

**CENTRAL
FLORIDA
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AUTHORITY**

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CFX Project Number: 408-175

ENVIRONMENTAL ASSESSMENT

SR 408 WESTBOUND CAPACITY IMPROVEMENTS FROM I-4 TO GOLDENROD ROAD PROJECT DEVELOPMENT & ENVIRONMENT STUDY

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1.0 - Project Information

Project Name: Westbound SR 408 Capacity Improvements from I-4 to Goldenrod Road PD&E Study

Projects Limits: Westbound SR 408 from I-4 to Goldenrod Road (**Figure 1**)

County: Orange County

Proposed Activity: Analyze and evaluate the addition of one lane along the westbound direction of SR 408 from I-4 to Bumby Avenue and SR 436 (Semoran Boulevard) to Goldenrod Road.

Responsible Agency: Central Florida Expressway Authority (CFX)

Planning Organization: CFX

Phase: Project Development & Environment (PD&E) Study

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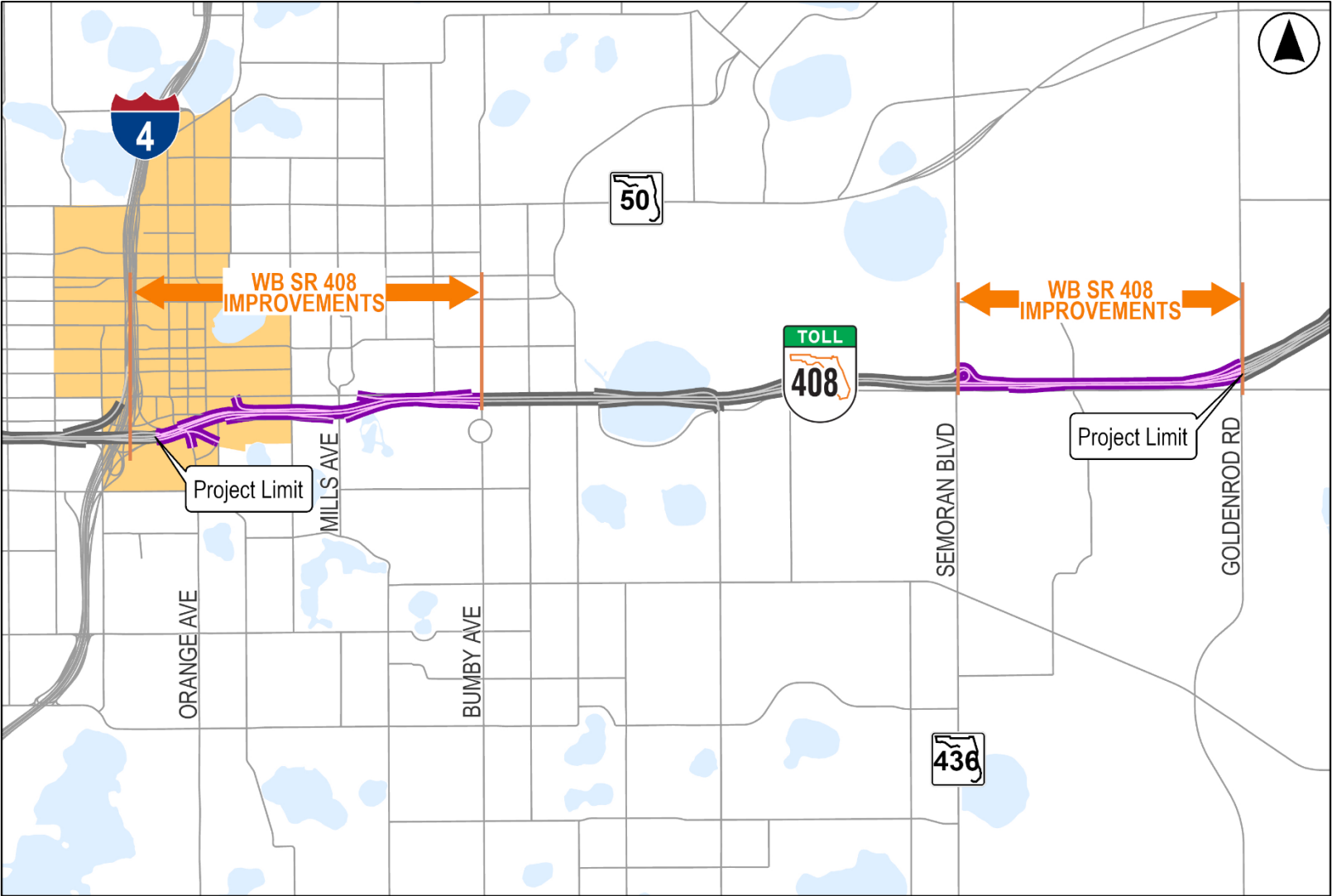
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Figure 1: Project Location Map



Project Background & Description

Background

In September 2022, CFX began conducting a Project Development and Environment (PD&E) Study for capacity improvements to westbound SR 408 between Interstate 4 (I-4) and Goldenrod Road.

More than 164,000 vehicles per day travel on SR 408 with a significant portion traveling westbound in the morning from east Orlando to reach downtown and I-4. As such, the SR 408 westbound lanes near downtown Orlando become congested and experience delay. Within the study area along the westbound direction, SR 408 provides four lanes from Goldenrod Road to Semoran Boulevard, five lanes from Semoran Boulevard to Bumby Avenue, and four lanes from Bumby Avenue to I-4. An additional lane within the existing four lane segments is needed to provide five lanes continuously from Goldenrod Road to I-4 and address the mobility and traffic needs of daily commuters.

This PD&E will evaluate the addition of one westbound lane from I-4 to Bumby Avenue and from Semoran Boulevard to Goldenrod Road, matching previous improvements between Bumby Avenue and Semoran Boulevard. Most of the work would occur within SR 408's existing right of way.

Study Description

The general objective of this PD&E Study is to provide documented information necessary for CFX to reach a decision on the type, design, and location of the proposed capacity improvements within the project limits. Public involvement and community engagement will be a crucial component of this PD&E Study.

The PD&E Study includes the development and evaluation of adding a lane within the corridor. The work includes the evaluation and documentation of the physical, natural, social, and cultural environment within the corridor and the potential impacts associated with the various mobility alternatives. This analysis also addresses economic and engineering feasibility, mobility capacity and levels of service, conceptual geometry, drainage, and structures.

Purpose and Need

The purpose and need provide the basis for developing, considering, evaluating, and eliminating alternatives.

Purpose

The purpose of the study is to address increasing traffic congestion and improve mobility along the westbound lanes of SR 408 between I-4 and Goldenrod Road. With over 164,000 vehicles traveling daily in the area, the traffic volume has been steadily rising and is expected to continue growing. The project aims to improve SR 408 by adding an additional travel lane in the westbound direction from I-4 to Bumby Ave and from Semoran Boulevard to Goldenrod Road. The goal is to improve traffic flow, accommodate growing demands, reduce congestion and delay, and enhance safety.

Need

The need for adding capacity on SR 408 is based on several factors:

- 1) **Improve traffic flow:** The westbound segment of SR 408 from Semoran Boulevard to Goldenrod Road currently operates at an acceptable Level of Service (LOS) D or better

during the AM peak hour. The segment from I-4 to Bumby Avenue operates at an unacceptable LOS of E and F in the AM. As travel demands continue to increase, the LOS is expected to deteriorate if nothing is done. By 2045, travel demands on westbound SR 408 are expected increase by over 18%.

- 2) **Reduce congestion and delay:** If nothing is done, increasing travel demands will result in more congestion and delays. This will affect the reliability of SR 408 for those who rely on it for their daily commute.
- 3) **Enhance safety:** A review of existing crash data indicates that rear end collisions account for approximately 53% of all crash types. This is indicative of increasing congestion and vehicles having to abruptly stop or slow down within a limited distance. If nothing is done, it is expected that crashes would increase.
- 4) **Support regional connectivity:** SR 408 is a vital transportation corridor connecting commuters to downtown Orlando and Interstate 4 (I-4). By enhancing the capacity and efficiency of SR 408, the improvements will contribute to regional connectivity and support economic growth and development.
- 5) **Provide consistency with local plans and policies:** Improvements to SR 408 are aligned with local plans and policies related to transportation infrastructure and land use. By providing a more efficient roadway, the project will ensure consistency with the existing land use patterns and support the area's planned growth and development.
- 6) **Support economic benefits:** Successful implementation of the study recommendations will bring economic benefits to the region. Reducing congestion and improving traffic flow will enhance logistics and other business transportation routes for goods and services. Commuters will also experience shorter travel times, leading to increased productivity and quality of life.

2.0 – Environmental Analysis & Report Introduction

General Existing Conditions of Project Area

The project area is on existing westbound SR 408 from I-4 to Goldenrod Road, with a focus on the existing 4-lane portions of this section. For consistency in studying the existing and anticipated conditions of the area surrounding the proposed lane addition, a half-mile radius of the general existing conditions surrounding the project area was used.

A majority of the project falls within the City of Orlando limits, except for the eastern 1.5-miles of SR 408 between Semoran Boulevard and Goldenrod Road. This portion of SR 408 traverses an area where unincorporated Orange County is located to the north of the roadway and City of Orlando is located to the south.

The land use along the segment between I-4 to Bumby Avenue is primarily single-family residential along the south side of SR 408. Downtown Orlando is located on the north side of SR 408 in this area with office buildings and multifamily buildings. From Semoran Boulevard to Goldenrod Road, there is dense single-family residential development on both the north and south side of SR 408. This is depicted on the aerial images below on Error! Reference source not found. and Error! Reference source not found..

Very little new development is anticipated in this area as a majority of the land in the project area is already developed. Significant change to the land use in this area is not anticipated.

Figure 2: I-4 to Bumby Avenue

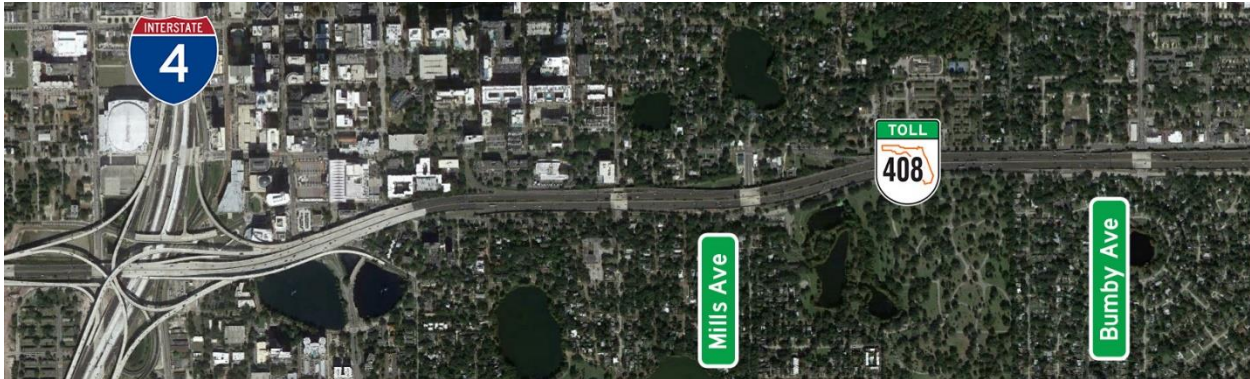


Figure 3: Semoran Boulevard (SR 436) to Goldenrod Road



2.a – Social & Economic Environment Analysis

2.a – Social & Economic Environment Analysis

Social

Demographics

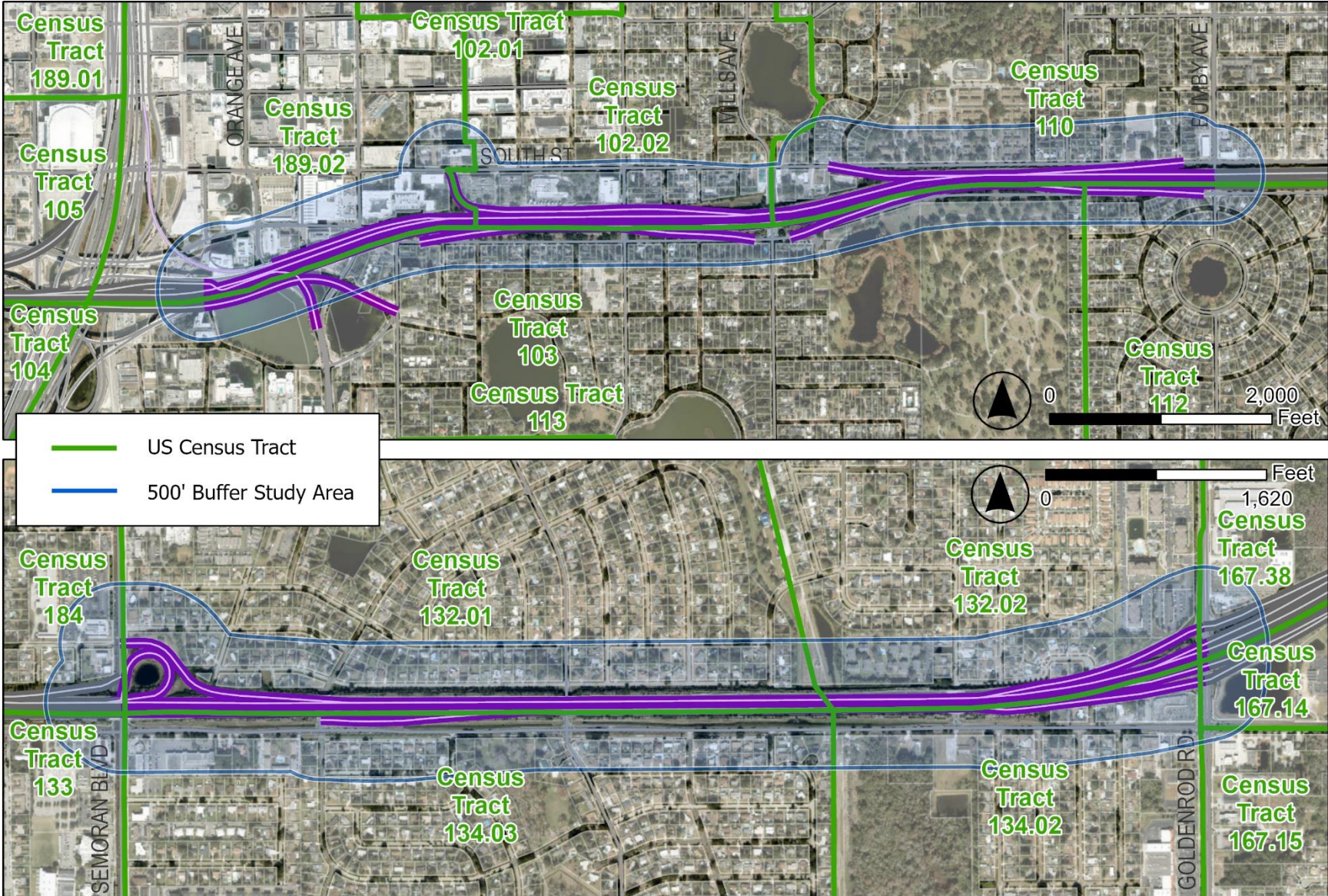
The study area was reviewed to identify minority and/or low-income populations as well as underrepresented population groups protected under *Title VI of the Civil Rights Act of 1964* and related nondiscrimination statutes and regulations. **Table 1** provides study area demographics based on the US Census Tracts in which the project is located. See **Figure 4** for the location of the tracts.

Table 1: Study Area Demographics by Census Tract

Location	Census Tract	Total Population	Percent Minority Population	Percent Population Below Poverty Level	Percent Population Aged 65 and Over
I-4 to Bumby Ave	132.01	4,480	79.17%	4.35%	20.36%
	132.02	6,812	84.70%	9.97%	18.01%
	133*	6,655	66.60%	14.53%	28.58%
	134.02	3,679	69.50%	1.53%	29.74%
	134.03	4,153	77.37%	9.93%	14.91%
	167.38*	4,505	76.78%	6.26%	8.63%
	167.14*	3,264	73.01%	2.30%	12.97%
	184*	2,723	52.15%	0.77%	11.35%
Semoran Blvd to Goldenrod Rd	102.02	3,453	31.71%	0.00%	11.44%
	103	2,510	28.69%	2.68%	18.85%
	110	3,069	43.53%	12.23%	6.14%
	112	3,236	21.08%	10.40%	14.31%
	189.02	3,893	47.96%	2.51%	17.23%
Orange County		1,340,469	56.0%	14.2%	12.0%

Source: 2020 U.S. Census (Total Population, Minority Population); 2020 ACS 5-Year Estimates (Poverty, 65 and Over)

Figure 4: Study Area Census Tracts



Community Features

A desktop review of the study area indicates that there are several community features within the study area: Dr. Phillips Center for the Performing Arts, WFTV television studios, Greenwood Urban Wetland, Greenwood Cemetery, Reeves Terrace Apartments, and H2O Church, all located within the I-4 to Bumby Ave segment. Within the segment from Semoran Blvd to Goldenrod Rd there are the following community features: Engelwood Park, Grace Church, and La Petite Academy daycare. These features along with others in close proximity to the study area are included in **Table 2** below.

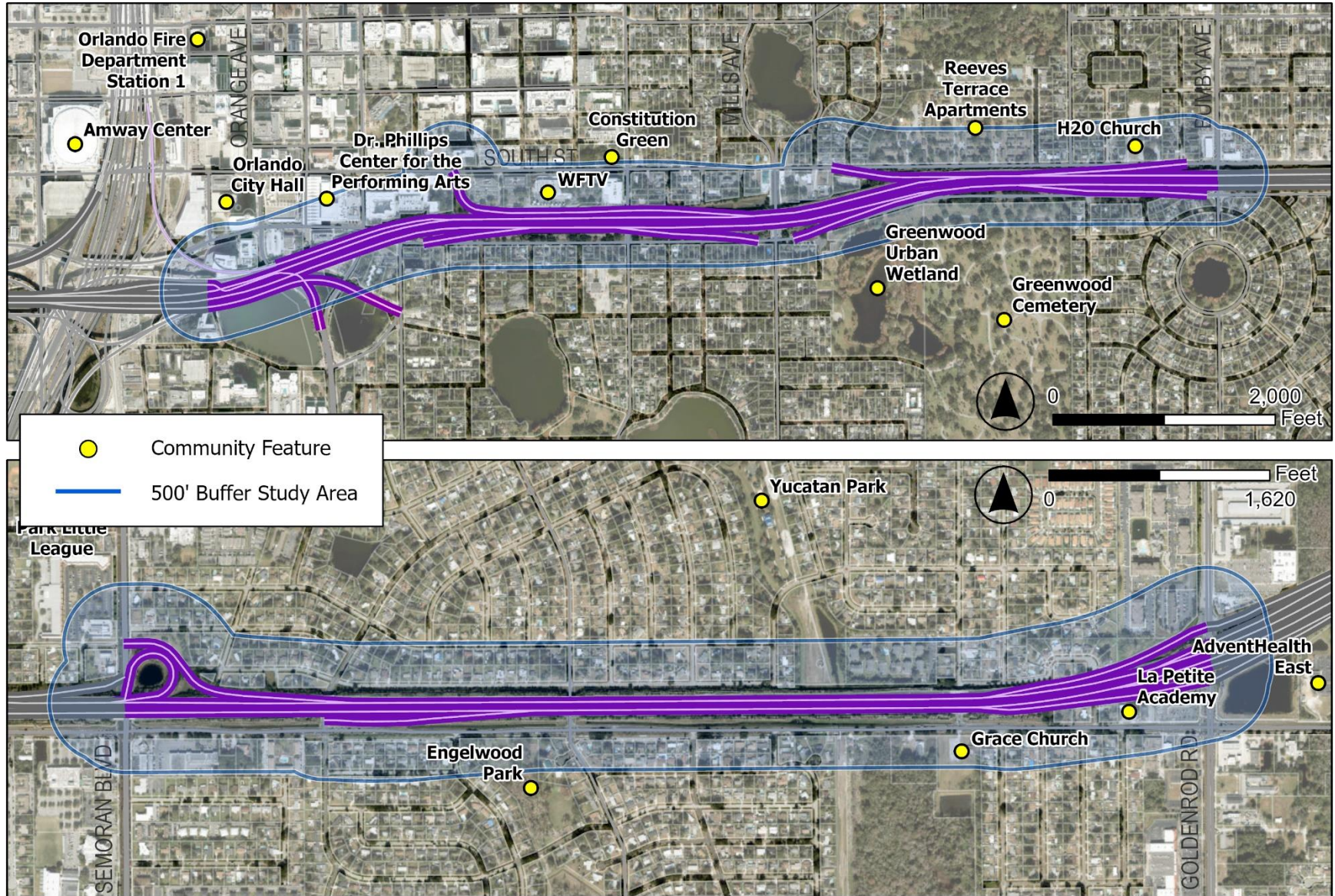
It should be noted that just to the north of the I-4 to Bumby Ave segment there is a City of Orlando fire station and just to the east of the Semoran Blvd to Goldenrod Rd segment there is an Advent Health hospital campus. **Figure 5** presents the community features locations.

Additionally, the area within and surrounding the project is mostly developed, with much of the land dedicated to residential uses, including Reeves Terrace Apartments, a public housing development, which is located just west of Bumby Ave, to the north of SR 408.

Table 2: Community Features

Location	Name	Type of Facility	Relative Location
I-4 to Bumby Ave	City of Orlando Fire Station 1	Institutional	±315 feet northeast of study area
	Amway Center	Recreation/Entertainment	±105 feet west of study area
	Orlando City Hall	Institutional	±155 feet northeast of study area
	Dr. Phillips Center for the Performing Arts	Cultural	Partially within study area
	First United Methodist Church of Orlando	Place of Worship	±250 feet north of study area
	WFTV	Television Studio and Equipment	Partially within study area
	Orange County Administration	Institutional	Several located along north side of study area
	Constitution Green	Recreation/Park	±120 feet north of study area
	Greenwood Urban Wetlands	Recreation/Park	Partially within study area
	Greenwood Cemetery	Cemetery	Partially within study area
	Reeves Terrace Apartments	Low-Income Housing	Partially within study area
	H2O Church Orlando	Place of Worship	Partially within study area
Semoran Blvd to Goldenrod Rd	Engelwood Park	Recreation/Park	Partially within study area
	Yucatan Park	Recreation/Park	±480 feet west of study area
	Grace Church	Place of Worship	Partially within study area
	La Petite Academy	Daycare	Within study area
	AventHealth East	Hospital	±800 feet north of study area
	Azalea Park Little League	Recreation/Park	±960 feet north of study area

Figure 5: Community Features



Economic

The proposed improvements will provide improved safety, enhanced capacity, and reduced congestion and travel time. As this stretch of SR 408 includes several connections to surface roads as well as the approach to the interchange with I-4, it is a critical connection to one of Central Florida’s major economic centers of downtown Orlando and surrounding neighborhoods.

Land Use Changes

Adjacent land includes parcels within Orlando City Limits and within unincorporated Orange County. Future Land Use (FLU) designations are summarized in **Table 3** and shown on **Figure 6**. Land adjacent to the study area generally consists of developed properties, the majority of which are residential. There are park features and commercial areas within 250 feet of the project, including portions of the central business district of Orlando.

Table 3: Future Land Uses Within Project Area

Jurisdiction	Future Land Use (FLU) Designation	FLU Code
City of Orlando	Community Activity Center	COMM-AC
	Conservation	CONSERV
	Downtown Activity Center	DT-AC
	Industrial	INDUST
	Mixed Use Corridor High Intensity	MUC-HIGH
	Mixed Use Corridor Medium Intensity	MUC-MED
	Neighborhood Activity Center	NEIGH-AC
	Office High Intensity	OFFICE-HIGH
	Office Low Intensity	OFFICE-LOW
	Office Low Intensity/Resource Protection Overlay	OFFICE-LOW/RES-PRO
	Office Medium Intensity	OFFICE-MED
	Public/Recreational & Institutional	PUB-REC-INST
	Residential Low Intensity	RES-LOW
	Residential Low Intensity/Resource Protection Overlay	RES-LOW/RES-PRO
	Residential Medium Intensity	RES-MED
Urban Reserve	UR-AC	
Orange County	Commercial	C
	Institutional	IN
	Low-Density Residential	LD
	Medium-Density Residential	MD
	Office	O
	Water Body	WB

In addition to the Orange County and City of Orlando Future Land Use classifications, the Florida Department of Environmental Protection (FDEP) Florida Land Use Cover Classification System (FLUCCS) was used to classify various land uses and land covers within the study area. **Table 4: FLUCCS Codes Within Project Area** summarizes the land uses and the locations are depicted on **Figure 7**.

Table 4: FLUCCS Codes Within Project Area

FLUCCS Code	Description
1200	Medium Density Residential
1300	Residential High Density
1400	Commercial and Services
1480	Cemetery
1550	Other Light Industrial
1700	Institutional
1850	Parks
1860	Community Recreation Facilities
1900	Open Land
2430	Ornamentals
3100	Herbaceous (Dry Prairie)
4340	Upland Mixed Coniferous/Hardwood
5200	Lakes
5300	Reservoirs
6410	Freshwater Marshes
6460	Mixed Scrub-shrub Wetland
8140	Roads and Highways
8370	Surface Water Collection Features

Figure 6: Project Area Future Land Use Designations

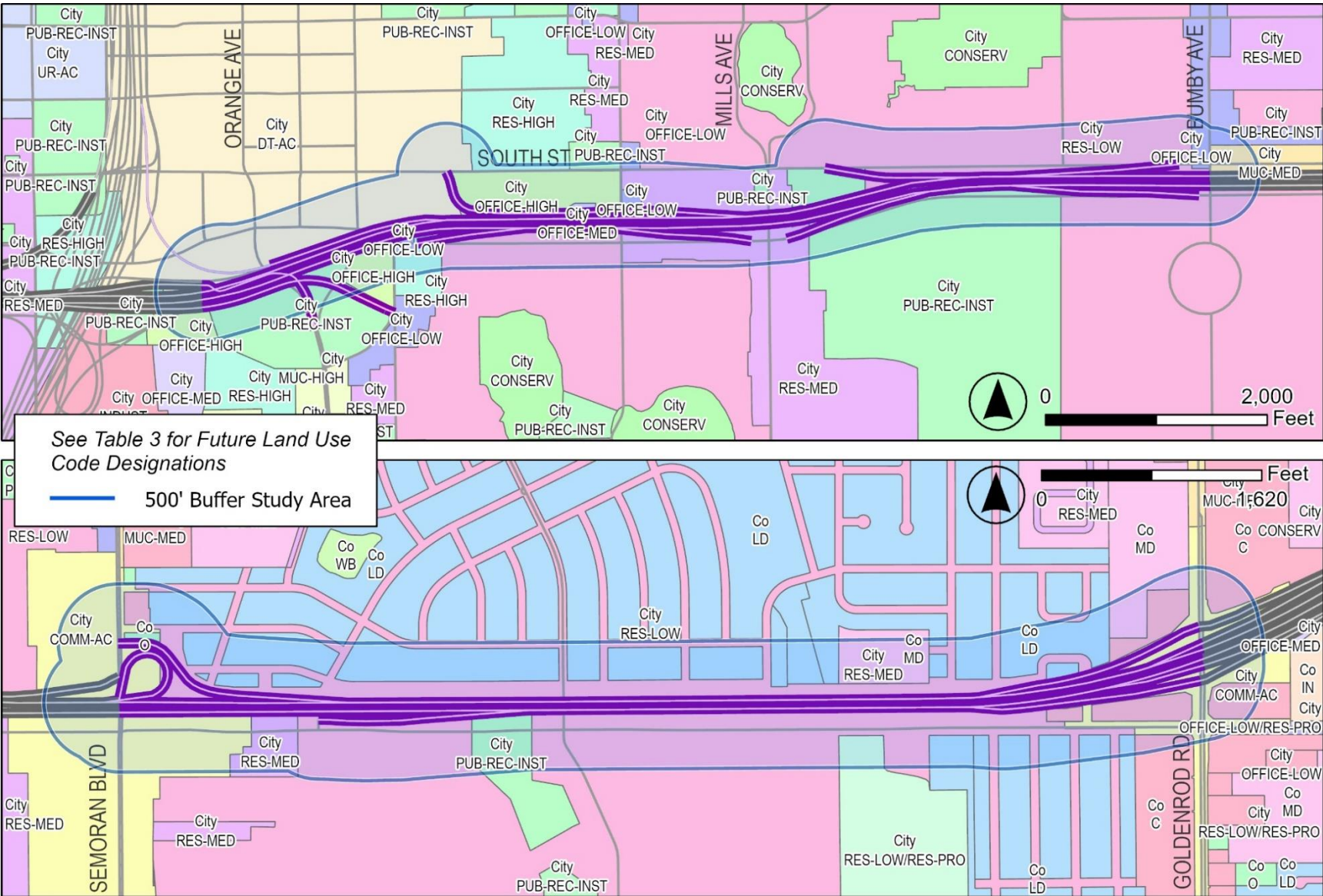
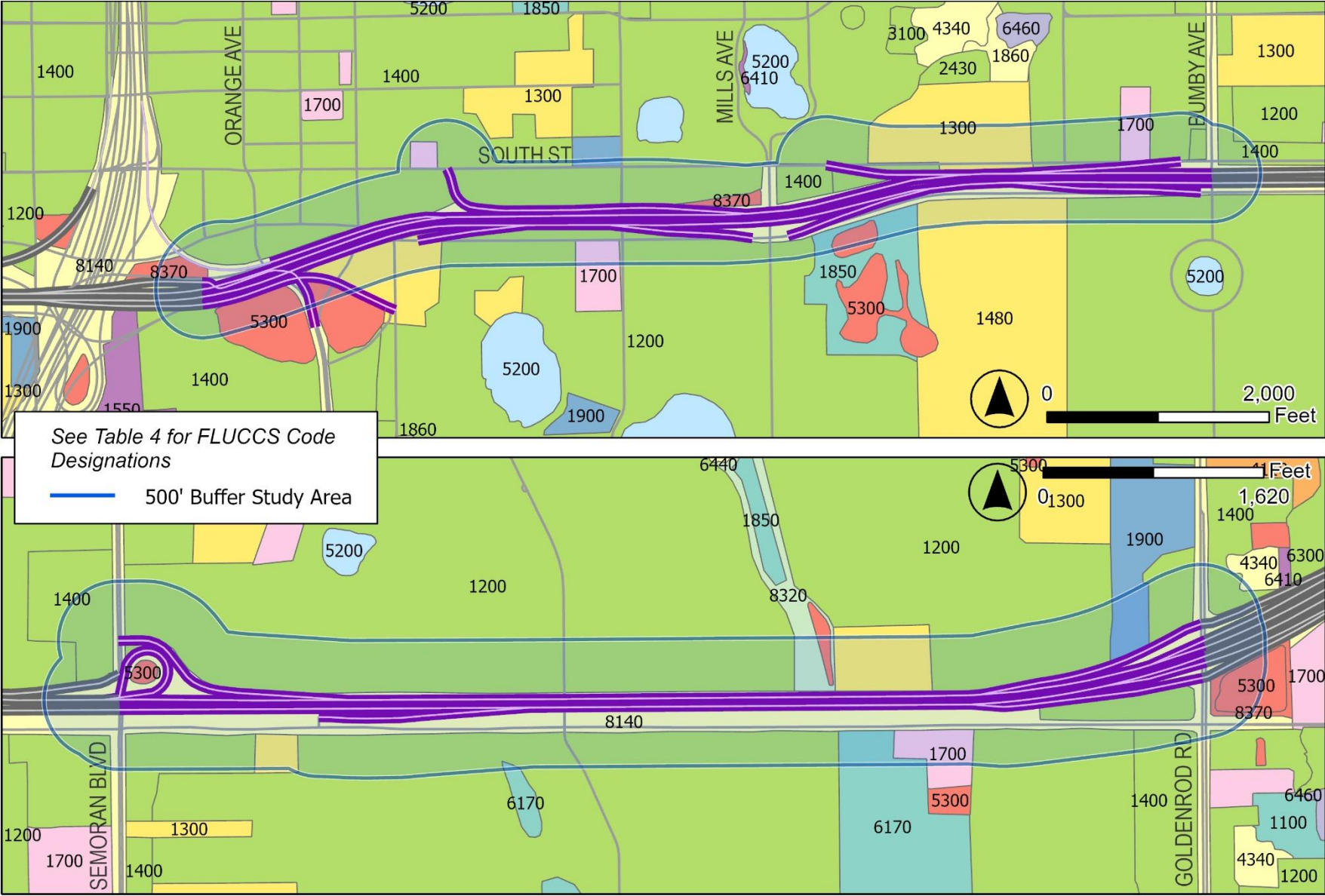




Figure 7: FLUCCS Within Project Area



Mobility

There are no existing transit routes that travel on SR 408 within the project area. Lynx Link 13 and Link 15 each travel parallel to SR 408 on Anderson St and South St between Orange Ave and Bumby Ave, with stops located along these roads. Several other routes travel under SR 408 along Orange Ave, including Links 7, 11, 18, and 40.

There is also a SunRail commuter rail station located between South St and Church St on the rail tracks, which crosses under the I-4/SR 408 interchange.

Between Semoran Blvd and Goldenrod Rd, two routes cross through the project area. Link 28 travels northbound on Semoran Blvd and southbound on Oxalis Ave, and Link 436S travels northbound and southbound on Semoran Blvd.

Between I-4 and Bumby Ave, there is sidewalk present along Anderson St and South St generally throughout the project area. A multiuse path is present on Anderson St from Summerlin Ave to Crystal Lake Dr and serves as part of the City of Orlando Downtown Loop. This area is also within the service area of micromobility vendors, and users of bikeshare and scootershare frequently travel within this area.

There is sidewalk present on the south side of Lake Underhill Rd throughout the project area, and on both sides from Dial Dr to Goldenrod Rd.

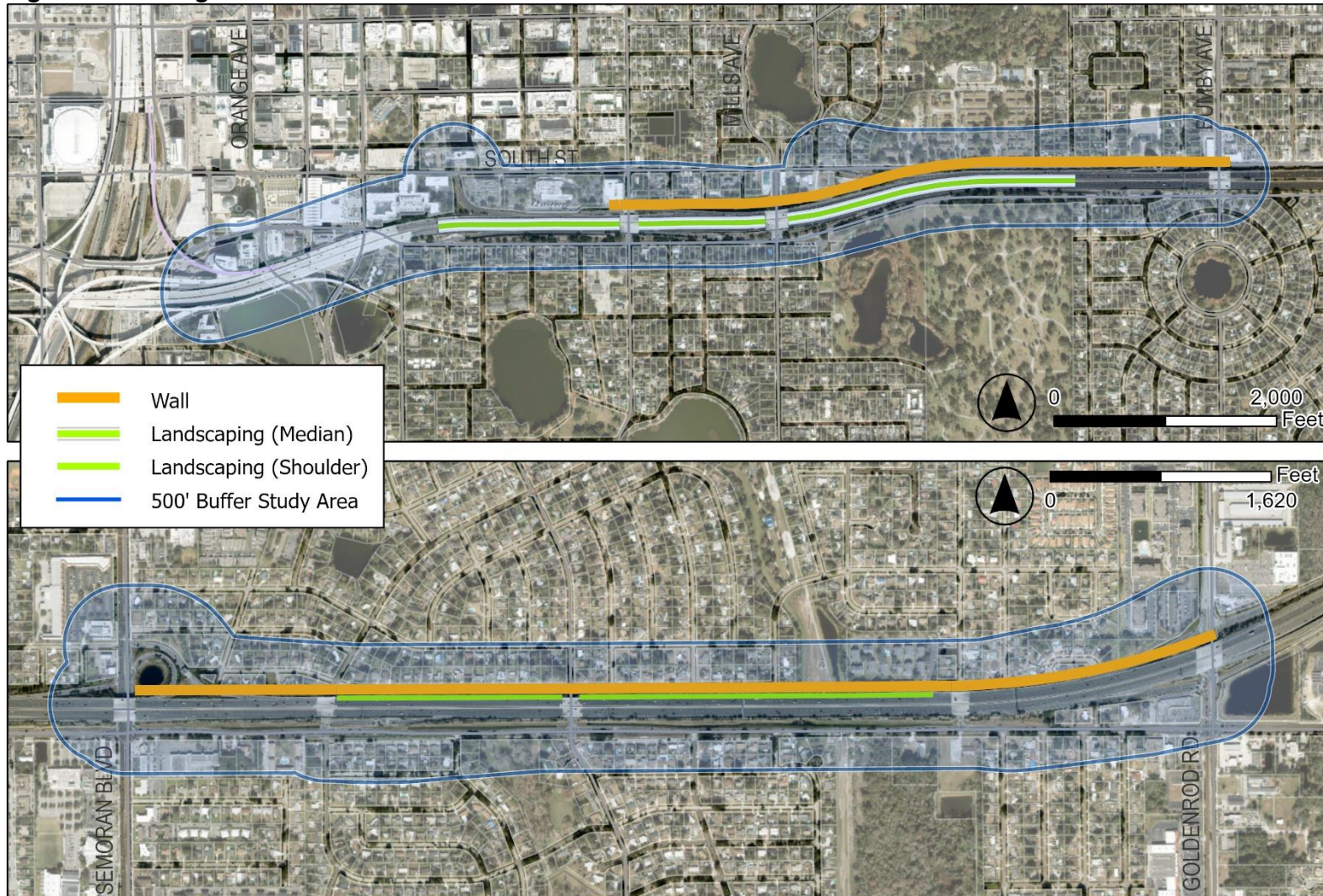
This project's proposed improvements will provide more efficient connections via SR 408, potentially taking additional automobiles off of surface roads to minimize potential conflicts with transit, pedestrians, and bicyclists.

Aesthetic Effects

There is an existing noise wall present along part of the I-4 to Bumby Ave segment and along most of the Semoran Blvd to Goldenrod Rd segment. There is also landscaping present in the median along the western segment and along the northern right of way within the eastern segment. A map illustrating these features is included on **Figure 8**.

Aesthetic impacts of the proposed improvements may include opportunities for landscaping and hardscaping enhancements. The project is anticipated to largely use existing right of way, and the context of the area will remain urban in nature as it is currently. As such, it is not anticipated that the project will negatively impact the overall aesthetics of the area.

Figure 8: Existing Aesthetic Features



2.b – Cultural Environment Analysis

2.b – Cultural Environment Analysis

Historic Sites/Districts & Archaeological Sites

On January 4, 2023, SEARCH reviewed concept plans for the widening of SR 408 from SR 436 to Goldenrod Rd. The purpose of this review was to identify previously recorded cultural resources within the project area. The Study Area was defined as the parcels where the proposed widening will take place (the potential construction area) in addition to a 152-meter (500-foot) buffer to address potential viewshed effects to historic resources. The present document is for information purposes only and does not satisfy any requirements under the National Environmental Policy Act or Section 106 of the National Historic Preservation Act.

Review of the Florida Master Site File (FMSF) database indicates that 131 historic buildings, one archaeological site, one historic cemetery, and five resource groups are located within the Study Area (**Table 5 – Table 8** ; see **Figure 9**). Of these resources, two buildings (8OR00111 and 8OR09989) and one resource group (8OR08984) are listed on the National Register of Historic Places (NRHP). In addition, 37 historic buildings, the historic cemetery (8OR09088), and four resource groups (8OR00258, 8OR00422, 8OR09612, and 8OR10041) have been recommended eligible or potentially eligible for the NRHP. The remaining resources have not been evaluated by the State Historic Preservation Office for NRHP eligibility or have been recommended ineligible.

Table 5: Previously Recorded Building Resources in the Study Area

FMSF No.	Address	Year Built	Surveyor Recommendation	NRHP Eligibility Status
8OR00022	125 N Lucerne Circle	ca. 1900	Ineligible for NRHP	Eligible for NRHP
8OR00111	135 Lucerne Circle NE	1893	Eligible for NRHP	NRHP listed 1979
8OR00112	500 South Magnolia	1919	Not Evaluated	Ineligible for NRHP
8OR00128	518 Delaney Street	1904	Not Evaluated	Not Evaluated
8OR00209	426 E South Street	1908	Not Evaluated	Not Evaluated
8OR00262	310 E Anderson Street	1921	Not Evaluated	Ineligible for NRHP
8OR00263	314 E Anderson Street	1908	Not Evaluated	Ineligible for NRHP
8OR00264	332 E Anderson Street	1935	Not Evaluated	Ineligible for NRHP
8OR00265	338 Anderson Street	1935	Not Evaluated	Ineligible for NRHP
8OR00266	340 E Anderson Street	1935	Not Evaluated	Ineligible for NRHP
8OR00267	400 E Anderson Street	1914	Not Evaluated	Ineligible for NRHP
8OR00268	404 E Anderson Street	1913	Not Evaluated	Ineligible for NRHP
8OR00269	408 E Anderson Street	1913	Not Evaluated	Ineligible for NRHP
8OR00270	412 E Anderson Street	1913	Not Evaluated	Ineligible for NRHP
8OR00271	416 E Anderson Street	1916	Not Evaluated	Ineligible for NRHP
8OR00272	420 E Anderson Street	1919	Not Evaluated	Ineligible for NRHP
8OR00273	502 E Anderson Street	1925	Not Evaluated	Ineligible for NRHP
8OR00274	508 E Anderson Street	1919	Not Evaluated	Ineligible for NRHP
8OR00275	516 E Anderson Street	ca. 1923	Not Evaluated	Ineligible for NRHP
8OR00276	520 E Anderson Street	ca. 1916	Not Evaluated	Ineligible for NRHP
8OR00277	600 E Anderson Street	ca. 1916	Not Evaluated	Ineligible for NRHP
8OR00278	608 E Anderson Street	ca. 1916	Not Evaluated	Ineligible for NRHP
8OR00279	612 E Anderson Street	ca. 1923	Not Evaluated	Ineligible for NRHP
8OR00280	618 E Anderson Street	ca. 1916	Not Evaluated	Ineligible for NRHP
8OR00281	620 E Anderson Street	1923	Not Evaluated	Ineligible for NRHP
8OR00304	507 S Delaney Avenue	1913	Not Evaluated	Ineligible for NRHP

FMSF No.	Address	Year Built	Surveyor Recommendation	NRHP Eligibility Status
8OR00305	510 S Delaney Avenue	1905	Not Evaluated	Not Evaluated
8OR00312	505 S Eola Drive	1913	Not Evaluated	Ineligible for NRHP
8OR00327	502 S Lake Avenue	ca. 1910	Not Evaluated	Ineligible for NRHP
8OR00336	211 N Lucerne Circle	ca. 1925	Ineligible for NRHP	Eligible for NRHP
8OR00338	505 Margaret Court	1923	Not Evaluated	Ineligible for NRHP
8OR00346	500 S Osceola Avenue	1914	Not Evaluated	Ineligible for NRHP
8OR00347	504 S Osceola Avenue	1913	Not Evaluated	Ineligible for NRHP
8OR00446	300 E Anderson Street	ca. 1930	Ineligible for NRHP	Eligible for NRHP
8OR00461	101 W Jackson Street	n/a	Not Evaluated	Not Evaluated
8OR01389	413 Bryan Avenue	ca. 1930	Ineligible for NRHP	Not Evaluated
8OR01390	415 Bryan Avenue	ca. 1920	Ineligible for NRHP	Ineligible for NRHP
8OR01391	417 Bryan Avenue	ca. 1910	Ineligible for NRHP	Not Evaluated
8OR02524	309 S Lawsona Boulevard	ca. 1935	Ineligible for NRHP	Ineligible for NRHP
8OR02525	229 S Lawsona Boulevard	ca. 1935	Ineligible for NRHP	Ineligible for NRHP
8OR03354	415 S Delaney Avenue	ca. 1919	Ineligible for NRHP	Not Evaluated
8OR03355	430 Anderson Court	ca. 1923	Ineligible for NRHP	Ineligible for NRHP
8OR03356	426 Anderson Court	ca. 1923	Ineligible for NRHP	Ineligible for NRHP
8OR03357	424 Anderson Court	ca. 1923	Ineligible for NRHP	Ineligible for NRHP
8OR03358	427 Anderson Court	ca. 1923	Ineligible for NRHP	Ineligible for NRHP
8OR04889	1525–1537 E South Street	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04890	324–332 Reeves Court	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04891	316–322 Reeves Court	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04893	334–344 Reeves Court	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04894	310–314 Reeves Court	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04895	335–345 Reeves Court	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04897	1615–1621 Reeves Court	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04898	338–340 Victor Avenue	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04900	1633–1639 E South Street	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04901	350–356 Victor Avenue	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04902	342–348 Victor Avenue	1942	Eligible for NRHP	Potentially Eligible for NRHP
8OR04914	333–335 Victor Avenue	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR04915	345–347 Victor Avenue	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR04916	1721–1729 E South Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR06112	428 S Crystal Lake Drive	1958	Ineligible for NRHP	Ineligible for NRHP
8OR06115	409 S Crystal Lake Drive	1950	Ineligible for NRHP	Ineligible for NRHP
8OR06116	3029 E South Street	1958	Ineligible for NRHP	Ineligible for NRHP
8OR06117	300 Maynard Avenue	1949	Ineligible for NRHP	Ineligible for NRHP
8OR06118	220 Maynard Avenue	1949	Ineligible for NRHP	Ineligible for NRHP
8OR08150	341–343 Victor Avenue	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08235	506 S Garland Avenue	ca. 1917	Ineligible for NRHP	Ineligible for NRHP
8OR08472	1214 E South Street	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR08498	337–339 Victor Avenue	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08549	2001 E South Street	ca. 1949	Ineligible for NRHP	Not Evaluated
8OR08550	2015 E South Street	ca. 1945	Ineligible for NRHP	Not Evaluated
8OR08551	2021 E South Street	ca. 1949	Ineligible for NRHP	Not Evaluated
8OR08562	328–330 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08563	332–331 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08564	1743–1745 E South Street	1951	Eligible for NRHP	Potentially Eligible for NRHP

FMSF No.	Address	Year Built	Surveyor Recommendation	NRHP Eligibility Status
8OR08565	336–338 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08566	324–326 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08569	325–327 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08570	337–339 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08571	1861–1863 E South Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08572	333–335 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08573	329–331 Johnson Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR08990	2120 Newman Street	ca. 1935	Ineligible for NRHP	Not Evaluated
8OR09001	503 S Orange Avenue	ca. 1943	Ineligible for NRHP	Not Evaluated
8OR09009	203 N Lucerne Circle	1946	Ineligible for NRHP	Not Evaluated
8OR09032	1018 E Anderson Street	ca. 1926	Ineligible for NRHP	Not Evaluated
8OR09033	812 E Anderson Street	ca. 1918	Ineligible for NRHP	Not Evaluated
8OR09034	700 E Anderson Street	ca. 1925	Ineligible for NRHP	Ineligible for NRHP
8OR09035	720 E Anderson Street	ca. 1947	Ineligible for NRHP	Not Evaluated
8OR09036	800 E Anderson Street	ca. 1920	Ineligible for NRHP	Not Evaluated
8OR09037	806 E Anderson Street	ca. 1920	Ineligible for NRHP	Not Evaluated
8OR09038	808 E Anderson Street	ca. 1920	Ineligible for NRHP	Not Evaluated
8OR09039	1000 E Anderson Street	ca. 1924	Ineligible for NRHP	Not Evaluated
8OR09040	1104 E Anderson Street	ca. 1924	Ineligible for NRHP	Not Evaluated
8OR09041	1108 E Anderson Street	ca. 1924	Ineligible for NRHP	Not Evaluated
8OR09042	507 Daniels Avenue	ca. 1925	Ineligible for NRHP	Not Evaluated
8OR09056	500 S Eola Drive	ca. 1910	Ineligible for NRHP	Eligible for NRHP
8OR09060	505 Summerlin Avenue	ca. 1920	Ineligible for NRHP	Ineligible for NRHP
8OR09061	509 Summerlin Avenue	ca. 1920	Ineligible for NRHP	Ineligible for NRHP
8OR09064	405 S Hyer Avenue	ca. 1935	Ineligible for NRHP	Ineligible for NRHP
8OR09065	416 S Hyer Avenue	ca. 1949	Ineligible for NRHP	Ineligible for NRHP
8OR09066	415 S Hyer Avenue	ca. 1949	Ineligible for NRHP	Ineligible for NRHP
8OR09071	420 Daniels Avenue	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR09072	417 Daniels Avenue	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR09073	416 Daniels Avenue	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR09074	412 Daniels Avenue	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR09075	408 Daniels Avenue	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR09076	708–710 E South Street	ca. 1949	Ineligible for NRHP	Ineligible for NRHP
8OR09077	712 E South Street	ca. 1949	Ineligible for NRHP	Ineligible for NRHP
8OR09078	718–720 E South Street	ca. 1948	Ineligible for NRHP	Ineligible for NRHP
8OR09079	800 E South Street	ca. 1935	Ineligible for NRHP	Ineligible for NRHP
8OR09080	814 E South Street	ca. 1930	Ineligible for NRHP	Ineligible for NRHP
8OR09081	900 E South Street	ca. 1935	Ineligible for NRHP	Ineligible for NRHP
8OR09082	1004 E South Street	ca. 1935	Ineligible for NRHP	Ineligible for NRHP
8OR09114	332–334 McJordan Avenue	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR09157	Garland Avenue	ca. 1942	Ineligible for NRHP	Not Evaluated
8OR09187	336–338 E South Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR09224	211 N Lucerne Circle	1916	Ineligible for NRHP	Eligible for NRHP
8OR09568	1877–1879 E South Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR09569	340–344 McJordan Street	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR09570	328–330 McJordan Avenue	1951	Eligible for NRHP	Potentially Eligible for NRHP
8OR09989	500 S Orange Avenue	1966	Eligible for NRHP	NRHP listed 2012
8OR10148	712 Anderson Street	ca. 1958	Ineligible for NRHP	Ineligible for NRHP

FMSF No.	Address	Year Built	Surveyor Recommendation	NRHP Eligibility Status
8OR10149	4215 Summerlin Avenue	ca. 1945	Ineligible for NRHP	Ineligible for NRHP
8OR11186	1216 E Anderson Street	ca. 1954	Ineligible for NRHP	Not Evaluated
8OR11187	1212 E Anderson Street	ca. 1953	Ineligible for NRHP	Not Evaluated
8OR11188	1206 E Anderson Street	ca. 1954	Ineligible for NRHP	Not Evaluated
8OR11437	506 Hyer Avenue	ca. 1920	Ineligible for NRHP	Not Evaluated
8OR11455	1010 Anderson Avenue	ca. 1960	Ineligible for NRHP	Not Evaluated
8OR11456	1114 Anderson Avenue	ca. 1949	Ineligible for NRHP	Not Evaluated
8OR11457	1122 Elmwood Street	ca. 1952	Ineligible for NRHP	Not Evaluated

Table 6: Previously Recorded Archaeological Resources in the Study Area

<i>Archaeological Site</i>				
FMSF No.	Name	Time Period	Surveyor Recommendation	NRHP Eligibility Status
8OR10062	Center for Performing Arts Site	Nineteenth-century American, 1821–1899; Twentieth-century American, 1900–present	Ineligible for NRHP	Ineligible for NRHP

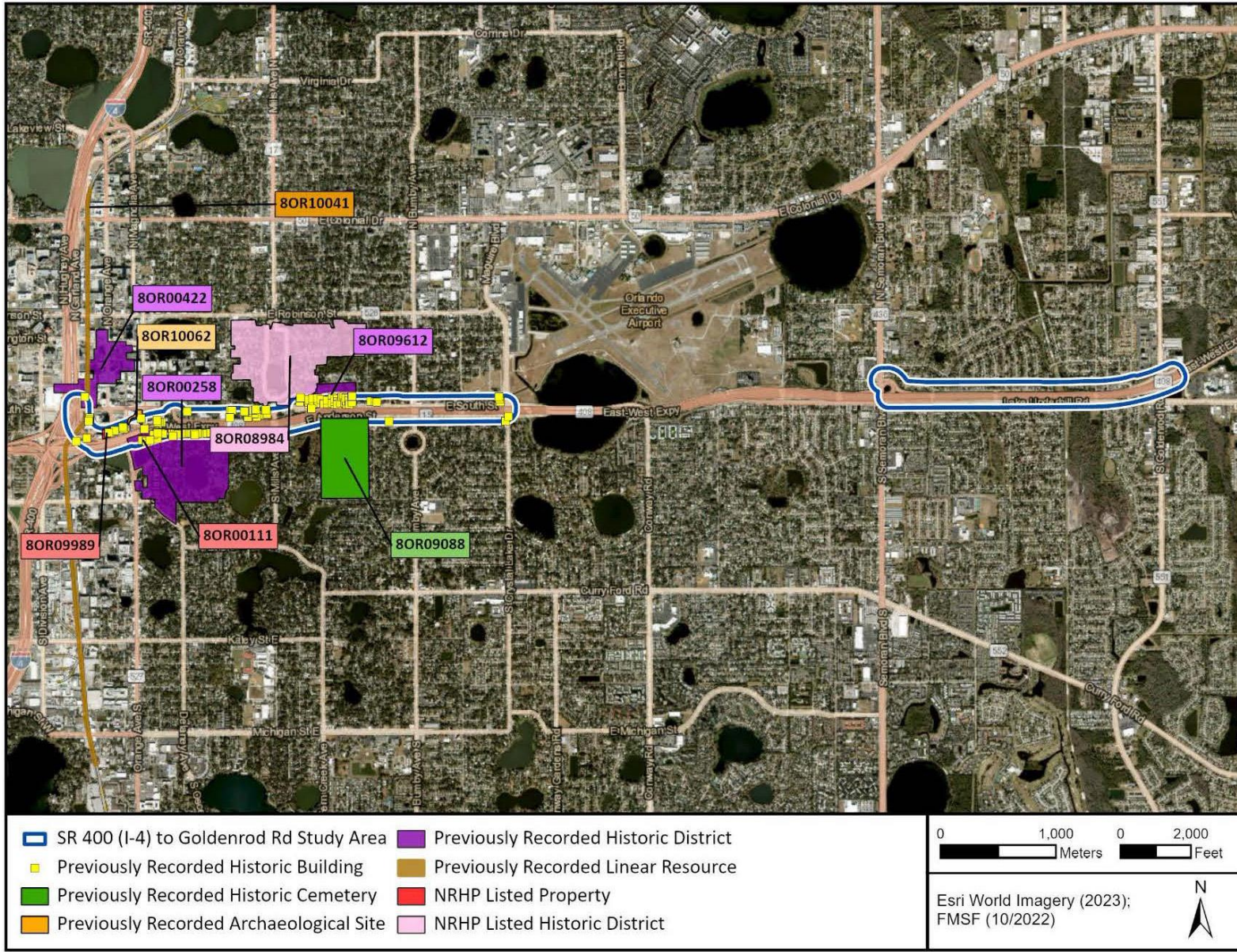
Table 7: Previously Recorded Cemetery Resources in the Study Area

<i>Cemeteries</i>				
FMSF No.	Name	Year Established	Condition	NRHP Eligibility Status
8OR09088	Greenwood Cemetery	ca. 1880	Well-maintained	Eligible for NRHP

Table 8: Previously Recorded Group and District and Resources in the Study Area

<i>Resource Groups and Historic Districts</i>			
FMSF No.	Name	Period of Significance	NRHP Eligibility Status
8OR00258	Lake Cherokee Historic District	Late twentieth century	Eligible for NRHP
8OR00422	Downtown Orlando Historic District	Late nineteenth- and early twentieth century	Eligible for NRHP
8OR08984	Lake Lawsona Historic District	American twentieth-century; Boom Times, 1921–1929; Post-Reconstruction, 1880–1897; WWI and Aftermath, 1917–1920; ca. 1887–1949	NRHP Listed 2019
8OR09612	Orlando Reeves Terrace	World War II & Aftermath, 1941–1950	Eligible for NRHP
8OR10041	South Florida Railroad	American 1821–present; Nineteenth-century American, 1821–1899; Disston Era of Expansion & Consolidation, 1881–1899	Eligible for NRHP

Figure 9: Previously Recorded Cultural Resources in the Study Area



This area of downtown Orlando has been subjected to numerous cultural resource surveys (Table 9, Figure 10), although the majority of these are centered on the Interstate 4 interchange and the eastern and western ends of the Study Area are comparatively unsurveyed. Portions of the Study Area that have been subjected previously to Module Three-compliant survey typically will not need additional archaeological survey but may need an updated architectural history survey.

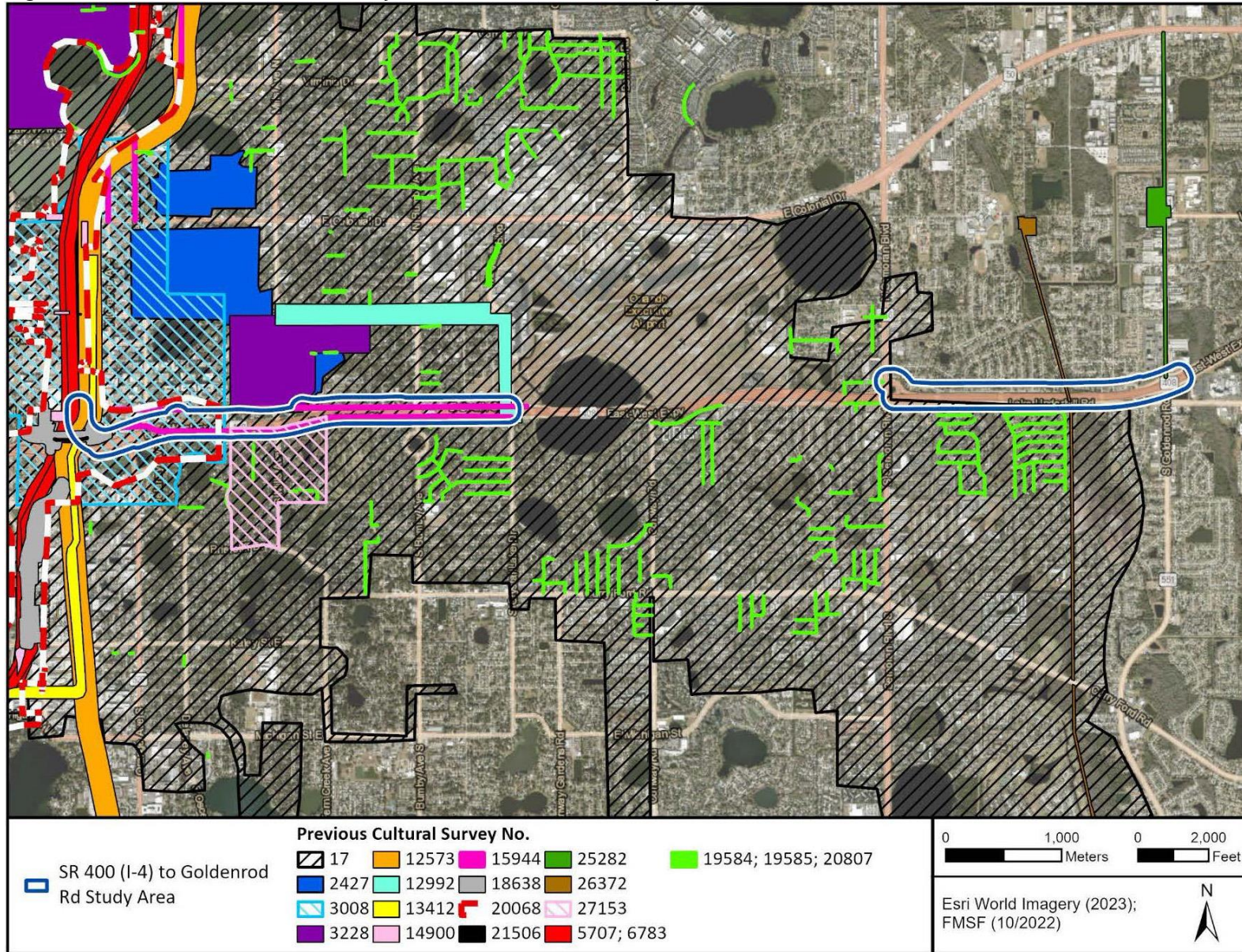
Table 9: Cultural Resource Surveys Conducted within the Study Area

FMSF No.	Title	Year	Consultant
17	Historical, Architectural, and Archaeological Survey of Orlando, Florida	1978	Carr and Werndli
2427	Historic Properties Survey of Lake Eola Heights, Lake Lawsona, Park Lake/Highland and Spring Lake in the City of Orlando, Florida	1990	Historic Property Associates
3008	Downton Orlando Historic Resource Survey Update	1991	Elliott and Logsdon
3228	Orlando Neighborhood Survey Project	1992	Elliot and Logsdon
5707	Cultural Resource Assessment Survey Interstate 4 Section 2 Project Development and Environment Study from Bee Line Expressway (S.R. 528) to S.R. 472 Interchange, Orange, Seminole, and Volusia Counties, Florida	1999	Almy, Marion
6783	Section 106 Effects Determination for the I-4 Interim Improvements from S.R. 423 (John Young Parkway) to S.R. 436 Semoran Boulevard) Orange and Seminole Counties, Florida	2000	Janus Research
12573	Cultural Resource Assessment Survey Report Central Florida Commuter Rail Transit (CFCRT) Environmental Assessment, Volusia, Seminole, Orange, and Osceola Counties, Florida	2005	Archaeological Consultants, Inc. (ACI)
12992	A Cultural Resource Assessment Survey E Robinson Street from Mills Avenue to S Crystal Lake Drive and Along S Crystal Lake Drive from E Robinson Street to Just South of Anderson Street City: Orlando County: Orange	2006	Janus Research
13412	Central Florida Light Rail Transit System, Downton CSXT Corridor Aerial Alternative, Cultural Resource Assessment Survey	1999	Janus Research
14900	I-4 Ultimate Improvement Project Additional Ponds and Improvements Cultural Resources Information (242484-4) I-4 from South of US 441/OBT to South of Ivanhoe Boulevard, Orlando, Orange County	2007	Janus Research
15944	Cultural Resource Reconnaissance Survey Six Segments of South Street, Anderson Street, Magnolia Avenue, and Orange Avenue to be Transferred to the City of Orlando in Orange County, Florida	2008	Chambless and Fulk
18638	Cultural Resource Assessment Survey Re-evaluation of Interstate 4 (State Road 500) Ultimate from South of Orange Blossom Trail to South of Ivanhoe Boulevard, Orange County, Florida	2011	Janus Research
19584	Tech Memo No. 4: Cultural Resources Effects Evaluation for the City of Orlando Sidewalks Project Work Zones 12, 13, 14, and 20, Orange County, Florida	2012	Chambless, et al.
19585	Technical Memorandum No. 5: Cultural Resources Effects Evaluation for the City of Orlando Sidewalks Project Work Zones 2, 3, 4, 5, 6, 8, 10, 18, and 21	2013	Salo, et al.
20068	I-4 CRAS Re-evaluation from West of Kirkman Road (SR 435) to North of Sanlando Springs Road (SR 434)	2013	Janus Research
20807	Cultural Resource Assessment Survey for Phase 2 of the City of Orlando Sidewalks Project, Orange County, Florida	2014	Bartlett et al.
21506	Cultural Resources Desktop Analysis and Field Review for Two I-4 Ultimate Design Changes	2015	Chambless, Elizabeth

FMSF No.	Title	Year	Consultant
25282	FM No. 437634-1-52-01, SR 441 (Goldenrod Road) from SR 408 to SR 50 (Colonial Drive) Safety Improvements, Orange County, Florida	2018	Armstrong et al.
26372	Cultural Resource Assessment Survey of the OUC Pershing to Azalea 230kV Transmission Line, Orlando, Orange County, Florida	2018	ACI
27153	Lake Davis-Greenwood Historic District Survey Report	2019	Cress, Dana B.

Given the number of NRHP-listed and -eligible resources in proximity to the Study Area, the lack of cultural resource survey at the east and west ends of the project corridor, and the presence of numerous evaluated resources in the Study Area, a Phase I Cultural Resource Assessment Survey (CRAS) will be considered as part of the design phase for this project.

Figure 10: Cultural Resource Surveys Conducted in the Study Area



Recreational Areas and Protected Lands

There are two recreational areas located within the project area. Greenwood Urban Wetlands/Greenwood Cemetery is located south of SR 408, between Mills Ave and Hampton Ave. Engelwood Park is located south of SR 408 between Engel Dr and S Oxalis Ave.

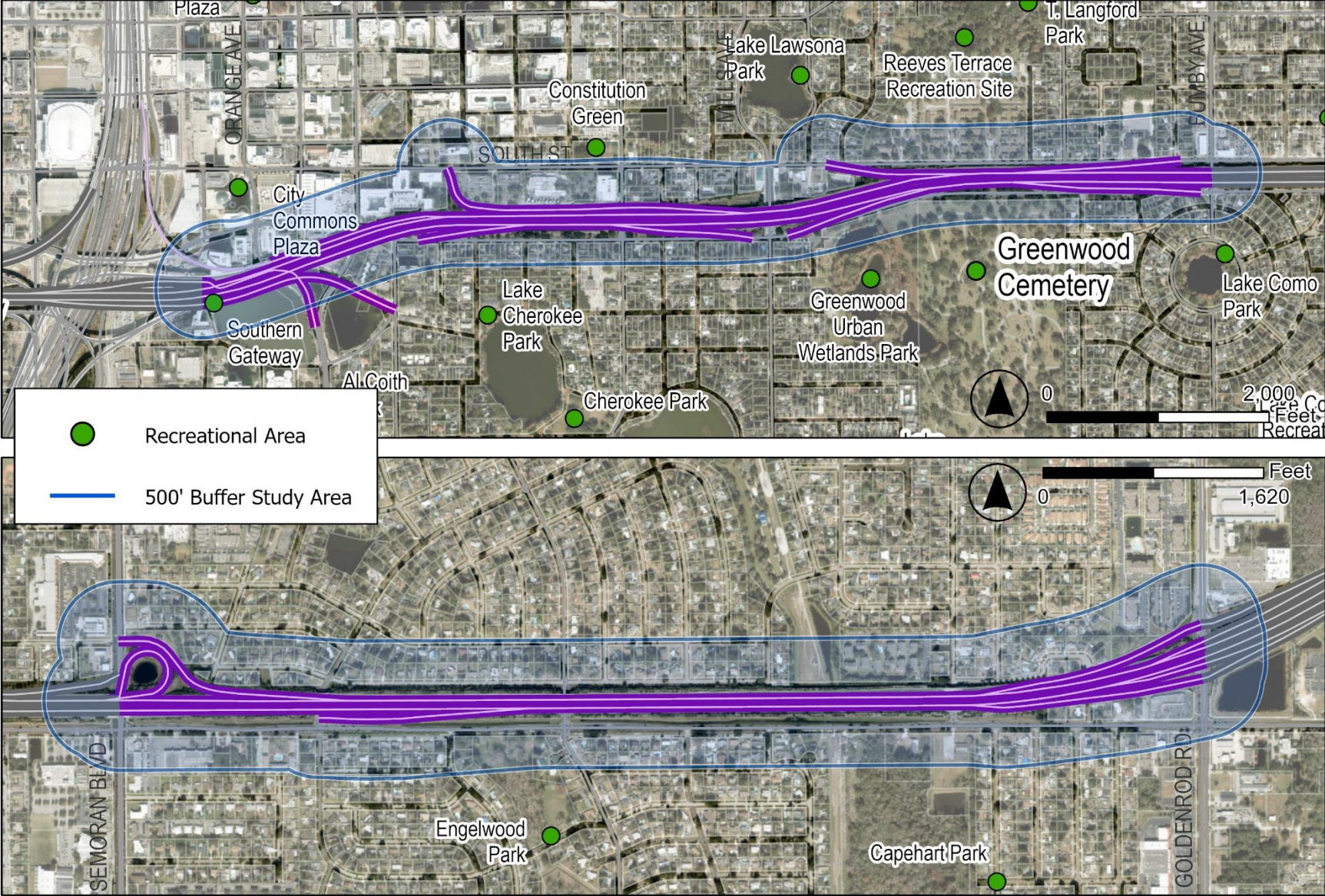
There are several other recreational and other public areas located nearby the project area, including City Commons Plaza, Southern Gateway, Lake Cherokee Park, Constitution Green, Lake Lawsona Park, Mayor Carl T. Langford Park, Reeves Terrace Recreation Site, Lake Como Park, and Capehart Park.

There are no other protected lands within the area. The locations of these recreational areas and protected lands are shown on **Figure 11**.

No direct impacts are anticipated to any recreational areas or protected lands.



Figure 11: Recreational Areas and Parks Within Project Area



2.c – Natural Environment Analysis

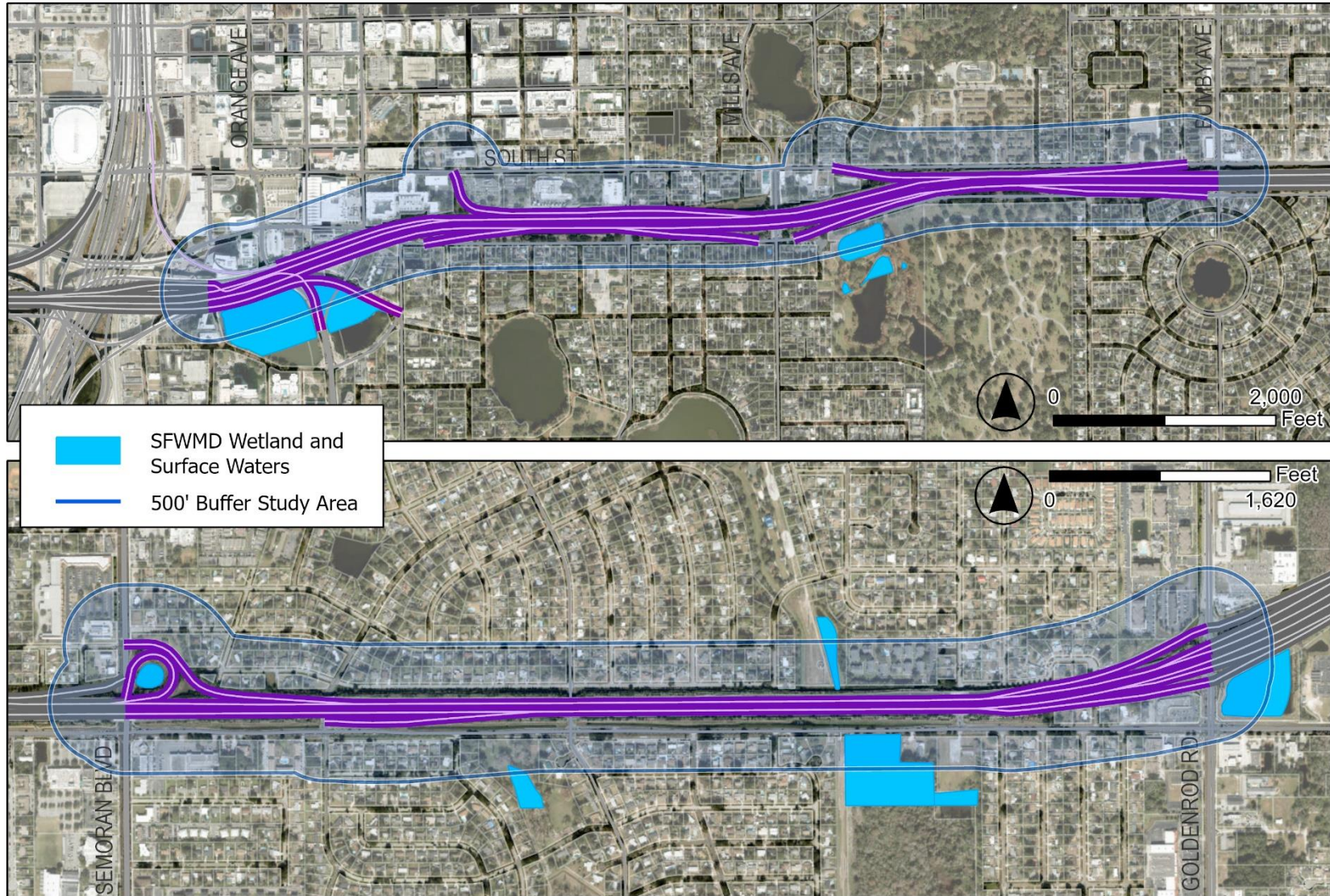
2.c – Natural Environment Analysis

Wetlands and Other Surface Waters

An assessment of wetlands and surface waters was conducted within the project study area utilizing the 2014 St Johns River Water Management District (SJRWMD) Florida Land Use, Cover and Forms Classification System (FLUCFCS) and the National Wetland Inventory (NWI) GIS datasets. The project study area contains two (2) potential wetland areas primarily adjacent to SR 408. There are 11 additional potential surface waters, consisting of Fern Creek and 10 storm water management facilities. Due to the hydrologic connections of the on-site wetlands, these wetlands may fall under the jurisdiction of the SJRWMD and FDEP.

Using the 2014 SJRWMD Land Use Land Cover data, the wetlands within the proposed limits of disturbance were used to calculate proposed impacts to wetlands. As of the current design, there are no proposed direct wetland impacts (**Figure 12**).

Figure 12: Wetlands and Surface Waters Impacts Map



Water Resources

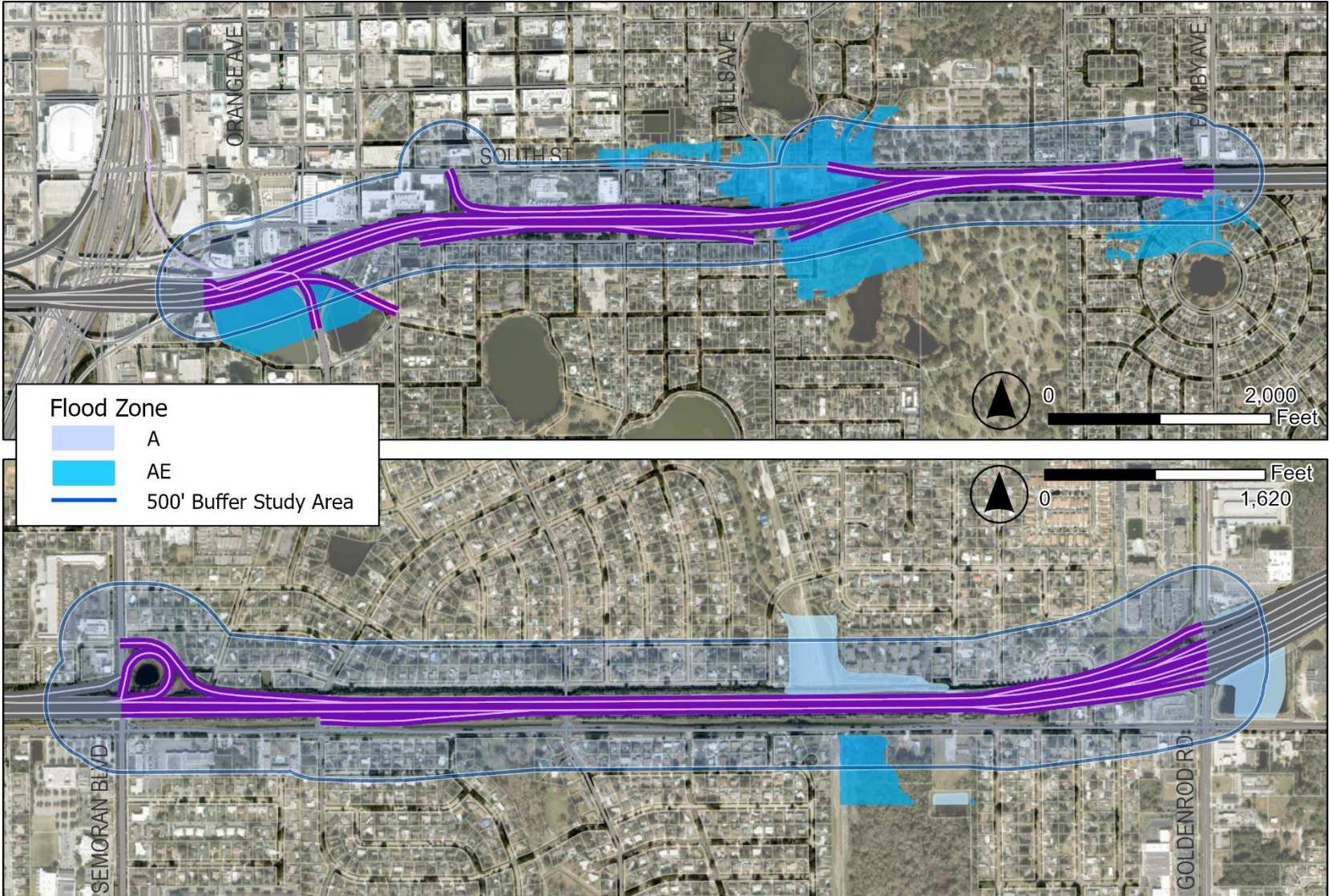
There are no Aquatic Preserves or Outstanding Florida Waters (OFWs) within the project study area. A review of EPA Sole Source Aquifer Protection Program maps of sole source aquifers in the southeastern United States indicated that the project study area is located within the Biscayne Sole Source Aquifer and Recharge Zone. The project will meet all applicable SJRWMD criteria related to water quality. The project is currently a non-federal action receiving no federal monies; therefore, concurrence from the EPA is not required according to the Safe Drinking Water Act. Best Management Practices (BMPs) to control erosion, sediment release, and storm water runoff to minimize adverse impacts on surface water resources will be implemented during design, permitting and construction. A Water Quality Impact Evaluation is provided in **Appendix B – Water Quality Impact Evaluation Checklist**.

Floodplains

The Federal Emergency Management Agency (FEMA) flood hazard GIS data for Orange County was used to determine proposed impacts to floodplain. Based on currently mapped FEMA data, both floodplain and floodway are within the proposed limits of disturbance. However, the project is being designed to avoid further impacts to floodplain.

Approximately 11 acres of the ±619-acre study area (1.8%) is classified as being within the FEMA Flood Zone A, within the Special Flood Hazard Areas, where an established Base Flood Elevation (BFE) has been determined. Approximately 64 acres of the ±619-acre study area (10.3%) is classified as being within the FEMA Flood Zone AE, within the Special Flood Hazard Areas, where an established Base Flood Elevation (BFE) has been determined. The remaining approximately 544 acres of the study area is classified as being within FEMA Flood Zone X, areas of minimal flood hazard. There is a FEMA Regulatory Floodway within the project study area at the SR 408 crossing of Fern Creek. The FEMA Flood maps are depicted on **Figure 13**.

Figure 13: FEMA Flood Map



Protected Species and Habitat

A database review of potential species occurring within the project study area and immediate vicinity was conducted. Results of the database review are summarized below.

Based on a review of the U.S. Fish and Wildlife Service (USFWS) Critical Habitat Mapper, there is no USFWS designated Critical Habitat within the project study area. Areas identified by the Florida Fish and Wildlife Conservation Commission (FWC) as Strategic Habitat Conservation Areas (SHCA) are located within the project study area. SHCAs are undeveloped natural areas identified by FWC as areas that could provide potential habitat to native plant and wildlife species and, therefore, may be considered for acquisition as conservation lands. However, these areas have no regulatory implications and have not been and may never be acquired for conservation.

Based on FNAI and USFWS IPaC data, bald eagle (*Haliaeetus leucocephalus*) have been documented near the study area; additionally, the wood stork (*Mycteria americana*) is listed as likely to occur within one (1) mile of the study area. The study area lies within the Core Foraging Area (CFA) of four (4) active wood stork colonies. The study area also lies within the USFWS Consultation Area for the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida scrub-jay (*Aphelocoma coerulescens*), red-cockaded woodpecker (*Picoides borealis*), and Lake Wales Ridge plants. Additional listed species with the potential to occur included the Florida sandhill crane (*Antigone canadensis pratensis*), Florida burrowing owl (*Athene cunicularia floridana*), Audubon's crested caracara (*Caracara cheriway*), bluetail mole skink (*Eumeces egregius lividus*), sand skink (*Neoseps reynoldsi*), Florida black bear (*Ursus americanus floridanus*), eastern indigo snake (*Drymarchon couperi*), red-cockaded woodpecker (*Dryobates borealis*), gopher tortoise (*Gopherus polyphemus*), eastern black rail (*Laterallus jamaicensis* ssp. *jamaicensis*), and Everglade snail kite (*Rostrhamus sociabilis plumbeus*). There are no known wading bird rookeries within the project study area or within one (1) mile of the study area. There are four (4) bald eagle nests within one (1) mile of the study area.

A list of the state and federally listed species potentially occurring within the immediate vicinity of the project site has been compiled in **Table 10**. The table below lists species that may occur and their effect determinations.

Table 10: Listed Species Potentially Within Project Area

Common Name	Scientific Name	Status	Documented (<1 mile)	Habitat Present	Effect Determination
Avian					
Audubon's crested caracara	<i>Caracara cheriway</i>	FT	No	No	No effect
Eastern black rail	<i>Laterallus jamaicensis jamaicensis</i>	FT	No	No	No effect
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	FE	No	No	No effect
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	FT	No	No	No effect
Red-cockaded woodpecker	<i>Picoides borealis</i>	FE	No	No	No effect
Wood stork	<i>Mycteria americana</i>	FT	No	No	No effect
Florida burrowing owl	<i>Athene cunicularia</i>	ST	No	No	No adverse effect anticipated
Florida sandhill crane	<i>Grus canadensis pratensis</i>	ST	No	No	No adverse effect anticipated
Reptilian					
Eastern indigo snake	<i>Drymarchon corais couperi</i>	FT	No	Yes	Not likely to adversely affect
Sand skink	<i>Neoseps reynoldsi</i>	FT	No	No	No effect
Bluetail mole skink	<i>Eumeces egregius lividus</i>	FT	No	No	No effect
Gopher tortoise	<i>Gopherus polyphemus</i>	ST	No	Yes	No adverse effect anticipated
Short-tailed snake	<i>Lampropeltis extenuate</i>	ST	No	No	No adverse effect anticipated
Legend: FE - Federally Endangered; FT - Federally Threatened; FT(S/A) – Threatened due to Similarity of Appearance; C - Candidate for Listing SE - State Endangered; ST - State Threatened Note: Coordination is not required with FWC for federally listed species					

Federal Listed Fauna

Birds

Audubon's Crested Caracara

Audubon's crested caracara (caracara) is listed as threatened by USFWS and FWC. This species has not been documented within one (1) mile of the project limits and suitable habitat is not located within the project limits. Therefore, it has been determined that the project will have "no effect" on the caracara.

Eastern Black Rail

The eastern black rail is listed as threatened by the USFWS. This species has not been documented within one (1) mile of the project limits and suitable habitat is not located within the project limits. Therefore, it has been determined that the project will have "no effect" on the

eastern black rail.

Everglade Snail Kite

The Everglade snail kite is listed as endangered by USFWS and FWC. The project limits are located within the USFWS consultation area for the snail kite; however, the species has not been documented within one (1) mile of the project limits and suitable habitat is not located within the project limits. Therefore, it has been determined that the project will have “no effect” on the Everglade snail kite.

Florida Scrub-Jay

The Florida scrub-jay (scrub-jay) is listed as threatened by USFWS and FWC. The project limits are located within the USFWS consultation area for the scrub jay; however, the species has not been documented within one (1) mile of the project limits and suitable habitat is not located within the project limits. Therefore, it has been determined that the project will have “no effect” on the Florida scrub-jay.

Red-Cockaded Woodpecker

The red-cockaded woodpecker (RCW) is listed as endangered by USFWS and FWC. This species has not been documented within one (1) mile of the project limits and suitable habitat is not located within the project limits. Therefore, it has been determined that the project will have “no effect” on the RCW.

Wood Stork

The wood stork is listed as threatened by USFWS and FWC. No wood storks have been documented within one (1) mile of the project limits and suitable habitat is not located within the project limits. Therefore, it has been determined that the project will have “no effect” on the wood stork. The path to this determination followed the USFWS Effect Determination Key for the Wood Stork in South Florida (Step A).

Reptiles

Eastern Indigo Snake

The eastern indigo snake is listed as threatened by USFWS and FWC. No indigo snakes have been documented within one (1) mile of the project limits; however, the project limits offer marginal habitat for indigo snakes. It has been determined that the project is “not likely to adversely affect” the eastern indigo snake. The path to this determination followed the Eastern Indigo Snake Programmatic Effect Determination Key (South Florida Ecological Service Office), steps A →B→C→D→NLAA.

Skinks

The sand skink and bluetail mole skink are listed as threatened by USFWS and FWC. The project limits are located within the USFWS Consultation Area for sand skinks and contains suitable soils; however, no sand skinks have been documented within one (1) mile of the project site. Therefore, it has been determined that the project will have “no effect” on the sand skink and bluetail mole skink.

State Listed Fauna

Birds

Florida Burrowing Owl

The Florida burrowing owl is listed as threatened by the FWC. Suitable habitat for this species

was not observed within the project limits and no individuals were observed during field review. Additionally, no individuals have been documented within one (1) mile of the project limits. Based on this information, it has been determined that the project will have “no adverse effect anticipated” on the Florida burrowing owl.

Florida Sandhill Crane

The Florida sandhill crane is listed as threatened by the FWC. Suitable habitat for this species was not observed within the project limits and no individuals were observed during field review. Additionally, no individuals have been documented within one (1) mile of the project limits. Based on this information, it has been determined that the project will have “no adverse effect anticipated” on the Florida sandhill crane.

Reptiles

Gopher Tortoise

The gopher tortoise is listed as threatened by the FWC and is a candidate species for listing under the ESA by USFWS. Potential suitable habitat is present within the project; however, no gopher tortoises have been documented within one (1) mile of the project limits. At the time of the site reviews, no gopher tortoise burrows were observed within or adjacent to the project limits. If gopher tortoises or burrows are found within the project limits, CFX will coordinate with the FWC to secure all permits needed to relocate the tortoises and associated commensal species prior to construction. With the implementation of these measures, it has been determined that this project will have “no adverse effect anticipated” on the gopher tortoise.

Short-tailed Snake

The short-tailed snake is listed as threatened by FWC. Suitable habitat for this species was not observed within the project limits and no individuals were observed during field review. Additionally, no individuals have been documented within one (1) mile of the project limits. Based on this information, it has been determined that the project will have “no adverse effect anticipated” on the short-tailed snake.

Non-Listed Species

Bald Eagle

The bald eagle is a large raptor with a distinctive white head and yellow bill. This species has been federally de-listed by the USFWS. However, it remains federally protected under the Bald and Golden Eagle Protection Act (BGEPA) in accordance with the 16 United States Code 668 and the Migratory Bird Treaty Act of 1918. In addition, the FWC has implemented a bald eagle management plan (FWC 2008). During design and permitting, CFX will survey the project area for eagle nests. If a nest is observed within 660 feet of the project limits, CFX will coordinate with the USFWS to secure all necessary permits.

Florida Black Bear

The Florida black bear was removed from the FWC list of state-threatened species in August 2012; however, the Florida black bear remains protected under other rules and regulations, primarily through the Florida Black Bear Conservation Rule 68A-4.009 (F.A.C.) and the FWC Florida Black Bear Management Plan. Based on these regulations, pursuing, hunting, molesting, capturing, killing, or attempting those actions, whether or not such actions result in possession of the bear is unlawful. In addition, Rule 68A-4.009, F.A.C., generally prohibits anyone from possessing, injuring, shooting, wounding, trapping, collecting, or selling bears or their parts or attempting to engage in such actions without prior authorization from FWC. Black Bear Management Units (BMU) have also been established based on the seven geographically distinct bear subpopulations in Florida. The project study area is located within the Central BMU.

2.d – Physical Environment Analysis

2.d – Physical Environment Analysis

Air Quality

As part of this project study, an air quality evaluation has been performed consistent with the FDOT PD&E Manual, Part 2, Chapter 19. Based on this initial evaluation, a detailed Air Quality analysis is not needed because the project does not meet the two qualifying criteria per Section 19.2.2.1, Part 2, Chapter 19 of the PD&E Manual. It does not require an Environmental Impact Statement, and it is not expected to have community controversy regarding air quality.

This project is not expected to create adverse impacts on air quality because the project area is in attainment for all National Ambient Air Quality Standards (NAAQS) and because the project is expected to improve the Level of Service (LOS) and not change delay and congestion on all facilities within the study area.

Construction activities may cause short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to applicable state regulations and to applicable FDOT Standard Specifications for Road and Bridge Construction.

Additional information is provided in **Appendix A – Air Quality Technical Memorandum**.

Water Quality

There are no aquatic preserves or Outstanding Florida Waters (OFWs) within the project study area. A review of EPA Sole Source Aquifer Protection Program maps of sole source aquifers in the southeastern United States indicated that the project study area is located within the Biscayne Sole Source Aquifer and Recharge Zone. The project will meet all applicable SJRWMD criteria related to water quality. The project is currently a non-federal action receiving no federal monies; therefore, concurrence from the EPA is not required according to the Safe Drinking Water Act. Best Management Practices (BMPs) to control erosion, sediment release, and storm water runoff to minimize adverse impacts on surface water resources will be implemented during design, permitting and construction. Determination has been made that there are no USACE retained waters. A Water Quality Impact Evaluation Checklist is provided in **Appendix B – Water Quality Impact Evaluation Checklist**.

Contamination Screening

A Contamination Screening Evaluation was prepared per the project scope as a part of the Evaluation of Physical Resources. The Contamination Screening Evaluation Technical Memorandum (**Appendix C – Contamination Screening Evaluation Technical Memorandum**) includes a site figure indicating the location of potential contamination sites, brief summaries of the most recent assessment information available through Map Direct, and recommendations on necessity for additional evaluation.

Highway Traffic Noise

A traffic noise analysis was performed in accordance with the FDOT PD&E Manual. A Traffic Noise Model was used to evaluate existing conditions, the No-Build Alternative and the Build Alternative for the Noise Sensitive Areas (NSAs) potentially impacted by traffic noise within 400 feet of the project corridor.

Per these analyses, 725 sites (716 Category B, seven Category C, one Category D, and one Category E) were analyzed for project-related impacts. Of the 725 analyzed sites, 88 (85 residential, two Category C, and one Category E) are currently affected by traffic noise. The

noise levels associated with the 2045 No-Build Alternative are predicted to meet or exceed the FDOT NAC at 90 sites (87 residential, two Category C, and one Category E).

The analysis concluded that once the project is built, the overall traffic noise levels will increase by an average of 1.1 dB(A), with the average project-related noise level predicted to be 64.3 dB(A). The 2045 Build Alternative’s noise levels are predicted to meet or exceed the applicable NAC at 183 sites (179 residential, three Category C, and one Category E). The greatest noise level increase is predicted to be 8.3 dB(A) in NSA 6. Most of the impacts result from the roadway footprint expansion, which necessitates removing existing noise barriers. None of the increases are considered substantial (i.e., 15 dB(A) or more over existing levels).

As required, noise abatement consideration was given to all 183 impacted sites. The 26 impacts (25 residential and cemetery) in NSAs 3, 5, 7, 9, 11, and 13 cannot be mitigated due to 1) no project improvements on the eastbound side and 2) the existing noise barriers being at the maximum allowed heights.

For the westbound side, Noise Barriers WB-A1, WB1, WB 2, and WB3 were evaluated to abate project impacts to the remaining 157 sites (154 residential, two daycares, and one hotel pool). Noise barrier WB-A1 was determined not to meet feasibility requirements. As described in **Table 11**, noise barriers WB1, WB2, and WB 3 meet acoustic and cost reasonableness criteria and are recommended for further consideration during the final design process.

Table 11: Noise Barrier Recommendations

Noise Study Area	Barrier ID	Barrier Height (ft) ²	Barrier Length (ft)	Barrier Location	Estimated Barrier Cost ^{*1}	Recommended for further evaluation?
NSA 2	WB-A1	8	1,218	Ramp/Flyover Shoulder (new)	\$292,320	No
NSA 2	WB1	8	545	MSE/Shoulder (new)	\$130,800	Yes
NSAs 4, 6, and 8	WB2	8	5,324	MSE/Shoulder Replacement	\$1,277,760	Yes
NSAs 10, 12, and 14	WB3	8	1,313	MSE/Shoulder (replacement)	\$315,120	Yes

Additional information is provided in the Traffic Noise Study Report provided in **Appendix D**.

Construction

Construction activities may cause short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to applicable state regulations and to applicable FDOT Standard Specifications for Road and Bridge Construction.

Based on the existing land use within the limits of this project, construction of the proposed roadway improvements will not have any noise or vibration impact. If noise-sensitive land uses develop adjacent to the roadway prior to construction, additional impacts could result. It is anticipated that the application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, CFX and the Contractor will investigate additional methods of controlling these impacts.

Because no federally listed species are likely to be present in the action area and no critical habitat was identified, the construction of this project is not anticipated to impact any proposed threatened or endangered species, any threatened or endangered species, or affect or modify any critical habitat.

Further, construction will likely temporarily impact existing traffic patterns, but as with all construction impacts, will be temporary in nature and efforts will be made to minimize negative impacts by adhering to applicable state regulations and to applicable FDOT Standard Specifications for Road and Bridge Construction.

Bicycles & Pedestrians


As stated earlier in this memo, there are sidewalk facilities within the project area, along the surface roads that run parallel to SR 408. Additionally, there is a multiuse path currently under construction on the north side of South Street that spans from Summerlin Ave to Crystal Lake Rd, located outside the project area.

Appendix A – Air Quality Technical Memorandum

AIR QUALITY TECHNICAL MEMORANDUM

SR 408 Westbound Capacity Improvements
from I-4 to Goldenrod Road
Project Development and Environment Study

Central Florida Expressway Authority



**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.

CFX Project No.: 408-175

Contract No.: 001844

September 2023

Introduction

In September 2022, Central Florida Expressway Authority (CFX) began a Project Development and Environment (PD&E) Study of State Road (SR) 408 from Interstate 4 (I-4) to Goldenrod Road in the City of Orlando and Orange County. The study is evaluating a proposed widening along the westbound lanes from I-4 to Goldenrod Road to enhance safety and travel time reliability approaching downtown Orlando from the east. This Technical Memorandum is to document the air quality analysis findings.

Study Description

The study area runs along the westbound lanes of SR 408 from the I-4 interchange to Bumby Avenue and from Semoran Boulevard to Goldenrod Road. Currently, westbound SR 408 within these limits is generally four lanes. The study will analyze roadway capacity improvements within the study limits.

General Existing Conditions and Land Uses of the Project Area

The project area, as defined within the PD&E Study, is the location where alternative concepts for a westbound widening on SR 408 may occur. For consistency in studying the existing and anticipated conditions of the area surrounding the PD&E Study Area, a 500-foot buffer beyond existing right of way is used.

The project area from I-4 to Bumby Ave falls entirely within the Orlando City limits. The project area from Semoran Blvd to Goldenrod Rd includes areas within the City limits to the west of Semoran Blvd and south of the existing right of way, west of Cosmos Dr. The rest of the study area around Semoran Blvd to Goldenrod Rd is located in unincorporated Orange County.

The area surrounding the corridor is fully-developed. Land Use in this area has historically been residential in nature, featuring smaller parcels with single-family homes or lower-density multifamily units. The western part of the I-4 to Bumby Ave segment is located partially within the Downtown Orlando Central Business District, and the study area includes hotels, offices, multifamily housing, and a performing arts facility. **Figure 1** shows the Future Land Use (FLU) designations of the area per the City of Orlando and Orange County. **Table 1** lists the codes and corresponding FLU designations.

Figure 1: Study Area Future Land Use (FLU) Map

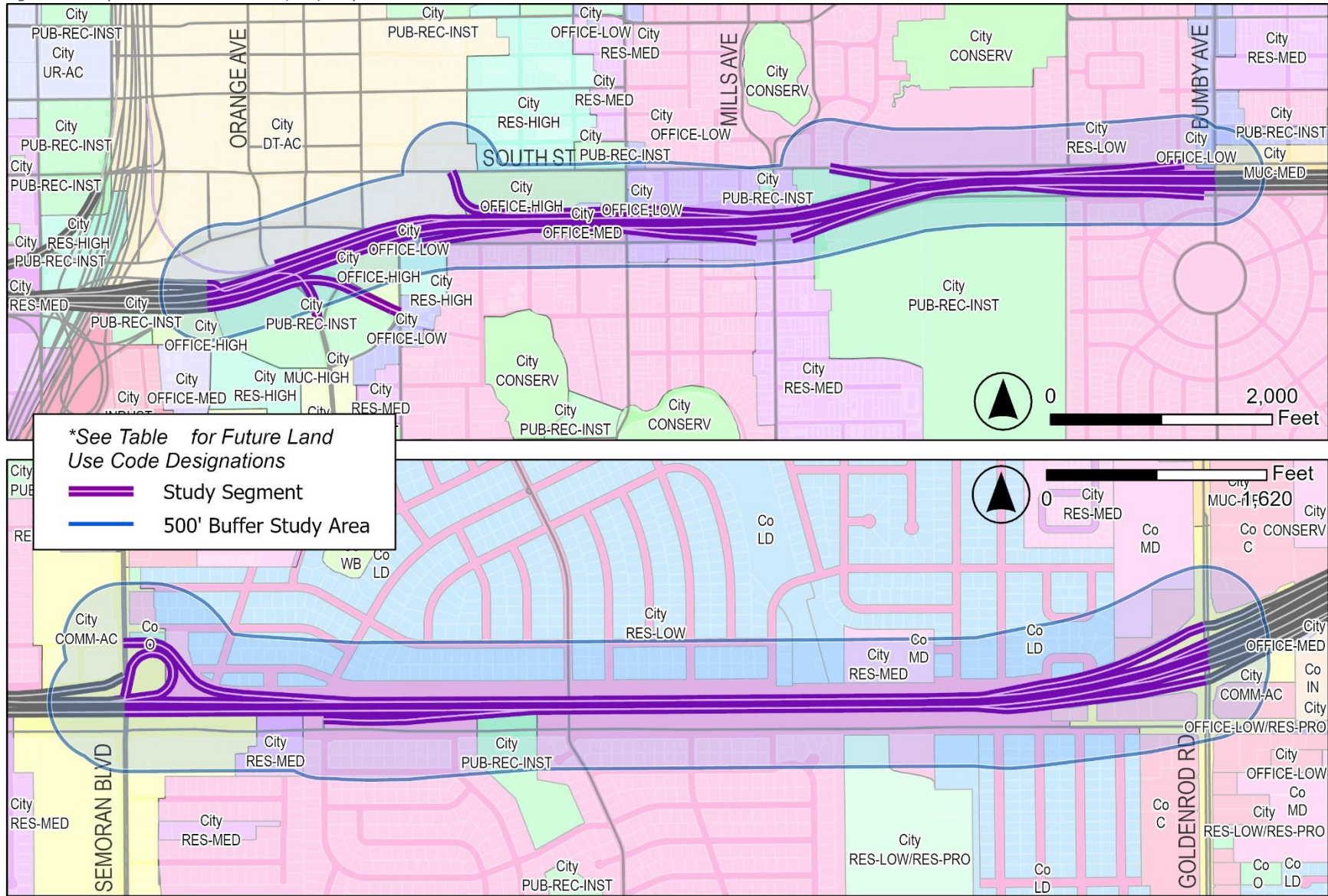


Table 1: Future Land Uses Within Study Area

FLU Code	Jurisdiction	Future Land Use (FLU) Designation
COMM-AC	City of Orlando	Commercial Activity Center
CONSERV		Conservation Area
DT-AC		Downtown Activity Center
INDUST		Industrial
MUC-MED		Mixed Use Corridor Medium Intensity
OFFICE-LOW		Office Low Intensity
OFFICE-HIGH		Office High Intensity
PUB-REC-INST		Public/Recreational & Institutional
RES-LOW		Residential Low Intensity
RES-LOW/RES-PRO		Residential Low Intensity/Resource Protection Overlay
RES-MED		Residential Medium Intensity
RES-HIGH		Residential High Intensity
UR-AC		Urban Reserve
LD		Orange County
MD	Medium Density Residential	
O	Office	
WB	Water Body	

Analysis and Results

As part of this project study, an air quality evaluation has been performed consistent with the FDOT PD&E Manual, Part 2, Chapter 19. Based on this initial evaluation, a detailed Air Quality analysis is not needed because the project does not meet the two qualifying criteria per Section 19.2.2.1, Part 2, Chapter 19 of the PD&E Manual. It does not require an Environmental Impact Statement, and it is not expected to have community controversy regarding air quality.

This project is not expected to create adverse impacts on air quality because the project area is in attainment for all National Ambient Air Quality Standards (NAAQS) and because the project is expected to improve the Level of Service (LOS) and not change delay and congestion on all facilities within the study area.

Construction activities may cause short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to applicable state regulations and to applicable FDOT Standard Specifications for Road and Bridge Construction.

References

- Florida Department of Transportation. "Air Quality", Part 2, Chapter 19. Project Development and Environment Manual, Florida Department of Transportation, Tallahassee, July 1, 2020.
- Chapter 62-204, F.S., Air Pollution Control – General Provisions.
<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-204>
- EPA, 1998. NOx, How Nitrogen Oxides Affect the Way We Live and Breathe. EPA – 456/F98-005.
- EPA, 2016. The Green Book Nonattainment Areas for Criteria Pollutants.
<https://www.epa.gov/green-book>
- EPA, 2014. National Emissions Inventory.
<https://epa.gov/air-emissionsinventories/nationalemissions-inventory-nei>
- FDOT, CO FDOT Florida 2012 User's Guide and Screening Model.
<http://www.dot.state.fl.us/emo/software/software.shtm>
- EPA, 2011 National Air Toxics Assessment Results.
<https://www.epa.gov/national-air-toxicsassessment/2011-nata-assessmentresults>
- FHWA, Advisory T6640.8A, Guidance for Preparing and Processing Environmental and Section 4(F) Documents, October 30, 1987; available from the FHWA Environmental Guidebook.
<https://www.environment.fhwa.dot.gov/projdev/impta6640.asp>
- FHWA, Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents.
https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/
- FHWA, A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives.
https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analyses/mobile_source_air_toxics/msatemissions.cfm
- Memorandum of Understanding Between FHWA and FDOT Concerning the State of Florida's Participation in the Surface Transportation Project Delivery Program Pursuant to
- 23 U.S.C. 327, December 14, 2016. [http://www.fdot.gov/environment/pubs/Executed-FDOT-](http://www.fdot.gov/environment/pubs/Executed-FDOT-NEPA-Assignment-MOU2016-1214.pdf)
- NEPA-Assignment-MOU2016-1214.pdf

Appendix B – Water Quality Impact Evaluation Checklist

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
WATER QUALITY IMPACT EVALUATION CHECKLIST

650-050-37
ENVIRONMENTAL
MANAGEMENT
10/17

PART 1: PROJECT INFORMATION

Project Name:	SR 408 Westbound Capacity Improvements from I-4 to Goldenrod Rd
County:	Orange
FM Number:	N/A
Federal Aid Project No:	N/A
Brief Project Description:	This PD&E includes evaluating a one-lane addition in the westbound direction of SR 408 from I-4 to Bumby Avenue and Semoran Boulevard to Goldenrod Road to provide greater capacity, reduce congestion and delay, and increase safety.

PART 2: DETERMINATION OF WQIE SCOPE

Does project discharge to surface or ground water? Yes No

Does project alter the drainage system? Yes No

Is the project located within a permitted MS4? Yes No

Name: City of Orlando, Permit FLS000014 and Orange County and Co Permittees, Permit FLS000011

If the answers to the questions above are no, complete the applicable sections of Part 3 and 4, and then check Box A in Part 5.

PART 3: PROJECT BASIN AND RECEIVING WATER CHARACTERISTICS

Surface Water

Receiving water(s) names: Lake Underhill Outlet, Lake Frederica Drain, Azalea Park Canal

Water Management District: St. Johns River Water Management District

Environmental Look Around meeting date: [Click here to enter a date.](#)

Attach meeting minutes/notes to the checklist.

Water Control District Name (list all that apply): N/A

Is the project located within a springshed or recharge area? Yes No

Ground Water

Sole Source Aquifer (SSA)? Yes No

Name Biscayne Sole Source Aquifer Streamflow and Recharge Source Zone

If yes, complete Part 5, D and complete SSA Checklist shown in Part 2, Chapter 11 of the PD&E Manual

Other Aquifer? Yes No

Name Floridan Aquifer

Springs vents? Yes No
Name _____

Well head protection area? Yes No
Name _____

Groundwater recharge? Yes No
Name Biscayne Sole Source Aquifer Streamflow and Recharge Source Zone

Notify District Drainage Engineer if karst conditions are expected or if a higher level of treatment may be needed due to a project being located within a WBID verified as Impaired in accordance with Chapter 62-303, F.A.C.

Date of notification: [Click here to enter a date.](#)

PART 4: WATER QUALITY CRITERIA

List all WBIDs and all parameters for which a WBID has been verified impaired, or has a TMDL in [Table 1](#). This information must be updated during each Re-evaluation.

Note: If BMAP or RAP has been identified in [Table 1](#), [Table 2](#) must also be completed.
Attach notes or minutes from all coordination meetings identified in [Table 2](#).

EST recommendations confirmed with agencies? Yes No

BMAP Stakeholders contacted: Yes No

TMDL program contacted: _____ Yes No

RAP Stakeholders contacted: Yes No

Regional water quality projects identified in the ELA Yes No

If yes, describe:

Potential direct effects associated with project construction Yes No

and/or operation identified?

If yes, describe:

Discuss any other relevant information related to water quality.

PART 5: WQIE DOCUMENTATION

- A. No involvement with water quality
- B. No water quality regulatory requirements apply.
- C. Water quality regulatory requirements apply to this project (provide Evaluator's information below). Water quality and quantity issues will be mitigated through compliance with the design requirements of authorized regulatory agencies.
- D. EPA Ground/Drinking Water Branch review required. Yes No
Concurrence received? Yes No
If Yes, Date of EPA Concurrence: [Click here to enter a date..](#)
Attach the concurrence letter

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 and executed by FHWA and FDOT.

Evaluator Name (print): Hannah Smith

Title: Environmental Scientist

Signature: *Hannah Smith*

Date: 1/17/2023

Table 1: Water Quality Criteria

Receiving Waterbody Name (list all that apply)	FDEP Group Number / Name	WBID(s) Numbers	Classification (I,II,III,IIIL,IV,V)	Special Designations*	NNC limits**	Verified Impaired (Y/N)	TMDL (Y/N)	Pollutants of concern	BMAP, RA Plan or SSAC
Lake Underhill Outlet	2/Middle St. Johns	3168ZA	III		Stream	Yes	No	Dissolved oxygen	Lake Okeechobee
Azalea Park Canal	2/Middle St. Johns	3025	III		Stream	No	No		
Lake Frederica Drain	2/Middle St. Johns	3036B	III		Stream	No	No		

* ONRW, OFW, Aquatic Preserve, Wild and Scenic River, Special Water, SWIM Area, Local Comp Plan, MS4 Area, Other

** Lakes, Spring vents, Streams, Estuaries

Note: If BMAP or RAP has been identified in [Table 1](#), [Table 2](#) must also be completed.

Appendix C – Contamination Screening Evaluation Technical Memorandum

TECHNICAL MEMORANDUM

December 14, 2022

Revised September 18, 2023

From: Richard McCormick, P.G. and Daniel C. Stanfill, P.E.

To: Mr. Michael Garau, P.E.

Subject: Existing Contamination Conditions Technical Memorandum
SR 408 WB CAPACITY IMPROVEMENTS FROM I-4 TO GOLDENROD ROAD
CFX 408-175
GEC Project No. 5116GE

Based on TWO 2 under Contract Number 001844 dated August 29, 2022, Geotechnical and Environmental Consultants, Inc. (GEC) is pleased to present this Existing Contamination Conditions Memorandum for the CFX SR 408 Westbound Capacity Improvements PD&E study. This PD&E Study is split into two sections of SR 408; SR 408 from east of I-4 to Bumby Avenue (Project 1) and SR 408 from SR 436 to Goldenrod Road (Project 2).

While this review of contamination status was performed using elements of the Chapter 20 of the FDOT PD&E Manual, it does not represent a complete contamination screening evaluation in accordance with Chapter 20 of the FDOT PD&E Manual.

Contamination Screening

GEC conducted this evaluation using limited elements of the Chapter 20 of the FDOT PD&E Manual dated July 1, 2020. The study area is defined by the following distances from the right-of-way:

- All sites within 500 feet
- Non-landfill solid waste sites within 1,000 feet
- Solid waste landfills, CERCLA, or National Priorities List (NPL) sites within ½ mile

GEC reviewed relevant information from the following sources of information:

- USGS Quadrangle Map of Orlando, Florida (**Figure 1**),
- National Resource Conservation Service (NRCS) Soil Survey (**Figure 2**), and
- Florida Department of Environmental Protection (FDEP) Map Direct and Nexus Information Portal file research for the sites of concern identified within the study area.

Based on the results of the contamination screening activities, GEC assigned Contamination Risk Ratings (CRRs) to 35 potential contamination sites in the Study Area. The Contamination Risk Rating (CRR) system was developed by FDOT and incorporates four levels of risk: **No, Low, Medium and High**. For a description of the four risk levels please refer to **Appendix A**.

The project study area is shown on a 2021 aerial photograph with site locations shown in attached **Figures 3A and 3B**. Select portions of public record documents (Map Direct maps) are included as **Appendix B**.

Table 1 – Potential Contamination Site Summary, presents the results of our evaluation. The information obtained from each source of information listed above is summarized for the study area and potential contamination site, along with the corresponding CRRs.

Contamination Risk Sites Summary

Our contamination risk ratings for the potential contamination sites are summarized below.

Table 1
Potential Contamination Site Summary

Site No.	Facility Name	Facility ID	Concerns	Risk Rating
1	Lucerne Plaza Office Bldg.	9700954	A 250-gallon underground gas tank was removed in 1987 without a closure assessment. No contamination is documented in the public file.	Low
2	Aloft Hotel	9804625	A 1,000-gallon aboveground emergency generator tank is currently out of compliance due to not being insured. No contamination is documented in the public file.	Medium
3	Orlando Utilities Commission Admin Building	FLD004076071 and 9814680	A 5,200-gallon aboveground emergency generator diesel tank is under SR 408. No contamination is documented in the public file. There is a 2007 complaint of buried asbestos material on-site that cannot be substantiated.	Medium

Site No.	Facility Name	Facility ID	Concerns	Risk Rating
4	CNL Center 1	9602184	A 3,000-gallon underground emergency generator tank was found to be in compliance in August 2021. No contamination is documented in the public file.	Medium
5	City Hall Parking Lot	9046919	An underground tank discharge was remediated, and the tank abandoned. A no further action status was assigned in March 2005.	No
6	Dr Phillips Performing Arts Center	ERIC_12729	Has a Site Rehabilitation Completion Order for the north half of the city block bounded by South Street, South Magnolia Street, East Anderson Street, and South Orange Avenue.	Low
7	Orlando City Material and Equipment	9300862	A 6,000-gallon underground tank of non-regulated product (aluminum sulfate) was installed at this location in 1993. No contamination is documented in the public file.	Medium
8	Orlando Expressway Authority	9809346	An underground 250-gallon oil tank was removed in 2007. Groundwater impacts were initially found but not confirmed. No cleanup was required.	Low
9	Orlando Fire Station #1	8629835	Has a Site Rehabilitation Completion Order for a 1991 release. There are currently no tanks on-site.	No
10	Kusner Dental Laboratory	SQG_104553	A dental laboratory that is not listed as a hazardous waste generator.	No
11	Lisa Renee Africk DC	SQG_75298	Dr. office that is not listed as a hazardous waste generator.	No
12	Kinneret II Inc.	9801328	A 550-gallon underground diesel tank was closed in-place in 2018. Soil impacts were initially found but not confirmed. No cleanup was required.	Low
13	WFTV Channel 9	8945182	A 3,000-gallon aboveground diesel tank is on-site for fueling and an emergency generator. No leaks or discharges are reported.	Medium
14	Bright House Networks	9810982	Has a 750-gallon aboveground emergency generator tank. No leaks or discharges are reported.	Medium
15	Orlando City Lift Station #001	9817675	Has a 10,000-gallon convault aboveground emergency generator tank. Site No. 17 indicates that contamination was detected and it is under a restrictive covenant.	Medium
16	FL Dept of Children & Families	8840760	A 2001 Score Sheet was found, assigning a contamination score to this facility for what was assumed to be an oil release from a historical tank.	Medium
17	Orlando City Lift Station #55	8841633, ERIC_7300	The file for 8841633 indicates that contamination was detected at this location, and it is under a restrictive covenant.	Medium
18	Greenwood Cemetery	8838411	A 280-gallon aboveground storage tank was removed in 1989. No contamination was reported.	Low

Site No.	Facility Name	Facility ID	Concerns	Risk Rating
19	Trinity United Methodist	9817573	A 1,000-gallon underground heating oil tank was removed in 2020 and a Site Rehabilitation Completion Order issued for some petroleum contamination that was remediated.	Low
20	Cabrera Auto Service & Repair	8943028	A March 2020, Low Score Site Initiative Report documents soil and groundwater impacts at this former gas station/Sonic Restaurant.	Medium
21	7-Eleven Store	9813645	Existing gas station that is currently in compliance with no reported spills or discharges.	Medium
22	Mobil Oil, Break Time Orlando	FLD984203836 , 8513195	Existing gas station. March 2021, Low Score Site Initiative Report documents soil and groundwater impacts at this location. Groundwater impacts extend into Semoran Boulevard and Lake Underhill Road right of ways.	Medium
23	Lake Underhill Coin Laundry	FLD984226068	A February 2000 Groundwater Assessment Report found petroleum and chlorine impacts on-site at low levels, apparently migrating from offsite.	Medium
24	Crest 1 Hr Cleaners	ERIC_4973, 9500727	This site scored a 27 for cleanup under the Drycleaning Solvent Cleanup Program.	Medium
25	Delia's Beauty Salon	SQG_73198	Beauty salon, not a hazardous waste generator.	No
26	Orlando ENT Associates	SQG_75691	Ear, Nose and Throat Doctor, not a hazardous waste generator.	No
27	Basewide Orange County Unknown Site	I04FL155	Large Formerly Used Defense Site. No Documented munitions or contamination concerns.	No
28	Basewide Orlando Range and Chemical Yard	ERIC_17533	Located south of SR 408 and west of Goldenrod Road. Chemical and gas training occurred here. Residentially developed.	Low
29	Bellsouth #33320	8732367	Facility has a 4,000-gallon aboveground emergency generator tank that was in compliance in 2020.	Medium
30	7-Eleven #1005	8512571	A September 2022 Natural Attenuation Monitoring Report documents petroleum impacts within the site boundaries.	Medium
31	Mobil 02-CV5	8512971	A 2017 Remedial Action Plan documents groundwater impacts on the southwest corner of the Lake Underhill Road and Goldenrod Road intersection.	Medium
32	Military Property	ERIC_17533	This area of the Orlando Range and Chemical Yard contained some buried munitions that were removed. The area was assessed prior to the recent construction on the northwest corner of the SR 408 and Goldenrod Road intersection.	Low

Site No.	Facility Name	Facility ID	Concerns	Risk Rating
33	7-Eleven #27508	8513540	A 2019 Template Site Assessment Report documents soil and groundwater impacts on the southeast corner of the Lake Underhill Road and Goldenrod Road intersection.	Medium
34	Disaster Debris Management Area	99934	This is an unused disaster debris management area. No contamination impacts are reported.	No
35	Cuban Cafe	9804818	This former gas station had 4 underground fuel tanks that were closed-in-place. No contamination is reported.	Low

Level II Impact to Construction Impact Assessments and Recommendations

Level II Impact to Construction Assessments (ICAs) or construction support will be dependent on the roadway improvement plans, dewatering requirements and the amount of right of way required that includes properties with tanks or known areas of impacts described in **Table 1**.

A Contamination Screening Evaluation Report will be required for this project.

Limitations

The findings, opinions, conclusions, and recommendations presented herein are based in part on reasonably ascertainable information contained in the public record. GEC does not warrant or guarantee the accuracy or completeness of this information. Some of this public record information may be dated and not representative of conditions at the time of this report was prepared (December 2022), or in the future. Additional limitations are as follows:

- Not discussed in this report are properties that have been historically undeveloped land, are associated with residential use and do not appear to pose a contamination risk, or are professional/commercial establishments that are not associated with hazardous materials or petroleum products.
- This study also does not include surveys of wetlands, endangered species, asbestos containing materials, lead-based paints, or other potential hazardous building materials.

Use of This Memorandum

GEC has prepared this memorandum for the exclusive use of our client, The Balmoral Group, Kimley-Horn, and CFX and for application to our client's project. GEC will not be held responsible for any other party's interpretation or use of this report's data or recommendations without our written authorization.

GEC has performed the services described in this report in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in Central Florida. No other representation is made or implied in this document.

The conclusions and recommendations should be disregarded if the final project design differs from the project description in this report. If such changes are contemplated, GEC should be retained to review the new plans to assess the applicability of this report in light of proposed changes.

We appreciate the opportunity to work with The Balmoral Group, Kimley Horn, and CFX on this project. If you have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC.



Richard P. McCormick, P.G.
Chief Geologist
Florida License No. 2096



Daniel C. Stanfill, P.E.
Senior Vice President
Florida License No. 42763

FIGURES

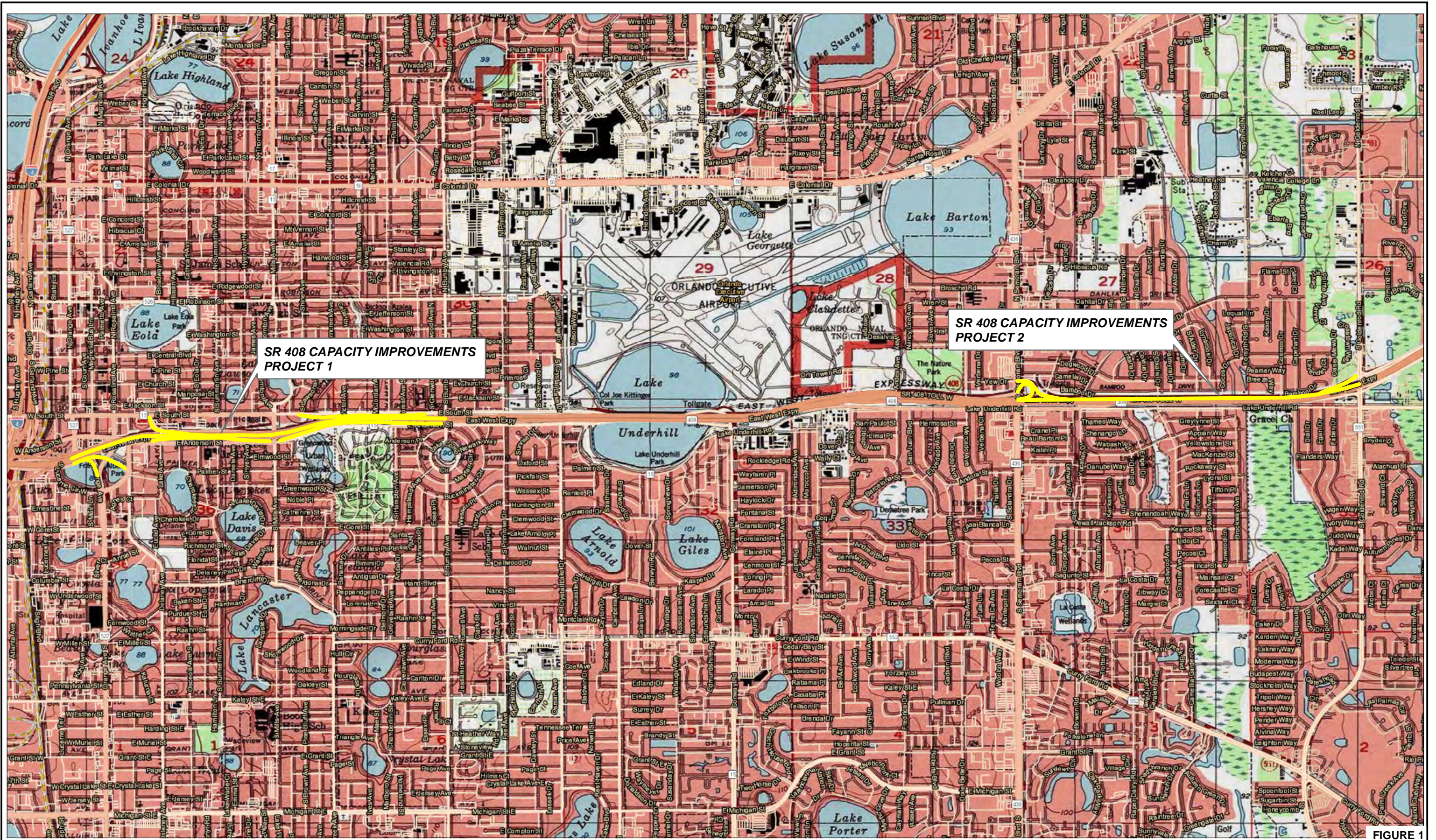
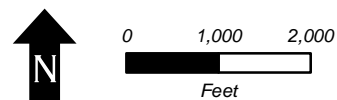


FIGURE 1

USGS Orlando East, FL Quadrangle Map
 Dated: 1980



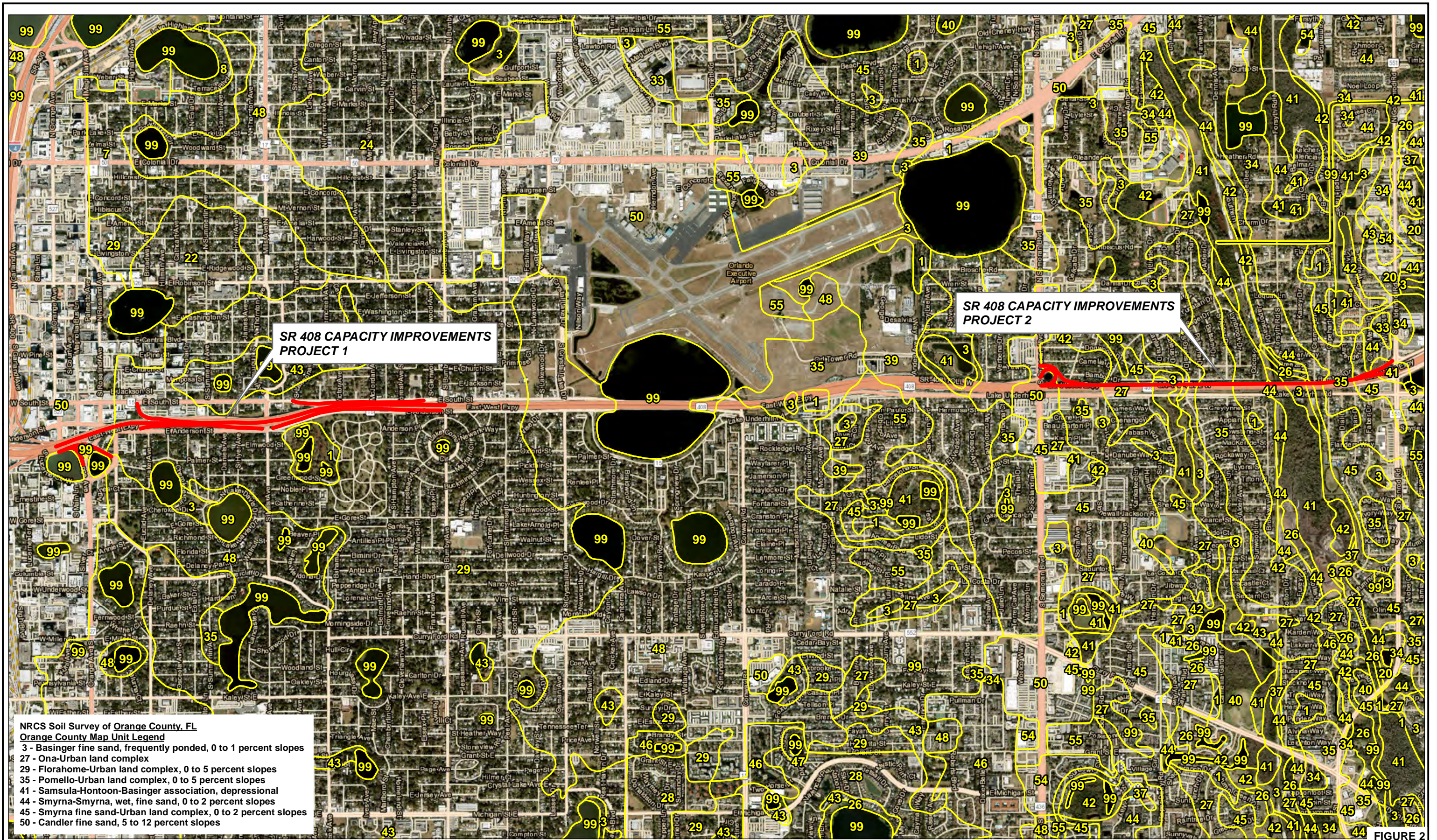
DANIEL C. STANFILL, P.E.
 P.E. LICENSE NUMBER 42763
 GEOTECHNICAL AND ENVIRONMENTAL
 CONSULTANTS, INC.
 919 LAKE BALDWIN LANE
 ORLANDO, FL. 32814

CFX PROJ. NO.:
 408-175

**CENTRAL
 FLORIDA
 EXPRESSWAY
 AUTHORITY**

USGS QUADRANGLE MAP

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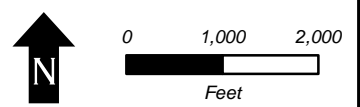


SR 408 CAPACITY IMPROVEMENTS PROJECT 1

SR 408 CAPACITY IMPROVEMENTS PROJECT 2

- NRCS Soil Survey of Orange County, FL
Orange County Map Unit Legend**
- 3 - Basinger fine sand, frequently ponded, 0 to 1 percent slopes
 - 27 - Ona-Urban land complex
 - 29 - Florahome-Urban land complex, 0 to 5 percent slopes
 - 35 - Pomello-Urban land complex, 0 to 5 percent slopes
 - 41 - Samsula-Hontoon-Basinger association, depressional
 - 44 - Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes
 - 45 - Smyrna fine sand-Urban land complex, 0 to 2 percent slopes
 - 50 - Candler fine sand, 5 to 12 percent slopes

FIGURE 2



DANIEL C. STANFILL, P.E.
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ORLANDO, FL. 32814

CFX PROJ. NO.:
408-175



NRCS SOIL SURVEY MAP

SHEET NO.

**SR 408 CAPACITY IMPROVEMENTS
PROJECT 1**

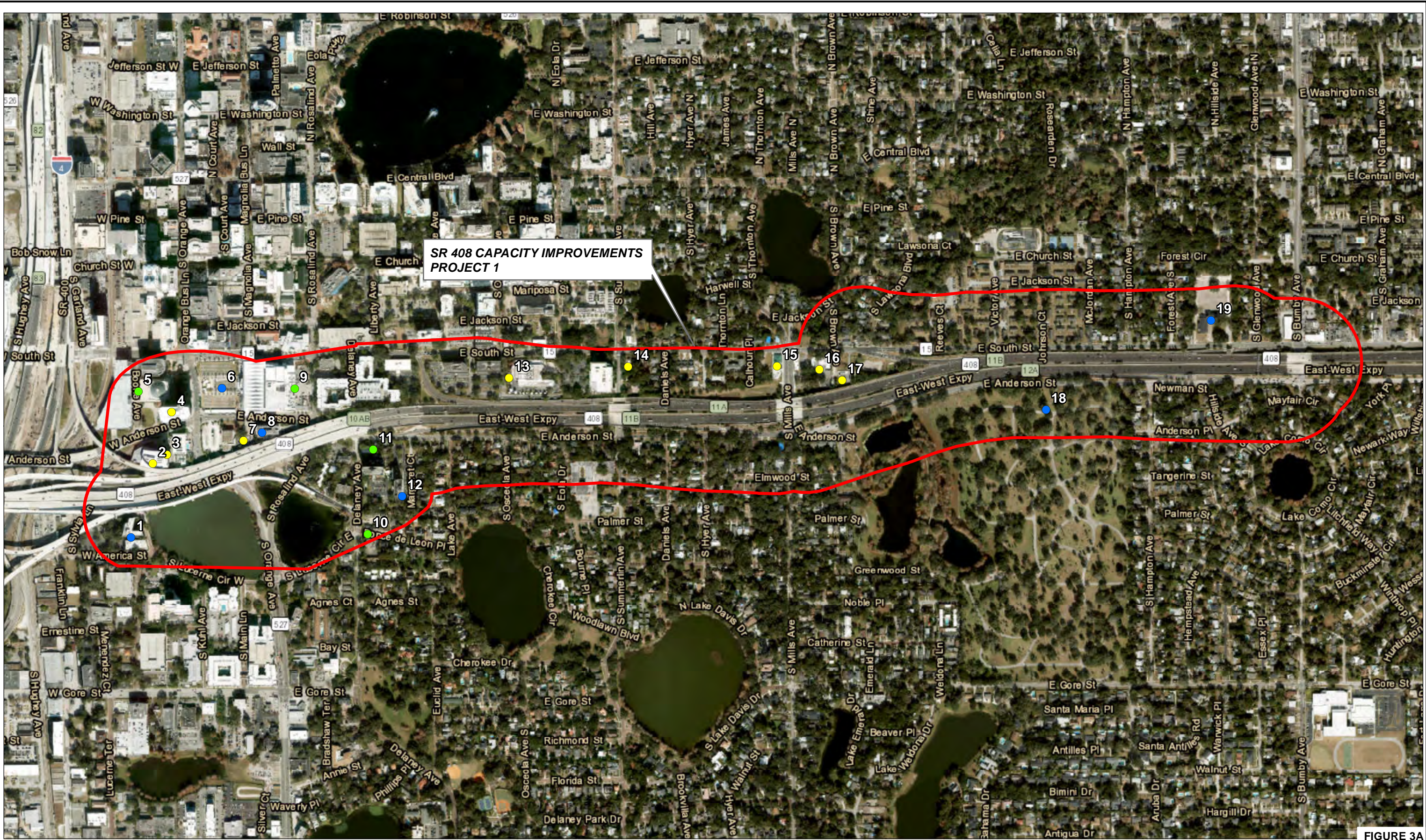


FIGURE 3A

- HIGH RISK RATING SITE LOCATION
- MEDIUM RISK RATING SITE LOCATION
- LOW RISK RATING SITE LOCATION
- NO RISK RATING SITE LOCATION



RICHARD P. McCORMICK, P.G.
P.G. LICENSE NUMBER 2096
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CONSULTANTS, INC.
919 LAKE BALDWIN LANE
ORLANDO, FL. 32814

CFX PROJ. NO.:
408-175



**POTENTIAL CONTAMINATION
SITE LOCATION MAP**

SHEET NO.

**SR 408 CAPACITY IMPROVEMENTS
PROJECT 2**

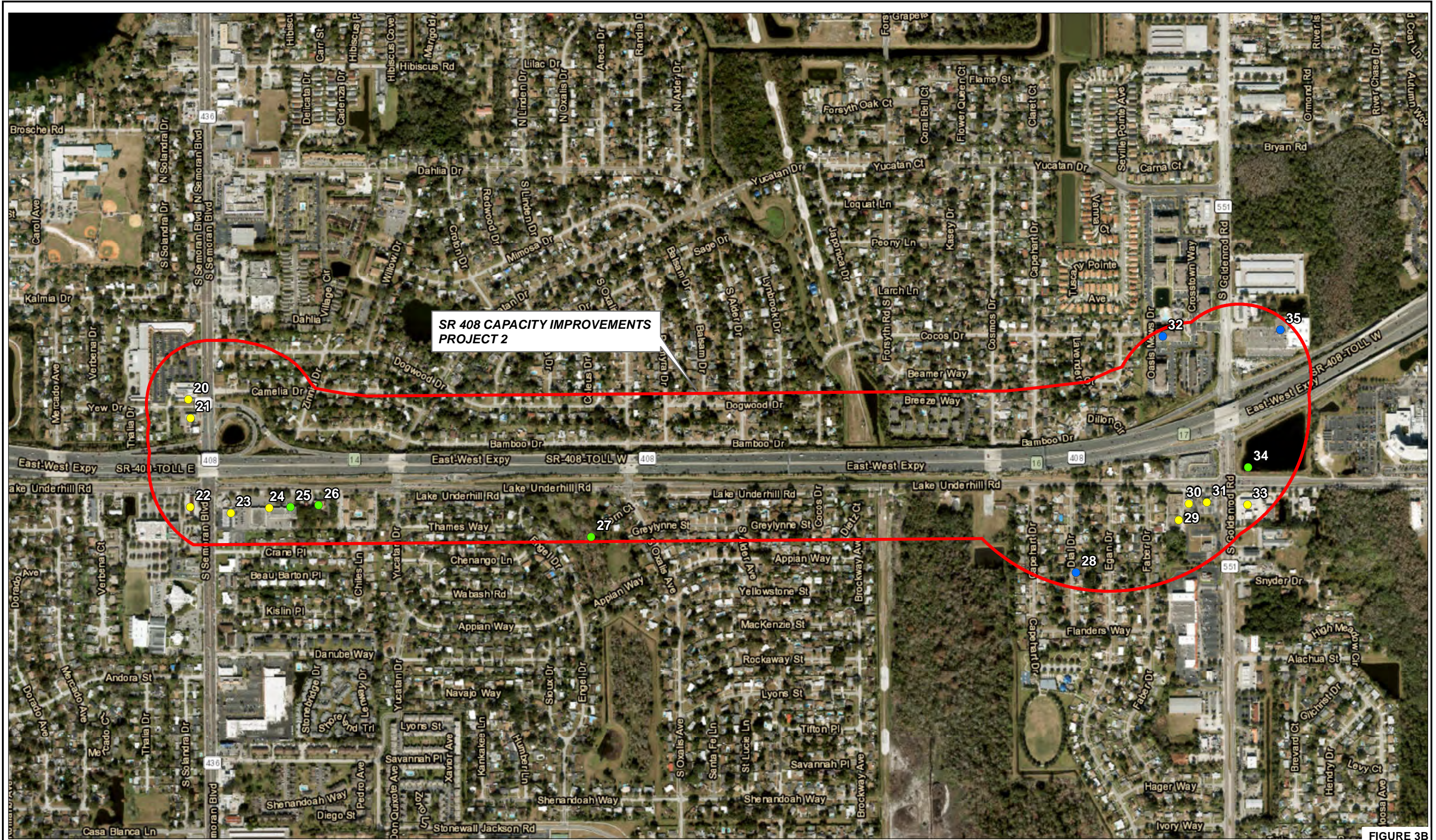


FIGURE 3B

<ul style="list-style-type: none"> ● HIGH RISK RATING SITE LOCATION ● MEDIUM RISK RATING SITE LOCATION ● LOW RISK RATING SITE LOCATION ● NO RISK RATING SITE LOCATION 		<p>RICHARD P. McCORMICK, P.G. P.G. LICENSE NUMBER 2096 GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS, INC. 919 LAKE BALDWIN LANE ORLANDO, FL. 32814</p>	<p>CFX PROJ. NO.:</p> <hr/> <p>408-175</p>	<p>CENTRAL FLORIDA EXPRESSWAY AUTHORITY</p>	<p><i>POTENTIAL CONTAMINATION SITE LOCATION MAP</i></p>	<p>SHEET NO.</p>
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APPENDIX A

Contamination Risk Rating Descriptions

The contamination potential risk rating system was developed by FOOT and is included in Part 2, Chapter 20 of the PD&E Manual, dated July 1, 2020. The rating system incorporates four levels of risk:

1. **No** - A review of available information on the property and a review of the conceptual or design plans indicates there is no potential contamination impact to the project. It is possible that contaminants have been handled on the property. However, findings from the Level I evaluation indicate that contamination impacts are not expected.

2. **Low** - A review of available information indicates that past or current activities on the property have an ongoing contamination issue; the site has a hazardous waste generator identification (ID) number, or the site stores, handles, or manufactures hazardous materials. However, based on the review of conceptual or design plans and/or findings from the Level I evaluation, it is not likely that there would be any contamination impacts to the project.

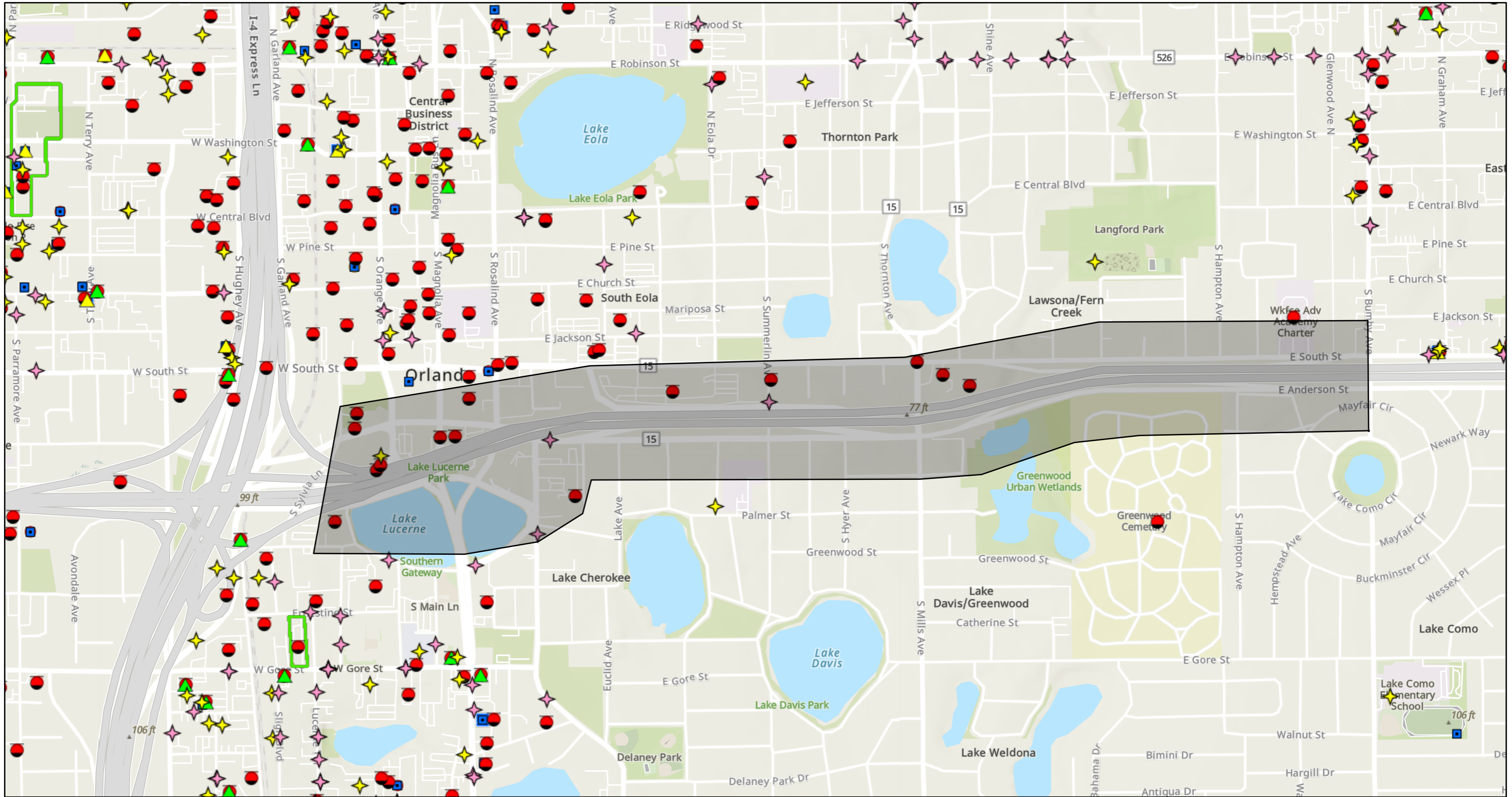
3. **Medium** - After a review of conceptual or design plans and findings from a Level I evaluation, a potential contamination impact to the project has been identified. If there is insufficient information (such as regulatory records or site historical documents) to make a determination as to the potential for contamination impact, and there is reasonable suspicion that contamination may exist, the property should be rated at least as a "Medium." Properties used historically as gasoline stations and which have not been evaluated or assessed by regulatory agencies, sites with abandoned in place underground petroleum storage tanks or currently operating gasoline stations should receive this rating.

4. **High** - After a review of all available information and conceptual or design plans, there is appropriate analytical data that shows contamination will substantially impact construction activities, have implications to ROW acquisition or have other potential transfer of contamination related liability to the FDOT.

APPENDIX B














Map Direct Maps

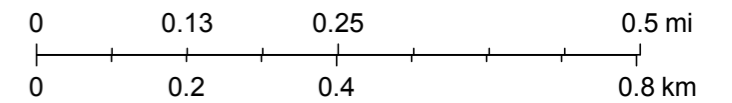
Standard Map



December 8, 2022

1:11,466

-  Drycleaning Solvent Program Cleanup Sites
-  Site Investigation Section Sites
-  OTHER WASTE CLEANUP
-  Florida Institutional Controls Registry
-  ERIC Waste Cleanup
-  PETROLEUM
-  ERIC Waste Cleanup
-  Storage Tank Contamination Monitoring (STCM)
-  Compliance & Enforcement Tracking-Hazardous Waste Facilities
-  State-Owned Lands Cleanup Program (SOLCP) Sites
-  DEP Cleanup Sites
-  County SQGS
-  BROWNFIELD SITES

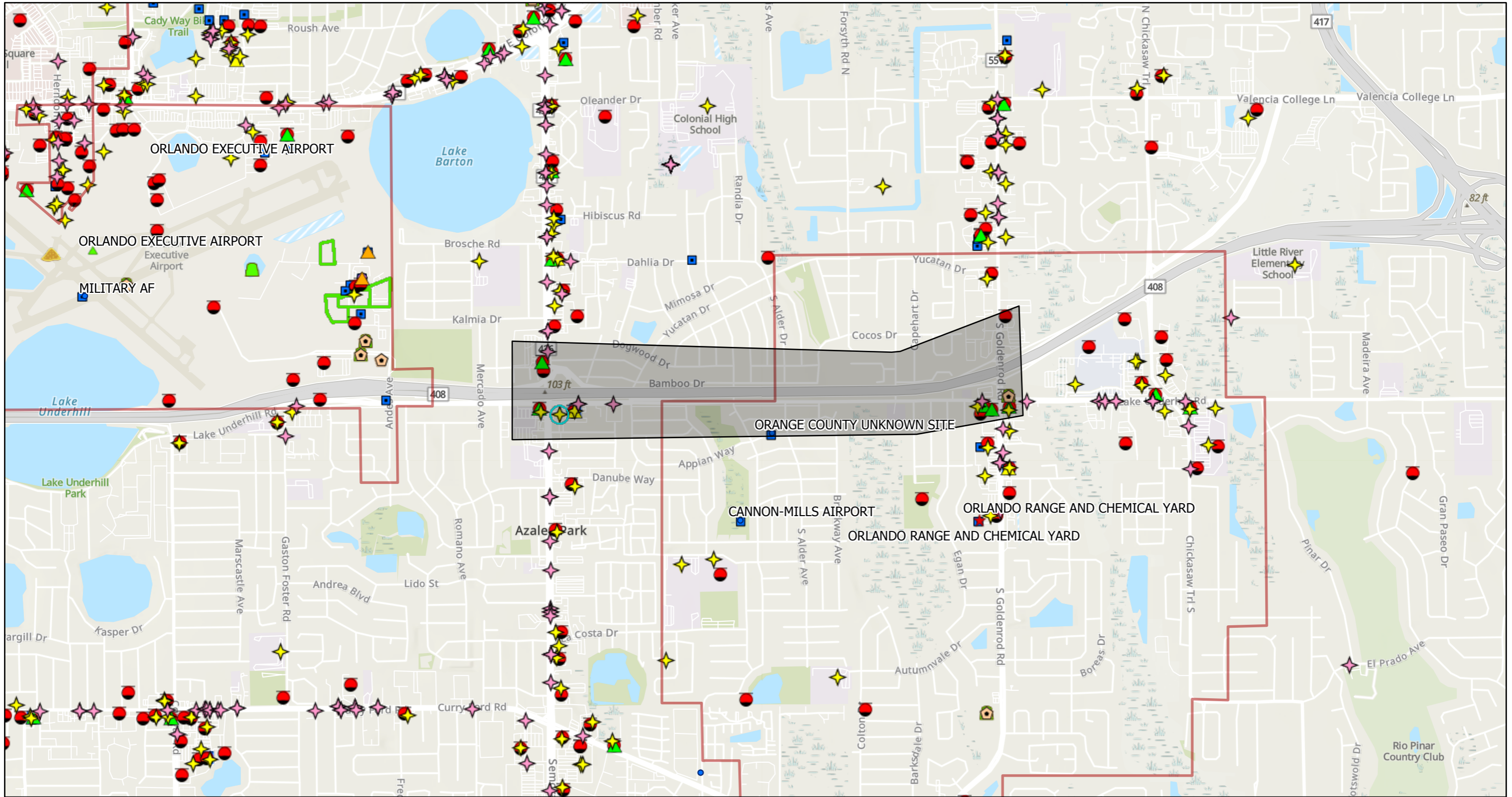


FDEP, DWM, FDEP,DWM, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User

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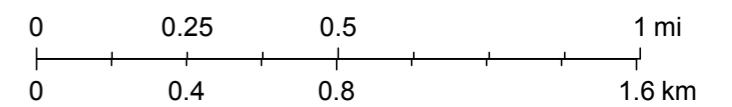
Standard Map



December 13, 2022

1:22,931

- | | |
|--|--|
| ERIC PFAS Sites | ERIC PFAS Sites |
| Department of Defense,Cleanup Underway | Department of Defense,Cleanup Underway |
| Department of Defense,Evaluation in progress | Department of Defense,Evaluation in progress |
| Drycleaning Solvent Program Cleanup Sites | Storage Tank Contamination Monitoring (STCM) |
| Florida Institutional Controls Registry | DEP Cleanup Sites |
| ERIC Waste Cleanup | OTHER WASTE CLEANUP |
| ERIC Waste Cleanup | PETROLEUM |



FDEP, DWM, FDEP,DWM, Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User

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Appendix D – Traffic Noise Study Report

Traffic Noise Study Report

Spessard Holland East-West Expressway (SR 408): Westbound Capacity Improvements from I-4 to Goldenrod Road

Project Development and Environment (PD&E) Study
Orange County, Florida
CFX Project No: 408-175

Prepared For:
Central Florida Expressway Authority



Prepared By:
Environmental Transportation Planning, LLC
Ponte Vedra Beach, FL

In Association With:
Dewberry Engineers, Inc.
Orlando, FL

August 2023

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1.0 INTRODUCTION

CFX is conducting a Project Development and Environment (PD&E) Study for capacity improvements to westbound (WB) SR 408 between Interstate 4 (I-4) and Goldenrod Road.

More than 164,000 vehicles per day travel on SR 408 with a significant portion traveling westbound in the morning from east Orlando to reach downtown and I-4. As such, the SR 408 WB lanes near downtown Orlando become congested and experience delays. Within the study area, the WB direction provides four lanes from I-4 to Bumby Avenue, five lanes from Bumby Avenue to SR 436 (Semoran Boulevard), and four lanes from SR 436 to Goldenrod Road.

The PD&E Study is evaluating the addition of one westbound lane from I-4 to Bumby Avenue and from SR 436 to Goldenrod Road, matching previous improvements between Bumby Avenue and SR 436. The study area runs along the vicinity of Binion Road and Boy Scout Road at SR 429. The project study area is illustrated in **Figure 1**.

The general objective of the PD&E Study is to provide documented information necessary for CFX to reach a decision on the type, design, and location of the proposed improvement within the project limits. The PD&E Study includes the evaluation and documentation of the physical, natural, social, and cultural environment within the corridor and the potential impacts associated with the various mobility alternatives. This analysis also addresses economic and engineering feasibility, mobility capacity and levels of service, conceptual geometry, drainage, and structures.

The goals of the project include:

- Enhance mobility of the area's growing population and economy by providing additional transportation infrastructure
- Reduce congestion and delay and increase safety
- Provide consistency with local plans and policies
- Promote regional connectivity

1.1 Build Alternative

The PD&E's preferred build alternative is illustrated in **Appendix A** and **Appendix D**. Additional engineering detail can be found in the project's associated engineering documentation.

1.2 No-Build Alternative

Consistent with FDOT guidelines, this analysis also considers an alternative that assesses what would happen to the environment in the future if this proposed project was not built. This

Alternative, called the No-Build Alternative, consists of the existing roadways within the study area, programmed improvements to existing facilities, and routine maintenance improvements to these facilities. While the No-Build Alternative does not meet project needs, it provides a baseline condition to compare and measure the proposed project's effects.

1.3 Study Objective

The objective of this report is to summarize the traffic noise analysis conducted for CFX Project #408-175. The analysis identifies the noise sensitive receptors within the study corridor, evaluates the noise levels predicted to occur due to the proposed project, and analyzes potential abatement options where noise impacts are predicted to occur.

The proposed build alternative does not include improvements in the eastbound direction. Thus, this study evaluated the noise sensitive sites south of SR 408 for impacts but did not evaluate additional abatement options beyond the existing noise walls, many of which are already at the maximum allowed heights.

Sites and communities not specifically identified in **Appendix D** are 1) not within the project limits, or 2) are located too far from the roadway to be considered noise sensitive.

Figure 1: Project Location Map



2.0 METHODOLOGY

The traffic noise study conducted for this project is consistent with *Code of Federal Regulations* (C.F.R.), Title 23, § 772; Chapter 335, Section 335.17, *Florida Statutes*; Part II, Chapter 18 of the Florida Department of Transportation's (FDOT) *Project Development and Environment Manual*; and Federal Highway Administration's (FHWA) traffic noise analysis guidelines contained in *FHWA-HEP-10-025*. The FHWA Traffic Noise Model (TNM) - version 2.5 was used to predict traffic noise levels for this project. The analysis evaluated noise levels for the existing condition and the 2045 No-Build and Build Alternatives.

Noise receptor coordinates used in the TNM are located in exterior areas where frequent human use may occur, usually at the edge of the residential structure closest to the project roadways, unless the analyst's professional judgment determines otherwise.

Project engineering design files were used to determine the design alternative's location for input into TNM. Roadway elevation data for the study was obtained from the project engineering team. Data for the noise receptors and cross streets were obtained from the United States Geological Survey digital elevation models¹.

2.1 NOISE METRICS

Sound levels for this analysis are expressed in decibels (dB) using an "A"-scale weighting, expressed as dB(A). This scale most closely approximates the response characteristics of the human ear to typical traffic sound levels. All reported sound levels are hourly equivalent noise levels [$L_{eq(h)}$]. The $L_{eq(h)}$ is defined as the equivalent steady-state sound level that, in a given hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period.

2.2 TRAFFIC DATA

Traffic noise is heavily dependent on traffic volume and speed, with the amount of noise generated by traffic increasing as the vehicle speed and number of vehicles increase. Characteristics contributing to the 2045 Design Year's highest traffic noise levels were used to predict project noise levels. Worst-case noise conditions occur with the maximum traffic traveling at the posted speed and represent a Level of Service (LOS) C operating condition. However, if the traffic analysis indicates the roadway will operate below LOS C, the project's Demand peak-hour

¹ USGS, <https://apps.nationalmap.gov/lidar-explorer/#/>

directional traffic volumes are used per Chapter 18 of the FDOT PD&E Manual. Traffic volumes and speeds used in the analysis are included in **Appendix B**.

2.3 NOISE ABATEMENT CRITERIA

Land use plays an important role in traffic noise analyses. To determine which land uses are “noise sensitive,” this noise impact analysis used the FHWA Noise Abatement Criteria (NAC). **Table 1** shows these criteria are divided into individual land use activity categories. The FDOT has established noise levels at which noise abatement must be considered for each of these categories, referred to in this report as the FDOT NAC. Another criterion for determining project impacts that warrant abatement consideration occurs when project noise levels are below the NAC but show a substantial increase (15.0 dB(A) or more) over existing levels.

Table 1: Noise Abatement Criteria

Hourly A-Weighted Sound Level- decibels (dB(A))			Evaluation Location	Description of Activity Category
Activity Category	Activity Leq(h) ¹			
	FHWA	FDOT		
A	57.0	56.0	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need; and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ²	67.0	66.0	Exterior	Residential.
C ²	67.0	66.0	Exterior	Active sports areas, amphitheatres, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, golf courses, places of worship, playgrounds, public meeting rooms, public/nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52.0	51.0	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public/nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E ²	72.0	71.0	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	-	-	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-	-	-	Undeveloped lands that are not permitted.
(Based on Table 1 of 23 CFR Part 772)				
¹ The Leq(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.				
² Includes undeveloped lands permitted for this activity category.				

An illustration of typical exterior and interior noises and their corresponding sound level is presented in **Table 2**. This table gives the reader a better understanding of the noise levels discussed herein. In Florida, noise levels that reach 66.0 dB(A) at Activity Category B and C land use require noise abatement consideration. A 71.0 dB(A) noise level is required for an Activity Category E land use to be impacted by traffic noise.

Table 2: Comparative Sound Levels

Common Outdoor Activity	dB(A)	Inside Activity
Jet Flyover at 1,000 ft. Gas Lawn Mower at 3 ft.	--110-- --100--	Rock Band
Diesel Truck at 50 ft. (at50 mph) Busy Urban Area Daytime	--90-- --80--	Food Blender at 3 ft. Garbage Disposal at 3 ft.
Gas Mower at 100 ft. Commercial Area Heavy Traffic at 300 ft.	--70-- --60--	Vacuum Cleaner at 10 ft. Normal Speech at 3 ft. Large Business Office
Quiet Urban Daytime Quiet Urban Nighttime Quiet Suburban Nighttime	--50-- --40--	Dishwasher Next Room Theater, Large Conference Room (Background)
Quiet Rural Nighttime	--30-- --20--	Library Bedroom at Night
Lowest Threshold of Human Hearing	--10-- --0--	Lowest Threshold of Human Hearing
Source: California Dept. of Transportation Technical Noise Supplement, Oct. 1998, Pg. 18		

2.4 Noise Abatement Measures

When traffic noise impacts are identified, noise abatement must be considered. The potential abatement alternatives include traffic management techniques, alternative roadway alignments, buffer zones, and noise barriers. The most common type of noise abatement measure is the

construction of a noise barrier that reduces traffic noise by blocking the sound path between the roadway and the adjacent noise receptor.

Consistent with the FDOT PD&E Manual – Chapter 18, the following factors must be evaluated to determine if a noise barrier is considered feasible and reasonable:

- To be considered acoustically feasible, the barrier must reduce traffic-related noise levels by at least 5.0 dB(A) for at least two impacted receptors. Receptors that receive the 5.0 dB(A) reduction, or higher, are defined as “benefited” by FDOT. Consequently, noise barriers are not evaluated for isolated and single receptors.
- To be considered acoustically reasonable, the noise barrier must achieve the FDOT noise reduction design goal of 7.0 dB(A) for at least one benefited receptor.
- The cost per benefited receptor (CBPR) is calculated by multiplying the barrier's total square footage by \$30. Per Chapter 18, \$30 per/ft² is the statewide average used to determine cost reasonableness regardless of barrier type (shoulder/traffic railing mounted, right-of-way post/panel, etc.) To be considered cost reasonable, the total cost of a barrier that meets all acoustical criteria should not exceed the cost of \$42,000 per benefited receptor.

In some locations, noise barriers may provide a benefit to non-impacted residences. Due to design considerations or aesthetics, CFX may propose noise barriers exceeding cost reasonableness limits. An example would be extending a noise barrier to maintain community continuity (i.e., avoiding terminating a noise barrier in the middle of a community).

Consistent with the FDOT Design Manual, Section 264², noise barrier heights are limited as follows:

- Noise barriers on bridge and retaining wall structures are limited to a maximum height of 8 feet; unless otherwise specified;
- Shoulder-mounted noise barriers at the edge of shoulder pavement are limited to a maximum height of 14 feet; and
- Non-shoulder mounted noise barriers (i.e., post and panel) located outside the clear recovery zone are limited to a maximum height of 22 feet. If a non-shoulder barrier is placed within the clear recovery zone, it must be shielded.

Other factors must also be considered when evaluating a barrier’s feasibility, including accessibility, sight distance, and aesthetics. Accessibility refers to the ingress and egress to

² FDOT, *FDOT Design Manual*

properties that would be affected by the construction of a noise barrier. Sight distance is a safety issue related to drivers' ability to see far enough in each direction to enter the roadway safely. Aesthetics refers to the noise barrier's physical appearance from both the highway and affected property sides.

3.0 TRAFFIC NOISE ANALYSIS

3.1 Identification of Noise Sensitive Sites

Using **Table 1** as a guide, the noise sensitive land uses analyzed within the study corridor fall under Activity Categories B [residential], C, D, and E. The Category C land uses associated with Cherokee School, Greenwood Urban Wetlands Park playground, Greenwood Cemetery, Merriday School daycare, Discover Academy daycare, Englewood Park, Community Christian Church, and the Iglesia Bautista De La Garcia Church. The Category D land use is associated with the WFTV Channel 9 building. The Category E site is the Aloft hotel pool.

No land uses in the study corridor warrant an Activity Category A analysis. A search of building permits for potentially noise sensitive Category G (undeveloped) and non-noise-sensitive Category F lands within the study area did not identify any active permits for future buildings that would be considered noise sensitive. Another search will be conducted during the final design process. Any noise sensitive land permitted between the time of this report and the approval of the Project Environmental Impact Report will be analyzed for project noise impacts if warranted.

3.2 Model Validation

Existing noise levels are measured in the project corridor to confirm if traffic is the primary noise source. These field measurements are also required to verify the accuracy of the TNM before it can be used to predict noise levels. A series of three 10-minute measurements were taken on October 18, 2022, using an Extech Instruments Model 407780 Type 2 Integrating Sound Level Meter. The sound level meter, calibrated at 114.0 dB(A) with an Extech Instruments Model 407766 calibrator, was adjusted to the A-weighted frequency scale, which approximates the frequency sensitivity of the human ear. Traffic data, including vehicle volumes, speeds by type, and meteorological conditions, were recorded during each measurement session. The data collection effort also recorded the travel speed for each type of vehicle using a Bushnell Speedster handheld radar gun.

One location within the study corridor was selected to undergo a series of three 10-minute measurements. The validation site, illustrated in **Appendix D – Page D-4**, was selected for measurement because it presented a clear view of free-flow traffic conditions on SR 408. No unusual noise events occurred during this location's three 10-minute monitoring sessions. The

weather during the monitoring session was 77°, 85% humidity, under clear skies with a mild breeze ranging from 3 to 6 m.p.h.

Validation of TNM occurs when the model-predicted noise levels are within three decibels of the field-measured levels. Since all noise levels in this analysis are based on one hour, each of the 10-minute sessions field-recorded traffic volumes was adjusted upward by a factor of “6” to reflect hourly traffic flow. Once adjusted, these volumes were input into the noise prediction model. As shown in **Table 3**, TNM predicted within the 3.0-decibel acceptance range for each 10-minute session. Consequently, the model is acceptable for predicting noise levels for this project.

Table 3: Field Measurement Data and TNM Validation Results

FIELD TRAFFIC COUNT: 10/18/2022										
Session #1: 12:46 PM										
SR 408	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles	
	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed
EB	794	69	27	67	21	66	1	0	0	68
WB	772	70	35	67	34	66	1	65	1	70
Anderson	73	35	4	35	0	0	0	0	0	0
Field Measurement (dB(A)):					70.8					
TNM Prediction (dB(A)):					68.1					
Variance:					-2.7					
Session #2: 12:58 PM										
SR 408	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles	
	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed
EB	711	68	34	67	26	66	0	0	3	68
WB	758	68	45	67	28	66	1	65	0	0
Anderson	67	35	2	35	0	0	0	0	0	0
Field Measurement (dB(A)):					70.7					
TNM Prediction (dB(A)):					67.9					
Variance:					-2.8					
Session #3: 1:10 PM										
SR 408	Cars		Medium Trucks		Heavy Trucks		Buses		Motorcycles	
	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed	Volume	Avg. Speed
EB	805	69	24	67	26	67	2	65	2	68
WB	803	70	32	67	43	66	1	65	1	70
Anderson	57	35	3	35	0	0	0	0	0	0
Field Measurement (dB(A)):					70.1					
TNM Prediction (dB(A)):					68.1					
Variance:					-2.0					

3.3 Predicted Noise Levels

Traffic on SR 408 is the dominant noise source within the project's evaluation area. For this project, 725 sites (716 Category B, seven Category C, one Category D, and one Category E) were analyzed for project-related impacts. The noise analysis divided the project corridor into three Noise Study Areas (NSA).

The 2022 existing condition and 2045 No-Build and Build Alternative noise analysis results discussed in this section are also presented in a noise impact comparison matrix in **Appendix C**. A summary of the results is provided in **Table 3**.

Eighty-five Category B receptors and three special use sites (two Category C and one Category E) currently experience noise levels that meet or exceed their respective FDOT NAC. Predicted noise levels for the No-Build Alternative meet or exceed the NAC at 87 Category B and three special use sites (two Category C and one Category E). By comparison, the Build Alternative is predicted to meet or exceed the NAC at 179 residential receptors and four special use sites (three Category C and one Category E), with an average 1.1 dB(A) increase in noise over the existing condition. The greatest increase over existing is 8.3 dB(A); thus, none of the noise increases are considered substantial (defined as 15 dB(A) or higher).

When discussing noise level increases, the general rule that applies to perception is:

- A 3 dB(A) increase is barely perceptible to most people.
- A 5 dB(A) increase is noticeable to most people.
- A 10 dB(A) increase is perceived as twice as loud and considered a doubling noise.

A discussion of each NSA and the corresponding impact and abatement analysis is provided in the following sections. A set of project aerials illustrating the NSA's and analyzed sites is included in **Appendix D**.

3.3.1 Noise Study Area 1

NSA 1 comprises the area SR 408 between I-4 and Margaret Court. Because there are no noise sensitive sites, this area was not analyzed for noise impacts. This NSA is illustrated in **Appendix D: Page D-1**.

3.3.2 Noise Study Area 2

Across from NSA 1, north of SR 408, is NSA 2, which consists of residences in the multi-story Grande Downtown Condominiums (receptors 2-1 through 2-8), the Aloft Hotel pool (SLU2-1), and the WFTV Channel 9 building (SLU2-2) special use sites. The residences are part of the multi-story and are represented by receptors 2-1 through 2-8. The condominium buildings have seven floors, with each unit having individual balconies. The noise analysis assigned a specific letter to indicate the floor on which a unit is located. The letter “a” represents ground-floor units, “b” represents 2nd-floor units, “c” represents 3rd-floor units, etc. Receptors 2-1 through 2-4 have balconies facing the interior courtyard, while receptors 2-5 through 2-8 have balconies facing SR 408. This NSA is illustrated in **Appendix D: Pages D-2 through D-4**.

Currently, the average noise level for all NSA 2 receptors is 60.4 dB(A), with the highest noise level being 75.7 dB(A) at receptors 2-6c and 2-6d. Twenty-four condo units represented by receptors 2-5a through 2-7f currently meet or exceed the 66.0 dB(A) FDOT NAC and continue to do so under the No-Build Alternative. Once the project is built, 23 sites are predicted to exceed the impact criterion.

Likewise, Receptor SLU2-1 currently has a noise level that exceeds the Category E 71.0 dB(A) NAC and continues to do so under the No-Build Alternative. Once the project is built, this receptor is predicted to have a project-related noise level of 71.7 dB(A); thus, it is considered impacted because it exceeds the impact criterion.

The Channel 9 building (SLU2-2) does not have an area of frequent exterior use. However, because it is a television studio, it was evaluated as an Activity Category D site. Using the metrics outlined in the PD&E Manual – Chapter 18, a Category D analysis accounts for the type of construction (i.e., light frame vs. masonry) and window type/condition, but does not account for additional interior soundproofing that may be in place. The interior sound level is calculated by subtracting 35 dB(A) (masonry and no windows) from the predicted exterior noise level. Currently, the exterior noise level is 65.8 dB(A); therefore, the existing interior noise level is 30.8 dB(A) and below the Category D 51.0 dB(A) NAC. The predicted interior noise level under the No-Build Alternative is also below the NAC at 30.9 dB(A). The Channel 9 site is predicted to have an interior noise level of 32.0 dB(A) with the build condition. Because the noise level is below the NAC, the Channel 9 building is not considered impacted.

The overall traffic noise levels in this NSA increase by an average of 0.3 dB(A), with the average project-related noise level predicted to be 60.7 dB(A). Receptor 2-6e has the highest build-related noise level, 76.4 dB(A), which is a 1.0 dB(A) increase over the existing condition. None of the increases over existing are considered substantial.

Because the predicted noise levels exceed NAC for the 23 residences and the hotel pool, they are considered impacted. Noise abatement was considered to mitigate these impacts, as summarized in **Section 3.4.1** and **Section 3.4.2**

3.3.3 Noise Study Area 3

NSA 3 is south of SR 408 from Margaret Court to Mills Avenue. Within this NSA, existing noise barriers are either along the eastbound shoulder edge of pavement (EOP) or offset from the EOP. The project does not involve improvements to the eastbound side; thus, the project does not affect the existing noise walls that currently provide effective noise reduction to most of the receptors within this NSA. Eighty-seven residences represented by receptors 3-1 through 3-52, and one Category C special use site (SLU3-1) were analyzed for project noise impacts. Receptor SLU3-1 represents the Orange County School Board's Cherokee School courtyard and playground area. The playground area is located on the interior courtyard side of the structure. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-2 through D-4**.

Currently, the average noise level for NSA 3 is 63.8 dB(A), with the highest noise level being 67.4 dB(A) at receptor 3-33. Currently, seven sites represented by receptors 3-1, 3-24, and 3-32 through 3-34 are affected by traffic noise and are predicted to be impacted by the No-Build Alternative. Once the project is built, the overall traffic noise levels increase by an average of 0.3 dB(A), with the average project-related noise level predicted to be 64.0 dB(A). Eight sites are predicted to meet or exceed the FDOT NAC. Receptor 3-33 has the highest predicted build noise level (67.9 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels meet or exceed the 66.0 dB(A) FDOT NAC at eight residential receptors, they are considered impacted. However, since the project is not proposing improvements in the eastbound direction, and the existing noise walls were constructed at or near the maximum allowed heights, additional abatement consideration was not warranted.

3.3.4 Noise Study Area 4

NSA 4 is north of SR 408 across from NSA 3 from Summerlin Avenue to Mills Avenue. Within this NSA, existing noise barriers are either along the eastbound shoulder edge of pavement (EOP) or offset from the EOP. The proposed improvements involve expanding the SR 408 footprint width; thus, the portions of the existing barrier will be removed as part of the project. Thirty-five residential sites, represented by receptors 4-1 through 4-18, were evaluated for project noise

impacts. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-3 and D-4**.

Currently, the average noise level for NSA 4 is 62.0 dB(A), with the highest noise level being 65.0 dB(A) at receptor 4-3. No sites are currently affected by traffic noise, nor are any impacted under the No-Build Alternative. Once the project is built, the overall traffic noise levels increase by an average of 3.3 dB(A), with the average project-related noise level predicted to be 65.4 dB(A). Five sites represented by receptors 4-3, 4-9, and 4-12 through 4-14 are predicted to exceed the 66.0 dB(A) impact criterion. Receptor 4-9 has the highest predicted build noise level (68.1 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels exceed NAC for the five residences, they are considered impacted. Noise abatement was considered to mitigate these impacts, as summarized in **Section 3.4.3**.

3.3.5 Noise Study Area 5

NSA 5 is south of SR 408 from Mills Avenue to Bumby Avenue. Within this NSA, existing noise barriers are along the eastbound shoulder edge of pavement (EOP). The project does not involve improvements to the eastbound side; thus, the project does not affect the existing noise walls that currently provide effective noise reduction to most of the receptors within this NSA. Thirty-nine residential sites, represented by receptors 5-1 through 5-30, and two Category C special use sites (SLU 5-1 and SLU 5-2) were analyzed for project noise impacts. Receptor SLU5-1 represents the Greenwood Urban Wetland Park playground, and receptors SLU5-2 and SLU5-2.1 represent approximately 5 acres of the nearly 70-acre Greenwood Cemetery.

This NSA and its associated receptors and existing barriers are illustrated in **Appendix D: Pages D-4 and D-5**

Currently, the average noise level for all NSA 5 receptors is 63.7 dB(A), with the highest noise level being 68.4 dB(A) at residential receptor 5-11. Eight residential sites and the cemetery are currently affected by traffic noise and will continue to do so under the No-Build Alternative. Once the project is built, the overall traffic noise levels increase by an average of 0.3 dB(A), with the average project-related noise level predicted to be 64.0 dB(A). The same nine sites that meet or exceed the NAC under No-Build Alternative are also predicted to be impacted by the Build Alternative. Receptor 5-11 has the highest predicted build noise level (68.7 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels for the nine sites meet or exceed the 66.0 dB(A) FDOT NAC, they are considered impacted. However, since the project is not proposing improvements in the

eastbound direction and the existing noise walls are at the maximum allowed height, additional abatement consideration was not warranted.

3.3.6 Noise Study Area 6

NSA 6 is north of SR 408, across from NSA 5, and contains 104 residences that were evaluated for project noise impacts (receptors 6-1 through 6-44). Within this NSA, existing noise barriers are either along the eastbound shoulder edge of pavement (EOP) or offset from the EOP. The proposed improvements involve expanding the SR 408 footprint width; thus, a substantial portion of the existing barrier will be removed as part of the project. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-4 and D-5**.

Currently, the average noise level is 65.0 dB(A), with the highest noise level being 68.7 dB(A) at receptor 6-30. Twenty-six sites are currently affected by traffic noise and will continue to be affected under the No-Build Alternative. Once the project is built and the existing noise barrier is removed, the overall traffic noise levels increase by an average of 4.6 dB(A), with the average project-related noise level predicted to be 69.6 dB(A). Ninety-eight sites are predicted to exceed the 66.0 dB(A) impact criterion because of the project and removal of the existing wall. Receptor 6-24 has the highest predicted build noise level (75.7 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels exceed NAC for the 98 residences, they are considered impacted. Replacement of the existing noise wall was considered to mitigate these impacts, as summarized in **Section 3.4.3**.

3.3.7 Noise Study Area 7

NSA 7 is south of SR 408 from Bumby Avenue to Crystal Lake Drive. Within this NSA, existing noise barriers are along the eastbound shoulder edge of pavement (EOP). The project does not involve improvements to the eastbound side; thus, the project does not affect the existing noise walls that currently provide effective noise reduction to most of the receptors within this NSA. Fifty-six residences, represented by receptors 7-1 through 7-36, were evaluated for noise impacts. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-5 and D-6**.

Currently, the average noise level in this NSA is 63.6 dB(A), with the highest noise level being 65.8 dB(A) at receptor 7-7. None of the sites are affected by traffic noise, nor are they predicted to be impacted by the No-Build or Build Alternatives. The average project-related noise increase over existing conditions is 0.1 dB(A), with the highest increase being 0.2 dB(A). None of the increases over existing are considered substantial.

3.3.8 Noise Study Area 8

NSA 8 is north of SR 408, across from NSA 7. Within this NSA, existing noise barriers are either along the eastbound shoulder edge of pavement (EOP). The proposed improvements involve expanding the SR 408 footprint width; thus, a large portion of the existing barrier will be removed as part of the project. Twelve residential sites (receptors 8-1 through 8-5) and two Category C special use sites (SLU8-1 and SLU8-2) were analyzed for noise impacts. Receptors SLU8-1 and SLU8-2 represent the Category C Merriday School daycare and Discover Academy daycare, respectively. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-5 and D-6**.

Currently, the average noise level for 14 analyzed sites in NSA 8 is 63.8 dB(A), with the highest noise level being 66.9 dB(A) at receptor SLU8-2. SLU8-2 is currently the only receptor affected by traffic noise and will continue to be affected under the No-Build Alternative. Once the project is built and the portion of the existing noise barrier is removed, the overall traffic noise levels increase by an average of 2.1 dB(A), with the average project-related noise level predicted to be 65.9 dB(A). Ten sites (eight residential and two daycare buildings) are predicted to exceed the 66.0 dB(A) impact criterion because of the project and removal of the existing wall. Receptor 8-2 has the highest predicted build noise level (67.0 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels exceed NAC for the ten receptors, they are considered impacted. Replacement of the existing noise wall was considered to mitigate these impacts, as summarized in **Section 3.4.4**.

3.3.9 Noise Study Area 9

NSA 9 is south of SR 408 from SR 436 (Semoran Boulevard) to Oxalis Avenue. Fifty-eight residential sites (receptors 9-1a through 9-15) and the Category C special land use Englewood Park (SLU9-1) were analyzed for noise impacts. Within this NSA, existing noise barriers are along the eastbound shoulder edge of pavement (EOP). The project does not involve improvements to the eastbound side; thus, the project does not affect the existing noise walls that currently provide effective noise reduction to the 59 analyzed receptors within this NSA. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-7 and D-8**.

Currently, the average noise level for all NSA 9 receptors is 62.2 dB(A), with the highest noise level being 65.2 dB(A) at receptor 9-1b in the Lake Underhill Gardens apartments. Currently, none of the analyzed sites are affected by traffic noise, nor are they predicted to be impacted by the No-Build or Build Alternatives. After the project is built, the average noise level is predicted to be 62.4 dB(A), with the highest noise level being 65.4 at receptor 9-1b. The average project-related

noise increase over existing conditions is 0.2 dB(A), with the highest increase being 0.3 dB(A). None of the increases over existing are considered substantial.

3.3.10 Noise Study Area 10

NSA 10 is north of SR 408, across from NSA 9. Forty-four residences, represented by receptors 10-1 through 10-30, were evaluated for noise impacts. Within this NSA, existing noise barriers are along the eastbound shoulder edge of pavement (EOP). The proposed improvements involve expanding the SR 408 footprint width between the Yucatan Drive overpass and the exit ramp toll facility, and widening the bridge structure over Oxalis Avenue. Because of this change, portions of the existing noise barrier will be removed as part of the project. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Pages D-7 and D-8**.

Currently, the average noise level for 44 analyzed sites in NSA 10 is 62.3 dB(A), with the highest noise level being 67.1 dB(A) at receptor 10-15. Receptor 10-15 is currently affected by traffic noise and will continue to be affected under the No-Build Alternative. The main source of noise for receptor 10-15 is SR 436, not SR 408. Once the project is built and the portion of the existing noise barrier is removed, the overall traffic noise levels increase by an average of 1.6 dB(A), with the average project-related noise level predicted to be 63.9 dB(A). Eight sites are predicted to exceed the 66.0 dB(A) impact criterion because the project removes the existing wall. The lone exception is for receptor 10-15, which is impacted due to its proximity to SR 436, not SR 408. Receptor 10-15 has the highest predicted build noise level (67.6 dB(A)), and the next highest level is 67.0 for receptor 10-1. None of the increases over existing are considered substantial.

Because the predicted noise levels exceed NAC for the seven impacted receptors adjacent to SR 408, they are considered impacted. Replacement of the existing noise wall was considered to mitigate these impacts, as summarized in **Section 3.4.5**.

3.3.11 Noise Study Area 11

NSA 11 is south of SR 408 from Oxalis Avenue to the overhead powerline that traverses SR 408. Within this NSA, existing noise barriers are along the eastbound shoulder edge of pavement (EOP). The project does not involve improvements to the eastbound side; thus, the project does not affect the existing noise walls that currently provide effective noise reduction to most of the receptors within this NSA. Forty residences, represented by receptors 11-1 through 11-19) were analyzed for noise impacts. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Page D-8**.

None of the 40 analyzed sites are currently affected by traffic noise, nor are they predicted to be impacted by the No-Build or Build Alternatives. Currently, the average noise level for all NSA 11

receptors is 63.3 dB(A), with the highest noise level being 65.2 dB(A) at receptor 11-13. After the project is built, the average noise level is predicted to be 63.5, with the highest noise level being 65.3 at receptor 11-13. The average project-related noise increase over existing conditions is 0.2 dB(A), with the highest increase being 0.3 dB(A). None of the increases over existing are considered substantial.

3.3.12 Noise Study Area 12

NSA 12 is north of SR 408, across from NSA 11. Within this NSA, existing noise barriers are either along the eastbound shoulder edge of pavement (EOP) or offset from the EOP. The proposed improvements include expanding the bridge structure over Oxalis Avenue. Because of this change, portions of the existing barrier will be removed as part of the project. Eighteen residences, represented by receptors 12-1 through 12-10, were analyzed for noise impacts. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Page D-8**.

Currently, the average noise level for 18 analyzed sites in NSA 12 is 62.0 dB(A), with the highest noise level being 63.9 dB(A) at receptor 12-7. None of the sites are currently affected by traffic noise, nor are they predicted to be impacted by the No-Build Alternative. Once the project is built and the portion of the existing noise barrier over Oxalis Avenue is removed, the overall traffic noise levels increase by an average of 1.6 dB(A), with the average project-related noise level predicted to be 63.5 dB(A). Receptor 12-1 is the only site predicted to exceed the 66.0 dB(A) impact criterion because the project removes the existing wall. Receptor 12-1 also has the highest predicted build noise level (67.8 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels exceed NAC for the impacted receptor, it is considered impacted. Replacement of the existing noise wall was considered to mitigate this impact, as summarized in **Section 3.4.5**.

3.3.13 Noise Study Area 13

NSA 13 is south of SR 408 from the overhead powerline to Goldenrod Road. Within this NSA, existing noise barriers are along the eastbound shoulder edge of pavement (EOP) and end east of the Cosmos Drive overpass. The project does not involve improvements to the eastbound side; thus, the project does not affect the existing noise walls that currently provide effective noise reduction to most of the receptors within this NSA. Thirteen residences, represented by receptors 13-1 through 13-6, and two Category C special land uses (SLU13-1 and SLU13-2) were analyzed for noise impacts. Receptors SLU13-1 and SLU13-2 represent the Community Christian Church and the Iglesia Bautista De La Garcia Church, respectively. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Page D-9**.

Nine of the 13 analyzed residential sites are currently affected by traffic noise and are predicted to be impacted by the No-Build and Build Alternatives. The two churches are not impacted. Currently, the average noise level for all NSA 13 receptors is 66.4 dB(A), with the highest noise level being 69.0 dB(A) at receptor 13-3. After the project is built, the average noise level is predicted to be 66.5 dB(A), with the highest noise level being 69.1 at receptor 13-3. The average project-related noise increase over existing conditions is 0.1 dB(A), with the highest increase being 0.1 dB(A). None of the increases over existing are considered substantial.

Because the predicted noise levels for the nine sites meet or exceed the 66.0 dB(A) FDOT NAC, they are considered impacted. However, since the project is not proposing improvements in the eastbound direction and the existing walls are at the maximum allowed height, additional abatement consideration was not warranted.

3.3.14 Noise Study Area 14

NSA 14 is north of SR 408, across from NSA 13. Within this NSA, existing noise barriers are either along the eastbound shoulder edge of pavement (EOP) or offset from the EOP. The proposed improvements are within the current footprint and include restriping; thus, the existing noise barrier adjacent to NSA 14 will not be affected. Seventy-eight residences, represented by receptors 14-1 through 14-26d, were analyzed for noise impacts. This NSA, its associated receptors, and existing barriers are illustrated in **Appendix D: Page D-9**.

Currently, the average noise level for 78 analyzed sites in NSA 14 is 64.7 dB(A), with the highest noise level being 72.5 dB(A) at receptor 14-25d. Ten sites are currently affected by traffic noise, while 11 sites are predicted to be impacted by the No-Build and Build Alternatives. Once the project is built, the overall traffic noise levels increase by an average of 1.6 dB(A), with the average project-related noise level predicted to be 64.8 dB(A). Receptor 14-25d has the highest predicted build noise level (72.6 dB(A)). None of the increases over existing are considered substantial.

Because the predicted noise levels for the 11 sites meet or exceed the 66.0 dB(A) FDOT NAC, they are considered impacted. Except for the Oasis at Crosstown apartments receptors 14-25a/b/c/d and 14-26a/b/c/d, the impacted receptors are included in the barrier analysis conducted for NSAs 10 and 12, as summarized in **Section 3.4.5**. The project does not propose any improvements to the westbound entry ramps, mainline, or structure over Goldenrod Road in the vicinity of apartment receptors; therefore, abatement consideration for the apartments is not warranted.

3.4 Barrier Analysis

Four noise barriers were evaluated to mitigate the impacts resulting from the project.

3.4.1 Noise Barrier WB-A1

The Aloft hotel pool, represented by receptor SLU2-1, is an exterior area where people may congregate; thus, it is considered a special use site which requires a two-phased approach to determine feasibility and reasonableness. The first phase determines feasibility. If the barrier meets feasibility requirements, it will undergo a special use cost reasonableness analysis.

Barrier WB-A1, illustrated in **Appendix E - Page E-2**, was evaluated parallel to the westbound SR 408 to eastbound I-4 flyover ramp and placed at the EOP. As shown in **Table 4**, at the maximum height of 8 feet and length of 1,218, the barrier provides only 0.6 dB(A) of noise reduction to the pool; thus, it cannot meet the minimum 5.0 dB(A) noise reduction requirement. Barrier WB-A1 is not considered feasible and has been removed from further consideration during the final design process.

Table 4: Noise Barrier WB-A1 Evaluation Summary

NSA 2: Barrier WB-A1 Evaluation Summary													
Evaluated Barrier Options				Number of Impacted Sites	Number of Impacted Sites Within a Noise Reduction Range			Number of Benefited Sites ^{*1}				Total Estimated Cost ^{*4}	Recommended for further consideration in final design?
Option	Barrier Type/Location	Height (feet) ^{*6}	Length (feet)		5-5.9 dB(A)	6-6.9 dB(A)	≥ 7.0 dB(A) ^{*2}	Impacted	Other ^{*3}	Total	Avg / Max Reduction dB(A)		
Option 1	Ramp/Flyover Shoulder	8	1,218	1 Special Use Site	0	0	0	0	0	0	0.6 / 0.6	\$ 292,320	No ^{*1}

*1 = Minimum of 5.0 dB(A) required to be considered benefited by noise barrier.
 *2 = FDOT Noise Reduction Design Goal is 7.0 dB(A) at a minimum of 1 benefited receptor.
 *3 = Refers to non-impacted noise-sensitive sites.
 *4 = Based on FDOT Statewide average of \$30 per square foot.
 *5 = FDOT Reasonable Cost Guideline is \$42,000.
 *6 = 8-ft max on MSE/Bridge; 14-ft max on shoulder; 22-ft max at ROW or offset from shoulder.

3.4.2 Noise Barrier WB1

To abate for impacts to the 23 Grande Downtown condominiums in NSA 2, Barrier WB1 was evaluated parallel to westbound SR 408 and placed at the EOP on top of the MSE wall and bridge structure. As shown in **Table 5**, the 8-foot tall [maximum allowed height] and 545-foot long barrier meets all FDOT acoustic and cost criteria and benefits six impacted residences, all on the second and third floors. No barrier scenarios are available to provide meaningful noise reduction to the balconies on floors four through seven. Barrier WB1, as illustrated in **Appendix E – Page 3**, is recommended for further consideration during the project’s final design phase.

Table 5: Noise Barrier WB1 Evaluation Summary

NSA 2: Barrier WB1 Evaluation Summary														
Evaluated Barrier Options				Number of Impacted Residential Sites	Number of Impacted Sites Within a Noise Reduction Range			Number of Benefited Sites ^{*1}				Total Estimated Cost ^{*4}	Cost per Benefited Receptor ^{*5}	Recommended for further consideration in final design?
Option	Barrier Type/Location	Height (feet) ^{*6}	Length (feet)		5-5.9 dB(A)	6-6.9 dB(A)	≥ 7.0 dB(A) ^{*2}	Impacted	Other ^{*3}	Total	Avg / Max Reduction dB(A)			
Option 1	MSE/Shoulder	8	545	23	4	1	1	6	0	6	6.2 / 8.2	\$ 130,800	\$ 21,800	Yes

*1 = Minimum of 5.0 dB(A) required to be considered benefited by noise barrier.

*2 = FDOT Noise Reduction Design Goal is 7.0 dB(A) at a minimum of 1 benefited receptor.

*3 = Refers to non-impacted noise-sensitive sites.

*4 = Based on FDOT Statewide average of \$30 per square foot.

*5 = FDOT Reasonable Cost Guideline is \$42,000.

*6 = 8-ft max on MSE/Bridge; 14-ft max on shoulder; 22-ft max at ROW or offset from shoulder.

3.4.3 Noise Barrier WB2

To abate for impacts to the 111 residences in NSAs 4, 6, and 8, Barrier WB2 was evaluated parallel to westbound SR 408 to replace portions of the 8-foot tall barrier removed by the build alternative. The barrier heights in the reconstruction area are limited to 8 feet due to the MSE wall and bridge structure. The cost per benefited receptor calculations accounted only for the lengths of replacement barrier but used the benefits gained by the entire barrier system/length. As shown in **Table 6**, the barrier replacement option meets acoustic feasibility and cost criteria while benefiting 37 impacted residences. Barrier WB2, as illustrated in **Appendix E – Page 4**, is recommended for further consideration during the project’s final design phase.

Table 6: Noise Barrier WB2 Evaluation Summary

NSAs 4, 6, and 8: Barrier WB3 Evaluation Summary														
Evaluated Barrier Options				Number of Impacted Residential Sites	Number of Impacted Sites Within a Noise Reduction Range			Number of Benefited Sites ^{*1}				Total Estimated Cost ^{*4}	Cost per Benefited Receptor ^{*5,7}	Recommended for further consideration in final design?
Option	Barrier Type/Location	Height (feet) ^{*6}	Length (feet)		5-5.9 dB(A)	6-6.9 dB(A)	≥ 7.0 dB(A) ^{*2}	Impacted	Other ^{*3}	Total	Avg / Max Reduction dB(A)			
Option 1	MSE/Shoulder (replacement)	8	5,324	111	22	15	0	37	0	37	5.6 / 6.5	\$ 1,277,760	\$ 34,534	Yes

*1 = Minimum of 5.0 dB(A) required to be considered benefited by noise barrier.
 *2 = FDOT Noise Reduction Design Goal is 7.0 dB(A) at a minimum of 1 benefited receptor.
 *3 = Refers to non-impacted noise-sensitive sites.
 *4 = Based on FDOT Statewide average of \$30 per square foot.
 *5 = FDOT Reasonable Cost Guideline is \$42,000.
 *6 = 8-ft max on MSE/Bridge; 14-ft max on shoulder; 22-ft max at ROW or offset from shoulder.
 *7 = CPBR calculated using only the replacement barrier length but all receptors benefited by the entire barrier system.

3.4.4 Noise Barrier WB3

To abate for impacts to the 13 residences in NSAs 10, 12, and 14, Barrier WB3 was evaluated as parallel to westbound SR 408 to replace portions of the 8-foot tall barrier removed by the build alternative. The barrier heights in the reconstruction area are limited to 8 feet due to the MSE wall and bridge structure. The cost per benefited receptor calculations accounted only for the lengths of replacement barrier but used the benefits gained by the entire barrier system/length. As shown in **Table 7**, the barrier replacement option meets all acoustic and cost criteria while benefiting 87 residences (three impacted and 84 non-impacted). Barrier WB3, as illustrated in **Appendix E – Page 4**, is recommended for further consideration during the project’s final design phase.

Table 7: Noise Barrier WB3 Evaluation Summary

NSAs 10, 12, & 14: Barrier WB3 Evaluation Summary														
Evaluated Barrier Options				Number of Impacted Residential Sites	Number of Impacted Sites Within a Noise Reduction Range			Number of Benefited Sites ^{*1}				Total Estimated Cost ^{*4}	Cost per Benefited Receptor ^{*5,7}	Recommended for further consideration in final design?
Option	Barrier Type/Location	Height (feet) ^{*6}	Length (feet)		5-5.9 dB(A)	6-6.9 dB(A)	≥ 7.0 dB(A) ^{*2}	Impacted	Other ^{*3}	Total	Avg / Max Reduction dB(A)			
Option 1	MSE/Shoulder (replacement)	8	1,313	13	0	0	3	3	84	87	7.1 / 10.0	\$ 315,120	\$ 3,622	Yes

*1 = Minimum of 5.0 dB(A) required to be considered benefited by noise barrier.
 *2 = FDOT Noise Reduction Design Goal is 7.0 dB(A) at a minimum of 1 benefited receptor.
 *3 = Refers to non-impacted noise-sensitive sites.
 *4 = Based on FDOT Statewide average of \$30 per square foot.
 *5 = FDOT Reasonable Cost Guideline is \$42,000.
 *6 = 8-ft max on MSE/Bridge; 14-ft max on shoulder; 22-ft max at ROW or offset from shoulder.
 *7 = CPBR calculated using only the replacement barrier length but all receptors benefited by the entire barrier system.

4.0 CONCLUSION

Of the 725 analyzed sites, 88 (85 residential, two Category C, and one Category E) are currently affected by traffic noise. The noise levels associated with the 2045 No-Build Alternative are predicted to meet or exceed the FDOT NAC at 90 sites (87 residential, two Category C, and one Category E).

The analysis concluded that once the project is built, the overall traffic noise levels will increase by an average of 1.1 dB(A), with the average project-related noise level predicted to be 64.3 dB(A). The 2045 Build Alternative’s noise levels are predicted to meet or exceed the applicable NAC at 183 sites (179 residential, three Category C, and one Category E). The greatest noise level increase is predicted to be 8.3 dB(A) in NSA 6. Most of the impacts result from the roadway footprint expansion, which necessitates removing existing noise barriers. None of the increases are considered substantial (i.e., 15 dB(A) or more over existing levels).

As required, noise abatement consideration was given to all 183 impacted sites. The 26 impacts (25 residential and cemetery) in NSAs 3, 5, 7, 9, 11, and 13 cannot be mitigated due to 1) no project improvements on the eastbound side and 2) the existing noise barriers being at the maximum allowed heights.

For the westbound side, Noise Barriers WB-A1, WB1, WB 2, and WB3 were evaluated to abate project impacts to the remaining 157 sites (154 residential, two daycares, and one hotel pool). Noise barrier WB-A1 was determined not to meet feasibility requirements. As described in **Table 8**, noise barriers WB1, WB2, and WB 3 meet acoustic and cost reasonableness criteria and are recommended for further consideration during the final design process.

Table 8: CFX Project #408-175 PD&E Noise Barrier Recommendations

Noise Study Area	Barrier ID	Barrier Height (ft) ^{*2}	Barrier Length (ft)	Barrier Location	Estimated Barrier Cost ^{*1}	Recommended for Further Evaluation?
NSA 2	WB-A1	8	1,218	Ramp/Flyover Shoulder (new)	\$292,320	No
NSA 2	WB1	8	545	MSE/Shoulder (new)	\$130,800	Yes
NSAs 4, 6, and 8	WB2	8	5,324	MSE/Shoulder (replacement)	\$1,277,760	Yes
NSAs 10, 12, and 14	WB3	8	1,313	MSE/Shoulder (replacement)	\$315,120	Yes

**1 = Based on FDOT Statewide average of \$30 per square foot.*

**2 = 8-ft max on MSE/Bridge; 14-ft max on shoulder; 22-ft max at ROW or offset from shoulder.*

4.1 Statement of Likelihood

The PD&E analyzed the alternative depicted in Appendix A and Appendix D; however, further coordination with FDOT as the project progresses will determine the final limit of capacity improvements at the western terminus fo the project, near I-4. No changes to the conclusions/recommendations of this PD&E noise analysis are anticipated.

The Central Florida Expressway Authority is committed to the construction of feasible and reasonable noise abatement measures identified in **Table 8**, contingent upon the following conditions:

- Final recommendations on the construction of abatement measures are determined during the project’s final design and through the public involvement process.
- Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement.
- Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion.
- Community input supporting types, heights, and locations of the noise barrier(s) is provided to CFX.

- Safety and engineering aspects as related to the roadway user and the adjacent property owner have been reviewed, and any conflicts or issues resolved.

5.0 CONSTRUCTION NOISE AND VIBRATION IMPACTS

Construction of the proposed roadway improvements is not expected to have significant vibration or construction noise impacts. Applying the FDOT Standard Specifications for Road and Bridge Construction is anticipated to minimize or eliminate most of the potential short-term noise and vibration impacts.

Should any construction noise or vibration issues arise during construction, the Project Engineer, in concert with the CFX Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

6.0 COMMUNITY COORDINATION

6.1 Noise Impact Contours

To aid in promoting land use compatibility, this report, which provides information that can be used to protect future land development from becoming incompatible with anticipated traffic noise levels, can be used by Orange County and City of Orlando officials. In addition, generalized noise impact contours for the Build Alternative have been developed, identifying the distances between the Build Alternative and the location where traffic noise levels approach the NAC for Activity Categories A, B, C, and E. The contour distances provided in **Table 9** do not account for any reduction in noise levels that may be provided by berms, privacy walls, or intervening structures. These distances also do not account for any increase in noise levels caused by local roads not included in the modeling, variation in the noise path, increased roadway elevation, or increased elevation of a noise sensitive site (e.g., second-floor patio). To minimize the potential for incompatible land use, future noise sensitive land uses should be located beyond these distances.

Table 9: Critical Distance Impact Contours

Impact Contours			
Activity Category ^{*1}	Corresponding Noise Abatement Criterion	Distance to EOP ^{*2}	
		SR 408: I-4 to Crystal Lake Dr.	SR 408: SR 436 to Goldenrod Rd.
Category A	56 dB(A)	1,050 ft	1100 ft
Category B and C	66 dB(A)	285 ft	315 ft
Category E	71 dB(A)	100 ft	75 ft

*1 Activity Categories as defined in 23 CFR 772.

*2 Distance to the nearest edge of pavement.

6.2 Public Meetings

A public meeting was held for this project on February 27, 2023. Any comments received during the public meeting comment period about the PD&E Study in general, as well as those pertinent to the noise analysis, will be documented under separate cover.

During the final design process, CFX will hold a meeting in which the proposed noise barrier and other pertinent project construction-related information will be presented to the public. To aid in the decision-making process, CFX will directly solicit the opinions of the property owners and renters found to benefit (e.g., receive a minimum 5 dB(A) reduction in noise) from the proposed noise barrier. The solicitation of viewpoints will be conducted as part of the meeting and mailed survey. The CFX decision-making process and survey results for this project will be documented under separate cover.

7.0 REFERENCES

FHWA. *Code of Federal Regulations*, Title 23 Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise." July 13, 2010.

FHWA. *Highway Traffic Noise: Analysis and Abatement Guidance*, FHWA-HEP-10-025. December 2011.

FHWA. *Recommended Best Practices for the Use of the FHWA Traffic Noise Model (TNM)*. December 8, 2015.

FDOT. A+ Plus Aerial Photo Look-Up System. 2022.

FDOT. *FDOT Design Manual*

FDOT. *Project Development and Environment Manual: Part II, Chapter 18*. Effective July 1, 2020.

FDOT. *Standard Specifications for Road and Bridge Construction*.

FDOT. *Traffic Noise Modeling and Analysis Practitioners Handbook*. December 2018.

Google Earth, @2022 Google. Imagery and elevation data.

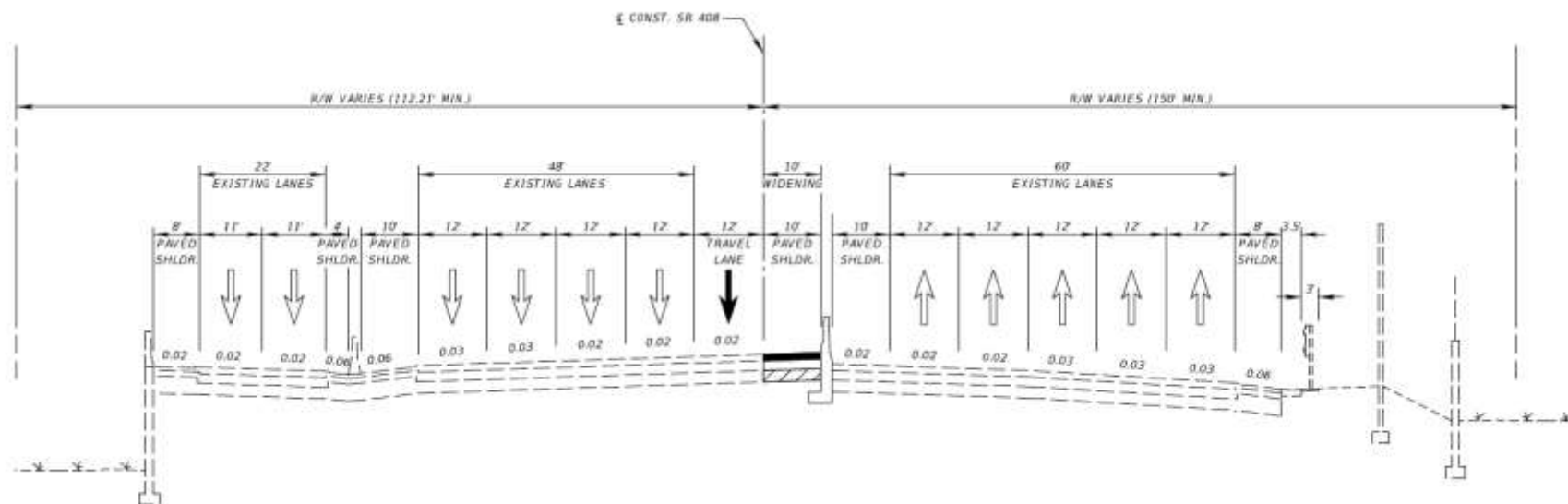
Section 335.17, *Florida Statutes. State Highway Construction; Means of Noise Abatement*. 2012.

USGS. National Map 2022; <https://apps.nationalmap.gov/lidar-explorer/#/>.

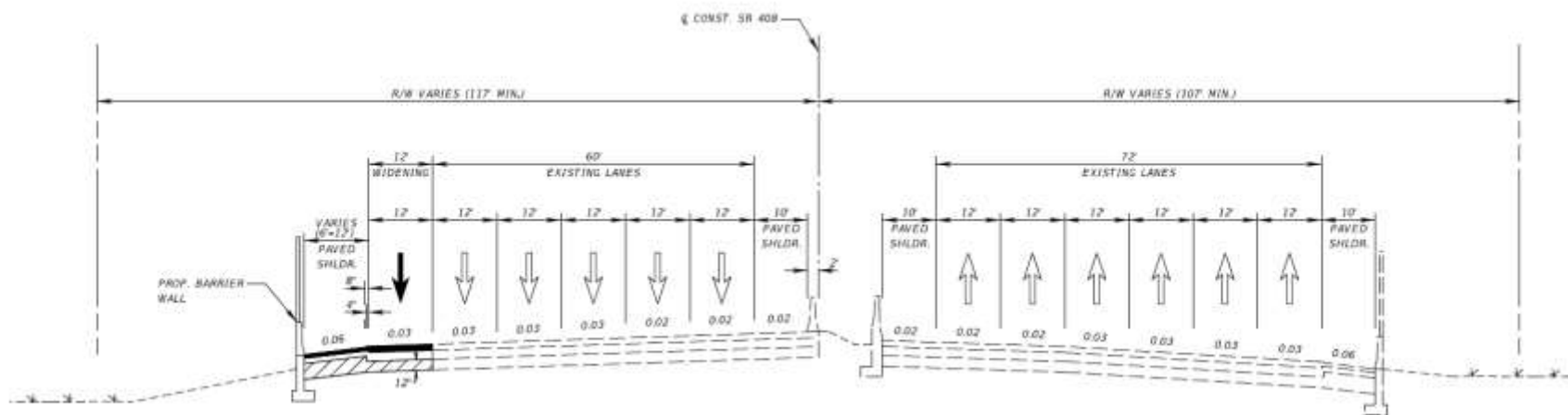
Appendix A:

Typical Sections

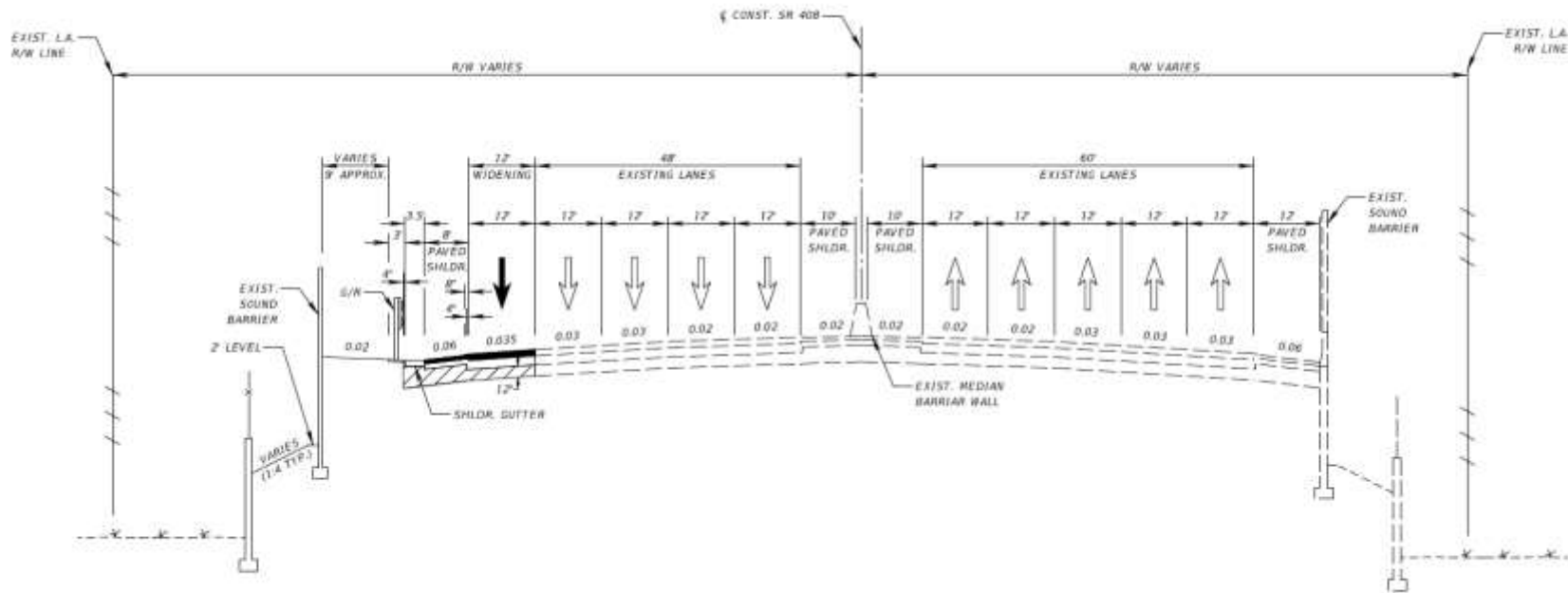
Typical Section – Adjacent to Rosalind Ave.



Typical Section – Bumby to Mills



Typical Section – SR 436 to Goldenrod



Appendix B:

Noise Study Traffic Data

Noise Analysis Traffic Data - SR 408, from I-4 to SR 417
2021 Existing Conditions

roadway Segment	Inventory Metrics										A-Index	D-Index	Posted Speed (mph)
	Number of Lanes	Two-Way AADT	Two-Way LOS C AADT	Peak Hour Peak	LOS C Peak Hour Peak	Design Hr. % T	Design Hr. % RT	Design Hr. % HT	Design Hr. % Bus	Design Hr. % Motorcycles			
SR 408 Ramps													
From I-4 to Roadside Avenue Off-ramp to 87th Avenue (Southbound)	4	182,542	121,576	6,723	4,362	2.0%	2.0%	1.1%	2.2%	0.2%	8.7%	55.0%	55
From Roadside Avenue Off-ramp to Anderson Street On-ramp to I-4 (Northbound)	10	175,610	130,900	7,047	4,075	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From I-4 Mile Avenue to S Betty Avenue	10	190,280	146,800	6,746	4,072	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From S Betty Avenue to S Crystal Lake Drive (Lake Underhill Road)	8	162,280	134,800	6,662	3,720	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From S Crystal Lake Drive (Lake Underhill Road) to Orange Street	11	195,450	154,200	6,990	3,965	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From Orange Street to S Orange Avenue	10	160,750	136,900	6,349	3,672	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From Orange Avenue to S Orange Boulevard (Orange Drive)	10	149,580	136,800	7,011	4,090	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From Orange Boulevard (Orange Drive) to S Goldenrod Road	8	145,850	139,500	7,173	5,123	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From S Goldenrod Road to S Chokoloskee Trail	8	120,650	139,800	6,538	4,220	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
From S Chokoloskee Trail to SR 408	10	150,380	144,000	6,922	3,760	2.0%	2.0%	0.9%	1.9%	0.2%	8.7%	55.0%	55
SR 408 Ramps													
Intersectors													
Intersector 1													
Southbound on	2	38,920	20,200	1,193	2,543	3.0%	0.9%	1.1%	3.3%	0.2%	7.8%	43.8%	50
Westbound on	2	38,920	20,200	2,022	2,543	2.0%	0.9%	1.1%	3.3%	0.2%	7.8%	43.8%	50
Intersector 2													
Intersector 3													
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Noise Analysis Traffic Data - SR 408, from I-4 to SR 417
2045 No Build Conditions

Mainline Segment	Business Routes												
	Number of Lanes	Two-Way AADT	Two-Way LOS-C AADT	Peak Hour Peak	LOS-C Peak Hour Peak	Design Hr. % T	Design Hr. % MT	Design Hr. % RT	Design Hr. % Buss	Design Hr. % Motorcycle	Standard K-factor	Adjusted	Posted Speed (mph)
SR 408 Ramps													
From I-4 Exit 104A to SR 408	4	225,568	138,830	8,548	4,300	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
From Roseland Avenue (I-4 ramp) to Anderson Street (Loop ramp to SR 408)	10	325,000	198,900	12,340	6,400	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
From SR 408 to SR 408	10	225,460	138,830	11,520	6,200	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
From SR 408 to SR 408	4	229,650	138,830	12,910	6,300	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
From SR 408 to SR 408	10	229,700	138,830	11,390	7,900	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
SR 408 Mainline													
From SR 408 to SR 408	10	180,900	138,830	8,700	4,800	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
From SR 408 to SR 408	4	187,000	138,830	9,010	5,200	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
From SR 408 to SR 408	4	182,400	138,830	8,050	4,300	2.00%	0.01%	1.18%	2.23%	3.22%	4.7%	88.2%	65
SR 408 Mainline													
Interstate 4													
Eastbound on	4	48,000	28,200	1,800	1,000	2.00%	0.01%	1.18%	2.23%	3.22%	7.8%	83.8%	65
Westbound on	4	45,000	26,000	1,500	1,200	2.00%	0.01%	1.18%	2.23%	3.22%	7.8%	83.8%	65
E Southbound Roseland Avenue, E Anderson Street													
Eastbound on	4	10,780	6,120	1,000	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	10.8%	88.2%	65
Westbound on	4	10,780	6,120	1,000	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	10.8%	88.2%	65
E SR 408													
Eastbound on	4	8,800	4,800	800	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	7.1%	100.0%	65
Westbound on	4	8,800	4,800	800	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	10.0%	88.2%	65
E Roseland Avenue, E Crystal Lake Drive/Lake Underhill Road													
Eastbound on	4	11,880	25,700	1,710	2,540	2.00%	0.01%	1.18%	2.23%	3.22%	8.5%	88.2%	65
Westbound on	4	11,880	25,700	1,180	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.5%	88.2%	65
Eastbound on	4	11,880	25,700	1,180	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.5%	88.2%	65
Westbound on	4	11,880	25,700	1,180	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.5%	88.2%	65
Gateway Road													
Eastbound on	4	11,000	18,000	800	1,010	2.00%	0.01%	1.18%	2.23%	3.22%	10.0%	88.2%	65
Westbound on	4	11,000	18,000	800	1,010	2.00%	0.01%	1.18%	2.23%	3.22%	10.0%	88.2%	65
Anna Avenue													
Eastbound on	4	11,000	18,000	1,140	1,240	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
Westbound on	4	11,000	18,000	1,140	1,240	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
S Southbound Roseland Avenue, Florida Drive													
Westbound on (Loop)	4	10,100	11,200	900	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.7%	100.0%	65
Westbound on (Loop)	4	8,500	30,000	800	1,240	2.00%	0.01%	1.18%	2.23%	3.22%	7.5%	100.0%	25
Eastbound on	4	7,200	16,000	800	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
Westbound on	4	7,200	16,000	740	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
E Collier Road													
Eastbound on	4	8,200	22,000	900	1,240	2.00%	0.01%	1.18%	2.23%	3.22%	8.4%	88.2%	65
Westbound on	4	8,200	11,000	1,010	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.4%	88.2%	65
Eastbound on	4	7,800	11,000	880	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
Westbound on	4	7,800	22,000	800	1,240	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
E Collier Road													
Eastbound on	4	7,200	16,000	800	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
Westbound on	4	7,200	16,000	740	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
E Collier Road													
Eastbound on	4	7,200	16,000	800	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
Westbound on	4	7,200	16,000	740	1,210	2.00%	0.01%	1.18%	2.23%	3.22%	8.8%	88.2%	65
SR 417													
Eastbound on	4	10,000	10,000	800	1,000	2.00%	0.01%	1.18%	2.23%	3.22%	10.0%	100.0%	65
Arroyo and Group Streets													
Arroyo Segment													
E Southbound Roseland Avenue													
North of SR 408	4	17,000	14,800	2,010	1,500	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
E Arroyo Street													
North of SR 408	4	10,400	8,000	1,120	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
Edgewater Avenue													
North of SR 408	4	7,700	7,500	440	400	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	8,000	8,700	500	400	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
E SR 408													
North of SR 408	4	8,400	10,800	1,110	700	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	8,700	8,000	600	500	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
E Roseland Avenue													
North of SR 408	4	10,700	16,700	1,300	700	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	8,800	8,300	600	400	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
Palmetto Drive													
North of SR 408	4	7,200	8,800	600	300	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	10,000	8,000	1,200	700	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
E Crystal Lake Drive													
North of SR 408	4	34,700	31,200	1,600	700	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	11,800	8,200	600	300	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
Lake Underhill Road													
North of SR 408	4	10,000	1,100	1,100	400	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
Gateway Road													
North of SR 408	4	10,000	10,000	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
Anna Avenue													
North of SR 408	4	8,000	8,000	900	400	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	8,000	8,000	900	400	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
S Roseland Avenue													
North of SR 408	4	10,000	10,000	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	10,000	10,000	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
E Collier Road													
North of SR 408	4	11,100	10,000	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	10,400	10,100	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
E Collier Road													
North of SR 408	4	10,000	10,000	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35
South of SR 408	4	10,000	10,000	1,000	1,000	4.00%	1.00%	1.00%	3.00%	3.00%	8.0%	100.0%	35

(1) Number of lanes was obtained from field observations and aerial maps. Number of lanes shown are based on studies with fewer lanes. Noise analysis to consider correct bridge per guidelines.
 (2) Traffic data is obtained from the operational analysis and PMSE study.
 (3) Peak hour demand and LOS-C peak hour maximum traffic volumes are provided directionally.
 (4) LOS-C targets are based on the FHWA 2010 Quality Level of Service Handbook tables, and adjusted for local conditions.
 (5) LOS-C AADTs are estimated using K and D factors and the design hour peak direction LOS-C Research traffic volumes.
 (6) The vehicle classification factors are obtained from Florida Traffic Data.
 (7) Posted speed data are obtained by field observations.

Appendix C:

Noise Impact Comparison Matrix

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
NSA 1: South of SR 408 from I-4 to Margaret Ct - Illustrated on Page D-2 - Appendix D							
No noise sensitive sites							
NSA 2: North of SR 408 from I-4 to Summerlin Ave. - Illustrated on Page D-2 through D-4 - Appendix D							
2-1a	3	66.0	48.6	48.8	49.3	0.7	-
2-1b	3	66.0	50.2	50.4	50.8	0.6	-
2-1c	3	66.0	50.3	50.5	50.9	0.6	-
2-1d	3	66.0	51.1	51.3	51.6	0.5	-
2-1e	3	66.0	52.9	53.1	53.4	0.5	-
2-1f	3	66.0	55.1	55.3	55.6	0.5	-
2-2a	4	66.0	49.2	49.3	49.7	0.5	-
2-2b	4	66.0	49.6	49.8	50.1	0.5	-
2-2c	4	66.0	50.2	50.3	50.7	0.5	-
2-2d	4	66.0	51.6	51.8	52.1	0.5	-
2-2e	4	66.0	52.3	52.5	52.8	0.5	-
2-2f	4	66.0	54.7	54.9	55.1	0.4	-
2-3a	3	66.0	49.1	49.3	49.6	0.5	-
2-3b	3	66.0	48.3	48.5	48.7	0.4	-
2-3c	3	66.0	50.5	50.7	50.9	0.4	-
2-3d	3	66.0	50.4	50.5	50.7	0.3	-
2-3e	3	66.0	51.8	52.0	52.2	0.4	-
2-3f	3	66.0	53.6	53.8	53.9	0.3	-
2-4a	6	66.0	49.2	49.4	49.6	0.4	-
2-4b	6	66.0	47.9	48.1	48.3	0.4	-
2-4c	6	66.0	50.3	50.5	50.8	0.5	-
2-4d	6	66.0	50.5	50.7	50.9	0.4	-
2-4e	6	66.0	51.6	51.8	51.9	0.3	-
2-4f	6	66.0	53.6	53.7	53.9	0.3	-
2-5a	1	66.0	67.4	67.5	65.8	-1.6	-
2-5b	1	66.0	73.7	73.7	70.8	-2.9	Yes
2-5c	1	66.0	74.6	74.6	74.7	0.1	Yes
2-5d	1	66.0	75.0	75.0	75.6	0.6	Yes
2-5e	1	66.0	74.7	74.7	75.6	0.9	Yes
2-5f	1	66.0	74.5	74.6	75.5	1.0	Yes

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
2-6a	1	66.0	69.1	69.1	67.7	-1.4	Yes
2-6b	1	66.0	75.2	75.2	73.3	-1.9	Yes
2-6c	1	66.0	75.7	75.7	75.9	0.2	Yes
2-6d	1	66.0	75.7	75.7	76.2	0.5	Yes
2-6e	1	66.0	75.4	75.5	76.4	1.0	Yes
2-6f	1	66.0	75.3	75.3	76.3	1.0	Yes
2-7a	2	66.0	66.6	66.7	66.0	-0.6	Yes
2-7b	2	66.0	72.4	72.4	70.5	-1.9	Yes
2-7c	2	66.0	73.1	73.1	72.7	-0.4	Yes
2-7d	2	66.0	73.2	73.2	73.6	0.4	Yes
2-7e	2	66.0	73.1	73.2	73.7	0.6	Yes
2-7f	2	66.0	73.0	73.0	73.6	0.6	Yes
2-8a	2	66.0	59.5	59.7	59.9	0.4	-
2-8b	2	66.0	62.4	62.6	63.1	0.7	-
2-8c	2	66.0	63.5	63.7	64.2	0.7	-
2-8d	2	66.0	63.9	64.1	64.7	0.8	-
2-8e	2	66.0	64.1	64.3	64.9	0.8	-
2-8f	2	66.0	64.3	64.5	65.0	0.7	-
SLU2-1	1	71.0	71.4	71.7	71.7	0.3	Yes
SLU2-2	1	51.0	30.8	30.9	32.0	1.2	-
NSA Summary	134		60.4	60.5	60.7	0.3	23
NSA 3: South of SR 408 from Margaret Ct. Mills Ave. - Illustrated on Pages D-2 through D-4 - Appendix D							
3-1	1	66.0	66.3	66.5	66.6	0.3	Yes
3-2	1	66.0	65.8	66.0	66.1	0.3	Yes
3-3	1	66.0	65.3	65.4	65.6	0.3	-
3-4	1	66.0	64.7	64.8	64.9	0.2	-
3-5	1	66.0	65.3	65.4	65.5	0.2	-
3-6	1	66.0	64.9	65.0	65.2	0.3	-
3-7	1	66.0	63.6	63.7	63.9	0.3	-
3-8	1	66.0	63.8	63.9	64.1	0.3	-
3-9	1	66.0	62.7	62.8	63.0	0.3	-
3-10	7	66.0	63.7	63.7	63.9	0.2	-
3-11	1	66.0	62.0	62.0	62.3	0.3	-

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
3-12	2	66.0	61.1	61.2	61.5	0.4	-
3-13	4	66.0	60.6	60.6	61.0	0.4	-
3-14	6	66.0	62.9	62.9	63.1	0.2	-
3-15	2	66.0	60.9	60.9	61.2	0.3	-
3-16	1	66.0	63.7	63.8	63.9	0.2	-
3-17	1	66.0	63.6	63.7	63.8	0.2	-
3-18	1	66.0	63.5	63.5	63.7	0.2	-
3-19	1	66.0	65.0	65.0	65.2	0.2	-
3-20	1	66.0	65.4	65.4	65.6	0.2	-
3-21	1	66.0	61.9	61.9	62.1	0.2	-
3-22	1	66.0	61.2	61.3	61.5	0.3	-
3-23	1	66.0	63.4	63.5	63.7	0.3	-
3-24	1	66.0	66.1	66.1	66.4	0.3	Yes
3-25	1	66.0	65.0	65.0	65.2	0.2	-
3-26	1	66.0	65.1	65.1	65.3	0.2	-
3-27	1	66.0	64.5	64.5	64.8	0.3	-
3-28	8	66.0	64.2	64.2	64.5	0.3	-
3-29	1	66.0	64.7	64.7	65.0	0.3	-
3-30	1	66.0	63.4	63.5	63.8	0.4	-
3-31	1	66.0	63.6	63.6	63.9	0.3	-
3-32	3	66.0	66.9	66.9	67.1	0.2	Yes
3-33	1	66.0	67.7	67.7	67.9	0.2	Yes
3-34	1	66.0	67.4	67.4	67.6	0.2	Yes
3-35	2	66.0	64.6	64.6	64.9	0.3	-
3-36	1	66.0	64.6	64.6	64.9	0.3	-
3-37	1	66.0	64.1	64.1	64.4	0.3	-
3-38	1	66.0	63.6	63.6	63.9	0.3	-
3-39	1	66.0	63.1	63.2	63.5	0.4	-
3-40	1	66.0	65.7	65.8	65.9	0.2	-
3-41	1	66.0	65.0	65.0	65.2	0.2	-
3-42	1	66.0	64.4	64.4	64.6	0.2	-
3-43	1	66.0	63.9	64.0	64.1	0.2	-
3-44	1	66.0	63.3	63.3	63.5	0.2	-

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
3-45	1	66.0	63.4	63.4	63.6	0.2	-
3-46	2	66.0	63.3	63.4	63.5	0.2	-
3-47	1	66.0	62.3	62.3	62.6	0.3	-
3-48	1	66.0	64.2	64.2	64.4	0.2	-
3-49	1	66.0	65.2	65.2	65.5	0.3	-
3-50	1	66.0	63.8	63.8	64.1	0.3	-
3-51	9	66.0	62.4	62.4	62.7	0.3	-
3-52	1	66.0	62.9	63.0	63.3	0.4	-
SLU3-1	1	66.0	50.2	50.2	50.6	0.4	-
NSA Summary	88		63.8	63.8	64.0	0.3	8
NSA 4: North of SR 408 from Summerlin Ave. to Mills Ave. - Illustrated on Pages D-3 and D-4 - Appendix D							
4-1	1	66.0	61.1	61.3	64.8	3.7	-
4-2	1	66.0	61.1	61.2	65.0	3.9	-
4-3	1	66.0	65.0	65.0	66.8	1.8	Yes
4-4	1	66.0	61.1	61.2	64.7	3.6	-
4-5	4	66.0	61.6	61.6	64.5	2.9	-
4-6	1	66.0	60.1	60.2	63.1	3.0	-
4-7	1	66.0	61.9	62.0	65.6	3.7	-
4-8	1	66.0	61.9	62.1	65.4	3.5	-
4-9	1	66.0	63.9	63.9	68.1	4.2	Yes
4-10	1	66.0	61.8	61.9	65.1	3.3	-
4-11	1	66.0	61.6	61.7	64.9	3.3	-
4-12	1	66.0	62.8	62.9	66.3	3.5	Yes
4-13	1	66.0	62.4	62.5	66.3	3.9	Yes
4-14	1	66.0	64.0	64.0	67.7	3.7	Yes
4-15	6	66.0	61.4	61.5	64.6	3.2	-
4-16	2	66.0	61.1	61.1	63.9	2.8	-
4-17	8	66.0	61.3	61.3	64.0	2.7	-
4-18	2	66.0	62.2	62.2	65.7	3.5	-
NSA Summary	35		62.0	62.1	65.4	3.3	5
NSA 5: South of SR 408 from Mills Ave. to Bumby Ave. - Illustrated on Pages D-4 and D-5 - Appendix D							
5-1	1	66.0	64.7	64.7	65.0	0.3	-

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
5-2	1	66.0	63.6	63.7	63.9	0.3	-
5-3	1	66.0	62.4	62.5	62.8	0.4	-
5-4	1	66.0	61.6	61.7	61.9	0.3	-
5-5	1	66.0	62.8	62.9	63.2	0.4	-
5-6	1	66.0	62.3	62.3	62.6	0.3	-
5-7	1	66.0	61.4	61.4	61.7	0.3	-
5-8	1	66.0	60.6	60.6	61.0	0.4	-
5-9	1	66.0	60.2	60.3	60.6	0.4	-
5-10	1	66.0	60.0	60.1	60.4	0.4	-
5-11	1	66.0	68.4	68.5	68.7	0.3	Yes
5-12	1	66.0	67.4	67.4	67.7	0.3	Yes
5-13	1	66.0	66.9	67.0	67.3	0.4	Yes
5-14	1	66.0	65.4	65.4	65.8	0.4	-
5-15	3	66.0	66.9	67.0	67.2	0.3	Yes
5-16	1	66.0	66.2	66.2	66.4	0.2	Yes
5-17	1	66.0	65.4	65.5	65.7	0.3	-
5-18	1	66.0	64.5	64.5	64.8	0.3	-
5-19	1	66.0	62.8	62.9	63.1	0.3	-
5-20	1	66.0	62.5	62.5	62.8	0.3	-
5-21	1	66.0	62.2	62.3	62.5	0.3	-
5-22	3	66.0	62.7	62.8	63.0	0.3	-
5-23	1	66.0	66.2	66.4	66.5	0.3	Yes
5-24	1	66.0	62.2	62.3	62.5	0.3	-
5-25	1	66.0	62.6	62.7	62.9	0.3	-
5-26	1	66.0	63.0	63.1	63.2	0.2	-
5-27	1	66.0	63.3	63.4	63.6	0.3	-
5-28	1	66.0	64.0	64.1	64.2	0.2	-
5-29	2	66.0	65.2	65.4	65.5	0.3	-
5-30	4	66.0	62.0	62.1	62.3	0.3	-
SLU5-1	1	66.0	60.5	60.6	60.8	0.3	
SLU5-2	1	66.0	66.8	66.8	67.4	0.6	Yes
SLU5-2.1			65.7	65.7	66.0	0.3	
NSA Summary	40		63.7	63.8	64.0	0.3	8

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
NSA 6: North of SR 408 from Mills Ave. to Bumby Ave. - Illustrated on Pages D-4 and D-5 - Appendix D							
6-1	3	66.0	67.8	67.9	68.3	0.5	Yes
6-2	3	66.0	64.6	64.6	65.3	0.7	-
6-3	1	66.0	63.3	63.4	64.2	0.9	-
6-4	4	66.0	67.6	67.7	68.3	0.7	Yes
6-5	2	66.0	66.0	66.0	67.0	1.0	Yes
6-6	2	66.0	65.5	65.6	66.8	1.3	Yes
6-7	2	66.0	64.9	65.0	66.2	1.3	Yes
6-8	2	66.0	64.2	64.3	65.8	1.6	Yes
6-9	10	66.0	64.6	64.6	66.0	1.4	Yes
6-10	1	66.0	65.1	65.2	67.9	2.8	Yes
6-11	1	66.0	66.2	66.2	70.9	4.7	Yes
6-12	2	66.0	64.4	64.4	68.7	4.3	Yes
6-13	1	66.0	63.8	63.9	66.6	2.8	Yes
6-14	2	66.0	63.5	63.5	67.7	4.2	Yes
6-15	4	66.0	62.5	62.5	66.8	4.3	Yes
6-16	1	66.0	67.4	67.4	73.8	6.4	Yes
6-17	1	66.0	64.5	64.5	70.6	6.1	Yes
6-18	1	66.0	63.8	63.9	69.9	6.1	Yes
6-19	2	66.0	64.9	64.9	72.0	7.1	Yes
6-20	2	66.0	63.4	63.4	69.7	6.3	Yes
6-21	4	66.0	63.1	63.1	70.4	7.3	Yes
6-22	4	66.0	61.8	61.8	67.8	6.0	Yes
6-23	6	66.0	64.7	64.8	73.0	8.3	Yes
6-24	4	66.0	67.7	67.7	75.7	8.0	Yes
6-25	1	66.0	65.4	65.4	73.6	8.2	Yes
6-26	2	66.0	64.0	64.0	70.6	6.6	Yes
6-27	4	66.0	63.2	63.2	70.5	7.3	Yes
6-28	4	66.0	62.4	62.4	68.9	6.5	Yes
6-29	3	66.0	65.7	65.7	72.5	6.8	Yes
6-30	4	66.0	68.7	68.8	74.8	6.1	Yes
6-31	2	66.0	64.7	64.8	69.5	4.8	Yes
6-32	2	66.0	63.5	63.5	68.2	4.7	Yes

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
6-33	4	66.0	68.3	68.3	74.4	6.1	Yes
6-34	2	66.0	65.2	65.2	70.3	5.1	Yes
6-35	2	66.0	63.8	63.9	68.3	4.5	Yes
6-36	1	66.0	68.3	68.3	74.2	5.9	Yes
6-37	1	66.0	64.9	65.0	69.9	5.0	Yes
6-38	1	66.0	63.7	63.8	68.2	4.5	Yes
6-39	1	66.0	68.1	68.3	71.6	3.5	Yes
6-40	1	66.0	66.7	66.8	71.0	4.3	Yes
6-41	1	66.0	65.6	65.8	69.9	4.3	Yes
6-42	1	66.0	64.6	64.7	69.5	4.9	Yes
6-43	1	66.0	64.1	64.3	68.6	4.5	Yes
6-44	1	66.0	63.3	63.4	68.3	5.0	Yes
NSA Summary	104		65.0	65.0	69.6	4.6	98
NSA 7: South of SR 408 from Bumby Ave. to Crystal Lake Dr. - Illustrated on Pages D-5 and D-6 - Appendix D							
7-1	2	66.0	64.5	64.5	64.6	0.1	-
7-2	1	66.0	63.8	63.8	64.0	0.2	-
7-3	1	66.0	63.2	63.2	63.3	0.1	-
7-4	1	66.0	62.5	62.5	62.7	0.2	-
7-5	2	66.0	62.0	62.0	62.2	0.2	-
7-6	1	66.0	62.2	62.2	62.4	0.2	-
7-7	4	66.0	65.8	65.8	65.9	0.1	-
7-8	3	66.0	64.1	64.1	64.2	0.1	-
7-9	3	66.0	63.2	63.2	63.4	0.2	-
7-10	1	66.0	62.6	62.6	62.8	0.2	-
7-11	1	66.0	62.2	62.3	62.4	0.2	-
7-12	1	66.0	63.9	63.9	63.9	0.0	-
7-13	1	66.0	63.7	63.7	63.7	0.0	-
7-14	1	66.0	62.6	62.6	62.7	0.1	-
7-15	1	66.0	62.7	62.7	62.8	0.1	-
7-16	3	66.0	61.9	61.9	62.0	0.1	-
7-17	1	66.0	64.4	64.4	64.4	0.0	-
7-18	1	66.0	64.4	64.4	64.4	0.0	-
7-19	3	66.0	64.8	64.8	64.8	0.0	-

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
7-20	1	66.0	64.7	64.7	64.7	0.0	-
7-21	1	66.0	62.6	62.6	62.7	0.1	-
7-22	3	66.0	62.8	62.8	62.8	0.0	-
7-23	1	66.0	62.2	62.2	62.3	0.1	-
7-24	1	66.0	62.0	62.0	62.1	0.1	-
7-25	2	66.0	62.6	62.6	62.6	0.0	-
7-26	1	66.0	65.8	65.8	65.9	0.1	-
7-27	1	66.0	65.2	65.2	65.2	0.0	-
7-28	3	66.0	65.4	65.4	65.4	0.0	-
7-29	1	66.0	64.9	64.9	64.9	0.0	-
7-30	1	66.0	64.8	64.8	64.8	0.0	-
7-31	2	66.0	64.1	64.1	64.1	0.0	-
7-32	1	66.0	63.6	63.6	63.6	0.0	-
7-33	1	66.0	63.8	63.8	63.8	0.0	-
7-34	2	66.0	63.2	63.2	63.2	0.0	-
7-35	1	66.0	63.2	63.2	63.2	0.0	-
7-36	1	66.0	63.0	63.0	63.0	0.0	-
NSA Summary	56		63.6	63.6	63.6	0.1	0
NSA 8: North of SR 408 from Bumby Ave. to Crystal Lake Dr. - Illustrated on Pages D-5 and D-6 - Appendix D							
8-1	1	66.0	62.2	62.2	66.7	4.5	Yes
8-2	7	66.0	62.8	62.8	67.2	4.4	Yes
8-3	1	66.0	62.4	62.4	64.5	2.1	-
8-4	1	66.0	65.4	65.4	65.4	0.0	-
8-5	2	66.0	64.7	64.7	64.7	0.0	-
SLU8-1	1	66.0	62.5	62.5	66.0	3.5	Yes
SLU8-2	1	66.0	66.9	66.9	67.0	0.1	Yes
NSA Summary	14		63.8	63.8	65.9	2.1	8
NSA 9: South of SR 408 from SR 436 to Oxalis Ave. - Illustrated on Pages D-7 and D-8 - Appendix D							
9-1a	4	66.0	63.3	63.3	63.4	0.1	-
9-1b	4	66.0	65.2	65.3	65.4	0.2	-
9-2a	4	66.0	60.1	60.1	60.2	0.1	-
9-2b	4	66.0	61.9	62.0	62.0	0.1	-

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
9-3a	4	66.0	58.5	58.6	58.7	0.2	-
9-3b	4	66.0	60.5	60.5	60.7	0.2	-
9-4a	9	66.0	57.9	58.0	58.0	0.1	-
9-4b	9	66.0	59.1	59.2	59.2	0.1	-
9-5	1	66.0	63.9	64.2	64.0	0.1	-
9-6	1	66.0	61.6	61.9	61.8	0.2	-
9-7	1	66.0	64.1	64.5	64.2	0.1	-
9-8	1	66.0	63.8	64.2	64.0	0.2	-
9-9	1	66.0	63.5	63.8	63.7	0.2	-
9-10	1	66.0	63.2	63.6	63.5	0.3	-
9-11	1	66.0	63.5	63.8	63.8	0.3	-
9-12	6	66.0	64.3	64.4	64.6	0.3	-
9-13	1	66.0	61.8	62.1	62.0	0.2	-
9-14	1	66.0	61.6	61.9	61.8	0.2	-
9-15	1	66.0	62.2	62.4	62.5	0.3	-
SLU9-1	1	66.0	64.2	64.1	64.3	0.1	-
NSA Summary	59		62.2	62.4	62.4	0.2	0
NSA 10: North of SR 408 from SR 436 to Oxalis Ave. - Illustrated on Pages D-7 and D-8 - Appendix D							
10-1	3	66.0	62.8	62.9	67.0	4.2	Yes
10-2	1	66.0	62.8	62.9	66.9	4.1	Yes
10-3	1	66.0	62.8	62.8	66.6	3.8	Yes
10-4	1	66.0	63.8	62.8	66.0	2.2	Yes
10-5	1	66.0	64.2	64.5	64.9	0.7	-
10-6	1	66.0	63.5	63.6	64.9	1.4	-
10-7	6	66.0	62.2	62.2	65.3	3.1	-
10-8	1	66.0	62.3	62.4	64.7	2.4	-
10-9	1	66.0	62.5	62.6	64.6	2.1	-
10-10	1	66.0	62.8	62.8	64.4	1.6	-
10-11	1	66.0	61.8	61.7	63.1	1.3	-
10-12	1	66.0	62.9	63.2	63.4	0.5	-
10-13	1	66.0	62.5	62.7	63.2	0.7	-
10-14	1	66.0	62.4	62.5	63.3	0.9	-
10-15	1	66.0	67.1	67.7	67.6	0.5	Yes

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
10-16	1	66.0	64.4	64.8	64.9	0.5	-
10-17	1	66.0	62.9	63.3	63.5	0.6	-
10-18	1	66.0	61.9	62.2	62.6	0.7	-
10-19	1	66.0	61.4	61.2	62.6	1.2	-
10-20	1	66.0	60.6	60.6	61.6	1.0	-
10-21	1	66.0	60.6	60.7	61.6	1.0	-
10-22	1	66.0	60.7	60.7	61.6	0.9	-
10-23	1	66.0	60.9	60.9	61.7	0.8	-
10-24	8	66.0	61.5	61.5	62.3	0.8	-
10-25	1	66.0	61.3	61.3	62.2	0.9	-
10-26	1	66.0	61.2	61.2	62.4	1.2	-
10-27	1	66.0	61.3	61.3	62.9	1.6	-
10-28	1	66.0	61.6	61.6	64.0	2.4	-
10-29	1	66.0	62.6	62.7	66.1	3.5	Yes
10-30	1	66.0	60.6	60.5	61.5	0.9	-
NSA Summary	44		62.3	62.4	63.9	1.6	8
NSA 11: South of SR 408 from Oxalis Ave. to powerline- Illustrated on Page D-8 - Appendix D							
11-1	1	66.0	64.2	64.2	64.4	0.2	-
11-2	1	66.0	63.0	62.9	63.2	0.2	-
11-3	1	66.0	61.7	61.6	61.9	0.2	-
11-4	1	66.0	61.7	61.6	62.0	0.3	-
11-5	1	66.0	63.5	63.5	63.8	0.3	-
11-6	1	66.0	63.4	63.3	63.6	0.2	-
11-7	8	66.0	63.8	63.8	64.0	0.2	-
11-8	1	66.0	62.0	62.0	62.3	0.3	-
11-9	8	66.0	62.3	62.3	62.6	0.3	-
11-10	1	66.0	65.0	65.0	65.2	0.2	-
11-11	1	66.0	64.7	64.7	64.9	0.2	-
11-12	1	66.0	64.7	64.7	64.9	0.2	-
11-13	4	66.0	65.2	65.3	65.3	0.1	-
11-14	1	66.0	62.9	62.9	63.2	0.3	-
11-15	1	66.0	62.5	62.5	62.8	0.3	-
11-16	1	66.0	62.4	62.4	62.6	0.2	-

Noise Impact Comparison Matrix

Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
11-17	5	66.0	62.9	62.9	63.0	0.1	-
11-18	1	66.0	63.4	63.4	63.5	0.1	-
11-19	1	66.0	64.2	64.2	64.2	0.0	-
NSA Summary	40		63.3	63.3	63.5	0.2	0
NSA 12: North of SR 408 from Oxalis Ave. to powerline- Illustrated on Page D-8 - Appendix D							
12-1	1	66.0	63.8	63.8	67.8	4.0	Yes
12-2	1	66.0	61.8	61.8	64.3	2.5	-
12-3	1	66.0	60.8	60.8	61.8	1.0	-
12-4	1	66.0	61.0	61.0	61.8	0.8	-
12-5	1	66.0	61.1	61.1	61.8	0.7	-
12-6	9	66.0	61.6	61.6	62.2	0.6	-
12-7	1	66.0	63.9	63.9	64.0	0.1	-
12-8	1	66.0	62.6	62.6	62.7	0.1	-
12-9	1	66.0	61.8	61.8	65.0	3.2	-
12-10	1	66.0	61.2	61.2	63.8	2.6	-
NSA Summary	18		62.0	62.0	63.5	1.6	1
NSA 13: South of SR 408 from powerline to Goldenrod Rd. - Illustrated on Page D-9 - Appendix D							
13-1	3	66.0	68.0	68.1	68.1	0.1	Yes
13-2	3	66.0	65.8	65.9	65.9	0.1	-
13-3	2	66.0	69.0	69.1	69.1	0.1	Yes
13-4	2	66.0	66.8	66.9	66.9	0.1	Yes
13-5	2	66.0	67.5	67.6	67.6	0.1	Yes
13-6	1	66.0	65.9	65.9	65.9	0.0	-
SLU13-1	1	66.0	63.3	63.3	63.3	0.0	-
SLU13-2	1	66.0	65.2	65.2	65.2	0.0	-
NSA Summary	15		66.4	66.5	66.5	0.1	9
NSA 14: North of SR 408 from powerline to Goldenrod Rd. - Illustrated on Page D-9 - Appendix D							
14-1a	2	66.0	61.8	61.9	61.9	0.1	-
14-1b	2	66.0	64.6	64.6	64.6	0.0	-
14-2a	4	66.0	61.3	61.3	61.4	0.1	-
14-2b	4	66.0	63.8	63.8	63.9	0.1	-

Noise Impact Comparison Matrix

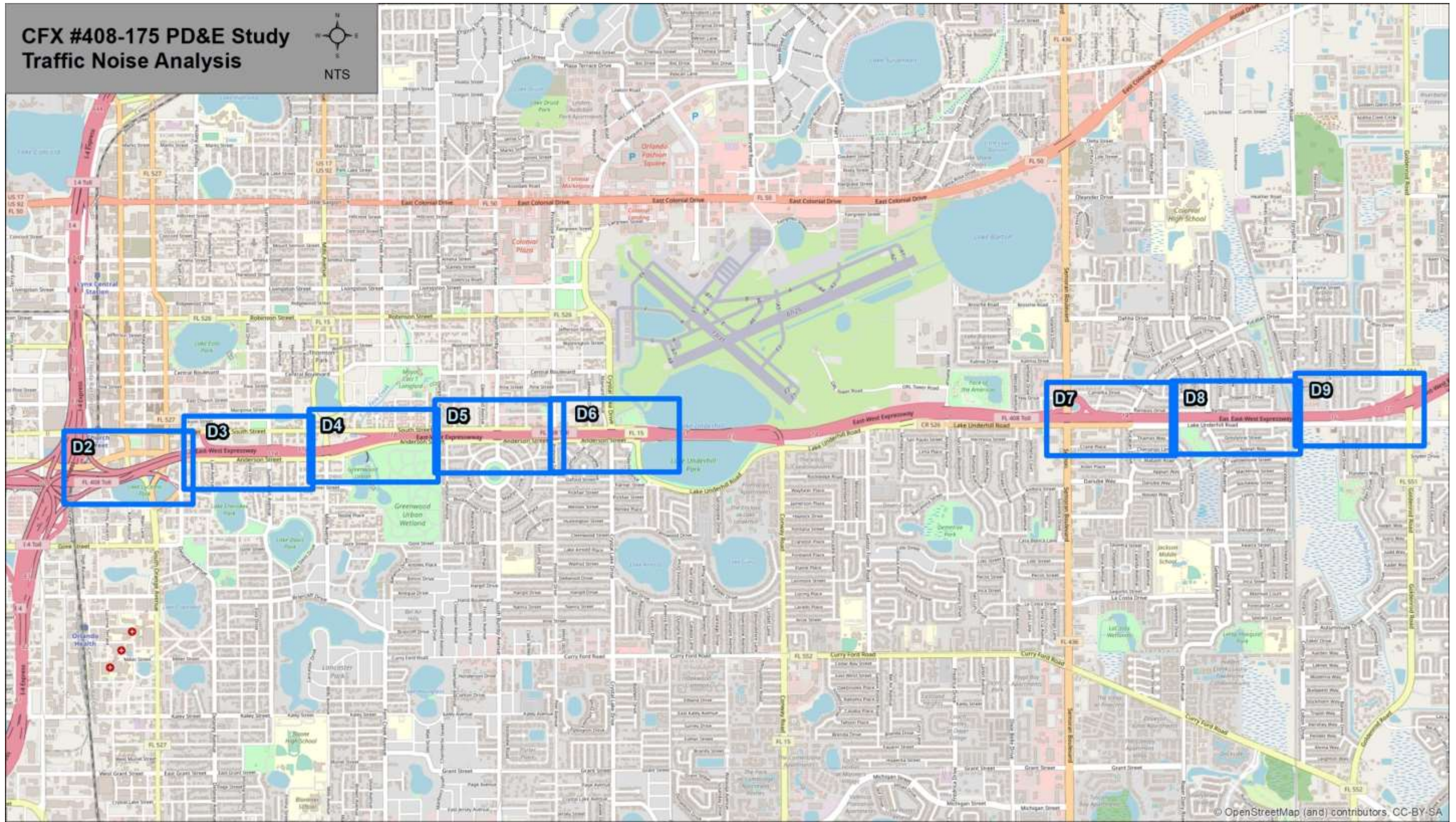
Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
14-3a	4	66.0	62.0	62.0	62.0	0.0	-
14-3b	4	66.0	65.0	65.0	65.1	0.1	-
14-4a	2	66.0	61.6	61.6	61.6	0.0	-
14-4b	2	66.0	64.5	64.5	64.6	0.1	-
14-5a	2	66.0	61.1	61.1	61.2	0.1	-
14-5b	2	66.0	63.7	63.7	63.8	0.1	-
14-6a	2	66.0	60.7	60.7	60.8	0.1	-
14-6b	2	66.0	63.3	63.3	63.3	0.0	-
14-7a	4	66.0	60.7	60.8	60.8	0.1	-
14-7b	4	66.0	63.5	63.5	63.5	0.0	-
14-8a	4	66.0	60.5	60.5	60.5	0.0	-
14-8b	4	66.0	63.1	63.1	63.1	0.0	-
14-9	1	66.0	63.1	63.1	63.1	0.0	-
14-10	1	66.0	61.7	61.7	61.8	0.1	-
14-11	1	66.0	63.8	63.8	63.9	0.1	-
14-12	1	66.0	64.4	64.3	64.4	0.0	-
14-13	1	66.0	62.7	62.7	62.8	0.1	-
14-14	1	66.0	63.3	63.3	63.4	0.1	-
14-15	1	66.0	61.9	61.9	62.0	0.1	-
14-16	1	66.0	62.3	62.3	62.4	0.1	-
14-17	2	66.0	67.6	67.7	67.7	0.1	Yes
14-18	2	66.0	65.8	65.9	65.9	0.1	-
14-19	2	66.0	65.2	65.3	65.3	0.1	-
14-20	1	66.0	63.1	63.1	63.1	0.0	-
14-21	4	66.0	64.5	64.6	64.6	0.1	-
14-22	1	66.0	65.9	66.0	66.0	0.1	Yes
14-23	1	66.0	66.6	66.7	66.7	0.1	Yes
14-24	1	66.0	67.2	67.4	67.4	0.2	Yes
14-25a	1	66.0	65.7	65.9	65.8	0.1	-
14-25b	1	66.0	70.3	70.4	70.4	0.1	Yes
14-25c	1	66.0	71.7	71.8	71.8	0.1	Yes
14-25d	1	66.0	72.5	72.6	72.6	0.1	Yes
14-26a	1	66.0	64.8	65.0	64.9	0.1	-

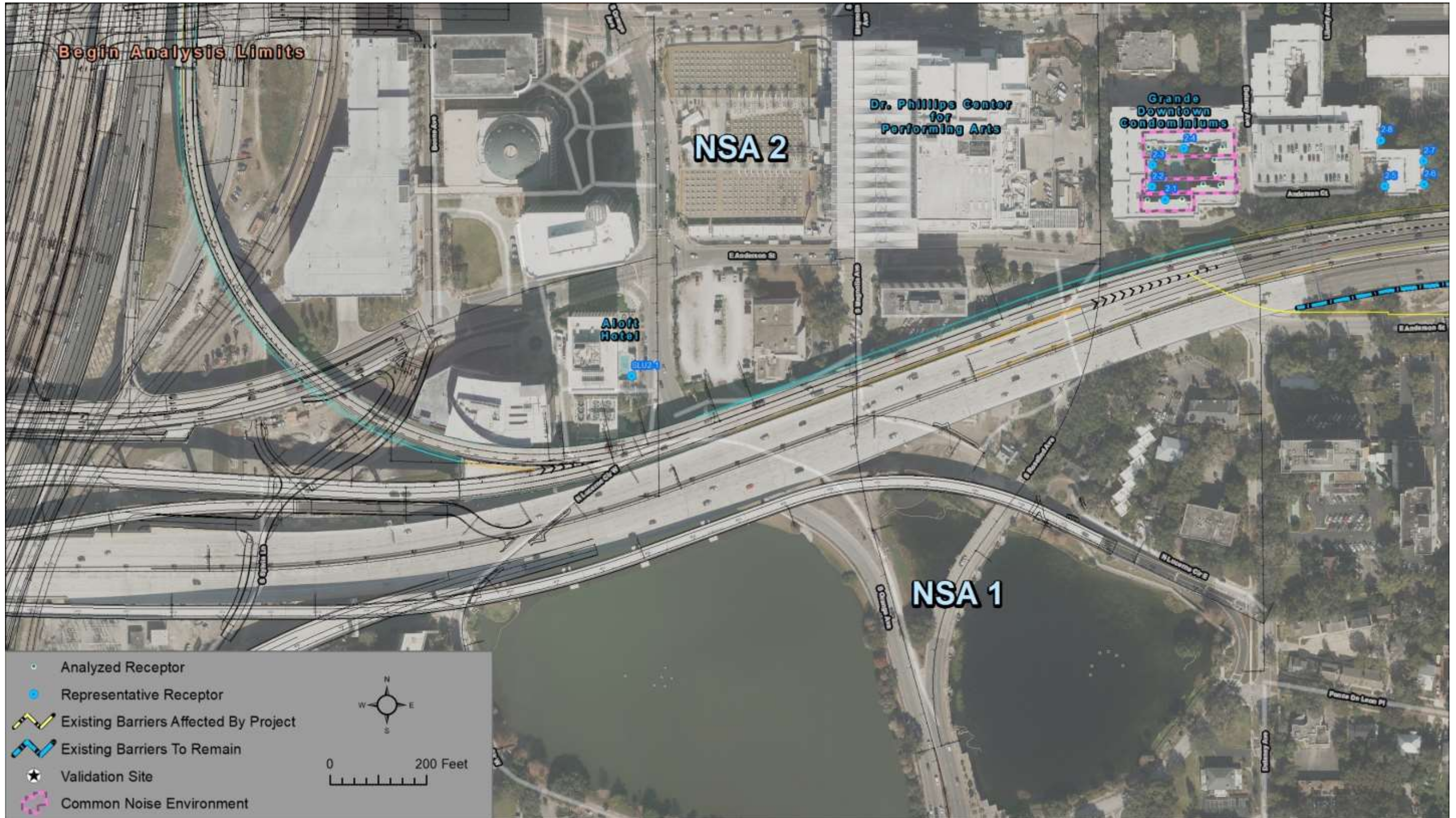
Noise Impact Comparison Matrix

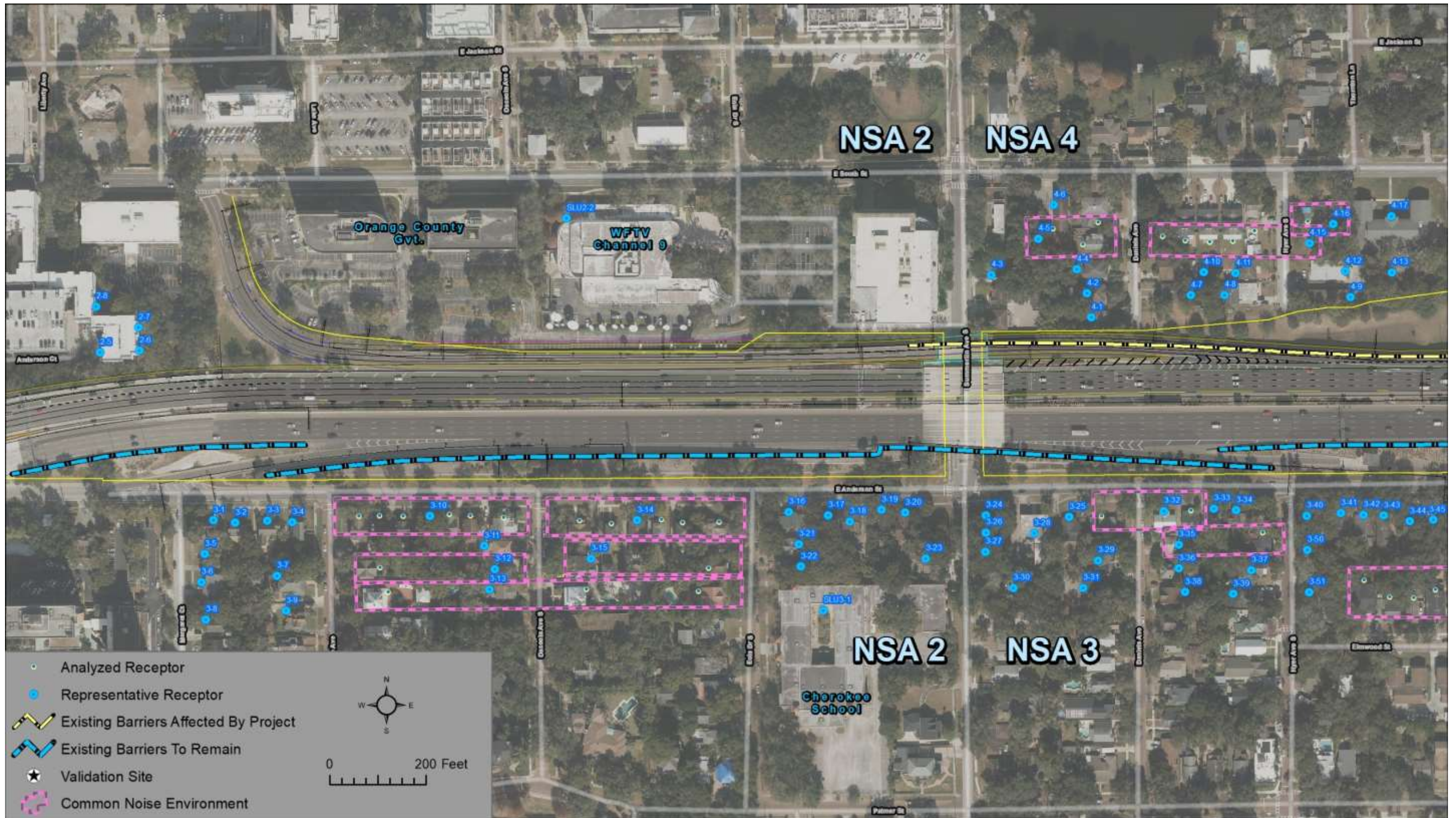
Noise Sensitive Sites			Predicted Noise Levels (dB(A)) <i>Red = Noise Level above NAC</i>				
Receptor ID	# Sites Represented	NAC Impact Criterion (dB(A))	2022 Existing	2045 No-Build Alternative	2045 Build Alternative	Build Change From Existing	Consider Abatement
14-26b	1	66.0	69.2	69.3	69.3	0.1	Yes
14-26c	1	66.0	70.6	70.8	70.8	0.2	Yes
14-26d	1	66.0	71.7	71.8	71.8	0.1	Yes
NSA Summary	78		64.7	64.7	64.8	0.1	11

Appendix D:

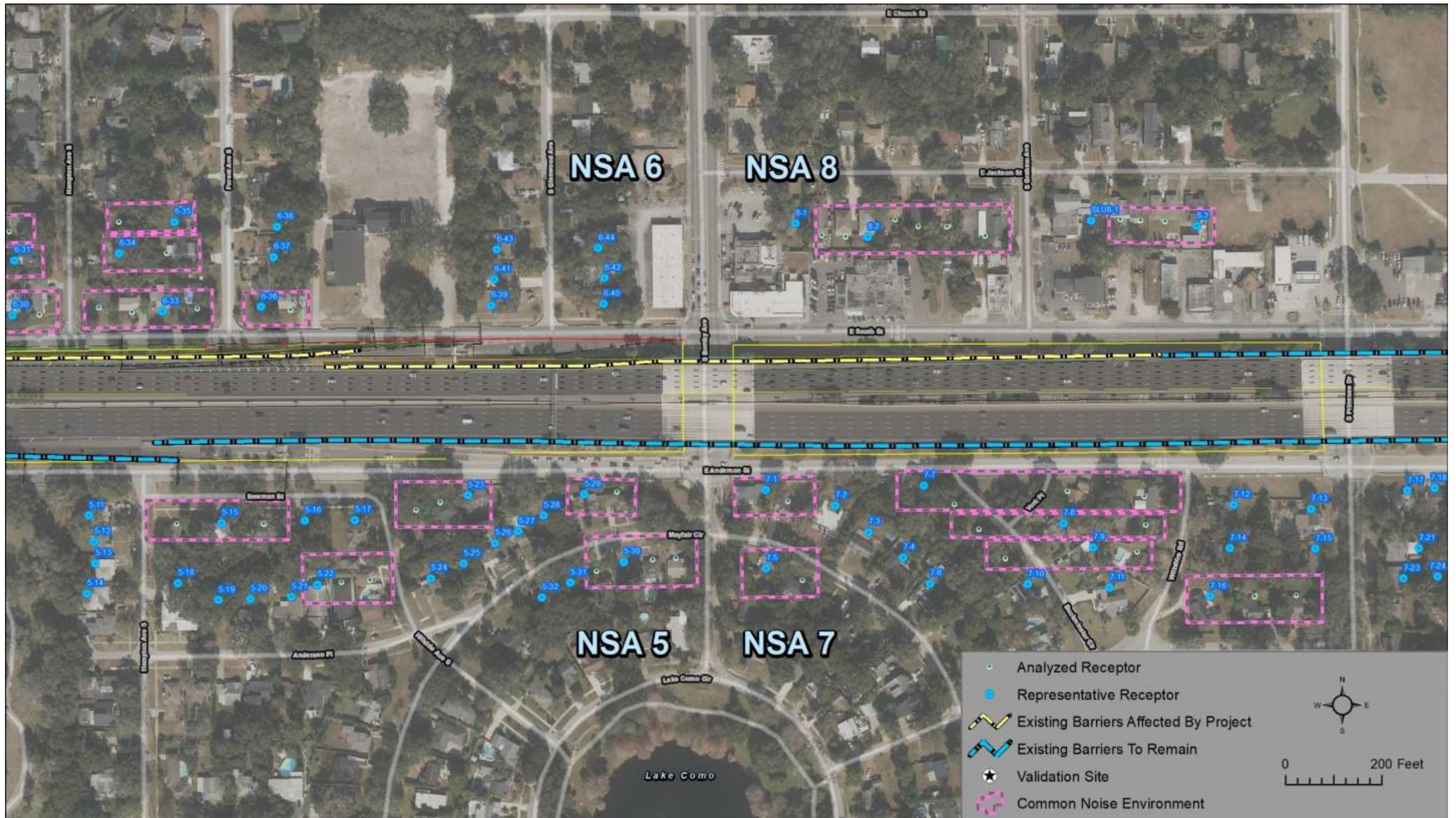
Project Aerials



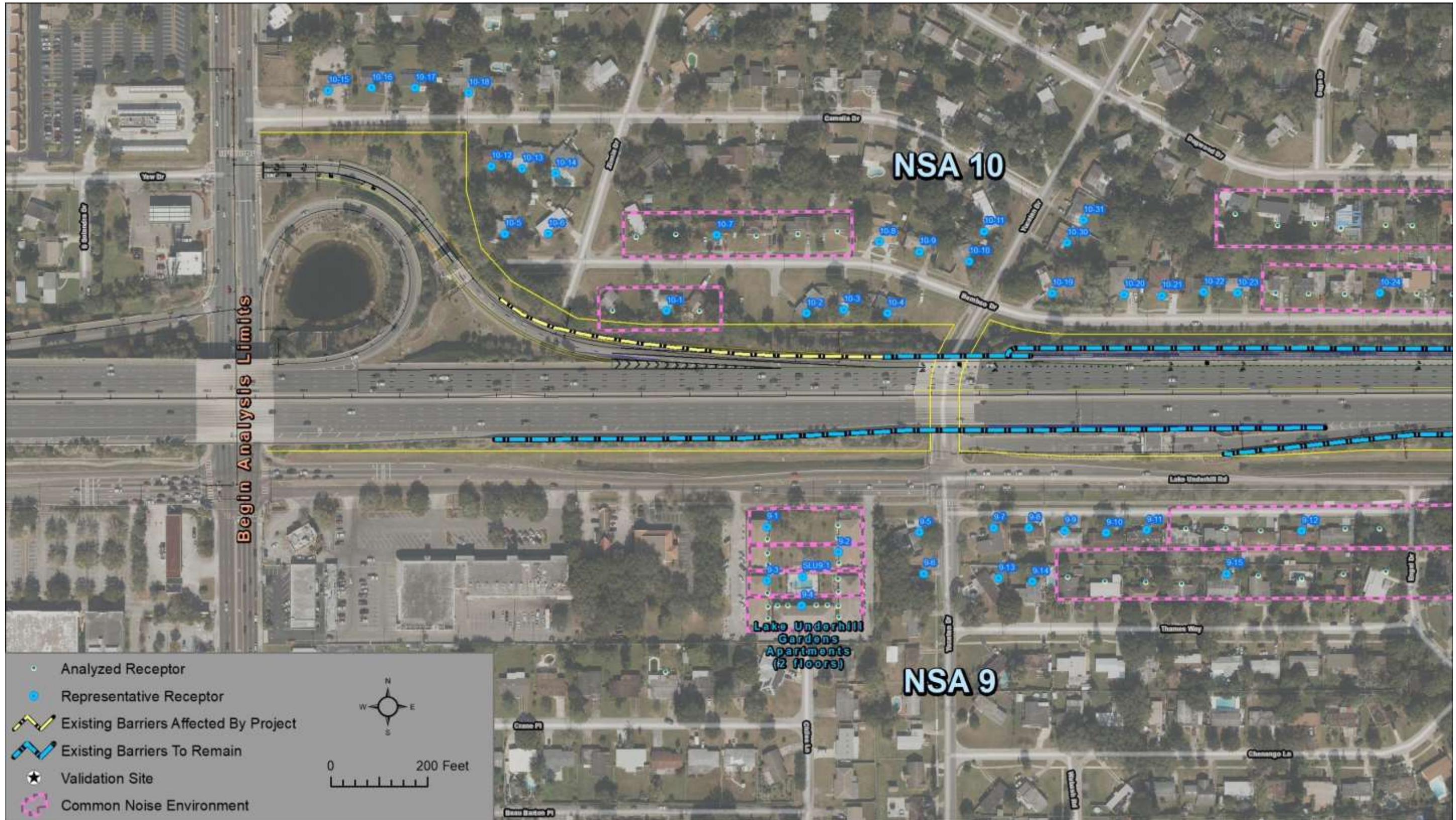


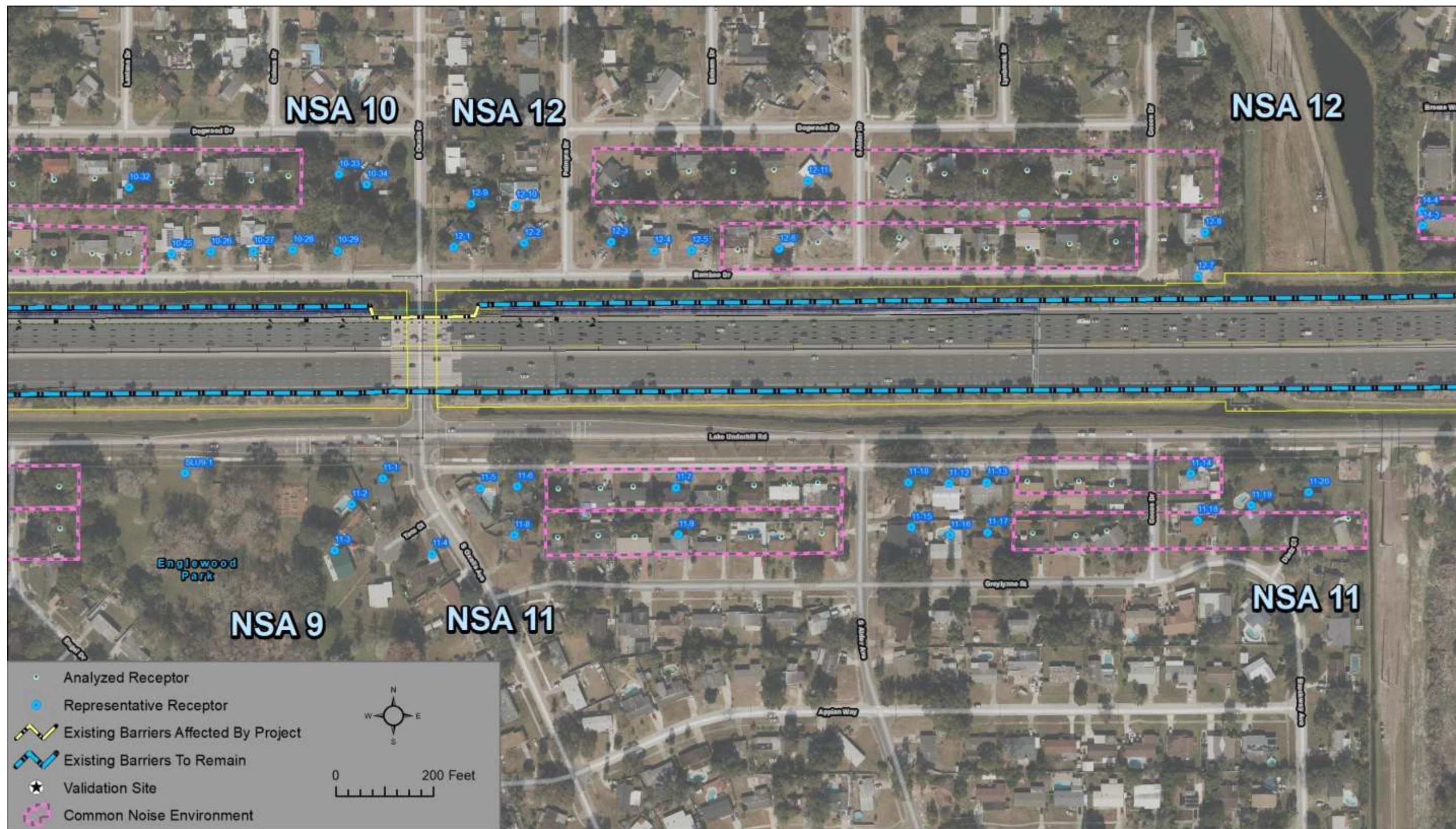


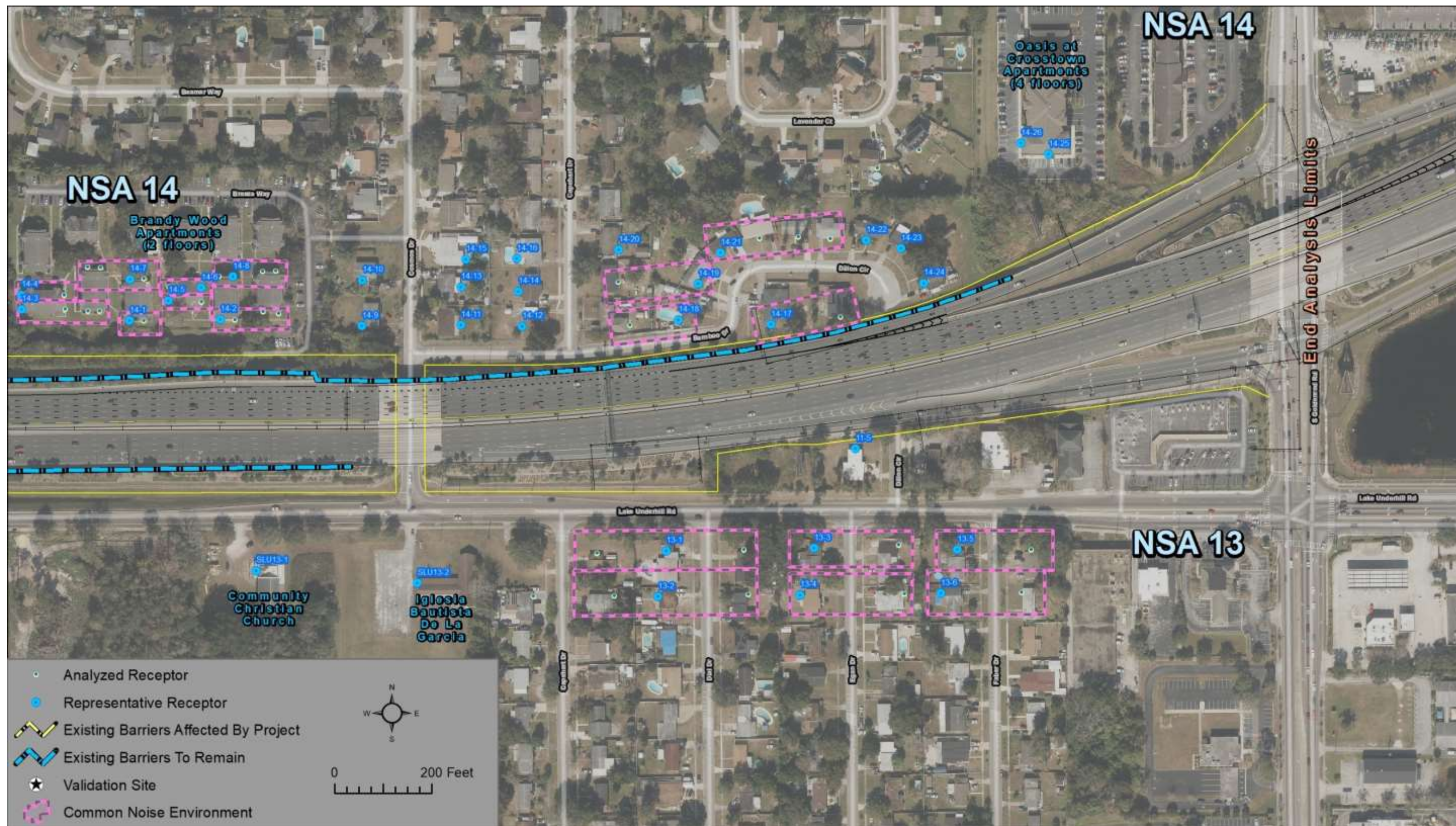












Appendix E:

Noise Barrier Maps

CFX Proejct #408-175 PD&E Noise Barrier Recommendations

- Analyzed
- Impacted - Benefited
- Not Impacted - Benefited
- ✗ Impacted - Not Benefited
- ▬ Existing Barrier To Remain
- ▬ Barrier Recommended
- ▬ Barrier Analyzed
- ▬ Barrier Not Recommended
- ⊗ Common Noise Environment



0 200 Feet

