

PRELIMINARY ENGINEERING REPORT

St. Johns River to Sea Loop. Multi-use Trail along S.R. 15 (U.S. 17) from S.R. 40 to Putnam County Line

Volusia County, Florida

Financial Project ID Number: 439876-1-22-01

ETDM Number: XXXXX

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 Federal Highway Administration and FDOT.

PROFESSIONAL ENGINEER CERTIFICATION

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Federal Aid Project Number: N/A

This preliminary engineering report contains engineering information that fulfills the purpose and need for the U.S. 17 Project Development & Environment Study from S.R. 40 to the Putnam County line Volusia County, Florida. 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 as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Landis Evans + Partners, Inc., and that I have prepared or approved the evaluation, findings, opinions, conclusions or technical advice for this project.

This item has been digitally signed and sealed by Theodore Petritsch, P.E. on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

TABLE OF CONTENTS

1.0	PROJECT SUMMARY	1-9
1.1	PROJECT DESCRIPTION	1-9
1.2	PURPOSE & NEED	1-9
1.3	COMMITMENTS.....	1-10
1.4	ALTERNATIVES ANALYSIS SUMMARY.....	1-11
1.4.1	Preliminary Route Alternatives	1-11
1.4.2	Final PD&E Alternatives.....	1-11
1.4.3	Evaluative Criteria.....	1-11
1.5	DESCRIPTION OF THE PREFERRED ALTERNATIVE	1-13
1.6	LIST OF TECHNICAL DOCUMENTS	1-13
2.0	EXISTING CONDITIONS	2-1
2.1	ROADWAY.....	2-1
2.2	RIGHT OF WAY	2-5
2.3	ROADWAY CLASSIFICATION & CONTEXT CLASSIFICATION	2-5
2.4	ADJACENT LAND USE	2-6
2.5	ACCESS MANAGEMENT CLASSIFICATION.....	2-7
2.6	DESIGN AND POSTED SPEEDS	2-7
2.7	VERTICAL AND HORIZONTAL ALIGNMENT.....	2-8
2.8	PEDESTRIAN ACCOMMODATIONS.....	2-9
2.9	BICYCLE FACILITIES.....	2-10
2.10	TRANSIT FACILITIES.....	2-10
2.11	PAVEMENT CONDITION	2-10
2.12	TRAFFIC VOLUMES AND OPERATIONAL CONDITIONS	2-10
2.12.1	Motor Vehicle Traffic	2-10
2.12.2	Transit Ridership.....	2-11
2.12.3	Nonmotorized Volumes.....	2-11
2.13	INTERSECTION LAYOUT AND TRAFFIC CONTROL	2-11
2.13.1	Intersection Layout.....	2-11
2.13.2	Traffic Control	2-12
2.14	RAILROAD CROSSINGS	2-12
2.15	CRASH DATA AND SAFETY ANALYSIS.....	2-12
2.15.1	Description of Pedestrian Crashes.....	2-13

2.15.2	Description of Bicycle Crashes.....	2-14
2.16	DRAINAGE	2-14
2.16.1	Existing Permits	2-15
2.17	SOILS AND GEOTECHNICAL DATA	2-17
2.18	UTILITIES	2-17
2.19	LIGHTING	2-19
2.20	SIGNS	2-19
2.21	AESTHETIC FEATURES.....	2-20
2.22	BRIDGES AND STRUCTURES.....	2-20
3.0	PROJECT DESIGN CONTROLS & CRITERIA	3-1
3.1	ROADWAY CONTEXT CLASSIFICATION	3-1
3.2	DESIGN CONTROL AND CRITERIA	3-1
4.0	ALTERNATIVES ANALYSIS	4-1
4.1	PREVIOUS PLANNING STUDIES.....	4-1
4.1.1	River to Sea TPO 2040 Long Range Transportation Plan	4-1
4.1.2	River to Sea TPO Bicycle and Pedestrian Plan.....	4-1
4.1.3	River to Sea TPO Regional Trails Corridor Assessment	4-1
4.1.4	Town of Pierson Comprehensive Plan	4-1
4.1.5	Volusia County Comprehensive Plan	4-2
4.1.6	Votran Transit Development Plan Major Update FY 2017-2026	4-2
4.1.7	FDOT District Five Project Traffic for PD&E and Design ETDM Mobility Evaluation Technical Memorandum	4-2
4.2	ALTERNATIVES ANALYSIS SUMMARY.....	4-2
4.2.1	Preliminary Route Alternatives	4-2
4.3	EVALUATION OF ROUTE ALTERNATIVES AND SELECTION FOR FULL PD&E STUDY	4-9
4.4	TYPICAL SECTIONS AND FINAL ALTERNATIVES DEVELOPMENT	4-10
4.4.1	Rural Typical Sections	4-10
4.4.2	Urban Typical Sections	4-10
4.4.3	Alternatives Development	4-16
4.5	NO-BUILD (NO-ACTION) ALTERNATIVE.....	4-16
4.6	TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS ALTERNATIVE (TSM&O) ...	4-16
4.7	FUTURE CONDITIONS	4-16
4.7.1	Land Use	4-16
4.7.2	Travel Demand	4-16
4.8	COMPARATIVE ALTERNATIVES EVALUATION	4-21

4.8.1	Facility Purpose	4-21
4.8.2	Social impacts.....	4-23
4.8.3	Potential Cultural/Natural Environment Impacts	4-24
4.8.4	Potential Physical Effects.....	4-25
4.8.5	Safety	4-26
4.8.6	Estimated Project Costs.....	4-26
4.9	SELECTION OF THE PREFERRED ALTERNATIVE.....	4-26
5.0	PROJECT COORDINATION & PUBLIC INVOLVEMENT	5-1
5.1	AGENCY COORDINATION.....	5-1
5.2	PUBLIC INVOLVEMENT	5-2
5.2.1	Feedback Received	5-3
6.0	DESIGN FEATURES OF THE PREFERRED ALTERNATIVE	6-1
6.1	ENGINEERING DETAILS OF THE PREFERRED ALTERNATIVE.....	6-1
6.1.1	Typical Sections.....	6-1
6.1.2	Bridges and Structures.....	6-7
6.1.3	Right of Way and Relocations	6-7
6.1.4	Horizontal and Vertical Geometry	6-7
6.1.5	Bicycle and Pedestrian Accommodations	6-7
6.1.6	Multi-Modal Accommodations	6-7
6.1.7	Access Management	6-7
6.1.8	Intersection Concepts	6-8
6.1.9	Intelligent Transportation System and TSMO Strategies.....	6-8
6.1.10	Utilities	6-8
6.1.11	Drainage and Stormwater Management Facilities	6-9
6.1.12	Floodplain Analysis	6-11
6.1.13	Transportation Management Plan	6-12
6.1.14	Special Features	6-12
6.1.15	Required Maintenance Agreements.....	6-12
6.1.16	Design Variations and Design Exceptions.....	6-12
6.1.17	Trailheads	6-13
6.1.18	Cost Estimates.....	6-14
6.2	SUMMARY OF ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE.....	6-15
6.2.1	Future Land Use	6-15
6.2.2	Section 4(f)	6-15
6.2.3	Cultural Resources	6-15

6.2.4	Wetlands.....	6-15
6.2.5	Protected Species and Habitat.....	6-15
6.2.6	Essential Fish Habitat	6-16
6.2.7	Highway Traffic Noise	6-16
6.2.8	Contamination.....	6-16
APPENDICES		A-1
APPENDIX A Evaluation Matrix Supporting Documentation		A-1
APPENDIX B Preferred Alternative (separate document)		B-1
APPENDIX C Land Use Maps		C-1
APPENDIX D Soil Map		D-1
APPENDIX E Wetlands Maps and Details Species Listing (with Land Use).....		E-1
APPENDIX F Utility Green Lines (separate document).....		F-1
APPENDIX G Potential Contamination Site Summary.....		G-1

LIST OF FIGURES

Figure 1-1	Project location map	1-10
Figure 1-2	Alternative routes	1-12
Figure 1-3	Project segmentation.....	1-14
Figure 4-1	Alternative routes	4-3
Figure 4-2	Alternative routes (zoom).....	4-4
Figure 4-3	Locations of potential rail crossings.....	4-6
Figure 4-4	Alternative "A" - rural.....	4-11
Figure 4-5	Alternative "B" - rural	4-12
Figure 4-6	Alternative "B" rural (additional R/W required).....	4-13
Figure 4-7	Alternative "A" or Alternative "D" - urban.....	4-14
Figure 4-8	Alternative "B" or Alternative "C" - urban.....	4-15
Figure 4-9	Project segmentation map.....	4-17
Figure 4-10	Volusia County Future Land Use Map	4-18
Figure 4-11	Town of Pierson (north) Land Use Map.....	4-19

Figure 4-12 Town of Pierson (south) Land Use Map.....	4-20
Figure 4-13 Alternatives evaluation matrix as presented at Alternatives Open House.....	4-22
Figure 5-1 Attendees at Alternatives Open House.....	5-2
Figure 5-2 Discussion at Alternatives Open House	5-3
Figure 6-1 Preferred alternative typical 1 - rural	6-2
Figure 6-2 Preferred alternative typical 2A - rural R/W required	6-3
Figure 6-3 Preferred alternative typical 2B - rural R/W not required.....	6-4
Figure 6-4 Preferred alternative typical 3 - constrained urban	6-5
Figure 6-5 Preferred alternative typical 4 - constrained rural.....	6-6

LIST OF TABLES

TABLE 2-1 Range of Right of Way Widths by Typical Section.....	2-5
TABLE 2-2 Roadway Segment Context Classification	2-6
TABLE 2-3 Roadway Segment Speed Limit.....	2-7
TABLE 2-4 U.S. 17 Highway Horizontal Alignment Data.....	2-8
TABLE 2-5 Sidewalk Locations.....	2-9
TABLE 2-6 Votran Stop Locations	2-10
TABLE 2-7 U.S. 17 Traffic Data.....	2-11
TABLE 2-8 Intersection Turn Lanes	2-12
TABLE 2-9 Intersection Traffic Control	2-12
TABLE 2-10 Existing SJRWMD Permits	2-16
TABLE 2-11 Lighting along U.S. 17	2-19
TABLE 2-12 Culvert Data Summary	2-22
TABLE 3-1 Design Criteria	3-1
TABLE 4-1 Preferred Alternative	4-27

TABLE 6-1 Impacted UAO Costs	6-8
TABLE 6-2 LRE Summary Table	6-14
Table 6-3 Recommended Level 2 Contamination Assessments	6-17

1.0 PROJECT SUMMARY

1.1 PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT) District 5 conducted a Project Development and Environment Study to determine the potential physical, cultural, and environmental effects of a proposed 13.7-mile segment of the St. Johns River to Sea (SJR2C) Loop shared use path on U.S. 17 or alternative route from S.R. 40 to the Putnam County line, in Volusia County (**FIGURE 1-1 Project location map**). The SJR2C Loop is the longest multi-use loop trail underway through the southeast United States and follows the East Coast Greenway along Florida's Atlantic Coast and St. Johns River corridor.

This project starts in the community of Barberville, north of S.R. 40, as a continuation of a shared use path that has been designed as part of the four-lane widening of U.S. 17 between Ponce DeLeon Springs Boulevard and S.R. 40 – Financial Project Identification (FPID) No. 410251-1. The study continues through the Town of Pierson and the community of Seville, to the Volusia/Putnam County line. North of the county line, the potential for an additional segment of the SJR2C along U.S. 17 is anticipated to be studied in the future by District 2.

1.2 PURPOSE & NEED

The purpose of the project is to provide a multi-use trail that meets Florida Shared-Use Nonmotorized (SUN) Trail Network criteria.

The need for the project is to provide pedestrian and bicycle accommodations for local and regional users by building a multi-use trail that adds approximately 14 miles to the existing and scheduled-for-construction system. It will span the distance between State Road 40 and the Volusia/Putnam County line and be a segment of the planned five-county, 260-mile St. Johns River to Sea Loop Trail.

The Purpose and Need for this project are supported by the trail corridor's inclusion in numerous transportation planning documents. The study corridor is identified in several local and regional transportation plans and studies.

- *River to Sea TPO 2040 Long Range Transportation Plan*
- *River to Sea TPO Bicycle and Pedestrian Plan*
- *River to Sea TPO Regional Trails Corridor Assessment*
- *Town of Pierson Comprehensive Plan*
- *Volusia County Comprehensive Plan*
- *Votran Transit Development Plan Major Update FY 2017-2026*
- *FDOT District Five Project Traffic for PD&E and Design ETDM Mobility Evaluation Technical Memorandum*

The relevance of these plans is discussed **Section 4**.

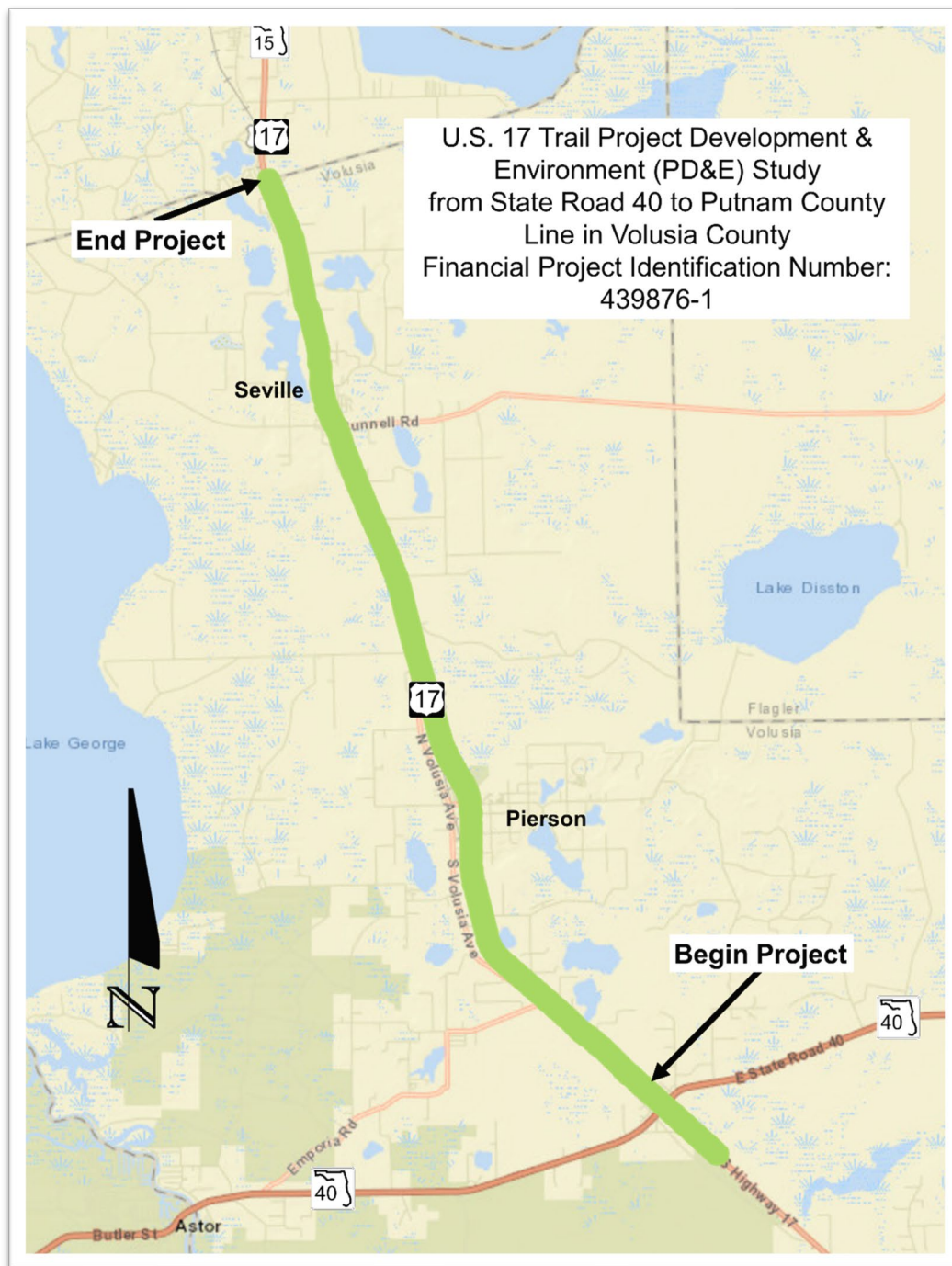


Figure 1-1 Project location map

1.3 COMMITMENTS

No commitments have been identified as of the submittal of this draft Preliminary Engineering Report.

1.4 ALTERNATIVES ANALYSIS SUMMARY

This summary documents two stages of the process used to develop, evaluate, and determine the recommended preferred alternative. These stages are the Preliminary Route Alternatives and the Final PD&E Alternatives.

1.4.1 Preliminary Route Alternatives

Within the southernmost one-third of the study area, three potential route alternatives (See **Figure 1-2 Alternative routes**) were evaluated. These alternatives included the “Power Line” route alignment, the “County Road 3” route, and the “U.S. 17” route. The U.S. 17 route follows U.S. 17 directly from Barberville to the Town of Pierson. The CR 3 route requires a short jog, approximately 850 feet to the west, on S.R. 40 to reach CR 3, then travels along CR 3 into the Town of Pierson, and then reconnects to U.S. 17 via a local street (2nd Avenue was considered for this connection).

These route alternatives were evaluated at the outset of this PD&E study to determine a viable route for the multi-use trail that will ultimately connect to the segment of the St. Johns River to Sea Loop in or near the Volusia/Putnam County line. The U.S. 17 route was advanced for the final PD&E study.

1.4.2 Final PD&E Alternatives

The final PD&E Alternatives included alignments along the east side of U.S. 17.

1.4.3 Evaluative Criteria

Six categories of evaluative criteria were finalized and established for evaluating the alignments:

1. Facility Purpose,
2. Social Impacts,
3. Potential Cultural/Natural Environment Impacts,
4. Potential Physical Effects,
5. Safety, and
6. Estimated Project Costs (following the Matrix Documentation Memorandum dated July 26, 2018, **APPENDIX A**)

Each of the candidate alternatives were evaluated within each of the eight segments, based on available data.

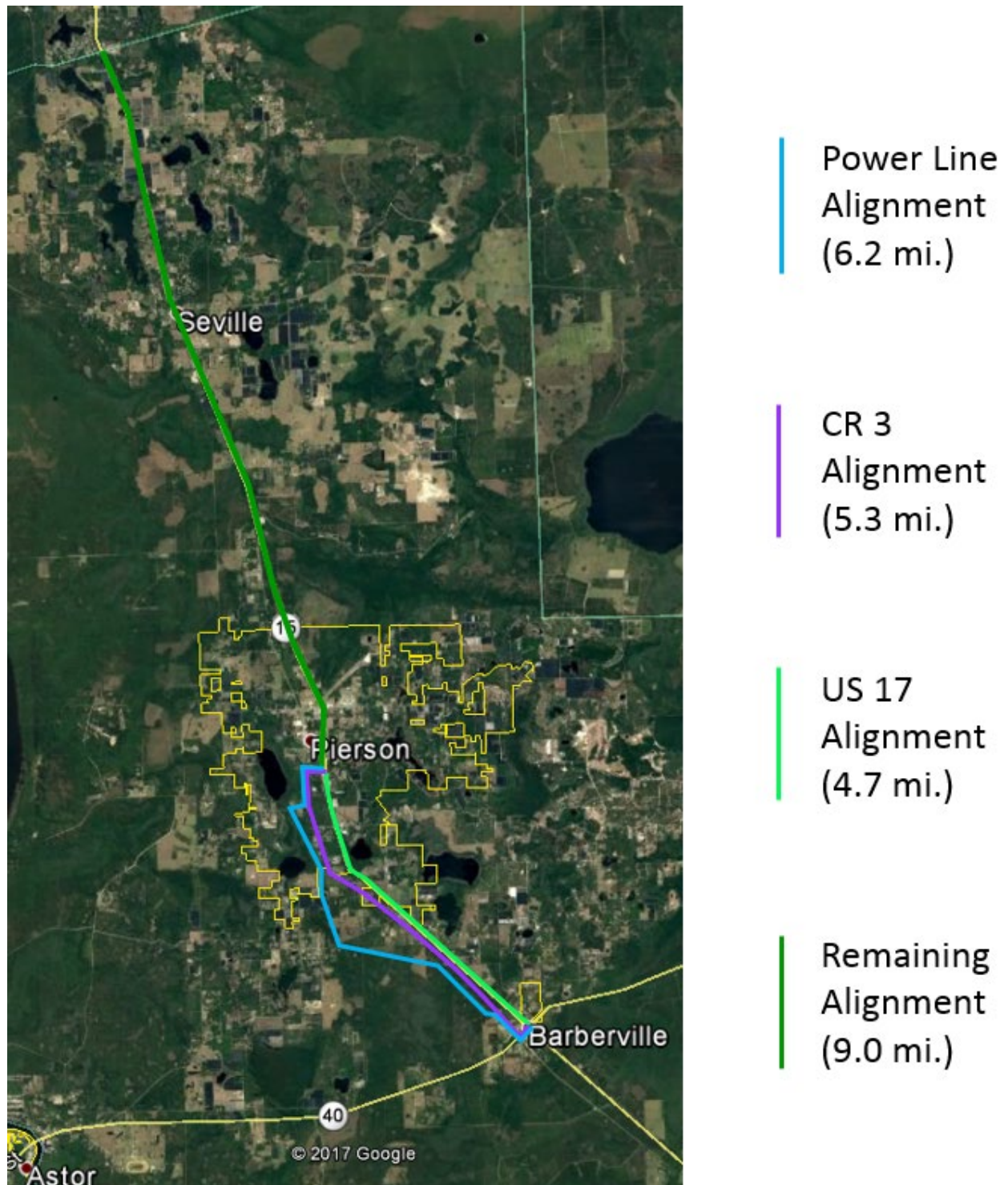


Figure 1-2 Alternative routes

1.5 DESCRIPTION OF THE PREFERRED ALTERNATIVE

The preferred alternative for the corridor follows U.S. 17 and is located on the east side of the roadway. For analysis the corridor was divided into 8 segments as shown in **Figure 1-3 Project segmentation**. The preferred alternatives are as follows:

<u>Segments</u>	<u>Typical Section</u>
1, 3, 4, and 7	Rural cross section 12-ft pathway
2 & 8	Rural cross section 12-ft pathway (additional right of way needed)
5 & 6	Urban cross section 8-ft wide pathway with existing bike lanes

1.6 LIST OF TECHNICAL DOCUMENTS

<i>Safety Analysis</i>	Final; February 2018
<i>Alternative Route Screening Evaluation</i>	Final; February 2018
<i>Natural Resource Evaluation (NRE)</i>	Final; January 2019
<i>Contamination Screening Evaluation Report (CSER)</i>	Final; March 2019
<i>Cultural Resource Assessment Survey (CRAS)</i>	Draft; March 2019
<i>Abbreviated Location Hydraulic Report Memorandum (LHR)</i>	Final; February 2020
<i>Matrix Documentation Memorandum</i>	Final; July 2018
<i>Utility Assessment</i>	Final; September 2019

SECTION 1 – PROJECT SUMMARY

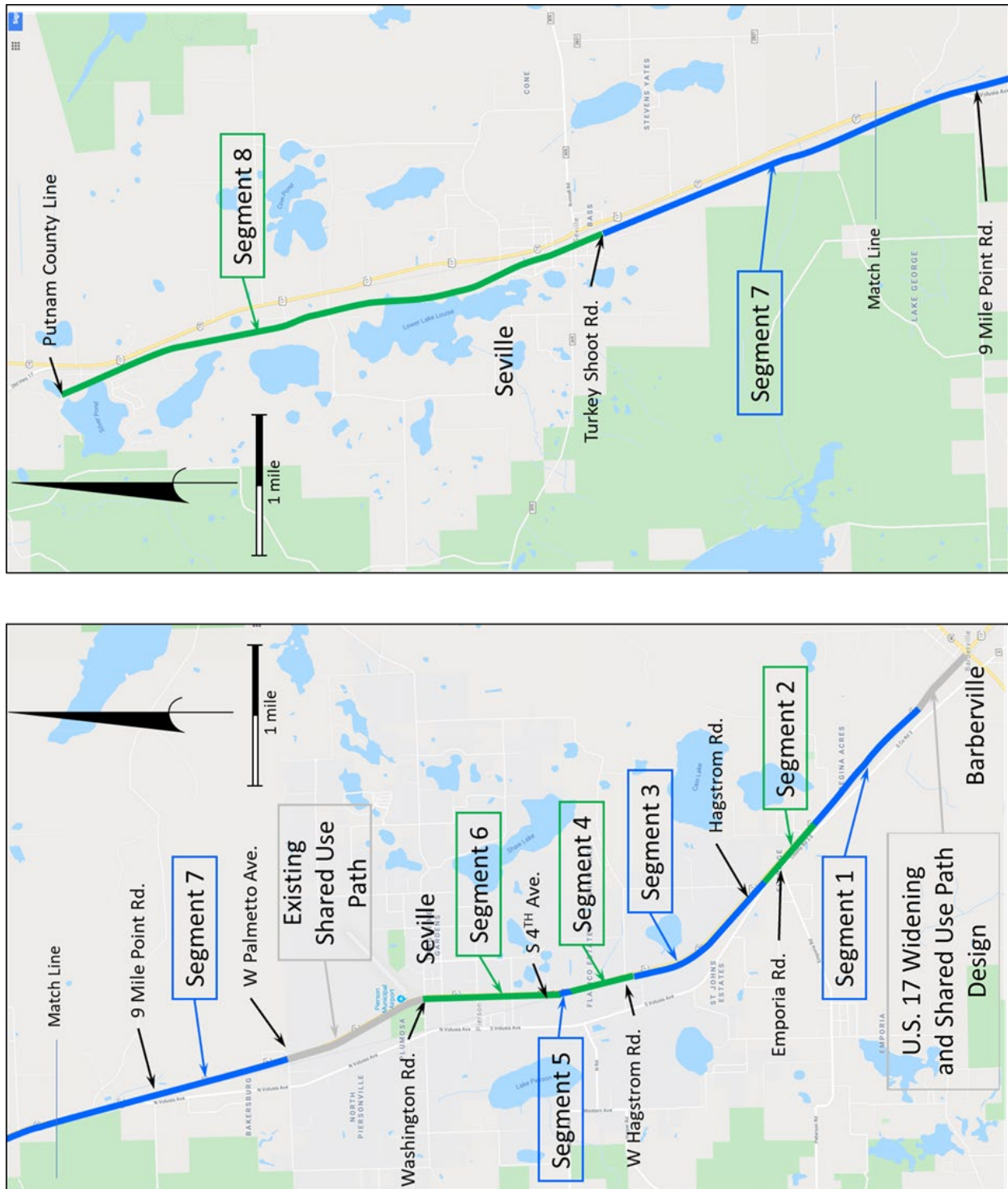


Figure 1-3 Project segmentation

2.0 EXISTING CONDITIONS

The existing conditions review provided in this section is for the final PD&E Alternatives. All these alternatives are located on the east side of U.S 17 (see **Section 1.4.2**).

2.1 ROADWAY

From the beginning of the project (MP 12.565) to Hagstrom Road (MP 15.708) U.S. 17 is a two-lane rural roadway with 11-ft lanes, 4-ft paved shoulders and 12-ft unpaved shoulders. The posted speed limit is 60 mph. No sidewalks are present on this section. The section widens briefly to accommodate a left turn lane at Emporia Road (MP 14.298).

At Hagstrom Road (MP15.708) the posted speed limit reduces to 40 mph and sidewalks are present on both sides of U.S. 17.

On the approach to Pierson, the travel lanes widen to 12-ft and the roadway begins to transition to an urban typical section. At MP 16.197 curb and gutter begins on the east side of U.S. 17. At E 4th Avenue. The cross-section through Pierson is two lanes (widths vary 10.5 – 12-ft), bike lanes (4 – 5-ft), curb and gutter and 5-ft sidewalk on both sides of the roadway separated from the curb and gutter by 5 feet (nominally).

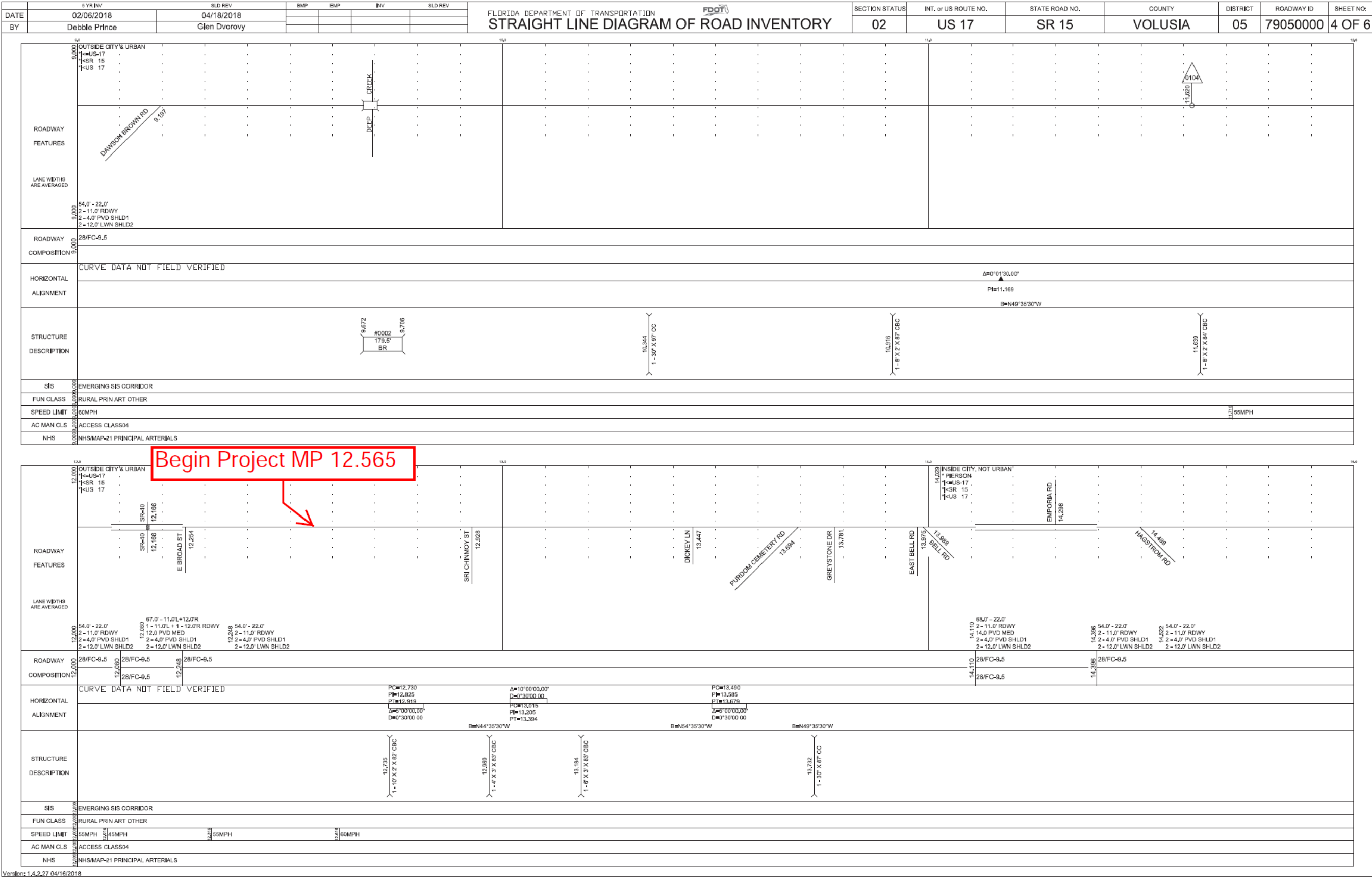
North of Pierson, the roadway transitions back to a rural typical cross-section with the west side curb and gutter ending at 1st Avenue (MP 17.064) and the east side curb and gutter ending at Washington Avenue (MP 17.194). The section widens briefly to accommodate left turn lanes for Washington Avenue.

U.S. 17 between Washington Avenue (MP 17.194) and Palmetto Avenue (MP 18.295) recently had a shared use path constructed on the east side and is not included in this project evaluation.

North of Palmetto Avenue (MP 18.295) to the Putnam County line (MP25.873) U.S.17 is a two-lane rural typical section with varying lane widths, 4-ft paved shoulders, and 12-ft unpaved shoulders. There is a left turn lane on the northbound approach to a development just south of Turkey Shoot Road (MP 22.713). There is a northbound right turn lane and north and southbound left turn lanes at CR 305/Bunnell Rd (MP 22.455). The posted speed limit along this section is 60 mph.

The FDOT Straight Line Diagrams for the study section of U.S. 17 are provided on the following pages.

SECTION 2 – EXISTING CONDITIONS



ROADWAY FEATURES

LANE WIDTHS ARE AVERAGED

ROADWAY COMPOSITION

HORIZONTAL ALIGNMENT

STRUCTURE DESCRIPTION

SIS

FUN CLASS

SPEED LIMIT

AC MAN CLS

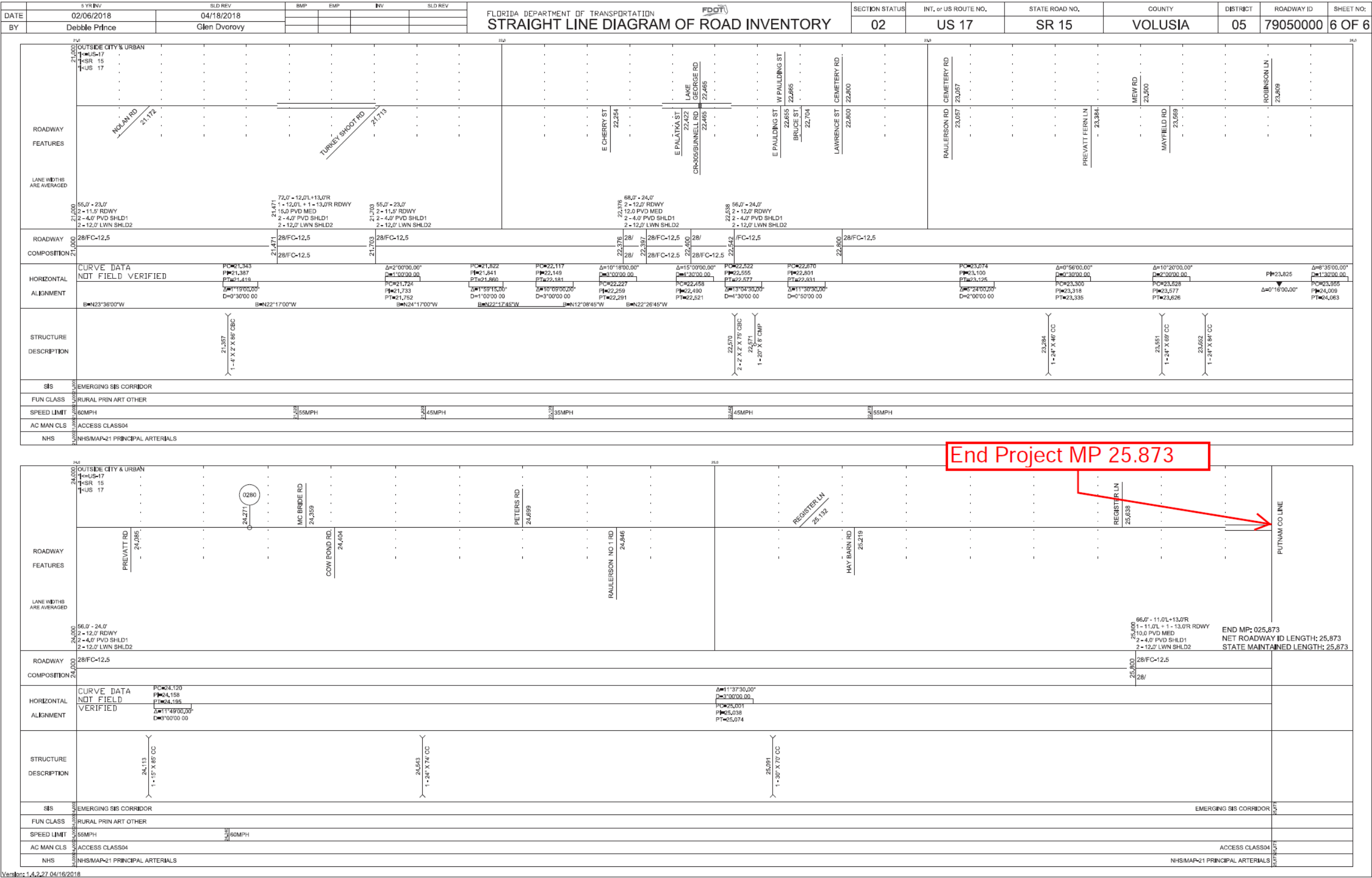
NHS

Begin Project MP 12.565

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SECTION 2 – EXISTING CONDITIONS

SECTION 2 – EXISTING CONDITIONS



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2.2 RIGHT OF WAY

Right of way documentation is sporadic along the study corridor. Right of way widths vary greatly along the corridor and at numerous locations the right of way maps did not identify any FDOT right of way. A Specific Purpose Survey was conducted to identify where FDOT right of way could be documented. Even after this survey, there were locations along the project where the right of way limits for U.S. 17 could not be documented.

The assumed right of way lines are shown on the concept plans in **APPENDIX B Preferred Alternative** under separate cover. A combination of FDOT right of way maps, the Specific Purpose Survey and Volusia County Property Appraiser Maps were used to develop the anticipated right of way for the project. The right of way lines shown on the concept plans are graphic representations only and have not been surveyed. The variation in right of way widths is identified in **TABLE 2-1 Range of Right of Way Widths by Typical Section** below. It shows the range of right of way widths over each segment of roadway represented by a separate typical section (numbered to be consistent with **Section 6.1.1 Typical Sections**).

TABLE 2-1 Range of Right of Way Widths by Typical Section

Begin Segment	End Segment	Right of Way Width	Typical Section
STA. 35+98	STA. 107+00	75' – 225'	Typical Section 1
STA. 107+00	STA. 131+00	50' – 120'	Typical Section 2A
STA. 131+00	STA. 201+00	75' – 225'	Typical Section 1
STA. 201+00	STA. 225+00	60' – 120'	Typical Section 2B
STA. 225+00	STA. 279.93+00	60'	Typical Section 3
STA. 339+00	STA. 519+00	75' – 225'	Typical Section 1
STA. 519+00	STA. 542+00	50'-120'	Typical Section 2A
STA. 542+00	STA. 584+45	60'	Typical Section 3
STA. 584+45	STA. 590+30	50'-120'	Typical Section 2A
STA. 590+30	STA. 603+90	60'	Typical Section 3
STA. 603+90	STA. 739+54	50'-120'	Typical Section 2A

For the purpose of determining appropriate cross sections in locations where the Special Purpose Survey was unable to define the right of way, 20 feet of width between the edge of pavement and the available right of way was assumed. This dimension was based upon discussions with FDOT maintenance and represents a conservative estimate of the area adjacent to U.S. 17 being maintained by FDOT.

2.3 ROADWAY CLASSIFICATION & CONTEXT CLASSIFICATION

U.S. 17 through the study corridor has a functional class of Rural Principal Arterial.

SECTION 2 – EXISTING CONDITIONS

Two Context Classifications are represented along this study section. The limits of each Context Classification segment are provided in **TABLE 2-2 Roadway Segment Context Classification**:

TABLE 2-2 Roadway Segment Context Classification

Begin Segment Location Begin Mile Point	End Segment Location End Mile Point	Context Classification
Begin Project MP 12.565	One mile N of Emporia Road MP 15.175	C2
One Mile N of Emporia Road MP 15.175	Begin Existing Trail MP 17.194	C3C
End Existing Trail MP 18.2905	E Cherry Street MP 22.250	C2
E Cherry Street MP 22.250	Cemetery Road MP 23.056	C3C
Cemetery Road MP 23.056	End of Project MP 25.872	C2

2.4 ADJACENT LAND USE

Within the Town of Pierson, the trail alignment considered is surrounded by an area generally characterized by undeveloped forested land and residential rural, light industrial, and some commercial land uses. In the Town of Pierson, the trail alignment passes along five areas designated as institutional land use and one park, Washington Avenue Park.

Within the community of Seville, the trail route considered is surrounded by an area generally characterized by undeveloped forested/pasture land and residential rural, residential low density, ornamentals and some commercial land uses.

Land Use Maps for the study corridor are provided in **APPENDIX C Land Use Maps**.

2.5 ACCESS MANAGEMENT CLASSIFICATION

U.S. 17 is designated and Access Class 4 for the entirety of the project length.

2.6 DESIGN AND POSTED SPEEDS

The design speed of the trail will be 18 mph. The posted speed limit through the corridor varies between 35 and 40 through the urban sections and 60 through the rural sections.

The designated speed limits by milepost are provided in **TABLE 2-3 Roadway Segment Speed Limit** below:

TABLE 2-3 Roadway Segment Speed Limit

Begin Segment Location Begin Mile Point	End Segment Location End Mile Point	U.S. 17 Speed Limit
Begin Project MP 12.565	270 feet north of project beginning MP 12.616	55 mph
270 feet north of project beginning MP 12.616	560 feet south of Hagstrom Road MP 15.602	60 mph
560 feet south of Hagstrom Road MP 15.602	1200 feet north of Hagstrom Road MP 15.936	50 mph
1200 feet north of Hagstrom Road MP 15.936	620 feet north of Washington Avenue MP 17.311	40 mph
620 feet north of Washington Avenue MP 17.311	2200 feet north of Washington Avenue MP 17.611	50 mph
2200 feet north of Washington Avenue MP 17.611	1020 feet south of Turkey Shoot Road MP 21.520	60 mph
1020 feet south of Turkey Shoot Road MP 21.520	565 feet north of Turkey Shoot Road MP 21.820	55 mph
565 feet north of Turkey Shoot Road MP 21.820	710 feet south of E Cherry Street MP 22.120	45 mph
710 feet south of E Cherry Street MP 22.120	460 feet north of CR335/ Bunnell Road MP 22.542	35 mph
460 feet north of CR335/ Bunnell Road MP 22.542	370 feet north of Raulerson Road MP 22.870	45 mph
370 feet north of Raulerson Road MP 22.870	820 feet north of Prevatt Road MP 24.240	55 mph
820 feet north of Prevatt Road MP 24.240	End of Project MP 25.872	60 mph

2.7 VERTICAL AND HORIZONTAL ALIGNMENT

The proposed shared use path will largely use the right of way of the U.S. 17 roadway corridor. While following the same general alignment as U.S. 17, the shared use path will have horizontal and vertical curves independent of the roadway alignment.

The alignment of U.S. 17 highway described below is provided based upon information on the existing horizontal roadway alignment and was obtained from the Specific Purpose Survey information. **TABLE 2-4 U.S. 17 Highway Horizontal Alignment Data** summarizes the existing horizontal curve data for U.S. 17 along the project corridor.

TABLE 2-4 U.S. 17 Highway Horizontal Alignment Data

Curve Number	PI Station	Back Tangent	Degree of Curvature	Radius (ft.)
C1	384+85.68	N 47° 57' 13.80" W	0° 29' 59.99"	11,459.21
C2	404+92.65	N 42° 57' 13.80" W	0° 29' 59.99"	11,459.20
C3	424+98.38	N 52° 57' 13.80" W	0° 29' 59.99"	11,459.21
C4	511+21.03	N 47° 57' 13.80" W	1° 57' 05.50"	2,935.94
C5	563+23.43	N 14° 01' 11.00" W	1° 00' 00.00"	5,729.58
C6	618+97.98	N 1° 16' 11.00" W	1° 45' 00.01"	3,274.04
C7	657+24.75	N29° 14' 40.00" W	0° 59' 20.11"	5,793.78
C8	727+31.90	N 16° 03' 42.79" W	0° 12' 00.42"	28,631.36
C9	779+69.40	N 14° 04' 38.72" W	0° 59' 13.05"	5,805.28
PI	791+72.56	N 22° 21' 34.87" W		
C10	813+81.33	N 22° 06' 09.78" W	0° 42' 12.61"	8,144.37
C11	837+09.03	N 23° 17' 45.54" W	0° 28' 06.10"	12,233.26
C12	855+46.83	N 22° 03' 45.54" W	0° 59' 58.93"	5,731.29
C13	861+08.60	N 24° 03' 45.54" W	0° 59' 59.46"	5,730.44
C14	877+36.77	N 21° 59' 11.61" W	2° 57' 18.26"	1,938.90
C15	883+11.13	N 11° 59' 11.59" W	3° 00' 00.10"	1,909.84
C16	895+35.45	N 22° 17' 11.59" W	4° 29' 55.24"	1,273.61
C17	898+80.13	N 35° 17' 11.59" W	4° 29' 56.84"	1,273.49
C18	911+74.84	N 22° 12' 41.59" W	0° 51' 24.24"	6,687.69
C19	927+50.70	N 10° 50' 39.51" W	1° 57' 14.54"	2,932.17
C20	939+02.71	N 5° 04' 46.84" W	0° 18' 44.93"	18,335.80
C21	952+69.94	N 4° 29' 46.84" W	1° 54' 09.48"	3,011.39
C22	976+81.30	N 14° 23' 12.17" W	2° 59' 59.91"	1,909.87
C23	983+14.77	N 25° 23' 12.17" W	3° 00' 38.13"	1,903.14
C24	1029+81.89	N 11° 01' 12.17" W	2° 58' 52.27"	1,921.91

Design level survey was not conducted as part of the PD&E Study phase. Based on field observations, the Conceptual Plan's alignment does not consist of any steep slopes and are

generally flat. To meet Americans with Disabilities Act (ADA), trail construction will not exceed a cross slope of 2% and the maximum longitudinal grade will be 5%.

No vertical alignment information was collected as a part of this phase.

2.8 PEDESTRIAN ACCOMMODATIONS

Sidewalks exist sparsely along the corridor. Approximately 1.5 miles of sidewalk exist on both the east and west sides of U.S. 17 through the Town of Pierson, north of Hagstrom Rd and south of Washington Ave. A 1-mile 12-ft-wide multi-use path now connects the eastern sidewalk to Pierson Elementary school from Washington Ave north up to E Palmetto Rd. The specific begin and end mile points and the side of the street (relative to stationing) are provided in **TABLE 2-5 Sidewalk Locations**.

TABLE 2-5 Sidewalk Locations

Begin Segment Location Begin Mile Point (MP)	End Segment Location End Mile Point (MP)	Sidewalk Side
Begin Project MP 12.565	Hagstrom Rd. MP 14.498	None
Hagstrom Rd. MP 14.498	E Washington Ave. MP 17.194	Both
W Washington Ave. MP 17.194	E Palmetto Ave. 18.295	*Shared Use Path (Right)
E Palmetto Ave. 18.295	N of E Cherry St. 22.324	None
N of E Cherry St. 22.324	S of E Palatka St. 22.374	Right
S of E Palatka St. 22.374	E Palatka St. 22.422	None
E Palatka St. 22.422	Lawrence St. 22.800	Right
Lawrence St. 22.800	Putnam Co. Line 25.873	None

Marked crosswalks exist across Hagstrom Rd, E 4th Ave, 3rd Ave, Echo St, 2nd Ave, an unoccupied business property driveway, 1st Ave, all 4 directions at Washington Ave, the concrete driveway located at Countryside Auto Repair, a concrete driveway near the municipal airport, and the elementary school's entrance. Approximately 0.36 miles of sidewalk exist through the community of Seville, north of Marion St north to Cemetery Rd. No marked crosswalks exist north of this section.

2.9 BICYCLE FACILITIES

In addition to the 12-ft-wide multi-use path through Pierson, 4-ft-wide paved shoulders are present through the entirety of the corridor; between Hagstrom Rd and Washington Ave, these paved shoulders are designated as bike lanes.

2.10 TRANSIT FACILITIES

Fixed route transit service along the corridor is provided by Votran Route 24, which runs from DeLand to New Hope Villas at the Putnam County line. In two locations (from Emporia Ave. to 1st Ave. and from Washington Ave. to Palmetto Rd.), the route runs parallel to U.S. 17 on CR 3 rather than along U.S. 17 itself. Three buses (morning, midday, and afternoon) run along the route six days a week; no Sunday service is provided.

Along the study corridor there are five transit stops that are signed and have recently-constructed, ADA-compliant, concrete pad waiting areas. Stops location by mile points and whether they are located on the approach or departure side of an intersection is noted in their location relative to an intersection are listed in **TABLE 2-6 Votran Stop Locations**.

TABLE 2-6 Votran Stop Locations

Transit Stop Mile Point (MP)	Side
Washington Ave. MP 17.194	Departure side, Right
Lake George Rd. MP 22.465	Departure side, Right
Peters Rd. MP 24.699	Departure side, Left
Raulerson No. 1 Rd. MP 24.846	Departure side, Right
New Hope Villas MP 25.873	Approach side, Right

2.11 PAVEMENT CONDITION

Cracking and ride ratings for U.S. 17 were identified from the FDOT Pavement Management reports.

From the beginning of the project to 306 feet south of E 4th Avenue in Pierson (MP 16.180) the cracking rating is 7.0 and the ride rating is 8.1. The balance of the project has a cracking rating of 7.0 and a ride rating of 7.8.

2.12 TRAFFIC VOLUMES AND OPERATIONAL CONDITIONS

2.12.1 Motor Vehicle Traffic

Traffic data for U.S. 17 was obtained from the FDOT 2018 Annual Average Daily Traffic Report.

TABLE 2-7 U.S. 17 Traffic Data

Location	Site #	AADT	K	D	T
4.724 miles north of S.R. 40	79-0448	7,400	9.5	60.0	7.6
0.17 mile south of CR 3	79-0046	5,300	9.5	60.0	11.25
0.074 mile south of McBride Ave.	79-0280	5,900	9.5	60.0	26.0

The FDOT District 5 Level of Service Report 2015 states that the entirety of the study corridor is operating at LOS B.

2.12.2 Transit Ridership

Votran reports (FY 2015) average daily weekday riders and daily Saturday riders of 46 riders and 39 riders respectively for Votran Route 24. Annual ridership is stated as 13,684 riders.

2.12.3 Nonmotorized Volumes

There are no bicycle or pedestrian counts for U.S. 17 on the project corridor. However, trips that will occur on the proposed shared use path facility were forecasted using the FDOT's *Conserve by Bicycling and Walking* (Phase II, 2009) corridor-level mode shift and induced recreational travel modeling method. This method predicts utilitarian and recreational bicycling and walking trips based on characteristics of the corridor itself, the quality of the surrounding transportation network, and demographics of the surrounding area. This method was applied for the area around Pierson as it represents the area likely to have the highest volume of users. The analysis assumed the construction of a shared use path adjacent to U.S. 17. Applying recommended temporal adjustment factors to the forecast daily user volumes yields an estimated 43 peak hour, peak season hourly directional trips within the corridor – this equates to an average of one user crossing a given point in either direction once every 42 seconds.

2.13 INTERSECTION LAYOUT AND TRAFFIC CONTROL

2.13.1 Intersection Layout

U.S. 17 is a two-lane roadway and most driveways and intersections do not include turn lanes. Those that do have turn lanes are listed in **TABLE 2-8 Intersection Turn Lanes**.

TABLE 2-8 Intersection Turn Lanes

Intersection	Mile Point	Turn Lanes
Emporia Rd	14.298	NB left turn lane
Washington Ave	11.194	NB left turn lane SB left turn lane
Pierson Elementary	18.143	SB left turn lane
Armellini Industries	19.700	NB right turn lane
Volusia Forest Trail	19.781	NB right turn taper
JCR Transportation	21.628	NB left turn lane
Marion St	22.422	SB left turn lane
Bunnell Rd/Clayton Ave	22.465	NB left turn lane NB right turn lane SB left turn lane

2.13.2 Traffic Control

At most of the intersections along the corridor there is no traffic control for U.S. 17; the side streets are stop-controlled. Those with additional traffic control are listed in **TABLE 2-9 Intersection Traffic Control**.

TABLE 2-9 Intersection Traffic Control

Intersection Location Mile Point (MP)	Traffic Control	Pedestrian Accommodations
2 nd Ave. MP 16.802	Signal	Crosswalks
1 st Ave. MP 17.064	Signal	Crosswalks
Washington Ave. MP 17.194	Signal	Crosswalks
Bunnel Rd. MP 22.465	Signal N/S Flashing Yellow E/W Flashing Red	None

2.14 Railroad Crossings

One railroad corridor was identified within the limits of the study area. The Sanford to Palatka line was reportedly constructed during 1885 and is located on the west side of U.S. 17 and within the study limits. The alignments evaluated for this study do not cross or impact the rail line. They maintain at least 75 feet of separation to the rail line.

2.15 CRASH DATA AND SAFETY ANALYSIS

A safety analysis was completed for this project in February of 2018. Crash data for U.S. 17 for 2011 – 2015 was provided by FDOT District 5. The data provided was in the form of Crash Analysis

Reporting System (CARS) outputs. FDOT provided a Crash Detail output and a Crash Summary output for the project. The Crash Detail is a crash-by-crash listing of spatial, temporal, behavioral, and environmental characteristics associated with each collision. The Crash Analysis data provides aggregated descriptions of the crashes which, while they can potentially be used to identify general trends, cannot be used to obtain information about individual crashes. A total of 112 crashes were analyzed. Of these, four were listed as pedestrian crashes and one was listed as a pedalcycle (bicycle) crash.

Subsequent to reviewing the CARS data, the Signal Four application was queried to search the actual crash reports for pedestrian and bicycle crashes. Four pedestrian crash reports were obtained. The bicycle crash noted in the CARS does not appear in the Signal Four dataset.

A subsequent Signal Four query for pedestrian and bicycle crashes was made for any additional crashes occurring in the 2016 – 2018 period. This query identified one additional bicycle crash.

2.15.1 Description of Pedestrian Crashes

Four pedestrian crashes occurred on the study section in the period including 2011 – 2018 and are described in the following paragraphs.

MP 12.245 – 6/28/2013

This was an injury pedestrian crash. A pedestrian was struck while trying to cross U.S. 17 west to east approximately 50 feet south of Broad Street. The crash occurred at 5:55 AM in DARK - NOT LIGHTED conditions. The pedestrian crossed the southbound lanes and walked into the northbound lanes. An approaching motorist was unable to stop in time to avoid the collision. The pedestrian's condition before the crash was noted as "staggering and out of it" by a witness. No alcohol test was performed because the pedestrian was in a medically induced coma.

MP 14.519 – 09/25/2011

This was a fatal pedestrian crash. A pedestrian was struck while walking on the west shoulder of U.S. 17 approximately 160 feet north of Hagstrom Road. The crash occurred at 7:50 PM under DARK – NOT LIGHTED conditions. Prior to this crash, another (motor vehicle) crash had occurred at Hagstrom Road. The pedestrian was walking on the shoulder adjacent to a queue of vehicles backed up in the southbound lanes, north of the Hagstrom Road crash. A pickup truck approaching southbound failed to notice the stopped cars in the southbound lanes; the driver reported trying to stop and failing to be able to do so in time, swerved onto the shoulder and struck the pedestrian. It was determined that the brakes of the pickup truck that struck the pedestrian failed due to improper maintenance.

MP 18.291 – 4/25/2013

This was an injury pedestrian crash. A pedestrian was struck while in the W Palmetto Avenue crosswalk on the west side of U.S. 17. The crash occurred at 5:10 AM under DARK – NOT LIGHTED

conditions. The pedestrian stated he was trying to flag down the vehicle that hit him as he thought his girlfriend was in the vehicle.

MP 18.387 – 7/11/2012

This was a fatal pedestrian crash. A pedestrian was walking along the western shoulder of U.S. 17 approximately 350 feet north W Palmetto Avenue when he apparently stepped into the southbound travel lane. The crash occurred at 9:10 PM under DARK – NOT LIGHTED conditions. A blood test was conducted on the pedestrian and he was found to have a BAC of 0.29.

2.15.2 Description of Bicycle Crashes

Two bicycle crashes occurred on the study section in the period including 2011 – 2018.

MP 18.491- 2/22/2015

This was an injury bicycle crash. The Signal Four search did not reveal a crash report for this crash. The crash occurred in the 6:00 PM hour under DARK – NOT LIGHTED conditions; the weather was coded as RAIN. The crash detail states the motorist was travelling northbound. The crash detail states the bicyclist failed to yield the right of way.

MP 19.287 – 10/11/2016

This crash resulted in an incapacitating injury. A bicyclist was traveling on the eastern shoulder of U.S. 17 approximately 800 feet south of CR 3 when he was hit by an overtaking motorist. The crash occurred at 7:50 AM in DAYLIGHT conditions. The report narrative suggests the bicyclist left the shoulder and entered the travel lane just prior to the collision.

2.16 DRAINAGE

The proposed shared use pathway alignment is located near the top of the ridge line in several areas and crosses seven different waterbodies. The waterbody names, waterbody identification (WBID) numbers, approximate location by stationing, and primary surface flow direction are as follows:



1. Unnamed slough (WBID 2911) from beginning of project to Station 85+00 and flows west,
2. Shaw Lake Outlet (WBID 2906) from Station 85+00 to Station 260+00 and flows east,
3. Price Creek (WBID 2904) from Station 260+00 to Station 450+50 and flows west,
4. Unnamed slough (WBID 2632) from Station 450+50 to Station 522+00 and flows west,

5. Lake George Leftover (2893A3) from Station 522+00 to Station 626+50 and flows east,
6. Louise Lake (Lower Segment) Drain (WBID 2902A) from Station 626+50 to Station 704+50 and flows east,
7. Crescent Lake (WBID 2606B) from Station 704+50 to end of project and flows east.

Two of the waterbodies (WBID 2606B and 28993A3) are on the 303(d) List based on the nutrient criteria for chlorophyll-a and total phosphorus. The Florida Department of Environmental Protection (FDEP) has prepared a Basin Management Action Plan for Crescent Lake (WBID 2606B). The Final TMDL Report for the Lower St. Johns Basin, Crescent Lake notes reduced load requirements for total phosphorus and nitrogen. It should be noted that the WBID 2632 which is part of the Lower St. Johns Group has a Basin Management Action Plan pending based on total nitrogen and phosphorus parameters.

Within the Town of Pierson there is a closed drainage system (from STA. 224+95 to STA. 280+38) which is in two waterbodies: the Shaw Lake Outlet (WBID 2906) and Price Creek (WBID 2904). The existing system is undersized, per current FDOT drainage design criteria, in several locations. More information concerning the Town of Pierson's existing closed drainage system is included in the *Abbreviated LHR* prepared under a separate cover and included as part of the study files.

2.16.1 Existing Permits

TABLE 2-10 Existing SJRWMD Permits lists existing permits which have been identified relative to the U.S. 17 PD&E Study issued by St. Johns River Water Management District (SJRWMD).

SECTION 2 – EXISTING CONDITIONS

TABLE 2-10 Existing SJRWMD Permits

Permit No	Project Name	Applicant	Issue Date	Expiration Date	Permit Status	Project Acreage	Imp. Wetland Req. Mitigation
29677	TD Taylor Middle & High School campus expansion	Volusia County Schools	9/8/2003	9/8/2008	Issued	55	Avg. 0.4 acres
65844	Seville Child Development Center	Redlands Christian Migrant Association	7/10/2000	7/10/2005	Issued	1.3	
67904	S.R. 40 expansion: Tymber Creek Rd to Cone Rd.	Florida Department of Transportation - District 5	5/7/2002	5/7/2007	Issued	164	Avg. 13.715 acres
67904	S.R. 40 widening: SR 11 to Cone Road (FPID 240837-1-32-01)	FDOT - District 5	9/16/2016	9/16/2026	Issued	186	Avg. 53 acres
67904	S.R. 40 Widening: U.S. 17 to SR 11 (FPID 240836-1-32-01)	FDOT - District 5	7/22/2016	7/22/2026	Issued	198.7	Avg. 62.76 acres
79423	Prime Inc Flower Warehouse	Prime Floral, LLC	8/17/2006	8/17/2011	Issued	6.13	
80917	45th Street Realty Warehouse	45th Street Realty	1/18/2002	1/18/2007	Issued	5.68	
85969	International Hair Design		12/6/2002	12/5/2007	Issued	1.24	
90801	Dollar General		10/28/2003	10/28/2008	Issued	1.25	
92468	New Buckles Road and Silver Road Paving	County of Volusia	3/9/2004	3/9/2009	Issued	1.98	
97958	Villanueva Fruit Stand		10/11/2005	10/11/2010	Issued	1.25	
99611	Barberville Bar-B-Que		7/13/2005	7/13/2010	Issued	0.61	
101963	Fourth Ave Sixth Ave Franklin St Pine St Block St and Lee St	Volusia County	11/17/2005	11/17/2010	Issued	2.62	
110402	Pecan St; Fredrick St; Echo St; Shiloh Pt. Rd; Shiloh Rd; and Kicklighter Rd.	Volusia County	4/17/2007	4/17/2012	Issued	5.96	
116699	TRC Pierson, LLC Family Dollar Pierson Florida	TRC Pierson, LLC	7/14/2008	7/14/2013	Issued	1.69	
117994	San Jose Mission	Bishop Diocese of Orlando	4/3/2009	4/3/2014	Issued	5.86	
120565	Frederick St. and Swoope Power Plant Dr.	Volusia County	10/15/2009	10/15/2014	Issued	1.85	
121381	Pitmasters BBQ	Sammie D & P Jackson Trivett	5/9/2011	5/9/2016	Issued	0.92	
123007	Heritage Heating & Air Contractor Shop	Heritage Heating & Air Inc	12/29/2009	12/29/2014	Issued	0.65	
124647	U.S. 17 (Ponce DeLeon Blvd to S.R. 40), FPID 410251-1-52-01	Florida Department of Transportation - District 5	9/13/2011	9/13/2016	Issued	229.09	Avg. 15.46 acres

SECTION 2 – EXISTING CONDITIONS

Permit No	Project Name	Applicant	Issue Date	Expiration Date	Permit Status	Project Acreage	Imp. Wetland Req. Mitigation
124647	U.S. 17 Widening: Ponce DeLeon Blvd to S.R. 40 (FPID 410251-1-52-01)	Florida Department of Transportation - District 5	7/19/2016	9/13/2018	Issued	229.09	
124647	U.S. 17 Widening: Ponce DeLeon Blvd to S.R. 40 (FPID 410251-1-52-01)	FDOT	7/19/2016	9/13/2018	Issued	229.09	
124647	U.S. 17 Widening: Ponce DeLeon Boulevard to S.R. 40	Florida Department of Transportation - District 5	3/8/2018	3/8/2023	Issued	247.08	Avg. -3.1 acres
131833	Dirt Road Reduction 2012 - Barberville & Seville Area	Volusia County	9/20/2012	9/20/2017	Issued	6.62	
139276	U.S. 17: Pierson sidewalks	Florida Department of Transportation, District Five	9/29/2014	9/29/2019	Issued	0.35	Avg. 0 acres
148488	Site Development for Texmex Shack		1/6/2017	1/6/2116	Issued	0.93	
148727	Pierson Elementary Replacement School	Volusia County Schools	2/28/2017	2/28/2022	Issued	17.4	Avg. 0 acres
150007	U.S. 17 Shared Use Path from N. of Washington Street to Palmetto Avenue	Florida Department of Transportation, District 5	6/7/2017	6/7/2022	Issued	1.5	

The Environmental Resource Permits for the projects listed above were reviewed to determine any potential impacts the preferred alignment may have on existing or proposed stormwater management ponds. Based on the plans submitted for SJRWMD permit number 139276, the preferred alignment is within 25 feet of the proposed Stormwater Pond 8 of the U.S. 17 Widening Project at Station 38+00. Although the preferred alternative gets close to pond, it should not impact the pond based on the plans provided the permit application.

2.17 SOILS AND GEOTECHNICAL DATA

The Natural Resources Conservation Service (NRCS) Soil Survey of Volusia County, Florida was reviewed for information regarding near-surface soil conditions within the project limits. A soils map is provided in **APPENDIX D**.

2.18 UTILITIES

As a result of the data collected and a design ticket from Sunshine 811, ten utility companies were identified as being present in the project corridor: AT&T, Bright House Networks, Clay Electric Cooperative, Crown Castle, Duke Energy – Distribution, MCI/Verizon Business, Opticatel, Uniti Fiber, Volusia County – Water & Utility, and Windstream Florida Inc. Two of these, Volusia County

SECTION 2 – EXISTING CONDITIONS

– Water & Utility and Windstream Florida Inc., indicated they do not have facilities within the limits of the study. Of the remaining eight, six have potential conflicts between their facilities and the proposed FDOT project, depending on what improvements are being made. There are several potential conflicts along the proposed non-motorized transportation facility. Potential conflicts include buried fiber, buried copper, and power poles. If Duke Energy is in conflict, then the joint users on the poles will be in conflict as well. It is unknown whether utility relocations within the limits of the project would be at the expense of the utility owner or would be eligible for reimbursement. There are no plans by any Utility Agency/Owner (UAO) for upgraded and/or betterments of their facilities at this time.

The following UAOs were contacted:

AT&T Florida

Mr. Kirby Spencer
Southeast Construction & Engineering
900 North Nova Road
Daytona Beach, FL 32117
(386) 257-7912
ks2488@att.com

Clay Electric Cooperative

Mr. John Nicholson
UAO Project Representative
Post Office Box 5500
Salt Springs, FL 32134
(352) 685-4211
jnicholson@clayelectric.com

Duke Energy- Distribution

Mr. Robb Brown
Distribution Governmental Liaison
3300 Exchange Place, NP4A
Lake Mary, FL 32746
(352) 459-4671
robb.brown@duke-energy.com

Opticaltel

Mr. Larry English
UAO Project Representative
6601 Lyons Rd Suite 44 & 45
Coconut Creek, FL 33073
(352) 988-3645
lenglish@opticaltel.com

Volusia County- Water & Utility

Mr. Scott Mays
Utility Engineer
123 West Indiana Avenue
DeLand, FL 32720
(386) 943-7027 x12076
smays@co.volusia.fl.us

Bright House Networks, LLC

Mr. Paul Liakos
UAO Project Representative
1195 S. Woodland Blvd.
DeLand, FL 32724
(407) 215-8838
paul.e.liakos@charter.com

Crown Castle

Mr. Danny Haskett
Operations Manager
2000 Corporate Drive
Cannonsburg, PA 15317
(786) 610-7073
Danny.haskett@crowncastle.com

MCI/Verizon Business

Mr. Thomas Clark
UAO Project Representative
6929 N. Lakewood Ave.
Tulsa, OK 74117
(918)590-9903
Thomas.clark@verizon.com

Uniti Fiber

Mr. Bob Mensching
UAO Project Representative
Address
City, State Zip
(904) 718-8152
bob.mensching@uniti.com

Windstream Florida Inc.

Mr. Douglas Pickle
Senior Construction Manager
2301 Lucien Way, Suite 200
Maitland, FL 32751
(407) 835-0341
douglas.pickle@windstream.com

2.19 LIGHTING

Lighting along the project corridor is sporadic. With the exception of the area around the newly constructed trail, the lighting is primarily cobra-style lights mounted on utility poles (listed as “Other” in **TABLE 2-13 Lighting along U.S. 17**). All lights operate.

TABLE 2-11 Lighting along U.S. 17

Location (Mile Point)	Type	Side	Notes
Emporia Rd. (MP 14.498)	Other (Mounted)	Left	One lamp only, SW corner
E. Hagstrom Rd. (MP 15.708)	Other (Mounted)	Right	One lamp only, NE corner
E. 4 th Ave. (MP 16.283) to Washington Avenue (MP 18.134)	Other	Right	On approximately 350 ft spacings, mounted on utility poles. east side only
Bunnel Rd. (MP 22.465)	Other (Mounted)	Left	One lamp only, SW corner
Bruce St. (MP 22.774)	Other	Right	Appears to be a lamp put up for the benefit of a property owner, directed away from roadway, but lights sidewalk
North of Hay Barn Rd. (MP 25.489)	Other	Right	Appears to be a lamp put up for the benefit of a property owner, lights driveway

2.20 SIGNS

There are no overhead traffic signs along the study corridor.

Other signs include those typical for a rural roadway. These include the following sign types:

Regulatory

- Speed Limit (R2-1)
- Turning Vehicles Yield to Peds (R10-15)
- Do Not Pass (R4-1)
- Reduce Speed Limit (W3-5)
- Speeding Fines Doubled (FTP-38-06)
- Reverse Curve (W1-4)
- All Traffic Both Directions Stop While School Buses Load and Unload

Guide

- US Route 17 (M1-4)
- CR 305 Directional (M1-6)

Warning

- School Advance (S1-1, W16-9P)
- School Crossing (S1-1, W16-7P)
- End School Zone (S5-2)
- Reduce School Speed Limit Ahead w/ Flasher(S4-5)
- No Passing Zone (W14-3)
- Signal Ahead (W3-3)
- Grade Crossing Advance (W10-3)
- Pedestrian Crossing (W11-2, W16-7P)
- Pedestrian Crossing Advance (W11-2, W16-9P)

- CR 305 Junction (M1-6, M2-1)
 - Destination (D1-x)
 - Distance (D2-x]
 - Trucks Entering Highway
- Other**
- Dial * FHP (FTP-43-06)
 - Florida Scenic Byways

Signs are also provided for Barberville, Pierson Town Limit, Seville, Volusia County and Putnam County. Votran signs mark bus stops along the corridor. There are also local service signs for the Pierson post office, library, and the airfield. There are several locations with No Parking posted along the corridor in Pierson and Seville. A recreational and cultural interest sign is posted for the Lake George Management Area. The community of Seville has posted a local service sign for the Post Office.

Nolan Road is a T-intersection with U.S. 17. There is a Two-Direction Large Arrow (W1-7) supplemented with an OM1-3 (yellow object marker diamond without reflectors) opposite Nolan Road at this T-intersection.

2.21 AESTHETIC FEATURES

The 13.7-mile project corridor traverses rural communities lined with commercial plant nurseries and greenhouses, open fields, and citrus groves. It also passes through the rural town centers of Pierson and the community of Seville. Although this corridor is a single link of the St. Johns River to Sea Loop trail system, it also serves as a portion of the “River of Lakes Heritage Corridor.” As a state designated Scenic Byway/Trail, this use is based more on the cultural and aesthetic aspects and should be a consideration for future aesthetic improvements. The future trail and landscape design should respect and embrace the existing “Natural Florida” characteristics that served as the basis for this scenic byway designation. It would require placing a high priority in regard to aesthetic sensitivity toward both communities, their historic structures and specimen trees. Landscaping and amenities may be implemented if funded and maintained by the local municipalities through a Memorandum of Agreement with the Department.

2.22 BRIDGES AND STRUCTURES

Each of the existing drainage structures was evaluated to determine its existing condition and the feasibility of its extension or use in the accommodation of the proposed trail. There are fourteen existing concrete box culverts within the project limits. Two of the culverts are exempted out of this project because they fall within the limits of another project. All of these culverts are non-qualifying structures, which means they do not qualify as a bridge structure and as such, are not on a routine inspection program with District 5 Structures Maintenance or FHWA. As a result, there are no current inspection reports available for these structures. In 2007, there was an initiative to inspect all nonqualifying culverts within District 5. These structures were inventoried as part of that initiative but have not been inspected since.

TABLE 2-12 Culvert Data Summary indicates the location, size, and inspection information for each culvert. The culvert locations were obtained from the Straight Line Diagram for U.S. 17 in Volusia County. There was one box culvert identified in the field (M.P. 16.333) that was not on the Straight Line Diagram.

A field review was performed in January 2018 for general observations at the culvert locations and overall conditions; however, the culverts were not traversed as part of that review. Many of the comments from the 2007 Inspection Reports related to elements within the culverts could not be verified. The field review confirmed the stability of the existing culverts, evidenced by the good asphalt condition above the culverts, and the embankment stability. As expected with culverts of this age, there are cracks, spalls, scaling, and other deficiencies noted in the Inspection Reports. There is a chance that the condition inside the culvert has worsened since 2007. However, there are no present indications as to why these culverts would not be eligible for extension or used to support a proposed trail. In fact, there may be an opportunity to perform some minor repairs or rehabilitation as part of the design project that would extend the longevity of these structures. Simple repairs such as crack injection, spall repairs, or gunite application would be a cost-effective means to substantially extend the longevity, in lieu of a full replacement.

Based on the information presented above, it is recommended that the PD&E continue under the assumption that the twelve existing box culvert structures can be extended or can accommodate a proposed multi-use trail. A future design project can further evaluate the structures to make final recommendations based on their condition at that time.

SECTION 2 – EXISTING CONDITIONS

TABLE 2-12 Culvert Data Summary

Culvert No.	MP1	Size	Length	Last Inspection Date	Inspection Comments
79050N07	12.746	1 -10' x 2' CBC	82'	1/22/2007	Inside of culvert was not inspected, Minor wingwall spalls (no exposed steel)
79050N08	12.981	1 -4' x 3' CBC	83'	1/22/2007	Scaling on walls (2'), Cracks in wingwall joints (1/4"), Minor wingwall rotation (1")
79050N09	13.140	1 -6' x 3' CBC	83'	1/22/2007	Minor wingwall spalls (no exposed steel), Minor erosion at wingwall (protected by sod)
79050N10	15.222	1 -4' x 2' CBC	82'	1/22/2007	Scaling on walls (1'), Longitudinal crack in sidewall (up to 1"), Minor wingwall spalls (no exposed steel), Minor erosion at wingwall (protected by sod)
Unknown	16.333	1 -2' x 2' CBC	Unknown	n/a	n/a
79050N13	18.718	1 -5' x 2' CBC	84'	1/22/2007	Minor wingwall spalls (no exposed steel), Erosion at wingwall (protected by sod) and toe of box (east)
79050N14	19.270	1 -5' x 2' CBC	86'	1/22/2007	Minor wingwall spalls (no exposed steel), Minor erosion at wingwall (protected by sod)
79050N15	19.617	2 -9' x 5' CBC	84'	1/23/2007	Concrete arch widened both sides by double CBC. Scaling on walls (3') most substantial on original arch, Minor cracks 1/32"), Arch section has spalls (6" deep), 1 wingwall spall (exposed steel)
79050N16	19.889	1 -14' x 4' CBC	84'	1/23/2007	Concrete arch widened both sides by single CBC. Scaling on walls (2'), Substantial cracks (up to 1", seepage), Minor wingwall spalls (no exposed steel), Top of culvert exposed adjacent to roadway
79050N17	20.188	1 -9' x 3' CBC	84'	1/23/2007	Concrete arch widened both sides by single CBC. Scaling on walls (2'), Minor wingwall spalls (no exposed steel)
79050N18	20.684	1 -10' x 5' CBC	86'	1/23/2007	Concrete arch widened both sides by single CBC. Scaling on walls (2'), Substantial cracks (up to 1"), Minor wingwall spalls (no exposed steel)
79050N19	21.347	1 -4' x 2' CBC	83'	1/23/2007	Inside of culvert was not inspected, Scaling on walls (2'), Minor wingwall spalls (no exposed steel)

3.0 PROJECT DESIGN CONTROLS & CRITERIA

3.1 ROADWAY CONTEXT CLASSIFICATION

Context Class C2 and C3C are represented along this study section.

The 2019 FDOT Design Manual requires sidewalks be provided on Context Class C3C roadways with and without curb and gutter and also on C2 roadways “where demand for use is demonstrated.” The FDM states sidewalks on C2 sections have a 5-ft minimum width and those on C3 sections have a 6-ft minimum width. Wider sidewalks can be provided when demand is demonstrated. The shared use path provides the sidewalk for one side of the highway.

3.2 DESIGN CONTROL AND CRITERIA

The proposed design criteria for the shared use path along U.S. 17 are primarily based upon the 2019 FDOT Design Manual. These design criteria are provided in **TABLE 3-1 Design Criteria**.

TABLE 3-1 Design Criteria

Design Component	U.S. 17 Path
Functional Class	Shared Use Path
Minimum Width (FDM Chapter 224, Section 224.4)	
Desirable	12'
Limited Right of Way	10'
Constrained Conditions	8'
Maximum Longitudinal Grade (FDM Chapter 224, Section 224.6)	5%
Maximum Cross Slope (FDM Chapter 224, Section 224.5)	2%
Minimum Lateral Offset from Obstruction (FDM Chapter 224, Section 224.7)	4'
Maximum Graded Shoulder Area (FDM Chapter 224, Section 224.7)	2'
Maximum Cross Slope of Shoulder (FDM Chapter 224, Section 224.7)	1:6
Minimum Vertical Clearance (FDM Chapter 224, Section 224.8)	
Overhead Signs and Obstruction (Constrained Conditions)	8'
Overhead Obstruction	10'
Design Speed (FDM Chapter 224, Section 224.9)	18 MPH
Minimum Radii for Horizontal Curves (FDM Chapter 224, Table 224.10.1)	
18 MPH, Normal Crown	74'
18 MPH, Reverse Crown	86'
Minimum Stopping Sight Distance (FDM Chapter 224, Table 224.10.2) Flat	134'
Maximum Change in Grade without a Vertical Curve (FDM Chapter 224, Section 224.11)	3%
Minimum Separation from Roadway (FDM Chapter 224, Section 224.12)	
Rural, Full Shoulder (Measured from Shoulder break)	5'
Urban, Back of Curb	4'
Minimum Railing Height (FDM Chapter 222, Section 222.4)	42"

SECTION 3 – PROJECT DESIGN CONTROLS & CRITERIA

Design Component	U.S. 17 Path
Edge Drop-off Height Requiring Shielding (FDM Chapter 224, Section 224.15)	
> total drop-off within 2 feet of path	10"
from a slope greater than 1:2 beginning within 2' from path	60"

4.0 ALTERNATIVES ANALYSIS

4.1 PREVIOUS PLANNING STUDIES

The study corridor appears in several local and regional transportation plans and studies. Each of these was reviewed and the study alternatives were developed to be consistent with relevant portions of each plan.

4.1.1 River to Sea TPO 2040 Long Range Transportation Plan

A PD&E "Safety Study" for the corridor is identified as one of five unfunded needs on the Strategic Intermodal System (SIS) within the region. The TPO does not have this section of U.S. 17 programmed for widening in the timeframe of the current 2040 LRTP.

4.1.2 River to Sea TPO Bicycle and Pedestrian Plan

The region's bicycle and pedestrian plan notes the corridor's existing sidewalks and paved shoulders, but not the designated bike lanes in the Town of Pierson. The Plan's Bicycle Route Map and Pedestrian Route Map both identify the entirety of the corridor with a "Proposed Trail: Adopted" designation. The corridor is shown as part of the St. Johns River to Sea Loop Trail.

4.1.3 River to Sea TPO Regional Trails Corridor Assessment

This study identifies the corridor as one of ten gaps in the regional trails system recommended for conceptual design. Such a conceptual design is included in the study, which states that "Based upon field reconnaissance and an engineering review, the east side of U.S. 17 appears to best suited for construction of a future regional trail." An approximately \$6.5 Million (LRE estimate, 2018 dollars) for the trail was calculated for the identified alignment.

4.1.4 Town of Pierson Comprehensive Plan

The Transportation Element of the Town's Comprehensive Plan identifies U.S. 17 as Pierson's only arterial street, having a SIS-specified auto level of service (LOS) standard of "C." A generalized capacity analysis shows an existing (2009 traffic volumes) LOS of "B" and a future year (2025 projected volumes) LOS of "C" south of Washington Street and "D" north of Washington Street. Bicycle and pedestrian facilities and conditions in the Town are discussed in general terms. A stated objective of the Plan is that "The needs of pedestrians and bicyclists shall be accommodated in all road construction projects and reconstruction projects whenever possible and appropriate."

The Plan's Utilities Element acknowledges that the Town has two roadway-related stormwater systems, one of which "was constructed by the Florida Department of Transportation to drain Highway 17."

4.1.5 Volusia County Comprehensive Plan

The U.S. 17 corridor is not specifically referenced in the Transportation Element of the County's Comprehensive Plan, though it is mapped as part of the SIS and the River of Lakes Heritage Scenic Corridor. The Plan "recognizes the importance of providing pedestrian and bicycle facilities ..." and acknowledges an ongoing commitment within the Volusia County community to work together in the development of a cohesive network of sidewalks, paths and trails."

4.1.6 Votran Transit Development Plan Major Update FY 2017-2026

The *Transit Development Plan* identifies Route 24 as the only fixed route transit service along the corridor and provides days of operation, service span, and headways for that route. The route ranks 23rd out of 25 routes for annual ridership and has the lowest projected growth rate. The Plan's stakeholder interview summary includes frequency of service in Pierson as a substantial issue facing transit users.

4.1.7 FDOT District Five Project Traffic for PD&E and Design ETDM Mobility Evaluation Technical Memorandum

The primary purpose of this Efficient Transportation Decision Making evaluation was to conduct an initial analysis of the potential need for future roadway widening of U.S. 17 between S.R. 40 in Volusia County and Orange Avenue in Putnam County. Conclusions on that topic were uncertain given the wide range of potential growth scenarios between the existing year (2012) and design year (2036) scenarios. The evaluation includes summaries of existing bicycle and pedestrian facilities, bicycle and pedestrian crash history, and impacts of future land use on nonmotorized activity within the corridor.

4.2 ALTERNATIVES ANALYSIS SUMMARY

This section documents two stages of the process used to develop, evaluate, and determine the recommended preferred alternative. These stages are the Preliminary Route Alternatives and the Final PD&E Alternatives.

4.2.1 Preliminary Route Alternatives

Within the southernmost one-third of the study area, three potential route alternatives (**Figure 4-1 Alternative routes**) were evaluated. These alternatives included the "Power Line" route alignment, the "County Road 3" route, and the "U.S. 17" route. The U.S. 17 route follows U.S. 17 directly from Barberville to the Town of Pierson. The CR 3 route requires a short jog, approximately 850 feet to the west, on S.R. 40 to reach CR 3, then travels along CR 3 into the Town of Pierson, and then reconnects to U.S. 17 via a local street (2nd Avenue was considered for this connection). the power line route shares a common alignment with the CR 3 route at its southern and northern extents (along S.R. 40, CR 3, and 2nd Avenue), but for most of its length would use the power line easement that contains 230-volt transmission lines owned and maintained by Duke Energy.

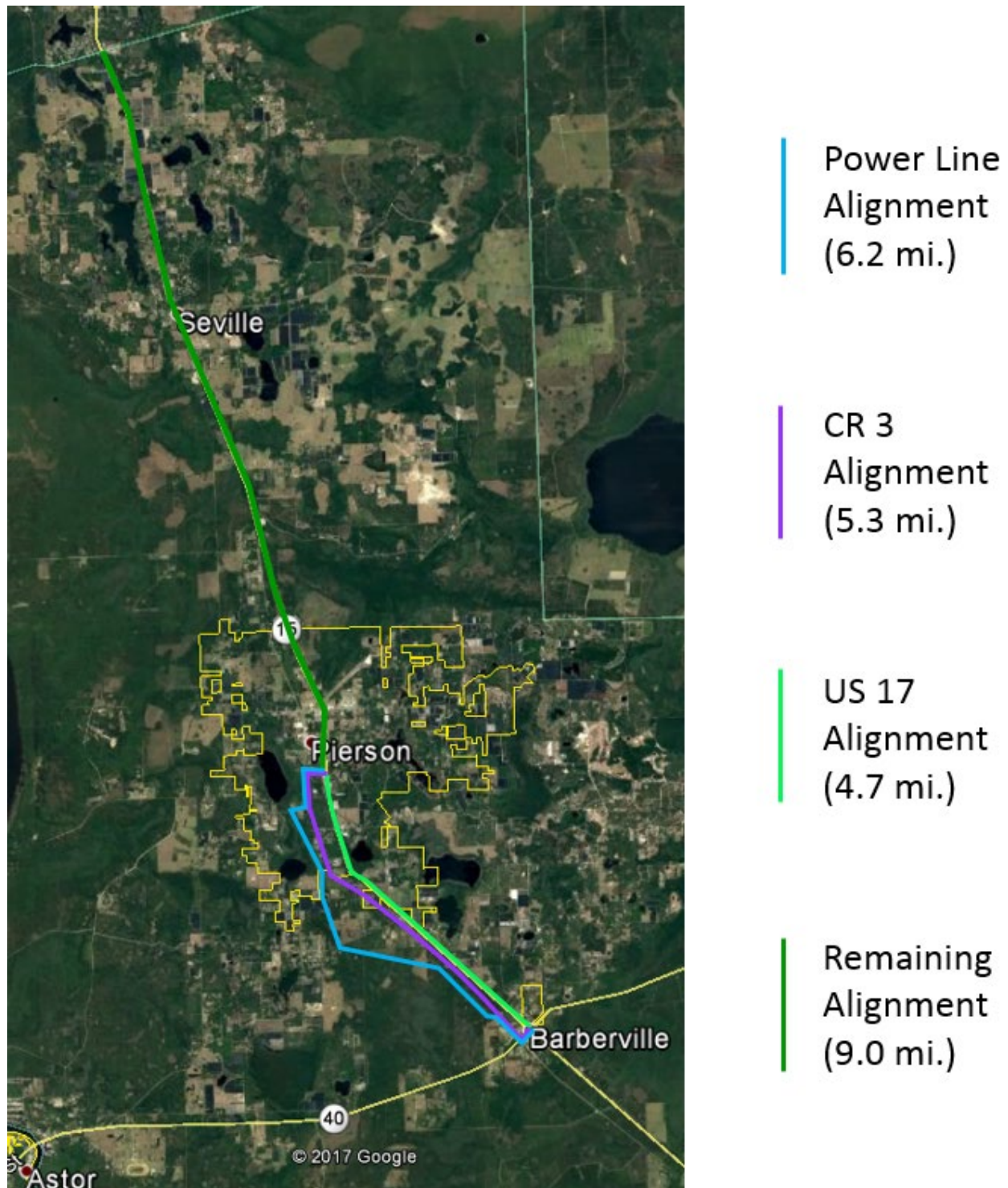


Figure 4-1 Alternative routes

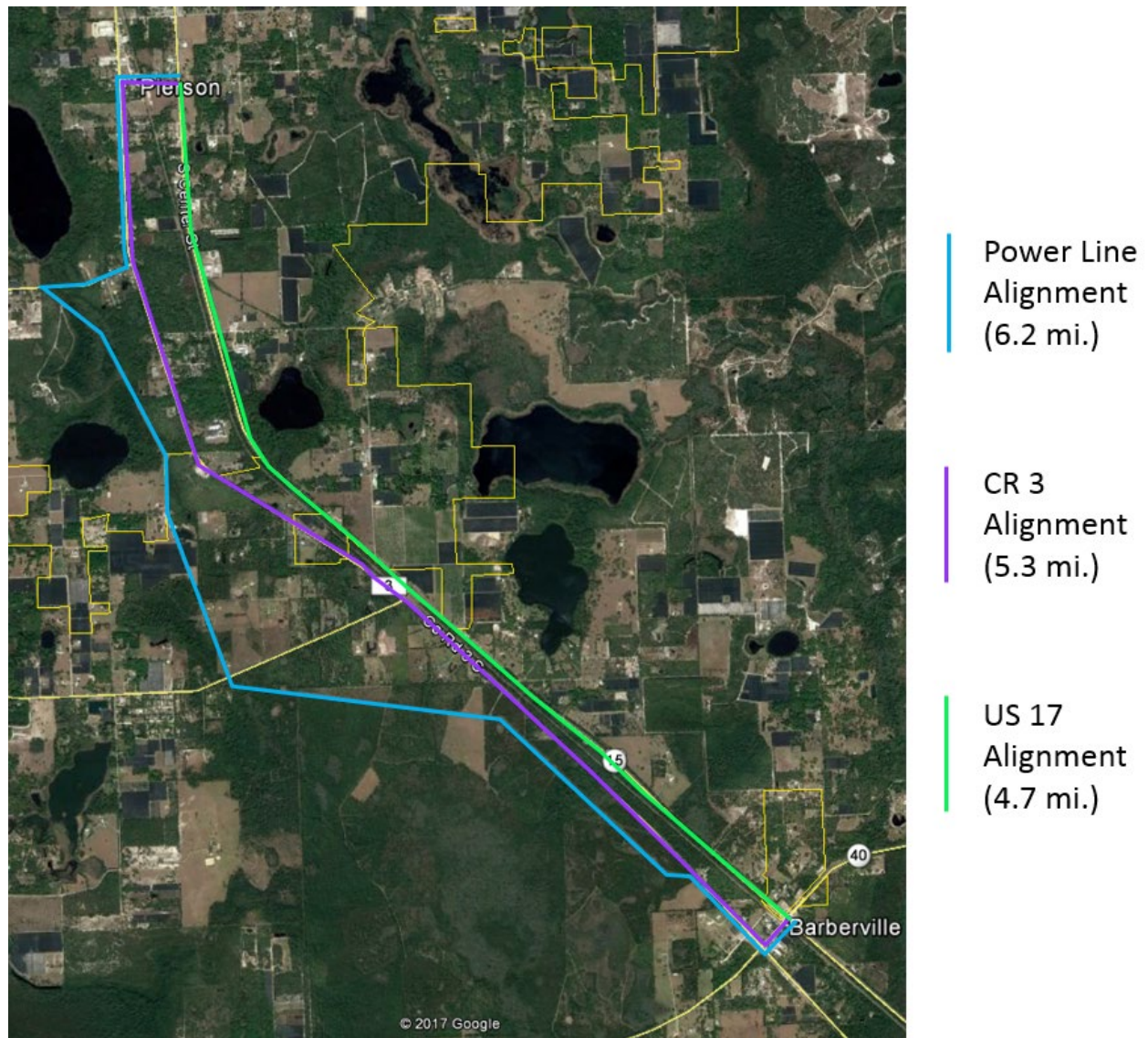


Figure 4-2 Alternative routes (zoom)

These route alternatives were evaluated at the outset of this PD&E study to determine a viable route for the multi-use trail that will ultimately connect to the segment of the St. Johns River to Sea Loop in or near the Volusia/Putnam County line. The evaluation criteria used during this initial route screening were consistent with those considered later in the study process in developing, evaluating, and selecting viable alignment alternative(s).

Screening/Evaluative Criteria

The criteria described below were approved for this stage of screening. For each criterion, a brief discussion of the merits of each of the route alternatives is provided.

Consistency with St. Johns River to Sea Loop, FDOT SUN Trail Program, and Prior/Established Plans

The purpose and need statement for this project was drafted based upon the goals of the St. Johns River to Sea Loop, the provisions of the SUN Trail program, and relevant prior established plans. It is provided as follows:

“The purpose of the project is to provide a multi-use trail that meets Florida Shared-Use Nonmotorized (SUN) Trail Network (SUN Trail) criteria. The need for the project is to provide pedestrian and bicycle accommodations for local and regional users by providing a multi-use trail that fills the approximately 14-mile existing gap, between State Road 40 and the Volusia/Putnam County line, a segment of the five-county, 260-mile St. Johns River to Sea Loop Trail.”

While all three route alternatives had the potential to fulfill the purpose and meet the need, they varied somewhat in their ability to meet related goals.

U.S. 17: U.S. 17, along with CR 3, passes through the Town of Pierson and therefore provides opportunities for through users to visit local businesses, such as nearby shops and restaurants. Additionally, this route provides residents with a multi-use trail that can be utilized for alternative travel modes and for leisure activities, such as bicycling and walking. The TPO’s (May 2015) RTCA specifies U.S. 17 (specifically the east side of U.S. 17), as being the best suited location to construct a 12-ft trail to fill this gap in the regional trail network and provides associated concept plans and construction cost estimates.

CR 3: A previous (February 2016) *County Road 3 Shared Use Path Bicycle/Pedestrian Feasibility Study* conducted by the TPO evaluated the potential for a multi-use trail along CR 3 through much of this area. While the study does not make a definitive statement as to such a trail’s feasibility, it does discuss challenges and complexities of the existing drainage system and lack of sufficient existing right of way (as discussed in later sections of this screening evaluation).

Power Line: Given its separation from parallel roadways, the power line route could possibly provide more potential for recreational travel opportunities; however, it has never previously been identified or studied as a route for this portion of the St. Johns River to Sea Loop. This route provides considerably less opportunities to “to provide pedestrian and bicycle accommodations for local and regional users.”

Continuity/Connectivity

South of the U.S. 17/S.R. 40 intersection, a 12-ft wide multi-use trail was designed on the east side of U.S. 17 as part of the U.S. 17 widening project from DeLeon Springs Boulevard to S.R. 40 (FM 410251-1). In addition, a 12-ft trail (FM# 439877-1) was constructed on the east side of U.S. 17 between Washington Avenue and Palmetto Avenue, a distance of approximately one mile, in the Town of Pierson.

SECTION 4 – ALTERNATIVES ANALYSIS

U.S. 17: Constructing the proposed facility within the U.S. 17 right of way, which varies between 90 and 200 feet between S.R. 40 and the south side of Pierson, would provide the greatest degree of continuity with the programmed multi-use trails and has the potential to eliminate the need for crossing U.S. 17.

CR 3: The CR 3 route would require crossing U.S. 17 twice, once at S.R. 40 to connect with trail terminating in the vicinity of S.R. 40 and again in the vicinity of Pierson to connect to the trail section in Pierson between Washington Avenue and Palmetto Avenue.

Power Line: As with CR 3, the power line route would require crossing U.S. 17 twice.

Interaction with, and Proximity to, Rail Line

A CSX-owned rail line is located west of U.S. 17 and east of CR 3. The line carries 19 daily trips of freight, traveling up to 69 mph, and six daily Amtrak passenger trains, traveling up to 79 mph. The CSX right of way width varies from approximately 40 to 200 feet.

U.S. 17: The U.S. 17 route alternative does not require any crossings of the CSX rail line. With respect to separation between the rail line and the trail (an important but somewhat less critical consideration than potential crossings), the typical separation between U.S. 17 and the rail line through this portion of the study area is less than 300 feet (based on the centerline of the roadway and a sampling every half-mile), and as little as 140 feet.

CR 3: The CR 3 alternative would require two crossings of the rail line, once at S.R. 40 and once in Pierson (**Figure 4-3 Locations of potential rail crossings**). The typical separation between CR 3 and the rail line is approximately 550 feet.

Power Line: The power line alternative would require the same two rail crossings as CR 3 would. It offers the greatest typical trail-rail separation (approximately 1,650 feet).



Figure 4-3 Locations of potential rail crossings

Environmental Impacts

Potential environmental impacts amongst the route alternatives, each assuming a 12-ft trail width include wetland and species impacts. Maps wetlands, along with a table of potential species occurrences, are provided in **APPENDIX E Wetlands Maps and Details Species Listing (with Land Use)**

U.S. 17: The U.S. 17 route would have between 0.21 and 2.46 acres of wetland impacts, depending on the eventual alignment within the right of way. The potential exists for 23 state-listed and three federally-listed plant species, as well as 22 state-listed and 10 federally-listed animal species. The route falls within the USFWS consultation area for the Red Cockaded Woodpecker and the Florida Scrub-Jay. It is within the 15-mile radius of the Lake Disston and Hontoon Island Core Foraging Area for the wood stork. There is one potentially active bald eagle nest that is within 0.5-mile. The project area contains suitable habitat for the state-listed Florida burrowing owl, the gopher tortoise, and listed commensals including the Eastern indigo snake, Florida pine snake, Florida burrowing owl, and Florida mouse.

CR 3: The CR 3 route would have between 2.13 and 2.92 acres of wetland impacts, depending on the eventual alignment within the right of way. All species impacts described above for U.S. 17 are the same for CR 3, but the potentially active bald eagle nest is within 0.25-mile.

Power Line: The power line route would have approximately 3.68 acres of wetland impacts, and a portion of the alignment is located within the Barberville Mitigation Bank, which has permits and a recorded conservation easement in favor of both the St. Johns River Water Management District (SJRWMD) and the U.S. Army Corps of Engineers (USACE), presenting potentially substantial permitting challenges. All species impacts described above for U.S. 17 are the same for the power line route, but the potentially active bald eagle nest is only approximately 400-500 feet west of the route. Furthermore, the likelihood of occurrence for the listed species is much higher along the power line easement given the absence of automobile traffic present along the other two alternatives.

Additional Right of Way Needs

A SUN Trail-compliant 12-ft trail typically requires approximately 30 feet of space to construct, including shoulders and swales. In accordance with SUN Trail requirements, FDOT may purchase additional right of way from willing sellers to implement trails but may not exercise eminent domain. This suggests that having sufficient right of way to construct and maintain the trail is at least advantageous, if not a necessity.

U.S. 17: Right of way along this southern section of U.S. 17 is generally abundant, ranging from approximately 90 to 200 feet, making it possible to construct a SUN Trail-compliant facility within the existing right of way between S.R. 40 and the south side of the Town of Pierson.

CR 3: In contrast to U.S. 17, the CR 3 right of way is much more constrained. The recent CR 3 feasibility study states that County-provided right of way information indicates variable width between approximately 40 and 80 feet, with narrower widths in the vicinity of Pierson and wider widths further south. That study indicates that between Steadman Road and 3rd Avenue alone

(approximately one mile of the CR 3 route), right of way would be required from approximately 30 to 40 property owners.

Power Line: Much of the power line route is located on an apparent easement within relatively large parcels (including two large County-owned parcels) containing Duke Energy transmission lines. It also includes smaller sections of S.R. 40, CR 3, and a connector in Pierson (potentially 2nd Avenue), with limited right of way available. As indicated above, a substantial portion of the off-street component is located within the Barberville Mitigation Bank.

Design/Construction Challenges

Drainage considerations can present varying degrees of challenges and mitigation costs of eventual trail design and construction. These considerations include floodplain crossings, roadside conveyance swales, structures, and underlying soil types.

U.S. 17: The U.S. 17 route does not cross any identified floodplains. Its roadside conveyance swales are generally well-separated from the edge of pavement. Between S.R. 40 and downtown Pierson, U.S. 17 crosses five culverts.

CR 3: As with U.S. 17, the CR 3 route alternative does not cross any floodplains. However, as compared to U.S. 17, CR 3's drainage swales are closer to the edge of the roadway and much steeper; they occupy much of the remaining right of way between the edge of pavement and property lines. The previously referenced CR 3 feasibility study notes "major drainage pipe crossings" north of Hagstrom Road and south of Silver Road; additional observations suggest the presence of several more culverts at the southern end of the route. Highlighting the challenges associated with drainage on CR 3, the feasibility study suggests that acquiring additional right of way would be preferable to constructing a trail inside the existing right of way "Due to the complexities associated with modifying the existing drainage system."

Power Line: 12 percent (approximately three-quarters of a mile) of the power line route crosses an identified floodplain. In the absence of an existing roadway, the majority of this alternative does not have existing swales or structures crossings. The Natural Resources Conservation Service Soil Survey for Volusia County indicates that, unlike the other two alternatives, the power line route passes through areas of Hontoon muck, an organic soil type that presents potentially severe construction limitations. Additionally, as much of the route is not adjoining a roadway, construction activities may impact a greater width than the eventual constructed pathway cross-section.

Length of Route Alternative

The length of the route alternative provides a reasonable surrogate for comparative construction and annual maintenance costs.

U.S. 17: U.S. 17 provides the shortest, most direct route between the beginning of the project (at S.R. 40) and Pierson, the portion of the overall study area subject to this screening and evaluation (4.7 miles).

CR 3: By comparison, CR 3 requires a degree of diversion, with the route totaling 5.3 miles, or approximately 13% longer than the U.S. 17 route.

Power Line: The diversion of the power line route is more substantial, leading to a 6.2-mile route, which is approximately 32% longer than the U.S. 17 route.

4.3 EVALUATION OF ROUTE ALTERNATIVES AND SELECTION FOR FULL PD&E STUDY

The screening evaluation results indicated that while each route alternative provides relative benefits, U.S. 17 emerged as the preferred route alignment, particularly regarding available right of way, environmental impacts, and system connectivity.

Following the selection of the route alignment, but prior to developing the typical sections for the alternatives, the project team first considered location alternatives within the U.S. 17 corridor, namely east (northbound) side and west (southbound) side alternatives. This occurred as they were developing the evaluative criteria. Initially, it was determined that there could be up to four distinct alternatives for the shared use pathway: two alternatives within the east (NB) side and two within the west (SB) side. The alternative pairs consisted of an alternative with the pathway alignment placed the maximum lateral distance away from the highway (as available right of way would permit) and another, a more “compact” configuration, placing the pathway as close to the highway as the FDOT roadway cross-section geometry would allow, for those segments with constrained rights of way.

Consideration of the emerging evaluative criteria enabled the elimination of a substantial portion of the (four) alternatives before the team progressed with evaluating all the alternatives according to the bulk of the criteria. Two alternative alignments on the west side of U.S. 17 - north of the Town of Pierson – were eliminated from further consideration based upon the following.

The west side alternatives north of Washington Avenue (in the Town of Pierson) up to the end of the project corridor at the Putnam County line were considered not viable to serve the purpose and need of the project. While this would be a substantial elimination of the PD&E’s alternatives (approaching 9 miles of alignment representing approximately a 32 percent reduction of alignment miles), it was determined that the west (SB) side trail alternatives would substantially fall short on several key evaluative criteria. These criteria include rail separation/coordination, trail user comfort/experience, and connectivity (or service) to established community or even developable parcels of land (see **Section 3.2 Design Control and Criteria**).

North of Pierson, much of these west side trail alternatives’ alignments directly adjoin the railroad right of way which would result in unpleasant operating conditions for trail users. The separation between the edge of pavement and the rail bed for much of this segment would be less than 30 feet. The alignments within this setting would result in trail users being bordered on one side by highway traffic operating at speeds of 60 mph, and on the other side by a rail line with 25 trains per day traveling at 69 to 79 mph. People may be less likely to use a facility situated so close to an active rail line. Furthermore, in several segments the shared-use pathway cross-section would likely fall short of meeting important FDOT design criteria for the trail and for roadside drainage.

Regarding connectivity (or service) to established community or developable parcels of land, the western alignments, north of the Pierson Elementary School / Palmetto Road area, would be considerably inferior to the east (NB) side alignment alternatives. For example, the west side

alternatives north of Pierson would provide direct access to only 15 parcels versus 70 parcels directly served by the east side alternatives. Additionally, only 12 local roads access the corridor from the west; the east side alternatives provide direct connectivity to nearly double that number. Finally, with the construction of the portion of trail on the east (NB) side serving the new elementary school under construction on U.S. 17 between Washington and Palmetto Avenues, continuation of the trail northward from the Town of Pierson area using west side alignments would require a crossing of U.S. 17 by the trail.

Thus, due to the above cited criteria evaluations, the project team eliminated the west (NB) side alternatives north of Washington Avenue from further study in the PD&E.

4.4 TYPICAL SECTIONS AND FINAL ALTERNATIVES DEVELOPMENT

To fulfill the purpose and meet the need articulated for this project, the proposed trail facility is a 12-ft shared use path for most of the study corridor alignment along U.S. 17. Five alternative typical sections were developed; three for the rural segments and two primarily for the urban segments through the Town of Pierson. The alternative typical sections are shown in **Figures 4-4 through 4-8**.

4.4.1 Rural Typical Sections

Alternative "A" – 12-ft pathway shifted east as far as there is existing FDOT right of way

Alternative "B" – 12-ft pathway shifted east only to the extent which allows the minimum 22-ft wide swale to be constructed between it and U.S. 17

Alternative "B" (Additional Right of Way Required) – 12-ft pathway that is shifted the minimum 22-ft distance to accommodate the minimum swale but will still require additional right of way

4.4.2 Urban Typical Sections

Alternative "A" or "D" – 12-ft pathway on the east and west sides, respectively, of U.S. 17 that will require additional right of way while maintaining the 4-ft separation from the roadway

Alternative "B" or "C" – 8-ft pathway on the east and west sides, respectively, of U.S. 17 that, together with the existing bike lanes, will serve the intended users, maintain the 4-ft separation, and can be constructed within the existing right of way

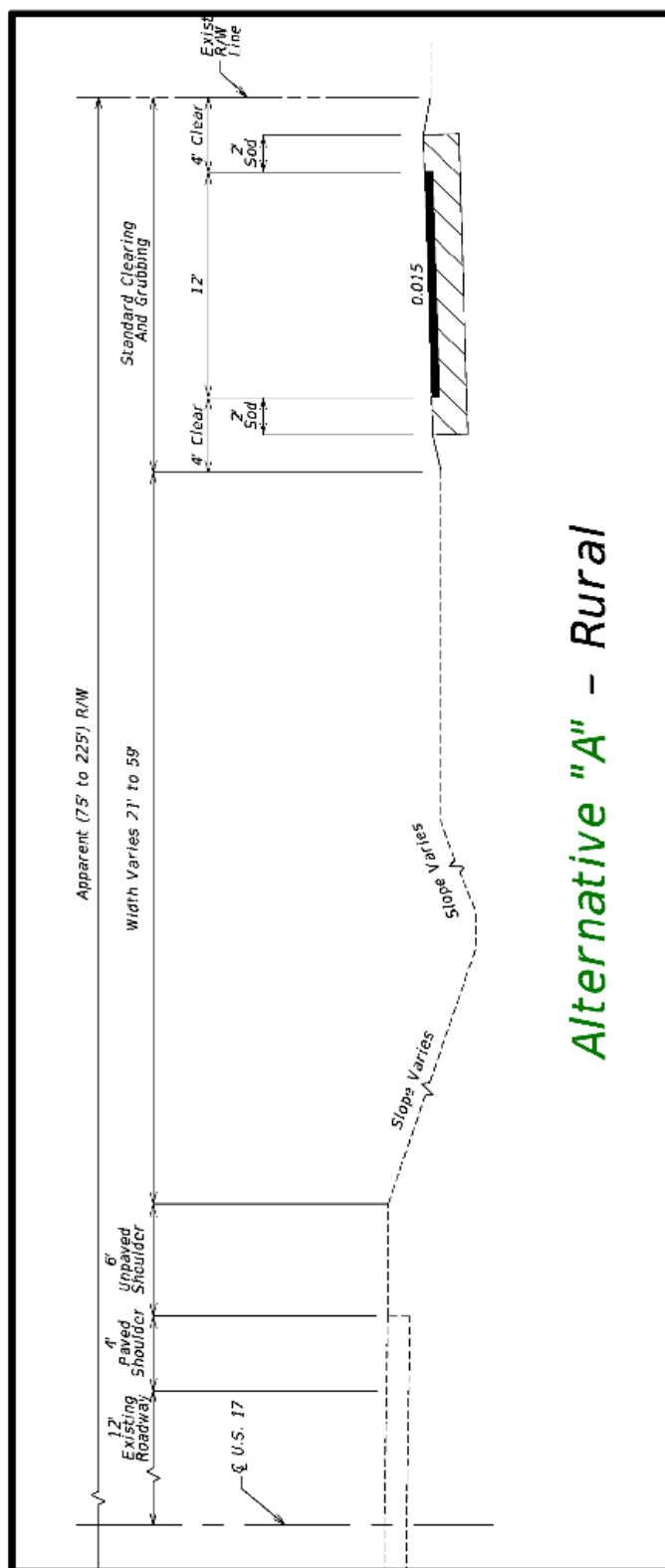
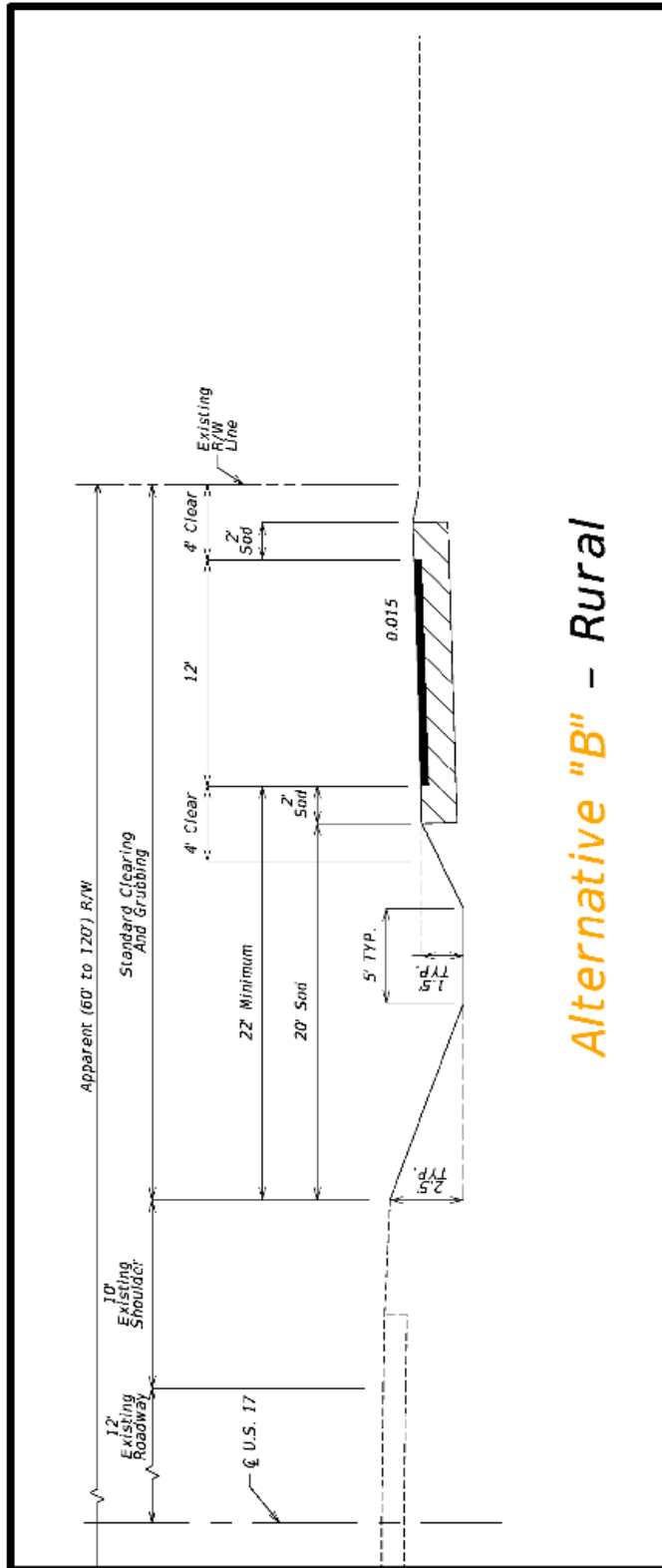


Figure 4-4 Alternative "A" - rural

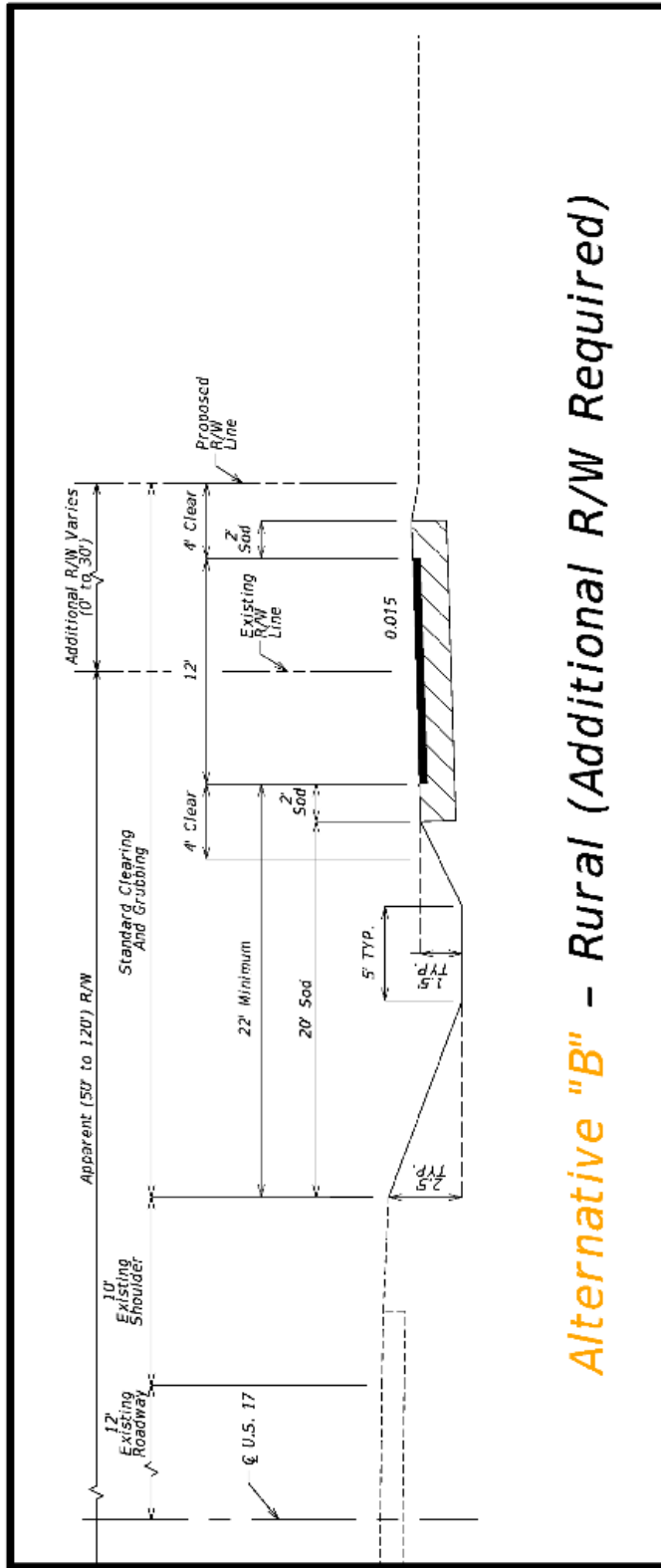
Segments 1, 3, 4 & 7



Alternative "B" – Rural

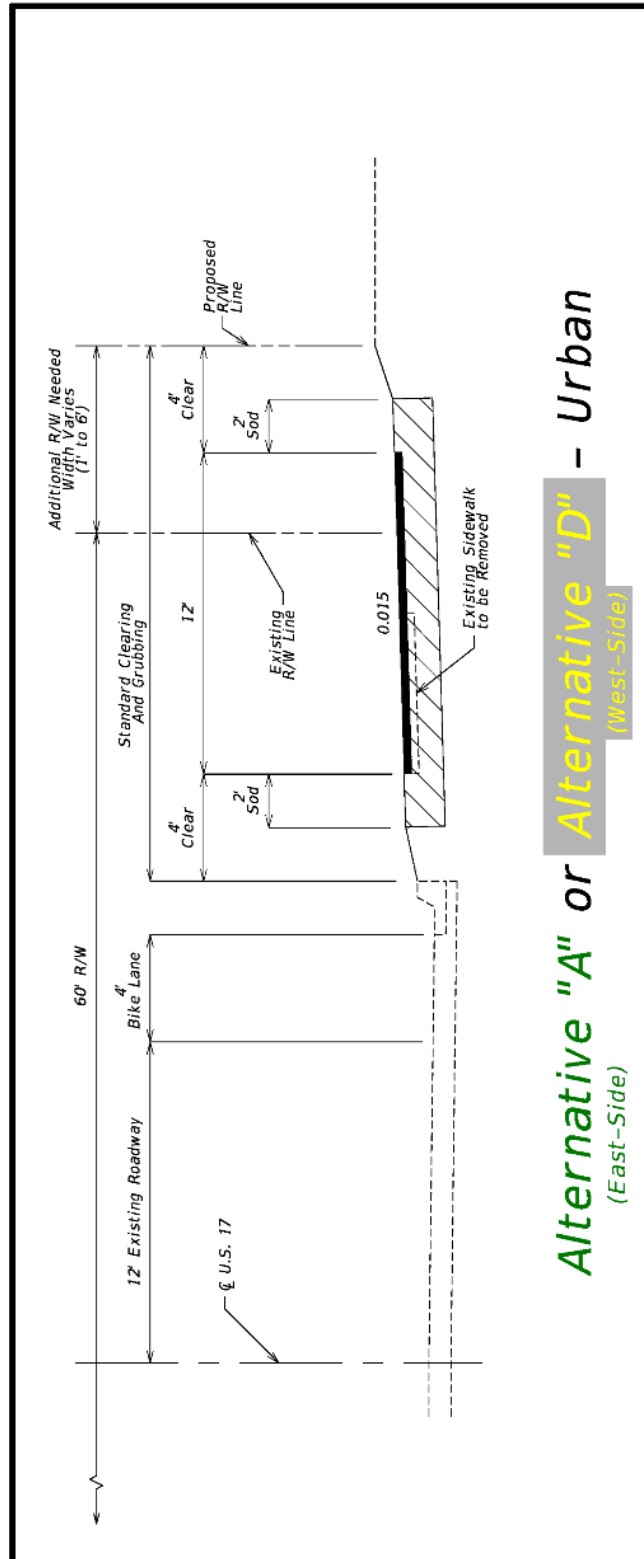
Figure 4-5 Alternative "B" - rural

Segments 2 & 8



Alternative "B" – Rural (Additional R/W Required)

Figure 4-6 Alternative "B" rural (additional R/W required)



Page 4-14

Segments 5 & 6

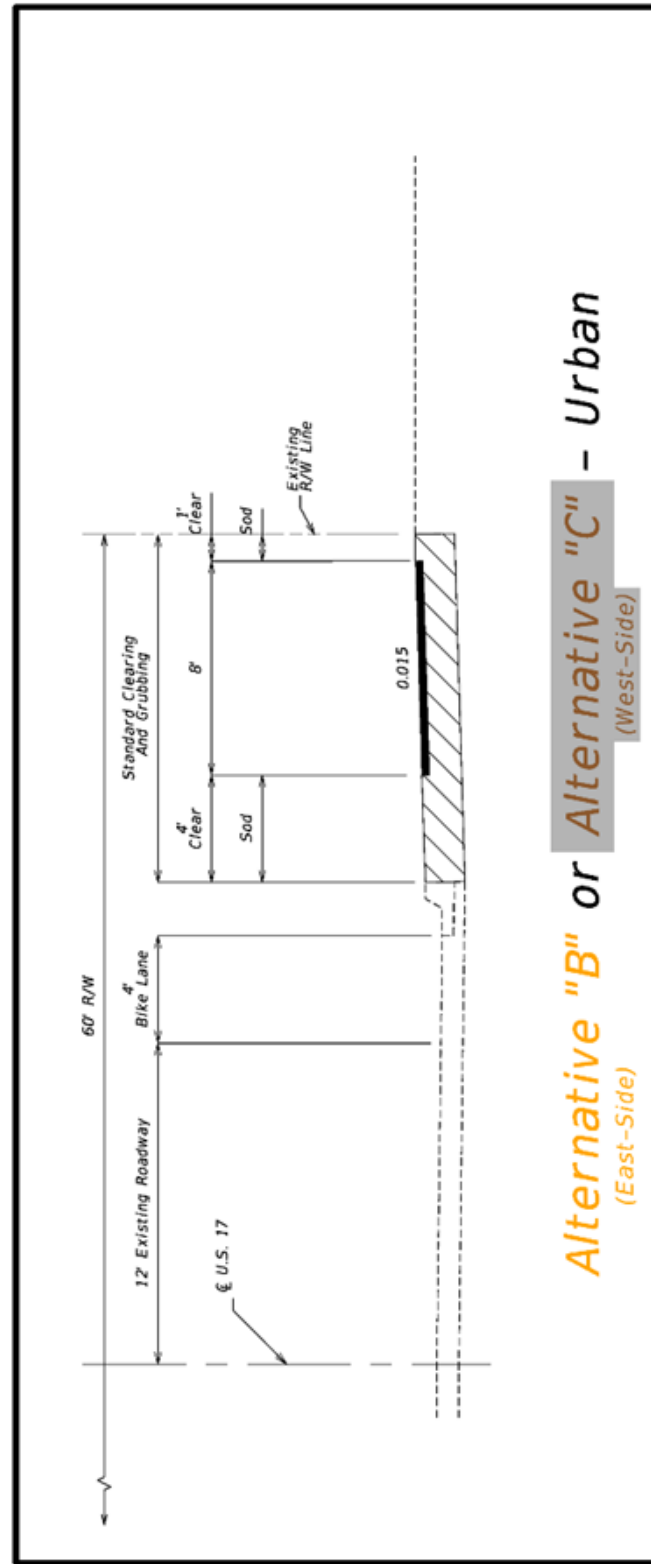


Figure 4-8 Alternative "B" or Alternative "C" - urban

4.4.3 Alternatives Development

In developing and applying these typical sections through the corridor, eight analysis segments emerged based on roadway configuration and anticipated right of way extents. They are shown in **Figure 4-9 Project segmentation map**. This map represents logical evaluative segmentation of the alternatives for implementing a multi-use pathway through the corridor. See the concept plan in **APPENDIX B Preferred Alternative** for more detail on the application of the typical sections and the resulting geometric design layout of the alternatives.

4.5 NO-BUILD (NO-ACTION) ALTERNATIVE

The primary advantage of the No-Build Alternative is no design or construction costs would be incurred.

The primary disadvantage is that the No-Build Alternative does not provide a shared use path that meets the objectives of the FDOT SUN Trail Program. It does not enhance pedestrian or bicycle mobility or safety. It would not fulfill the purpose and need of the the project.

4.6 TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS ALTERNATIVE (TSM&O)

No TSM&O alternatives would meet the purpose and need of the project and were not considered viable alternatives for this trail.

4.7 FUTURE CONDITIONS

4.7.1 Land Use

Future land use maps from the Volusia County Comprehensive Plan (updated July 30, 2018) suggest the study corridor will remain rural with Pierson being the only incorporated community; Barberville and Seville are designated Local Plan Areas. Land uses shown adjacent to the study corridor include Conservation, Agricultural Resources, Forestry Resource, and Environmental Systems Corridor. A small area north of Pierson is designated as Low Impact Urban. **Figure 4-10 Volusia County Future Land Use** shows the section of the future land use map that contains the project corridor. **Figure 4-11 Town of Pierson (north) Land Use Map** and **Figure 4-12 Town of Pierson (south) Land Use Map** show the land uses planned for the Town of Pierson.

4.7.2 Travel Demand

The Volusia County Comprehensive Plan (updated July 30, 2018) shows U.S. 17 as remaining a two-lane road until at least 2025. It is anticipated to be operating at an LOS C.

SECTION 4 – ALTERNATIVES ANALYSIS

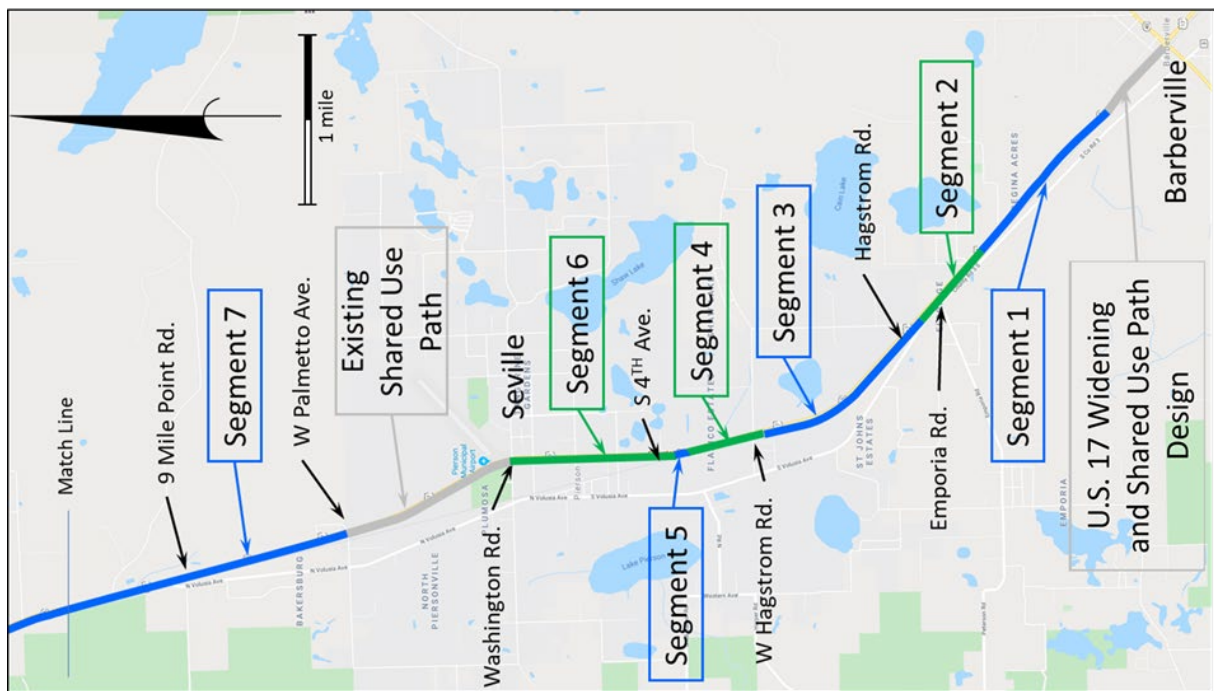
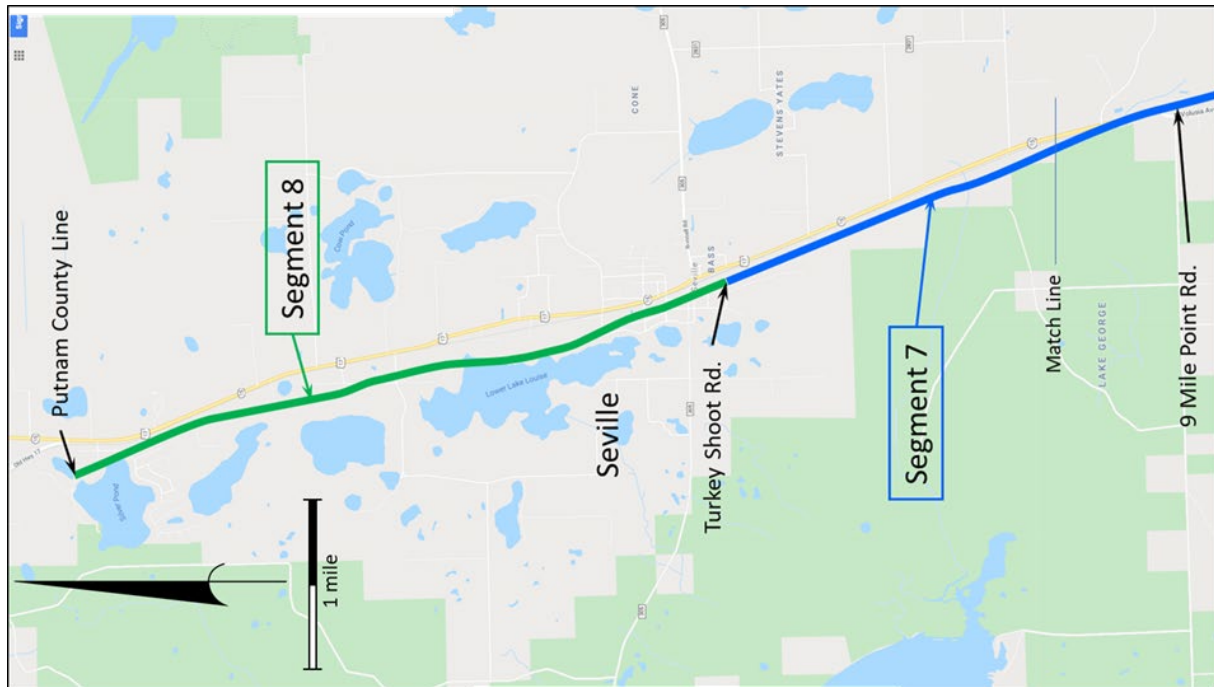


Figure 4-9 Project segmentation map

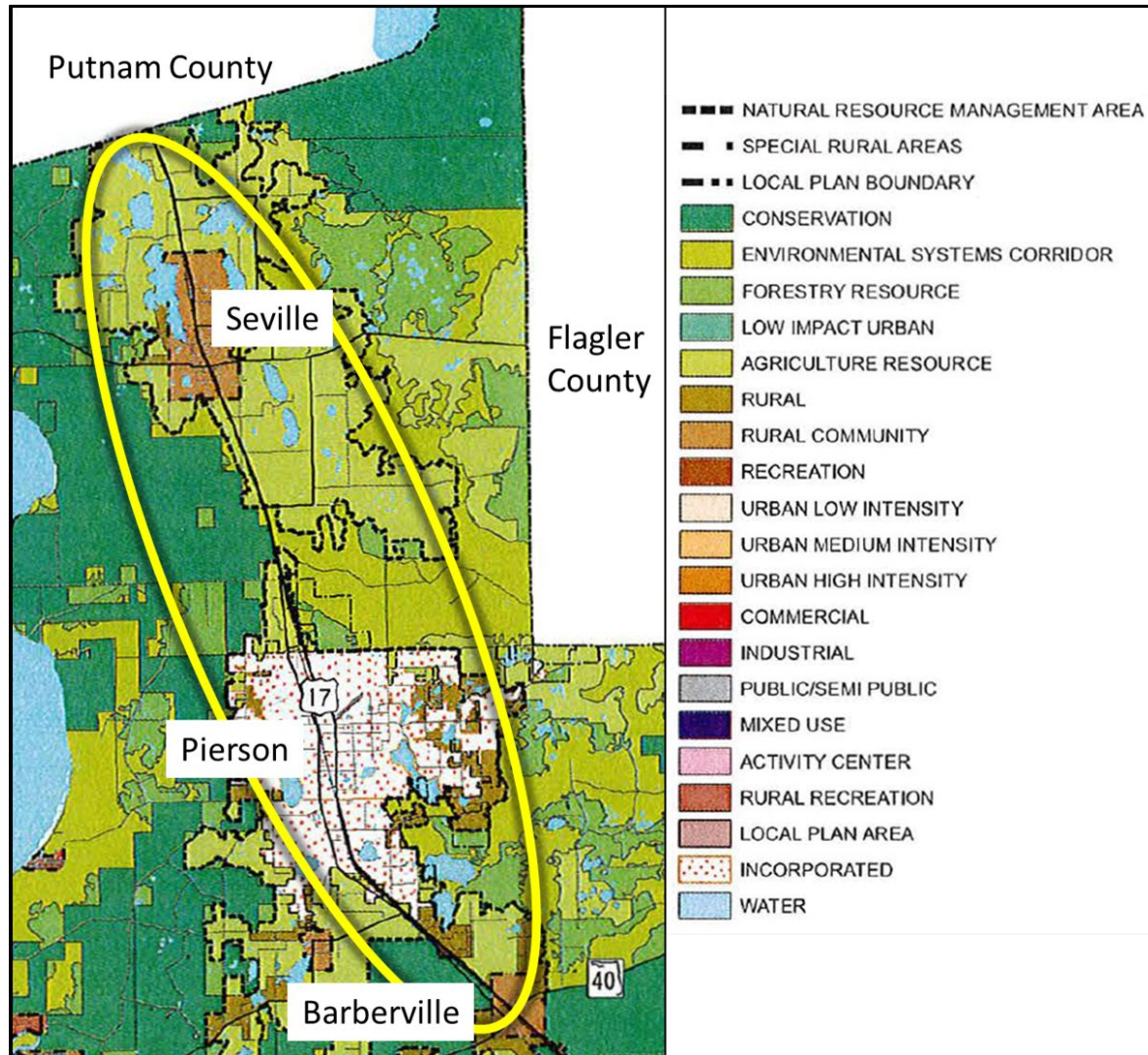


Figure 4-10 Volusia County Future Land Use Map

Seville and Barberville are designated within their Special Rural Areas map as Rural Communities.

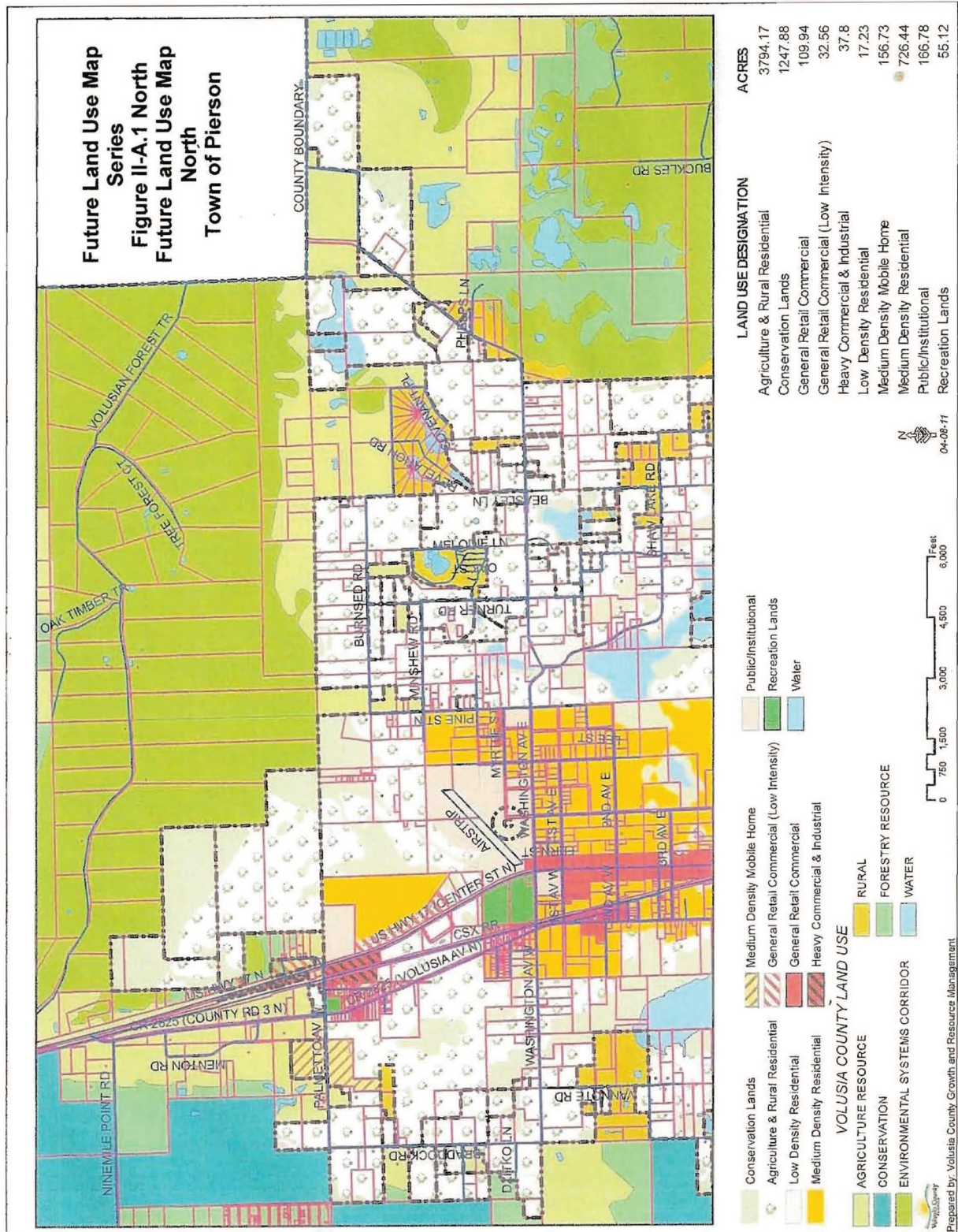


Figure 4-11 Town of Pierson (north) Land Use Map

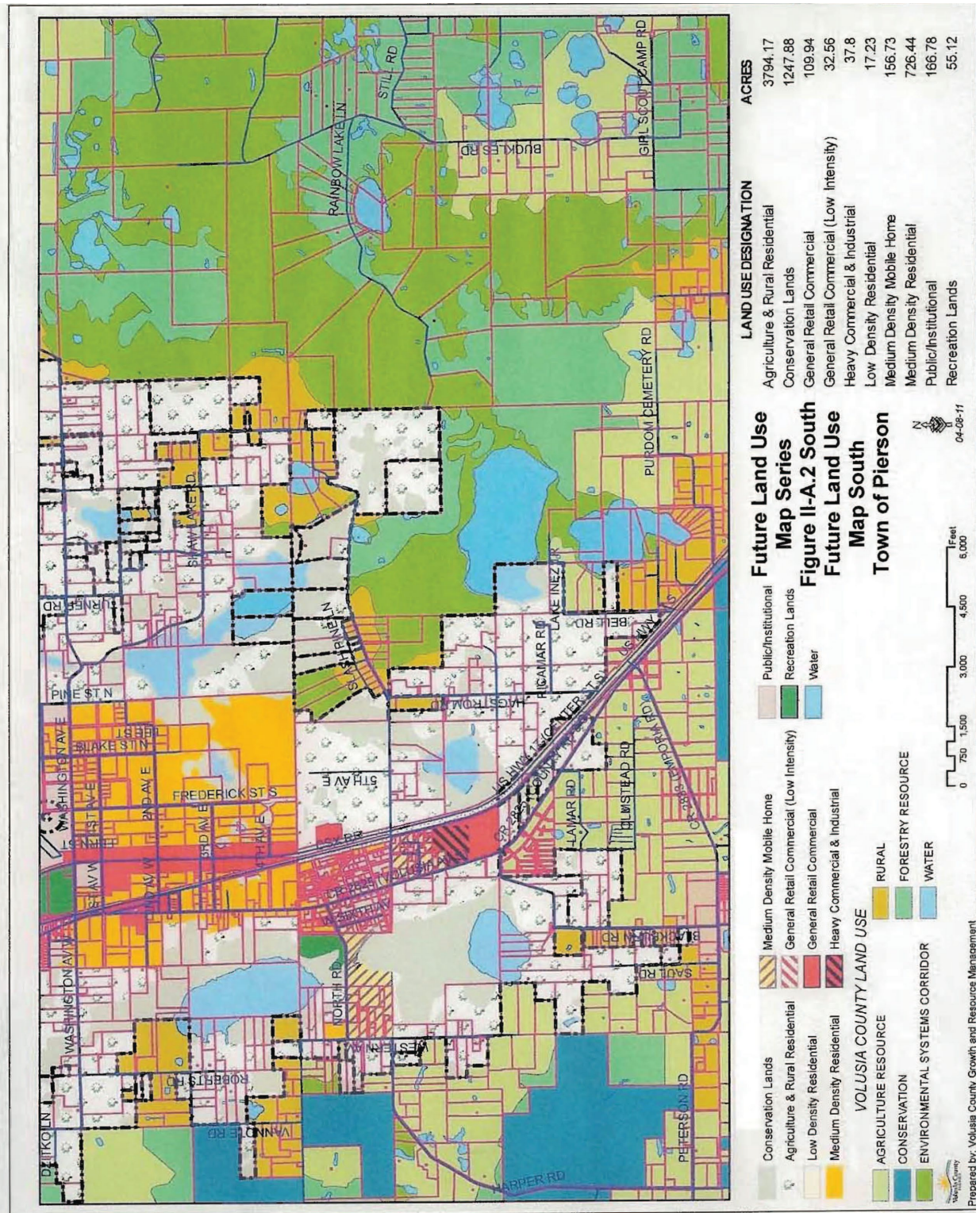


Figure 4-12 Town of Pierson (south) Land Use Map

4.8 COMPARATIVE ALTERNATIVES EVALUATION

Six categories of evaluative criteria were finalized and established:

1. Facility,
2. Social Impacts,
3. Potential Cultural/Natural Purpose Environment Impacts,
4. Potential Physical Effects,
5. Safety, and
6. Estimated Project Costs (following the Matrix Documentation Memorandum dated July 26, 2018, APPENDIX A)

Each of the candidate alternatives were evaluated within each of the eight segments based on available data. The results were displayed on the Evaluation Matrix presented at the Alternatives Open House on May 30, 2019. The Evaluation Matrix as presented at the open house is shown in **Figure 4-13 Alternatives evaluation matrix.**

4.8.1 Facility Purpose

Trail User Operating Environment and Comfort (i.e., Lateral Separation)

Trail separation from the roadway is a key determining factor in users' perceived comfort and enjoyment of the operating environment of the proposed shared use pathway, as affirmed by numerous studies, including FDOT's Sidepath Level of Service Model. Stakeholders have suggested that this is especially true in this case given the generally high-speed nature of motor vehicle traffic on U.S. 17. Alternative B was specifically developed to minimize separation (to avoid other potential impacts) while still meeting FDOT design criteria. Therefore, Alternative A (in segments in which the two alternatives are not co-aligned) provides a more optimal user experience.

Aesthetics

This evaluative criterion is substantial pursuant to Chapter 11 of the PD&E Manual which establishes that "*FDOT considers Aesthetic Effects (AE) in project development because it influences community cohesion, community values, and can affect the travel experience*" (Section 5.1.1 Purpose) and is especially relevant given this type of transportation project. The primary evaluative metric for this criterion is the relative level of shade tree protection (i.e., potential canopy coverage) afforded by each alternative alignment. This has a substantial effect on the alternatives' ability to serve the purpose and need of this project as a substantial portion of Florida's St. Johns River to Sea Loop Trail. For additional precision, this qualitative criterion was evaluated on a five-level scale.

ALTERNATIVES EVALUATION MATRIX

Evaluation Criteria*	L = Low M = Moderate H = High	'No-Build' Alternative	'Build' Alternatives: U.S. 17 Trail														
			Segment 1		Segment 2	Segment 3		Segment 4	Segment 5		Segment 6				Segment 7		Segment 8
			Alt. A	Alt. B	Alt. A/B	Alt. A	Alt. B	Alt. A/B	Alt. A	Alt. B	Alt. A	Alt. B	Alt. C	Alt. D	Alt. A	Alt. B	Alt. A/B
Facility Purpose																	
Trail User Operating Environment and Comfort (i.e., lateral separation) (L/M/H)	None	M	L	L	M	L	M	M	M	M	M	M	M	H	L	L	
Service to Community Destinations and Developable Parcels/Population Access (Local Traffic Potential) (L/M/H)	None	M	M	M	M	M	M	M	M	M	M	H	H	M	M	L	
School Access/Student Mobility (L/M/H)	None	M	M	M	M	M	M	M	M	H	H	M	M	H	H	M	
Trail System Connectivity (L/M/H)	None	H	H	H	H	H	H	H	H	H	H	M	M	H	H	H	
Social Impacts																	
Number of Parcels Impacted**	0	6	0	6	0	0	0	1	0	17	0	0	14	0	0	50	
Anticipated R/W Acquisition (acres) **	0	4.33	1.47	0.49	0.30	0	0	0.21	0	2.14	0	0	2.26	3.88	1.23	16.89	
Supported by Local Governments (L/M/H)	None	H	M	H	H	M	H	H	M	H	H	H	H	H	M	H	
Potential Natural/Cultural Environmental Effects																	
Number of Archaeological Sites***	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Number of Historical Sites****	0	1	1	2	1	1	3	0	0	8	8	14	14	4	4	22	
Floodplains (acres)	0	0	0	0	0.09	0.02	0.12	0	0	0	0	0	0	0.61	0.57	0.64	
Wetlands (acres)	0	1.67	3.17	0.14	1.5	1.47	2.38	0	0	0	0	0	0	3.37	3.51	0.46	
Wildlife/Threatened and Endangered Species Occurrence Potential (L/M/H)*****	None	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	
Potential Physical Effects																	
Number of Utility Relocations	0	1	0	0	0	1	6	8	8	36	36	2	2	4	18	42	
Number of Contamination Sites	0	2	2	4	2	2	7	3	3	6	6	6	6	9	9	17	
Safety																	
Number of Driveway Crossings	0	4	4	3	5	5	1	1	1	9	9	13	13	12	12	20	
Number of Street Crossings	0	3	3	2	1	1	1	0	0	4	4	4	4	4	4	13	
Estimated Project Costs (2019 USD)																	
Construction	\$0	\$690,000	\$840,000	\$290,000	\$410,000	\$490,000	\$610,000	\$70,000	\$80,000	\$460,000	\$560,000	\$510,000	\$440,000	\$1,600,000	\$2,000,000	\$2,700,000	
Design & Construction Engineering and Inspection (30% of Construction Cost)	\$0	\$207,000	\$252,000	\$87,000	\$123,000	\$147,000	\$183,000	\$21,000	\$24,000	\$138,000	\$168,000	\$153,000	\$132,000	\$480,000	\$600,000	\$810,000	
Right of Way Acquisition (Under development)	\$0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Estimated Total Costs (pending Right of Way Acquisition Costs)	\$0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	

* Additional background information and rating/scoring guidelines related to these evaluation criteria are contained in an accompanying memorandum (dated July 26, 2018).
** Pending findings from forthcoming Specific Purpose Survey.
*** Although there are no previously recorded archaeological sites, there is a moderate-to-H archaeological probability along the whole corridor.
**** Based on preliminary Area of Potential Effect (APE) that includes immediately adjacent parcels.
***** Wood Stork foraging habitat impacts are possible for Alternatives A and B, but can likely be avoided through design and/or offset by newly created ditches/swales associated with the trail.

Note: yellow shading represents notable difference between/ among alternatives

- SEGMENT 1: S.R. 40 to South of Bell Rd.

SEGMENT 2: South of Bell Rd. to South of Hagstrom Rd.

SEGMENT 3: South of Hagstrom Rd. to South of W. Hagstrom Rd.

SEGMENT 4: South of W. Hagstrom Rd. to South of E 4th Ave.
- SEGMENT 5: South of E 4th Ave. to E 4th Ave.

SEGMENT 6: E 4th Ave. to Washington Ave.

SEGMENT 7: Washington Ave. to Turkey Shoot Rd.

SEGMENT 8: Turkey Shoot Rd. to Putnam County Line

Figure 4-13 Alternatives evaluation matrix as presented at Alternatives Open House

Service to Community Destinations and Developable Parcels/Population Access (Local Traffic Potential)

With the prior elimination of trail alternatives on the west side of U.S. 17 south of 4th Avenue and north of Washington Avenue, which suffered from lack of access provided to developable parcels because of the proximity to the rail line, variation amongst remaining alternative alignments are generally nominal as related to this criterion. Between 2nd Avenue and Washington Avenue within the Town of Pierson, Alternatives C and D on the west side of U.S. 17 provide slightly elevated population access and service to community destinations. This is supported by the presence of the CR 3 commercial corridor, Chipper Jones Family Sports Complex, and the site of the former elementary school/potential future community center, all of which are located west of U.S. 17.

School Access/Student Mobility

Administrators from Pierson Elementary School and T. Dewitt Taylor Middle-High School reported that current levels of walking to school are low, but implementation of the proposed trail is expected to make walking and/or bicycling a more viable mode of transportation for students. The existing student population is divided generally evenly between the east and west sides of U.S. 17 throughout the corridor, according to student residence maps provided by the Volusia County School Board for Pierson Elementary School and Taylor Middle-High School. Near downtown Pierson, however, student populations are clustered west of U.S. 17 along CR 3, suggesting that Alternatives C and D provide marginally better student mobility than their counterparts on the east side.

Trail System Connectivity

South of the U.S. 17/S.R. 40 intersection, a multi-use trail is being designed on the east side of U.S. 17 as part of the U.S. 17 widening project from DeLeon Springs Boulevard to S.R. 40 (FM# 410251-1); this project's design extends approximately 2,000 feet north of S.R. 40. In addition, a trail (FM# 439877-1) is being constructed on the east side of U.S. 17 between Washington Avenue and Palmetto Avenue, a distance of approximately one mile, in the Town of Pierson. Thus, Alternatives C and D would necessitate two crossings of U.S. 17 to connect to these programmed elements of the trail system and therefore provide somewhat reduced system connectivity than the alternatives on the east side of U.S. 17.

4.8.2 Social impacts

Number of Parcels Impacted

Where available, these parcel counts are based on FDOT's documented right of way; elsewhere, they are based on Volusia County parcel boundaries. The findings from an ongoing Specific Purpose Survey may lead to refinements in these counts.

Anticipated R/W Acquisition

This criterion represents the total acreage of overlap between the alignment's estimated 20-ft footprint (12' trail buffered by 4' on each side) and the parcels through which they pass, as identified in the criterion above; thus, it represents a rough estimate of the magnitude of right of way acquisition that may be required. In segments where Alternatives A and B do not coincide, Alternative A impacts more parcels and has greater anticipated right of way acquisition because it is located further from the roadway.

Supported by Local Governments

Meetings and discussions with the two jurisdictions through which the corridor passes, the Town of Pierson and Volusia County, indicate that there is strong local government support for the trail. At an alternative alignments review Technical Working Group meeting with representatives from these two local governments, as well as the regional transportation planning agency (the River to Sea Transportation Planning Organization), a common preference for maximizing separation between U.S. 17 and the trail was indicated; thus, where applicable, Alternative A is shown as having the highest local government support.

4.8.3 Potential Cultural/Natural Environment Impacts

Number of Archaeological Sites & Number of Historical Sites

Preliminary reviews, field reviews informed by computer-based research, of the corridor reveals that cultural resources, including archaeological sites and historic resources, will be a minimal issue for this project. The preliminary Area of Potential Effects (APE) may be comprised of the existing right of way and immediately adjacent parcels. Any undeveloped acreage within the project APE, exclusive of manmade land, is considered to have a potential for archaeological site occurrence. The evaluation matrix shows a moderate-to-high archaeology probability along the entire corridor and a low-to-moderate probability for historic resources.

A review of the Florida Master Site File (FMSF) indicates that 15 historic resources have been previously recorded along the east side (Alternatives A and B) of the project corridor. None of the historic resources have been evaluated by SHPO and approximately five appear destroyed. Based on a consultant team review of Volusia County Property Appraiser data and Google Earth aerial imagery, there are approximately 26 newly identified historic resources located on the east side (Alternatives A and B) and 14 historic resources located on the west side (Alternatives C and D) built in 1972 or earlier.

Floodplains

This evaluation element is the total acreage of overlap between the alignments' footprints and identified floodplains as represented by Flood Zone "A." In segments where Alternatives A and B do not coincide, Alternative A generally has nominally greater floodplain impacts.

Wetlands

Approximate wetland and other surface water (OSW) locations were identified along the alternative alignments. Wetland impacts can be mitigated pursuant to Section 373.4137 Florida Statutes (F.S.) to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.S. 1344. Under Section 373.4137 F.S., mitigation of wetland impacts will be implemented by the purchase of mitigation bank credits from a SJRWMD-approved mitigation bank. Potential wetland and OSW impacts for Alternative A are 3.77 acres and 5.75 acres, respectively (9.52 acres total), and potential wetland and OSW impacts for Alternative B are 0.64 acre and 10.49 acres, respectively (11.13 acres total).

Wildlife/Threatened and Endangered Species Occurrence Potential

GIS review of potential wildlife species impacts included the following elements: aerial photography; United States Fish & Wildlife Service's National Wetlands Inventory (NWI) mapping; USFWS Consultation Area GIS data layers; Florida Fish and Wildlife Conservation Commission's (FWC) Occurrence System data; FWC Eagles Nest Locations data; FWC Fish and Wildlife Research Institute Florida Scrub-Jay Locations data; and USFWS Wood Stock Core Foraging Habitat data.

Adverse impacts to individual species or regional populations of federal or state protected species or their habitat are not anticipated as a result of the construction of this project. Although wetland and OSW impacts to Wood Stork potential Suitable Foraging Habitat (SFH) appear to exceed half an acre for each alternative, there are upland areas between the alternatives in which the alignment could be shifted during design to avoid most of the potential impacts. It is also likely, based on preliminary drainage evaluations, that additional ditch/swale areas will need to be created for this project. These new ditch areas could be designed to match the hydroperiod and function of the impacted SFH, offsetting any proposed impacts within the same Core Foraging Area (CFA).

4.8.4 Potential Physical Effects

Number of Utility Relocations

More than ten utility/agency owners within the corridor were provided with the alternative alignments to mark up utility locations and potential impacts. The values in the matrix represent the approximate number of relocations amongst the seven owners who reported involvement.

Number of Contamination Sites

In accordance with Chapter 20 of the PD&E Manual, historical aerial photograph reviews, city directory reviews, a database search, FDEP and County file reviews, and a precursory site reconnaissance were all performed to identify and rank the potential contamination risk facilities along the alignment alternatives. These sites and rankings are preliminary; the numbers and rankings may change slightly as the Contamination Screening Evaluation Report is prepared and the data sources re-reviewed as required.

4.8.5 Safety

Number of Driveway Crossings

This evaluation element is as documented through field and aerial imagery-based research.

Number of Street Crossings

This evaluation element is as documented through field and aerial imagery-based research.

4.8.6 Estimated Project Costs

Estimated project costs have not been evaluated in detail at this stage. Right of way cost estimates will be calculated in a later project task and will be finalized based on the findings of a Specific Purpose Survey. At this stage, differences in design and construction costs among alternatives are not expected to be appreciably different. As one example, the selected manner of crossing the corridor's numerous cross-drains (either a routing of the trail in close proximity to the highway, an extension of the highway cross-drain, or an independent trail crossing) would likely be the same whether Alternative A or B is selected. Utility relocation costs to FDOT are expected to be minimal because all utilities are believed to be in the right of way by permit.

4.9 SELECTION OF THE PREFERRED ALTERNATIVE

The recommended preferred alternatives by segment are shown in **TABLE 4-1 Preferred Alternative**. These recommendations are made considering the evaluation results as shown within the Evaluation Matrix presented at the Alternatives Open House and considering the public input. Additional consideration has been given to the preliminary results of a Special Purpose Survey being conducted to confirm the location of existing FDOT right of way through the corridor.

The implementation of the above recommendation would result in the following:

<u>Segments</u>	<u>Typical Section</u>
1, 3, 4, and 7	Rural 12-ft pathway
2 & 8	Rural 12-ft pathway (additional right of way needed)
5 & 6	Urban 8-ft wide pathway with existing bike lanes

TABLE 4-1 Preferred Alternative

Segment #	Approximate Stationing	From (Approx.)	To (Approx.)	Length (miles)	Preferred Alternative	Rationale/Notes
1	Sta. 35 to Sta. 107	0.4 mile north of S.R. 40	400 ft south of Bell Road	1.4	Alt. "A" (Rural)	While right of way may be needed through a few limited areas, user comfort is important, particularly through higher-speed rural sections. Separation from the highway will help achieve this. Available right of way extends well beyond the minimum needed for most of this segment.
2	Sta. 107 to Sta. 131	400 ft south of Bell Road	700 ft south of Hagstrom Road southern connection	0.5	Alt. "B" (Rural) + right of way	Right of way is not available for maximized separation through most of this segment. Minimum separation can be implemented with few right of way needs.
3	Sta. 131 to Sta. 201	700 ft south of Hagstrom Road southern connection	100 ft south of Hagstrom Road northern connection	1.3	Alt. "A" (Rural)	Most of this segment has wide right of way available to optimize separation while shifting the alignment in towards the road at driveway crossings. At about Sta. 173, the right of way reduces, and the typical section should be shifted to Alt. "B".
4	Sta. 201 to Sta. 225	100 ft south of Hagstrom Road northern connection	700 ft south of E 4 th Avenue	0.5	Alt. "B" (Rural)	While right of way is more constrained, lower posted traffic speeds through this segment should allow the path to be brought closer to the minimum separation distance while meandering the alignment to avoid existing trees.
5	Sta. 225 to Sta. 232	700 ft south of E 4 th Avenue	S of 4 th E 4 th Avenue	0.1	East (NB) side Alt. "B" (Urban)	The west side of U.S. 17 is very close to the RR tracks. The constrained right of way in this urban section and availability of U.S. 17's bike lanes make Alt. "B" the optimal choice.
6	Sta. 232 to Sta. 281	S of 4 th E 4 th Avenue	E Washington Avenue	0.9	East (NB) side Alt. "B" (Urban)	The constrained right of way in this urban section and availability of U.S. 17's bike lanes make Alt. "B" the optimal choice. Additionally, the east (NB) side maintains continuity with Segment 5's location as well as the new trail north of Washington Street, reducing street crossings for users. Should the higher number of utility relocations contain telephone/power poles, the trail alignment can be meandered in design.
7	Sta. 339 to Sta. 519	50 ft north of E Palmetto Road	Turkey Shoot Road	3.4	Alt. "A" (Rural)	Plenty of available and wide right of way can be utilized through this segment.
8	Sta. 519 to Putnam County Line	Turkey Shoot Road	Putnam County Line	4.2	Alt. "B" (Rural) + right of way	As this segment passes through Seville and northward, much of it is either reduced or unknown right of way. To reduce the potential right of way needs, the trail should be located at the minimum separation distance.

5.0 PROJECT COORDINATION & PUBLIC INVOLVEMENT**5.1 AGENCY COORDINATION**

Per the *Public Involvement Plan*, the project team met with and also communicated numerous times with public agencies involved in functions influencing the project's development and its environment. These agencies are engaged in various planning, programming, maintenance, regulatory, and/or enforcement functions. Below is a list of those agencies:

- River to Sea Transportation Planning Organization (TPO)
- Volusia County: Public Works; School Board; Votran; Parks, Recreation, and Culture; Planning & Development Services; etc.
- Town of Pierson
- St. Johns Water Management District

The project team met with a number of these project partners in the context of Project Advisory Group (PAG) meetings (two held: June 5 (District Five Headquarters) and October 22, 2018 (Town of Pierson Community Center)). The coordination and/or meetings included the director of the St. Johns River to Sea Loop Alliance and the District Five Scenic Highway Coordinator (this project is within the River of Lakes Heritage Corridor). Furthermore, following the general encouragement of the District's Director of Operations, members of the project team met with the District Maintenance Office to gain perspective from their years of maintaining this portion of U.S. 17. Their insight was not only beneficial to the Conceptual Plan alignment but also to the approach and design of the pathway's crossing of the twenty (20) cross drains.

In addition to affirming the emerging development aspects of the project, the project partner representatives provided observations, perspectives, and suggestions including:

- Agency representatives articulated a general preference for Alternative "A" (maximizing the pathway's separation from highway traffic) and further suggested that curves/meanders in the trail alignment would make for a better experience than a strictly parallel alignment with the highway.
- As a large percentage of corridor will be shaded and can provide a nice user experience, selecting and/or conceptually planning the pathway's alignment between the two rows of trees (in the wide right of way, in the southern portions of the corridor) is best where feasible.
- For the new trail between Washington and Palmetto Streets, constructed in 2018 by the Department, the Town of Pierson indicated they would maintain the grass but wanted Volusia County to maintain the trail surface; rather than two agreements, it should emerge as one (interlocal agreement). This should provide a model agreement for the

future implementation of the balance of the pathway within U.S. 17 within the Town limits.

- Beyond the south end of the project, within the planned widening of U.S. 17, an existing concrete billboard is to be moved to the Barberville Pioneer's Settlement as part of a U.S. 17 widening project and a historical marker and bench is to be placed at billboard location.

The project team also met with the TPO staff, the Bicycle Pedestrian Advisory Committee, and also the TPO's Board, keeping them updated on the progress of the PD&E study and providing advance invitations and briefings prior to the Alternatives Open House.

5.2 PUBLIC INVOLVEMENT



Figure 5-1 Attendees at Alternatives Open House

After developing preliminary trail alternatives, the project team conducted an Alternatives Open House on May 30th, 2019 at the Pierson Community Center in the Town of Pierson. The public was invited to express their views concerning the social, economic, and environmental impacts of the proposed alternatives. After signing in, the attendees freely examined project information displayed throughout the meeting room. Project team staff were stationed throughout the venue to answer questions and discuss specific items of interest and assist attendees.

The project team used a variety of methods to publicize the Alternatives Open House:

May 3rd, 2019	Letters and Newsletter #2 emailed to 106 Elected and Appointed Officials
May 6th, 2019	Letters and Newsletter #2 emailed to 12 Tribal Officials
May 7th, 2019	Letters and Newsletter #2 physically mailed to 281 Letters to Property Owners and Interested Parties
May 16th, 2019	Legal Advertisement published in The Daytona Beach News-Journal
May 10th, 2019	CFLRoads.com is updated with Newsletter #2

May 23rd, 2019 Advertisement published in the Florida Administrative Record and FDOT Public Notices website

May 23rd, 2019 FDOT sends press release for radio and television

5.2.1 Feedback Received

Attendees were encouraged to provide feedback on the physical form that was available throughout the meeting. They were also permitted to mail in their response form so long as it was postmarked by June 10th, 2019. The project team received 12 written comment forms. The following summarizes the received feedback and the number of times they were received:

Construction

- Driveways see many heavy vehicle loadings from trucks hauling oranges (1)
- Preference for trail to be concrete (1)
- Maintain wildlife and avoid placing impenetrable fences (1)
- Suggestion for Emergency Call boxes (1)
- Delay construction on segments with existing pedestrian facilities (1)

Drainage

- Remind FDOT to be aware of additional runoff; Large creeks with high water during rainy season (1)

Environment

- Take steps to preserve large trees throughout corridor (1)
- Plant additional shade trees between trail and U.S. 17 (1)
- Consideration of wildlife and avoid placing of impenetrable fences (1)

General Support

- Long-time resident welcomes addition (3)
- Future trail user appreciates addition (1)



Figure 5-2 Discussion at Alternatives Open House

SECTION 6 – DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

Location

- Avoid County Road 3 (1)
- Shift trail as far from U.S. 17 as possible to avoid high-speed commercial semi-trucks (1)
- Reminder that business on east side of U.S. 17 must maintain parking (1)

Right of Way

- Worry over right of way taking – (2)

General Disapproval or Dissatisfaction

- Poor use of taxes (2)
- Disbelief that there is a need for this trail (1)

The original Meeting Summary for the Alternatives Open House as well as Newsletters 1, 2, and 3 are included in the Comments and Coordination Report document under separate cover.

6.0 DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

6.1 ENGINEERING DETAILS OF THE PREFERRED ALTERNATIVE

6.1.1 Typical Sections

Five Typical Sections are anticipated for this project. These typicals and their applications are described below. The typicals are provided in **Figure 6-1** through **Figure 6-5**.

Typical Section 1

Typical Section 1 would be applied in areas without curb and gutter, where right of way is sufficient to meet all roadway clearance and SUN Trail, criteria and where no constraints prevent maximizing the separation between the shared use path and the roadway.

Typical Sections 2a and 2b

Typical Sections 2a and 2b are to be applied on segments with no curb and gutter where right of way constraints require minimum separation between the roadway and the shared use path. Design speed and/or longitudinal grade considerations precluded the use of curb and gutter in the segments where Typical Sections 2a and 2b are recommended. In some of these locations right of way may be required. The geometry of the two typicals is identical: 2a requires right of way, 2b does not.

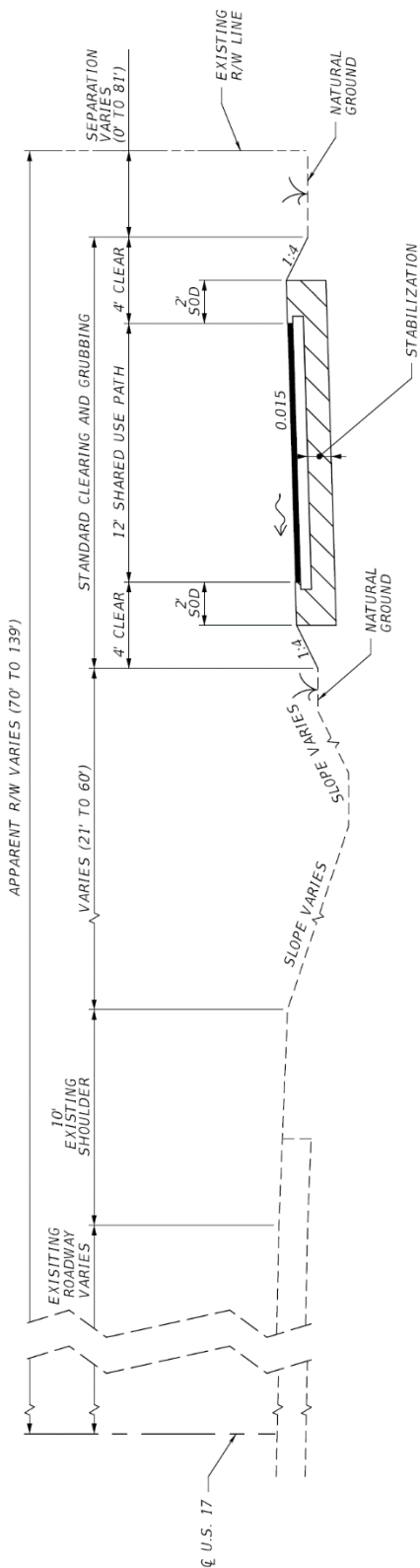
Typical Section 3

Typical Section 3 will be applied in areas with curb and gutter. The shared use path width has been minimized to fit within the available right of way.

Typical Section 4

Typical Section 4 will be applied on a segment with no curb and gutter constrained by adjacent development. The width of the ditch between the shared use path and the roadway has been minimized to reduce right of way impacts.

SECTION 6 – DESIGN FEATURES OF THE PREFERRED ALTERNATIVE



TYPICAL SECTION 1 (ALTERNATIVE "A" - RURAL)

SHARED USE PATH
 STA. 35+98 TO STA. 107+00
 STA. 131+00 TO STA. 201+00
 STA. 339+00 TO STA. 519+00

TRAFFIC DATA

CURRENT YEAR = 2019
 U.S. 17 AADT = 5,000-6,200
 SHARED USE PATH DESIGN SPEED = 18 MPH

Figure 6-1 Preferred alternative typical 1 - rural

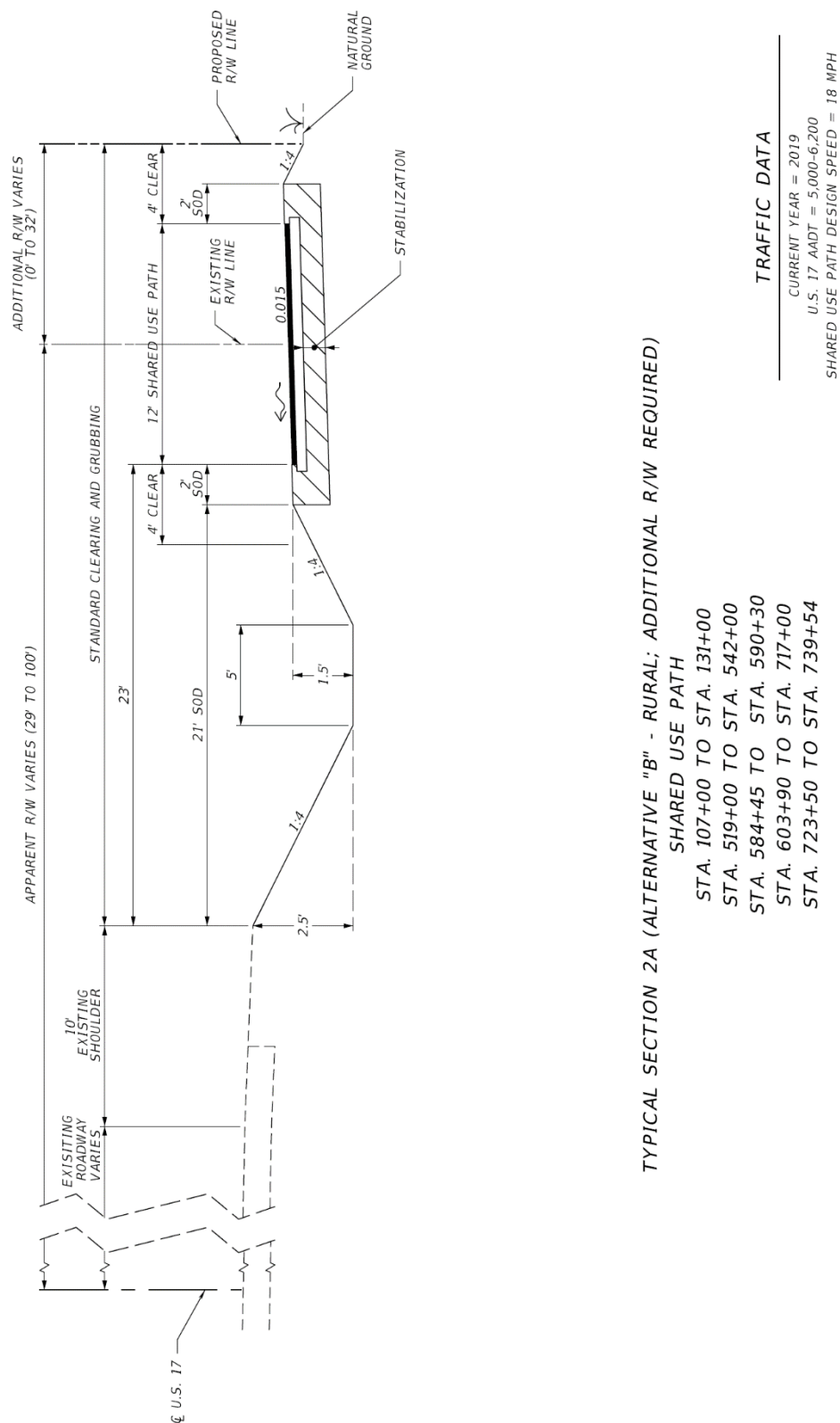
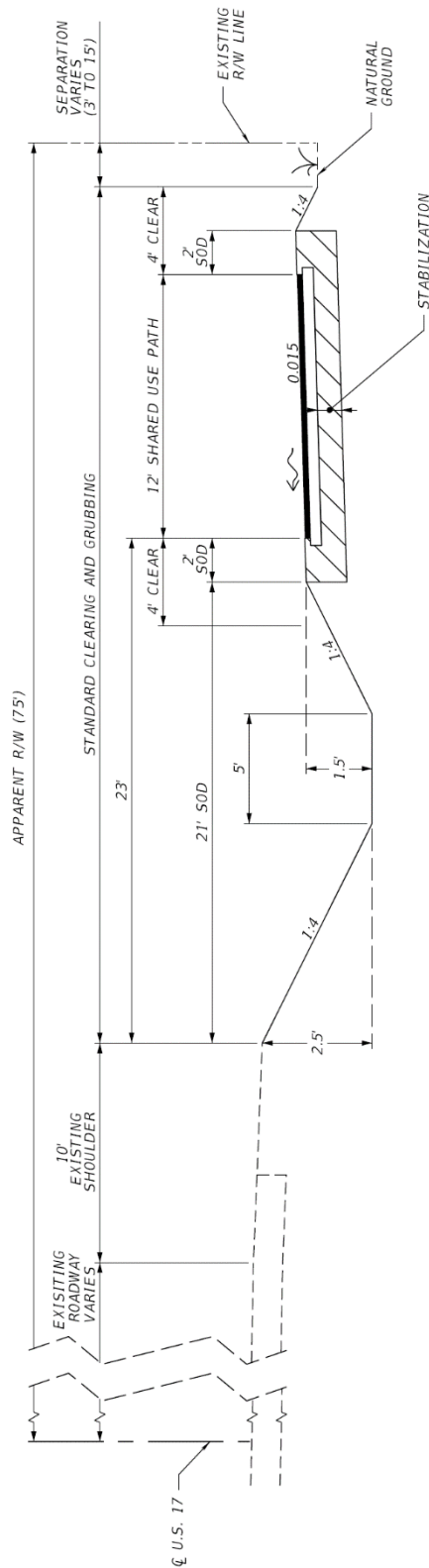


Figure 6-2 Preferred alternative typical 2A - rural R/W required

SECTION 6 – DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

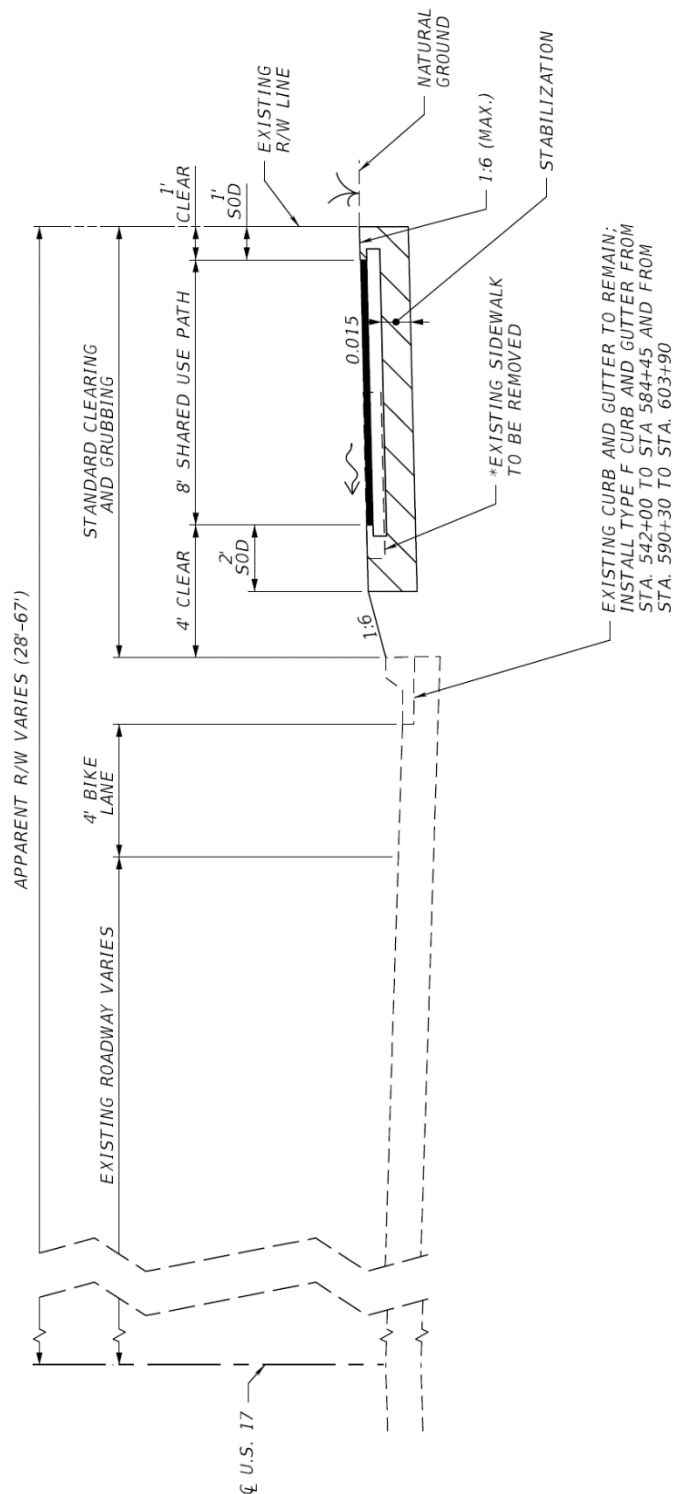


TYPICAL SECTION 2B (ALTERNATIVE "B" - RURAL)
SHARED USE PATH
STA. 201+00 TO STA. 225+00

TRAFFIC DATA

CURRENT YEAR = 2019
U.S. 17 AADT = 5,000-6,200
SHARED USE PATH DESIGN SPEED = 18 MPH

Figure 6-3 Preferred alternative typical 2B - rural R/W not required



TYPICAL SECTION 3 (ALTERNATIVE "B" - URBAN)

SHARED USE PATH

STA. 225+00 TO STA. 279+93

STA. 542+00 TO STA. 584+45

STA. 590+30 TO STA. 603+90

TRAFFIC DATA

CURRENT YEAR = 2019

U.S. 17 AADT = 5,000-6,200

SHARED USE PATH DESIGN SPEED = 18 MPH

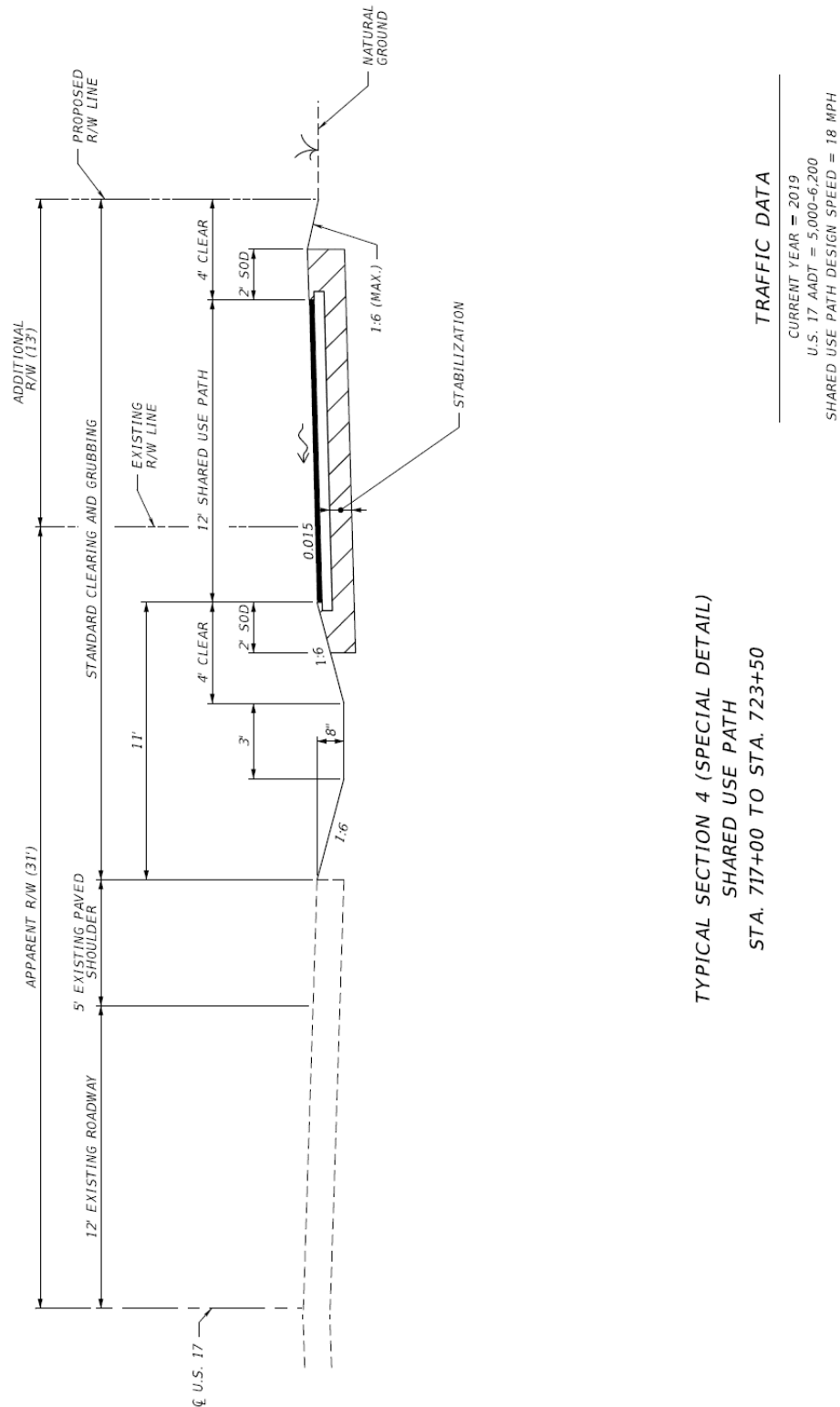
*NO EXISTING SIDEWALK BETWEEN

STA. 553+80 TO STA. 556+50

STA. 576+80 TO STA. 584+45

Figure 6-4 Preferred alternative typical 3 - constrained urban

SECTION 6 – DESIGN FEATURES OF THE PREFERRED ALTERNATIVE



TYPICAL SECTION 4 (SPECIAL DETAIL)
SHARED USE PATH
STA. 717+00 TO STA. 723+50

Figure 6-5 Preferred alternative typical 4 - constrained rural

6.1.2 Bridges and Structures

No bridges or structures have been proposed as part of this PD&E study.

6.1.3 Right of Way and Relocations

The preferred alternative will not require any relocations.

It is anticipated that forty-seven parcels will be impacted by the preferred alternative. The total anticipated required right of way is 12.5 acres. Refer to the preferred alternative plans for the assumed right of way lines and for specific parcels impacted.

The right of way lines on the preferred alternative (**Appendix B Preferred Alternative**) are assumed. In some locations along the right of way the FDOT right of way maps could not confirm the right of way limits. In these areas, the Preferred Alternative plan shows parcel lines and an apparent right of way line. The parcel lines were obtained from the Volusia County Property Appraiser. The representation of these lines over the aerial background may not be accurate. The apparent right of way line was created to represent an extremely conservative right of way based upon 20 feet of maintained space adjacent to the pavement. Neither the parcel lines nor the assumed right of way lines should be considered actual right of way as neither has been surveyed.

6.1.4 Horizontal and Vertical Geometry

The geometry of the preferred alternative meets the criteria in the FDM except where a narrower pathway was needed to avoid right of way impacts. These locations are discussed in **Section 6.1.16 Design Variations and Design Exceptions**.

The Preferred Alternative plans are provided in **Appendix B Preferred Alternative** under separate cover.

6.1.5 Bicycle and Pedestrian Accommodations

This project will provide a shared use path along the east side of U.S. 17 from SR 44 north to the Putnam County Line. This path will serve as a pedestrian facility and as a supplement to the existing paved shoulders and bike lanes along U.S. 17.

6.1.6 Multi-Modal Accommodations

This shared use path will provide a continuous pedestrian and bicycle facility providing access to Votran route stops along the U.S. 17. Accessible transit pads have been constructed at each Votran stop. The proposed shared use path will provide accessible connections to those pads (as illustrated in the plans).

6.1.7 Access Management

This project is not anticipated to require the substantial modification of driveways or medians along U.S. 17.

6.1.8 Intersection Concepts

Preferred alternative plans are provided in **Appendix B Preferred Alternative** under separate cover. This project does not alter the configuration of any intersections beyond the provision of facilities for the shared use path.

6.1.9 Intelligent Transportation System and TSMO Strategies

This project is not anticipated to include or impact any ITS or TSMO strategies implemented or planned along this corridor.

6.1.10 Utilities

Contact information cost estimates for unavoidable relocations of major utilities are presented in **TABLE 6-1 Impacted UAO Costs**. The costs do not reflect the probability of having to relocate the utility. Utility Green Line plans are provided in **Appendix F** under separate cover.

TABLE 6-1 Impacted UAO Costs

Utility Agency Owner	Description	Estimated Cost
AT&T Distribution	AT&T owns overhead and underground copper and fiber on the east and west side of U.S. 17.	\$8,346,600
Bright House Networks	Bright House Networks owns overhead fiber that is a joint user on Duke Energy poles on the west side of U.S. 17.	\$672,000
Clay Electric Cooperative	Clay Electric Cooperative owns 14' crossarm wooden power poles of 25kV on the east and west side of U.S. 17.	\$3,400,000
Crown Castle	Crown Castle owns aerial facilities that are a joint user on Duke Energy Poles on the east and west side of U.S. 17.	\$1,074,000
Duke Energy Distribution	Duke owns 44' wooden poles with a voltage of 12.47 kV on the east and west side of U.S. 17.	\$9,352,500
MCI/Verizon	Verizon owns facilities on the west side of U.S. 17.	\$4,350,000
Opticalcel	Opticalcel owns facilities on the east and west side of U.S. 17 and are joint users on Duke Energy poles.	\$126,000
Uniti	Uniti owns three 1-1/4" HDPE Duct E/W 96ct fiber with 24"x36"x30" hand holes every 1000' on the east side of U.S. 17.	\$1,000/Hand Hole

There were no responses from the UAO's in regards to entering into a utility work by highway contractor agreement (UWHCA) with FDOT. All UAO's were requested to provide a response.

6.1.11 Drainage and Stormwater Management Facilities

The Environmental Resource Permits for the projects listed in **TABLE 2-10 Existing SJRWMD Permits** reviewed to determine any potential impacts the preferred alignment may have on existing or proposed stormwater management ponds. Based on the plans submitted for SJRWMD permit number 139276, the preferred alignment is within 25 feet of the proposed Stormwater Pond 8 of the U.S. 17 Widening Project at Station 38+00. Although the preferred alternative gets close to pond, it should not impact the pond based on the plans provided the permit application.

Anticipated Stormwater Management Permitting

The project is in the St. Johns River Water Management District. Shared use path projects are exempt from SJWMD stormwater requirements and Environmental Resource Permits (ERP) when the project does not impact wetlands, floodplains, or an existing ERP stormwater systems. The proposed alignment has been meandered to avoid or minimize impacts to issues that could require an ERP.

ERPs or other permits may be required in areas where closed drainage systems and/or cross drains are being constructed or modified, and at the 7 potential encroachments into the floodplain, which are in the listed below:

1. Encroachment 1 is located from Sta. 172+50 to 185+00,
2. Encroachment 2 is located from Sta. 408+55 to 410+00,
3. Encroachment 3 is located from Sta. 462+50 to 467+50,
4. Encroachment 4 is located from Sta. 565+50 to 580+00,
5. Encroachment 5 is located from Sta. 596+70 to 598+25,
6. Encroachment 6 is located from Sta. 602+00 to 605+00,
7. Encroachment 7 is located from Sta. 725+00 to 737+00.

The proposed alignment avoids impacting jurisdictional wetlands and surface waters to the degree practicable. Further avoidance and minimization can be achieved during the design phase with a formal survey. Where there are impacts, the swale would be relocated closer to the roadway, only 4-5 feet from the original location in most cases. Reestablishment of the ditch should serve to offset any surface water impacts and would also likely offset the wood stork core foraging impacts as indicated in our Natural Resources Evaluation memo (February 2019). Based on this, three permits are anticipated to be required:

1. St. Johns River Water Management District – either a General Permit or Individual Environmental Resource Permit
2. U.S. Army Corps of Engineers – either a Nationwide 23 or SAJ 92
3. U. S. Environmental Protection Agency – National Pollutant Discharge Elimination System Permit

Additional Drainage Considerations

The balance of this section of the Preliminary Engineering Report provides a summary of three prominent drainage design topics influencing the preferred alignment and preferred alternative:

1. The drainage cross-flow design approach for the rural pathway typical section;
2. The adequacy of the existing closed drainage system to accommodate the pathway within the approximate one-mile curb and gutter segment (within the Town of Pierson); and
3. how the trail will traverse the existing eighteen (18) U.S. 17 cross drains/culverts.

More information concerning these topics are included in the *LHR*.

Drainage Cross-flow for Rural Typical Section

The majority of the preferred alternative implements Rural Typical Sections "A" and "B" and anticipates allowing for off-site sheet flow across the trail. The preferred alternative assumes there will be some limited sheet flow across the trail. The occurrences of off-site sheet flow will be very limited. The nearby (and parallel) railroad, the highway, and preferred trail alignment, all follow the crest of natural ridges; approximately 85 percent of the terrain slopes away from the proposed trail alignment.

There are a few short portions within the planned Typical Section "A" alignment where there exist "double" longitudinal swales. One is the adjoining constructed and continuous roadside swale; the other is an intermittent, shallow, natural, and much less discernable swale more laterally distant from the roadway. In these areas, the right of way is generously wide and will allow a pathway alignment and subsequent design to accommodate the second swale where it may be needed.

The roadside swales have been evaluated at several representative locations during the development of the rural typical sections to ensure that the proposed drainage swale in the typical sections can accommodate the stormwater runoff from the existing roadway, right of way, and the future path (sloped inward toward the roadside swale, of course). The primary design frequencies are 10-year for roadside swales and 25-year for outfall swales/ditches.

Typical Section 4 is used from STA. 717+00 to STA. 723.50. This cross section provides an 8-inch deep trapezoidal swale with a 3-foot wide bottom, 1:6 front and back side slopes, and a 0.3% longitudinal slope. This shallow swale has been provided to allow the property owner to continue to access U.S. 17 along the frontage of the property without restricting the access point with standard driveway culverts. This swale has been designed to provide conveyance for the 10-yr storm event. An alternative to this swale is to provide a 24-inch driveway culvert approximately 200' long.

Closed Drainage System Adequacy (Town of Pierson)

The closed drainage system within the Town of Pierson has been evaluated to determine the improvements needed to bring the systems into compliance per current FDOT drainage design criteria. A summary of what is needed is provided below:

- Install 127 LF of 15" concrete pipe,
- Extend 900 LF of 18" concrete pipe,
- Replace 1,035 LF of 18" concrete pipe with 24" concrete pipe,
- Construct 13 additional curb inlets,
- Install 1 additional inlet, and
- Additional maintenance of traffic will be needed for installation of drainage system improvements, specifically the cross drains.

U.S. 17 Cross Drain/Culvert Crossings

The preferred alignment crosses eighteen (18) existing cross drains or culverts. Fourteen of the crossings can be achieved by routing the trail alignment over the existing pipe or culvert. In some cases, the trail will need to be narrowed and railings will need to be provided for the trail to be routed over the cross drain or culvert, as illustrated in the preferred alternative plans. There are three areas where the cross drain or culvert will need to be extended to provide adequate area for the trail crossing. One crossing will require the installation of an independent cross drain for the trail.

6.1.12 Floodplain Analysis

There are seven potential minimal floodplain encroachments along the alignments. The encroachments are in FEMA Zone A floodplain but are not within FEMA regulated floodway (24" x 36" FIRM Maps with the path alignment overlay are provided in the *LHR*). A list of the encroachment areas is provided in **Section 6.1.11 Drainage and Stormwater Management Facilities**.

The encroachments will not cause any roadway overtopping nor an impact on the floodplains. The trail crossing elevations should be established lower than both the highway's travel lane and shoulder elevations. This will eliminate the potential for the construction of the trail to cause overtopping of U.S. 17.

Along the approach to the crossings and in Encroachments 4, 5, and 7, it is recommended the path's proposed grade line match existing grade. This can reduce or eliminate the need for cut and fill compensation in floodplain areas. If it is determined that cut and fill compensation is required for these encroachments, there are areas adjacent to the floodplain which can be used to achieve the necessary compensation.

6.1.13 Transportation Management Plan

The proposed trail can be constructed in a single phase. Travel Lane closures are not anticipated along U.S. 17, however, shoulder/bike lane closures are anticipated throughout the corridor in areas along Segments B through E, where the proposed trail is to be constructed adjacent to the existing shoulder. Shoulder closures are expected as well for the culvert crossings, with the use of temporary barrier to protect against any drop offs created. Temporary driveway/side street lane closures will be needed to construct the proposed trail crossings. For side street single lane closures, a flagging operation will be needed, as there are two-lane roads at many locations. In Segment B, a temporary pedestrian detour route will be needed to shift pedestrians to the west side of U.S. 17 in order to maintain continuity of the existing sidewalk during construction.

6.1.14 Special Features

Approximately 100 feet of pedestrian railing will be required at each location where Option #1 cross drain/culvert crossing is used. The approximate station numbers for Option #1 cross drain/culverts are as follows:

- Station 45+00
- Station 57+50
- Station 65+90
- Station 97+90
- Station 390+20
- Station 422+90
- Station 438+70
- Station 465+20
- Station 622+60
- Station 645+60
- Station 678+00

6.1.15 Required Maintenance Agreements

The shared use path will require maintenance agreements with Volusia County and the Town of Pierson.

6.1.16 Design Variations and Design Exceptions

One design variation is anticipated for this project. This variation applies to the following station limits:

- Station 225+00 to Station 279+93
- Station 542+00 to Station 584+45, and
- Station 590+30 to Station 603+90.

In these locations, right of way is constrained and does not allow for the provision of 4.5 feet of separation between the roadway and the shared use path, a 12-ft shared use path, and 4 feet clear area adjacent to the path between the path and the right of way.

A variation will be needed to reduce the separation of the path to the right of way line from 4 feet to 1 foot. The FDM section 224.7 requires a 4-foot clear area adjacent to both sides of a shared

use path. The FDM allows this separation to be reduced to a 2-foot clear area under restricted conditions. Given the right of way constraints, the separation between the path and the right of way line will be limited to 1 foot much of the trail length in the sections listed above.

The typical section for the three segments is represented in **Figure 6-4 Preferred alternative typical 3 - constrained urban**.

The reduction to an 8-ft wide shared use path recommended for consideration will, per the FDM, need to be approved by the Chief Planner. This approval has been received.

There are bike lanes on U.S. 17 through this area that will accommodate those bicyclists more comfortable riding in traffic. This may remove this (typically) higher-speed bicycling cohort from the proposed path. FHWA's Shared Use Path Level of Service Calculator was used to evaluate the path through this section and an 8-ft wide path is anticipated to provide LOS B as required for SUN Trail facilities.

6.1.17 Trailheads

The scope did not include a task to identify or design trailheads. However, the SUN Trail program seeks to have trailheads located on approximately six-mile intervals. Three locations seem likely as potential trail heads near, or within, the study corridor: the Heart Island Conservation Area, Washington Avenue Park in Pierson, and the Lake George Conservation Area.

Heart Island Conservation Area

The Heart Island Conservation Area is adjacent to U.S. 17 approximately ½ mile south of S.R. 40. The study corridor is linked directly to this location by a planned, designed shared use path along S.R. 40.

Washington Avenue Park

Approximately 5.5 miles north of the Heart Island Conservation Area is Washington Avenue Park in Pierson. The Washington Avenue Park is located in the northeast quadrant of U.S. 17 and Washington Avenue intersection in Pierson. Placing a trailhead at this location would require a crossing of U.S. 17 at the signalized intersection with Washington Avenue.

Lake George Conservation Area

At the northern end of the project, the Lake George Conservation Area lies west of the project corridor along the eastern shore of Lake George. There is currently no paved access route between the corridor and the Lake George Conservation Area. A future study could evaluate the potential for connecting this natural resource into the SJR2C corridor.

6.1.18 Cost Estimates

Construction costs were calculated using the FDOT Long Range Estimating System. A summary of the LRE costs are provided in **TABLE 6-2 LRE Summary Table**.

TABLE 6-2 LRE Summary Table

Segment	Component					
	Earthwork	Roadway	Shoulder	Drainage	Signing	Total
Project Begin to Hagstram Road	330,332	1,412,731	77,596	38,150	40,955	1,899,765
Hagstram Road to Washington Avenue	166,544	543,329	24,700	-	19,068	753,642
Palmetto Avenue to Cherry Street	407,196	1,227,622	81,420	56,803	44,946	1,817,987
Cherry Street to Raulerson Road	93,086	234,482	8,979	-	22,814	359,360
Raulerson Road to Project End	280,943	991,969	51,901	21,139	33,710	1,379,661
Project Segment Subtotal	1,278,101	4,410,134	244,595	116,092	161,492	6,210,415
Maintenance of Traffic (6%)	76,686	264,608	14,676	6,966	9,690	372,625
Mobilization (10%)	135,479	467,474	25,927	12,306	17,118	658,304
Contingency (15%)	\$223,540	\$771,332	\$42,780	\$20,304	\$28,245	\$1,086,202
Total	\$1,713,806	\$5,913,549	\$327,978	\$155,668	\$216,545	\$8,327,546

Right of way costs for the total project are estimated as \$3,129,000.

6.2 SUMMARY OF ENVIRONMENTAL IMPACTS OF THE PREFERRED ALTERNATIVE

6.2.1 Future Land Use

This shared use path project will not impact the existing land use.

6.2.2 Section 4(f)

No existing nor proposed Section 4(f) protected resources are a part of this PD&E study.

6.2.3 Cultural Resources

Following the approval of the recommended preferred alternative, alignment changes were made (after the Cultural Resource Assessment Survey (CRAS) had been submitted to and reviewed by the State Historic Preservation Officer (SHPO) earlier in 2019). As a result, the proposed trail will no longer encroach on the six historic properties located along the U.S. 17 corridor.

The Seville Public School Building Complex (8VO10042) and its four contributing buildings (8VO03136 and 8VO10043-10045), the C.E. Smith House (8VO05053), and the Seville Fire Tower (8VO10051) are located on the east side of U.S. 17; the preferred alternative is on the east side as well. In recognition of these historic properties the proposed alignment has been shifted closer to U.S. 17 and away from the respective properties. The proposed trail for this alignment will no longer be constructed as a 12-ft trail but rather an 8-ft typical section with curb and gutter (see Preferred alternative plans, Typical Section 3; Sheet 5). The proposed preferred alternative will not encroach on these historic properties and will remain within the right of way. The undertaking will not result in the removal or destruction of anything substantial. As a result, the proposed undertaking will have no adverse effect on these historic properties.

6.2.4 Wetlands

Wetland impacts associated with the construction of this project can be mitigated pursuant to Section 373.4137 Florida Statutes (F.S.) to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.s. 1344. Under Section 373.4137 F.S., mitigation of wetland impacts will be implemented by the purchase of mitigation bank credits from a SJRWMD-approved mitigation bank. Potential wetland and OSW impacts for Alternative A are 3.77 acres and 5.75 acres, respectively (9.52 acres total), and potential wetland and OSW impacts for Alternative B are 0.64 acre and 10.49 acres, respectively (11.13 acres total).

Implementing the preferred alternative would result in impacts to 3.77 acres of wetland and OSW impacts of 5.75 acre, for a total of 9.52 acres impacted.

6.2.5 Protected Species and Habitat

Adverse impacts to individual species or regional populations of federal or state protected species or their habitat are not anticipated because of the construction of this project.

6.2.6 Essential Fish Habitat

There are no Essential Fish Habitats (EFH) within the project corridor, therefore the project will have no effect on EFH.

6.2.7 Highway Traffic Noise

Given the users of this project will be non-motorized (pedestrians and bicyclists), no noise study was required for this project.

6.2.8 Contamination

The purpose of the CSER evaluation was to assess the risk of encountering petroleum or hazardous substance contamination of soil, groundwater, surface water, or sediment that could adversely affect this project. The CSER activities included a review of public regulatory files and historical data sources, and a site reconnaissance of the project study area.

As a result of this evaluation, we have assigned Contamination Risk Ratings to 57 sites. The 57 site locations are shown along with a detailed description of each site in **APPENDIX G Potential Contamination Site Summary**.

Using the FDOT Risk Ratings presented in Chapter 20 of the PD&E Manual, dated June 14, 2017, we have identified 15 Low Risk sites, 36 Medium Risk sites, and 6 High Risk sites. Based on their proximity to the trail improvements, a Level 2 Contamination Assessment is recommended for the sites listed in **Table 6.3 Recommended Level 2 Contamination Assessments**.

Table 6-3 Recommended Level 2 Contamination Assessments

Site #	Location	Station	Notes	Risk Rating
7	Wayne's Repair 1115 S. U.S. 17 17, Pierson, FL NE quadrant of US17 at Bell Rd.	Sta. 113 Right	Historical vehicle repair shop	High
8	Well Pump U.S. 17 south of Emporia Rd.	Sta 125 Right	Soil staining was observed under the aboveground fuel tank.	Medium
32	Historical Gas Station 925 N. U.S. 17 17, Pierson, FL NE quadrant of U.S. 17 at North C.R. 3 Intersection	Sta 401+50 Right	A fuel island base is visible on-site. Lack of Regulatory Records and proximity of proposed trail	High
39	Seville Auto Center a.k.a. Joe's Service Center 1495 U.S. 17 17 N., Seville, FL SE quadrant U.S. 71 at E. Cherry St.	Sta. 547 Right	Tanks were removed from this old gas station, but no closure assessment	High
40	Estate of Mary V. Hendrickson Vacant land presently, former gas station NE of U.S. 17 and Cherry St.	Sta 550+50 Right	Tanks were removed but no closure assessment	Medium
45	Historical Gas Station 1899 U.S. 17 17 N., Seville, FL SE quadrant of U.S.17 at Lawrence St.	Sta 576 Right	A building and turn-off exist at this location dating back to 1943. No available documentation or assessment.	Medium
46	Historical Commercial Facility 2046 U.S. 17 17 N., Seville, FL Possible former fruit packing house or gas station	Sta. 602 Left	Extensive earthwork and extension of cross-drain culvert on east side This building was associated with the railroad dating back to 1951. Potential gas station.	Medium
47	Historical Repair Facility 2095 U.S. 17 N., Seville, FL SE quadrant of U.S. 17 at Mayfield Rd. Former agricultural maintenance facility	Sta. 616 Right	Extensive earthwork anticipated at this. Appears to have been a repair facility in 1975 - 1984.	Medium
51	Senyah Station 2183 U.S. 17 N, Seville, FL South of Prevatt Rd. Old gas station, 2 tanks removed, but 2 possibly	Sta. 640+50 Right	Historical gas station and auto repair facility with potential that underground tanks remain on-site. Hydraulic lift on north side of building	Medium
646	Well & Pipes at Drainage endwall Just north of Prevatt Rd.	Sta. 646 Right	Dead – stressed vegetation. In some photos pipes are attached to a tractor with a portable pump.	Medium
52	Sterling Nurseries NE quadrant of U.S. 17 at Raulerson Rd. Former aboveground petroleum tank	Sta. 684+50 Right	Historical aboveground tank reported as leaking. No assessment or remediation activities documented.	Medium
54	3L Enterprises 2489 U.S. 17 17 N, Seville, FL Former Gas station, tanks were removed in 1970's	Sta. 720 Right	Soils highly stained, possible petroleum contamination	Medium

APPENDICES

APPENDIX A – EVALUATION MATRIX SUPPORTING DOCUMENTATION

APPENDIX A Evaluation Matrix Supporting Documentation



Florida Department of Transportation

RICK SCOTT
GOVERNOR

719 S. Woodland Boulevard
DeLand, FL 32720-6834

MIKE DEW
SECRETARY

MEMORANDUM

DATE: July 26, 2018

TO: Lorena Cucek, FCCM, cpm – FDOT Project Manager

FROM: Bruce Landis, P.E., AICP – Landis Evans + Partners Project Manager

COPIES: Jesse Blouin, AICP

SUBJECT: 439876-1 (US 17 Trail PD&E) First Draft Evaluation Matrix Supporting Documentation

Introduction and Summary

At this stage of the US 17 Trail PD&E study process, several viable alternatives have been identified. Alternatives A and B are both located on the east side of US 17 and are present for the entire 13.7-mile corridor. Alternative A is designed to maximize separation between the roadway and the trail given known or apparent right-of-way, while Alternative B provides minimum roadway-trail separation to meet FDOT design criteria (while potentially minimizing other impacts). Note that there are significant portions of the corridor within which these two east side alternatives are co-aligned. Alternatives C and D are located on the west side of US 17 for only the 0.9-mile segment between 4th Avenue and Washington Avenue in the Town of Pierson. These alternatives follow the same approach as the east side alternatives, with Alternative C minimizing separation and Alternative D maximizing separation (though the resulting variation is much smaller because of the constrained right-of-way in that segment).

These alignment alternatives are being evaluated based on numerous criteria relating to the degree to which the facility purpose is met, social impacts, natural/cultural environmental effects, physical effects, safety, and costs. The First Draft Evaluation Matrix provides qualitative or quantitative findings for all identified criteria for eight different segments; the corresponding segmentation is based on locations where multiple alternatives are or are not present.

This Memorandum accompanies the First Draft Evaluation Matrix and provides background and support for the initial findings. While the findings suggest moderate differences in various benefits and impacts among the alternative alignments, those differences do not consistently favor one alternative over another at this time. This suggests that all remain viable alternatives to continue through the study process, including consideration at the Alternatives Public Meeting.

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Evaluative Criteria

The following sections provide background and support for each evaluative criterion.

Trail User Operating Environment and Comfort (i.e., Lateral Separation)

Trail separation from the roadway is a key determining factor in users' perceived comfort and enjoyment of the operating environment of the proposed shared use pathway, as affirmed by numerous studies, including FDOT's Sidepath Level of Service Model. Stakeholders have suggested that this is especially true in this case given the generally high-speed nature of motor vehicle traffic on US 17. Alternative B was specifically developed to minimize separation (to avoid other potential impacts) while still meeting FDOT design criteria. Therefore, Alternative A (in segments in which the two alternatives are not co-aligned) provides a more optimal user experience.

Aesthetics

This evaluative criterion is significant pursuant to Chapter 11 of the PD&E Manual which establishes that "*FDOT considers Aesthetic Effects (AE) in project development because it influences community cohesion, community values, and can affect the travel experience*" (Section 5.1.1 Purpose) and is especially relevant given this type of transportation project. The primary evaluative metric for this criterion is the relative level of shade tree protection (i.e., potential canopy coverage) afforded by each alternative alignment. This has a substantial effect on the alternatives' ability to serve the purpose and need of this project as a significant portion of Florida's St. Johns River to Sea Loop Trail. For additional precision, this qualitative criterion was evaluated on a five-level scale.

Service to Community Destinations and Developable Parcels/Population Access (Local Traffic Potential)

With the prior elimination of trail alternatives on the west side of US 17 south of 4th Avenue and north of Washington Avenue, which suffered from lack of access provided to developable parcels because of the proximity to the rail line, variation amongst remaining alternative alignments are generally nominal as related to this criterion. Between 2nd Avenue and Washington Avenue within the Town of Pierson, Alternatives C and D on the west side of US 17 provide marginally better population access and service to community destinations given the presence of the CR 3 commercial corridor, Chipper Jones Family Sports Complex, and the site of the former elementary school/potential future community center, all of which are located west of US 17.

School Access/Student Mobility

Administrators from both schools report that current levels of walking to school are remarkably low, but implementation of the proposed trail is expected to make walking and/or bicycling a more viable mode of transportation for students. The existing student population is divided generally evenly between the east and west sides of US 17 throughout the corridor, according to

439876-1 (US 17 Trail PD&E)
First Draft Evaluation Matrix Memorandum - July 18, 2018

Page 2 of 5

Evaluative Criteria

The following sections provide background and support for each evaluative criterion.

Trail User Operating Environment and Comfort (i.e., Lateral Separation)

Trail separation from the roadway is a key determining factor in users' perceived comfort and enjoyment of the operating environment of the proposed shared use pathway, as affirmed by numerous studies, including FDOT's Sidepath Level of Service Model. Stakeholders have suggested that this is especially true in this case given the generally high-speed nature of motor vehicle traffic on US 17. Alternative B was specifically developed to minimize separation (to avoid other potential impacts) while still meeting FDOT design criteria. Therefore, Alternative A (in segments in which the two alternatives are not co-aligned) provides a more optimal user experience.

Aesthetics

This evaluative criterion is significant pursuant to Chapter 11 of the PD&E Manual which establishes that "*FDOT considers Aesthetic Effects (AE) in project development because it influences community cohesion, community values, and can affect the travel experience*" (Section 5.1.1 Purpose) and is especially relevant given this type of transportation project. The primary evaluative metric for this criterion is the relative level of shade tree protection (i.e., potential canopy coverage) afforded by each alternative alignment. This has a substantial effect on the alternatives' ability to serve the purpose and need of this project as a significant portion of Florida's St. Johns River to Sea Loop Trail. For additional precision, this qualitative criterion was evaluated on a five-level scale.

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With the prior elimination of trail alternatives on the west side of US 17 south of 4th Avenue and north of Washington Avenue, which suffered from lack of access provided to developable parcels because of the proximity to the rail line, variation amongst remaining alternative alignments are generally nominal as related to this criterion. Between 2nd Avenue and Washington Avenue within the Town of Pierson, Alternatives C and D on the west side of US 17 provide marginally better population access and service to community destinations given the presence of the CR 3 commercial corridor, Chipper Jones Family Sports Complex, and the site of the former elementary school/potential future community center, all of which are located west of US 17.

School Access/Student Mobility

Administrators from both schools report that current levels of walking to school are remarkably low, but implementation of the proposed trail is expected to make walking and/or bicycling a more viable mode of transportation for students. The existing student population is divided generally evenly between the east and west sides of US 17 throughout the corridor, according to

APPENDIX A - EVALUATION MATRIX SUPPORTING DOCUMENTATION

439876-1 (US 17 Trail PD&E)

Page 4 of 5

First Draft Evaluation Matrix Memorandum - July 18, 2018

undeveloped acreage within the project APE, exclusive of manmade land, is considered to have a potential for archaeological site occurrence. The evaluation matrix shows a moderate-to-high archaeology probability along the entire corridor and a low-to-moderate probability for historic resources.

A review of the Florida Master Site File (FMSF) indicates that 15 historic resources have been previously recorded along the east side (Alternatives A and B) of the project corridor. None of the historic resources have been evaluated by SHPO and approximately five appear destroyed. Based on a consultant team review of Volusia County Property Appraiser data and Google Earth aerial imagery, there are approximately 26 newly identified historic resources located on the east side (Alternatives A and B) and 14 historic resources located on the west side (Alternatives C and D) built in 1972 or earlier.

Floodplains

This evaluation element is the total acreage of overlap between the alignments' footprints and identified floodplains as represented by Flood Zone "A." In segments where Alternatives A and B do not coincide, Alternative A generally has nominally greater floodplain impacts.

Wetlands

Approximate wetland and other surface water (OSW) locations were identified along the alternative alignments. Wetland impacts associated with the construction of this project can be mitigated pursuant to Section 373.4137 Florida Statutes (F.S.) to satisfy all mitigation requirements of Part IV, Chapter 373, F.S. and 33 U.S.C.S. 1344. Under Section 373.4137 F.S., mitigation of wetland impacts will be implemented by the purchase of mitigation bank credits from a SJRWMD-approved mitigation bank. Potential wetland and OSW impacts for Alternative A are 3.77 acres and 5.75 acres, respectively, and potential wetland and OSW impacts for Alternative B are 0.64 acre and 10.49 acres, respectively. The total potential wetland and OSW impacts associated with the proposed alternatives along the US 17 trail corridor are 9.52 acres for Alternative A and 11.13 acres for Alternative B.

Wildlife/Threatened and Endangered Species Occurrence Potential

GIS review of potential wildlife species impacts included the following elements: aerial photography; United States Fish & Wildlife Service's National Wetlands Inventory (NWI) mapping; USFWS Consultation Area GIS data layers; Florida Fish and Wildlife Conservation Commission's (FWC) Occurrence System data; FWC Eagles Nest Locations data; FWC Fish and Wildlife Research Institute Florida Scrub-Jay Locations data; and USFWS Wood Stock Core Foraging Habitat data.

Adverse impacts to individual species or regional populations of federal or state protected species or their habitat are not anticipated as a result of the construction of this project. Although wetland and OSW impacts to Wood Stork potential Suitable Foraging Habitat (SFH) appear to exceed half an acre for each alternative, there are upland areas between the alternatives in which

APPENDIX A - EVALUATION MATRIX SUPPORTING DOCUMENTATION

439876-1 (US 17 Trail PD&E)

Page 5 of 5

First Draft Evaluation Matrix Memorandum - July 18, 2018

the alignment could be shifted during design to avoid most of the potential impacts. It is also likely, based on preliminary drainage evaluations, that additional ditch/swale areas will need to be created for this project. These new ditch areas could be designed to match the hydroperiod and function of the impacted SFH, offsetting any proposed impacts within the same Core Foraging Area (CFA).

Number of Utility Relocations

More than ten utility/agency owners within the corridor were provided with the alternative alignments to mark up utility locations and potential impacts. The values in the matrix represents the approximate number of relocations amongst the seven owners who reported involvement.

Number of Contamination Sites

In accordance with Chapter 20 of the PD&E Manual, historical aerial photograph reviews, city directory reviews, a database search, FDEP and County file reviews, and a precursory site reconnaissance were all performed to identify and rank the potential contamination risk facilities along the alignment alternatives. These sites and rankings are preliminary; the numbers and rankings may change slightly as the Contamination Screening Evaluation Report is prepared and the data sources re-reviewed as required.

Number of Driveway Crossings

This evaluation element is as documented through field- and aerial imagery-based research.

Number of Street Crossings

This evaluation element is as documented through field- and aerial imagery-based research.

Estimated Project Costs

Estimated project costs have not been evaluated in detail at this preliminary stage. Right-of-way cost estimates will be calculated in a later project task and will be finalized based on the findings of a recently begun Specific Purpose Survey. At this stage, differences in design and construction costs among alternatives are not expected to be appreciably different. As one example, the selected manner of crossing the corridor's numerous cross-drains (either a routing of the trail in close proximity to the highway, an extension of the highway cross-drain, or an independent trail crossing) would likely be the same whether Alternative A or B is selected. Utility relocation costs to FDOT are expected to be minimal because all utilities are believed to be in the right-of-way by permit.

BWL:psm

PRELIMINARY ENGINEERING REPORT

Preferred Alternative

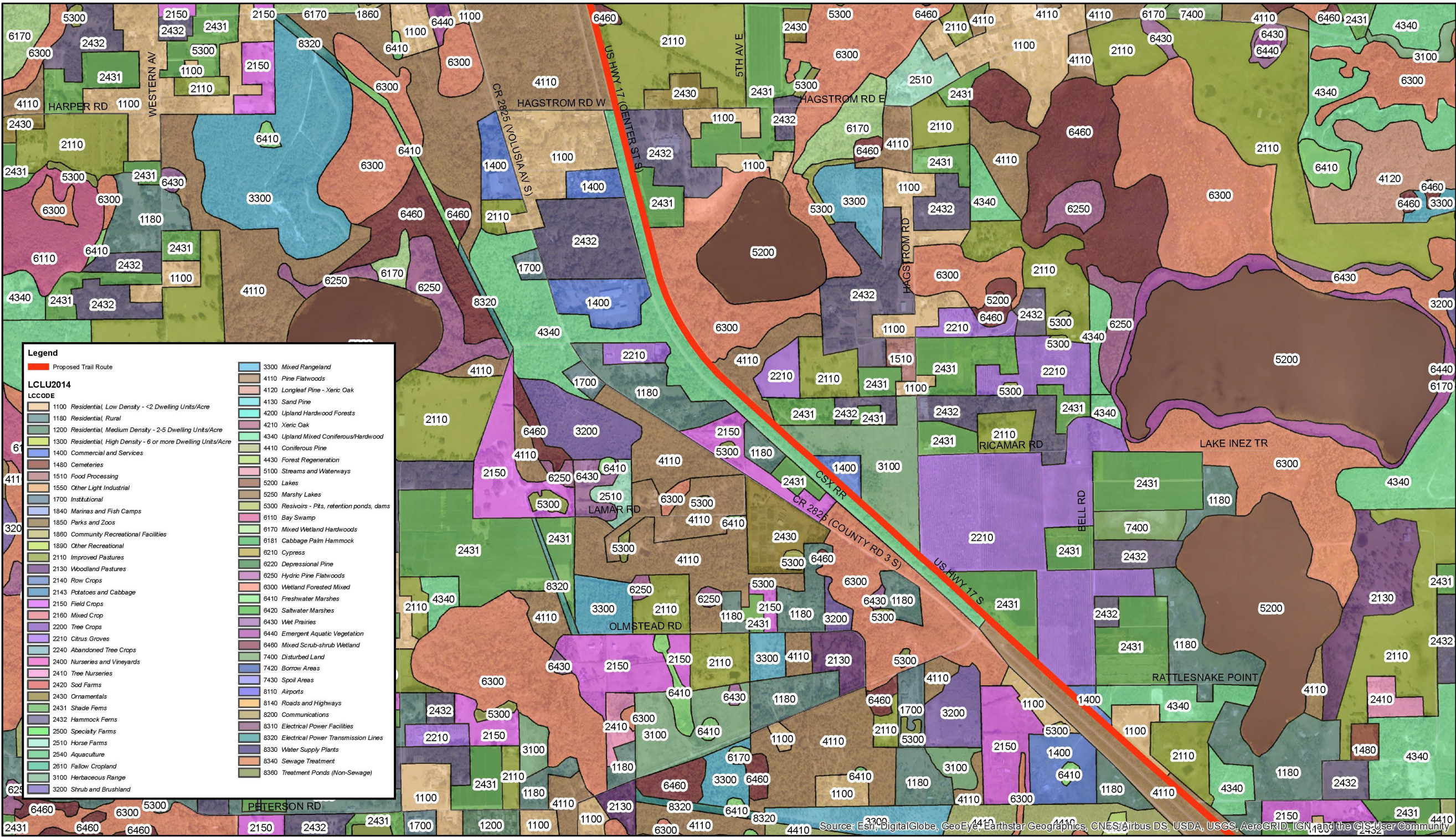
St. Johns River to Sea Loop. Multi-use Trail along S.R. 15 (U.S. 17) from S.R. 40 to Putnam County Line

Volusia County, Florida

Financial Project ID Number: 439876-1-22-01

ETDM Number: XXXXX

APPENDIX C – LAND USE MAPS



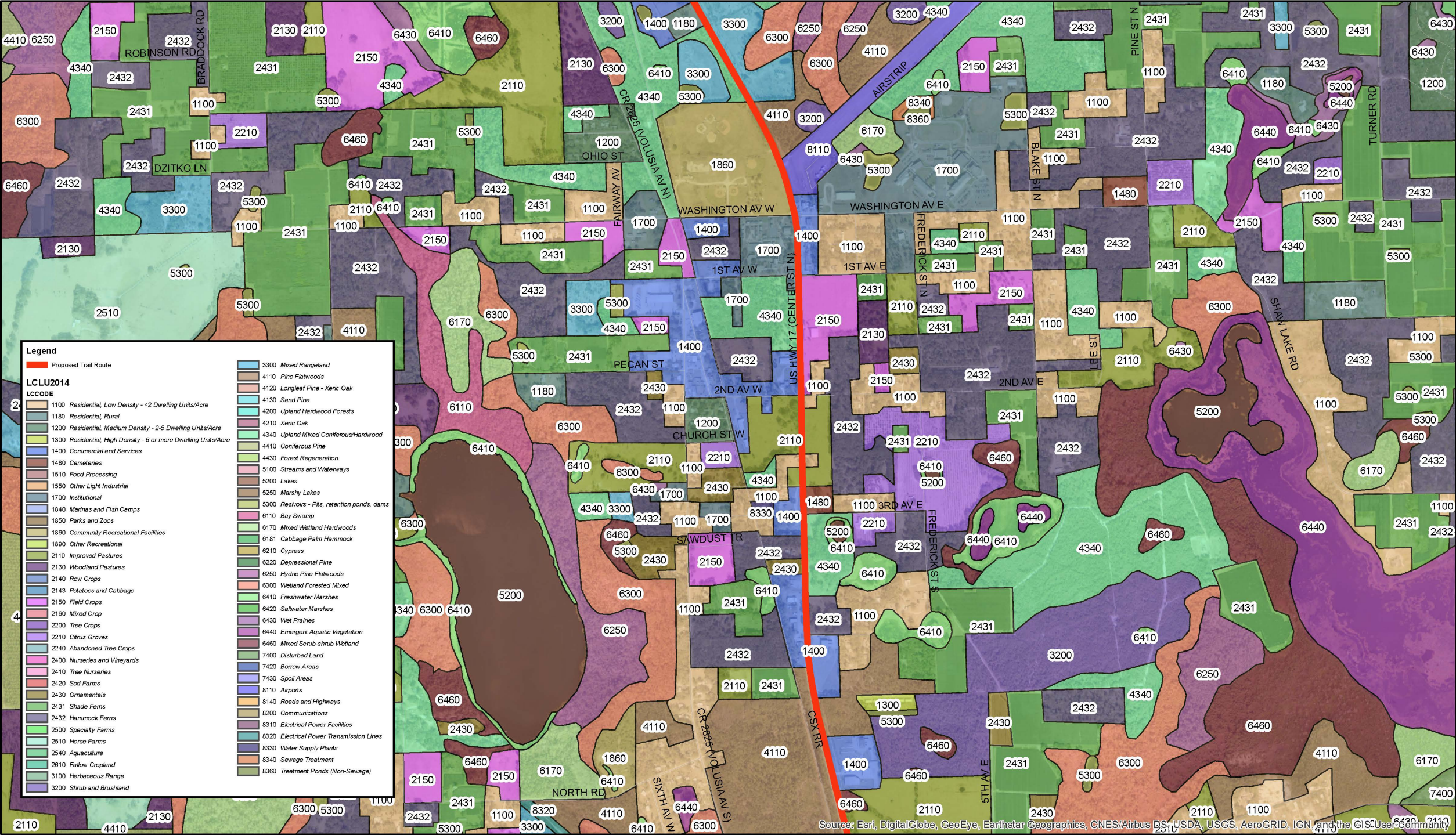
Land Use Map
Sheet 2 of 9

FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

0 320 640 1,280 1,920 2,560
Feet

FIGURE : EXISTING LAND USE MAP



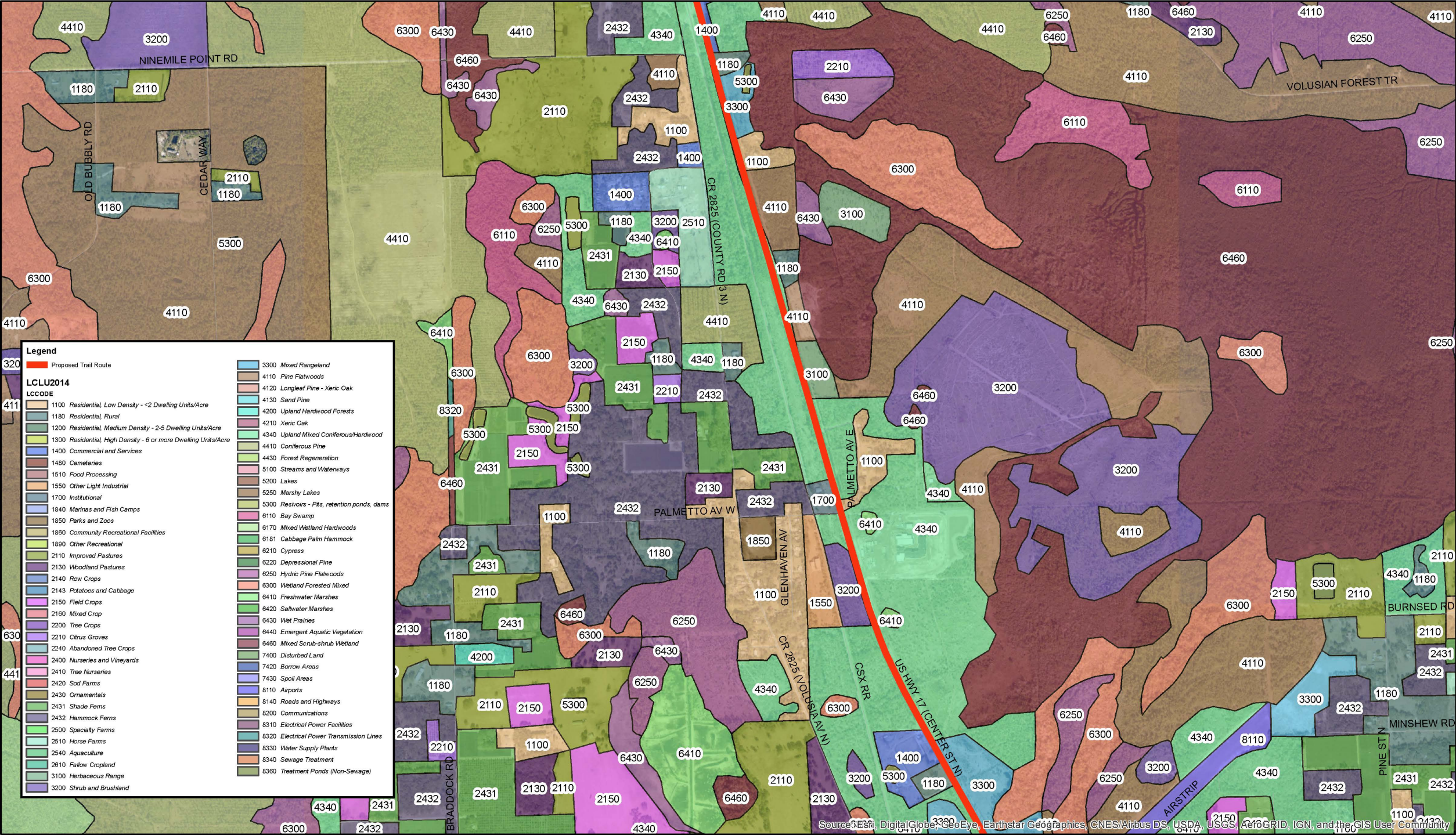
Land Use Map
Sheet 3 of 9

FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

0 320640 1,280 1,920 2,560
Feet

FIGURE : EXISTING LAND USE MAP

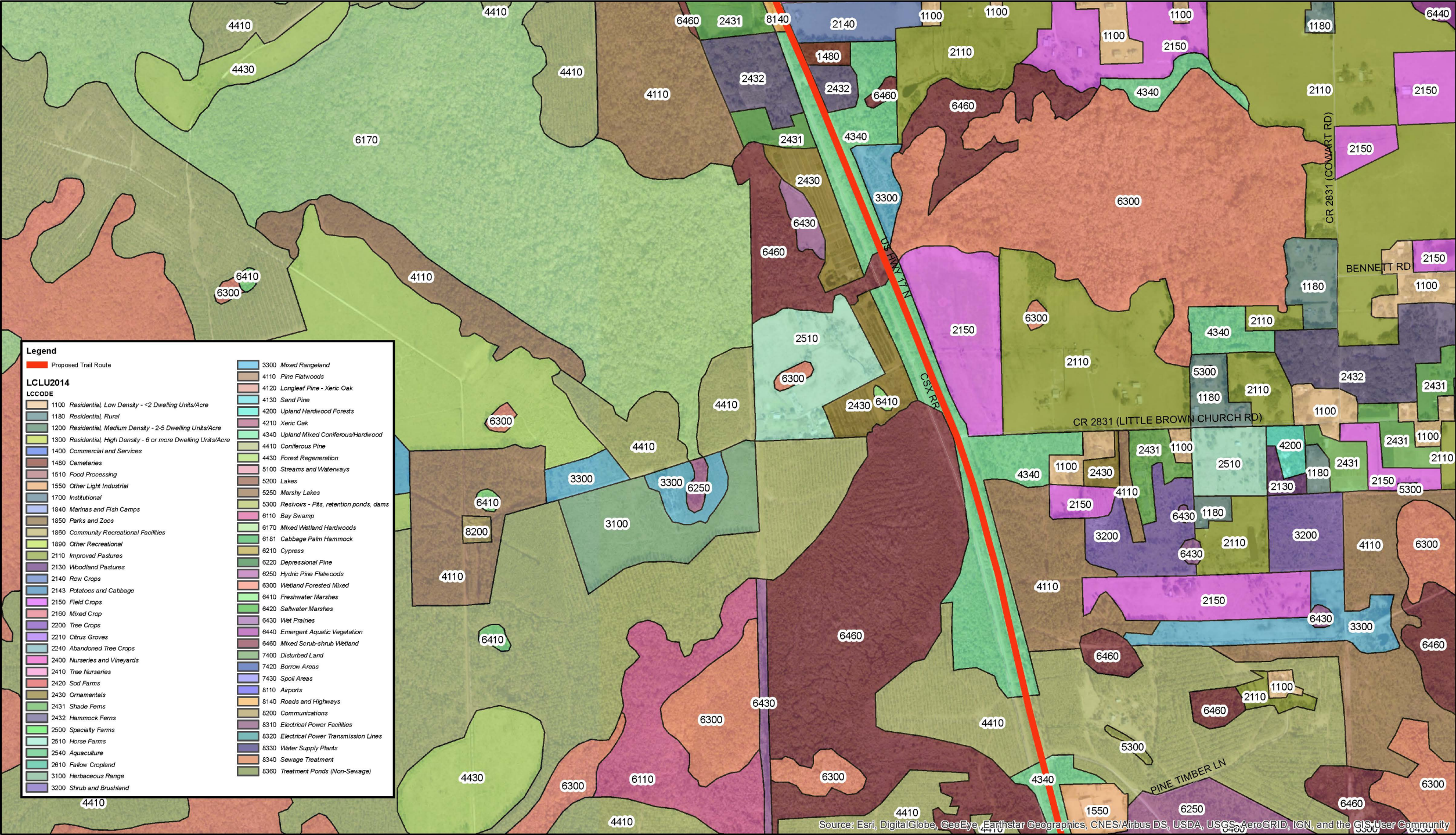


Land Use Map
Sheet 4 of 9
FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

0 320 640 1,280 1,920 2,560
Feet

FIGURE : EXISTING LAND USE MAP



Land Use Map
Sheet 5 of 9
FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

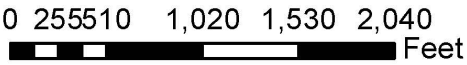
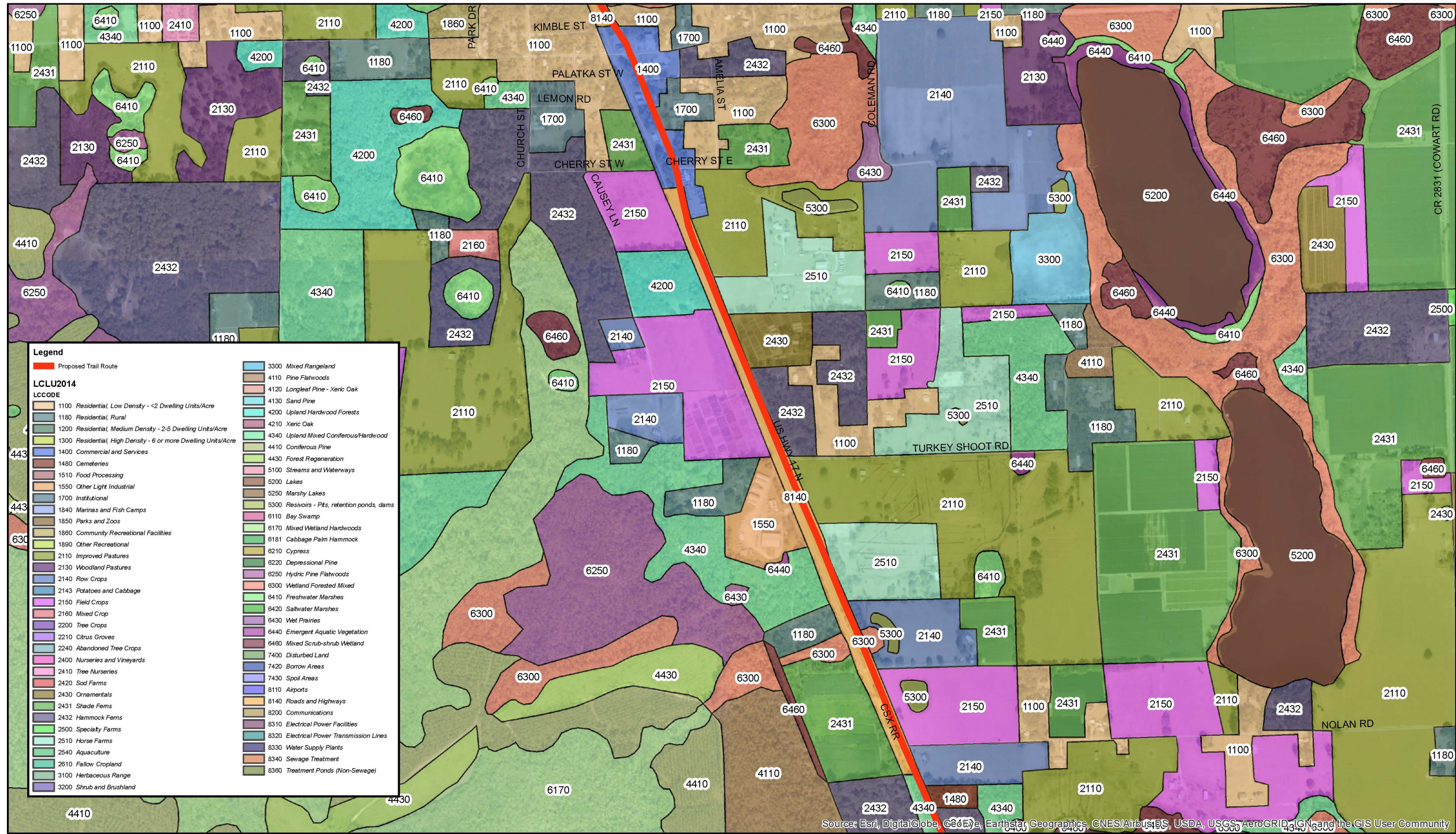


FIGURE : EXISTING LAND USE MAP



Land Use Map
Sheet 6 of 9
FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

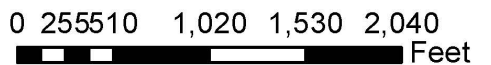
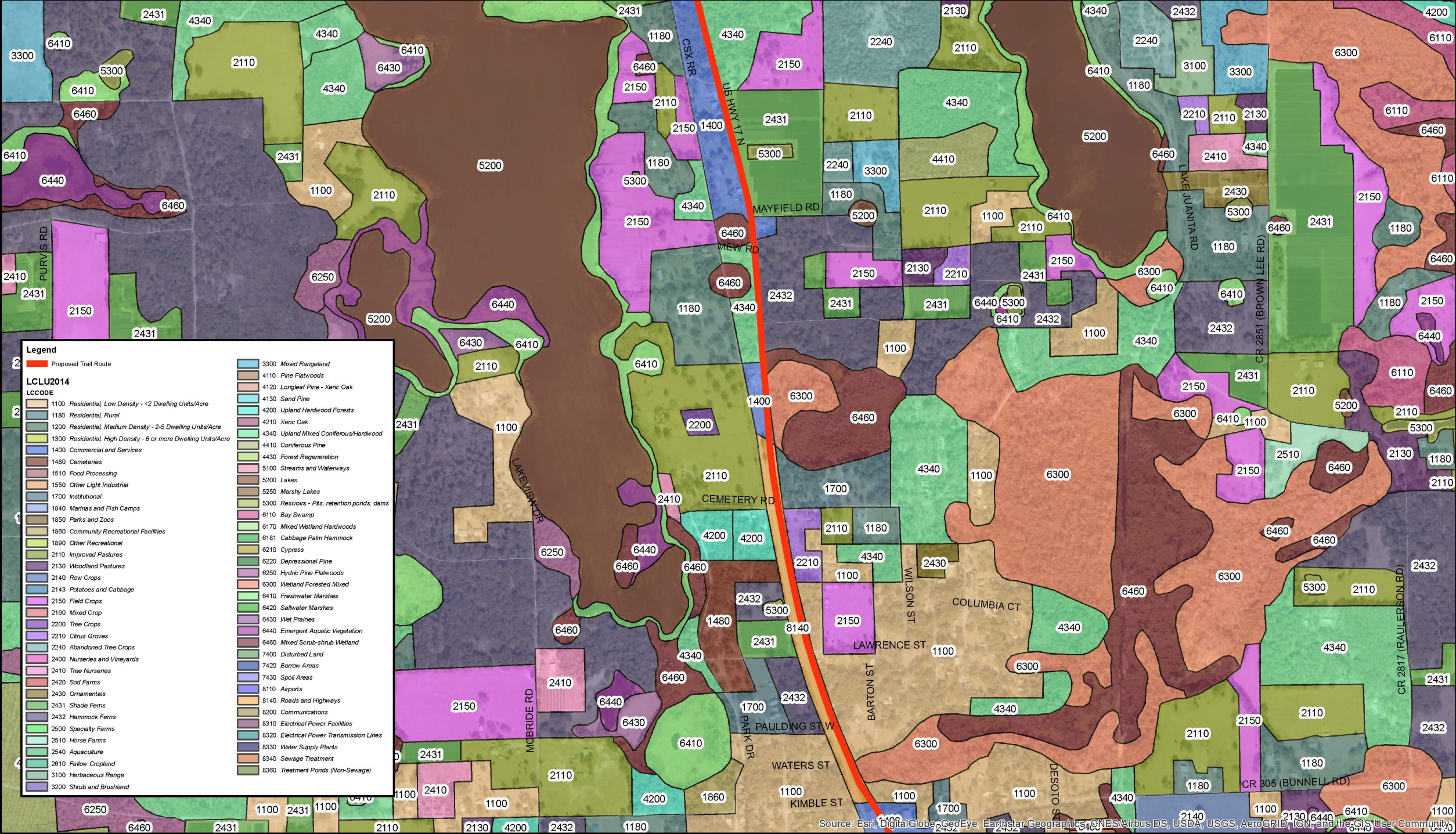


FIGURE : EXISTING LAND USE MAP

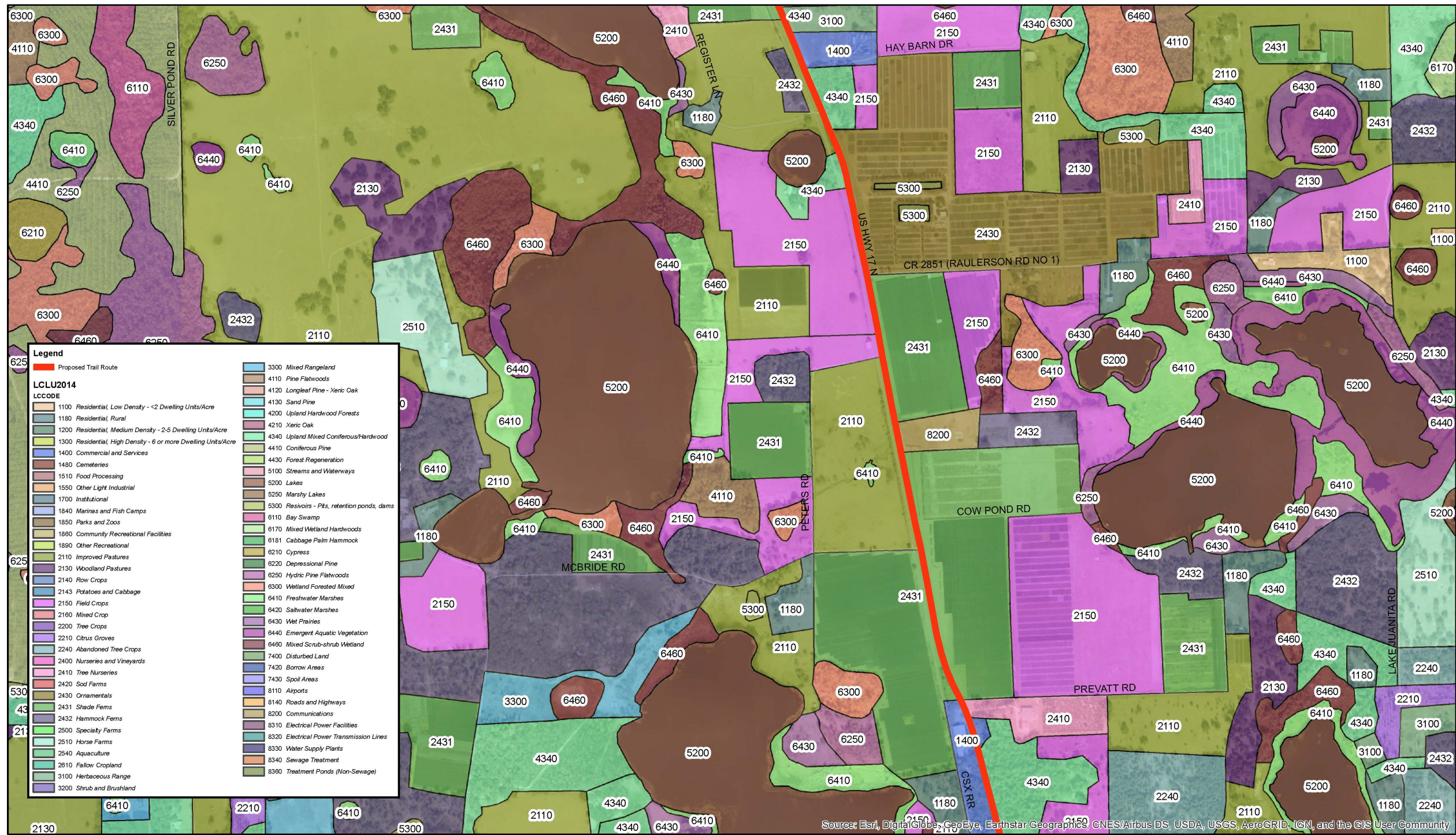


Land Use Map
Sheet 7 of 9
FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

0 25510 1,020 1,530 2,040
Feet

FIGURE : EXISTING LAND USE MAP

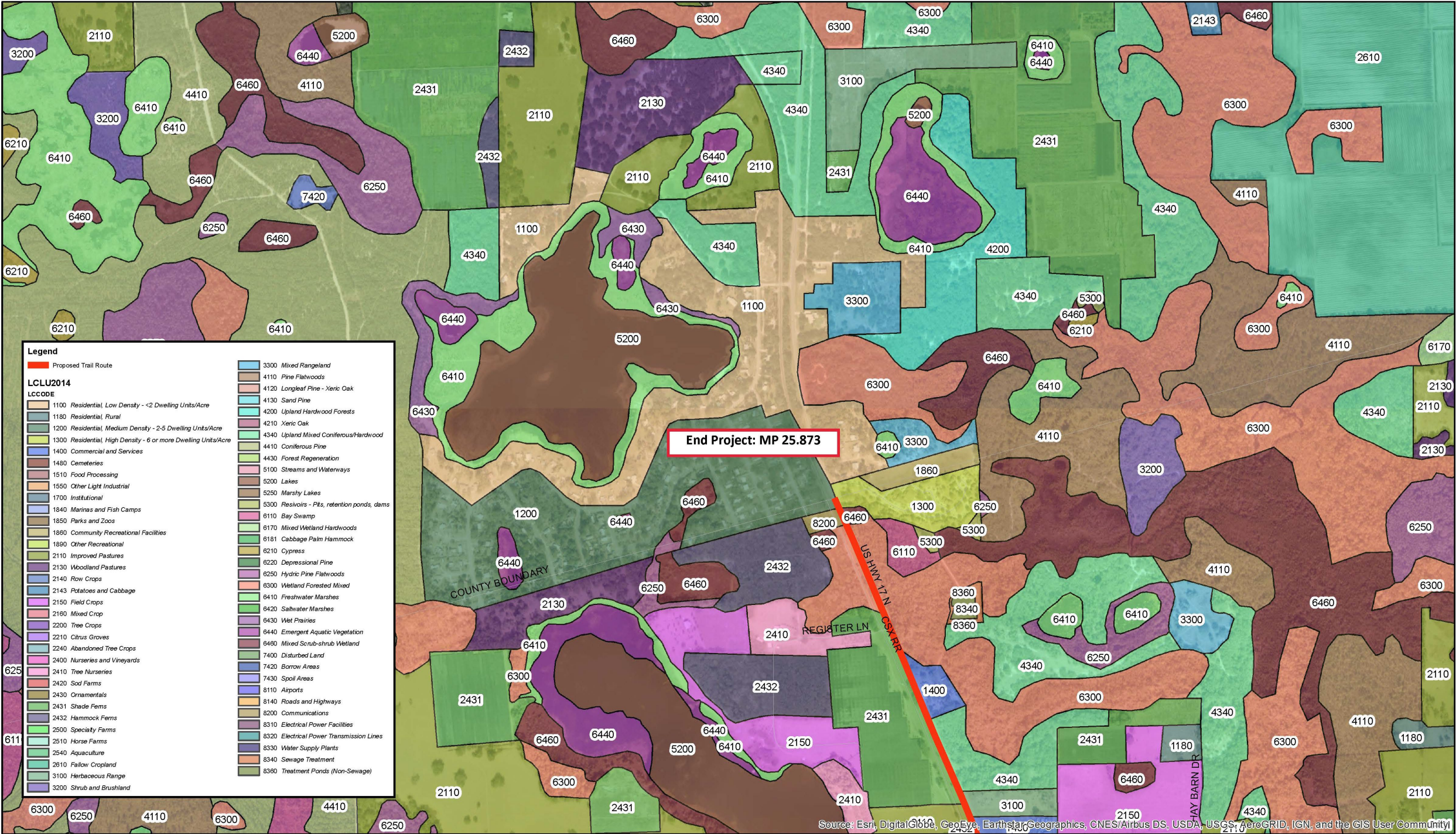


Land Use Map
Sheet 8 of 9
FPID No. 439876-1-22-01
US 17 Trail PD&E Study
Volusia County

Data Source: SJRWMD 2014 Land Use/Land Cover
Imagery Date: 2017

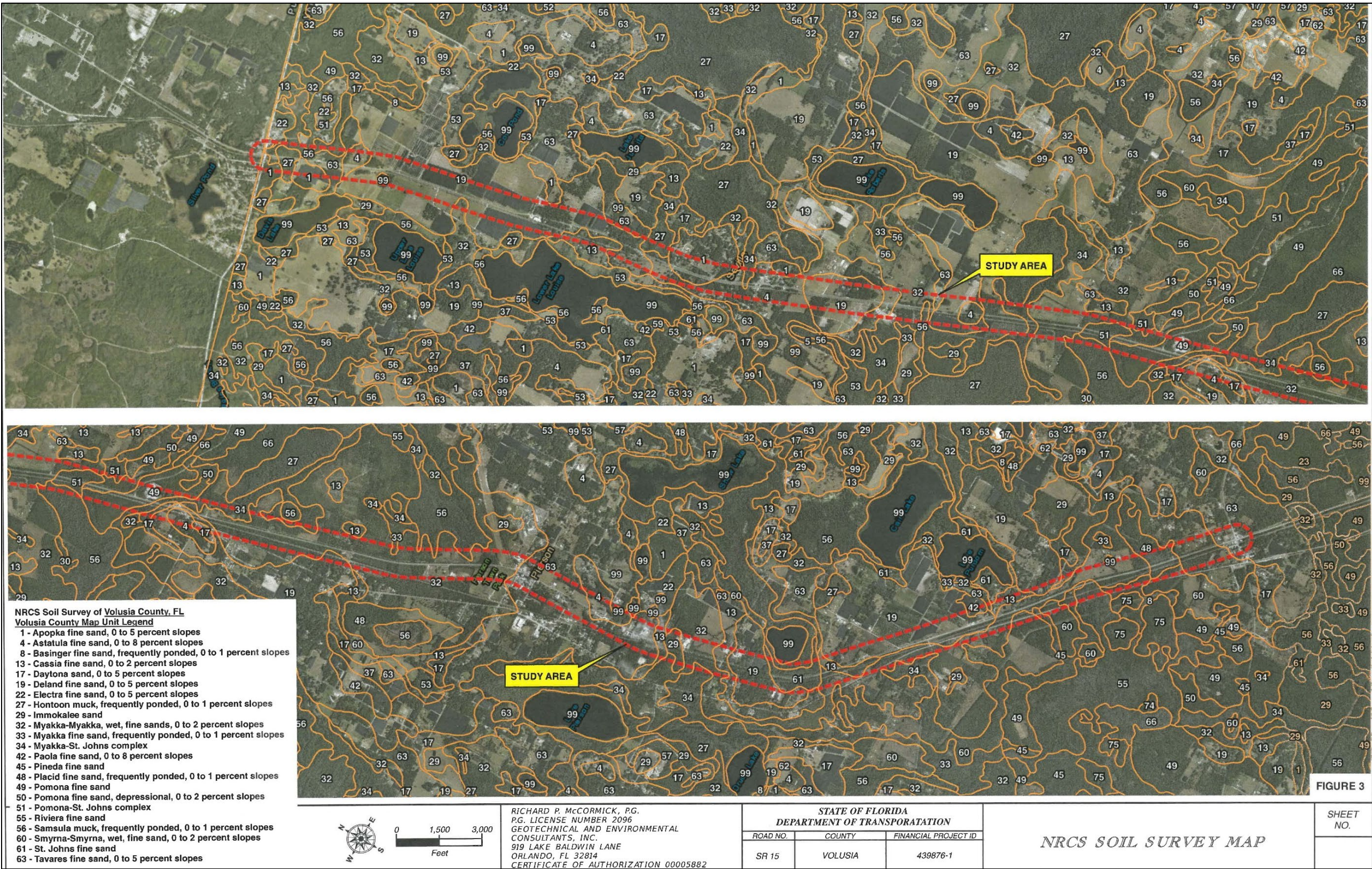
0 25510 1,020 1,530 2,040 Feet

FIGURE : EXISTING LAND USE MAP

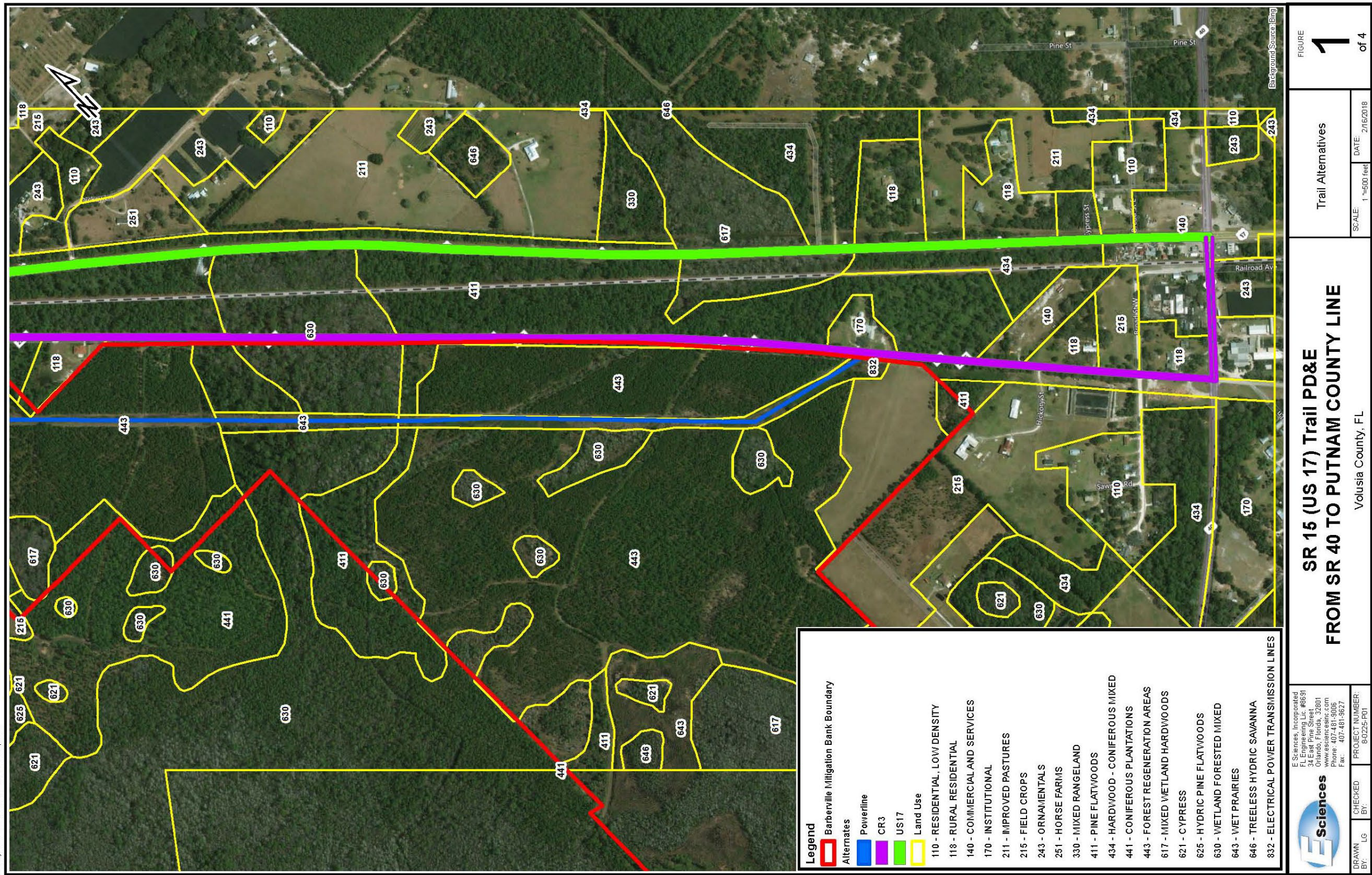


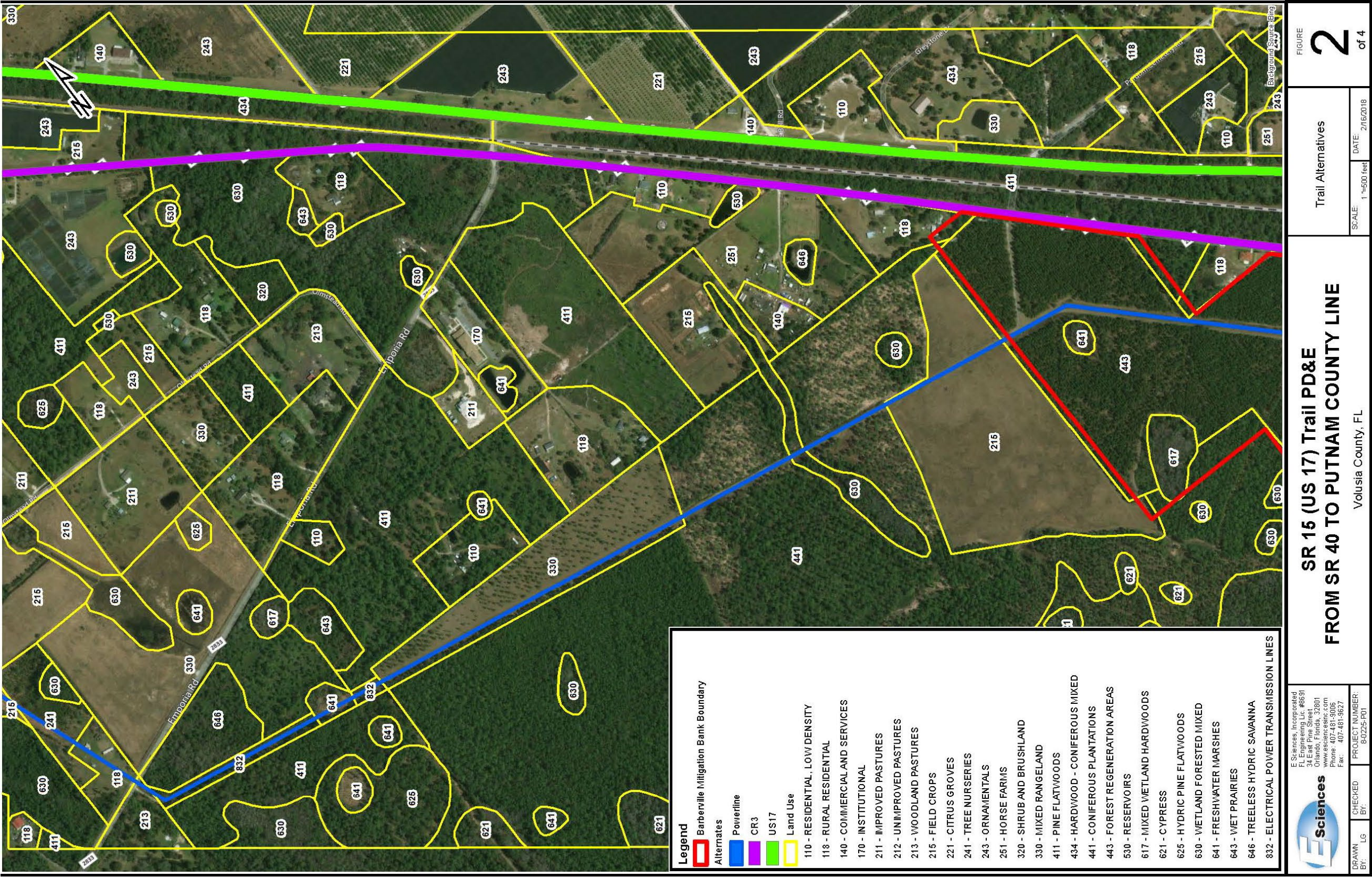
APPENDIX D – SOIL MAPS

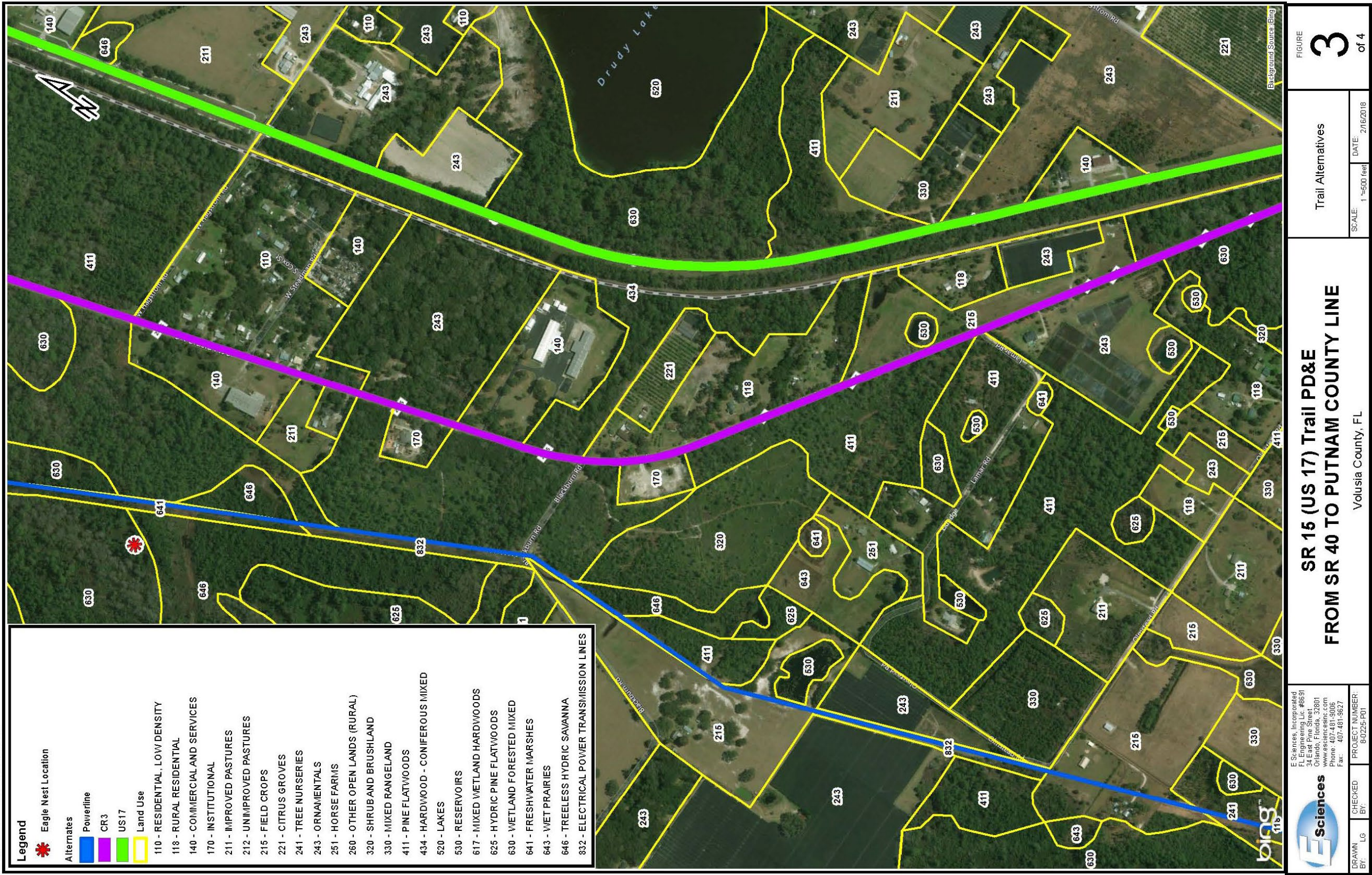
APPENDIX D Soil Map

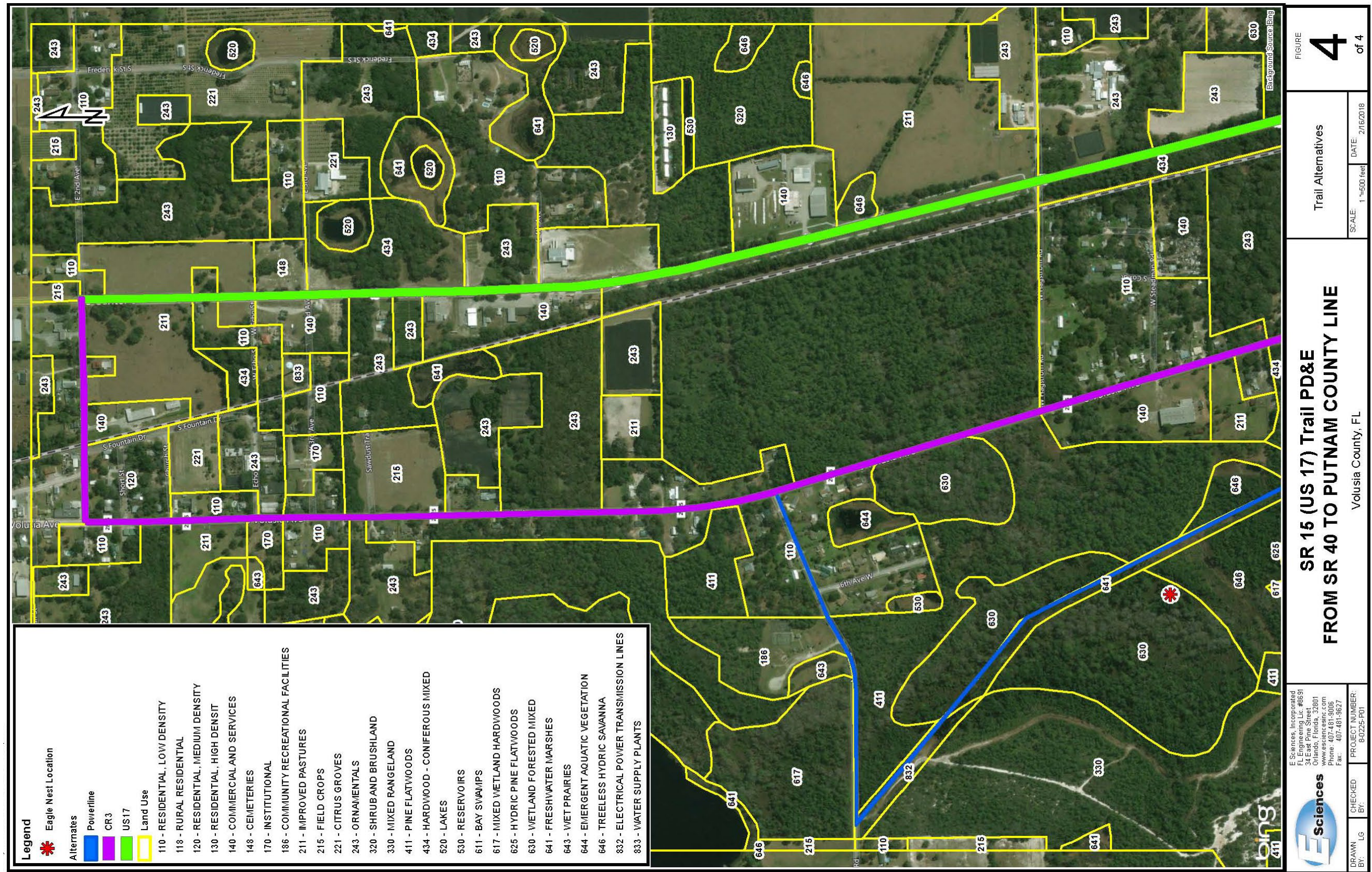


APPENDIX E Wetlands Maps and Details Species Listing (with Land Use)









APPENDIX E - WETLANDS MAPS AND DETAILS SPECIES LISTING (WITH LAND USE)

Potential Listed Species Occurrence

Scientific Name	Common Name	Federal Status	State Status
Reptiles & Amphibians			
<i>Alligator mississippiensis</i>	American Alligator	Threatened	Threatened
<i>Drymarchon couperi</i>	Eastern Indigo Snake	Threatened	Threatened
<i>Gopherus polyphemus</i>	Gopher Tortoise	Concern	Threatened
<i>Nerodia clarkii taeniata</i>	Atlantic Salt Marsh Snake	Threatened	Threatened
<i>Notophthalmus perstriatus</i>	Striped Newt	Concern	N/A
<i>Pituophis melanoleucus</i>	Pine Snake	N/A	Threatened
Birds			
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	N/A	Threatened
<i>Aphelocoma coerulescens</i>	Florida Scrub Jay	Threatened	Threatened
<i>Caracara cheriway</i>	Crested Caracara	Threatened	Threatened
<i>Charadrius melodus</i>	Piping Plover	Threatened	Threatened
<i>Egretta caerulea</i>	Little Blue Heron	N/A	Threatened
<i>Egretta rufescens</i>	Reddish Egret	N/A	Threatened
<i>Egretta tricolor</i>	Tricolored Heron	N/A	Threatened
<i>Falco sparverius paulus</i>	Southeastern American Kestrel	N/A	Threatened
<i>Haematopus palliatus</i>	American Oystercatcher	N/A	Threatened
<i>Mycteria americana</i>	Wood Stork	Threatened	Threatened
<i>Pandion haliaetus</i>	Osprey	N/A	Special Concern
<i>Picoides borealis</i>	Red Cockaded Woodpecker	Endangered	Endangered
<i>Platalea ajaja</i>	Roseate Spoonbill	N/A	Threatened
<i>Rynchops niger</i>	Black Skimmer	N/A	Threatened
<i>Sternula antillarum</i>	Least Tern	N/A	Threatened
Mammals			
<i>Sciurus niger shermani</i>	Sherman's Fox Squirrel	N/A	Special Concern
Plants			
<i>Acrostichum aureum</i>	Golden Leather Fern	N/A	Threatened
<i>Asplenium dentatum</i>	American Toothed Spleenwort	N/A	Endangered
<i>Asplenium erosum</i>	Auricled Spleenwort	N/A	Endangered
<i>Chamaesyce cumulicola</i>	Sand-Dune Spurge	N/A	Endangered
<i>Conradina grandiflora</i>	Large-flowered Rosemary	N/A	Threatened
<i>Cucurbita okeechobeensis</i>	Okeechobee Gourd	Endangered	Endangered
<i>Deeringothamnus rugelii</i>	Rugel's Pawpaw	Endangered	Endangered
<i>Glandularia maritima</i>	Coastal Vervain	N/A	Endangered

APPENDIX E – WETLANDS MAPS AND DETAILS SPECIES LISTING (WITH LAND USE)

Scientific Name	Common Name	Federal Status	State Status
<i>Harrisia fragrans</i>	Fragrant Prickly Apple	Endangered	Endangered
<i>Helianthus carnosus</i>	Lake-side Sunflower	N/A	Endangered
<i>Illicium parviflorum</i>	Star Anise	N/A	Endangered
<i>Lantana depressa</i> var. <i>floridana</i>	Atlantic Coast Florida Lantana	N/A	Endangered
<i>Lechea cernua</i>	Nodding Pinweed	N/A	Threatened
<i>Nemastylis floridana</i>	Celestial Lily	N/A	Endangered
<i>Nolina atopocarpa</i>	Florida Beargrass	N/A	Threatened
<i>Ophioglossum palmatum</i>	Hand Fern	N/A	Endangered
<i>Pecluma plumula</i>	Plume polypody	N/A	Endangered
<i>Pecluma ptilota</i> var. <i>bourgeauana</i>	Comb polypody	N/A	Endangered
<i>Pteroglossaspis ecristata</i>	Giant Orchid	N/A	Threatened
<i>Sideroxylon lycioides</i>	Buckthorn	N/A	Endangered
<i>Spigelia loganioides</i>	Pinkroot	N/A	Endangered
<i>Tephrosia angustissima</i> var. <i>curtissii</i>	Coastal Hoary-pea	N/A	Endangered
<i>Zephyranthes simpsonii</i>	Redmargin Zephyrlily	N/A	Threatened

PRELIMINARY ENGINEERING REPORT

Utility Green Lines

St. Johns River to Sea Loop. Multi-use Trail along S.R. 15 (U.S. 17) from S.R. 40 to Putnam County Line

Volusia County, Florida

Financial Project ID Number: 439876-1-22-01

ETDM Number: XXXXX

APPENDIX F – UTILITY GREEN LINES

AT&T Florida

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ks2488@att.com

Clay Electric Cooperative

Mr. John Nicholson
UAO Project Representative
Post Office Box 5500
Salt Springs, FL 32134
(352) 685-4211
jnicholson@clayelectric.com

Duke Energy- Distribution

Mr. Robb Brown
Distribution Governmental Liaison
3300 Exchange Place, NP4A
Lake Mary, FL 32746
(352) 459-4671
robb.brown@duke-energy.com

Opticaltel

Mr. Larry English
UAO Project Representative
6601 Lyons Rd Suite 44 & 45
Coconut Creek, FL 33073
(352) 988-3645
lenglish@opticaltel.com

Volusia County- Water & Utility

Mr. Scott Mays
Utility Engineer
123 West Indiana Avenue
DeLand, FL 32720
(386) 943-7027 x12076
smays@co.volusia.fl.us

Bright House Networks, LLC

Mr. Paul Liakos
UAO Project Representative
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Crown Castle

Mr. Danny Haskett
Operations Manager
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MCI/Verizon Business

Mr. Thomas Clark
UAO Project Representative
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Tulsa, OK 74117
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Thomas.clark@verizon.com

Uniti Fiber

Mr. Bob Mensching
UAO Project Representative
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City, State Zip
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bob.mensching@uniti.com

Windstream Florida Inc.

Mr. Douglas Pickle
Senior Construction Manager
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Maitland, FL 32751
(407) 835-0341
douglas.pickle@windstream.com

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

APPENDIX G Potential Contamination Site Summary

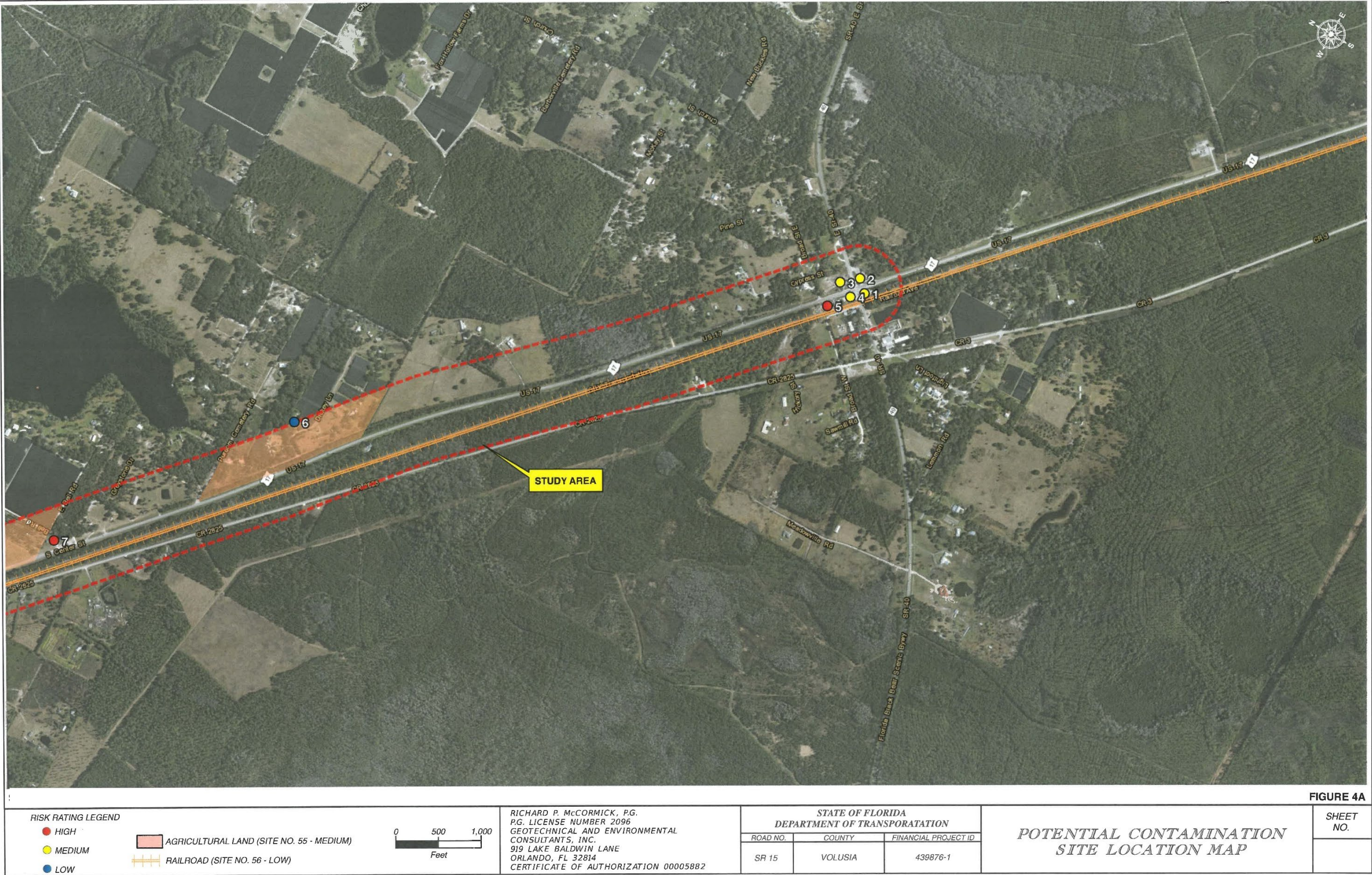




FIGURE 4B

RISK RATING LEGEND

- HIGH
- MEDIUM
- LOW

AGRICULTURAL LAND (SITE NO. 55 - MEDIUM)

RAILROAD (SITE NO. 56 - LOW)

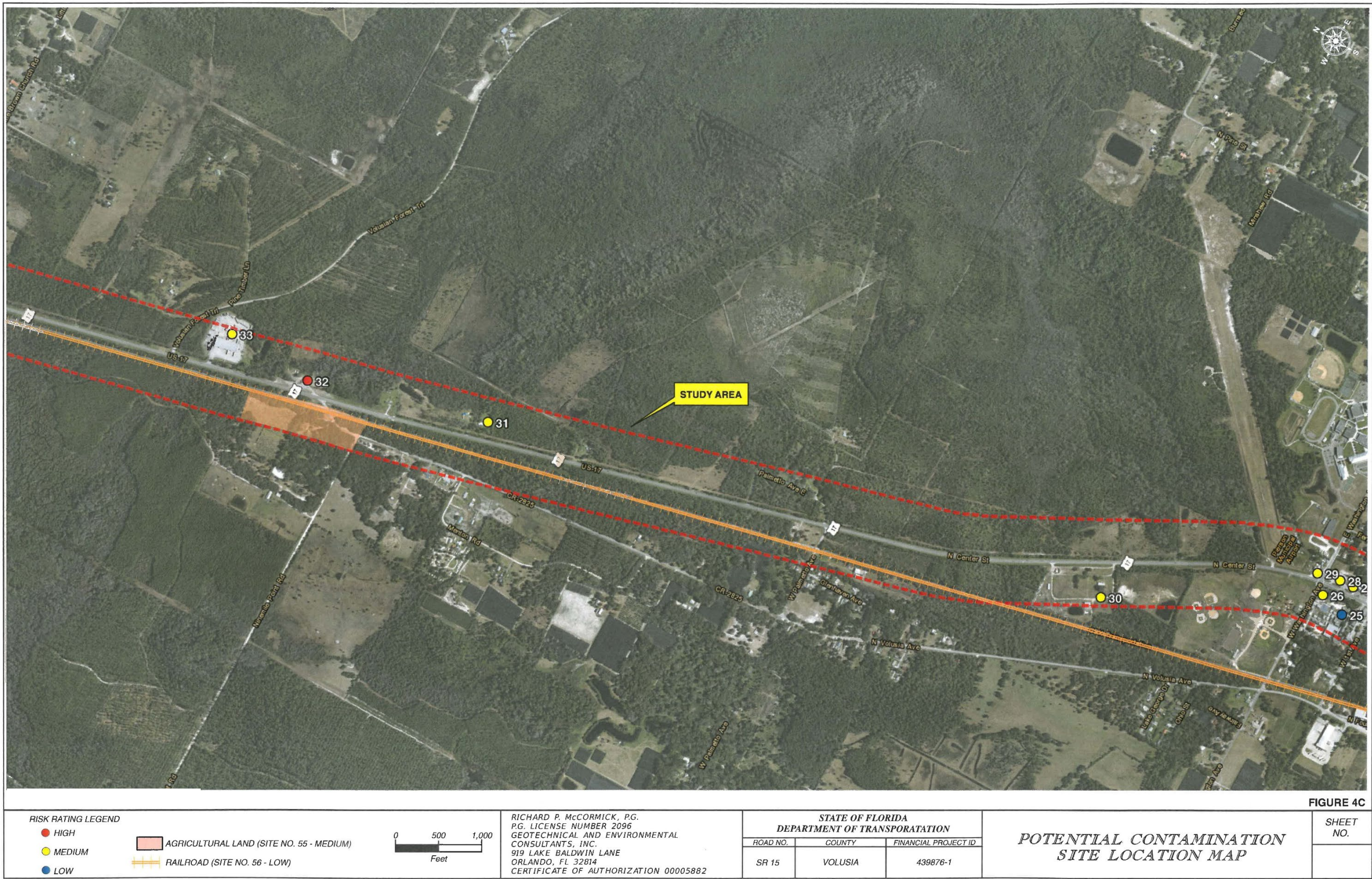
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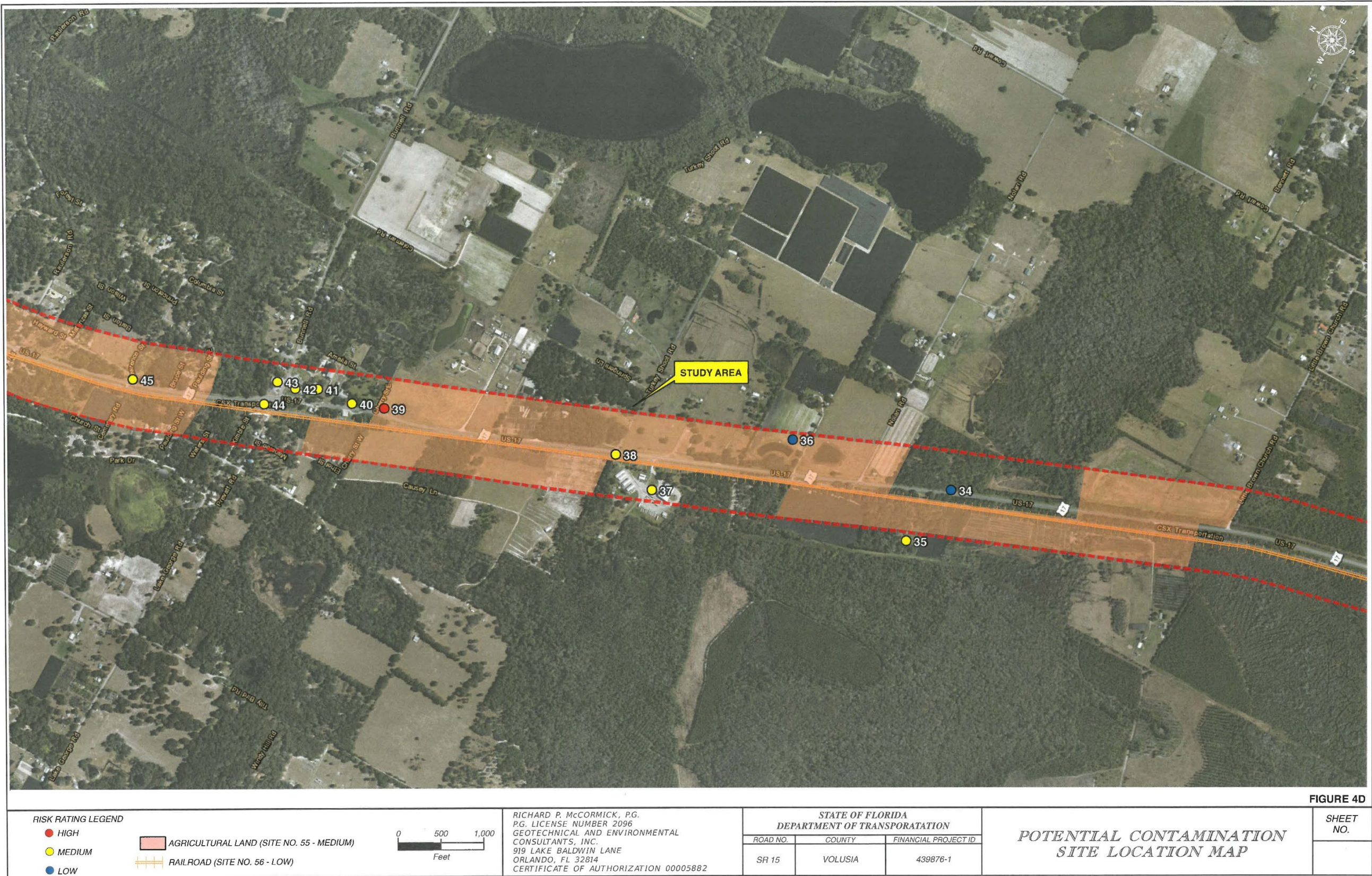
RICHARD P. MCCORMICK, P.G.
P.G. LICENSE NUMBER 2096
GEOTECHNICAL AND ENVIRONMENTAL
CONSULTANTS, INC.
919 LAKE BALDWIN LANE
ORLANDO, FL 32814
CERTIFICATE OF AUTHORIZATION 00005882

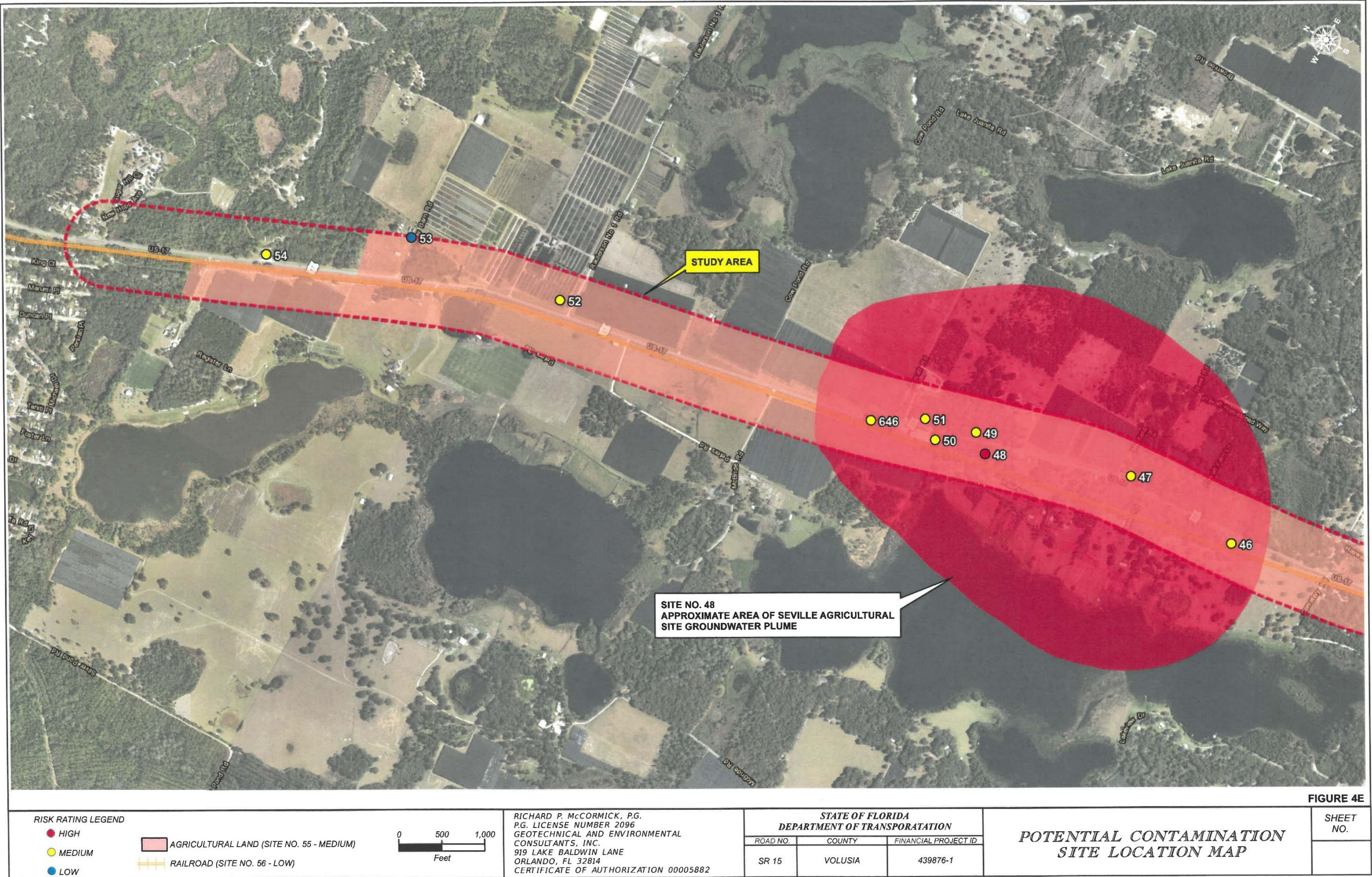
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 15	VOLUSIA	439876-1

*POTENTIAL CONTAMINATION
SITE LOCATION MAP*

SHEET
NO.







APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 1 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
1	Former Gas Station	1720 South Hwy 17	N/A	Vacant, Former Gas Station	Petroleum	Y	2,100 feet Southeast	Aerial Photographs, Interview	Y	Medium	Historical gas station visible in 1958 aerial photograph.
2	Circle K	1717 South Hwy 17	8622863	Gas Station	Petroleum	Y	2,100 feet Southeast	UST, LUST	Y	Medium	Historical and existing gas station with groundwater contamination impacts.
3	Former Trucking Facility	1695 South Hwy 17	N/A	Vacant Lot	Hazardous Materials and Petroleum Products	N	1,700 feet Southeast	Aerial Photographs, Interview	Y	Medium	Historical trucking facility with reported contamination impacts.
4	Express Mart #169	1692 South Hwy 17	8517573	Gas Station	Petroleum	Y	2,000 feet Southeast	UST, LUST, AST	Y	Medium	Historical and existing gas station with groundwater contamination impacts.
5	Adams Motors	1658/1660 South Hwy 17	9600096, 96162	Former gas station and auto repair	Hazardous Materials and Petroleum Products	Y	1,600 feet Southeast	UST, SQG	Y	High	Historical gas station being used as an auto repair facility.
6	McGee Fernery	124 Dickie Lane	8839197, 97061	Fernery	Hazardous Materials and Petroleum Products	Y	375 feet Northeast	AST, SQG	Y	Low	Former fernery with 250-gallon diesel tank. No documented contamination impacts.
7	Wayne's Repair	1109/1115 Hwy 17	96313	Auto Repair	Hazardous Materials and Petroleum Products	N	Adjacent North	SQG, Aerial Photographs, City Directories	Y	High	Historical automotive repair facility.
8	Well Pump	Hwy 17	N/A	Well Pump	Hazardous Materials and Petroleum Products	Y	Adjacent North	Aerial Photographs, Site Reconnaissance	Y	Medium	Soil staining was observed under the aboveground fuel tank.
9	Historical Buildings	Hwy 17	N/A	Historical Buildings, Currently Grassy	Hazardous Materials and Petroleum Products	N	Beneath	Aerial Photograph	Y	Low	The historical land use is unknown for this site.

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 2 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
10	Emporia	Emporia Road	9601950	Materials and Campers on Partially Wooded Land	Hazardous Materials and Petroleum Products	Y	700 feet West	UST	Y	Low	There were numerous campers and inert objects being used or stored at this location.
11	Former Commercial Facility	913 South Center Street	N/A	Nightclub	Hazardous Materials and Petroleum Products	N	Adjacent	Aerial Photographs	Y	Low	Unknown historical use prior to being used as a nightclub. No documented contamination concerns.
12	Coes Byrd (Fern Co-op)	589 Volusia Avenue	8945353	Agricultural	Hazardous Materials and Petroleum Products	Y	500 feet West	UST	Y	Low	Two aboveground diesel tanks listed for site. Multiple agricultural chemical tanks observed and ethanol-free fuel for sale sign. Fuel tanks not seen on-site.
13	Auto Salvage yard	West Steadman Road	N/A	Auto Salvage Yard	Hazardous Materials and Petroleum Products	N	500 feet West	Aerial Photographs	Y	High	Auto Salvage Yard located about 500 feet west of trail alignment.
14	Pierson Landfill	Volusia Avenue at Hagstrom Road	27541	Landfill	Hazardous Materials and Petroleum Products	N	1400 feet West	Solid Waste Landfill	Y	Low	Closed landfill with no reported contamination impacts.
15	Hagstrom & Sons Inc.	135 Hagstrom Road	8839149	Fernery	Hazardous Materials and Petroleum Products	Y	250 feet East	UST, SQG	Y	Medium	An active plant nursery with 13 aboveground fuel tanks.
16	Morrison	Hagstrom Road	9601946	Agricultural Maintenance	Hazardous Materials and Petroleum Products	Y	275 feet East	Cattle Vat, UST	Y	Medium	A maintenance area, oil tank, and pesticide storage shed were observed. Cattle dip vat listed as being on property.
17	Pierson Supply Company	407 South Center Street	9200258, 97122	Agricultural Supply	Hazardous Materials	Y	Adjacent East	Tanks, SQG	Y	Low	Facility has fertilizer tanks that are in compliance. Unregulated diesel tank observed about 150 feet east of trail.
18	Pierson Coin Laundry	304 South Center Street	FLA011221	Coin Laundry facility	Hazardous Materials	N	95 feet West	NPDES	Y	Low	This is not a dry cleaner site.

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 3 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
19	Pierson Feed	307 South Center Street	96312	Agricultural supply, former trucking facility	Hazardous Materials and Petroleum Products	N	Adjacent East	SQG	Y	Low	No documented complaints, violations, or contamination impacts on-site.
20	NAPA Auto Parts	284 South Center Street	96593	Retail Auto Parts	Hazardous Materials and Petroleum Products	N	60 feet West	SQG	Y	Low	No documented complaints, violations, or contamination impacts on-site.
21	Hartley's Station	202 South Center Street	8517447, 96657	Historical Gas & Service Station	Hazardous Materials and Petroleum Products	Y	Adjacent West	UST	Y	Medium	Two underground tanks were abandoned on-site in 1989. No assessment was performed.
22	Vacant Commercial Property	110 East 2nd Avenue	127513	Residence with barns	Hazardous Materials and Petroleum Products	N	Adjacent East	SQG	Y	Medium	Historical citrus grove property.
23	Well Pump	Hwy 17	N/A	Well Pump	Hazardous Materials and Petroleum Products	Y	250 feet East	Aerial Photographs, Site Reconnaissance	Y	Medium	Well pump is located across a field from the proposed trail.
24	Pierson Discount Beverage	178 North Center Street	N/A	Historical Gas Station	Hazardous Materials and Petroleum Products	Y	Adjacent West	Site Reconnaissance, Aerial Photographs	Y	Medium	This facility appears to be a former gasoline and service station. No public records are available.
25	Pierson Elementary School	657 North Center Street	FLR10RA51	Elementary School	Hazardous Materials	N	Adjacent West	NPDES	Y	Low	No documented hazardous waste generation or contamination impacts on-site.
26	Volusia County School Board	1 West First Avenue	8631509	School Bus Filling Station	Petroleum	Y	Adjacent West	UST, LUST	Y	Medium	Historical bus fueling depot.
27	Pierson Food Store	221 North Center Street	9103251	Historical Gas Station	Petroleum	Y	Adjacent East	UST, LUST	Y	Medium	Historical gas station and automotive repair facility.

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 4 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
28	Kangaroo Express	239 North Center Street	FLR000017038, 8517425	Gas Station	Petroleum	Y	Adjacent East	UST	Y	Medium	Existing gas station.
29	Pierson Chevron, Countryside Auto	303 North Center Street	8943789	Historical Gas and Service Station	Hazardous Materials and Petroleum Products	Y	75 feet North	UST, LUST	Y	Medium	This facility has existing groundwater contamination impacts.
30	Union Camp Corp.	402 North Center Street	8622849, 8517608	Construction Company	Hazardous Materials and Petroleum Products	N	2,500 feet Northwest	UST	Y	Medium	This is a construction yard and maintenance facility.
31	Residence	859 North Hwy 17	N/A	Residence	Hazardous Materials and Petroleum Products	N	Adjacent East	Aerial Photographs	Y	Medium	Multiple vehicles on-site in aerial photograph with less during site reconnaissance. Appears to be a backyard auto mechanic.
32	Historical Gas Station	925 Hwy 17	N/A	Historical Gas Station	Petroleum	Y	Adjacent East	Site Reconnaissance, Aerial Photographs	Y	High	A fuel island base is visible on-site.
33	Armellini Express	941 Hwy 17	8517179	Trucking Company	Petroleum	Y	Adjacent East	UST, LUST	Y	Medium	Tanks were removed and contamination impacts detected. No site assessment was performed.
34	Historical Buildings	1215 Hwy 17	N/A	Abandoned Farm	Hazardous Materials and Petroleum Products	N	Adjacent East	Aerial Photographs, City Directories	Y	Low	Abandoned pole barn and mobile home. Former Building company.
35	Muller Farms	Hwy 17	8838784	Farm	Hazardous Materials and Petroleum Products	Y	>250 feet West	UST	Y	Medium	Two 500-gallon diesel tanks are registered at this location.
36	Solen Hartley	1305 North Hwy 17	3	Small Farm	Petroleum	Y	Adjacent East	UST	Y	Low	An irrigation pump is located about 275 feet east of the trail on the opposite side of a pond.

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 5 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
37	Volusia Timber Corp Rail Yard, Seville Material Transfer	1330/1332 North Hwy 17	8622753, 8943820, FLR000160366	Rail Yard	Hazardous Materials and Petroleum Products	Y	200 feet West	UST SQG	Y	Medium	Two fuel tanks were removed from the site without closure assessments.
38	Spill Incident	Turkey Shoot Road at Hwy 17	N/A	Railway	Petroleum	N	95 feet West	Spills	Y	Medium	No public files regarding cleanup or assessment information.
39	Seville Auto Center	1495 North Hwy 17	9100164, 130283	Auto Repair	Hazardous Materials and Petroleum Products	Y	Adjacent East	UST	Y	High	Tanks removed. No closure reports.
40	Estate of Mary V. Hendrickson	Hwy 17	9700289, 9602457	Vacant	Petroleum	Y	Adjacent East	UST	Y	Medium	Uncertain if an underground fuel tank still exists on-site.
41	Volusia County School Board	1591 Hwy 17	9100974	School	Petroleum	Y	Adjacent East	UST, LUST	Y	Medium	500-gallon underground heating oil tank. No known contamination impacts.
42	Circle K	1695 Hwy 17	9200693	Gas Station	Petroleum	Y	Adjacent East	UST	Y	Medium	Existing gas station.
43	Handy Way Food Store	170 CR 305	8517428	Former Gas Station	Petroleum	Y	100 feet East	UST, LUST	Y	Medium	Existing contamination impacts on-site.
44	Seville Discount Grocery	1710 North Hwy 17	N/A	Grocery Store, former gas station	Hazardous Materials and Petroleum Products	Y	75 feet West	Aerial Photographs, Site Reconnaissance	Y	Medium	Historical gasoline service station in parking lot north of site building between 1943 and 1975.
45	Historical Gas Station	1899 North Hwy 17	N/A	Vacant	Petroleum	Y	Adjacent East	Aerial Photographs, Site Reconnaissance	Y	Medium	A building and turn-off exist at this location dating back to 1943.

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 6 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
46	Historical Commercial Facility	2046 North Hwy 17	N/A	Commercial	Hazardous Materials and Petroleum Products	N	100 feet West	Aerial Photographs, Site Reconnaissance	Y	Medium	This building was associated with the railroad dating back to 1951. Potential gas station.
47	Historical Repair Facility	2095 North Hwy 17	N/A	Agricultural Maintenance	Hazardous Materials and Petroleum Products	N	Adjacent East	Aerial Photographs, Site Reconnaissance	Y	Medium	Appears to be a repair facility in 1975 - 1984.
48	Seville Solvent Site	North Hwy 17	224-1	Agricultural	Hazardous Materials	N	Adjacent, Under	FDEP Map Direct	Y	High	Vinyl chloride contamination plume. Drinking water wells impacted.
49	Well Pump	North Hwy 17	N/A	Well Pump	Hazardous Materials and Petroleum Products	Y	100 feet East	Site Reconnaissance	Y	Medium	Irrigation pump and tank in fernery beneath oak trees. No obvious leaks or discharges.
50	Seville Agricultural Services	2184 North Hwy 17	8517540	Agricultural	Hazardous Materials and Petroleum Products	Y	75 feet West	UST, LUST	Y	Medium	Petroleum groundwater impacts exist on-site.
51	Senyah Station	2183 North Hwy 17	8517659	Gas and Service Station	Hazardous Materials and Petroleum Products	Y	Adjacent East	UST, SQG	Y	Medium	Historical gas station and auto repair facility with potential that underground tanks remain on-site.
52	Sterling Nurseries	160 Ravlerson Road	8839154	Plant Nursery	Hazardous Materials and Petroleum Products	Y	Adjacent East	AST, LUST	Y	Medium	Historical aboveground tank reported as leaking. No assessment or remediation activities documented.
53	Auto Storage Yard	Haybarn Road	N/A	Auto Salvage Yard	Hazardous Materials and Petroleum Products	N	400 feet East	Aerial Photographs	Y	Low	Vehicle parking area behind a metal barn. Burn appears to be used for storage. Vehicles appear to be parked/sorted and not salvaged.
54	3L Enterprises	2489 North Hwy 17	9202414	Historical Gas Station	Hazardous Materials and Petroleum Products	Y	Adjacent East	UST	Y	Medium	Site is a historical gasoline service station.

APPENDIX G - POTENTIAL CONTAMINATION SITE SUMMARY

Table 1
Potential Contamination Site Summary
SR 15 (US 17) TRAIL PD&E STUDY
Financial Project ID 439876-1-22-01
GEC Project No. 4145E
Page 7 of 7

Site No.	Site Name	Site Address	Facility ID	Facility Type	Contaminants of Concern	Active, Inactive, or Historical Storage Tanks (Y/N)	Distance/Direction from ROW	Database Source	Location Verified (Y/N)	Risk Potential	Comments
55	Agricultural Land Use	Hwy 17	N/A	Agricultural Land	Hazardous Materials and Petroleum Products	*See Comments	Adjacent	Aerial Photographs, Site Reconnaissance	Y	Medium	Agricultural properties have potential for pesticide, herbicide, and petroleum usage. * Some agricultural properties along the alignment have irrigation wells and fuel tanks for diesel-powered pumps.
56	Railroad	West of Hwy 17	N/A	Railroad Corridor	Hazardous Materials and Petroleum Products	N	>75 feet West	Quadrangle Map, Aerial Photographs	Y	Low	The railroad is west of Hwy 17 along the opposite side as the proposed trail.
646	Well and Piping at Drainage Endwall	East of Hwy 17, Roadway Station 646 Right	N/A	Agricultural Feature	Hazardous Materials	N	Adjacent East	Aerial Photographs	Y	Medium	Stressed/Dead vegetation visible at site, piping extending from ground and to a roadway drainage feature.