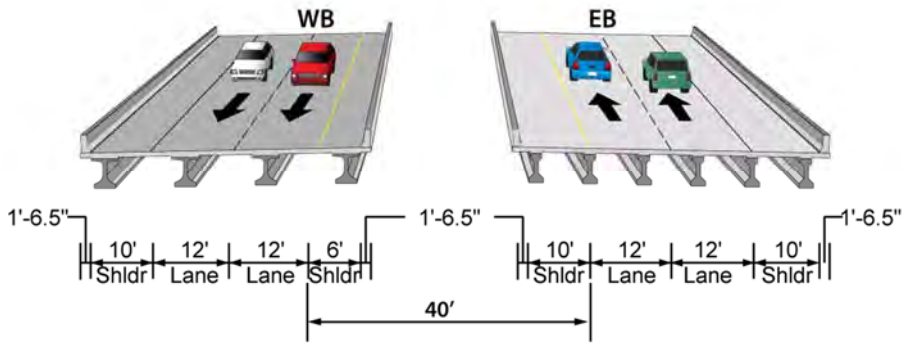
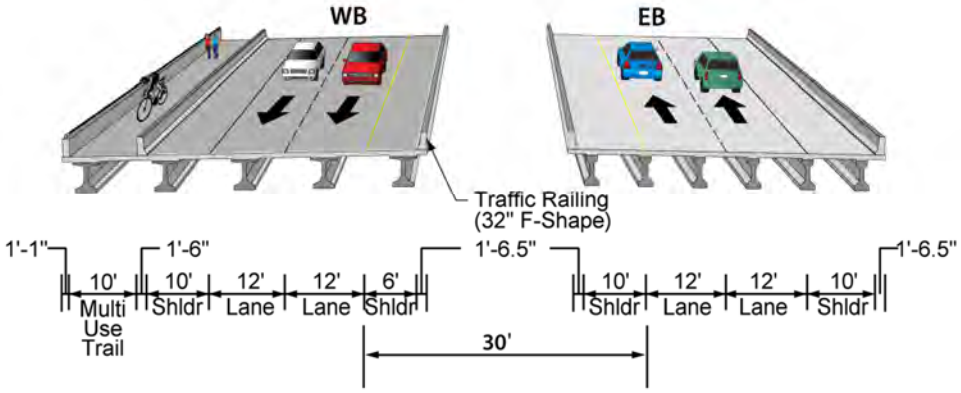


Figure 4.9 – Bridge Typical Section with Shared Use Path



Both bridge typical sections retain the existing bridge as the future eastbound lanes. The proposed westbound lanes, to be built on the alignment of the old bridge and causeway that was removed during the construction of the existing bridge, provides two 12-foot lanes, a six-foot inside shoulder and a 10-foot outside shoulder. The typical section without the shared-use path is intended for use with the rural roadway typical section and maintains the 40-foot median. The typical section with the shared-use path is intended for use with the suburban typical section and maintains a 30-foot median. The shared use path is barrier-separated from the travel lanes and is 10 feet wide.

Once the typical sections were identified, typical section alternatives were selected by segment.

Segment 1

To minimize impacts to the conservation easements both north and south of SR 46 within this segment (see Section 4.4.11), only the suburban typical sections are considered for Segment 1.

Segment 2

Segment 2 is the bridge typical section and is dependent on the typical section selected for Segment 3 as indicated below. The Bridge with Shared Use Path typical section is compatible with the suburban typical section and the Bridge without Shared Use Path is compatible with the rural typical section.

Segment 3

Both the rural and suburban typical sections are appropriate for use within Segment 3. Both typical sections are evaluated and vary between north and south widening to minimize impacts to both the natural, physical and social environments. These combinations of north and south widenings are known as the Rural Best Fit and Suburban Best Fit alternatives.

Segment 4

Only the urban typical section is analyzed for Segment 4 to minimize right-of-way acquisition to the commercial land uses in the downtown Geneva area.

Full Build Alternatives were developed from the alternative typical sections for each segment. The bridge with the shared use path is compatible with the Suburban Best Fit Alternative, and the bridge without the shared use path is compatible with the Rural Best Fit Alternative. The Segment 1 typical section alternatives are interchangeable and the Segment 4 typical section alternative works with either the Suburban or Rural Best Fit alternatives. Table 4.5 lists the potential Build Alternatives for the widening of SR 46.

Table 4.5 – Build Alternatives

Build Alternative	Segment 1	Segment 2	Segment 3	Segment 4
A	Suburban North	Bridge with Path	Suburban Best Fit	Urban
B	Suburban South	Bridge with Path	Suburban Best Fit	Urban
C	Suburban North	Bridge without Path	Rural Best Fit	Urban
D	Suburban South	Bridge Without Path	Rural Best Fit	Urban

4.4.2 Horizontal and Vertical Alignment

Horizontal Alignment

In general, the proposed horizontal alignment of the Build Alternatives follows the existing alignment of SR 46 as the existing horizontal geometry meets current FDOT standards (see Table 2.1, previously presented); however, there are constraints in each segment related to the

horizontal alignment. At the beginning of the project, SR 46 through SR 415 is being widened to the north (FPID 240216-2-52-01 – under construction as of April 2017)), so the Build Alternative must tie to the future roadway. In addition, the bridge over Lake Jesup/St. Johns River was built to the south of the original bridge and causeway with the intent that a similar bridge for future westbound lanes would follow the old bridge and causeway alignment. Therefore, any build alternative must tie in to the fixed alignments at SR 415 and the bridge over Lake Jesup/St. Johns River.

East of the bridge, the proposed Build Alternatives involve a combination of north and south widening. Transitions between north and south widenings are proposed through a series of reverse curves at normal crown (no superelevation). Locations of these reverse curves can be found on the Conceptual Design Plans in Appendix A.

Vertical Curves

The vertical geometry of the existing roadway is presented in Section 2.5. The Build Alternatives propose to maintain the existing vertical profile and existing pavement to the greatest practical extent; however, there are areas that may require reconstruction or overbuild to meet current design criteria.

There are a series of deflections at the beginning of Segment 1 (VPI numbers 1 through 4 in Table 2.2, previously presented) with changes in grade ranging between 0.6% and 0.7% designed as part of FPN 240216-2-52-01 for a design speed of 45 mph. VPI's 3 and 4 are located within the transition from the four lane section proposed as part of FPN 240216-2-52-01 to the existing roadway. The profile grade in this area can be adjusted through milling, resurfacing and overbuild to meet the criteria of a minimum grade change of 0.55% for a design speed of 55 mph.

There are five vertical curves (four crest, one sag and all are located within Segment 3), that do not meet FDOT standards for vertical curve length (see Table 5.6) for the proposed design speed. The profile grade at these curves can be adjusted through milling, resurfacing and overbuild to meet the minimum vertical curve length criteria.

Table 4.6 – Substandard Vertical Curve Lengths

VPI #	Station	Type	L (ft)	Design Speed (mph)	Roadway Segment
14	183+83.96	Crest	300	50	3
17	278+83.96	Crest	200	<50	3
20	320+83.96	Crest	300	50	3
22	356+83.96	Crest	300	50	3
23	365+83.96	Sag	200	50	3
24[1,2]	368+33.96	Crest	200	<50	4
25[1,2]	388+33.96	Crest	300	50	4

[1]These curves are below standard for the existing roadway's 60 mph design speed, but meet the proposed criterion for a 45 mph design speed

[2]Over former railroad grade

For the suburban typical section, a minimum longitudinal grade of 0.3% must be maintained to ensure proper drainage of the roadway. Table 5.7 lists the segments of SR 46 that do not meet this minimum grade criterion.

Table 4.7 – Longitudinal Grades below 0.3%

From Station	To Station	Number of VPIs between Stations	Length (ft)	Roadway Segment
30+46.96	93+55.43	1	6308.47	1
143+26.96[1]	240+83.96	3	9757	3
278+83.96[1]	312+33.96	1	3350	3
365+83.96[2]	368+33.96	0	250	4

[1]Only applicable to suburban best fit alternative
[2]Over former railroad grade

Since the areas of 0.00% existing grade occur along tangent sections of SR 46, corrections to the grades to meet the longitudinal grade criterion can be made through milling, resurfacing and overbuild rather than reconstruction to minimize construction costs.

4.4.3 Right-of-Way

All Build Alternatives will require additional right-of-way with the exception of the bridge and approaches. Specific right-of-way requirements for the roadway are listed in Table 4.8 by Build Alternative.

Table 4.8 – Roadway Right-of-Way Requirements

Build Alternative	Parcels Impacted	Potential Relocations	R/W Required (ac.)
A	61	0	29.73
B	70	2	30.38
C	82	2	55.14
D	91	2	55.79

Refined right-of-way requirements and cost estimates for the Recommended Alternative are provided in Section 6.0 – Alternative Alignment Analysis and specific details regarding proposed right-of-way for the Recommended Alternative can be found in the Conceptual Design Plans provided in Appendix A.

4.4.4 Estimated Costs

Table 4.9 lists initial preliminary construction costs by segment from FDOT's Long Range Estimate (LRE) system. Refined costs for the Recommended Alternative are provided in Section 5.0 – Alternative Alignment Analysis.

Table 4.9 – Long Range Estimate

Sequence #	Description	Estimated Cost
1	Segment 1 – Suburban South	$6,639,000
2	Segment 1 – Suburban North	$6,639,000
3	Segment 2 – Bridge with Shared Use Path	$22,581,000
4	Segment 2 – Bridge without Shared Use Path	$17,878,000
5	Segment 3 – Suburban Best Fit	$15,854,000
6	Segment 3 – Rural Best Fit	$8,990,000
7	Segment 4 – Urban Centered	$2,686,000

Table 4.10 lists the estimated project costs for the four Build Alternatives.

Table 4.10 – Estimated Construction Costs

Element	Alternative			
	A	B	C	D
Estimated Construction Costs	$47,760,000	$47,760,000	$36,193,000	$36,193,000
Contingencies (20%)	$9,552,000	$9,552,000	$7,238,600	$7,238,600
MOT (10%)	$4,776,000	$4,776,000	$3,619,300	$3,619,300
Mobilization (10%)	$4,776,000	$4,776,000	$3,619,300	$3,619,300
Total	$66,864,000	$66,864,000	$50,670,200	$50,670,200

The estimated project costs presented in Table 4.10 do not include design, utility relocations or environmental mitigation.

4.4.5 Preliminary Drainage and Pond Siting

SR 46 is located within the jurisdiction of SJRWMD. The project limits lie within the Middle St. Johns River Basin of which Lake Jesup is a tributary. The Middle St. Johns River Basin is considered an open basin that discharges to the St. Johns River, which is not designated as an OFW. FDEP has adopted TMDLs for both nitrogen and phosphorus for any basin discharging to the St. Johns River above Lake Monroe, Lake Jesup near St. Johns River, and the St. Johns River above Lake Jesup. Also, 100-year floodplains are found within the project limits with the majority being located around the bridge over Lake Jesup.

To determine feasible pond locations, the following procedures were used:

- Establish sub-basins and determine existing outfall locations. The majority of the sub-basins have been divided between existing cross drains.
- Soil conditions and geotechnical subsurface ground water elevations were evaluated to determine the type of stormwater treatment facility (i.e. wet or dry pond). The estimated seasonal high water table (ESWHT) elevations were established based on the preliminary roadway soil survey, permitted conditions for existing Pond(s) 1 & 2 (Bridge Replacement project; SJRWMD Permit No. 40-117-95925-5), and permitted conditions for existing Pond 101 (Sterling Meadows Subdivision; SJRWMD permit No. 4-117-5166-2). The bottom elevations for all dry ponds were set at a minimum of 18” above the ESHWT elevation.

- Existing ground elevations were determined by using Seminole County GIS LiDAR Data, one foot contours.
- Based on SJRWMD, water quality (treatment) and water quantity (attenuation) criteria were determined.
- All ponds were sized with the capacity to retain the required treatment volume plus the Post-Pre attenuation volume (25 year / 24 hour) with one-foot of freeboard to the inside berm elevation.
- Hydraulic Grade Line (HGL) elevations were compared to roadway elevations in each basin to develop the allowable pond stages. The estimated storm sewer tailwater elevation was assumed to be the pond stage at the three year / 24 hour Post-Pre attenuation volume (closed system) plus the required treatment volume.
- The FDOT Critical Storm of 100 year / 72 hour, for open basins, was used to determine the required Post-Pre attenuation volume in basins where there has been record of flooding. This applies to Basin C & D.
- 100-year floodplain impacts will be compensated by Floodplain Compensation Pond(s) 1 & 2 and roadside ditches. Floodplain compensation will be based on any cut volume between the 100-year floodplain elevation and the ESHWT elevation at each pond and ditch location.
- Post-development TMDLs will be equal to or less than pre-development TMDLs for all basins discharging to the St. Johns River above Lake Monroe, Lake Jesup near St. Johns River, the St. Johns River above Lake Jesup, and the St. Johns River above Lake Harney.

All wet ponds were sized with a 15.0-foot maintenance berm (1:15 or flatter). Side slopes of 1:4 to two feet below the seasonal high water table, and then a 1:2 slope to the proposed pond bottom. All dry ponds were sized with a 15.0-foot maintenance berm (1:15 or flatter) and side slopes of 1:4 to the proposed pond bottom.

Following is the proposed drainage design, by segment:

Segment 1

The storm sewer system will be designed to collect stormwater runoff from the new lanes by a series of curb and gutter inlets and convey it to proposed Pond A for both proposed typical sections. If SR 46 is widened to the north, existing Pond 1 will be impacted; therefore, the pond will be modified to accommodate the reduction in treatment volume within this pond. Also, Floodplain Compensation Pond 1 is proposed within this segment to compensate for 100-year floodplain impacts. The ponds have been designed to provide water quality, quantity and compensation for any loss of floodplain volumes.

Segment 2

Both existing Pond 1 and Pond 2 will be modified to provide additional treatment and attenuation of stormwater runoff from the new parallel bridge. The basin limits for existing Pond 1 and Pond 2 will remain the same as delineated in the bridge replacement project. The Pond 1 storm sewer system will be designed to collect stormwater runoff from Station 75+40 to the high point of the new and existing bridge by a series of curb and gutter inlets. The Pond 2 storm sewer system will be designed to collect stormwater runoff from the high point of the new and existing bridge to Station 158+15 by a series of bridge scuppers and curb and gutter inlets with a suburban typical section in Segment 3. Shoulder gutter inlets and ditch bottom inlets will replace the curb and gutter inlets with a rural typical section in Segment 3. Also, 100-year floodplain impacts within this segment will be compensated by Floodplain Compensation Pond 1, and Floodplain Compensation Pond 2 located in Segment 3.

Segment 3

With the suburban typical section, stormwater runoff will be treated and attenuated by modified existing Pond 2 and proposed Pond(s) B through G. The storm sewer system will be designed to collect stormwater runoff from the new lanes by a series of curb and gutter inlets and convey it to the proposed Ponds within this segment.

With the rural typical section, roadside treatment swales will replace proposed Pond(s) E through G. Also, the curb and gutter inlets proposed for the storm sewer system will be replaced with ditch bottom inlets for conveyance. In addition, 100-year floodplain impacts within this segment will be compensated by Floodplain Compensation Pond 2 and proposed ditches.

Segment 4

The Segment 4 storm sewer system will be designed to collect stormwater runoff from the new lanes by a series of curb and gutter inlets and convey it to proposed Pond H.

Alternative pond sites have been identified along the project limits. The locations of all alternative ponds are shown in Appendix G of the *Pond Siting Report* (April 2014). Pond sizing calculations can also be found in the *Pond Siting Report* (April 2014). The analysis estimates right-of-way needs using volumetric analysis, which accounts for water quality treatment and water quantity for runoff attenuation. The pond recommendations were based on pond sizes and locations determined from preliminary calculations, reasonable engineering judgment, and assumptions. Pond sizes and locations may change during the final design as more detailed information on ESHWT elevations, wetland normal pool elevations, final roadway profile design, and confirmed TMDL requirements, etc. become available.

Table 4.11 shows the summary of pond recommendations that are reflected in the Conceptual Design Plans in Appendix A.

Table 4.11 – Summary of Pond Recommendations

Basin	Preferred Pond Alternative
A	A1
B	B1
C	C1
D	D1
E	E2
F	F2
G	G2
H	H1
1	Modify Pond 1
2	Modify Pond 2
Floodplain No. 1	FPC 1
	FPC 2

4.4.6 Utilities and Railroads

Overhead electric lines within Segments 1 and 3 will be impacted regardless of the Build Alternative selected. In Segment 1, both the FPL distribution and transmission line will need to be relocated with either alternative; however, the impacts will be substantially less with the Suburban – Widen South typical section. For the Suburban – Widen North alternative, the transmission and distribution lines, which are spaced approximately 350 feet apart, will be impacted between approximately Stations 18+50 (the end of the adjacent widening project) to Station 90+00, a distance of 7,150 feet (approximately 20 poles). The Suburban – Widen South alternative will impact the overhead electric between approximately Station 75+50 and Station 90+00, a distance of 1,450 feet (approximately five poles).

In Segment 3, overhead electric distribution is located along the north side of the roadway from the bridge to Cochran Road where they cross to the south side and continue through the end of the project. The Rural Best Fit alternative will impact every pole, which are spaced between approximately 300 and 400 feet apart since right-of-way will be acquired from both sides of the road. The Suburban Best Fit alternative, which only requires right-of-way acquisition from one side of the road, has fewer impacts to utilities than the Rural Best Fit. Overhead electric will be impacted with the Suburban Best Fit alternative between approximately Stations 144+00 and 174+00; Stations 191+00 and 238+00; Stations 261+00 and 302+00; and Stations 323+00 and 339+00, a total distance of 13,400 feet (approximately 46 poles).

There is potential involvement with the underground utilities throughout the project limits. Specific utility location and coordination must be performed during final design with the utility owners/agencies listed in Section 2.13, Table 2.7 related to the utilities listed in Table 2.8.

4.4.7 Traffic Control Concepts

A benefit of retaining the existing pavement in Segments 1, 2 and 3 is that traffic can be maintained on the existing roadway during the construction of the additional lanes. Special care must be taken in areas of crossovers to maintain one lane of traffic in each direction.

In Segment 4 the widening is centered on the existing centerline of the roadway. Traffic can be shifted to one side on temporary pavement while widening is performed on the other side. Traffic can then be shifted again while the widening is complete. All maintenance of traffic must be performed in accordance with Index 600 of FDOT's *Design Standards* (2017).

4.4.8 Bicycle and Pedestrian Accommodations

Each of the alternative typical sections provides accommodations for bicyclists. The rural typical section includes five-foot paved outside shoulders that will serve as undesignated bicycle lanes. The bridge typical section that is paired with the rural typical section has 10-foot outside shoulders that bicyclists may share. There are no separate facilities for pedestrians or bicyclists proposed as part of this bridge typical section.

The suburban typical section includes six and one half-foot outside shoulders that serve as bicycle lanes. In addition, the suburban typical section includes a 10-foot paved multi-use path on the north side of the roadway. This multi-use path is included on the bridge that is paired with the suburban typical section, where it is barrier separated from the travel lanes. The urban typical section provides buffered seven-foot designated bicycle lanes.

Pedestrians can be accommodated on sidewalks provided with the suburban and urban typical sections. In addition to the multi-use path proposed as part of the suburban typical section, a five-foot sidewalk will be provided along the south side of the road. There are accommodations to shift pedestrians from the south side of the roadway to the north side to direct them to the multi-use path proposed for the north side of the bridge. Details of the sidewalk proposed at the bridge approaches can be seen on the Conceptual Design Plans in Appendix A.

There are no pedestrian accommodations proposed as part of the rural typical section.

4.4.9 Multi-Modal Accommodations

There are no future plans for multimodal transportation (bus or rail) identified for this segment of SR 46. The Build Alternatives will not preclude any future multi-modal plans.

4.4.10 Access Management

Widening SR 46 from two to four lanes introduces a median to the roadway that does not exist today. Florida Administrative Rule Chapter 14-97 establishes the classifications for state highways and contains separation standards for access features by Access Class. SR 46 within the project limits is designated as Access Class 3. Roadways with this access classification are limited to one-half mile (2,640 feet) between full median openings and one-quarter mile (1,320 feet) between directional median openings. Signal spacing is limited to one-half mile (2,640 feet). Connection spacing is one-eighth mile (660 feet) for a posted speed greater than 45 mph and one-twelfth mile (440 feet) for a posted speed less than or equal to 45 mph. Table 4.12 identifies the preliminary access management plan for the Build Alternatives (the access management plan is identical within each Build Alternative).

The highlighted fields in Table 4.12 indicate which segments of SR 46 do not meet access management standards for a class 3 facility with the proposed improvements. While not meeting the standards assigned to a class 3 facility in Rule 14-97, the proposed median openings provide the best access and circulation for the community of Geneva. Seminole County will work with FDOT to secure variations. The access management plan as proposed will not impede the efficient movement of traffic along SR 46.

Table 4.12 – Access Management Plan

Approx. Station/Street	Proposed Opening	Proposed Spacing (ft)	±10%
0+00/SR 415	Full - Signal		
		2,150	N
21+50/Richmond Avenue	Full		
		7,200	Y
93+50/Old Geneva Road	Full		
		5,525	Y
148+75/Swamp Lane	Full		
		2,425	Y
173+00/Osceola Road	Full		
		5,050	Y
223+50/Mullet Lake Park Road	Full		
		3,100 (EB) 3,400 (WB)	Y
254+50/Torren Point (EB) 257+50/Lake Jesup Groves (WB)	Directional		
		2,000 (EB) 1,700 (WB)	Y
274+50/Mockingbird Lane	Full		
		4,625	Y
320+75/Ridge Road	Full		
		1,825	Y
339+00/Cochran Road	Directional		
		950	N
348+50/Avenue C	Full		
		1,650	N
365+00/Seminole County Fire Station #42	Full – Emergency Signal		
		1,075 (EB) 1,500 (WB)	N (EB) Y (WB)
375+75/Oak Street (EB) 380+00/Geneva Church of the Nazarene (WB)	Directional		
		1,325 (EB) 900 (WB)	Y (EB) N (WB)
389+00/CR 426	Full		

4.4.11 Engineering Evaluation of Environmental Impacts

Natural Environment

Wetlands

The widening of SR 46 and the replacement of the bridge over Lake Jesup have been the subject of numerous studies since 1995. In 2002, FDOT initiated the SR 46 Lake Jesup Bridge Replacement PD&E study. The PD&E study involved the evaluation of potential impacts associated with replacing the existing SR 46 bridge over Lake Jesup/St. Johns River. The PD&E study was completed in 2003 and the project moved forward into design and permitting, followed by right-of-way acquisition, and construction. The SR 46 Lake Jesup Bridge Replacement construction project was initiated in December 2007 and completed in June 2009. During the construction, the aging and obsolete bridge and causeway was removed. The new bridge was constructed to span the entire lake/river area and eliminate the need for a causeway. As part of the wetland mitigation plan for this project, Channel B (oxbow channel) was excavated to one-foot National Geodetic Vertical Datum (NGVD) 1929 within the limits of the FDOT right-of-way. The mitigation plan also included the causeway removal, the removal of the adjacent fish camps, wetland restoration and enhancement and preservation of the adjacent marsh habitat. The U.S. Army Corps of Engineers (USACE), in partnership with the St. Johns River Water Management District (SJRWMD) and FDOT, began a study in 2001 to explore the issue of the restricted hydrologic connection between Lake Jesup and the St. Johns River. The USACE report was prepared under the authority of the Lake Jesup Continuing Authorities Program (CAP) Section 1135 of the 1986 Water Resources Development Act (WRDA), as amended. Section 1135 involves the modification of existing USACE projects and operations to improve the quality of the environment. The USACE distributed a Final Ecosystem Restoration Report (ERR) in April 2012. The report recommended no further federal action was warranted due to the fact that the hydrologic modeling did not demonstrate that the decline of water quality within Lake Jesup was a result of USACE's bypass canal known as "Government Cut".

Lake Jesup is a Class III waterbody with a surface area totaling approximately 10,660 acres and drains a watershed of approximately 87,331 acres to the St. Johns River, which is located on the northeast side of the Middle St. Johns Basin. A majority of the watershed occurs within Seminole County, but a small portion extends into Orange County. The lake was verified by the FDEP as impaired for nutrients and unionized ammonia due to elevated annual average Trophic State Index (TSI) values and exceedances of the unionized ammonia criterion and was included on the Verified List of impaired waters for the Middle St. Johns Basin that was adopted by Secretarial Order on May 27, 2004. The TMDL report for nutrients and unionized ammonia for Lake Jesup (including Lake Jesup outlet) was completed in 2006.

Heath Spring is located within the eastern portion of the study corridor and approximately 1 mile northwest of Geneva, Florida (approximately Sta. 330+00 on the Conceptual Design Plans in Appendix A). Heath Spring is composed of several seeps in a steep sand slope on the southeast edge of a large sinkhole. The spring is located approximately 200 feet north of the existing right-of-way within private property.

There are two large tracts that are under recorded conservation easements located immediately adjacent to SR 46; these include the Rolf Bergmann Mitigation Tract and the North Lake Jesup Tract of the Lake Jesup Conservation Area (formerly known as the Futch Property). The Rolf Bergmann Mitigation Tract is located on the north side of SR 46 and is a private mitigation bank. The North Lake Jesup Tract is located on the south side of SR 46 and is publicly owned. Both tracts are west of the Lake Jesup Bridge. The Rolf Bergmann Mitigation Tract has been recognized as being of "regional ecological significance" due to its geophysical location and hydrologic importance to the St. Johns River as well as the Lake Jesup watershed and floodplains. The eleven recorded conservation easements within the project are detailed in the *Natural Resources Evaluation (NRE)* dated June 2017.

The wetland mitigation conducted to offset the unavoidable wetland impacts associated with the Lake Jesup Bridge Replacement project is located within the project study area (SJRWMD Permit No. 4-117-95925-1). The mitigation included wetland restoration and enhancement activities associated with the excavation of uplands within the adjacent fish camps, the enhancement of marsh systems impacted by the previously dredged boat basins, and the removal of the existing bridge causeway. The mitigation areas are within the existing right-of-way and within areas north of the existing Lake Jesup Bridge, which are located outside of the existing right-of-way.

Forty-one wetland and 59 other surface waters (OSW) were identified within 200 feet of the centerline of the roadway. Existing wetlands presented on aerial photographs and details regarding direct and indirect impacts to each wetland and OSW by alternative are detailed in the *NRE* (June 2017).

Table 4.13 lists the wetland and OSW impact areas (wetland cut ditches and upland cut ditches) by alternative.

Table 4.13 – Wetland Impacts

Build Alternative	Direct Wetland Impacts (ac.)	Secondary Wetland Impacts[1] (ac.)	Wetland Cut Ditch Impacts (ac.)	Upland Cut Ditch Impacts (ac.)	Bridge Shading Impact (ac.)	Conservation Easement Impact (ac.)
A	23.30	8.59	2.40	5.91	4.26	14.76
B	26.43	9.89	1.33	5.93	4.26	17.59
C	25.45	5.95	2.18	5.83	4.26	14.76
D	28.57	7.25	1.11	5.85	4.26	17.59

[1]Secondary wetland impacts occur to wetlands remainders within 25 feet of direct impacts.

Although Alternatives A and C have lower wetland impacts than Alternatives B and D, Alternatives B and D do not impact the Rolf Bergmann Mitigation Tract located north of SR 46 west of the bridge.

Functional losses from direct and secondary impacts will be offset through the appropriate mitigation. Cumulative wetland impacts are not anticipated when appropriate mitigation is provided within the same mitigation basin as defined by the SJRWMD. The proposed project is not anticipated to cause water quality impacts based on the storm water design guidelines to be implemented.

Wildlife and Habitat

Project biologists performed reviews of available databases and literature and conducted pedestrian wildlife surveys in February and March, 2012. A species specific survey for the crested caracara was conducted between January and April 2015. The field surveys conducted for the PD&E Study revealed occurrences of wading birds, eagles, osprey and other raptors, small passerine birds and amphibians in the area. Evidence of deer and wild hogs was also clearly marked as was evidence of mesomammals (e.g. raccoons, opossums). While portions of the study area have clearly been impacted by human activity, substantial portions of natural areas as well as agricultural and ruderal lands remain providing habitat to numerous wild and human habituated species. Reported occurrences of protected species and critical habitat are presented in Figure 5.9. Bear nuisance incident reports from 1980 to 2011 are also shown in Figure 4.10. Additional details regarding wildlife and habitat can be found in the *NRE* (June 2017).

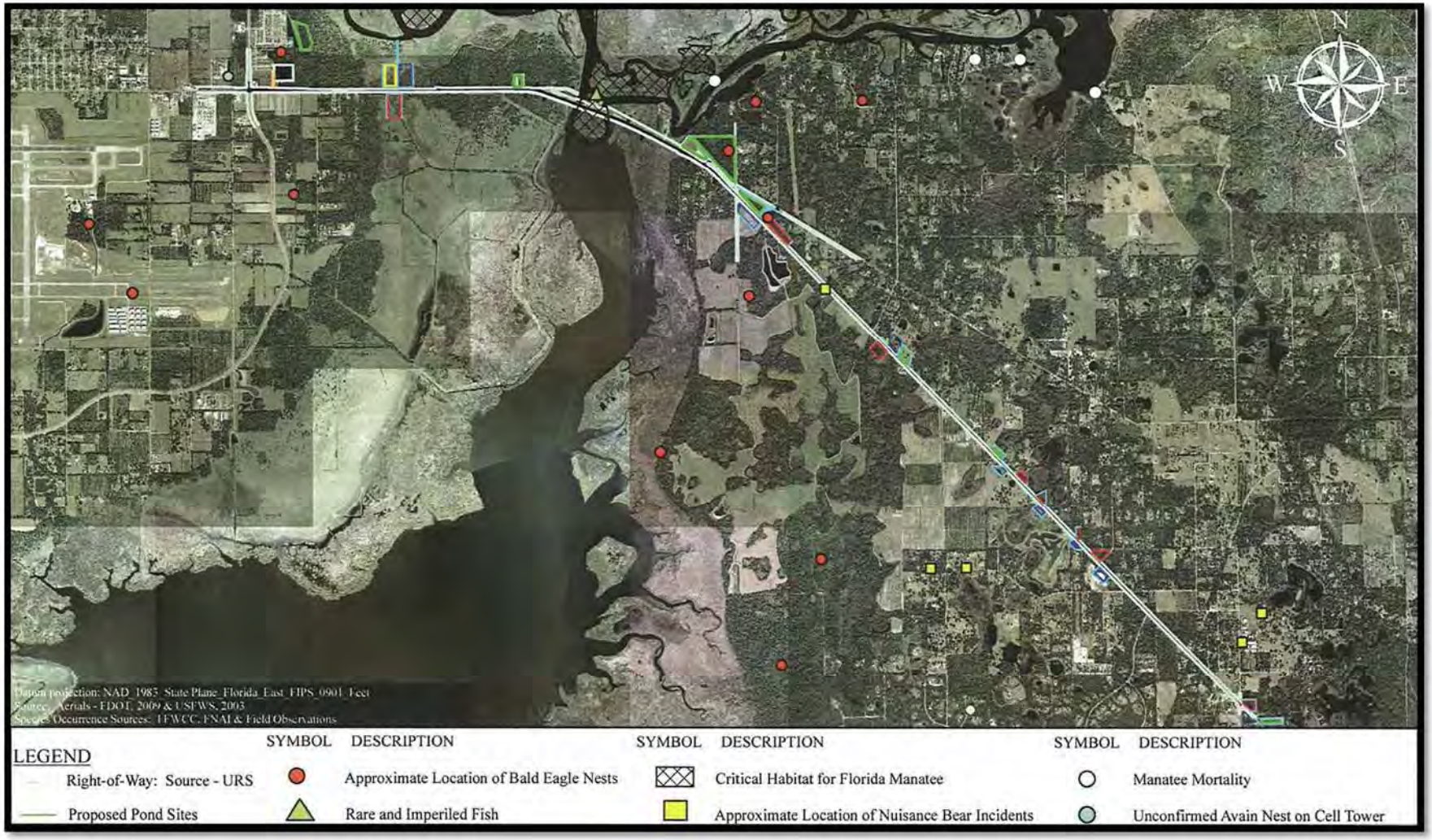
The FWC bald eagle nest database provides a source of information statewide regarding nest identification numbers, nest locations, and status of nest activities within the past five years. Reported nest locations are accurate to within one-tenth of a mile. Four nests have been reported within one-half mile of the project. These nests are SE 034, SE 036, SE 051, and SE 082 (Figure 4, Appendices 1 & 2 in Part A of the *NRE* (June 2017)).

Nest SE 034 - Nest SE 034 is located about 2,100 feet southwest of SR 46 within the City of Sanford Water Reclamation Facility and will not be impacted by this project.

Nest SE 036 - The nearest active eagle nest, SE 036, is located approximately 100 feet northeast of the maintained SR 46 right-of-way, opposite the entrance to the City of Sanford Water Reclamation Facility. The last FWC eagle nest survey (2015) documented that this nest was active. In 2016, project biologists verified this nest as still active.

Nest SE 051 - According to the FFWCC eagle nest database, the location of SE 051 is approximately 350 feet west of a proposed compensating storage pond (FPC 1). The FWC database documents that the nest has been inactive since 2008. Aerial photographs indicate that the location of this eagle nest is within a residential subdivision that was constructed in 2009. Project biologists verified that this nest was no longer present in 2016. Residents of the Sterling Meadows subdivision reported (in 2012) that a pair of eagles had successfully nested in a nearby cell tower located approximately 2,300 feet southwest of SE 051. It has not been confirmed whether eagles or osprey are using this new nest. However, the project does not propose any construction activity within 660 feet of this nest.

Figure 4.10 – Protected Species Occurrence



Nest SE 082 - Nest SE 082 is located approximately 2,500 feet northeast of the SR 46 right-of-way. The last FFWCC eagle nest survey within this County (2015) documented that this nest was active. This project does not propose any construction activity within 660 feet of this nest.

Undocumented eagle nest - Field reviews of the project area during the PD&E Study (2012-2013) determined that an eagle nest was located approximately 850 feet northeast of the SR 46 right-of-way within the boundary of a proposed compensating storage pond (FCP 2). In 2015 and 2016, additional field reviews were conducted to determine the exact location of this nest; however, the nest could not be located either year. It is therefore assumed that this nest no longer exists.

Although no longer listed as a threatened species by either state or federal agencies, the bald eagle is protected under the Migratory Bird Treaty Act of 1917 and the Bald and Golden Eagle Protection Act of 1940. The National Bald Eagle Management Guidelines (May 2007) provide guidance for human-eagle interaction and are consistent with the USFWS clearance letter of June 5, 2006 which states that projects that are greater than 660 feet from an active eagle nest tree do not need to contact USFWS.

The proposed project may cause a disturbance to eagle nest SE 036 due to the proximity of the proposed roadway improvements and the realignment of Osceola Road. However, because the design phase of this project is not scheduled until 2021 and this corridor has a large regional population of eagles, it is likely that conditions could change in the next four (4) years. As such, it is too early to determine whether this project will affect the bald eagle. FDOT will perform additional surveys for eagle nests and agency coordination during the design phase of the project to ascertain whether a federal disturbance permit will be necessary.

Table 4.14 summarizes the anticipated effect of the proposed improvements upon protected species identified as potentially occurring within the project area. There are no “may effect” determinations proposed for either of the 29 protected animal species identified as occurring or potentially occurring within the project area.

There appears to be no criteria-based preference for the alternative selection with respect to wildlife. The potential wildlife impacts identified in the ESBA study are common to all the build alternatives. Ubiquitous and marginally protected (non-listed) wildlife species utilize the natural and agricultural areas within and adjacent to the project corridor both seasonally and year long.

FDOT received correspondence from USFWS on May 29, 2014 concurring with the effects determination for the Florida manatee, Florida scrub-jay and sand skink. USFWS requests that consultation be reinitiated prior to construction to complete their analysis of the project’s effects on listed species and to complete consultation on the project. A copy of the letter in response to the *Draft Endangered Species Biological Assessment* (March 2014) is located in Appendix D.

The FDOT submitted a revised Natural Resources Evaluation (June 2017) to USFWS on July 12, 2017. On August 10, 2017, USFWS provided a letter of concurrence (located in Appendix D)

agreeing with FDOT's finding of "may affect, not likely to adversely affect" for Audubon's crested caracara, wood stork and eastern indigo snake.

Table 4.14 – Protected Species Determination of Effect

Determination of Effect	Federally/State Protected Species
"may affect, not likely to adversely affect"	Florida manatee
	crested caracara
	bald eagle
	wood stork
	Eastern indigo snake
"no effect"	Florida panther
	Florida scrub jay
	red-cockaded woodpecker
	snail kite
	sand skink
	Atlantic sturgeon
	Species Only Protected by the State
"may affect, not likely to adversely affect"	Sherman's fox squirrel
	Florida black bear
	little blue heron
	tricolored heron
	Florida sandhill crane
	osprey
	gopher tortoise
	short-tailed snake
	Florida pine snake
"no effect"	Florida burrowing owl
	southeastern American kestrel
	roseate spoonbill
	bluenose shiner

Floodplains

SR 46 crosses several floodplain areas longitudinally. Floodplain locations were determined using the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Seminole County, Florida and incorporated areas. The following Community-Panel Numbers were used in reference:

- 12117C0090F
- 12117C0095F
- 12177C0185F
- 12117C0205F

FEMA FIRM identified three floodplain zones present within the limits of this project. These zones are defined as follows:

- Zone AE – Base flood elevation determined (Elev. 9.0 feet, NAVD)
- Zone AE – Base flood elevation determined (Elev. 29.0 feet , NAVD)
- Zone A – No base flood elevation determined

Effective dates of these panels are September 28, 2007 (See Figure 4.11 at the end of this section).
SR 46 within the limits of this project was constructed on fill and according to available information it appears that the highway is above the 100-year floodplain. An evaluation of 100-year floodplain conditions for this project has been performed to determine the impacts from the embankment required for the proposed widening and proposed ponds. By superimposing the FEMA FIRM maps onto the preferred roadway build alternative, the 100-year floodplain encroachment locations have been determined.

The 100-year floodplain impacts and compensation analysis were based on the Recommended Alternative and preferred stormwater treatment ponds. Conceptual design of the proposed improvements was optimized to avoid wetland and floodplain areas wherever feasible; therefore, floodplain impacts did not drive the selection of a Recommended Alternative. The analysis identified five floodplain boundary encroachments within the project limits. The following provides details regarding floodplain impact locations, conditions, and the method used for floodplain calculations are discussed below.

Floodplain No. 1

According to the FEMA FIRM maps, the limits of Floodplain No. 1 begin at STA 30+32 and end at STA 142+84. This floodplain is classified as Zone AE, where the base floodplain elevation has been determined to be 9.0 feet NAVD. The roadway embankment required for the proposed widening of SR 46, construction of the new bridge and proposed ponds will result in impacts to this floodplain. Floodplain impacts will be based on any fill volume above the ESHWT elevation or natural ground, whichever is higher, to the 100-year floodplain elevation.

To quantify volumetric floodplain impacts due to the proposed widening of SR 46, preliminary roadway cross sections were developed for the proposed Suburban Typical Section (widen south and best fit). LiDAR data for Seminole County was used to determine existing ground conditions. Estimated seasonal high water table (ESHWT) elevations from the Bridge Replacement project were used to establish ground water conditions from STA 77+00 to STA 148+00. The Bridge Replacement project datum is NGVD, therefore a conversion factor of one foot has been used to convert from NGVD to NAVD, with NAVD elevations being lower. From STA 22+00 to STA 30+00, a conservative approach will be used to define volumetric floodplain impacts as any fill above the existing ground elevation to the 100-year floodplain elevation. From STA 31+00 to STA 76+00, the ESHWT elevation will be based on the highest existing ground elevation on the north side of SR 46. This approach is conservative and consistent with typical ESHWT elevations that occur within wetlands as well as the preliminary pond boring taken for proposed Pond A.

Based on the preliminary roadway cross sections, floodplain impact (fill) area(s) were quantified per cross section and the average end method was used to determine the volumetric floodplain impacts due to the proposed widening of SR 46.

Floodplain impacts due to the construction of the new bridge are minimal and were not calculated as part of this floodplain analysis.

Floodplain impacts due to the construction of the ponds were determined by calculating the average fill height between the 100-year floodplain elevation and the ESHWT elevation per location. Then the pond area required to tie down the proposed pond berm elevation to the ESHWT elevation was determined. In some cases only a portion of the pond is within the floodplain boundary. In these cases, only those areas were measured to determine the floodplain impacts. To determine the volumetric floodplain impact created by the pond berms, the impact area(s) were multiplied by the average fill height.

Floodplain compensation for Floodplain No. 1 will be achieved by the construction of Floodplain Compensation Pond(s) 1 and 2. Floodplain compensation will be based on any cut volume between the 100-year floodplain elevation and the ESHWT elevation at each pond location.

Floodplain Compensation Pond 1 is located north of SR 46, adjacent to the Sterling Meadows subdivision. The geotechnical boring information from the Sterling Meadows subdivision Pond 101 (SJRWMD Permit No. 4-117-51666-2), was used to establish the ESHWT elevation for Floodplain Compensation Pond 1. The Sterling Meadows subdivision Pond 101 is located just west of proposed Floodplain Compensation Pond 1. The northeast corner of this pond creates minor floodplain impacts and has been calculated by the method described above.

Floodplain Compensation Pond 2 is located east of Lake Jesup and north of SR 46, adjacent to modified Pond 2. An estimate of 8.0 feet NAVD will be used as the ESHWT elevation within the proposed pond area for the floodplain compensation calculations. The northwest corner of this pond creates minor floodplain impacts and has been calculated by the method described above.

Table 4.15 summarizes the 100-year floodplain impacts and compensation associated with Floodplain No. 1. For detailed calculations of the values shown, please refer to the *Location Hydraulics Report* (February 2014). Floodplain impacts were only calculated for Preferred Ponds. Since the *Location Hydraulics Report* was accepted, the preferred pond for basin A has changed from Pond A3 to Pond A1; however, the similarity in size of the ponds and location in Floodplain No. 1 will result in a negligible change in potential floodplain impacts.

Table 4.15 – Impacts to Floodplain No. 1

Proposed Condition	Floodplain Impact Volume (ac-ft)	Floodplain Compensation Volume (ac-ft)
SR 46 Widening	29.17	NA
Floodplain Comp Pond 1	0.04	11.09
Pond A1	2.14	NA
Modified Pond 1	0.82	NA
Floodplain Comp Pond 2	0.08	24.27
Floodplain No. 1 Project Total:	**32.25**	**35.36**

Floodplain No. 2

According to the FEMA FIRM maps, the limits of Floodplain No. 2 begin at STA 199+59 and ends at STA 211+48 within the proposed right of way required for the proposed widening of SR 46. This floodplain is located on the north side of SR 46 and is classified as Zone A, where the base floodplain elevation has not been determined. In order to establish the 100-year floodplain elevation, the FEMA floodplain area was digitized and overlaid upon the one-foot LiDAR contours and compared to one another. Through this process, a preliminary estimate for the 100-year floodplain elevation was determined to be 16.5 feet NAVD. Due to the proximity and similar soil type, the ESWHT elevation from the preliminary pond boring for proposed Pond B will be used to establish the ESHWT elevation for Floodplain No. 2 calculations. According to LiDAR Data, the existing ground elevation at the boring is 15.0 feet NAVD, which puts the ESHWT elevation at 14.5 feet NAVD. The roadway embankment required for the proposed widening of SR 46 will result in impacts to this floodplain. Floodplain impacts will be based on any fill volume above the ESHWT elevation or natural ground, whichever is higher, to the 100-year floodplain elevation.

Floodplain compensation for Floodplain No. 2 will be achieved by the construction of roadside ditches. Floodplain compensation will be based on any cut volume between the 100-year floodplain elevation and the ESHWT elevation.

Table 5.16 summarizes the 100-year floodplain impacts and compensation associated with Floodplain No. 2. For detailed calculations of the values shown, please refer to the *Location Hydraulics Report*.

Table 4.16 – Impacts to Floodplain No. 2

Proposed Condition	Floodplain Impact Volume (ac-ft)	Floodplain Compensation Volume (ac-ft)
SR 46 Widening	0.69	0.69
Floodplain No. 2 Project Total:	**0.69**	**0.69**

Floodplain No. 3

According to the FEMA FIRM maps, the limits of Floodplain No. 3 begin at STA 198+77 and ends at STA 204+99 within the proposed right-of-way required for the proposed widening of SR 46. This floodplain is located on the south side of SR 46 and is classified as Zone A, where the base floodplain elevation has not been determined. In order to establish the 100-year floodplain elevation, the FEMA floodplain area was digitized and overlaid upon the one-foot LiDAR contours and compared to one another. Through this process, a preliminary estimate for the 100-year floodplain elevation was determined to be 16.5 feet NAVD. Due to the proximity and similar soil type, the ESWHT elevation from the preliminary pond boring for proposed Pond B will be used to establish the ESHWT elevation for Floodplain No. 3 calculations. According to LiDAR Data, the existing ground elevation at the boring is 15.0 feet NAVD, which puts the ESHWT elevation at 14.5 feet NAVD. The roadway embankment required for the proposed widening of SR 46 will result in impacts to this floodplain. Floodplain impacts will be based on

any fill volume above the ESHWT elevation or natural ground, whichever is higher, to the 100-year floodplain elevation.

Floodplain compensation for Floodplain No. 3 will be achieved by the construction of roadside ditches. Floodplain compensation will be based on any cut volume between the 100-year floodplain elevation and the ESHWT elevation.

Table 5.17 summarizes the 100-year floodplain impacts and compensation associated with Floodplain No. 3. For detailed calculations of the values shown, please refer to the *Location Hydraulics Report*.

Table 4.17 – Impacts to Floodplain No. 3

Proposed Condition	Floodplain Impact Volume (ac-ft)	Floodplain Compensation Volume (ac-ft)
SR 46 Widening	0.19	0.22
Floodplain No. 3 Project Total:	**0.19**	**0.22**

Floodplain No. 4

According to the FEMA FIRM maps, the limits of Floodplain No. 4 begin at STA 295+18 and ends at STA 313+10. This floodplain is located on the south side of SR 46 and is classified as Zone AE, where the base floodplain elevation has been determined to be 29.00 feet NAVD.

The existing roadway profile within this area ranges from 25 feet to 28.5 feet NAVD. The preliminary roadway cross sections with use of one-foot LiDAR contours for this area indicates an existing land berm contains the 100-year floodplain from encroaching into SR 46. The fact that there has been no record of flooding issues in this area would further reinforce this assumption.

During the design phase of this project, it would be prudent to gather additional survey data to define the limits of the existing land berm to ensure that the 100-year floodplain would not encroach into the proposed widening of SR 46. If any proposed improvements impact the existing land berm, replacement of the berm at an elevation higher than 29 feet NAVD will be required.

Floodplain No. 5

According to the FEMA FIRM maps, the limits of Floodplain No. 5 begin at STA 295+35 and ends at STA 296+32 within the proposed right-of-way required for the proposed widening of SR 46. This floodplain is located on the north side of SR 46 and is classified as Zone A, where the base floodplain elevation has not been determined. In order to establish the 100-year floodplain elevation, the FEMA floodplain area was digitized and overlaid upon the one-foot LiDAR contours and compared to one another. Through this process, a preliminary estimate for the 100-year floodplain elevation was determined to be 22.5 feet NAVD.

The limits of Floodplain No. 5 only encroach into the proposed 10-foot shared-use path on the north side of the roadway. Since this encroachment area is so minor, during the design phase of this project the horizontal and vertical placement of the proposed 10-foot shared-use path should be adjusted to avoid any impacts to Floodplain No. 5.

Cultural Resources

The cultural resource assessment survey (CRAS) for the SR 46 PD&E Study resulted in the identification of three archaeological sites (8SE1145, 8SE1788, and 8SE2757) and two archaeological occurrences. Site 8SE1788 had previously been evaluated by the State Historic Preservation Office (SHPO) to be ineligible for listing in the National Register of Historic Places (NRHP) and no change in status is recommended. The portions of 8SE1145 and 8SE2757 within the project Area of Potential Effect (APE) are not considered significant and are not eligible for listing in the NRHP.

The historic resources survey resulted in the identification of 13 historic resources located within the project APE. The identified historic resources include 12 buildings (8SE2190, 8SE2759-8SE2769) and one road (8SE1953). One historic resource (8SE2190) was previously determined ineligible for listing in the NRHP by SHPO on March 23, 2006.

The 11 newly recorded historic buildings (8SE2759-8SE2769) represent common architectural styles and many exhibit non-historic exterior alterations. These modifications obscured the buildings' original appearance and compromised the historic integrity needed to convey architectural or historical significance. For this reason, the commonness of the resource types, and the lack of historical associations with significant events or persons, these buildings are considered ineligible for listing in the NRHP on an individual basis. In addition, these resources are not located in contiguous areas of historic resources and are not eligible for listing in the NRHP as a historic district.

SR 46 (8SE1953) continues to serve its historic function as a transportation corridor. However, the road has undergone several non-historic improvements to meet modern transportation needs. SR 46 exhibits common modern road materials and is of common design. It does not retain any trace of historic materials, configuration, or character. A portion of SR 46 outside of the current project APE was determined ineligible for listing in the NRHP by SHPO on June 27, 2007. Therefore, SR 46 (8SE1953) within the current project APE is considered ineligible for listing in the NRHP individually or as part of a historic district.

Additional details regarding cultural resources can be found in the *Cultural Resource Assessment Survey for the SR 46 PD&E Study* (January 2014). FDOT received concurrence from SHPO on April 22, 2014. The concurrence letter is included in Appendix E.

Figure 4.11– FEMA FIRM (1 of 5)

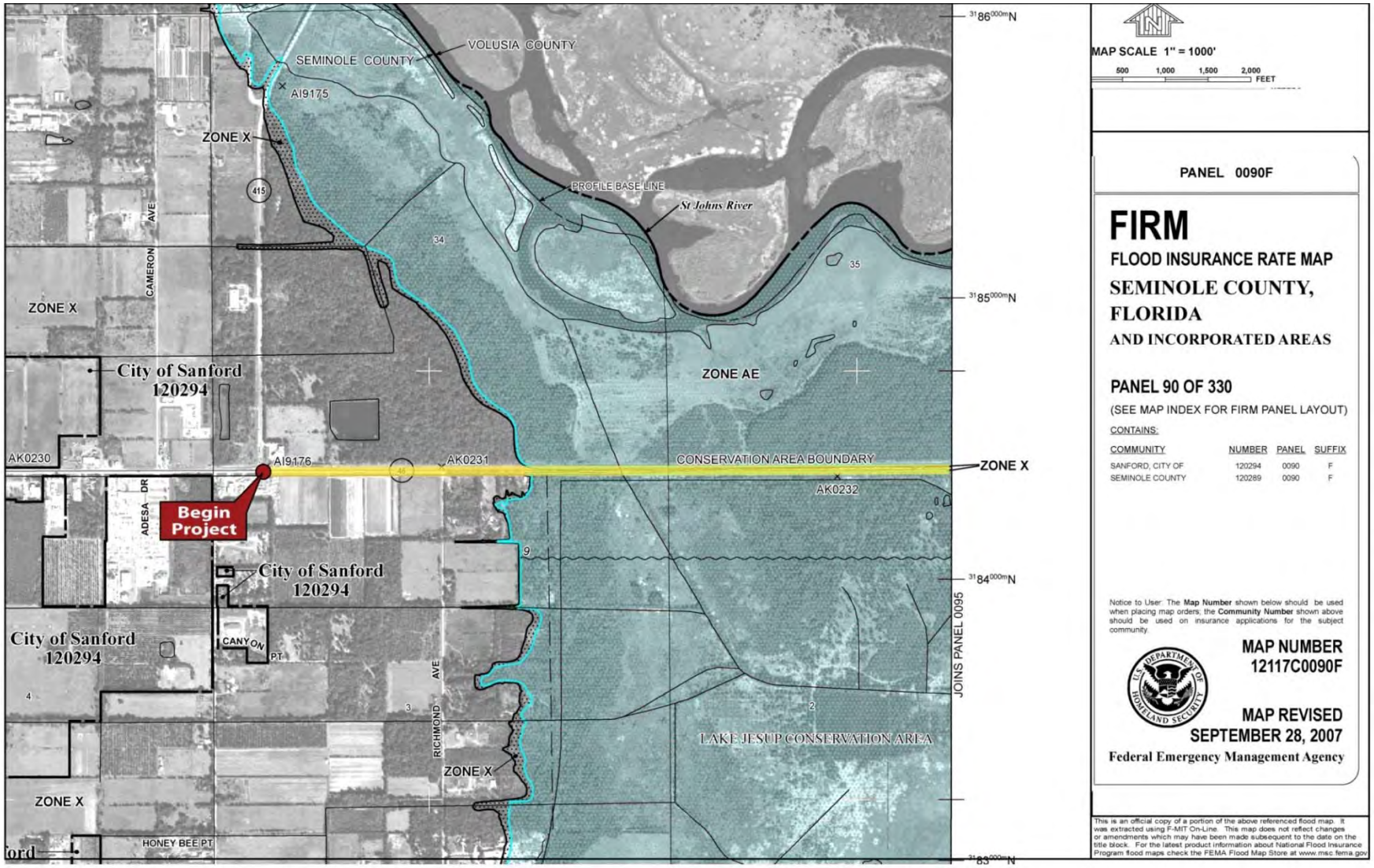


Figure 4.12 – FEMA FIRM (2 of 5)

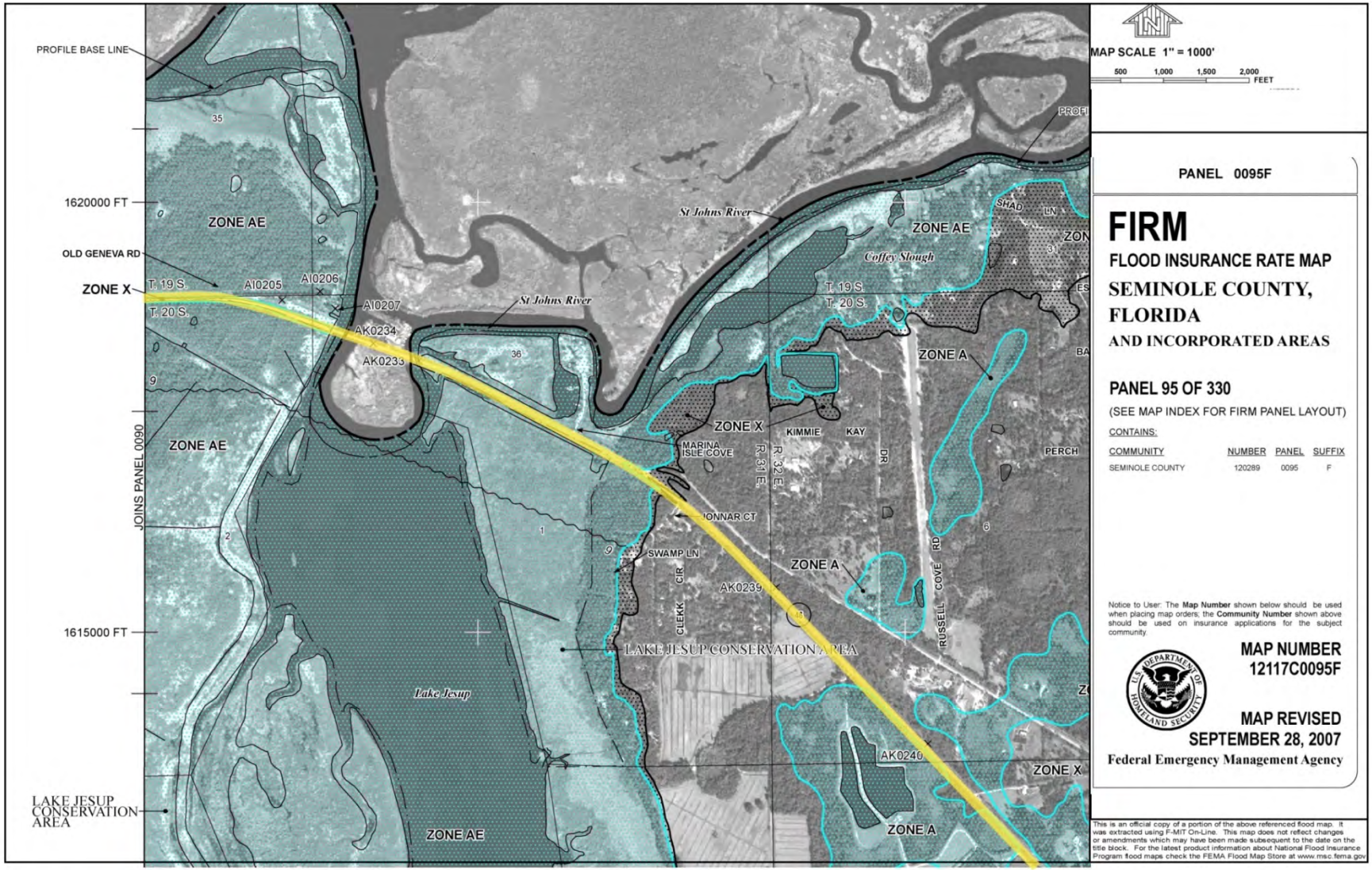


Figure 4.13 – FEMA FIRM (3 of 5)

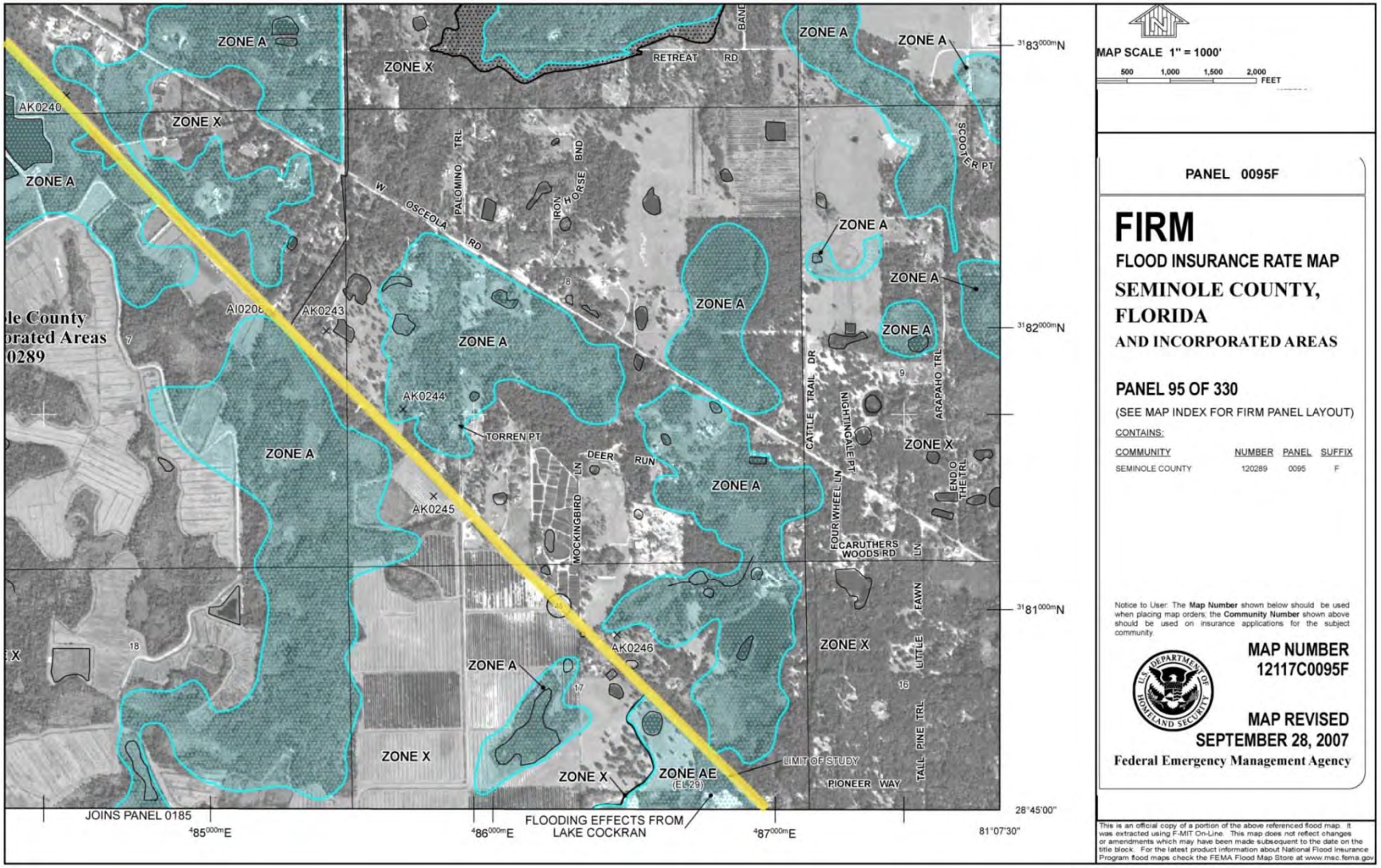


Figure 4.14 – FEMA FIRM (4 of 5)

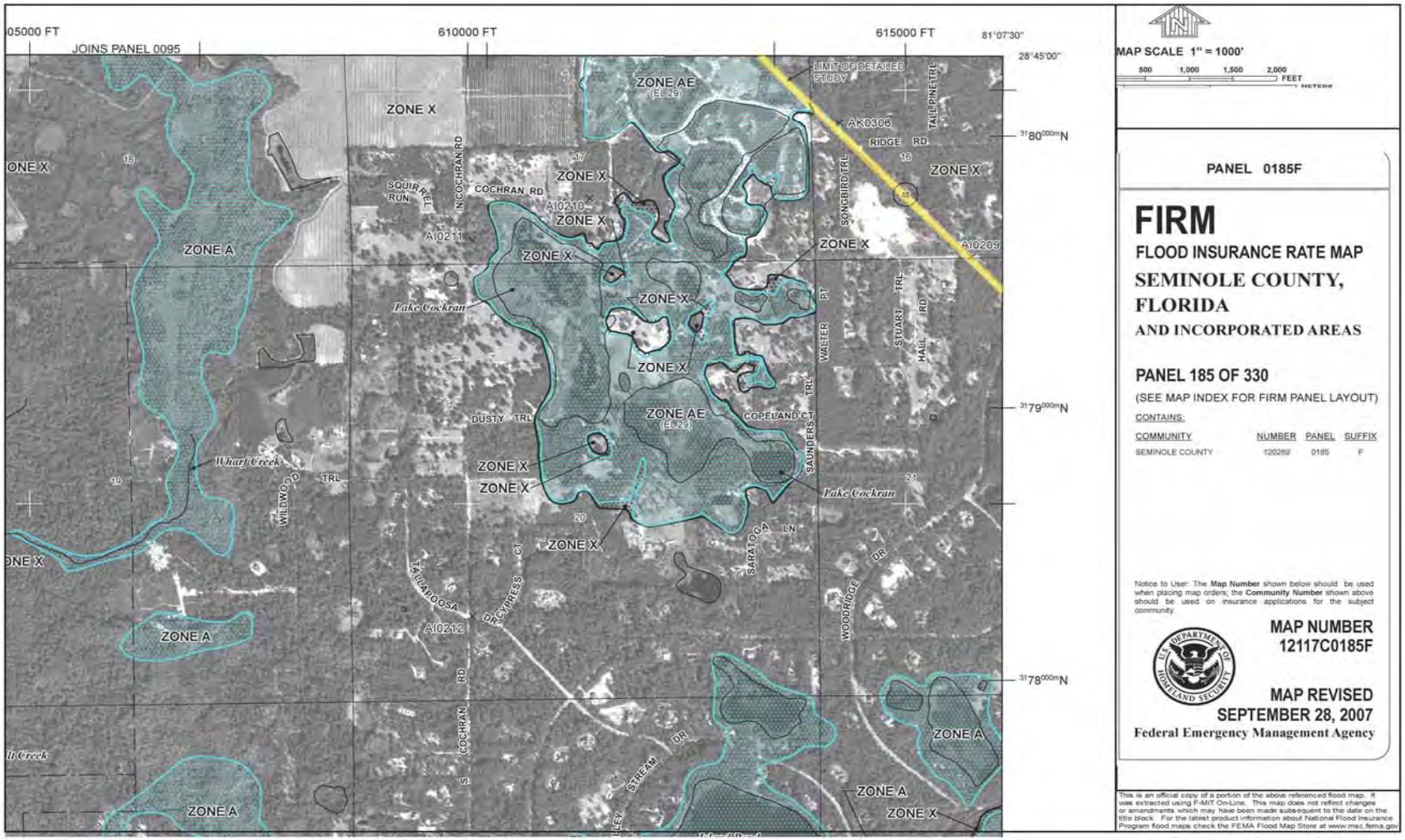
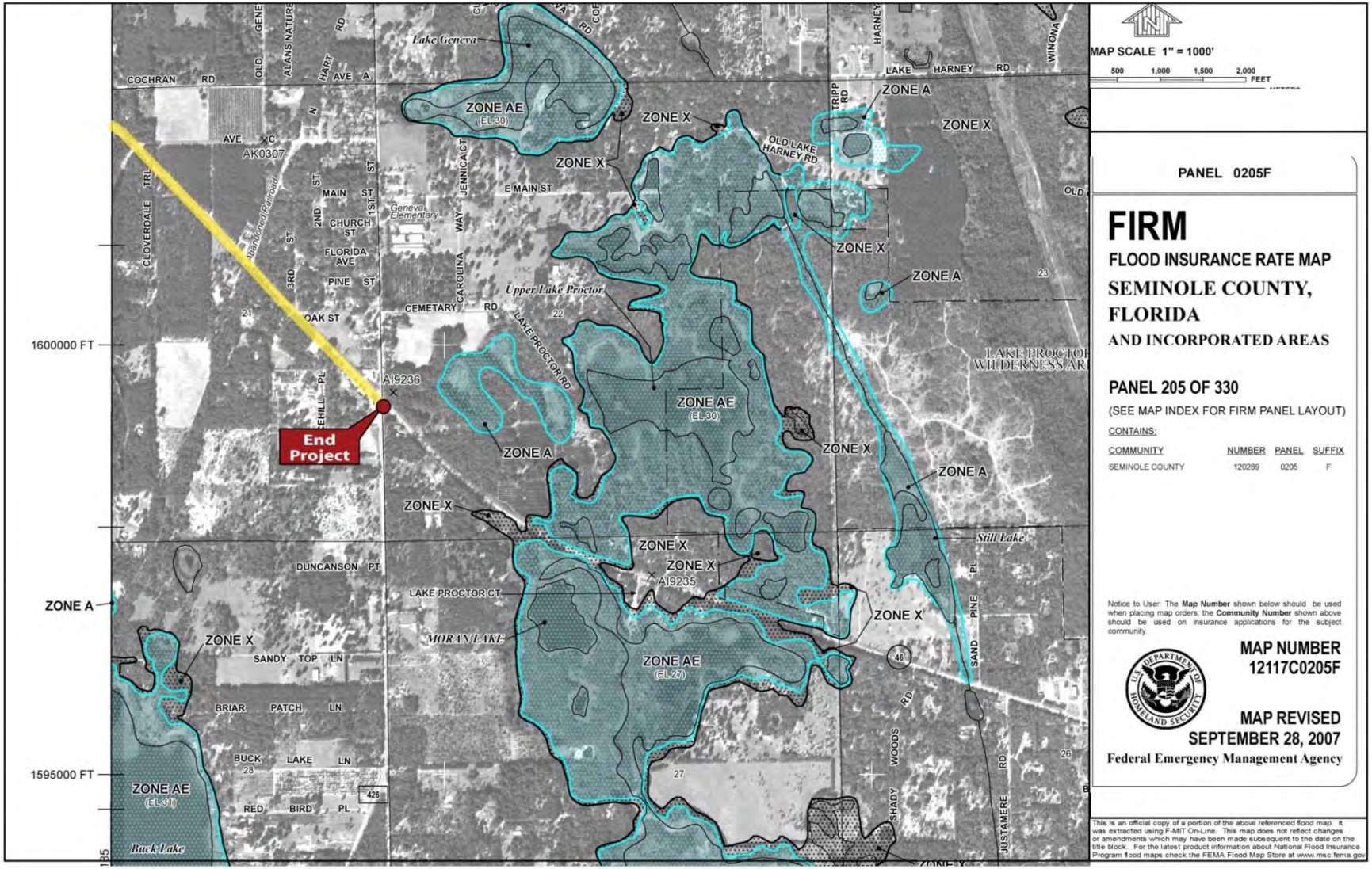


Figure 4.15 – FEMA FIRM (5 of 5)



Section 4(f)

Cameron Wight Park, owned and operated by Seminole County, is a three-acre park used as a boat launching facility into the St. Johns River basin. It is located on SR 46 at the west end of the Lake Jesup Bridge and is open 24 hours a day. The proposed roadway improvements in this area will not result in direct or indirect adverse impacts to the use of the park.

The Lake Jesup Conservation Area (LJCA) is 6,220 acres and owned and managed by the SJRWMD. This conservation area is composed of three tracts, the Marl Bed Flats Tract, the North Cameron Tract (sometimes referred to as the North Lake Jesup Tract) and the East Lake Jesup Tract. The Marl Bed Flats Tract was initially purchased to meet legislative requirements established for mitigation of the Seminole County portion of SR 417. Now these lands contribute to the enhancement and protection of water resource and increase flood protection and the protection of ecological functions and habitats in the Lake Jesup area.

The North Cameron Tract (south of SR 46 and west of Lake Jesup) is the portion of the Lake Jesup Conservation Area adjacent to the existing roadway. Approximately 4.25 acres of right-of-way will be acquired from this tract for the proposed roadway widening. Functional losses from direct and secondary impacts will be offset through the appropriate mitigation. Cumulative wetland impacts are not anticipated when appropriate mitigation is provided within the same mitigation basin as defined by the SJRWMD. A Section 4(f) Determination of Applicability (DOA) was prepared and submitted to FHWA in July 2015. On August 27, 2015 FHWA concurred that Section 4(f) does not apply to the North Cameron Tract of the LJCA. No lands are required from the Marl Bed Flats Track and the East Lake Jesup Tract and will not result in direct or indirect adverse impacts to these properties.

Noise

Sixty-seven receptor areas were selected to represent the 74 potential noise sensitive sites along SR 46 within the project limits. Predicted noise levels for these receptor sites for the Existing Year (2013) and the Design Year (2035), as well as the No Build and Build alternatives were determined using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) Version 2.5. Noise levels at 20 noise sensitive receptor sites are predicted to approach or exceed the FHWA Noise Abatement Criteria (NAC) of 67 dB(A) for each Build Alternative. Compared to the existing conditions, no noise sensitive receptor sites are expected to experience a substantial increase (>15 dB(A)) in traffic noise as a result of this project. The traffic noise analysis was not updated for the updated Design Year (2045) since the original Design Year (2035) traffic forecasts yielded a more conservative result.

Based on impacts to the noise sensitive sites that approached or exceeded the NAC, noise abatement measures were evaluated within the project corridor. For this evaluation of noise abatement measures, impacted sites were grouped into three Noise Sensitive Areas (NSAs) based on their proximity, similar characteristics and geography. Although feasible, traffic management, alternative alignments, and property acquisitions were determined to be unreasonable methods of reducing predicted traffic noise impacts to the affected receptors. Based on predicted noise levels exceeding the NAC, noise barrier evaluations were performed as potential abatement for

noise sensitive sites contained in NSA 1, NSA 2, and NSA 3. The results of these barrier evaluations indicate that the construction of noise barriers does not appear to be a feasible or cost reasonable method of reducing traffic noise impacts for any of the proposed improvements to SR 46. Therefore, based on the noise analyses performed to date, there appears to be no apparent solutions available to mitigate the noise impacts at the 20 noise sensitive receptor sites predicted to approach or exceed the NAC for each Build Alternative.

Specific information regarding the noise analysis and barrier evaluations can be found in the *Noise Study Report* (January 2014).

Air Quality

This project is not located in an area which is designated as attainment for all of the National Ambient Air Quality Standards (NAAQS) under the criteria provided in the Clean Air Act. Therefore, the Clean Air Act conformity requirements do not apply to the project.

No impacts to air quality are expected with any of the Build Alternatives.

Socio-Cultural Effects

Community Cohesion

Geneva is an unincorporated area of Seminole County and is a census-designated place. The limits of Geneva within the project area are from Mullet Lake Park Road to the end of the project, and comprise the majority of the residential areas of the project. As of the 2010 census, the total population of Geneva is 2,940. The racial makeup of the community is 91.8% white, 1.7% African American, 0.5% American Indian and Alaska Native, 2.4% Asian, 1.3% "Other Race" and 2.3%"Two or More Races". A total of 5.3% of the population identified themselves as Hispanic or Latino origin. A total of 1.8% households in Geneva reported incomes below the poverty level. Of the 1,034 housing units in Geneva, 90.5%, or 936 units, are owner-occupied.

This project has been developed in accordance with the Civil Rights Act of 1964, as amended. The proposed improvements are not expected to have an adverse effect on historically disadvantaged populations nor will it have a significant impact on community cohesion.

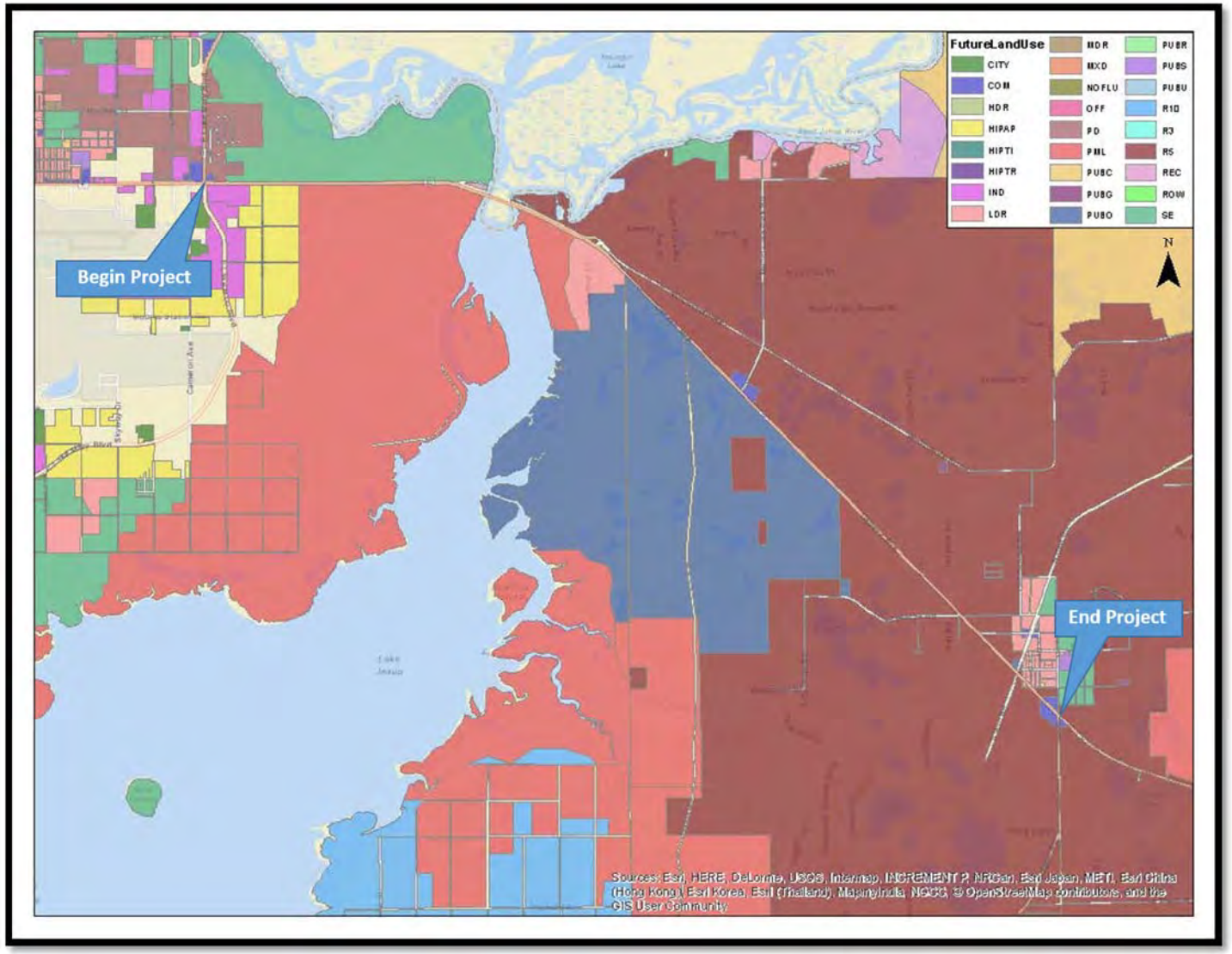
Land Use

The future land use for the project area is shown on Figure 4.12. This project is consistent with the future land use identified in the Seminole County Comprehensive Plan.

Economic and Community Development

Implementation of the Build Alternative will increase mobility on this regionally significant facility. Improved traffic flow will result in corresponding reduction in travel costs as goods and services are transported more efficiently and commuting times are reduced.

Figure 4.16 – Future Land Use



Community Services

There are five elementary, three middle and two high schools which are offered as public education options to residents along the project corridor via districting or the "cluster schools" School Choice option. These schools are:

- Geneva Elementary School
- Hamilton Elementary School
- Midway Elementary School
- Pinecrest Elementary School
- Goldsboro Elementary School
- Chiles Middle School
- Millennium Middle School
- Sanford Middle School
- Oviedo High School
- Seminole High School

Seminole County Public Schools Transportation Services operates bus routes throughout the project corridor for the schools listed above, with the highest density of stops along SR 46 dedicated to Geneva Elementary School, Chiles Middle School and Oviedo High School. The Geneva Elementary School stops begin at approximately at 7:30 a.m. and operate through 8:00 a.m. with stops on SR 46 between Clekk Circle and Torren Point and on Osceola Road near Kimmie Kay Drive and Russell Cove Road. The Chiles Middle School stops are typically at 8:30 a.m. with stops on SR 46 between Osceola Road and Ridge Road. The Oviedo High School bus routes begin just before 6:00 a.m. and continue through to approximately 6:20 a.m. with stops along SR 46 between Ridge Road and Hart Road.

As part of the public involvement process, the project team received several comments from local residents concerned about motorists ignoring stopped school buses along SR 46, either speeding by in the opposite direction, or passing them across the centerline. This presents a safety concern, especially before sunrise when Oviedo High School students are picked up. Widening SR 46 to a divided four lane facility is expected to improve safety for children who depend on the bus for transportation to and from school.

No impacts to the schools within the project, nor their corresponding bus routes, are anticipated as a result of the proposed improvements.

There is one fire station, Seminole County Fire Station #42, within the project limits, located on the north side of SR 46 at the intersection with North Hart Road. There is an emergency signal (flashing yellow) on SR 46 at this location. A full median opening will be provided at this location and no impacts to the fire station or emergency response time is anticipated as a result of the proposed improvements.

Contamination

Forty-one properties within the project area were assessed for potential contamination and assigned risk ratings. Of these 41 properties, 12 were assigned potential contamination risk ratings of low, medium or high. These 12 properties are shown on Figure 4.17 and listed in Table 4.18. Potential contamination sites were not a factor in the selection of a preferred alternative as this project contains no known significant contamination.

Detailed information regarding potential contamination sites can be found in the *Contamination Screening Evaluation Report* (February 2014).

Table 4.18 – Potential Contamination Sites

ID	Name	Address	Risk Rating
1	RaceTrac	4115 SR 46 E	Low
2	Joyce Well Drilling (former location)	4125 E HWY 46	Low
3	The Pantry, Inc. (gas station)	4140 E SR 46 (@ SR 415)	High
4	Residence/Complete Well & Pump Service	4565 SR 46 E	Low
5	Former Trombley's Auto Body	2740 SR 46 W	High
6	Lake Jesup Groves Maintenance Area	2017 SR 46 W	Medium
7	Former Landscape Supply/Nursery	Not Listed	Low
8	Former Mining/Borrow Pit	Not Listed	Low
9	Focal Point Landscape Supplies – Nursery Area	145 SR 46 W	Low
10	Geneva Food Store/MJM Food Store	140 SR 46 W	Medium
11	Kangaroo Express/Handy Way 2655	173 1st St.	Low
12	Chuck's Automotive Repair	145 E. SR 46	Low

Figure 4.17 – Potential Contamination Sites

Construction

Construction activities for the proposed SR 46 will have air, noise, vibration, water quality, traffic flow, and visual impacts for those residents and travelers within the immediate vicinity of the project.

The air quality impact will be temporary and will primarily be in the form of emissions from diesel-powered construction equipment and dust from embankment and haul road areas. Air pollution associated with the creation of airborne particles will be effectively controlled through the use of watering or the application of other controlled materials in accordance with FDOT's *Standard Specifications for Road and Bridge Construction* as directed by the FDOT Project Engineer.

Noise and vibrations impacts will be from the heavy equipment movement and construction activities such as pile driving and vibratory compaction of embankments. Noise control measures will include those contained in FDOT's *Standard Specifications for Road and Bridge Construction* in addition to those recommended in the Noise Impact section of this document. Adherence to local construction noise and/or construction vibration ordinances by the contractor will also be required where applicable.

Water quality impacts resulting from erosion and sedimentation will be controlled in accordance with FDOT's *Standard Specifications for Road and Bridge Construction* and through the use of Best Management Practices.

Maintenance of traffic and sequence of construction will be planned and scheduled so as to minimize traffic delays throughout the project. Signs will be used as appropriate to provide notice of road closures and other pertinent information to the traveling public. The local news media will be notified in advance of road closings and other construction-related activities which could excessively inconvenience the community so that motorists, residents, and business persons can plan travel routes in advance.

A sign providing the name, address, and telephone of a Department contact person will be displayed on-site to assist the public in obtaining immediate answers to questions and logging complaints about project activity.

Access to all businesses and residences will be maintained to the extent practical through controlled construction scheduling. In the SR 46 area from SR 415 to CR 426, the present traffic congestion may become worse during stages of construction where narrow lanes may be necessary. Traffic delays will be controlled to the extent possible where many construction operations are in progress at the same time. The contractor will be required to maintain one lane of traffic in each direction of SR 46 at all times and to comply with the Best Management Practices of FDOT (Commitments and Recommendations). Also, present interchange movements will be maintained through use of detour ramps. No other locations will require temporary roads or bridges.

For the residents living along SR 46 right-of-way, some of the materials stored for the project may be displeasing visually; however, this is a temporary condition and should pose no substantial problem in the short term.

Construction of the roadway and bridges requires excavation of unsuitable material (muck), placement of embankments, and use of materials, such as limerock, asphaltic concrete, and Portland cement concrete. Demucking is anticipated at most of the wetland sites and will be controlled by Section 120 of the FDOT Standard Specifications. Disposal will be on-site in detention areas or off-site. The removal of structures and debris will be in accordance with local and state regulation agencies permitting this operation. The contractor is responsible for their own methods of controlling pollution on haul roads; in borrow pits, other materials pits, and areas used for disposal of waste materials from the project. Temporary erosion control features as specified in the FDOT's Standard Specifications, Section 104, will consist of temporary

grassing, sodding, mulching, sandbagging, slope drains, sediment basins, sediment checks, artificial coverings, and berms.

4.4.12 Bridge Analysis

The existing bridge was constructed 88 feet to the south of the bridge and causeway it replaced. The proposed bridge will be constructed to the north of the existing bridge, within the limits of the old bridge and causeway. Depending on the selected typical section, the proposed bridge will either be offset 30 or 40 feet to the north of the existing bridge. There will be no walls on the project, as sloped embankment will be used at both end bents.

As the proposed bridge will run along-side the existing bridge, span the same distance, have similar geometric constraints and provide the same number of travel lanes, both aesthetics and economics dictate that the proposed bridge be constructed with the same structural system as that used by the recently completed existing bridge. The only difference from the existing structure will be the use of Florida-I girders in lieu of AASHTO Type IV girders. The 2012 FDOT Structures Design Guidelines state in section 4.3.1 that all new bridges and bridge widenings with I-shaped beams shall utilize Florida-I Beams. These beams are more cost effective than AASHTO girders, providing for longer spans with wider beam spacings. Horizontal and vertical alignments will match those of the existing bridge.

The proposed bridge will provide two 12-foot wide travel lanes, with 10-foot outside and six-foot inside shoulders and 32-inch F-Shape Traffic Railings for a total width of 43 feet, one inch. The typical section will consist of 4 Florida-I 54 girders, spaced at 11'-11", and an eight and one half inch thick slab. Spans will largely match those of the existing bridge, with all pile bents perpendicular to the centerline except for those at Channel B. For the intermediate bents on either side of Channel B to align with those of the existing bridge, span lengths will need to be adjusted within the vicinity of the channel. The substructure will use pile bents.

To accommodate a multi-use path, the bridge's cross section width could be increased. In this case, the cross-section would consist of two 12-foot travel lanes, with 10-foot outside and six-foot inside shoulders and 32-inch F-Shape Traffic Railings, and the trail with a 42-inch Vertical Pedestrian/Bicycle Railing – a total width of 53'-10". For this alternative, the typical section will consist of five Florida I-54 girders, spaced at 11'-9", and an eight and one half inch thick slab. As is the case without the multi-use trail, spans will match those of the existing bridge, with all pile bents perpendicular to the centerline except for those at Channel B, and the substructure will exclusively use pile bents.

The existing bridge's intermediate pier placement at Channels A, B, and C were largely dictated by the need to accommodate a possible future navigable waterway. At the time, the USACE was investigating the possible closure of a portion of the existing navigable waterway, which runs along the north side of the bridge, and redirecting it through two of the channels to improve water flow into Lake Jesup. Since that time the USACE finalized the Lake Jesup Ecosystem Restoration Report, selecting the No Action Alternative. Having concluded that Government Cut has not attributed to the ecological decline of Lake Jesup, there are no current plans to run

the navigable waterway through any of the channels. However, during final design, coordination with the USACE should take place in order to confirm that this is still the case.

Deck drainage for the proposed bridge will match that of the existing bridge. From the high point to the west water will flow to inlets located at the end of the bridge. From the high point to the east inlets along the deck will route water to an underdeck drainage pipe.

4.4.13 Intersection Layout

There are two major intersections within the project limits, at Osceola Road and CR 426 (the SR 415 intersection will be improved as part of the adjacent design project).

Osceola Road

The intersection of SR 46 with Osceola Road was modified during the bridge design-build project. These modifications did not account for the heavy truck traffic along Osceola Road accessing the Seminole County landfill and turning truck traffic often overruns the curb and gutter or drifts into the adjacent travel lane. Each Build Alternative proposes to realign Osceola Road and move the intersection approximately 2,425 feet east. The greater separation between SR 46 and Osceola Road at this location allows for a perpendicular intersection and greater radius on the curve back to the existing alignment of Osceola Road. The remaining area between the existing and proposed intersection locations can be used for stormwater treatment. Figure 4.18 is an illustration of the proposed SR 46/Osceola Road intersection and realignment.

The intersection configuration is a “T”. A left-turn lane will be provided for eastbound SR 46 traffic to turn onto Osceola Road. There is no dedicated westbound right-turn lane needed on SR 46. From Osceola Road there will be one right-turn and one left-turn lane. There is room in the median of SR 46 to provide a lane for westbound U-turns.

Access to and from SR 46 will change slightly for residents on the private streets of Kimmie Kay Drive and Russell Cove Road. The existing Osceola Road will be removed from its current intersection with SR 46 to Kimmie Kay Drive. From Kimmie Kay Drive to the realigned Osceola Road, the pavement will remain but end in a cul-de-sac. A new intersection of SR 46 by Kimmie Kay Drive will be provided with right-in/right-out access. Residents of Kimmie Kay drive wishing to head east on SR 46 can either turn right onto eastbound SR 46 and U-turn at the full median opening at Swamp Lane, or drive to Russell Cove Road and access the realigned Osceola Road.

The Final Design Traffic Technical Memorandum (May 2012) indicates the potential need for a signal at the intersection of Osceola Road and SR 46 by the Interim Year (2025). Prior to the installation of a signal, FDOT must perform a signal warrant analysis.

Figure 4.18 – Proposed Osceola Road Intersection Configuration[1]

[1]Proposed configuration is shown with Suburban Best Fit alternative but concept is identical in Rural Best Fit alternative

CR 426

The widening of SR 46 will be taken through the CR 426 intersection so future widening to the east will not impact the intersection a second time. There are two factors influencing the proposed intersection concept at this location: the 43°31' skew and high projected eastbound to southbound/northbound to westbound peak hour movement (580 and 513 vph, respectively in the a.m. peak hour and 639 and 652 vph, respectively, in the p.m. peak hour). The proposed configuration provides one left-turn lane, two through lanes and one right-turn lane on the eastbound approach, dual left-turn lanes and a shared through-right lane on the northbound approach, a left turn lane, a through lane and a shared through-right lane on the westbound approach and a left-turn lane and a shared through-right lane on the southbound approach. In addition, extra pavement is provided in the northwest and southeast quadrants of the intersection to accommodate right-turning WB-62 trucks through the small skew angle. Figure 4.19 is an illustration of the proposed SR 46/CR 426 intersection.

The most recent right-of-way estimate performed by FDOT indicated that the proposed design of the SR 426/CR 46 intersection impacts the retention area of the gas station in the northwest quadrant of the intersection. An alternative design that eliminates the potential impact to the retention area, but requires additional right-of-way acquisition along the east side of First Street/CR 426 north and south of SR 46, is presented in Figure 4.20. Right-of-way costs should be reviewed during final design to make a determination as to a preferred configuration for this intersection.

Figure 4.19 – Proposed CR 426 Intersection Configuration

Figure 4.20 – Alternative CR 426 Intersection Configuration

4.4.14 Design Exceptions and Variations

The proposed improvements widen the existing roadway and maintain the existing geometry where practical. Since the time of the original design and construction of SR 46, design criteria have changed. This will result in potential design variations to reduce the need for reconstruction.

Table 4.19 lists the 13 controlling design elements and state whether or not FDOT and AASHTO design criteria have been satisfied. If a design exception of variation is required for a certain controlling design element, it is noted in the table. Table 4.19 is applicable to all alternatives and indicates that no design exceptions or variations are required. Table 4.20 lists four additional design elements that are not addressed by AASHTO but will require a design variation at the District level if the standards are not met. As seen in Table 4.20, design variations for border width (related to the urban typical section between Hart Road and CR 426) and length of vertical curves are required for the project.

Table 4.19 – Design Exceptions and Variations

Controlling Design Element	Design Exception	Design Variation
Design Speed	Satisfied	Satisfied
Lane Width	Satisfied	Satisfied
Shoulder Width	Satisfied	Satisfied
Bridge Width	Satisfied	Satisfied
Structural Capacity	Satisfied	Satisfied
Vertical Clearance	Satisfied	Satisfied
Grades	Satisfied	Satisfied
Cross Slopes	Satisfied	Satisfied
Superelevation	Satisfied	Satisfied
Horizontal Alignment	Satisfied	Satisfied
Vertical Alignment	Satisfied	Satisfied
Stopping Sight Distance	Satisfied	Satisfied
Horizontal Clearance	Satisfied	Satisfied

Table 4.20 – Additional Design Elements

Controlling Design Element	Design Variation
Border Width	**Required**
Median Width	Satisfied
Length of Horizontal Curve	Satisfied
Length of Vertical Curve	**Required**[1]

[1]If not corrected through milling, resurfacing and overbuild or reconstruction

4.4.15 Special Features

A 10-foot asphalt multi-use path is proposed for the north side of the roadway for Alternatives A and B instead of a standard five-foot concrete sidewalk. An eight-foot concrete sidewalk adjacent to the curb and gutter is proposed in Segment 4 instead of a six-foot sidewalk that is standard for an urban typical section. Provisions will be made to route pedestrian traffic from the south side of the roadway under the bridge and up to the shared use path on the north side of the bridge for these Build Alternatives.

A mechanically stabilized earth (MSE) wall is proposed for the western approach to the proposed bridge, similar to what was built for the existing bridge. The wall extends approximately 515 feet west from the beginning of the bridge and will have a base on the fill for the bridge that was removed, which remains from the construction of the existing bridge. This will eliminate the need for right-of-way acquisition from Cameron Wight Park, a potential Section 4(f) resource.

There are no other special features proposed for this project.

4.5 Evaluation Matrix

Table 4.21 summarizes and compares the engineering and environmental analysis of the Build Alternatives presented within this section.

Table 4.21 – Evaluation Matrix

Evaluation Criterion	Alternative				
	No-Build	A	B	C	D
Right-of-Way					
Impacts (ac.)	0	29.73	30.38	55.14	55.79
Parcels Affected	0	61	70	82	91
Relocations	0	0	2	2	2
Wetlands					
Direct Wetland Impacts (ac.)	0.00	12.55	14.45	14.36	16.26
Secondary Wetland Impacts (ac.)	0.00	8.59	9.89	5.95	7.25
Wetland Cut Ditch Impacts (ac.)	0.00	2.40	2.02	2.10	1.72
Upland Cut Ditch Impacts (ac.)	0.00	4.65	5.85	5.89	5.85
Wildlife and Habitat					
Potential Wildlife Impacts	None	Minimal	Minimal	Minimal	Minimal
Floodplains					
Floodplain Area Impacts (ac.)	0.0	7.9	8.5	10.5	11.1
Noise Impacts					
Impacted Noise Sensitive Sites	1	20	20	20	20
Noise Abatement Reasonable/Feasible?	No	No	No	No	No
Bike/Ped					
Bicycle Accommodations	Yes	Yes	Yes	Yes	Yes
Pedestrian Accommodations	No	Yes	Yes	No	No
Multi-use Path	No	Yes	Yes	No	No
Traffic					
Projected Design Year Arterial LOS	F	C	C	C	C
Project Costs					
Estimated Construction Cost	$0	$66,864,000	$66,864,000	$50,670,200	$50,670,200

4.6 Recommended Alternative

As a result of the engineering and environmental analyses of the four Build Alternatives and public comments received throughout the duration of the project and at the Project Information Meeting held on August 29, 2012, ***Alternative B*** (suburban south, bridge with multi-use path, suburban best fit, urban) was selected as the recommended alternative for the ultimate improvements for the following reasons:

- It minimizes right-of-way impacts by using the Suburban Best-Fit Alternative (148-foot total width) rather than the Rural Best-Fit Alternative (188-foot total width),
- Although construction costs are higher than Alternatives C and D, it provides facilities for bicycles and pedestrians including a multi-use path the full length of the project,
- Although Alternative B has a greater amount of potential wetland impacts than Alternative A, it avoids impacts to the Bergmann Tract mitigation bank located north of SR 46 west of the St. Johns River/Lake Jesup. Potential impacts to the Lake Jesup Conservation Area, south of SR 46, have been coordinated with SJRWMD

Overall, the potential impacts of each alternative are similar and each meets the purpose and need of the project. However, Alternatives A and B, which use the suburban typical section rather than the rural typical section, require less right of way and thus minimize potential environmental impacts while providing bicycle and pedestrian facilities. All alternatives utilize the urban typical section between Hart Road and CR 426A to minimize right of way acquisition.

Because there is only 100 feet of existing right of way and the suburban typical section requires 148 feet of right of way, the project team calculated potential impacts of a left side and right side widening. Analysis of potential impacts from a left and right side widening enabled the project team to develop a “best fit” alignment. A “best fit” alignment transitions back and forth from a left side widening to a right side widening in order to avoid or minimize potential impacts.

SECTION 5.0 – DESIGN DETAILS OF THE RECOMMENDED ALTERNATIVE

5.1 Typical Section Package

Refer to Table 4.5 for the roadway typical sections of the Recommended Alternative (Alternative B). The typical sections for the roadway segments of the Recommended Alternative are shown in Figures 4.2, 4.3 and 4.7, previously presented. The recommended alternative bridge typical section is shown in Figure 4.9, previously presented. The Typical Section Package is provided in Appendix E.

5.2 Intersection Concepts and Signal Analysis

The concepts for the two major intersections proposed as part of the Recommended Alternative are discussed in Section 4.4.13 and presented on Figure 4.18 (Osceola Road) and Figure 4.19 (CR 426). These intersections will be reconstructed as part of the recommended alternative. In addition, 3rd Street will be closed at SR 46 with access to and from SR 46 remaining at Oak Street. Figures 5.1 and 5.2 illustrate the proposed geometry of the Recommended Alternative, as presented in the *Final SR 46 Design Traffic Technical Memorandum* (May 2012) (DTTM).

Figure 5.1 – Recommended Intersection Geometry (1 of 2)

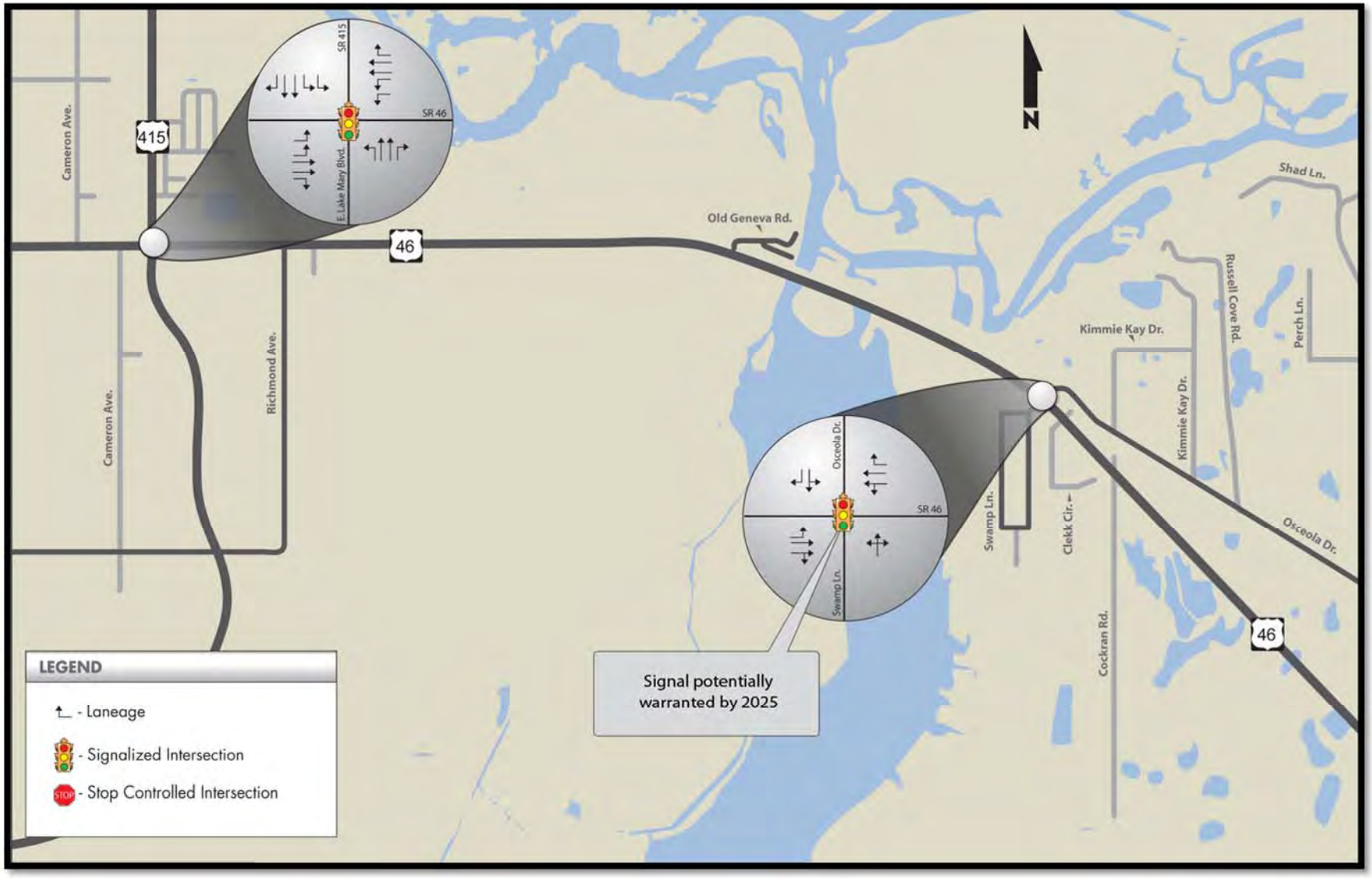
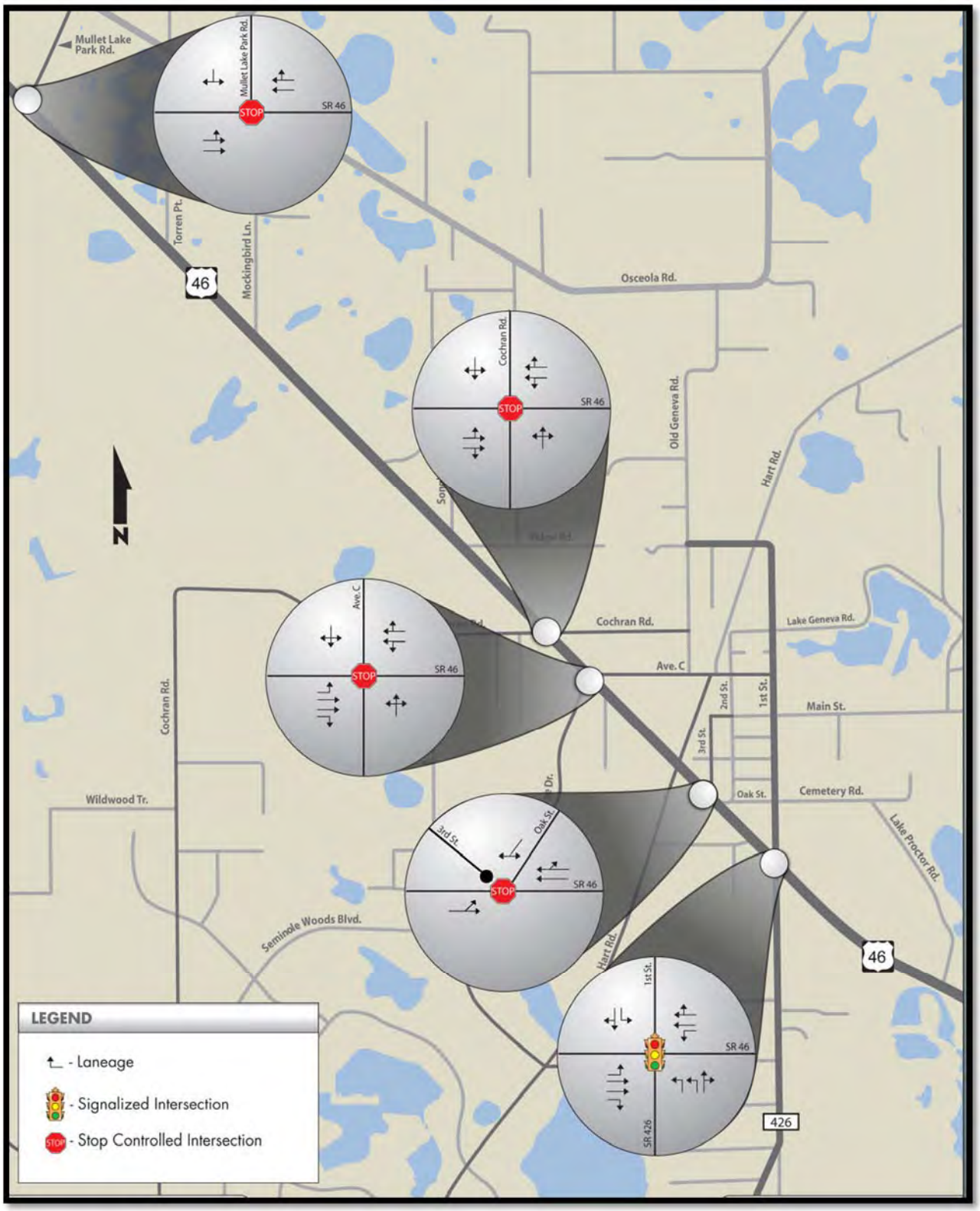


Figure 5.2 – Recommended Intersection Geometry (2 of 2)



5.3 Design Traffic Volume

This section summarizes the results of the operational analyses of the Recommended Alternative. Complete design traffic analyses for the corridor are documented in the *Final SR 46 Design Traffic Technical Memorandum* (May 2012) for the original Design Year (2035) and subsequently validated for the updated Design Year (2045) in the *Traffic Forecasts Update Report* (February 2017). All conditions were analyzed using the most current adopted procedures as outlined in the Transportation Research Board's Special Report 209 - Highway Capacity Manual (HCM). Specific analysis techniques utilized with the Synchro 7 Software include signalized intersection analyses.

Future Traffic Operations Summary

Future Intersection Operations

Under the Build Alternative, four intersections are projected to operate below the adopted LOS standard during the original Design Year (2035) a.m. and p.m. design hours.

- The signalized intersection of SR 46 and SR 415/Lake Mary Boulevard
- The minor street approach at the unsignalized intersection of SR 46 and Mullet Lake Park Road
- The minor street approach at the unsignalized intersection of SR 46 and Cochran Road
- The minor street approach at the unsignalized intersection of SR 46 and Woodridge Drive/Avenue

The intersection of SR 46 and SR 415/Lake Mary Boulevard is projected to operate at LOS E during the original Design Year (2035) a.m. and p.m. peak hours, which is below the FDOT adopted LOS standard of D; however, the intersection is projected to operate at an acceptable LOS based on the Seminole County adopted LOS E for this section of SR 46.

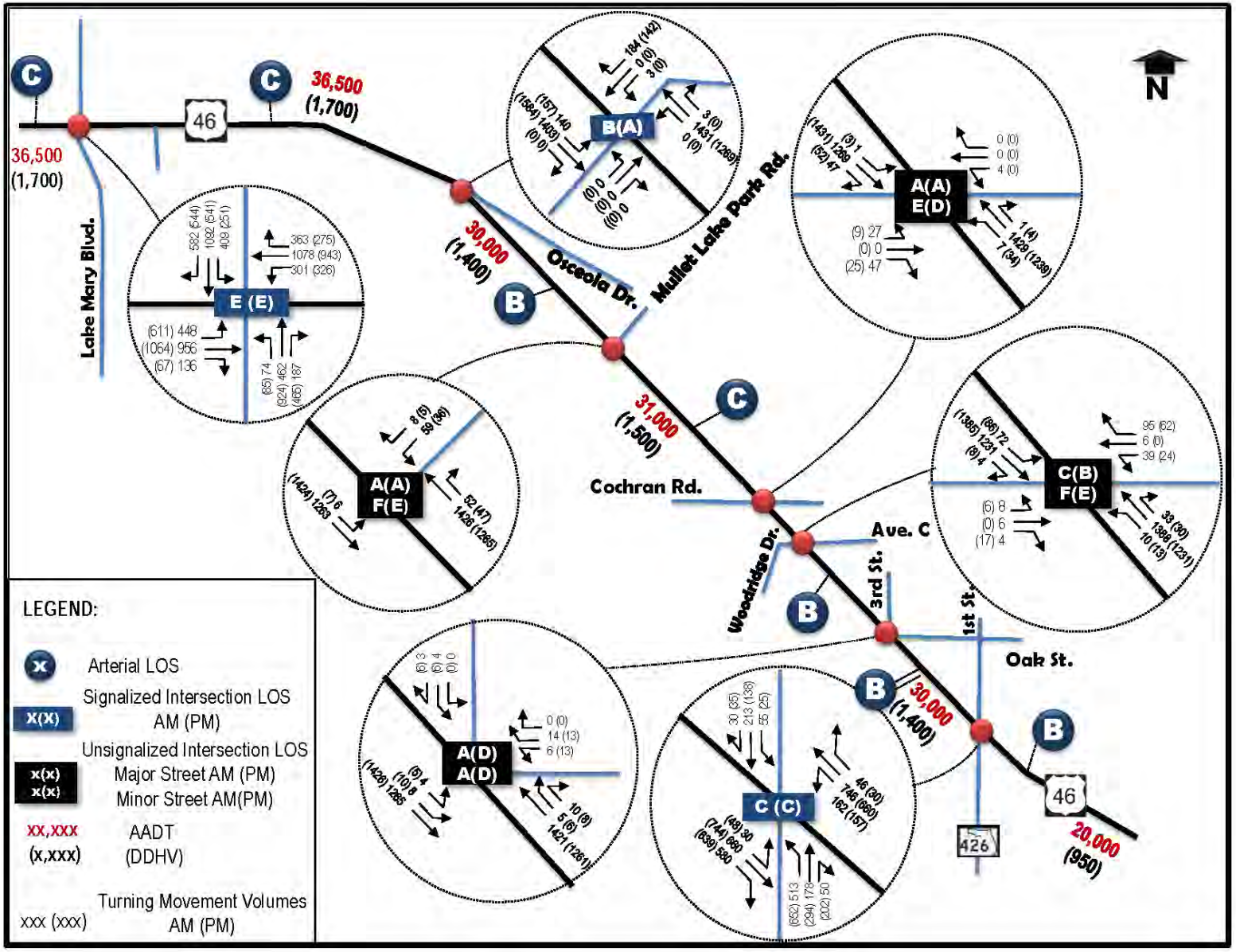
The intersections of SR 46 and Mullet Lake Park Road and SR 46 and Woodbridge Drive are projected to operate at LOS F during the original Design Year (2035) a.m. peak hour conditions, which is below the Seminole County adopted LOS of E for unsignalized intersections. Unsignalized intersections typically display an adverse LOS for the minor side streets and the delay projected for these two intersections is not excessive. Furthermore, the addition of the Build Alternative improvements is projected to result in improved LOS and reduced delay compared to the LOS projected for the No Build Alternative.

Future Arterial Operations

The DTTM shows that all SR 46 roadway segments are projected to operate at LOS E (from Osceola Road to CR 426) or F (from SR 415 to Osceola Road) during the original Design Year (2035) No-Build peak hours. All the roadway segments within the project limits under the Build condition are anticipated to operate at acceptable LOS conditions during the original Design Year (2035) peak hours.

A summary of projected original Design Year (2035) traffic and operations is illustrated on Figure 5.3.

Figure 5.3 – Recommended Alternative Original Design Year (2035) Projected Traffic and LOS



Recommended Queue Lengths

Table 5.1 provides recommended queue lengths for turn lanes for the Design Year (2035) design hour conditions for the Build Alternative. These lengths do not include the taper or deceleration distance. These storage lengths are recommended at locations where these lengths can be achieved. Actual design and implementation of these storage length requirements will be a function of design and the physical practicality of their construction as provided in the Conceptual Design Plans located in Appendix A.

Table 5.1 - Recommended Queue Lengths – Original Design Year 2035 Build Alternative

Intersection with SR 46	Recommended Turn Lane Queue length (ft)							
	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
SR 415 / Lake Mary Blvd.	350	125	200	300	100	675	175	425
Osceola Rd.	100	-	-	100	-	-	100	100
CR 426	100	325	100	-	200	-	100	-

Signal Warrant Analysis

The projected traffic volumes in the original Design Year (2035) do not meet the 70% criteria for signal warrant 1A at any of the unsignalized intersections along the SR 46 corridor, with the exception of the intersection of SR 46 and Osceola Road. This intersection is projected to meet the 70% criteria by the Interim Year (2025); therefore, it is recommended that a signal warrant analysis be performed for the intersection of SR 46 and Osceola by the Interim Year (2025).

Traffic Forecast Update

In February 2017 Seminole County updated the traffic forecasts for the SR 46 study corridor for a revised Design Year (2045) and validated the need for four-lane widening of the study corridor using revised Design Year (2045) traffic forecasts. The justification (per Part 2, Chapter 5 of FDOT's PD&E Manual) for this reevaluation comes from a change in the adopted regional travel demand model and a change in the Design Year of the project. The original DTTM (May 2012) used the previous iteration of the regional travel demand model (with 2005 as the base year and 2035 as the horizon year) and assumed a project Design Year of 2035. The latest update to the regional travel demand model (with 2009 as the base year and 2040 as the horizon year) has the latest planning assumptions and represents a significant change in travel forecasts.

Table 5.2 lists the projected LOS for SR 46 using the updated model forecasts. The projected No-Build LOS exceeds the LOS C standard adopted for SR 46 in the revised Design Year (2045), while the projected LOS for the Recommended Alternative is within the LOS standard.

Table 5.2 – Revised Design Year (2045) Roadway LOS Analysis Summary

Roadway Segment	FDOT LOS Standard (Rural Area)	No Build Alternative			Build Alternative		
		Capacity (vpd)	2045 AADT	2045 LOS	Capacity	2045 AADT	2045 LOS
SR 415 to Osceola Road	C	16,400	23,100	E	40,700	27,700	C
Osceola Road to Mullet Lake Park Road	C		19,500	D		23,300	B
Mullet Lake Park Road to Woodridge Drive	C		20,400	D		24,400	B
Woodridge Drive to CR 426	C		19,500	D		23,300	B

5.4 Right-of-Way Needs and Relocations

The Recommended Alternative includes a suburban typical section that requires a minimum of 148 feet of right-of-way. Existing right-of-way along SR 46 within the project limits is generally 100 feet with an extra 27 feet on the north side of SR 46 west of the Lake Jesup bridge from approximately Sta. 58+91.69 to approximately Sta. 83+44.20. Additional right-of-way will need to be acquired from the beginning of the project east of SR 415 to Hart Road. At Hart Road, the Recommended Alternative provides an urban typical section that can be built within the existing right-of-way. Additional right-of-way will be required at the skewed intersection of SR 46 with CR 426 to provide for additional turn lanes and adequate pavement to accommodate turns by the design vehicle.

Right-of-way will also be required to construct the stormwater management and floodplain compensation areas. Table 6.3 lists the right-of-way acquisition area required for the roadway and ponds for the Recommended Alternative. Specific right-of-way requirements can be seen on the Conceptual Design Plans in Appendix A.

Table 5.3 – Recommended Alternative Right-of-Way Requirements

Roadway Feature	Right-of-Way Required (ac.)
Roadway	30.09
Stormwater Management	33.32
Floodplain Compensation	35. 11

FDOT prepared a right-of-way cost estimate for the Recommended Alterative in March 2014. A total of 68 parcels are impacted (10 business, 20 residential and 38 unimproved). Two residential relocations will result from the construction of the Recommended Alternative. The two residential relocations are located on the south side of SR 46 east of Richmond Street, at 4545 and 4565 E. SR 46 (see Appendix A, Concept Design Plans, for the location of these residences).

To minimize the unavoidable effects of right-of-way acquisition and displacement of people, the Florida Department of Transportation will carry out a Right-of-Way and Relocation Program in accordance with Florida Statute 339.09 and the Uniform Relocation Assistance and Real

Property Acquisition Policies Act of 1970 (Public Law 91-646 as amended by Public Law 100-17).

The Florida Department of Transportation provides advance notification of impending right-of-way acquisition. Before acquiring right-of-way, all properties are appraised on the basis of comparable sales and land use values in the area. Owners of property to be acquired will be offered and paid fair market value for their property rights.

No person lawfully occupying real property will be required to move without at least 90 days written notice of the intended vacation date, and no occupant of a residential property will be required to move until decent, safe and sanitary replacement housing is made available. "Made available" means that the affected person has either by himself obtained and has the right of possession of replacement housing, or that the Florida Department of Transportation has offered the relocatee decent, safe and sanitary housing which is within his financial means and available for immediate occupancy.

At least one relocation specialist is assigned to each highway project to carry out the Relocation Assistance and Payments program. A relocation specialist will contact each person to be relocated to determine individual needs and desires, and to provide information, answer questions, and give help in finding replacement property. Relocation services and payments are provided without regard to race, color, religion, sex, or national origin.

All tenants and owner-occupant displacees will receive an explanation regarding all options available to them, such as (1) varying methods of claiming reimbursement for moving expenses; (2) rental replacement housing, either private or publicly subsidized; (3) purchase of replacement housing; and (4) moving owner-occupied housing to another location.

Financial assistance is available to the eligible relocatee to:

- Reimburse the relocatees for the actual reasonable costs of moving from homes, businesses and farm operations acquired for a highway project.
- Make up the difference, if any, between the amount paid for the acquired dwelling and the cost of a comparable decent, safe and sanitary dwelling available on the private market, as determined by the Department.
- Provide reimbursement of expenses, incidental to the purchase of a replacement dwelling.
- Make payment for eligible increased interest cost resulting from having to get another mortgage at a higher interest rate. Replacement housing payments, increased interest payments and closing costs are limited to $31,000 total.

A displaced tenant may be eligible to receive a payment, not to exceed $7,200, to rent a replacement dwelling or room, or to use as down payment, including closing costs, on the purchase of a replacement dwelling.

The brochures that describe in detail the Florida Department of Transportation's Relocation Assistance Program and Right-of-Way acquisition program are "Residential Relocation Under the Florida Relocation Assistance Program", "Relocation Assistance Business, Farms and Non-

profit Organizations", "Sign Relocation Under the Florida Relocation Assistance Program", "Mobile Home Relocation Assistance", and "Relocation Assistance Program Personal Property Moves". All of these brochures are distributed at all public hearings and made available upon request to any interested persons.

Total estimated cost of right-of-way acquisition for the Recommended Alternative is $7,753,000.

5.5 Utility Impacts

The recommended alternative will require the relocation of power poles along various segments of the project. Table 5.4 lists the limits of this relocation and estimated costs provided by the utility agency/owner.

Table 5.4 – Estimated Utility Relocation Costs

Station Limits	Utility	Number of Poles	Estimated Costs
75+50 to 90+00	FPL Transmission/Distribution	5	$600,000
144+00 to 174+00	FPL Distribution	10	$100,000
191+00 to 238+00	FPL Distribution	16	$160,000
261+00 to 302+00	FPL Distribution	14	$140,000
323+00 to 339+00	FPL Distribution	6	$60,000
		TOTAL	$1,060,000

5.6 Cost Estimates

Table 5.5 presents total project costs for the Recommended Alternative. Utility costs were provided by the Utility Agency/Owner and include utilities located within easement or if it is unknown whether or not the utility is located within easement or by permit, assuming there would be impacts to utilities within easement and relocation would be required. This estimate does not include environmental mitigation. Mitigation costs and detailed utility location and impacts will be finalized during final design and permitting when additional survey can be performed and impacts can be quantified in detail.

Table 5.5 – Estimated Costs – Recommended Alternative

Element	Estimated Cost
Construction	$50,300,000
MOT (10%)	$5,030,000
Mobilization (10% of subtotal)	$5,533,000
Design (15%)	$7,545,000
Contingencies[1] (25%)	$12,575,000
Subtotal	$80,983,000
Right-of-Way	$11,337,000
Utilities	$1,060,000
Total	$93,380,000

[1]Only 5% contingencies are included in the LRE (prepared on 5/31/2017, see Appendix F)

5.7 Schedule

Final design of the Recommended Alternative is programmed to begin in FY 2022. There is no funding for right of way acquisition or construction.

5.8 Pedestrian and Bicycle Facilities

The Recommended Alternative provides both pedestrian and bicycle facilities for SR 46 throughout the project limits. Bicyclists are accommodated on the roadway within a 6.5-foot undesignated bicycle lane between SR 415 and Hart Road. From Hart Road to CR 426, there is a buffered seven-foot bicycle lane adjacent to the travel lanes. In addition to the bicycle lanes, bicyclists can use the 10-foot asphalt shared-use path provided on the north side of SR 46 to Hart Road at the start of the urban typical section.

In addition to the shared use path on the north side of SR 46, pedestrians may also use a five-foot sidewalk that will be provided on the south side of SR 46 from SR 415 to Hart Road. East of Hart Road, pedestrians may use the six-foot sidewalk on either side of SR 46 to CR 426.

The proposed bridge over Lake Jesup, which will accommodate two lanes of westbound traffic, will also include a barrier-separated shared-use path adjacent to the outside westbound shoulder for use by both bicyclists and pedestrians. The 10-foot outside shoulder in each direction may also be used by bicyclists. Accommodations shall be provided to safely direct pedestrians on the south side of SR 46 to the shared-use path on both ends of the proposed bridge.

5.9 Temporary Traffic Control Plan

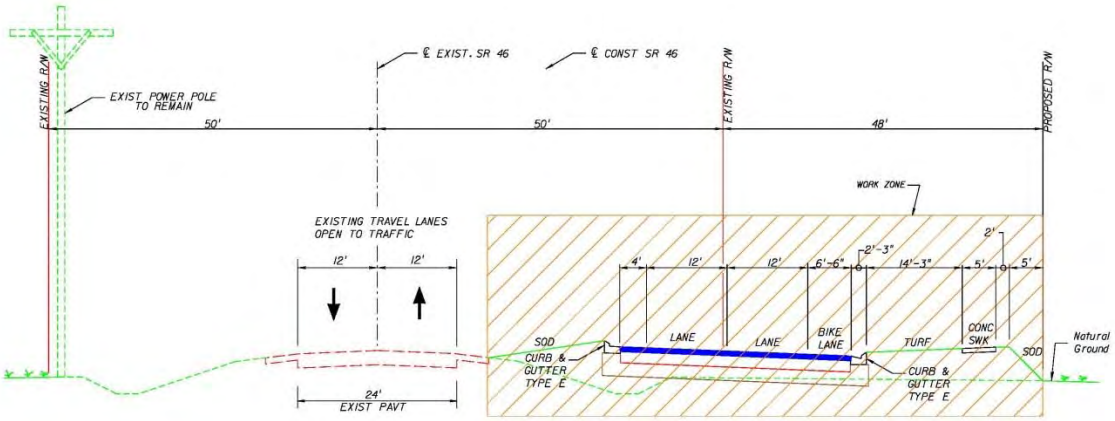
A three-phase traffic control plan is proposed for the construction of the SR 46 widening to maintain traffic safely and efficiently through the work zone. The three phases are outlined below:

Phase I

SR 46 Suburban South Section (see Figure 5.4)

Traffic will be maintained on the existing roadway while the additional lanes are built to the south of the existing roadway. During this phase crossover temporary pavement required for Phase II transitioning will be constructed and any curb and gutter, sod, and sidewalk required south of the existing roadway will be also constructed.

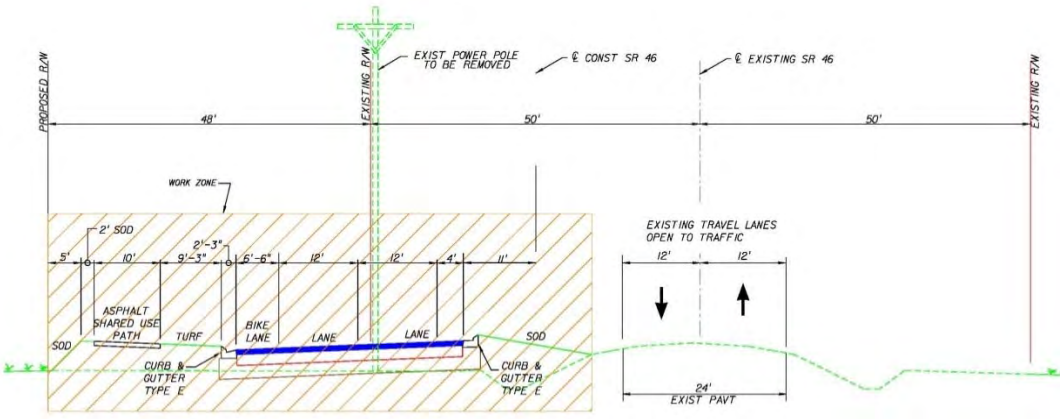
Figure 5.4 – Suburban South Section Temporary Traffic Control – Phase I



SR 46 Suburban North Section (see Figure 5.5)

Traffic will be maintained on the existing roadway while the additional lanes are built to the north of the existing roadway. During this phase crossover temporary pavement required for Phase II transitioning will be constructed and any curb and gutter, sod, and sidewalk required north of the existing roadway will be also constructed.

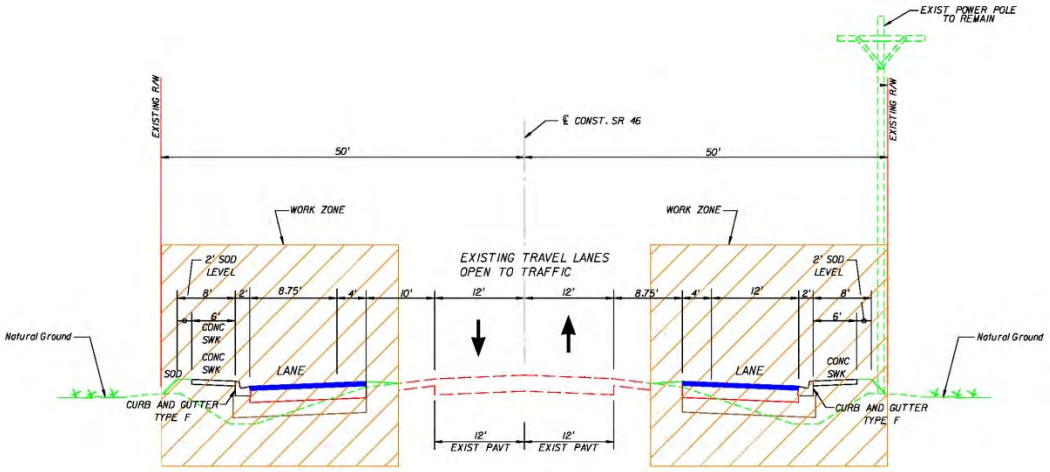
Figure 5.5 – Suburban North Section Temporary Traffic Control – Phase I



SR 46 Urban Section (see Figure 5.6)

Traffic will be maintained on the existing roadway while one lane to the north and one lane to the south of the existing roadway are built. Two work zones north and south of the existing roadway will be developed in this section. During this phase crossover temporary pavement required for Phase II transitioning will be constructed and any curb and gutter, sod, and sidewalk on both sides of the roadway that are required will be also constructed.

Figure 5.6 – Urban Section Temporary Traffic Control – Phase I



SR 46 Bridge

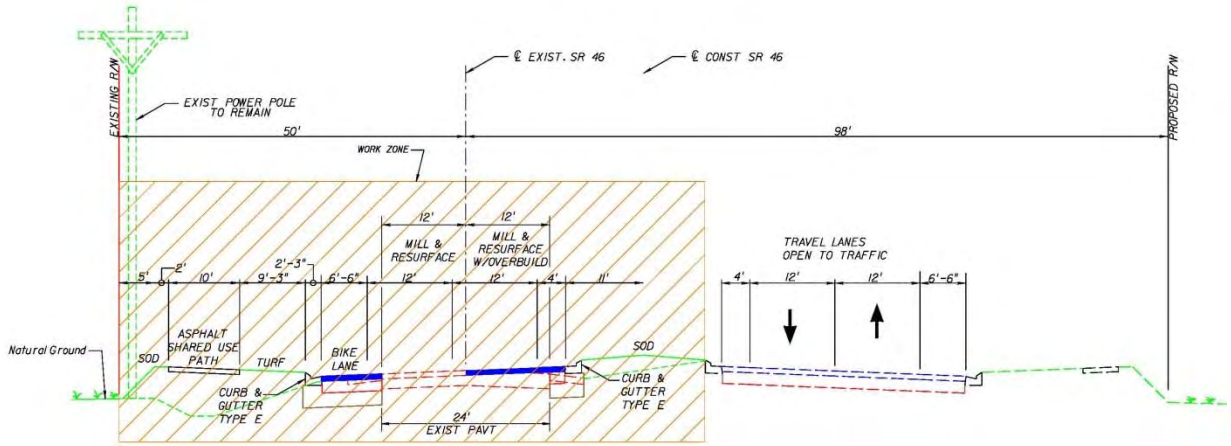
Traffic will be maintained on the existing bridge. During this phase crossover temporary pavement required for the construction of the new bridge in Phase II will be constructed.

Phase II

SR 46 Suburban South Section (see Figure 5.7)

Traffic will be shifted toward the new lanes built south of the existing roadway during Phase I to develop a work zone in the existing roadway extending north from those new lanes to the existing right-of-way line. During this phase milling and resurfacing with overbuild of existing pavement and any curb and gutter, sod, and sidewalk required within this work zone will be constructed. Pedestrians will be shifted to the new sidewalk that was built in Phase I.

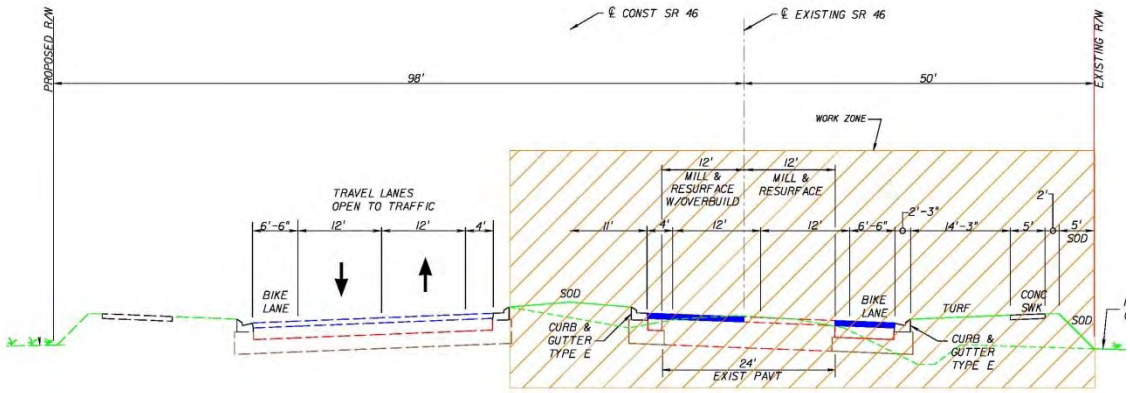
Figure 5.7 – Suburban South Section Temporary Traffic Control – Phase II



SR 46 Suburban North Section (see Figure 5.8)

Traffic will be shifted toward the new lanes built north of the existing roadway during Phase I to develop a work zone in the existing roadway extending south from those new lanes to the existing right-of-way line. During this phase milling and resurfacing with overbuild of existing pavement and any curb and gutter, sod, and sidewalk required within this work zone will be constructed. Pedestrians will be shifted to the new sidewalk that was built in Phase I.

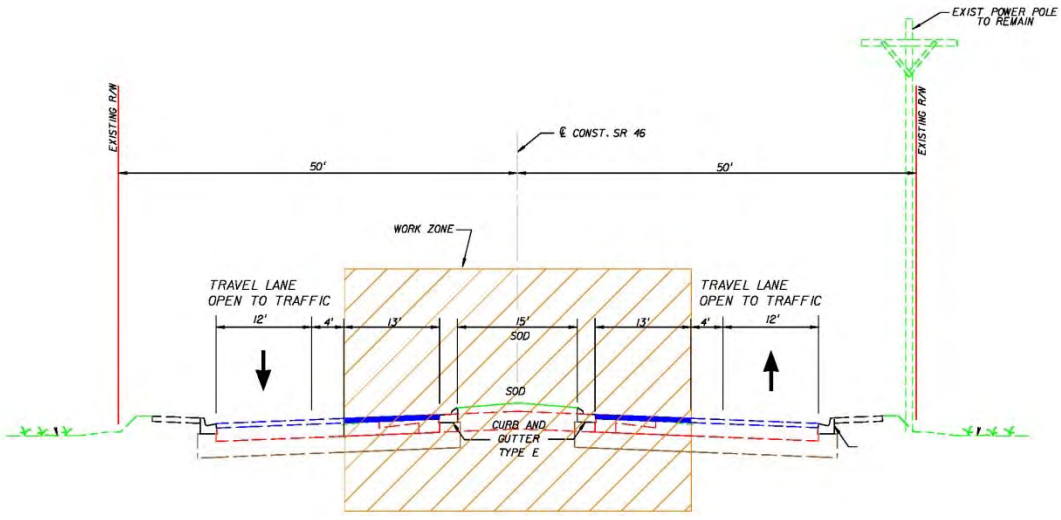
Figure 5.8 – Suburban North Section Temporary Traffic Control – Phase II



SR 46 Urban Section (see Figure 5.9)

Traffic will be shifted to the new lanes built on each side of the existing lanes during Phase I while an additional inside lane is inside each of the new lanes. In this phase existing lanes will be removed and replaced with turf median. Also in this phase bike lanes will be used by vehicular traffic until this phase is completed to provide safe clearance for the construction to the inside.

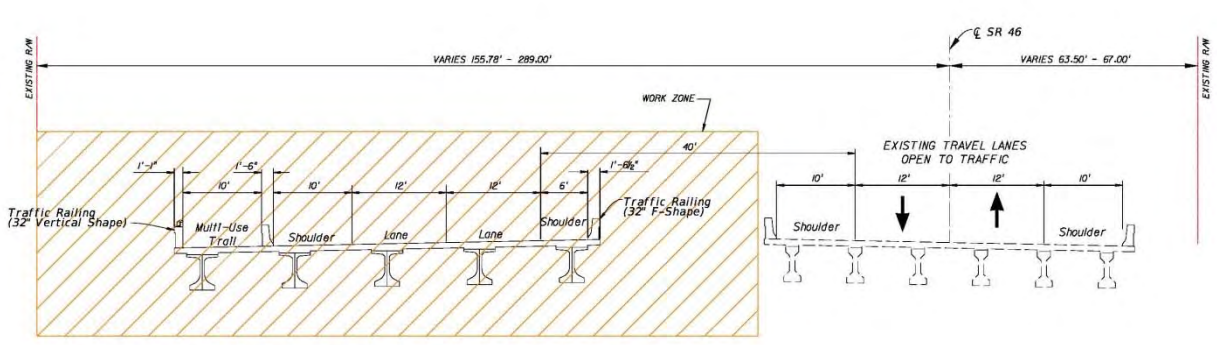
Figure 5.9 – Urban Section Temporary Traffic Control – Phase II



SR 46 Bridge (see Figure 5.10)

Traffic will be maintained on the existing bridge while the second bridge to the north (WB) is built.

Figure 5.10 – SR 46 Bridge Temporary Traffic Control – Phase II



Phase III

In this phase all crossover lane transition areas between phases for each section will be constructed, final pavement surfaces will be laid and striping will be completed.

5.10 Drainage

The proposed drainage conditions outlined in Section 4.4.5 accommodates the Recommended Alternative. Detailed information can be found in the *Pond Siting Report* (April 2014).

5.11 Bridge Analysis

The proposed bridge over Lake Jesup, which will accommodate the ultimate westbound lanes of SR 46, was discussed previously in Section 4.4.12. The bridge as proposed is consistent with the Recommended Alternative.

5.12 Special Features

The special features discussed in Section 4.4.15 are accommodated in the Recommended Alternative. These include the following features:

- A 10-foot asphalt paved multi-use path along the north side of SR 46 from SR 415 to Hart Road
- An 8-foot sidewalk along the north side of SR 46 from Hart Road to CR 426
- A five-foot sidewalk along the south side of SR 46 from SR 415 to Hart Road
- A six-foot sidewalk along the south side of SR 46 from Hart Road to CR 426
- Provisions to route pedestrians from the south side of the road to the multi-use path along the westbound lanes of the proposed bridge

- An MSE wall along 515-feet of the north side of SR 46 immediately west of the proposed bridge

The special features as proposed are consistent with the Recommended Alternative.

5.13 Access Management

The access management plan presented in Section 4.4.10 is consistent with the Recommended Alternative.

Appendix A

Conceptual Design Plans

COMPONENTS OF CONTRACT PLANS SET

CONCEPTUAL DESIGN PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

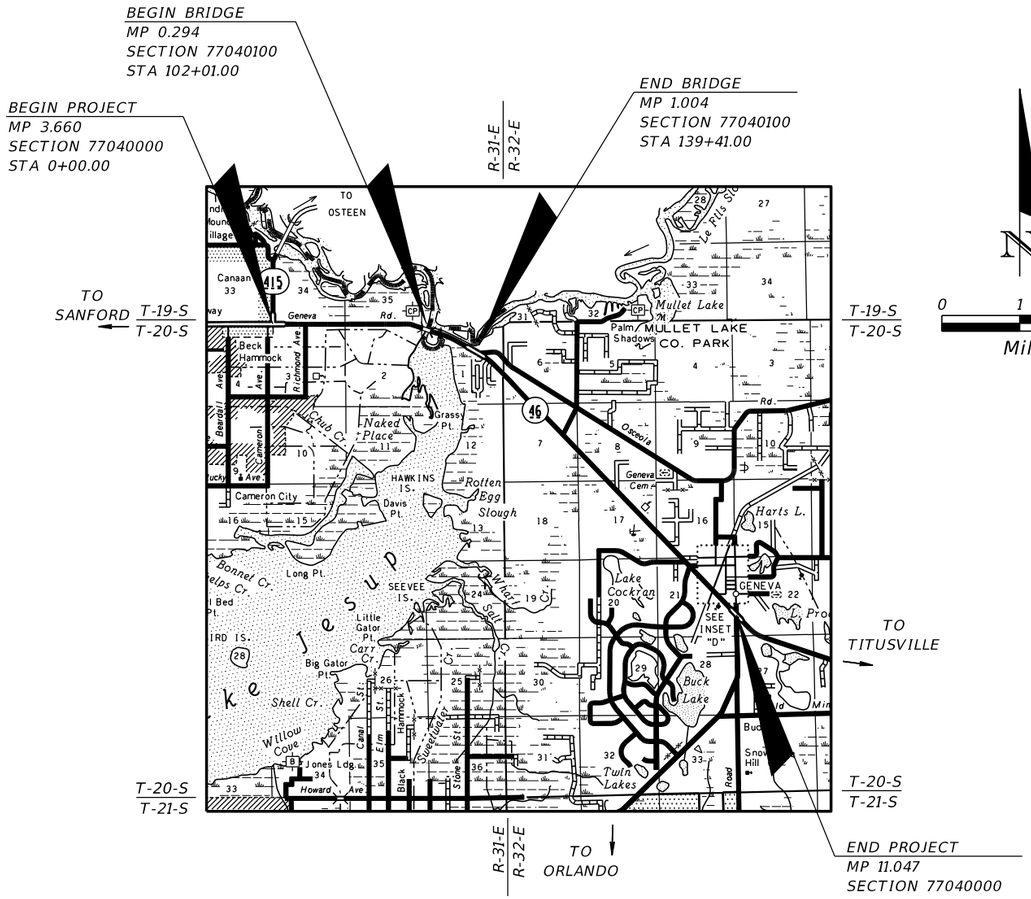
CONCEPTUAL DESIGN PLANS

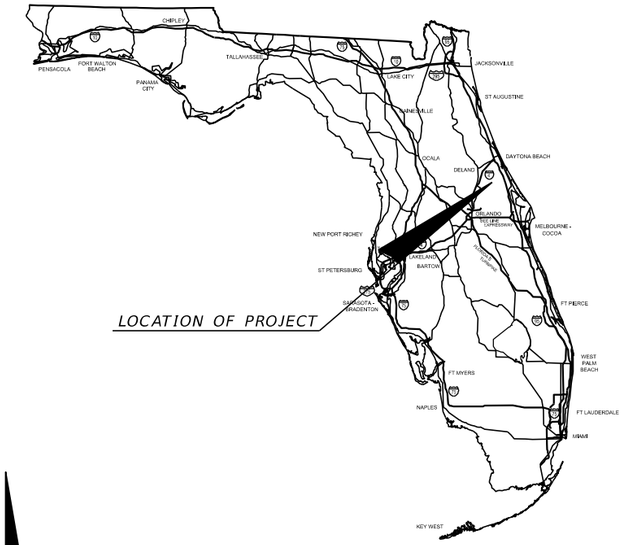
FINANCIAL PROJECT ID 240216-4-28-01

SEMINOLE COUNTY CONTRACT NO. PS-5738-10/JVP

SEMINOLE COUNTY (77040)

STATE ROAD NO. 46





LOCATION OF PROJECT

PLANS PREPARED BY:

URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002
VENDOR NO. F592087895002

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

LENGTH OF PROJECT

	LINEAR FEET	MILES
ROADWAY	35,203.29	6.67
BRIDGES	3,740.00	0.71
NET LENGTH OF PROJECT	38,943.29	7.38
EXCEPTIONS	0.00	0.00
GROSS LENGTH OF PROJECT	38,943.29	7.38

KEY SHEET REVISIONS

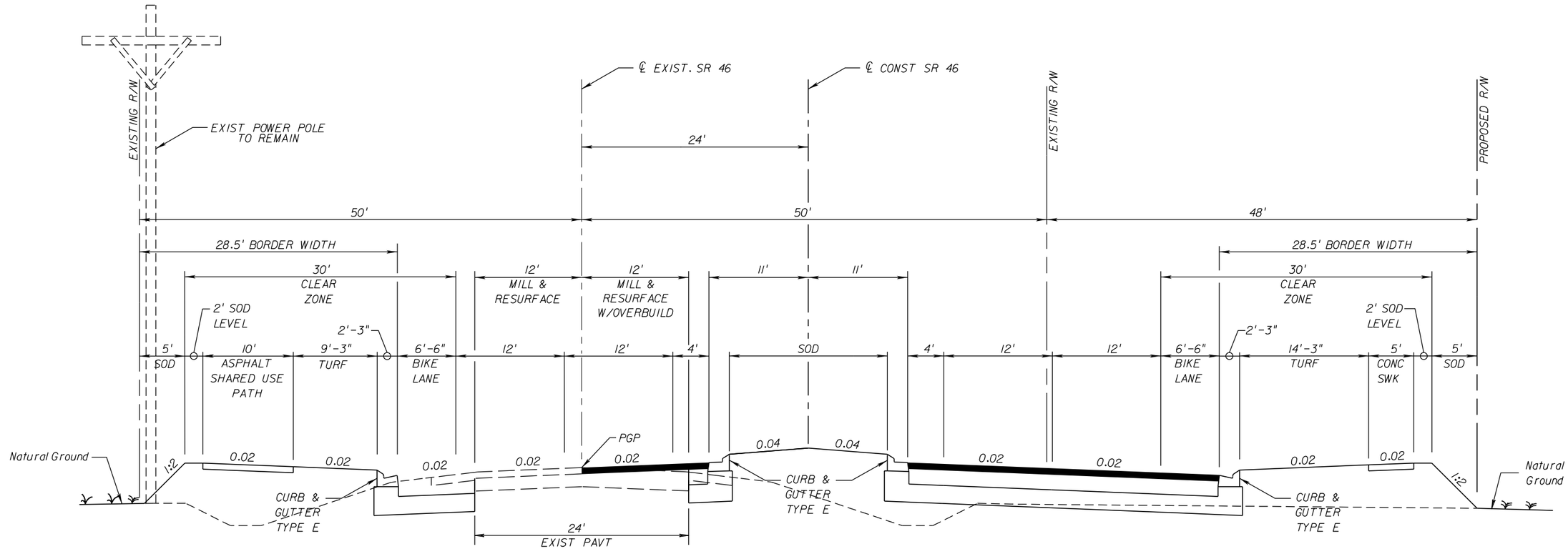
DATE	DESCRIPTION

SEMINOLE COUNTY PROJECT MANAGER: MATT HASSAN, P.E.

ROADWAY PLANS
ENGINEER OF RECORD: CHRISTOPHER RIZZOLO, P.E.

P.E. NO.: 54078

FISCAL YEAR	SHEET NO.
	1



55 MPH

FROM STA 7+13.36 (EAST OF SR 415) TO STA 58+91.69

FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE)

TO STA 339+00 (COCHRAN ROAD)*

* - WHERE WIDENING OCCURS TO THE SOUTH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO. 2

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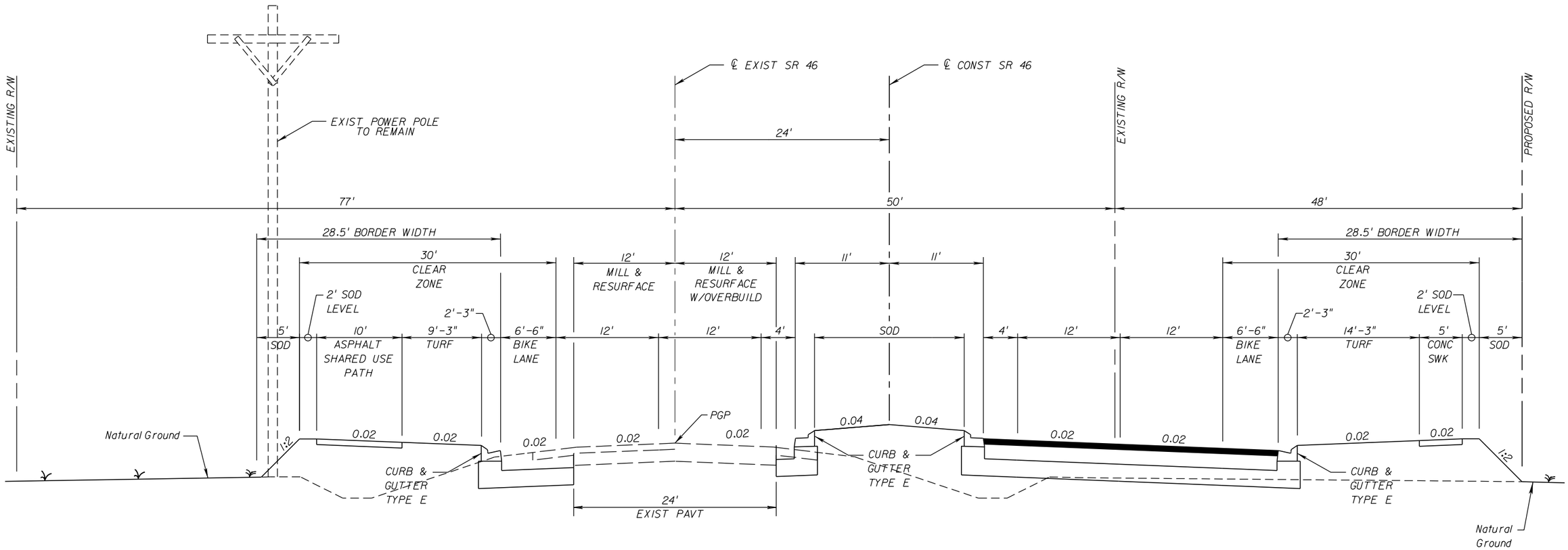

55 MPH
FROM STA 58+91.69 TO STA 83+44.20
(WEST OF ST. JOHNS RIVER BRIDGE)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO. 3

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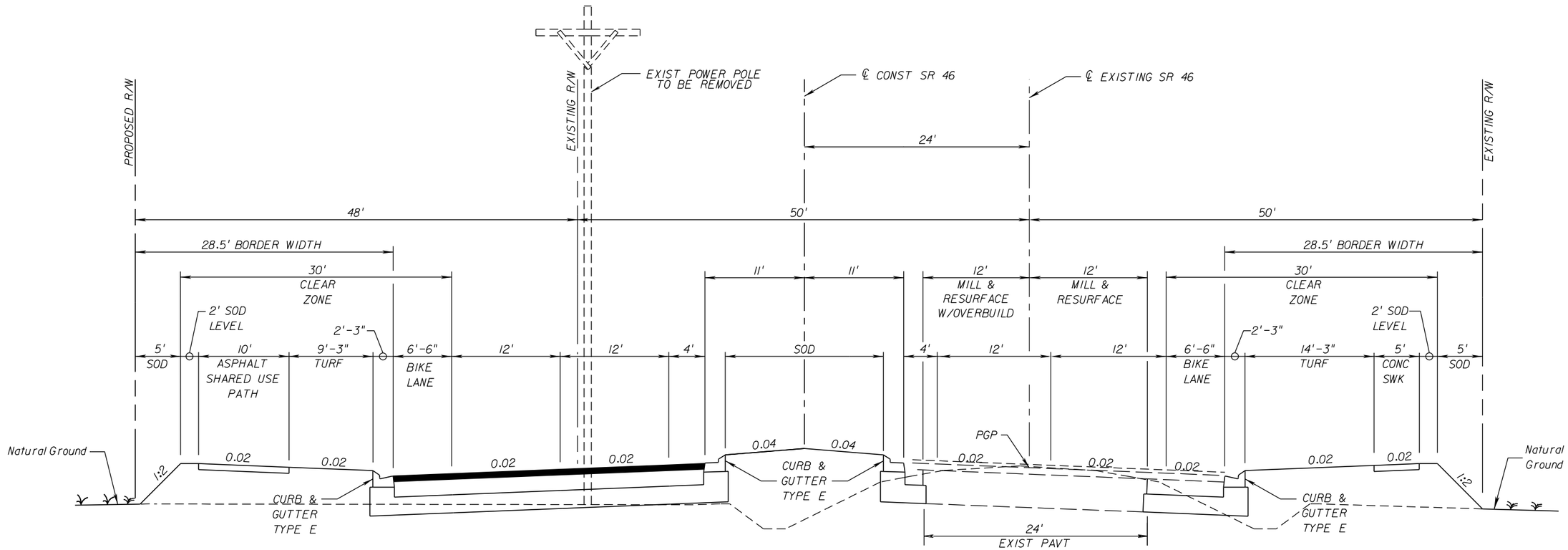

55 MPH

FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE)
TO STA 339+00 (COCHRAN ROAD)*

* - WHERE WIDENING OCCURS TO THE NORTH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
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CERTIFICATE OF AUTHORIZATION NO. 000002

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

SHEET NO. 4

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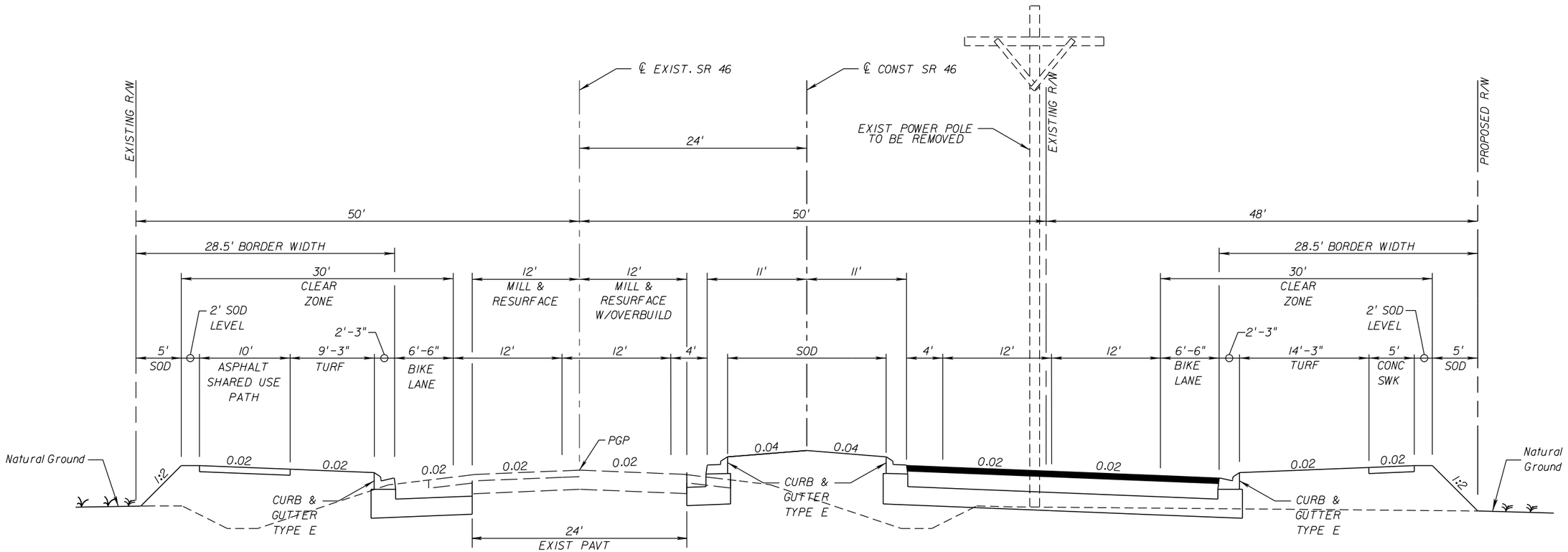

55 MPH

FROM STA 339+00 (COCHRAN ROAD)

TO STA 368+00 (HART ROAD)*

* - WHERE WIDENING OCCURS TO THE SOUTH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
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CERTIFICATE OF AUTHORIZATION NO. 000002

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO. 5

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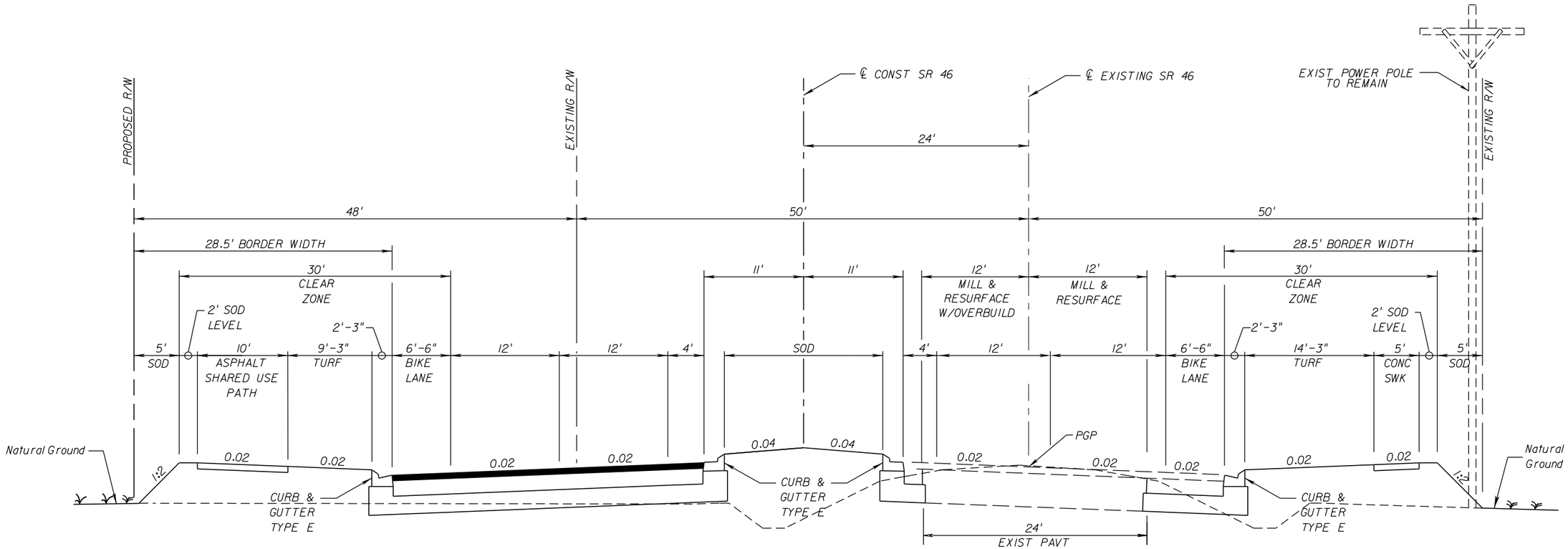

55 MPH

FROM STA 339+00 (COCHRAN ROAD)

TO STA 368+00 (HART ROAD)*

* - WHERE WIDENING OCCURS TO THE NORTH

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

SHEET NO. 6

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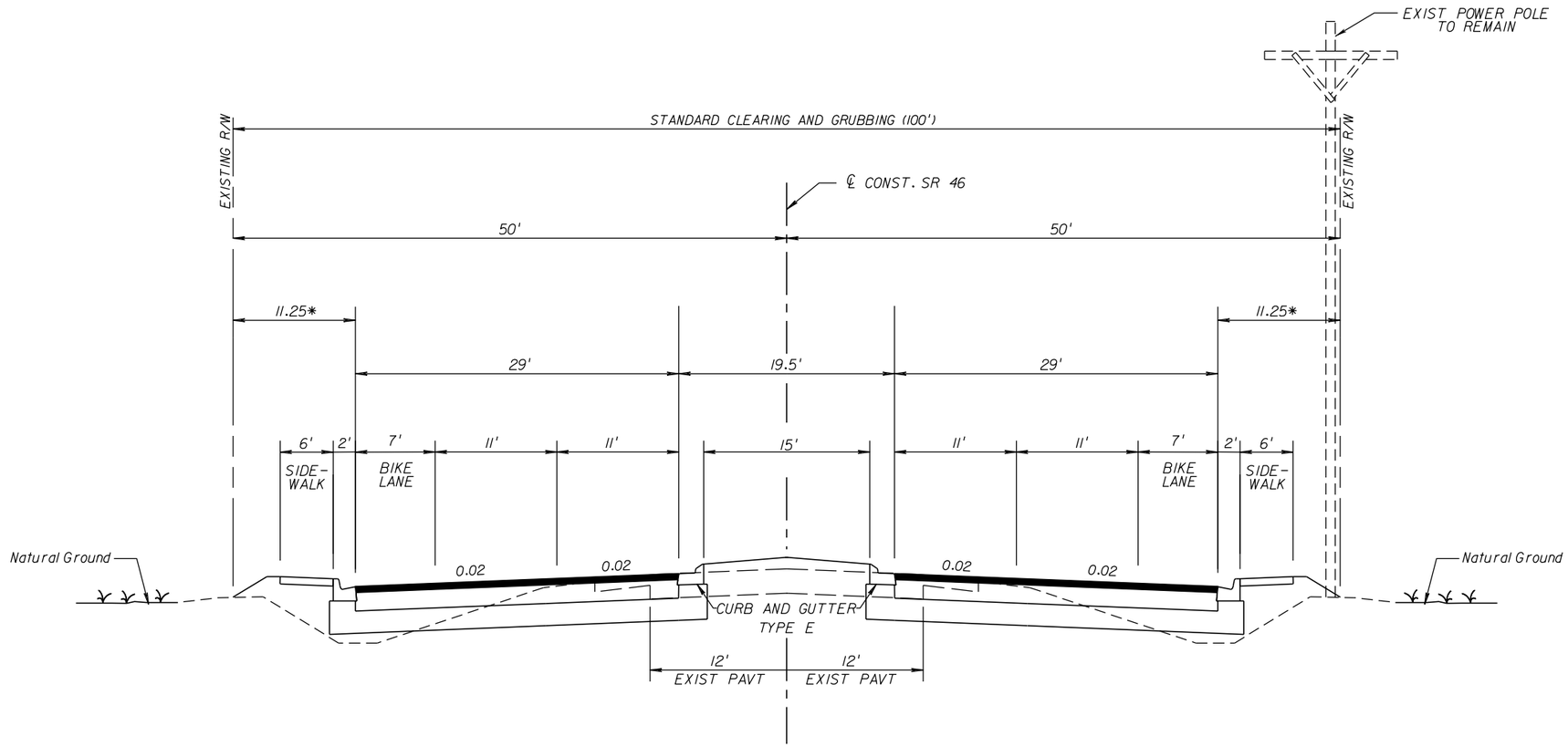

45 MPH

FROM STA 368+00 (HART ROAD)

TO STA 389+43.29 (CR 426)

*LIKELY TO REQUIRE A DESIGN VARIATION

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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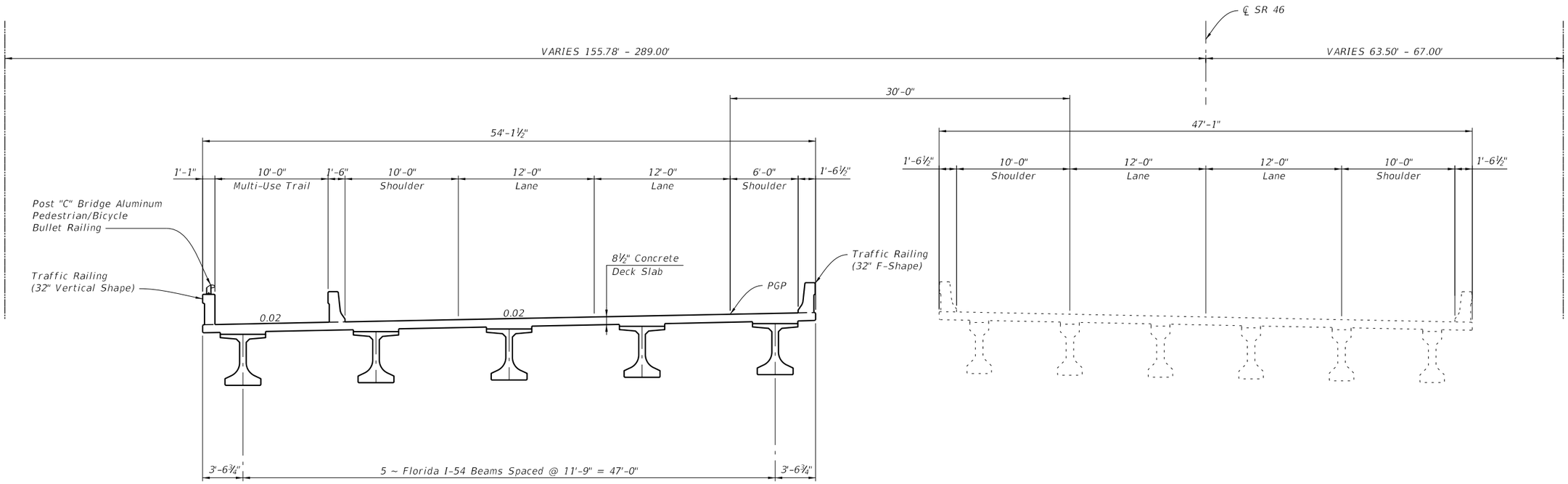
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

URBAN TYPICAL SECTION

SHEET NO. 7



55 MPH

FROM STA 102+03

TO STA 139+41

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
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CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

BRIDGE TYPICAL SECTION

SHEET NO. 8

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
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URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 9

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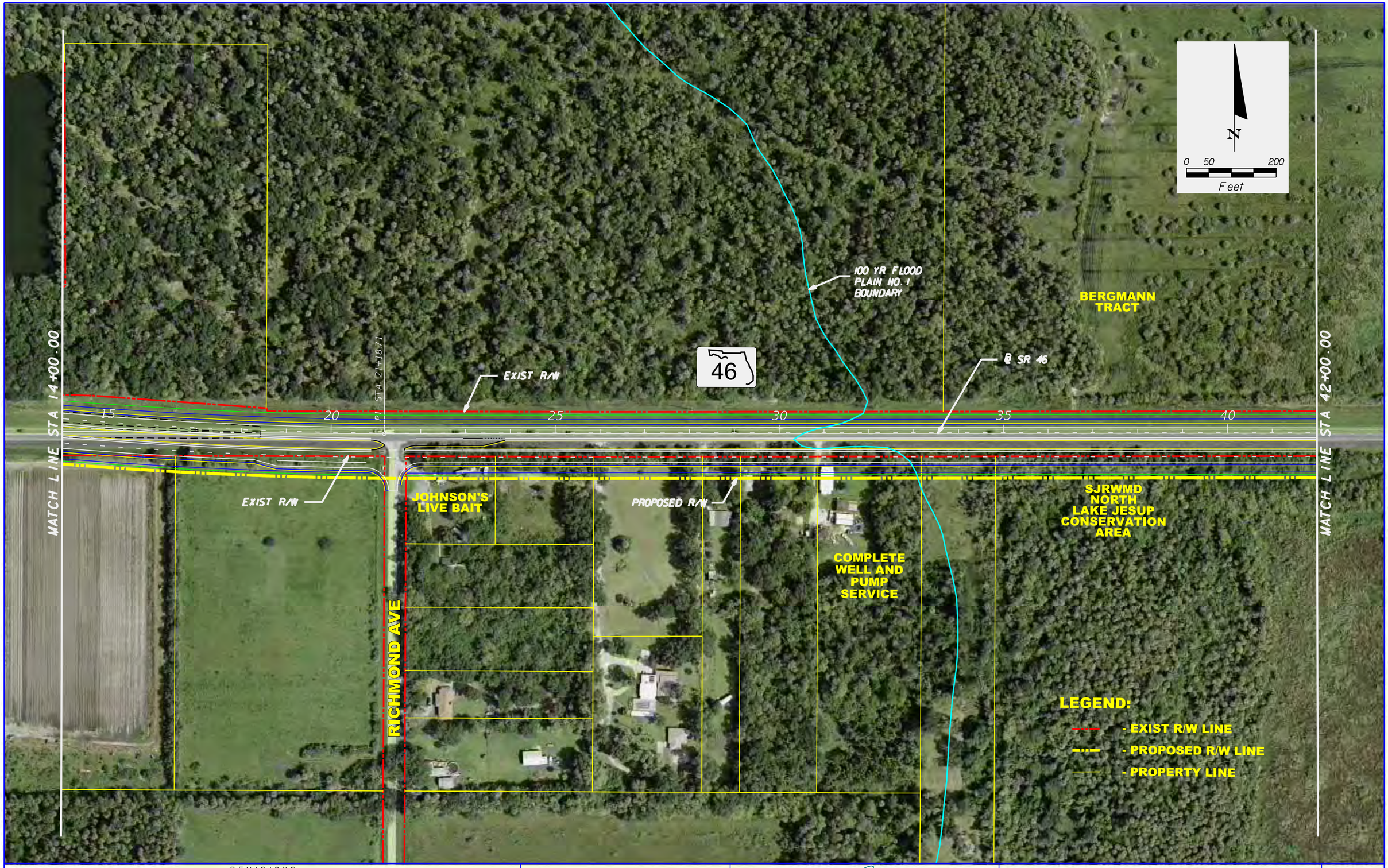

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 10

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 11

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

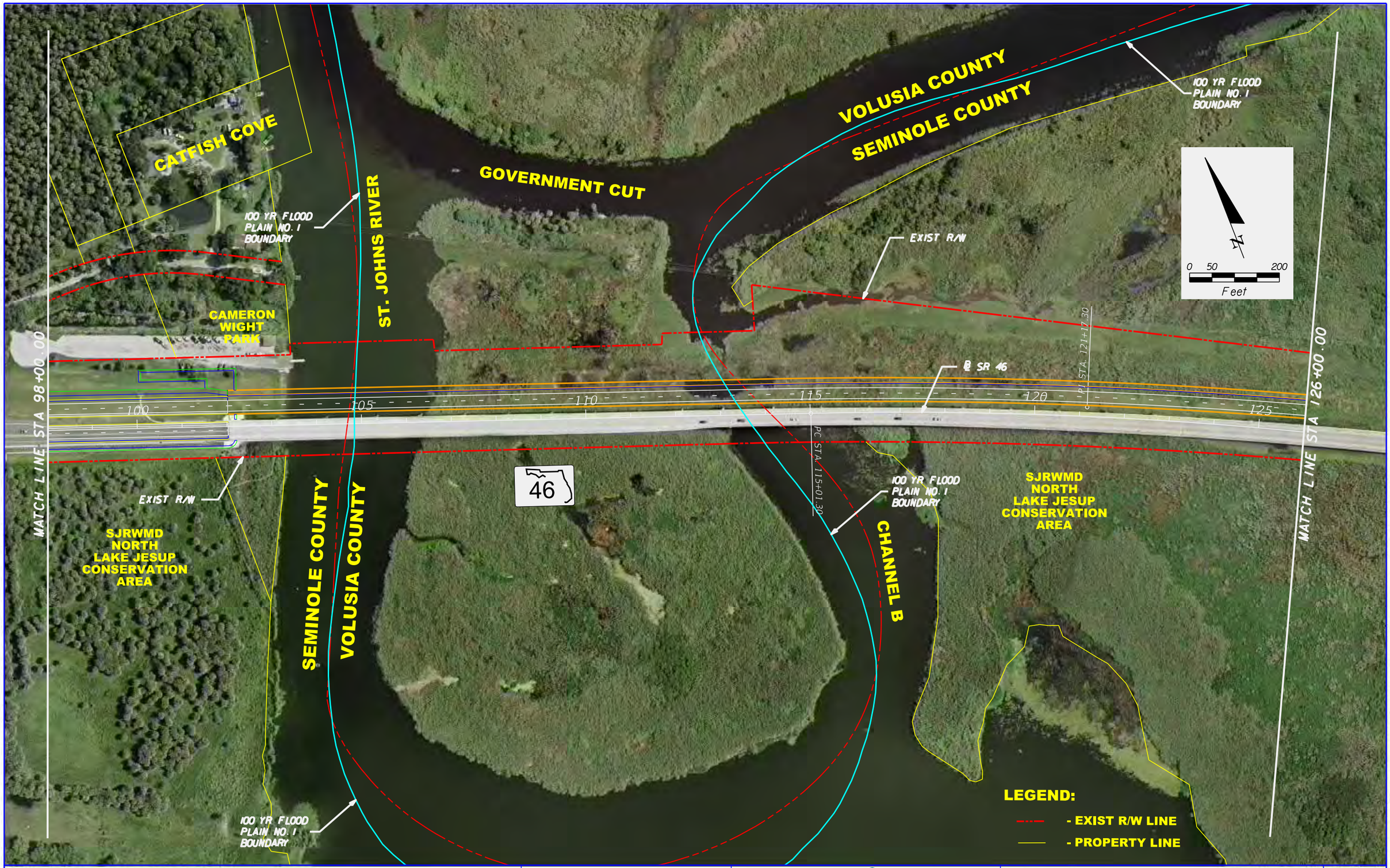
CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN SOUTH PREFERRED ALTERNATIVE

SHEET NO. 12



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 WEST SUBURBAN WIDEN NORTH PREFERRED ALTERNATIVE

SHEET NO. 13

VOLUSIA COUNTY
SEMINOLE COUNTY
ST. JOHNS RIVER
100 YR FLOOD PLAIN NO. 1 BOUNDARY
100 YR FLOOD PLAIN NO. 1 BOUNDARY
COMP POND 2
MODIFIED POND 2
0 50 200
Feet
N
EXIST R/W
EXIST R/W
PROPOSED R/W
W OSCEOLA RD
46
@ SR 46
130
135
140
145
150
PT STA. 127+31.42
PC STA. 134+47.67
MATCH LINE STA 126+00.00
MATCH LINE STA 154+00.00
SWAMP LN
CLEKK CIR
100 YR FLOOD PLAIN NO. 1 BOUNDARY
SJRWMD NORTH LAKE JESUP CONSERVATION AREA

LEGEND:

- PAVEMENT TO BE REMOVED
- EXIST R/W LINE
- PROPOSED R/W LINE
- PROPERTY LINE
- RETENTION AREA
- SAFETY IMPROVEMENTS (UNDER CONSTRUCTION 2017)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
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CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN WIDEN NORTH PREFERRED ALTERNATIVE

SHEET NO. 14

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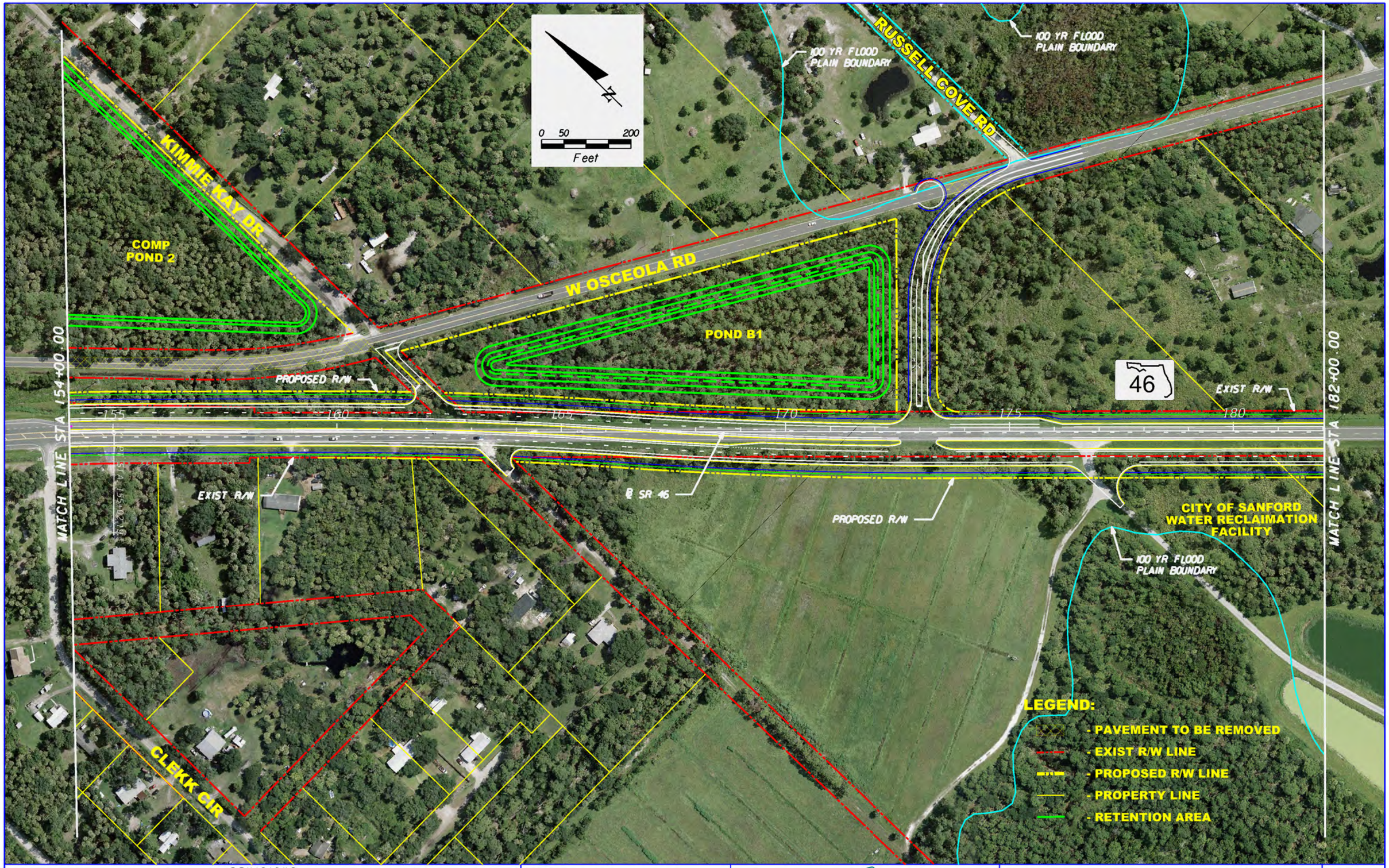

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

SHEET NO. 15

#USER# #DATE# #TIME# #FILE#

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

SHEET NO. 16

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MULLET LAKE PARK RD

100 YR FLOOD PLAIN NO. 2 BOUNDARY

PROPOSED R/W

EXIST R/W

@ SR 46

46

210 215 220 225 230 235

STA 210+00.00

STA 238+00.00

0 50 200

Feet

100 YR FLOOD PLAIN BOUNDARY

POND C1

MATCH LINE STA 210+00.00

EXIST R/W

CD-4 (2-8' X 3' CBC)

PROPOSED R/W

MATCH LINE STA 238+00.00

SANFORD AERO MODELERS FLYING FIELD

100 YR FLOOD PLAIN NO. 3 BOUNDARY

100 YR FLOOD PLAIN BOUNDARY

LEGEND:

- EXIST R/W LINE
- PROPOSED R/W LINE
- PROPERTY LINE
- RETENTION AREA

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

SHEET NO. 17

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

SHEET NO. 18

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
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ORLANDO, FL 32801-1949
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

SHEET NO. 19

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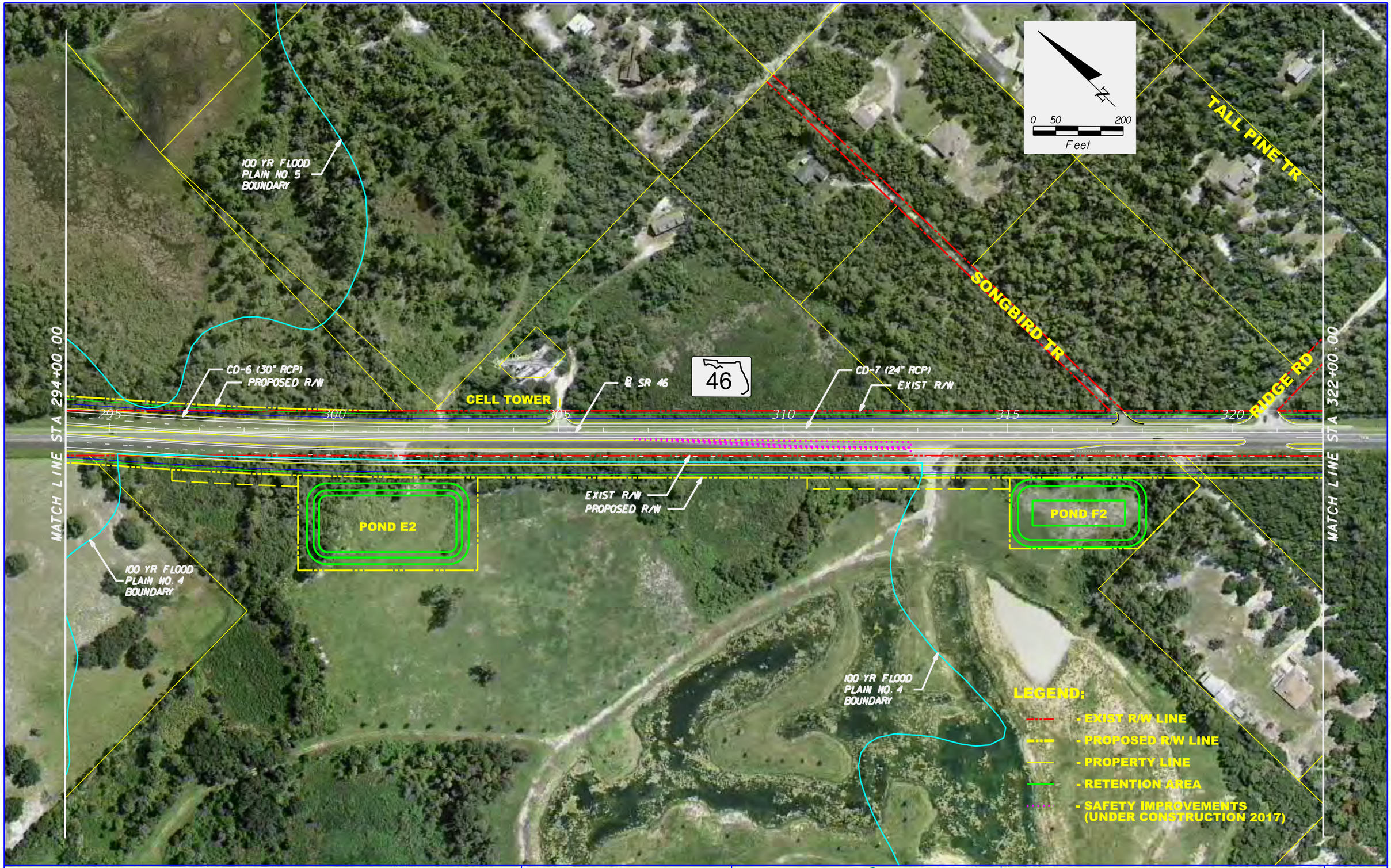

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

SHEET NO. 20

glen.dvorovy 6/9/2017 3:46:30 PM O:\Projects\CADD\2722145 SR46 PDE\roadway\plan\suburban\planrd14.dgn

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST SUBURBAN PREFERRED ALTERNATIVE

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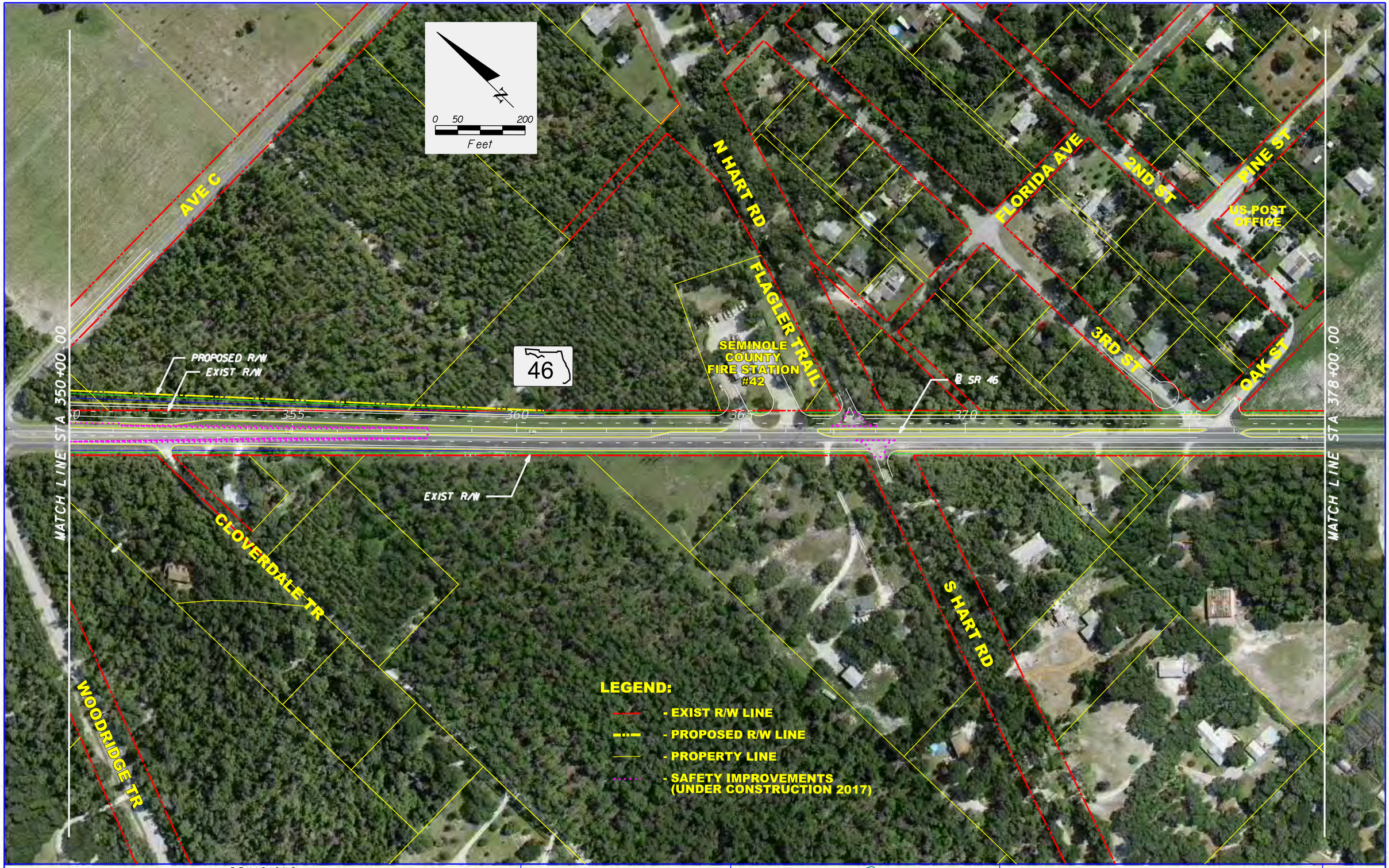

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

CHRISTOPHER RIZZOLO, P.E.
P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST URBAN PREFERRED ALTERNATIVE

SHEET NO. 22

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

PLAN SR 46 EAST URBAN PREFERRED ALTERNATIVE

SHEET NO. 23

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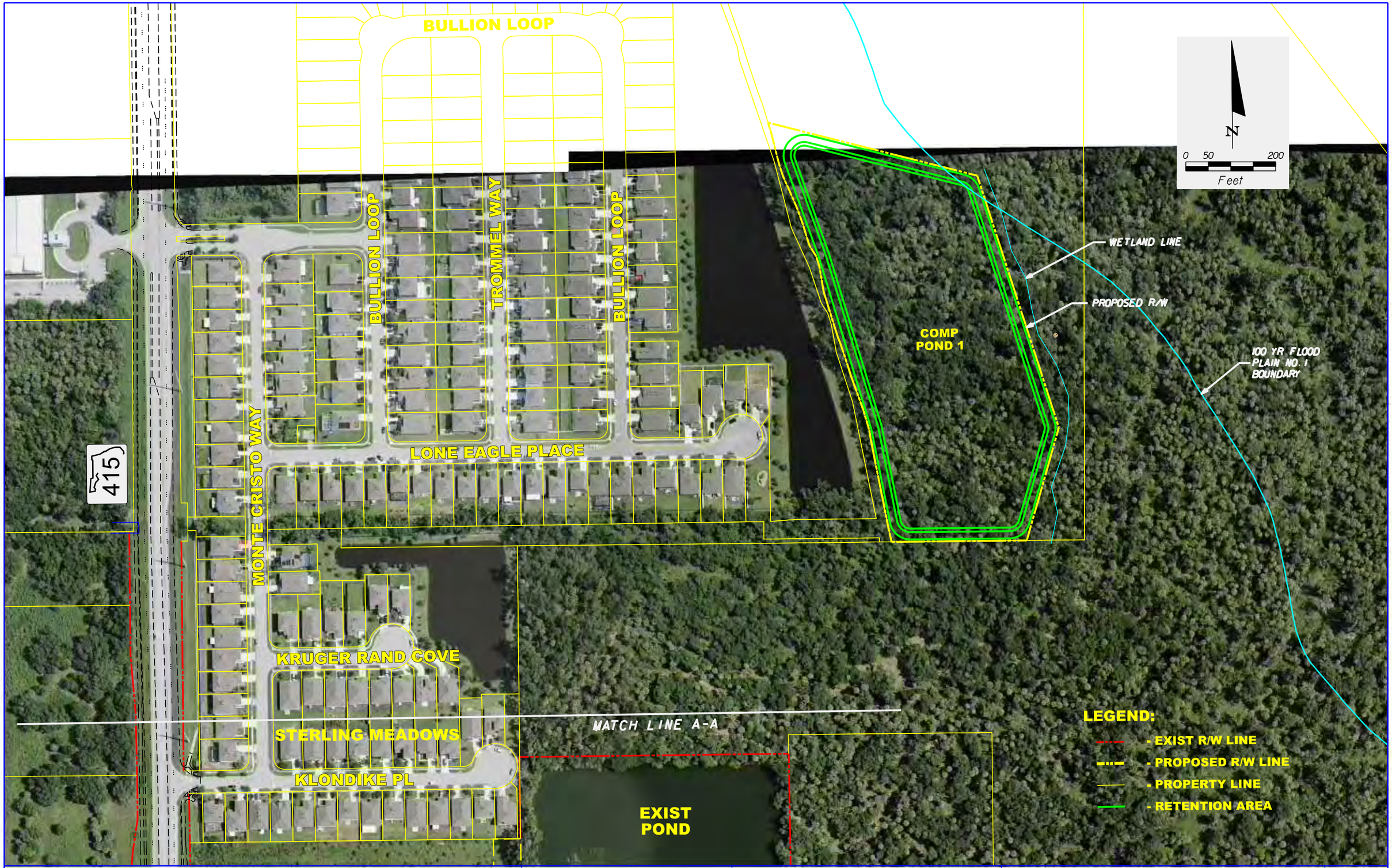

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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P.E. LICENSE NO. 54078
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

FLOOD PLAIN COMPENSATION POND 1

SHEET NO. 24

glen.dvorovy 6/9/2017 3:46:52 PM O:\Projects\CADD\2722145 SR46 PDE\drainage\flood comp pond 1.dgn

Appendix B

ETDM Summary Report

ETDM Summary Report

Project #4972 - SR 46 from SR 415 to CR 426

Programming Screen - Published on 09/20/2010

Printed on: 12/09/2011

Introduction to Programming Screen Summary Report

The Programming Screen Summary Report shown below is a read-only version of information contained in the Programming Screen Summary Report generated by the ETDM Coordinator for the selected project after completion of the ETAT Programming Screen review. The purpose of the Programming Screen Summary Report is to summarize the results of the ETAT Programming Screen review of the project; provide details concerning agency comments about potential effects to natural, cultural, and community resources; and provide additional documentation of activities related to the Programming Phase for the project. Available information for a Programming Screen Summary Report includes:

- Screening Summary Report chart
- Project Description information (including a summary description of the project, a summary of public comments on the project, and community-desired features identified during public involvement activities)
- Purpose and Need information (including the Purpose and Need Statement and the results of agency reviews of the project Purpose and Need)
- Alternative-specific information, consisting of descriptions of each alternative and associated road segments; an overview of ETAT Programming Screen reviews for each alternative; and agency comments concerning potential effects and degree of effect, by issue, to natural, cultural, and community resources.
- Project Scope information, consisting of general project commitments resulting from the ETAT Programming Screen review, permits, and technical studies required (if any)
- Class of Action determined for the project
- Dispute Resolution Activity Log (if any)

The legend for the Degree of Effect chart is provided in an appendix to the report.

For complete documentation of the project record, also see the GIS Analysis Results Report published on the same date as the Programming Screen Summary Report.

Table of Contents

4972 - SR 46 from SR 415 to CR 426 ** Most Recent Data			
Review Start Date:	4/13/2010	**Phase:**	Programming Screen
From:	SR 415 (MP 3.66)	**To:**	CR 426 (MP 11.047),"Location not available."
District:	District 5	**County:**	Seminole County
Planning Organization:	FDOT District 5	**Plan ID:**	
Contact Name / Phone:	Mary McGehee (386) 943-5063	**Contact Email:**	mary.mcgehee@dot.state.fl.us

Project Re-Published 9/20/2010

Project Overview: Summary Degree of Effect Chart

Legend

- N/A N/A / No Involvement
- 1 Enhanced
- 0 None
- 2 Minimal (after 12/5/2005)
- 3 Moderate
- 4 Substantial
- 5 Dispute Resolution (Programming)

	Evaluation of Direct Effects																					
	Natural											Cultural			Community							
	Air Quality	Coastal and Marine	Contaminated Sites	Farmlands	Floodplains	Infrastructure	Navigation	Special Designations	Water Quality and Quantity	Wetlands	Wildlife and Habitat	Historic and Archaeological Sites	Recreation Areas	Section 4(f) Potential	Aesthetics	Economic	Land Use	Mobility	Relocation	Social	Secondary and Cumulative Effects
Alternative #1 From SR 415 (MP 3.66) To CR 426 (MP 11.047) *- Reviewed from 4/13/2010 to 6/12/2010 - Published on 9/20/2010*	2	2	0	3	3	2	N/A	3	3	3	3	3	3	3	2	1	3	1	2	2	2

Project Description Summary

The limits for this programming screen event are from SR415 to CR426. This project previously went through a planning screening in 2005. The limits for the planning screen were from SR415 to the Volusia County Line, which is east of CR426. The planning screen limits do not represent a logical terminus for a subsequent PD&E Study; therefore, the limits have been adjusted to match the only intersecting road that serves more than local residential interest.
The major portion of the roadway segment to be studied is a rural principal arterial. The existing roadway consists of two travel lanes with a rural, open drainage system. The proposed action is a capacity project which would involve widening the existing facility from a two lane undivided roadway to a four lane divided roadway. There is a bridge structure crossing the St. Johns River within the project limits which has recently been demolished along with removal of the road causeway and replaced with a 3,740 foot long structure that now spans the floodplain of the St. Johns River at the mouth of Lake Jesup. It is anticipated that four lanning would entail construction of a parallel structure of the same length on the north side of the new bridge. The project is not within an urban service area or a transportation concurrency exception area.

LAND USE
Existing land uses within the corridor consist of low density residential, agricultural, public and conservation lands. Community facilities such as schools, a Seminole County Fire Station, and a Seminole County park are also located within the study area. Cameron Wight Park is located at MP 5.500 where SR 46 crosses the St. Johns River north of Lake Jessup. The entire corridor is characterized predominantly by undeveloped land. Development is limited to some commercial and light industrial uses concentrated around the SR 415 and SR 426 intersections in the community of Geneva.

System Linkage
The western project terminus connects to SR 415 which has been designed to be widened to a four lane divided facility. The recently extended four lane divided Lake Mary Blvd. intersects SR 46 at SR415 and provides a direct connection to the Orlando-Sanford International Airport and the Seminole County Greeneway (SR 417). State Road 46 west of SR415 has also been designed for a divided four lane facility from US 17/92 to SR 415. This project is currently in the right of way acquisition phase. The eastern terminus of the proposed SR 46 four lanning is at CR 426 which provides a direct connection to the town of Oviedo, a growing suburb of Orlando.
Federal, State, and Local Authority
The project is listed in the 2030 LRTP for METROPLAN Orlando and is in the most recently adopted Cost Feasible Plan. The project is also in the Seminole County Comp Plan and METROPLAN Orlando's Priority List.

Summary of Public Comments

Community Desired Features

No desired features have been entered into the database. This does not necessarily imply that none have been identified.

Purpose and Need Statement

The purpose of this project is to increase capacity of the roadway in order to improve both the existing and projected future Levels of Service (LOS) and to evaluate the profile grade elevation of the roadway to ensure it is above flood elevation. The limits of the proposed action on SR 46 in Seminole County are from SR 415 (MP 3.660) to CR 426 (MP 11.047), which is a distance of 7.387 miles. The project is oriented from west to east and terminates at CR 426 in Geneva, an unincorporated area of Seminole County.

Seminole County's adopted Level of Service (LOS) Standard for SR 46, based on the OUATS Model, is D both for the roadway segment from SR415 to Osceola Road and for the segment from Osceola Road to CR426. This LOS equates to capacity volumes of 13,700 Average Annual Daily Traffic for both segments. Existing traffic volumes from 2008 are 15,502 AADT for SR415 to Osceola Rd. and 10,161 for the segment from Osceola Rd. to CR426. These volumes represent a LOS of E for the first segment and D for the second segment. Projected future traffic volumes in 2025 are 24,409 for the segment from SR415 to Osceola Rd. and 22,714 for Osceola Rd. to CR426. The roadway segment from SR415 to Osceola Rd. is currently below and projected to remain below the adopted Level of Service. The segment from Osceola Rd. to CR426 is currently not below but is projected in the future to be below the adopted LOS. Future traffic projections indicate the need to multi-lane this portion of SR46.

During the past few hurricane seasons portions of SR 46 were completely inundated by high water resulting in the closure of this road. SR 46 serves as a major evacuation route for Northern Brevard and Southern Volusia Counties. The next two closest east-west evacuation routes are SR50 located about 8 miles to the south and SR44 located about 25 miles to the north. The PD&E study will evaluate the profile grade elevation of SR46 within these study limits to ensure that this portion of SR46 would remain open during emergency evacuations.

Purpose and Need Reviews

Federal Highway Administration Comments

Agency	Acknowledgment	Review Date
Federal Highway Administration	Accepted	5/27/2010

Comments

Plan consistency and cost feasibility requirements will need to be met before FHWA can approve the environmental document.

US Coast Guard Comments

Agency	Acknowledgment	Review Date
US Coast Guard	Understood	5/14/2010

Comments

Section 107 of the Coast Guard Authorization Act of 1982, 33 U.S.C. 530, exempts bridge projects from Coast Guard bridge permits when the bridge project crosses non-tidal waters which are not used, susceptible to use in their natural condition; or susceptible to use by reasonable improvement as a means to transport interstate or foreign commerce. The previous SR 46 Bridge replacement project across Lake Jesup fell under this exemption. The proposed dualization of this bridge also falls under this bridge permit exemption.

US Environmental Protection Agency Comments

Agency	Acknowledgment	Review Date
US Environmental Protection Agency	Understood	5/28/2010

Comments

Based upon the Purpose & Need Statement, portions of the project area (SR 46) has been closed during recent hurricane seasons as a result of being inundated by high water. SR 46 serves as a major evacuation route for Northern Brevard and Southern Volusia Counties. The PD&E study will evaluate the profile grade elevation of SR46 within these study limits to ensure that this portion of SR46 would remain open during emergency evacuations. EPA supports the Purpose & Need of the project for capacity purposes. However, if this roadway serves as a critical hurricane evacuation route, widening of the roadway without an assessment of the grade elevation and flooding issues is not appropriate. EPA would have less support for a capacity improvement project on this roadway segment without the roadway being able to adequately provide hurricane evacuation needs.

FL Department of Community Affairs Comments

Agency	Acknowledgment	Review Date
FL Department of Community Affairs	Understood	6/29/2010

Comments

No Purpose and Need Comments Were Found.

FL Fish and Wildlife Conservation Commission Comments

Agency	Acknowledgment	Review Date
FL Fish and Wildlife Conservation Commission	Understood	5/21/2010

Comments

No Purpose and Need Comments Were Found.

FL Department of Environmental Protection Comments		
Agency	**Acknowledgment**	**Review Date**
FL Department of Environmental Protection	Understood	5/25/2010
Comments		
No Purpose and Need Comments Were Found.		

National Marine Fisheries Service Comments		
Agency	**Acknowledgment**	**Review Date**
National Marine Fisheries Service	Understood	5/15/2010
Comments		
None.		

FL Department of State Comments		
Agency	**Acknowledgment**	**Review Date**
FL Department of State	Understood	5/25/2010
Comments		
No Purpose and Need Comments Were Found.		

US Fish and Wildlife Service Comments		
Agency	**Acknowledgment**	**Review Date**
US Fish and Wildlife Service	Understood	4/28/2010
Comments		
No Purpose and Need Comments Were Found.		

Alternative #1

Alternative Description	
From	SR 415 (MP 3.66)
To	CR 426 (MP 11.047)
Type	Widening
Status	ETAT Review Complete
Total Length	7.387 mi.
Cost	
Modes	Roadway

Location and Length				
	Segment #1	**Segment #2**	**Segment #3**	**Segment #4**
Name				
Beginning Location				
Ending Location				
Length (mi.)	0.103	0.418	5.239	1.627
Roadway Id	77040000	77040000	77040000	77040000
BMP	??	??	??	??
EMP	??	??	??	??
Jurisdiction and Class				
	Segment #1	**Segment #2**	**Segment #3**	**Segment #4**
Jurisdiction				
Urban Service Area		In/Out		
Functional Class	Roadway Feature	RURAL: Principal Arterial - Other	RURAL: Principal Arterial - Other	RURAL: Principal Arterial - Other
Current and Future Conditions				
Base Conditions				
	Segment #1	**Segment #2**	**Segment #3**	**Segment #4**
Year	0	2008	2008	2008
AADT	$0.00	$15,502.00	$9,100.00	$10,435.00
Lanes		2		
Config		Lanes Undivided		
Interim Plan				
	Segment #1	**Segment #2**	**Segment #3**	**Segment #4**
Year				
AADT	unspecified	unspecified	unspecified	unspecified
Lanes				
Config				
Needs Plan				
	Segment #1	**Segment #2**	**Segment #3**	**Segment #4**
Year		2025		
AADT	unspecified	$24,409.00	unspecified	unspecified
Lanes		4		
Config		Lanes Divided		
Cost Feasible Plan				
	Segment #1	**Segment #2**	**Segment #3**	**Segment #4**
Year		2025		

AADT	unspecified	unspecified	unspecified	unspecified
Lanes				
Config				

No funding sources found.

Project Effects Overview

Issue	Degree of Effect	Organization	Date Reviewed
Natural			
Air Quality	2 Minimal	US Environmental Protection Agency	6/11/2010
Coastal and Marine	2 Minimal	National Marine Fisheries Service	5/15/2010
Contaminated Sites	0 None	FL Department of Environmental Protection	5/27/2010
Contaminated Sites	0 None	US Environmental Protection Agency	6/11/2010
Farmlands	3 Moderate	Natural Resources Conservation Service	4/22/2010
Floodplains	3 Moderate	US Environmental Protection Agency	6/11/2010
Navigation	N/A N/A / No Involvement	US Coast Guard	5/14/2010
Special Designations	3 Moderate	US Environmental Protection Agency	6/12/2010
Water Quality and Quantity	3 Moderate	FL Department of Environmental Protection	5/27/2010
Water Quality and Quantity	3 Moderate	US Environmental Protection Agency	6/12/2010
Wetlands	3 Moderate	FL Department of Environmental Protection	5/27/2010
Wetlands	3 Moderate	National Marine Fisheries Service	5/15/2010
Wetlands	3 Moderate	US Fish and Wildlife Service	5/25/2010
Wetlands	3 Moderate	US Environmental Protection Agency	6/12/2010
Wildlife and Habitat	3 Moderate	US Fish and Wildlife Service	5/25/2010
Wildlife and Habitat	3 Moderate	FL Fish and Wildlife Conservation Commission	5/21/2010
Cultural			
Historic and Archaeological Sites	3 Moderate	Federal Highway Administration	5/27/2010
Historic and Archaeological Sites	3 Moderate	Miccosukee Tribe of Indians of Florida	4/26/2010
Historic and Archaeological Sites	3 Moderate	FL Department of State	5/25/2010
Recreation Areas	3 Moderate	Federal Highway Administration	5/27/2010
Recreation Areas	3 Moderate	FL Department of Environmental Protection	5/27/2010
Section 4(f) Potential	3 Moderate	Federal Highway Administration	5/27/2010
Community			

Land Use	3 Moderate	FL Department of Community Affairs	6/29/2010
Social	0 None	FL Department of Community Affairs	6/29/2010
Social	2 Minimal	US Environmental Protection Agency	6/12/2010

Secondary and Cumulative

ETAT Reviews: Natural

Air Quality

Coordinator Summary

2 Summary Degree of Effect

Air Quality Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (6/18/2010)
Comments:
The USEPA provided comments on this issue and noted that Seminole County has not been designated a non-attainment area for ozone, carbon monoxide or particulate matter. The EPA recommended that an air impact analysis be conducted during the study to which we concur and assigned a degree of effect of Minimal. We agree and have assigned a Minimal degree of effect.

ETAT Reviews for Air Quality

2 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/11/2010)

Air Quality Effect: Minimal

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Resources: Air Quality

Level of Importance: Low, due to minimal degree of effect

Comments on Effects to Resources:
Seminole County has not been designated non-attainment or maintenance for ozone, carbon monoxide (CO) or particulate matter (PM) in accordance with the Clean Air Act. There are no violations of National Ambient Air Quality Standards (NAAQS). Nevertheless, it is recommended that the environmental review phase of this project include air impact analyses which documents the current pollutant concentrations recorded at the nearest air quality monitors, an evaluation of anticipated emissions, and air quality trend analyses. It is also recommended that environmental reviews of the project include hot spot analyses at the points in time and places where congestion are expected to be greatest or in areas of sensitive receptors.

Additional Comments (optional):
As population growth and vehicle volumes increase, there is the potential to have air quality conformity and non-attainment issues in the future. FDOT, MPOs, municipalities, and regional planning agencies should conduct air quality modeling as traffic forecasts increase.

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your review and comments. An Air Impact Analysis will be conducted

during the PD&E study for this project.
*Date Feedback Submitted:*6/18/2010

- No review submitted from the Federal Highway Administration

Coastal and Marine

Coordinator Summary

2 Summary Degree of Effect

Coastal and Marine Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (6/18/2010)
Comments:
The National Marine Fisheries Service provided comments and recommendation regarding this issue, see below. The NMFS assigned a Minimal degree of effect for this issue to which we concur.

ETAT Reviews for Coastal and Marine

2 ETAT Review by Brandon Howard, National Marine Fisheries Service (05/15/2010)

Coastal and Marine Effect: Minimal

Coordination Document: To Be Determined: Further Coordination Required

Dispute Information:N/A

Identified Resources and Level of Importance:
NOAA's National Marine Fisheries Service (NMFS) conducted a site inspection on March 16, 2005, and responded to the Planning Screen for this project on April 6, 2005. Lacustrine, palustrine, and riverine wetlands are present in the project area. NMFS staff identified highly functional wetlands, such as bay swamps, cabbage palm hammock, emergent aquatic vegetation, freshwater marsh, wet prairies, and a mix of scrub-shrub, hardwoods, and forested wetlands, within the proposed project corridor. The project involves an additional bridge adjacent to the existing bridge across the St. Johns River. Our comments to the Planning Screen indicated that wetlands in the project corridor are designated as essential fish habitat (EFH) by the South Atlantic Fishery Management Council (SAFMC). At that time, SAFMC managed red drum under the Magnuson-Stevens Act. Effective November 5, 2008, management of Atlantic stocks of red drum was no longer authorized through the Magnuson-Stevens Act, which also removed the EFH designations for red drum. Based on these changes, NMFS determines that wetlands likely to be affected by the project are not EFH (Lake Monroe essentially is the upstream extent of white shrimp in the St. Johns River, and the site of the proposed project is upstream of Lake Monroe). While these wetlands are not EFH, they nonetheless are important to downstream fisheries in the St. Johns River.

Comments on Effects to Resources:
The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and

other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, or ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

NMFS recommends that the following measures be implemented as project progresses to PD&E, design, and construction:

1. Adverse impacts to wetlands should be sequentially avoided and minimized; unavoidable impacts should be offset in a manner that precludes a net loss of wetland function.
2. The proposed median should be eliminated or minimized to avoid impacts to wetlands.

3. Retaining walls should be used in place of side slopes where feasible to minimize the roadway footprint.

4. A habitat characterization of the wetlands within the project site, including the size and location of wetlands that would be directly and/or indirectly impacted by the proposed project should be prepared.

5. Conservation measures (i.e., best management practices for water quality and erosion control) should be included in the project design and implemented during project construction.

6. A Stormwater Management Plan for containment and treatment of surface and stormwater runoff from impervious surfaces should be prepared. Treatment should be in accordance with state and federal (NPDES) standards. Details of the stormwater plan should include location, area, and cross section of any proposed stormwater swales and ponds and information on wetland vegetation planting, if proposed.

7. Buffer zones at a minimum of 50 feet should be given to wetlands. If not, indirect impacts should be considered.

8. Prior to construction, all wetlands should be delineated in the field so that construction crews can readily recognize these sensitive areas and avoid them.

9. Preconstruction meetings should occur with construction personnel describing activities that should not occur in wetlands and measures that can be taken to minimize impacts.

10. Seasonal high and normal pool water elevations should be preserved in wetlands adjacent to the project. This can be accomplished by having a comprehensive surface water management plan that has control elevations compatible with these wetlands to reduce drawdown effects.

11. The water contributing areas for each wetland should be considered. Treated stormwater should be routed to these wetlands to preserve each hydroperiod. The use of spreader swales that imitate natural overland sheet flow should be utilized to minimize erosion impacts and mimic natural rain events.

12. Wildlife crossings should be installed along the eco-tone of wetlands adjacent to the project corridor. Fencing should be placed along the roadway to funnel wildlife to these crossings. The crossings should be buried to provide a natural substrate for the animals to cross on. Efforts should be made to acquire the latest research performed on wildlife crossing and construct the crossings in this manner. The use of elevated bridges is another alternative to minimize impacts and additionally provide a wildlife crossing.

13. Roadside plantings should not provide a food source, habitat or shelter for wildlife. Avoiding these plantings will minimize road kill.

14. A mitigation plan should be developed that includes the following items:

Detailed overview and cross-sectional drawings of the mitigation area(s) with elevations.
A vegetative planting plan for the mitigation site.
A detailed description of the proposed mitigation plan, including success criteria. The mitigation plan should contain sufficient detail to ensure no net loss of wetland functions and values as a result of project authorization.

Timely coordination between NMFS and FDOT staff should continue through project planning and until environmental issues are addressed and resolved.

Additional Comments (optional):
Magnuson-Stevens Act: Based on the project location, information provided in the ETDM website, and GIS-based analysis of impacts, NOAA's National Marine Fisheries Service (NMFS) concludes the proposed work would not directly impact areas that support essential fish habitat (EFH). NMFS has no comments or recommendations to provide pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297); and this project will not require an EFH Assessment. Further EFH consultation on this matter is not necessary unless modifications are proposed and you believe the modified proposal may result in adverse impacts to EFH.

Endangered Species Act: We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation.

FDOT District 5 Feedback to National Marine Fisheries Service's Review
*Comments:*Thank you for your review and comments. Thank you for pointing out the change in EFH designation, an EFH assessment will not be required for this project and no further coordination under the Magnuson-Stevens Act will be required. All of your recommended implementation measures will be considered during the PD&E, design and construction phases. Most of these recommendations will be implemented and the evaluation of the remaining recommendations will be discussed with your agency as the project progresses.
*Date Feedback Submitted:*6/18/2010

- No review submitted from the Federal Highway Administration
- No review submitted from the Saint Johns River Water Management District

Contaminated Sites

Coordinator Summary

0 Summary Degree of Effect

Contaminated Sites Summary Degree of Effect: None

Reviewed By:
FDOT District 5 (6/18/2010)
Comments:
No contaminated sites where identified through the GIS analysis and both the US EPA and the FDEP assigned None as the degree of effect. We concur and are assigning a None degree of effect for this issue.

ETAT Reviews for Contaminated Sites

0 ETAT Review by Lauren P. Milligan, FL Department of Environmental Protection (05/27/2010)

Contaminated Sites Effect: None

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
None found.

Comments on Effects to Resources:
None found.

FDOT District 5 Feedback to FL Department of Environmental Protection's Review
*Comments:*Thank you for your review.
*Date Feedback Submitted:*6/18/2010

0 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/11/2010)

Contaminated Sites Effect: None

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
None found.

Comments on Effects to Resources:
None found.

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your review.
*Date Feedback Submitted:*6/18/2010

- No review submitted from the Federal Highway Administration
- No review submitted from the Saint Johns River Water Management District

Farmlands

Coordinator Summary

3 Summary Degree of Effect

Farmlands Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (6/29/2010)
Comments:
Thank you for your review and comments. Although there may be no Prime Farmland Soils impacted by this project, it has been determined that there are Unique Farmland soils that will be impacted by the proposed project. Further coordination with the National Resource Conservation Service will take place during the study phase of this project and prior to conducting a Farmland Evaluation of potential unique farmland soil impacts, as this evaluation may be warranted. We concur with a Moderate degree of effect for this issue.

ETAT Reviews for Farmlands

3 ETAT Review by Rick Allen Robbins, Natural Resources Conservation Service (04/22/2010)
Farmlands Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
The USDA-NRCS considers soil map units with important soil properties for agricultural uses to be Prime Farmland. In addition, the USDA-NRCS considers any soils used in the production of commodity crops (such as, cotton, citrus, row crops, specialty crops, nuts, etc.) to possibly be considered as Unique Farmlands. Nationally, there has been a reduction in the overall amount of Prime and Unique Farmlands through conversion to non-farm uses. This trend has the possibility of impacting the nation's food supply and exporting capabilities.

Comments on Effects to Resources:
Conducting GIS analysis of Prime Farmland (using USDA-NRCS data) and Important (Unique) Farmland Analysis (using 2004 SJRWMD data) has resulted in the determination that there are no Prime Farmland Soils at any buffer width. However, there are Unique Farmland soils at all buffer widths within the Project Area. Conducting GIS analysis of Prime and Other Important Farmland (using USDA-NRCS data) and Cropland Information (using 2004 SJRWMD data) has resulted in the determination that there are significant amounts of Unique Farmland soils at all buffer widths within the Project Area. For Alternative #1, there are between 10 and 50 acres of Unique Farmland that would be impacted between the 100 and 500 foot buffer widths. Of these Unique Farmland soils, in excess of 5 percent of the areal extent is currently in agricultural uses (Citrus Groves and Row Crops). In addition, there are other important agricultural soils (Improved Pasture, Field Crops, Sod Farms, Ornamentals) that are not included in the acreages listed previously.

Additional Comments (optional):
This alternative is being assigned a Moderate Degree of Effect for several reasons. First, it is impacting locally important farmlands that are currently being used for agricultural crop production. Secondly, there are significant acres of other farmlands (Improved pasture, Sod, Ornamentals) that would be impacted by this alternative. Lastly, the impact of this project on local agricultural land use is detrimental and adds to the long term trend for loss of important agricultural lands in Florida and Nationwide. The only reason that this alternative was not rated as Substantial is that the number of acres impacted is relatively minor. This rating does not (in any way) condone the conversion of these agricultural lands to nonfarm use.

CLC Commitments and Recommendations:

FDOT District 5 Feedback to Natural Resources Conservation Service's Review
*Comments:*Further coordination with the NRCS will take place during the study phase of this project.

Thank you for your comments.
*Date Feedback Submitted:*6/29/2010

- No review submitted from the Federal Highway Administration

Floodplains

Coordinator Summary

3 Summary Degree of Effect

Floodplains Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (6/29/2010)
Comments:
Thank you for your review and comments. A Location Hydraulic Report conducted during the PD&E Study will evaluate potential floodplain impacts of the proposed improvements. This report will evaluate the significance of floodplain encroachment, conveyance capabilities of crossdrain structures under both existing and proposed conditions, profile grade elevation of the roadway in relation to flood elevations, an analysis of any flood flow-ways, and any potential increase in flood elevations as a result of the project and will address any need for floodplain compensation. Depending on the results of the LHR, consultation with flood management agencies will take place as warranted. We are assigning a Moderate degree of effect for this issue.

ETAT Reviews for Floodplains

3 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/11/2010)

Floodplains Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Resources: Floodplains

Level of Importance: Development within the 100-year floodplain is of a high level of importance. Construction of roadways within the floodplain should not impede, obstruct or divert the flow of water or debris in the floodplain which would alter the roadway's discharge capacity or otherwise adversely affect public health, safety and welfare, or cause damage to public or private property in the event of a flood. A moderate degree of effect is being assigned for the proposed project (ETDM #4972, SR 46 from SR 415 to SR 426).

Comments on Effects to Resources:
A review of GIS analysis data (DFIRM Flood Hazard Zones and FEMA Special Flood Hazard Areas) in the EST at the programming screen phase of the project indicates that approximately 30% of the project area immediately surrounding the proposed project lies within the 100-year floodplain, as designated by Zones A and AE of the flood hazard zone designation. This project has the potential

to impact floodplains and their functions in the area.

The purpose and need statement states that "During the past few hurricane seasons portions of SR 46 were completely inundated by high water resulting in the closure of this road. SR 46 serves as a major evacuation route for Northern Brevard and Southern Volusia Counties. The next two closest east-west evacuation routes are SR50 located about 8 miles to the south and SR44 located about 25 miles to the north. The PD&E study will evaluate the profile grade elevation of SR46 within these study limits to ensure that this portion of SR46 would remain open during emergency evacuations." This raises additional concerns regarding flooding in the area and the need to maintain proper flood control.

General comments relating to floodplains include the fact that any development within the 100-year floodplain has the potential for placing citizens and property at risk of flooding and producing changes in floodplain elevations and plan view extent. Development (such as roadways, housing developments, strip malls and other commercial facilities) within floodplains increases the potential for flooding by limiting flood storage capacity and exposing people and property to flood hazards. Development also reduces vegetated buffers that protect water quality and destroys important habitats for fish and wildlife. Although the entire corridor is characterized predominantly by undeveloped land, flooding of properties and roadways are a concern.

The PD&E phase of the project should include an evaluation of floodplain impacts. FDOT should consider alternatives to avoid adverse effects and incompatible development in the floodplains. Efforts should be made to avoid or minimize impacts to floodplain resources and functions. Engineering design features and hydrological drainage structures should be such that stormwater transport, flow, and discharge meet or exceed flood control requirements. Consultation and coordination with appropriate flood management agencies should occur relating to regulatory requirements, avoidance, minimization and/or mitigation strategies.

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your comments. Floodplain impacts will be further evaluated during the PD&E Study.
*Date Feedback Submitted:*6/29/2010

- No review submitted from the FL Department of Environmental Protection
- No review submitted from the Federal Highway Administration
- No review submitted from the Saint Johns River Water Management District

Infrastructure

Coordinator Summary

2 Summary Degree of Effect

Infrastructure Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (8/13/2010)
Comments:
No reviews for this issue were submitted. Based on the GIS analysis for this issue, within the 500 foot buffer area the existing infrastructure consists of a fire station, an FAA obstruction, 2 limited use drinking water wells and a wireless antenna structure. Impacts to adjacent infrastructure and utilities are always a consideration in development of design concept. The PD&E study will develop a design concept that avoids

impacts to adjacent infrastructure is possible. If impacts to these facilities cannot be avoided then the cost to cure those impacts or the cost to relocate the utility is documented and becomes a factor in selection of the preferred alternative. Since there is little adjacent infrastructure we are assign a Minimal degree of effect.

ETAT Reviews for Infrastructure

No reviews found for the Infrastructure Issue.
- No review submitted from the Federal Highway Administration

Navigation

Coordinator Summary

N/A Summary Degree of Effect

Navigation Summary Degree of Effect: N/A / No Involvement

Reviewed By:
FDOT District 5 (7/06/2010)
Comments:
Although a U.S. Coast Guard navigational bridge permit may not be required for construction of a second bridge across Lake Jesup in order to accommodate widening of SR 46, a new bridge will match navigational clearance of the existing structure. For Federal navigational issues, we are assigning a No Involvement degree of effect.

ETAT Reviews for Navigation

N/A ETAT Review by Evelyn Smart, US Coast Guard (05/14/2010)

Navigation Effect: N/A / No Involvement

Coordination Document: No Involvement

Dispute Information:N/A

Identified Resources and Level of Importance:
None found.

Comments on Effects to Resources:
Section 107 of the Coast Guard Authorization Act of 1982, 33 U.S.C. 530, exempts bridge projects from Coast Guard bridge permits when the bridge project crosses non-tidal waters which are not used, susceptible to use in their natural condition; or susceptible to use by reasonable improvement as a means to transport interstate or foreign commerce. The previous SR 46 Bridge replacement project across Lake Jesup fell under this exemption. The proposed dualization of this bridge also falls under this bridge permit exemption.

FDOT District 5 Feedback to US Coast Guard's Review
*Comments:*Thank you for your review and comments. Although a Coast Guard Bridge permit will not

be required, we will nonetheless coordinate with your agency as this project progresses. The dualization of the SR 46 Bridge across Lake Jesup will match navigational clearances of the recently completed new SR 46 Bridge at this location.
*Date Feedback Submitted:*7/6/2010

- No review submitted from the Federal Highway Administration
- No review submitted from the US Army Corps of Engineers

Special Designations

Coordinator Summary

3 Summary Degree of Effect

Special Designations Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (7/06/2010)
Comments:
As pointed out, Special Designations can involve numerous issues that this project has the potential to impact. Each of these issues will be evaluated more thoroughly during the study phase. We concur with EPA's assessment and are assigning a Moderate degree of effect for special designations.

ETAT Reviews for Special Designations

3 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/12/2010)

Special Designations Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Resources: Recreation areas, public lands, floodplains, prime farm land, and sole sole aquifer (Volusia-Floridan Aquifer)

Level of Importance: These resources are of a high level of importance in the State of Florida and in the project area. Measures should be taken to avoid or minimize impacts to Special Designation features. A moderate degree of effect is being assigned to this issue for the proposed project.

Comments on Effects to Resources:
Please refer to EPA comments regarding floodplains listed under Floodplains Issue.

Please refer to EPA comments regarding recreation areas, conservation areas, and public lands listed under Recreation Areas Issue.

The project area may directly and indirectly impact prime farm land (Basinger).

This project may directly and indirectly impact the Volusia-Floridan Sole Source Aquifer.

Additional Comments (optional):
Consultation with FDEP, St. Johns Water Management District, and other environmental agencies affiliated with groundwater, drinking water, and sole source aquifers may be required.

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your review and comments. Responses to comments received for floodplains, prime farm land, public lands and recreation are addressed under those individual issues. Potential impacts to the Volusia-Floridan Sole Source Aquifer will be addressed as the project moves into the PD&E study phase
*Date Feedback Submitted:*7/6/2010

- No review submitted from the FL Department of Agriculture and Consumer Services
- No review submitted from the Federal Highway Administration
- No review submitted from the Saint Johns River Water Management District

Water Quality and Quantity

Coordinator Summary

3 Summary Degree of Effect
Water Quality and Quantity Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (7/07/2010)
Comments:
Both the U.S. Environmental Protection Agency and the Florida Department of Environmental Protection provided comments on this issue. Both agencies assigned Moderate degrees of effect for this issue. We concur with both agencies' comments and are assigning a Moderate degree of effect for water quality and quantity.

ETAT Reviews for Water Quality and Quantity

3 ETAT Review by Lauren P. Milligan, FL Department of Environmental Protection (05/27/2010)
Water Quality and Quantity Effect: Moderate

Coordination Document: Permit Required

Dispute Information:N/A

Identified Resources and Level of Importance:
The proposed project could cause adverse impacts to the St. Johns River and associated wetlands and floodplains. Heath Spring is also located adjacent to the road. Impacts should be minimized to maximum extent possible. Stormwater runoff from the road and bridge surface may alter groundwater and adjacent surface waters and other wetlands through increased nutrient and pollutant loading.

Comments on Effects to Resources:

Every effort should be made to maximize the treatment of stormwater runoff from the proposed road/bridge project to prevent ground and surface water contamination. Stormwater treatment should be designed to maintain the natural predevelopment hydroperiod and water quality, as well as to protect the natural functions of adjacent wetlands and springs. We recommend that the PD&E study include an evaluation of existing stormwater treatment adequacy and details on the future stormwater treatment facilities. Retro-fitting of stormwater conveyance systems would help reduce impacts to ground and surface water quality.

FDOT District 5 Feedback to FL Department of Environmental Protection's Review
*Comments:*Thank you for your review and comments. Heath Spring will be field located during the PD&E Study so that any potential impacts to this resource can be fully evaluated. Impacts to the St. Johns River floodplain will be minimized by matching the proposed bridge to the recently completed new bridge which currently spans the 100 year floodplain of the St. Johns River. Existing stormwater conveyance and treatment facilities will be evaluated during the PD&E Study along with conceptual design for treatment and attenuation of stormwater from the new impervious surfaces. Several potential pond locations per drainage basin will also be analyzed during the study phase in order to determine preferred pond locations.
*Date Feedback Submitted:*7/7/2010

3 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/12/2010)
Water Quality and Quantity Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Resources: Water quality - surface water, groundwater

Level of Importance: These resources are of a high level of importance in the State of Florida and within the project area. A moderate degree of effect is being assigned to this issue for the proposed project.

Comments on Effects to Resources:
Lake Jessup, Lake Harney, and Econlockhatchee River may be directly impacted by the proposed project.

Econlockhatchee River is listed on the Clean Water Act 303(d) lsit of impaired waters for exceedance of water quality standards for lead, nutrients, biochemical oxygen demand (BOD), coliforms, dissolved oxygen, and fish consumption advisory for mercury.

Lake Jessup is listed on the Clean Water Act 303(d) list of impaired waters for exceedance of water quality standards for unionized ammonia and nutrients.

Lake Harney is listed on the Clean Water Act 303(d) lsit of impaired waters for exceedance of water quality standards for cadmium, nutrients, dissolved oxygen, and silver.

Further impairment to these surface water bodies, along with other small tributaries, creeks, and streams located within the project area is a concern. The project will have both direct and indirect impact to the water due to construction activities, stormwater runoff, and future development (residential, commercial, and industrial).

The shorelines of Lake Jessup and Lake Harney are highly functional wetland areas and serve as essential wildlife and fish habitat. Degradation of water quality will negatively impact these wetland areas and native aquatic and/or terrestrial species.

This project may directly and indirectly impact the Volusia-Floridan Sole Source Aquifer, which serves as a primary drinking water source.

There is also a spring located within the project area (Heath Spring).

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your review and comments. Portions of the project area do fall within all three of the waterbody IDs mentioned, all of which are 303(d) listed impaired waterbodies. The majority of the project area that drains to an impaired waterbody falls within the Lake Jesup Basin for which Total Maximum Daily Loads have been established and an Action Plan for this basin is in effect. We will coordinate with the St. Johns River Water Management District in regards to the Lake Jesup BMAP to ensure compliance with these criteria. We will also seek guidance from St. Johns in an effort to comply with future Basin Management Action Plans which are under development for the Middle Basin of the St. Johns River, which includes Lake Harney and the Econlockhatchee River. With the exception of the recently constructed new bridge across the Lake Jesup floodplain, formal stormwater treatment facilities do not exist for this portion of SR 46. It is anticipated that all existing and future proposed impervious surfaces will receive stormwater treatment and attenuation under post construction conditions.

*Date Feedback Submitted:*7/7/2010

- No review submitted from the Federal Highway Administration
- No review submitted from the Saint Johns River Water Management District

Wetlands

Coordinator Summary

3 Summary Degree of Effect

Wetlands Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (8/05/2010)
Comments:
Four agencies provided comments on wetland issues and all assigned Moderate degrees of effect. Wetlands and associated wildlife issues will be a major focal point during the PD&E study and design phases. We concur with the agencies and are assigning a Moderate summary degree of effect.

ETAT Reviews for Wetlands

3 ETAT Review by Lauren P. Milligan, FL Department of Environmental Protection (05/27/2010)

Wetlands Effect: Moderate

Coordination Document: Permit Required

Dispute Information:N/A

Identified Resources and Level of Importance:
According to the EST, there are 71.6 acres of palustrine wetlands, 3.8 acres of riverine wetlands and 1.2 acres of lacustrine wetlands within the 200-ft. project buffer zone. The proposed widening of SR 46 would involve impacts to the St. Johns River and adjacent wetlands. Project impacts to the river, wetlands and adjacent Heath Spring should be minimized and fully mitigated. Staff recommends that the proposed roadway expansion include modification of existing culverts and elevated structures to allow for increased wildlife movement underneath the roadway.

Comments on Effects to Resources:
An Environmental Resource Permit (ERP) will be required from the St. Johns River Water Management District - the ERP applicant would be required to eliminate or reduce the proposed wetland resource impacts of roadway widening to the greatest extent practicable:
- Minimization should emphasize avoidance-oriented corridor alignments, wetland fill reductions via pile bridging and steep/vertically retained side slopes, and median width reductions within safety limits.
- Wetlands should not be displaced by the installation of stormwater conveyance and treatment swales; compensatory treatment in adjacent uplands is the preferred alternative.
- After avoidance and minimization have been exhausted, mitigation must be proposed to offset the adverse impacts of the project to existing wetland functions and values. Significant attention is given to forested wetland systems, which are difficult to mitigate.
- The cumulative impacts of concurrent and future transportation improvement projects in the vicinity of the subject project should also be addressed.

FDOT District 5 Feedback to FL Department of Environmental Protection's Review
*Comments:*Thank you for your review and comments. Roadway typical sections through wetland areas will be evaluated to minimize impacts if impacts cannot be avoided. A proposed bridge structure spanning the Lake Jesup and St. Johns River floodplain will greatly reduce potential wetland impacts and provide for unhindered wildlife movement along this corridor. The PD&E Study will evaluate wildlife movement along the remaining corridor and will evaluate the potential of providing structures to facilitate those movements where they may be appropriate.
*Date Feedback Submitted:*8/5/2010

3 ETAT Review by Brandon Howard, National Marine Fisheries Service (05/15/2010)
Wetlands Effect: Moderate

Coordination Document: To Be Determined: Further Coordination Required

Dispute Information:N/A

Identified Resources and Level of Importance:
NOAA's National Marine Fisheries Service (NMFS) conducted a site inspection on March 16, 2005, and responded to the Planning Screen for this project on April 6, 2005. Lacustrine, palustrine, and riverine wetlands are present in the project area. NMFS staff identified highly functional wetlands, such as bay swamps, cabbage palm hammock, emergent aquatic vegetation, freshwater marsh, wet prairies, and a mix of scrub-shrub, hardwoods, and forested wetlands, within the proposed project corridor. The project involves an additional bridge adjacent to the existing bridge across the St. Johns River. Our comments to the Planning Screen indicated that wetlands in the project corridor

are designated as essential fish habitat (EFH) by the South Atlantic Fishery Management Council (SAFMC). At that time, SAFMC managed red drum under the Magnuson-Stevens Act. Effective November 5, 2008, management of Atlantic stocks of red drum was no longer authorized through the Magnuson-Stevens Act, which also removed the EFH designations for red drum. Based on these changes, NMFS determines that wetlands likely to be affected by the project are not EFH (Lake Monroe essentially is the upstream extent of white shrimp in the St. Johns River, and the site of the proposed project is upstream of Lake Monroe). While these wetlands are not EFH, they nonetheless are important to downstream fisheries in the St. Johns River.

Comments on Effects to Resources:
The wetlands along the proposed roadway expansion provide water quality functions, such as removal of sediments, excess nutrients, and contaminants, which benefit and support these aquatic ecosystems. Through hydrological connections, these wetlands also contribute plant material and other useable nutrients (both dissolved and particulate organic matter) into aquatic food webs that include recreationally, commercially, or ecologically important species within downstream estuaries. If wetland impacts are unavoidable, sequential minimization and mitigation should take place.

NMFS recommends that the following measures be implemented as project progresses to PD&E, design, and construction:

1. Adverse impacts to wetlands should be sequentially avoided and minimized; unavoidable impacts should be offset in a manner that precludes a net loss of wetland function.
2. The proposed median should be eliminated or minimized to avoid impacts to wetlands.

3. Retaining walls should be used in place of side slopes where feasible to minimize the roadway footprint.

4. A habitat characterization of the wetlands within the project site, including the size and location of wetlands that would be directly and/or indirectly impacted by the proposed project should be prepared.

5. Conservation measures (i.e., best management practices for water quality and erosion control) should be included in the project design and implemented during project construction.

6. A Stormwater Management Plan for containment and treatment of surface and stormwater runoff from impervious surfaces should be prepared. Treatment should be in accordance with state and federal (NPDES) standards. Details of the stormwater plan should include location, area, and cross section of any proposed stormwater swales and ponds and information on wetland vegetation planting, if proposed.

7. Buffer zones at a minimum of 50 feet should be given to wetlands. If not, indirect impacts should be considered.

8. Prior to construction, all wetlands should be delineated in the field so that construction crews can readily recognize these sensitive areas and avoid them.

9. Preconstruction meetings should occur with construction personnel describing activities that should not occur in wetlands and measures that can be taken to minimize impacts.

10. Seasonal high and normal pool water elevations should be preserved in wetlands adjacent to the project. This can be accomplished by having a comprehensive surface water management plan that has control elevations compatible with these wetlands to reduce drawdown effects.

11. The water contributing areas for each wetland should be considered. Treated stormwater should be routed to these wetlands to preserve each hydroperiod. The use of spreader swales that imitate natural overland sheet flow should be utilized to minimize erosion impacts and mimic natural rain

events.

12. Wildlife crossings should be installed along the eco-tone of wetlands adjacent to the project corridor. Fencing should be placed along the roadway to funnel wildlife to these crossings. The crossings should be buried to provide a natural substrate for the animals to cross on. Efforts should be made to acquire the latest research performed on wildlife crossing and construct the crossings in this manner. The use of elevated bridges is another alternative to minimize impacts and additionally provide a wildlife crossing.

13. Roadside plantings should not provide a food source, habitat or shelter for wildlife. Avoiding these plantings will minimize road kill.

14. A mitigation plan should be developed that includes the following items:
Detailed overview and cross-sectional drawings of the mitigation area(s) with elevations.
A vegetative planting plan for the mitigation site.
A detailed description of the proposed mitigation plan, including success criteria. The mitigation plan should contain sufficient detail to ensure no net loss of wetland functions and values as a result of project authorization.

Timely coordination between NMFS and FDOT staff should continue through project planning and until environmental issues are addressed and resolved.

Additional Comments (optional):
Magnuson-Stevens Act: Based on the project location, information provided in the ETDM website, and GIS-based analysis of impacts, NOAA's National Marine Fisheries Service (NMFS) concludes the proposed work would not directly impact areas that support essential fish habitat (EFH). NMFS has no comments or recommendations to provide pursuant to the EFH requirements of the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 104-297); and this project will not require an EFH Assessment. Further EFH consultation on this matter is not necessary unless modifications are proposed and you believe the modified proposal may result in adverse impacts to EFH.

Endangered Species Act: We are not aware of any threatened or endangered species or critical habitat under the purview of NMFS that occur within the project area. However, it should be noted that a "no effect" determination must be made by the action agency and the reasoning underlying the determination should be documented in a project file. Please coordinate closely with the U.S. Fish and Wildlife Service for other species listed under the Endangered Species Act that may require consultation.

FDOT District 5 Feedback to National Marine Fisheries Service's Review
*Comments:*Thank you for your review, comments and recommendations which will be evaluated during the study and design phases. Further coordination with the U.S. Fish and Wildlife Service will take place as the project progresses.
*Date Feedback Submitted:*8/5/2010

3 ETAT Review by Jane Monaghan, US Fish and Wildlife Service (05/25/2010)
Wetlands Effect: Moderate

Coordination Document: To Be Determined: Further Coordination Required

Dispute Information:N/A

Identified Resources and Level of Importance:
Federally listed species, State listed speceis, migratory birds, wetlands and St. John's River ecosystem.

Comments on Effects to Resources:
Federally listed species: The Service has reviewed our Geographic Information Systems (GIS) database for recorded locations of federally listed threatened and endangered species on or adjacent to the project study area. The GIS database is a compilation of data received from several sources.

Wood Storks (Mycteria americana)
The project fall within the Core Foraging Areas (CFA) of at least 2 active nesting colonies of the endangered wood stork (Mycteria americana) in North Florida. The Service has determined that the loss of wetlands within a CFA due to an action could result in the loss of foraging habitat for the wood stork. To minimize adverse effects to the wood stork and other wetland dependent species, we recommend that impacts to suitable foraging habitat and all wetlands, be avoided. Please refer to the North Florida Field Office website for WOST colony locations, definitions and effect determinations for any wetland impacts in Seminole County: http://www.fws.gov/northflorida/
Wood Stork colonies in Central Florida are given a 15 mile radius for the delineation of the core foraging circle.

Bald Eagle (Halieatus leucocephalus)
The nest locator database on the FFWCC (Florida Fish and Wildlife Conservation Commission) website (MyFWC.com/Eagle) should be checked for documented nests. However, new nests may not be in the database and a thorough examination of the proposed areas from the air is recommended. Any bald eagle nest within 700 feet of the proposed alternatives should be documented and all future actions should be coordinated with the USFWS Office of Migratory Birds, Eagle permitting section. The current permit coordinator is Resee Collins (404-314-6526). USFWS office websites can provide further information on the new Eagle Act regulations.

Florida Manatees (Trichechus manatus floridanus)
Lake Jesup and the St. John's River are utilized by Florida manatees. Manatee mortality (watercraft collisions, perinatal and unknown causes) within the project area has been documented. Any bridge work will require further coordination on this species. Submerged aquatic vegetation should also be addressed if present.

Audubon's Crested Caracara(Polyborus plancus audubonii)
This species is extending its range Northward into Brevard, Orange and Semiole counties. Wildlife surveys should include this species. If nest sites or foraging birds are seen, further coordination will be needed.

Additional Comments (optional):
The Service recommends further environmental review of this project in order to reduce the size of the footprint and the impacts on the wetlands, floodplains and riverine systems. Other alternatives should be discussed that would avoid furhter fragmentation of this rural, undeveloped, agricultural land. We would support the use of elevated highways to reduce road kill and maintain the hydrologic connections without degrading the habitat. We would not support any action that would compromise the ability of land managers to manage conservation land, such as the Lake Jesup and Lake Monroe Conservation areas, within the footprint of the project.

FDOT District 5 Feedback to US Fish and Wildlife Service's Review
*Comments:*Thank you for your review, comments and contact info for the USF&WS Eagle permitting section. Wildlife surveys during the PD&E study will include Caracara, Scrub jays, Snail Kite and Bald Eagles. Further coordination with the USF&WS will take place. Manatee conditions will ultimately be included in the construction contract for in water work required for new bridge

construction. Coordination will also take place with the land managers for the adjacent conservation lands.
*Date Feedback Submitted:*8/5/2010

3 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/12/2010)
Wetlands Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Resources: Wetlands, wetlands habitat

Level of Importance: These resources are of a high level of importance in the State of Florida and within the project area. A moderate degree of effect is being assigned to this issue for the proposed project.

Comments on Effects to Resources:
According to a review of GIS analyses for the proposed project there are palustrine, lacustrine, and riverine wetlands within the project area.

EPA recommends that the PD&E study include an analysis of wetland areas to be potentially impacted by the project, including the swamp area to the west of the project. The PD&E study should include a delineation of wetlands; functional analysis of wetlands to determine their value and function; an evaluation of stormwater pond sites to determine their impact on wetlands; avoidance and minimization strategies for wetlands; and mitigation plans to compensate for adverse impacts.

One issue of concern includes increased stormwater runoff and the increase of pollutants into surface waters and wetlands as a result of any roadway project and other point and nonpoint sources. Every effort should be made to maximize the collection and treatment of stormwater. Stormwater collection and treatment mechanisms should be designed to protect the function of surrounding wetlands, floodplains, and surface water features. Engineering design features and hydrological drainage structures should be such that stormwater transport, flow, and discharge meet or exceed requirements.

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your review and comments. A Wetland Evaluation Report will be completed during the PD&E Study which will locate, identify, describe and quantify wetland functions and values. Roadway typical section alternatives will be evaluated to avoid or at least minimize, to the extent practical, adverse impacts to adjacent wetlands. Stormwater conveyance and treatment facilities will be evaluated for potential adverse impacts to adjacent wetlands, including the hydroperiod of those wetlands.
*Date Feedback Submitted:*7/7/2010

- No review submitted from the Federal Highway Administration
- No review submitted from the Saint Johns River Water Management District
- No review submitted from the US Army Corps of Engineers

Wildlife and Habitat

Coordinator Summary

3 Summary Degree of Effect

Wildlife and Habitat Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (8/10/2010)
Comments:
Two agencies provided comments for this issue and both assigned Moderate degrees of effect. Both agencies mentioned fragmentation of habitat and urged consideration of habitat connectivity along with avoidance and minimization of impacts to habitats. The department concurs and is assigning a Moderate degree of effect for this issue.

ETAT Reviews for Wildlife and Habitat

3 ETAT Review by Jane Monaghan, US Fish and Wildlife Service (05/25/2010)

Wildlife and Habitat Effect: Moderate

Coordination Document: To Be Determined: Further Coordination Required

Dispute Information:N/A

Identified Resources and Level of Importance:
Federally listed species, State listed speceis, migratory birds, wetlands and St. John's River ecosystem.

Comments on Effects to Resources:
Federally listed species: The Service has reviewed our Geographic Information Systems (GIS) database for recorded locations of federally listed threatened and endangered species on or adjacent to the project study area. The GIS database is a compilation of data received from several sources.

Wood Storks (Mycteria americana)
The project fall within the Core Foraging Areas (CFA) of at least 2 active nesting colonies of the endangered wood stork (Mycteria americana) in North Florida. The Service has determined that the loss of wetlands within a CFA due to an action could result in the loss of foraging habitat for the wood stork. To minimize adverse effects to the wood stork and other wetland dependent species, we recommend that impacts to suitable foraging habitat and all wetlands, be avoided. Please refer to the North Florida Field Office website for WOST colony locations, definitions and effect determinations for any wetland impacts in Seminole County: http://www.fws.gov/northflorida/
Wood Stork colonies in Central Florida are given a 15 mile radius for the delineation of the core foraging circle.

Bald Eagle (Halieatus leucocephalus)
The nest locator database on the FFWCC (Florida Fish and Wildlife Conservation Commission) website (MyFWC.com/Eagle) should be checked for documented nests. However, new nests may not be in the database and a thorough examination of the proposed areas from the air is recommended. Any bald eagle nest within 700 feet of the proposed alternatives should be documented and all future actions should be coordinated with the USFWS Office of Migratory Birds, Eagle permitting section. The current permit coordinator is Resee Collins (404-314-6526). USFWS office websites can provide further information on the new Eagle Act regulations.

Florida Manatees (Trichechus manatus floridanus)
Lake Jesup and the St. John's River are utilized by Florida manatees. Manatee mortality (watercraft collisions, perinatal and unknown causes) within the project area has been documented. Any bridge work will require further coordination on this species. Submerged aquatic vegetation should also be addressed if present.

Audubon's Crested Caracara(Polyborus plancus audubonii)
This species is extending its range Northward into Brevard, Orange and Semiole counties. Wildlife surveys should include this species. If nest sites or foraging birds are seen, further coordination will be needed.

Additional Comments (optional):
The Service recommends further environmental review of this project in order to reduce the size of the footprint and the impacts on the wetlands, floodplains and riverine systems. Other alternatives should be discussed that would avoid furhter fragmentation of this rural, undeveloped, agricultural land. We would support the use of elevated highways to reduce road kill and maintain the hydrologic connections without degrading the habitat. We would not support any action that would compromise the ability of land managers to manage conservation land, such as the Lake Jesup and Lake Monroe Conservation areas, within the footprint of the project.

FDOT District 5 Feedback to US Fish and Wildlife Service's Review
*Comments:*Thank you for your review and comments. The Wildlife and Habitat Report will address the four species mentioned above. Further coordination with the Service in regards to threatened and endangered species issues will take place as the project moves through the PD&E Study phase.
*Date Feedback Submitted:*8/10/2010

3 ETAT Review by Scott Sanders, FL Fish and Wildlife Conservation Commission (05/21/2010)
Wildlife and Habitat Effect: Moderate

Coordination Document: To Be Determined: Further Coordination Required

Dispute Information:N/A

Identified Resources and Level of Importance:
The Habitat Conservation Scientific Services Section of the Florida Fish and Wildlife Conservation Commission (FWC) has coordinated an agency review of ETDM #4972 in Seminole County, and provides the following comments related to potential impacts to fish and wildlife resources and recommendations for resource conservation measures on this Programming Phase project.

The Project Description Summary states that the proposed work involves the expansion of SR-46 from a two-lane undivided roadway to a four-lane divided highway over a distance of 7.4 miles from SR-415 to SR 426. Portions of the SR-46 project are currently in the Right-of-way acquisition phase and a new 3,740-foot long bridge structure would be constructed north of the recently constructed bridge over the St. John's River north of Lake Jesup. FDOT relates that the project area is characterized primarily by undeveloped land, and existing land uses in the corridor consist of low density residential, agricultural, and public conservation lands, although some light commercial and industrial land uses are concentrated around the SR-415 and SR-426 intersections in the community of Geneva. The Purpose and Need for the project is to increase capacity of the roadway in order to improve the existing and future Levels of Service and to evaluate the profile grade elevation to

ensure it is above the flood elevation. The project area is just to the east and southeast of Sanford, but is not within an urban service area or a transportation concurrency exception area. The project is listed in the 2030 Long Range Transportation Plan for METROPLAN Orlando, and is in the most recently adopted Cost Feasible Plan.

A GIS analysis of fish, wildlife, and habitat resources was conducted within 500 feet along both sides of the proposed project Right-of-way (ROW). This analysis indicates the project area is rural in nature, and supports a diverse and significant acreage of native upland and wetland plant community types in addition to agriculture adjacent to the ROW. Overall, land use types are represented by 22.4 percent upland forests (204.1 acres), 40.2 percent wetlands and aquatic areas (367.2 acres), 14.7 percent Agriculture (133.7 acres), and 22.4 percent High and Low Impact Urban (204.6 acres). Uplands are characterized by dry prairie, upland hardwood hammocks, mixed hardwood-pine forests, pinelands, shrub and brushland, sandpine scrub, and xeric oak scrub. A review of aerial photographs also shows that a sizable area of sand pine and xeric oak scrub communities roughly covering an area about 1.5 miles wide (east to west) and 2.0 miles long (north to south) occurs immediately adjacent to and south of the project area's eastern terminus. Forested and herbaceous wetlands and aquatic areas include bay swamp, cypress swamp, hardwood swamp, mixed wetland forest, freshwater marsh and wet prairie, and open water. Agricultural operations support 5.4 percent citrus (49.3 acres), 4.1 percent improved pasture (37.1 acres), 3.1 percent row or field crops (28.0 acres), and 2.1 percent unimproved /woodland pasture (19.3 acres).

The habitat in the project area is rated as good to excellent in terms of habitat quality as indicated by the following FWC GIS wildlife and habitat resource data layers that are based on vegetation modeling: Biodiversity Hot Spots found in the affected project area are capable of supporting 3 to 4 to 7 or more focal species; Strategic Habitat Conservation Areas have been established for the Florida sandhill crane; Priority wetlands for Wetland Dependent Listed species have also been established that are capable of supporting 1 to 3 focal species in uplands, and 1 to 3 species in wetlands; and FWC's Rare and Imperiled Fish Species data layer has identified that the Atlantic Sturgeon and Snail bullhead occur within the St. John's River and ironcolor shiner is supported by the Econlockhatchee River watersheds. Also, a majority of the project area is within Consultation Areas established by the U.S. Fish and Wildlife Service (USFWS) for the Florida scrub jay, snail kite, Florida manatee, and Audubon's caracara. In addition, a portion of the project area is within an area designated as Critical Habitat for the Florida Manatee by the USFWS. Public conservation lands that also occur immediately adjacent to the highway include the Lake Monroe Conservation Area, and Lake Jesup Conservation Area.

Based on range and preferred habitat type, the following species could potentially occur within or adjacent to the project area: Eastern indigo snake (T), short-tailed snake (T), sand skink (T), Florida pine snake (SSC), gopher tortoise (T), gopher frog (SSC), Sherman's fox squirrel (SSC), Florida manatee (E), Everglades snail kite (E), Florida burrowing owl (SSC), tricolored heron (SSC), little blue heron (SSC), white ibis (SSC), snowy egret (SSC), red-cockaded woodpecker (SSC), limpkin (SSC), Florida sandhill crane (T), wood stork (E), Florida scrub jay (T), Southeastern American kestrel (T), Atlantic sturgeon (SSC), and possibly the Florida black bear. The project area is located predominately east of the St. John's River within the St. Johns bear population area; however, after crossing the river, the northwestern project terminus is in the Ocala Bear Population area. No roadkills were found in the FWC records for the project area; however, a single nuisance bear complaint was recorded adjacent to the project area in the past.

The following wildlife species, while not officially listed, have a high agency priority for habitat conservation and protection due to prior habitat loss, and may occur within this region's upland and wetland plant community types: swallow-tailed kite, river otter, Florida mottled duck, Florida box turtle, Eastern diamondback rattlesnake, Eastern kingsnake, Northern bobwhite, red-headed woodpecker, common ground dove, bald eagle, Eastern cottontail rabbit, and possibly the Southern hognose snake.

Furthermore, wetlands within and adjacent to the project area may provide habitat for waterfowl,

including blue and green winged teal, ring necked duck, mallard, pintail, wood duck, hooded merganser, gadwall and other ducks. In addition, important habitat is also provided for species such as the Northern harrier; and the short-tailed hawk also potentially occurs in the areas adjacent to the project. Finally, our screening shows that six bald eagle nests are within 1 mile of the project area ROW and the Nest Id #, Latitude and Longitude, and last date of known activity are: Nest SE051 (Latitude 80 28 47.38 Longitude 81 12.86) (last active 2007); Nest SE054 (Latitude 80 28 47.90 Longitude 81 13.09) (last active 2007); SE014 (Latitude 80 28 47.22 Longitude 81 09.13) (last active 2007); SE034 (Latitude 80 28 46.12 Longitude 81 09.84) (last active 2007); SE043 (Latitude 80 26 46.71 Longitude 81 12.43) (last active 2006); and SE036 (Latitude 80 28 46.32 Longitude 81 09.87) (last active 2006)

Freshwater wetlands provide important habitat features that directly support mammals and many migratory and resident birds, and mature swamp systems provide mast and cavities that are used for nesting and roosting by many wildlife species, including the wood duck, barred owl, pileated woodpecker, and tufted titmouse. Swamps also serve an important role in the storage and attenuation of floodwaters, which reduce erosion, downstream flooding and sedimentation, and naturally improve the quality and clarity of surface waters. Management and long-term protection of these high quality wetland areas along with the adjoining upland habitat systems are of paramount importance in our agency's long-term conservation objective of maintaining viable and diverse wildlife and fish populations. The St. John's River and nearby interconnected lakes support a valuable recreational fishery for species such as bluegill, shellcracker, catfish and largemouth bass, and also the migratory American shad, all of which importantly support tourism.

Comments on Effects to Resources:
Direct effects from the project could be at least moderate based on the total length of the project, and the extent and quality of wetlands and upland habitat that occur within and adjacent to the project footprint. Upland and wetland habitat will be lost due to ROW clearing, and construction of Drainage Retention Areas (DRAs). A large acreage of wetlands and aquatic areas, a significant amount of which are associated with the ST. John's River, are also within the project area and would be adversely affected by construction of the new bridge. In addition, some upland habitats, including sandpine and xeric oak scrub communities, also occur adjacent to and possibly within the project area along the southeast terminus of the roadway and therefore may be impacted. Project impacts could adversely affect regional wetland and upland habitat systems, and also detrimentally impact a moderate to substantial number of listed wildlife species, as well as adversely affecting species identified by our agency as Species of Greatest Conservation Need. Public conservation lands managed by the St. John's River Water Management District could also be affected.

Indirect and cumulative effects of this project could also be at least moderate. Habitat fragmentation and isolation reduces habitat quality; and roadkills could increase for many mammals, reptiles, birds and amphibians, including species listed by our agency due to the additional lanes and increased vehicle speed. Water quality could be adversely affected due to increased runoff from the additional impervious roadway surface resulting in increased oils, greases, and sedimentation of natural habitat systems along the roadway. Additional habitat could also be affected by increased residential and commercial development due to improved human access within the rural setting along the current highway.

Additional Comments (optional):
Our recommendations for this project are centered on reducing impacts to upland and wetland habitat, public conservation lands, and avoiding impacts to listed wildlife species to the extent practicable. The following recommendations and Best Management Practices (BMPs) are offered for consideration in future planning in an attempt to achieve a more conservation friendly roadway design that avoids, minimizes, or mitigates project impacts to wildlife and their habitat to the extent practicable , and encourages appropriate funding levels for proper future mitigation.

1. A vegetative cover map and accounting by acreage for each plant community type should be made for the affected project area. Compensatory mitigation for all direct and indirect upland and

wetlands habitat loss should be accomplished on a type for type basis. If wetlands are mitigated under the provisions of Chapter 373.4137 F.S., the proposed mitigation sites should be located within the immediate or same regional area; be functionally equivalent; equal to or of higher functional value; and as or more productive as the impacted wetlands. Land acquisition and restoration of appropriate tracts adjacent to existing public conservation lands near the project area, or tracts placed under conservation easement or located adjacent to large areas of jurisdictional wetlands that currently serve as regional core habitat areas, would be supported by our agency. An important focus of the selection process for mitigation lands for this project should include a strong consideration of, and habitat replacement for, the birds, mammals, amphibians, and reptiles, both listed and unlisted, which are discussed above as potentially occurring in the project area.

2. Surveys for listed species should be accomplished within and adjacent to the ROW and proposed sites for Drainage Retention Areas (DRAs). The methodology for these surveys should be coordinated with FWC early in the Project Development and Environment (PD&E) Study and follow appropriate survey techniques or guidelines to determine presence, absence, or probability of occurrence of various species, and to assess habitat quality. These study methods should be designed considering the potential listed species discussed above. Please note that some species, such as the Florida scrub jay, are known to use atypical habitat types and transitional habitat areas; therefore, due diligence and thorough coverage during field investigations are key to adequately determining presence or absence of these and other species.

3. We recommend that FDOT develop and implement customized BMPs especially formulated for this project, as they pertain to dredging and filling, control of siltation and turbidity, and the nutrient loading associated with discharge of roadside runoff, to reduce impacts within freshwater wetlands and riparian systems. These BMPs should be implemented only after all efforts to avoid and minimize impacts are completed. For example, moderate-sized wetlands and streams and their floodplains, including those in the project area, could be bridged to reduce both the loss and degradation of habitat, in addition to promoting hydrological and habitat connectivity functions; and roadkills could be reduced with appropriately designed and strategically placed fencing along the ROW. In addition, expanding the road on the side of the existing ROW where less habitat resources occur may serve to significantly avoid habitat impacts. Furthermore, utilizing the median and roadside swales for stormwater storage and management in lieu of offsite DRAs could further avoid habitat loss.

4. Since no information was provided in terms of seasonality of bridge replacement, the length or duration of project work, demolition methods for removing the old structures or constructing the new bridge, and type of dredging to be utilized, it would be premature for us to recommend specific avoidance and minimization measures for the manatee and sea turtles at this time. However, possible manatee protection measures that may be required by our agency could include Standard Manatee Conditions for In-Water Work, restrictions on blasting, monitoring of turbidity barriers, exclusionary grating on culverts, presence of manatee observers during in-water work, a defined or limited construction window, and no nighttime work. If blasting is to be considered as a method of demolition, please be aware that in the area of the project, it is important to perform the blasting during specific times of the year, if possible. In addition, an extensive blast plan and species watch plan will need to be developed and submitted to FWC for approval as early in the process as possible. Further coordination with our agency will be necessary in order to determine site-specific measures for this project. For technical assistance and coordination on manatees please contact Ms. Mary Duncan in our Imperiled Species Management Section in Tallahassee at (850) 922-4330 very early in the planning process for the Project Development and Environment (PD&E) Study.

5. Coordination and consultation with our agency biologists on the Atlantic sturgeon (SSC) is requested during the planning process for bridge construction. Important avoidance and minimization considerations include control of turbidity, identification and protection of sturgeon holding areas, seasonality of bridge construction considering sturgeon migration between fresh and salt water habitats, and adherence to Standard Sturgeon Protection Guidelines. Please contact and coordinate with Mr. Jeffry Wilcox at (850) 410-0656 Ext. 17338 or Jeffrey.wilcox@MyFWC.com .

6. Construction equipment staging areas; storage of oils, greases, and fuel; fill and roadbed material; and equipment maintenance activities should be sited in previously disturbed or cleared areas far removed from streams, wetlands, or surface water bodies. Staging areas, along with borrow areas, should also be surveyed for listed species, and approved by resource agencies.

We appreciate the opportunity to provide input on highway design and the conservation of fish and wildlife resources. Please contact Terry Gilbert at (850) 402-6311 or email terry_gilbert@urscorp.com to initiate the process for further coordination on this project.

FDOT District 5 Feedback to FL Fish and Wildlife Conservation Commission's Review
*Comments:*Thank you for your review, comments and recommendations which will be evaluated during the study. Further coordination with the Commission will occur during study phase along with consultation with the USF&WS. Listed species surveys will be conducted for proposed right of way and for any water detention areas.
*Date Feedback Submitted:*8/10/2010

- No review submitted from the Federal Highway Administration
- No review submitted from the US Forest Service

ETAT Reviews: Cultural

Historic and Archaeological Sites

Coordinator Summary

3 Summary Degree of Effect

Historic and Archaeological Sites Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (8/10/2010)
Comments:
Three agencies provided comments on this issue and all three assigned Moderate degrees of effect due to the proximity of historic or archaeological resources. A Cultural Resource Assessment Survey will be conducted during the PD&E Study which will be coordinated through the FHWA for State Historic Preservation Officer review. Additional consultation with FHWA, SHPO and the Miccosukee Tribe will take place should it appear that the project will impact any of these resources. We concur with these agencies on the potential degree of effect and are assigning a Moderate rating.

ETAT Reviews for Historic and Archaeological Sites

3 ETAT Review by Cathy Kendall, Federal Highway Administration (05/27/2010)

Historic and Archaeological Sites Effect: Moderate

Confidential: Review will not be displayed on Public Access website

Coordination Document:PD&E Support Document As Per PD&E Manual

Dispute Information:N/A

Identified Resources and Level of Importance:
The following historic resources are located within 200 feet of the proposed project:
SR 46 Resource Group;
Lake Jessup Bridge; and
Two archaeological sites - one previously determined ineligible, and one that has not yet been evaluated.

Comments on Effects to Resources:
CRAS is needed to further assess the significance of historic resources within the area of potential effect. The CRAS should specifically address these resources.

FDOT District 5 Feedback to Federal Highway Administration's Review
*Comments:*Thank you for your review. A CRAS will be conducted during the PD&E study and the results of which will be coordinated with your agency for SHPO review.
*Date Feedback Submitted:*8/10/2010

3 ETAT Review by Steve Terry, Miccosukee Tribe of Indians of Florida (04/26/2010)
Historic and Archaeological Sites Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
There are two recorded archaeological sites reported within 200 feet of this project. A Cultural Resources Survey will need to be done to ascertain if there are any archaeological sites within the project boundaries.

Comments on Effects to Resources:
Once a Cultural Resources Survey has been done, then effects, if any, to archaeological sites can be ascertained.

Additional Comments (optional):
If the Cultural Resources Survey shows there are no archaeological sites that will be impacted by this project, then no further consultation is necessary. However, if the Cultural Resources Survey does show that archaeological sites will be impacted by this project, then further consultation with the Miccosukee Tribe should be done.

FDOT District 5 Feedback to Miccosukee Tribe of Indians of Florida's Review
*Comments:*Thank you for your review. If the CRAS determines that this project may impact any archaeological sites then further consultation with the Miccosukee Tribe will take place.
*Date Feedback Submitted:*8/10/2010

ETAT Review by Jennifer R Ross, FL Department of State (05/25/2010)

3

Historic and Archaeological Sites Effect: Moderate

Coordination Document:PD&E Support Document As Per PD&E Manual

Dispute Information:N/A

Identified Resources and Level of Importance:
*****FLORIDA SITE FILE HISTORIC BRIDGES
The GIS analysis indicates that the only previously-identified FLORIDA SITE FILE HISTORIC BRIDGE(S) within close vicinity (500 feet or closer) to the project area is the JESSUP BRIDGE (SE01783), which has been determined INELIGIBLE FOR NRHP by this agency. This resource is in the 100 foot buffer.

****FLORIDA SITE FILE HISTORIC STANDING STRUCTURES
The GIS analysis revealed that there are 4 previously-identified FLORIDA SITE FILE HISTORIC STANDING STRUCTURES within close vicinity (500 feet) of the proposed project area. These resources include:
BELLSOUTH (SE01967), NOT EVALUATED BY SHPO (Please note that Survey # 11672 recommended that this resource was eligible for the NRHP as a contributing resource to a potential district)
GENEVA COMMUNITY CENTER (SE01245), NOT EVALUATED BY SHPO (Please note that Survey # 11672 recommended that this resource was eligible for the NRHP as a contributing resource to a potential district)
YARBOROUGH, PEARL HOUSE (SE01247), NOT EVALUATED BY SHPO (Please note that Survey # 11672 recommended that this resource was eligible for the NRHP individually and as a contributing resource to a potential district)
LE FILS, GROVER HOUSE (SE01264), NOT EVALUATED BY SHPO (Please note that Survey # 11672 recommended that this resource was eligible for the NRHP as a contributing resource to a potential district)

All four of these resources are located within the project's 500 foot buffer.

****FLORIDA SITE FILE ARCHAEOLOGICAL OR HISTORIC SITES
The GIS analysis revealed that there are two previously-identified FLORIDA SITE FILE ARCHAEOLOGICAL OR HISTORIC SITES within close vicinity (500 feet or closer) to the project area. These resources include:
OSTEEN WEST (SE01145), NOT EVALUATED BY SHPO
OSCEOLA ROAD SITE (SE01788), INELIGIBLE FOR NRHP
Both resources are located in the project's 200 foot buffer.

****RESOURCE GROUPS
The GIS indicated that there is one RESOURCE GROUP(S) - STATE ROAD 46 (SE01953) - within close vicinity of the proposed project area. The resource is in the 100 foot buffer zone and was determined to be ineligible for listing in the NRHP by this agency.

Comments on Effects to Resources:
*****FLORIDA SITE FILE HISTORIC BRIDGES
The only previously-identified FLORIDA SITE FILE HISTORIC BRIDGE(S) within close vicinity, the JESSUP BRIDGE (SE01783), could be directly impacted by the project.

****FLORIDA SITE FILE HISTORIC STANDING STRUCTURES
None of the 5 previously-identified FLORIDA SITE FILE HISTORIC STANDING STRUCTURES within the project's one mile buffer is likely to be directly affected by the proposed project because all are located 500 feet away from the project corridor. However, these resources could suffer

indirect/cumulative affects as a result of the project. Also, the GIS map indicates that there are a cluster of historic resources near the project corridor as roadway extends through Geneva's historic central business district. Therefore, there exists the potential that an historic district extends into the project area. This district could suffer direct/indirect/cumulative affects from the project.

****FLORIDA SITE FILE ARCHAEOLOGICAL OR HISTORIC SITES
Both of the two previously-identified FLORIDA SITE FILE ARCHAEOLOGICAL OR HISTORIC SITES within close vicinity of the project - OSTEEN WEST (SE01145) and OSCEOLA ROAD SITE (SE01788) - will likely be directly affected by the project because both are in the project's 200 foot buffer.

****RESOURCE GROUPS
STATE ROAD 46 (SE01953) will be directly impacted by the project as the resource will be widened by the proposed activities.

Additional Comments (optional):
A review of the GIS analysis revealed that the project area has not undergone a recent comprehensive cultural resources assessment survey. Therefore, since potentially significant archaeological and historic sites may be present within the project area, it is our recommendation that prior to initiating any project related land clearing or ground disturbing activities within the project area it should be subjected to a systematic professional archaeological and historical survey. The purpose of this survey will be to locate and assess the significance of historic resource present within the project's area of potential effects. The survey should identify and assess any undocumented historic-age resources within the project area and reassess any previously-identified historic resources within the APE. The survey should also determine if any historic s extend into the project area. The resultant survey report shall conform to the specifications set forth in Chapter 1A-46 Florida Administrative Code and will need to be forwarded to this agency in order to complete the process of reviewing the impact of this proposed project on historic properties.

FDOT District 5 Feedback to FL Department of State's Review
*Comments:*Thank you for your review and comments. A Cultural Resource Assessment Survey will be conducted during the PD&E study and forwarded to your agency for review. In development of the design concepts for this roadway, avoidance of historic and archaeological resources will be a primary undertaking. Coordination with your department will take place during development of the CRAS, particularly in regards to the SR46 Resource Group. The Florida Site File Historic Bridge, Jessup Bridge (SE01783) which was ineligible for listing in the NRHP, was replaced during a recently completed project to replace that functionally obsolete structure (FM# 240163-1).
*Date Feedback Submitted:*8/10/2010

- No review submitted from the Seminole Tribe of Florida

Recreation Areas

Coordinator Summary

3 Summary Degree of Effect

Recreation Areas Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (8/10/2010)
Comments:

Two agencies provided comments on this issue and assigned Moderate degrees of effect. There are adjacent public lands along this project corridor which we intend to avoid. Further coordination on this issue will take place during the study phase. We are assigning a Moderate degree of effect for this issue.

ETAT Reviews for Recreation Areas

3 ETAT Review by Cathy Kendall, Federal Highway Administration (05/27/2010)

Recreation Areas Effect: Moderate

Coordination Document:PD&E Support Document As Per PD&E Manual

Dispute Information:N/A

Identified Resources and Level of Importance:
The following recreation areas are adjacent to the project:
Cameron Wright Park;
City of Sanford Park; and
Seminole County Park.

Comments on Effects to Resources:
Impacts to these recreation areas should be avoided. Any potential impacts may result in a Section 4(f) use.

FDOT District 5 Feedback to Federal Highway Administration's Review
*Comments:*Thank you for your review. The PD&E study will evaluated these resources and all attempts to avoid impacts to potential Section 4(f) resources will be made. Further coordination on these issues will take place as the project progresses.
*Date Feedback Submitted:*8/10/2010

3 ETAT Review by Lauren P. Milligan, FL Department of Environmental Protection (05/27/2010)

Recreation Areas Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
The following public conservation lands are located within 500 ft. of the roadway: Flagler Trail North and the Lake Jesup Conservation Area and Lake Monroe Conservation Area - owned and managed for wetland restoration by the St. Johns River Water Management District.

Comments on Effects to Resources:
These lands contain significant natural communities and numerous element occurrences of listed species, as indicated by the Florida Natural Areas Inventory. The Department is interested in preserving the area's natural communities, wildlife corridor functions, natural flood control, stormwater runoff filtering capabilities, aquifer recharge potential and recreational trail opportunities. Therefore, future environmental documentation should include an evaluation of the primary, secondary, and cumulative impacts of roadway/bridge construction on the above public lands and any proposed acquisition sites.

Additional Comments (optional):
Under Article X, Section 18 of the Florida Constitution (as amended in 1998), dispositions of state-owned conservation lands are restricted to those lands "no longer needed for conservation purposes." If the proposed roadway/bridge construction activities necessitate right-of-way expansion, the FDOT may need to request that the St. Johns River Water Management District Governing Board determine whether the subject properties are no longer needed for conservation purposes. This requirement must be met before the conveyance of these lands can proceed.

FDOT District 5 Feedback to FL Department of Environmental Protection's Review
*Comments:*Thank you for your review and comments. We believe that sufficient right of way currently exists such that direct impacts to the Lake Jesup Conservation Area or the Lake Monroe Conservation Area will not be required. Nonetheless, coordination with these agencies will take place as the project moves through the study phase. Secondary and cumulative effects to these public lands will be evaluated during the study.
*Date Feedback Submitted:*8/10/2010

- No review submitted from the National Park Service
- No review submitted from the Saint Johns River Water Management District
- No review submitted from the US Environmental Protection Agency

Section 4(f) Potential

Coordinator Summary

3 Summary Degree of Effect

Section 4(f) Potential Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (8/10/2010)
Comments:
This project does have the potential to have Section 4(f) resource impacts which will be evaluated during the PD&E study. We concur with a Moderate degree of effect for Section 4(f) potential.

ETAT Reviews for Section 4(f) Potential

3 ETAT Review by Cathy Kendall, Federal Highway Administration (05/27/2010)

Section 4(f) Potential Effect: Moderate

Coordination Document:PD&E Support Document As Per PD&E Manual

Dispute Information:N/A

Identified Resources and Level of Importance:
CAMERON WIGHT PARK
Lake Jessup conservation area
Lake Jessup bridge

Comments on Effects to Resources:
Please provide a Section 4f determination of applicability for the above resources if it is anticipated that there would be any impacts to these resources. The bridge should first, however, be evaluated for eligibility for the NRHP under Section 106.

FDOT District 5 Feedback to Federal Highway Administration's Review
*Comments:*Thank you for your review and comments. The Lake Jesup Bridge has been evaluated for NRHP eligibility under Section 106 during a previous project and was found to be ineligible for NRHP listing. This documentation can be provided. If it appears that any of the other resources may be impacted, a determination of Section 4(f) applicability will be made during the study.
*Date Feedback Submitted:*8/10/2010

ETAT Reviews: Community

Aesthetics

Coordinator Summary

2 Summary Degree of Effect

Aesthetics Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (8/18/2010)
Comments:
No comments were received for aesthetic issues. Given the rural character of this area and the fact that the future land use element of the County's Comprehensive Plan calls for this Rural Boundary Area to maintain its rural character, we believe aesthetics will be a minor issue. We are assigning a Minimal degree of effect for this issue.

ETAT Reviews for Aesthetics

No reviews found for the Aesthetics Issue.
- No review submitted from the Federal Highway Administration

Economic

Coordinator Summary

1 Summary Degree of Effect

Economic Summary Degree of Effect: Enhanced

Reviewed By:
FDOT District 5 (8/18/2010)
Comments:
No comments were received for economic issues. Geneva is a rural residential community with few

commercial activities besides convenience stores and gas stations. In general, residents desire to maintain the rural character of the community. We do not believe the project will have economic impacts to Geneva. However, SR 46 does connect to the Sanford Orlando International Airport which is a Strategic Intermodal System and it also provides connection to the Greeneway Expressway facility via the extended Lake Mary Blvd. Due to the increased level of service and accessibility that a four lane divided roadway would provide there is the potential for economic enhancement to the SIS facility and surrounding communities. We are assigning an Enhanced degree of effect for this issue.

ETAT Reviews for Economic

No reviews found for the Economic Issue.
- No review submitted from the Federal Highway Administration

Land Use

Coordinator Summary

3 Summary Degree of Effect

Land Use Summary Degree of Effect: Moderate

Reviewed By:
FDOT District 5 (8/13/2010)
Comments:
The Florida Department of Community Affairs provided a review for Land Use issues. FDCA noted that the project is consistent with the Seminole County Comprehensive Plan and that it is subject to several County policies and objectives in regards to the rural area character. FDCA assigned a Moderate degree of effect for this issue to which the department concurs.

ETAT Reviews for Land Use

3 ETAT Review by Gary Donaldson, FL Department of Community Affairs (06/29/2010)

Land Use Effect: Moderate

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
This project is located in the Rural Boundary area as identified in FLU Exhibit 40 of the Seminole County Comprehensive Plan Future Land Use Element and is identified as an evacuation route on the Airport, Port, and Rail Facilities, Evacuation Routes 2025 map.

The project is consistent with the following objectives and policies:

Policy 2.12 Use of Design Standards for Roadways Serving East Rural Area Neighborhoods
The County shall protect the character of the East Rural Area through the use of design standards that require public facilities serving the Rural Area, including roadways, shall be designed in a context sensitive manner to ensure protection of the character of the Rural Area. The Florida Department of Transportation should coordinate closely with Seminole County on the design standards.

A context sensitive facility considers abutting land uses as well as engineering requirements in determining roadway features such as lighting, sidewalks, bicycle lanes, and drainage.

Objective FLU 11 PRESERVE RURAL LIFESTYLES IN SEMINOLE COUNTY
The County shall continue to implement and enforce policies and programs designed to preserve and reinforce the positive qualities of the rural lifestyle presently enjoyed in East Seminole County, referred to herein on occasion as the "Rural Area, (as defined in Exhibit FLU: Special Area Boundaries and Exhibit FLU: Rural Boundary Map) and thereby ensure the rural lifestyle is available to future residents.

Policy FLU 11.1 Recognition of East Rural Area
The County shall continue to enforce Land Development Code provisions and implement existing land use strategies and those adopted in 2008 that were based on the Rural Character Plan of 2006 and that recognize East Seminole County as an area with specific rural character, rather than an area anticipated to be urbanized. It shall be the policy of the County that rural areas require approaches to land use intensities and densities, rural roadway corridor protection, the provision of services and facilities, environmental protection and Land Development Code enforcement consistent with the rural character of such areas.

Policy 11.5 Roadway Corridor Overlay District for Major Roadways in East Seminole County
The County shall continue to enforce Land Development Code provisions relating to the East Seminole County Scenic Corridor Overlay District Ordinance for major roads in East Seminole County in order to regulate land development along major roadways to improve or protect the rural character of the area. The overlay corridor classification shall extend 200 feet of each side of the road right-of-way which will generally correspond to the building, parking, and clearing setbacks unless specifically determined that a particular structure or activity that is located upon property assigned the classification uniquely reinforces the rural character of the area. The overlay district shall regulate land development along the major roadway system in East Seminole County by, at a minimum, establishing standards for:

A Land use types and frequencies;
D Landscaping requirements;
L Number of travel lanes;
Q Easements, deed restrictions and other instruments required to perpetually preserve the undeveloped portion of the roadway corridor;

For the purposes of this policy the term "major roadway system" means County Road 419, State Road 46, County Road 426, and Snowhill Road, to the extent that they are located in East Seminole County.

Strategic Regional Policy Plan - East Central Florida Regional Planning Council

The following policies in the Plan should be addressed in the development of this project:

Policy 5.26
Design of regionally significant transportation facilities - and improvements to existing regionally significant facilities - should incorporate measures to minimize adverse impacts of such facilities on the tranquility and viability of residential neighborhoods and communities.

Policy 5.27
New transportation facilities or improvement of existing facilities that promotes leapfrog or sprawl development and adversely impacts other public facilities and services should not be undertaken. The following should be adhered to in implementing this policy:
e. Consistency with adopted state, regional and local comprehensive plans, relevant to transportation systems and land uses.

The Department of Community Affairs has reviewed the referenced project and has determined that the project is identified on the Seminole County 2025 Roadway Number of Lanes Future Transportation Map and is therefore consistent with the Seminole County Comprehensive Plan.

Comments on Effects to Resources:
see above

FDOT District 5 Feedback to FL Department of Community Affairs's Review
*Comments:*Thank you for your review. Design of this project will be managed by the Seminole County Engineering department and will be subject to internal review by the County and review by the department for appropriate FDOT engineering standards. Context Sensitive Solutions shall be employed in the design of this project so as to ensure protection of the character of the designated East Rural Area.
*Date Feedback Submitted:*8/13/2010

- No review submitted from the Federal Highway Administration

Mobility

Coordinator Summary

1 Summary Degree of Effect

Mobility Summary Degree of Effect: Enhanced

Reviewed By:
FDOT District 5 (8/18/2010)
Comments:
No agencies provided comments for this issue. A new four lane divided roadway connecting a SIS facility and serving as an evacuation route will provide for Enhanced mobility.

ETAT Reviews for Mobility

No reviews found for the Mobility Issue.
- No review submitted from the Federal Highway Administration
- No review submitted from the Federal Transit Administration

Relocation

Coordinator Summary

2 Summary Degree of Effect

Relocation Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (8/18/2010)
Comments:
We believe the potential for relocations to be very low for this project. We are assigning a Minimal degree of effect for relocations.

ETAT Reviews for Relocation

No reviews found for the Relocation Issue.
- No review submitted from the Federal Highway Administration

Social

Coordinator Summary

2 Summary Degree of Effect

Social Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (8/13/2010)
Comments:
The U.S. EPA provided comments on this issue noting that widening of SR 46 could result in growth and development along this rural corridor. Since the County's Future Land Use Element of their Comprehensive Plan designates this area as within the Rural Boundary Area and the policies and objectives of this designation call for the preservation of the rural character, we believe the potential for future non compatible land uses to be low. Therefore, we are assigning a Minimal degree of effect for social issues.

ETAT Reviews for Social

0 ETAT Review by Gary Donaldson, FL Department of Community Affairs (06/29/2010)

Social Effect: None

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Social impact comments cannot currently be determined for this project.

Comments on Effects to Resources:
see above

FDOT District 5 Feedback to FL Department of Community Affairs's Review
*Comments:*Thank you. The PD&E study will conduct a formal Public Involvement Plan which will include outreach activities with the community of Geneva and other adjacent residents. This plan may include community informational meetings, newsletters, a web site and ultimately a formal Public Hearing. Citizens will have the opportunity to provide comments and concerns about the

project for consideration and response by the project development team. Seminole County's Comprehensive Plan identifies and calls for this area to remain rural in character. Several County policies and objectives call for this area to be maintained in Rural Area. We believe that the social impacts of this project will be Minimal.
*Date Feedback Submitted:*8/13/2010

2 ETAT Review by Madolyn Dominy, US Environmental Protection Agency (06/12/2010)
Social Effect: Minimal

Coordination Document: No Selection

Dispute Information:N/A

Identified Resources and Level of Importance:
Resources: Residential areas, public lands, conservation areas, schools, etc.

Level of Importance: Low, due to minimal degree of effect

Comments on Effects to Resources:
Existing land uses within the corridor consist of low density residential, agricultural, public and conservation lands. Community facilities such as schools, a Seminole County Fire Station, and a Seminole County park are also located within the study area. Cameron Wight Park is located at MP 5.500 where SR 46 crosses the St. Johns River north of Lake Jessup. The entire corridor is characterized predominantly by undeveloped land. Development is limited to some commercial and light industrial uses concentrated around the SR 415 and SR 426 intersections in the community of Geneva.

The proposed project may impact recreational trails, conservation and recreational lands projects, and conservation management areas. These areas may be subject to Section 4(f) review.

The widening of this stretch of SR 46 will most likely result in growth and development along the corridor. Current residential communities will be impacted by construction activities and increased traffic flow. Assessments and surveys of residential communities should be conducted to determine whether low income or elderly populations will be affected. The project should avoid or minimize impacts to certain sectors of the populations who may be negatively impacted by the possibility of relocation.

Additional Comments (optional):
The Purpose and Need Statement states that "During the past few hurricane seasons portions of SR 46 were completely inundated by high water resulting in the closure of this road. SR 46 serves as a major evacuation route for Northern Brevard and Southern Volusia Counties. The next two closest east-west evacuation routes are SR50 located about 8 miles to the south and SR44 located about 25 miles to the north. The PD&E study will evaluate the profile grade elevation of SR46 within these study limits to ensure that this portion of SR46 would remain open during emergency evacuations."

EPA believes that the PD&E study should properly evaluate the ability of this roadway to serve as an adequate emergency evacuation route.

FDOT District 5 Feedback to US Environmental Protection Agency's Review
*Comments:*Thank you for your review and comments. The potential to impact Section 4(f) resources will be evaluated during the PD&E study. These resources will be avoided if at all possible.

Seminole County has designated this area of the county as a Rural Boundary Area in their Comprehensive Plan Future Land Use element. The County's policy objective for this area of East Seminole County is to maintain the rural character of the area. Because of this, we believe the social impacts of this project will be Minimal.
*Date Feedback Submitted:*8/13/2010

- No review submitted from the Federal Highway Administration

ETAT Reviews: Secondary and Cumulative

Secondary and Cumulative Effects

Coordinator Summary

2 Summary Degree of Effect

Secondary and Cumulative Effects Summary Degree of Effect: Minimal

Reviewed By:
FDOT District 5 (8/18/2010)
Comments:
Secondary and cumulative effects will be assessed during the PD&E study. Given that the county's comprehensive plan and future land use element calls for this area to maintain its rural character, the roadway improvement should not result in any significant secondary and cumulative effects. We are assigning a Minimal degree of effect for this issue.

ETAT Reviews for Secondary and Cumulative Effects

No reviews found for the Secondary and Cumulative Effects Issue.

General Project Commitments

No General Project Commitments Found

Permits

No Permits Found.

Technical Studies

Technical Study Name	Type	Review Org	Review Date
Location Hydraulics Report	ENGINEERING	FDOT District 5	06/06/05
Drainage/Pond Siting Report	ENGINEERING	FDOT District 5	08/18/10
Conceptual Design Roadway Plan Set	ENGINEERING	FDOT District 5	06/06/05
Geotechnical Report	ENGINEERING	FDOT District 5	06/06/05
Typical Section Package	ENGINEERING	FDOT District 5	06/06/05
Bridge Hydraulic Report	ENGINEERING	FDOT District 5	06/06/05
Public Involvement Plan	ENVIRONMENTAL	FDOT District 5	06/06/05
Class of Action Determination	ENVIRONMENTAL	FDOT District 5	06/06/05
Contamination Screening Evaluation Report	ENVIRONMENTAL	FDOT District 5	06/06/05
Wetlands Evaluation Report	ENVIRONMENTAL	FDOT District 5	06/06/05
Cultural Resource Assessment	ENVIRONMENTAL	FDOT District 5	06/06/05
Air Quality Screening and Technical Memo	Other	FDOT District 5	06/06/05
Wildlife and Habitat Report	Other	FDOT District 5	08/18/10
4 (f) Determination	Other	FDOT District 5	06/06/05
Section 4f Evaluation	ENVIRONMENTAL	FDOT District 5	08/18/10
WQIE	Other	FDOT District 5	08/18/10
Type 2 CE	ENVIRONMENTAL	FDOT District 5	08/18/10
Floodplains Assessment	Other	FDOT District 5	08/18/10
Noise Study Report	ENVIRONMENTAL	FDOT District 5	08/18/10
EFH Assessment	Other	FDOT District 5	08/18/10
Air Quality Report	ENVIRONMENTAL	FDOT District 5	08/18/10
Cultural Resource Assessment Survey Report	Other	FDOT District 5	08/18/10
Public Hearing Transcript	ENVIRONMENTAL	FDOT District 5	08/18/10
Environmental Assessment	ENVIRONMENTAL	FDOT District 5	08/18/10
Project Development Summary Report (PDSR)	ENGINEERING	FDOT District 5	08/18/10
Farmlands Assessment	Other	FDOT District 5	08/18/10

Class of Action

Class of Action	Other Actions
Categorical Exclusion	None
Lead Agency	**Cooperating Agency/Agencies**
Federal Highway Administration	

Signatures

	Name	Review Status	Date
Lead Agency ETAT Member	Cathy Kendall (Federal Highway Administration)	ACCEPTED	9/16/2010

Comments	FHWA accepts the class of action as a Type 2 Categorical Exclusion. This finding is based on the results and comments provided through the ETDM, which indicate a lack of potential significant impacts from the proposed project. Please include, as part of the PD&E study, an evaluation of roadway elevation that is subject to flooding (as noted in the EPA P&N comments). Also, plan consistency requirements will need to be met prior to FHWA signing an environmental document.		
	Name	**Review Status**	**Date**
FDOT ETDM Coordinator	Richard Fowler (FDOT District 5)	ACCEPTED	8/24/2010
Comments	We intend to conduct a Type II Categorical Exclusion for this project.		

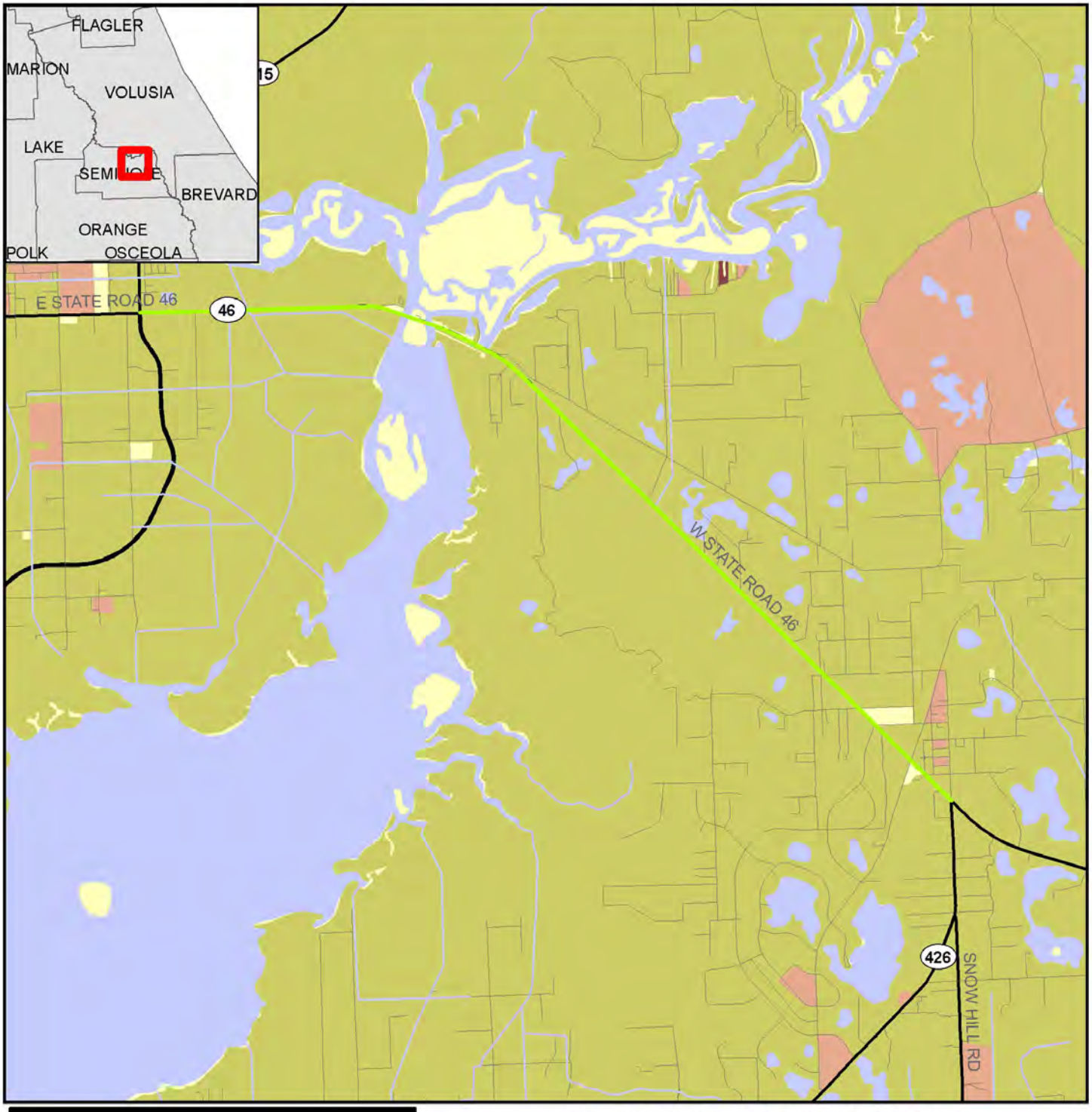
Dispute Resolution Activity Log

No Dispute Actions Found.

Hardcopy Maps: Alternative #1

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 3 Miles

Population Age Distribution Map

N W E S

Data Sources:
US Geological Survey
FL Department of Transportation
Geographic Data Technology, Inc.
US Census Bureau

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Median Age

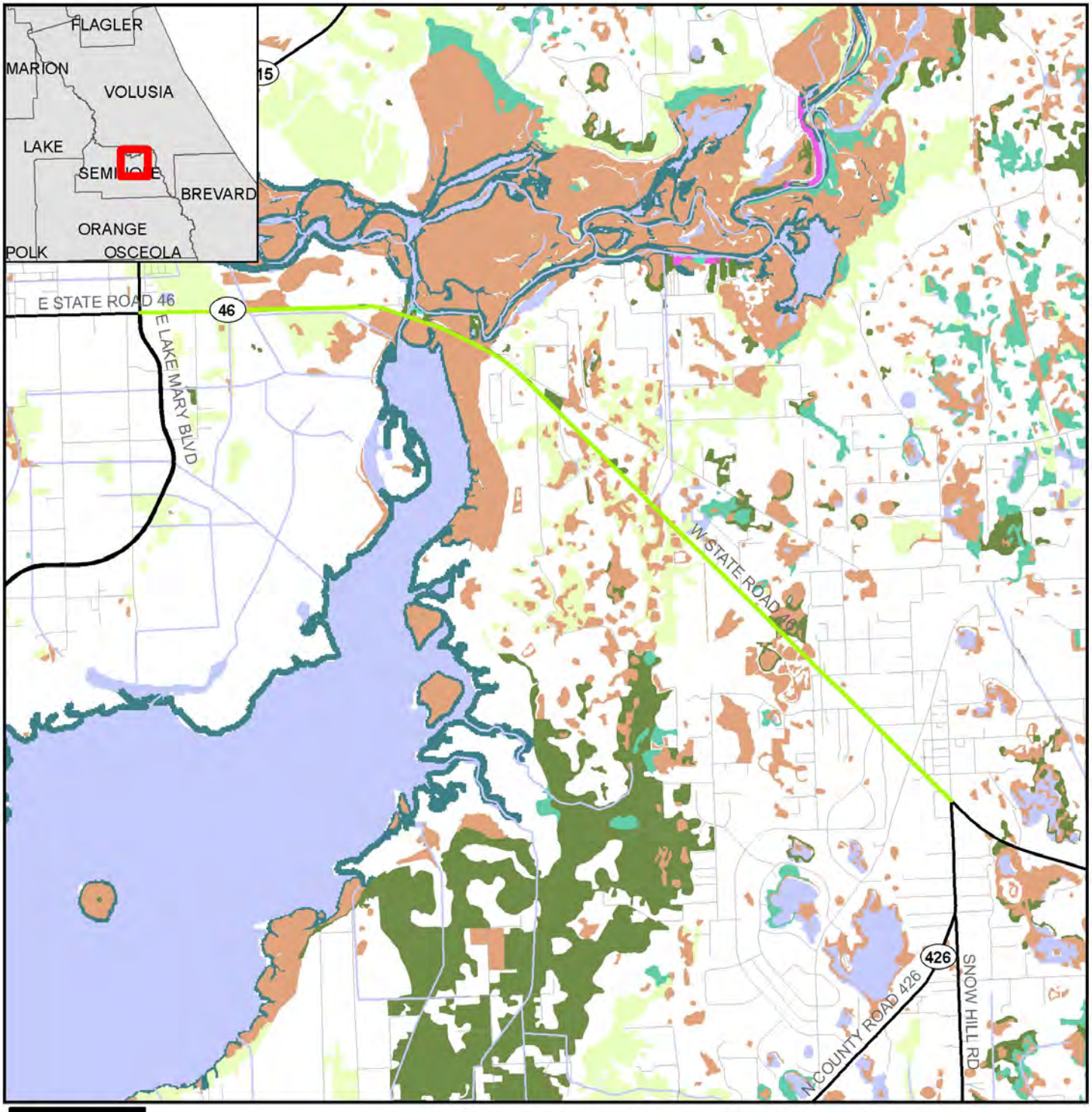
0 - 18 | 18 - 30 | 30 - 65 | > 65

Printed on: 12/09/2011

Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



Coastal and Marine Resource Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Aquatic Preserve
- Navigable Water Way
- Continuous Seagrass
- Discontinuous Seagrass
- Coastal Barrier Resource Area
- Swamp or Marsh
- Exposed Rocky Platform
- Sand Beach
- Gravel Beach/Riprap
- Exposed Tidal Flat
- Sheltered Tidal Flat
- Mixed Sand And Gravel Beach
- Sheltered Rock/Seawall/Vegetated
- Exposed Vertical Rocky Shore/Seawall

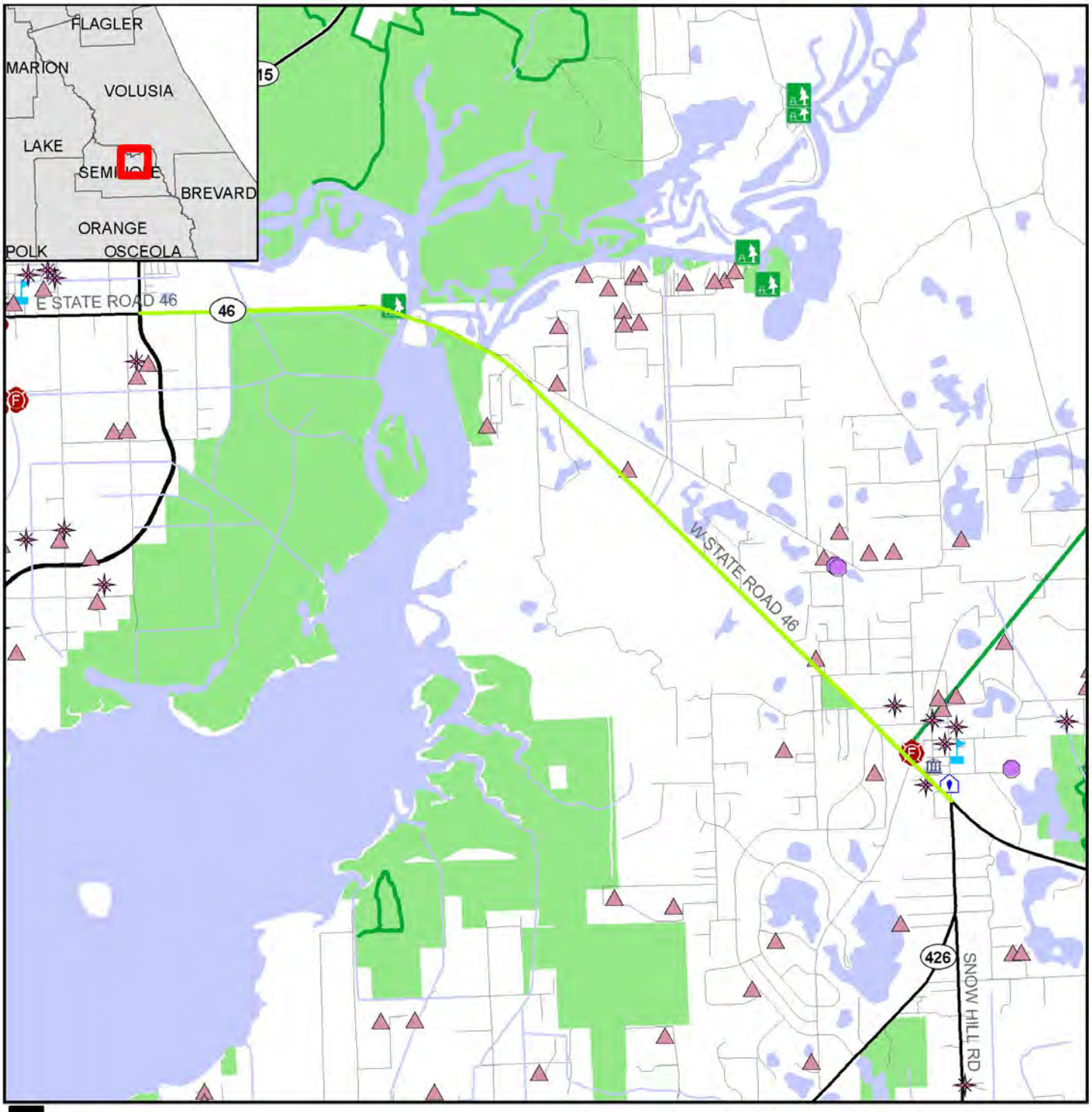
Data Sources: Geographic Data Technology, Inc.; US Geological Survey; Florida Marine Research Institute; Florida Department of Transportation; Florida Department of Environmental Protection; National Oceanic and Atmospheric Association; Florida Water Management Districts

Printed on: 12/09/2011

Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 0.25 Miles

N W E S

Community Facilities and Services Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Government
- Civic Center
- Cemetery
- Social Service
- Community Center
- Law Enforcement
- Place of Worship
- Cultural Center
- Fire Station
- Health Care
- School
- Park
- River, Stream or Canal
- Recreational Trail
- Major Road
- Local Road or Trail
- Railroad
- Community Boundary
- Water Body
- Conservation or Recreation Area

Data Sources:
US Geological Survey; FL Department of Transportation; Geographic Data Technology, Inc.; FL Property Appraisers; FL Natural Areas Inventory

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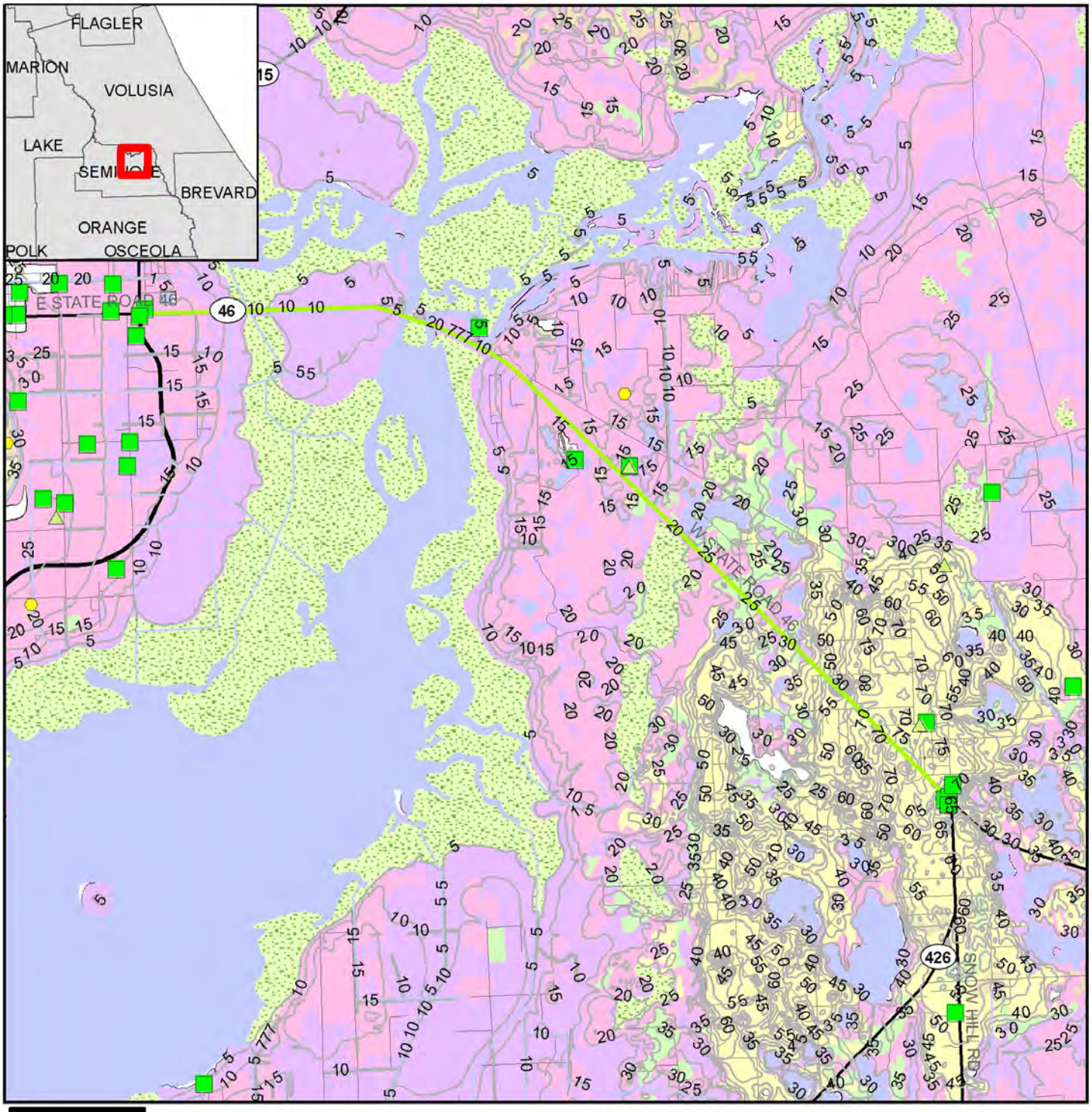
Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 1 Miles

Potential Contamination Assessment Map

N W E S

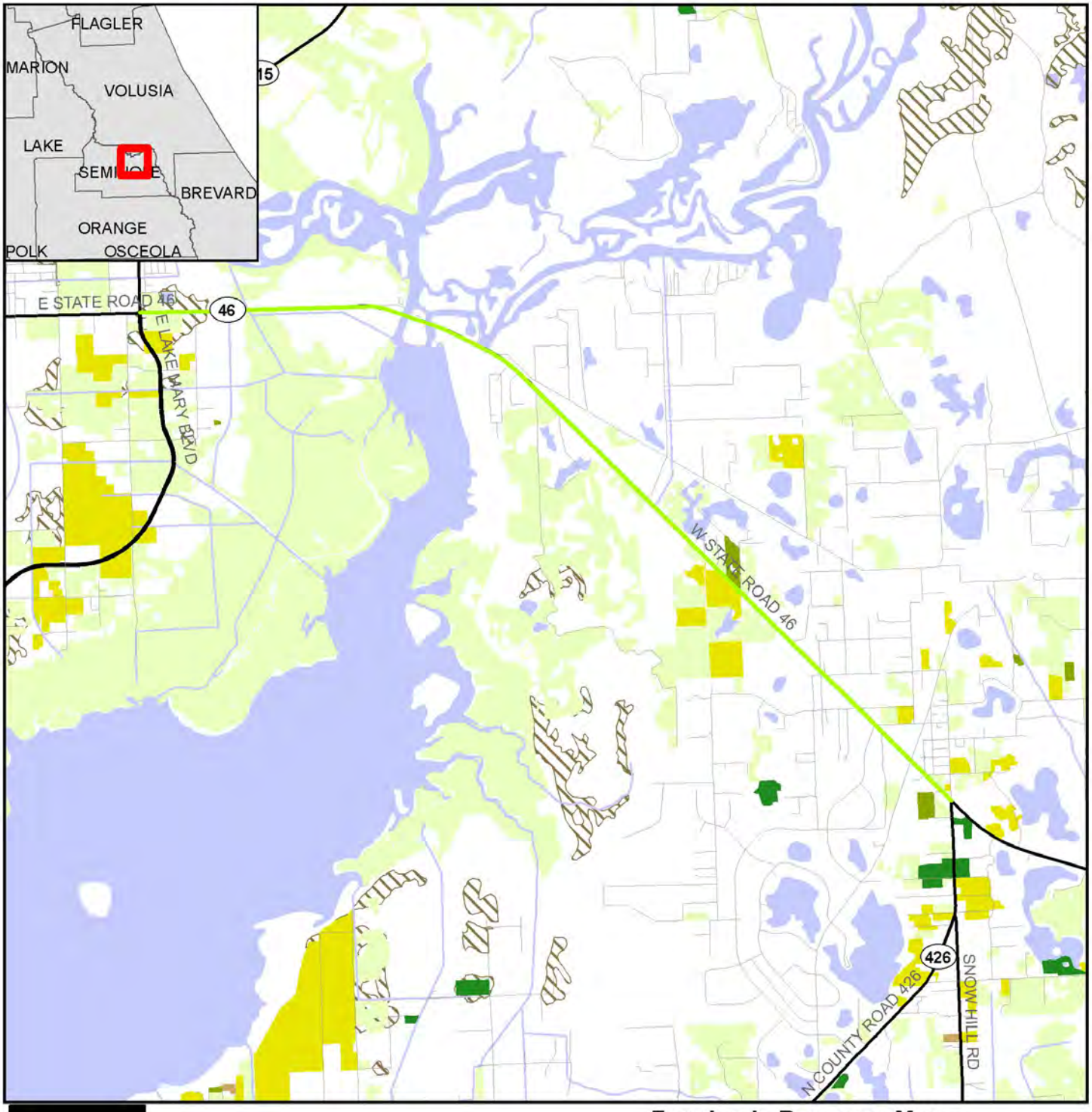
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Toxic Release Inventory
- Dry Cleaning Facility
- Solid Waste Facility
- NPL Remediation Site
- Hazardous Material Site
- Power Plant
- Superfund Site
- Nuclear Site
- FDEP Tanks
- Brownfield Area
- 5 FT Contour
- Water Body
- Swamp/Marsh

Data Sources:
Geographic Data Technology, Inc.; US Geological Survey; FL Department of Transportation; FL Department of Environmental Protection; FL Water Management Districts; US Environmental Protection Agency; Natural Resource Conservation Service

Printed on: 12/09/2011
Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



Farmlands Resource Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- River, Stream or Canal

Roads

- Major Road
- Local Road or Trail
- Water Body
- Prime Farmland Soils

- Cropland/Pastureland
- Nurseries/Vineyards
- Specialty Farms
- Tree Crops
- Rural Open Lands

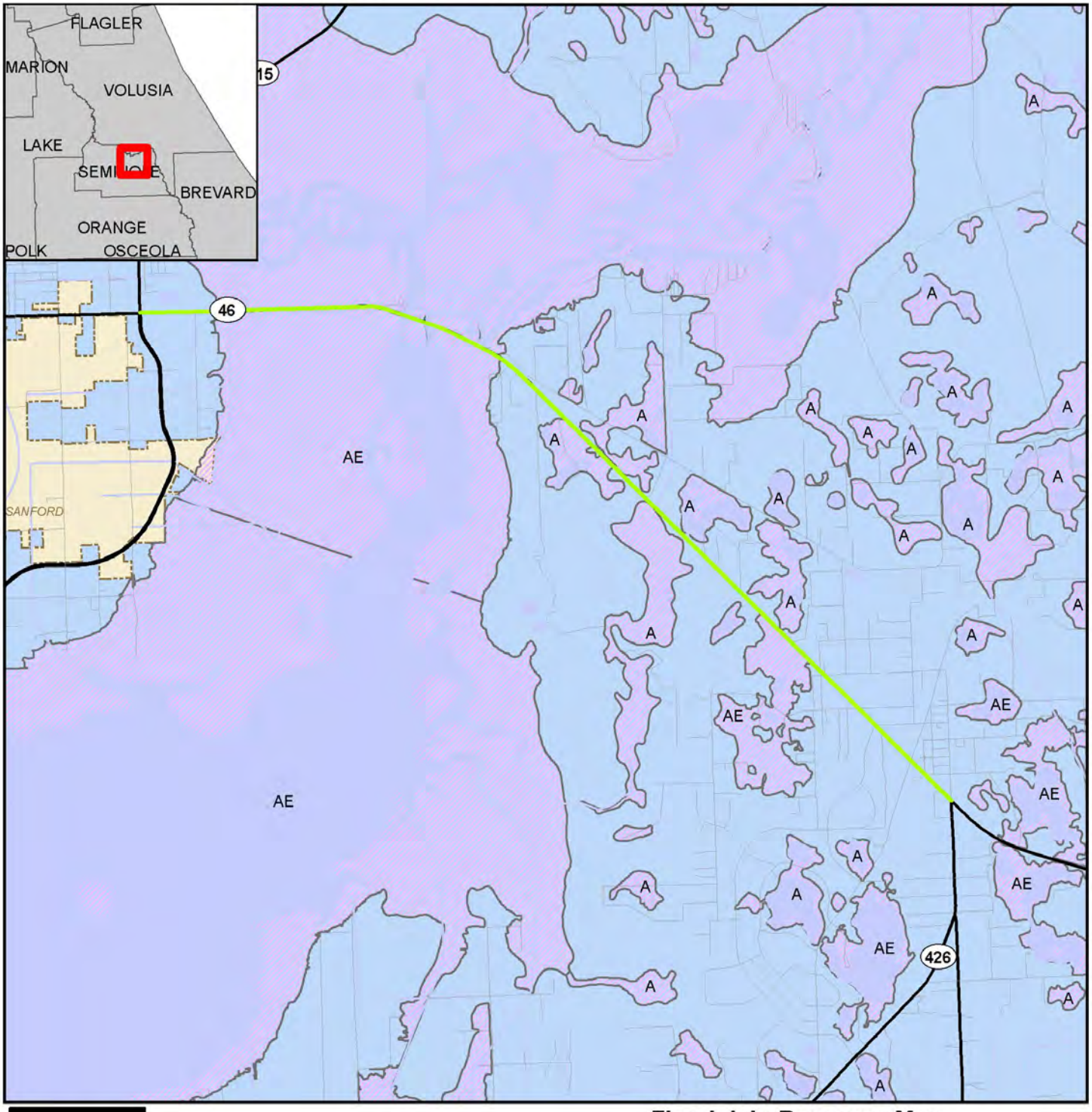
Data Sources: Geographic Data Technology, Inc., Florida Water Management Districts, US Geological Survey, Natural Resources Conseration Services

Printed on: 12/09/2011

Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



Floodplain Resource Map

0 1 Miles

N W E S

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body
- City Limits
- County Boundaries
- Special Flood Hazard Area

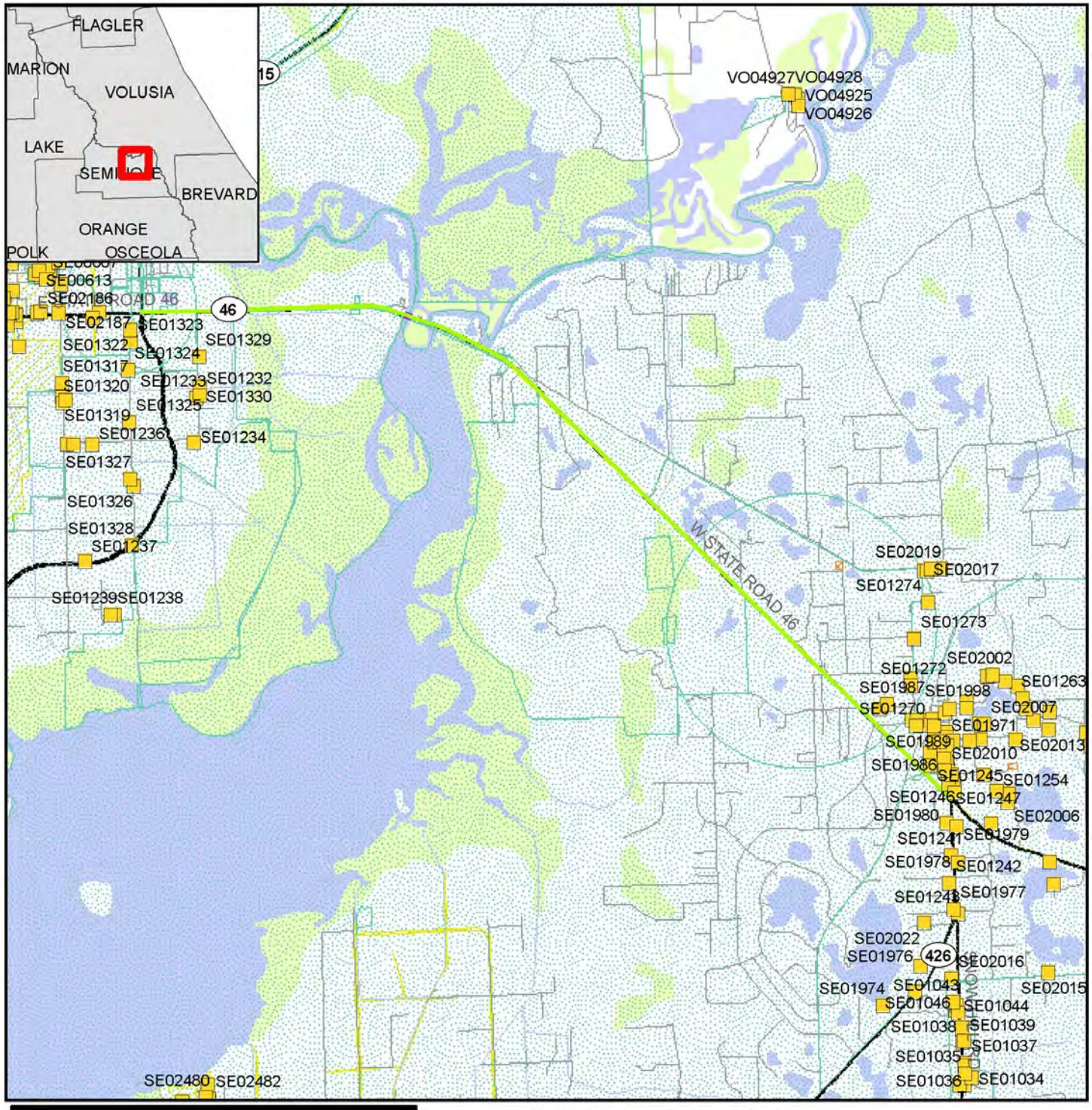
Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
Federal Emergency Management Agency

Printed on: 12/09/2011

Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 3 Miles

N W E S

Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
Florida Department of Transportation
Florida Department of State,
Bureau of Archaeological Research

Historic Resources Map

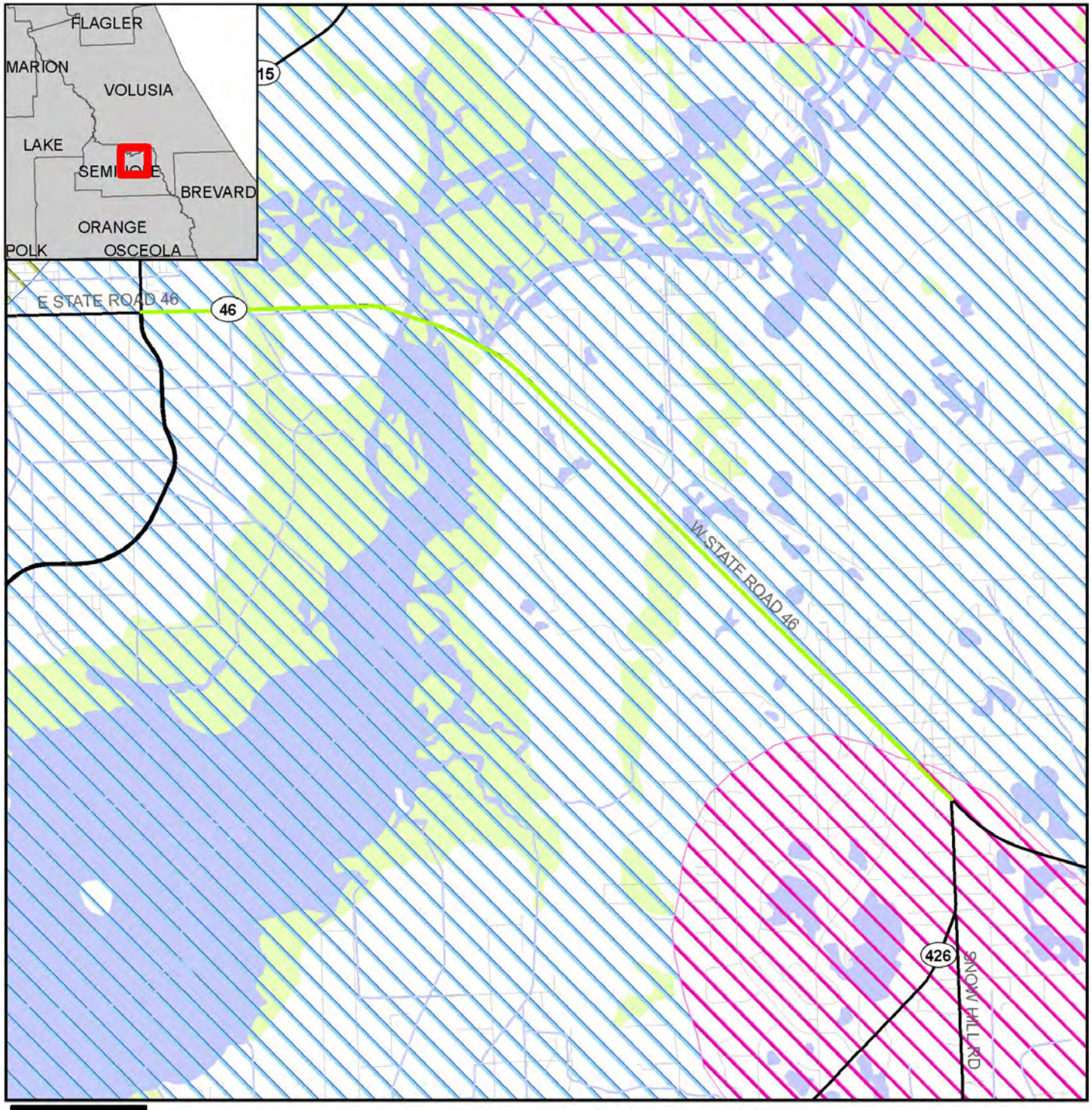
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Major Road
- Local Road or Trail
- Railroad
- Historic Structure
- Historic Cemetery
- Historic Bridge
- Historic Resource Group
- Cultural Resource Field Survey Area
- State Historic Highway

Note: Historic properties depicted on this map represent resources listed in the Florida Master Site File excluding archeological site locations, which, pursuant to Chapter 267.135, Florida Statutes, may be exempt from public record (Chapter 119.07, Florida Statutes). Absence of features on the map does not necessarily indicate an absence of resources in the project vicinity.

Printed on: 12/09/2011
Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 1 Miles

Hydrogeology Resource Map

N W E S

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Swamp/Marsh

Recharge Areas of the Floridan Aquifer

- Discharge 1 TO 5
- Discharge > 5
- Disharge < 1
- Recharge 1 TO 10
- Recharge > 10
- Recharge < 1

Geological Epoch

- Eocene
- Holocene
- Miocene
- Miocene/Pliocene
- Oligocene
- Oligocene/Miocene
- Pleistocene
- Pleistocene & Holocene
- Pliocene
- Pliocene/Pleistocene

Data Sources: Geographic Data Technology, Inc.; US Geological Survey; Florida Department of Transportation; South West Florida Water Management District; Florida Geological Survey

Printed on: 12/09/2011

Map Generated on: 4/13/2010

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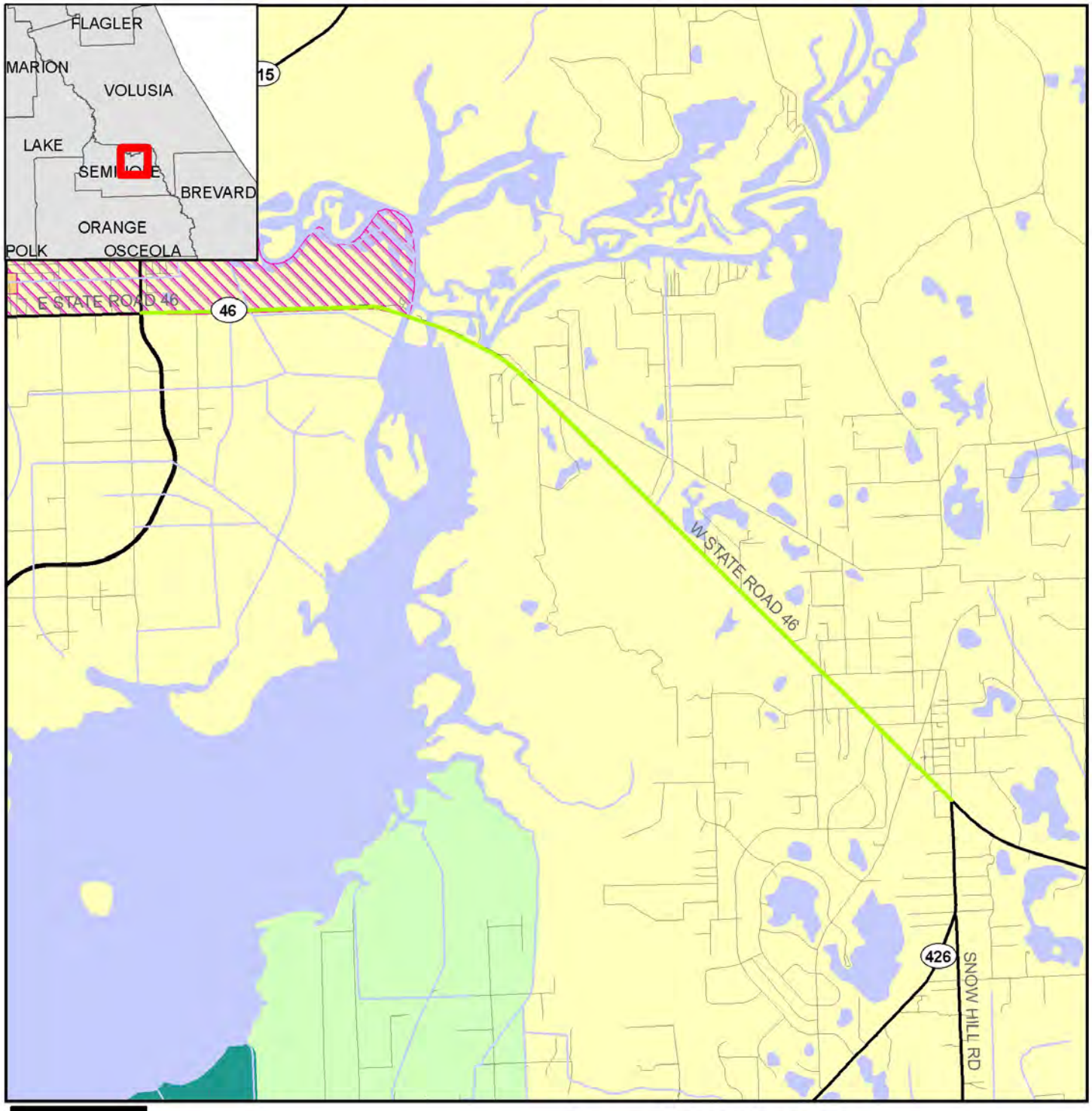


0 1 Miles

N
W E
S

Data Sources:
US Geological Survey
FL Department of Transportation
Geographic Data Technology, Inc.
US Census Bureau

Income Distribution Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- > 20% Below Poverty
- Water Body

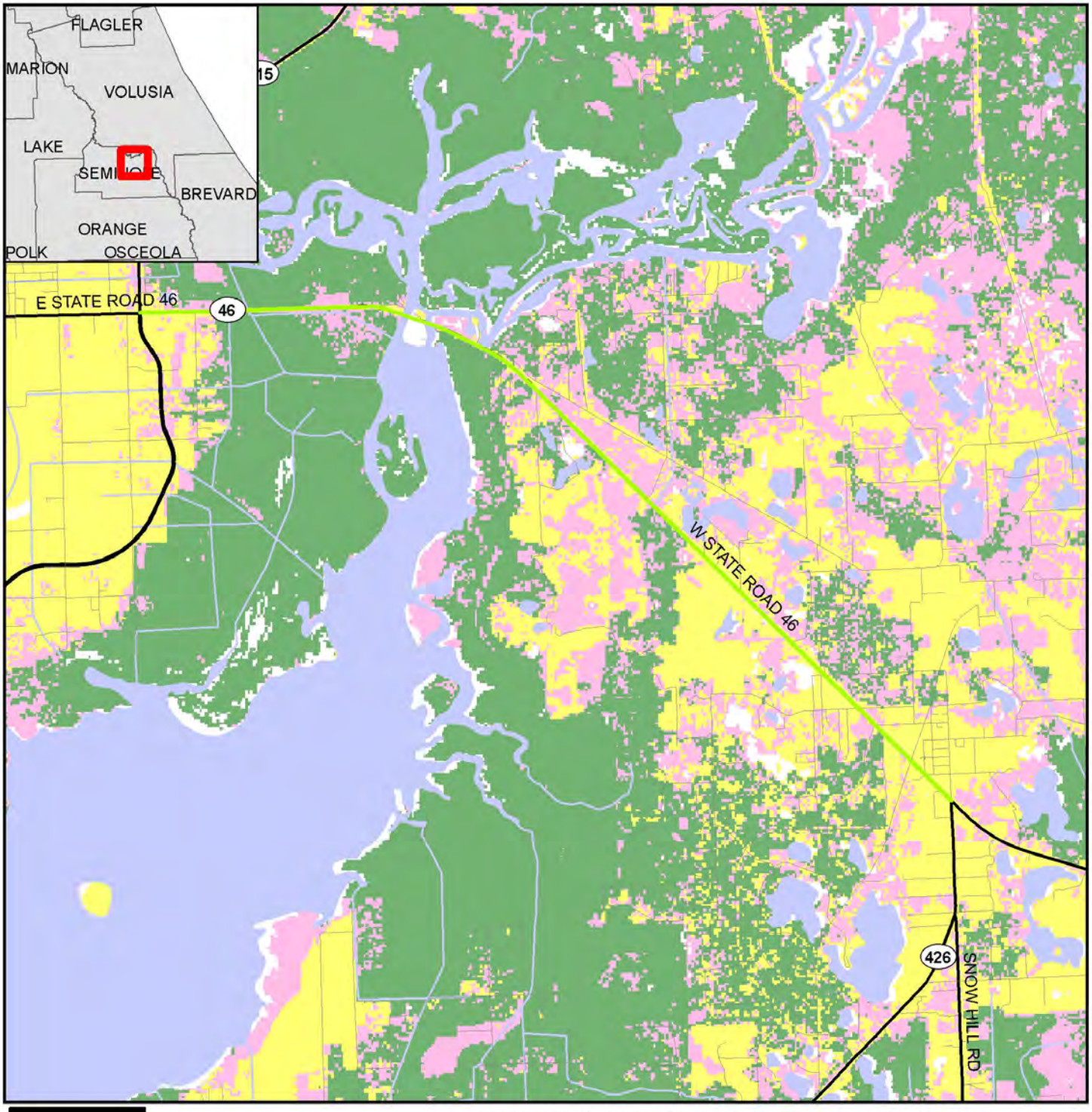
Median Household Income

0 - 10000
10001 - 29999
30000 - 49999
50000 - 79999
80000 - 125000
> 125000

Printed on: 12/09/2011
Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 1 Miles

N W E S

Integrated Wildlife Habitat Ranking System Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body
- Low Habitat Quality
- Medium Habitat Quality
- High Habitat Quality

Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
Florida Department of Transportation
Florida Fish & Wildlife Conservation Commission

Printed on: 12/09/2011

Map Generated on: 4/13/2010

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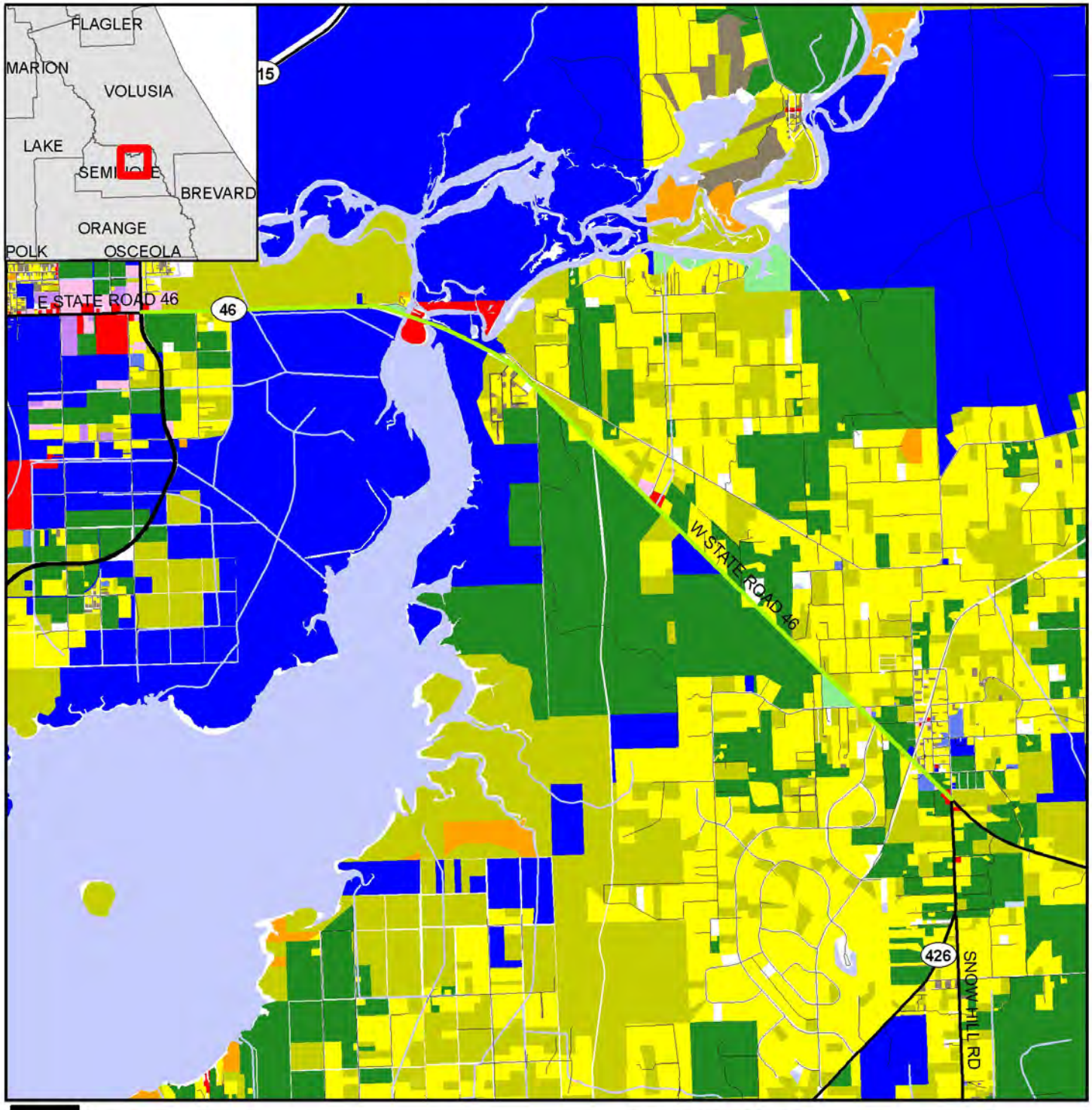

0 0.5 Miles

N W E S

Land Use Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Agricultural
- Industrial
- Institutional
- Mining
- Open (Not Agricultural)
- Other
- Public
- Right-of-Way
- Recreational
- Residential
- Retail/Office
- Vacant (Residential)
- Vacant (Nonresidential)
- Water
- No Data

Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
Florida Department of Revenue
Florida Department of Transportation
Florida County Property Appraiser Offices

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Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

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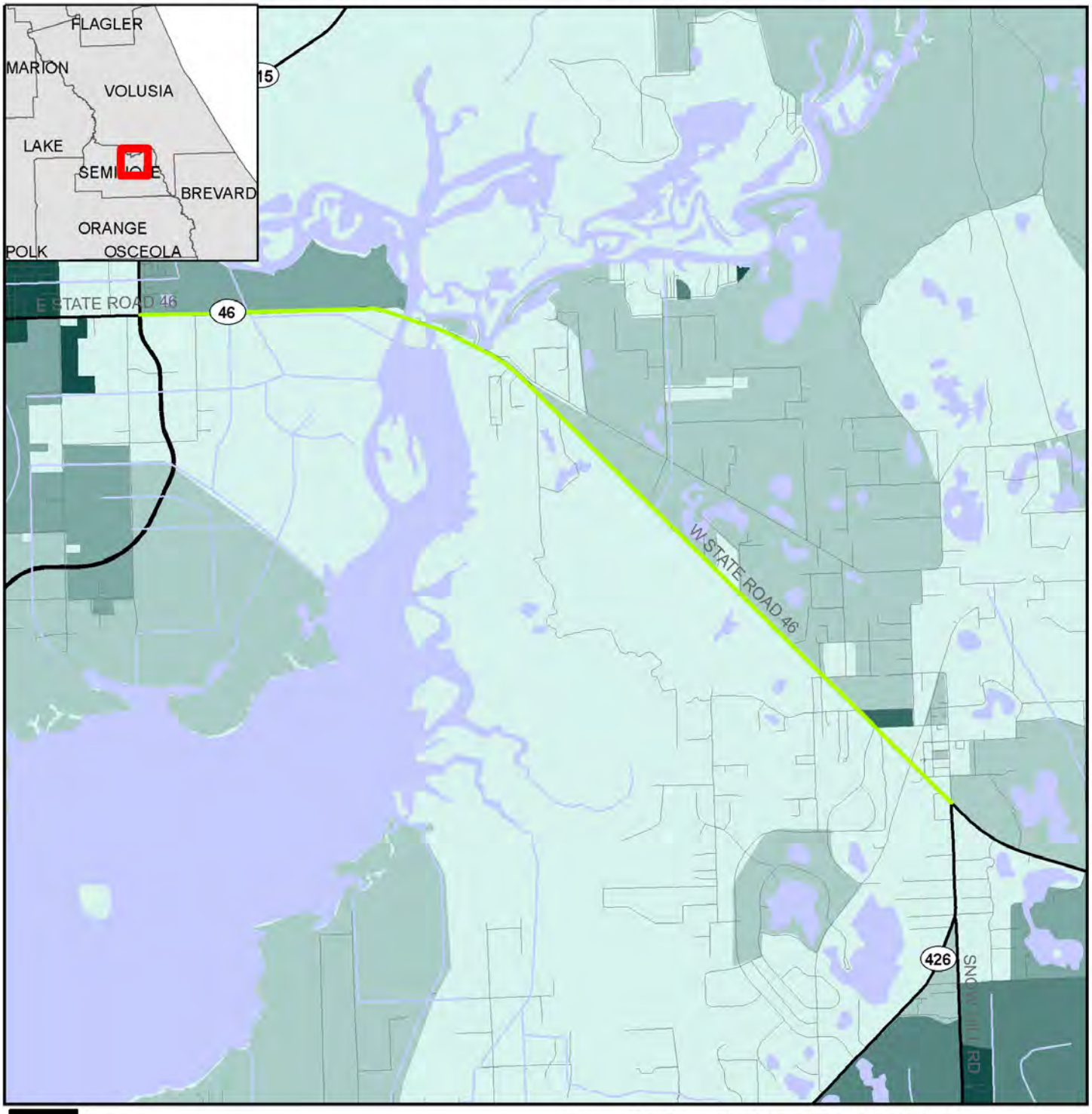

0 0.5 Miles

N
W E
S

Data Sources:
US Geological Survey
FL Department of Transportation
Geographic Data Technology, Inc.
US Census Bureau

Minority Population Distribution Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Percent Minority Population

0 - 6 | 7 - 20 | 21 - 38 | 39 - 60 | 61 - 85 | 86 - 100

Printed on: 12/09/2011
Map Generated on: 4/13/2010

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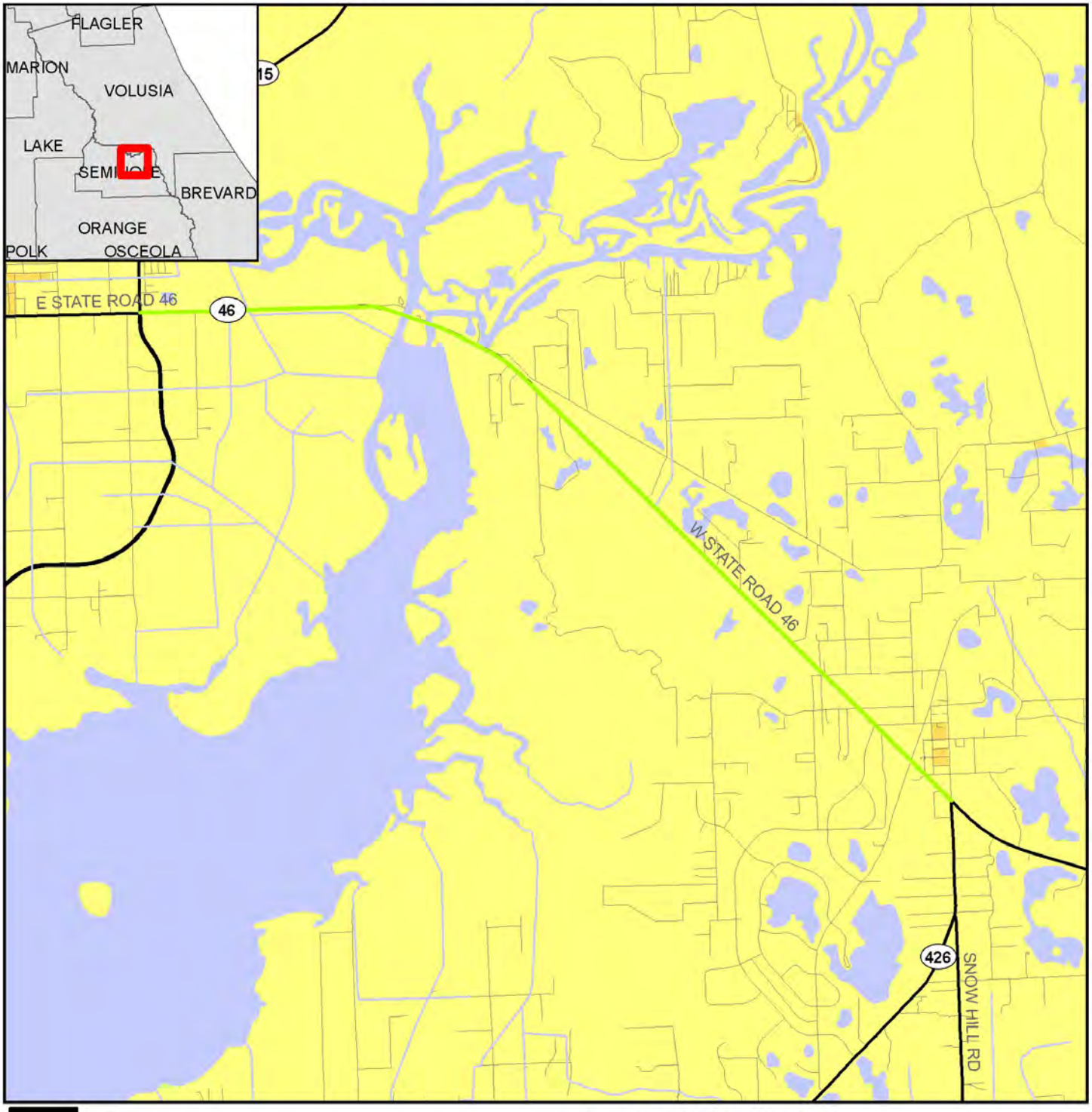


0 0.5 Miles

N
W E
S

Data Sources:
US Geological Survey
FL Department of Transportation
Geographic Data Technology, Inc.
US Census Bureau

Population Density Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Population per Acre

0 - 4.9 | 5 - 29.9 | 30 - 99.9 | 100 - 349.9 | 350 - 800 | > 800

Printed on: 12/09/2011
Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)

0 1 Miles

Project Aerial Map

N
W E
S

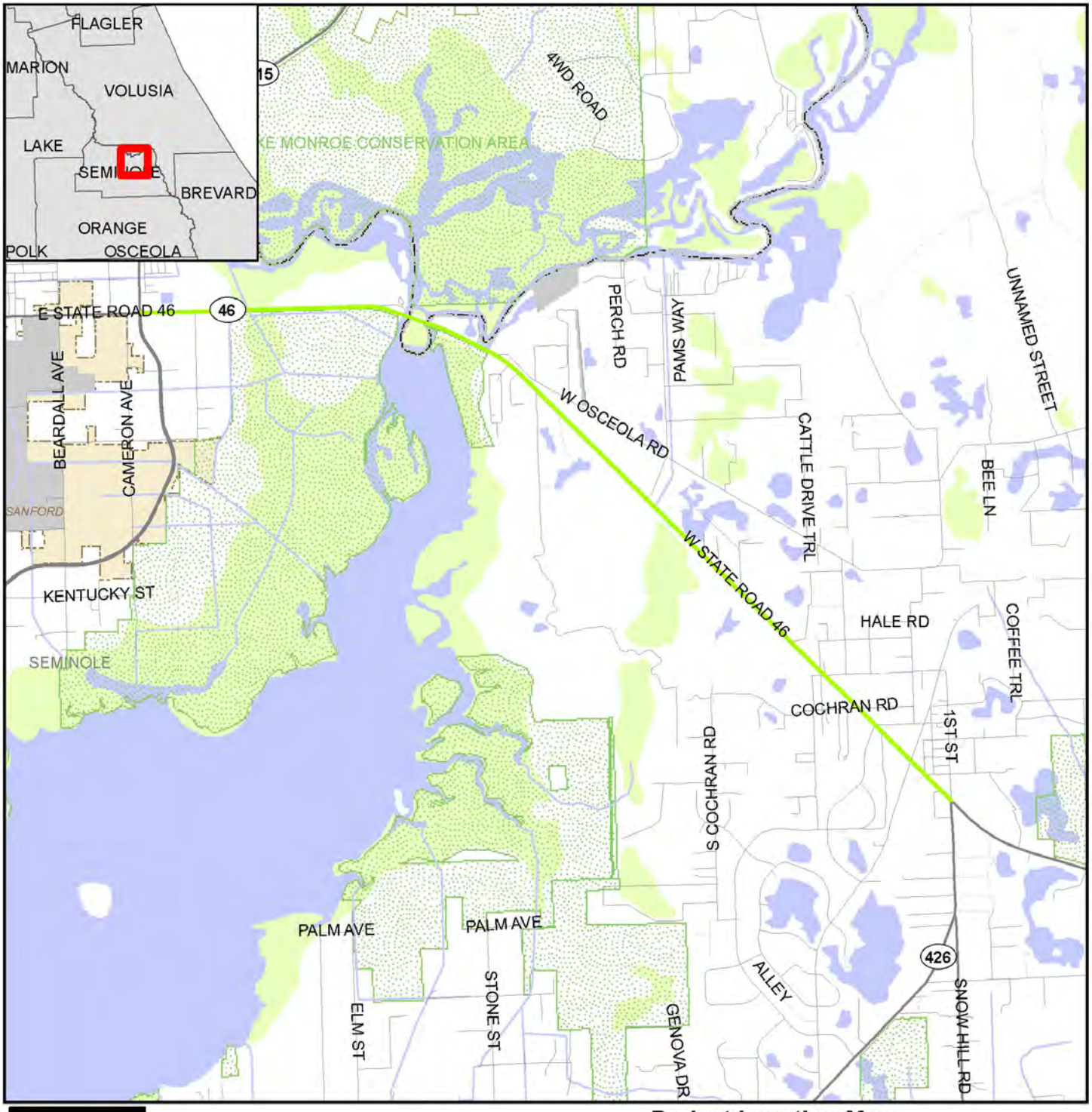
- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Primary and Limited Access Highway
- Secondary, Unlimited Access Highway
- Other Highway Feature

Data Sources:
Highways - Geographic Data Technology, Inc.
Digital Orthophotograph - US Geological Survey

Printed on: 12/09/2011
Map Generated on: 4/13/2010

4972 SR 46 from SR 415 to CR 426, Alternative #1

SR 415 (MP 3.66) to CR 426 (MP 11.047)



0 1 Miles

Project Location Map

N W E S

Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
US Census Bureau
County Property Appraisers
Florida Natural Areas Inventory

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Managed Conservation Lands
- Primary and Limited Access Highway
- Secondary, Unlimited Access Highway
- Connecting Road
- Local Road or Trail
- Other Roadway Feature
- Toll Road
- Railroad
- Airport
- City Limits
- County Boundaries

Printed on: 12/09/2011
Map Generated on: 4/13/2010

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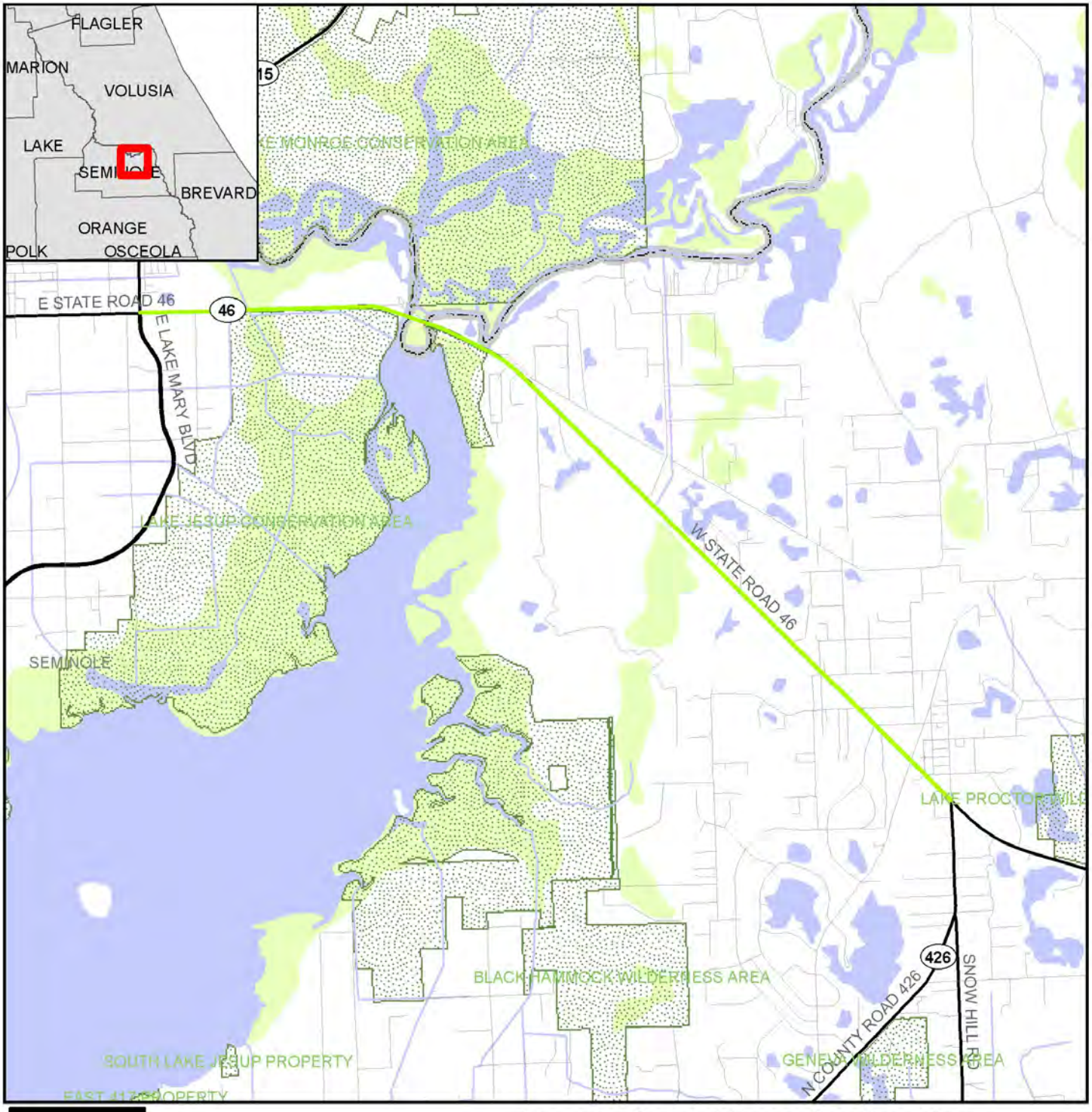

0 1 Miles

Conservation and Recreation Area Map

Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
Florida Natural Areas Inventory

- ETDM Alternative Point
- ETDM Alternative Segment
- ETDM Alternative Polygon
- ETDM Alternative Terminus
- River, Stream or Canal
- Water Body
- Swamp/Marsh
- Conservation or Recreation Area
- Major Road
- Local Road or Trail
- Railroad
- County Boundary

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Map Generated on: 4/13/2010

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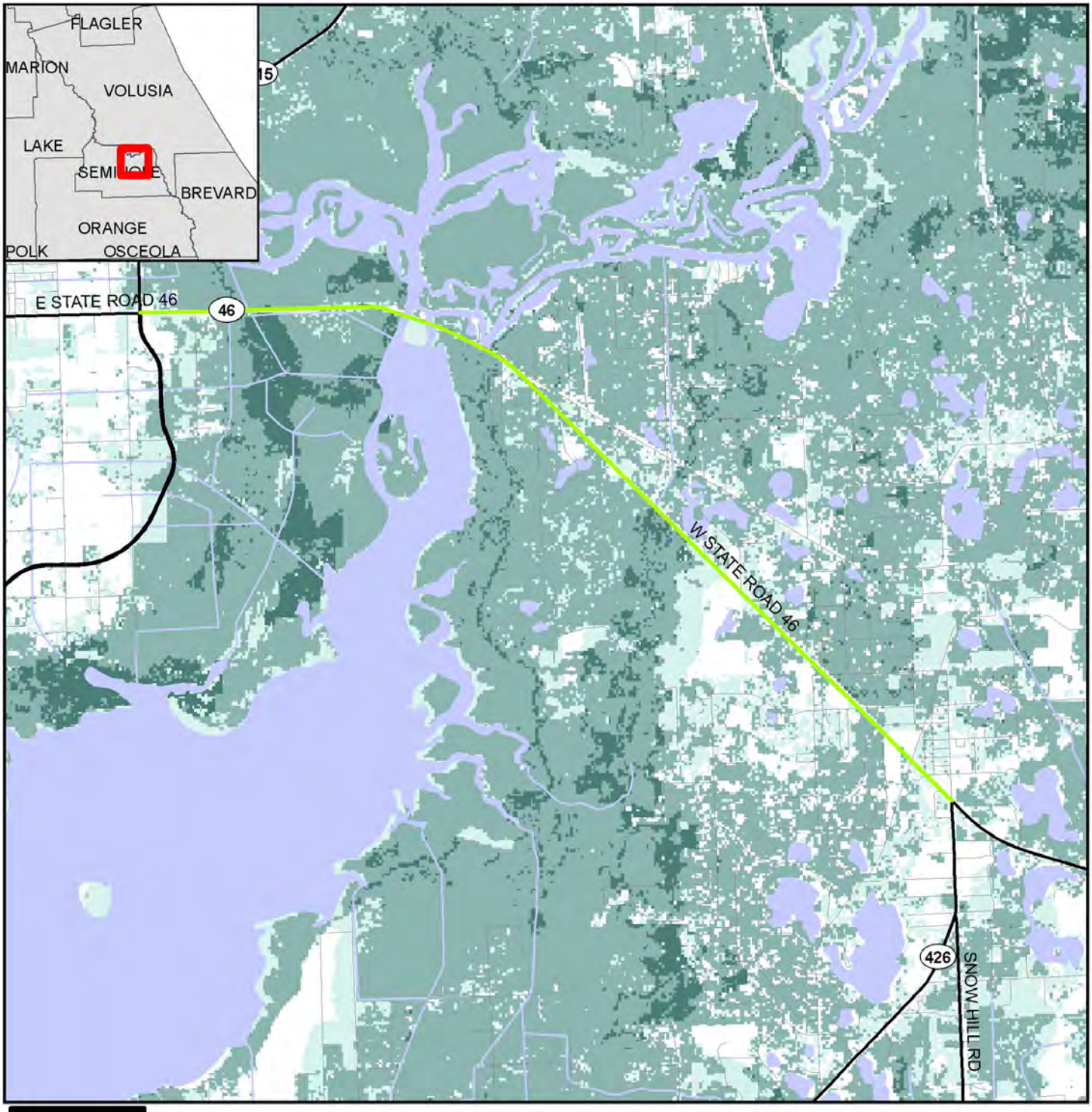

0 1 Miles

N W E S

Species Potential Habitat Model Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- River, Stream or Canal
- Water Body

Potential Habitat Richness

- 1 - 2 Species
- 3 - 5 Species
- 6 - 8 Species
- 9 - 10 Species
- 11 - 13 Species

Data Sources:
Geographic Data Technology, Inc.
US Geological Survey
Florida Department of Transportation
Florida Fish & Wildlife Conservation Commission

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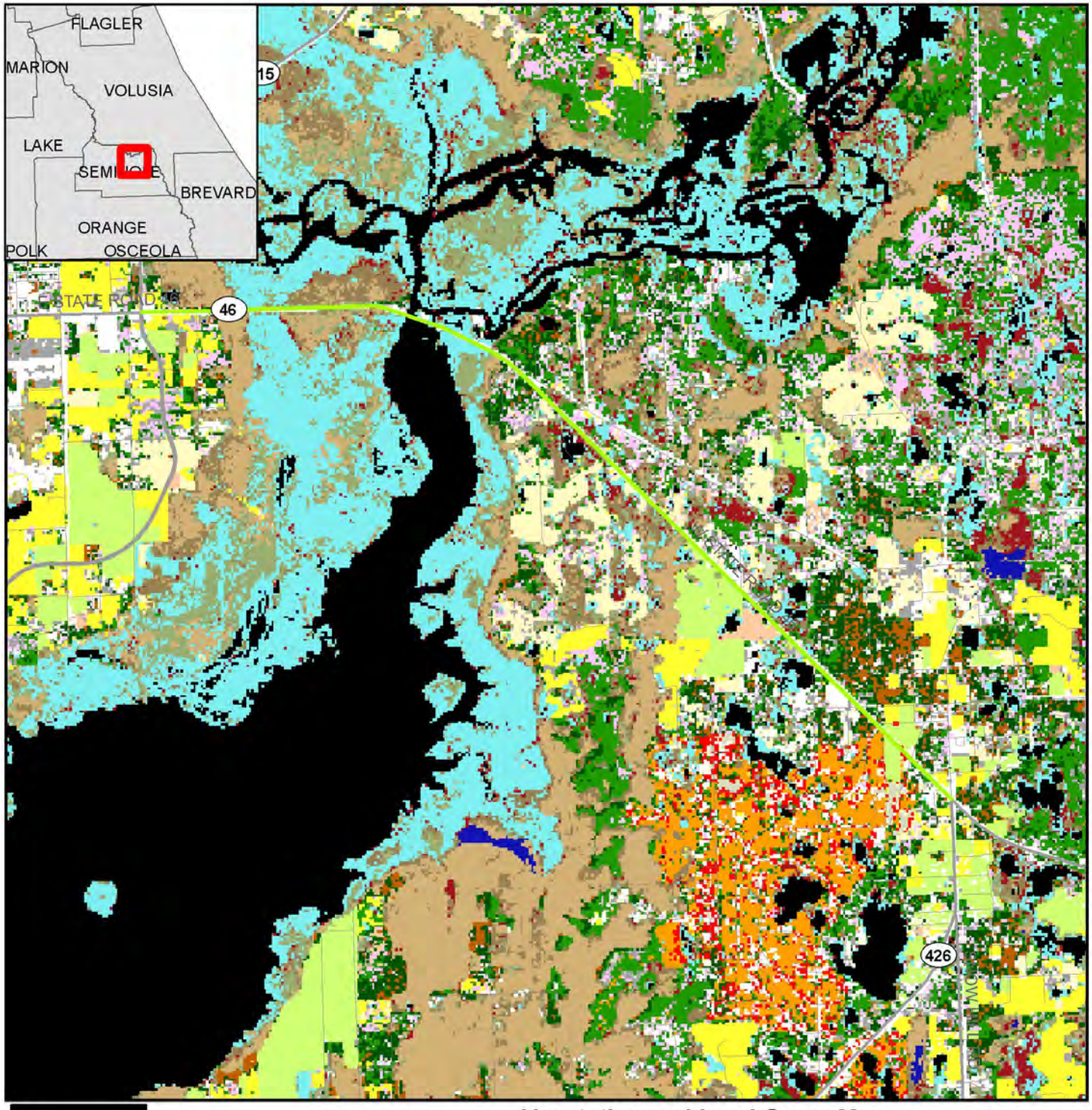

Vegetation and Land Cover Map

- ETDM Alternative Polygon
- ETDM Alternative Segment
- ETDM Alternative Terminus
- ETDM Alternative Point
- Major Road
- Local Road or Trail

- Not Classified
- Coastal Strand
- Sand/Beach
- Xeric Oak Scrub
- Sand Pine Scrub
- Sandhill
- Dry Prairie
- Mixed Hardwood-pine Forest
- Hardwood Hammocks and Forests
- Pinelands
- Cabbage Palm-live Oak Hammock
- Tropical Hardwood Hammock
- Freshwater Marsh and Wet Prairie
- Sawgrass Marsh
- Cattail Marsh
- Shrub Swamp
- Bay Swamp
- Cypress Swamp
- Cypress/Pine/Cabbage Palm
- Mixed Wetland Forest
- Hardwood Swamp
- Hydric Hammock
- Bottomland Hardwood Forest
- Salt Marsh
- Mangrove Swamp
- Scrub Mangrove
- Tidal Flats
- Open Water
- Shrub and Brushland
- Grassland
- Bare Soil/Clearcut
- Improved Pasture
- Unimproved Pasture
- Sugarcane
- Citrus
- Row and Field Crops
- Other Agriculture
- Exotic Plants
- Australian Pine
- Melaleuca
- Brazilian Pepper
- High Impact Urban
- Low Impact Urban
- Extractive

Data Sources:
Geographic Data Technology, Inc.; Florida Department of Transportation; Florida Fish and Wildlife Conservation Commission

Printed on: 12/09/2011
Map Generated on: 4/13/2010

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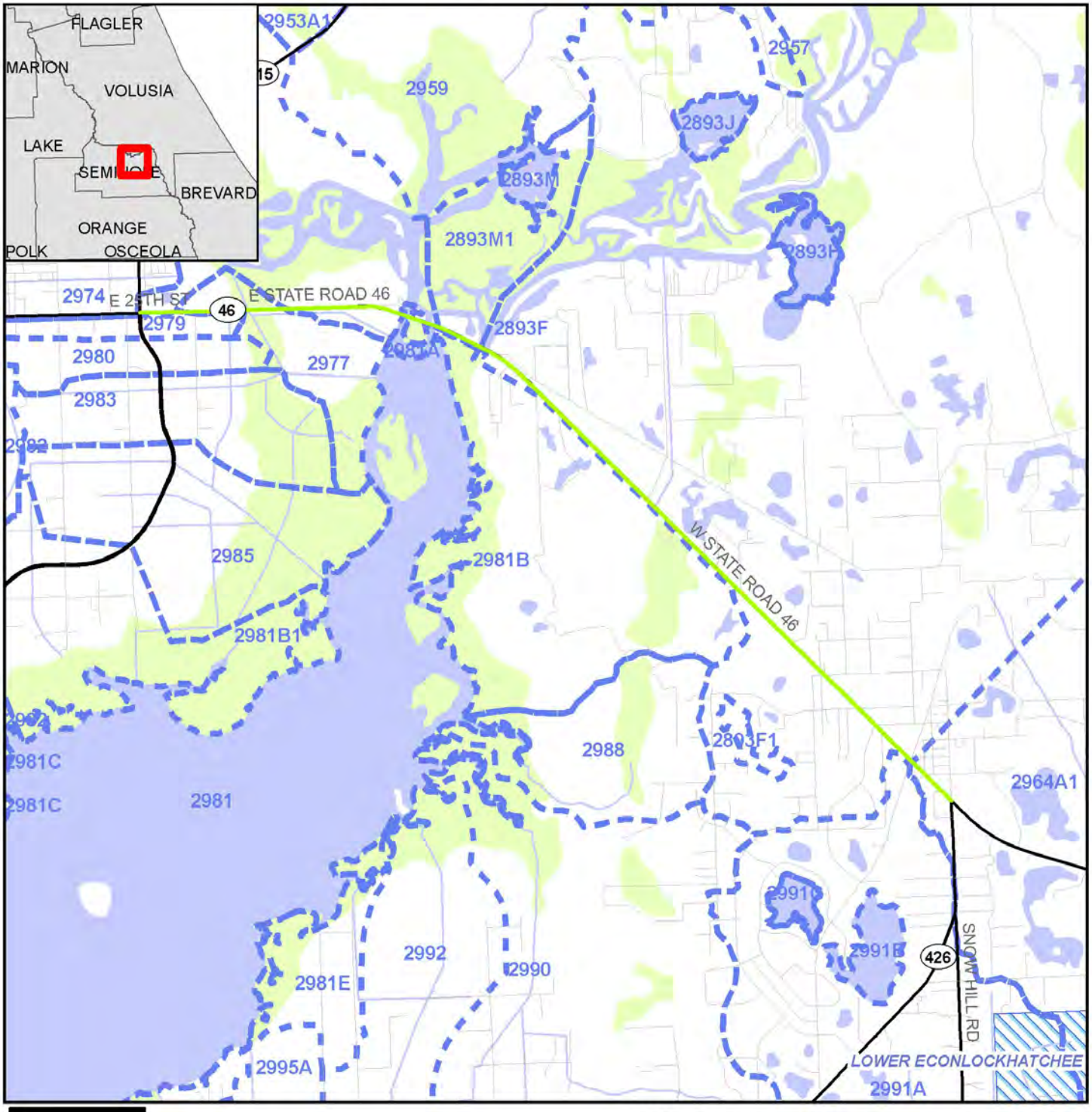

0 1 Miles

Water Resources Map

- ETDM Alternative Point
- ETDM Alternative Terminus
- ETDM Alternative Segment
- ETDM Alternative Polygon
- Major Road
- Local Road or Trail
- Railroad
- 1st Magnitude Spring
- River, Stream or Canal
- Navigable Water Way
- Drainage Basin
- Outstanding Florida Water
- Surface Water Class I
- Surface Water Class II
- Water Body
- Swamp/Marsh

Data Sources:

Geographic Data Technology, Inc.
US Geological Survey
Florida Department of Transportation
Florida Department of Environmental Protection
Florida Geological Survey
US Bureau of Transportation Statistics

Printed on: 12/09/2011

Map Generated on: 4/13/2010

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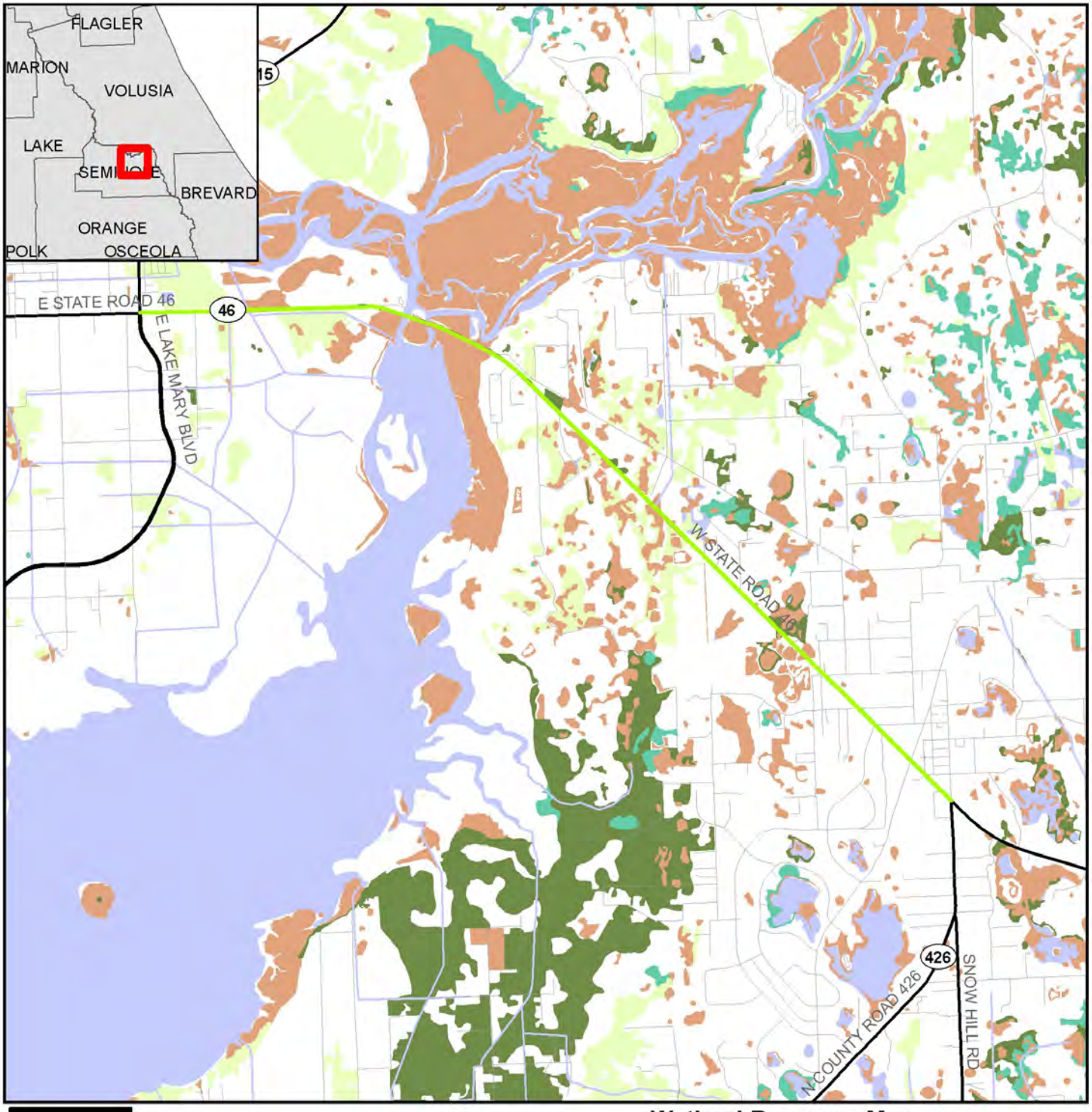


0 0.9 Miles

Wetland Resource Map

- ETDM Alternative Polygon
- ETDM Alternative Segment
- ETDM Alternative Terminus
- ETDM Alternative Point
- Major Road
- Local Road or Trail
- River, Stream or Canal
- Water Body
- Non-vegetated Wetland
- Vegetated Non-forested Wetland
- Wetland Forested Mixed
- Wetland Coniferous Forest
- Wetland Hardwood Forest

Data Sources: Geographic Data Technology, Inc.; Florida Water Management Districts; US Geological Survey

Printed on: 12/09/2011

Map Generated on: 4/13/2010

Appendicies

Legend			
Color Code	**Meaning**	**ETAT**	**Public Involvement**
0	None	The issue is present, but the project will have no impact on the issue; project has no adverse effect on ETAT resources; permit issuance or consultation involves routine interaction with the agency.	No community opposition to the planned project. No adverse effect on the community.
1	Enhanced	Project has positive effect on the ETAT resource or can reverse a previous adverse effect leading to environmental improvement.	Affected community supports the proposed project. Project has positive effect.
2	Minimal to None	Project has little adverse effect on ETAT resources. Permit issuance or consultation involves routine interaction with the agency. Low cost options are available to address concerns.	Minimum community opposition to the planned project. Minimum adverse effect on the community.
3	Moderate	Agency resources are affected by the proposed project, but avoidance and minimization options are available and can be addressed during development with a moderated amount of agency involvement and moderate cost impact.	Project has adverse effect on elements of the affected community. Public Involvement is needed to seek alternatives more acceptable to the community. Moderate community interaction will be required during project development.
4	Substantial	The project has substantial adverse effects but ETAT understands the project need and will be able to seek avoidance and minimization or mitigation options during project development. Substantial interaction will be required during project development and permitting.	Project has substantial adverse effects on the community and faces substantial community opposition. Intensive community interaction with focused Public Involvement will be required during project development to address community concerns.
5	Dispute Resolution	Project does not conform to agency statutory requirements and will not be permitted. Dispute resolution is required before the project proceeds to programming	Community strongly opposes the project. Project is not in conformity with local comprehensive plan and has severe negative impact on the affected community.
	No ETAT Consensus	ETAT members from different agencies assigned a different degree of effect to this project, and the ETDM coordinator has not assigned a summary degree of effect.	
	No ETAT Reviews	No ETAT members have reviewed the corresponding issue for this project, and the ETDM coordinator has not assigned a summary degree of effect.	

Supporting Documents

Date	Type	Size	Link	Name / Description
4/13/2010	Form SF-424: Application for Federal Assistance	343 KB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=9972	Application for Federal Assistance: Application for Federal Assistance
4/08/2010	Photo	1.41 MB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=9969	SR46 Lake Jesup Bridge: New Bridge SR46 @ Lake Jesup
2/28/2005	Photo	998 KB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=142	Aerial of project : Aerial of project
2/28/2005	Ancillary Project Documentation	295 KB	http://etdmpub.fla-etat.org/est/servlet/blobViewer?blobID=153	Ancillary Project Documentation for ETDM Project #4972

Appendix C

Typical Section Matrix/Initial Typical Sections

Description	Segment 1A - From STA 18+56.72 (East of SR 415) to STA 58+91.69					
	Rural Typical Section			Suburban Typical Section		
	Widen North	**Centered**	**Widen South**	**Widen North**	**Centered**	**Widen South**
Right-of-Way Required						
From North side	78'	46'	14'	48'	24'	0'
From South side	14'	46'	78'	0'	24'	48'
Acres	9.92	9.89	7.15	5.1	4.84	5.16
Parcels	15	15	15	4	15	11
Relocations/Business Impacts	0	3	3	0	3	3
Utility Relocation - Electric						
North side	yes	yes	no	yes	yes	no
South side	no	no	no	no	no	no
Wetland Impacts	8.55 acres	4.85 acres	1.42 acres	5.1 acres	2.27 acres	0.0 acres
Floodplain impacts	9.92 acres	9.89 acres	7.15 acres	5.1 acres	4.84 acres	5.16 acres
Use existing pavement	yes	no	yes	yes	no	yes
Per mile cost (in millions)						
Reconstruct both lanes	$3.42	$3.42	$3.42	$5.38	$5.38	$5.38
Mill & Resurface old lanes	$2.78	N/A	$2.78	$5.10	N/A	$5.10
Other Items	Existing pavement does not meet base clearance		Existing pavement does not meet base clearance			
	Cost estimate includes raising the profile 1.5' to compensate for inadequate existing base clearance	Cost estimate includes raising the profile 1.5' to compensate for inadequate existing base clearance	Cost estimate includes raising the profile 1.5' to compensate for inadequate existing base clearance	May not meet community expectations	May not meet community expectations	May not meet community expectations
		Impacts North Lake Jesup Conservation Area	Impacts North Lake Jesup Conservation Area		Impacts North Lake Jesup Conservation Area	Impacts North Lake Jesup Conservation Area

Advantages			Advantages		
• May be able to use existing pavement • Does not impact conservation areas		• Least right-of-way acreage • May be able to use existing pavement • Lowest wetland impacts • Least number of parcels impacted for rural section • Lowest Floodplain impacts • No relocation of existing utility poles on north side of SR 46	• Requires R/W from only 1 side • May be able to use existing pavement • Does not impact conservation areas • No relocations	• Least right-of-way acreage • Least floodplain impacts	• Requires R/W from only 1 side • May be able to use existing pavement • Least wetland impacts • No relocation of existing utility poles on north side of SR 46
• Provides 60 mph design speed	• Provides 60 mph design speed				
Limitations			**Limitations**		
• Requires raising the grade for base clearance • Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on north side of SR 46 • Highest Wetland and Floodplain impacts	• Requires raising the grade for base clearance • Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on north side of SR 46 • Does not use existing pavement	• Requires raising the grade for base clearance • Requires R/W from both sides of SR 46	• May require raising the grade for base clearance • Requires relocation of existing utility poles on north side of SR 46	• May require raising the grade for base clearance • Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on north side of SR 46	• May require raising the grade for base clearance
• Highest right-of-way acreage required	• Impacts North Lake Jesup Conservation Area	• Impacts North Lake Jesup Conservation Area	• May not meet community expectations for rural roadway	• Impacts North Lake Jesup Conservation Area • May not meet community expectations for rural roadway	• Impacts North Lake Jesup Conservation Area • May not meet community expectations for rural roadway

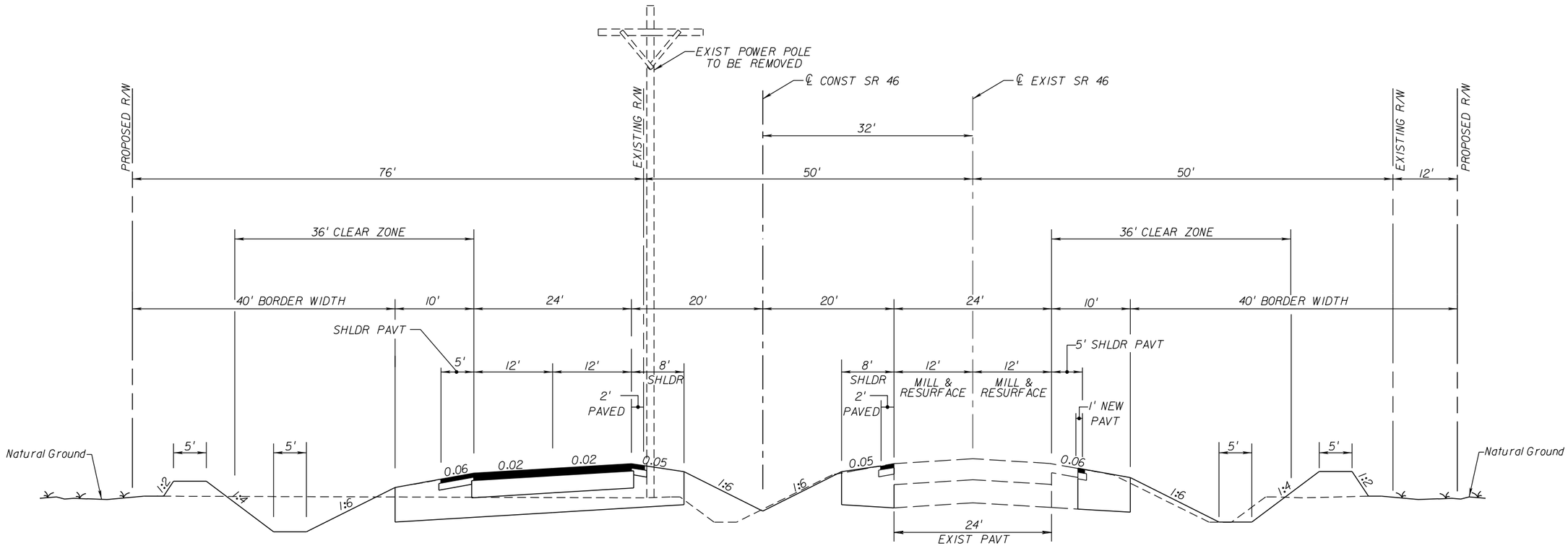
Description	Segment 1B - From STA 58+91.69 to STA 83+44.20					
	Rural Typical Section			Suburban Typical Section		
	Widen North	Centered	Widen South	Widen North	Centered	Widen South
Right-of-Way Required						
From North side	51'	19'	0'	21'	0'	0'
From South side	14'	46'	78'	0'	24'	48'
Acres	3.72	4.32	8.00	1.22	1.43	3.34
Parcels	2	2	2	1	2	1
Relocations/Business Impacts	0	0	0	0	0	0
Utility Relocation - Electric						
North side	yes	yes	no	yes	yes	no
South side	no	no	no	no	no	no
Wetland Impacts	2.99 acres	1.1 acres	0.0 acres	1.22 acres	0.0 acres	0.0 acres
Floodplain impacts	3.72 acres	4.32 acres	8.00 acres	1.22 acres	1.43 acres	3.34 acres
Use existing pavement	yes	no	yes	yes	no	yes
Per mile cost (in millions)						
Reconstruct both lanes	$3.42	$3.42	$3.42	$5.38	$5.38	$5.38
Mill & Resurface old lanes	$2.78	N/A	$2.78	$5.10	N/A	$5.10
Other Items	Existing pavement does not meet base clearance		Existing pavement does not meet base clearance			
	Cost estimate includes raising the profile 1.5' to compensate for inadequate existing base clearance	Cost estimate includes raising the profile 1.5' to compensate for inadequate existing base clearance	Cost estimate includes raising the profile 1.5' to compensate for inadequate existing base clearance	May not meet community expectations	May not meet community expectations	May not meet community expectations
		Impacts North Lake Jesup Conservation Area	Impacts North Lake Jesup Conservation Area		Impacts North Lake Jesup Conservation Area	Impacts North Lake Jesup Conservation Area

Advantages			Advantages		
• Least right-of-way acreage			• Requires R/W from only 1 side		• Requires R/W from only 1 side
• May be able to use existing pavement		• May be able to use existing pavement	• May be able to use existing pavement		• May be able to use existing pavement
• Does not impact conservation areas		• Lowest wetland impacts	• Does not impact conservation areas	• Least wetland impacts	• Least wetland impacts
			• No relocations		
• Lowest floodplain impacts			• Least floodplain impacts		
		• No relocation of existing utility poles on north side of SR 46	• Least right-of-way acreage		• No relocation of existing utility poles on north side of SR 46
• Provides 60 mph design speed	• Provides 60 mph design speed	• Provides 60 mph design speed			
Limitations			**Limitations**		
• Requires raising the grade for base clearance	• Requires raising the grade for base clearance	• Requires raising the grade for base clearance	• May require raising the grade for base clearance	• May require raising the grade for base clearance	• May require raising the grade for base clearance
• Requires R/W from both sides of SR 46	• Requires R/W from both sides of SR 46	• Highest right-of-way acreage required		• Requires R/W from both sides of SR 46	
• Requires relocation of existing utility poles on north side of SR 46	• Requires relocation of existing utility poles on north side of SR 46		• Requires relocation of existing utility poles on north side of SR 46	• Requires relocation of existing utility poles on north side of SR 46	
• Highest Wetland impacts	• Does not use existing pavement	• Highest Floodplain impacts			
	• Impacts North Lake Jesup Conservation Area	• Impacts North Lake Jesup Conservation Area		• Impacts North Lake Jesup Conservation Area	• Impacts North Lake Jesup Conservation Area
			• May not meet community expectations for rural roadway	• May not meet community expectations for rural roadway	• May not meet community expectations for rural roadway

Description	Segment 2 - From STA 158+15.32 (East of St. Johns River Bridge) to STA 339+00 (Cochran Road)					
	Rural Typical Section			Suburban Typical Section		
	Widen North	Centered	Widen South	Widen North	Centered	Widen South
Right-of-Way Required						
From North side	78'	46'	14'	48'	24'	0'
From South side	14'	46'	78'	0'	24'	48'
Acres	39.56	40.47	40.49	22.17	20.33	19.45
Parcels	59	64	62	38	64	27
Relocations/Business Impacts	3	3	3	2	3	1
Utility Relocation - Electric						
North side	yes	yes	no	yes	yes	no
South side	no	no	no	no	no	no
Wetland Impacts	8.5 acres	8.7 acres	8.6 acres	5.2 acres	4.6 acres	3.7 acres
Floodplain impacts	28.4 acres	30.8 acres	32.9 acres	24.7 acres	25.7 acres	25.5 acres
Use existing pavement	yes	no	yes	yes	no	yes
Per mile cost (in millions)						
Reconstruct both lanes	N/A	$3.12	N/A	N/A	$5.08	N/A
Mill & Resurface old lanes	$2.63	N/A	$2.63	$4.84	N/A	$4.84
Other Items		Impacts Lake Jesup Groves Reclaimed Water Facility	Impacts Lake Jesup Groves Reclaimed Water Facility		Impacts Lake Jesup Groves Reclaimed Water Facility	Impacts Lake Jesup Groves Reclaimed Water facility
			Least number of relocations	May not meet community expectations	May not meet community expectations	May not meet community expectations
		Impacts the East Lake Jesup Conservation Area	Impacts East Lake Jesup Conservation Area		Impacts East Lake Jesup Conservation Area	Impacts East Lake Jesup Conservation Area

Advantages			Advantages		
• Least right-of-way acreage for rural section			• Requires R/W from only 1 side		• Requires R/W from only 1 side
• Uses existing pavement		• Uses existing pavement	• Uses existing pavement		• Uses existing pavement
• Least wetland impacts for rural section			• Does not impact conservation areas		• Least wetland impacts
• Lowest wetland impacts					• Least number of relocations
• Lowest floodplain impacts			• Least floodplain impacts		• Requires least R/W acreage
		• No relocation of existing utility poles on north side of SR 46			• No relocation of existing utility poles on north side of SR 46
Limitations			**Limitations**		
• Requires relocation of existing utility poles on north side of SR 46	• Does not use existing pavement • Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on north side of SR 46	• Highest right-of-way acreage required	• Requires relocation of existing utility poles on north side of SR 46	• Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on north side of SR 46	
	• Highest Wetland impacts	• Highest Floodplain impacts			
	• Impacts East Lake Jesup Conservation Area	• Impacts East Lake Jesup Conservation Area		• Impacts East Lake Jesup Conservation Area	• Impacts East Lake Jesup Conservation Area
			• May not meet community expectations for rural roadway	• May not meet community expectations for rural roadway	• May not meet community expectations for rural roadway
	• Impacts Lake Jesup Groves Reclaimed Water Facility	• Impacts Lake Jesup Groves Reclaimed Water Facility		• Impacts Lake Jesup Groves Reclaimed Water Facility	• Impacts Lake Jesup Groves Reclaimed Water Facility

Description	Segment 3 - From STA 339+00 (Cochran Road) to STA 389+43.29 (CR 426)						
	Rural Typical Section			Suburban Typical Section			Urban Typical Section
	Widen North	Centered	Widen South	Widen North	Centered	Widen South	19.5' median
Right-of-Way Required							
From North side	78'	46'	14'	48'	24'	0'	0'
From South side	14'	46'	78'	0'	24'	48'	0'
Acres	10.39	10.49	10.81	5.25	5.32	5.12	0
Parcels	34	33	33	14	33	19	0
Relocations/Business Impacts	2 Residences 1 Billboard 1 Business Impacts parking for 4 businesses and a church	1 Residence 1 Billboard 2 Businesses Impacts parking for 3 businesses and 1 church	2 Residences 1 Business Impacts parking for 4 businesses and 1 church	1 Business Relcoation/ 1 Billboard/ 3 Residential Parcels	1 Business Relocation/ 1 Residential Parcel/ Parking Impacts to 4 Businesses & 1 Church	1 Business Relocation/1 Residence Relocation/ 1 Business /Parking Impact to 1 Church & 3 Businesses	0
Utility Relocation - Electric							
North side	no	no	no	no	no	no	no
South side	no	yes	yes	no	yes	yes	no
Wetland Impacts	0	0	0	0	0	0	0
Floodplain impacts	0	0	0	0	0	0	0
Use existing pavement	yes	no	yes	yes	no	yes	no
Per mile cost (in millions)							
Reconstruct both lanes	N/A	$3.12	N/A	N/A	$5.08	N/A	$4.71
Mill & Resurface old lanes	$2.63	N/A	$2.63	$4.84	N/A	$4.84	N/A
Other Items				May not meet community expectations	May not meet community expectations	May not meet community expectations	May not meet community expectations
	Advantages			**Advantages**			**Advantages**
	• Uses existing pavement • No relocation of existing utility poles on south side of SR 46		• Uses existing pavement	• Requires R/W from only 1 side • Uses existing pavement • Requires no utility relocations		• Requires R/W from only 1 side • Uses existing pavement • Least number of parcels impacted for suburban section	• No R/W required for roadway • Uses existing pavement • No relocations
	Limitations			**Limitations**			**Limitations**
	• Requires R/W from both sides of SR 46 • Requires relocations	• Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on south side of SR 46 • Requires relocations	• Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on south side of SR 46 • Requires relocations	• Requires relocations • May not meet community expectations for rural roadway	• Requires R/W from both sides of SR 46 • Requires relocation of existing utility poles on south side of SR 46 • Requires relocations • Does not use existing pavement • May not meet community expectations for rural roadway	• Requires relocation of existing utility poles on south side of SR 46 • Requires relocations • May not meet community expectations for rural roadway	• May not meet community expectations for rural roadway



60 MPH

- FROM STA 18+56.72 (EAST OF SR 415) TO STA 58+91.69
- FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE) TO STA 339+00 (COCHRAN ROAD)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

URS

URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

SHEET NO.

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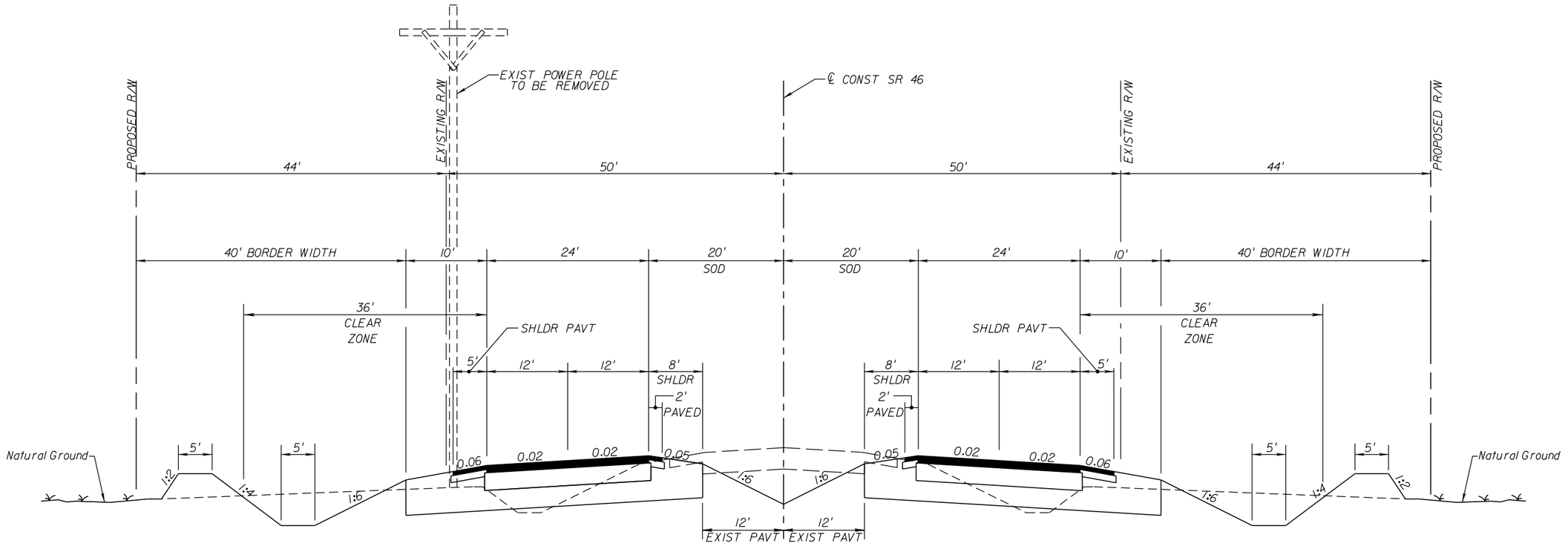

60 MPH

- FROM STA 18+56.72 (EAST OF SR 415) TO STA 58+91.69
- FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE) TO STA 339+00 (COCHRAN ROAD)

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SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION CENTERED ON EXISTING CENTERLINE

SHEET NO.

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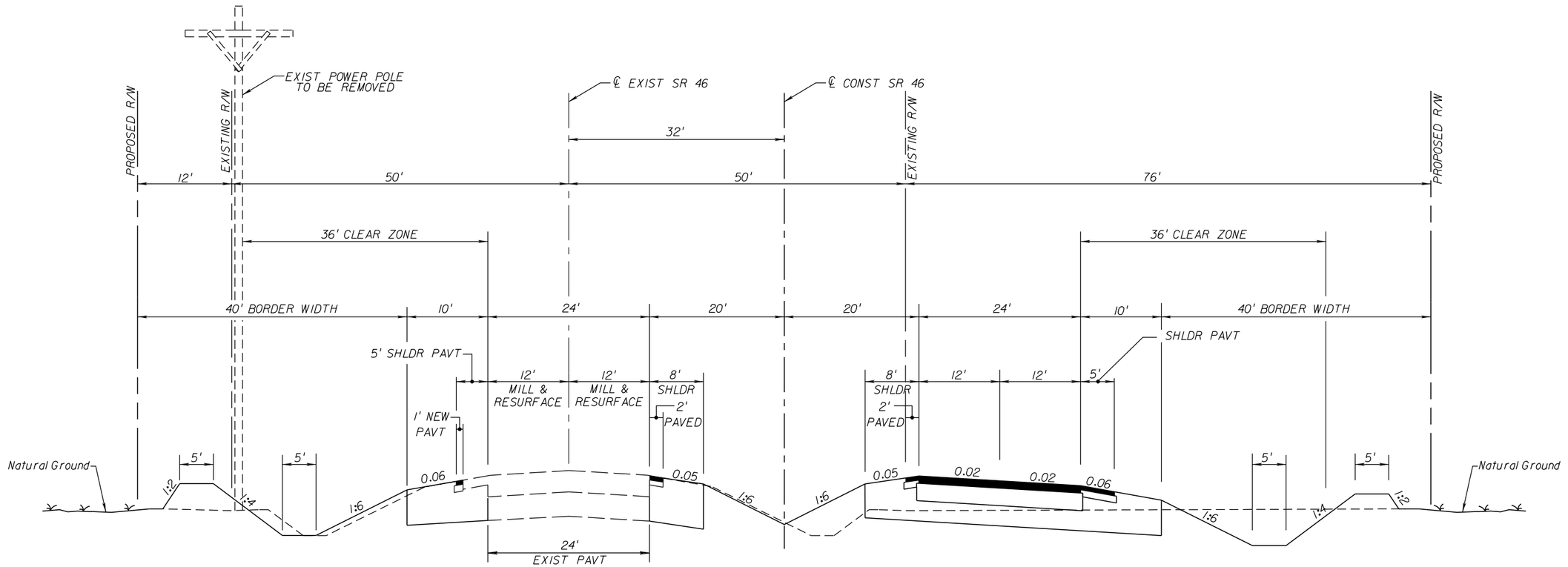

60 MPH

- FROM STA 18+56.72 (EAST OF SR 415) TO STA 58+91.69
- FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE) TO STA 339+00 (COCHRAN ROAD)

REVISIONS			
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FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO.

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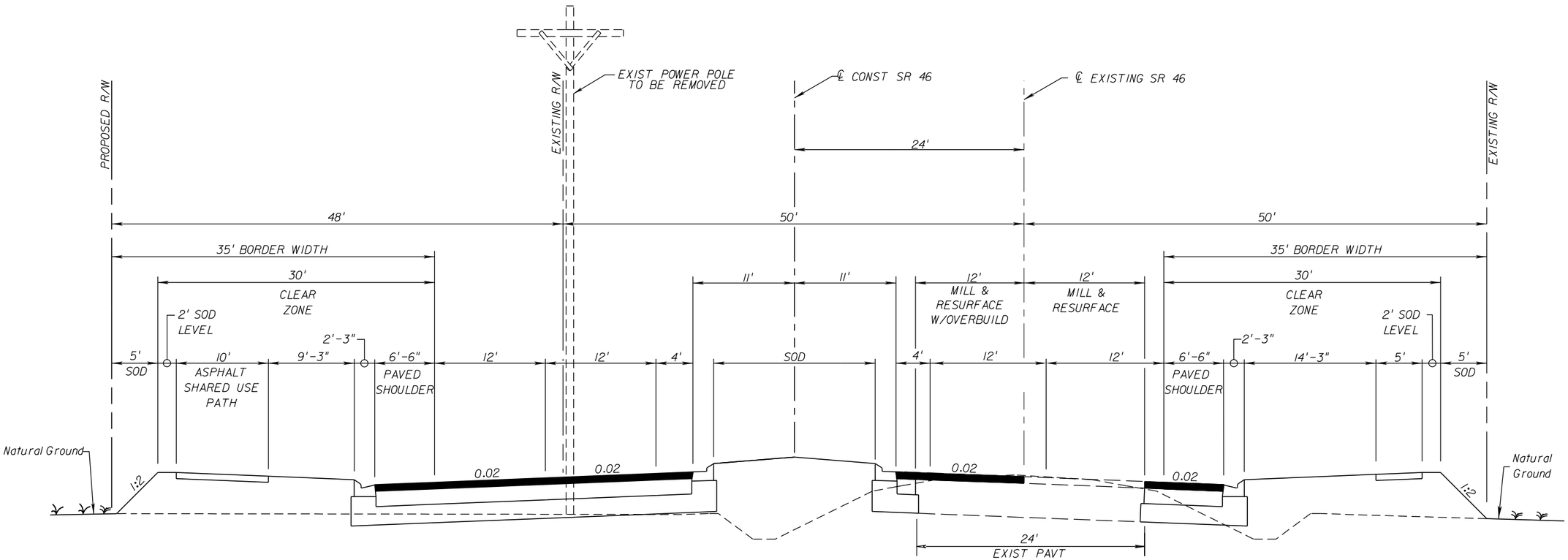

55 MPH

- FROM STA 18+56.72 (EAST OF SR 415) TO STA 58+91.69
- FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE) TO STA 339+00 (COCHRAN ROAD)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

SHEET NO.

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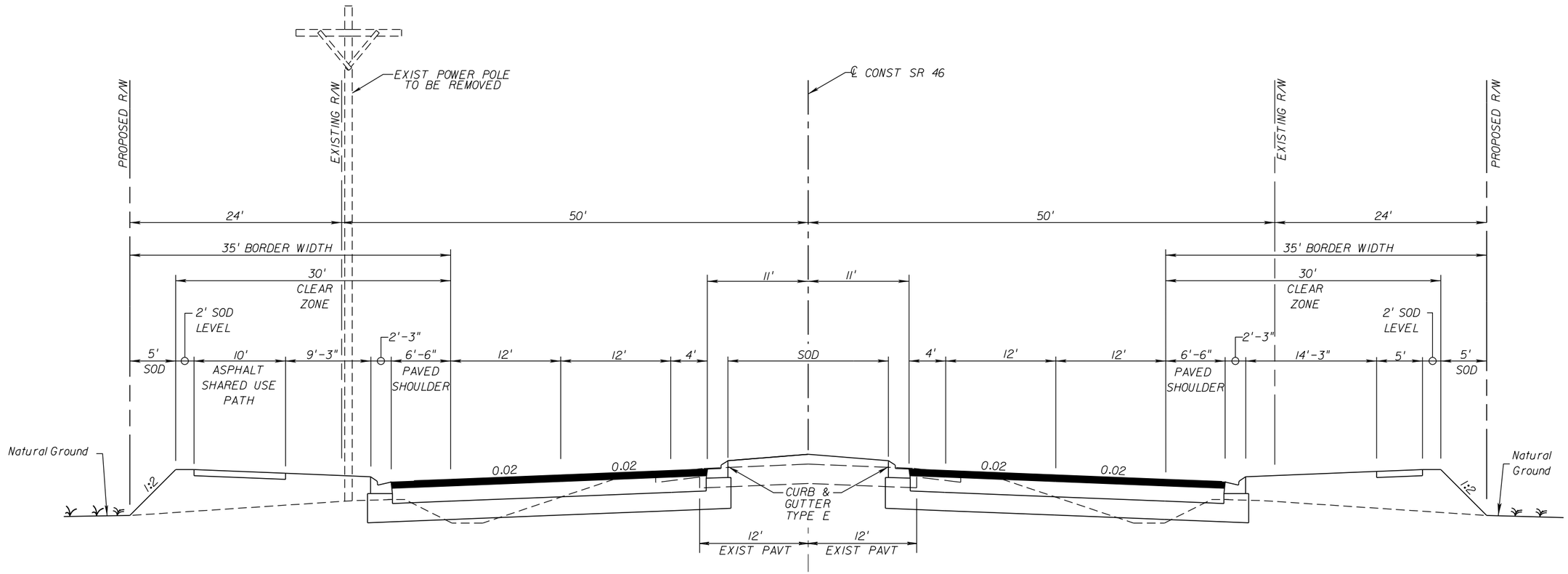


55 MPH

- FROM STA 18+56.72 (EAST OF SR 415) TO STA 58+91.69
- FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE) TO STA 339+00 (COCHRAN ROAD)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

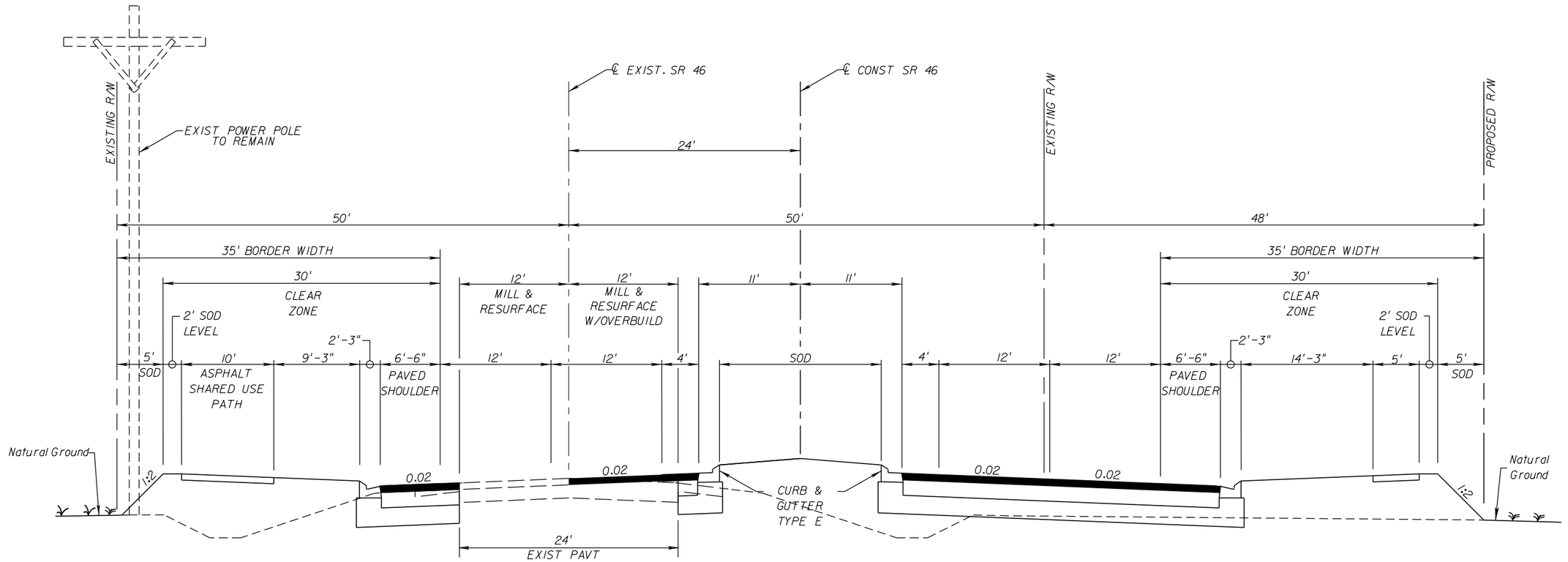
URS
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION CENTERED ON EXISTING CENTERLINE

SHEET NO.



55 MPH

- FROM STA 18+56.72 (EAST OF SR 415) TO STA 58+91.69
- FROM STA 158+15.32 (EAST OF ST. JOHNS RIVER BRIDGE) TO STA 339+00 (COCHRAN ROAD)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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SEMINOLE COUNTY FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO.

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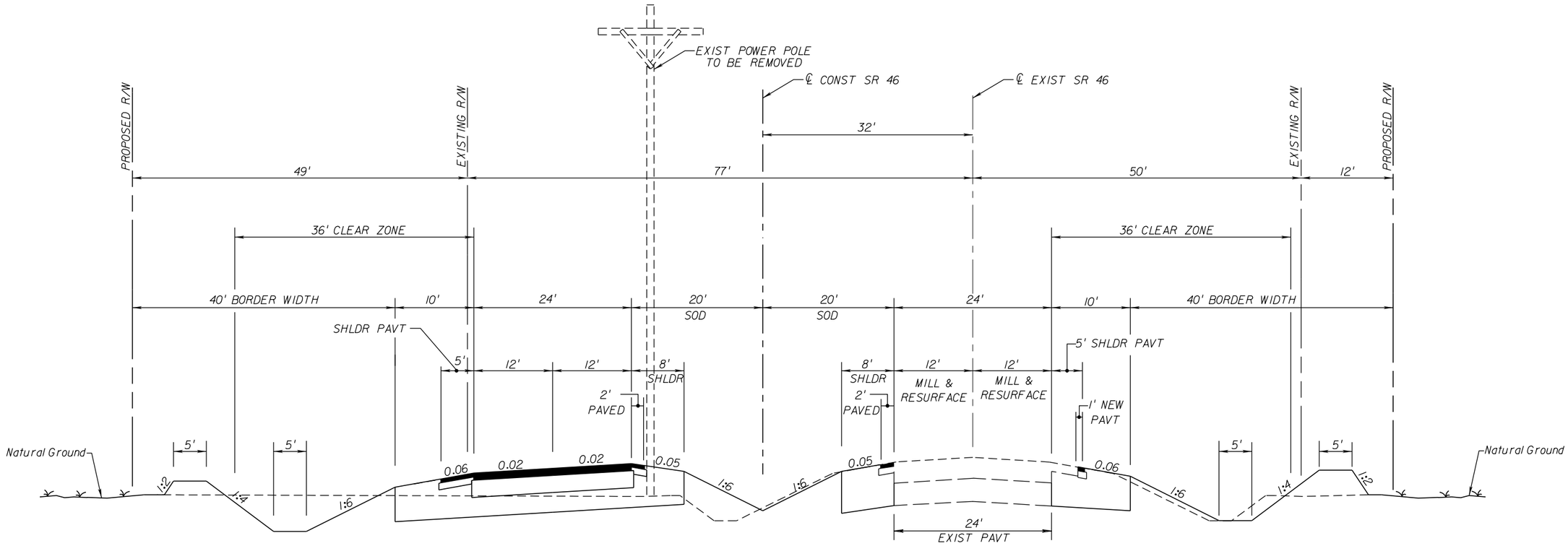


60 MPH
FROM STA 58+91.69 TO STA 83+44.20
(WEST OF ST. JOHNS RIVER BRIDGE)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

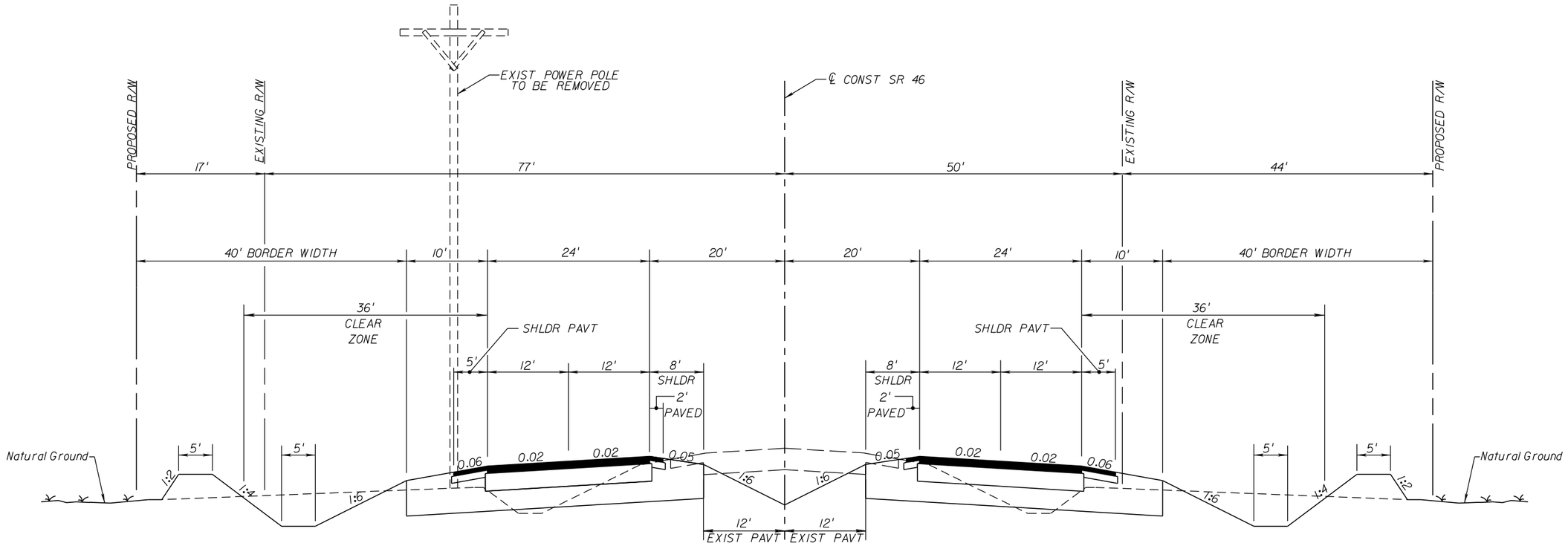
URS
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION
USE EXISTING
FOR EASTBOUND LANES

SHEET NO.



60 MPH

FROM STA 58+91.69 TO STA 83+44.20

(WEST OF ST. JOHNS RIVER BRIDGE)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

URS

URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION CENTERED ON EXISTING CENTERLINE

SHEET NO.

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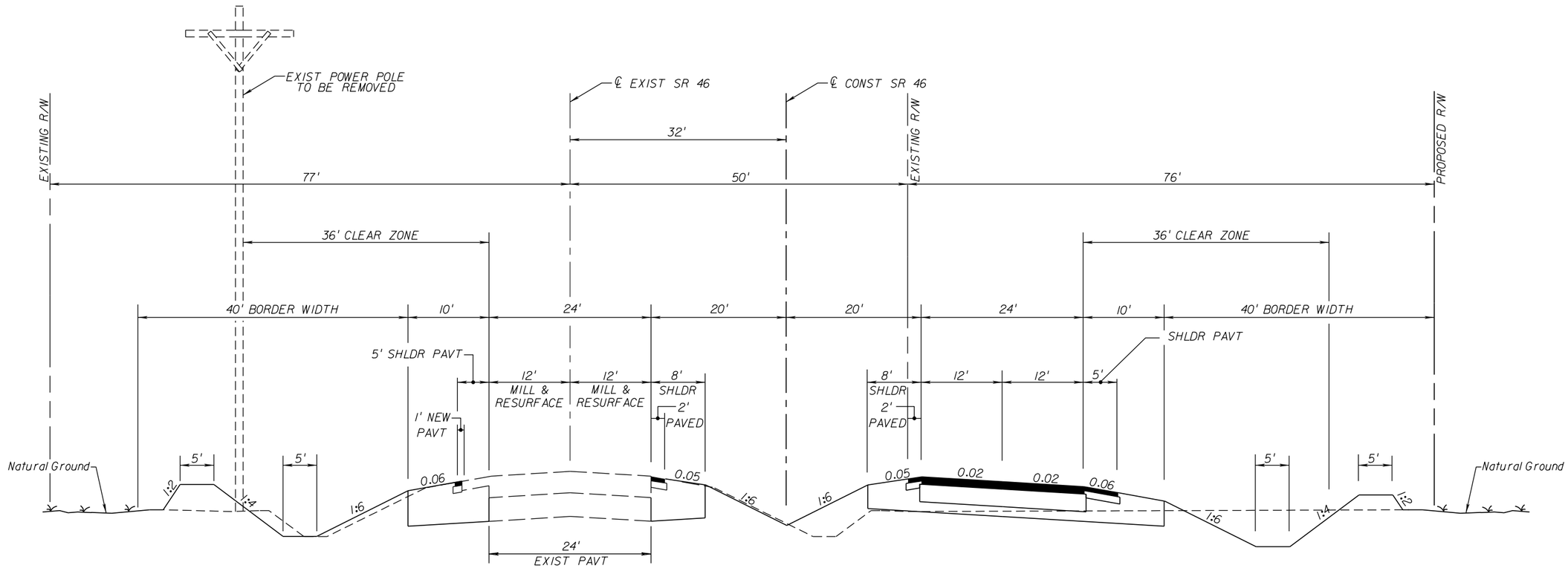

60 MPH

FROM STA 58+91.69 TO STA 83+44.20

(WEST OF ST. JOHNS RIVER BRIDGE)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

URS

URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL COAST

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

SHEET NO.

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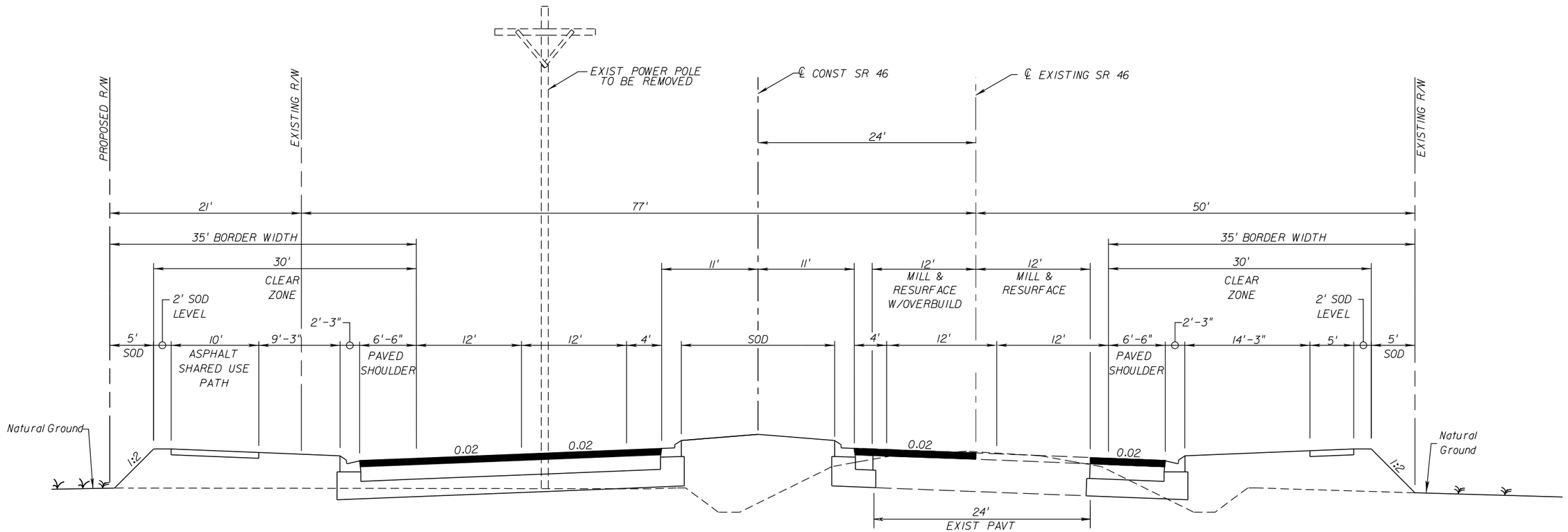

55 MPH
FROM STA 58+91.69 TO STA 83+44.20
(WEST OF ST. JOHNS RIVER BRIDGE)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

URS
URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

SHEET NO.

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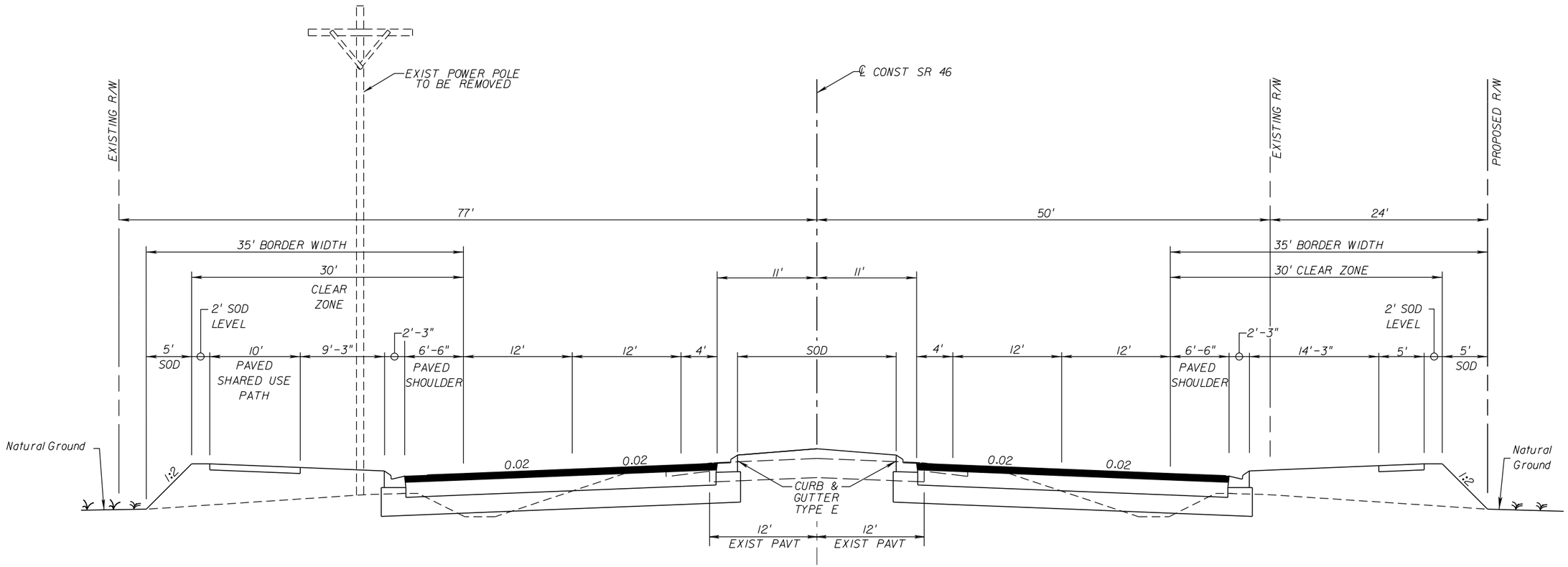

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SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION CENTERED ON EXISTING CENTERLINE

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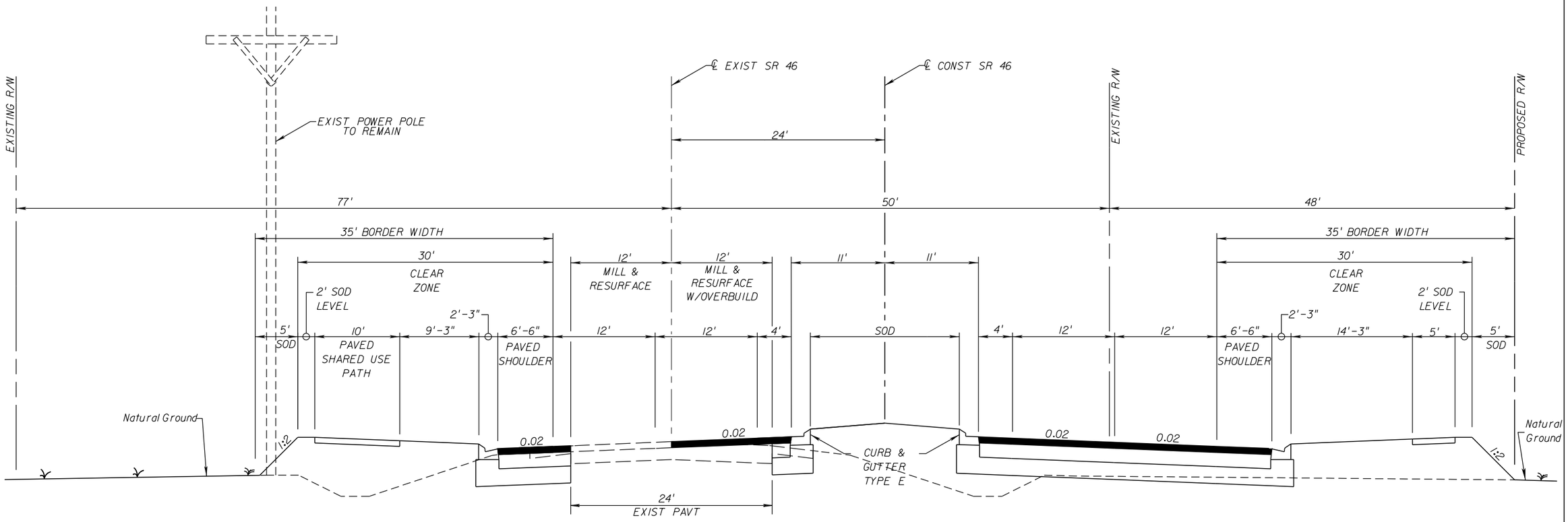

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ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
Florida's Natural Choice

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

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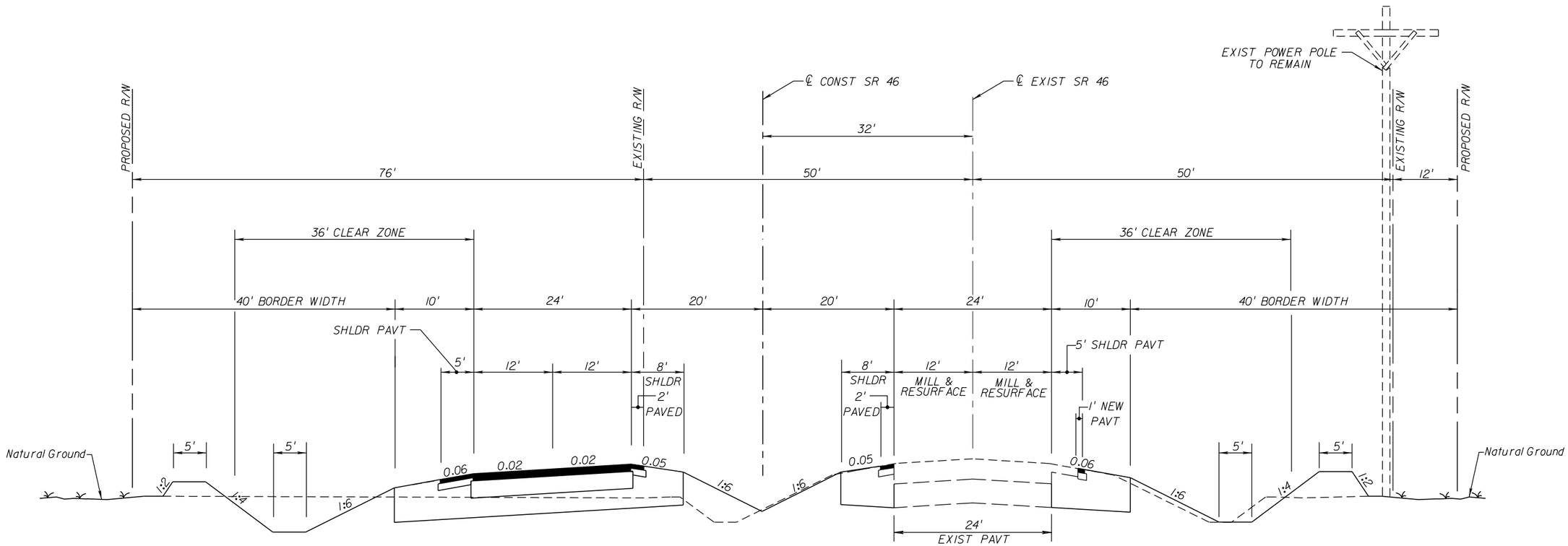

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TO STA 389+43.29 (CR 426)

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315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

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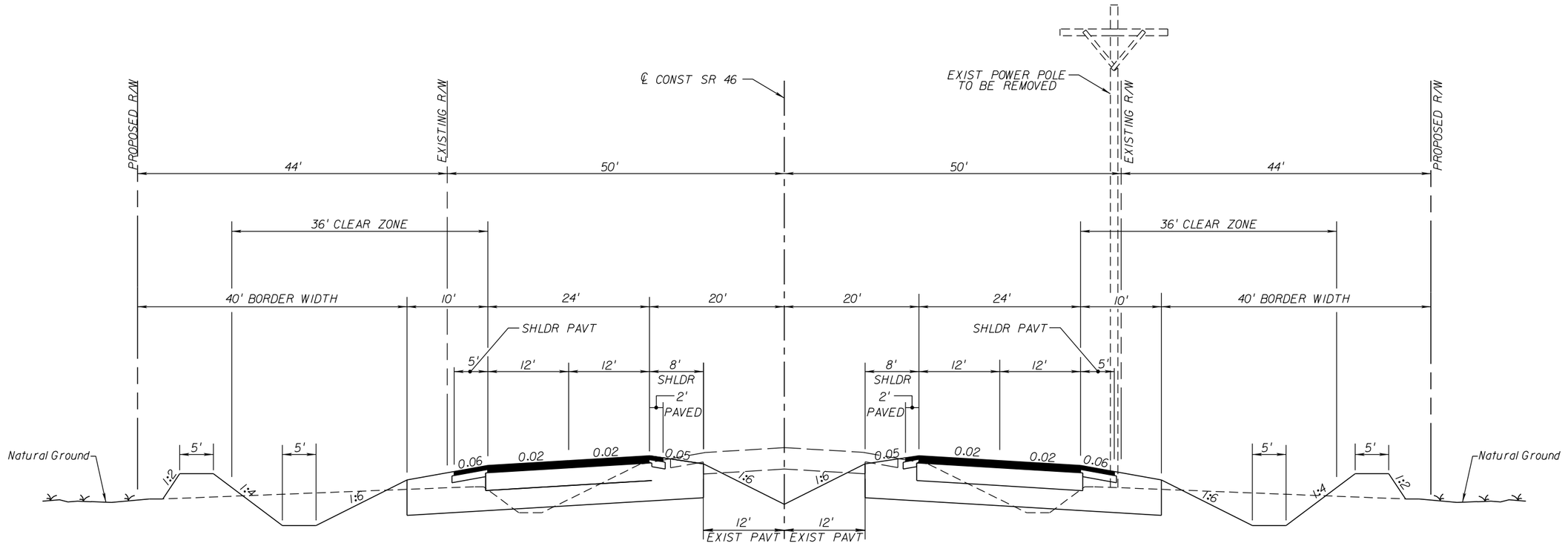

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TO STA 389+43.29 (CR 426)

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315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION CENTERED ON EXISTING CENTERLINE

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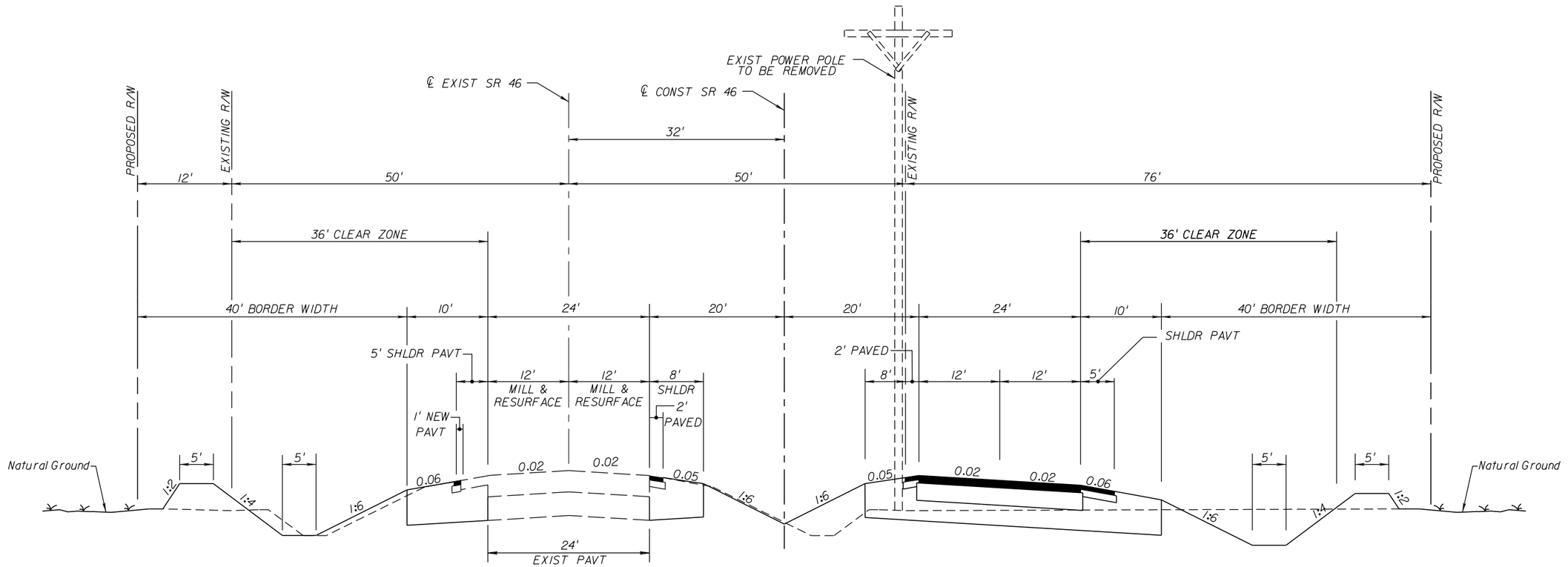

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TO STA 389+43.29 (CR 426)

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315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
Florida's Natural Coast

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

RURAL TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

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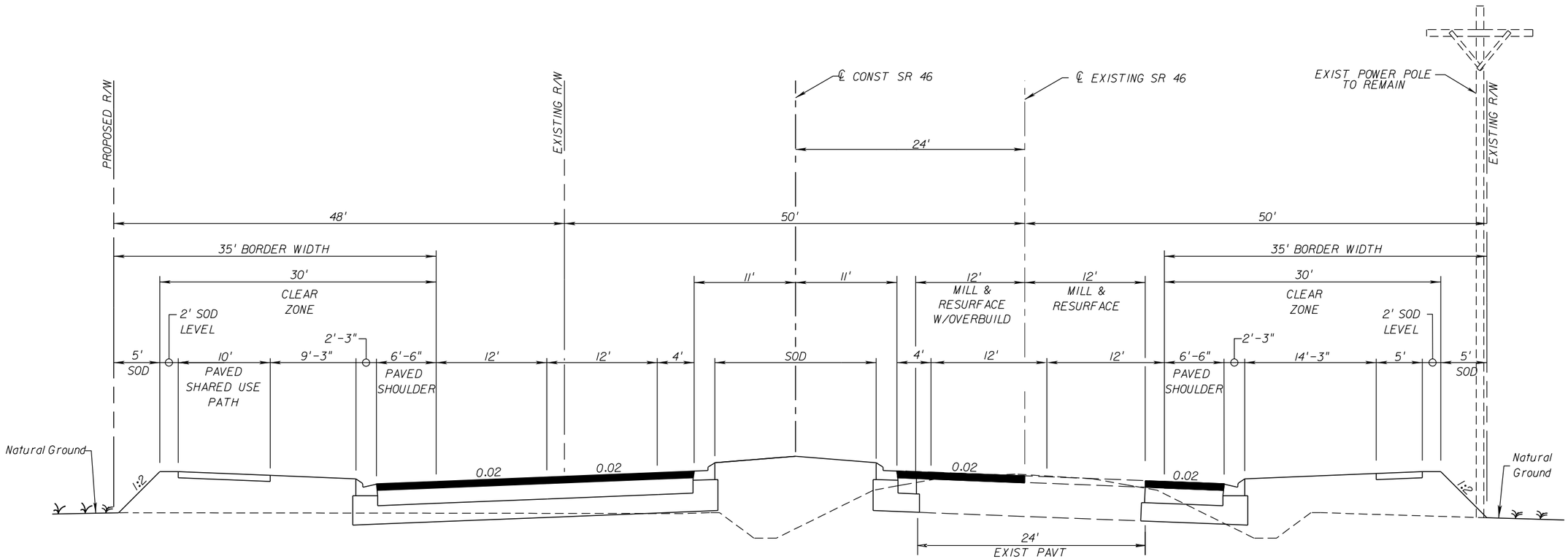

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TO STA 389+43.29 (CR 426)

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315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR EASTBOUND LANES

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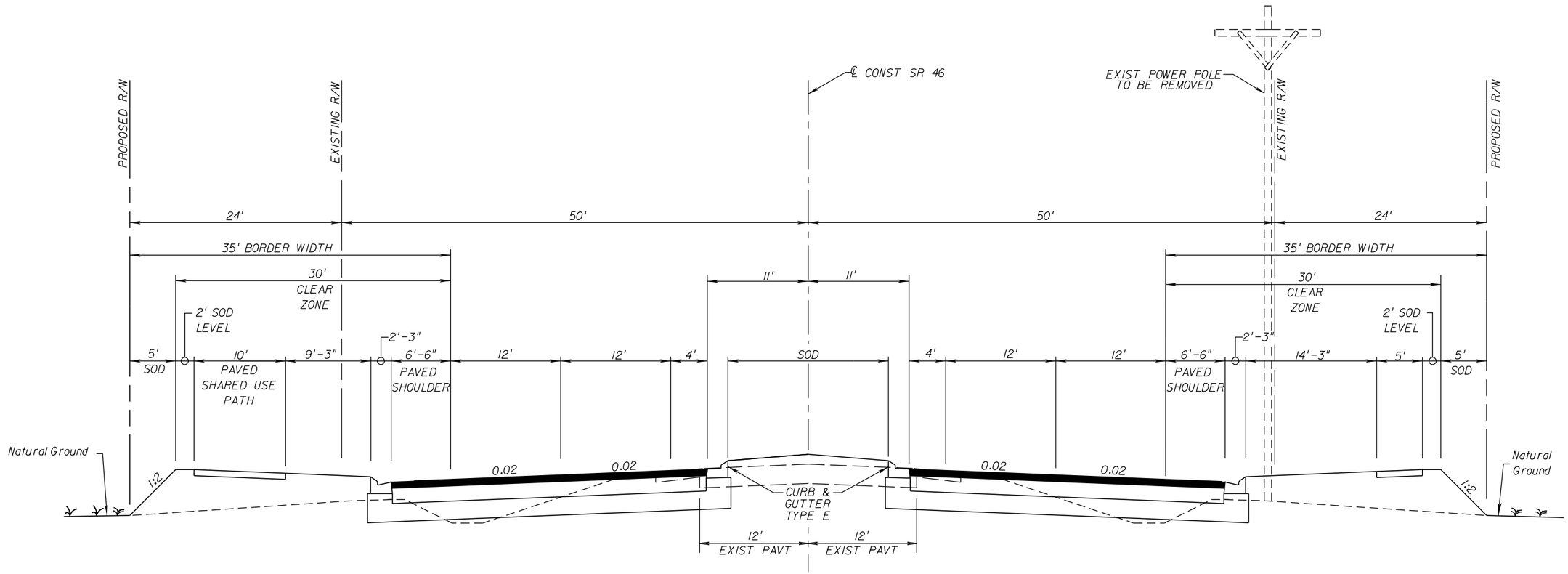

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TO STA 389+43.29 (CR 426)

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URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION CENTERED ON EXISTING CENTERLINE

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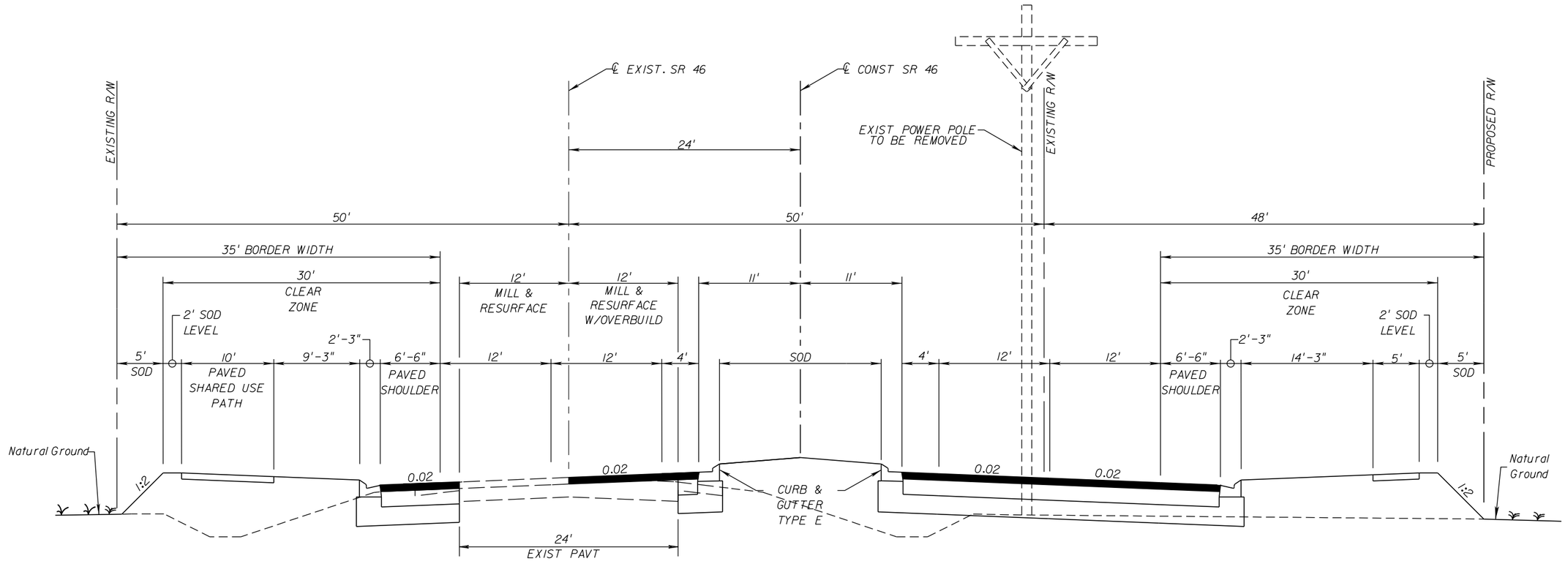

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TO STA 389+43.29 (CR 426)

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URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

SUBURBAN TYPICAL SECTION USE EXISTING FOR WESTBOUND LANES

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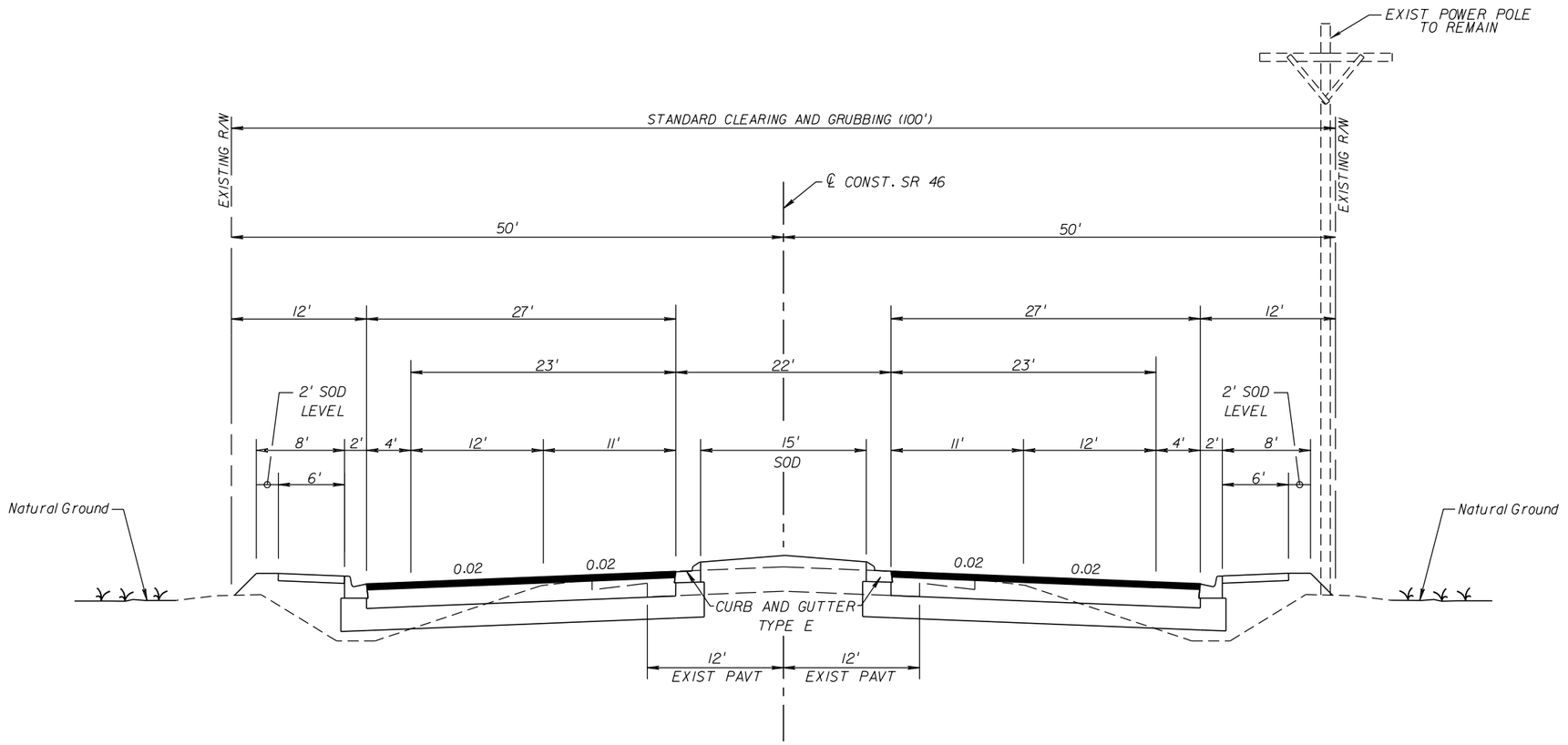

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URS CORPORATION
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
CERTIFICATE OF AUTHORIZATION NO. 000002

SEMINOLE COUNTY
FLORIDA'S NATURAL CHOICE

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 46	SEMINOLE	240216-4-28-01

URBAN TYPICAL SECTION
REDUCED MEDIAN

SHEET NO.

Appendix D

Concurrence Letters

RECEIVED
APR 2 8 2014

FDOT

Florida Department of Transportation

RICK SCOTT
GOVERNOR

719 S. Woodland Blvd.
DeLand, FL 32720

ANANTH PRASAD, P.E.
SECRETARY

April 9, 2014

RECEIVED
BUREAU OF
HISTORIC PRESERVATION
2014 APR 16 P 4:28

Mr. James Christian, Division Administrator
U.S. Department of Transportation
Federal Highway Administration
Florida Division Office
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Attention: Mr. Joseph Sullivan

Re: Cultural Resource Assessment Survey for State Road (SR) 46 from SR 415 to County Road (CR) 426 PD&E Study (Financial ID # 240216-4-28-01), Seminole County, Florida

Dear Mr. Christian:

The above-referenced report was transmitted to FHWA in a letter dated March 3, 2014, and was approved by FHWA on March 25, 2014. This letter was revised on April 9, 2014 to also request concurrence on the effects finding.

This cultural resource assessment survey (CRAS) for SR 46 from SR 415 to CR 426 PD&E Study (Financial ID # 240216-4-28-01), Seminole County, Florida was conducted in cooperation with URS at the request of Seminole County Engineering by Janus Research in May-August 2012. The objective of this CRAS was to identify and assess any cultural resources occurring within the Area of Potential Effect (APE) in terms of their eligibility for listing in the *National Register of Historic Places* (National Register) according to the criteria set forth in 36 CRP Section 60.4.

One newly recorded archaeological site (8SE2757), two previously recorded archaeological sites (8SE1145 and 8SE1788), and two archaeological occurrences were identified within the current archaeological APE. Site 8SE1788, a small lithic scatter, had previously been evaluated by the State Historic Preservation Officer (SHPO) to be ineligible for listing in the National Register and no change in status is recommended. Site SE1145 is an artifact scatter located to the south of the project APE. One positive test extends the boundary of the site into the project APE. However, the artifacts recovered were sparse and non-diagnostic. Site SE2757 consists of several sherds of St. Johns Plain pottery but no other artifacts. The portions of 8SE1145 and 8SE2757 within the project APE are not considered significant and are not eligible for listing in the National Register.

This survey identified a total of 13 historic resources located within the project APE. The identified historic resources include 12 buildings (8SE2190, 8SE2759-8SE2769) and one road (8SE1953). The 11 newly recorded historic buildings (8SE2759-8SE2769) are considered ineligible for inclusion in the National Register individually or as part of a historic district. The structures have common architectural styles, many exhibit non-historic exterior alterations, and they lack of historical associations with significant events or persons. The previously recorded historic building (8SE2190) was previously determined ineligible for listing in the National Register in 2006; no change of status is recommended. SR 46 (8SE1953) within the current project APE is considered ineligible for listing in the National Register individually or as part of a historic district. It has undergone several non-historic improvements to meet modern transportation needs and does not retain any trace of historic materials, configuration, or character.

Please find within this package the following items:

- one bound copy of the CRAS report for your files;
- one unbound copy of the CRAS report with an unbound set of Florida Master Site File (FMSF) forms and survey log for submittal to the State Historic Preservation Office (SHPO);
- CD with photographs of the resources, a PDF of the final report, FMSF forms, and Survey Log for submittal to the SHPO

This information is being provided in accordance with the provisions of the *National Historic Preservation Act of 1966*, as amended, which are implemented by the procedures contained in 36 C.F.R., Part 800, as amended, as well as the provisions contained in the revised F.S. Chapter 267.

Based on the results of this investigation, it is the opinion of the District that the proposed undertaking will have no effect on NRHP-listed or eligible historic resources, and no further work is necessary.

We respectfully request your concurrence with these findings. At the bottom of this cover letter, a signature box has been included for convenience following review and concurrence with the findings of this document.

If you have any questions or need further assistance, please contact Catherine Owen at (386) 943-5383 or me at (386) 943-5411.

Sincerely,

FOR William G. Walsh
FDOT District 5 Environmental Administrator

The FHWA finds the attached Cultural Resource Assessment Survey complete and sufficient and Δ approves / ___ does not approve the above recommendations and findings.

The FHWA requests the SHPO's opinion on the sufficiency of the attached report and the SHPO's opinion on the recommendations and findings contained in this cover letter and in the comment block below.

FHWA Comments:

Based on the information provided in the February 2014 CRAS FHWA agrees there should be No significant effects on cultural resources.

/s/ _____ 4-15-14
For: James Christian **Date**
Division Administrator
Florida Division
Federal Highway Administration

The Florida State Historic Preservation Officer:

✓ **finds the attached report complete and sufficient and** ✓ **concurs/ ___ does not concur with the findings and recommendations contained in this cover letter.**

___ **does not find the attached report complete and sufficient and requires additional information in order to provide an opinion on the potential effects of the proposed project on historic resources.**

/s/ _____ 4/22/14
For: Robert Bendus **Date**
Florida State Historic Preservation Officer

2014-11162
DHR Project No.

United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:
FWS Log No. 41910-2014-I-0176

May 29, 2014

Mr. William G. Walsh
Environmental Administrator
FDOT District 5
719 South Woodland Blvd
DeLand FL 32720-6800

RE: Widen SR 46 from east of SR 415 to CR 426.
Financial ID No. 240216-4-28-01
Federal Aid No. TCSP-045-U
ETDM #4972

Dear Mr. Walsh:

The United States Fish and Wildlife Service (Service) has completed its review of a proposal to widen SR 46 from SR 415 to CR 426 and construct an additional two-lane bridge over Lake Jesup in Seminole County.

Project description
SR 46 is currently a two-lane rural roadway connecting SR 415 to CR 326 in eastern Seminole County. The project length is approximately 7.4 miles. The western terminus connects to SR 415, which is under construction to a four-lane divided facility. The eastern terminus of the project occurs at CR 426 in Geneva, which provides a direct connection to the City of Oviedo. Additional stormwater ponds and access roads are also included in this proposal.

The PD&E study divided the project into 4 segments:

1. Widen SR 46 from SR 415 to west end of Lake Jesup Bridge
2. Construct additional two-lane bridge over Lake Jesup
3. Widen SR 46 from east of bridge to Hart road
4. Widen SR 46 from Hart road to CR426

Based on the information provided by FDOT in the draft WEBAR and draft ESBA (dated March 2014) regarding the presence or absence of species within the action area the Service provides the following comments and recommendations.

Endangered Species Act Coordination

Our comments are for the purpose of providing informal consultation in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661 *et seq.*), and the Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703-712 *et seq.*).

Florida Manatee (*Trichechus manatus latirostris*)
The new two-lane bridge across the St. John's River and Lake Jesup will impact manatee habitat and may affect manatees. The WEBAR concluded a 'may affect, not likely to adversely affect' (MANLAA) determination for the Florida manatee and FDOT listed several action items in the WEBAR to protect manatees for the duration of the project. Critical habitat for this species has been designated within the St. John's River. The level of manatee use in the area is considered low. The Service concurs with a determination of MANLAA if the conditions listed below are incorporated into the project.

- 2011 In-Water Construction Conditions (or current version) will be followed. In the future, current guidelines and contact numbers could be found on our office website or the Army Corps website.

- Any culverts larger than eight inches in diameter should be grated to prevent manatee entrapment. The spacing between the bridge pilings will be at least 60 inches apart to allow for manatee movement in between the pilings.

- Barges will be equipped with fender systems that provide a minimum standoff distance of four feet between wharves, bulkheads and vessels moored together to prevent crushing manatees between the barges or between the barge and work site. All existing slow speed or no wake zones will apply to all work boats and barges associated with the construction.

- No dredging is proposed at this time. If dredging is needed, consultation should be reinitiated.

- No blasting is proposed at this time. FDOT understands that blasting will result in a 'may affect' determination and FDOT would initiate formal ESA consultation.

Wood Stork (*Mycteria Americana*)
The project corridor is approximately 7.4 miles long and is right on the edge (15-16 miles) of the Core Foraging Area (CFA) of at least two active nesting colonies (#612320 and Mud Lake) of the endangered wood stork. Extensive canals, ditches and forested wetlands are within and adjacent to the ROW. Wood storks have been documented foraging in these wetlands. The Service has determined that the loss of wetlands within a CFA due to an action could result in the

loss of foraging habitat for the wood stork. To minimize adverse effects to the wood stork and other wetland dependent species, we recommend that impacts to suitable foraging habitat be avoided. The amount of direct wetland impacts for Alternative 2 is approximately 27 acres, according to the WEBAR. FDOT should utilize the Wood Stork Effect Determination Key developed with the Army COE to reach an effect determination. The amount of wetland mitigation needed and where it will be purchased should also be disclosed in order to reach a MANLAA determination. The Service recommends investigating options within the vicinity of Lake Jesup and the St. John's River to improve connectivity and water quality for this severely impaired water body or provide additional nesting habitat for wading birds and wood storks with dredge spoil if any dredging is needed. Recommendations provided by resource agencies during the ETDM screening exercise stressed spanning the floodplains and wetlands with the new bridge to reduce the footprint of this structure.

Audubon's Crested Caracara (*Polyborus plancus)*
The caracara is a resident, diurnal, non-migratory species that occurs in Florida as well as the Southwestern U.S. and Central America. Only the Florida population, which is isolated from the remainder of the species, is listed as threatened under the ESA. Suitable habitat for this species includes wet and dry prairies, improved pastures and lightly wooded areas. Cabbage palms, cypress, scrub oaks and saw palmetto may be habitat indicators as to the presence or absence of this species. According to the ESBA, two adult caracara's were observed flying south near the western terminus. The exact location and date of the observation was not included. Suitable habitat can be found within the project corridor and may be impacted by this proposal directly and indirectly. The presence of road kill, which will increase after the road is widened, can negatively affect this species and bald eagles, especially young birds, as they learn to forage near roadways. FDOT has committed in the ESBA to conducting field surveys for caracaras prior to construction. The Service recommended surveys for this species 2010 and we have a history of sightings near SR 415. Once surveys are complete, consultation can be reinitiated.

Eastern Indigo Snake (*Drymarchon corais couperi*)
Suitable habitat for this species can be found within the project corridor and this species has been documented on the Lake Jesup Conservation Tract. Wider, divided, highways are likely to increase the number of amphibian and reptile deaths as the animals attempt to cross a wider barrier with increased levels of traffic. Direct effects for this species include mortality from additional vehicle traffic and the need to cross wider roadways. Indirect effects from increased commercial and residential development in this portion of Seminole and Brevard County, as a result of the new roadway, will result in further habitat fragmentation and mortality. FDOT has agreed to utilize the new eastern indigo snake guidelines (dated August 2013) found on our office website, http://www.fws.gov/northflorida/. Generally, a complete gopher tortoise survey is needed within the ROW in order to utilize the effect determination key. The Service also recommends that plastic netting, frequently used on roadsides under grass or seed, be eliminated from the construction design. Studies have shown that plastic netting entraps many species of snakes and does not deteriorate over time. Biodegradable matting or a similar material should be used to reduce direct, indirect and cumulative effects to this federally listed species and many other common species of snakes found in this area. The Service recommends integrating wildlife-friendly components within culverts and providing additional dry culverts with natural

bottoms to allow for wildlife crossing under the roadway. All of these recommendations were included in the ETDM screening process.

Gopher Tortoise (*Gopherus polyphemus*)
Gopher tortoises are long-lived reptiles that occupy upland habitat throughout Florida including forests, pastures, and yards. They dig deep burrows for shelter and forage on low-growing plants. Gopher tortoises share these burrows with more than 350 other species, and are therefore referred to as a keystone species. In July 2011, the Service determined that listing the eastern population of the tortoise as Threatened under the Endangered Species Act is warranted. However, it is precluded from doing so at this time due to higher priority actions and a lack of sufficient funds. Therefore, the tortoise was placed on the candidate conservation list and should be listed as a candidate species in FDOT documents. Gopher tortoises are a State threatened wildlife species and are protected by state law. State permitting guidelines for avoidance, minimization and mitigation should be followed. The ESBA notes that abundant suitable habitat exists in the area for this species. Therefore, FDOT has committed to a complete survey for this species prior to construction. A complete survey will facilitate the use of the eastern indigo snake effect determination key.

Florida Scrub-Jay (*Aphelocoma coerulescens*)
At one time this species could be found throughout Seminole County in suitable habitats (scrub and scrubby pine flatwoods). Recent declines are attributable to habitat conversion and lack of management. FNAI data indicated that patches of scrub habitat can be found in the action area but they are fragmented by residential areas and some have been disturbed from sand mining. Florida scrub-jays can be found to the west at Yankee Lake wastewater treatment plant. No records of this species exist for the eastern portion of Seminole county. Therefore, the Service can concur with FDOT that this project will have 'No Effect' on the Florida scrub-jay.

Sand Skink (*Neoseps reynoldsi*)
The proposed expansion corridor does not support suitable habitat for this species. Recent aerial photos on GOOGLE Earth reveal that the elevations along this proposed expansion range from approximately 5-75 feet above sea level. The Service concurs with the 'No Effect' determination made by FDOT.

The FDOT has determined the project 'May Affect but is Not Likely to Adversely Affect' (MANLAA) the following species: Florida manatee, Audubon's crested caracara, bald eagle, wood stork, eastern indigo snake and Atlantic sturgeon. In a letter, dated April 14, 2014, FDOT requested a concurrence with a MANLAA determination for all of these species at this time. As stated earlier, the Service concurs with this determination of effect for the Florida manatee. The consultation for the Atlantic sturgeon should be coordinated with NMFS.

The Service does not have enough information to provide concurrence or non-concurrence with FDOT's determination [pursuant to Section 7 of the ESA, as described in 50 § CFR402.14]. In order to comply with Section 7 of the ESA, FDOT has committed to reinitiate consultation with the Service prior to advancing the project to construction. At the time of re-initiation, FDOT will provide additional information, as needed, which will allow the Service to complete our analysis of the project's effects on the species noted above and complete consultation on the project. The

FDOT must document this commitment in the final environmental document for the project and in documents for any subsequent re-evaluations of the project.

Bald eagles are no longer listed under the ESA. Early coordination with the FFWCC and the Office of Migratory Birds is needed for this project. Information about the new eagle guidelines can be found at (http://www.fws.gov/migratorybirds/BaldEagle.htm). Seminole County is considered a core nesting area for the State of Florida. The ESBA indicates that nest tree SE36 (active in 2012) is within 100 feet of existing ROW and will be disturbed. Also, nest tree SE51 may be within the boundary of compensation pond #1 and may be disturbed or taken. A new nest tree that has not yet been numbered or mapped by FFWCC could also be taken with the construction of compensation pond #2.

No federally listed plants are known to occur in Seminole County, Florida.

Fish and Wildlife Coordination Act

The FDOT is statutorily obligated to mitigate all wetland impacts according to the Clean Water Act and the Section 404 permitting process through the Army Corps of Engineers. In addition, the State of Florida also requires the demonstration of avoidance, minimization and mitigation of wetland impacts. During the design and permitting phase the FDOT committed to avoiding and minimizing the direct and indirect effects of this project on wetland ecosystems. The January 2013 WEBAR states that the Preferred Alternative will impact approximately 27 acres of forested wetlands, 10 acres of secondary impacts, 1.33 acres of wetland-cut ditches, 6 acres of upland-cut ditches, 4.26 acres of shading impacts from the new bridge and 17.59 acres of impacts to the Lake Jesup Conservation Area.

FHWA and USFWS requested Section 4(f) analysis for this project due to the proposed impacts to the Lake Jesup Conservation Area. Avoidance and minimization measures were demonstrated by selecting Alternative 2 with the least amount of impacts to numerous ecologically significant conservation easements adjacent to SR 46, such as the Rolf Bergman Tract. The easements and conservation areas were set aside to mitigate for past wetland impacts as a result of new road construction or improvement. The Service has determined that the Lake Jesup conservation area meets the definition of a Section 4(f) property under the Transportation Act of 1966, as amended. Spanning the floodplains of the St. John's River and the conservation area with a longer bridge may be one solution to avoiding ~18 acres of impact to public land. The Service also requests consideration of recommendations to reduce the footprint of the highway by choosing a design that minimizes the width of the roadway, including eliminating the median.

The need to reinitiate consultation will allow the Service to review the final design for the interchange as well as all of the pond locations, wildlife crossings and wetland impacts.

This letter does not represent a biological opinion as described in Section 7 of the ESA nor a final concurrence with project effects on listed species as determined by the FDOT. New information regarding species presence, changes to and refinement of the proposed project design, and potential adverse effects not initially considered may increase the risk of adverse

effects to a level at which take is reasonably certain to occur. All additional information available will be evaluated when ESA consultation is reinitiated.

If you have any questions, please contact Jane Monaghan at (904)731-3119.

Sincerely,

for Jay B. Herrington
Field Supervisor

cc: Scott Sanders-FFWCC
Andrew Phillips-ACOE
Ulgonda Kirkpatrick-USFWS

United States Department of the Interior

U. S. FISH AND WILDLIFE SERVICE

7915 BAYMEADOWS WAY, SUITE 200
JACKSONVILLE, FLORIDA 32256-7517

IN REPLY REFER TO:
FWS Log No. 04EF1000-2014-I-0176-R001

August 10, 2017

William Walsh
Environmental Manager
Florida Department of Transportation, District 5
719 S. Woodland Blvd.
Deland, FL 32720

RE: Reinitiation of Section 7 Informal Consultation
State Road 46 (SR 46) Project Development and Environment (PD&E) Study
From east State Road 415 (SR 415) to County Road (CR 426)
FPID Number: 240216-4-28-1
Seminole County, Florida

Dear Mr. Walsh:

On May 29, 2014, the U.S. Fish and Wildlife Service (Service) provided an informal consultation letter for the SR 46 PD&E study from east of SR 415 to CR 426 following the review of the draft Wetland Evaluation and Biological Report (WEBAR) and draft Endangered Species Biological Assessment (ESBA) prepared for this PD&E study. The Service then concurred with FDOT's species determinations of "may affect, but not likely to adversely affect" for the West Indian manatee with conditions, and a "no effect" determination for the Florida scrub-jay and Florida sand skink. The letter also provided comments and recommendations for FDOT's completion of informal consultation related to the Audubon's crested caracara, wood stork, and the eastern indigo snake.

The Service received a request from the Florida Department of Transportation (FDOT) for reinitiation of informal consultation on July 12, 2017. The FDOT is requesting concurrence and review of the updated Natural Resources Evaluation (NRE) report. The Service has completed its review of the NRE report which addressed the Service's comments and recommendations outlined in the previous consultation in regards to the Audubon's crested caracara, wood stork, and the eastern indigo snake. The Service provides the following comments in accordance with Section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

Audubon's crested caracara

The Service has reviewed FDOT's effects determination and commitments, as well as the information provided in the NRE. A formal crested caracara survey of the SR 46 project was conducted between January 1 and April 30, 2015. No caracaras were observed nesting or foraging within the SR 46 PD&E study area during the time of the survey. The survey also

documented that the closet caracara nest was located over 4,000 feet west of the project. After, review of the survey information and the commitments outlined in the revised NRE the Service concurs with a "may affect, not likely to adversely affect" determination. FDOT has committed to conduct subsequent caracara surveys and reiniate consultation with the Service during the design phase of the project (estimated 2021).

Wood stork

The proposed project lies within the 15-mile Core Foraging Area (CFA) of one wood stork nesting colony (#612320). There is no nesting habitat within or immediately adjacent to the project, but there is foraging habitat. The project will impact 26.43 acres (wetlands) and 1.33 acres (wetland-cut ditches) of potential suitable foraging habitat (SFH). To offset impacts to wetlands used as wood stork core foraging areas (CFA) FDOT proposes to purchase credits from a Service approved mitigation bank. The FDOT has also committed to reiniate consultation prior to advancing the project into construction. After analyzing our data and the information provided by FDOT the Service concurs with FDOT's determination of "may affect not likely to adversely affect".

Eastern indigo snake

The proposed project contains a mixture of different habitat types. Since the species is known to inhabit a variety of different vegetative communities and range over large areas, it is likely that this species may forage within the project corridor. There are no xeric habitats mapped for the project area, however within the project area there are a few xeric vegetative patches. A 100% gopher tortoise survey was conducted on June 2 and 4, 2015 and concluded that there was a total of 18 potentially occupied gopher tortoise burrows. The FDOT has committed to using the Standard Protection Measures for the eastern indigo snake during construction and the excavation of all gopher tortoise burrows within the project area prior to disturbance in the project area. The Service concurs with the FDOT's determination of "may affect, not likely to adversely affect".

Thank you for considering the effects of your proposed project on fish and wildlife, and the ecosystems upon which they depend. Although this does not represent a biological opinion as described in Section 7 of the Act, it does fulfill the requirements of the Act. Should changes to the proposed project occur or new information regarding fish and wildlife resources become available, further consultation with the Service should be initiated to assess any or further potential impacts. If you have any questions, please contact Zakia Williams at (904)731-3119.

Sincerely,

Jay B. Herrington
Field Supervisor

Appendix E

Typical Section Package

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID 240216-4-28-01 FEDERAL AID PROJECT NO. TCSP-045-U

COUNTY (SECTION) SEMINOLE (77)

PROJECT DESCRIPTION SR 46 FROM 0.135 MI EAST OF SR 415 TO 0.212 MI EAST OF 1st STREET (CR 426) (PROJ. LENGTH 7.25 MI).

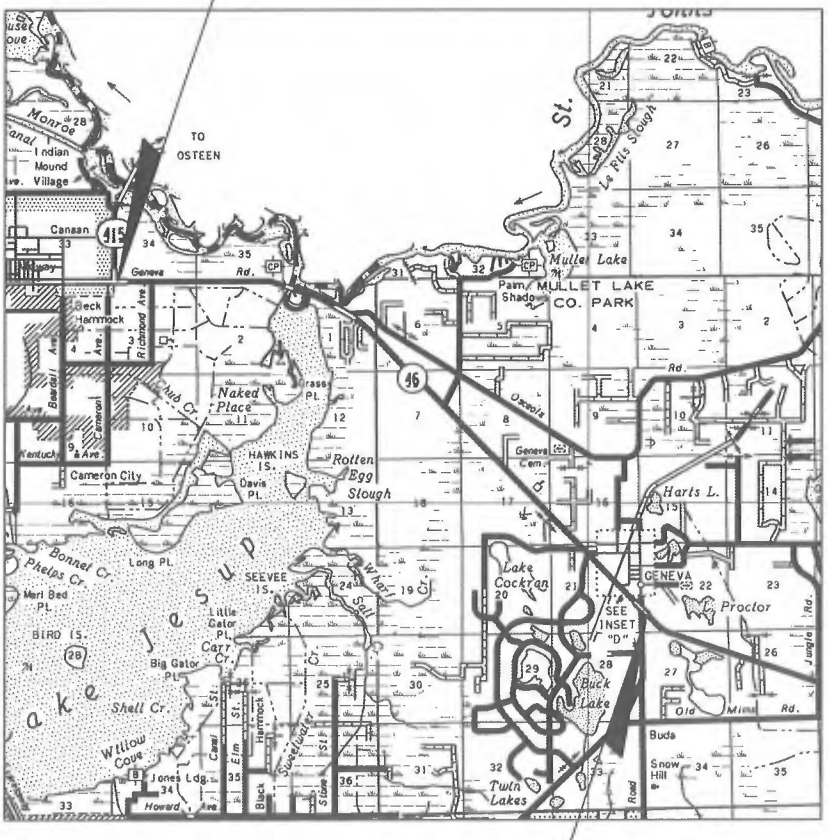
PROJECT LOCATION

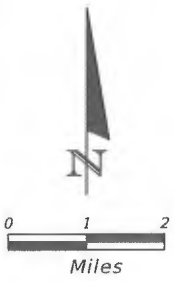
TYPICAL SECTION PACKAGE

BEGIN PROJECT 240216-4-28-01
STA. 7+13.36

R-31-E
R-32-E

T-19-S
T-20-S





T-20-S
T-21-S

END PROJECT 240216-4-28-01
STA. 400+63.31

SR 46

SEMINOLE COUNTY PROJECT MANAGER: MATT HASSAN, P.E.

PROJECT IDENTIFICATION

FINANCIAL PROJECT ID: 240216-4-28-01 COUNTY (SECTION): SEMINOLE (77)

PROJECT DESCRIPTION: SR 46 FROM 0.135 MI EAST OF SR 415 TO 0.212 MI EAST OF 1st STREET (CR 426) (PROJ. LENGTH 7.25 MI).

PROJECT CONTROLS - SR 46

FUNCTIONAL CLASSIFICATION

(X) RURAL
(X) URBAN

( ) FREEWAY/EXPWY. ( ) MAJOR COLL.
(X) PRINCIPAL ART. ( ) MINOR COLL.
( ) MINOR ART. ( ) LOCAL

HIGHWAY SYSTEM

Yes	No	
(X)	( )	NATIONAL HIGHWAY SYSTEM
(X)	( )	FLORIDA INTRASTATE HIGHWAY SYSTEM
( )	(X)	STRATEGIC INTERMODAL SYSTEM
(X)	( )	STATE HIGHWAY SYSTEM
( )	(X)	OFF STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
(X) 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

TRAFFIC

	YEAR	AADT
OPENING	2015	15,000
MID YEAR	2025	25,500
DESIGN	2035	36,500

		DISTRIBUTION	
DESIGN SPEED	45,55	K	9.0 %
POSTED SPEED	45,50	D	53.0 %
		T_{24}	12.3 %

CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
( ) RRR INTERSTATE / FREEWAY
( ) RRR NON-INTERSTATE / FREEWAY
( ) TDLC / NEW CONSTRUCTION / RECONSTRUCTION
( ) TDLC / RRR
( ) MANUAL OF UNIFORM MINIMUM STANDARDS (FLORIDA GREENBOOK) (OFF-STATE HIGHWAY SYSTEM ONLY)

DESIGN SPEED APPROVALS

DISTRICT DESIGN ENGINEER — DATE 2/2/18

DISTRICT TRAFFIC OPERATIONS ENGINEER — DATE 2/13/18

LIST ANY POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION ELEMENTS:

LENGTH OF VERTICAL CURVE
BORDER WIDTH

LIST MAJOR STRUCTURES LOCATION/DESCRIPTION - REQUIRING INDEPENDENT STRUCTURE DESIGN:

SR 46 OVER ST JOHN'S RIVER

LIST MAJOR UTILITIES WITHIN PROJECT CORRIDOR:

CITY OF SANFORD (BURIED RECLAIMED WATER)
BRIGHT HOUSE NETWORKS, LLC (BURIED FIBER OPTIC)
FPL - DISTRIBUTION (BURIED AND OVERHEAD ELECTRIC)
FPL - TRANSMISSION (OVERHEAD ELECTRIC)
LEVEL 3 (BURIED FIBER OPTIC CABLE)
ATT FLORIDA (BURIED FIBER OPTIC CABLE)
SEMINOLE COUNTY TRAFFIC (BURIED FIBER OPTIC CABLE)
MULLET LAKE WATER ASSOCIATION, INC (BURIED WM)

LIST OTHER INFORMATION PERTINENT TO DESIGN OF PROJECT:

PROJECT IDENTIFICATION

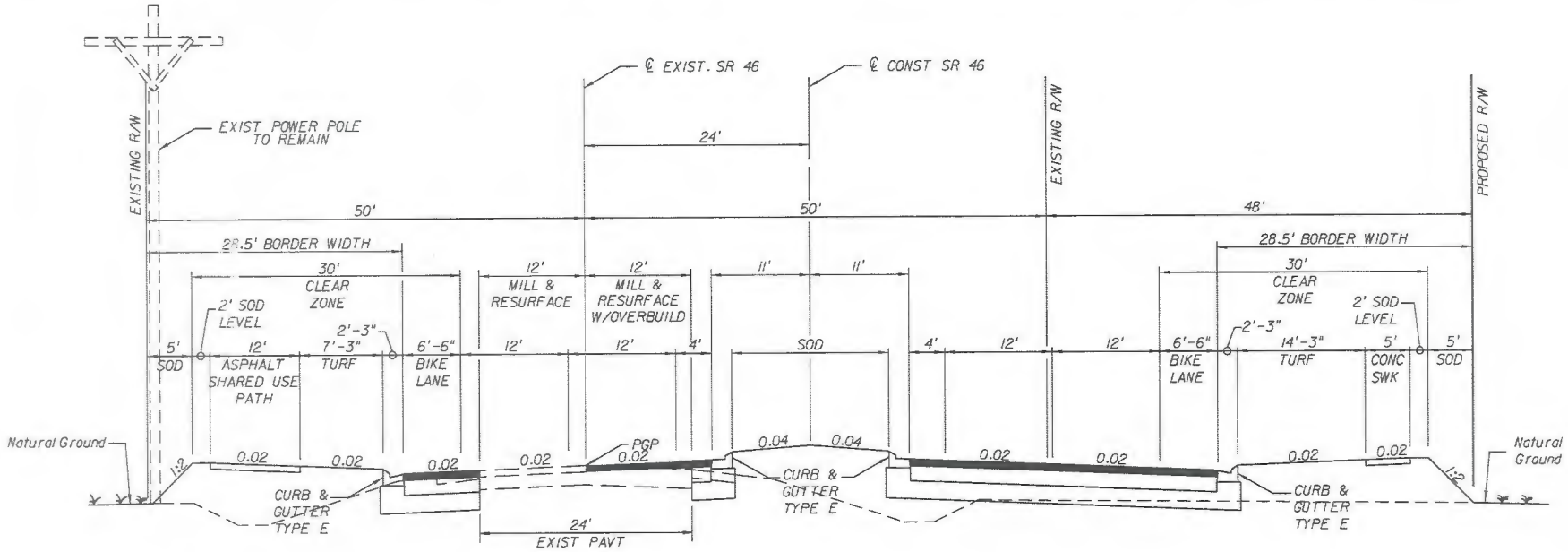
FINANCIAL PROJECT ID 240216-4-28-01 FEDERAL AID PROJECT NO. TCSP-045-U COUNTY NAME SEMINOLE

ROAD DESIGNATION SR 46 LIMITS/MILEPOST MP 3.795 - MP 11.047

PROJECT DESCRIPTION SR 46 FROM 0.135 MI EAST OF SR 415 TO 0.212 MI EAST OF 1st STREET (CR 426)

(PROJ. LENGTH 7.25 MI).

PROPOSED ROADWAY TYPICAL SECTION



55MPH

STA 22+95.00 TO STA 58+91.69

STA 173+38.55 TO STA 190+93.52

STA 237+92.05 TO STA 261+41.55

STA 302+40.50 TO STA 323+29.34

APPROVED BY	FDOT CONCURRENCE	FHWA CONCURRENCE
Christopher Rizzolo, P.E. - 54078 Date Engineer of Record	Mario Bizzio, P.E. Date FDOT District Design Engineer	FHWA Transportation Engineer Date

CHRISTOPHER RIZZOLO LICENSE NO. 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER

2/28/18

2/28/18

$USERS DATE NAME FILES

PROJECT IDENTIFICATION

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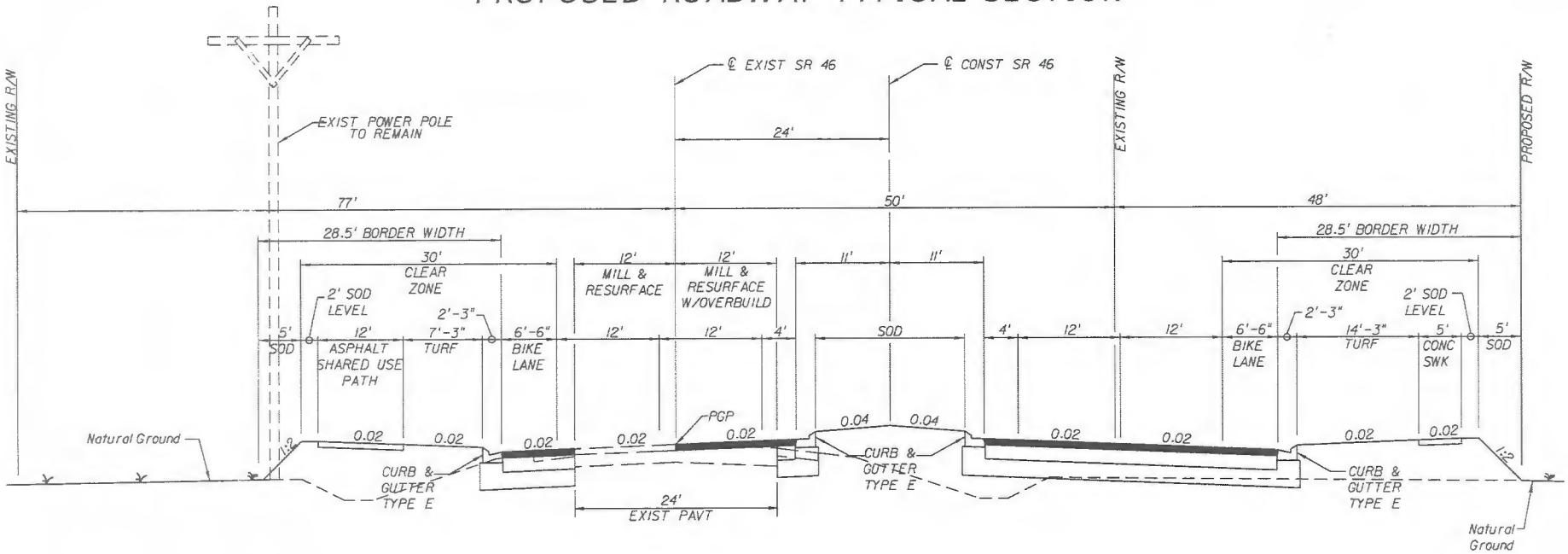

55 MPH

FROM STA 58+91.69 TO STA 75+52.00

(WEST OF ST. JOHNS RIVER BRIDGE)

APPROVED BY	FDOT CONCURRENCE	FHWA CONCURRENCE
Christopher Rizzolo, P.E. 54078 Date Engineer of Record	Mario Bizzio, P.E. Date FDOT District Design Engineer	FHWA Transportation Engineer Date

CHRISTOPHER RIZZOLO LICENSE NO. 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER

2/10/18

12/28/18

$USERS $DATE $TIME $FILES

PROJECT IDENTIFICATION

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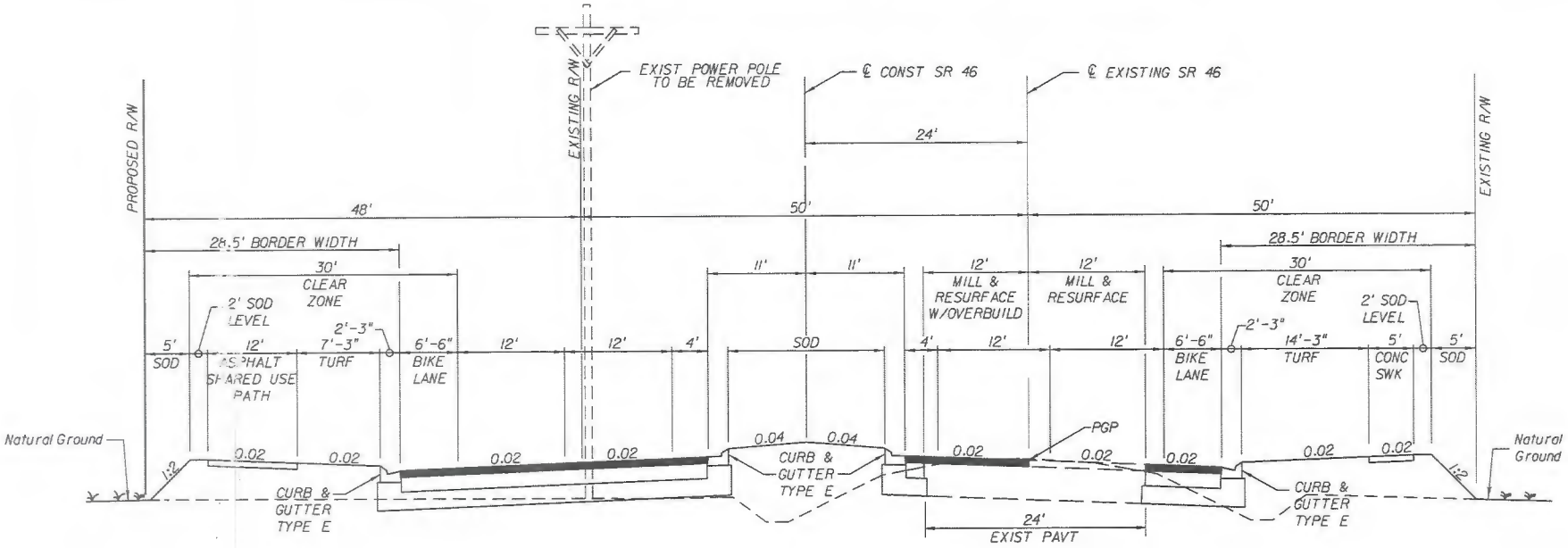
(PROJ. LENGTH 7.25 MI).

PROPOSED ROADWAY TYPICAL SECTION



55 MPH

STA 86+49.75 TO STA 102+02.62

STA 139+41.00 TO STA 159+57.26

STA 204+74.76 TO STA 224+10.87

STA 275+22.81 TO STA 288+51.59

STA 337+10.59 TO STA 349+31.72

APPROVED BY:	FDOT CONCURRENCE	FHWA CONCURRENCE
Christopher Rizzolo, P.E. NO. 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER Engineer Of Record — Date 2/28/18	Mario Bizzio, P.E. FDOT District Design Engineer — Date 2/28/18	FHWA Transportation Engineer — Date

CHRISTOPHER RIZZOLO LICENSE NO. 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER

$USERS $DATE $TIME $FILES

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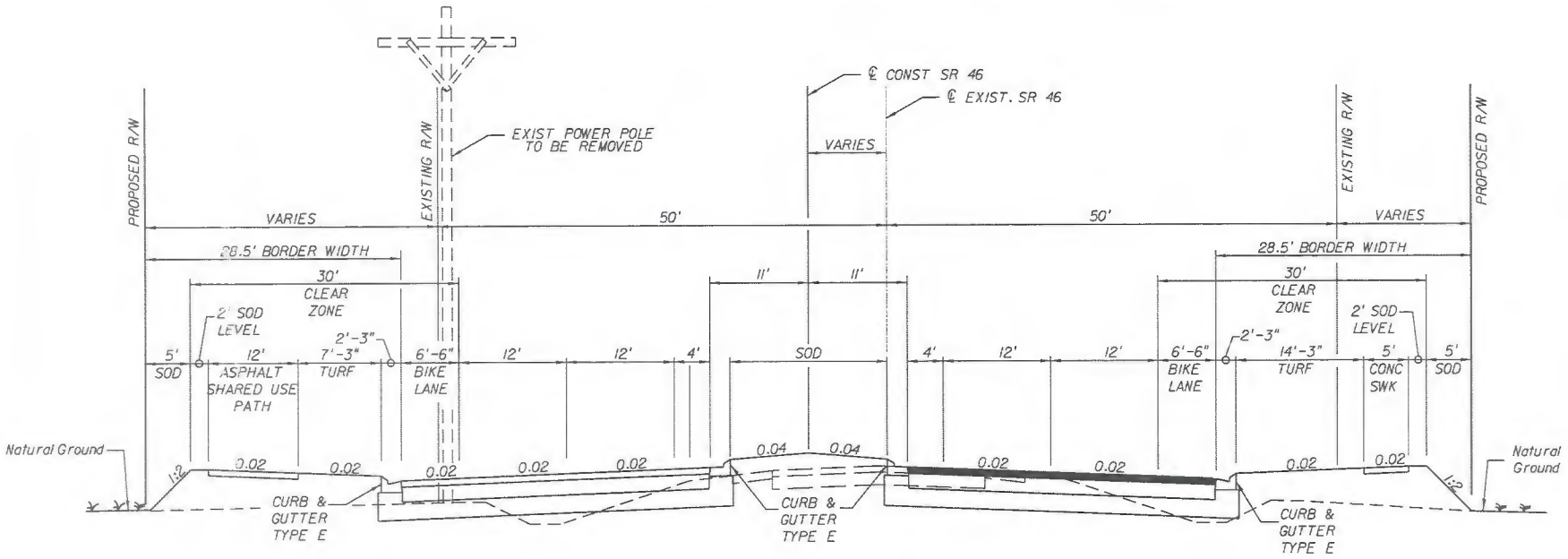
PROJECT DESCRIPTION SR 46 FROM 0.135 MI EAST OF SR 415 TO 0.212 MI EAST OF 1st STREET (CR 426)

(PROJ. LENGTH 7.25 MI).

PROPOSED ROADWAY TYPICAL SECTION



55MPH

STA 75+52.00 TO STA 86+49.75
STA 159+57.26 TO STA 173+38.55
STA 190+93.52 TO STA 204+74.46
STA 224+10.87 TO STA 237+92.05
STA 261+41.55 TO STA 275+22.81
STA 288+51.59 TO STA 302+40.50
STA 323+29.34 TO STA 337+10.59
STA 349+31.72 TO STA 360+60.68

APPROVED BY	FDOT CONCURRENCE	FHWA CONCURRENCE
Christopher Rizzolo, P.E. 54078 Engineer of Record — Date 2/28/18	Mario Bizzio, P.E. FDOT District Design Engineer — Date 2/28/18	FHWA Transportation Engineer — Date

CHRISTOPHER RIZZOLO LICENSE NO. 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER

$USER$ $DATE$ $TIME$ $FILES$

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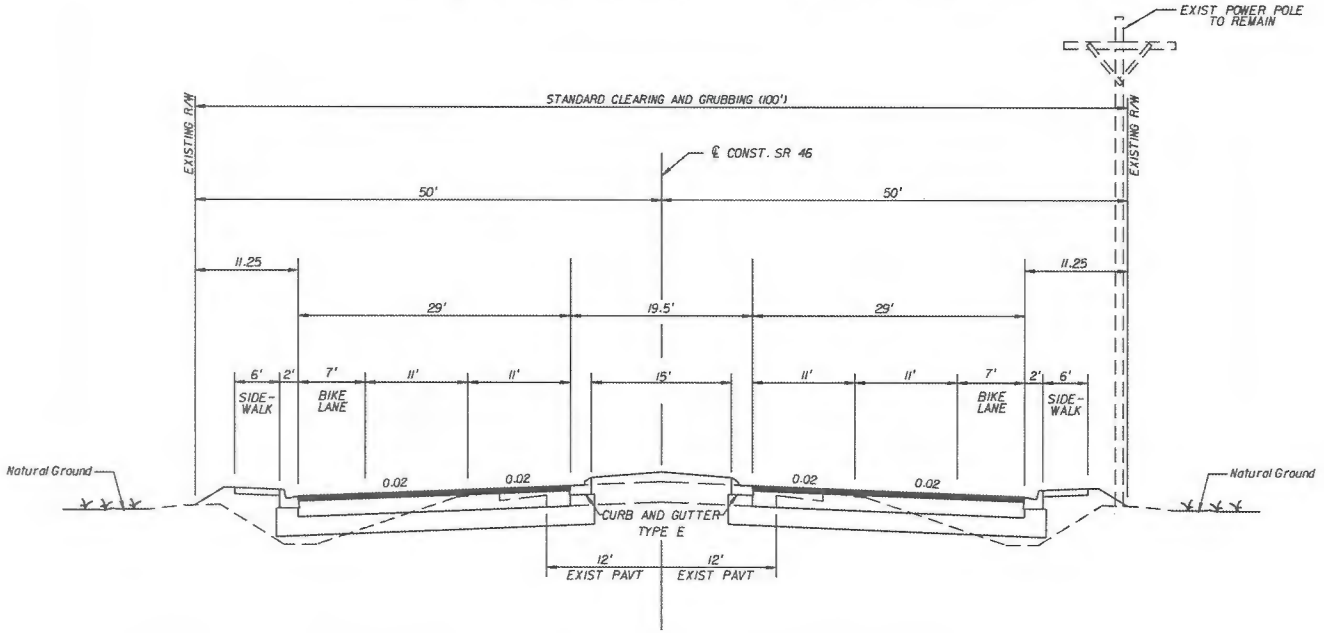
(PROJ. LENGTH 7.25 MI).

PROPOSED ROADWAY TYPICAL SECTION



45 MPH

STA 360+60.68 TO STA 389+43.29

APPROVED BY:	FDOT CONCURRENCE	FHWA CONCURRENCE
Christopher Rizzolo, P.E. 54078 Date Engineer Of Record	Mario Bizzio, P.E. 2/2/18 Date FDOT District Design Engineer	FHWA Transportation Engineer Date

CHRISTOPHER RIZZOLO LICENSE NO. 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER

12/1/17

$USER$ $DATE$ $TIME$ $FILE$

PROJECT IDENTIFICATION

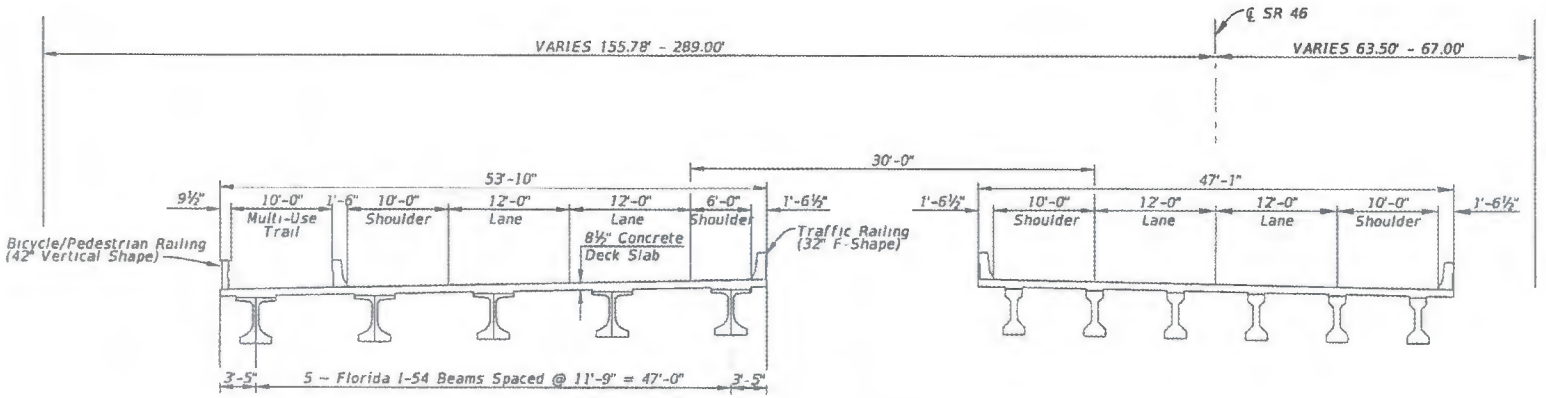
FINANCIAL PROJECT ID 240216-4-28-01 FEDERAL AID PROJECT NO. TCSP-045-U COUNTY NAME SEMINOLE

ROAD DESIGNATION SR 46 LIMITS/MILEPOST MP 3.795 - MP 11.047

PROJECT DESCRIPTION SR 46 FROM 0.135 MI EAST OF SR 415 TO 0.212 MI EAST OF 1st STREET (CR 426)

(PROJ. LENGTH 7.25 MI).

PROPOSED BRIDGE TYPICAL SECTION



55 MPH

STA 102+02.62 TO STA 139+41.00

APPROVED	FDOT CONCURRENCE	FHWA CONCURRENCE
Christopher Rizzolo, P.E. #54078 Date Engineer of Record	Mario Bizzio, P.E. 2/2/18 Date FDOT District Design Engineer	FHWA Transportation Engineer Date

CHRISTOPHER RIZZOLO LICENSE NO 54078 STATE OF FLORIDA PROFESSIONAL ENGINEER

$USER$ $FILE$

Appendix F

Long Range Estimates

Date: 5/31/2017 3:47:53 PM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 240216-4-28-01 Letting Date: 01/2099

Description: SR 46 WIDENING SR 415 TO CR 426 SEMINOLE COUNTY

District: 05 County: 77 SEMINOLE Market Area: 08 Units: English
Contract Class: 5 Lump Sum Project: N Design/Build: N Project Length: 7.453 MI

Project Manager: MIM

Version 6 Project Grand Total $64,051,475.05

Description: SR 46 WIDENING SR 415 TO CR 426 SEMINOLE COUNTY - THIS IS AN UPDATE TO REFLECT ONLY THE PREFERRED ALTERNATIVE IN MORE DETAIL. UPDATED ON 3/11/14.

Sequence: 1 NDS - New, Divided, Suburban (Urban In/Rural Out) Net Length: 1.797 MI 9,490 LF

Description: 4-Lane Suburban-Sta 7+10 to Sta 102+00. Widen to the south utilizing existing pavement. 2 lanes new construction and 2 lanes mill & resurface/overbuild/widening.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	65.00 / 100.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	1.797
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	2 to 1 / 2 to 1
Median Shoulder Cross Slope L/R	0.00 % / 0.00 %
Outside Shoulder Cross Slope L/R	0.00 % / 0.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	35.94	AC	$6,000.00	$215,640.00
120-6	EMBANKMENT	113,756.01	CY	$5.00	$568,780.05
	Earthwork Component Total				$784,420.05

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	10.50 / 34.50
Structural Spread Rate	220
Friction Course Spread Rate	110

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

160-4	TYPE B STABILIZATION	52,889.51	SY	$2.50	$132,223.78
285-709	OPTIONAL BASE,BASE GROUP 09	48,840.55	SY	$16.00	$781,448.80
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	5,219.36	TN	$85.00	$443,645.60
337-7-73	ASPH CONC FC,TRAF C,FC-9.5,PG 76-22, ARB	2,609.68	TN	$133.45	$348,261.80

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	25,307.00	SY	$3.00	$75,921.00
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	6,959.00	TN	$85.00	$591,515.00
	Comment: For milling area (includes overbuild).				
337-7-73	ASPH CONC FC,TRAF C,FC-9.5,PG 76-22, ARB	1,392.00	TN	$133.45	$185,762.40
	Comment: For milling area.				
400-0-11	CONC CLASS NS, GRAVITY WALL	2,500.00	CY	$578.75	$1,446,875.00
570-1-1	PERFORMANCE TURF	24,779.00	SY	$1.13	$28,000.27
570-1-2	PERFORMANCE TURF, SOD	14,762.00	SY	$2.57	$37,938.34

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	728.00	EA	$3.41	$2,482.48
710-11-111	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	14.38	NM	$811.67	$11,671.81
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	7.19	GM	$291.85	$2,098.40

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 0.00
Bike Path Structural Spread Rate	0
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

Roadway Component Total $4,087,844.68

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	0.00 / 0.00

Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips No. of Sides	0

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-709	OPTIONAL BASE,BASE GROUP 09	10,544.00	SY	$16.00	$168,704.00
	Comment: SHARED USE PATH				
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	580.00	TN	$85.00	$49,300.00
	Comment: SHARED USE PATH				
520-1-7	CONCRETE CURB & GUTTER, TYPE E	18,980.00	LF	$12.40	$235,352.00
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	5,272.00	SY	$37.29	$196,592.88

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	11,599.00	SY	$2.50	$28,997.50
	Comment: SHARED USE PATH				

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	24,673.33	LF	$1.16	$28,621.06
104-11	FLOATING TURBIDITY BARRIER	449.32	LF	$10.11	$4,542.63
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	449.32	LF	$4.27	$1,918.60
104-15	SOIL TRACKING PREVENTION DEVICE	2.00	EA	$2,103.15	$4,206.30
104-18	INLET PROTECTION SYSTEM	92.00	EA	$75.17	$6,915.64
107-1	LITTER REMOVAL	32.23	AC	$54.26	$1,748.80
107-2	MOWING	32.23	AC	$72.06	$2,322.49
	Shoulder Component Total				$729,221.90

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	17.50

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	18,979.49	LF	$12.40	$235,345.68
570-1-2	PERFORMANCE TURF, SOD	18,452.28	SY	$2.57	$47,422.36
	Median Component Total				$282,768.04

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

400-2-2	CONC CLASS II, ENDWALLS	32.35	CY	$500.00	$16,175.00
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	4,760.00	LF	$57.91	$275,651.60
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	432.00	LF	$104.15	$44,992.80
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	15.00	EA	$1,103.10	$16,546.50
570-1-2	PERFORMANCE TURF, SOD	690.00	SY	$2.57	$1,773.30

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-311	INLETS, CURB, TYPE P-1, <10'	65.00	EA	$4,958.29	$322,288.85
425-1-411	INLETS, CURB TYPE J-1, <10'	18.00	EA	$8,563.52	$154,143.36
425-1-521	INLETS, DT BOT, TYPE C, <10'	9.00	EA	$2,264.13	$20,377.17
425-2-41	MANHOLES, P-7, <10'	9.00	EA	$3,143.73	$28,293.57
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	5,200.00	LF	$102.18	$531,336.00
430-175-166	PIPE CULV, OPT MATL, ROUND, 66"S/CD	1,000.00	LF	$203.21	$203,210.00
	Comment: FOR PONDS				
550-10-120	FENCING, TYPE A, 5.1-6.0, STANDARD	5,724.00	LF	$5.70	$32,626.80
	Comment: FOR PONDS				
550-60-124	FENCE GATE,TYP A, DBL, 18.1-20.' OPENING	3.00	EA	$921.16	$2,763.48
	Comment: FOR PONDS				
570-1-1	PERFORMANCE TURF	31,024.00	SY	$1.13	$35,057.12
	Comment: FOR POND BOTTOMS				
570-1-2	PERFORMANCE TURF, SOD	29,378.00	SY	$2.57	$75,501.46
	Comment: FOR PONDS				

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING AND GRUBBING	17.59	AC	$6,000.00	$105,540.00
	Comment: FOR PONDS				
120-1	REGULAR EXCAVATION	113,258.00	CY	$4.00	$453,032.00
	Comment: FOR PONDS				
120-6	EMBANKMENT	4,229.00	CY	$5.00	$21,145.00
	Comment: FOR PONDS				
	Drainage Component Total				$2,340,454.01

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	44.00	AS	$339.04	$14,917.76
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	4.00	AS	$1,200.61	$4,802.44
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	4.00	AS	$4,889.99	$19,559.96
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	4.00	AS	$4,884.17	$19,536.68
	Signing Component Total				$58,816.84

LANDSCAPING COMPONENT

User Input Data

Description	Value
Cost %	2.00
Component Detail	N

Landscaping Component Total $173,028.44

UTILITIES COMPONENT

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
UTILITIES	UTILITY RELOCATION	1.00	LS	$600,000.00	$600,000.00

Utilities Component Total $600,000.00

Sequence 1 Total $9,056,553.96

Sequence: 2 NDS - New, Divided, Suburban (Urban In/Rural Out) Net Length: 0.708 MI 3,740 LF

Description: 2-Lane Suburban - Sta 102+00 to Sta 139+40. Proposed bridge to the north of the existing bridge. Includes 12' shared use path adjacent to outside shoulder.

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	2
Roadway Pavement Width L/R	24.00 / 0.00
Structural Spread Rate	330
Friction Course Spread Rate	80

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	1.42	GM	$291.85	$414.43
	Comment: This item was added because it is not reflected as a "Pay Item," this being because the number of lanes specified is 2.				

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	0

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	96.00	EA	$3.41	$327.36
710-11-111	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	2.83	NM	$811.67	$2,297.03

	Roadway Component Total	$3,038.82

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	10.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	10.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips No. of Sides	0

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	9,723.54	LF	$1.16	$11,279.31
104-11	FLOATING TURBIDITY BARRIER	177.08	LF	$10.11	$1,790.28
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	177.08	LF	$4.27	$756.13
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$2,103.15	$2,103.15
104-18	INLET PROTECTION SYSTEM	6.00	EA	$75.17	$451.02
	Shoulder Component Total				$16,379.89

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	12.75	CY	$500.00	$6,375.00
425-1-551	INLETS, DT BOT, TYPE E, <10'	6.00	EA	$3,553.72	$21,322.32
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	3,000.00	LF	$57.91	$173,730.00
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	6.00	EA	$1,103.10	$6,618.60

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
506-3	BRIDGE DRAIN	15.00	EA	$2,200.00	$33,000.00
	Comment: SCUPPER INLETS				
	Drainage Component Total				$241,045.92

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-20-11	SINGLE POST SIGN, F&I, LESS THAN 12 SF	17.00	AS	$260.46	$4,427.82
700-20-12	SINGLE POST SIGN, F&I, 12-20 SF	2.00	AS	$491.55	$983.10
700-21-11	MULTI- POST SIGN, F&I, 50 OR <	2.00	AS	$2,843.33	$5,686.66
700-21-12	MULTI- POST SIGN, F&I, 51-100	2.00	AS	$3,709.50	$7,419.00

Signing Component Total	$18,516.58

LANDSCAPING COMPONENT

User Input Data

Description	Value
Cost %	2.00
Component Detail	N

Landscaping Component Total	$5,209.29

BRIDGES COMPONENT

Bridge 100

Description	Value
Estimate Type	Detailed Estimate
Primary Estimate	YES
Structure No.	
Geographic District	05
Segment Count	1
Bridge Length (LF)	3,740.00
Average Bridge Width (LF)	55.00
Average Skew Angle	0.00
Construction Type	New/Replacement
Typical Section	Urban Undivided, Flush SW
Sidewalk Width Left	10.00
Sidewalk Width Right	0.00
Concrete Traffic Railing	Left/Right
Pedestrian/Bicycle Railing	Left
Total Design Load Demand Weight	121,700
Final Bridge Cost	$20,295,178.97
Calculated Final Cost per SF	$98.66
Description	THIS BRIDGE IS LOCATED TO THE NORTH OF THE EXISTING BRIDGE AND IS TO RUN PARALLEL TO IT. ALSO INCLUDES 10' SHARED USE PATH ADJACENT TO OUTSIDE SHOULDER.

Bridge Deck and Approach Slab Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	123.98	CY	$300.00	$37,194.00
400-9	BRIDGE DECK GROOV &PLANING, DECK 8.5" GR	18,720.00	SY	$5.54	$103,708.80
415-1-9	REINF STEEL- APPROACH SLABS	23,650.00	LB	$1.05	$24,832.50
458-1-11	BRIDGE DECK EXPANSION JNT,NEW,POURED	1,260.00	LF	$30.07	$37,888.20
471-1-1	FENDER SYS,PLASTIC MARINE LUMBER,REINF	2.00	MB	$16,708.62	$33,417.24
510-1	NAVIGATION LIGHTS- FIXED BRIDGE, SYSTEM	1.00	LS	$32,276.15	$32,276.15
515-2-301	PED/BICYCLE RAILING, ALUM,42"PICKET RAIL	3,800.00	LF	$34.68	$131,784.00
521-5-4	CONC TRAF RAIL, BRG, 32" VERT FACE	3,800.00	LF	$74.46	$282,948.00
521-5-4	CONC TRAF RAIL, BRG, 32" VERT FACE	3,800.00	LF	$74.46	$282,948.00
530-3-3	RIPRAP- RUBBLE, BANK AND SHORE	1,000.00	TN	$81.00	$81,000.00

Bridge EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
521-1	MEDIAN CONCRETE BARRIER WALL	3,740.00	LF	$122.03	$456,392.20
	Comment: THIS ITEM ADDED FOR BARRIER WALL SEPARATING TRAFFIC AND PEDESTRIANS. WAS NOT LISTED IN X-ITEM PULL-DOWN SO WAS ADDED AS EX-ITEM.				

BRIDGE SEGMENTS

Segment 1

Segment Position	First/Last
Segment Over	Water
Segment Length (LF)	3740
Segment Width (LF)	55
Average Clearance (LF)	25
End Bent Fill Height (LF)	18
Average Pile Length (LF)	100
No. of Intermediate Supports	21
Superstructure / Beam Type	I-Beam
Substructure / Pier Type	Multi Columns
Foundation Type	Pre-stressed Sq. Piles 18"
Design Load Demand Weight	121,700
Total Segment Cost	$18,790,789.88

Segment 1 Superstructure, Substructure and Foundation Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-4	CONC CLASS II, BRIDGE SUPERSTRUCTURE	6,496.79	CY	$400.00	$2,598,716.00
400-4-5	CONC CLASS IV, SUBSTRUCTURE	1,946.65	CY	$600.00	$1,167,990.00
400-4-5	CONC CLASS IV, SUBSTRUCTURE	2,577.17	CY	$600.00	$1,546,302.00
400-147	COMPOSITE NEOPRENE PADS	207.68	CF	$857.95	$178,179.06
415-1-4	REINF STEEL- SUPERSTRUCTURE	1,494,261.70	LB	$1.05	$1,568,974.78
415-1-5	REINF STEEL- SUBSTRUCTURE	347,917.95	LB	$1.00	$347,917.95
415-1-5	REINF STEEL- SUBSTRUCTURE	418,529.75	LB	$1.00	$418,529.75
450-2-78	PREST BEAMS: FLORIDA-I BEAM 78"	29,920.00	LF	$234.97	$7,030,302.40
455-34-3	PRESTRESSED CONCRETE PILING, 18" SQ	44,744.40	LF	$67.75	$3,031,433.10
455-143-3	TEST PILES-PREST CONCRETE,18" SQ	4,971.60	LF	$181.52	$902,444.83
	Bridge 100 Total				$20,295,178.97
	Bridges Component Total				$20,295,178.97

RETAINING WALLS COMPONENT

Retaining Wall 1

Description	Value
Length	515.00
Begin height	4.00

End Height	16.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	5,150.00	SF	$21.48	$110,622.00
	Retaining Walls Component Total				$110,622.00

Sequence 2 Total $20,689,991.47

Sequence: 3 NDS - New, Divided, Suburban (Urban In/Rural Out) Net Length: 4.277 MI 22,580 LF

Description: 4-Lane Suburban - Sta 139+40 to Sta 365+20. Widen to the north and south utilizing existing pavement. 2 lanes new construction and 2 lanes mill & resurface/overbuild/widening.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	50.00 / 100.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	4.277
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	2 to 1 / 2 to 1
Median Shoulder Cross Slope L/R	0.00 % / 0.00 %
Outside Shoulder Cross Slope L/R	0.00 % / 0.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	77.75	AC	$6,000.00	$466,500.00
120-6	EMBANKMENT	270,748.17	CY	$5.00	$1,353,740.85

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.41	AC	$6,000.00	$8,460.00
	Comment: FOR EXISTING W OSCEOLA RD PAVEMENT REMOVAL				
	Earthwork Component Total				$1,828,700.85

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	10.50 / 34.50
Structural Spread Rate	220
Friction Course Spread Rate	110

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	125,845.42	SY	$2.50	$314,613.55
285-709	OPTIONAL BASE,BASE GROUP 09	116,211.32	SY	$16.00	$1,859,381.12
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	12,418.96	TN	$85.00	$1,055,611.60
337-7-73	ASPH CONC FC,TRAF C,FC-9.5,PG 76-22, ARB	6,209.48	TN	$133.45	$828,655.11

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,467.00	SY	$2.50	$6,167.50
	Comment: For W Osceola Rd realignment.				
285-709	OPTIONAL BASE,BASE GROUP 09	2,400.00	SY	$16.00	$38,400.00
	Comment: For W Osceola Rd realignment.				
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	60,213.00	SY	$3.00	$180,639.00
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	16,823.00	TN	$85.00	$1,429,955.00
	Comment: For milling area (includes overbuild) and W Osceola Rd realignment.				
337-7-73	ASPH CONC FC,TRAF C,FC-9.5,PG 76-22, ARB	3,444.00	TN	$133.45	$459,601.80
	Comment: For milling area and W Osceola Rd realignment.				
570-1-1	PERFORMANCE TURF	58,959.00	SY	$1.13	$66,623.67
570-1-2	PERFORMANCE TURF, SOD	35,124.00	SY	$2.57	$90,268.68

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	1,732.00	EA	$3.41	$5,906.12
710-11-111	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	34.21	NM	$811.67	$27,767.23
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	17.11	GM	$291.85	$4,993.55

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 0.00
Bike Path Structural Spread Rate	0
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

	Roadway Component Total	$6,368,583.93

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Paved Outside Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips No. of Sides	0

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
285-709	OPTIONAL BASE,BASE GROUP 09	25,089.00	SY	$16.00	$401,424.00
	Comment: SHARED USE PATH				
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,380.00	TN	$85.00	$117,300.00
	Comment: SHARED USE PATH				
520-1-7	CONCRETE CURB & GUTTER, TYPE E	45,160.00	LF	$12.40	$559,984.00
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	12,544.00	SY	$37.29	$467,765.76

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	27,598.00	SY	$2.50	$68,995.00
	Comment: SHARED USE PATH				

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	58,707.79	LF	$1.16	$68,101.04
104-11	FLOATING TURBIDITY BARRIER	1,069.12	LF	$10.11	$10,808.80
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	1,069.12	LF	$4.27	$4,565.14
104-15	SOIL TRACKING PREVENTION DEVICE	5.00	EA	$2,103.15	$10,515.75
104-18	INLET PROTECTION SYSTEM	218.00	EA	$75.17	$16,387.06
107-1	LITTER REMOVAL	8.13	AC	$54.26	$441.13
107-2	MOWING	8.13	AC	$72.06	$585.85

	Shoulder Component Total	$1,726,873.53

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	17.50

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

520-1-7	CONCRETE CURB & GUTTER, TYPE E	45,159.84	LF	$12.40	$559,982.02
570-1-2	PERFORMANCE TURF, SOD	43,905.40	SY	$2.57	$112,836.88
	Median Component Total				$672,818.90

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	76.98	CY	$500.00	$38,490.00
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	11,320.00	LF	$57.91	$655,541.20
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	1,016.00	LF	$104.15	$105,816.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	35.00	EA	$1,103.10	$38,608.50
570-1-2	PERFORMANCE TURF, SOD	1,642.00	SY	$2.57	$4,219.94

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-311	INLETS, CURB, TYPE P-1, <10'	154.00	EA	$4,958.29	$763,576.66
425-1-411	INLETS, CURB TYPE J-1, <10'	43.00	EA	$8,563.52	$368,231.36
425-1-521	INLETS, DT BOT, TYPE C, <10'	21.00	EA	$2,264.13	$47,546.73
425-2-41	MANHOLES, P-7, <10'	21.00	EA	$3,143.73	$66,018.33
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	912.00	LF	$104.15	$94,984.80
	Comment: FOR PONDS				
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	12,312.00	LF	$102.18	$1,258,040.16
430-175-154	PIPE CULV, OPT MATL, ROUND, 54"S/CD	992.00	LF	$180.80	$179,353.60
	Comment: FOR PONDS				
430-175-166	PIPE CULV, OPT MATL, ROUND, 66"S/CD	544.00	LF	$203.21	$110,546.24
	Comment: FOR PONDS				
550-10-120	FENCING, TYPE A, 5.1-6.0, STANDARD	16,932.00	LF	$5.70	$96,512.40
	Comment: FOR PONDS				
550-60-124	FENCE GATE,TYP A, DBL, 18.1-20.' OPENING	8.00	EA	$921.16	$7,369.28
	Comment: FOR PONDS				
570-1-1	PERFORMANCE TURF	120,031.00	SY	$1.13	$135,635.03
	Comment: FOR POND BOTTOMS				
570-1-2	PERFORMANCE TURF, SOD	80,008.00	SY	$2.57	$205,620.56
	Comment: FOR PONDS				

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING AND GRUBBING	47.11	AC	$6,000.00	$282,660.00
	Comment: FOR PONDS				
120-1	REGULAR EXCAVATION	439,616.00	CY	$4.00	$1,758,464.00
	Comment: FOR PONDS				
120-6	EMBANKMENT	14,136.00	CY	$5.00	$70,680.00
	Comment: FOR PONDS				

	Drainage Component Total	$6,287,915.19

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-20-11	SINGLE POST SIGN, F&I, LESS THAN 12 SF	103.00	AS	$260.46	$26,827.38
700-20-12	SINGLE POST SIGN, F&I, 12-20 SF	9.00	AS	$491.55	$4,423.95
700-21-11	MULTI- POST SIGN, F&I, 50 OR <	9.00	AS	$2,843.33	$25,589.97
700-21-12	MULTI- POST SIGN, F&I, 51-100	9.00	AS	$3,709.50	$33,385.50
	Signing Component Total				$90,226.80

LANDSCAPING COMPONENT

User Input Data

Description	Value
Cost %	2.00
Component Detail	N

	Landscaping Component Total	$353,705.12

UTILITIES COMPONENT

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
UTILITIES	UTILITY RELOCATION	1.00	LS	$460,000.00	$460,000.00
	Utilities Component Total				$460,000.00

Sequence 3 Total $17,788,824.32

Sequence: 4 NDU - New Construction, Divided, Urban Net Length: 0.671 MI 3,543 LF

Description: 4-Lane Urban - Sta 365+20 to Sta 400+63 (includes 740 ft of CR 426 to the south of SR 46). Does not utilize existing pavement. 4 lanes new construction.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	50.00 / 50.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.671
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	2 to 1 / 2 to 1
Median Shoulder Cross Slope L/R	0.00 % / 0.00 %
Outside Shoulder Cross Slope L/R	0.00 % / 0.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	8.13	AC	$6,000.00	$48,780.00
120-6	EMBANKMENT	57,993.01	CY	$5.00	$289,965.05
	Earthwork Component Total				$338,745.05

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	29.00 / 29.00
Structural Spread Rate	220
Friction Course Spread Rate	110

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	26,894.40	SY	$2.50	$67,236.00
285-709	OPTIONAL BASE,BASE GROUP 09	22,831.89	SY	$16.00	$365,310.24
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,511.51	TN	$85.00	$213,478.35
337-7-73	ASPH CONC FC,TRAF C,FC-9.5,PG 76-22, ARB	1,255.75	TN	$133.45	$167,579.84

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,069.00	SY	$2.50	$2,672.50
	Comment: FOR 740 FT OF WIDEN 1 LANE OF CR 426.				
285-709	OPTIONAL BASE,BASE GROUP 09	987.00	SY	$16.00	$15,792.00
	Comment: FOR 740 FT OF WIDEN 1 LANE OF CR 426.				
327-70-4	MILLING EXIST ASPH PAVT, 3" AVG DEPTH	2,960.00	SY	$3.00	$8,880.00
	Comment: FOR 740 FT OF MILL & RESURFACE 3 LANES OF CR 426.				
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	434.00	TN	$85.00	$36,890.00
	Comment: FOR 740 FT OF MILL & RESURFACE 3 LANES/WIDEN 1 LANE OF CR 426.				
337-7-73	ASPH CONC FC,TRAF C,FC-9.5,PG 76-22, ARB	217.00	TN	$133.45	$28,958.65
	Comment: FOR 740 FT OF MILL & RESURFACE 3 LANES/WIDEN 1 LANE OF CR 426.				
570-1-2	PERFORMANCE TURF, SOD	5,511.00	SY	$2.57	$14,163.27

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE PAVEMENT MARKERS	272.00	EA	$3.41	$927.52
710-11-111	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	5.37	NM	$811.67	$4,358.67
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	2.68	GM	$291.85	$782.16

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 0.00
Bike Path Structural Spread Rate	0
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

Roadway Component Total $927,029.20

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	8.25 / 8.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,542.88	LF	$18.30	$64,834.70
520-1-10	CONCRETE CURB & GUTTER, TYPE F	3,542.88	LF	$18.30	$64,834.70
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	4,723.84	SY	$37.29	$176,151.99

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-1	MILLING EXIST ASPH PAVT, 1" AVG DEPTH	658.00	SY	$1.00	$658.00
	Comment: FOR 740 FT OF MILL & RESURFACE CR 426 OUTSIDE SHLDRS (4FT EACH).				
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	36.00	TN	$85.00	$3,060.00
	Comment: FOR 740 FT OF MILL & RESURFACE CR 426 OUTSIDE SHLDRS (4FT EACH).				

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	7,085.76	LF	$1.16	$8,219.48
104-11	FLOATING TURBIDITY BARRIER	167.75	LF	$10.11	$1,695.95
104-12	STAKED TURBIDITY BARRIER-	167.75	LF	$4.27	$716.29

	NYL REINF PVC			
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	$2,103.15	$2,103.15
104-18	INLET PROTECTION SYSTEM	36.00 EA	$75.17	$2,706.12
107-1	LITTER REMOVAL	17.08 AC	$54.26	$926.76
107-2	MOWING	17.08 AC	$72.06	$1,230.78
	Shoulder Component Total			$327,137.92

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	19.50
Performance Turf Width	15.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	7,085.76	LF	$12.40	$87,863.42
570-1-2	PERFORMANCE TURF, SOD	5,904.80	SY	$2.57	$15,175.34
	Median Component Total				$103,038.76

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-2	CONC CLASS II, ENDWALLS	12.08	CY	$500.00	$6,040.00
425-1-521	INLETS, DT BOT, TYPE C, <10'	4.00	EA	$2,264.13	$9,056.52
425-2-41	MANHOLES, P-7, <10'	4.00	EA	$3,143.73	$12,574.92
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,768.00	LF	$57.91	$102,384.88
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	160.00	LF	$104.15	$16,664.00
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	3,096.00	LF	$102.18	$316,349.28
570-1-1	PERFORMANCE TURF	203.98	SY	$1.13	$230.50

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-311	INLETS, CURB, TYPE P-1, <10'	25.00	EA	$4,958.29	$123,957.25
425-1-411	INLETS, CURB TYPE J-1, <10'	7.00	EA	$8,563.52	$59,944.64
430-175-154	PIPE CULV, OPT MATL, ROUND, 54"S/CD	120.00	LF	$180.80	$21,696.00
	Comment: FOR POND				
550-10-220	FENCING, TYPE B, 5.1-6.0', STANDARD	1,873.00	LF	$12.95	$24,255.35
	Comment: FOR POND				
550-60-224	FENCE GATE,TYP B, DBL,18.1-20.0' OPENING	1.00	EA	$1,150.01	$1,150.01
	Comment: FOR POND				
570-1-1	PERFORMANCE TURF	2,372.00	SY	$1.13	$2,680.36
	Comment: FOR POND BOTTOM				

570-1-2	PERFORMANCE TURF, SOD Comment: FOR POND	11,616.00	SY	$2.57	$29,853.12

EX-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING AND GRUBBING Comment: FOR POND	2.89	AC	$6,000.00	$17,340.00
120-1	REGULAR EXCAVATION Comment: FOR POND	6,393.00	AC	$4.00	$25,572.00
120-6	EMBANKMENT Comment: FOR POND	5,667.00	AC	$5.00	$28,335.00
	Drainage Component Total				$798,083.83

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	17.00	AS	$339.04	$5,763.68
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,200.61	$2,401.22
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	2.00	AS	$4,884.17	$9,768.34
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	2.00	AS	$8,735.01	$17,470.02
	Signing Component Total				$35,403.26

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MIN

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	3,542.88	LF	$5.35	$18,954.41
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	703.21	LF	$15.40	$10,829.43
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	24.00	EA	$534.34	$12,824.16
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	12,939.56	LF	$1.92	$24,843.96
715-4-111	LIGHT POLE COMP, F&I, WS150, 40'	24.00	EA	$4,135.57	$99,253.68
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	24.00	EA	$435.17	$10,444.08
	Subcomponent Total				$177,149.72
	Lighting Component Total				$177,149.72

LANDSCAPING COMPONENT

User Input Data

Description	Value

Cost %	2.00
Component Detail	N

Landscaping Component Total $54,362.90

Sequence 4 Total $2,760,950.64

Date: 5/31/2017 3:47:54 PM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 240216-4-28-01 Letting Date: 01/2099

Description: SR 46 WIDENING SR 415 TO CR 426 SEMINOLE COUNTY

District: 05 County: 77 SEMINOLE Market Area: 08 Units: English

Contract Class: 5 Lump Sum Project: N Design/Build: N Project Length: 7.453 MI

Project Manager: MIM

Version 6 Project Grand Total $64,051,475.05

Description: SR 46 WIDENING SR 415 TO CR 426 SEMINOLE COUNTY - THIS IS AN UPDATE TO REFLECT ONLY THE PREFERRED ALTERNATIVE IN MORE DETAIL. UPDATED ON 3/11/14.

Project Sequences Subtotal			$50,296,320.39
102-1	Maintenance of Traffic	10.00 %	$5,029,632.04
101-1	Mobilization	10.00 %	$5,532,595.24
Project Sequences Total			$60,858,547.67
Project Unknowns		5.00 %	$3,042,927.38
Design/Build		0.00 %	$0.00

Non-Bid Components:

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	$150,000.00	$150,000.00
Project Non-Bid Subtotal					$150,000.00
Version 6 Project Grand Total					$64,051,475.05