

**CONCEPT, FEASIBILITY &
MOBILITY STUDY REPORT**

FOR THE

**NORTHEAST CONNECTOR
EXPRESSWAY EXTENSION**

Orange and Osceola Counties, Florida

From US 192 to SR 50 & SR 520

Prepared for:



**CENTRAL
FLORIDA
EXPRESSWAY
AUTHORITY**

The logo for the Central Florida Expressway Authority is centered on the page. It consists of the words "CENTRAL", "FLORIDA", "EXPRESSWAY", and "AUTHORITY" stacked vertically in a bold, serif font. The word "EXPRESSWAY" is highlighted in orange, while the other words are in black. The logo is framed by two horizontal orange bars, one above and one below the text.

Contract Number: 001209 CFX Project Number: 599-215

July 2019

PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Volkert, Inc., and that I have supervised the preparation of and approved the analysis, findings, opinions, conclusions, and technical advice reported in:

REPORT: Concept, Feasibility & Mobility Study Report
PROJECT: Northeast Connector Expressway Extension
LOCATION: From US 192 to SR 50 and SR 520
CLIENT: Central Florida Expressway Authority

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This report includes a summary of data collection efforts, corridor analysis, and conceptual design analysis for the Northeast Connector Expressway Extension from US 192 to SR 50 and SR 520.

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 design standards and criteria set forth by the federal, state, and local regulatory agencies as well as professional judgment and experience.

Signature: 

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Executive Summary

I. Project Summary

Project Description

The Concept, Feasibility & Mobility Study for the Northeast Connector Expressway Extension (NECEE) was initiated by the Central Florida Expressway Authority (CFX) in February 2018 to identify potential corridor alternatives for regional connectivity in East Central Florida. The NECEE is a planned limited-access facility. This new transportation corridor has previously been represented as “Corridor I” in the East Central Florida Corridor Task Force Summary Report published in December 2014. A new limited-access expressway within the NECEE study area is generally identified in the Orange County Comprehensive Plan-Destination 2030, Osceola County Comprehensive Plan 2025, CFX 2040 Master Plan and the MetroPlan Orlando 2040 Long Range Transportation Plan (LRTP). This study is being conducted by CFX to fulfill a commitment set forth in the purchase and sale agreement with Farmland Reserve and Suburban Land Reserve for right-of-way property along State Road (SR) 528. This right-of-way would allow for the eventual eight-lane build-out of SR 528 and facilitate a high-speed passenger train between Miami and Orlando. The proposed project is located within Orange and Osceola counties.

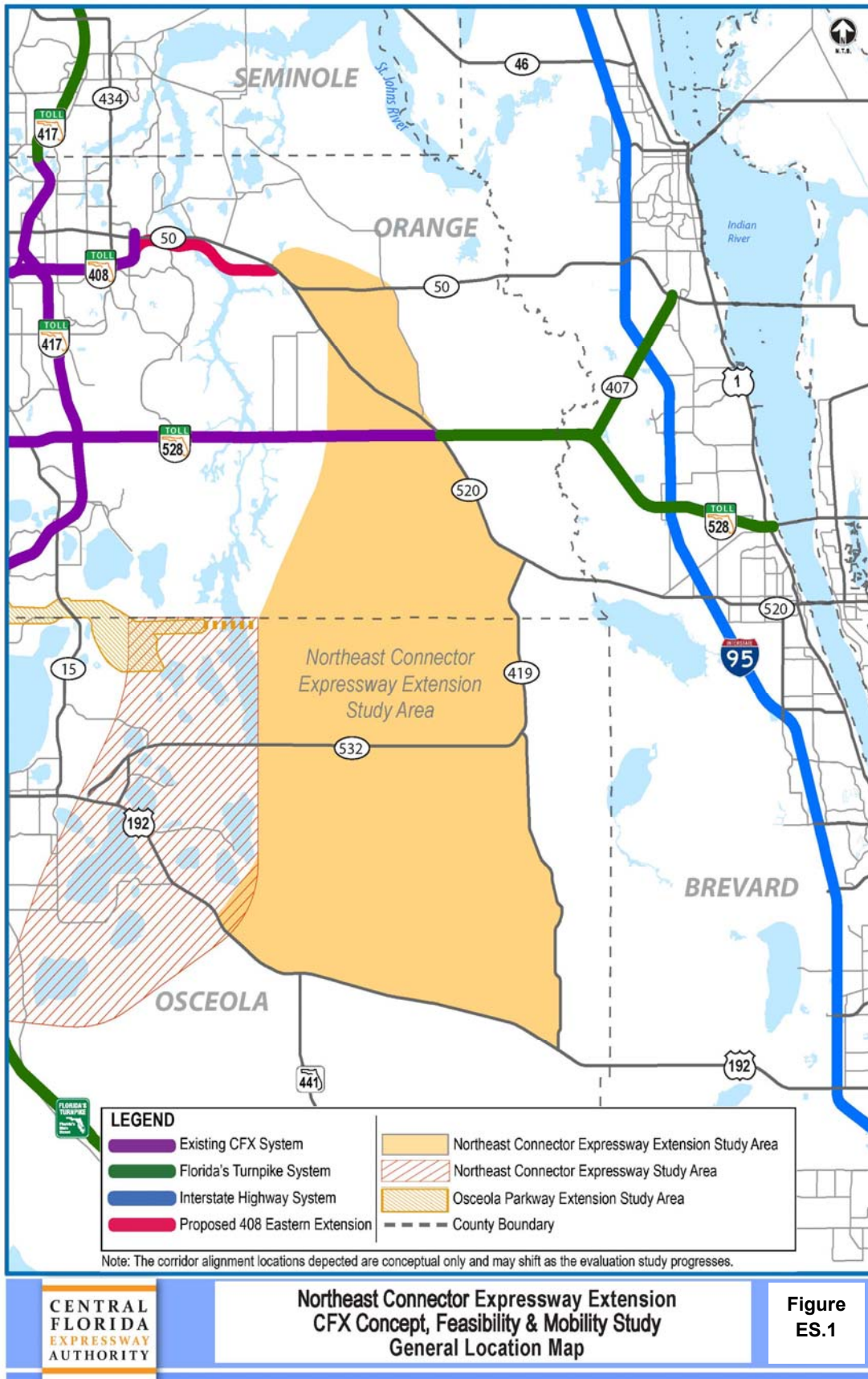
Purpose of Report

The purpose of this report is to document the evaluation effort for the NECEE. Specifically, this report addresses the documentation of the purpose and need for the project; existing conditions within the study area; traffic considerations; design criteria; mobility alternatives evaluation; anticipated effects to the natural, human, and physical environment; and stakeholder involvement as well as an evaluation of the feasibility and viability of the proposed project.

Project Location

As shown on Figure ES.1, the proposed NECEE study area generally extends in the north from the vicinity of the existing SR 50/SR 520 intersection in Orange County south to US 192 in Osceola County, a distance of approximately 25 miles. The study area is generally bound by the Econlockhatchee River to the west and Deer Park Road/Nova Road/SR 520 to the east.

The goal of the NECEE is to enhance north-south mobility and provide connections between existing and future east-west corridors within the study area. These connections will promote regional connectivity, provide for the incorporation of transit options, and provide enhanced mobility of the area’s growing population and economy.



Previous Studies Related to the Project

The following two previous reports addressed the NECEE:

- *East Central Florida Corridor Task Force Final Report, 2014*
- *North Ranch Master Plan, 2015*

East Central Florida Corridor Task Force Final Report, 2014

In 2013, then-Governor Rick Scott issued Executive Order 13-319, which created the East Central Florida Corridor Task Force (Task Force). The Task Force was charged with developing recommendations on future transportation corridors serving established and emerging activity centers in portions of Brevard, Orange, and Osceola counties. In 2014, the Task Force submitted a Final Report to Governor Scott recommending 21 guiding principles for planning the future of east central Florida's transportation corridors, including nine transportation corridor alternatives for further study. The Task Force proposed an action plan for implementation of the recommendations, which included conducting "one or more Evaluation Studies of potential new north-south corridors in eastern Orange and Osceola counties". The new multimodal corridor, referred to as "Corridor I" or "Alternative I", would serve planned population centers within the North Ranch and establish connectivity to other regional destinations and east-west corridors.

North Ranch Master Plan, 2015

The North Ranch Master Plan, developed by Osceola County and Farmland Reserve (Deseret Ranches), involves approximately 133,000 acres of property owned by Deseret Ranches and extends east and south from the Northeast District to US 192 and the Osceola/Brevard County line. In 2015, the Osceola County Urban Growth Boundary (UGB) was expanded to include all of the property within the North Ranch Planning Area through Comprehensive Plan Amendment (CPA) 14-0005. The North Ranch Comprehensive Plan Element calls for development to be consistent with Mixed-Use District regulations and the North Ranch Planning Area to consist of seven place types including urban center, employment center, neighborhoods, community center, neighborhood center, and special district.

Referred to as the SR 408 Extension to US 192 in the Master Plan, the new north-south facility would extend SR 408 to the SR 50/SR 520 interchange, and extending it further to SR 528 would provide system-level connectivity. Extending it south of SR 528 creates the north-south transportation spine for the North Ranch Planning Area as it connects to US 192. According to the plan, traffic forecasts indicate the need to make the connection from the Orange-Osceola County line to SR 528 to balance north-south traffic flows between the Northeast Connector to the west and I-95 to the east.

II. Feasibility and Viability of the Proposed Project

Existing Conditions Summary

The existing major roadways within the study area are East Colonial Drive (SR 50), SR 520, Martin Andersen Beachline Expressway (SR 528), US 192 (SR 500), Deer Park Road (CR 419), Nova Road (CR 532), and Taylor Creek Road. Most of the state roads in the study area (i.e., US 192 [SR 500], SR 520 and SR 50) range in traffic growth rates between -1.47 and 2.19 percent per year. The Martin Andersen Beachline Expressway (SR 528) experienced a higher growth rate at 9.11 percent per year. All of the roadways currently operate with a volume to capacity (V/C) ratio of less than 1.0, which signifies sufficient capacity and no congestion.

Land types found within the project area are predominantly classified as Agriculture and Wetlands. The study area is mostly undeveloped and is primarily located in the central region of the Upper St. Johns River Watershed. Ninety-one percent (91%) of the study area falls within the St. Johns River Water Management District (SJRWMD), and the remaining 9% of the study area falls within the South Florida Water Management District (SFWMD). The region has a relatively flat topography and a high surface water table. The area is characterized by gently rolling hills, agricultural lowlands, and forested and herbaceous wetlands. Several large swamps are present on the western side of the study area including Jug Creek, Cat Island, John H. Bay, Islet Pond, and Bee Tree. The Taylor Creek Reservoir is an area consisting of 7,104 acres (approximately 3,191 acres of wetlands and 3,913 acres of surface water).

Wetlands within the study area are primarily comprised of large forested wetlands systems, composed of cypress (*Taxodium* sp.) and other hardwoods, such as bays, gums, and maples. Smaller wetland systems are composed of herbaceous communities of submerged and emergent wetland plants. These forested and herbaceous systems are potentially hydrologically connected during the wet season and, therefore, fall under the jurisdiction of the SJRWMD, SFWMD, and the United States Army Corps of Engineers (USACE). It is anticipated that these wetlands are medium to high quality due to the large intact wetland systems that are hydrologically connected throughout and the undeveloped characteristics of the study area.

Several federal and state-listed species have the potential to occur within the study area. The entire study area is located within consultation areas for the federally threatened Audubon's crested caracara, federally endangered Everglade snail kite, federally endangered Florida grasshopper sparrow, federally endangered red-cockaded woodpecker, and the federally threatened Florida scrub-jay. However, as part of this high-level concept study, field surveys were not conducted but will be performed in a subsequent study. The study area does not contain essential fish habitats.

Three bald eagle nests are located within the study area: two nests in the eastern-central portion of the study area north and east of Nova Road and one in the western-central portion of the study area. The study area is within 11 wood stork nesting colony core foraging areas and four historical rookeries. Three of the historic wading bird rookeries are located in the eastern central portion of the study area, northwest of Nova Road and the fourth is located in the southeastern corner of the study area, west of Lake Conlin.

Upland areas within the study area have the potential to contain habitat suitable for the federally-protected Florida scrub-jay and red-cockaded woodpecker and the state-protected gopher tortoise, Sherman's fox squirrel, southeastern American kestrel and burrowing owl. Wetlands contain suitable habitat for the federally-protected crested caracara, wood stork, and everglade snail kite along with numerous state-protected wading birds. In addition, the diversity of the wetland and upland habitats increases the likelihood of federally-protected plants and eastern indigo snake occurring within the study area.

The Florida Natural Areas Inventory (FNAI) Geographical Information Systems (GIS) database depicts five areas that are identified as conservation lands within the study area. These areas are within and adjacent to the study area and are located on the northern, western, and southwestern border of the study area: TM Econ Ranch, Lake X Ranch, Savage/Christmas Creek Preserve, Holopaw State Forest and Hal Scott Preserve Conservation Easement. The study area also contains Florida Forever Lands and priority habitat, including Big Bend Swamp/Holopaw Ranch Florida Forever Lands. These Florida Forever Lands serve as a corridor between Triple N Wildlife Management Area (WMA) and Three Lakes WMA in Osceola County, which are located south of the project corridor. The WMAs will not be impacted by the proposed project. The study area does not contain any Areas of Critical State Concern, state parks, WMAs, or Florida Scenic Highways and Byways.

Two mitigation banks are located within the project area: TM Econ Ranch and Lake X Ranch. The most prominent would be Lake X Ranch, which surrounds Lake Conlin and encompasses approximately three and a half percent of the study area. The TM Econ Ranch mitigation area accounts for a fraction of the study area near the Osceola/Orange County line.

Review of the October 2018 Florida Master Site File (FMSF) GIS data indicates that eight historic structures have been recorded within the study area. Of these, three have been determined not eligible for listing in the National Register of Historic Places (NRHP) by the Florida State Historic Preservation Officer (SHPO), while the remaining five have not been evaluated.

The archaeological background research revealed one previously recorded archaeological site, which has the potential to be impacted by corridor alternatives. However, the boundaries of this prehistoric site are unclear as it was recorded as a "general vicinity" location by the FMSF based on a description from 1884. The site has not been evaluated by the SHPO for listing in the NRHP. There are only six additional archaeological sites recorded within one mile of the corridor alternatives.

A preliminary contamination screening evaluation was conducted for the study area. Contamination concerns in the study area include 29 petroleum tanks, 5 hazardous waste sites, 7 county hazardous waste sites, cattle grazing that may have incorporated cattle dip vats (arsenic) and citrus groves (herbicides/pesticides/heating oil).

Thirteen Utility Agencies/Owners (UAOs) have been identified within the study area. Of these, the major utilities within the study include Duke Energy electric transmission lines, Florida Power & Light electric transmission lines, Orlando Utilities Commission electric transmission lines, City of Cocoa Water Utilities transmission lines, Florida Gas Transmission gas pipelines, and Transtate Industrial Pipeline Systems natural gas transmission lines.

Mobility Alternatives Evaluation Summary

Two mobility alternatives were considered for the NECEE. These include the No-Build alternative and a tolled limited-access alternative.

No-Build Alternative

The No-Build Alternative assumes the NECEE does not exist in the design year 2045. In this case, travel demand would be accommodated by the existing and planned regional roadway network. It should be noted this project is not anticipated to be developed until after the year 2040 at such time when land use associated with the North Ranch Master Plan begins to develop. A true no-build analysis related to regional travel demand and capacity was not performed for this study; however, it would be anticipated that a traditional no-build traffic analysis would be performed in subsequent reevaluations and project development studies for this project.

Transportation Systems Management and Operations Alternative

At this time, Transportation Systems Management and Operations (TSM&O) alternatives were not considered during this study. When the need for this project is additionally supported by future travel demand, TSM&O alternatives may be considered in combination with other improvements to serve the projected design year traffic within the study area. However, TSM&O alternatives alone are not expected to fulfill the anticipated need and purpose for the project.

Mass Transit Technology and Intermodal Facilities

CFX is in the beginning stages of the multimodal financier partnership model. Characteristics supportive of this model include densely developed areas with limited ability to provide additional highway capacity. Thus, while portions of the CFX service area are supportive of this model, the NECEE area is currently not. With the development of North Ranch and the Northeast District, further multimodal considerations will eventually be appropriate. The design concept for the NECEE assumes a 500-foot wide typical section, which includes space beyond the limits of limited-access right-of-way to accommodate multimodal capacity and/or technological advancements in transportation (i.e., autonomous, connected and shared vehicles). The recommended considerations for multimodal improvements include identifying and preserving right-of-way at interchanges where necessary to accommodate future intermodal or park-and-ride facilities.

Tolled Limited-Access Alternatives

Using GIS analysis, the process of developing alternative alignments within the study area began by identifying areas of avoidance, to the extent possible, such as wetlands, residential developments, and parks and recreational areas. The approach involved developing individual corridor segments to eventually create composite alignment alternatives. Once established, the individual corridor

segments were evaluated based on engineering design criteria and potential environmental impacts. Following the initial screening of each corridor segment, a total of twelve (12) alternative corridor alignments were then identified. All of the alternative corridor alignments utilize a typical section which consists of two 12-foot wide travel lanes in each direction separated by a 106-foot median. Both the outside and inside shoulders are 14 feet wide (12 feet paved). The border width varies. The minimum right-of-way width for the proposed limited-access expressway portion of each corridor alternatives is 330 feet which would be located within an overall 500-foot wide corridor envelope. The corridors recommended for further consideration are shown on Figure ES.2 and are designated as Alternatives 1 through 12, as described below.

Alternative 1 begins at a proposed interchange and realignment of US 192 near Osceola Drive and continues in a northerly direction to a proposed interchange at Nova Road near the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line then northwest to a proposed interchange at SR 528. From SR 528, Alternative 1 continues north across SR 520 and then northwesterly before terminating at the Florida Turnpike's proposed Colonial Parkway project at SR 50 and SR 520.

Alternative 2 begins at a proposed interchange and realignment of US 192 near Osceola Drive and continues in a northerly direction to a proposed interchange at Nova Road near the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line then northwest to a proposed interchange at SR 528. From SR 528, Alternative 2 continues north across SR 520 and then in a northwesterly direction before turning north to cross SR 50 then west before terminating at the proposed connection of the SR 408 Eastern Extension project.

Alternative 3 begins at a proposed interchange and realignment of US 192 near Osceola Drive and continues in a northerly direction to a proposed interchange at Nova Road near the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line to a proposed interchange at SR 528. From SR 528, Alternative 3 continues in a northeasterly direction across SR 520 then in a north-northwesterly direction around the proposed Florida Power and Light solar field before terminating at the Florida Turnpike's proposed Colonial Parkway project at SR 50 and SR 520.

Alternative 4 begins at a proposed interchange and realignment of US 192 near Osceola Drive and continues in a northerly direction to a proposed interchange at Nova Road near the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line to a proposed interchange at SR 528. From SR 528, Alternative 4 continues in a northeasterly direction across SR 520 then in a north-northwesterly direction around the proposed Florida Power and Light solar field. It then turns north across SR 50 and then west before terminating at the proposed connection of the SR 408 Eastern Extension project.

Alternative 5 begins at a proposed interchange on US 192 south of Harmony High School and

continues in a northeast and easterly direction south of the Lake X Ranch property. It then continues in a northerly direction to a proposed interchange at Nova Road. Alternative 5 then turns east along Nova Road to a proposed interchange near the future Central Business District node of the North Ranch Master Plan. From there, it continues north traversing the Osceola / Orange County line then northwest to a proposed interchange at SR 528. From SR 528, Alternative 5 continues north across SR 520 and then in a northwesterly direction terminating at the Florida Turnpike's proposed Colonial Parkway project at SR 50 and SR 520.

Alternative 6 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It then continues in a northerly direction to a proposed interchange at Nova Road. Alternative 6 turns east along Nova Road to a proposed interchange near the future Central Business District node of the North Ranch Master Plan. From there, it continues north traversing the Osceola / Orange County line then northwest to a proposed interchange at SR 528. From SR 528, Alternative 6 continues north across SR 520 and then in a northwesterly direction before turning north to cross SR 50 then west before terminating at the proposed connection of the SR 408 Eastern Extension project.

Alternative 7 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It then continues in a northerly direction to a proposed interchange at Nova Road. Alternative 7 turns east along Nova Road to a proposed interchange near the future Central Business District node of the North Ranch Master Plan. From there, it continues north traversing the Osceola / Orange County line to a proposed interchange at SR 528. From SR 528, Alternative 7 continues in a northeasterly direction across SR 520 then in a north-northwesterly direction around the proposed Florida Power and Light solar field before terminating at the Florida Turnpike's proposed Colonial Parkway project at SR 50 and SR 520.

Alternative 8 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It then continues in a northerly direction to a proposed interchange at Nova Road. Alternative 8 turns east along Nova Road to a proposed interchange near the future Central Business District node of the North Ranch Master Plan. From there, it continues north traversing the Osceola / Orange County line to a proposed interchange at SR 528. From SR 528, Alternative 8 continues north across SR 520 and then in a northwesterly direction before turning north to cross SR 50 then west before terminating at the proposed connection of the SR 408 Eastern Extension project.

Alternative 9 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It continues east then turns north to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. From there, it then continues north traversing the Osceola / Orange County line then northwest to a proposed interchange at SR 528. From SR 528, Alternative 9 continues north across SR 520 and then northwesterly before terminating at the Florida Turnpike's

proposed Colonial Parkway project at SR 50 and SR 520.

Alternative 10 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It continues east then turns north to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line then northwest to a proposed interchange at SR 528. From SR 528, Alternative 10 continues north across SR 520 and then in a northwesterly direction before turning north to cross SR 50 then west before terminating at the proposed connection of the SR 408 Eastern Extension project.

Alternative 11 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It continues east then turns north to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line to a proposed interchange at SR 528. From SR 528, Alternative 11 continues in a northeasterly direction across SR 520 then in a north-northwesterly direction around the proposed Florida Power and Light solar field before terminating at the Florida Turnpike's proposed Colonial Parkway project at SR 50 and SR 520.

Alternative 12 begins at a proposed interchange on US 192 south of Harmony High School and continues in a northeast and easterly direction south of the Lake X Ranch property. It continues east then turns north to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. It then continues north traversing the Osceola / Orange County line to a proposed interchange at SR 528. From SR 528, Alternative 12 continues in a northeasterly direction across SR 520 then in a north-northwesterly direction around the proposed Florida Power and Light solar field. It then turns north across SR 50 and then west before terminating at the proposed connection of the SR 408 Eastern Extension project.

Table ES.1 summarizes the design elements associated with each alternative.

Figure ES.2: Corridors Recommended for Further Consideration



	Segments										
Alternative 1	1	2	3	4a	9	10					
Alternative 2	1	2	3	4a	9	11					
Alternative 3	1	2	3	4b	9	10					
Alternative 4	1	2	3	4b	9	11					
Alternative 5	5	6	8	3	4a	9	10				
Alternative 6	5	6	8	3	4a	9	11				
Alternative 7	5	6	8	3	4b	9	10				
Alternative 8	5	6	8	3	4b	9	11				
Alternative 9	5	7	2	3	4a	9	10				
Alternative 10	5	7	2	3	4a	9	11				
Alternative 11	5	7	2	3	4b	9	10				
Alternative 12	5	7	2	3	4b	9	11				

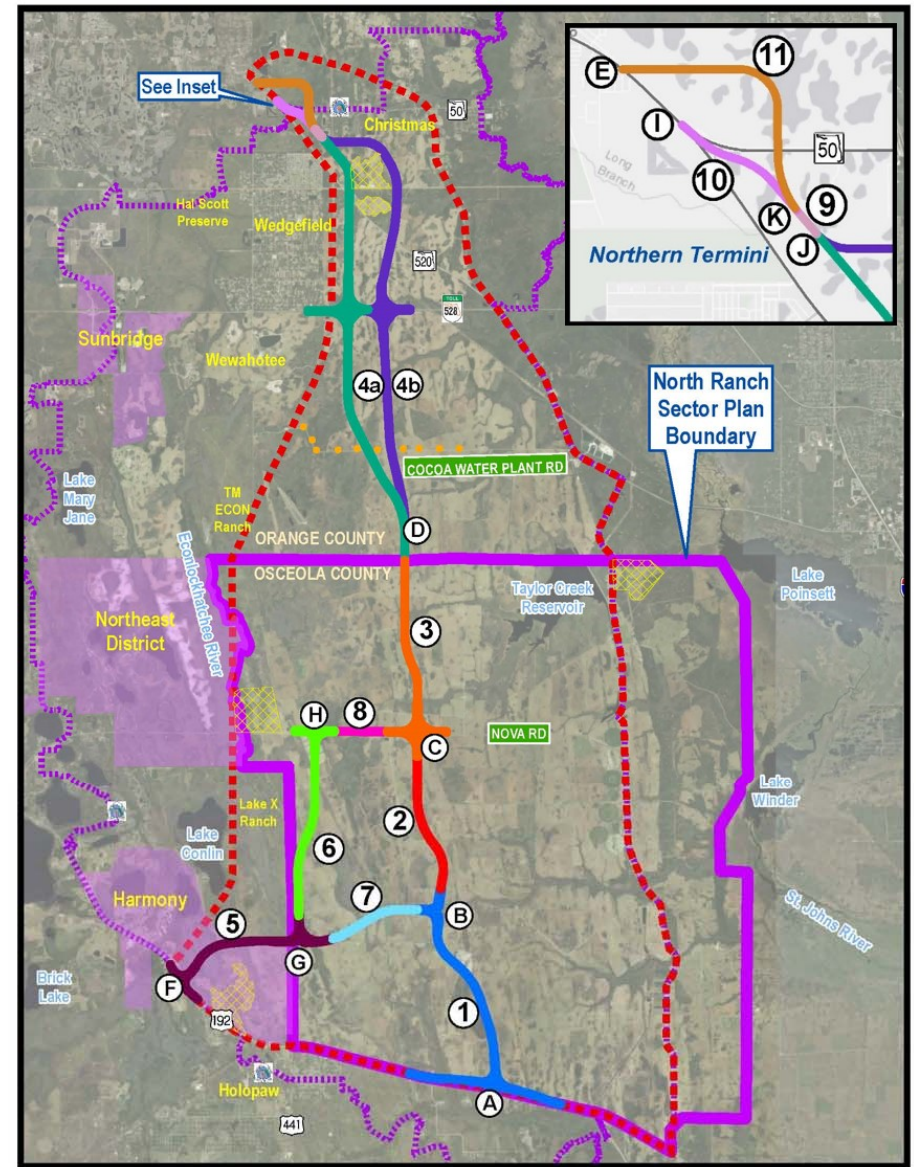


Table ES.1: Summary of Design Elements

Design Element	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Alternative Length (approximate)	miles	39	40	40	41	38	40	39	41	37	39	38	40
Proposed Right-of-Way Width (general and varies at interchanges)	feet	500	500	500	500	500	500	500	500	500	500	500	500
Proposed Bridges - total structures per alternative	Structures	53	55	56	58	55	57	58	60	44	46	47	49
Total length of all proposed structures	feet	85,928	95,215	87,351	96,638	128,132	137,419	129,555	138,842	101,133	110,420	102,556	111,843
Proposed Interchanges	Number	3	3	3	3	4	4	4	4	3	3	3	3
Projected 2045 Annual Average Daily Traffic (AADT) Volume (as a tolled facility)	vehicles	5,600 - 5,700	5,600 - 5,700	5,600 - 5,700	5,600 - 5,700	4,300 - 4,800	4,300 - 4,800	4,300 - 4,800	4,300 - 4,800	2,300 - 3,000	2,300 - 3,000	2,300 - 3,000	2,300 - 3,000

Anticipated Effects Summary

Utilities - There is the potential for existing major utility conflicts. Existing utility conflicts range from 11 (Alternatives 1, 2, 3 and 4) to 13 (Alternatives 9, 10, 11 and 12). There are no planned utilities in the study area.

Contamination - Potential contamination site conflicts range from one (Alternatives 1, 3, 5, 7, 1 and 11) to two (Alternatives 2, 4, 6, 8, 10 and 12).

Railroads - No alternatives cross any railroads.

Public Lands - Impacts to public lands range from 11 (Alternatives 5, 6, 9 and 10) to 34 (Alternatives 1, 2, 3 and 4). Coordination with all appropriate agencies will be required.

Historical - There is a potential for impacts to historic structures, although it is unlikely that any of the structures would be eligible for listing on the National Register of Historic Places. The potential impacts to historic structures range from two (Alternatives 7 and 11) to seven (Alternative 2). The potential impacts to linear historic resources range from four (Alternatives 1, 2, 5 and 6) to seven (Alternatives 11 and 12).

Archaeological Resources - A total of six corridor alternatives have the potential to impact one archaeological resource (Alternatives 3, 4, 7, 8, 11 and 12).

Water Features - Impacts to ponds and lakes range from six acres (Alternative 12) to 25 acres (Alternative 5). Conflicts with canals/regulated floodways range from zero (Alternatives 1, 2, 3 and 4) to three (Alternatives 5, 6, 7 and 8). Impacts to flood hazard areas (100-year floodplain) range from 790 acres (Alternative 3) to 1,446 acres (Alternative 6).

Wetlands - Impacts to wetlands range from 461 acres (Alternative 3) to 854 acres (Alternative 6).

Listed Species - Impacts to potential habitat for federal listed species range from 2,472 acres (Alternative 9) to 2,902 acres (Alternative 8). Impacts to potential habitat for state-listed species range from 1,750 acres (Alternative 5) to 2,257 acres (Alternative 4). Alternatives 4 and 5 have high potential for impacts to the protected species. Most notably, the percentage of total right-of-way within Alternatives 4 and 5 impacting listed species habitat is high. The remaining Alternatives have a medium impact on potential species.

Mitigation Banks - Only one corridor (Alternative 6) impacts Lake X Ranch Mitigation Bank totaling 50 acres.

Conservation Easements - No conservation easements are impacted.

Right-of-Way - Right-of-way needs range from 2,611 acres (Alternative 9) to 2,950 acres (Alternative 8).

Residential - Potential residential impacts (including partially impacted parcels) range from seven (Alternatives 8 and 12) to 14 (Alternative 1). Potential non-residential impacts (including partially impacted parcels) range from 99 (Alternative 3) to 150 (Alternatives 6 and 10).

Community Facilities - No community facilities will be impacted by the current Alternatives.

Parks and Recreational Facilities - Impacts to parks and recreational facilities range from two (Alternatives 5-12) to three (Alternatives 1-4).

Trails - All the corridor alternatives impact the Florida National Scenic Trail in one location adjacent to East Colonial Drive.

Community Cohesion - Negative community cohesion effects are considered low for all corridor alternatives.

Socio-Economic - Socio-economic impacts are considered low for all corridor alternatives.

Proposed Developments - Impacts to proposed developments and developments of regional impact range from 1,561 acres (Alternatives 9-12) to 1,712 acres (Alternatives 5-8).

Table ES.2 summarizes the anticipated effects on the physical, cultural, natural and social environments for each alternative.

Table ES.2: Summary of Anticipated Effects

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Physical													
Major Utility Conflicts - Existing	No. of Conflicts	11	11	11	11	12	12	12	12	13	13	13	13
Major Utility Conflicts - Planned	No. of Conflicts	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Contamination Sites & Facilities	No. of Conflicts	1	2	1	2	1	2	1	2	1	2	1	2
Railroad Involvement	No. of Conflicts	0	0	0	0	0	0	0	0	0	0	0	0
Cultural Environment													
Public Lands	acres	34	34	34	34	11	11	12	12	11	11	12	12
Section 4(f) Coordination Required (Public Recreation Lands, Wildlife Refuges, etc.)	Y/N	N	N	N	N	N	N	N	N	N	N	N	N
Potential Historic Resources	No. of Conflicts	5	7	4	6	3	5	2	4	3	5	2	4
Potential Historic Linear Resources (Canals/Highways/Railroads)	No. of Resources	4	4	6	6	4	4	6	6	5	5	7	7
Potential Archaeological Resources	No. of Resources	0	0	1	1	0	0	1	1	0	0	1	1

RED = High impacts = potential impacts greater than one standard deviation above the mean

YELLOW = Medium impacts = potential impacts within one standard deviation of the mean

GREEN = Low impacts = potential impacts with zero or greater than one standard deviation below the mean

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Natural Environment													
Water Features													
<i>Ponds / Lakes</i>	acres	24	17	15	7	25	18	16	8	23	16	14	6
<i>Canals / Regulated Floodways</i>	No. of Conflicts	0	0	0	0	3	3	3	3	2	2	2	2
<i>Flood Hazard Areas – 100 Year Floodplain</i>	acres	1,004	1,064	790	850	1,386	1,446	1,172	1,232	1,224	1,284	1,010	1,070
Wetlands (non-forested and forested)	acres	571	620	461	510	805	854	695	744	679	728	569	618
Potential Habitat – Federal Listed Species	acres	2,534	2,654	2,679	2,799	2,637	2,757	2,782	2,902	2,472	2,593	2,617	2,738
Potential Habitat – State-Listed Species	acres	1,990	2,059	2,189	2,257	1,750	1,819	1,949	2,017	1,789	1,857	1,987	2,056
Potential Bald Eagle Nest	Y/N	N	N	N	N	N	N	N	N	N	N	N	N
Potential Species Impacts (composite rating)	High/Med/Low	Med	Med	Med	High	High	Med	Med	Med	Med	Med	Med	Med
Mitigation Bank													
<i>Lake X Ranch</i>	acres	0	0	0	0	0	50	0	0	0	0	0	0
Conservation Easement													
<i>Triple N Ranch WMA</i>	acres	9	9	9	9	0	0	0	0	0	0	0	0
<i>Bull Creek WMA</i>	acres	17	17	17	17	0	0	0	0	0	0	0	0
Florida Forever Acquired													
<i>Osceola Pines Savannas</i>	acres	12	12	12	12	0	0	0	0	0	0	0	0
<i>Big Bend Swamp/ Holopaw Ranch</i>	acres	0	0	0	0	225	225	225	225	225	225	225	225
<i>Conlin Lake X</i>	acres	0	0	0	0	0	59	0	0	0	0	0	0
Public Lands (FLMA, Sept. 2018)	acres	34	11	11	11	6	0	6	6	6	6	0	0

RED = High impacts = potential impacts greater than one standard deviation above the mean

YELLOW = Medium impacts = potential impacts within one standard deviation of the mean

GREEN = Low impacts = potential impacts with zero or greater than one standard deviation below the mean

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Social													
Right-of-Way Area (not including proposed ponds)	acres	2,653	2,758	2,736	2,841	2,762	2,867	2,845	2,950	2,611	2,716	2,694	2,799
Potential Residential Impacts (includes partially impacted parcels)	Total Parcels	14	12	10	8	13	11	9	7	13	11	9	7
<i>Existing</i>	Parcels	14	12	10	8	13	11	9	7	13	11	9	7
<i>Planned</i>	Parcels	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potential Non-Residential Impacts (includes partially impacted parcels)	Total Parcels	100	140	99	139	110	150	109	149	110	150	109	149
<i>Existing</i>	Parcels	100	140	99	139	110	150	109	149	110	150	109	149
<i>Planned</i>	Parcels	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Community Facilities	No. of Conflicts	0	0	0	0	0	0	0	0	0	0	0	0
Parks and Recreational Facilities (public and private)	No. of Conflicts	3	3	3	3	2	2	2	2	2	2	2	2
Trails	No. of Conflicts	1	1	1	1	1	1	1	1	1	1	1	1
Community Cohesion Effects	High/Med/Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Socio-Economic Impacts to Special Populations	High/Med/Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Proposed Development / Development of Regional Impact	acres	1,603	1,603	1,603	1,603	1,712	1,712	1,712	1,712	1,561	1,561	1,561	1,561

RED = High impacts = potential impacts greater than one standard deviation above the mean

YELLOW = Medium impacts = potential impacts within one standard deviation of the mean

GREEN = Low impacts = potential impacts with zero or greater than one standard deviation below the mean

Stakeholder Involvement Summary

Public involvement and interagency coordination have been an integral part of the assessment process, and multiple opportunities for participation have been provided. A Public Involvement Plan (PIP) was established to initiate and maintain early, meaningful, continuous and high-level public and stakeholder involvement during the studies. The public involvement techniques utilized provided information to, and helped obtain vital input from: citizen, residential and business groups; elected and appointed officials; other government entities; environmental advocates; and others interested in the corridor-wide implications of the study segments. The public was engaged to provide crucial input, resolve issues and minimize negative impacts along this corridor. The robust public engagement program included meetings of an Environmental Advisory Group (EAG), public meetings held in Orange and Osceola counties, meetings with local elected and appointed officials, as well as meetings with key stakeholders. A complete summary of public involvement efforts and individual meeting minutes are included in Chapter 8 of this report.

Projected Project Costs Summary

The range of project costs is from \$1,992,000,000 for Alternative 1 to \$2,827,900,000 for Alternative 8. Table ES.3 summarizes the projected costs for each alternative, which include roadway construction with retention ponds, bridge construction, interchange construction, toll collection equipment, and mitigation for wetlands and wildlife. For this study, costs were not calculated for right-of-way. All costs are in 2019 dollars.

Table ES.3: Northeast Connector Expressway Extension Summary of Projected Costs

Cost Element	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Roadway Construction	\$828,200,000	\$880,700,000	\$850,200,000	\$902,700,000	\$974,300,000	\$1,026,700,000
Bridges Construction	\$334,300,000	\$443,100,000	\$356,000,000	\$464,800,000	\$706,200,000	\$815,000,000
Interchanges Construction	\$650,000,000	\$650,000,000	\$650,000,000	\$650,000,000	\$750,000,000	\$750,000,000
Toll Collection Equipment	\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000	\$7,600,000	\$7,600,000
Right-of-Way	\$0	\$0	\$0	\$0	\$0	\$0
Mitigation, Wetlands, Floodplains & Wildlife	\$173,200,000	\$180,000,000	\$133,100,000	\$139,900,000	\$218,200,000	\$225,000,000
Total	\$1,992,000,000	\$2,160,100,000	\$1,995,600,000	\$2,163,700,000	\$2,656,300,000	\$2,824,300,000

Cost Element	Alternative 7	Alternative 8	Alternative 9	Alternative 10	Alternative 11	Alternative 12
Roadway Construction	\$996,300,000	\$1,048,700,000	\$862,300,000	\$914,700,000	\$884,300,000	\$936,700,000
Bridges Construction	\$727,900,000	\$836,700,000	\$513,400,000	\$622,200,000	\$535,100,000	\$643,900,000
Interchanges Construction	\$750,000,000	\$750,000,000	\$650,000,000	\$650,000,000	\$650,000,000	\$650,000,000
Toll Collection Equipment	\$7,600,000	\$7,600,000	\$7,600,000	\$7,600,000	\$7,600,000	\$7,600,000
Right-of-Way	\$0	\$0	\$0	\$0	\$0	\$0
Mitigation, Wetlands, Floodplains & Wildlife	\$178,100,000	\$184,900,000	\$200,200,000	\$207,000,000	\$160,000,000	\$166,800,000
Total	\$2,659,900,000	\$2,827,900,000	\$2,233,500,000	\$2,401,500,000	\$2,237,000,000	\$2,405,000,000

Projected Traffic and Revenue Summary

Based on the high-level, conceptual nature of this study, a traffic and revenue analysis was not performed. As the project moves forward in subsequent studies, detailed traffic and revenue studies will be completed.

Alternative Comparison Matrix

The corridor alternatives comparison matrices are provided in Tables ES.1 (Summary of Design Elements), ES.2 (Summary of Anticipated Effects), and ES.3 (Summary of Projected Costs). These matrices provide a convenient comparison of the various information and effects of all the alternatives evaluated.

III. Recommendations for The Proposed Project

The purpose of this Concept, Feasibility, and Mobility report is to determine if the identified alternatives are feasible from an engineering and environmental standpoint. Regarding engineering and environmental issues, no “fatal flaws” have been observed. As development within or near the study area progresses, a more comprehensive study is recommended to identify a preferred alternative that will serve the needs of the community.

1. Introduction

1.1 Project Description

The Concept, Feasibility & Mobility Study for the Northeast Connector Expressway Extension (NECEE) was initiated by the Central Florida Expressway Authority (CFX) in February 2018 to identify potential corridor alternatives for regional connectivity in East Central Florida. The NECEE is a planned limited-access facility. This new transportation corridor has previously been represented as “Corridor I” in the East Central Florida Corridor Task Force Summary Report published in December 2014. A new limited-access expressway within the NECEE study area is generally identified in the Orange County Comprehensive Plan-Destination 2030, Osceola County Comprehensive Plan 2025, CFX 2040 Master Plan and the MetroPlan Orlando 2040 Long Range Transportation Plan (LRTP). This study is being conducted by CFX to fulfill a commitment set forth in the purchase and sale agreement with Farmland Reserve and Suburban Land Reserve for right-of-way property along State Road (SR) 528. This right-of-way would allow for the eventual eight-lane build-out of SR 528 and facilitate a high-speed passenger train between Miami and Orlando. The proposed project is located within Orange and Osceola counties.

1.2 Purpose of Report

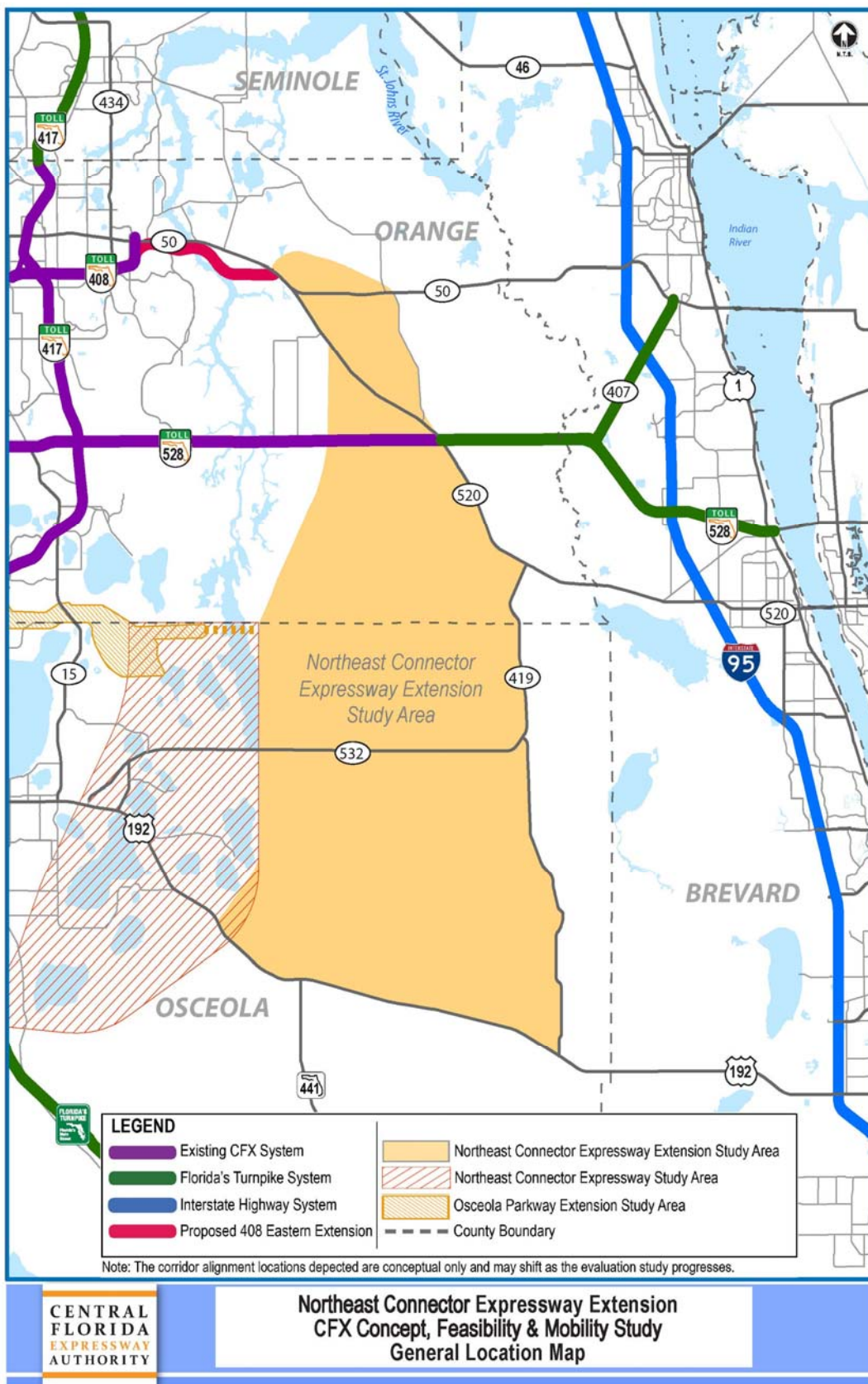
The purpose of this report is to document the evaluation effort for the NECEE. Specifically, this report addresses the documentation of the purpose and need for the project; existing conditions within the study area; traffic considerations; design criteria; mobility alternatives evaluation; anticipated effects to the natural, human, and physical environment; and stakeholder involvement as well as an evaluation of the feasibility and viability of the proposed project.

1.3 Project Location

As shown on Figure 1.1, the proposed NECEE study area generally extends in the north from the vicinity of the existing SR 50/SR 520 intersection in Orange County south to US 192 in Osceola County, a distance of approximately 25 miles. The study area is generally bound by the Econlockhatchee River to the west and Deer Park Road/Nova Road/SR 520 to the east.

The goal of the NECEE is to enhance north-south mobility and provide connections between existing and future east-west corridors within the study area. These connections will promote regional connectivity, provide for the incorporation of transit options, and provide enhanced mobility of the area’s growing population and economy.

Figure 1.1: Project Location Map



1.4 Previous Studies Related to the Project

The following two previous reports addressed the NECEE:

- *East Central Florida Corridor Task Force Final Report, 2014*
- *North Ranch Master Plan, 2015*

East Central Florida Corridor Task Force Final Report, 2014

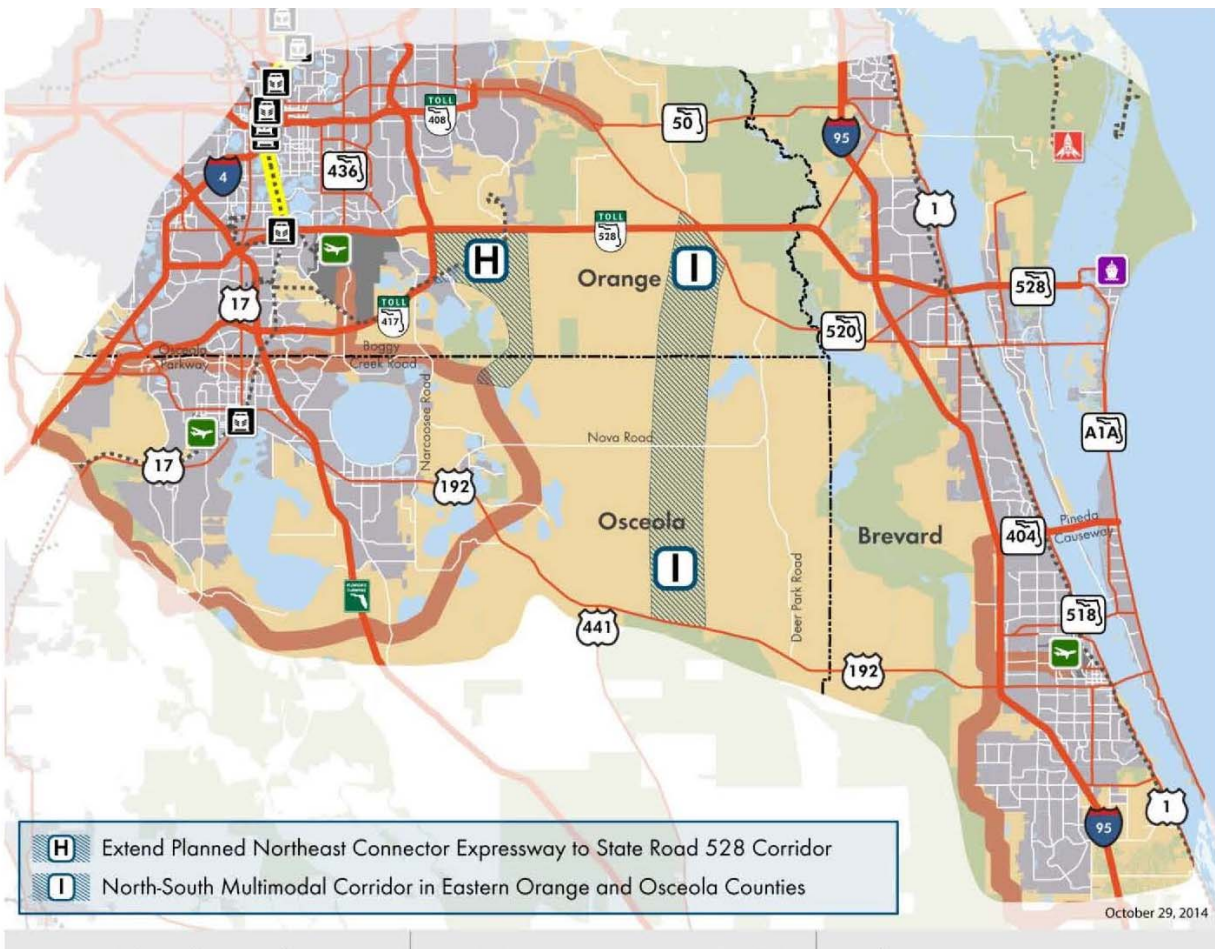
In 2013, then-Governor Rick Scott issued Executive Order 13-319, which created the East Central Florida Corridor Task Force (Task Force). The Task Force was charged with developing recommendations on future transportation corridors serving established and emerging activity centers in portions of Brevard, Orange, and Osceola counties. In 2014, the Task Force submitted a Final Report to Governor Scott recommending 21 guiding principles for planning the future of east central Florida's transportation corridors, including nine transportation corridor alternatives for further study. The Task Force proposed an action plan for implementation of the recommendations, which included conducting "one or more Evaluation Studies of potential new north-south corridors in eastern Orange and Osceola counties". The new multimodal corridor, referred to as "Corridor I" or "Alternative I", would serve planned population centers within the North Ranch and establish connectivity to other regional destinations and east-west corridors (Figure 1.2). The corridor concepts are described below:

At its northern end, the corridor could be integrated with proposed improvements to the State Road 520 and State Road 50 corridors and provide connectivity to the University of Central Florida area and downtown Orlando. At its southern end, the corridor could be integrated with proposed improvements to US 192 and provide connectivity to Melbourne/Palm Bay. The corridor also could connect to proposed new and improved east-west corridors linking Orange and Osceola counties to Brevard County, including State Road 528, the proposed new east-west multimodal corridor along the Orange-Osceola County line, and the proposed new east-west multimodal corridor from the Orlando International Airport/Lake Nona area to central/southern Brevard County.

The acquisition of right-of-way for a new corridor could impact the connectivity and function of lands currently in productive agricultural use, and could facilitate new development in an area outside of established urban service area/growth boundaries. In southeastern Orange County, the corridor would pass through areas that are identified as rural service areas in the County's comprehensive plan.

The corridor could be completed in phases corresponding to phasing of development in the North Ranch Master Plan area and contingent on future planning in southeast Orange County. For example, the segment between Nova Road and US 192 could be timed to coincide with development of centers in the central portion of the North Ranch and linked with multimodal improvements to the US 192 corridor and proposed new east-west corridors.

**Figure 1.2: East Central Florida Corridor Task Force
Recommended North-South Corridors**



North Ranch Master Plan, 2015

The North Ranch Master Plan, developed by Osceola County and Farmland Reserve (Deseret Ranches), involves approximately 133,000 acres of property owned by Deseret Ranches and extends east and south from the Northeast District to US 192 and the Osceola/Brevard County line. In response to the growing needs of Osceola County and the region to plan for an economically sustainable future, the North Ranch Master Plan identifies goals, policies, frameworks, and opportunities within the North Ranch Planning Area, taking into consideration environmental factors, market conditions, surrounding land uses, transportation and available infrastructure. Included in the goals of the North Ranch Master Plan was to connect regions and economic centers through a multimodal transportation system in coordination with long-term land use decisions, environmental protection, and agricultural preservation.

In 2015, the Osceola County Urban Growth Boundary (UGB) was expanded to include all of the property within the North Ranch Planning Area through Comprehensive Plan Amendment 14-0005 (Appendix 1). The North Ranch Comprehensive Plan Element calls for development to be

consistent with Mixed-Use District regulations and the North Ranch Planning Area to consist of seven place types including urban center, employment center, neighborhoods, community center, neighborhood center, and special district.

Referred to as the SR 408 Extension to US 192 in the plan, the new north-south facility would extend SR 408 to the SR 50/SR 520 interchange, and extending it further to SR 528 would provide system-level connectivity. Extending it south of SR 528 creates the north-south transportation spine for the North Ranch Planning Area as it connects to US 192. According to the plan, traffic forecasts indicate the need to make the connection from the Orange-Osceola County line to SR 528 to balance north-south traffic flows between the Northeast Connector to the west and I-95 to the east.

1.5 Other Projects Within or Near the Study Area

1.5.1 CFX Projects

Osceola Parkway Extension Project Development and Environment (PD&E) - CFX is conducting a Re-evaluation of the Project Environmental Impact Report (PEIR) completed in May 2017 by the Osceola County Expressway Authority for the proposed Osceola Parkway Extension. The study will re-evaluate a potential new expressway connection between State Road 417 near Boggy Creek Road in Orange County and the proposed Sunbridge Parkway in Osceola County. Goals of the proposed 9-mile, limited-access facility include providing for additional east-west routes within the project area, enhancing mobility of the area's growing population and economy, relieving congestion on local roads, providing for the incorporation of transit options and promoting regional connectivity. The re-evaluation began in July 2018 and is expected to be complete in Summer of 2019.

SR 528 Econlockhatchee Bridge Replacement – CFX is replacing the dual bridges of the existing SR 528 (Martin B. Andersen Beachline Expressway) over the Econlockhatchee River. The new bridges will be built at a high profile and will accommodate future widening from two to three lanes in each direction. This 0.8-mile roadway construction project includes milling and resurfacing, drainage improvements, and utility relocation.

1.5.2 Other Area Projects

Colonial Parkway PD&E Study - The proposed Colonial Parkway (SR 50) facility improvements would extend from SR 408, at its current eastern terminus, to SR 520 along the SR 50 corridor to provide added capacity along with a limited-access, tolled east-west corridor. The goals of this facility are to: reduce congestion; enhance mobility options for longer trips; provide multimodal enhancements such as continuous sidewalks, bike lanes and opportunities for transit connections; improve vehicle, pedestrian and bicyclist safety; and, improve evacuation and emergency response times. The PD&E study began in Fall 2017 and CFX has been informed the study will be complete by the end of 2019.

1.5.3 Additional Capacity Projects DOT, MetroPlan Orlando, Local Projects

There are several roadway and other capital improvement projects identified in the Florida Department of Transportation’s (FDOT) Five Year Work Program, the MetroPlan Orlando, Orange and Osceola County’s Capital Improvement Worksheet for 2019 Budget Exercise for the Years 2019 through 2023 that are scheduled to occur within or near the study area. These projects are identified in Table 1.1.

Table 1.1: Identified Roadway and Other Capital Improvement Projects

Roadway	From	To	Responsible Entity	Improvement
US 192 (SR 500)	W Arthur J Gallagher Blvd	East of Harmony Square Drive	FDOT	Resurfacing
Deer Park Rd (SR 419)	At Wolf Creek	N/A	FDOT	Bridge repair
Colonial Parkway (SR 50)	SR 520	SR 528	FDOT	New Road Construction
SR 520	Ramp onto SR 50	SR 528 Ramp	FDOT	Resurfacing
Taylor Creek Reservoir	N/A	N/A	Orange County	Reservoir Expansion
Canoe Creek Road (CR 523)	Deer Run Road	US 192 (SR 500)	Osceola County	Reconstruction of existing two-lane rural roadway to a four-lane divided urban roadway with sidewalks and bike lanes
Hickory Tree Road (CR 534) Safety Upgrade	Deer Run Road	US 192 (SR 500)	Osceola County	Study to determine the extent of improvements needed to bring the existing road and bridges in compliance with County standards
Hickory Tree Road (CR 534)	Hunting Lodge Road	US 192 (SR 500)	Osceola County	Reconstruction of existing two-lane rural roadway to a four-lane divided urban roadway with sidewalks and bike lanes

2. Project Need and Purpose

2.1 Need for Improvement

The need and purpose for a transportation improvement project is to establish the foundation upon which proposed alternatives are evaluated. The need for a project identifies the transportation problem to be addressed. The purpose of a project addresses why the undertaking is being proposed and articulates the intended positive outcomes.

The NECEE project is to provide system linkage, improve regional connectivity and mobility, meet future planned social and economic needs, achieve consistency with transportation plans, provide for multimodal opportunities, and improve evacuation support.

2.1.1 System Linkage

System linkage is defined as linking two or more existing transportation facilities, types of modal facilities, geographic areas, or regional traffic generators.

The FDOT has identified a network of transportation facilities that are important to the state's economy and mobility. This network is referred to as the Strategic Intermodal System (SIS). SR 528, a designated SIS facility, is located within the study area. Other designated SIS facilities such as SR 408, SR 417, Florida's Turnpike, and I-95 are adjacent to or in relatively close proximity to the study area and are illustrated on Figure 2.1. When completed, the NECEE will provide system linkage between two or more of these designated SIS facilities.

In 2013, Florida Governor Rick Scott signed Executive Order 13-319 creating the East Central Florida Corridor Task Force (Task Force). The Task Force was charged with developing consensus recommendations for future transportation corridor planning in portions of Brevard, Orange, and Osceola counties. In 2014, the Task Force submitted a Final Report to Governor Scott documenting the evaluation and development of future transportation corridors serving established and emerging economic activity centers in the region. The Task Force's recommendations included 21 guiding principles for planning the future of east central Florida's transportation corridors, nine transportation corridor alternatives for further study, and a proposed action plan for implementation of the recommendations. The nine transportation corridors identified for further study are shown on Figures 2.1, 2.2, and 2.3.

In addition to existing corridors SR 50, SR 520, SR 528 and US 192, the NECEE study area includes the following proposed new transportation corridors:

Corridor D: A new east-west multimodal corridor in Osceola and Orange counties that would enhance east-west travel to and from Northern Brevard County.

Corridor F: A new east-west multimodal corridor in Osceola and Brevard counties that would enhance east-west travel to and from Central and Southern Brevard County.

Corridor I: A new north-south multimodal corridor in Orange and Osceola counties that would enhance north-south travel between Orange and Osceola counties.

Each of these corridors would serve to connect the future population centers in east Orange and northeast Osceola counties to other regional destinations and east-west corridors.

Figure 2.1: Task Force Recommendations, Existing Transportation Facilities

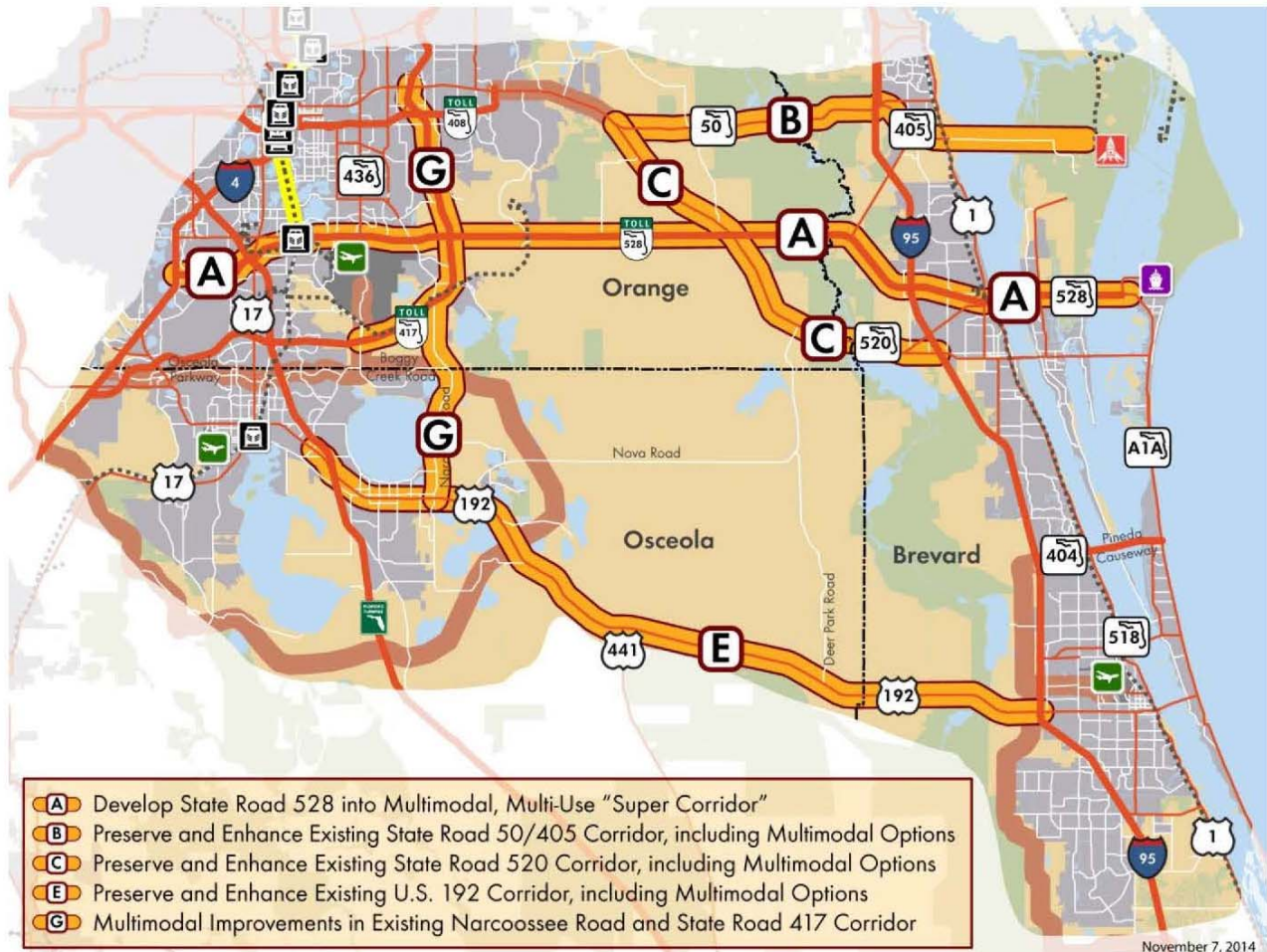


Figure 2.2: Task Force Recommendations New East-West Corridors

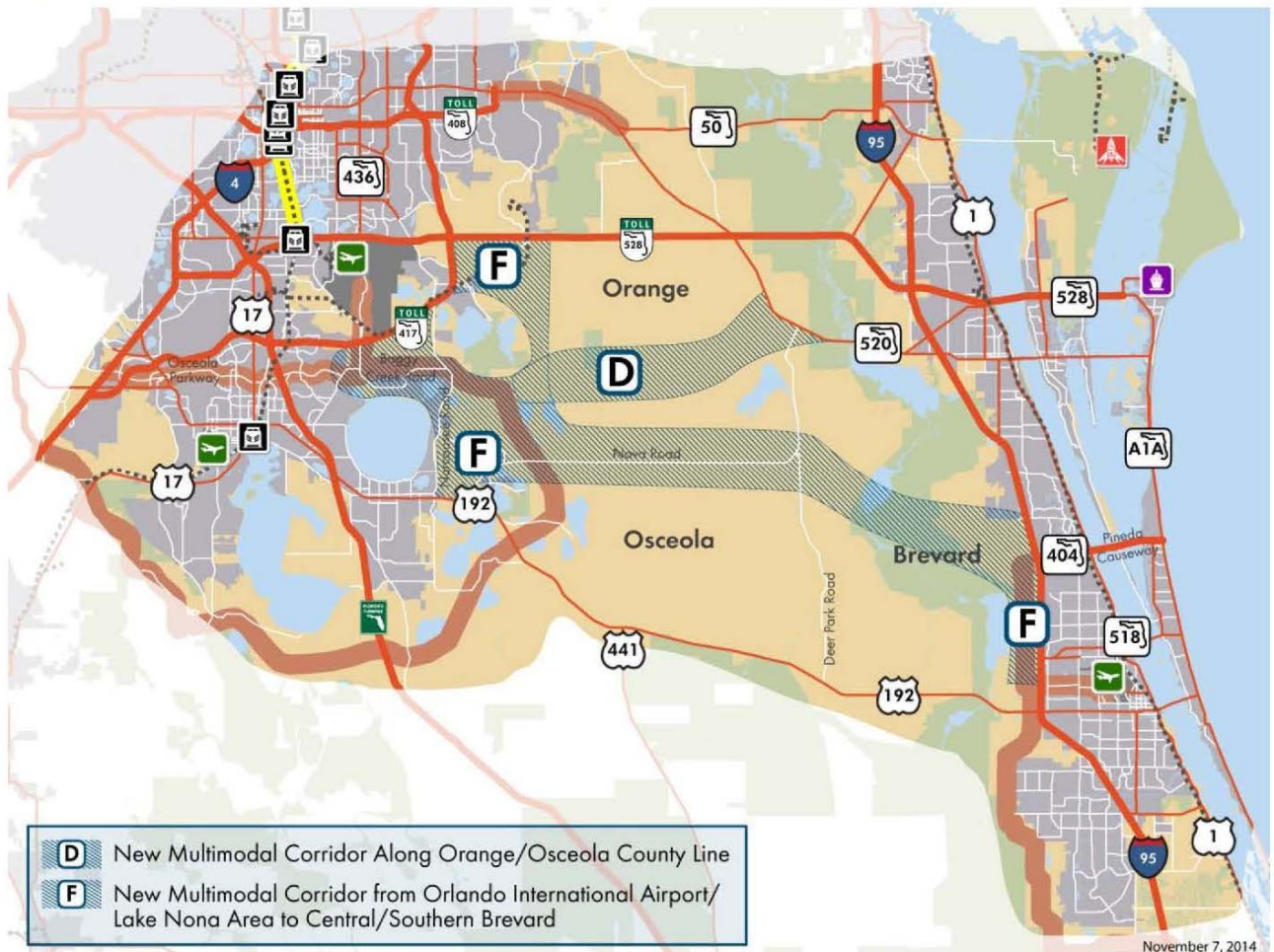
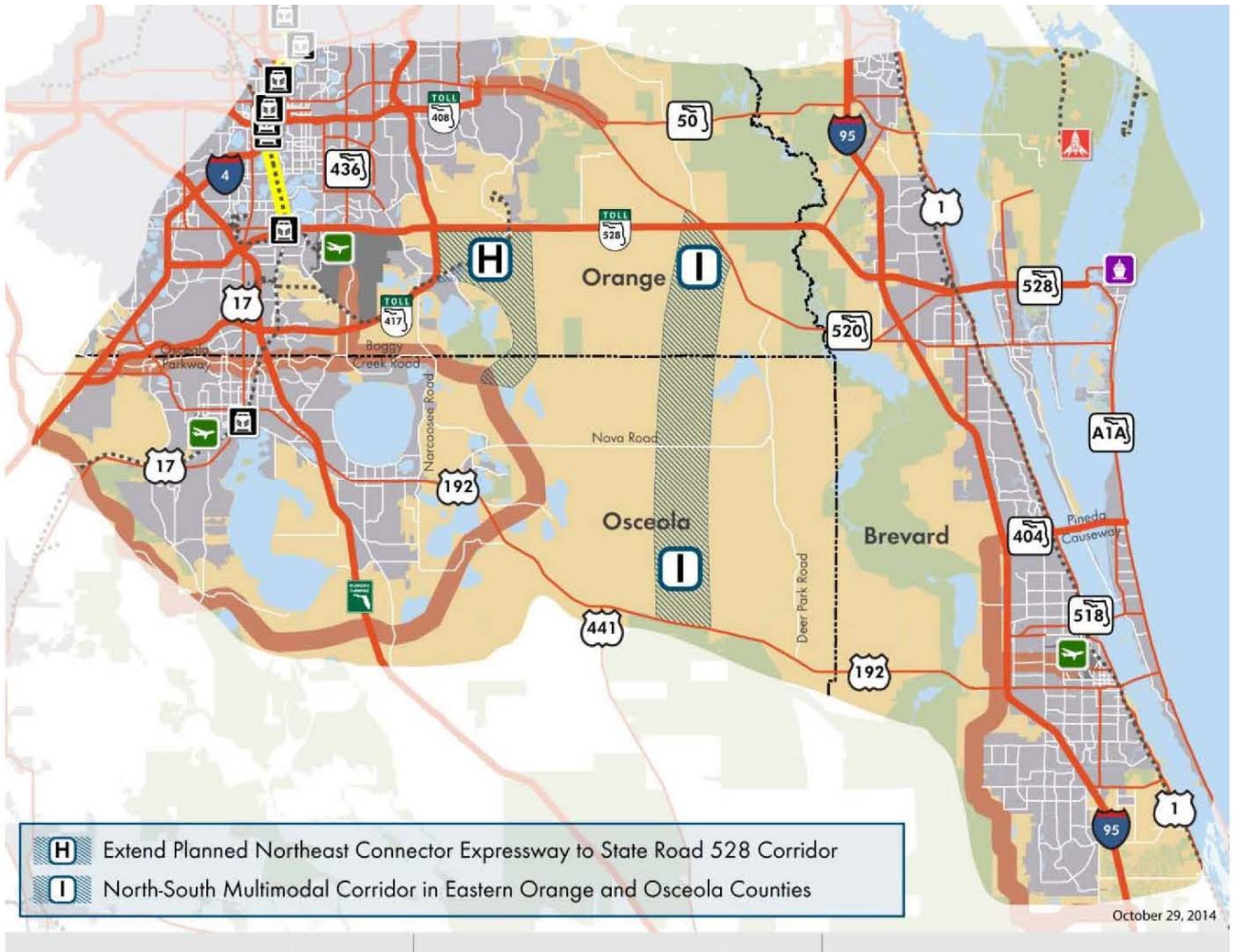


Figure 2.3: Task Force Recommendations New North-South Corridors



2.1.2 Regional Connectivity and Mobility

Mobility is the movement of people and goods and the ability to meet transportation demands. Due to the anticipated population and employment growth in the study area, the proposed facility would play a critical role in accommodating travel demands and improving the movement of goods and people. The NECEE would provide connections to US 192, Task Force Corridor F (Nova Road), SR 528, and SR 408 via either CFX's SR 408 Eastern Extension or Florida Turnpike Enterprise's Colonial Parkway. The proposed project would also potentially provide connections to Florida's Turnpike via the proposed Northeast Connector Expressway, SR 417 and Orlando International Airport via the proposed Osceola Parkway Extension, and I-95 via connections to US 192 and Task Force Corridor F (Nova Road).

2.1.3 Social and Economic Needs

Current and future growth in land-use development, population, and employment opportunities within the study area contribute to the need for a coordinated transportation network providing access to and mobility within the east central Florida region (see Figure 2.4). Over the past several years, a number of initiatives have been considered to develop a regional vision for managing growth and mobility needs.

In 2007, *myregion.org* completed a 50-year regional visioning process with input from nearly 20,000 residents of Brevard, Lake, Orange, Osceola, Polk, Seminole, and Volusia counties. This process culminated in the adoption of the *How Shall We Grow?* vision and regional growth compact by representatives of seven counties and 86 cities. The vision focused on four key themes: conservation, countryside, centers, and corridors. The vision specifically identified the need for improving connectivity between Orlando and southern Brevard County.

In 2013, Osceola County and Farmland Reserve, Inc. (an entity of Deseret Ranches of Florida), jointly initiated a long-term master planning process for 133,000 acres of the North Ranch in Osceola County under Florida's sector planning law. The North Ranch planning area is within the NECEE study area and is east and southeast of the Northeast District – a previously-approved 19,000 acre planned development area. The stated goals of the sector planning process are to maximize job growth and reinforce long-term economic sustainability for the region; protect large-scale natural systems; connect regions and economic centers with multimodal transportation systems; and plan mixed-use communities using highest quality growth practices.

The North Ranch Master Plan was adopted by the Osceola County Board of County Commissioners in September 2015. The North Ranch plan anticipates creating a network of 16 development nodes or centers to accommodate a population of approximately 355,000 residents by the year 2060 and an estimated 490,000 residents by the year 2080. The transportation framework within the North Ranch plan identifies the need for several new limited-access expressway corridors including a north-south corridor generally representing Task Force Corridor I.

Figure 2.4: Planned Development Map



The proposed NECEE would support the planned economic development within the study area consistent with the North Ranch plan. This transportation corridor would also serve existing and planned developments adjacent to the study area including Harmony in Osceola County. A north-south alternative, as proposed by the NECEE, is anticipated to meet the future transportation needs of Orange and Osceola counties.

2.1.4 Consistency with Transportation Plans

Future transportation corridors including a new north-south corridor representative of the NECEE are addressed in the following current adopted long-range transportation plans:

2.1.4.1 Central Florida Expressway Authority (CFX) 2040 Master Plan

The 2040 Master Plan is CFX's visionary blueprint for system improvements and new projects. The Master Plan defines the policies CFX follows when evaluating projects for future mobility needs and it identifies specific near- and long-term projects that CFX reevaluates annually as the Five-Year Work Plan is developed. The Master Plan explains CFX's expanded roles; including an expanded geographic extent - from a system entirely in Orange County - to now include Lake, Osceola, Seminole and Brevard counties; and its ability to partner or lead multimodal and intermodal projects. The Master Plan identifies an estimated \$9.7 to \$12.2 billion in potential regional project needs through the year 2040, including \$6.5 to \$9 billion for twelve new projects and approximately \$2 billion in capacity and operating improvements to the existing system.

The Master Plan provides an overview of the Osceola Parkway Extension, Southport Connector Expressway, and Northeast Connector Expressway, including status and estimated cost of each project; and the developments that would potentially be served, such as the Northeast District and North Ranch Planning Area in Osceola County. The Master Plan identifies Task Force Corridor I (NECEE) as a potential new expressway project.

2.1.4.2 MetroPlan Orlando 2040 Long Range Transportation Plan

MetroPlan Orlando is the metropolitan planning organization for the greater Orlando area. It coordinates and leads transportation planning efforts in Orange, Osceola, and Seminole counties. The 2040 LRTP emphasizes the need for more travel choices but recognizes the continued need for new roads in Central Florida, including the integral role toll roads play in the region's future. The 2040 LRTP mentions the 57-mile ring of expressway segments identified in the Osceola County Expressway Authority 2040 Master Plan, which includes the Northeast Connector Expressway. MetroPlan Orlando's most recent Transportation Improvement Program (TIP) also includes the NECEE Study in 2018/19.

2.1.4.3 Orange County Comprehensive Plan - Destination 2030

Orange County's Comprehensive Plan policies promote the development of safe, accessible, convenient, and efficient mobility options. To enhance land use and transportation integration, Orange County encourages infill development in the County and promotes the use of alternative modes of transportation. Orange County commits to promoting compact, transit-oriented

development within the Urban Service Area (USA) boundary. Orange County Comprehensive Plan Amendment 2015-2-B-TRAN-1 was adopted to amend the Transportation Element policies to incorporate the East Central Florida Corridor Task Force’s Guiding Principles. This includes the Task Force’s recommended new north/south Corridor I (NECEE). Within Orange County, the NECEE study area is within the Rural Service Area and the Econlockhatchee River Protection Area. The NECEE study area is also near the Innovation Way Multimodal Transportation District.

2.1.4.4 Osceola County Comprehensive Plan 2025

The study area within Osceola County has a future land use classification of *Mixed Use District* and is within the County’s UGB. As noted above, the study area also includes the Northeast District Conceptual Master Plan and the North Ranch Master Plan. Through the Northeast District Element and the North Ranch Master Plan Element, Comprehensive Plan 2025 proposes significant growth in this area contingent upon identified transportation improvements and enhancements. The North Ranch Master Plan Element identifies Limited-Access 3, a north-south corridor between US 192 and SR 528, as a planned major transportation facility. Both the Northeast District and North Ranch Master Plan rely on and commit to limited-access transportation facilities such as the Osceola Parkway Extension and the Northeast Connector Expressway be constructed before specific stages of development can occur. The Comprehensive Plan also commits the County and the landowner to coordinate with regional partners to create these improvements. Through these various elements, the Comprehensive Plan also calls for the creation of Multimodal Transportation Districts (MMTDs) and regional transit corridors to create complete communities that reduce automobile dependence.

2.1.5 Multimodal Opportunities

CFX has established a multimodal policy to fund or partner on multimodal initiatives where revenue generated from the investment equals the project cost or where toll user benefits are equal to or exceed the project cost. In addition, through the incorporation of the North Ranch Master Plan, Osceola County’s Comprehensive Plan calls for an integrated, multimodal transportation network. Opportunities to support multimodal improvements will be considered as part of the alternatives developed to address the need and purpose for this project.

2.1.6 Safety and Evacuation Support

The Florida Division of Emergency Management has identified I-4, I-95, Florida’s Turnpike, SR 417, SR 408 and SR 528 as significant evacuation routes in the region. Other evacuation routes within or near the study area are SR 50, SR 520, Narcoossee Road (CR 15), US 192 (SR 500) and Nova Road (CR 532). The proposed NECEE would provide a direct connection to US 192, SR 528 and SR 50/SR 520. Depending on the final proposed alternative for the NECEE, indirect connections to other evacuation routes such as SR 417, SR 408, Florida’s Turnpike, I-4 and I-95 would be established.

2.2 Purposes of the Proposed Project

The purposes of this proposed new limited-access facility include providing direct system linkage

to existing and proposed regionally-significant transportation networks, promoting overall regional connectivity and evacuation support, enhancing the mobility of the region's growing population and economy, and providing for the incorporation of transit options.

3. Existing Conditions

This section addresses the existing conditions within the study area.

3.1 Existing Road Network

Due to the rural and mostly undeveloped nature of the study area, the existing roadway network has a limited number of roads. The existing roadway evaluation for this study focused on arterial and collector roadways within the study area. The roadways evaluated include East Colonial Drive (SR 50), SR 520, Martin Andersen Beachline Expressway (SR 528), US 192 (SR 500), Deer Park Road (CR 419), Nova Road (CR 532), and Taylor Creek Road. The existing roadway network was evaluated to determine the classifications of each roadway for their functional, access management, and context classifications.

3.1.1 Functional Classification

The existing functional classifications for the existing major roadways within the study area are shown in Table 3.1. Functional classification is the assignment of roadways into systems according to the character of service they provide in relation to the total roadway network. The assignments of the roadways were interpreted from the Straight Line Diagrams for each road (Appendix 2), and the FDOT District 5, 2010 Urban Area Boundary & Federal Functional Classification Maps for Orange and Osceola counties (Appendix 3).

Table 3.1: Existing Roadway Functional Classification

Roadway		Functional Classification
From	To	
E Colonial Dr (SR 50)		
SR 520	Taylor Creek Rd	Rural Principal Arterial - Other
SR 520		
SR 50	Maxim Pkwy	Rural Principal Arterial - Other
Maxim Pkwy	Taylor Creek Rd	Rural Principal Arterial - Other
Taylor Creek Rd	SR 528	Rural Principal Arterial - Other
SR 528	Nova Rd (CR 532)	Rural Principal Arterial - Other
Martin Andersen Beachline Expressway (SR 528)		
Dallas Blvd	SR 520	Rural Principal Arterial - Expressway
US 192 (SR 500)		
Arthur J Gallagher Blvd	Holopaw Rd (SR 15)	Rural Principal Arterial - Other
Holopaw Rd (SR 15)	Deer Park Rd (SR 419)	Rural Principal Arterial - Other
Deer Park Rd (CR 419)		
US 192	Nova Rd (CR 532)	Rural Major Collector
Nova Rd (CR 532)		
US 192	SR 520	Rural Minor Arterial
Taylor Creek Rd		
SR 520	SR 50	Rural Major Collector

3.1.2 Access Classification

The existing access management classifications for the roadways within the study area are shown in Table 3.2. The classifications of the roadways on the State Highway System (SHS) were interpreted from the Straight Line Diagrams provided in Appendix 2, while the classifications of the local government controlled roadways were determined based on the observed use and interpretation from the FDOT Access Management Classification System. The access control classifications system and access management standards are set forth by Chapter 14-97, Florida Administrative Code in accordance with the State Highway System Access Management Act of 1988. There are seven access classes arranged from the most restrictive to the least restrictive class. Within the study area there are only three access classifications for the existing road network. The FDOT Access Management Classification system for the applicable access classes are described below:

- Access Class 1: limited-access facilities, roadways do not provide direct property connections. Access to the road only via interchanges. Interchange spacing is 2 miles for urbanized areas, 3 miles for transitioning areas, and 6 miles for rural areas.
- Access Class 3: controlled access facilities where direct access to abutting land is controlled to maximize the operation of through traffic movement. Spacing for full median opening is 2,640 ft, spacing for directional median opening is 1,320 ft, spacing for connections is 660 ft for more than 45 mph posted speed limit, and 440 ft for 45 mph or lower speed limits.
- Access Class 4: control access facilities roadways where direct access to abutting land is controlled to maximize the operation of through traffic movement. The land adjacent to these roadways is generally not extensively developed and/or the probability of significant lane use change exists.

Table 3.2: Existing Roadway Access Management Classification

Roadway		Access Management Classification
From	To	
E Colonial Dr (SR 50)		
SR 520	Taylor Creek Rd	3
SR 520		
SR 50	Maxim Pkwy	3
Maxim Pkwy	Taylor Creek Rd	3
Taylor Creek Rd	SR 528	3
SR 528	Nova Rd (CR 532)	3
Martin Andersen Beachline Expressway (SR 528)		
Dallas Blvd	SR 520	1
US 192 (SR 500)		
Arthur J Gallagher Blvd	Holopaw Rd (SR 15)	3
Holopaw Rd (SR 15)	Deer Park Rd (CR 419)	3
Deer Park Rd (CR 419)		

Table 3.2: Existing Roadway Access Management Classification (continued)

Roadway		Access Management Classification
From	To	
US 192	Nova Rd (CR 532)	4
Nova Rd (CR 532)		
US 192	SR 520	4
Taylor Creek Rd		
SR 520	SR 50	4

3.1.3 Context Classification

The existing context classifications of the major roadways within the study area are shown in Table 3.3. The context classifications shown do not consider any future developments within the study area. The FDOT context classification system broadly identifies the various built environments existing in Florida. The system describes the general characteristics of the surrounding land use, development patterns, roadway connectivity along a roadway, and the intended uses of the roadway. The context classification system is composed of eight context classifications. The FDOT Context Classification Handbook, August 2017 was used for guidance to determine the context classifications of the roadways within the study area. Only two of the eight context classifications were identified within the study area, which are described below:

- C2-Rural: Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.
- C3R-Suburban Residential: Mostly residential uses within large blocks and a disconnected or sparse roadway network.

Table 3.3: Existing Roadway Context Classification

Roadway		Context Classification
From	To	
E Colonial Dr (SR 50)		
SR 520 (MP 20.000)	Taylor Creek Rd (MP 24.148)	C2
SR 520		
SR 50 (MP 0.000)	Macon Pkwy (MP 1.862)	C2
Macon Pkwy (MP 1.862)	Maxim Pkwy (MP 2.218)	C3R
Maxim Pkwy (MP 2.218)	CR 532 (MP 15.122)	C2
Martin Andersen Beachline Expressway (SR 528)		
MP 23.000	SR 520 (MP 30.320)	C2
US 192 (SR 500)		
Arthur J. Gallagher Blvd (MP 18.446)	Harmony Square Dr (MP 19.022)	C3R
Harmony Square Dr (MP 19.022)	CR 419 (MP 35.839)	C2
Deer Park Rd (CR 419)		
US 192	Nova Rd (CR 532)	C2
Nova Rd (CR 532)		
US 192	SR 520	C2
Taylor Creek Rd		
SR 520	SR 50	C2

3.2 Existing Roadway Characteristics

3.2.1 Typical Sections

The number of lanes and lane widths for the major roadways within the study area are shown in Table 3.4, and the shoulder widths are shown in Table 3.5. The widths for the roadways on the SHS were interpreted from the FDOT Straight Line Diagrams for each roadway (Appendix 2). Local government road widths were determined based on Google Earth aerial views from 2018. The minimum shoulder width required is based on the 2018 FDOT Design Manual, Chapter 210, Table 210.4.1 “Standard Shoulder Widths” (Appendix 4).

Table 3.4: Roadway Laneage

Roadway		Number of Lanes and Width (ft)	Total Lane Width (ft)
From	To		
E Colonial Dr (SR 50)			
SR 520 (MP 20.000)	Taylor Creek Rd (MP 24.148)	4 – 12 ft	48 ft
SR 520*			
MP 0.500	CR 532 (MP 15.122)	4 – 12 ft	48 ft
Martin Andersen Beachline Expressway (SR 528)			
MP 23.000	SR 520 (MP 30.320)	4 – 12 ft	48 ft
US 192 (SR 500)			
Arthur J. Gallagher Blvd (MP 18.446)	CR 419 (MP 35.839)	4 – 12 ft	48 ft
Deer Park Rd (CR 419)			
US 192	Nova Rd (CR 532)	2 – 12 ft	24 ft
Nova Rd (CR 532)			
US 192	SR 520	2 – 12 ft	24 ft
Taylor Creek Rd			
SR 520	SR 50	2 – 12 ft	24 ft

* SR 520 N to SR 50 W ramp from MP 0.000 to MP 0.500

Table 3.5: Shoulder Widths

Roadway		Total Shoulder (ft)		Paved Shoulder (ft)	
From	To	Left	Right	Left	Right
E Colonial Dr (SR 50)					
SR 520 (MP 20.000)	MP 20.082	8 ¹	8 ¹	6	6
MP 20.082	Taylor Creek Rd (MP 24.148)	12	12	4 ²	4 ²
SR 520 (SR 500)					
SR 50 (MP 0.000)	MP 0.113	12	12	4 ²	5
MP 0.113	MP 0.500	10	12	10	5
MP 0.500	SR 528 (MP 8.811)	12	12	5	5
SR 528 (MP 8.811)	MP 8.859	12	10	5	10

Table 3.5: Shoulder Widths (continued)

Roadway		Total Shoulder (ft)		Paved Shoulder (ft)	
		Left	Right	Left	Right
From	To				
MP 8.859	MP 8.963	10	12	10	4 ²
MP 8.963	MP 9.111	12	12	5	5
MP 9.111	MP 9.310	10	10	10	10
MP 9.310	MP 10.190	12	12	5	5
MP 10.190	MP 10.467	10	10	10	10
MP 10.467	CR 532 (MP 15.122)	12	12	5	5
Martin Andersen Beachline Expressway (SR 528)					
MP 23.000	MP 25.311	12	12	10	10
MP 25.311	MP 25.357	12	12	10	12
MP 25.357	MP 25.734	12	12	12	12
MP 25.734	MP 25.766	12	12	12	10
MP 25.766	SR 520 (MP 30.320)	12	12	10	10
US 192 (SR 500)					
Arthur J. Gallagher Blvd (MP 18.446)	MP 18.585	12	12	5	5
MP 18.585	MP 18.867	11	11	8	8
MP 18.867	Holopaw Rd (MP 24.463)	12	12	5	5
Holopaw Rd (MP 24.463)	MP 28.976	12	5 ¹	5	5
MP 28.976	MP 29.222	11	11	8	8
MP 29.222	MP 31.448	12	5 ¹	5	5
MP 31.448	MP 31.488	12	0 ¹	5	0 ²
MP 31.488	MP 33.426	12	12	5	5
MP 33.426	MP 33.427	12	8 ¹	5	3 ²
MP 33.427	MP 33.433	10	8 ¹	5	3 ²
MP 33.433	MP 33.443	10	7 ¹	5	5
MP 33.443	MP 33.446	7 ¹	7 ¹	5	5
MP 33.446	MP 33.483	7 ¹	12	5	5
MP 33.483	CR 419 (MP 35.839)	12	12	5	5

¹ Does not meet minimum 10 ft total shoulder width specified in Table 210.4.1 of the 2018 FDOT Design Manual

² Does not meet minimum 5 ft paved shoulder width specified in Table 210.4.1 of the 2018 FDOT Design Manual

The minimum shoulder width required for Deer Park Rd, Nova Rd, and Taylor Creek Rd is 2 feet according to Table 3-11 of the 2016 FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (Florida Greenbook).

3.2.2 Design and Posted Speed

The design and posted speed for the roadways in the study area are shown in Table 3.6. The posted speed for each road was found on the FDOT Straight Line Diagrams (Appendix 2) and verified using Google Maps street view images from 2016. The design speeds were determined using Table 201.4.1 of the 2018 FDOT Design Manual (Appendix 5) and based on Context Classification.

Table 3.6: Roadway Design and Posted Speed

Roadway		Posted Speed (mph)	Design Speed (mph)
From	To		
E Colonial Dr (SR 50)			
SR 520 (MP 20.000)	MP 20.500	55	65
MP 20.500	Taylor Creek Rd (MP 24.148)	60	65
SR 520			
SR 50 (MP 0.000)	MP 1.830	55	65
MP 1.830	MP 2.418	55 ¹	50
MP 2.418	MP 7.882	65	65
MP 7.882	MP 9.400	55	65
MP 9.400	CR 532 (MP 15.122)	65	65
Martin Andersen Beachline Expressway (SR 528)			
MP 23.000	SR 520 (MP 30.320)	70	70
US 192 (SR 500)			
Arthur J. Gallagher Blvd (MP 18.446)	MP 19.297	55 ¹	50
MP 19.297	MP 24.259	65	65
MP 24.259	MP 24.652	55	65
MP 24.652	CR 419 (MP 35.839)	65	65

¹ Posted speed greater than design speed

3.2.3 Right-of-Way

The total roadway pavement widths and right-of-way widths for the roadways on the SHS within the study area are shown in Table 3.7. The width data were interpreted from the FDOT Straight Line Diagrams (Appendix 2) for the combined mainline and paved shoulder widths and right-of-way maps for the right-of-way widths. Right-of-way maps for the local government roadways were not available.

Table 3.7: Roadway Total and Right-of-Way Widths

Roadway		Total Roadway Width (ft)	R/W Width (ft)
From	To		
E Colonial Dr (SR 50)			
SR 520 (MP 20.000)	MP 20.082	60	200
MP 20.082	MP 20.470	56	200
MP 20.470	Taylor Creek Rd (MP 24.148)	60	200
SR 520			
SR 50 (MP 0.000)	MP 0.500	24 (WB Ramp)	N/A
MP 0.500	MP 0.605	62	226
MP 0.605	MP 2.218	62	223
MP 2.218	MP 7.750	62	239

Table 3.7: Roadway Total and Right-of-Way Widths (continued)

Roadway		Total Roadway Width (ft)	R/W Width (ft)
From	To		
MP 7.750	MP 8.048	62	223
MP 8.048	MP 8.107	65	223
MP 8.107	MP 8.149	68	223
MP 8.149	MP 8.200	65	223
MP 8.200	MP 8.811	62	223
MP 8.811	MP 8.918	71	200
MP 8.918	MP 8.963	66	200
MP 8.963	MP 9.111	62	200
MP 9.111	MP 9.310	72	200
MP 9.310	MP 10.190	62	200
MP 10.190	MP 10.467	72	200
MP 10.467	CR 532 (MP 15.122)	62	200
Martin Andersen Beachline Expressway (SR 528)			
MP 23.000	MP 25.311	76	300
MP 25.311	MP 25.357	78	300
MP 25.357	MP 25.734	80	300
MP 25.734	MP 25.766	78	300
MP 25.766	SR 520 (MP 30.320)	76	300
US 192 (SR 500)			
Arthur J. Gallagher Blvd (MP 18.446)	MP 18.585	62	200
MP 18.585	MP 18.867	68	200
MP 18.867	MP 28.976	62	200
MP 28.976	MP 29.222	68	200
MP 29.222	MP 31.448	62	200
MP 31.448	MP 31.488	62	200
MP 31.488	MP 33.426	62	232
MP 33.426	MP 33.433	60	200
MP 33.433	CR 419 (MP 35.839)	62	200

3.2.4 Border Width

The border width for the roadways within the study area are shown in Table 3.8. The width data were interpreted from the FDOT Straight Line Diagrams (Appendix 2) and right-of-way maps for the respective roadways. The minimum border width required is based on the 2018 FDOT Design Manual, Chapter 210, Table 210.7.1 “Minimum Border Widths” (Appendix 7).

Table 3.8: Border Widths

Roadway		Border width (ft)
From	To	
E Colonial Dr (SR 50)		
SR 520 (MP 20.000)	MP 20.082	58.5
MP 20.082	MP 20.687	50.5
MP 20.687	Taylor Creek Rd (MP 24.148)	40
SR 520		
MP 0.605	MP 2.218	50.5
MP 2.218	MP 7.750	58.5
MP 7.750	MP 8.811	50.5
MP 8.811	MP 8.859	42.5
MP 8.859	MP 8.693	43
MP 8.693	MP 9.111	39
MP 9.111	MP 9.310	46
MP 9.310	MP 10.190	39
MP 10.190	MP 10.467	46
MP 10.467	CR 532 (MP 15.122)	39
Martin Andersen Beachline Expressway (SR 528)		
MP 23.000	MP 24.891	83
MP 24.891	MP 25.311	79
MP 25.311	MP 25.357	84
MP 25.357	MP 25.734	89
MP 25.734	MP 25.766	84
MP 25.766	MP 26.238	79
MP 26.238	SR 520 (MP 30.320)	83
US 192 (SR 500)		
Arthur J. Gallagher Blvd (MP 18.446)	MP 18.585	39
MP 18.585	MP 18.867	45
MP 18.867	MP 24.463	39
MP 24.463	MP 28.976	42.5
MP 28.976	MP 29.222	45
MP 29.222	MP 31.448	42.5
MP 31.448	MP 31.488	47.5
MP 31.488	MP 33.426	55
MP 33.426	MP 33.427	43.5
MP 33.427	MP 33.433	47
MP 33.433	MP 33.443	47.5
MP 33.443	MP 33.446	49
MP 33.446	MP 33.483	44
MP 33.484	CR 419 (MP 35.839)	39

3.2.5 Pavement Conditions

The pavement conditions for the existing roadways within the study area are shown in Table 3.9. The pavement condition data were obtained from the Florida Department of Transportation “All System Pavement Condition Forecast” for Orange and Osceola County in August 2018 (Appendix 6).

Table 3.9: Roadway Pavement Conditions

Roadway		Surface Type	Year	Cracking		Ride	
From	To			Left	Right	Left	Right
E Colonial Dr (SR 50)							
MP 20.000	MP 24.148	FC5	2018	7.5	7.5	8.1	8.2
SR 520							
SR 50 (MP 0.000)	MP 0.409	OGFC	2018	9.0	9.0	7.4	7.8
MP 0.409	MP 8.231	FC5	2018	6.5	4.5 ¹	8.0	7.7
MP 8.231	MP 16.072	FC5	2018	7.5	6.5	8.0	8.0
Martin Andersen Beachline Expressway (SR 528)							
MP 23.000	MP 24.815	OGFC	2018	9.0	9.0	8.3	8.4
MP 24.815	MP 26.290	OGFC	2018	9.0	9.0	7.6	7.7
MP 26.290	MP 29.825	OGFC	2018	9.0	9.0	8.5	8.4
MP 29.825	MP 30.300	OGFC	2018	9.0	7.0	7.8	7.6
US 192 (SR 500)							
MP 18.446	MP 19.298	FC5	2018	6.5	5.5 ¹	7.5	6.8
MP 19.298	MP 31.600	FC125/FC5M	2018	9.5	9.5	8.2	8.2
MP 31.600	MP 35.839	FC5	2018	9.0	9.0	8.0	8.0

¹ Became deficient in 2017

3.2.6 Horizontal Alignment

The horizontal alignments for the major roadways within the study area are shown in Table 3.10. The curve data were interpreted from the FDOT Straight Line Diagrams (Appendix 2) for the respective roadways on the SHS. Horizontal data was not available for the local government roadways. The minimum curve length is established based on the 2018 FDOT Design Manual, Chapter 210, Table 210.8.1 “Length of Horizontal Curve” (Appendix 8).

Table 3.10: Roadway Horizontal Alignment

Roadway					
PC (MP)	PI (MP)	PT (MP)	Δ	D	LC (ft)
E Colonial Dr (SR 50) – MP 20.000 to 24.148					
22.129	22.246	22.370	6°21'30.00"	0°30'00.00"	1272
22.668	22.776	22.873	11°13'10.00"	1°00'00.00"	1082
23.749	23.798	23.830	4°22'30.00"	1°00'00.00"	428 ¹
SR 520 – MP 0.000 to 16.072					
0.000	0.019	0.111	19°44'15.00"	2°00'00.00"	586 ¹

Table 3.10: Roadway Horizontal Alignment (continued)

Roadway					
PC (MP)	PI (MP)	PT (MP)	Δ	D	LC (ft)
0.000	0.314	0.625	11°01'30.00"	0°20'00.00"	3300
0.474	0.568	0.661	19°44'15.00"	2°00'00.00"	987
1.855	1.016	2.169	4°00'00.00"	0°15'00.00"	1658
4.162	4.272	4.374	11°37'00.00"	1°00'00.00"	1119
5.545	5.658	5.771	11°52'00.00"	1°00'00.00"	1193
7.463	7.561	7.659	10°17'00.00"	1°00'00.00"	1035
8.607	8.629	8.724	6°30'00.18"	0°39'00.59"	618 ¹
8.724	5.851	8.977	13°26'00.26"	0°59'26.00"	1336
9.053	9.105	9.153	1°56'00.26"	0°20'00.00"	528 ¹
11.047	11.177	11.295	13°26'00.59"	1°00'00.00"	1309
13.224	13.620	14.007	41°21'00.20"	1°00'00.00"	4134
US 192 (SR 500) – MP 18.446 to 35.839					
19.431	19.752	20.055	33°09'38.00"	1°00'00.00"	3295
20.452	20.665	20.872	22°24'52.00"	1°00'00.00"	2218
22.430	22.714	22.996	15°03'35.00"	0°30'00.00"	2988
23.446	23.771	24.060	31°35'28.0"	1°00'00.00"	3242
24.100	24.218	24.336	6°16'24.00"	0°30'00.00"	1246
24.566	24.646	25.115	5°14'37.00"	0°29'00.00"	2899
28.164	28.391	28.618	5°00'14.00"	2°15'03.00"	2397
30.115	30.286	30.457	4°30'05.00"	2°14'57.00"	1806
30.501	30.589	30.676	2°09'47.00"	0°14'00.00"	924 ¹
33.574	33.730	33.885	16°25'51.00"	1°00'00.00"	1642
35.657	35.781	35.904	3°15'27.00"	0°15'00.00"	1304

¹ Does not meet minimum length of curve specified in Table 210.8.1 of the 2018 FDOT Design Manual

3.2.7 Vertical Alignment

For this level of study, no topographic survey is readily available to assess the existing vertical alignment geometry. However, the existing vertical alignments of the roadways within the study area appear to be in relative conformance with accepted standards.

3.2.8 Structures

The structures present on the SHS roadways within the study area are shown in Table 3.11. The structures data were interpreted from the FDOT Straight Line Diagrams (Appendix 2) for the respective roadways.

Table 3.11: Existing Roadway Structures

Roadway		Structure Type
From	To	
E Colonial Dr (SR 50)		
MP 20.039	MP 20.045	Underpass
SR 520		

Table 3.11: Existing Roadway Structures (continued)

Roadway		Structure Type
From	To	
MP 0.322	MP 0.368	Underpass
MP 8.145	MP 8.153	Box Culvert
MP 8.878	MP 8.886	Underpass
MP 8.895	MP 8.906	Underpass
MP 9.222	MP 9.251	Bridge
MP 10.274	MP 10.317	Bridge
MP 14.684	MP 14.695	Box Culvert
Martin Andersen Beachline Expressway (SR 528)		
MP 23.281	MP 23.296	Bridge
MP 27.442	MP 27.437	Bridge
MP 30.042	MP 30.053	Box Culvert
US 192 (SR 500)		
MP 21.300	MP 21.304	Box Culvert
MP 29.100	MP 29.130	Bridge
MP 30.093	MP 30.097	Box Culvert
MP 33.395	MP 33.422	Bridge

3.2.9 Identification of Controlling Design Elements

The controlling design elements for high speed roadways (design speed \geq 50 mph) were studied for the existing roadways within the study area. Design elements that are below the FDOT and AASHTO’s criteria will require design exceptions.

- Design Speed: all major existing roadways within the study area conform to the minimum criteria.
- Lane width: all major existing roadways within the study area conform to the minimum criteria.
- Shoulder width: roadways below the minimum design criteria are identified in Table 3.5.
- Horizontal curve radius: roadways below the minimum design criteria are identified in Table 3.10.

3.3 Geotechnical Data

The geography and current land uses in the study area vary from pine flatwoods to cypress swamps, and cattle pastureland to stands of ancient oak trees. The key geotechnical issue will be identifying the potential for deep, highly compressible, organic soils (**bold in list below**) that could impact the expressway alignment and cost. Further, shallow groundwater levels will be a major factor in determining expressway grades, stormwater pond sizes and construction cost estimates.

The Natural Resources Conservation Service (NRCS) Soil Surveys for Orange and Osceola and counties indicate predominant soil types within the study area include:

Orange County Soils

- Arents, nearly level
- Basinger fine sand, frequently ponded, 0 to 1 percent slopes
- Felda fine sand, 0 to 2 percent slopes
- Felda fine sand, 0 to 2 percent slopes, occasionally flooded
- Felda fine sand, 0 to 2 percent slopes, frequently flooded
- Floridana fine sand, 0 to 2 percent slopes, frequently flooded
- **Floridana mucky fine sand**, frequently ponded, 0 to 1 percent slopes
- Immokalee fine sand
- Malabar fine sand
- Ona fine sand, 0 to 2 percent slopes
- Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes
- Pinellas fine sand, 0 to 2 percent slopes
- Pits
- Pomello fine sand, 0 to 5 percent slopes
- **Samsula muck**, frequently ponded, 0 to 1 percent slopes
- Samsula-Hontoon-Basinger association, depressional
- **Sanibel muck**
- Seffner fine sand, 0 to 2 percent slopes
- Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes
- Zolfo fine sand, 0 to 2 percent slopes

Osceola County Soils

- Adamsville sand, 0 to 2 percent slopes
- Arents, 0 to 5 percent slopes
- Basinger fine sand, 0 to 2 percent slopes
- Basinger fine sand, depressional, 0 to 1 percent slopes
- Cassia fine sand, 0 to 2 percent slopes
- Delray loamy fine sand, depressional
- Floridana fine sand, frequently ponded, 0 to 1 percent slopes
- **Hontoon muck**, frequently ponded, 0 to 1 percent slopes
- Immokalee fine sand, 0 to 2 percent slopes
- **Kaliga muck**, frequently ponded, 0 to 1 percent slopes
- Malabar fine sand, 0 to 2 percent slopes

- Malabar fine sand, frequently ponded, 0 to 1 percent slopes
- Malabar-Pineda complex
- Myakka fine sand, 0 to 2 percent slopes
- **Nittaw** muck
- Ona fine sand, 0 to 2 percent slopes
- Pits
- Placid fine sand, frequently ponded, 0 to 1 percent slopes
- Placid variant fine sand
- Pomello fine sand, 0 to 5 percent slopes
- Pompano fine sand, 0 to 2 percent slopes
- Pompano fine sand, frequently ponded, 0 to 1 percent slopes
- Riviera fine sand, 0 to 2 percent slopes
- Riviera fine sand, frequently ponded, 0 to 1 percent slopes
- **Samsula muck**, frequently ponded, 0 to 1 percent slopes
- Smyrna fine sand, 0 to 2 percent slopes
- Tavares fine sand, 0 to 5 percent slopes
- Wauchula fine sand
- Placid-Riviera-Samsula complex, frequently flooded

3.3.1 Sand and Groundwater

The NRCS Soil Survey map predominantly depicts soils made up of fine sand (A-3) to silty fine sand (A-2-4) with shallow groundwater levels. These materials are generally suitable for roadway construction and are classified by FDOT as Select material. However, the sands are poorly drained and sensitive to moisture compact during compaction efforts. The seasonal high water table (SHWT) is typically within 3 feet of the natural ground surface. Sands with shallow groundwater are highlighted in blue on the NRCS Study Area Map on Figure 3.1. As shown on Figure 3.1, almost the entire study area is characterized by shallow groundwater levels. Sands with deeper groundwater are highlighted in yellow on Figure 3.1.

3.3.2 Muck and Water Features

The NRCS Soil Survey also depicts Hontoon, Kaliga, Samsula, Nittaw, and Sanibel muck, predominantly in wetlands along the study area perimeter. Muck soils are highlighted in green on Figure 3.1 and consist of highly decomposed organic material to a depth of more than 65 inches. Muck is classified as A-8 in the AASHTO system and has severe limitations for roadway construction. It is generally unsuitable for embankment support and typically requires removal and replacement with engineered fill. The NRCS soil survey predicts the seasonal high groundwater levels for these soil types to be from 2.0 feet above ground surface to natural ground surface. Water features, highlighted in purple on Figure 3.1, can also contain muck deposits that are not identified on the NRCS maps.

3.3.3 Relic Sinkholes

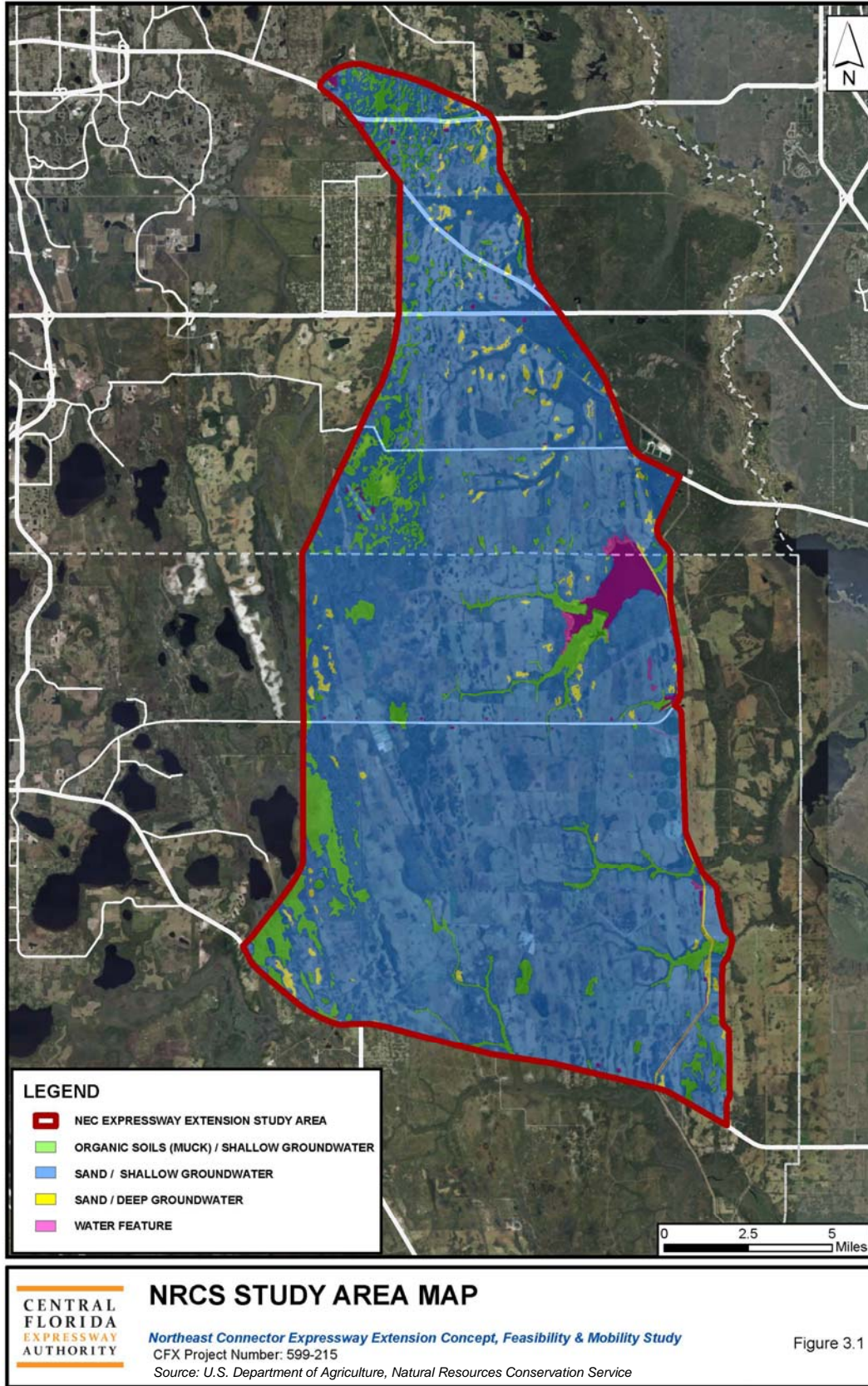
The critical geologic hazard to roadway development in the study area is the presence of relic sinkholes within the wetland and water features that can contain muck to depths greater than 100

feet. Avoidance of these relic sinkholes is the most effective way to reduce project risk. If avoidance is impractical, the muck would have to be mitigated during construction by its removal or improvement, or a combination thereof. When alignment alternatives are available, the geologic risk for each alternative will be assessed based on the extent each alternative coincides with wetlands and water features that could contain relic sinkholes.

3.3.4 Subsurface Drainage

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

Figure 3.1: NRCS Study Area Map



3.4 Water Resources

3.4.1 Surface Water

The Federal Water Pollution Control Act, as amended by the Clean Water Act (CWA, 33 United States Code 1251), provides the authority to establish water control standards, control discharges into surface waters and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and for dredging and or filling in surface waters. Section 303 of the CWA requires states to establish water quality standards for waters within their boundaries that are subject to CWA jurisdiction. Florida is authorized to administer its CWA program and has U.S. Environmental Protection Agency (EPA)-approved water quality standards, which are contained in Florida Administrative Code (FAC) Chapter 62-302. Section 303(d) of the CWA requires states to develop a list of waters not meeting water quality standards or not supporting their designated use classifications. Section 303(d) of the CWA and Florida Statutes Section 403.067 define impaired waters as those not meeting applicable water quality standards, which include:

- Designated uses;
- Water quality criteria;
- The Florida antidegradation policy; and
- Moderating provisions.

In 2001, the Florida Department of Environmental Protection (FDEP) adopted the “Impaired Waters Rule” for the purpose of interpreting existing water quality criteria and evaluating attainment of established designated uses. FAC Chapter 62-303 establishes the methodology used to identify state surface waters that will be included in the state’s planning list of waters that will be assessed. Chapter 62-303 also identifies impaired waters based on representative data that are included on the state’s verified list of impaired waters. The FDEP calculates the Total Maximum Daily Loads (TMDLs) for identified state impaired waters, pursuant to Florida Statutes subsection 403.067(4). Additionally, the list of impaired waters is submitted to the EPA as mandated by Section 303(d)(1) of the CWA. Once a TMDL is established for a basin, it is removed from the impaired waters list and the process of developing a Basin Management Action Plan (BMAP) to improve surface water quality within the basin commences. The BMAP involves coordination with state agencies, county and local governments, private and non-governmental organizations, and other stakeholders within the basin to identify projects and assist with the development of regulations that will improve the water quality.

Water quality indicator data (e.g., TMDL, adopted BMAPs, number of impaired water bodies, etc.) were evaluated for the study area and are summarized in Table 3.12. The study area contains five impaired water bodies, eight TMDL parameters of concern, and three approved BMAPs.

Table 3.12: Summary of Impaired Waters Within the Project Study Area

Basin Name	FDEP Group	Water Body Identification Number (WBID)	Impaired Water Body	TMDL Parameter(s)	Approved BMAP
Jim Creek	3	3042	Yes	Fecal Coliform	No
Lake Winder	3	2893Y1	Yes	Iron	No
Econlockhatchee River	2	2991	Yes	Fecal Coliform	No
St. John River Above Puzzle Lake	3	2893I	Yes	Ag, DO, TP, BOD, TN	Yes
St. John River Above Puzzle Lake (South Segment)*	3	28935	Yes	Fecal Coliform and Ag	No
Long Branch	2	3030	Not Listed	Fecal and DO	Yes
Wolf Creek	3	3075	Not Listed	TP, BOD, Total TN	No
Crabgrass Creek	3	3073	Not Listed	TP, BOD, TN	No
Jane Green Creek	3	3084	Not Listed	TP, BOD, TN	No
Lake Okeechobee	1	3212A, 3212B, 3212C, 3212D, 3212E, 3212F, 3212G, 3212H, 3212I	Not Listed	TP	Yes

Source:
 2018 FDEP Website:
 Basin Management Action Plan (BMAP) <https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps>
 Total Maximum Daily Loads (TMDL) <https://floridadep.gov/dear/water-quality-evaluation-tmdl/content/total-maximum-daily-loads-tmdl-program>
 TMDL Parameters:
 Ag – Silver, BOD – Biological Oxygen Demand, DO – Dissolved Oxygen, TP – Total Phosphorus, TN – Total Nitrogen,
 * St. John River Above Puzzle Lake (South Segment) is south of SR 50

3.4.2 Existing Drainage

The study area is mostly undeveloped and is primarily located in the central region of the Upper St. Johns River Watershed. Ninety-one percent (91%) of the study area falls within the St. Johns River Water Management District (SJRWMD), and the remaining 9% of the study area falls within the South Florida Water Management District (SFWMD). The region has a relatively flat topography and a high surface water table. The area is characterized by gently rolling hills, agricultural lowlands, and forested and herbaceous wetlands.

Most of the land drains naturally into a series of creeks that flow eastward towards the St. Johns River. Drainage is augmented in some areas with ditching that interconnects a mosaic of natural depressions and sloughs. Several large swamps are present on the western side of the study area including Jug Creek, Cat Island, John H. Bay, Islet Pond, and Bee Tree. The existing Taylor Creek

Reservoir and proposed Pennywash/Wolf Creek Reservoir are envisioned to provide water supply to the North Ranch Planning Area during and after development. The Taylor Creek Reservoir is an area consisting of 7,104 acres (approximately 3,191 acres of wetlands and 3,913 acres of surface water). The proposed Pennywash/Wolf Creek Reservoir is 5,548 acres (approximately 3,838 acres of uplands, 1,632 acres of wetlands and 78 acres of surface water). The major creeks, reservoirs, and water bodies are labeled on Figure 3.4.

The study area is split between the Orange County and Osceola County jurisdiction for floodplain impacts as well as SJRWMD, SFWMD, and FDOT District 5 jurisdictions for stormwater management. According to the FDEP, there is currently no BMAP for the majority of the study area. A small section in the southwest corner falls within the Lake Okeechobee BMAP and a small section in the northwest corner is located within the Long Branch BMAP. The SFWMD will require the regulation of total phosphorus (TP) discharge for Lake Okeechobee and SJRWMD will require the regulation of the fecal and dissolved oxygen (DO) for Long Branch. Additional protective measures, such as pollutant loading analysis and additional 50% water quality treatment volume will be reviewed to comply with Lake Okeechobee and Long Branch BMAP criteria.

3.4.3 Floodplains

The 2009 (Orange County) and 2013 (Osceola County) Federal Emergency Management Agency (FEMA) flood maps identify the general location of the 100-year floodplains within the study area with primarily Zone A and a small segment of Zone AE. Approximately 75,800 acres (or 45%) of the 169,700-acre study area is classified as a Zone A or Zone AE FEMA floodplain. The Zone AE designations have established Base Flood Elevations (BFEs) and are limited to the upper reach of the Econlockhatchee River Swamp. The Zone A designations do not have established BFEs and are typically located in the tributaries and wetlands.

There are three United States Geological Survey (USGS) monitoring stations within the study area that provide daily stage data. This data can be used to check the expected stages for 10-year, 50-year, 100-year, and 500-year storms. Figure 3.2 shows the location of the FEMA flood zones and surface water monitoring stations within the study area.

Figure 3.2: Drainage/Floodplain Evaluation Map

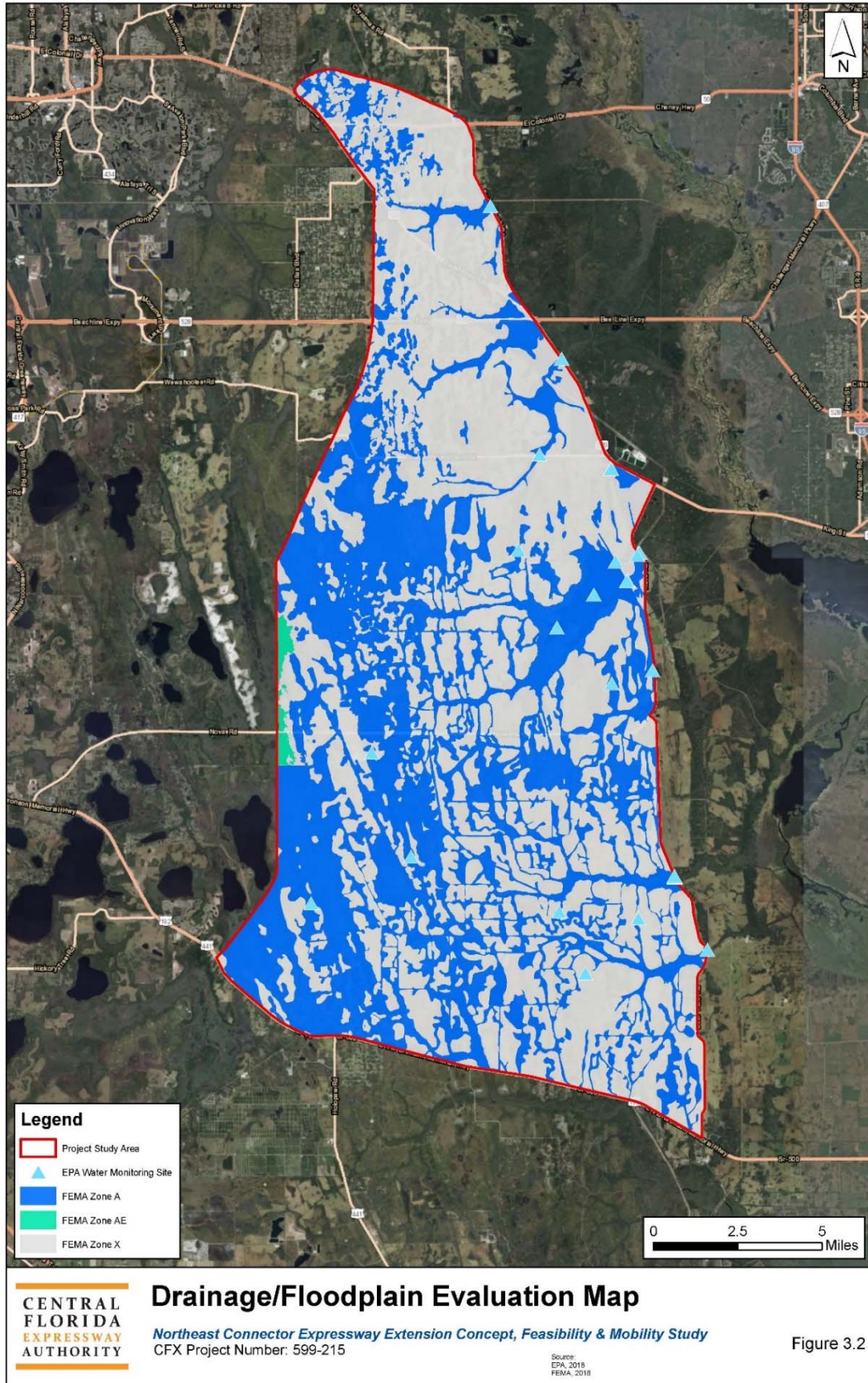


Figure 3.2

3.4.4 Groundwater

In east Orange and Osceola counties, groundwater is the primary water supply source for commercial and residential development in the region. Groundwater within the study area comes from three aquifer systems: the surficial aquifer, intermediate aquifer, and the Floridan aquifer, which are discussed below.

- The surficial aquifer is composed of sand, silt, clay, and shell that are unconfined. It is directly replenished by rainfall percolation from surface water bodies and is limited by seasonal fluctuations of the water table. Typically, water from the surficial aquifer is used for live-stock and domestic purposes that do not require large volumes of water.
- The intermediate aquifer consists of the unconsolidated sand, silt, clay and shell and consolidated beds of shell, limestone, and dolomite. The Hawthorne Formation comprises most of the thickness within the study area that separates the three aquifers. The immediate aquifer is recharged by the surficial aquifer and discharges into the Floridan aquifer when the water table is low. In many areas, the intermediate and Floridan aquifers are separated by thin layers and in some cases directly intermingle. The immediate aquifer is used for individual residential, commercial, and agricultural areas that need large water volumes for potable use, landscaping, manufacturing, crops and live-stock.
- The Floridan aquifer consists of interbedded limestone, dolomite, and dolomitic limestone in which the amount of primary and secondary porosity is highly variable. This system is the deepest of the aquifer systems and recharge for this aquifer is almost exclusively from downward seepage from the surficial aquifer system. The Floridan aquifer is the main water supply for municipalities in the region. For example, the City of Cocoa Beach has groundwater wells located on the north side of Cocoa Water Plant Road that draws from the Floridan aquifer.

The SJRWMD Upper Florida Aquifer Groundwater Recharge (2015) Geographic Information Systems (GIS) data indicates that most of the study area is located within a low recharge area with a rate of 1 to 5 inches per year (Figure 3.3). The northern portion of the study area is located within a medium recharge area with a rate 5 to 10 inches per year and groundwater from the eastern boundary discharges directly into surface waters, such as the St. Johns River and its tributaries. However, groundwater in the southwestern portion of the study area recharges at a rate of 10 to 15 inches a year (SFWMD Excess Precipitation – Florida, Biscayne and Surficial Aquifers GIS data).

Figure 3.3: Floridan Aquifer Recharge Rates

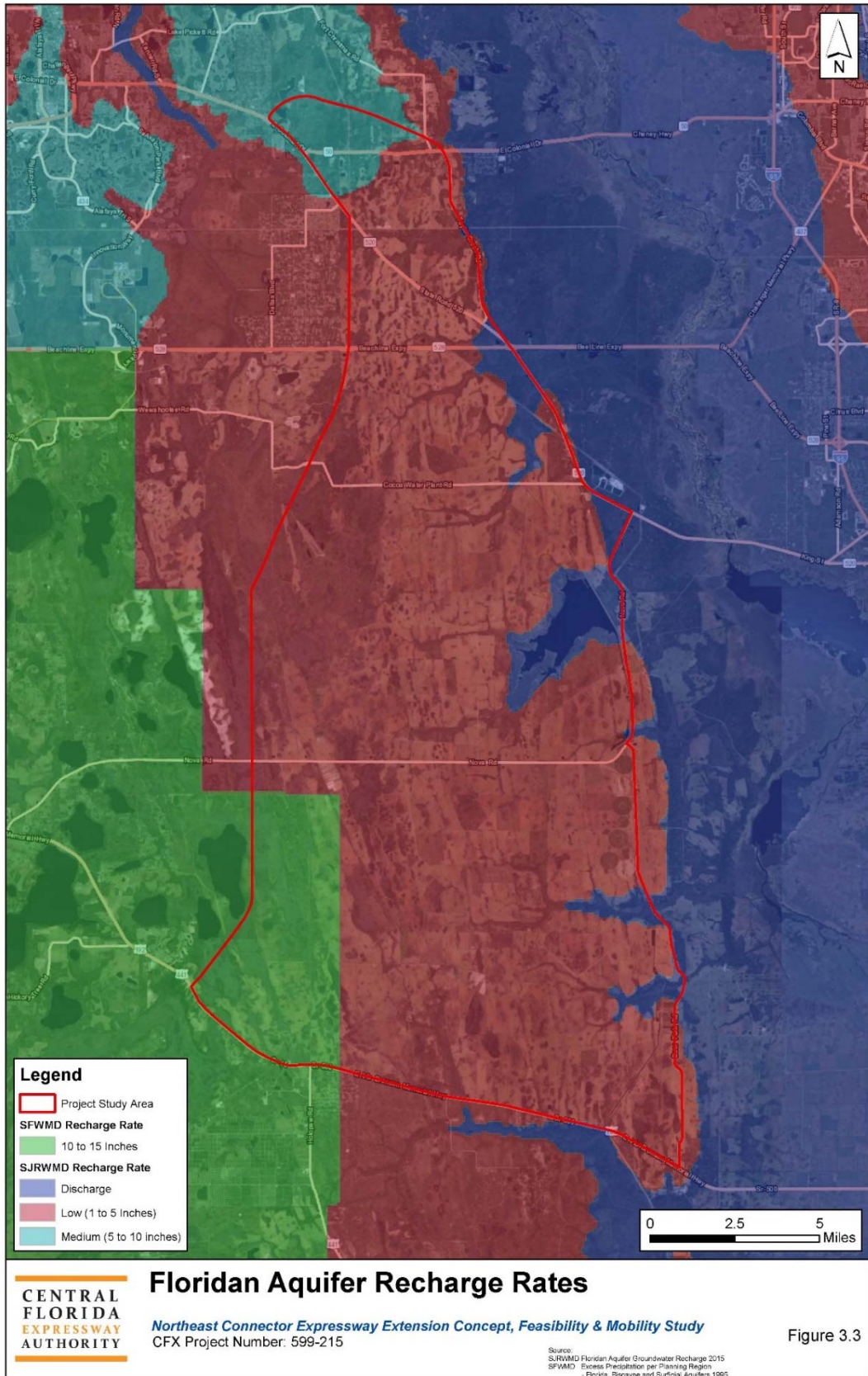


Figure 3.3

3.4.5 Sinkholes

In 1985, the US Geological Survey (USGS) and FDEP developed the “Sinkhole Type, Development, and Distribution in Florida” map, which identifies four Area classifications that have sinkhole formation potential and describes three types of sinkholes based on the geological formation and position of the aquifers in Florida. These sinkhole Area classifications are described below:

- Area 1 –Sinkholes are few, generally shallow and broad, develop gradually. Solution sinkholes dominate (usually fill in with water and become small ponds and lakes).
- Area 2 – Consist mainly of incohesive and permeable sand. Sinkholes are few, shallow, small in diameter, and develop gradually. Cover-subsidence sinkholes dominate.
- Area 3 – Consist of cohesive clayey sediments of low permeability. Sinkholes are numerous, varying size, and develop abruptly. Cover-collapse sinkholes dominate.
- Area 4 – Consist of cohesive sediments interlayered with discontinuous carbonate beds. Sinkholes are very few, but are large in diameter and deep. Cover-collapse sinkholes dominate.

According to the FDEP Florida Sinkhole Type and Subsidence Incident Report data, the entire study area is located within Area 2 (sinkholes few, shallow, and develop gradually). When considering the subsidence and sinkhole formation data, the likelihood of sinkhole subsidence development within the study area is low. Figure 3.4 depicts the location of the subsidence incidents and sinkhole type within the project study area.

Figure 3.4: Sinkhole Area and Subsidence Reports

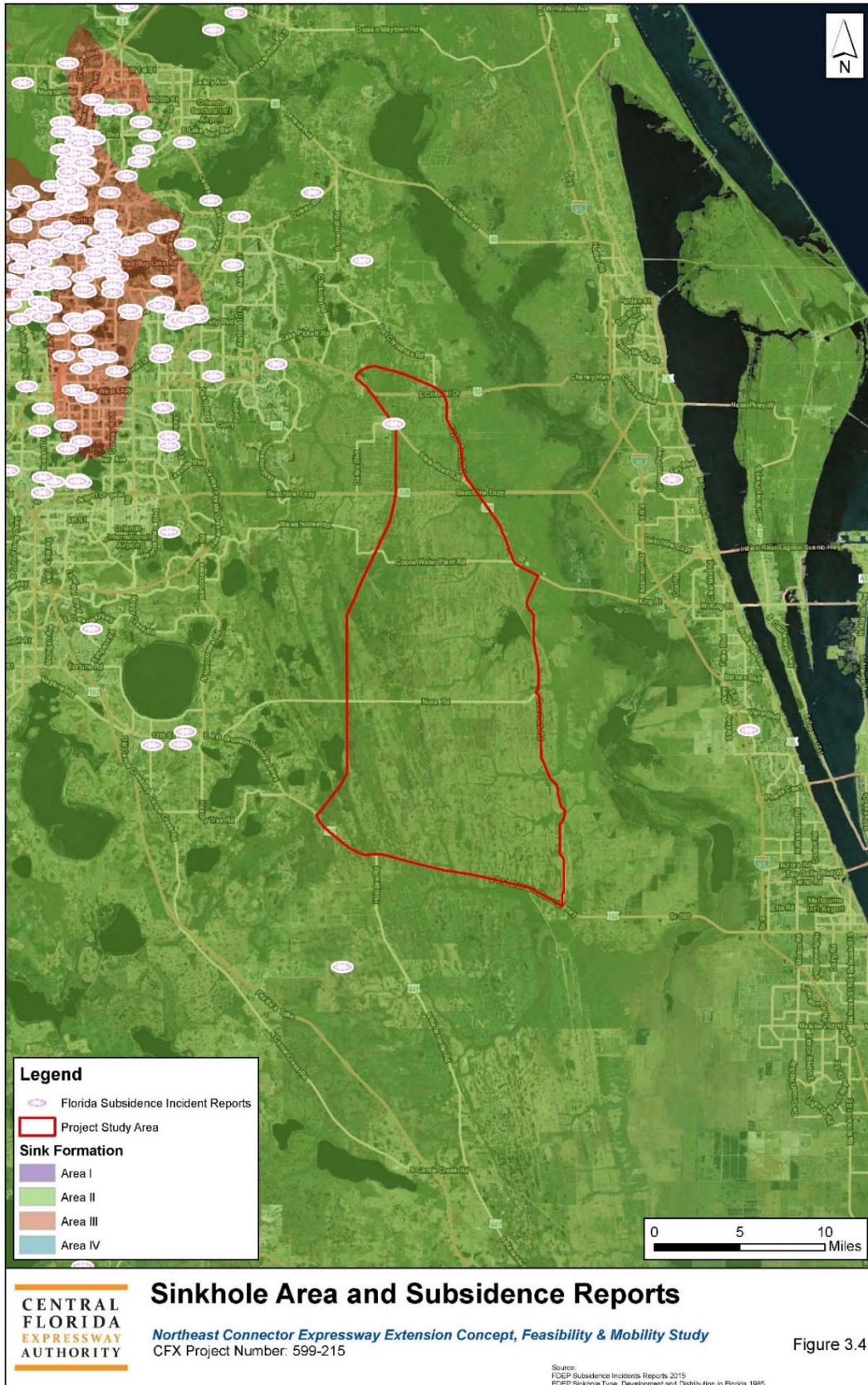


Figure 3.4

3.5 Natural Environment

3.5.1 Wetlands

Activities in, on or over Waters of the United States (WOTUS), including wetlands, are regulated at the state and federal level. Executive Order 11990, Protection of Wetlands, mandates that all federal agencies take action to minimize the destruction, loss, or degradation of wetlands, and preserve or enhance their natural value. The USACE has jurisdictional authority over activities in WOTUS under the CWA of 1972, as amended. In addition, Florida Statue 373.016 requires the preservation of natural resources, such as wetlands and other surface waters, for fish and wildlife. If activities in, on or over wetlands or surface waters cannot be avoided by an activity, it is subject to the conditions set forth in FAC 62-330. The USACE, SJRWMD, and SFWMD have jurisdictional authority over wetlands and surface waters within the study area.

A preliminary assessment of wetlands and surface waters was conducted within the study area utilizing the 2014 SJRWMD Florida Land Use, Cover, and Forms, Classification System (FLUCFCS), 2014 SFWMD FLUCFCS, and 2013 Osceola County National Wetland Inventory (NWI) GIS datasets. The study area contains large forested wetlands systems, composed of cypress (*Taxodium* sp.) and other hardwoods, such as bays, gums, and maples. Smaller wetland systems are composed of herbaceous communities of submerged and emergent wetland plants. Based on a review of recent and historical aerial photography, these forested and herbaceous systems are potentially hydrologically connected during the wet season and, therefore, fall under the jurisdiction of the SJRWMD, SFWMD, and USACE. Qualitative field reviews were not conducted within the study area; however, based on aerial interpretation, it is anticipated that these wetlands are medium to high quality due to the large intact wetland systems that are hydrologically connected throughout and the undeveloped characteristics of the study area. A map depicting the SJRWMD and SFWMD wetland land use types within the study area is presented on Figure 3.5. Figure 3.6 depicts the areas mapped as wetlands according to the NWI data.

3.5.2 Soil Classifications

Multiple upland and wetland soil types occur within the study area based on 2017 Natural Resources Conservation Service (NRCS) soils GIS data. For the purpose of this study, soil data was used to assist with the determination of wetland and upland areas and to identify soils that are protected under Farmland Project Policy Act (FPPA) of 1981. Figure 3.7 depicts the NRCS hydric soil types within the study area. The following section discusses the prime and unique farmlands.

Figure 3.5: SFWMD and SJRWMD Wetlands and Surface Waters

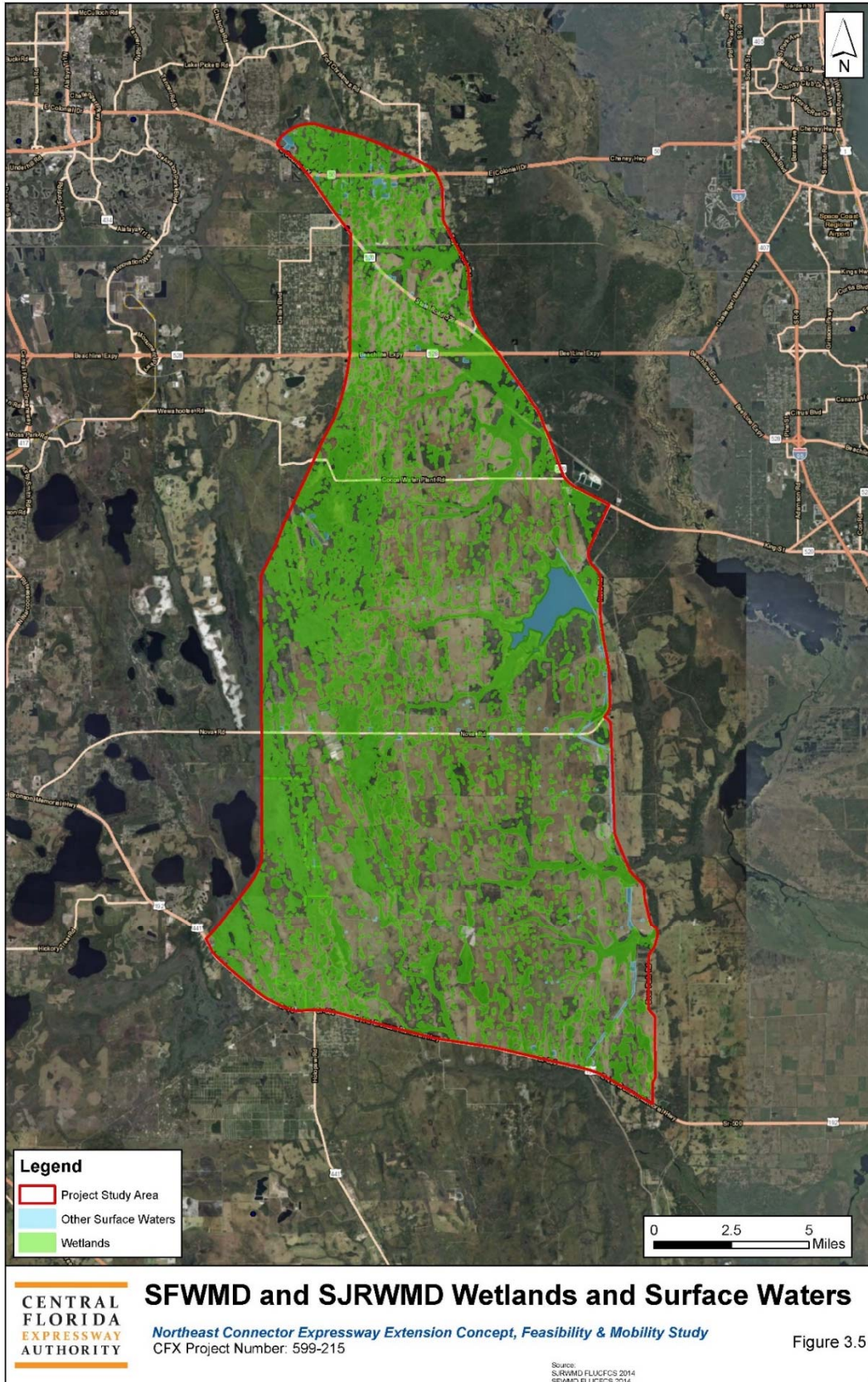


Figure 3.6: USFWS National Wetland Inventory

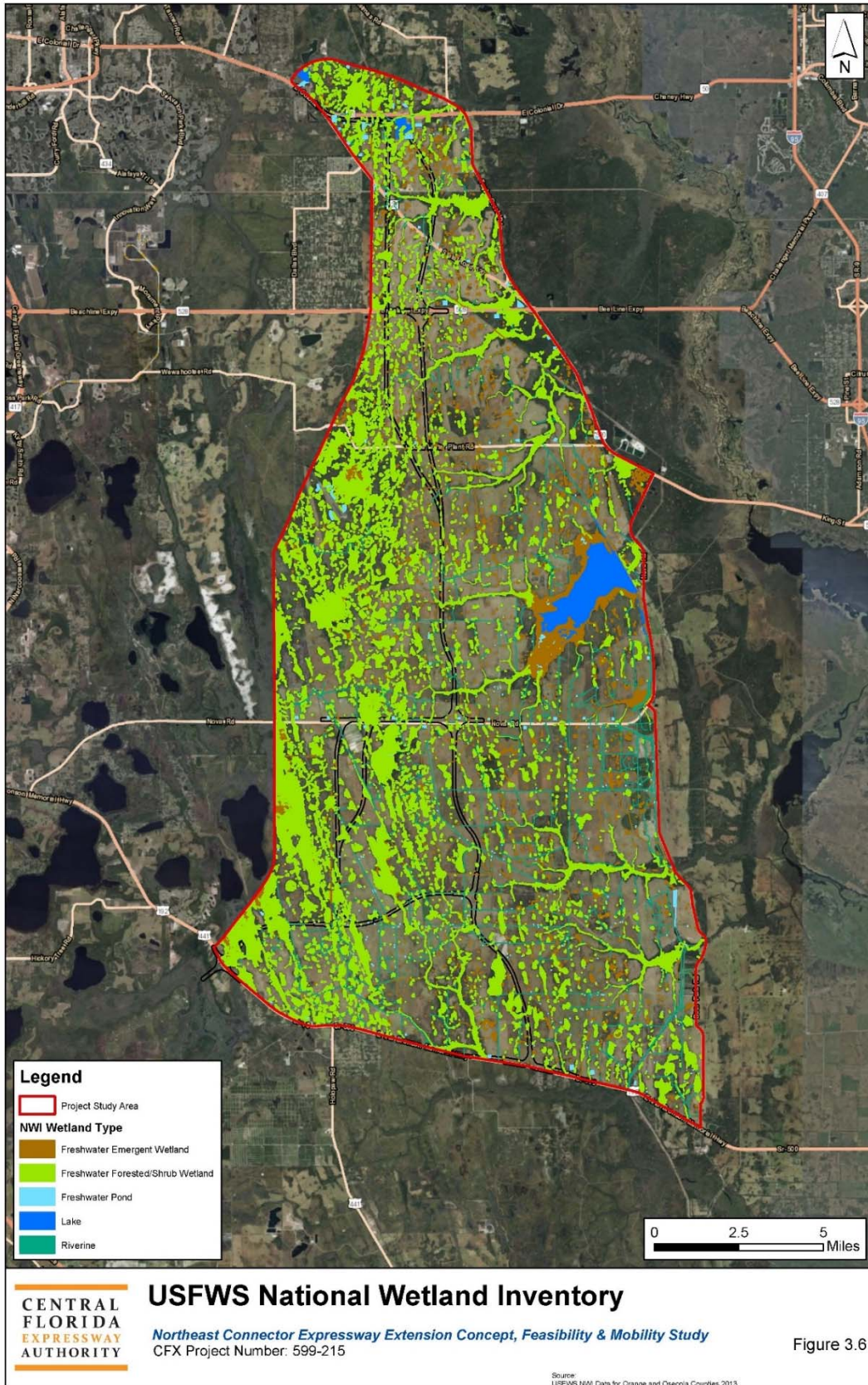


Figure 3.6

Figure 3.7: NRCS Hydric Soils

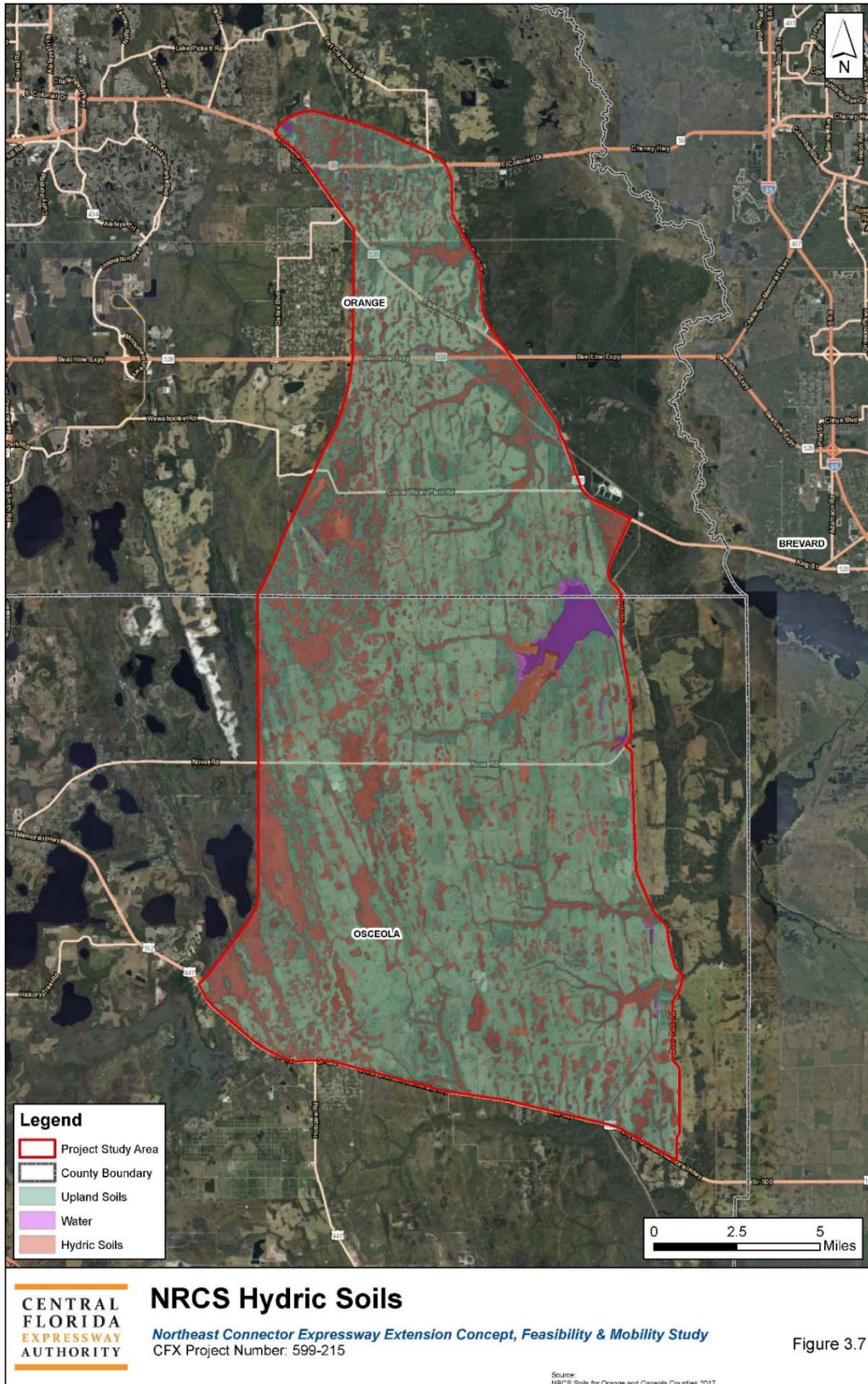


Figure 3.7

3.5.3 Farmlands

In 1981, the U.S. Congress passed the Agriculture and Food Act containing the FPPA and the final regulation was promulgated in 1994. The FPPA gave the NRCS jurisdiction over farmlands and requires consultation for projects that are federally funded and will convert farmland to permanent non-agricultural uses. The consultation with NRCS determines whether the farmland is classified as “prime” or “unique.” If an area is considered prime or unique the FPPA requires a complete site assessment based on length of time farmed, evaluation of surrounding farmland, level of local farm support services, and the level of urban land in the area.

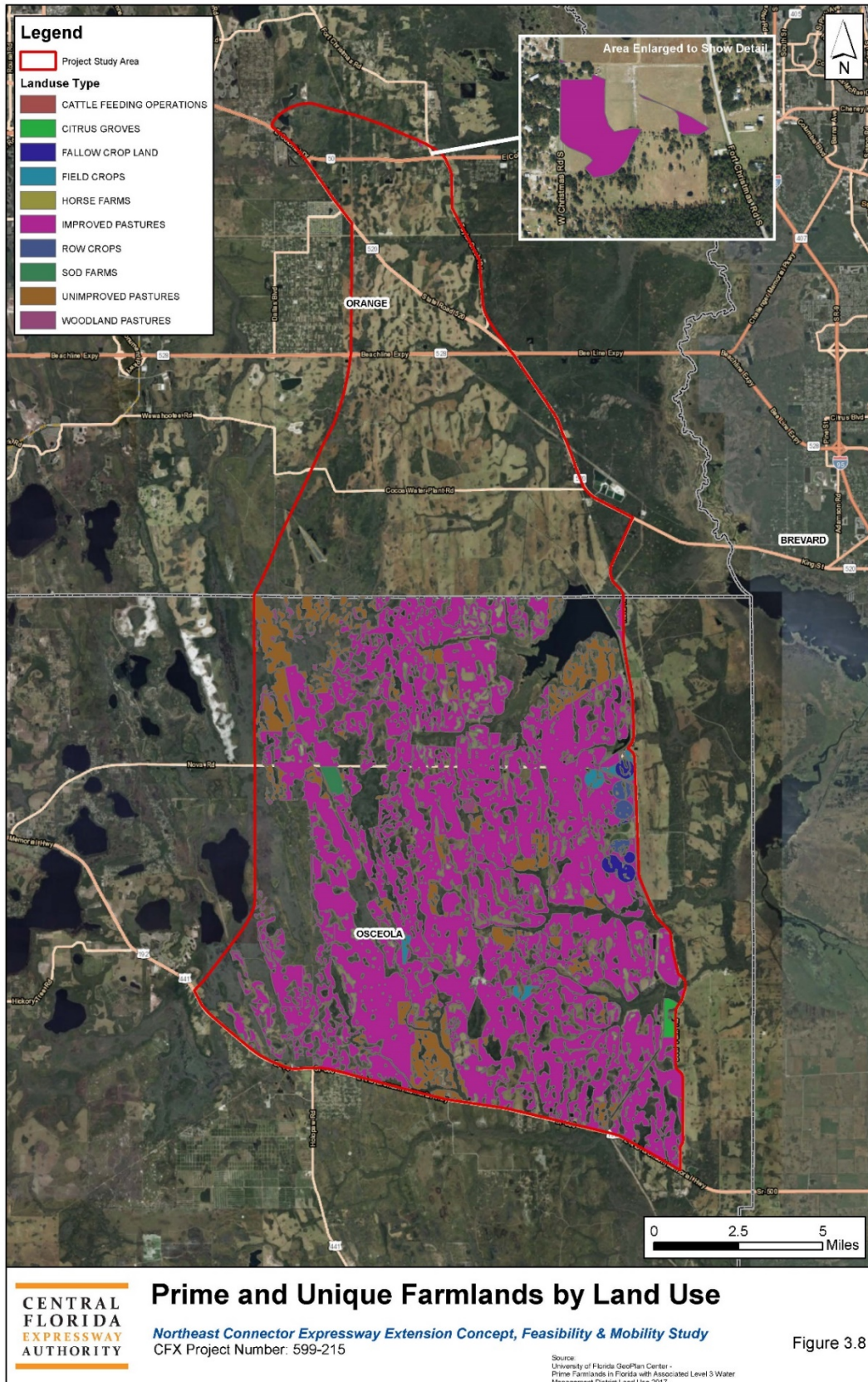
A further analysis of the prime farmland was conducted by the University of Florida GeoPlan Center in 2018 and this analysis identifies prime farmland using 2017 NCRS soils data and cross-references it with the Florida Land Use, Cover and Forms Classification Systems (FLUCFCS) that are developed by the state water management districts.

Based on a review of the “University of Florida’s Prime Farmlands in Florida with associated Level 3 Water Management District Land Use Descriptions” data, most of the prime or unique farmland occurs within the Osceola County portion of the study area, with a small isolated area within Orange County in the extreme northeast section of the study area. Improved pastures are the dominant land use type associated with prime farmland, comprising almost one third of the study area (Table 3.13). Figure 3.8 depicts the prime farmlands in the study area.

Table 3.13: Prime Farmland Land Use within the Project Study Area

Land Use Type	Acres	Percentage (%) of Project study area
Cattle Feeding Operations	7	0.003
Citrus Groves	218	0.1
Fallow Crop Land	478	0.3
Field Crops	468	0.3
Horse Farms	6	0.003
Improved Pastures	54,543	32
Row Crops	379	0.2
Sod Farms	237	0.1
Unimproved Pastures	7,358	4
Woodland Pastures	734	0.4
Total	64,428	37.4

Figure 3.8: Prime and Unique Farmlands by Land Use



3.5.4 Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) have authority under the U.S. Endangered Species Act of 1973 (ESA) and the State of Florida's Endangered and Threatened Species Act (Florida Statute 379.2291) to provide comments and recommendations concerning protected species. The ESA requires federal agencies ensure that actions are not likely to jeopardize the continued existence of listed species or impact critical habitats of those species. If actions may affect federally or state-protected species or critical habitats, then coordination with USFWS and FWC will be required. The following information and datasets were reviewed to determine the likelihood of state and federally-protected species occurring within the study area:

- True color aerial photography (Environmental Science Research Institute's (ESRI) Online Database);
- USGS topographic (ESRI Online Database);
- U.S. Department of Agriculture NRCS soils GIS data for Orange and Osceola Counties (2017);
- SJRWMD Land Use data (2014);
- SFWMD Land Use Data (2014)
- USFWS NWI data (2013);
- "Federal Listed Species in Orange and Osceola Counties, Florida" USFWS (October 2018);
- Endangered & Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12;
- "Notes on Florida's Endangered and Threatened Plants," FDACS (2010), and 5B-40 FAC;
- Florida Natural Areas Inventory (FNAI) database of listed species known to occur in Orange and Osceola Counties (2018);
- USFWS Wood Stork Key for South Florida (revised 2010)
- USFWS Wood Stork Florida Nesting Colonies and Core Foraging Areas Active 2008-2017 (2018);
- "Florida's Endangered and Threatened Species," FWC (May 2016);
- FWC listed species occurrence data (2017);
- FWC Gopher Tortoise Permitting Guidelines (2017);
- Osceola County - North Ranch Sector Plan Long-Term Master Plan, Peer Review of the Environmental Plan (April 2015)
- USFWS Consultation Areas and Critical Habitat Maps (2018)

Based on the data review, there are numerous state- and federally-protected species documented to occur within and adjacent to the study area (Figure 3.9). Additionally, the study area is located completely within the USFWS Consultation Areas for crested caracara, everglades snail kite, Florida scrub-jay, and red-cockaded woodpecker. The study area also partially occurs within Florida grasshopper sparrow consultation area, which begins south of SR 528 and extends to the southern boundary of the study area. No USFWS designated critical habitat occurs within the study area.

The bald eagle was removed from the threatened and endangered list; however, it is still afforded protection under the Migratory Bird Treaty Act of 1918 and Bald and Golden Eagle Protection Act of 1940. According to FWC Bald Eagle Nesting data, three bald eagle nests are located within the study area: two nests are located in the eastern central portion of the study area north and east of Nova Road, and the third nest is located in the western central portion of the study area.

Figure 3.9: Protected Species

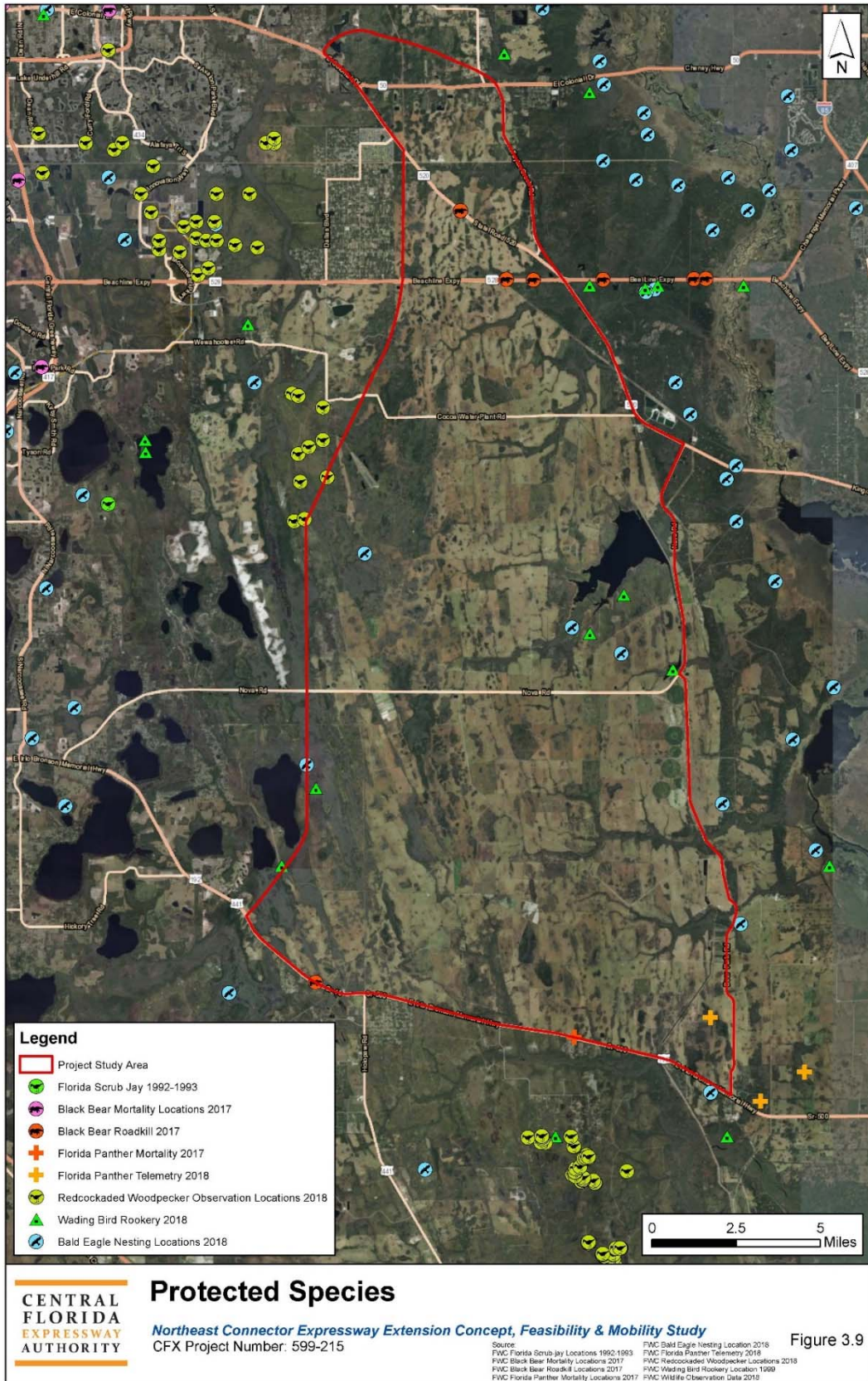


Figure 3.9

A review of the FWC Wading Bird Rookery data was conducted and four historical rookeries were identified within the study area. Three of the wading bird rookeries are located in the eastern central portion of the study area, north and west of Nova Road. The other is located in the southeastern corner of the study area and west of Lake Conlin. In addition, the study area is within 11 wood stork nesting colony core foraging areas. Given the undeveloped nature of the study area, and species occurrence data, it is anticipated that multiple state- and federally-protected species may occur within the study area. Upland areas within the study area have the potential to contain habitat suitable for the federally-protected Florida scrub-jay and red-cockaded woodpecker and the state-protected gopher tortoise, Sherman’s fox squirrel, southeastern American kestrel and burrowing owl. Wetlands contain suitable habitat for the federally-protected crested caracara, wood stork, and everglade snail kite along with numerous state-protected wading birds. In addition, the diversity of the wetland and upland habitats increases the likelihood of federally-protected plants and eastern indigo snake occurring within the study area.

3.5.5 Essential Fish Habitat

A review of the National Marine Fisheries Service (NMFS) essential fish habitat (EFH) GIS data and literature was conducted and it was determined that the study area does not contain EFH. Should revised EFH GIS data and literature become available, a further analysis will be conducted during the Project Development and Environment (PD&E) study.

3.5.6 Conservation and Mitigation Areas

According to the FNAI Florida Conservation Lands GIS data, there are five areas that are identified as conservation lands within the study area. These areas are within and adjacent to the study area and are located on the northern, western, and southwestern border of the study area. Listed below are conservation lands within and adjacent to the study area and these areas are depicted on Figure 3.10. Mitigation banks are required to have conservation easements with the State of Florida or the federal government identified as the easement holders; therefore, mitigation banks are classified as public lands in the database.

- TM-Econ Mitigation Bank
- Lake X Mitigation Bank
- Savage/Christmas Creek Preserve
- Holopaw State Forest
- Hal Scott Preserve Conservation Easement

The FNAI Florida Forever Board of Trustees (FFBOT) GIS data indicates that the Big Bend Swamp/Holopaw Ranch and Conlin Lake X, which occur within the study area, have been approved for acquisition by the State of Florida’s Acquisition and Restoration Council as of August 24, 2018. These areas are located in the southwest corner of the study area and north of US 192. The conservation lands and mitigation banks within the study area are summarized in Table 3.14.

Based on the review of the North Ranch Long-Term Master Plan/Sector Plan, several areas have been identified within the study area as potential mitigation sites for wetlands and state- and federally-protected species. However, no areas, including those areas south of the Osceola/Orange County line, have currently been authorized for mitigation or conservation lands to offset impacts to wetlands or protected species.

Table 3.14: Conservation Lands and Mitigation Banks within the Project Study Area

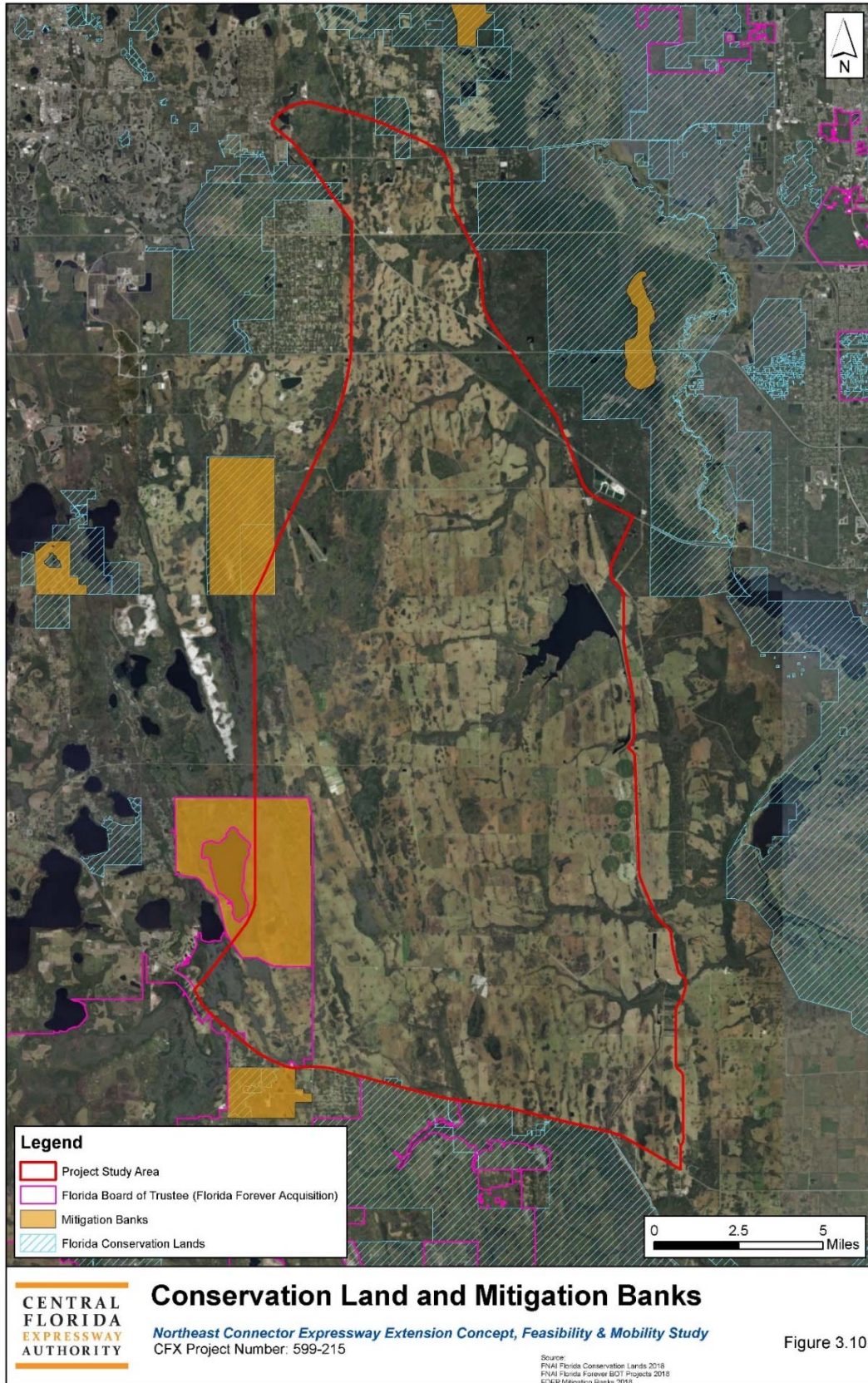
Conservation Land/ Mitigation Bank Name	Agency/Management Responsibility	Acres	Percentage (%) of Project Study Area
Big Bend Swamp/Holopaw Ranch Florida Forever BOT Project	FFBOT	5,166	3.1%
Conlin Lake X*	FFBOT	5,777	3.4%
TM-Econ Mitigation Bank	Orange County/Holland Properties	270	0.2%
Lake X Mitigation Bank	Lake X Holdings	468	0.3%
Savage/Christmas Creek Preserve	Orange County	328	0.2%
Holopaw State Forest	BOT and Florida Forest Service	57	0.03%
Hal Scott Preserve Conservation Easement	Orange County/SJRWMD	379	0.2%
Total		12,445	7.3%
*According to the FFBOT data, this area has been identified for acquisition and is a part of the Lake X Mitigation Bank			

3.5.7 Prescribed Burn Areas

Many of Florida’s natural communities have been fire-suppressed historically and have become a danger to the public due to the amount of fuel accumulation. In recent years, controlled burns have been conducted on public lands to reduce this danger and improve habitat for wildlife. Most upland and some wetland habitats are fire-dependent for seed dispersal and germination.

On August 7, 2018, TM-Econ Mitigation bank conducted a controlled burn in accordance with its management plan. The SFWMD permit (Permit Number 49-0004-M) for the Lake X Mitigation Bank indicates a burn regime for management of the property, but no records were found confirming burns were conducted. In addition, prescribed burning is one of the management techniques discussed in the North Ranch Long-Term Master Plan/Sector Plan for the management of mitigation sites and conservation lands. Controlled burns produce smoke that may affect roadway visibility as well as negatively affect public safety during these activities. No areas within North Ranch are actively managed with prescribed fire; however, as management plans for these areas are implemented, they will be taken into consideration and re-evaluated during the PD&E.

Figure 3.10: Conservation Land and Mitigation Banks



3.6 Human Environment

3.6.1 Existing Land Use

A review of GIS data provided by the SJRWMD and SFWMD was performed in order to assess the existing land use within the project area. Land cover determination was based on the Florida Land Use, Cover, and Forms Classification System (FLUCFCS). Land types found within the project area are predominantly classified as Agriculture and Wetlands. Figure 3.11 displays the existing land use for the project area.

3.6.2 Future Land Use

Future Land Use classification of the project area was determined based on GIS data from Osceola County (September 2018) and Orange County (last amended November 2017). In the year 2030, the project area land use will largely consist of Rural/Agricultural in Orange County and in the year 2025, the land use will largely consist of Mixed Use in Osceola County. The future land use of the project area is displayed on Figure 3.12.

Figure 3.11: Existing Land Use Map

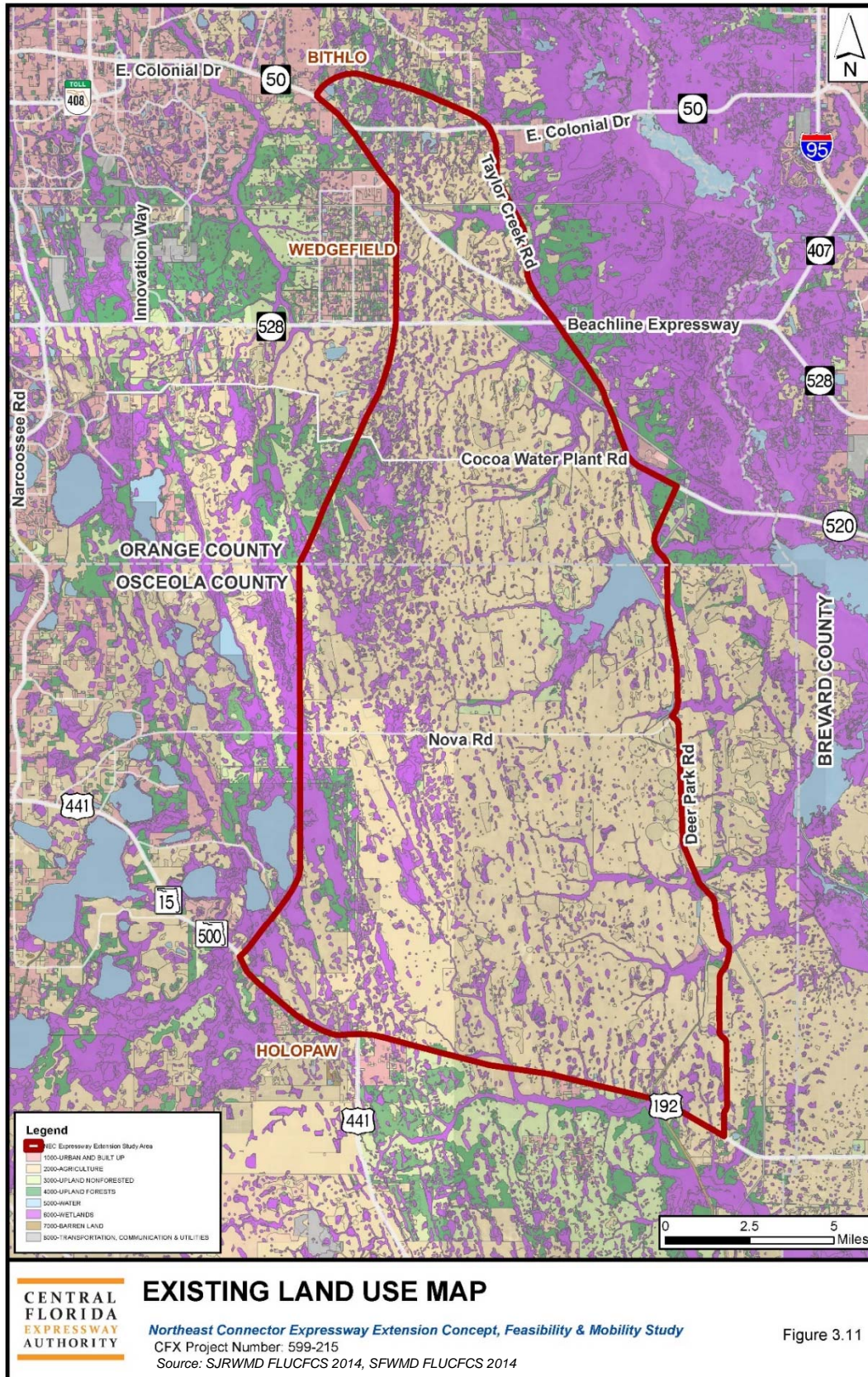
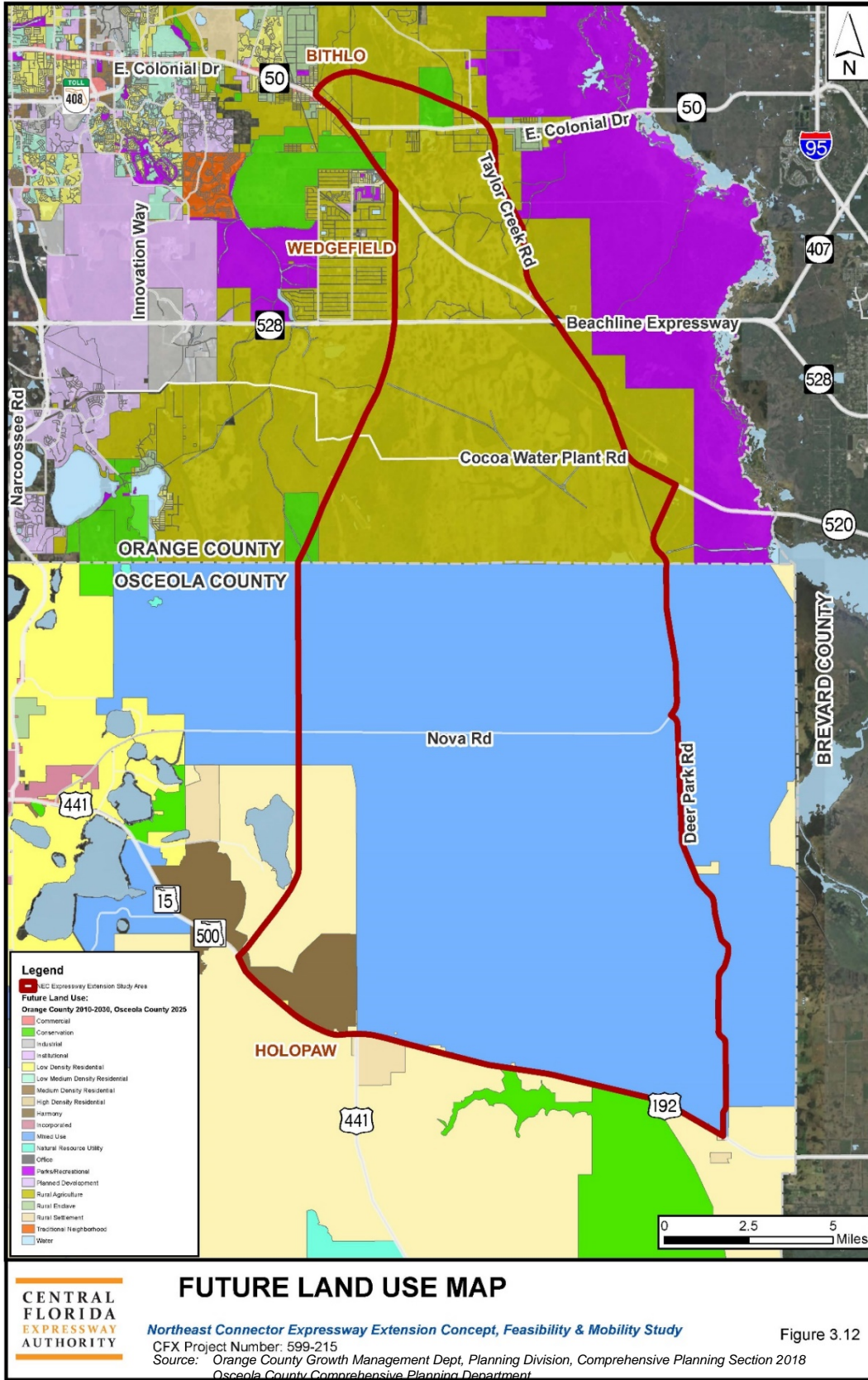


Figure 3.12: Future Land Use Map



3.6.3 Community and Neighborhood Features

A GIS evaluation of community features within the study area was performed to identify existing police stations, religious facilities, daycares, schools, fire stations, cemeteries, government buildings, cultural centers, and hospitals. A total of four existing places of worship occur within the project area and are listed in Table 3.15.

Table 3.15: Community Features

Site Name	Location	Type of Facility
Pine Grove Missionary Baptist	766 Christmas School House Road. Christmas, FL 32709	Religious
Fort Christmas Baptist Church	23600 E. Colonial Drive. Christmas, FL 32709	Religious
Refuge House of Praise Church of God	20875 E. Colonial Dr. Christmas, FL 32709	Religious
Christmas Church of God	24313 E. Colonial Drive. Christmas, FL 32709	Religious

3.6.4 Development Plans

3.6.4.1 Orange County

Review of the Orange County Comprehensive Plan showed no future development plans within the Orange County portion of the study area.

3.6.4.2 Osceola County

The Osceola County portion of the study area contains three future development plans adopted into the Osceola County Comprehensive Plan (Figure 3.13): Harmony, the Northeast District Sector Plan and the North Ranch Master Plan. Each plan will provide the opportunity to integrate the study area into an overall vision of the future.

3.6.4.3 Northeast District

A portion of the Northeast District Conceptual Master Plan (NED Plan) occurs within the study area. The NED Plan, adopted into the Osceola County Comprehensive Plan in August 2010, encompasses more than 19,000 undeveloped acres northeast of St. Cloud consisting of a regional employment center, residential communities, commercial services, and natural areas.

3.6.4.4 North Ranch Master Plan

The North Ranch Master Plan was adopted into the Osceola County Comprehensive Plan in September 2015. Development of the North Ranch Master Plan is anticipated to begin after 2045 with a complete build-out by 2080. The NRSP encompasses 133,000 acres to include urban centers, employment centers, residential neighborhoods, transportation, trails and conservation lands to serve an anticipated 500,000 residents within the NRSP.

3.6.4.5 Harmony

A portion of the Harmony mixed-use community occurs in the southwest portion of the study area. Located along US 192 in eastern Osceola County, the Harmony Development of Regional Impact (DRI) is an approximately 11,000-acre master planned project, designed as a Traditional Neighborhood Development consisting of residential units, light industrial space, commercial space, office space, and recreation areas.

Figure 3.13: Planned Development Map



3.6.5 Cultural Resources

Previously recorded cultural resources that occur within or near the study area are shown on Figure 3.14.

3.6.5.1 Historical

Review of the October 2018 Florida Master Site File (FMSF) GIS data indicates that eight historic structures have been recorded within the study area. Of these, three (8OR05972, 8OR06224, and 8OR10295) have been determined not eligible for listing in the National Register of Historic Places (NRHP) by the Florida State Historic Preservation Officer (SHPO), while the remaining five (8OR08099, 8OR08101, 8OR08102, 8OR08103, and 8OR08106) have not been evaluated. Additionally, three historic bridges (8OR10054, 8OR10056, and 8OR10059) have been recorded within the study area, but have not been evaluated by the SHPO. Finally, one historic highway (8OR01804) has been recorded and determined not eligible, while one historic railroad spur (8OR10979) has not been evaluated.

3.6.5.2 Archaeological

The archaeological background research indicated that 12 archaeological sites have been recorded within the study area (Table 3.16). Of these, five have been determined not eligible for listing in the NRHP by the SHPO. The remaining seven have not been evaluated regarding NRHP eligibility. Corridors developed as part of this study will be analyzed further in a future PD&E Study to determine archaeological significance.

Figure 3.14: Previously Recorded Cultural Resources Map

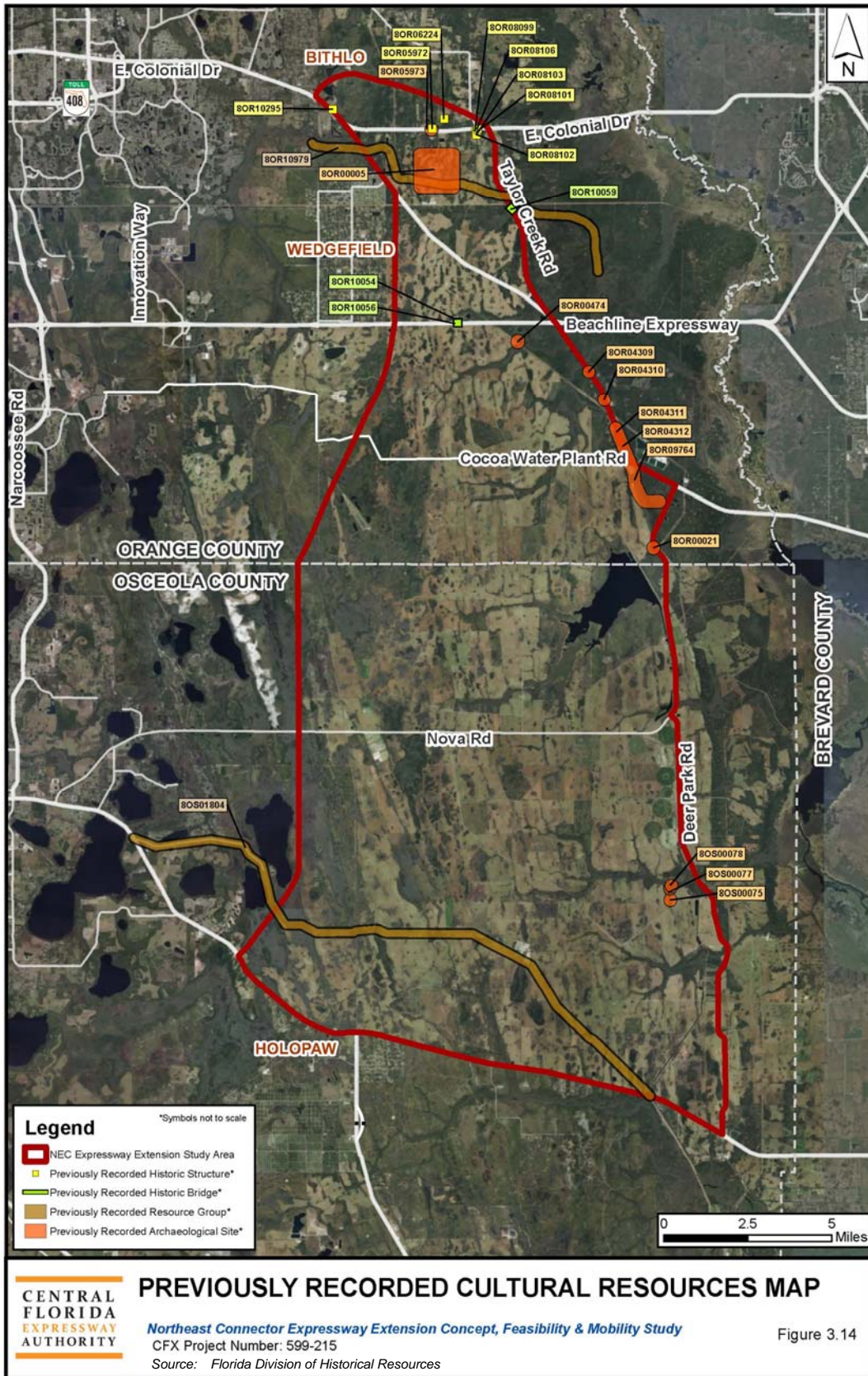


Table 3.16: Previously Recorded Archaeological Sites Near the Project Area

FMSF #	Site Name	Site Type	Culture	SHPO Evaluation
8OR00005	NN	Prehistoric mound(s)	Prehistoric	Not Evaluated by SHPO
8OR00021	Fort McNeil	Historic fort	American Acquisition/Territorial Development 1821-45	Not Evaluated by SHPO
8OR00474	Second Creek Mound	Prehistoric mound(s)	St. Johns, 700 B.C.-A.D. 1500	Not Evaluated by SHPO
8OR04309	Bored Boar	Campsite (prehistoric)	Prehistoric lacking pottery	Ineligible for NRHP
8OR04310	Nowhere	Single artifact or isolated find	Prehistoric lacking pottery	Ineligible for NRHP
8OR04311	Rock Knocker	Single artifact or isolated find	Prehistoric lacking pottery	Ineligible for NRHP
8OR04312	Ground Score	Campsite (prehistoric)	Prehistoric lacking pottery	Ineligible for NRHP
8OR05973	Christmas Creek	Farmstead	Twentieth century American, 1900-present	Ineligible for NRHP
8OR09764	Fort Christmas To Fort McNeil Military Trail	Historic road segment	American Acquisition/Territorial Development 1821-45	Not Evaluated by SHPO
8OS00075	Cold Field	Single artifact or isolated find	Twentieth century American, 1900-present	Not Evaluated by SHPO
8OS00077	Wolf Branch	Single artifact or isolated find	Prehistoric	Not Evaluated by SHPO
8OS00078	Orange Swamp	Single artifact or isolated find	Prehistoric	Not Evaluated by SHPO

3.6.6 Demographics Characteristics

The study area consists of seven population ranges. Information regarding the study area census tracts and block groups is provided on Figure 3.15. Area demographics, household income, and employment status related to each 2015 US Census tract were obtained through 2015 US Census data. This information is located in Table 3.17, Table 3.18, and Table 3.19.

Figure 3.15: 2015 United States Census Bureau Tracts

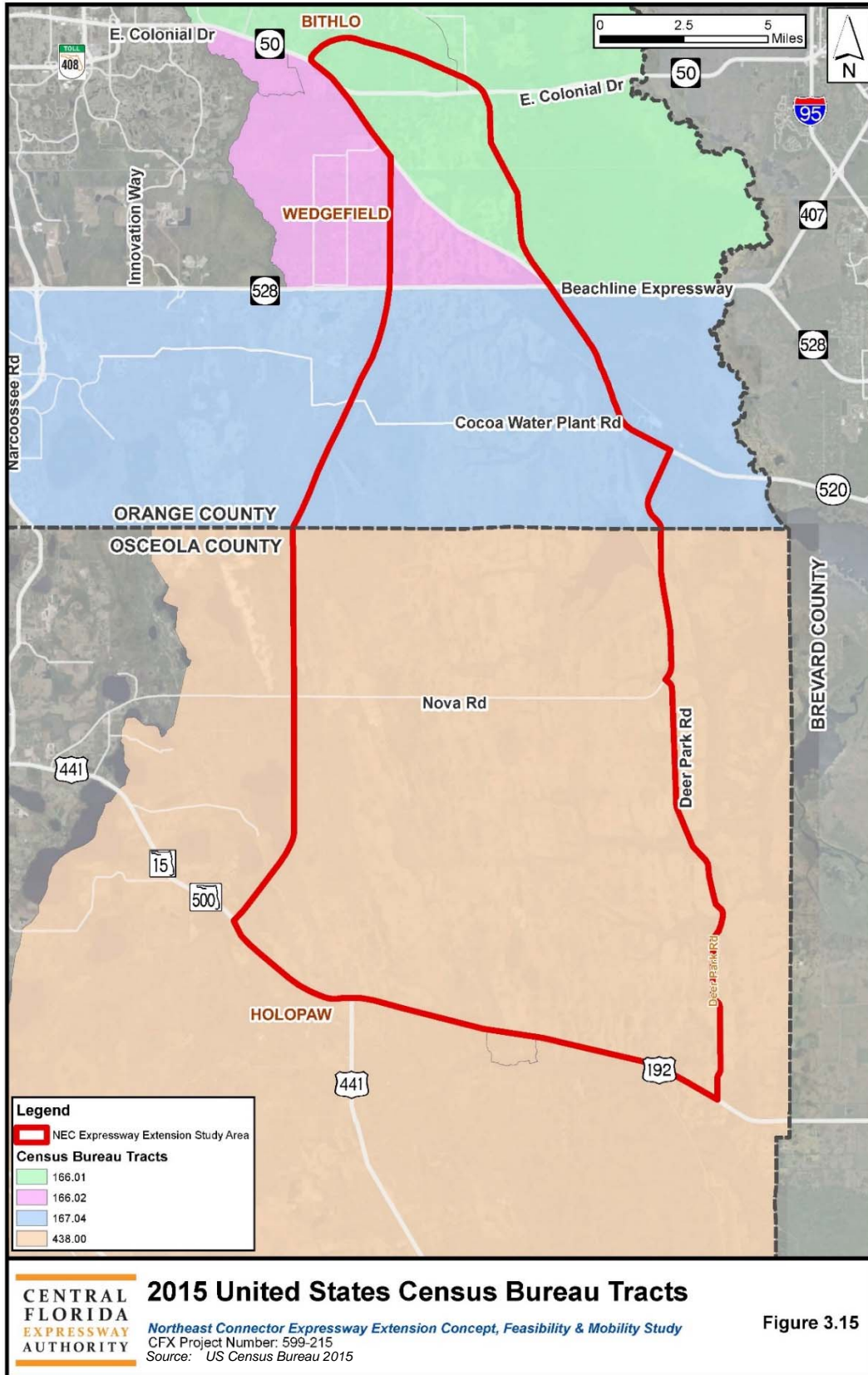


Table 3.17: Project Area Demographics

Geography	Census Block Group	2015 Population	Percent White	Percent Black	Percent Other	Total Hispanic Population
Study Area (including entire Block Group)	-	44,951	80%	8%	44%	31%
Census Tract 166.01	1	6,752	76%	10%	6%	28%
Census Tract 166.01	2	4,124	84%	2%	8%	17%
Census Tract 166.02	2	8,743	75%	15%	2%	20%
Census Tract 167.04	1	18,630	78%	8%	5%	44%
Census Tract 438.00	1	3,739	92%	5%	1%	22%
Census Tract 438.00	2	816	95%	0%	0%	1%
Census Tract 438.00	4	2,144	89%	0%	9%	15%

Table 3.18: Project Area Household Income Characteristics

Geography	Census Block Group	Percentage of population Above Poverty Level	Percentage of Population Below Poverty Level
Study Area (including entire Block Group)	-	89%	11%
Census Tract 166.01	1	15%	18%
Census Tract 166.01	2	8%	16%
Census Tract 166.02	2	19%	25%
Census Tract 167.04	1	44%	19%
Census Tract 438.00	1	9%	6%
Census Tract 438.00	2	2%	3%
Census Tract 438.00	4	4%	13%

Table 3.19: Project Area Employment Status

Geography	Census Block Group	Percentage of Employed Population 16 Years Old + in Labor Force	Percentage Unemployed Population in 16 Years Old + in Labor Force
Study Area (including entire Block Group)	-	48%	52%
Census Tract 166.01	1	15%	15%
Census Tract 166.01	2	9%	9%
Census Tract 166.02	2	19%	20%
Census Tract 167.04	1	44%	40%
Census Tract 438.00	1	8%	9%
Census Tract 438.00	2	2%	2%
Census Tract 438.00	4	3%	6%

3.6.7 Aesthetic Features

The study area has a relatively flat topography and high surface water table. The area contains large lakes, gently rolling hills, agricultural lowlands, and forested wetlands. In the North Ranch Master Plan, according to the FLUCFCS, the area is also comprised of a mixture of upland and wetland community types, including agricultural lands, rangeland, upland forests, wetlands, and surface waters.

3.6.8 Transit Facilities

A segment of SR 520 in the northwest portion of the study area is served by The Bithlo Circulator operated by LYNX as shown on Figure 3.16. Referred to as NeighborLink 621, the route runs along SR 520 from SR 50 and provides service to/from Waterford Lakes Town Center, Bithlo Health Center and Wedgefield communities. The frequency, span of service, and average monthly ridership of LYNX NeighborLink 621 is shown in Table 3.20. Paratransit options (e.g., ACCESS, LYNX) exist and are assumed to use the existing roadway network.

Table 3.20: Existing Transit Service

Route	Frequency (min.)	Average Monthly Ridership (2013)	Weekday Span of Service	Saturday Span of Service
621 NeighborLink Bithlo	90 (Mon-Fri) 90 (Sat)	1,524	5:25am – 7:10pm	5:25am – 7:10pm

Source: LYNX Comprehensive Operations Analysis, 2014 (pg. 1-27).

3.6.9 Freight and Intermodal Centers

There are no intermodal centers located within the study area.

3.6.10 Pedestrian and Bicycle Facilities

A portion of an existing trail from the Florida Greenways and Trails System and proposed portions of the Florida National Scenic Trail (FNST), All Aboard Florida Trail and East Orange Trails are located within the study area (see Figure 3.17). It is anticipated that the Office of Greenways and Trails will approve these portions in the near future.

Figure 3.16: Existing Transit Facilities

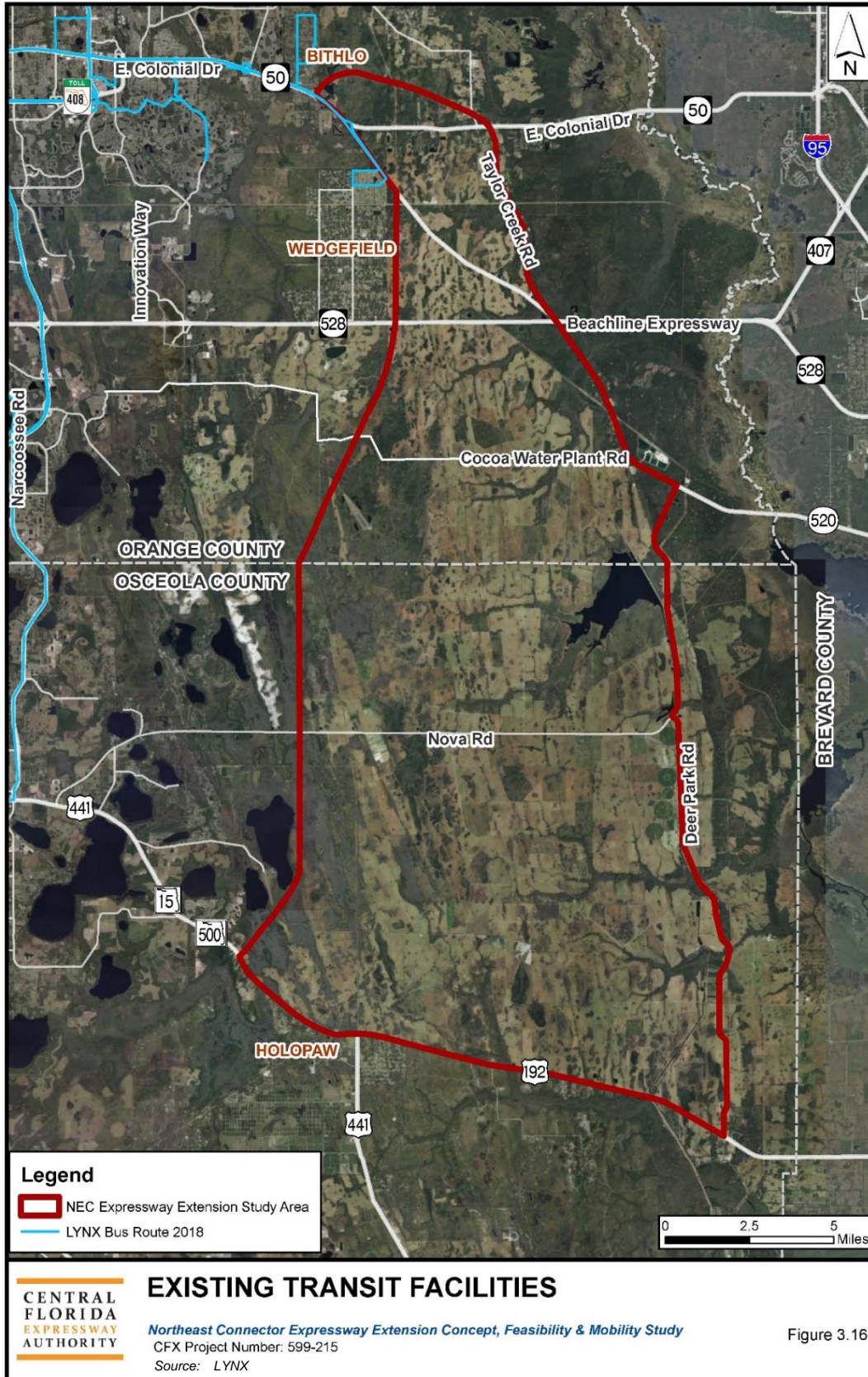
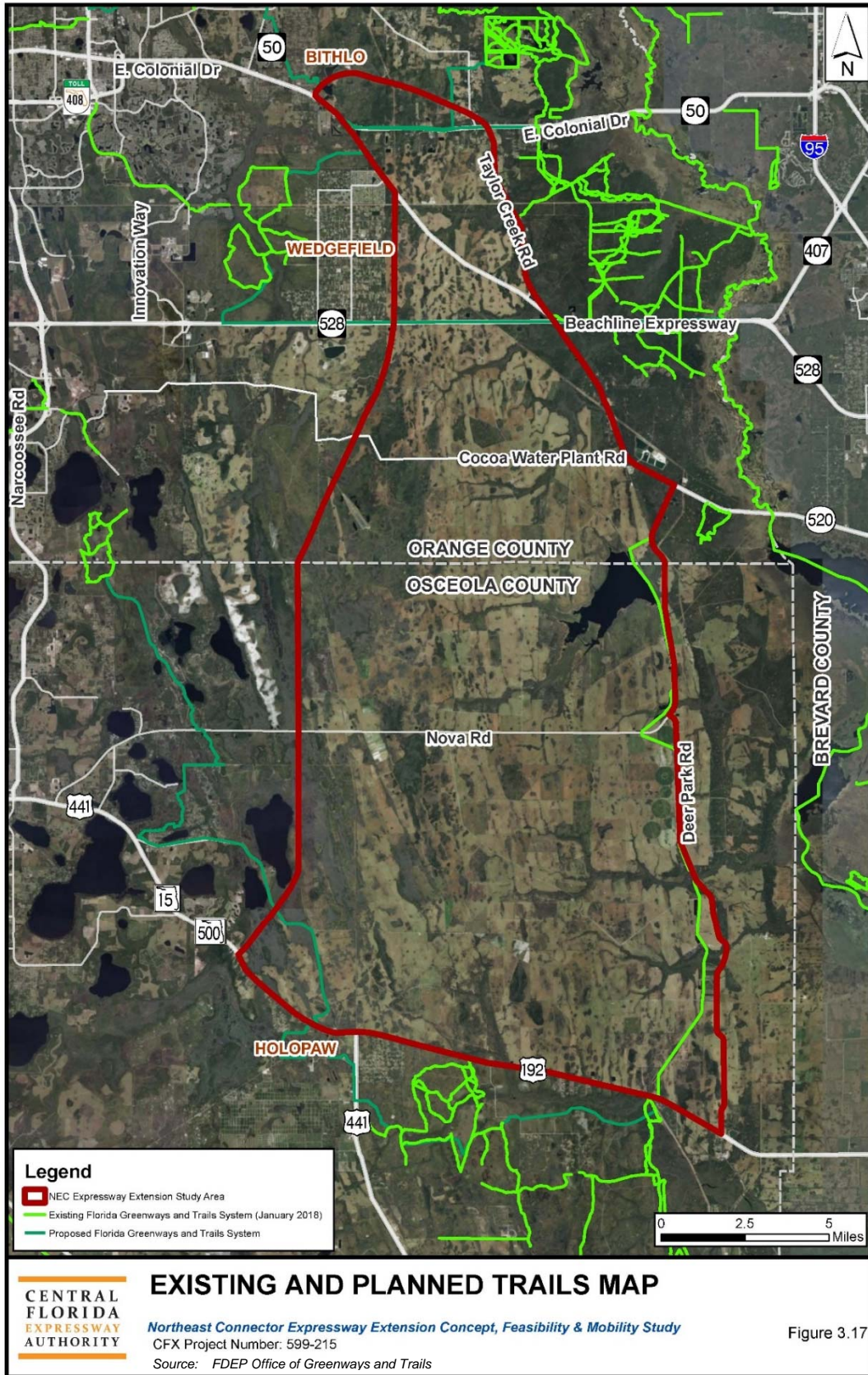


Figure 3.17: Existing and Planned Trails Map



3.6.11 Transportation Plans

Existing land use and transportation plans, studies and policies were reviewed to understand the extent to which local and regional plans are supportive of the proposed expressway extension and to ensure that the project is consistent with those plans. The following documents are relevant to the study area:

- Brightline Phase II, Final Environmental Impact Statement, 2015
- Central Florida Expressway Authority (CFX) 2040 Master Plan
- Central Florida Expressway Authority (CFX) Strategic Plan
- East Central Florida Corridor Task Force Final Report, 2014
- LYNX Comprehensive Operations Analysis (COA), 2014
- LYNX Ten-Year Transit Development Plan (TDP), Major Update 2018-2027
- MetroPlan Orlando 2040 Long Range Transportation Plan (LRTP)
- MetroPlan Orlando Regional Transit Study, 2018
- Northeast District Conceptual Master Plan, 2011
- North Ranch Sector Plan, 2015
- Orange County Comprehensive Plan-Destination 2030
- Osceola County Comprehensive Plan 2025
- Osceola County Expressway Authority (OCX) 2040 Master Plan

Most of these plans and future programs share a common message for more mixed-use, dense, walkable multimodal environments that support transit, increased connectivity, and enhanced regional economic competitiveness. Another common theme is the coordination of development projects and co-location of transportation facilities in the eastern portions of Osceola County to promote social and economic diversity.

Brightline Phase II, Final Environmental Impact Statement (FEIS), 2015

All Aboard Florida – Operations LLC (AAF) has plans to construct a privately-owned and operated intercity passenger railroad system to connect Orlando and Miami, with intermediate stops in Fort Lauderdale and West Palm Beach, Florida. Phase I from Miami to West Palm Beach is constructed and operations began in 2018. In Phase II, AAF proposes to extend the existing service from West Palm Beach to Orlando, which will include construction of approximately 35 miles of dedicated rail corridor parallel to SR 528 connecting Florida East Coast (FEC) Railway’s North-South Corridor in Brevard County to Orlando International Airport (OIA) in Orange County.

Beyond the FEIS report, Brightline Phase II service to OIA is expected to open in 2021. OIA has dedicated space to accommodate dual tracks for Brightline at the new OIA South Terminal

Facility. In June 2018 Orange County Board of County Commissioner approved a Conservation Area Impact Permit to allow AAF to convert over 100 acres of wetlands to lay tracks along SR 528. In September 2018, the State of Florida approved \$1.75 billion in tax free bonds to start laying tracks north to Brevard and Orange counties. In November 2018, Brightline announced their partnership with the Virgin Group and will rebrand as Virgin Trains USA sometime in 2019.

Central Florida Expressway Authority (CFX) 2040 Master Plan

The 2040 Master Plan is CFX's visionary blueprint for system improvements and new projects. The Master Plan defines the policies CFX follows when evaluating projects for future mobility needs and it identifies specific near- and long-term projects that CFX reevaluates annually as the Five-Year Work Plan is developed. The Master Plan explains CFX's expanded roles; including an expanded geographic extent - from a system entirely in Orange County - to now include Lake, Osceola, Seminole and Brevard counties; its ability to participate in the development of feeder roads up to one mile beyond the tolled system; and its ability to partner or lead multimodal and intermodal projects. The Master Plan identifies an estimated \$9.7 to \$12.2 billion in potential regional project needs through the year 2040, including \$6.5 to \$9 billion for twelve new projects and approximately \$2 billion in capacity and operating improvements to the existing system.

The Master Plan provides an overview of the Osceola Parkway Extension, Southport Connector Expressway and Northeast Connector Expressway, including status and estimated cost of each project; and the developments that would potentially be served, such as the Northeast District and North Ranch Planning Area in Osceola County.

East Central Florida Corridor Task Force Final Report, 2014

In 2013, then-Governor Rick Scott issued Executive Order 13-319, which created the East Central Florida Corridor Task Force (Task Force). The Task Force was charged with developing recommendations on future transportation corridors serving established and emerging activity centers in portions of Brevard, Orange, and Osceola counties.

With the Task Force's 21 recommended Guiding Principles as a basis, the Task Force's Action Plan includes nine (9) recommendations with the fourth recommendation being to "Conduct one or more Evaluation Studies of potential new north-south corridors in eastern Orange and Osceola counties". The recommendations include a new multimodal corridor to serve planned population centers within the North Ranch, also referred to as "Corridor I".

LYNX Comprehensive Operations Analysis (COA), 2014

The Central Florida Regional Transportation Authority's (d/b/a LYNX) Comprehensive Operations Analysis (COA) was completed in 2014. The COA primarily focuses on implementing operational efficiencies to existing services but also calls for the creation of new fixed route services and express services. The COA proposed service enhancements along US 192 and services to Lake Nona but does not propose any new services to or near the NECEE study area.

LYNX Transit Development Plan, Major Update 2018-2027

LYNX finalized its ten-year Transit Development Plan (TDP) in 2018. The TDP guides operating and capital improvements for fiscal years 2018 to 2027. The TDP service improvements remained fairly consistent with the previous TDP and propose a number of improvements to existing services, but also recognizes the need to enhance feeder bus services to further support SunRail. The TDP is different than past TDP updates in that it is ongoing with a strategic initiative known as “LYNX Forward”. LYNX Forward focuses on optimizing and reimagining the existing fixed-route network, creating frequent core services, creating new express services to provide more direct services throughout Central Florida and ultimately guiding the update to the LYNX Vision 2030 plan. LYNX Forward also looks to develop new flexible service models to meet customer demand in areas that do not currently support fixed route services. The TDP and LYNX Forward do not currently propose transit services to connect to or operate within the NECEE study area.

MetroPlan Orlando 2040 Long Range Transportation Plan

The 2040 LRTP emphasizes the need for more travel choices but recognizes the continued need for new roads in Central Florida, including the integral role toll roads play in the regions’ future. The 2040 LRTP mentions the 57-mile ring of expressway segments identified in the Osceola County Expressway Authority 2040 Master Plan, which includes the Northeast Connector Expressway. MetroPlan Orlando’s most recent Transportation Improvement Program (TIP) also includes the NECEE Study in 2018/19.

MetroPlan Orlando Regional Transit Study, 2018

The Regional Transit Study (RTS) Final Report, finalized in October 2018, is in direct response to the East Central Florida Corridor Task Force’s recommendation to “Develop a regional transit study to identify and set priorities for long-term transit investments in the three study area counties and the broader Central Florida region.” The RTS provides an overview of existing transit services, recommendations for improved local and regional coordination for cross-jurisdictional services and facilities, develops a Regional Transit Vision Framework, and recommendations for short-term high priority regional transit investments. The study states that the key to advancing the Regional Transit Vision Framework is the extension of the Brightline intercity rail service to OIA. The study also adds that the potential for a future Brightline station along SR 528 could serve the North Ranch and Northeast District developments, and might also support commuter rail service along SR 528 to Brevard County, if warranted. The study included an analysis of regional travel patterns and incorporated Deseret Ranches networks and socio-economic data into the Central Florida Regional Planning Model.

Northeast District Conceptual Master Plan, 2015

The Northeast District (NED) Conceptual Master Plan guides the growth for over 19,000 undeveloped acres located west of the North Ranch Sector Plan area and along Osceola County's northern boundary. The Master Plan and Osceola County's Comprehensive Plan 2025, establish a Multimodal Transportation District (MMTD) for the purpose of promoting walking, bicycling, and reducing automobile dependence. The Master Plan also emphasizes developing a dense and interconnected street network and local transit facilities that will support a streetcar system and regional transit corridors. The Master Plan proposes a Jobs to Housing Ratio of 1.5 to 1 and is projected to reach 44,000 jobs at buildout. The Master Plan identifies regional roadway connections including the Osceola Parkway Extension and the Northeast Connector Expressway as vital linkages to provide access to the region and support growth through development of its Urban, Community and Neighborhood Centers.

North Ranch Master Plan, 2015

The North Ranch Master Plan, developed by Osceola County and Farmland Reserve (Deseret Ranches), involves approximately 133,000 acres of property owned by Deseret Ranches and extends east and south from the Northeast District to US 192 and the Osceola/Brevard County line. In 2015, the UGB was expanded to include all of the property within the North Ranch Planning Area through Comprehensive Plan Amendment 14-0005 (Appendix 1). The North Ranch Comprehensive Plan Element calls for development to be consistent with Mixed-Use District regulations and the North Ranch Planning Area to consist of seven place types including urban center, employment center, neighborhoods, community center, neighborhood center, and special district.

Orange County Comprehensive Plan - Destination 2030

Orange County's Comprehensive Plan policies promote the development of safe, accessible, convenient, and efficient mobility options. To enhance land use and transportation integration, Orange County encourages infill development in the County and promotes the use of alternative modes of transportation. Orange County commits to promoting compact, transit-oriented development within the Urban Service Area (USA) boundary. Within Orange County, the NECEE study area is within the Rural Service Area and the Econlockhatchee River Protection Area. The NECEE study area is also near the Innovation Way Multimodal Transportation District.

Osceola County Comprehensive Plan 2025

The study area within Osceola County has a future land use classification of *Mixed Use District* and is within the County's UGB. As noted above, the study area also includes the Northeast District Conceptual Master Plan and the North Ranch Master Plan. Through the Northeast District Element and the North Ranch Master Plan Element, Comprehensive Plan 2025 proposes significant growth in this area contingent upon identified transportation improvements and

enhancements. Both the Northeast District and North Ranch Master Plan rely on and commit to limited-access transportation facilities such as the Osceola Parkway Extension and the Northeast Connector be constructed before specific stages of development can occur. The Comprehensive Plan also commits the County and the landowner to coordinate with regional partners to create these improvements. Through these various elements, the Comprehensive Plan also calls for the creation of Multimodal Transportation Districts (MMTDs) and regional transit corridors to create complete communities that reduce automobile dependence.

OCX 2040 Master Plan

The Osceola County Expressway Authority (OCX) Master Plan focused on developing a long-range master plan that identifies policies, direction and capital projects that represented OCX's vision and objectives. While OCX is no longer active, in 2016 the CFX Board approved an interlocal agreement with Osceola County and OCX to transfer the lead for OCX Master Plan development to CFX. The Northeast Connector Expressway was one of the projects that CFX agreed to study to determine viability.

The Master Plan states that “The OCX 2040 system is structured on a series of expressways that ring the interior of the County’s Urban Growth Boundary; connecting existing and emerging cities and centers.” The Northeast District is recognized to be strategically located to play a key role in the County’s transition from primarily service jobs to a greater mix of employment sectors. The Master Plan also states that the expressway system plays a complementary role in the diversification of transportation choices and support for the development of multimodal corridors and dedicated transit lanes connecting urban centers throughout Osceola County.

3.7 Contamination

Contamination concerns in the study area include cattle grazing operations that may have incorporated cattle dip vats (arsenic) and citrus groves (herbicides/pesticides/heating oil). However, the majority of the contamination concerns are located along SR 50 in Bithlo, at the north end of the study area (see Figure 3.18). The Bithlo portion of the study area is characterized by light industrial development comprised of numerous auto repair and auto salvage operations that often generate contamination impacts to soil and/or groundwater. Utilizing aerial photographs, a Google Earth railroad map, and FDEP’s Map Direct website, the following potential contamination concerns were identified in the study area that will be considered in the evaluation of alignment alternatives:

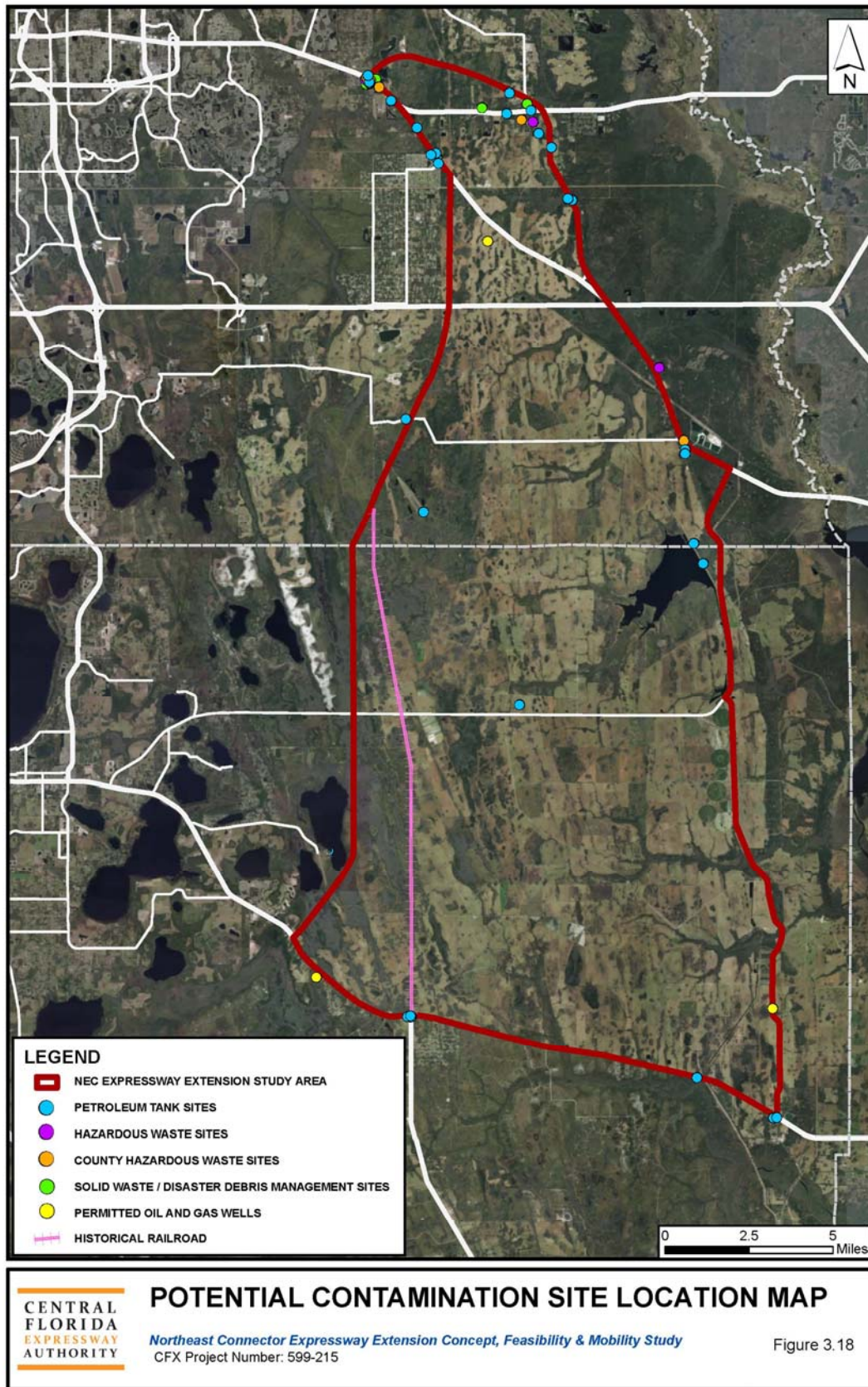
- Cattle grazing
- Citrus Groves
- 29 petroleum tank sites
 - 4 have documented contamination impacts
- 5 hazardous waste sites

- 7 county hazardous waste sites
- 5 solid waste / disaster debris management sites
- 1 solid waste facility/landfill/recycling center that has institutional controls
- 1 solid waste facility/recycling center
- 1 solid waste facility/landfill that has a Brownfield status
- 3 permitted oil and gas wells
- 1 historic railroad
- No CERCLA or Superfund sites were found within one mile

The predominant indicator of potential contamination in the study area is the 29 petroleum tank sites. Petroleum storage tanks are prone to leakage and spills, causing contaminated soil and/or groundwater. The presence of petroleum contamination can impact highway construction activities including soil excavation and dewatering. Construction in petroleum-impacted areas typically has to be performed by a Contamination and Remediation (CAR) contractor and project costs increase due to the requirement for special handling and treatment of contaminated material.

The presence of non-petroleum contaminated environmental media (soil, groundwater, surface water, and sediment) can also have a significant negative impact on the cost and schedule to complete a roadway development project. The purpose of this preliminary contamination site evaluation will be the early identification of potential contamination sites that could impact this project and to provide valuable input for the design, right-of-way acquisition, and construction phases.

Figure 3.18: Potential Contamination Site Location Map



3.8 Utilities

Thirteen Utility Agencies/Owners (UAOs) have been identified within the project study area by obtaining a Sunshine 811 Design Ticket and through contacts as part of our initial utility coordination efforts. These utilities are described in the following sections and depicted on Figure 3.19.

3.8.1 Electrical

Three electric UAOs have been identified within the project study area, including transmission and distribution facilities. Table 3.21 identifies these UOA and provides a general description of their facilities located on the project.

Table 3.21: Existing Electrical Utilities in the Study Area

Utility Company	Facility	Description
Duke Energy	Electric Transmission	<ul style="list-style-type: none"> 69 kV overhead transmission lines running east to west along south side of Cocoa Water Plant Road. 230 kV overhead transmission lines from the power substation on the north side of US 192 just west of Turn Around Bay Road, then traverses northeasterly to CR 419 and Cocoa Water Plant Road
Duke Energy	Electric Distribution	<p>Electric distribution service throughout the study area, particularly at the following locations where proposed routes cross:</p> <ul style="list-style-type: none"> Duke Energy overhead distribution lines with tenant attachments on the north side of US 192 Duke Energy overhead distribution lines with tenant attachments on the south side of Nova Road Duke Energy overhead distribution lines with tenant attachments on the south side of SR 520 Duke Energy overhead distribution lines with tenant attachments on the south side of SR 50
Orlando Utilities Commission	Electric Transmission	<ul style="list-style-type: none"> 69 kV overhead transmission lines with distribution underbuilt along the north side of US 192 from western study limits to the substation on the north side of US 192 just west of Turn Around Bay Road 115 kV overhead transmission pole line and a 230 kV overhead transmission lines on steel tower structures in an easement traversing east and west across undeveloped land approximately 3.5 miles north of and parallel to SR 528
Florida Power & Light	Electric Transmission	<ul style="list-style-type: none"> 69 kV overhead transmission lines crosses SR 50 just west of Bithlo and traverses southeasterly to the Orange-Brevard County Line, crossing over SR 528 and SR 520 69 kV overhead transmission lines running north to south along the east side of eh Wedgefield subdivision

3.8.2 Natural Gas

Florida Gas Transmission Company (FGT) and Transtate Industrial Pipeline Systems have been identified as having pipelines within the project study area. Table 3.22 provides a general description of their facilities.

Table 3.22: Existing Natural Gas Utilities in the Study Area

Utility Company	Facility	Description
Florida Gas Transmission	Natural Gas Transmission	<ul style="list-style-type: none"> • 26" transmission main in an easement running east and west approximately 1.66 miles south of SR 528. • 20" and 30" gas transmission pipelines in an easement running along the north side and nearly parallel to US 192.
Transtate Industrial Pipeline Systems	Natural Gas Transmission	<ul style="list-style-type: none"> • 12" transmission main crosses US 192 on the west side of US 441 and connects to FGT pipe line on the north side of US 192.

3.8.3 Other Utilities

Seven other UAOs have been identified as having facilities within the project study area, including existing cable television (CATV), telecommunications and proposed water and wastewater utilities. Table 3.23 identifies these UOAs and provides a general description of their facilities located on the project.

Table 3.23: Existing and Proposed Utilities in the Study Area

Utility Company	Facility	Description
AT&T Corporation	Long Distance Fiber Optic Cable	<ul style="list-style-type: none"> • Fiber optic cable in conduit along the north LA right-of-way line of SR 520
AT&T Florida	Telephone / Fiber Optic Cable	<ul style="list-style-type: none"> • 24 count fiber optic cable on Duke Energy distribution poles along the north side of US 192.
CFX	Fiber Optic and Electrical Cable	<ul style="list-style-type: none"> • ITS duct bank on the north and south sides of SR 528 containing fiber optic and electrical cables
Sprint Nextel	Fiber Optic Cable	<ul style="list-style-type: none"> • Fiber optic cable in a leased duct within the CFX ITS duct bank along the north side of SR 528
Charter Communications and Level 3 Communications	CATV / Telephone Fiber Optic Cable	<ul style="list-style-type: none"> • Aerial and buried fiber optic cable along the north side of US 192 • Aerial fiber optic cable on Duke Energy distribution poles on the south side of SR 50 • Aerial fiber optic cable on Duke Energy distribution poles on the south side of SR 520

Table 3.23 Existing and Proposed Utilities in the Study Area (continued)

Utility Company	Facility	Description
City of Cocoa Water Utilities	Water Transmission	<ul style="list-style-type: none"> • 36" and 42" water transmission pipes along the north side of Cocoa Water Plant Road between Dallas Blvd. and SR 520. • Pipes interconnect the City of Cocoa's Wewahootie and Clyde Dyal water treatment plants.

3.8.4 Utility Mitigation and Cost

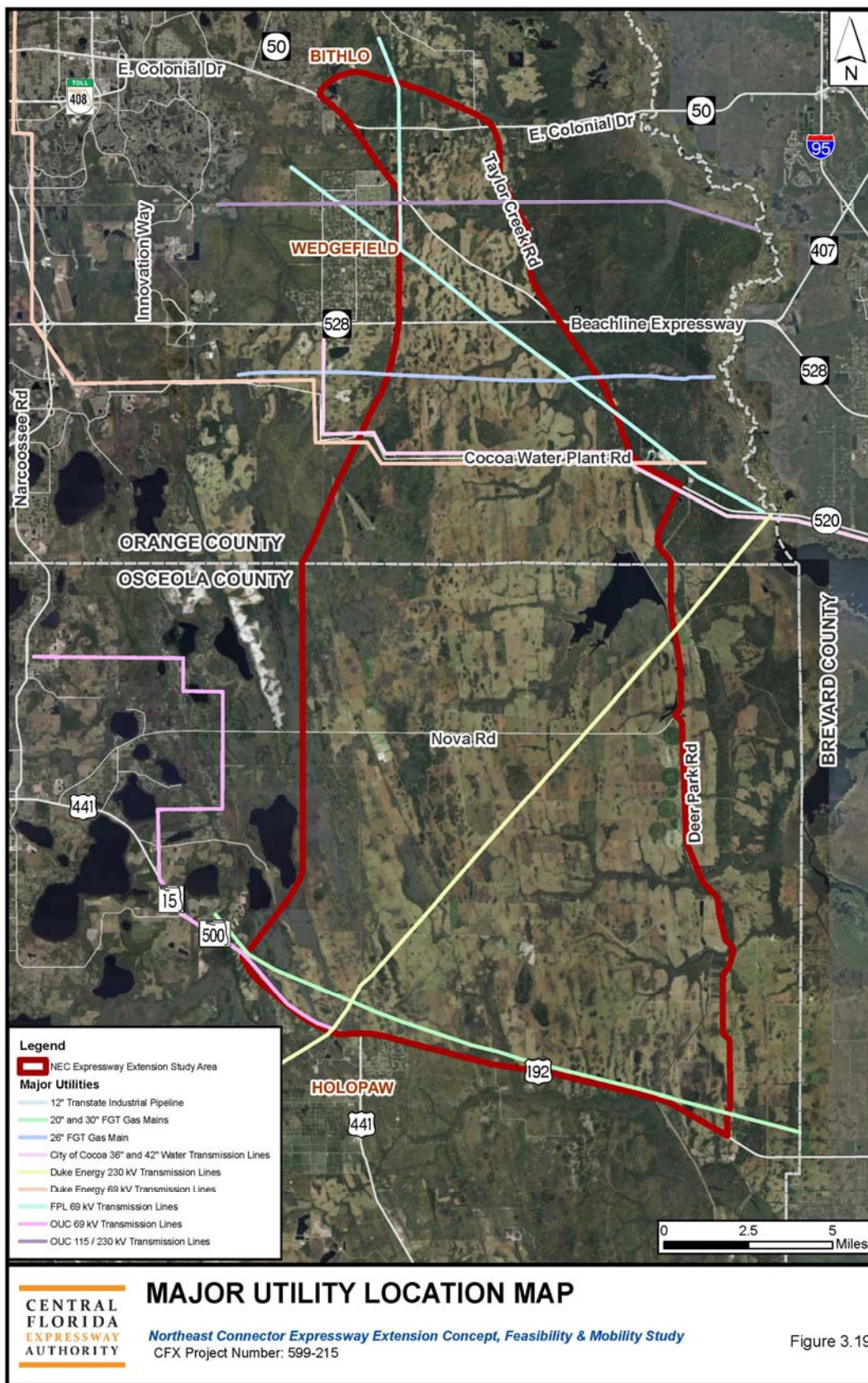
Due to the nature of the existing conditions throughout the study area, it is anticipated that the alternative corridor alignments for the Northeast Connector will impact a number of utility facilities on the project. Major utility facilities that could be potentially impacted include natural gas pipelines owned and operated by FGT and Transtate Industrial Pipeline Systems. In addition, Duke Energy, Florida Power & Light and Orlando Utilities Commission collectively have four transmission substations and various high voltage transmission lines throughout the project study area. The substations are located on fee simple parcels owned by the respective electric utility companies.

The roadway design planning should be completed to maintain the minimum clearance form power lines per Table A of the OSHA Rule 29 CFR Part 1926. The cost for raising overhead transmission lines to provide the required clearances could be in the range of \$400,000 (2019 dollars) per pole for a minimum of four poles for standard transmission poles. H-tower structures would be significantly costlier to replace or relocate.

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

Relocations of facilities located in easements and on private property would likely be eligible for reimbursement. Crossings over FGT pipeline easements would require an easement encroachment agreement between FGT and CFX. Such agreements stipulate specific design requirements within the limits of the easements. All measures will be taken to avoid impacting the existing utility facilities identified in easements or located on privately-owned parcels. Though relocation of other facilities within the existing right-of-way are anticipated, all efforts will be made during the study to minimize impacts to existing pipelines, substations, and transmission facilities, to the greatest extent possible.

Figure 3.19: Major Utility Location Map



3.9 Railroads

There are no existing railroads or crossings within the study area.

4. Traffic Considerations

4.1 Historical and Current Traffic

Osceola and Orange counties have experienced significant growth over the past two decades. According to the U.S. Census, the population of Osceola County more than tripled from 1990 (110,319) to 2017 (352,180), a 219% increase. During the same time period, the population of Orange County nearly doubled from 1990 (685,768) to 2017 (1,348,975), a 97% increase. Most of this growth occurred on the outskirts of the metropolitan Orlando area and the City of Kissimmee. However, the new proposed developments are now being located in East Orange and Northeast Osceola counties.

The Florida Traffic Online (2017) website was used to identify count stations and obtain traffic growth rates within the study area. The results are summarized in Table 4.1. The R² value is a statistical measure of how close the actual volumes are to the fitted growth rate regression line. A value of 100% reflects a growth rate that exactly matches the historic volumes.

Table 4.1: Historical AADT Growth Rates

Roadway		2017 AADT	Historical Growth Rate	Years of Data	R ²	Site ID
From	To					
E Colonial Drive (SR 50)						
SR 520	Taylor Creek Road	12,500	-1.47%	15	52.10%	751008
SR 520						
E Colonial Drive (SR 50)	Maxim Parkway	17,500	1.48%	15	69.75%	751009
Maxim Parkway	Taylor Creek Road	17,500 ⁽¹⁾	1.48%	15	69.75%	751009
Taylor Creek Road	Martin Andersen Beachline Expressway (SR 528)	17,500 ⁽¹⁾	1.48%	15	69.75%	751009
Martin Andersen Beachline Expressway (SR 528)	Nova Road (CR 532)	20,500 ⁽²⁾	9.11%	15	86.53%	700367
Martin Andersen Beachline Expressway (SR 528)						
Dallas Boulevard	SR 520	51,210	1.83%	15	48.72%	750336
US 192 (SR 500)						
Arthur J Gallagher Boulevard	Holopaw Road (SR 15)/US 441	10,799	2.19%	15	60.82%	920065
Holopaw Road (SR 15)/US 441	Deer Park Road (CR 419)	7,400	1.28%	15	35.87%	921008

Table 4.1: Historical AADT Growth Rates (continued)

Roadway		2017 AADT	Historical Growth Rate	Years of Data	R ²	Site ID
From	To					
Deer Park Road (CR 419)						
US 192	Nova Road (CR 532)	300	-6.67%	7	75.00%	928069
Nova Road (CR 532)						
US 192	Sun Grove Lane	3,900	4.37%	10	92.97%	927041
Sun Grove Lane	SR 520	1,600	5.56%	7	83.52%	928050
Taylor Creek Road						
SR 520	E Colonial Drive (SR 50)	600	8.33%	4	60.00%	758089

⁽¹⁾ There is no count station along this segment; therefore, traffic count site 751009 was used for segments from Maxim Parkway to Martin Andersen Beachline Expressway (SR 528)

⁽²⁾ There is no count station along this segment; therefore, traffic count site 700367 was used. This site is located on the same roadway (SR 520) approximately five miles east of Nova Road (CR 532)

4.2 Roadway Operational Conditions

Table 4.2 summarizes the current roadway operating conditions within the study area. All of the roadways are currently operating with a volume to capacity (v/c) ratio of less than 1.0 which indicates sufficient capacity and no congestion.

Table 4.2: Existing Roadway Operational Conditions

Roadway		Number of Lanes	Type	2017 AADT	2017 v/c ⁽¹⁾
From	To				
E Colonial Drive (SR 50)					
SR 520	Taylor Creek Road	4	Uninterrupted Highway	12,500	0.20
SR 520					
E Colonial Drive (SR 50)	Maxim Parkway	4	Uninterrupted Highway	17,500	0.28
Maxim Parkway	Taylor Creek Road	4	Uninterrupted Highway	17,500	0.28
Taylor Creek Road	Martin Andersen Beachline Expressway (SR 528)	4	Uninterrupted Highway	17,500	0.28
Martin Andersen Beachline Expressway (SR 528)	Nova Road (CR 532)	4	Uninterrupted Highway	20,500	0.32
Martin Andersen Beachline Expressway (SR 528)					
Dallas Boulevard	SR 520	4	Limited-Access Tolloed Roadway	51,210	0.65

Table 4.2: Existing Roadway Operational Conditions (continued)

Roadway		Number of Lanes	Type	2017 AADT	2017 v/c ⁽¹⁾
From	To				
US 192 (SR 500)					
Arthur J Gallagher Boulevard	Holopaw Road (SR 15)/US 441	4	Uninterrupted Highway	10,799	0.17
Holopaw Road (SR 15)/US 441	Deer Park Road (CR 419)	4	Uninterrupted Highway	7,400	0.12
Deer Park Road (CR 419)					
US 192	Nova Road (CR 532)	2	Uninterrupted Highway	300	0.01
Nova Road (CR 532)					
US 192	Sun Grove Lane	2	Uninterrupted Highway	3,900	0.15
Sun Grove Lane	SR 520	2	Uninterrupted Highway	1,600	0.06
Taylor Creek Road					
SR 520	E Colonial Drive (SR 50)	2	Uninterrupted Highway	600	0.02

⁽¹⁾ Capacity based on the Level of Service D volumes listed in the *FDOT Quality/Level of Service Handbook, 2018*

4.3 Safety/Crash Analysis

A crash analysis was conducted for all roadway segments within the study area. The crash analysis was based on crash data from January 1, 2013 through December 31, 2017. Given the wide variation in AADT among the roadway segments within the study area, crash rates, expressed in crashes per million vehicle-miles traveled, were calculated. These crash rates control for exposure (traffic volumes) and allow for an “apples-to-apples” comparison between corridors. The crash rates also allow for a comparison against statewide average crash rates for various road classifications and can be used to identify roadway segments experiencing an abnormally high number of crashes.

Table 4.3 displays the crash rate calculated for each segment. The highlighted cells in Table 4.3 identify road segment crash rates higher than the statewide average for similar facilities.

Table 4.3: Crash Analysis

Roadway		5-Year Crashes	Length (miles)	5-Year Crash Rate	Statewide Average Rate
To	From				
E Colonial Drive (SR 50)					
SR 520	Taylor Creek Road	103	4.148	1.088	0.596
SR 520					
E Colonial Drive (SR 50)	Maxim Parkway	52	2.217	0.734	0.596
Maxim Parkway	Taylor Creek Road	45	5.587	0.252	
Taylor Creek Road	Martin Andersen Beachline Expressway (SR 528)	35	1.073	1.021	
Martin Andersen Beachline Expressway (SR 528)	Nova Road (CR 532)	92	6.275	0.803	
SR 528 (Martin Andersen Beachline Expressway)					
Dallas Boulevard	SR 520	269	7.32	0.393	0.367
US 192 (SR 500)					
Arthur J Gallagher Boulevard	Holopaw Road (SR 15)/US 441	88	11.928	0.374	0.596
Holopaw Road (SR 15)/US 441	Deer Park Road (CR 419)	127	11.363	0.828	
Deer Park Road (CR 419)					
US 192	Nova Road (CR 532)	20	13.111	2.786	0.650 ⁽¹⁾
Nova Road (CR 532)					
US 192	Sun Grove Lane	46	4.67	1.384	0.650 ⁽¹⁾
Sun Grove Lane	SR 520	55	21.859	0.862	
Taylor Creek Road					
SR 520	E Colonial Drive (SR 50)	13	2.608	4.552	0.650 ⁽¹⁾

⁽¹⁾ Based on statewide average crash rate of a rural 2-lane roadway

Within the study area, only two segments, SR 520 from Taylor Creek Road to Maxim Parkway and US 192 (SR 500) from Holopaw Road (SR 15) to Arthur J Gallagher Boulevard, have a lower crash rate than the statewide average.

The remainder of the segments have a higher crash rate than statewide averages for similar facilities. To identify potential contributing factors, an analysis of crashes by type of collision and by milepost was conducted. The results are summarized below:

E Colonial Drive (SR 50) – The predominant crash type was “Rear End” followed by “Other and Off-Road.” Common factors that contribute to “Rear End” crashes are congestion, tailgating and driver distraction. The majority of the crashes were located at the Fort Christmas Road and

Ponchos Lane median opening and at the SR 50/SR 520 merge.

Given the type and location of crashes, the high crash rate is primarily caused by turning movements blocking the through traffic.

SR 520 – The predominant crash type on SR 520 from SR 50 to Maxim Parkway was “Rear End.” Analysis of crashes by milepost did not identify any clustering of crashes.

From Taylor Creek Road to Nova Road, the predominant crash type was “Left Turn” with a large clustering of crashes at the Martin Andersen Beachline Expressway (SR 528) interchange. All the movements at this interchange are currently free flow and the speed limit on SR 520 changes from 55 MPH to 45 MPH as vehicles approach the interchange. Since the roadway is divided, the left-turning vehicles must find gaps in traffic for both directions. The high crash rate is primarily due to drivers misjudging gaps in traffic when executing a left-turning movement.

Martin Andersen Beachline Expressway (SR 528): The predominant crash type was “Rear End” followed by “Off Road” and “Animal Crashes.” Common factors that contribute to “Rear End” crashes are congestion, tailgating and driver distraction. Common factors that contribute to “Off Road” collisions are speeding and driver impairment. The traffic counts on Martin Andersen Beachline Expressway (SR 528) have increased from 38,400 in 2012 to 51,200 in 2017. The high crash rate is most likely due to the increase in traffic on Martin Andersen Beachline Expressway (SR 528).

US 192 (SR 500): The predominant crash type was “Rollover” and “Animal Crashes.” This segment of US 192 (SR 500) is located north of the Triple N Ranch Wildlife Management Area and it is very likely that most of the “Rollover” crashes are drivers swerving to avoid collisions with animals and losing control of their vehicle in the process. The corridor is currently not lighted and the majority of crashes are occurring between sunset and sunrise (7:00 p.m. and 7:00 a.m.).

Deer Park Road (CR 419) and Nova Road (CR 532): The predominant crash type was “Animal Crashes”. Both of these roads are located north of the Triple N Ranch Wildlife Management Area and the Bull Creek Wildlife Management Area and traverse through a large palustrine wetland system. The high crash rates are most likely due to crashes with wildlife located within the wetland systems and the wildlife management areas.

Taylor Creek Road: The predominant crash type was “Animal Crashes.” Taylor Creek Road is located west of the Tosohatchee Wildlife Management Area. The corridor is currently not lighted and the majority of the crashes are taking place between sunset and sunrise (7:00 p.m. and 7:00 a.m.). The high crash rate is most likely due to crashes with wildlife.

The construction of the NECEE should divert traffic from county/state roads to the new limited-access facility. Generally, limited-access facilities are required to meet the highest design standards and typically experience lower crash rates than other facilities. Therefore, construction

of the NECEE and the subsequent traffic diversion is anticipated to reduce crash rates on all roadway segments within the study area.

4.4 Travel Demand Modeling

Traffic forecasts for the NECEE Concept, Feasibility and Mobility (CFM) study are based on the updated and improved travel demand model created specifically for the OCX Master Plan Project CFM Studies (Appendix 9). The travel demand model was used to estimate the expected traffic based on input data such as socio-economic data (i.e. land use, population, employment) and transportation network data (e.g. number of lanes, facility types, trip rates). The primary forecasting tool used over the last 30 years in Florida has been the Florida Standard Urban Transportation Model Structure (FSUTMS). Within the FSUTMS, toll modeling originated by establishing specific toll amounts for appropriate network links and a coefficient to convert tolls to travel time impedance. FSUTMS is run from the Cube Voyager operating system.

CDM Smith, the General Traffic and Earnings Consultant, had developed a new daily model for the Central Florida region due to expansion of the CFX jurisdictional area and the need to study the OCX Master Plan projects in this expanded area. This new model, the CFX 3.0 model, is based on the Central Florida Regional Planning Model (CFRPM) version 6.1, in Cube Voyager, because of the larger study area and updated socio-economic data sets. The development of this model was documented in Chapter 4 of the CFM Final Reports for each of the four projects. The following documents the model assumptions made to the CFX 3.0 Model to evaluate traffic forecasts on the NECEE project.

4.4.1 CFX 3.0 Future Year Model (2045)

By starting with the CFX 3.0, the future year model retains all the updates and enhancements created for the CFX 3.0 Model and with additional model improvements in the study area. The design traffic forecast was set to 2045 and is consistent with the requirements for the OCX CFM Projects. Even though the NECEE project is anticipated outside the 2045 horizon year, the 2045 model was used because it is the best available model for planning purposes. Additions were made to the 2045 data set and network to address potential development in the study area that is anticipated in year 2060.

4.4.2 Zonal Structure

For the purpose of evaluating the NECEE alternatives, traffic analysis zone (TAZ) disaggregation was needed in the study area, specifically the North Ranch Master Plan area, to accommodate the project alignments and supporting road network. In the model the study area has large TAZs, as this area is mostly rural land uses. The zone disaggregation allows for the SE data to be distributed in multiple zones and distribution of traffic on the network. For the study, an additional 148 zones were added to the model, in a pattern consistent with the SE data in the North Ranch Master Plan.

4.4.3 Socio-Economic Data

The socio-economic data forecast for 2045 was based on the CFX 3.0 Model which included

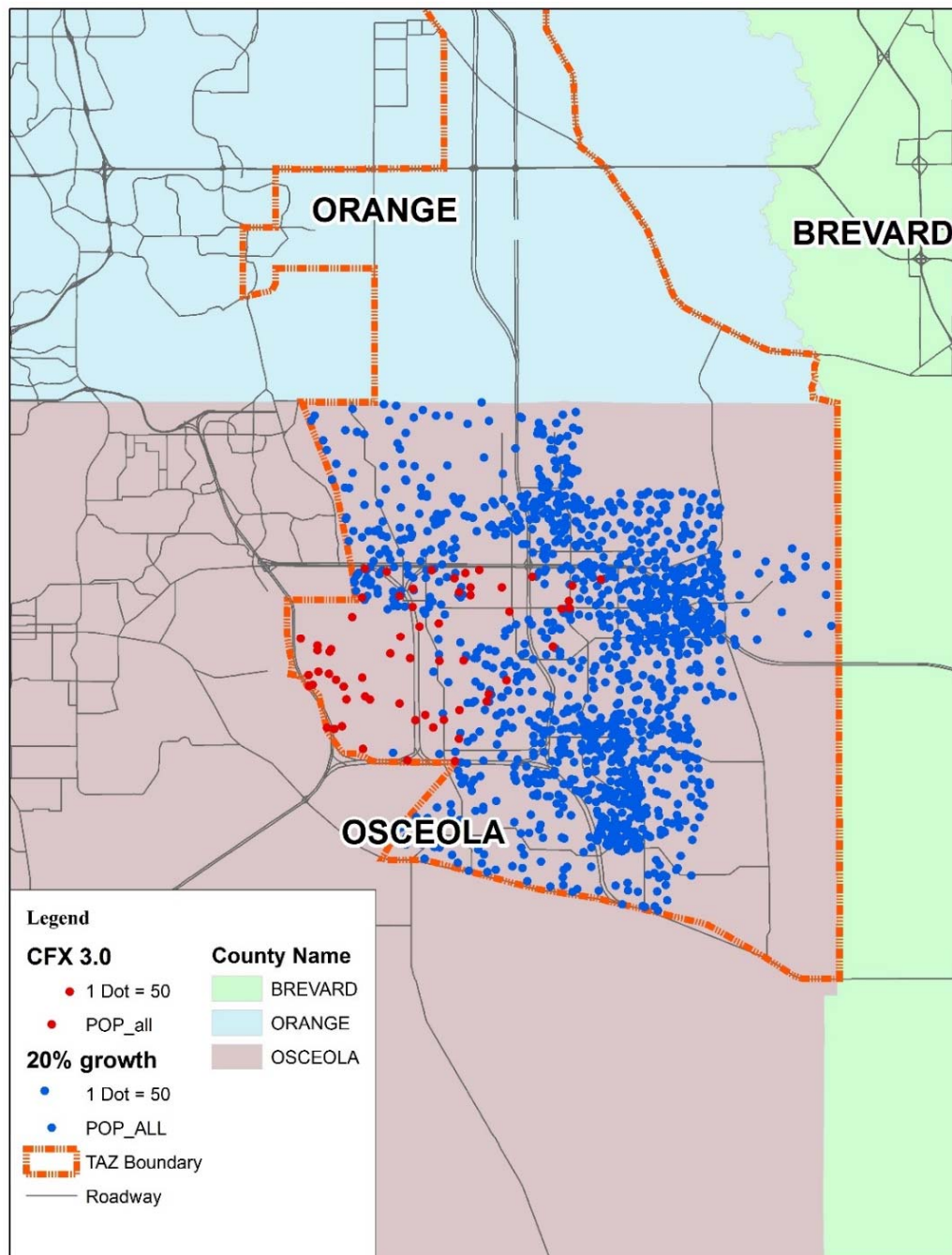
the independent socio-economic data forecast for Orange and Osceola counties developed by Fishkind & Associates for the OCX Master Plan projects. As stated above, additional development was added to the 2045 data set to address potential population and employment in the study area anticipated in 2060. This approach included approximately 20% of the North Ranch Master Plan development in Osceola County, as the NECEE alternatives are expected to serve this future development. The North Ranch Master Plan is a very large development, with an expected build out to accommodate a population of nearly 500,000 residents. The increase in population, dwelling units and employment is shown in Table 4.4.

Table 4.4: Socio-Economic Data Set Adjustments

Regional Socio-Economic Data Set	Total Population	Total Dwelling Units	Total Employment
CFX 3.0 Model	7,296,879	3,290,319	3,759,610
CFX 3.0 Model with 20% of North Ranch Master Plan	7,386,814	3,325,337	3,790,839
Increase	89,935	35,018	31,229

The distribution of the SE data set from the North Ranch Master Plan is consistent with the Year 2060 SE data sets from the sector plan. As stated above, 20% of the SE data was included in the study area for the NECEE analysis. The distribution of the North Ranch population is shown on Figure 4.1.

Figure 4.1: Distribution of Additional SE Data in Study Area

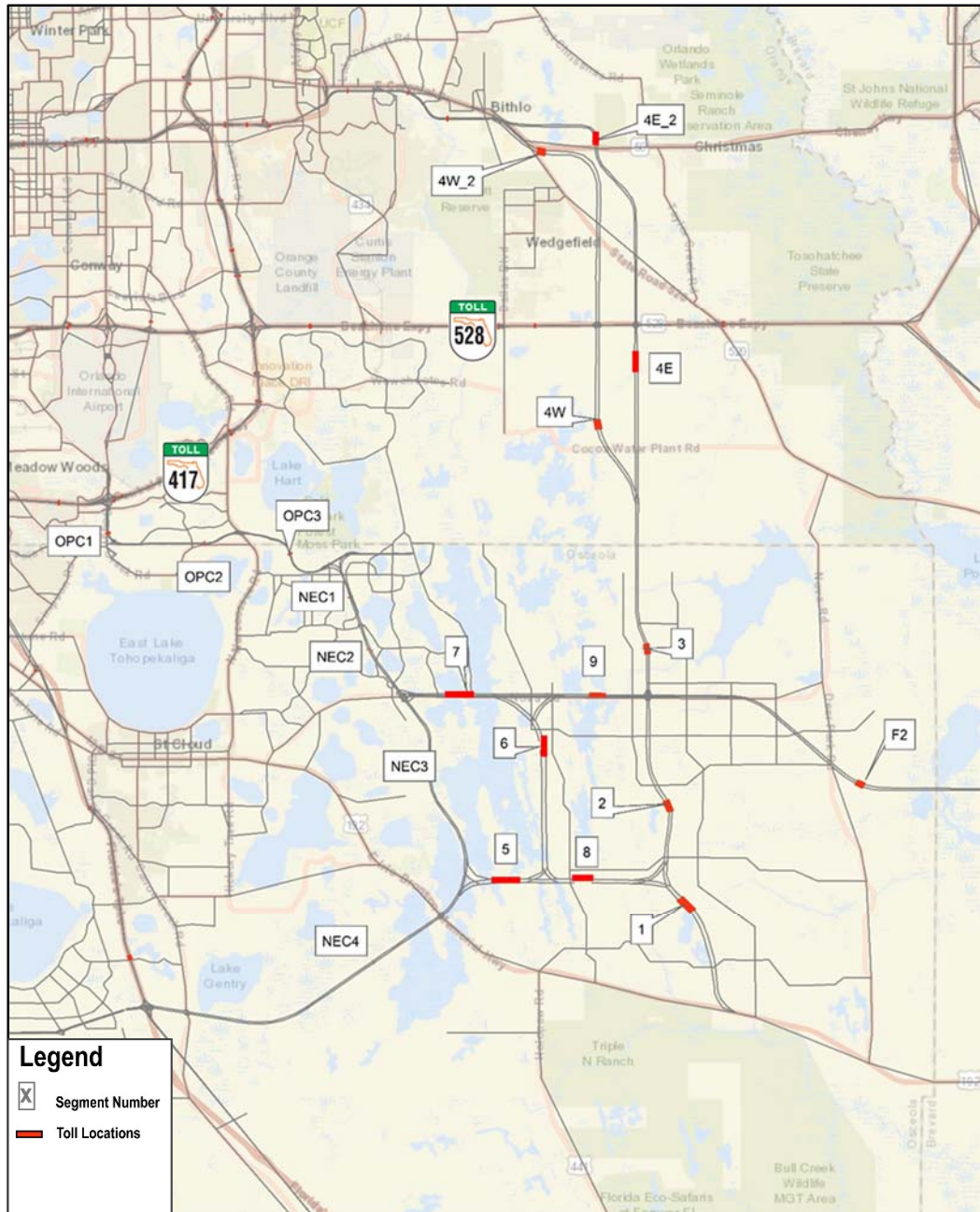


4.4.4 Highway Network - Design Network (2045)

The future year networks in the model contain the transportation improvements identified in the CFX, FDOT and county work programs, as well as the improvements included in the cost feasible plan from the MetroPlan Orlando LRTP for year 2040. To ensure proper loading and distribution of trips on the NECEE study alternatives, there was significant TAZ disaggregation in the study

area, specifically in the North Sector Plan Area. This zone disaggregation includes significant future roadway networks to support the study corridors and surrounding future development in the North Ranch Master Plan. The highway network for the NECEE study area is shown on Figure 4.2.

Figure 4.2: 2045 Highway Network for NECEE Study Area



The traffic forecasts used for design are developed so that the projects would be adequately sized to serve customers through their useful life (30 years). The traffic forecasts used for revenue

estimation are, on the other hand, created so that the projects would be able to produce the forecasted revenue, especially in the opening years. The traffic forecasts prepared for design purposes are therefore somewhat different from (higher than) the traffic forecasts prepared for revenue-estimation purposes. While the basic assumptions (including overall level and location of future socio-economic activity and toll amounts/values of time) are the same, the network assumptions near the project are somewhat different.

As such, the design network was developed to maximize the amount of traffic on the NECEE Alternatives, so competitor roads are constrained. To “maximize” traffic on the project facilities in the design network, future improvements were limited to the 2025 LRTP network in Osceola County. More specifically, any improvements identified in Osceola County after 2025 were removed from the 2035 and 2045 networks. In addition, the following 2025 improvements were removed from all the design networks:

- Boggy Creek Road from Simpson Rd to Narcoossee Road: 2 to 4 lanes
- Cyrils Drive from Narcoossee Road to Absher Road: 2 to 4 lanes
- Simpson Rd from Osceola Parkway to Boggy Creek Rd: 2 to 4 lanes
- Lakeshore Blvd from Boggy Creek to Narcoossee Rd: 2 to 4 lanes
- US 192 from Partin Settlement Rd to Brown Chapel Rd: 4 to 6 lanes
- Narcoossee Road from Boggy Creek Road to US 192: 4 to 6 lanes
- Reaves Road from Poinciana Blvd to Pleasant Hill Rd: 2 to 4 lanes
- Poinciana Blvd from Crescent Lakes Way to Pleasant Hill Road: 2 to 4 lanes
- Lake Wilson Rd from Sinclair Rd to Osceola Polk Line Rd (CR 532): 2 to 4 lanes
- Osceola Polk Line Rd (CR 532) from I-4 to Old Lake Wilson Rd: 4 to 6 lanes

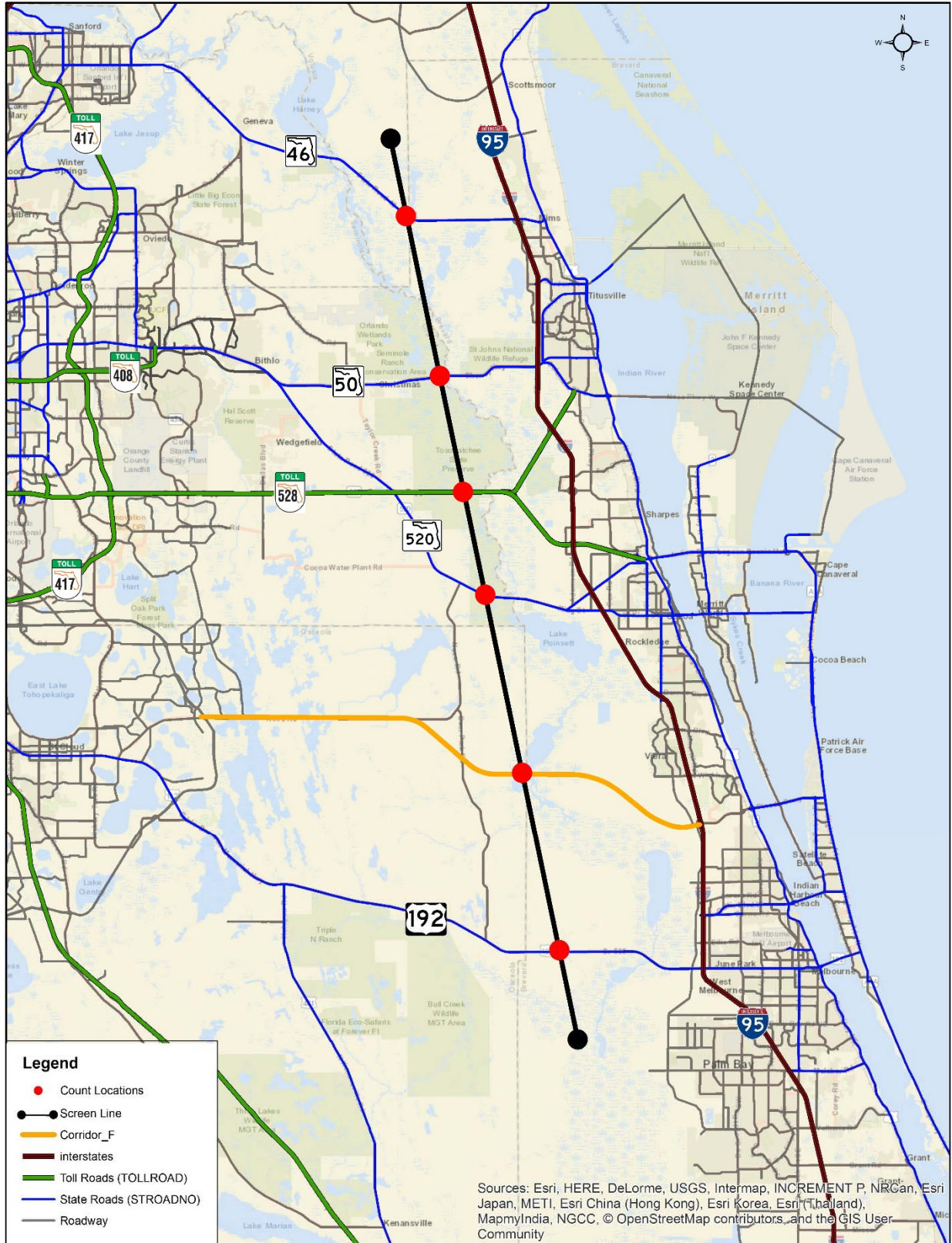
4.4.5 Toll Rates

Future-year tolls in the project-specific model reflect current toll amounts and agency policies concerning future toll rate adjustments. An average toll rate is established that is a combination of the cash and electronic toll rates, based on an electronic participation rate. For the NECEE alternatives, the toll rate was set to \$0.18 per mile in 2018 for design traffic, consistent with the toll rate established for the OCX Projects. Toll rates were escalated at 1.5% per year according to the CFX Customer First Toll Policy.

4.4.6 Screenlines

A final measure of success in validation is the volume of traffic crossing the screenlines within the study area. The critical screenline for the study area is the St. Johns River screenline that runs north-south through the study area between Orange/Seminole counties and Brevard County. The screenline includes SR 46, SR 50, SR 528, SR 520, Nova Road and US 192, shown on Figure 4.3.

Figure 4.3: Screenline for NECEE Project



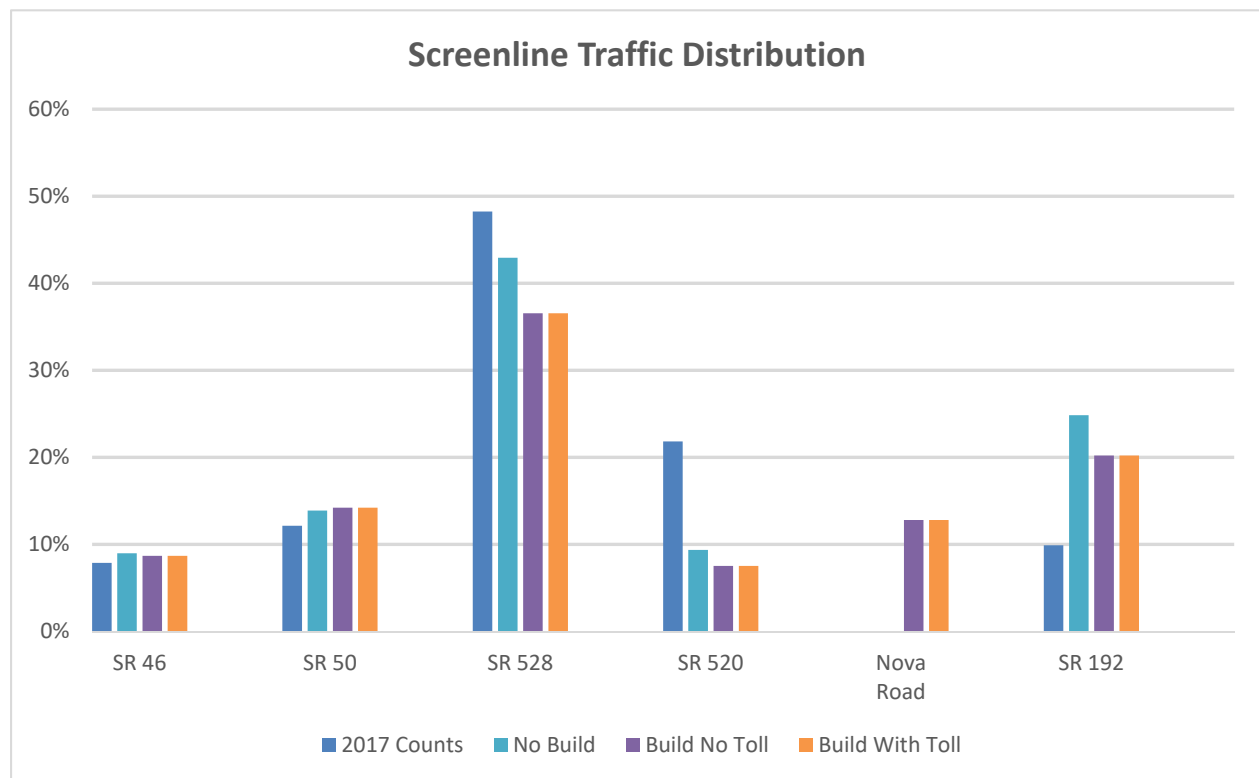
This screenline includes six east-west running highways. Table 4.5 contains a summary of 2017 traffic counts, 2045 model-predicted traffic volumes for No Build, Build No Toll/No Additional SE data, Build No Toll and the Build Alternatives.

Table 4.5: Screenline Counts and Forecasts

Roadway	2017 Count	2045								
		No Build	Build No Toll/No SE Data	Build No Toll	Alternatives 1 & 2	Alternatives 3 & 4	Alternatives 5 & 6	Alternatives 7 & 8	Alternatives 9 & 10	Alternatives 11 & 12
SR 46	7,400	13,700	13,100	13,500	13,700	13,700	13,700	13,600	13,700	13,700
SR 50	11,400	21,200	20,900	22,100	20,900	20,900	20,600	21,100	20,300	20,500
SR 528	45,300	65,500	52,200	56,800	62,500	62,800	62,200	62,200	62,100	62,400
SR 520	20,500	14,300	7,700	11,700	12,200	12,200	12,000	12,000	12,000	12,000
Nova Rd	0	0	22,100	19,900	10,700	10,600	11,400	11,300	11,200	11,200
US 192	9,300	37,900	27,900	31,400	32,700	32,700	32,800	32,600	33,400	32,700
TOTAL	93,900	152,600	143,900	155,400	152,700	152,900	152,700	152,800	152,700	152,500

There is a good fit between model volumes and 2017 counts on the screenline, with the traffic distribution along the screenline being consistent between the counts, the No Build, and the Build Scenarios, as shown on Figure 4.4.

Figure 4.4: Screenline for NECEE Project



5. Design Criteria

5.1 Roadway Design Standards

Development of this project was guided by the basic design criteria listed below.

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

Design Element	Design Standard				Source	
	Total (ft)		Paved (ft)			
	Outside	Left	Outside	Left		
<u>Shoulder Width (lanes 1-way)</u>					FDM Part 2, Tbl. 210.4.1, 211.4.1 Fig 211.4.1, 211.4.2, 210.4.2, 210.4.3	
Freeway						
3-lane or more	12	12	10	10		
2-lane	12	8	10	4		
Ramp						
1-lane	6	6	4	2		
2-lane	10	8	8	4		
Aux. Lane	12	N/A 8	10	N/A 4		
Arterial & Collector (Norm. volume)						
2-lane divided	10	8	5	0		
2-lane undivided	10	N/A 8	5	N/A 0		
Service Road, 2-Lane, 2-Way, Undivided	10	10	5	5		
<u>Shoulder Cross Slope</u>	0.06	0.05	-	-		FDM Part 2, Sect. 210.4.1, 211.4.2 Fig 210.4.2, 211.4.1
<u>Max. Shoulder "Roll-over"</u>	7.0%	7.0%	-	-		
<u>Bridge section (lanes 1-way)</u>					FDM Part 2, 260.3, Fig 260.1.1, 260.1.2	
2-lane	10	6	-	-		
3-lane or more	10	10	-	-		
1-lane ramp	6	6	-	-		
<u>2-lane ramp</u>	10	6	-	-		
Service Road, 2-Lane, 2-Way, Undivided	10	10	-	-		
<u>Border Width</u>					FDM Part 2, Sect. 211.6 - (CFX Policy) ³ FDM Part 2, Sect 210.7, Tbl 210.7.1	
Freeway	94-ft, (94-ft desirable)					
Ramp	94-ft, (L.O.C. plus 10-ft as minimum)					
Arterial/Collector (Curb & Gutter)						
C1 Natural	35-ft					
C2 Rural	35-ft					
C2T Rural Town	12-ft					
C3 Suburban	12-ft					
C4 Urban General	12-ft					
C5 Urban Center	12-ft					
C6 Urban Core	14-ft					
<u>Roadside Slopes</u>	Fill Height (ft)		Rat		FDM Part 2, Tbl. 215.2.3 - (CFX Policy) ³ Use 1:3 slopes, avoid 1:2 slopes except where as necessary	
Front Slope	0.0-5		1:6			
	5-10		1:6 to CZ & 1:4			
	10-20		1:6 to CZ & 1:3			
	>20		1:2 with guardrail (Use 10-ft bench at half the height of fill)			
Front slope (curb & gutter)	All		1:2 not flatter than 1:6			
Back slope	All		1:4 or 1:3 w/ standard width trap ditch & 1:6 front slope			
Back slope (curb & gutter)	All		1:2 not flatter than 1:6			
Transverse slope	All		1:10 or flatter (freeway/interstate)			
Transverse slope (curb and gutter)	All		1:4			

Design Element	Design Standard		Source	
<u>Max. Grade / Max. Change in Grade</u> Freeway (Rural/Urban) Ramp Directional Loop Arterial C1 Natural C2 Rural C2T Rural Town C3 Suburban C4 Urban General C5 Urban Center C6 Urban Core Min. Grade Curb & Gutter	Max. Grade	Max Change in (70 mph/60 mph) 0.20% / 0.40%	FDM Part 2, Tbl. 210.10.1, 210.10.2, 211.9.1	
	3.0%			
	5.0%	0.60%		
	7.0%	1.00%		
	4.0%	0.50%		
	4.0%	0.50%		
	8.0%	1.00%		
	7.0%	0.90%		
	8.0%	1.00%		
	8.0%	1.00%		
	8.0%	1.00%		
0.3%	-	FDM Part 2, Sect. 210.10.1.1		
<u>Minimum Stopping Sight Distance</u> (Grades 2.0%)	Dsgn. Speed (mph)	Distance (ft)	FDM 210.11.1	
	70	730		
	60	570		
	55	495		
	50	425		
	45	360		
<u>Decision Sight Distance</u> (Per avoidance maneuver)	Dsgn. Speed (mph)	Distance (ft)	-AASHTO Exh. 3-3	
	70	780-1445		
	60	610-1280		
	55	535-1135		
	50	465-1030		
	45	395-930		
30	220-620			
<u>Horizontal Curve Length</u> Freeway Others <u>Max. Curvature (Degree of Curve)</u> Freeway DS = 70 mph Rural DS = 60 mph Urban Arterial DS = 55 mph Rural DS = 45 mph Urban Collector DS = 45 mph Frontage Road DS = 50 mph Service Road Ramp DS = 50 mph Directional DS = 30 mph Loop	V = Design Speed 30V (desirable) 15V (min.)		FDM Part 2, Tbl 211.7.1	
			FDM Part 2, Tbl 210.9.1, 210.9.2	
	3° 30' 00"			
	5° 15' 00"			
	6° 30' 00"			
	8° 15' 00"			
	8° 15' 00"			
	8° 15' 00"			
	8° 15' 00"			
	24° 45' 00"			
	<u>Superelevation Transition</u> Tangent Curve Spirals	80% (50% min.) 20% (50% min.) (Curves <1°30' 00" do not use spirals) ₄		FDM Part 2, Sect. 210.9 - (CFX Policy)
		<u>Superelevation Transition Rates</u>		FDM Part 2, Tbl. 210.9.3
		e _{max} = 0.10		
	2-lane	1:200 (45-50 mph) 1:225 (55-60 mph) 1:250 (65-70 mph)		- Design Standards Ind. No. 510, 511 - AASHTO Exh. 3-28
3-lane	1:150 (45-50 mph) 1:170 (55-60 mph) 1:190 (65-70 mph)			
4-lane or more	1:100 (25-35 mph) 1:125 (40 mph)			
e _{max} = 0.05 (all lanes)	1:150 (45 mph)			

Design Element	Design Standard			Source	
<u>Vertical Curves</u> Length, $L = KA$ Mainline Ramps	Dsgn. Speed (mph)		K-value		FDM Part 2, Tbl 211.9.2 - AASHTO Exh. 3-72 (crest), 3-75 (sag) - <i>CFX Policy</i> ³ <i>Note: FDOT K-values for "ALL OTHER FACILITIES" are desirable</i>
			Crest	Sag	
	70		401	181	
	60		245	136	
	55		185	115	
	50		136	96	
	45		98 N/A	79 N/A	
	30		31 N/A	37 N/A	
	70		401	181	
	60		245	136	
	50		136	96	
	45		98	79	
30		31	37		
<u>Minimum Lengths</u>	Crest	Sag			FDM Part 2, Tbl 211.9.3
Freeway					
DS = 70 mph Rural	1000-ft	800-ft	*Crest = 1800-ft within interchange		
DS = 60 mph Urban	1000-ft	800-ft			
Arterial					
DS = 55 mph Rural	350-ft	250-ft			
DS = 45 mph Urban	135-ft	135-ft			
Collector					
DS = 45 mph Frontage Road	135-ft	135-ft			
DS = 50 mph Service Road	300-ft	200-ft			
Ramp					
DS = 50 mph Directional	300-ft	200-ft			
DS = 30 mph Loop	90-ft	90-ft			
Lane Drop Taper	$L = WS$ (DS = 45 mph) $L = WS^2/60$ (DS ≤ 40 mph) 50:1 min, 70:1 desirable (freeways)			- Design Standards Ind. No. 525, 526 - AASHTO Pg. 818	
<u>Clear Zone</u>	Travel Lanes		Auxiliary Lanes		FDM Part 2, Sect. 210, 211, 215 FDM Tbl 215.2.1
Freeway	36-ft		24-ft		
DS = 70 mph Rural					
DS = 60 mph Urban					
Arterial	30-ft		18-ft		
DS = 55 mph Rural	4-ft (Curb & Gutter)		14-ft		
DS = 45 mph Urban	24-ft				
Collector	4-ft (Curb & Gutter)				
DS = 45 mph Frontage Road	24-ft		14-ft		
DS = 50 mph Service Road	24-ft		14-ft		
Ramp	18-ft		8-ft		
DS = 50 mph Directional	6-ft		6-ft		
1 to 2-lane					
DS = 30 mph Loop					
1 to 2-lane					
<u>Vertical Clearance</u>	Over Roadway 16'-6" FDM 16.5 Over Railroad 23'-6" FDM 23.5 Sign over Roadway 17'-6" FDM 17.5 Over Water 12'-0" min. FDM 12'-0"			FDM 260.6 FDM Overhead Sign 210.10.3 FDM Waterway 260.8.1	
<u>Limited-Access Limits</u>	Rural 300-ft min. Urban 100-ft min. Crossroad overpass/no interchange 200-ft			FDM Part 2, Sect. 211.15.	

5.2 Drainage Design Standards

The NECEE basins are open basins located within Orange and Osceola counties.

The criteria used for design is set by CFX, SFWMD, SJRWMD, FDEP, FDOT, Osceola County and Orange County. The most stringent criteria governs.

Resources are listed below:

- SFWMD ERP Applicant's Handbook Volumes I and II, May 2016
- SJRWMD ERP Applicant's Handbook, Volumes I and II, June 2018
- FDOT Drainage Manual, January 2018
- FDOT Drainage Design Guide, January 2018
- FDOT Design Manual, January 2018
- NRCS Urban Hydrology for Small Watersheds - TR-55, June 1986

5.2.1 Pond Design

Peak Runoff Rates

- Calculated using SCS Runoff Curve Number Method

Attenuation Criteria

- The post developed peak rate of discharge must not exceed the pre-developed peak rate of discharge for the 25 year/72 hour (SFWMD) or 25 year/24 hour (SJRWMD) storm.
- Outlet design additionally checked for the 10 year/24 hour storm in the Upper St. Johns River Hydrologic Basin (SJRWMD)

Treatment Volume Criteria

Water Quality (SFWMD and SJRWMD): Provide wet detention volume for the greater of:

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

Nutrient Reduction Criteria

BMAP - Lake Okeechobee and Long Branch Basins, potentially others:

- Limit post development discharge loading rates to meet predevelopment rates. Specific loading rate criteria will require meetings with the water management districts to provide greater detail for project within impaired waterbodies.

- Presumptive criteria- An additional 50% water quality treatment is required in all the basins as a best management practice to address impaired waters.

Control Devices/Bleed-down

- Maximum discharge of 1/2 of the detention volume in 24 hours (SFWMD)
- Discharge of 1/2 of the detention volume in 24 to 30 hours (SJRWMD)
- Devices greater than 6 square inches cross sectional area, 2" minimum dimension (SFWMD and SJRWMD)

Permanent Pool Volume

- Permanent pool shall be sized to provide at least a 14-day average residence time during the wet season (June to October) (SJRWMD).
- At least 30% of pond surface area shall consist of littoral zone. Alternatively, increase permanent pool volume to provide a 21-day residence time (SJRWMD).
- Minimum 6-foot depth at control elevation (SFWMD).
- Maximum 12-foot depth at control elevation and mean depth between 2 and 8 feet (SJRWMD).

Pond Configuration

- 0.5 AC minimum and minimum width of 100 feet for linear areas in excess of 200 feet (SFWMD).
- Length to width ratio must be at least 2:1 to minimize short circuiting (SJRWMD).
- Maximum side slope 1V:4H from top of bank to three feet below the control elevation per Osceola County. Side slopes steeper than 1:4 should be checked for slope stability issues.
- 20-foot wide maintenance easement provided beyond control elevation and connect to a public road.
- Maintenance berms with cross slope of 1:15 (V:H) or gentler, with back slopes no steeper than 1:3.
- Design high water levels shall meet base clearance requirements of 3 feet for mainline and 1 foot for ramps for a period of greater than 24 hours.
- One foot of freeboard between design high water level and the minimum berm elevation.

5.2.2 Floodplain Impacts

FEMA has developed Flood Insurance Rate Maps (FIRM's) for the study area as listed below:

Osceola County

- 12097C0150G
- 12097C0175G
- 12097C0285G
- 12097C0295G
- 12097C0325G
- 12097C0350G

Orange County

- 12095C0315F
- 12095C0320F
- 12095C0500F
- 12095C0525F

FEMA: No net encroachment into the floodplain, between the average wet season water table and that encompassed by the 100-year event. Compensating storage will be provided for the impacts.

SJRWMD: No net encroachment for the 10-year event.

5.2.3 Cross Drains

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

Peak Runoff Rates

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

Design Frequency

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

5.2.4 Canal Criteria

Unregulated Canals

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

6. Mobility Alternatives Evaluation

6.1 No-Build Alternative

The No-Build Alternative assumes the NECEE does not exist in the design year 2045. In this case, travel demand would be accommodated by the existing and currently planned regional roadway network. It should be noted this project is not anticipated to be developed until after the year 2040 at such time when land use associated with the North Ranch Master Plan begins to develop. A true no-build analysis related to regional travel demand and capacity was not performed for this study; however, it would be anticipated that a traditional no-build traffic analysis would be performed in subsequent reevaluations and project development studies for this project.

6.1.1 Projected Design Year Traffic – Year 2045

The traffic forecasts used for design purposes are developed so that the project would be adequately sized to serve customers through its useful life (30 years). The traffic forecasts used for revenue estimation are, on the other hand, created so that the project would be able to produce the forecasted revenue, especially in the opening years. Therefore, traffic forecasts prepared for design purposes are somewhat different from, and higher than, the traffic forecasts prepared for revenue-estimation purposes. While the basic assumptions, including overall level and location of future socio-economic activity and toll amounts/values of time are the same, the assumptions about the network near the project are somewhat different.

CDM Smith, CFX's General Traffic and Earnings Consultant, developed a project-specific travel demand model to prepare traffic forecasts for concept study evaluation of the OCX Master Plan projects (Osceola Parkway Extension, Northeast Connector Expressway, Southport Connector Expressway, and Poinciana Parkway I-4 Connector). The model characteristics, socio-economic data, validation and calibration of the travel demand model, CFX 3.0 Model, is described in detail in the Concept, Feasibility and Mobility study reports for those projects. The travel demand model used for the analysis of the NECEE project was the CFX 3.0 Model with some updates specific to this study. This study area model description, socio-economic data assumptions, zonal disaggregation and screenline analysis are described in Chapter 4 of this document. The following section describes the model assumptions used in developing the traffic forecasts for design purposes.

6.1.2 Design Network – Year 2045

The CFX 3.0 Model has a 2045 Base Network that includes the transportation improvements included in the MetroPlan Orlando LRTP and CFX's 2040 Master Plan. In the 2040 LRTP, the OCX Master Plan Projects: Osceola Parkway Extension, Northeast Connector Expressway, Southport Connector Expressway, and Poinciana Parkway I-4 Connector are included as 4-lane tolled expressways. As well, the SR 408 Eastern Extension was also included as a 4-lane expressway from Challenger Parkway to SR 50 just north of SR 520. To ensure that traffic forecasts provide the level of traffic over the life of the project, the 2045 Design Traffic Network

is typically scaled back to reflect the 2025 LRTP improvements to the local street network. For this evaluation the design network included the following improvements in the study area (Shown in Table 6.1) as a matter of reference, as well as a local street network from the North Ranch development. The North Ranch collector system was added as all 2-lane facilities to help distribute trips on the network to the traffic analysis zones.

Table 6.1: Improvements in Study Area included in Design Network

Facility	From	To	Improvement/ Number of lanes
SR 528	SR 436/Semorán Blvd	Innovation Way	8-lanes
SR 528	Innovation Way	Dallas Blvd	6-lanes
Simpson Road	Osceola Parkway	Boggy Creek Road	4-lanes
Boggy Creek Rd	Simpson Road	Tradeport Drive	4-lanes
Sunbridge Parkway	SR 528/Innovation Way	Osceola Pkwy Ext	New 4-lane
Sunbridge Parkway	Osceola Pkwy Ext	Nova Road	New 2-lane
Corridor F	Northeast Connector	I-95	New 4-lane

6.1.3 Socio-Economic Assumptions

For the NECEE forecasts, the Socio-Economic (SE) data sets from CFX 3.0 Model were used as a base. This base SE data set included a new housing, employment, school enrollment and hotel/motel forecast developed by Fishkind & Associates (FKA), an independent economist, for the OCX Master Plan projects. FKA developed a set of SE data forecasts for years 2025, 2035 and 2045, as well as a low-side and high-side forecast. For the design traffic forecasts, the 2045 base, or medium, SE data forecasts were used.

Since the NECEE project is outside the current planning horizon of most SE data forecasts, the SE data in the study area is very limited and is typical of rural/agricultural land uses. To provide a design traffic forecast, a portion of the North Ranch Master Plan land uses were considered for the study. The adopted North Ranch Master Plan transportation plan was provided by Deseret Ranches and 20% of the land uses were included in the SE data set. A more detailed description of the land uses is defined in Chapter 4 of this document.

6.1.4 Toll Rates

The project has been coded in the design network with a toll rate of \$0.18 per mile in FY 2018 dollars, consistent with the average toll on all new CFX facilities. The toll rates were set by

multiplying the rate per mile with the project segment lengths in miles, measured to centerline of the interchange cross street. The toll rates were then inflated to 2045 using the new toll policy of a compounded annual growth rate of one and one-half percent (1.5%), in accordance with the CFX Customer First toll rate policy, adopted by the CFX Board in January 2017.

6.1.5 Project Alignments AADT Volumes – Year 2045

For study purposes, the NECEE was studied as one of many projects completed by 2045. For the “No-Build” alternative, the four OCX Master Plan projects were assumed to be constructed as part of the background network along with the SR 408 Eastern Extension and Corridor F alignment from the East Central Florida Corridor Evaluation Study. Using the calibrated model, traffic forecasts were developed for the year 2045 to coincide with the opening year of the project since this project is not anticipated to be needed until 2045 or later. The full model was run using the Design Network and the medium SE data set with 20% of the expected development from the North Ranch Master Plan for the Build No-Toll option to attract the most amount of traffic to the study area. Using the Trip Table from this full model run, assignment only runs were completed for each of the six Build options or project tolled alignments. The FDOT Model Output Conversion Factor (MOCF) of 0.98 was applied to the model segment volumes to estimate 2045 AADT. The MOCF for Orange and Osceola counties was obtained from the FTI webpage. The set of maps depicting the NECEE alternatives with the 2045 design traffic by segment are shown on Figures 6.1 – 6.6.

Figure 6.1: NECEE Alternatives 1 & 2

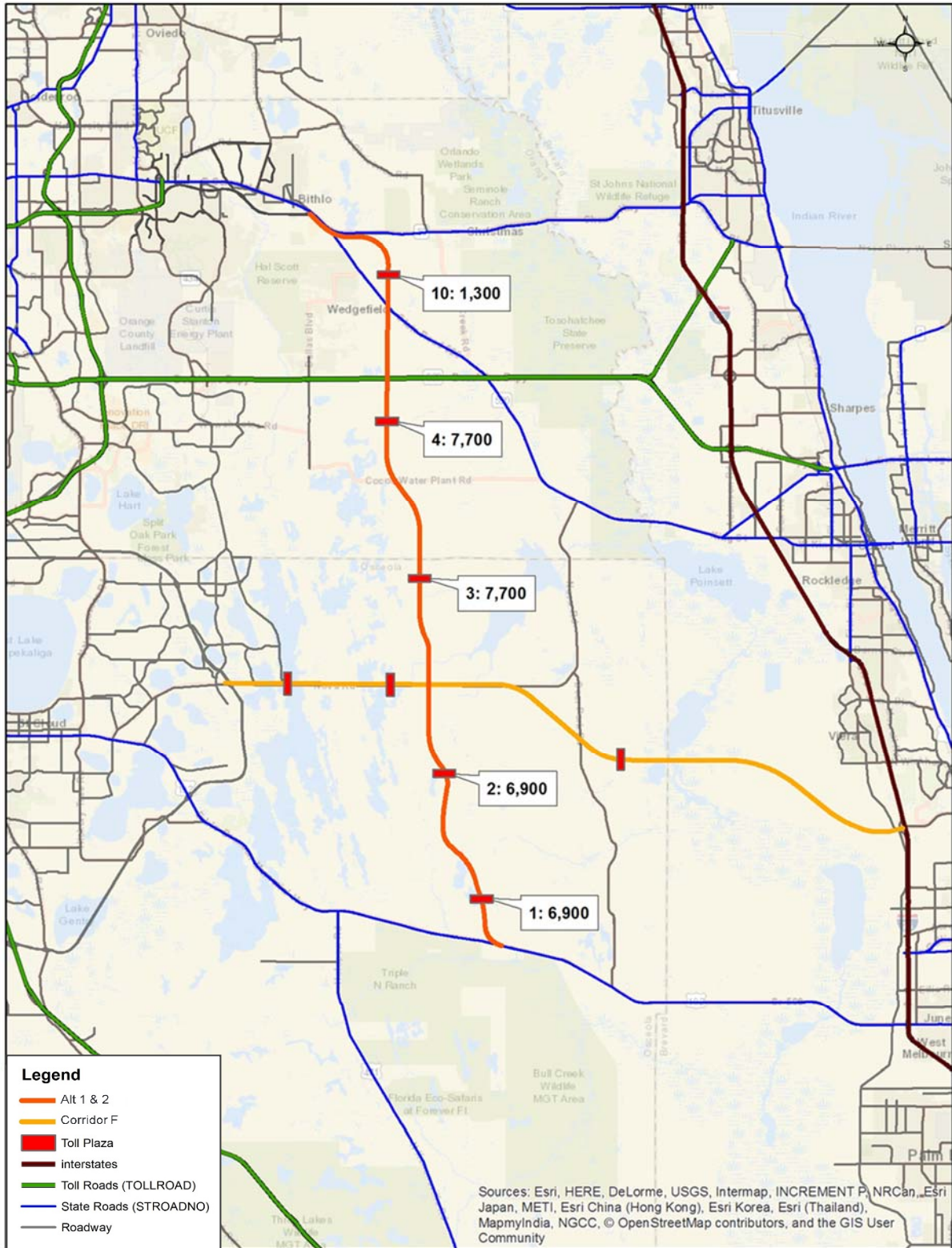


Figure 6.2: NECEE Alternatives 3 & 4

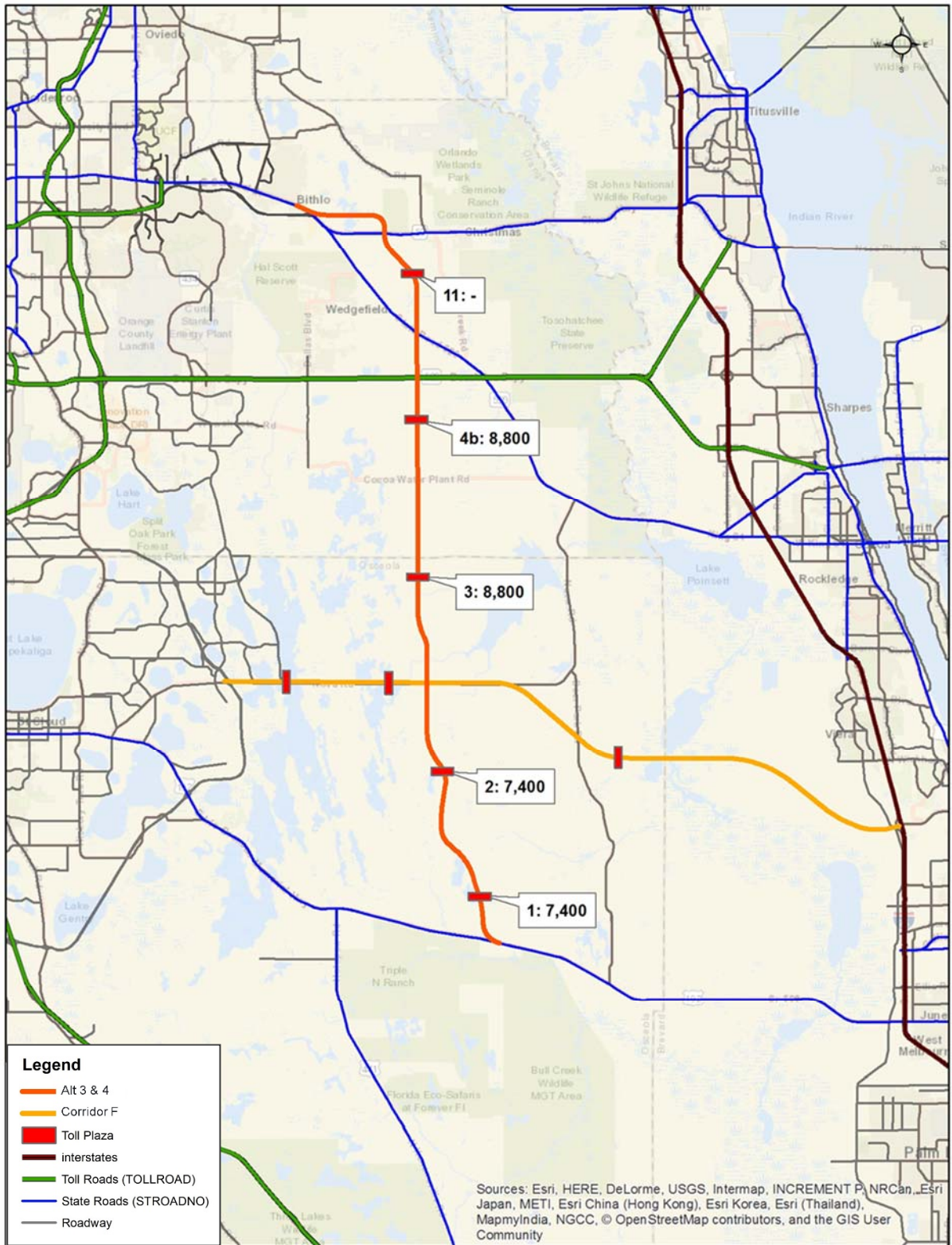


Figure 6.3: NECEE Alternatives 5 & 6

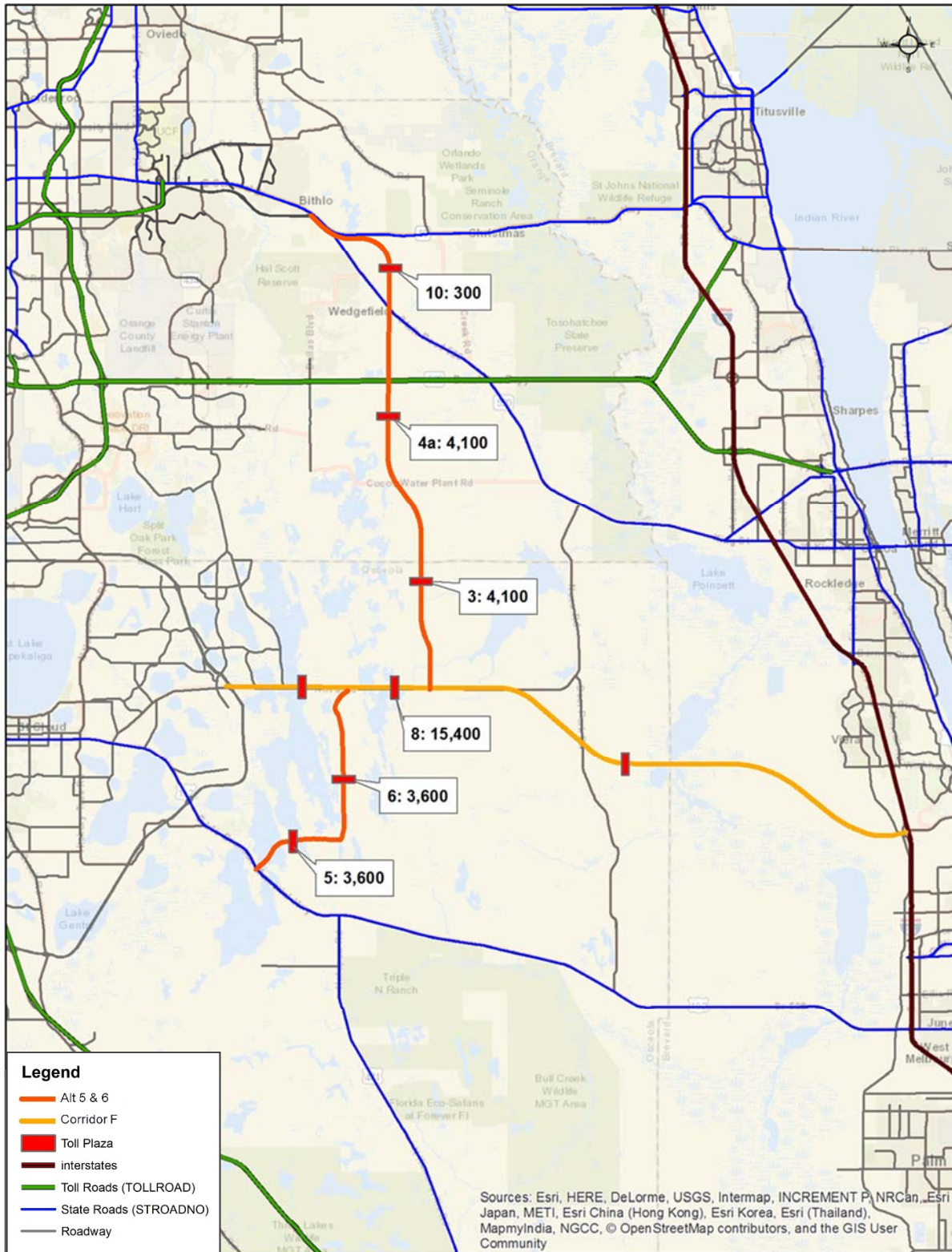


Figure 6.4: NECEE Alternatives 7 & 8

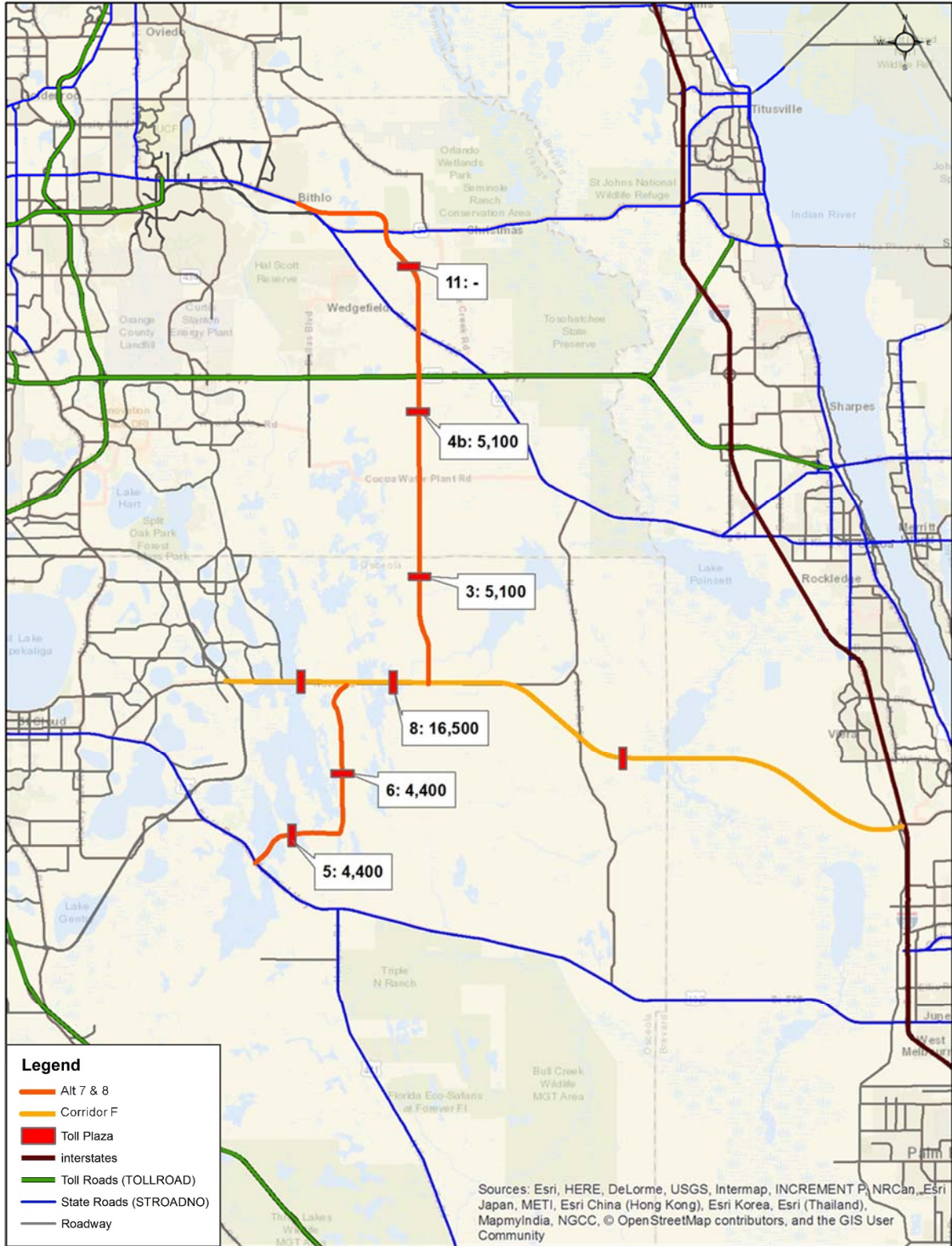


Figure 6.5: NECEE Alternatives 9 & 10

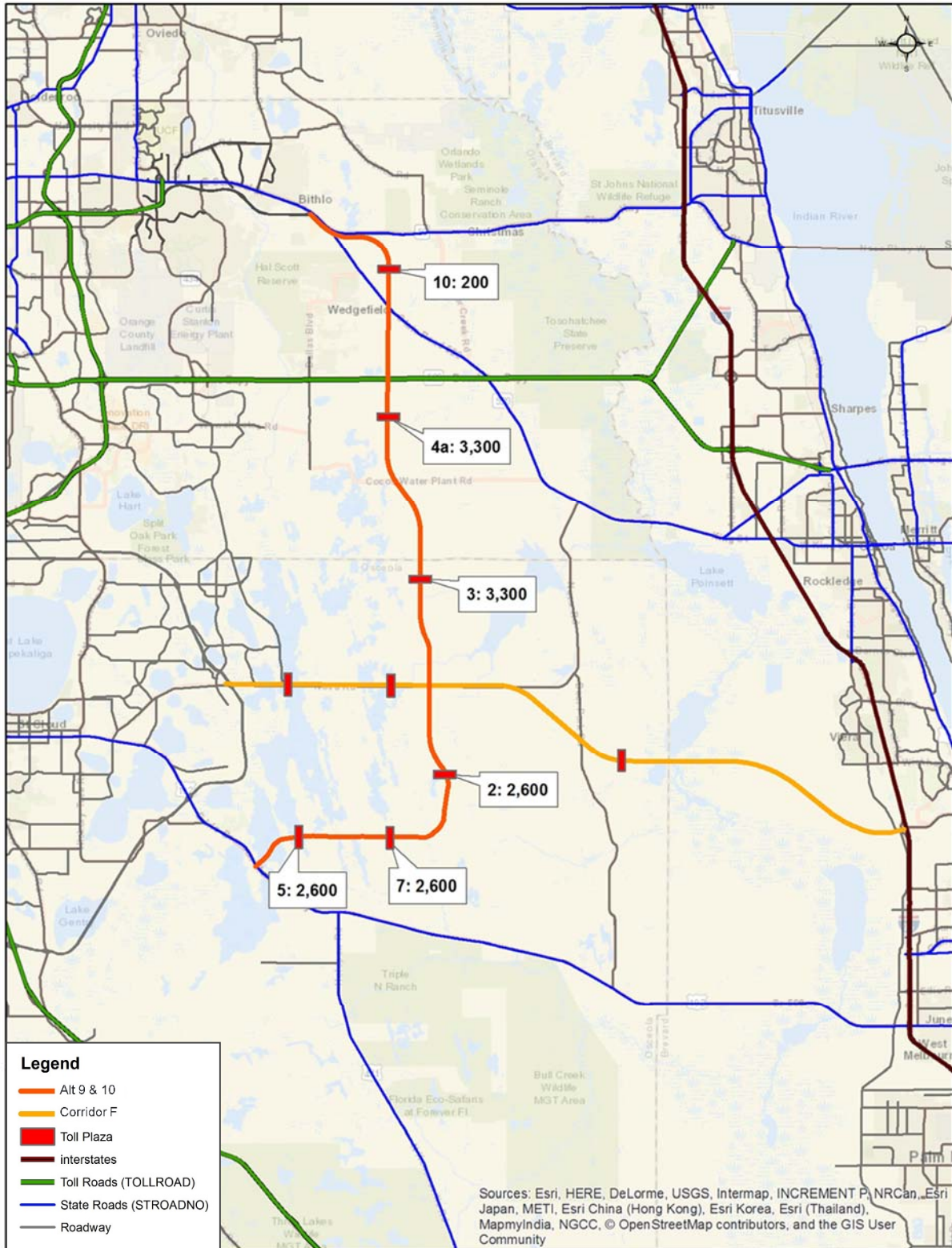
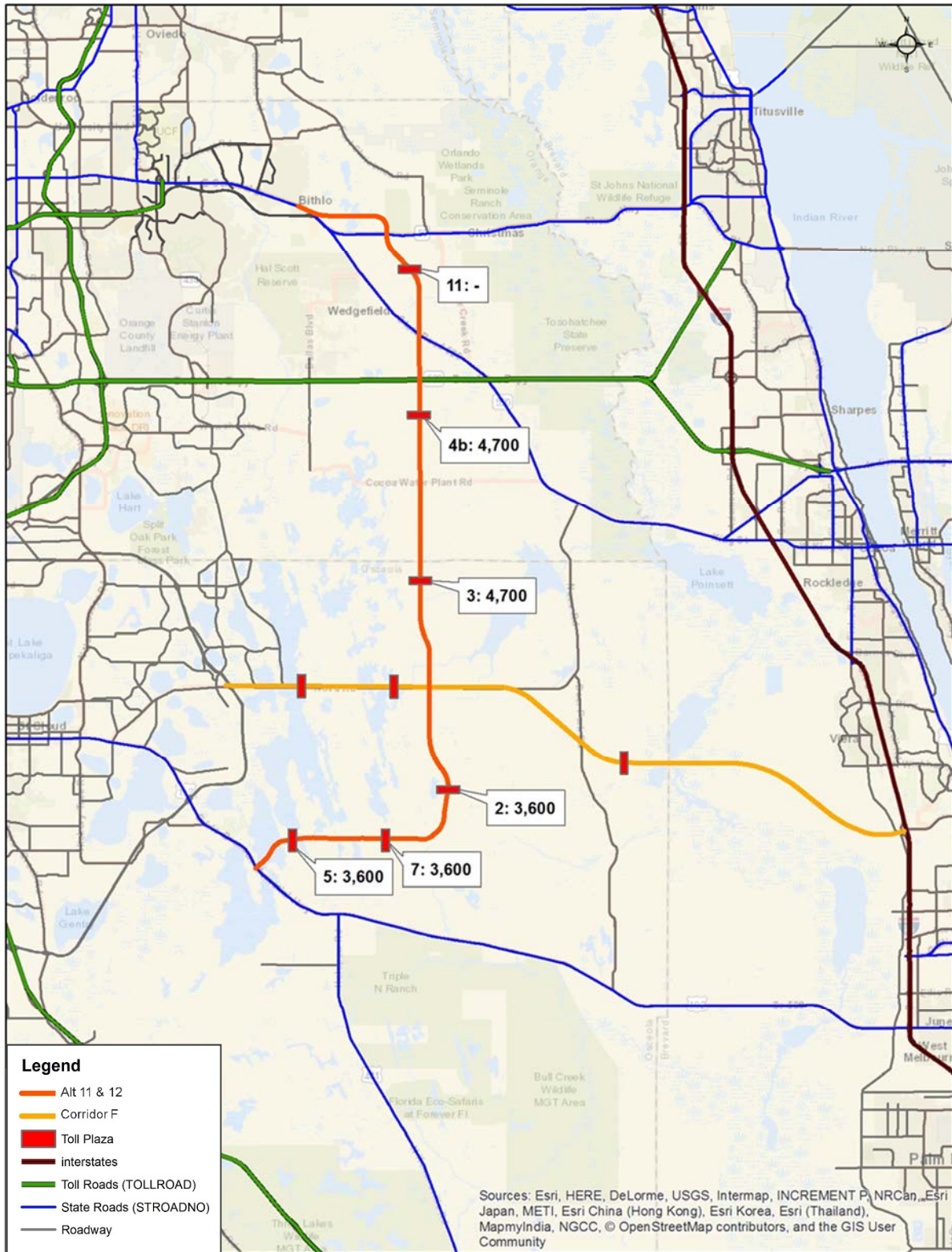


Figure 6.6: NECEE Alternatives 11 & 12



6.2 Weighted Average AADT

For the project evaluation matrix, a weighted average AADT was provided to compare the alignments. The weighted average provided an even comparison based on the amount of traffic generated by the project weighted by the length of the project. The 2045 design traffic AADT per segment was multiplied by the length of each segment and the sum was divided by the total length of the alignment. The weighted average 2045 Design AADT for each alignment is provided in Table 6.2.

Table 6.2: Weighted Average Daily Traffic

Alternative	Total AADT	Length	Weighted AADT
1	30,500	32.81	5,600
2	30,500	32.81	5,600
3	32,400	33.26	5,700
4	32,400	33.26	5,700
5	31,100	35.22	4,300
6	31,100	35.22	4,300
7	35,500	35.66	4,800
8	35,500	35.66	4,800
9	14,600	36.38	2,300
10	14,600	36.38	2,300
11	20,200	36.82	3,000
12	20,200	36.82	3,000

General Notes:

Design traffic conditions with medium-level SE data and tolls at \$0.18 per mile toll rate.

All Alternatives assume Corridor F is open.

All Alternatives assume 20% of the North Ranch SE data is included.

6.3 Transit, Intermodal, Multimodal Alternatives

This assessment focuses primarily on mass transit technologies and supporting facilities, but also considers how technological advances and future developments may increase use of multimodal alternatives and how mobility choices may affect the expressway design, use, capacity and travel times.

6.3.1 CFX Multimodal Policy

This assessment began with a review of the CFX Multimodal Policy. Potential multimodal improvements were identified and reviewed for consistency with the CFX Multimodal Policy.

On March 9, 2017, the CFX Board amended the 2040 Master Plan to include the following policy statement pertaining to multimodal projects:

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

This policy recognizes two types of multimodal initiatives:

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

6.3.2 Potential Multimodal Improvements

The Center for Urban Transportation Research (CUTR) conducted a Multimodal Investment Assessment for CFX in 2016 that identified the following types of multimodal improvements as candidate projects.

- Rapid transit, trams, or fixed guideways located within the CFX right-of-way
- Project is within a CFX County (or by invitation in other counties)
- Project is consistent with the MetroPlan Orlando LRTP
- Intermodal facility/facilities within CFX right-of-way, or multimodal corridor/corridors within CFX right-of-way, which improve the level of service on the expressway system. Connections to the CFX system can also be constructed up to one mile from the system.

As defined by CFX (in the 2040 Master Plan), the term “intermodal” usually means facilities, such as when transportation modes and services are brought together to promote the seamless transfer of travel between two or more modes. This can include, but is not limited to, vehicles and parking facilities (including park-and-ride lots); transit (e.g., buses, local rail, and intercity rail); taxis; rental cars; and shuttle vans. Furthermore, the term “multimodal” typically refers to a corridor serving a combination of cars and trucks, buses, fixed guideways, trams, and bicycles.

The CUTR assessment also recommended a Work Plan Project Consideration Process to ensure that candidate projects also meet CFX financial and revenue requirements and/or benefit CFX system users, and it identified seven potential projects for further consideration through a multimodal project development and evaluation program. The list below illustrates the types of

projects recommended for consideration and their primary purpose.

- SR 408: Bus Rapid Transit/Express Bus Treatment/Higher Education Connectivity
 - Supported by the MetroPlan Orlando LRTP and would support new downtown UCF Campus
- I-Drive/Florida Mall to OIA via SR 528: High Capacity Transit Evaluation
 - Supported by the MetroPlan Orlando LRTP and CFX 2040 Master Plan (improvement to SR 528)
- SR 417: Express Bus Accommodation
 - Included in the MetroPlan Orlando LRTP and CFX 2040 Master Plan (improvement to SR 417)
- Area Wide: Parking Structure Funding Feasibility
 - Alleviate expressway congestion and potential revenue generation
- Area Wide: Integrated Regional Fare/Toll Services
 - Facilitate regional mobility and potential revenue benefit or neutrality
- Area Wide: Variable Pricing Study/Future Funding Options
 - Congestion mitigation measure and potential multimodal funding stream
- Area Wide: Transit Joint Development Opportunities
 - Contribution to regional mobility and potential revenue generation

Based on this information and CUTR's recommended Work Plan Project Consideration Process, the following types of multimodal improvements are candidates for inclusion in the NECEE Study.

- Multimodal improvements in the MetroPlan Orlando LRTP
- New multimodal improvements in CFX right-of-way
- New multimodal improvements within one mile of CFX right-of-way

6.3.2.1 Potential MetroPlan Orlando LRTP Multimodal Improvements

The MetroPlan Orlando 2040 LRTP includes five transit projects wholly or partially in Osceola County or Orange County. These include the US 192 (SR 500) Bus Rapid Transit (US 27 in Lake County - Downtown Kissimmee), the Kissimmee Circulator (within Kissimmee), the Orlando International Airport (OIA) Connector Corridor, the SR 50 Corridor (Downtown Orlando – UCF), and SunRail Phase 3 (SunRail Phase 2 – OIA). These projects are not within one mile of the NECEE; therefore, they are outside the limits established by the Master Bond Resolution. Based on this review, there are currently no multimodal candidate projects within the MetroPlan Orlando LRTP to consider for the NECEE.

6.3.2.2 Potential New Multimodal Improvements

While no multimodal improvements are in the MetroPlan Orlando LRTP, it is possible for new multimodal improvements to be developed by CFX within the right-of-way of a planned expressway; however, the multimodal improvement would need to meet CFX financial and/or revenue requirements. Based on this review, there are no current multimodal candidate projects to include in the planned right-of-way for the NECEE; however, preserving right-of-way for multimodal improvements now will help to manage long-term congestion and could provide a test-bed for emerging technologies.

Technology and Multimodal Improvements

Intelligent Transportation Systems (ITS) have a wide range of applications that continue to advance and expand. Advances in areas such as autonomous, connected, electric and shared vehicles and communication networks will have impacts on the nature and timing of potential multimodal projects. Advances in these areas do offer significant potential to improve traffic safety, flow and travel times, but they may also influence a shift in travel behavior and mode choice. And, while rapid advances in ITS seem to increase uncertainty in planning for multimodal projects, leveraging lower cost investments now will help build a foundation for future multimodal projects that benefit all users.

Preserving right-of-way for future intermodal facilities at or near all major interchanges is one example of a lower cost solution that lays the groundwork for connections between local and regional mobility programs and services. Plans for both the North Ranch and Northeast District call for a system of regional transit corridors and several forms of premium transit, including Commuter and Light Rail, to support their planned communities, urban centers and employment centers. Over time, intermodal facilities on these major corridors will provide connections for planned transit services. While these areas are developing, park-and-ride facilities may be a suitable interim use for ride sharing, ride hailing and regional express bus services. Park-and-ride facilities could support partnerships with service providers to advance knowledge and data to inform future mobility programs and services. Mobility as a Service (MaaS) will play an increasing role in shaping mobility services, and the development of park-and-ride facilities could provide CFX a means to progress and further define its role in the (MaaS) landscape. MaaS focuses on unifying modal data in to a single web-based platform that assists customers with obtaining the most optimal mode choices to complete their entire trip. Park-and-ride and, eventually, intermodal facilities are likely critical components in future mobility services that offer potential for new revenue sources and space for future transit joint developments.

Hard Shoulder Running

While the proposed 500-foot typical section reserves significant right-of-way for a Multimodal/Special Use Corridor, design consideration for Hard Shoulder Running (HSR) could help defer widening in the future. HSR is a strategy that DOTs use now or are exploring to enable

dynamic use of the hard shoulder (inside and outside) to improve travel times and avoid road widening. The application of HSR could increase the level of service and capacity during peak times, and, over time, support multimodal programs. HSR relies heavily on detection, communication and information systems for success and functional elements to consider include monitoring, safeguarding, dynamic information, safety precautions and lane activation/de-activation.

6.3.2.3 Potential New Multimodal Improvements within One Mile of CFX Right-of-Way

Potential multimodal improvements within one mile of the CFX right-of-way need to benefit CFX system users. Currently, viable multimodal improvements within the NECEE right-of-way are limited and largely dependent on completion of proposed development plans in Osceola County such as the Northeast District and North Ranch Master Plan. When mass transit within the NECEE study area becomes viable, additional transit, bicycle, and pedestrian improvements that expand access to intermodal facilities should be considered.

Development of the corridor alignment alternatives presented in this report considered the current Transportation Framework developed for the North Ranch Master Plan (Table 11 and Map 5 in Appendix 1). This framework includes a series of proposed east-west and north-south multimodal corridors with specified multimodal and transit features such as sidewalks, bike lanes, trails, bus rapid transit, light-rail and commuter. In consideration of the North Ranch Transportation Framework, future park-and-ride facilities at interchanges are one potential multimodal improvement to consider as the NECEE project advances in subsequent project development studies. At that time, a review of the CFX Multimodal Policy financial requirements would be required to determine if the expressway segment demand would be exceeding capacity to the point that removing a toll-paying vehicle from the expressway benefits other users (i.e., decreasing the level of congestion, increasing travel speeds, and increasing level of service). Future travel demand modeling would be required to support the need for future park-and-ride facilities.

6.3.3 Recommended Multimodal Considerations

Based on the results of the NECEE study regarding multimodal opportunities, the recommended considerations for multimodal improvements include identifying and preserving right-of-way at all interchanges to accommodate future intermodal or park-and-ride facilities. In addition, future project development studies of the NECEE should continue to evaluate and include grade-separation at locations where future multimodal corridors may cross or intersect the NECEE (i.e.: North Ranch Transportation Framework).

In addition, as described in the CUTR Multimodal Investment Assessment, CFX is in the beginning stages of the multimodal financier partnership model. Characteristics supportive of this model include densely developed areas with limited ability to provide additional highway capacity. Thus, while portions of the CFX service area are supportive of this model, the NECEE area is currently not. With the development of the North Ranch and Northeast District, further multimodal considerations will eventually be appropriate. Additionally, the current design assumes a 500-foot

typical section, which includes space for multimodal capacity; the technological advancements in transportation (i.e., autonomous, connected and shared vehicles) make it likely that the current typical section can accommodate intermodal facilities and additional modes in the future.

6.4 Tolled Limited-Access Alternative

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

6.5 Corridor Development Process

6.5.1 Development of New Corridors

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

- Prepare a base map of the study area
- Prepare Environmental and Social Constraints Maps process to identify social, natural, and physical constraints
- Develop the corridor typical section
- Identify reasonable corridor alignments that:
 - Conform to CFX design criteria; and
 - Minimize impacts to the social and natural environment, and physical constraints.

6.5.1.1 Base Map Development

A base map was prepared for the study area, depicting the existing road network, existing and planned developments, proposed roadways, utilities and environmental features. This map is shown on Figure 6.7.

6.5.1.2 Environmental and Social Constraints Maps

Environmental and Social Constraints maps were used to help identify and select corridors that are an optimal fit within a study area. Publicly available GIS data is used to identify the locations of documented sensitive resources (e.g., historic and archaeological sites, recreational areas, wetlands, and species) which occur in or around the study area. This GIS data was overlaid on a map of the study area to assist in the development of each corridor and ensure reduced impacts on these sensitive resources.

The data used to further evaluate potential environmental impacts was derived from literature and GIS datasets within the Florida Geographical Data Library, the SFWMD, the SJRWMD, the FNAI, the FDEP, FEMA, the USFWS, the FWC, and City and County. Figures 6.8 and 6.9 show the environmental and social constraints maps and the GIS sources.

Figure 6.7: NECEE Base Map

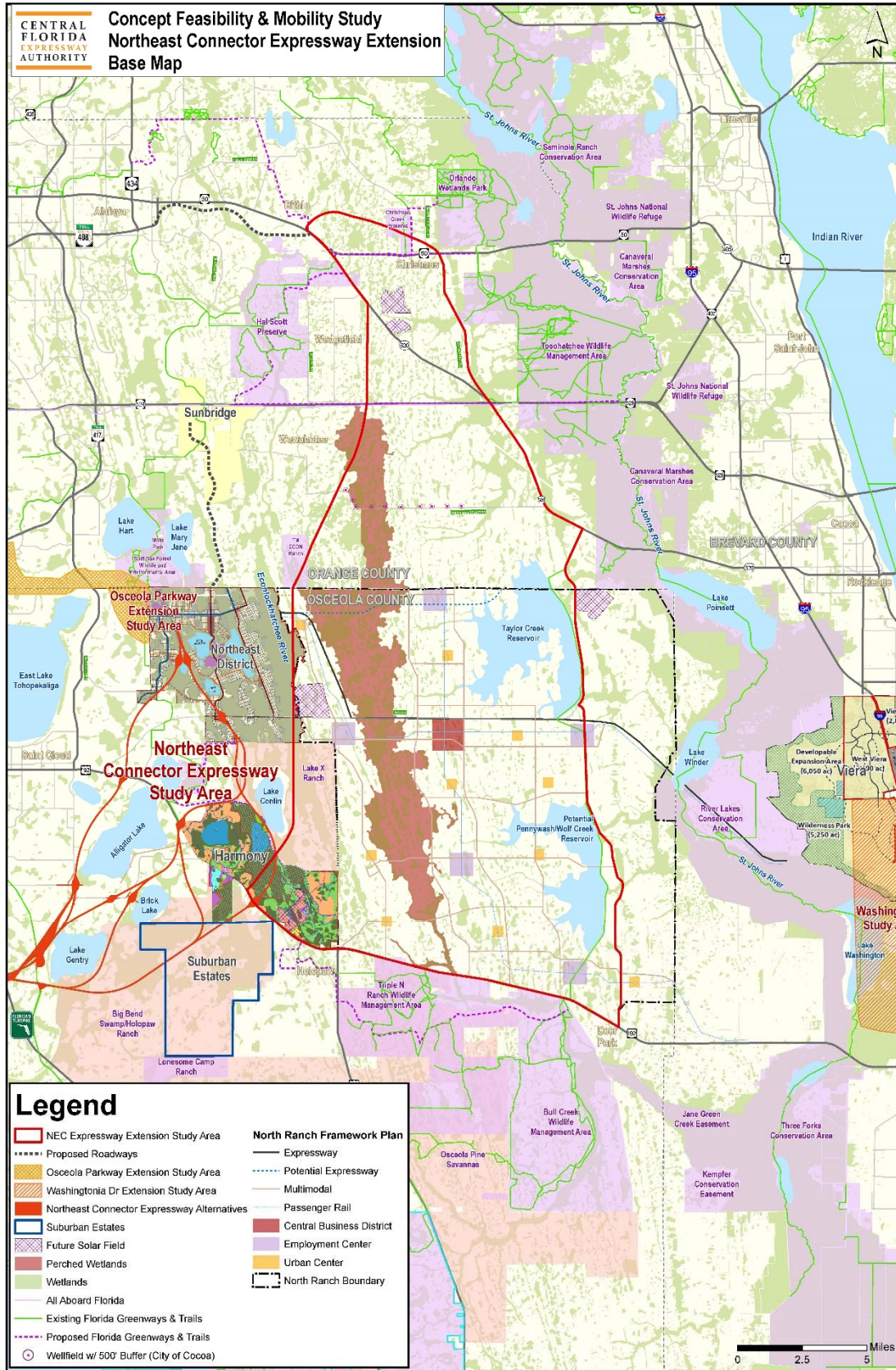


Figure 6.8: Environmental Constraints Map

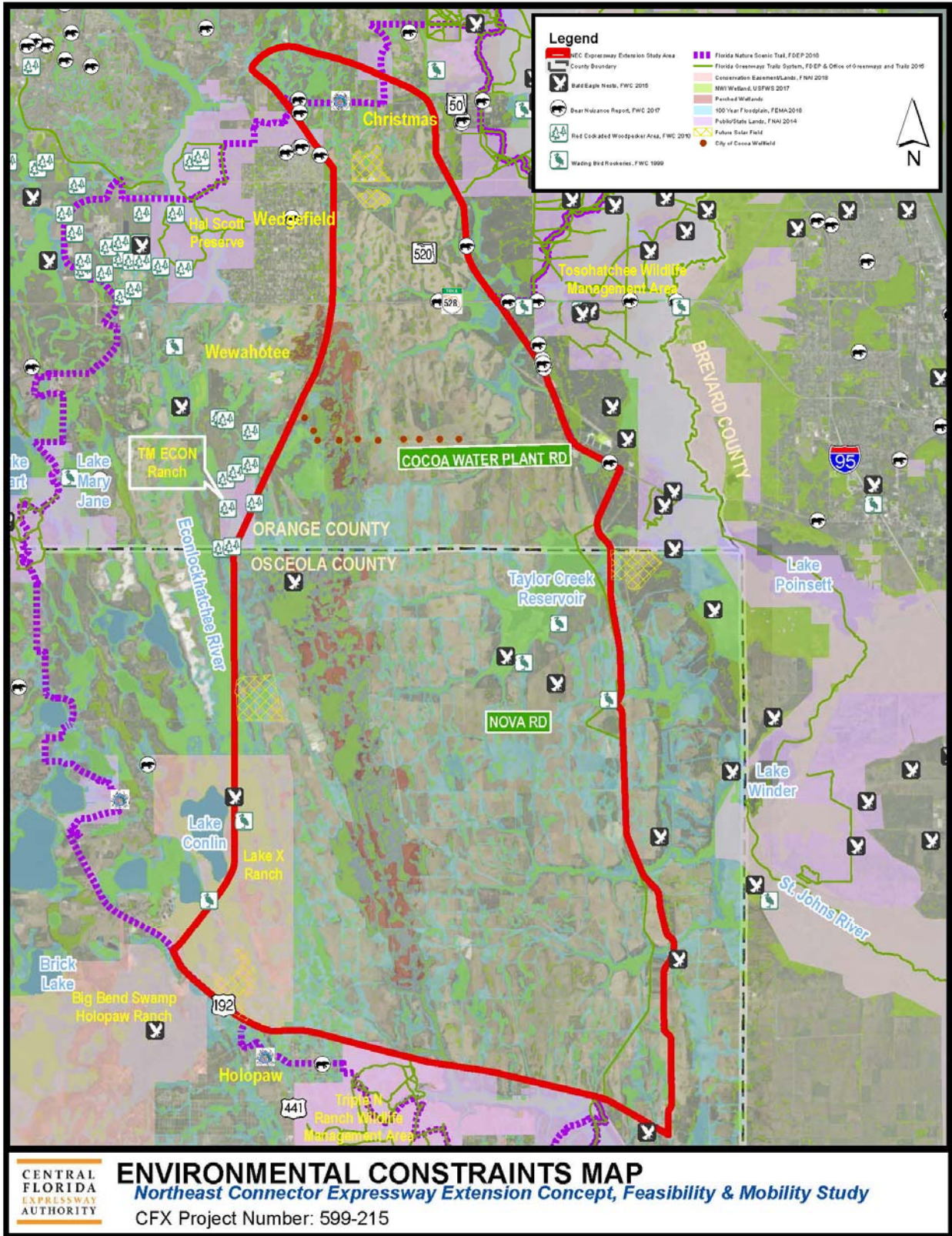
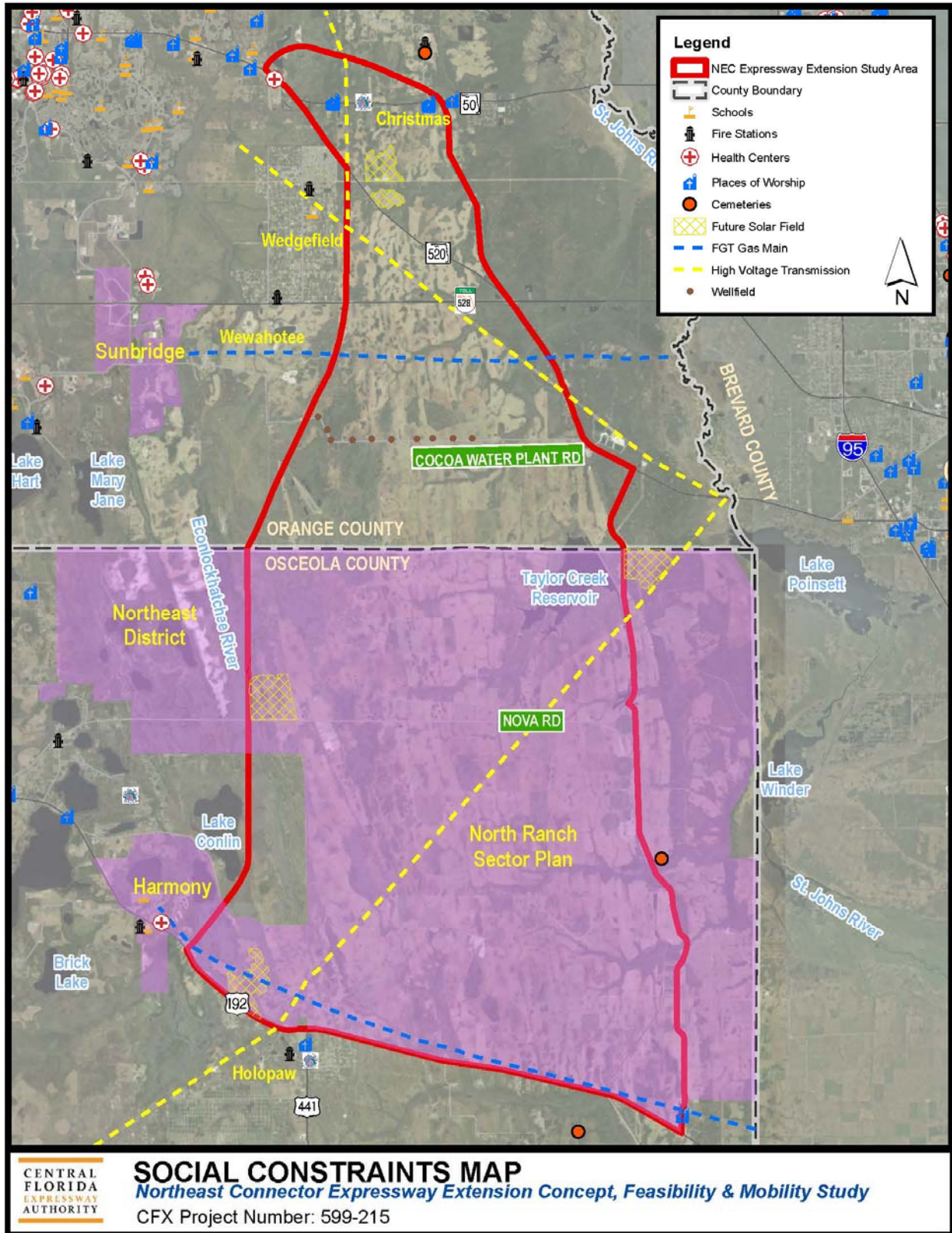


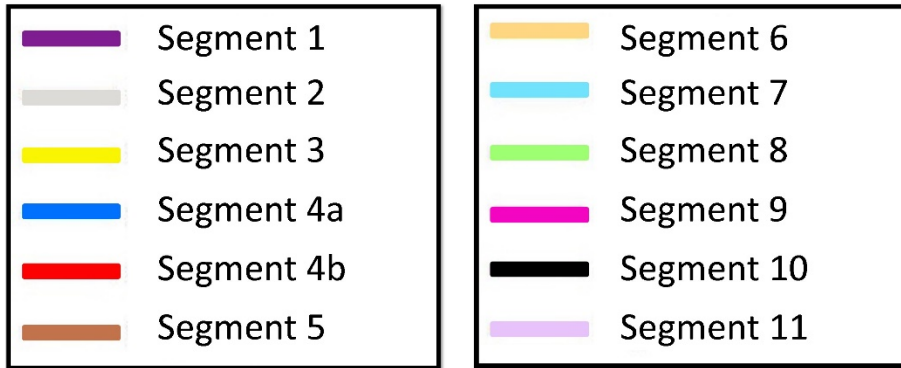
Figure 6.9: Social Constraints Map



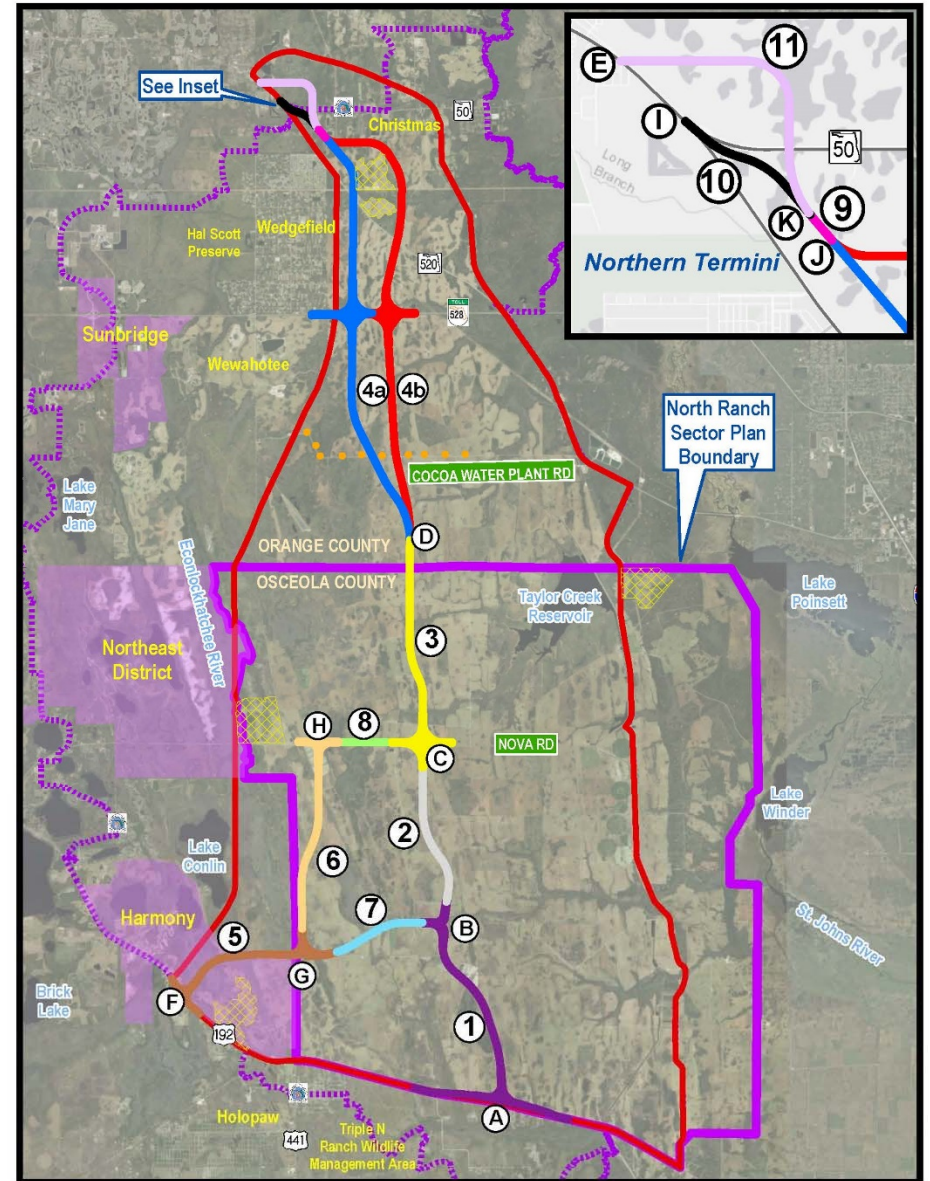
6.6 Corridor Narrative

As part of the preliminary analysis for the NECEE Feasibility Study, eleven corridor segments were identified to provide north-south connectivity between all existing corridors. As the study area is largely undeveloped, it proved most useful to first establish shorter segments to evaluate. These segments were developed in areas that provided essential connections to existing corridors including US 192, the proposed Northeast Connector Expressway leading to the Florida Turnpike, Nova Road, SR 528, SR 50 and the proposed SR 408 Eastern Extension. Each segment was evaluated using GIS analysis to identify areas of avoidance, to the extent possible, such as wetlands, residential development, parks and recreational areas. Once established, individual segments were then combined in various ways to offer multiple alternative alignments to provide optimal regional connectivity and achieve all project goals. As a result of this analysis, a total of twelve (12) alternative corridor alignments were identified. These alternative corridor alignments are shown on Figure 6.10 and described below.

Figure 6.10: Corridors Recommended for Further Consideration



	Segments												
Alternative 1	1	→	2	→	3	→	4a	→	9	→	10		
Alternative 2	1	→	2	→	3	→	4a	→	9	→	11		
Alternative 3	1	→	2	→	3	→	4b	→	9	→	10		
Alternative 4	1	→	2	→	3	→	4b	→	9	→	11		
Alternative 5	5	→	6	→	8	→	3	→	4a	→	9	→	10
Alternative 6	5	→	6	→	8	→	3	→	4a	→	9	→	11
Alternative 7	5	→	6	→	8	→	3	→	4b	→	9	→	10
Alternative 8	5	→	6	→	8	→	3	→	4b	→	9	→	11
Alternative 9	5	→	7	→	2	→	3	→	4a	→	9	→	10
Alternative 10	5	→	7	→	2	→	3	→	4a	→	9	→	11
Alternative 11	5	→	7	→	2	→	3	→	4b	→	9	→	10
Alternative 12	5	→	7	→	2	→	3	→	4b	→	9	→	11



6.6.1 Alternatives 1 – 4

6.6.1.1 Alignment Location

Alternatives 1-4 begin at a proposed interchange and realignment of US 192 near Osceola Drive and continue in a northerly direction to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. They continue in a northerly direction traversing the Osceola / Orange County line then continue in a northerly direction to a proposed interchange at SR 528. They continue in a northerly direction to traverse SR 520 and then continue in a northwesterly direction. Alternatives 1 and 3 terminate at the connection of the Florida Turnpike’s proposed Colonial Parkway and Alternatives 2 and 4 terminate at the proposed connection of the SR 408 Eastern Extension project.

6.6.1.2 Proposed Interchanges

The locations and types of interchanges for Alternatives 1-4 are shown in Table 6.3. Figure 6.10 shows the locations of the proposed interchanges for each corridor alignment alternative.

Table 6.3: Alternatives 1 - 4 Interchange Type and Location

Location ID	Cross Road	Interchange Type
A	US 192	Full Directional System to System
C	Nova Road	Full Directional System to System
SR 528	SR 528	Full Directional System to System

6.6.2 Alternatives 5 – 8

6.6.2.1 Alignment Location

Alternatives 5-8 begin at a proposed interchange on US 192 south of Harmony High School and continue in a northeasterly direction past the Lake X Ranch property. They continue in a northerly direction to a proposed interchange at Nova Road and then turn to continue in an easterly direction along Nova Road to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. The Alternatives continue in a northerly direction traversing the Osceola / Orange County line then continue in a northwesterly direction to a proposed interchange at SR 528. They continue in a northerly direction to traverse SR 520 and then continue in a northwesterly direction. Alternatives 5 and 7 terminate at the connection of the Florida Turnpike’s proposed Colonial Parkway and Alternatives 6 and 8 terminate at the proposed connection of the SR 408 Eastern Extension project.

6.6.2.2 Proposed Interchanges

The locations and types of interchanges for Alternatives 5-8 are shown in Table 6.4. Figure 6.10 shows the locations of the proposed interchanges for each corridor alignment alternative.

Table 6.4: Alternatives 5 - 8 Interchange Type and Location

Location ID	Cross Road	Interchange Type
F	US 192	Full Directional System to System
H	Nova Road	Full Directional System to System
C	Nova Road	Full Directional System to System
SR 528	SR 528	Full Directional System to System

6.6.3 Alternatives 9 – 12

6.6.3.1 Alignment Location

Alternatives 9-12 begin at a proposed interchange on US 192 south of Harmony High School and continue in a northeasterly direction to a proposed interchange at the North Ranch Master Plan's proposed limited-access facility (LA-3). They continue in a northerly direction to a proposed interchange at Nova Road and the future Central Business District node of the North Ranch Master Plan. The Alternatives continue in a northerly direction traversing the Osceola / Orange County line then continue in a northwesterly direction to a proposed interchange at SR 528. They continue in a northerly direction to traverse SR 520 and then continue in a northwesterly direction. Alternatives 9 and 11 terminate at the connection of the Florida Turnpike's proposed Colonial Parkway and Alternatives 10 and 12 terminate at the proposed connection of the SR 408 Eastern Extension project.

6.6.3.2 Proposed Interchanges

The locations and types of interchanges for Alternatives 9-12 are shown in Table 6.5. Figure 6.10 shows the locations of the proposed interchanges for each corridor alignment alternative.

Table 6.5: Alternatives 9 - 12 Interchange Type and Location

Location ID	Cross Road	Interchange Type
F	US 192	Full Directional System to System
B	LA-3	Full Directional System to System
C	Nova Road	Full Directional System to System
SR 528	SR 528	Full Directional System to System

6.6.4 Proposed Typical Section

The proposed typical section for the NECEE is shown on Figure 6.11 and consists of two 12-foot travel lanes in each direction separated by a 106-foot median. The outside and inside shoulders are 14 feet wide (12 feet paved). The border width will vary and the minimum right-of-way width for the limited-access expressway is 330 feet.

The total right-of-way width for each of the proposed NECEE corridor alternatives is 500 feet. This would allow for the consideration of multimodal and/or special use features adjacent to the limits of limited-access required for the new expressway. Additional right-of-way would be required at proposed interchanges. The estimated right-of-way acreage required for each alternative is listed in Table 6.6. These right-of-way estimates do not include stormwater management or floodplain compensation ponds as these will be further defined in subsequent project development studies.

6.6.4.1 Proposed Structures

In addition to the structural needs at proposed interchanges, the development of corridor alignment alternatives considered potential grade-separations at existing cross-roads, environmentally sensitive areas, major gas transmission lines, and canal crossings. In addition, grade-separations have been identified in areas of known future development and transportation improvements such as Harmony and the North Ranch. The alternatives analysis considered the locations of proposed roadways, trails and other features. As the NECEE moves into subsequent project development studies, specific locations and types of bridge crossings will be determined for the NECEE.

Figure 6.11: Proposed Typical Section

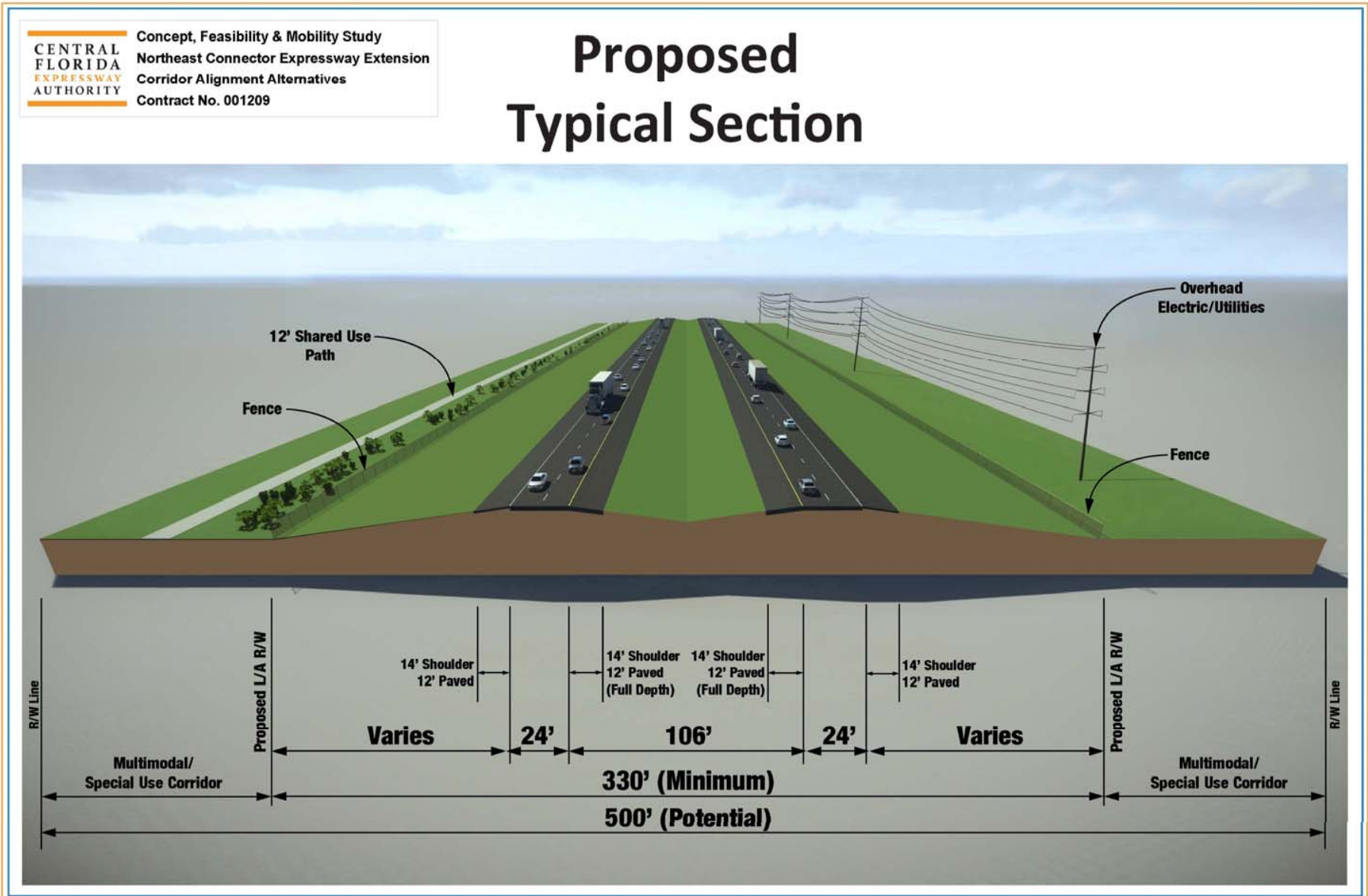


Table 6.6: Northeast Connector Expressway Extension Right-of-Way Area

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Right-of-Way Area (not including proposed ponds)	acres	2,653	2,758	2,736	2,841	2,762	2,867	2,845	2,950	2,611	2,716	2,694	2,799

7. Anticipated Effects

7.1 Natural Environment

Potential adverse effects to natural resources that may result from the proposed build alternatives are evaluated in this section. The identification and assessment of potential effects to protected species and habitats, wetlands and surface waters, and public/conservation lands were evaluated. While field reviews of the study area were not conducted, available literature and GIS data were used to estimate effects and identify anticipated regulatory agency coordination. Greater in-depth analysis, including quantification of costs, of effects to natural resources will be evaluated during subsequent project development studies.

7.1.1 Water Resources

The 2014 SJRWMD and SWFWMD FLUCFCS and the USFWS NWI GIS databases were used to identify wetlands and surface waters within the project study area. Surface waters were identified as lake or riverine systems generally comprised of open water with little vegetation limited to littoral zones, such as lakes, canals, and ponds. Wetlands were identified as either freshwater emergent (herbaceous) or freshwater forested/shrub.

7.1.1.1 Surface Waters

Project alternatives will result in direct impacts to surface waters such as canals and ponds. The anticipated surface water impacts for the proposed alternatives are summarized in Table 7.1.

Table 7.1: Surface Water Impacts for Each Alternative

Alternative	Ponds/Lakes (Acres)	Canal and Regulated Floodways (Number of Conflicts)
1	24	-
2	17	-
3	15	-
4	7	-
5	25	3
6	18	3
7	16	3
8	8	3
9	23	2
10	16	2
11	14	2
12	6	2

7.1.1.2 Groundwater

Stormwater treatment facilities will be required for all the proposed alternatives and will be designed and constructed in accordance with the FDEP, SJRWMD, and SFWMD rules and regulations. Stormwater facilities within the northern portion of the study area will be located an appropriate buffer distance from the City of Cocoa municipal water supply wells along Cocoa Water Plant Road. With the implementation of these guidelines, the effect on groundwater from the project is expected to be minimal.

7.1.1.3 Stormwater

Stormwater management facilities will be an integral part of the planned roadway infrastructure. Based on the high groundwater table conditions known to occur throughout the study area, the predominant facility type along this corridor will be wet detention pond. Final pond sizes and locations will be determined by factors such as existing topography, soil type, existing land use coverage, estimated seasonal high groundwater elevation, and proximity to creek or basin outfalls. For the purposes of estimating land impact acreages and construction costs for this study, total area to be dedicated to stormwater ponds is estimated at **15% of total roadway right-of-way area**. This percentage is a commonly used calculation for roadway project estimating based on project experience and engineering judgement. A more detailed conceptual stormwater management plan will be developed in subsequent project development studies.

Cost estimating for stormwater ponds for this study was accomplished by utilizing a composite rate for pond construction by acre of pond surface area of **\$177,813** per acre. This value is available in the *Cost Estimates User Guide* provided by CFX with consideration of the following items:

- Clearing and grubbing
- Excavation (average 5-feet deep)
- Berm construction
- Sodding
- Seed and mulch
- Fencing with access gate
- Outfall system with structure, piping, and endwall

Note that cost estimating excludes land acquisition costs for right-of-way. The estimated stormwater pond right-of-way acreages and construction costs are tabulated by alternative in Table 7.2. Also note that a portion of the stormwater pond right-of-way acreages can be provided within interchanges. As planning proceeds for the developments along the alignment, there will be opportunities for joint-use facilities where adjacent development and roadway may be served with a single pond. The twelve (12) alternative roadway alignments are similar in total right-of-way footprint; therefore, the stormwater pond acreages and costs are comparable.

Table 7.2: Estimated Stormwater Pond Needs for Each Alternative

Alternative	Roadway Right-of-way (acre)	Stormwater Pond Right-of-way (acre)	Stormwater Pond Cost
1	2,799	420	\$74,681,460
2	2,873	431	\$76,637,403
3	2,822	423	\$75,214,899
4	2,897	435	\$77,348,655
5	2,767	415	\$73,792,395
6	2,841	426	\$75,748,338
7	2,790	419	\$74,503,647
8	2,865	430	\$76,459,590
9	2,644	397	\$70,591,761
10	2,719	408	\$72,547,704
11	2,668	400	\$71,125,200
12	2,743	411	\$73,081,143

The proposed roadway will include a rural cross-section with open drainage swales for collection and conveyance of roadway runoff to the ponds. Drainage inlets and piping are anticipated to be necessary to connect swale segments at interchanges and inflow connections to ponds.

Maintaining offsite drainage patterns is a consideration with multiple crossings over large creeks, swamps, and ponds. Many of the larger water features will be spanned with bridges. Additionally, many crossings with smaller tributaries (mostly man-made ditches) will require culverts or box-culverts sized to ensure no upstream or downstream impacts. For cost estimating purposes, as provided in the Cost Estimates User Guide from CFX, a 24-inch cross-drain is assumed at 500-foot intervals for the entire roadway corridor length. For this study, larger spacing between cross-drains is anticipated, however, sizes are also expected to be larger with many requiring box culvert sizes. Therefore, the embedded cross-drain costs are approximate and considered appropriate for this study.

7.1.1.4 Floodplains

Floodplains are extensive across the entire study area. At the time of this study, floodplain delineations are only approximately determined and include Zone A areas as shown on the FEMA Flood Insurance Rate Maps (FIRM's). Detailed watershed modeling of the overall region should be pursued for future planning and design purposes. A planning-level analysis of floodplain impacts and floodplain compensation measures has been performed for this study based on this approximate information. For planning purposes, impacts from roadway construction (minus bridged segments) to all Zone A floodplain areas are considered to need compensation. Note that some impacts to floodplains associated with creeks or flowing water may be considered "traversing works" that may be analyzed with a computer model and could be accommodated in hydraulic

design of bridge or culverts. However, for planning purposes all floodplain impacts are considered to require volumetric compensation in order to show no net impact to floodplain elevations. Additionally, impacted floodplain areas are estimated to require a comparable acreage of compensation area (**1:1 ratio**). Roadway segments under study are depicted over FEMA floodplains on Figure 7-1.

Cost estimating for floodplain compensation areas for this study was accomplished by utilizing a composite rate for compensation area construction by acre of surface area of \$92,000 per acre. This value is derived from values available in the Cost Estimates User Guide provided by CFX with consideration of the following items:

- Clearing and grubbing
- Excavation (average 5-feet deep)
- Sodding
- Seed and mulch

Note this composite rate for floodplain compensation area was derived from the stormwater pond rate with removal of berms, fencing, and outfall. Also note that cost estimating excludes land acquisition costs for right-of-way.

The estimated floodplain compensation area right-of-way acreages and construction costs are tabulated by Alternative in Table 7.3. In reviewing the roadway segments that are aggregated for alternatives, Segments 4a and 5 include the highest acreages of floodplain impacts with 418 acres and 343 acres, respectively. Consequently, Alternatives 5, 6, 9, and 10 (that include these segments) show the highest floodplain compensation acreages and costs.

Table 7.3: Estimated Floodplain Compensation Needs for Each Alternative

Alternative	Floodplain Compensation Area (acre)	Floodplain Compensation Cost
1	940	\$86,468,960
2	941	\$86,531,520
3	658	\$60,538,760
4	659	\$60,601,320
5	1,117	\$102,733,640
6	1,117	\$102,796,200
7	835	\$76,803,440
8	836	\$76,866,000
9	1,096	\$100,821,880
10	1,097	\$100,884,440
11	814	\$74,891,680
12	815	\$74,954,240

Figure 7.1: Drainage and Floodplain Evaluation Map

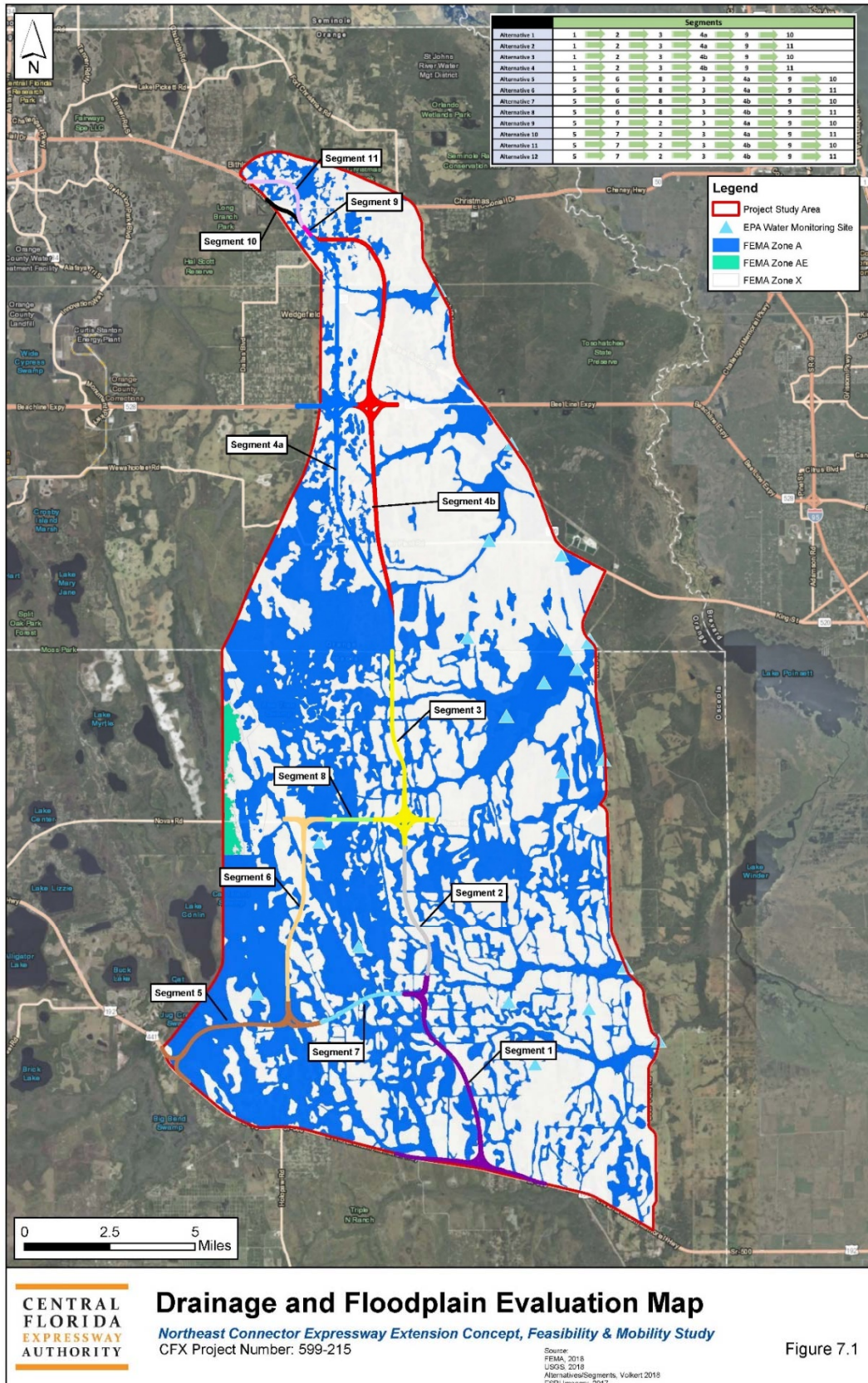


Figure 7.1

Since most of the study area is under common ownership, there are opportunities to reduce floodplain compensation requirements based on floodplain modeling analysis. Impacting some floodplains and causing floodplain elevations to rise may be allowable in some areas that are entirely within the common property ownership. Additionally, floodplain compensation may be incorporated into the stormwater ponds by increasing storage volumes over that required by permitting agencies for stormwater management. Using these methods of floodplain analysis and comprehensive design, overall floodplain compensation costs could be significantly reduced from the values tabulated above.

7.1.1.5 Wetlands

Wetlands were identified within the project alternatives using the 2014 SJRWMD/SFWMD FLUCFCS data, 2013 National Wetland Inventory (NWI) data, and current aerial photography (Figure 3-3 and 3-4). These wetland classifications are based on hydric soils, vegetation, and site hydrology and match the regulatory definition utilized by the USEPA and USACE for administering the permitting program under Section 404 of the Clean Water Act which states, “Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

The project alternatives will impact large forested wetlands systems, composed of cypress (*Taxodium sp.*) and other hardwoods, such as bays, gums, and maples, and smaller wetland systems composed of submerged and emergent herbaceous wetland plants. Table 7.4 summarizes the anticipated wetland impacts for the forested and herbaceous systems and the estimated wetland mitigation cost for each alternative.

Table 7.4: Wetland Impacts and Mitigation Cost for Each Alternative

Alternative	Forested Wetland (Acres)	Herbaceous Wetland (Acres)	Total Wetland Impacts (Acres)	Estimate of Wetland Mitigation Cost* (2019 US Dollars)
1	307	264	571	\$74,515,500
2	358	262	620	\$80,910,000
3	307	154	461	\$60,160,500
4	358	152	510	\$66,555,000
5	598	207	805	\$105,052,500
6	647	97	854	\$111,447,000
7	597	97	695	\$90,697,500
8	648	96	744	\$97,092,000
9	463	216	679	\$88,609,500
10	514	214	728	\$95,004,000
11	463	106	569	\$74,254,500
12	514	104	618	\$80,649,000

*Estimate of Wetland Mitigation Cost is based on Wetland Mitigation tab in the Cost Estimating Template. Wetland delineations and UMAM analysis of wetland function will be required to determine final wetland mitigation costs.

7.1.2 Farmlands

The FDOT PD&E Manual defines farmlands as prime or unique farmlands as defined in Title 7 Code of Federal Regulations (CFR) § 658.2(a), or farmland that is determined by appropriate state or unit of local government agency or agencies with concurrence of the United States Department of Agriculture Secretary to be farmland of statewide or local importance. The study area was evaluated for areas considered prime or unique farmlands. Table 7.5 summarizes farmland impacts by project alternative. Figure 7.2 depicts the location of prime farmlands for the study area.

Table 7.5: Prime and Unique Farmland Impacts for Each Alternative

Alternative	Acres
1	996
2	
3	
4	
5	807
6	
7	
8	
9	800
10	
11	
12	

Figure 7.2: Alternatives and Prime Farmlands Map

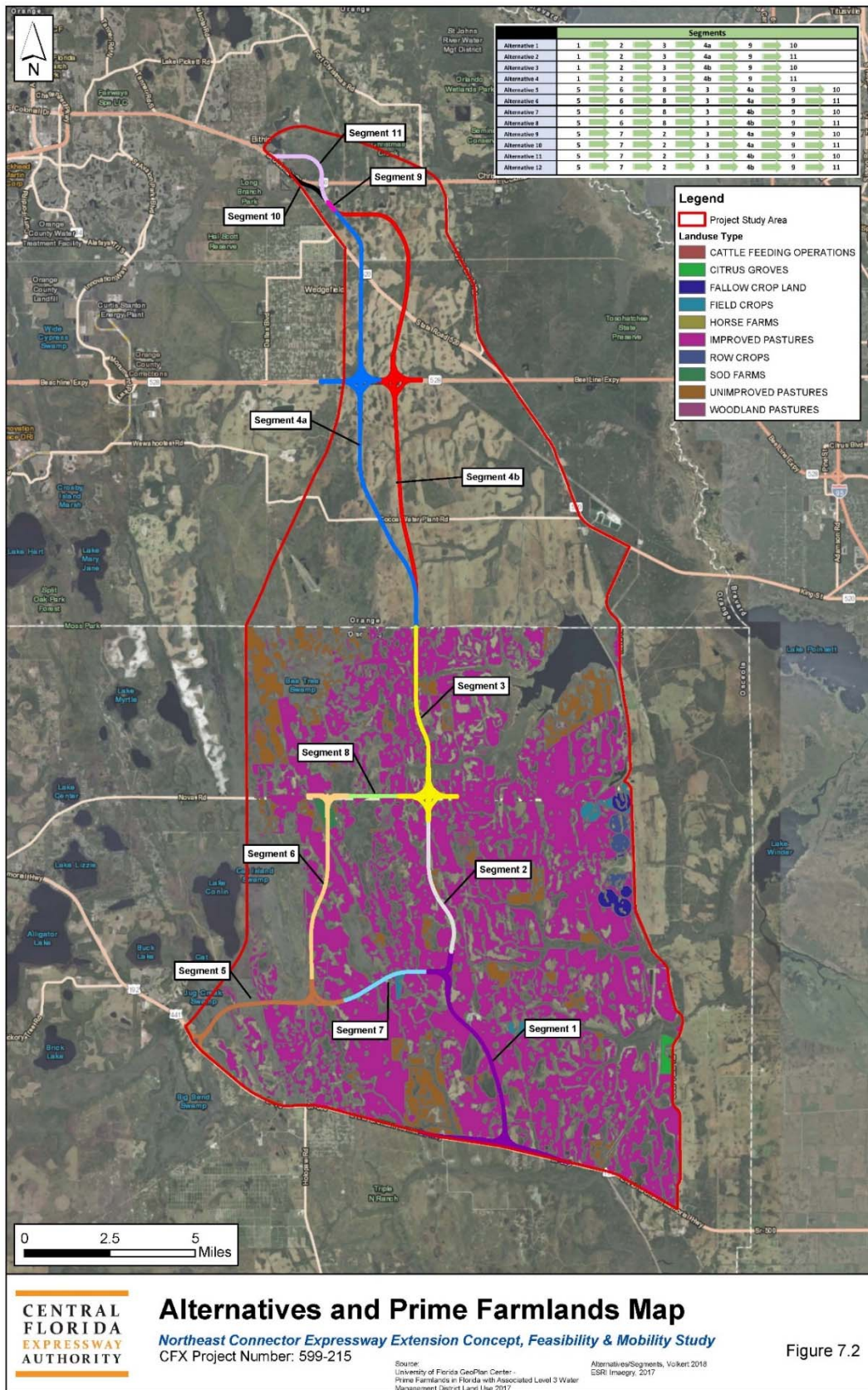


Figure 7.2

7.1.3 Threatened and Endangered Species

A review of available GIS data and published information from both the USFWS and FWC was performed to identify any potential for threatened or endangered species to occur within the study area, as shown on Figure 7.3. This review also considered certain environmentally sensitive resources like consultation areas, critical habitats, and essential fish habitats.

Habitats within the study area have the potential to support numerous state- and federally listed species. The entire study area is located within the USFWS consultation areas for Audubon's crested caracara, Everglade snail kite, Florida scrub-jay, and red-cockaded woodpecker. The study area also partially occurs within the Florida grasshopper sparrow consultation area. The project alternatives are all located in USFWS wood stork core foraging areas. Four wading bird rookeries and three bald eagle nests are located within the study area. Florida black bear (protected under Rule 68A-4.009, FAC) roadway mortalities are documented within the study area along SR 528, SR 520, and SR 500. Although Florida panther are documented from the southeast corner, the study area is not located within a primary or secondary panther zone. Project wetlands and surface waters may be used as foraging or nesting sites by various birds, including Audubon's crested caracara, Everglade snail kite, wood stork, Florida sandhill crane, and little blue heron. Upland habitats may provide habitat suitable for Florida scrub-jay, red-cockaded woodpecker, gopher tortoise, southeastern American kestrel, and burrowing owl. Additionally, the mosaic of wetland and upland habitats increases the likelihood of occurrence for federally-protected plants and eastern indigo snakes.

Figure 7.3: Alternatives and Protected Species Map

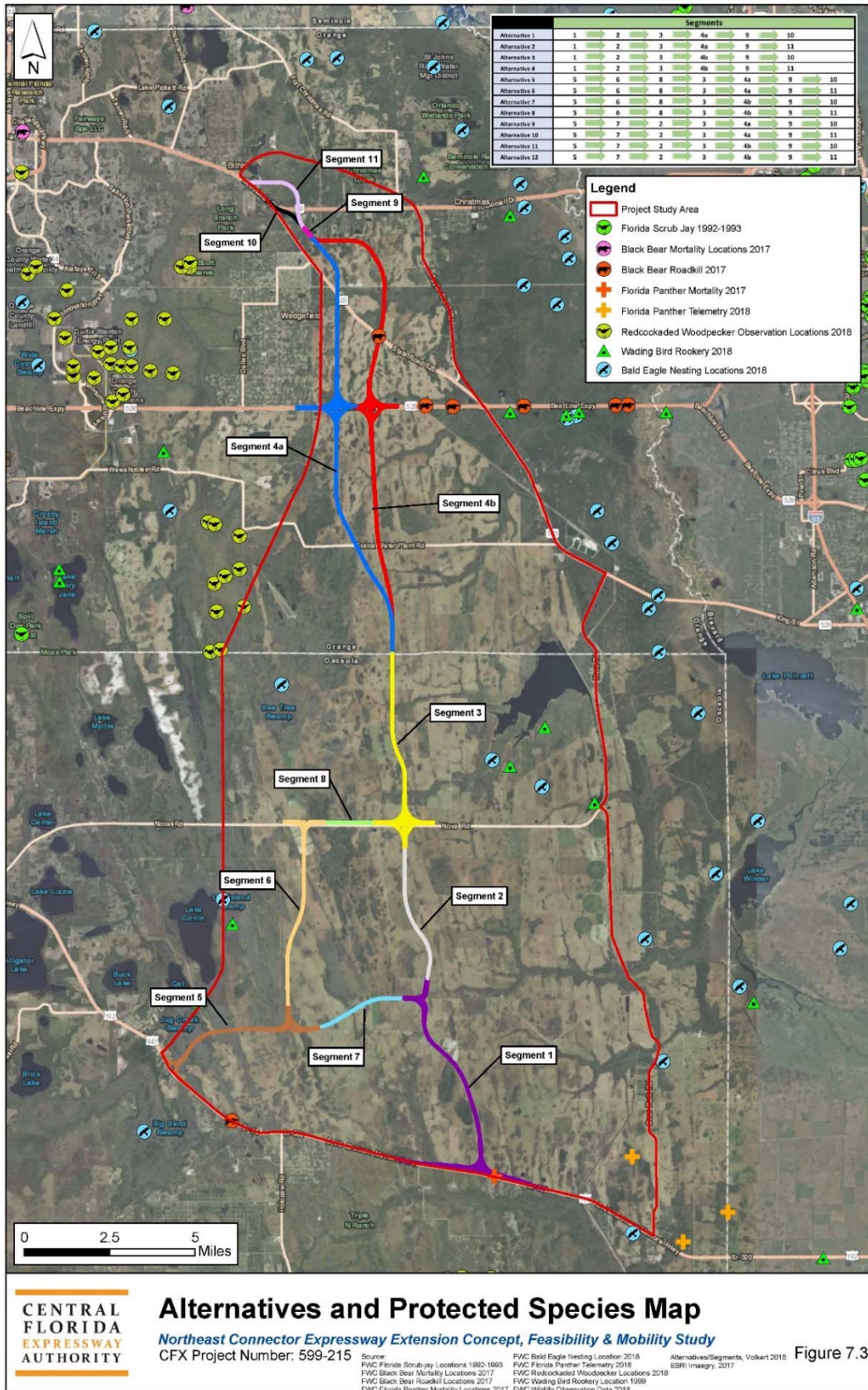


Table 7.6 summarizes the suitable habitat within the study area for ten state and federally-protected species. Suitable habitat was identified using the species' conservation guidelines and the FLUCFCS datasets obtained from the SJRWMD and the SFWMD.

Table 7.6: Suitable Habitat for State and Federally-Protected Species

Species Name	Status	Suitable Habitat based on FLUCFCS Code Data
Audubon's Crested Caracara	FT	2110, 2120, 3200, 6410, 6430, 6460,
Florida Scrub-Jay	FT	3100, 3200,3300
Florida Grasshopper Sparrow	FE	2110, 2120, 2130, 3200, 6410, 6430, 6460,
Everglades Snail Kite	FE	6110, 6170, 6172, 6210,6215, 6216, 6300, 6410, 6460
Red-Cockaded Wood Pecker	FE	3200, 3300, 4100
Wood Stork	FT	6110, 6170, 6172, 6210,6215, 6216, 6300, 6410, 6460
Eastern Indigo Snake	FT	Use Natural Land Use Habitats Map*
Gopher Tortoise	ST	2110, 2120, 2130, 3100, 3200, 3300, 4100, 4200, 4210, 4340
Southeastern American Kestrel	ST	2110, 2120, 2130, 3100, 3200, 3300, 4100, 4200, 4210, 4340
Burrowing Owl	ST	2110, 2120, 3100, 3200, 3300
FT – Federally Threatened FE – Federally Endangered ST – State Threatened		

All proposed build alternatives are located within large areas of improved and unimproved pasture and wetlands, which have the potential to support state and federally-protected species (Figure 7.2). In addition, all alternatives cross the northeast corner of Hal Scott Regional Preserve (near Segment 9, dark pink), which has documented red-cockaded woodpecker populations. Alternatives that include Segment 5 (dark brown) impact Lake X Ranch Mitigation Bank, which has documented bald eagle nests and a wading bird rookery.

Each build alternative was evaluated for its potential to impact listed species. Four representative listed species were selected for the purpose of conducting a comparative analysis between alternatives. The federally listed species evaluated were the Audubon's crested caracara, Florida scrub-jay, and red-cockaded woodpecker. The state-listed species evaluated was the gopher tortoise. Wide-ranging species or those considered to be habitat generalists, such as the eastern indigo snake or wood stork, were not included in the comparison and may occur within all alternatives. Table 7.7 depicts the impacts to suitable habitat for each representative species.

Table 7.7: Habitat Impacts (acres) by Protected Species for Each Alternative

Species Name	Alternative											
	1	2	3	4	5	6	7	8	9	10	11	12
<i>Federally-Protected Species</i>												
Audubon's Crested Caracara	329	34	342	346	272	276	284	288	281	285	293	297
Florida Scrub-Jay	16	20	7	11	18	22	9	13	18	22	9	13
Red-Cockaded Woodpecker	6	5	10	9	5	4	9	8	5	4	9	8
<i>State-Protected Species</i>												
Gopher Tortoise	316	323	341	349	268	276	294	302	276	284	301	309

Mitigation for impacts to listed species was calculated using an adjustment factor of 0.15 to capture the difference between occupied habitat versus suitable habitat. While much of the habitat within the project study area is suitable, or otherwise has potential to support listed species, it is not reasonable to assume 100 percent occupancy within all suitable habitat. Therefore, the application of the 0.15 adjustment factor assumes 15 percent occupancy within suitable habitat for each species assessed. Since wetland mitigation typically offsets the impacts to wetland-dependent species, it is assumed impacts to wetland-dependent species will be accounted for with wetland mitigation costs. Table 7.8 outlines the costs per acre of impact for each species assessed. Table 7.9 provides the mitigation cost estimates for impacts to listed species for each alternative.

Table 7.8: Cost Per Acres of Habitat for Protected Species

Species	Cost
Audubon’s Crested Caracara*	\$30,000.00
Florida Scrub-Jay**	\$50,000.00
Red-Cockaded Woodpecker***	\$30,000.00
Gopher Tortoise****	\$4,500.00
*Assumed impacts using the USFWS 1,500-meter nest protection buffer	
**Assumes mitigation ratio of 2:1 at a current rate of \$25,000.00 per credit	
***Assumes mitigation ratio of 2:1 at a rate of \$15,000.00 per credit	
****Assumes relocation of cost of \$1,500.00 per tortoise with a density of three potential occupied burrows per acre	

Table 7.9: Mitigation Cost Estimate for Species Impacts by Alternative

Alternative	Federally-Protected Species			State-Protected Species	Total Cost
	Audubon’s Crested Caracara	Florida Scrub-Jay	Red-Cockaded Woodpecker	Gopher Tortoise	
1	\$9,878,000	\$777,000	\$171,000	\$1,418,000	\$12,245,000
2	\$10,005,000	\$985,000	\$154,000	\$1,454,000	\$12,597,000
3	\$10,246,000	\$329,000	\$293,000	\$1,533,000	\$12,401,000
4	\$10,373,000	\$536,000	\$275,000	\$1,569,000	\$12,753,000
5	\$8,149,000	\$908,000	\$144,000	\$1,208,000	\$10,408,000
6	\$8,276,000	\$1,115,000	\$126,000	\$1,244,000	\$10,761,000
7	\$8,517,000	\$459,000	\$266,000	\$1,322,000	\$10,564,000
8	\$8,644,000	\$666,000	\$248,000	\$1,358,000	\$10,916,000
9	\$8,429,000	\$908,000	\$144,000	\$1,240,000	\$10,721,000
10	\$8,556,000	\$1,115,000	\$126,000	\$1,276,000	\$11,073,000
11	\$8,797,000	\$459,000	\$266,000	\$1,354,000	\$10,876,000
12	\$8,924,000	\$666,000	\$248,000	\$1,390,000	\$11,229,000

7.1.4 Essential Fish Habitat

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

7.1.5 Conservation and Mitigation Areas

According to the FNAI Florida Conservation Lands GIS data, five conservation lands occur within the study area (Figure 7.4):

- TM-Econ Mitigation Bank
- Lake X Mitigation Bank
- Savage/Christmas Creek Preserve
- Holopaw State Forest
- Hal Scott Preserve Conservation Easement

All alternatives cross the northeast corner of Hal Scott Regional Preserve (near Segment 9, dark pink) and alternatives that include Segment 5 (dark brown) impact Lake X Ranch Mitigation Bank.

Areas within the proposed FFBOT Florida Forever and North Ranch Long-Term Master Plan, will need to be evaluated during subsequent project development studies as these areas have existing commitments for wetland and species mitigation. Coordination with regulatory agencies, land owners, and land management agencies will be required to determine appropriate actions during design to avoid or mitigate impacts to these lands.

7.1.6 Prescribed Burn Areas

The SFWMD permit (Permit Number 49-0004-M) for Lake X Ranch Mitigation indicates a burn regime for management of the property, but no records were found confirming burns were conducted. In addition, prescribed burning is one of the management techniques discussed in the North Ranch Master Plan for the management of mitigation sites and conservation lands. Controlled burns produce smoke that may affect roadway visibility and negatively affect public safety; therefore, Alternatives 5-8 would need to include methods to mitigate public safety hazards (e.g., smoke warning signs and a prescribed fire alert system) during final design. All other project alternatives will need to be re-evaluated during subsequent project development studies to determine locations of new conservation areas, public lands, or mitigation sites that use prescribed burning as a management practice.

7.1.7 Anticipated Permits

Construction and maintenance activities are regulated by numerous environmental laws and regulations administered by state and federal agencies. These agencies have established environmental programs to conserve, protect, manage, and control the air, land, water, and natural resources of the state or the United States. The following is a list of anticipated permits needed from the state and federal agencies for the proposed project.

Figure 7.4: Alternatives and Conservation Lands Map

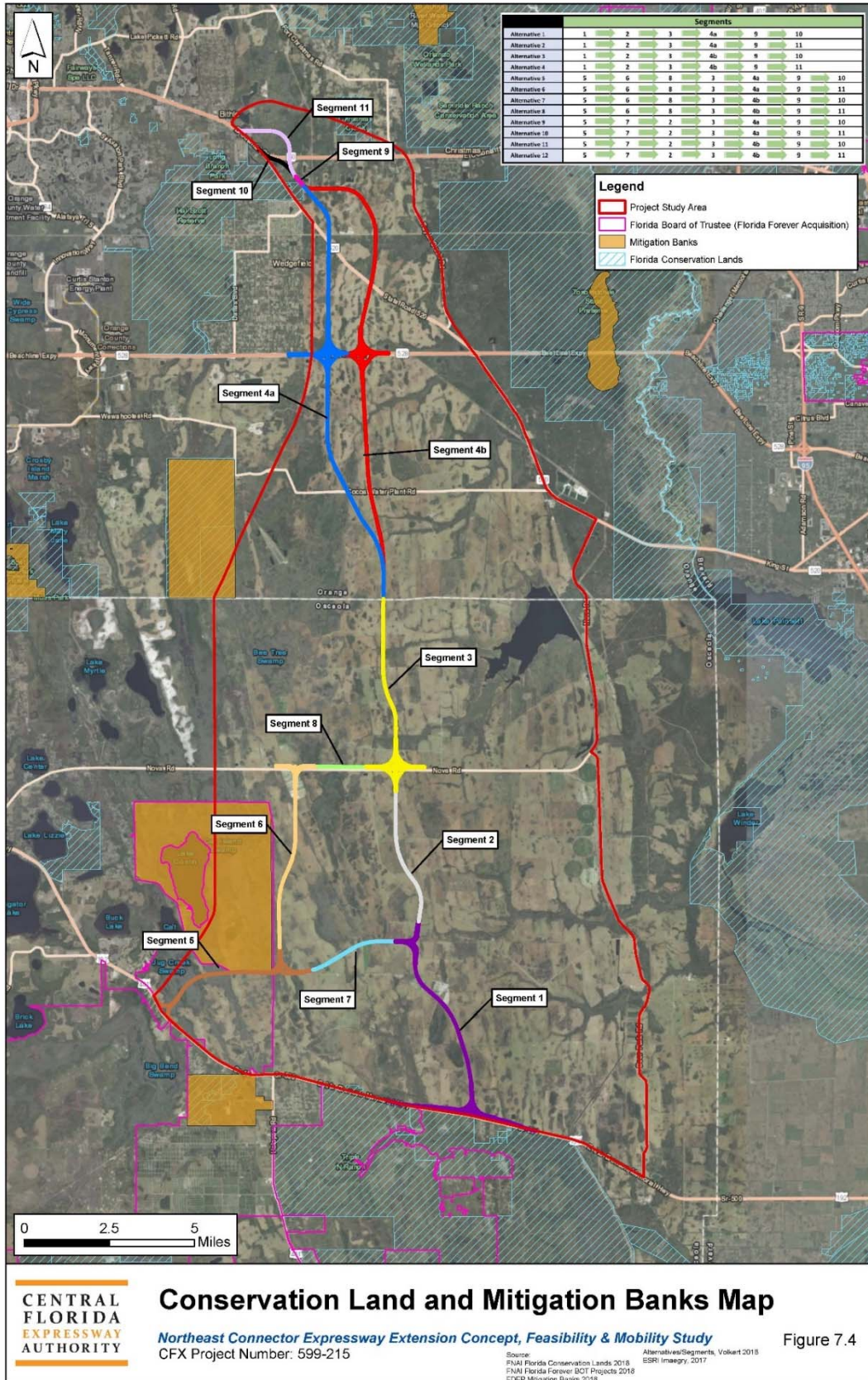


Figure 7.4

7.1.7.1 USACE Section 404 Dredge and Fill Permit

The USACE regulates the discharge of dredge and fill material into Waters of the United States, including wetlands, under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act of 1899. Section 404 requires the issuance of a permit before dredge or fill material may be discharged into Waters of the United States, unless the activity is exempt from this regulation (e.g., certain farming and silviculture activities). The issuance of a Water Quality Certification, under Section 401 of the CWA, is required prior to the issuance of a Section 404 Dredge and Fill Permit. This Water Quality Certification is obtained with the issuance of a state Environmental Resource Permit issued by the FDEP or a Water Management District. A federal dredge and fill permit would be required for impacts to Surface Waters or Wetlands within the project area.

7.1.7.2 Biological Opinion/Incidental Take Permit

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

The proposed project will potentially require ESA Section 7 consultation for impacts to the eastern indigo snake, wood stork, red-cockaded woodpecker, Florida grasshopper sparrow, Audubon’s crested caracara, Florida scrub-jay, and Everglade snail kite. This consultation will result in a Biological Opinion from the USFWS. This process will be initiated during the permitting phase by the USACE as they are the lead federal agency.

7.1.7.3 FWC Incidental Take Permit/Gopher Tortoise Relocation Permit

The FWC issues permits for all state designated threatened species, some non-listed species, and some federally listed species. Permits are issued for activities that may cause take, as defined in the Rule 68A-27.001(4), FAC., as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct.” The FWC issues an ITP for take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Separate permits are issued for gopher tortoises (relocation), Florida burrowing owls, and other state-listed birds.

The proposed project will potentially require coordination with FWC for the issuance of an ITP for impacts to southeastern American kestrel, a gopher tortoise conservation permit, and a nest

removal permit for burrowing owl and other bird species.

7.1.7.4 NPDES Permit

As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into Waters of the United States. The USEPA delegated its authority to implement the NPDES program to the FDEP. This permit is required because the proposed project will disturb more than one acre of land, and the stormwater runoff will discharge to waters of the state. A Stormwater Pollution Prevention Plan (SWPPP) is required to be developed as part of the NPDES and implemented during construction. The objectives of the SWPPP are to prevent erosion where construction activities occur, prevent pollutants from mixing with stormwater, and prevent pollutants from being discharged by trapping them on-site, before they can affect the receiving waters. The applicant must submit a Notice of Intent with FDEP at least two days prior to the commencement of construction. The proposed project is expected to require a NPDES permit to allow stormwater runoff to discharge to waters of the state.

7.1.7.5 Environmental Resource Permit (ERP)

FDEP and Florida's five water management districts implemented Chapter 62-330, Florida Administrative Code, ERP to govern certain regulated activities, such as works in waters of the state, including wetlands, and construction of stormwater management systems. The proposed project is located within the jurisdiction of the SFWMD and SJRWMD. The proposed project is expected to require an ERP for a stormwater management plan and impacts to wetlands and wetland- dependent wildlife.

7.2 Human Environment

7.2.1 Community and Neighborhood Facilities

This section provides an overview of community and neighborhood facilities and includes general impacts to residential and non-residential properties, proposed developments, community facilities, and community cohesion. The right-of-way needs for each of the corridor alternatives are also presented.

A review of Orange and Osceola counties GIS data and UCF's Geoplan Center GIS data of existing police stations, religious facilities, day cares, schools, fire stations, cemeteries, government buildings, cultural centers, and hospitals within the project area was performed. Community facilities within the project area are listed in Table 3.15.

No existing community or neighborhood facilities are impacted by any of the corridor alignment alternatives.

The total impacts to residential and non-residential parcels were evaluated for each corridor. The residential properties were identified from property tax records and consisted of the number of parcels designated as single-family homes or mobile homes. Planned residential parcels are based

on development plans under review by each county. At this time, no development is planned in the study area. Other parcels were the remaining parcels impacted by the corridors. Determination of the acreage of impacts to proposed developments was also estimated. Table 7-10 summarizes these impacts.

Impacts to community cohesion were evaluated. Community cohesion is a term used to assess the sense of belonging residents felt toward their community or neighborhood. This may include a resident's commitment to the community, attachment to neighbors, community institutions, or particular subgroups. No community cohesion impacts occur within the study area.

Table 7.10: Impacts to Residential and Non-Residential Parcels and Planned Developments

Category	Alternative											
	1	2	3	4	5	6	7	8	9	10	11	12
R/W Area (Acres)	2,653	2,758	2,736	2,841	2,762	2,867	2,845	2,950	2,611	2,715	2,694	2,799
Total Potential Residential Impacts (Total Parcels)	14	12	10	8	13	11	9	7	13	11	9	7
Existing	14	12	10	8	13	11	9	7	13	11	9	7
Planned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total Potential Non-Residential Impacts (Total Parcels)	100	140	99	139	110	150	109	149	110	150	109	149
Existing	100	140	99	139	110	150	109	149	110	150	109	149
Planned	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Planned Development (Acres)	1,603	1,603	1,603	1,603	1,712	1,712	1,712	1,712	1,561	1,561	1,561	1,561

7.2.2 Cultural Resources

A desktop review was conducted for the 12 NECEE corridor alignment alternatives. Direct Impact and Indirect Impact are defined in 36 CFR Part § 800.16(d), as the “geographic area or areas within which an undertaking may directly or indirectly [visual/audible/atmospheric] cause alterations in the character or use of historic properties, if any such properties exist.” A summary of the desktop review of the NECEE corridor alignment alternatives is provided below.

7.2.2.1 Archaeological

Background research revealed one previously recorded archaeological site, 8OR00005, which has the potential to be impacted by Alternatives 3, 4, 7, 8, 11 and 12. However, the boundaries of this prehistoric site are unclear as it was recorded as a “general vicinity” location by the Florida Master Site File (FMSF) based on a description from 1884. The site has not been evaluated by the State Historic Preservation Officer (SHPO) for listing in the National Register of Historic Places (NRHP). A 2018 cultural resource survey (FMSF Survey No. 25502) of 146 acres within the current site boundary of 8OR00005 revealed no evidence of cultural material, but this survey does not intersect NECEE Alternatives that cross the site.

There is generally a low probability for aboriginal archaeological sites within the corridor alternatives based on the abundance of poorly- and very poorly-drained soils. Furthermore, there are only six additional archaeological sites recorded within one mile of the alternatives. The areas of highest prehistoric archaeological potential are limited and would likely be located where moderately well-drained soils, such as Pomello Fine Sand, are found.

The potential to identify historic archaeological sites within the corridor alternatives is moderate. The previously recorded Tosohatchee Railway Spur (8OR10979) crosses all the alternatives, sometimes multiple times. Although recorded as a historic linear resource, there may be subsurface deposits relating to the railway spur where it is not clearly visible on the surface. This resource is discussed further under the Historical section. Additionally, there are multiple lines of “Old Railroad Grade” depicted on US Geological Survey (USGS) topographic maps from the 1950s that cross Alternatives 1, 2, 3, and 4 in six different Townships, Ranges and Sections. Subsurface remains of historic rail lines may be located in these areas.

7.2.2.2 Historical

A review of historic USGS topographic maps from the early 1950s revealed a moderate potential for historic resources to be identified within the corridor alternatives. Although the area surrounding the alternatives is depicted as containing numerous wetlands, swampland, sloughs, creeks, ponds, and lakes, there are “railroad grades” intersecting the alternatives, as well as private roads, undeveloped roads, and trails in the vicinity. Additionally, SR 50 (previously Cheney Highway) and SR 520 are evident by this time at the northern end of the corridor alternatives, while US 441/92 and the Old Brick Road (Old Melbourne Highway/County Road [CR] 500A) are visible in the southern end.

Background research indicated that two historic linear resources and two historic bridges have been previously recorded intersecting the corridor alternatives and within each corridor alternative's respective Area of Potential Effects (APE). Linear resources are the Brick Road/Old Melbourne Highway (8OS01804) and the Tosohatchee Railway Spur (8OR10979). The Brick Road/Old Melbourne Highway (8OS01804) intersects all the alternatives. Various portions of the Brick Road/Old Melbourne Highway (8OS01804) have been recorded, and the SHPO determined it was ineligible for listing in the NRHP in 2014; however, the segments within the corridor alternatives have not been evaluated. As discussed in the Archaeological section, the Tosohatchee Railway Spur (8OR10979) intersects all the alternatives, sometimes in multiple locations, and may be both above and belowground. The Tosohatchee Railway Spur (8OR10979) was used to transport timber from Tosohatchee to one of the local sawmills from the late 1800s into the early 1900s. It was recorded in 2017 by the Florida Fish & Wildlife Conservation Commission, but has not been evaluated by SHPO for listing in the NRHP. A 2018 cultural resource survey (FMSF Survey No. 25502) found no evidence of the former railroad spur, but the survey investigated a length of the spur outside the corridor alternatives. The two historic "sister" bridges (8OR10054 and 8OR10056) were constructed in 1967 and recorded in 2010, but have not been evaluated by SHPO. These concrete girder bridges are integral to the SR 528/Beachline (formerly Beeline) Expressway. Additionally, Alternative 11 passes through the property of previously recorded historic resource 19543 East Colonial Drive (8OR10295); however, the actual structure is approximately 575 feet (175 meters) outside the APE and would not need to be evaluated for direct or indirect impact.

A review of the Orange County and Osceola County Property Appraiser's GIS databases and historic USGS topographic maps from the 1950s and 1972 suggest there are unrecorded historic resources within the corridor alternatives. There is the potential for a direct impact to 12 unrecorded historic resources, including four parcels with historic-age structures and eight historic-age linear resources, six of which are denoted as "Old Railroad Grade" on historic maps. None of the 12 historic resources are previously recorded in the FMSF nor listed or determined eligible for listing in the NRHP. As mentioned in the Archaeological section above, six areas of the "Old Railroad Grade" intersect the corridor alternatives. Regardless of resource type, all potential, but unrecorded, cultural resources that could be impacted require a field survey for proper identification and evaluation.

For historic properties, the actual year built (ACTYRBLT) date and parcel use (PARUSEDESC) is taken from the Orange County and Osceola County Property Appraiser's GIS databases. These dates and uses are not always accurate; therefore, it is important to conduct a field survey for proper identification and evaluation. Additionally, all the recorded and unrecorded historic resources discussed have the potential to be directly impacted by the current alternatives; none were found to have the potential for solely indirect impacts. Information on recorded and potential historic resources that may be affected by the various corridor alternatives is provided in Tables 7.11-7.22.

Alternative 1 intersects three previously recorded linear resources. This corridor also has the potential to directly affect four unrecorded linear resources and three properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.11.

Table 7.11: Alternative 1 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	1
n/a	Property	11545 Old Brick Road	1940	Grazing Land Soil Class 1	1
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	4a
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 6)	Pre-1953	Potential Linear Resource	4a
n/a	Property	21777 State Road 520	1965	Grazing land Soil Class 2	4a
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	10

Alternative 2 intersects three previously recorded linear resources, including multiple crossings of the Tosohatchee Railway Spur. This corridor also has the potential to directly affect four unrecorded linear resources and three properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.12.

Table 7.12: Alternative 2 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	1
n/a	Property	11545 Old Brick Road	1940	Grazing Land Soil Class 1	1
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	4a
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 6)	Pre-1953	Potential Linear Resource	4a
n/a	Property	21777 State Road 520	1965	Grazing land Soil Class 2	4a
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	11
n/a	Property	19543 East Colonial Drive (Historic Structure 8OR10295 is on parcel but 175 meters from APE so would not be evaluated for indirect impact)	1956	Grazing Land Soil Capability Class II	11

Alternative 3 intersects two previously recorded historic bridges and three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. This corridor also has the potential to directly affect six unrecorded linear resources and two properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.13.

Table 7.13: Alternative 3 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	1
n/a	Property	11545 Old Brick Road	1940	Grazing Land Soil Class 1	1
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur (Crossing resource twice)	Late 1800s–early 1900s	Linear Resource	4b
8OR10054	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750059)	1967	Historic Bridge	4b
8OR10056	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750214)	1967	Historic Bridge	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 23 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 5)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 8)	Pre-1953	Potential Linear Resource	4b
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	10

Alternative 4 intersects two previously recorded historic bridges and three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. This corridor also has the potential to directly affect six unrecorded linear resources and two properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.14.

Table 7.14: Alternative 4 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	1
n/a	Property	11545 Old Brick Road	1940	Grazing Land Soil Class 1	1
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	"Railroad Spur	Tosohatchee Railway Spur (Crossing resource twice)	Late 1800s–early 1900s	Linear Resource	4b
8OR10054	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750059)	1967	Historic Bridge	4b
8OR10056	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750214)	1967	Historic Bridge	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 23 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 5)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 8)	Pre-1953	Potential Linear Resource	4b
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	11
n/a	Property	19543 East Colonial Drive (Historic Structure 8OR10295 is on parcel but 175 meters from APE so would not be evaluated for indirect impact)	1956	Grazing Land Soil Capability Class II	11

Alternative 5 intersects three previously recorded historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect three unrecorded linear resources and three properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.15.

Table 7.15: Alternative 5 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	4a
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 6)	Pre-1953	Potential Linear Resource	4a
n/a	Property	21777 State Road 520	1965	Grazing land Soil Class 2	4a
8OR10979	Railroad spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	10

Alternative 6 intersects three previously recorded historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect three unrecorded linear resources and four properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.16.

Table 7.16: Alternative 6 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	4a
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 6)	Pre-1953	Potential Linear Resource	4a
n/a	Property	21777 State Road 520	1965	Grazing land Soil Class 2	4a
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	11
n/a	Property	19543 East Colonial Drive (Historic Structure 8OR10295 is on parcel but 175 meters from APE so would not be evaluated for indirect impact)	1956	Grazing Land Soil Capability Class II	11

Alternative 7 intersects two previously recorded historic bridges and three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect five unrecorded linear resources and two properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.17.

Table 7.17: Alternative 7 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur (Crossing resource twice)	Late 1800s–early 1900s	Linear Resource	4b
8OR10054	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750059)	1967	Historic Bridge	4b
8OR10056	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750214)	1967	Historic Bridge	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 23 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 5)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 8)	Pre-1953	Potential Linear Resource	4b
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	10

Alternative 8 intersects two previously recorded historic bridges and three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect five unrecorded linear resources and three properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.18.

Table 7.18: Alternative 8 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur (Crossing resource twice)	Late 1800s–early 1900s	Linear Resource	4b
8OR10054	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750059)	1967	Historic Bridge	4b
8OR10056	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750214)	1967	Historic Bridge	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 23 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 5)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 8)	Pre-1953	Potential Linear Resource	4b
8OR10979	Railroad spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	11
n/a	Property	19543 East Colonial Drive (Historic Structure 8OR10295 is on parcel but 175 meters from APE so would not be evaluated for indirect impact)	1956	Grazing Land Soil Capability Class II	11

Alternative 9 intersects three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect four unrecorded linear resources and three properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.19.

Table 7.19: Alternative 9 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s– early 1900s	Linear Resource	4a
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 6)	Pre-1953	Potential Linear Resource	4a
n/a	Property	21777 State Road 520	1965	Grazing land Soil Class 2	4a
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s– early 1900s	Linear Resource	10

Alternative 10 intersects three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect four unrecorded linear resources and four properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.20.

Table 7.20: Alternative 10 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	4a
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 6)	Pre-1953	Potential Linear Resource	4a
n/a	Property	21777 State Road 520	1965	Grazing land Soil Class 2	4a
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	11
n/a	Property	19543 East Colonial Drive (Historic Structure 8OR10295 is on parcel but 175 meters from APE so would not be evaluated for indirect impact)	1956	Grazing Land Soil Capability Class II	11

Alternative 11 intersects two previously recorded historic bridges and three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect six unrecorded linear resources and two properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.21.

Table 7.21: Alternative 11 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur (Crossing resource twice)	Late 1800s–early 1900s	Linear Resource	4b
8OR10054	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750059)	1967	Historic Bridge	4b
8OR10056	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750214)	1967	Historic Bridge	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 23 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 5)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 8)	Pre-1953	Potential Linear Resource	4b
8OR10979	Railroad Spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	10

Alternative 12 intersects two previously recorded historic bridges and three historic linear resources, including multiple crossings of the Tosohatchee Railway Spur. A significant length of the Brick Road/Old Melbourne Highway is located within the alternative. This corridor also has the potential to directly affect six unrecorded linear resources and three properties with historic-age structures. The potential cultural resource impacts are listed in Table 7.22.

Table 7.22: Alternative 12 Cultural Resource Potential Impacts

Previously Recorded Cultural Resource Designation	Direct Impact	Address/Site Name	Build Date	Use	Segment
8OS01804	Road	Brick Road/Old Melbourne Highway	20th century	Linear Resource	5
n/a	Property	3860 Turn Around Bay Road	1945	Grazing Land Soil Class 1	5
n/a	Road	Gator Branch Road	Pre-1972	Potential Linear Resource	2
n/a	Railroad Grade	Old Railroad Grade near South Fork Taylor Creek (within Township 25 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	3
n/a	Railroad Grade	Old Railroad Grade near North Fork Taylor Creek (within Township 25 South, Range 33 East, Section 9)	Pre-1953	Potential Linear Resource	3
n/a	Property	1170 Taylor Woods Road	1969	Grazing Land Soil Class 1	3
8OR10979	Railroad Spur	Tosohatchee Railway Spur (Crossing resource twice)	Late 1800s–early 1900s	Linear Resource	4b
8OR10054	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750059)	1967	Historic Bridge	4b
8OR10056	Bridge	SR-528 / Farm Access Road (FDOT Bridge No. 750214)	1967	Historic Bridge	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 23 South, Range 33 East, Section 28)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 5)	Pre-1953	Potential Linear Resource	4b
n/a	Railroad Grade	Old Railroad Grade (within Township 24 South, Range 33 East, Section 8)	Pre-1953	Potential Linear Resource	4b
8OR10979	Railroad spur	Tosohatchee Railway Spur	Late 1800s–early 1900s	Linear Resource	11
n/a	Property	19543 East Colonial Drive (Historic Structure 8OR10295 is on parcel but 175 meters from APE so would not be evaluated for indirect impact)	1956	Grazing Land Soil Capability Class II	11

7.2.2.3 Recommendations and Conclusions

In subsequent project development studies, once a preferred alternative is selected for the proposed improvements, the project APE should be defined and a Phase I cultural resource assessment survey (CRAS) should be conducted. Any historic buildings within the APE should be recorded and evaluated for NRHP eligibility. The construction area also should be subjected to subsurface testing according to probability for archaeological resources to determine if any prehistoric or historic archaeological sites are present. Generally, areas that have been sufficiently tested as part of a previous archaeological survey do not require further subsurface testing, except in the cases of previously identified, but unevaluated, sites. Given the lack of archaeological testing performed in this area, subsurface investigation will likely include the entire preferred alternative. Historic resources and archaeological sites identified during survey of the NECEE project should be assessed for their potential eligibility for listing in the NRHP. Depending on the funding and permitting requirements of the project, the resulting CRAS report should be submitted to the SHPO for review and comment.

7.3 Noise

A noise analysis will be conducted during subsequent project development studies.

7.4 Air Quality

An air quality analysis will be conducted during subsequent project development studies.

7.5 Contamination

A discussion of the identified potential contamination sites within the study area is contained in Section 3.6. Figure 7.5 shows the locations of the identified sites relative to the alternative corridor alignments.

Segment 3 is located approximately 1,000 feet to the southeast of Site No. 2, WRDQ TV, 10227 Nova Road, St. Cloud. A 3,000-gallon aboveground diesel emergency generator tank is currently located on-site. As of December 2017, this site is operating in compliance with FDEP regulations. The WRDQ TV site is rated as Low for contamination potential.

Segment 5 is intersected by Site No. 1, Historical FEC – Chuluota to Kenansville railroad. Existing and historical rail lines have several common chemical constituents of concerns as follows:

- Arsenic: The most commonly used arsenic-containing products were herbicides, pesticides, insecticides, and wood-treating agents such as chromated copper arsenate.
- Creosote: Creosote is used to coat railroad ties.
- Polynuclear aromatic hydrocarbons: Polynuclear aromatic hydrocarbons are a coal tar and creosote by-product. Coal tar is more commonly associated with rail yards.
- Other inorganic constituents used in herbicides.

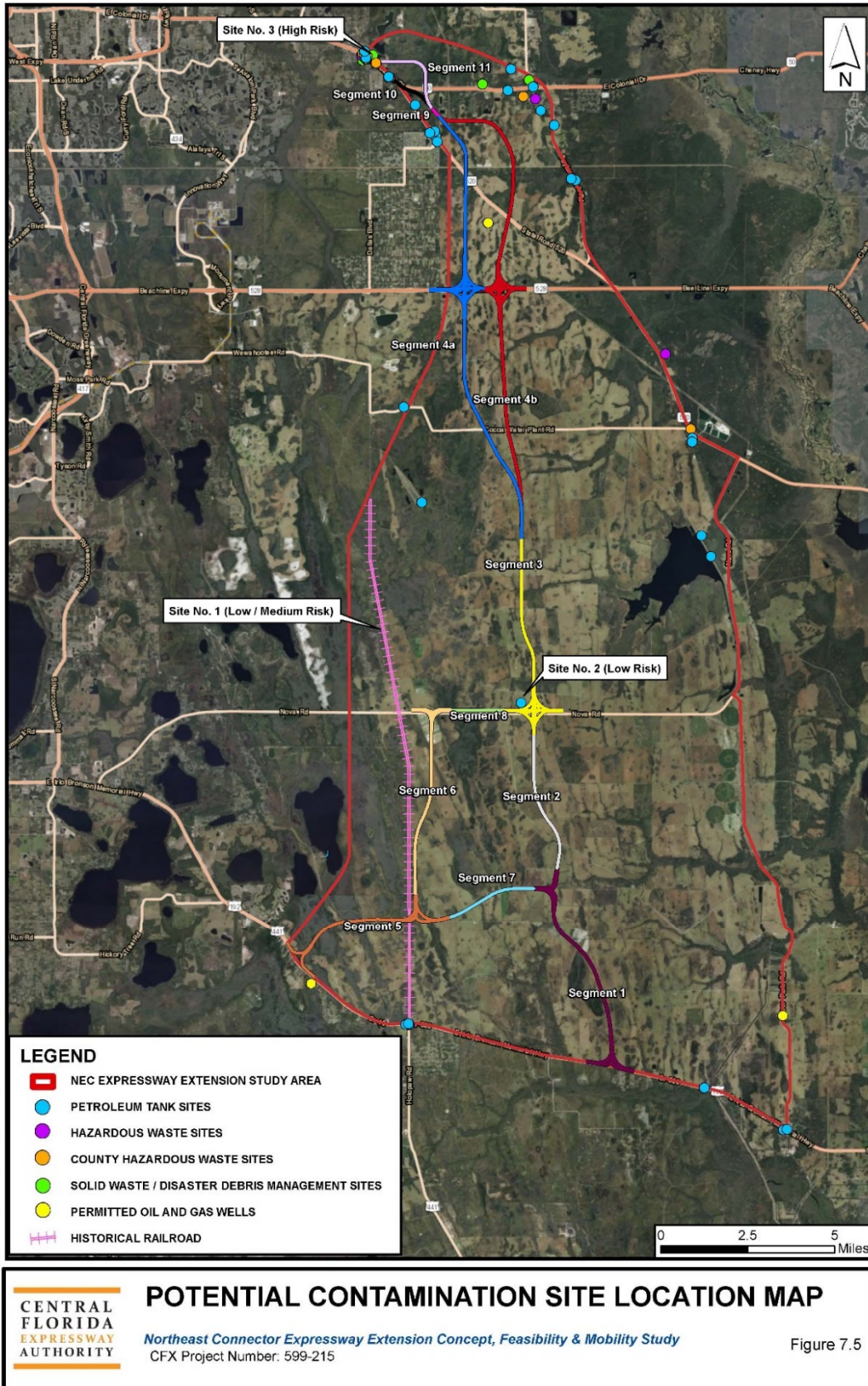
Due to its residual nature, arsenic is the most commonly occurring chemical constituent related to railroad beds, and liberal applications of herbicides were used to keep the railroad free of vegetation. The creosote and polynuclear aromatic hydrocarbons are commonly associated with railroad ties and rail yards. The Historical FEC – Chuluota to Kenansville railroad is rated as a Medium with respect to Segment 5 based on its crossing of the historical railway.

Segment 6 is located approximately 850 feet to the east of Site No. 1, Historical FEC – Chuluota to Kenansville railroad (at its closest point). See Segment 5 description for general environmental concerns regarding historical rail lines. The Historical FEC – Chuluota to Kenansville railroad is rated as Low with respect to Segment 6 based on the distance to the historical railway.

Segment 11 is located approximately 600 feet to the southeast of Site No. 3, Honey Bee Ranch, 16877/19001/19160 East Colonial Drive, Orlando. This site operated as a land clearing debris disposal facility from 2000 to 2013. During its operation, the facility was found out of compliance with waste disposal regulations multiple times. Violations included potential contamination impacts such as unlawful storage of used oil on site. The latest inspection found the site in compliance with all closure regulations. The Honey Bee Ranch is rated as a High contamination risk based on the possibility of contamination due to unlawful waste disposal.

No other potential contamination sites were identified in close proximity to the corridor alignment alternatives.

Figure 7.5: Potential Contamination Site Location Map



7.6 Utilities

Existing and planned utilities that may be affected by the proposed build alternatives are evaluated in this section.

Due to the nature of the existing conditions throughout the study area, it is anticipated that the alternative corridor alignments for the NECEE will impact a number of utility facilities on the project. Major utility facilities that could be potentially impacted include natural gas pipelines owned and operated by FGT Company and Transtate Industrial Pipeline Systems. In addition, Duke Energy, Florida Power & Light and Orlando Utilities Commission collectively have four transmission substations and various high voltage transmission lines throughout the project study area. The substations are located on fee simple parcels owned by the respective electric utility companies.

The roadway design planning should be completed to maintain the minimum clearance from power lines per Table A of the OSHA Rule 29 CFR Part 1926. The cost for raising overhead transmission lines to provide the required clearances could be in the range of \$400,000 (2019 dollars) per pole for a minimum of four poles for standard transmission poles. H-tower structures would be significantly costlier to replace or relocate.

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

Relocations of facilities located in easements and on private property would likely be eligible for reimbursement. Crossings over FGT pipeline easements would require an easement encroachment agreement between FGT and CFX. Such agreements stipulate specific design requirements within the limits of the easements. All measures will be taken to avoid impacting the existing utility facilities identified in easements or located privately-owned parcels. Though relocation of other facilities within the existing right-of-way are anticipated, all efforts will be made during the study to minimize impacts to existing pipelines, substations, and transmission facilities, to the greatest extent possible.

A general description and location of the major utilities currently within or planned within the study area can be found in Section 3.7.1, Table 3.21. Below is a description of the major utilities that may be adversely affected by the corridors evaluated for the project. Figure 7.6 shows the locations of the utilities relative to the alternative corridor alignments.

Alternatives 1-4

Existing Utility Impacts:

- Alignment crosses 20" and 30" FGT gas mains on the north side of US 192.
- Alignment crosses Duke Energy overhead distribution lines on the south side of Nova Road.
- Alignment crosses Duke Energy overhead transmission lines running southwest to northeast.
- Alignment crosses Duke Energy 69 kV overhead transmission lines on the south side of Cocoa Water Plant Road.
- Alignment crosses City of Cocoa 36" and 42" water transmission lines on the north side of Cocoa Water Plant Road.
- Alignment crosses 26" FGT pipeline and easement 1.66 miles south of and parallel to SR 528.
- Alignment crosses CFX ITS duct bank and Sprint FOC in a leased duct on the north side of SR 528.
- Alignment crosses Duke Energy overhead distribution lines with tenant attachments on the south side of SR 520.
- Alignment crosses FPL 69 kV overhead transmission lines running northwest to southeast.
- Alignment crosses FPL 69 kV overhead transmission lines running north to south along the east side of Wedgefield subdivision.
- Alignment crosses Duke Energy overhead distribution lines with tenant attachments on the south side of SR 50.
- Alignment crosses OUC easement with 115 kV transmission lines on south side of the easement and 230 kV transmission lines on the north side of the easement.

Planned Utility Impacts:

- No impacts with any known planned utilities.

Alternatives 5-8

Existing Utility Impacts:

- Alignment crosses OUC 69 kV overhead transmission lines with distribution lines underbuilt on the north side of US 192.
- Alignment crosses 20" and 30" FGT gas mains on the north side of US 192.
- Alignment has Duke Energy overhead distribution lines on the south side of Nova Road.
- Alignment crosses Duke Energy 230 kV overhead transmission lines running southwest to northeast.
- Alignment crosses Duke Energy 69 kV overhead transmission lines on the south side of Cocoa Water Plant Road.
- Alignment crosses City of Cocoa 36" and 42" water transmission lines on the north side of Cocoa Water Plant Road.
- Alignment crosses 26" FGT pipeline and easement 1.66 miles south of and parallel to SR 528.
- Alignment crosses CFX ITS duct bank and Sprint FOC in a leased duct on the north side of SR 528.

- Alignment crosses Duke Energy overhead distribution lines with tenant attachments on the south side of SR 520.
- Alignment crosses FPL 69 kV overhead transmission lines running northwest to southeast.
- Alignment crosses FPL 69 kV overhead transmission lines running north to south along the east side of Wedgefield subdivision.
- Alignment crosses Duke Energy overhead distribution lines with tenant attachments on the south side of SR 50.
- Alignment crosses OUC easement with 115 kV transmission lines on south side of the easement and 230 kV transmission lines on the north side of the easement.

Planned Utility Impacts:

- No impacts with any known planned utilities.

Alternatives 9-12

Existing Utility Impacts:

- Alignment crosses OUC 69 kV overhead transmission lines with distribution lines underbuilt on the north side of US 192.
- Alignment crosses 20" and 30" FGT gas mains on the north side of US 192.
- Alignment crosses Duke Energy 230 kV overhead transmission lines running southwest to northeast.
- Alignment crosses Duke Energy overhead distribution lines on the south side of Nova Road.
- Alignment crosses Duke Energy overhead transmission lines running southwest to northeast.
- Alignment crosses Duke Energy 69 kV overhead transmission lines on the south side of Cocoa Water Plant Road.
- Alignment crosses City of Cocoa 36" and 42" water transmission lines on the north side of Cocoa Water Plant Road.
- Alignment crosses 26" FGT pipeline and easement 1.66 miles south of and parallel to SR 528.
- Alignment crosses CFX ITS duct bank and Sprint FOC in a leased duct on the north side of SR 528.
- Alignment crosses Duke Energy overhead distribution lines with tenant attachments on the south side of SR 520.
- Alignment crosses FPL 69 kV overhead transmission lines running northwest to southeast.
- Alignment crosses FPL 69 kV overhead transmission lines running north to south along the east side of Wedgefield subdivision.
- Alignment crosses Duke Energy overhead distribution lines with tenant attachments on the south side of SR 50.
- Alignment crosses OUC easement with 115 kV transmission lines on south side of the easement and 230 kV transmission lines on the north side of the easement.

Planned Utility Impacts:

- No impacts with any known planned utilities

Figure 7.6: Major Utility Impacts

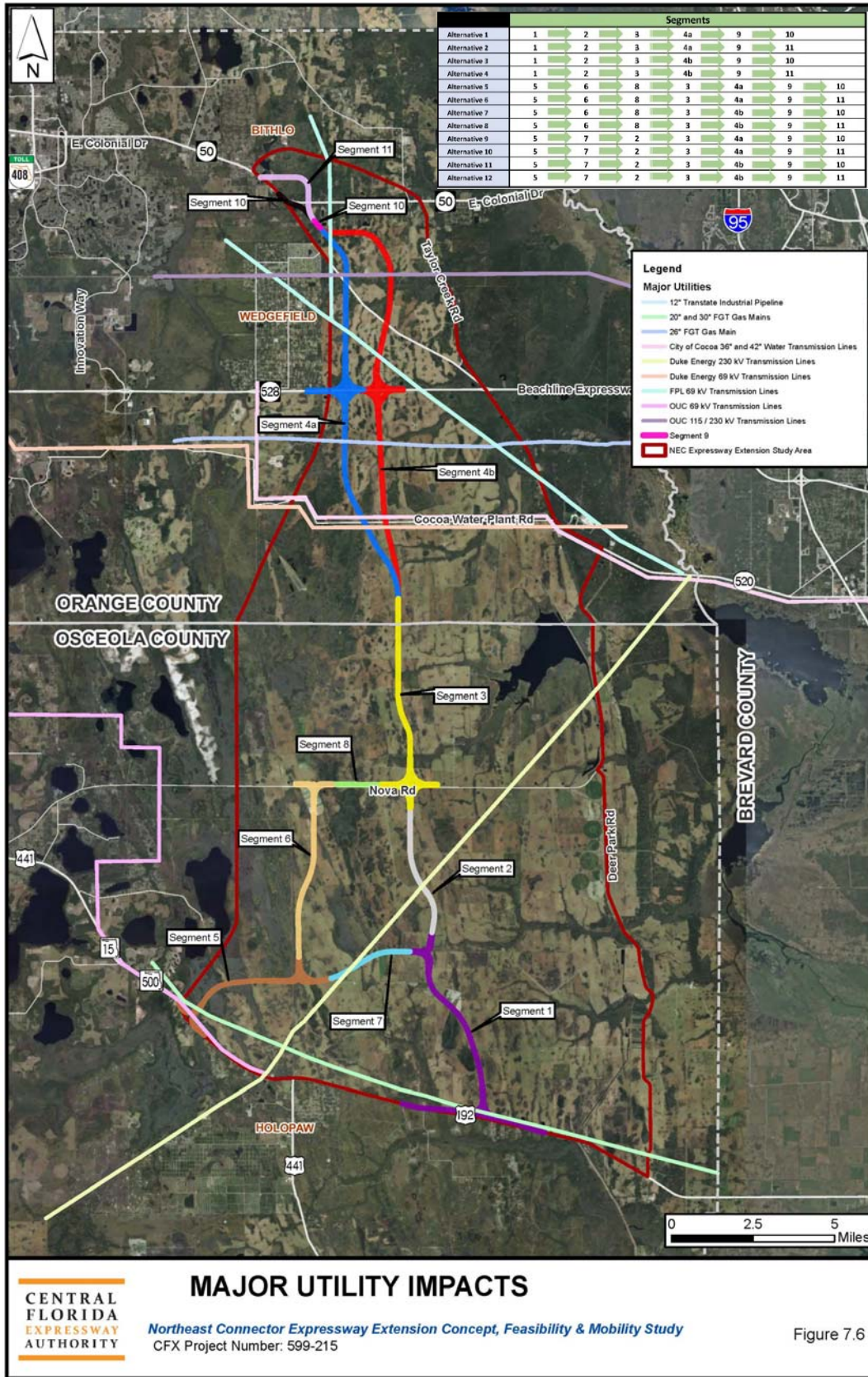


Figure 7.6

8. Stakeholder Involvement

8.1 Introduction

Public involvement and interagency coordination are an integral part of the Concept, Feasibility and Mobility assessment process and multiple opportunities for participation have been provided for the NECEE study. A Public Involvement Plan (PIP) was established to initiate and maintain early, meaningful, continuous and high-level public and stakeholder involvement during the study. The public involvement techniques utilized provided information to, and helped obtain vital input from: citizen, residential and business groups; elected and appointed officials; other government entities; environmental advocates; and others interested in the corridor-wide implications of the study segments.

The public was engaged to provide crucial input, resolve issues and minimize negative impacts along this corridor. The robust public engagement program included the establishment of and meetings with Environmental Advisory Group (EAG), public meetings held in Orange and Osceola counties, meetings with local elected and appointed officials, as well as individual meetings with key stakeholders. Since the vast majority of the land in the study area is owned by one stakeholder (Deseret Ranches), a Project Advisory Group was not established for this study. There was extensive coordination with Deseret Ranches regarding long-range plans for their property. Other stakeholders were engaged through letters advising of the study kick-off, where they could access information on the study website, and how they could contact the public involvement coordinator with questions and comments. Those stakeholders were also mailed letters regarding the public meetings.

Study kick-off activities included setting up a study webpage on the www.CFXway.com website and establishing a Facebook page to engage the public in study activities. Kick-off letters were sent to more than 95 state and local elected and appointed officials in June 2018 announcing the 15-month study.

Brief summaries from each public meeting are provided below. Detailed agendas, summaries and meeting materials are provided under separate cover in the NECEE Comments and Coordination Report.

8.2 Stakeholder Coordination and Meetings

8.2.1 Environmental Advisory Group

The main purpose of the EAG was to help provide input on environmental impacts in the evaluation of the feasibility of the study corridor. The EAG was to inform the study team of environmental local needs, issues and concerns within the study limits.

EAG meeting invitations were sent to representatives from environmental agencies and organizations, other government agencies, large landholders, community groups, and other key stakeholders.

EAG meetings were held on June 26, 2018 and December 20, 2018. The meetings were attended by a total of more than 34 members.

June 26, 2018, EAG Meeting: The Kick-off EAG meeting was held Tuesday, June 26, 2018, from 1:30 p.m. to 3:00 p.m. at the Central Florida Expressway Authority, Ibis Conference Room, 4974 ORL Tower Road, Orlando, FL 32807. Invitation letters were emailed to 93 members of the EAG on June 14, 2018. Reminder invites were emailed to EAG members on June 22, 2018. There were 20 attendees and seven staff members.

The meeting included a discussion of the study's background, purpose and goals, and schedule, as well as the EAG role. The study corridor consultant gave a presentation on the study. Discussion topics included future planned development tied to Osceola County's Northeast District and North Ranch Master Plan, the need for connectivity between US 192 and SR 50/SR 520, and environmental constraints such as public lands, mitigation banks, Cocoa wellfields, regional conservation land, Econlockhatchee River protections, reservoirs, and wildlife corridors.

There was extensive discussion about how this corridor would affect important lands and conservation areas, its relationship to the previously-studied Northeast Connector Expressway, and its impact on the ability of environmental agencies to conduct controlled burns.

It was noted that input from the EAG would be considered in the further evaluation and development of study alternatives. A full EAG meeting summary can be found in Appendix 10.

December 20, 2018, EAG Meeting: The second EAG meeting occurred on December 20, 2018, from 9:30 a.m. to 11:30 a.m. at the Central Florida Expressway Authority, Pelican Conference Room, 4974 ORL Tower Road, Orlando, FL 32807. Notifications were emailed to 93 members of the EAG on November 27, 2018. There were 14 attendees and nine staff members.

The meeting included a discussion of the study's background, purpose and goals, and schedule, as well as the EAG role. The study corridor consultant gave a presentation on the latest refined alternatives. The presentation included an evaluation matrix comparing the physical, cultural, natural and human environment, and social impacts of the respective alternatives.

It was noted during the meeting that study findings would be presented to the CFX Board in Spring of 2019. It was expected that the study would be placed on hold and used as the foundation for future studies as growth in the region increased.

Discussion topics included the need to buffer the Cocoa wellfields and avoid impacts to the Econ Mosaic and conservation areas; the importance of providing grade separations for planned connections between Harmony and future roadway networks in Osceola County; and the need for bridging for wildlife corridors.

It was noted that exhibits and information provided to the EAG would be displayed at the upcoming public meetings on January 22 and 24, 2019.

8.2.2 Local Government Officials

The Public Involvement Program involved identifying and communicating with regional, state, and local agencies having a potential interest in this project due to jurisdictional review or expressed interest.

A kick-off letter to inform regional, state, and local officials about the project was emailed on June 1, 2018.

Elected and appointed officials were provided notice of all public meetings. Municipal and agency officials also participated in the two EAG meetings.

Representatives from Osceola County, Orange County and the Space Coast Transportation Planning Organization attended, on average, one study progress meeting each month.

Formal presentations were made to local official boards to gain input and to provide study updates as follows:

- Space Coast Transportation Planning Organization, February 14, 2019
- Central Florida Expressway Authority, February 21, 2019
- MetroPlan Orlando, *Scheduled September 11, 2019*

It should be noted that four members of the CFX Board sit on local government boards, including the Brevard County Commission, Osceola County Commission, and Orange County Commission, including the County Mayor.

At the February 21, 2019 meeting, the CFX Board received a progress update of the NECCE concept study. The findings of the study will be presented to the CFX Board at a subsequent Board meeting (tentatively scheduled for August 2019).

Additionally, the study team met and coordinated with agency officials and staff during the concept study process as follows:

- 2/11/19, Space Coast TPO Technical and Community Advisory Committees
- 6/06/19, MetroPlan Orlando Municipal Advisory Committee
- 6/26/19, MetroPlan Orlando Community Advisory Committee
- 6/28/19, MetroPlan Orlando Technical Advisory Committee

Multiple meetings were held with stakeholders and government agencies to update them on the progress of the study and gather their input. Those meetings are summarized below:

May 18, 2018, Osceola County Staff: Following team introductions, a brief overview of the study and evaluation process was given including the approved schedule. The purpose for conducting the study is to satisfy the conditions of the right-of-way transfer along SR 528. Discussion was held regarding the timing of this study relative to the Northeast Connector Expressway (NEC) and/or Southport Connector. Specifically, county staff asked if a PD&E study for Corridor I was going to be advanced ahead of either the Northeast Connector Expressway or Southport Connector. CFX staff stated this is a high-level planning study for Corridor I and a PD&E study is not anticipated for quite some time. The need for Corridor I is partially dependent on land-use development and growth within the study area. Land-use development related to the North Ranch Master Plan is not expected to occur until after 2045 and is dependent on the development schedule for the Northeast District. County staff asked about future interchanges. Interchanges for this study will be considered at locations such as US 192, SR 528 and the northern project terminus, at a minimum. The level of detail in the concept study will be limited to developing general right-of-way requirements for alternative interchange types.

May 29, 2018, Brevard County & Space Coast Transportation Planning Organization Staff: Following team introductions, a brief overview of the study background and history was provided. An overview of the study process was provided including corridor location, purpose and need, study goals and schedule. CFX is conducting this study on behalf of Deseret Ranches as specified in the right-of-way agreement to accommodate All Aboard Florida's passenger rail alignment along the SR 528 (Beachline Expressway) corridor. County staff suggested reviewing previous east-west connectivity to I-95 studies within the study area including Nova Road and a corridor south of Lake Poinsett. They also noted that Brevard County is currently scoping the next Long-Range Transportation Plan which may need to include this study corridor.

June 12, 2018, Orange County Staff: An overview of the study process was provided including corridor location, purpose and need, study goals and schedule. CFX is conducting this study on behalf of Deseret Ranches as specified in the right-of-way agreement to accommodate All Aboard Florida's passenger rail alignment along the SR 528 (Beachline Expressway) corridor. Goals to improve east-west connections, enhance the mobility of future populations, provide transit and promote north-south connectivity were highlighted. The intent of this study is to identify the potential right-of-way needs for a future north-south limited-access facility serving the capacity and mobility needs in east-central Florida. County staff stated that Orange County's existing comprehensive plan lists policies and objectives for future corridors. Orange County will forward the comprehensive plan goals, objectives and policies document to the study consultant, Volkert, for review and consideration during the development of corridor alternatives. Staff also indicated that Orange County has a conservation overlay showing development restrictions and a land stewardship layer. Volkert requested these be forwarded to them for use in developing corridor footprint alternatives.

June 18, 2018, Orange County Commissioner Jennifer Thompson: An overview of the study process was provided including corridor location, purpose and need, study goals and schedule. Commissioner Thompson asked about the number of public meetings to be held for the project. Ralph Bove of Volkert explained there would be two separate public meetings, one in Orange County and one in Osceola County. These meetings will be scheduled in late 2018 or early 2019 to present the potential corridor alternatives.

June 25, 2018, Florida Department of Transportation, District 5: Following team introductions, a brief overview of the corridor background and history was provided. The overall goal of this study is to delineate a right-of-way footprint generally representing Corridor I and its associated interchanges. East-west connectivity was discussed and the importance of connecting to I-95. It was noted that there is an effort to improve Washingtonia Boulevard in Viera. Viera's conservation areas and land use designations should be considered when planning an east-west connection. There was also discussion about travel demand forecasting that considers 2045 as the design year; however, land use development within the study area is not expected to occur until after 2045. Therefore, the definition of corridor viability as it relates to toll revenue and ridership factors will be modified for this study.

July 2, 2018, Orange County Commissioner Emily Bonilla: Ralph Bove of Volkert explained that this is a high-level study for a Northeast Connector Expressway Extension, similar in scope to the recently-completed Northeast Connector Expressway Concept, Feasibility & Mobility Study. Ralph went through the presentation and made it clear this is more than 20 years away, that the North Ranch Master Plan won't begin to see building until 2045. He pointed out that the study area largely consists of Deseret Ranches land and the North Ranch Master Plan. Commissioner Bonilla asked how CFX decided to do this study if it's an East Central Florida Corridor Task Force (ECFCTF) alignment? Bove explained that this is part of the agreement made for the right-of-way for the former All Aboard Florida, now Brightline, along the SR 528 corridor. Deseret Ranches was part of the Task Force and CFX agreed it would study the Task Force's Corridor H or I. Corridor H became Sunbridge Parkway, so CFX is studying Corridor I.

July 16, 2018, MetroPlan Orlando Staff: Following team introductions, Ralph Bove of Volkert provided a brief review of the corridor background and history, an update on the schedule, an overview of the North Ranch Master Plan and stated CFX is conducting this study on behalf of Deseret Ranches as specified in the right-of-way agreement to accommodate the former All Aboard Florida's passenger rail alignment along the SR 528 (Beachline Expressway) corridor. MetroPlan Orlando staff stated they are working with Osceola County on trends and recommended the NECEE study team use the same methodology. With regards to transit, the study team will review transit assumptions in the NRSP and will consider scenario planning for the overall travel demand forecasting. The team was asked if Orange County will adopt the preferred corridor at the end of the NECEE study. Ralph Bove of Volkert responded that the next updated LRTP will run through the year 2045, prior to the construction of the NECEE. Therefore, the study will most likely only be referenced in the plan without a formal adoption.

July 18, 2018, City of Cocoa Staff: An overview of the study process was provided including corridor location, purpose and need, study goals and schedule. Cocoa Utility staff advised that there are several water mains along Dallas Boulevard, but should not interfere with corridor development. Cocoa Utility staff said the study team should be aware of possible challenges regarding floodplain issues, which could result in the need for high levels of fill and several grade separations. Moving forward, utility staff does not believe the well fields will impede corridor development.

October 23, 2018, Orange County Environmental Protection Department: Following team introductions, Ralph Bove of Volkert provided a brief review of the corridor background and history, an update on the schedule, an overview of the North Ranch Master Plan and a reminder that CFX is conducting this study on behalf of Deseret Ranches as specified in the right-of-way agreement to accommodate the former All Aboard Florida’s passenger rail alignment along the SR 528 (Beachline Expressway) corridor. County staff asked if County Road (CR) 13 was assessed as an option for the proposed alignment? Staff stated that it looked like a straight shot from SR 50 to US 441 in Holopaw. Ralph Bove of Volkert replied that CR 13 generally aligns with Dallas Boulevard and runs along the west side of Wedgefield, which is outside the NECEE study area. Upon general review of this corridor, a corridor alternative for the NECEE in this area would result in substantial social and environmental impacts.

County staff provided the following statement: “The future land use for the Orange County portion of the study area is predominately Rural Agriculture, which is equal to one unit per ten acres. Rural Settlement areas have permitted densities/future land use designations that vary. The majority of Rural Settlement in the vicinity of the study area includes one unit per acre or four units per acre to recognize historic settlement patterns, such as in Wedgefield. Documenting a potential alignment through future Rural Agriculture land could lead to public concern that the alignment will attract development in the area. Segment 4b on the current map impacts the East Orange District Park Recreation Center and potentially interferes with prescribed burning at Christmas Creek Preserve. The proposed purple alignment shown on the map connecting segment 4b to 4a is preferred. Maintaining wildlife connections and avoiding water quality issues should be a priority when developing proposed alignments.”

November 16, 2018, Florida’s Turnpike Enterprise (FTE): Following team introductions, a brief overview of the corridor background and history was provided. Ralph Bove of Volkert focused on a review of several potential corridor routes that have been developed in the northern terminus showing connections to either the CFX SR 408 Eastern Extension or FTE Colonial Parkway. Turnpike staff then provided a brief overview of the Colonial Parkway study. FTE staff suggested our team be consistent with any public responses to questions about why both the SR 408 Eastern Extension and Colonial Parkway projects are being considered. FTE staff indicated both agencies have agreed to generally answer this question as follows: “Although there are two studies in the same general vicinity, both agencies recognize there is a need for just one proposed

improvement.” FTE staff asked about the east-west corridor along Nova Road (Corridor F) and the additional north-south connectors west of the main Corridor I alternative. Ralph Bove of Volkert indicated those are being shown to illustrate regional connectivity to other projects such as the NEC, Osceola Parkway Extension (OPE) and Corridor F into Brevard County. Jonathan Williamson of Dewberry, the CFX General Engineering Consultant, explained that portions of Corridor F along Nova Road are being considered in the OPE PD&E study, and that a separate study may continue east of Corridor I into Brevard County.

November 20, 2018, Osceola County Staff: Following team introductions, a brief overview of the corridor background and history was provided. County staff asked if the alternatives that have a southern terminus west of the main alignment representing Corridor I stay in the study? Ralph Bove of Volkert answered yes, these alternatives satisfy a primary need to connect to the Florida Turnpike. The county staff acknowledged that a connection from the Osceola Parkway Extension to Nova Road would provide economic viability and an important evacuation route. Ralph Bove further explained how the southern termini was established. Both terminus points provide a logical connection, while minimizing environmental and socioeconomic impacts. County staff asked if grade separations along each alternative are being evaluated in this study and will they be presented at the Environmental Advisory Group (EAG) meeting on December 20? Ralph Bove affirmed that the project team is currently evaluating the location and types of grade separations along the alternatives. The purpose of identifying and analyzing these is to include them in the complete right-of-way footprint needed for the project. Prior to the EAG meeting, the study team will decide if grade separations are necessary to show on any displays. County staff reiterated that community development for the North Ranch Master Plan cannot begin until a certain percentage of buildout has occurred in the Northeast District. County staff mentioned the Northeast District buildout will likely be pushed further into the future than the published dates.

8.2.3 Other Stakeholder Meetings

Additional stakeholder meetings were convened with large landholders, community associations, agricultural interests, environmental advocates, developers, business and civic groups and other stakeholders.

March 15, 2018, Deseret Ranches: The subject meeting was held to discuss data collection and data sharing. Specifically, the Volkert study team was seeking permission from Don Whyte, Director of Planning for Deseret Ranches, to obtain and utilize data from Deseret Ranches and their consultants relative to the North Ranch Master Plan. Mr. Whyte said he would talk to Deseret Ranches consultants Mike Dennis at Breedlove Dennis & Associates (BDA) and Chris Sinclair at Renaissance Planning Group (RPG) and provide his permission for them to share any information we need. Mr. Whyte also indicated that BDA has initiated environmental data collection and analysis on the Ranch property in Orange County, which may be useful in our study as well. A discussion ensued regarding the northern termini of the NECEE in the vicinity of SR 50 and SR 520. Ralph explained that an adjustment in the study area boundary slightly to the north and east

was recommended to allow more flexibility in minimizing and/or avoiding potential impacts to the Hal Scott Preserve and Wedgefield community as well as to allow opportunities to connect into the proposed SR 408 Eastern Extension.

April 26, 2018, Deseret Ranches: The subject meeting was held to obtain approval from Deseret Ranches to utilize the North Ranch Master Plan travel demand modeling files from Renaissance Planning Group (RPG). Don Whyte roughly sketched out two areas on the NECEE location map where Deseret Ranches have entered into a 30-year lease agreement with Florida Power and Light to build solar fields. Volkert agreed to include these footprints on future study maps.

September 11, 2018, Harmony Development: An overview of the study process was provided including corridor location, purpose and need, study goals and schedule. Richard Jerman of SunTerra stated that his team had previously met with the Northeast Connector Expressway Concept, Feasibility & Mobility study team, as well as with Osceola County Commissioner Fred Hawkins, Jr. to discuss their preference for any future corridor alternatives through the Harmony Development. Mr. Jerman emphasized that both the SunTerra team and Commissioner Hawkins do not approve of developing a limited-access corridor through the portion of the Harmony Master Plan along Old Melbourne Highway, known as The Villages at Harmony. Mr. Jerman also stated that the southern portion of the Harmony Development plan, known as the East Region, was sold to Deseret Ranches in December of 2017. The SunTerra planning team gave their full support for the future development of a limited-access corridor in this area, as well as the southern conservation and mitigation easement area of the development plan still owned by their firm.

September 20, 2018, Viera Staff: An overview of the study process was provided including corridor location, purpose and need, study goals and schedule. The purpose of this meeting was to discuss potential opportunities to connect a future east-west, limited-access corridor to I-95 in Brevard County in the vicinity of Viera. This connection has been illustrated in previous planning studies and documents including the East Central Florida Corridor Task Force (ECFCTF) Final Report and the most current adopted long-range transportation plan, Year 2040 Update, for the Space Coast TPO. Known as Corridor F in the ECFCTF Final Report, the future corridor connection to I-95 would occur in the vicinity of the Pineda Causeway extension (proposed) and existing Pineda Causeway interchange. Todd Pokrywa, President of The Viera Company, stated the final stage (Phase 4) of the Viera Development of Regional Impact (DRI) has been approved by the Brevard County Board of County Commissioners (BOCC). Mr. Pokrywa indicated a traffic study was conducted as part of the DRI Substantial Deviation (SD) and Notice of Proposed Change (NOPC) and stated a limited-access corridor as illustrated in the ECFCTF Final Report (i.e., Corridor F) is not desired by Viera. According to Mr. Pokrywa, based on the traffic analysis conducted by The Viera Company, a new north-south facility located west of and parallel to I-95 between US 192 and Wickham Road is their preferred solution to mitigate traffic circulation and provide access to and from Viera to I-95 (via Wickham Road and US 192). The Viera Company has dedicated funding (up to \$5 million) for the study, design and implementation of this new

north-south corridor, known as Washingtonia Boulevard. FDOT has conducted a preliminary feasibility study of Washingtonia Boulevard to determine purpose and need and evaluate the potential effects of this new arterial corridor. A discussion ensued regarding potential opportunities to modify the location of a new limited-access corridor (i.e., Corridor F) connection to I-95 by avoiding direct impacts to future development associated with Phase 4. Viera Company representatives indicated development is anticipated on both sides of the proposed extension of Pineda Causeway (as it is shown in their Master Plan) and that future development would be impacted by a limited-access corridor. In addition, Viera stated they set aside approximately 5,300 acres of natural area known as the Viera Wilderness Park to serve as a conservation area and mitigation of environmental impacts resulting from their development. According to Viera, impacts to the Wilderness Park would affect their overall mitigation plan and standing in the environmental community.

October 18, 2018, Deseret Ranches: The subject meeting was held to provide a status update on the CFX NECEE and discuss the preliminary corridor alternatives to date. Don Whyte of Deseret Ranches inquired if CFX was urging the study corridor to tie into the Florida Turnpike. Jonathan Williamson of Dewberry, CFX General Engineering Consultant, responded that CFX is in favor of linking to the Florida Turnpike to provide regional connectivity; however, that connection is not part of the NECEE study and would be analyzed in a future study. Don Whyte commented that corridor alternatives should avoid impacting the major powerline easement. Volkert will research and layout the easement in GIS to use as a resource for avoidance.

March 21, 2019, Deseret Ranches: The subject meeting was held to discuss the results of the study with representatives from Deseret Ranches including Don Whyte and Chris Sinclair. CFX and the Volkert study team were seeking input relative to the study corridor alternatives. Ralph provided a brief overview of the corridor alternatives developed for the NECEE. Don and Chris did not express any concerns with the general locations of the NECEE corridor alternatives as presented. Ralph explained that the corridor evaluation considered potential impacts to the social, natural and physical environment. The results of this evaluation were presented to the EAG in December 2018 and to the public in January 2019. There was general discussion regarding the corridor alternatives in Orange County and the study team was asked if there was a preference for either of those alternatives currently being evaluated. Ralph explained that both options were being retained as will all other corridor segments and alternatives considered. Overall, Don and Chris expressed no objections to the results of the study and commented it was exactly what they had expected.

8.2.4 Public Involvement and Meetings

The Public Involvement Plan (PIP) included conducting public meetings to present the latest study information and to gather vital feedback. Two public meetings, one in Orange County and one in Osceola County, were conducted as open houses, presenting identical exhibits, handouts and audiovisual presentations. Members of the public were able to have one-on-one discussions with

study team staff, and to get their questions addressed. They also were able to view the corridor alternatives on smart screens that allowed them to zoom in to see the impact on their properties. All meetings were held in readily accessible and well-known locations throughout the community.

More than 40 people attended the public workshops, where they offered three written comments. The public meetings were conducted as follows:

1. Public Meeting No. 1 was conducted on Tuesday, January 22, 2019, from 5:30 p.m. to 7:30 p.m., at Wedgefield K8 School Cafeteria, 3835 Bancroft Blvd, Orlando, FL 32833.
2. Public Meeting No. 2 was conducted on Thursday, January 24, 2019, from 5:30 p.m. to 7:30 p.m. at the Harmony High School Cafeteria, 3601 Arthur J. Gallagher Blvd., St. Cloud, FL 34771.

Public meeting invitation letters were sent on Friday, January 11, 2019, by email to 52 elected officials and their aides, as well as 43 appointed officials, regional agency contacts, and federal and state agency contacts. An additional 772 meeting invitation letters were mailed to property owners and tenants within the corridor on Tuesday, January 8, 2019.

The public meetings were advertised in advance with legal ads in the *Osceola News Gazette* on Thursday, January 10, 2019 and Thursday, January 17, 2019; and in the *Orlando Sentinel's* Orange and Osceola editions on Sunday, January 13, 2019 and Sunday, January 20, 2019. An ad was posted in the *Florida Administrative Register* (FAR) on Friday, January 4, 2019.

A total of three comment forms were received at the meetings.

8.2.5 Summary of Public Comments

Three comment forms were received at the two public meetings. All three were received at the January 22, 2018 meeting. Many people attending the meetings told study staff that because the potential project was so many years in the future, they didn't have an opinion to share. Following is a summary of the feedback received from the meetings:

- A copy of a letter from Audubon Florida Director of Advocacy Charles Lee to Orange County Mayor Jerry Demings and Commissioners. In short, Mr. Lee said that while the Central Florida Expressway Authority is sensitive to site specific environmental concerns relating to roadway alignments, Audubon Florida believes "...that attention to the large-scale land use impacts of this roadway should be a major priority focus for Orange County."
- Attendee Bill Andrews wrote: "Need to widen SR 50 from Avalon Park Blvd. to SR 520."
- Nearby resident Dawn Michel wrote that study staff were helpful in their explanations and asked that future meetings be promoted on 96.5 FM Radio.

8.3 Project Website

Concept study information was housed for easy access on the study's webpage:

<https://www.cfxway.com/agency-information/plans-studies/project-studies/northeast-connector-expressway-extension/>

The page was updated concurrently with project milestones with the latest corridor exhibits, schedules, handouts, presentations, meeting notices and summaries, photos and news releases. Information from the EAG meetings also were posted on the web page.

An electronic comment form was available, as well as a request form to receive email updates. The web page received more than 1,750 visits during the 15-month study.

Additionally, a study Facebook page provided meeting notices and summaries, exhibits, photos, links to information available on the website and more.

8.4 Media Coverage

The Public Involvement Program included the strategy of using the media to help share information and meeting notices about the concept study. This study is to serve as a foundation for future studies in this area. As such, there was minimal media interest in the study since a potential project would not result for more than two decades.

In May 2018, the PIO team sent Florida Today reporter Rick Neale the study area map and link to the study website. No story resulted. Florida Today, the Orlando Sentinel and Osceola News Gazette were emailed the invitation to the January 22 and January 24 public meetings.

9. Feasibility & Viability of the Proposed Project

9.1 Benefits of the Proposed Project

The NECEE addresses the project needs, as outlined in Chapter 2, by providing system linkage, improving regional connectivity and mobility, meeting future planned social and economic needs, achieving consistency with transportation plans, providing for multimodal opportunities, and improving evacuation support.

9.1.1 System Linkage

The FDOT has identified a network of transportation facilities that are important to the state's economy and mobility. This network is referred to as the Strategic Intermodal System (SIS). SR 528, a designated SIS facility, is located within the study area. Other designated SIS facilities such as SR 408, SR 417, Florida's Turnpike, and I-95 are adjacent to or in relatively close proximity to the study area and are illustrated on Figure 2.1. When completed, the NECEE will provide system linkage between two or more of these designated SIS facilities.

9.1.2 Regional Connectivity and Mobility

Mobility is the movement of people and goods and the ability to meet transportation demands. Due to the anticipated population and employment growth in the study area, the proposed facility would play a critical role in accommodating travel demands and improving the movement of goods and people. The NECEE would provide connections to US 192, Task Force Corridor F (Nova Road), SR 528, and SR 408 via either SR 408 Eastern Extension (CFX) or Colonial Parkway (Florida's Turnpike Enterprise). The proposed project would also potentially provide connections to Florida's Turnpike via the proposed Northeast Connector Expressway, SR 417 and Orlando International Airport via the proposed Osceola Parkway Extension Expressway, and I-95 via connections to US 192 and Task Force Corridor F (Nova Road).

9.1.3 Social and Economic Needs

The proposed project would support the planned economic development within the study area consistent with the North Ranch plan. This transportation corridor would also serve existing and planned developments adjacent to the study area including Harmony in Osceola County and Viera in Brevard County. A north-south alternative, as proposed by the NECEE, is anticipated to meet the future transportation needs of Orange and Osceola counties.

9.1.4 Consistency with Transportation Plans

The NECEE has previously been represented as "Corridor I" in the East Central Florida Corridor Task Force Summary Report, published in December 2014. A new limited-access expressway within the NECEE study area is generally identified in the Orange County Comprehensive Plan-Destination 2030, Osceola County Comprehensive Plan 2025, CFX 2040 Master Plan and the MetroPlan Orlando 2040 LRTP.

9.1.5 Multimodal Opportunities

CFX has established a multimodal policy to fund or partner on multimodal initiatives where revenue generated from the investment equals the project cost or where toll user benefits are equal to or exceed the project cost. In addition, through the incorporation of the North Ranch Master Plan, Osceola County's Comprehensive Plan calls for an integrated, multimodal transportation network. Opportunities to support multimodal improvements will be considered as part of the alternatives developed to address the need and purpose for this project.

9.1.6 Safety and Evacuation Support

The Florida Division of Emergency Management has identified I-4, I-95, Florida's Turnpike, SR 417, SR 408 and SR 528 as significant evacuation routes in the region. Other evacuation routes within or near the study area are SR 50, SR 520, Narcoossee Road (CR 15), US 192 (SR 500) and Nova Road (CR 532). The proposed NECEE would provide a direct connection to US 192, SR 528 and SR 50/SR 520. Depending on the final proposed alternative for the NECEE, indirect connections to other evacuation routes such as SR 417, SR 408, Florida's Turnpike, I-4 and I-95 would be established.

9.2 Controversy of the Proposed Project

General feedback for the NECEE as a whole has been positive. Feedback received from the public and project stakeholders was summarized in Section 8 and is included in the NECEE Comments and Coordination Report published under separate cover.

9.3 Support for the Proposed Project

Support for this project was shown during meetings with the EAG as well as from several stakeholders and the public. The NECEE would provide key system linkage and regional connectivity. The facility would provide for potential multimodal facilities as well as enhance safety and evacuation routes.

Generally, the stakeholders expressed overall support for the project. Stakeholders expressing support for the project include:

- Florida's Turnpike Enterprise
- Orange County
- Osceola County
- Brevard County / Space Coast TPO
- Deseret Ranches

9.4 Projected Project Costs

Table 9.1 summarizes the projected cost for each alternative. These costs include roadway construction with retention ponds, bridge construction, interchange construction, toll collection equipment, and mitigation costs for wetlands and species. For this study, costs were not calculated for right-of-way. The costs presented are in 2019 dollars.

Table 9.1: Northeast Connector Expressway Extension Summary of Projected Costs

Cost Element	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Roadway Construction	\$828,200,000	\$880,700,000	\$850,200,000	\$902,700,000	\$974,300,000	\$1,026,700,000
Bridges Construction	\$334,300,000	\$443,100,000	\$356,000,000	\$464,800,000	\$706,200,000	\$815,000,000
Interchanges Construction	\$650,000,000	\$650,000,000	\$650,000,000	\$650,000,000	\$750,000,000	\$750,000,000
Toll Collection Equipment	\$6,300,000	\$6,300,000	\$6,300,000	\$6,300,000	\$7,600,000	\$7,600,000
Right-of-Way	\$0	\$0	\$0	\$0	\$0	\$0
Mitigation, Wetlands, Floodplains & Wildlife	\$173,200,000	\$180,000,000	\$133,100,000	\$139,900,000	\$218,200,000	\$225,000,000
Total	\$1,992,000,000	\$2,160,100,000	\$1,995,600,000	\$2,163,700,000	\$2,656,300,000	\$2,824,300,000

Cost Element	Alternative 7	Alternative 8	Alternative 9	Alternative 10	Alternative 11	Alternative 12
Roadway Construction	\$996,300,000	\$1,048,700,000	\$862,300,000	\$914,700,000	\$884,300,000	\$936,700,000
Bridges Construction	\$727,900,000	\$836,700,000	\$513,400,000	\$622,200,000	\$535,100,000	\$643,900,000
Interchanges Construction	\$750,000,000	\$750,000,000	\$650,000,000	\$650,000,000	\$650,000,000	\$650,000,000
Toll Collection Equipment	\$7,600,000	\$7,600,000	\$7,600,000	\$7,600,000	\$7,600,000	\$7,600,000
Right-of-Way	\$0	\$0	\$0	\$0	\$0	\$0
Mitigation, Wetlands, Floodplains & Wildlife	\$178,100,000	\$184,900,000	\$200,200,000	\$207,000,000	\$160,000,000	\$166,800,000
Total	\$2,659,900,000	\$2,827,900,000	\$2,233,500,000	\$2,401,500,000	\$2,237,000,000	\$2,405,000,000

9.5 Projected Traffic and Revenue

9.5.1 2045 Revenue Analysis

Since this project will not be implemented until sometime after 2040, a revenue analysis was not performed. As the project moves forward in subsequent studies, detailed traffic and revenue analyses will be completed.

9.5.2 Present Value

Based on the high-level, conceptual nature of this study, the Present Value (PV) was not performed. As the project moves forward in subsequent studies, detailed analyses will be completed.

9.6 Alternative Comparison Matrix

An alternative comparison matrix is provided in Tables 9.2 and 9.3. This matrix provides a convenient comparison of the various information and effects of all the alternatives evaluated.

Table 9.2: Northeast Connector Expressway Extension Alternative Comparison Matrix

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Physical													
Major Utility Conflicts - Existing	No. of Conflicts	11	11	11	11	12	12	12	12	13	13	13	13
Major Utility Conflicts - Planned	No. of Conflicts	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Contamination Sites & Facilities	No. of Conflicts	1	2	1	2	1	2	1	2	1	2	1	2
Railroad Involvement	No. of Conflicts	0	0	0	0	0	0	0	0	0	0	0	0
Cultural Environment													
Public Lands	acres	34	34	34	34	11	11	12	12	11	11	12	12
Section 4(f) Coordination Required (Public Recreation Lands, Wildlife Refuges, etc.)	Y/N	N	N	N	N	N	N	N	N	N	N	N	N
Potential Historic Resources	No. of Conflicts	5	7	4	6	3	5	2	4	3	5	2	4
Potential Historic Linear Resources (Canals/Highways/Railroads)	No. of Resources	4	4	6	6	4	4	6	6	5	5	7	7
Potential Archaeological Resources	No. of Resources	0	0	1	1	0	0	1	1	0	0	1	1

RED = High impacts = potential impacts greater than one standard deviation above the mean

YELLOW = Medium impacts = potential impacts within one standard deviation of the mean

GREEN = Low impacts = potential impacts with zero or greater than one standard deviation below the mean

Table 9.2: Northeast Connector Expressway Extension Alternative Comparison Matrix (continued)

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Natural Environment													
Water Features													
<i>Ponds / Lakes</i>	acres	24	17	15	7	25	18	16	8	23	16	14	6
<i>Canals / Regulated Floodways</i>	No. of Conflicts	0	0	0	0	3	3	3	3	2	2	2	2
<i>Flood Hazard Areas – 100 Year Floodplain</i>	acres	1,004	1,064	790	850	1,386	1,446	1,172	1,232	1,224	1,284	1,010	1,070
Wetlands (non-forested and forested)	acres	571	620	461	510	805	854	695	744	679	728	569	618
Potential Habitat – Federal Listed Species	acres	2,534	2,654	2,679	2,799	2,637	2,757	2,782	2,902	2,472	2,593	2,617	2,738
Potential Habitat – State-Listed Species	acres	1,990	2,059	2,189	2,257	1,750	1,819	1,949	2,017	1,789	1,857	1,987	2,056
Potential Bald Eagle Nest	Y/N	N	N	N	N	N	N	N	N	N	N	N	N
Potential Species Impacts (composite rating)	High/Med/Low	Med	Med	Med	High	High	Med	Med	Med	Med	Med	Med	Med
Mitigation Bank													
<i>Lake X Ranch</i>	acres	0	0	0	0	0	50	0	0	0	0	0	0
Conservation Easement													
<i>Triple N Ranch WMA</i>	acres	9	9	9	9	0	0	0	0	0	0	0	0
<i>Bull Creek WMA</i>	acres	17	17	17	17	0	0	0	0	0	0	0	0
Florida Forever Acquired													
<i>Osceola Pines Savannas</i>	acres	12	12	12	12	0	0	0	0	0	0	0	0
<i>Big Bend Swamp/ Holopaw Ranch</i>	acres	0	0	0	0	225	225	225	225	225	225	225	225
<i>Conlin Lake X</i>	acres	0	0	0	0	0	59	0	0	0	0	0	0
Public Lands (FLMA, Sept. 2018)	acres	34	11	11	11	6	0	6	6	6	6	0	0
RED = High impacts = potential impacts greater than one standard deviation above the mean													
YELLOW = Medium impacts = potential impacts within one standard deviation of the mean													
GREEN = Low impacts = potential impacts with zero or greater than one standard deviation below the mean													

Table 9.2: Northeast Connector Expressway Extension Alternative Comparison Matrix (continued)

Evaluation Criteria	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Social													
Right-of-Way Area (not including proposed ponds)	acres	2,653	2,758	2,736	2,841	2,762	2,867	2,845	2,950	2,611	2,716	2,694	2,799
Potential Residential Impacts (includes partially impacted parcels)	Total Parcels	14	12	10	8	13	11	9	7	13	11	9	7
<i>Existing</i>	Parcels	14	12	10	8	13	11	9	7	13	11	9	7
<i>Planned</i>	Parcels	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potential Non-Residential Impacts (includes partially impacted parcels)	Total Parcels	100	140	99	139	110	150	109	149	110	150	109	149
<i>Existing</i>	Parcels	100	140	99	139	110	150	109	149	110	150	109	149
<i>Planned</i>	Parcels	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Community Facilities	No. of Conflicts	0	0	0	0	0	0	0	0	0	0	0	0
Parks and Recreational Facilities (public and private)	No. of Conflicts	3	3	3	3	2	2	2	2	2	2	2	2
Trails	No. of Conflicts	1	1	1	1	1	1	1	1	1	1	1	1
Community Cohesion Effects	High/Med/Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Socio-economic Impacts to Special Populations	High/Med/Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Proposed Development / Development of Regional Impact	acres	1,603	1,603	1,603	1,603	1,712	1,712	1,712	1,712	1,561	1,561	1,561	1,561

RED = High impacts = potential impacts greater than one standard deviation above the mean

YELLOW = Medium impacts = potential impacts within one standard deviation of the mean

GREEN = Low impacts = potential impacts with zero or greater than one standard deviation below the mean

Table 9.3: Alternatives Evaluation Design Elements Matrix

Design Element	Unit of Measure	ALTERNATIVE											
		1	2	3	4	5	6	7	8	9	10	11	12
Alternative Length (approximate)	miles	39	40	40	41	38	40	39	41	37	39	38	40
Proposed Right-of-Way Width (general and varies at interchanges)	feet	500	500	500	500	500	500	500	500	500	500	500	500
Proposed Bridges – total structures per alternative	Structures	53	55	56	58	55	57	58	60	44	46	47	49
Total length of all proposed structures	feet	85,928	95,215	87,351	96,638	128,132	137,419	129,555	138,842	101,133	110,420	102,556	111,843
Proposed Interchanges	Number	3	3	3	3	4	4	4	4	3	3	3	3
Projected 2045 Annual Average Daily Traffic (AADT) Volume (as a tolled facility)	vehicles	5,600 - 5,700	5,600 - 5,700	5,600 - 5,700	5,600 - 5,700	4,300 - 4,800	4,300 - 4,800	4,300 - 4,800	4,300 - 4,800	2,300 - 3,000	2,300 - 3,000	2,300 - 3,000	2,300 - 3,000

9.7 CFX Financial Viability Criteria

In previous CFX Concept, Feasibility, and Mobility project studies financial viability criteria was determined to aid in defining whether a project met the collective definition of viability. However, the NECEE study was conducted by CFX to fulfill a commitment set forth in the purchase and sale agreement with Farmland Reserve and Suburban Land Reserve for right-of-way property along SR 528. This right-of-way would allow for the eventual eight-lane build-out of SR 528 and facilitate a high-speed passenger train between Miami and Orlando. Since this project is not expected to be implemented until sometime after the year 2040, and in consideration of the high-level, conceptual nature of this study, the financial viability of the alternatives was not determined and will be addressed at a later date.

9.8 Findings of the Concept, Feasibility, & Mobility Study

The purpose of this Concept, Feasibility, and Mobility report was to determine if the identified alternatives are feasible from an engineering and environmental standpoint. Regarding engineering and environmental issues, no “fatal flaws” have been observed. As development within or near the study area progresses, a more comprehensive study is recommended to conclude a preferred alternative that will serve the needs of the community.