CENTRAL FLORIDA EXPRESSWAY AUTHORITY

CFX Contract Number: 001844
CFX Project Number: 429-309

Level 1
Project Environmental Impact Report (PEIR)

SR 429 at Binion Road Interchange
PROJECT DEVELOPMENT & ENVIRONMENT STUDY

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Submitted By:

Signature: _____

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The Balmoral Group, LLC
1/31/2023

Central Florida Expressway Authority
Level 1 Project Environmental Impact Report

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Attachments

1.0 - Project Description and Purpose and Need

1.A - PROJECT INFORMATION

Project Name: SR 429 / BINION ROAD INTERCHANGE

County: Orange

Background: In August 2022, CFX began a Project Development and Environment (PD&E) Study of the State Road 429/Binion Road Interchange. The study is evaluating a proposed half interchange (northbound on-ramp and southbound off-ramp) expressway connection from Binion Road to SR 429 to provide enhanced access and mobility to southwest Apopka.

Proposed Activity: Evaluating a proposed half interchange (northbound on-ramp and southbound off-ramp) expressway connection from Binion Road to SR 429 to provide enhanced access and mobility to southwest Apopka. Analyze intersection improvements and access management modifications along the proposed interchange.

Responsible Agency: Central Florida Expressway Authority (CFX)

Planning Organization: CFX

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

Project Contact Information:

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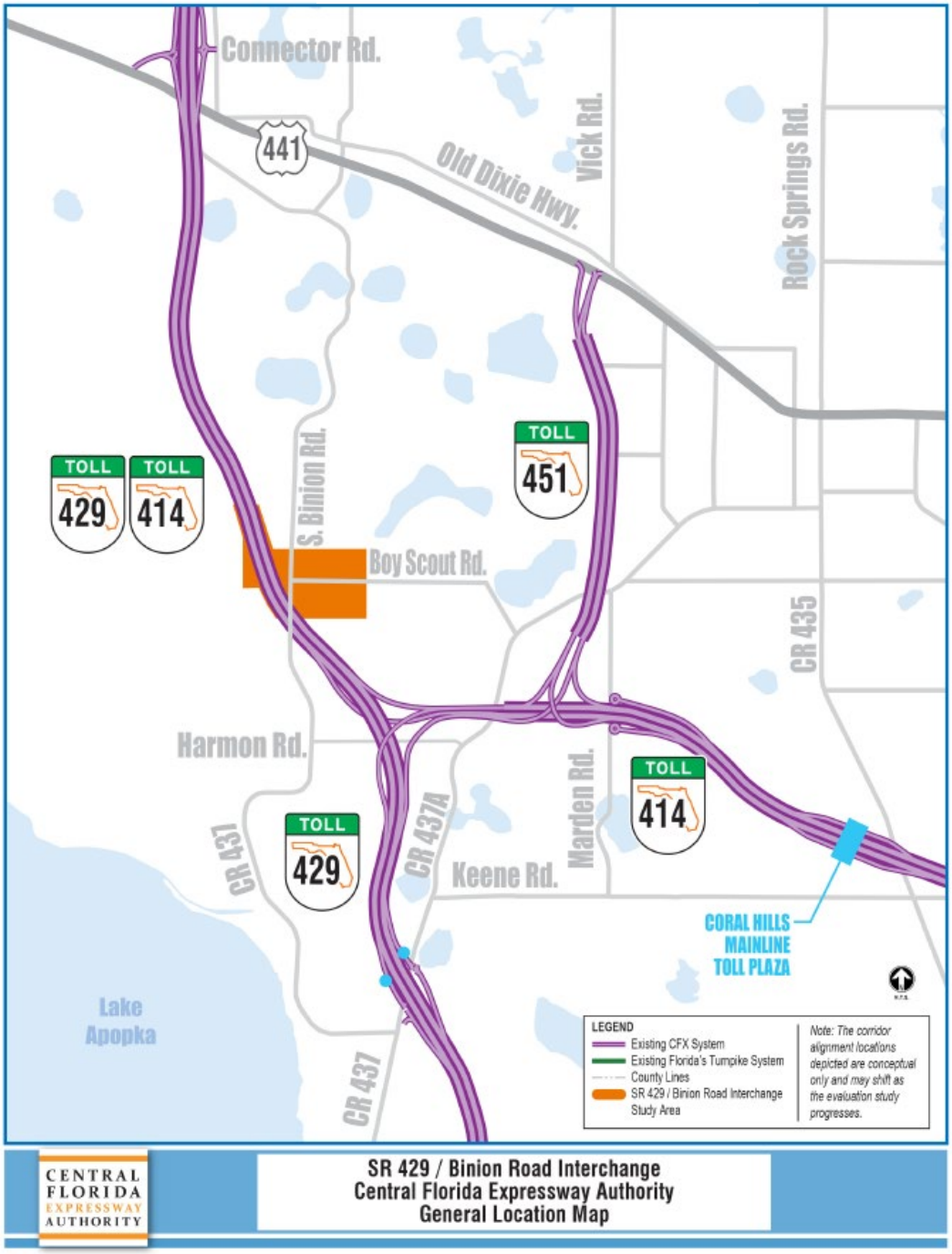
Project Location Map

Figure 1 - Project Location Map



1.B - PROPOSED IMPROVEMENTS

The project area, as defined within the PD&E Study, is the location where alternative concepts for a half interchange that would provide access to SR 429 and a new intersection design at Binion Road and Boy Scout Road are being considered. For consistency in studying the existing and anticipated conditions of the area surrounding the PD&E Study Area, a half mile radius of the general existing conditions surrounding the project area are used.

Figure 2: Project area (2012)

Figure 3: Project area (2022)

The entirety of the project area falls within the City of Apopka limits, except for 2 parcels at the northeast corner of the intersection of Boy Scout Road and S Binion Road.

The Land Use in this area has slowly changed from primarily larger tracts of land often used for agriculture, to the development of many single-family subdivisions. The rise in population density and subsequent vehicle trips have put stress on the existing roadway network. The development of single- family lot subdivisions is likely to continue in the surrounding area, based on current market demand.

These photos (**Figure 2** and **Figure 3**) show aerial images of the surrounding project area taken in 2012 (top) and in 2022 (bottom). The suburbanization is quite evident, and the pressure for connection to SR 429 and enhanced regional multi-modal connectivity is expected to increase.

A new interchange connection between State Road (SR) 429 and Binion Road has been identified as a need to provide enhanced access and mobility to southwest Apopka from SR 429 in the vicinity of Binion Road. Currently, vehicles in the vicinity of Binion Road must enter or exit SR 429 by travelling approximately three miles north to just north of US 441 at the SR 429 Connector Road interchange or travel approximately three miles south to the interchange at Ocoee Apopka Road. Therefore, this PD&E Study will analyze and evaluate a proposed half interchange (northbound on-ramp and southbound off-ramp) expressway connection from Binion Road to SR 429. See **Figure 1** for Project Location Map.

1.C - PURPOSE AND NEED

The purpose and need for a project provide the basis for developing, considering, evaluating, and eliminating alternatives while also shaping the alternatives and assisting with the identification of reasonable and feasible alternatives. The need aspect lays the foundation and basis of a proposed project while the purpose presents proposed solutions to the stated need.

Purpose:

A new interchange connection between SR 429 and Binion Road has been identified as a need to provide enhanced access and mobility to southwest Apopka from SR 429 in the vicinity of Binion Road. Currently, vehicles in the vicinity of Binion Road must enter or exit SR 429 by traveling approximately three miles north to just north of US 441 at the SR 429 Connector Road interchange or travel approximately three miles south to the interchange at Ocoee Apopka Road. Additional purposes for the project include improved emergency vehicle access to the hospital and supporting economic development. Therefore, this PD&E Study will analyze and evaluate a proposed half interchange (northbound on-ramp and southbound off-ramp) expressway connection from Binion Road to SR 429.

Need:

There are six (6) project needs that serve as justification for the proposed improvements. These needs are to:

1) Provide system linkage. A new interchange connection between SR 429 and Binion Road has been identified as a need to provide enhanced access and mobility to southwest Apopka from SR 429 in the vicinity of Binion Road. Currently, vehicles in the vicinity of Binion Road must enter or exit SR 429 by travelling approximately three miles north to just north of US 441 at the SR 429 Connector Road interchange or travel approximately three miles south to the interchange at Ocoee Apopka Road.

2) Provide regional connectivity and mobility. This connection will improve mobility and future connectivity with the region to the north, including Mt. Dora, Tavares, and Eustis.

3) Support social and economic needs. The proposed improvements will provide enhanced regional connectivity in southwest Apopka, which has been experiencing significant population growth, with more development underway, providing access to jobs, services, and recreation. The enhanced mobility will continue to drive economic development.

4) Provide consistency with Local and Regional Plans. The Interchange is consistent with planned roadway realignment projects and development in the City of Apopka, along with consistency with regional transportation plans for the area.

5) Accommodate and provide for multi-modal transportation options. Where bicycle or pedestrian facilities exist, this project will provide connection to existing facilities. The project will create the opportunity for future sidewalks or trails as the area develops.

6) Improve safety at the intersection at Binion Road & Boy Scout Road. Currently, this is a T-intersection, with traffic only stopping at the Stop sign where Boy Scout Road meets Binion Rd. The Preferred Alternative will realign this intersection to create a safer signalized intersection at Boy Scout Road, Binion Road, and the 429 Interchange. Dedicated turn lanes will also be provided. This project will provide striped and signalized pedestrian crossings, with the ability to add sidewalk as future development occurs.

2.0 - Environmental Analysis

Issues/Resources	Substantial Impacts?*				
	Yes	No	Enhance	No Inv	Supporting Information**
A. Social and Economic					
1. Social		X			Attachment 1-A.1
2. Economic			X		Attachment 1-A.2
3. Land Use Changes		X			Attachment 1-A.3
4. Mobility			X		Attachment 1-A.4
5. Aesthetic Effects		X			Attachment 1-A.5
6. Relocation Potential		X			Attachment 1-A.6
B. Cultural					
1. Historic Sites/Districts		X			Attachment 1-B.1
2. Archaeological Sites		X			Attachment 1-B.2
3. Recreational Areas and Protected Lands		X			Attachment 1-B.3
C. Natural					
1. Wetlands and other Surface Waters		X			Attachment 1-C.1
2. Aquatic Preserves and Outstanding FL Waters				X	Attachment 1-C.2
3. Water Resources		X			Attachment 1-C.3
4. Wild and Scenic Rivers				X	Attachment 1-C.4
5. Floodplains		X			Attachment 1-C.5
6. Coastal Barrier Resources				X	Attachment 1-C.6
7. Protected Species and Habitat		X			Attachment 1-C.7
8. Essential Fish Habitat				X	Attachment 1-C.8
D. Physical					
1. Highway Traffic Noise		X			Attachment 1-D.1
2. Air Quality		X			Attachment 1-D.2
3. Contamination		X			Attachment 1-D.3
4. Utilities and Railroads		X			Attachment 1-D.4
5. Construction		X			Attachment 1-D.5
6. Bicycles and Pedestrians			X		Attachment 1-D.6
7. Navigation				X	Attachment 1-D.7

Substantial Impacts - Quick Definitions				
Yes:	*Substantial Impact*		*Enhance:*	*Enhancement*
No:	*No Substantial Impact*		*No Inv:*	*Issue absent, no involvement*

***Supporting information is documented in the referenced attachment(s).*

3.0 – Anticipated Permits

If the Preferred Alternative and the conceptual design are constructed, it is anticipated that the following permits will be required:

X Section 404 Clean Water Act Dredge and Fill Permit - *(USACE or FDEP 404)*

X Nationwide/General Permit- *(USACE or FDEP 404)*

__ Bridge Permit- USCG

X Environmental Resource Permit (SJRWMD)

X National Pollutant Discharge Elimination System (FDEP)

X Listed Species Coordination (USFWS and FWC)

X Gopher Tortoise Conservation Permit (FWC)

4.0 – Engineering Analysis

4.1 – ROADWAY

Existing Roadway Network

The existing roadway network under evaluation is comprised of two county roads and one limited access facility. The primary roadways in the study area are detailed below:

- SR 429 – six-lane divided expressway providing Orange and Osceola counties with an alternate north-south route to heavily travelled I-4.
- Binion Road (Orange County Road 437) – Two-lane, two-way roadway connecting residential subdivisions and single-family homes to other roadway collectors in the area as well as connecting travelers to US 441 in the north and Ocoee Apopka Road in the South. Binion Road crosses over SR 429 just south of the project limits.
- Boy Scout Road (un-numbered County Road) – Two-lane, two-way roadway connecting residential subdivisions and single-family homes to Binion Road in the west and Ocoee Apopka Road (CR 437A) in the east. CR 437A is currently in the final planning stages of being widened from Harmon Road to Hawthorne Avenue and will facilitate connectivity to the interchange via Boy Scout Road.

Access Classification

Under Florida Statutes 335.18 the legislature authorized FDOT to develop rules to administer the "State Highway System Access Management Act". These rules regulate access to the state highway system in order to preserve the functional integrity of the system. FDOT uses seven access classifications numbered one thru seven as defined in Rule 14-97. In general, as the access classification increases so does the number of access points and connections to the facility. On the other hand, speed is inversely related, and as the access classification increases the speed on the facility decreases. **Table 1** lists access classification for the roadways under consideration.

Table 1 - Access Classification

Roadway Name	Access Classification
SR 429	Access Class 1, Area Type 3
Binion Road	Access Class 4
Boy Scout Road	Access Class 4

Crash Data Analysis

Crash data was reviewed for the primary roads identified. The 2017-2022 crash period was selected due to the irregularity of traffic during 2020 as a result of the pandemic. Crash data has been collected from the Signal4 Analytics database. Crash data was evaluated based on environmental conditions, lighting conditions, road surface conditions, severity and frequency, and weather. The results are located in the **Existing Conditions Technical Memorandum,** under separate cover.

Project Design Controls & Criteria

The following table outlines the design controls and criteria that were used to develop the proposed concepts and should be utilized during final design. It is expected that the proposed alternatives will require additional refinement to the attached concept plans. An example would be the shoulder width on Ramp D which could increase for stopping sight distance in the bridge and wall sections.

Table 2 - Design Controls & Criteria

DESIGN ELEMENT	EXPRESSWAY		CROSSROADS/COLLECTORS (BOY SCOUT RD AND BINION ROAD)
	MAINLINE	RAMPS	
HORIZONTAL ALIGNMENT A. MAX. CURVE, DEGREES	3° 30'	RAMP C = 10° 15' RAMP D = 13° 15'	8° 15'
B. MAX. SUPERELEVATION	0.10	0.10	0.10 RURAL
DESIGN SPEED	70 MPH	RAMP C = 45 MPH RAMP D = 40 MPH	50 MPH
CREST MINIMUM K-VALUE	506 FDOT 247 AASHTO	RAMP C = 98 FDOT RAMP D = 70 FDOT 44 TO 61 AASHTO	84 GREENBOOK
SAG MINIMUM K-VALUE	206 FDOT 181 AASHTO	RAMP C = 79 FDOT RAMP D = 64 FDOT 64 TO 79 AASHTO	96 GREENBOOK

Table 2 (cont'd) Design Control & Criteria

	EXPRESSWAY		CROSSROADS/COLLECTORS (BOY SCOUT RD AND BINION ROAD)
	MAINLINE	RAMPS	
CROSS SECTIONS			
A. LANE WIDTHS	12 FT	12 FT DUAL LANES 15 FT SINGLE LANES	12 FT LANES
B. SHOULDER WIDTHS	**3-LANE OR MORE**	**1-LANE RAMP**	**2-LANE**
RIGHT	12 FT (10 FT PAVED)	6 FT (4 FT PAVED)	8 FT
LEFT	12 FT (10 FT PAVED)	6 FT (2 FT PAVED), additional analysis needed at Final Design	8 FT
		2-LANE RAMP	
RIGHT		12 FT (10 FT PAVED)	
LEFT		8 FT (4 FT PAVED)	
BRIDGE		**1-LANE RAMP**	
RIGHT		6 FT	
LEFT		6 FT	
		2-LANE RAMP	
RIGHT		10 FT	
LEFT		6 FT	
C. CROSS SLOPES			
1. TRAFFIC LANES	2% (4-LANE) 3% OR TBD (6-LANE)	2%	2%
2. BRIDGE LANES	2% TYP. (NO BREAK)		
3. LEFT SHOULDER	5%	5%	2-6%
4. RIGHT SHOULDER	6%	6%	2-6%
LATERAL OFFSET	FDM TABLE 215.2.2	FDM TABLE 215.2.2	20 FT - GREENBOOK
VERTICAL CLEARANCE			
A. OVER ROADWAY	16.5 FT	16.5 FT	16 FT – GREENBOOK
B. OVERHEAD SIGNS	17.5 FT	17.5 FT	17.5 FT

4.1 – ALTERNATIVE ANALYSIS

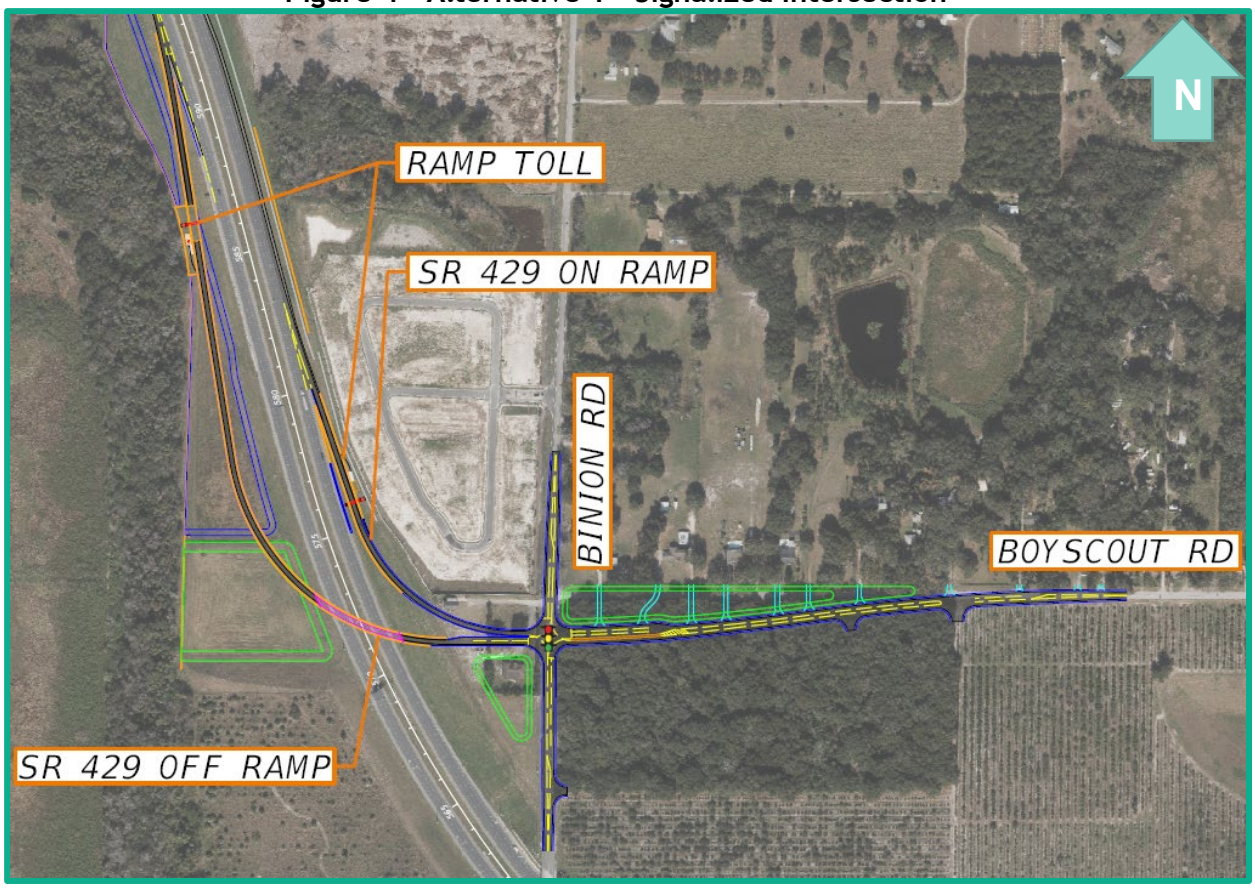
Alternative # 1 - Signalized Intersection

A traditional signal-controlled intersection has been evaluated; see **Figure 4**. Similar to the roundabout alternative, Binion Road makes use of north and south approaches to the intersection, the eastern approach is Boy Scout Road, and SR 429 on/off ramps utilize the western approach.

The intersection features dedicated left and right turn lanes for the Boy Scout Road approach. Both Binion Road approaches, and the SR 429 off-ramp approach have dedicated left turn lanes.

The estimated cost for Alternative # 1 – Signalized Intersection is $28.9 Million.

Figure 4 - Alternative 1 - Signalized Intersection



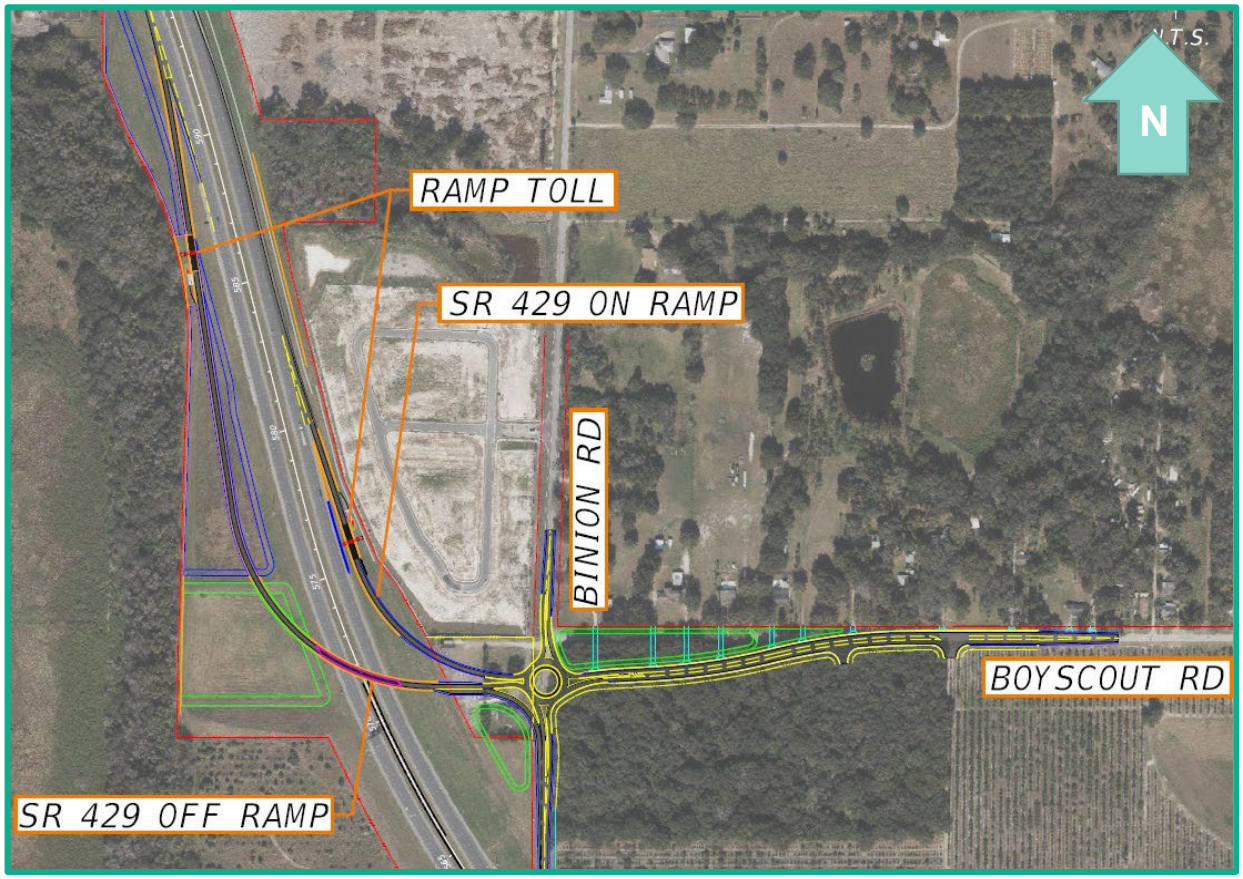
Alternative # 2 - Roundabout Intersection

A roundabout concept was also evaluated, as depicted on **Figure 5**. Roundabouts improve safety by promoting lower speeds and reducing conflict points. Rural intersection crashes tend to result in severe injuries due to high speeds and roundabouts are known to reduce crashes (68% overall reduction and 88% reduction in injury crashes).

A Single-Lane Roundabout alternative with a 148' inscribed circle diameter and an 18' circulatory roadway width has been evaluated. Binion Road makes use of north and south legs of the roundabout, the eastern leg is Boy Scout Road, and SR 429 on/off ramps utilize the western leg. A slip-lane is recommended for the SR 429 Off-Ramp access to the roundabout which will provide free-flow access to southbound Binion Road and mitigate traffic backups onto the SR 429.

The estimated cost for Alternative # 2 – Roundabout Intersection is $28.1 Million.

Figure 5 - Alternative 2 - Roundabout Intersection

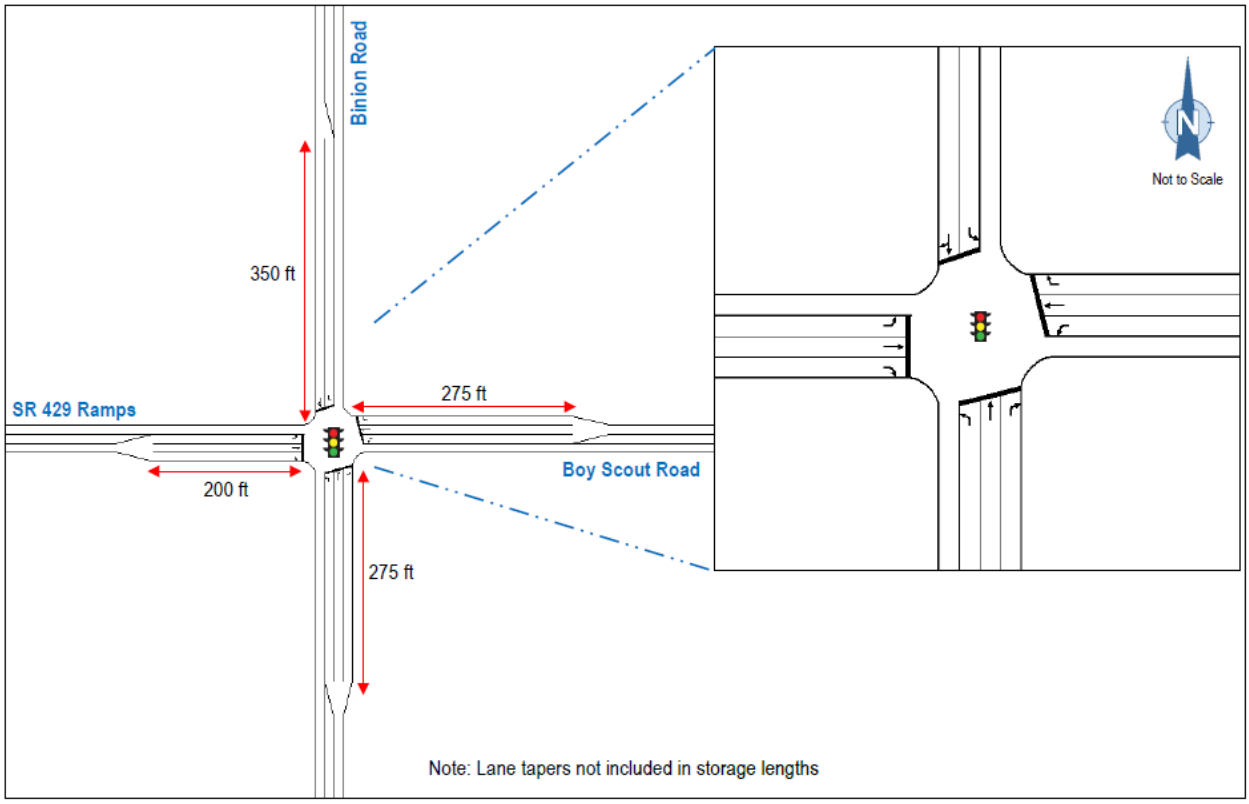


4.1 - ANALYSIS OF PREFERRED ALTERNATIVE

Roadway & Intersection

The proposed SR 429 and Binion Road interchange will form a partial interchange on SR 429, providing access to/from the north only. The ramps will be tolled and will terminate at the Binion Road and Boy Scout Road intersection. Due to right-of-way constraints on SR 429, a concept was developed in which the southbound ramp flies over the SR 429 mainline. To accommodate the geometrics for the flyover ramp, Boy Scout Road will need to be realigned to the south as it intersects with Binion Road. A detail of the intersection laneage is depicted on **Figure 6**.

Figure 6 - Proposed Lane Geometry & Storage Lengths for Intersection



Traffic

The proposed SR 429 and Binion Road partial interchange is being considered to provide new access by adding ramps to and from the north. The Binion Road interchange will provide additional local access between SR 414 and US 441 and allow trips that need to navigate the local street system to access SR 429 to points north including US 441, SR 46, and the Wekiva Parkway. The analysis showed that traffic will primarily be diverted from the Ocoee Apopka Road and US 441 ramps to/from the north of SR 429 to the proposed Binion Road ramps. A small diversion is expected from the SR 414 ramps to/from the north and there will be a small amount of induced trips due to the proposed ramps.

Two intersection configurations were developed for the ramp terminal: a signalized and a roundabout intersection. Both intersection alternatives are expected to operate at an acceptable LOS C or better in the 2045 design year. However, the roundabout alternative has fewer conflict points and is deemed safer than the signalized alternative.

Roadway Lighting

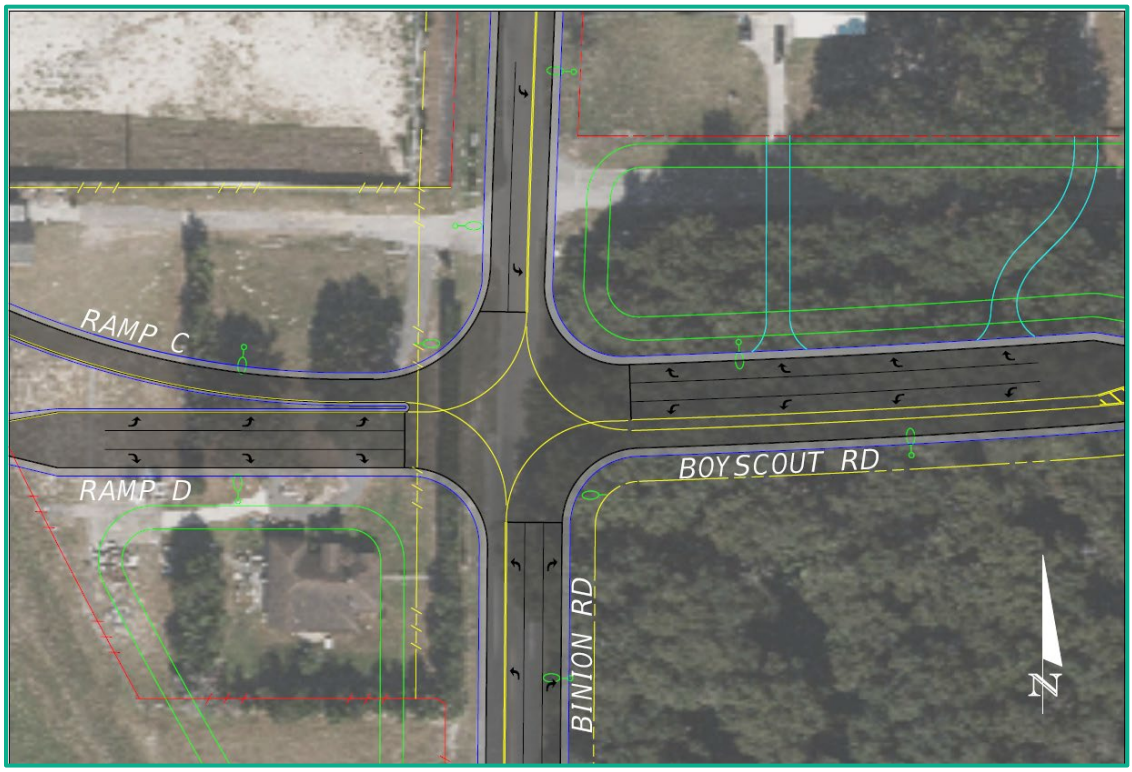
Based on the data and the analysis performed, roadway lighting is automatically warranted for the proposed on/off ramps.

Per Section 231.4 of the FDOT Design Manual (FDM), interchanges that are on the interstate highway system must be lighted to assure consistency and to meet driver expectations. Since all the existing interchanges along SR 429 are already lighted, the driver expectation is that the proposed Binion interchange would also be lighted. Additionally, roadway lighting can reduce the apprehension of drivers using the elevated exit ramp and provide a better delineation of the proposed on/off ramp. Due to the shape of the proposed elevated ramp under deck lighting should be reviewed and coordinated during the design phase.

For added safety the signalized intersection should be lighted to meet the latest edition of the FDOT Green Book design values. Transition lighting is implemented to allow the drivers' eyes to adjust from the non-illuminated to the illuminated ramps and intersection. This gradual lighting adjustment is accomplished by adding additional light poles for approximately 200-ft past the signalized intersection. The design team will have to coordinate with the City of Apopka if the City will be willing to maintain the proposed lighting system at the signalized intersection. The intersection lighting is depicted in **Figure 7**.

The cost for roadway lighting has been included on **Attachment 2 - Refined Engineer's Cost Estimate**.

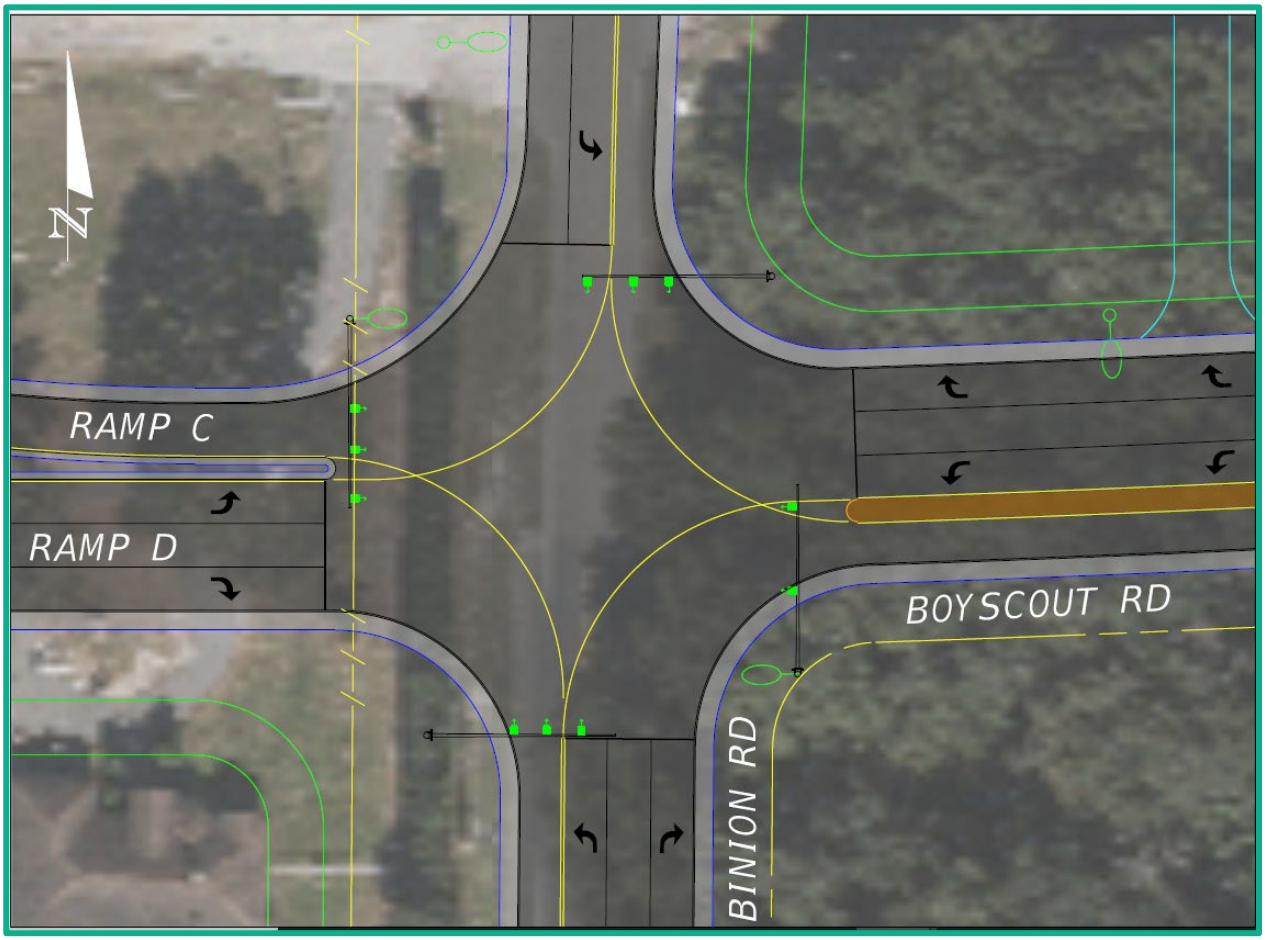
Figure 7 - Intersection Lighting



Signalization

The proposed signalized intersection shall meet all CFX's design criteria and requirement as specified in CFX's Design Details. Video Detection cameras are recommended for the proposed traffic signal that can perform detection of vehicles on multiple lanes. The preliminary design includes four (4) mast arms that includes a signal head with yellow retroreflective back plates for each movement. The mast arm locations should consider clear zone requirements, existing and proposed utilities, signal head locations, mast arm lengths, elevation differences, and right-of-way constraints. During design the design team should coordinate the location for the power source with the power utility company. As this area continues to develop, additional signalized intersections will be studied. The City of Apopka will maintain the intersection. The intersection signalization is depicted on **Figure 8**.

Figure 8 - Intersection Signalization



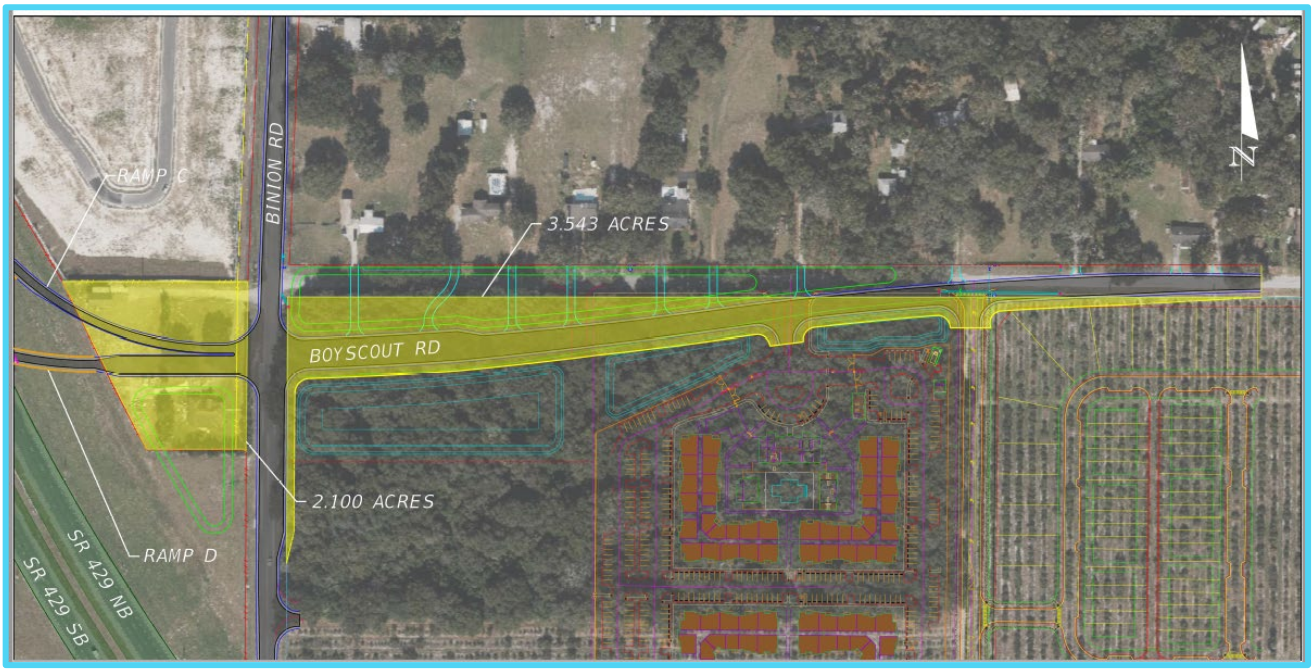
Signing

The pavement striping at the signalized intersection will be installed per FDOT Standard Plans Index 711-001. A conceptual signing plan for the mainline and mainline ramps will be provided by CFX for the project, showing guide sign locations and messages.

Right-Of-Way (R/W) Needs & Impacts

The R/W need is the same for both of the Alternatives being considered, so there is no additional impact to the R/W needs for the project for the Preferred Alternative. The City of Apopka is providing the Limited Access R/W and all other R/W needed for the realignment of Boy Scout Road, the signalized intersection and the ramp connection to SR 429. Additionally, while Binion Road is currently owned by Orange County, it is the understanding of CFX that ownership of Binion Road within the vicinity of the project area will ultimately be transferred to the City of Apopka. **Figure 9** depicts the anticipated R/W that would be required for the construction of the Preferred Alternative.

Figure 9 - R/W Needs



Intelligent Transportation Systems (ITS)

To increase the safety of the traveling public, the SR 429 southbound off ramp and northbound on ramp proposed ITS infrastructure will include ITS equipment consistent with CFX's overall ITS vision for the future. The safety aspect of ITS equipment consists of its ability to monitor traffic and provide incident management and travel information to travelers within SR 429. More detailed ITS Analysis can be found in the **Preliminary Engineering Report**, under separate cover. The future design team should consider the following ITS elements for the proposed SR 429 and Binion Road interchange:

- **Wrong-Way Vehicle Detection and Warning Equipment**
- **Data Collection Sensor (DCS)**
- **Traffic Monitoring Sites (TMS)**
- **Power Distribution System and Fiber Connections**

Bicycle, Pedestrian & Connectivity Analysis

The project area exists in a location that is rapidly transitioning from a rural-residential and agricultural area in Orange County to new single-family neighborhoods, multi- family, and commercial development, which will be within Apopka City limits. As these areas develop, new sidewalk will be built along the roadways, connecting to the existing and new sidewalks associated with this project, creating safe connectivity for non-vehicular users, where none has existed in the past.

The new intersection will provide for safe, signalized crossing for non-vehicular users of the intersection, with striped crosswalks and ADA-compliant ramp design, with locations coordinated with the City of Apopka in Final Design. All new bike/ pedestrian facilities will be coordinated with the City of Apopka.

Access Management

SR 429 has an Access Classification 1, Area Type 3 while Binion Road and Boy Scout Road both have an Access Classification of 4.

Any existing driveways that may be removed or modified as a part of this project will be replaced and designed with appropriate driveway aprons where they meet the roadway, including the appropriate radii for movement in and out of the driveway. Eastbound access for the existing driveways closest to Binion Road on Boy Scout Road will need to be evaluated during Final Design. Appropriate drainage or stormwater conveyance structures may be built within the new driveways or apron areas to manage stormwater runoff from the roadways. No existing access will be removed as a part of this project.

Horizontal & Vertical Alignment

The northbound SR 429 on-ramp (Ramp C) utilizes a 45 mph Design Speed, 559’ radius, superelevation rate of 0.10, and a 3.9% vertical grade. Barrier wall is located along the east side of Ramp C and Noise Walls are proposed along the north side.

The southbound SR 429 off-ramp (Ramp D) utilizes a 40 mph Design Speed, 739’ radius, superelevation rate of 0.08, and a 4.5% maximum vertical grade. Barrier wall is located along both sides of Ramp D. An existing pond and floodplain compensation area are within the footprint of Ramp D.

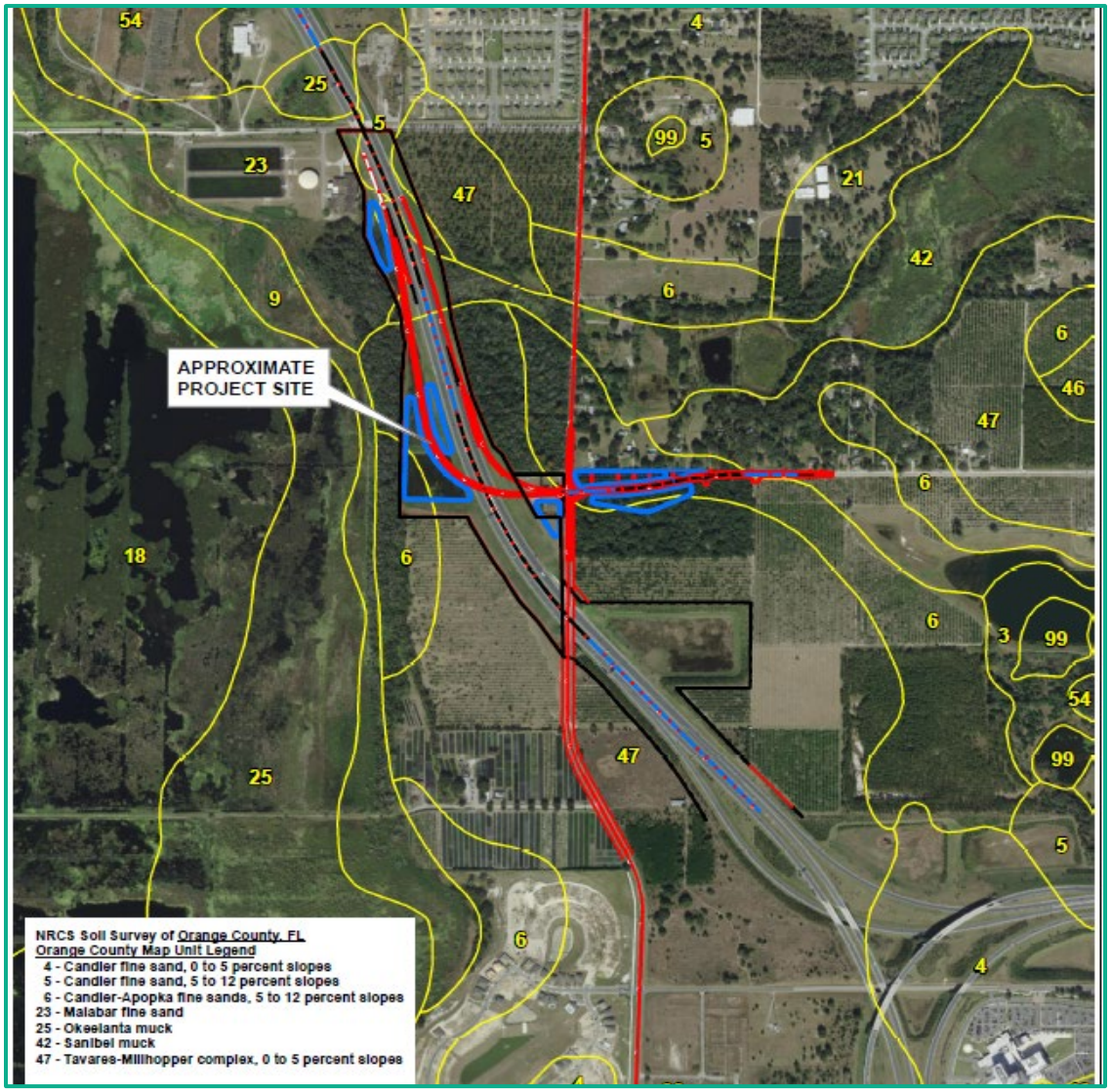
Boy Scout Road will require realignment for the proposed on/off-ramp configuration to SR 429. Reverse curves at 0° 45’ 00” will allow for normal crown cross slopes on the realigned roadway.

The horizontal and vertical geometry of Binion Road is relatively unchanged from the exiting condition.

Soil Conditions

According to desktop geotechnical analysis utilizing the Natural Resources Conservation Service (NRCS) Orange County Soil Survey, as depicted on **Figure 10**, near surface soils range from well drained Type A sand soils (soil types 4, 5, 6 and 47) to poorly drained Type D muck soils (soil types 25 and 42). Additionally, Plastic clay layers are present underneath the sands and groundwater generally is perched on top of the relatively impervious clay soils. The project location is in a karst or sinkhole prone environment. Bridges should be supported on a deep driven pile substructure due to Karst environment and likely high Factored Loads required.

Figure 10 - NRCS Orange County Soil Survey



Stormwater & Drainage

The **Preliminary Engineering Report** prepared under separate cover for this Level 1 PEIR contains a more detailed stormwater analysis.

Stormwater management for water quality treatment and runoff attenuation will be evaluated using existing and proposed dry retention stormwater management facilities. Floodplain compensation estimates used the cup-for-cup method. The design of the stormwater facilities will comply with the standards set forth by CFX, SJRWMD, FDEP, Orange County, City of Apopka, and FDOT. Several existing permits and previous hydraulic studies were used to assist in making assumptions to establish the Seasonal High Ground Water Table (SHGWT), 100-year floodplain elevations, and existing on-site storage and treatment.

It is suggested that the Pre-Application meeting is held early in the design phase to confirm methodology and applicable criteria for finalizing pond and floodplain compensation design prior to developing final roadway geometry.

Treatment Volume

As previously stated the project corridor is within the SJRWMD. Since the FDEP typically follows the water management district's criteria, SJRWMD will govern. The required dry retention treatment volume is considered the greater of 1) one-half inch of runoff over the drainage area or 2) the total runoff of 1.25 inches times the impervious area. (For on-line retention an additional one-half inch of runoff from the drainage area over that volume specified for off-line treatment is required.

Because all of the project ponds indirectly discharge to Lake Apopka Outstanding Florida Water (OFW) criteria needs to be met. An additional fifty percent of the required treatment volume must be provided.

Attenuation

Offsite discharge rate is limited to rates not causing adverse impacts to existing offsite properties, and: a) Historic discharge rates; or b) Rates determined in previous Agency permit actions; or c) Rates specified in District criteria. The project is an open basin and the local government criteria using the 25-year/24-hour storm event with Orange County distribution will govern. (Section 13.2 SJRWMD ERP Applicant's Handbook Volume II).

Utility Relocation

Existing utilities will need to be relocated along Binion Road and Boy Scout Road. A **Utility Assessment Technical Memorandum** was prepared sunder separate cover, and contains additional information. There are five known utilities within the Binion Road / Boy Scout Road proposed construction limits:

CenturyLink

CenturyLink has facilities on Binion Road and Boy Scout Road. They have an underground copper line for telephone service. Along Binion Road, their service line is located on the west side of the road. There is also a crossing just south of Boy Scout Road. Along Boy Scout Road, the service line runs on the south side, and has several crossings that service the residential homes and subdivisions.

Lake Apopka Natural Gas District (LANGD)

LANGD has facilities along Binion Road. They have a 6" Poly Gas Main located on the east side of the road. A crossing exists on the east leg of Boy Scout Road. A 10" steel casing is proposed around the 6" gas main at the SR 429 overpass as well as just beyond the overpass for both directions. Installation began November 11, 2022.

City of Apopka

Within the study area, the City of Apopka Public Works owns and maintains the water, sewer and reclaimed water facilities. Along Binion Road, the water line is a 16" DIP, and the sewer line is a 12" PVC. Both are located on the east side of the road. The reclaimed water line varies from a 30" PVC, 30" DIP, and 36" DIP, and is located on the west side of the road. The water and sewer lines cross just north of the SR 429 overpass and run adjacently with the reclaimed water line under the SR 429 to the south. Similarly, the water and sewer line cross Binion Road just north of Boy Scout Road to service the nearby subdivisions. The Sewer line and reclaimed water line also run east along Boy Scout Road. Along Boy Scout Road, the reclaimed water line is a 16" PVC, and the sewer line is an 8" PVC. Both lines are located on the south side of the road. Operational improvements are planned for both Binion Road and Boy Scout Road which will add left turn storage lanes and right turn auxiliary lanes at the intersection. Public works have begun to relocate utilities within the existing right-of-way and have moved the utilities immediately adjacent to the right-of-way as part of the planned roadway improvements.

Duke Energy (Distribution)

Duke Energy is the electric service provider for this area. They have aerial and underground facilities on both Binion Road and Boy Scout Road. Along Binion Road, service poles carry overhead electric lines and are located on the west side of the road. There is also underground electric on the west side that crosses Binion Road just north of the intersection. Along Boy Scout Road, service poles and overhead electric exist on the south side of the road. These facilities service nearby residential homes using both aerial and ground transformers. These service points would need to be addressed prior to any relocation efforts.

MCI

MCI has facilities along Binion Road and Boy Scout Road. For the most part MCI shares Duke Energy's service poles. Their facilities start at the intersection and continue northward and eastward. They have an underground crossing through the intersection which run between pull boxes and ultimately lead to the risers attached to the service poles. Future relocation efforts involving MCI are dependent on Duke Energy's relocations.

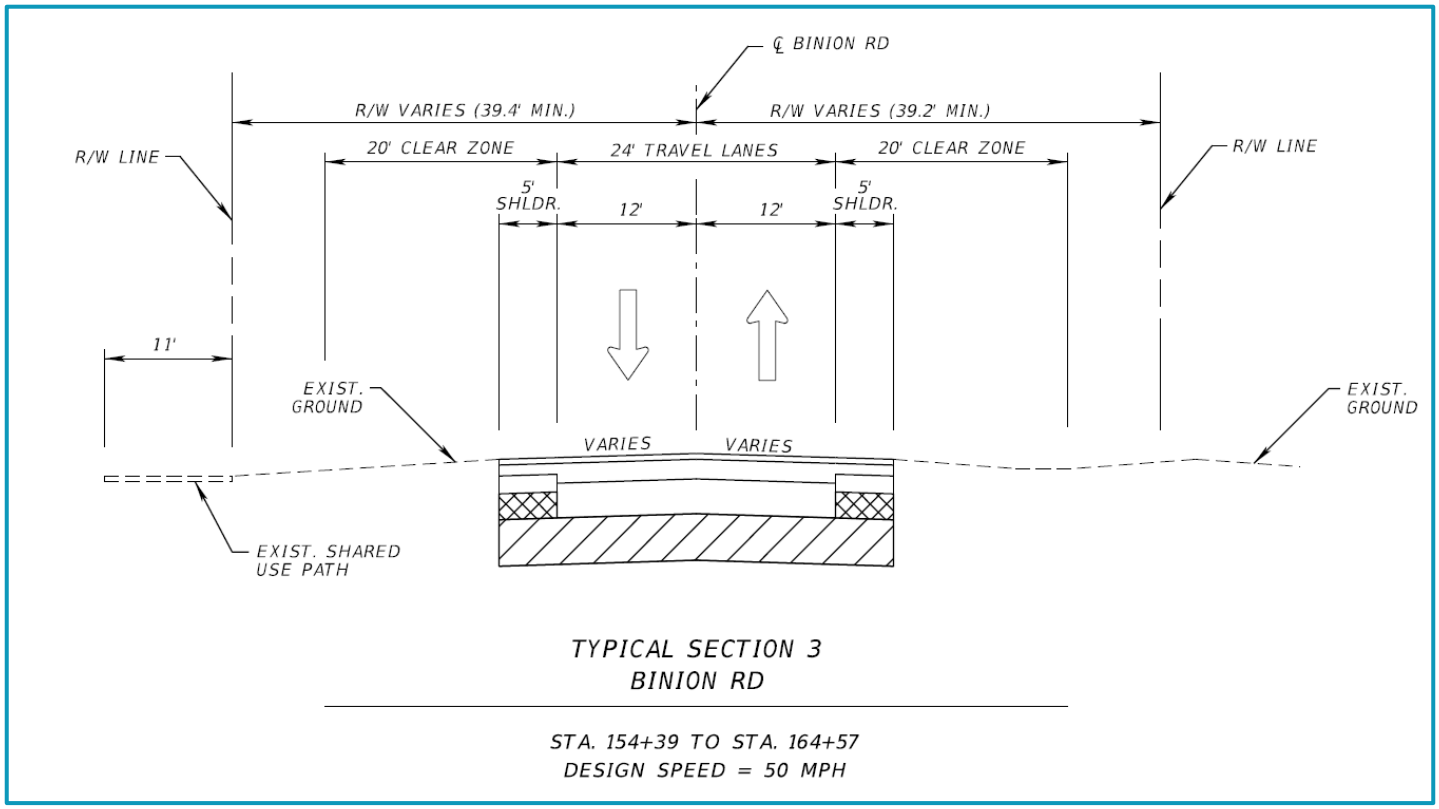
4.2 - PREFERRED ALTERNATIVE TYPICAL SECTIONS

A **Typical Section Package**, available under separate cover, has been prepared for the Preferred Alternative, as depicted below. The Typical Sections include the conceptual design for Binion Road, the re-aligned portion of Boy Scout Road, the Interchange on-ramp (Ramp C) for northbound SR 429, and the Interchange off-ramp and bridge over SR 429 (Ramp D) for southbound traffic exiting SR 429 to arrive at the new signalized intersection of the Preferred Alternative.

Roadway Typical Sections

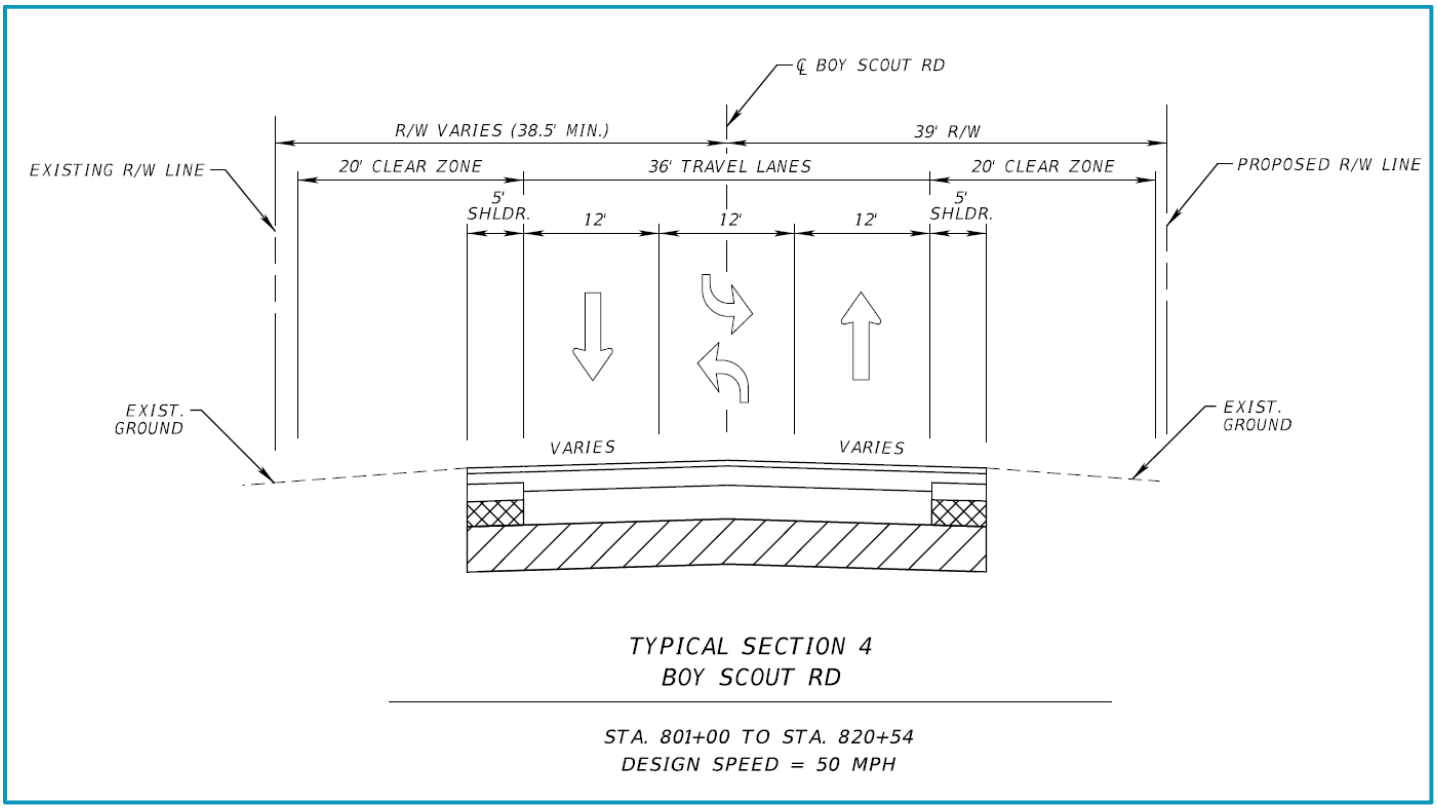
The Typical section for Binion Road is depicted on **Figure 11**. The roadway design is 2-lanes with a 12' travel lane for north and southbound traffic. A 5' paved shoulder is designed outside the travel lanes, ending the paved section at the existing ground.

Figure 11 - Typical Section - Binion Road



The Typical section for the re-aligned Boy Scout Road is depicted on **Figure 12**. The roadway design is 2 travel lanes at 12' for east and westbound traffic, along with a 12' dual center turn lane. A 4' paved shoulder is designed outside the travel lanes, ending at Type F Curb & Gutter. A design speed of 50 MPH was utilized for the design.

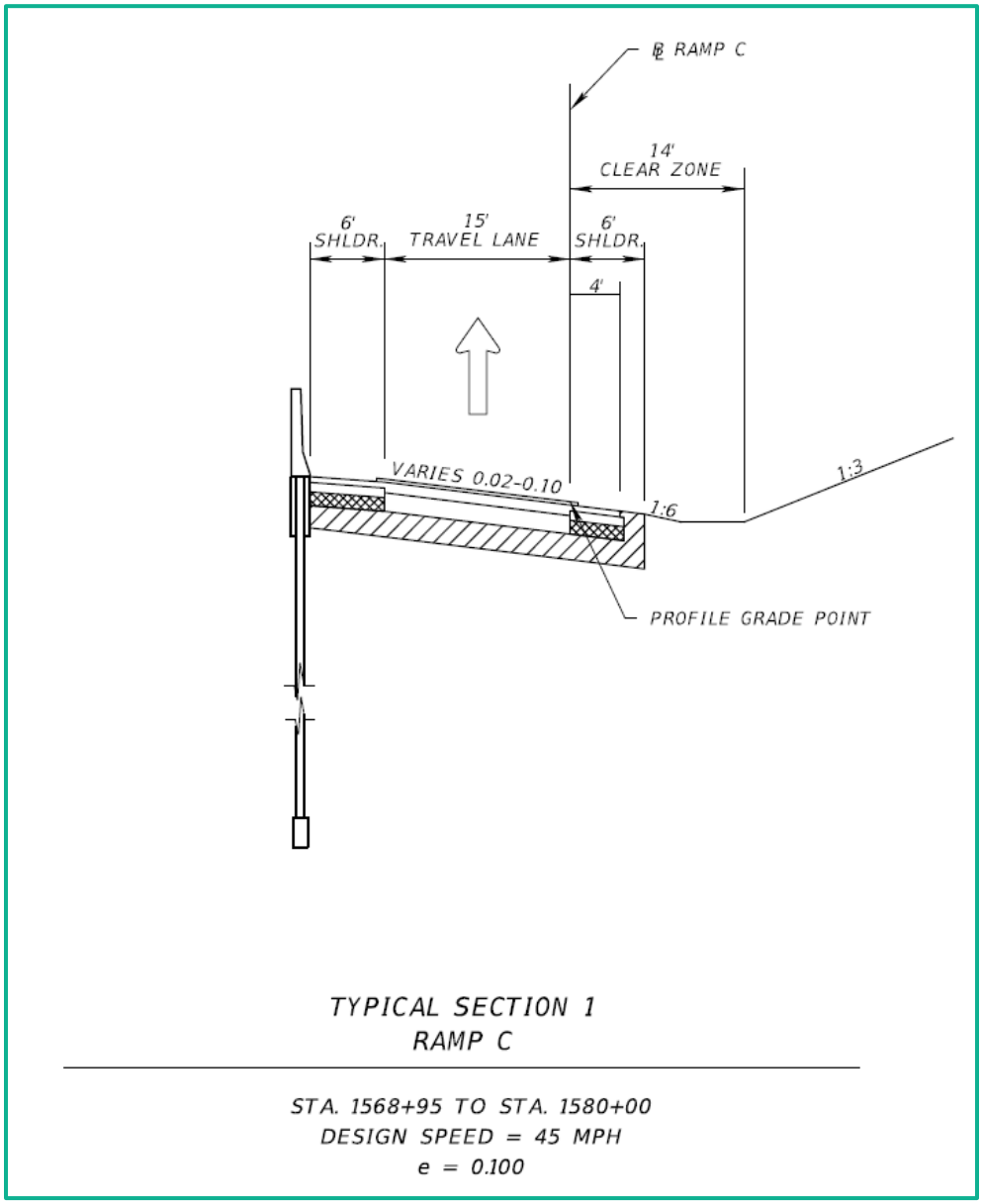
Figure 12 - Typical Section - Boy Scout Road



Ramp Typical Sections

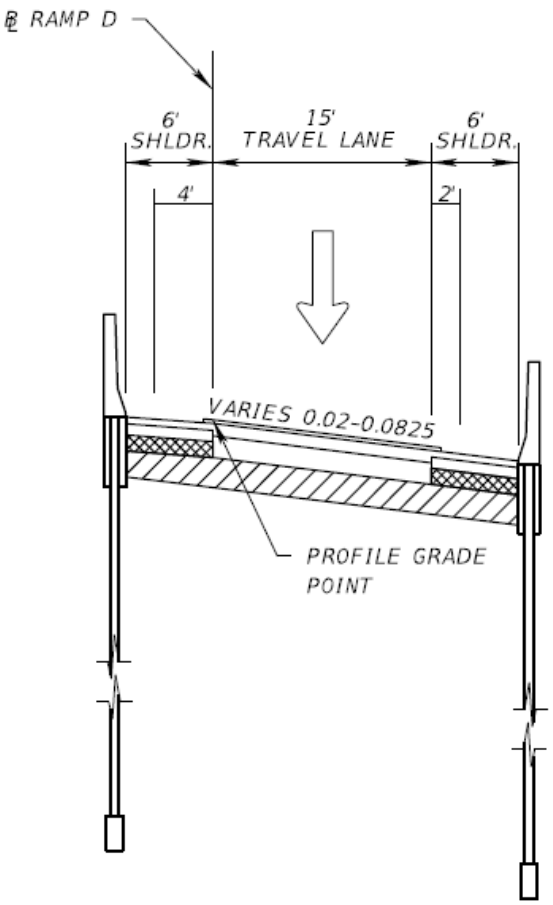
The Typical section for Ramp C (on-ramp from re-aligned Binion Road & Boy Scout Road intersection to northbound SR 429) is depicted on **Figure 13**. Ramp C has a 15' wide travel lane, with a 6' shoulder on each side of the travel lane. A concrete barrier wall is located on the west side of the ramp where the ramp is elevated and a 14' clear zone is maintained where the ramp meets grade on the east side.

Figure 13 - Ramp C Typical Section



The Typical section for Ramp D (southbound SR 429 off-ramp connecting to the re-aligned intersection of Binion Road & Boy Scout Road) is shown on **Figure 14**. Vehicles exiting southbound SR 429 at the off-ramp will travel along Ramp D, which includes an elevated bridge to cross over SR 429 to connect to the subject intersection. Ramp D includes a 15' travel lane, with a 6' shoulder along each side of the travel lane and a concrete barrier wall on the outside of each shoulder. Ramp D utilizes a Design Speed of 40 MPH.

Figure 14 - Ramp D Typical Section



TYPICAL SECTION 2
RAMP D

STA. 2565+21 TO STA. 2592+20
DESIGN SPEED = 40 MPH
e = 0.0825

Bridge Typical Sections

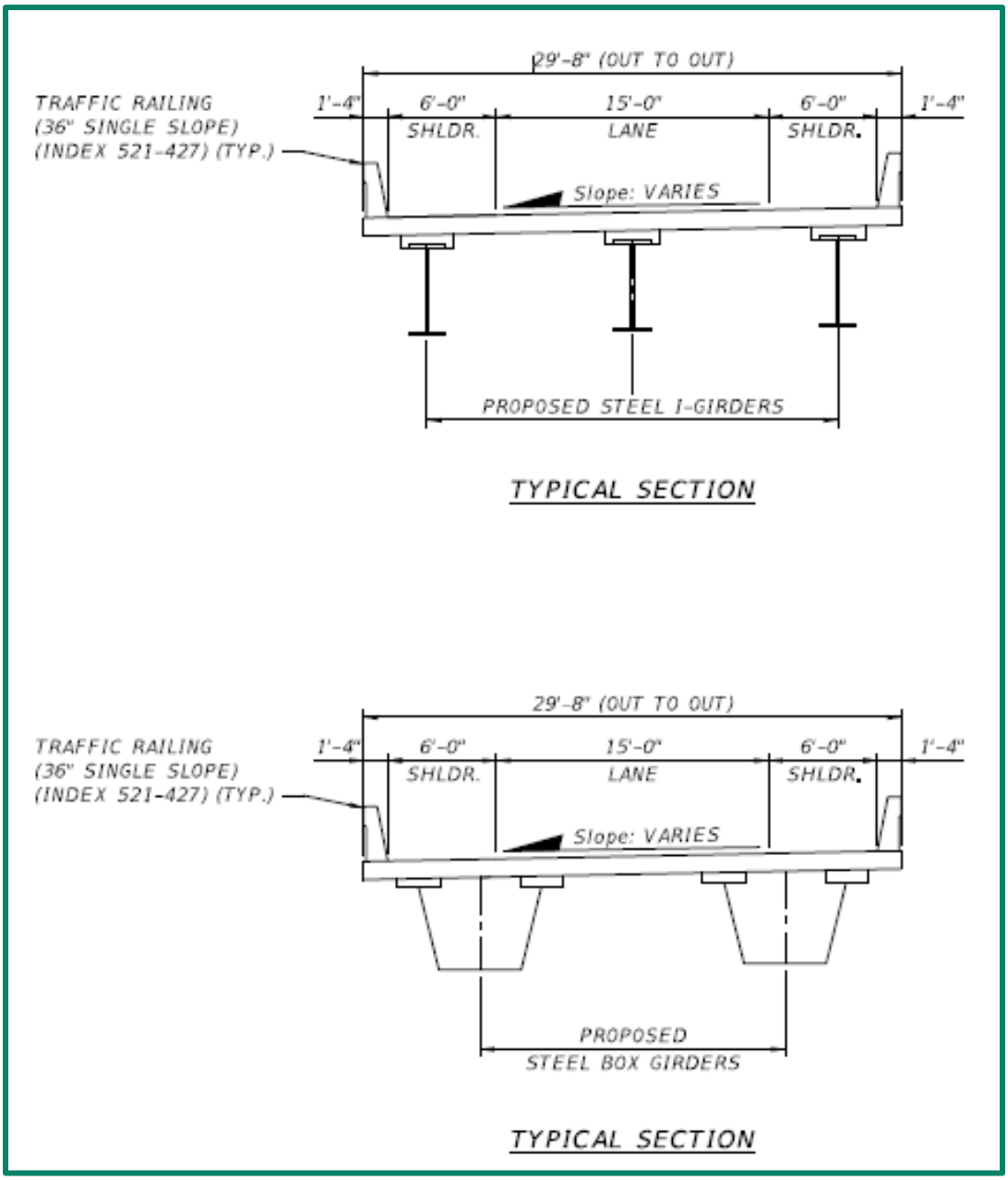
Structures Ramp D Options:

The southbound off ramp at the proposed interchange of SR 429 and Binion Road is a single-lane flyover with the following typical section: 6-ft wide inside and outside shoulders and one 15-ft wide lane. Two superstructure design options are provided for the ramp structure. Both options are for a 2-span continuous, curved and skewed, steel girder bridge with an overall bridge length of 315 ft along the bridge centerline. The minimum radius for the bridge is 717 ft and can be accommodated utilizing steel I-girders or steel box girders. **Table 3** provides data for both the I-girder and box girder structure options and **Figure 15** depicts the options.

Table 3 - Ramp D Alternative Costs

SR 429 Ramp D Preliminary Bridge Design Information: I-Girder vs. Box Girder Options			
			Comments
Length =	315	ft	from Ramp D profile sheet
Width =	29.67	ft	from typical section and FDM 260. (2) 1.33 ft wide traffic barriers
Structure Depth =	5.0	ft	Assumes 2-span continuous bridge ~ 153.5 ft each. Follows AASHTO Table 2.5.2.6.3-1 for continuous girder - rounded to nearest ft
Total Area =	9344.79	SF	
I- Girder Cost per Sqft =	$ 230.00	USD/SF	Cost based on SDG 9.3 - Steel Girder - High Range
Box Girder Cost per Sqft =	$ 276.00	USD/SF	Cost based on SDG 9.3 - Steel Box Girder - High Range with 15% increase for curved alignment
I-Girder Bridge Cost =	$ 2,149,301.70	USD	
Box Girder Bridge Cost =	$ 2,579,162.04	USD	

Figure 15 - Bridge Option Typical Sections



4.3 - PREFERRED ALTERNATIVE PRELIMINARY CONSTRUCTION COSTS

A refined preliminary cost estimate for the Preferred Alternative was created, totaling $**28.9 Million**. This **Alternatives Cost Estimate** breakdown is provided in **Attachment 2**.

5.0 – Commitments

The following commitments have been made for the project:

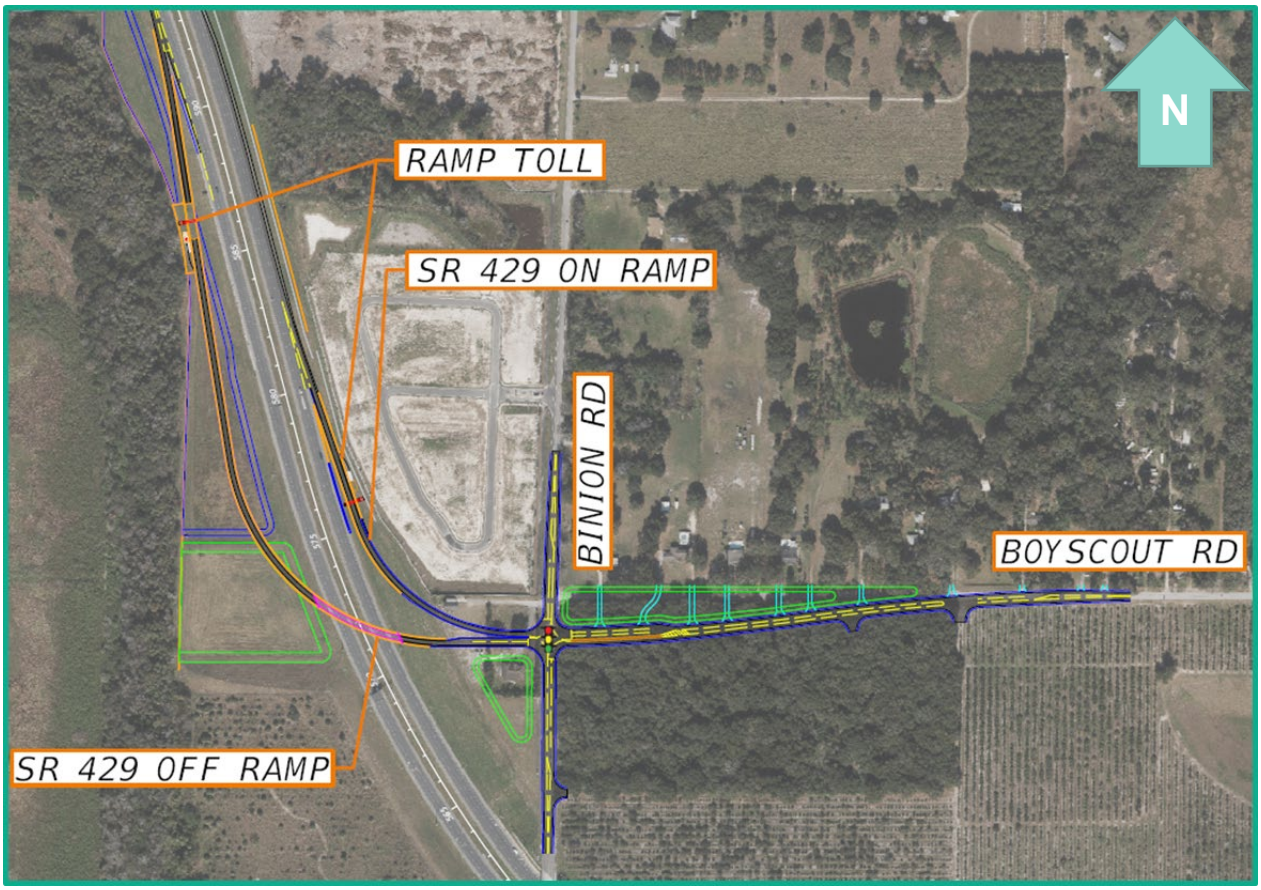
- The City of Apopka shall acquire and provide the Limited Access Right-of-Way needed by CFX for the proposed interchange ramps as well as any additional Right-of-Way needed for local road improvements as part of the project.
- CFX shall reconstruct driveways to all existing properties where existing driveways may be affected.
- CFX shall coordinate sidewalk accommodations with the City of Apopka during the Design Phase of the project.
- CFX commits to re-evaluate the Traffic Noise Study during the Design Phase of the project.
- CFX commits to re-evaluate the need for a Phase I Cultural Resource Assessment Survey (CRAS) during the Design Phase of the project.
- Best Management Practices to control erosion and sedimentation in accordance with Standard Specifications for Road and Bridge Construction will be implemented.
- Wetland impacts which may result from the construction of this project will be mitigated pursuant to Section 373.4137, F.S., to satisfy all mitigation requirements of Part IV of Chapter 373, F.S., and 33 U.S.C. §1344.
- Any species-specific surveys will first be coordinated with the United States Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FFWCC), then conducted as agreed to with USFWS and FFWCC during the permitting phase.
- A preconstruction gopher tortoise burrow survey and any resultant permitting will be conducted in accordance with FWC protocols.
- The project will implement the USFWS-approved Standard Protection Measures for the Eastern Indigo Snake (updated August 1, 2017) during the proposed roadway improvements.
- Avoidance and minimization of wetland and listed species impacts will continue to be evaluated and all possible and practicable measures to avoid or minimize these impacts will be incorporated.
- CFX commits to conducting an additional public meeting during the Design Phase of the project.

6.0 – Preferred Alternative

6.1 - PREFERRED ALTERNATIVE

On December 8, 2022, correspondence was received from the City of Apopka Planning and Zoning Division that the alternative concept preferred by the City of Apopka was Alternative # 1, the SR 429 & Binion Road interchange with the on and off-ramps connecting to a signalized intersection with Binion Road and the re-aligned Boy Scout Road. However, Alternative #2, the SR 429 & Binion Road interchange with the on and off-ramps connecting to a roundabout with Binion Road and the re-aligned Boy Scout Road could still be considered during the Design Phase. The conceptual design of the Preferred Alternative is depicted on **Figure 16**.

Figure 16 - Preferred Alternative



7.0 – Public Involvement

Public Meeting

The Public Meeting was held in-person on Thursday, November 3, 2022 from 5:30 p.m. – 7:30 p.m. at Apopka High School's cafeteria. Nearly 20 people attended the in-person meeting. Attendees were able to ask study team members questions and provide written comments. One written comment was submitted during the meeting.

Seven public comments and questions were received during the public meeting's 10-day comment period. Most questions were from residents seeking clarification about what to expect regarding the construction timeline, noise mitigation and various safety precautions for homes, drivers, and pedestrians.

Residents expressed a desire for a full interchange at this location and a preference towards a roundabout vs. a signalized intersection.

A full summary of public involvement activities can be found in the study's **Comments and Coordination Report**, under separate cover.

8.0 - Approval of Final Document

This project has been developed without regard to race, color, national origin, age, sex, religion, disability, or family status.

The final Level 1 PEIR reflects consideration of the Project Development and Environment Study and Public Involvement.

Date: January 31, 2023

Greg Seidel, PE

Project Manager & Principal in Charge

The Balmoral Group, LLC

Date: Feb 01, 2023

David Falk, PE

Project Manager

Central Florida Expressway Authority

Date: Feb 01, 2023

Glenn Pressimone, PE

Chief of Infrastructure

Central Florida Expressway Authority

9.0 – Support of Environmental Analysis

For supporting information for each issue/resource, please see Attachment I: Environmental Analysis.

Attachment 1

2.A – Social & Economic Environment Analysis

2.A.1 - SOCIAL

Demographics

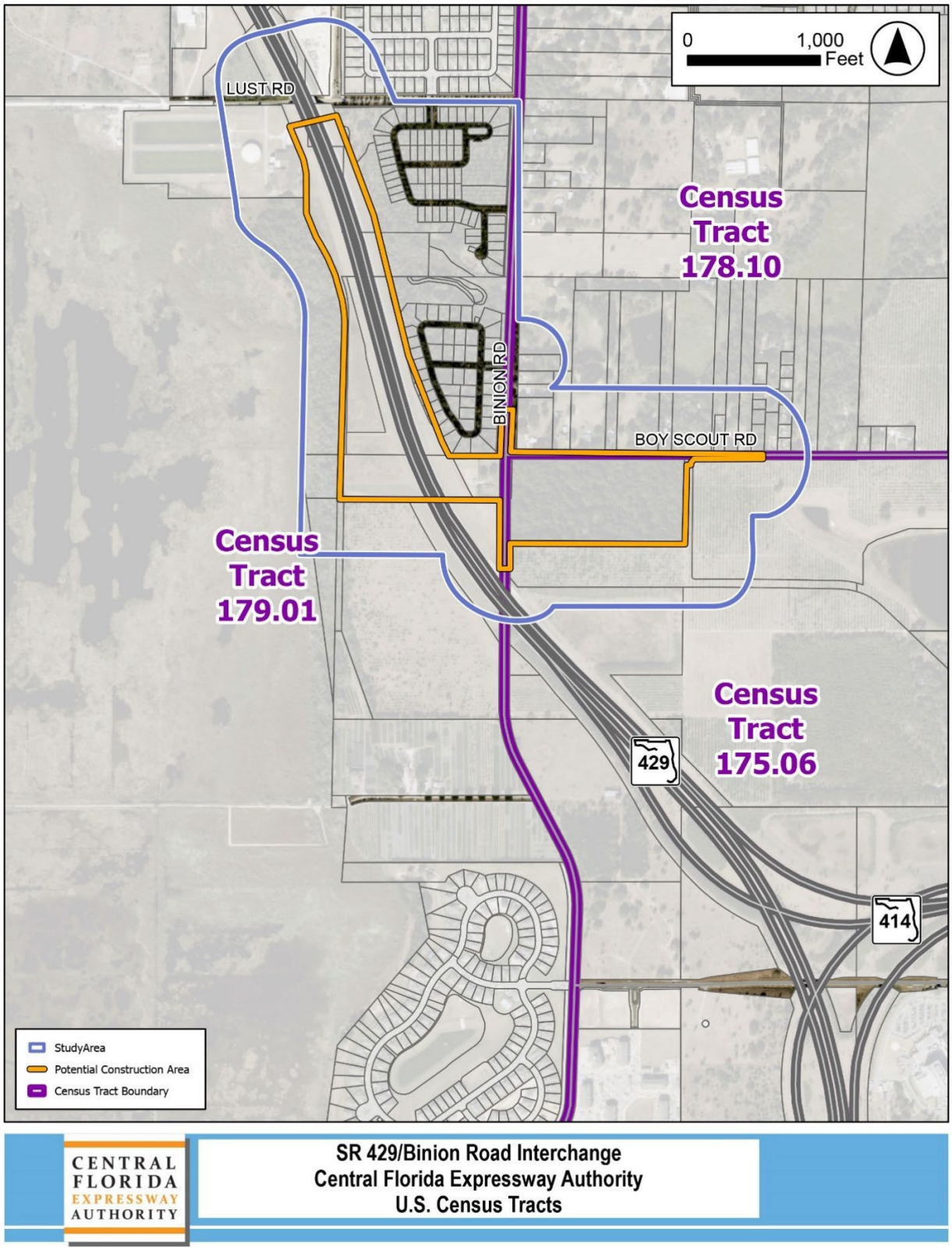
The study area was reviewed to identify minority and/or low-income populations as well as underrepresented population groups protected under *Title VI of the Civil Rights Act of 1964* and related nondiscrimination statutes and regulations. **Table 1** provides study area demographics based on the US Census Tracts in which the project is located. See **Figure 1** for the location of the tracts. Construction of the Preferred Alternative is not anticipated to cause adverse impacts to the demographics of the Study Area.

Table 1: Study Area Demographics by Census Tract

Census Tract	Total Population	Percent Minority Population	Percent Population Below Poverty Level	Percent Population Aged 65 and Over
175.06	12,043	62.8%	12.8%	6.2%
178.10	6,244	62.4%	21.3%	15.8%
179.01	2,539	61.5%	5.2%	14.8%
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 1: Study Area Census Tracts



Community Facilities

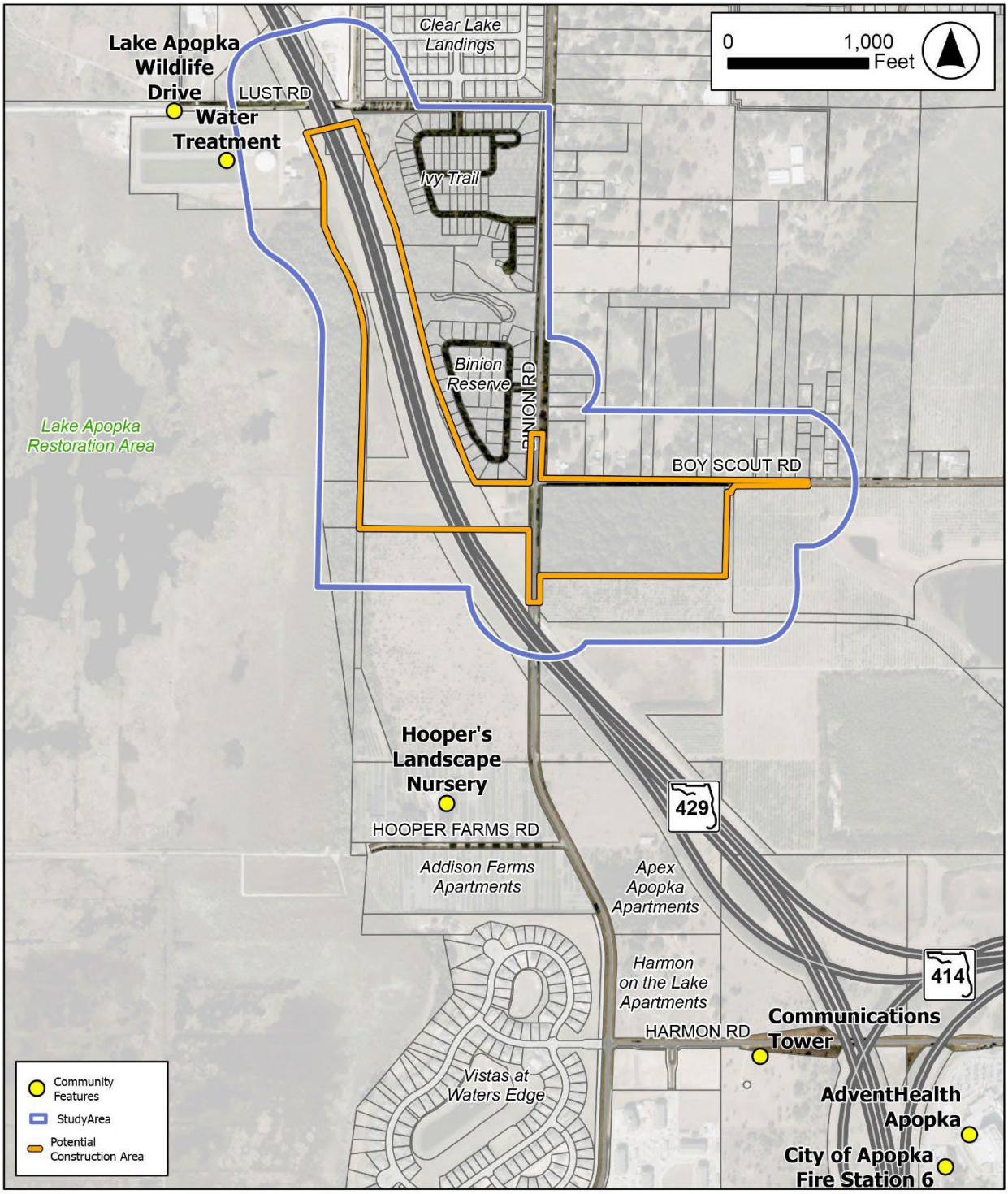
A desktop review of the study area indicates that there are three community facilities within the study area: the entrance to the Lake Apopka Wildlife Drive, including a parking lot used by trail cyclists and hikers, a water treatment facility, and a communications tower. Additionally, there are several neighborhoods within, partially within, or nearby the study area.

It should be noted that just to the southeast of the study area, there is a hospital and City of Apopka fire station. **Table 2** presents community facilities within or near the study area. **Figure 2** presents the community facility locations. Construction of the Preferred Alternative is not anticipated to cause adverse impact to Community Features.

Table 2: Community Features

Name	Type of Facility	Relative Location
City of Apopka Fire Station 6	Institutional	±3,880 feet southeast of study area
Communications Tower	Institutional	±3,120 feet south of study area
Water Treatment Facility	Institutional	Within study area
Lake Apopka Wildlife Drive	Recreation	Partially within study area
Advent Health Apopka	Healthcare	±3,350 feet southeast of study area
Hooper's Landscape Nursery	Commercial Nursery	±780 feet south of study area
Addison Farms Apartments	Neighborhood	±1,350 feet south of study area
Binion Reserve	Neighborhood	Within study area
Clear Lake Landings	Neighborhood	Partially within study area
Ivy Trail	Neighborhood	Within study area
Vistas at Water Edge	Neighborhood	±1,950 feet south of study area
Apex Apopka Apartments	Proposed Neighborhood	±750 feet south of study area
Harmon on the Lake	Proposed Neighborhood	±2,050 feet south of study area

Figure 2: Community Features



2.A.2 - ECONOMIC

The proposed improvements will provide enhanced regional connectivity in southwest Apopka, which has been experiencing significant population growth, with more development underway. This connection will improve mobility with the region to the north, including Mt. Dora, Tavares, and Eustis, providing access to jobs, services, and recreation. The enhanced mobility will continue to drive economic development, creating a positive impact to the area.

2.A.3 - LAND USE CHANGES

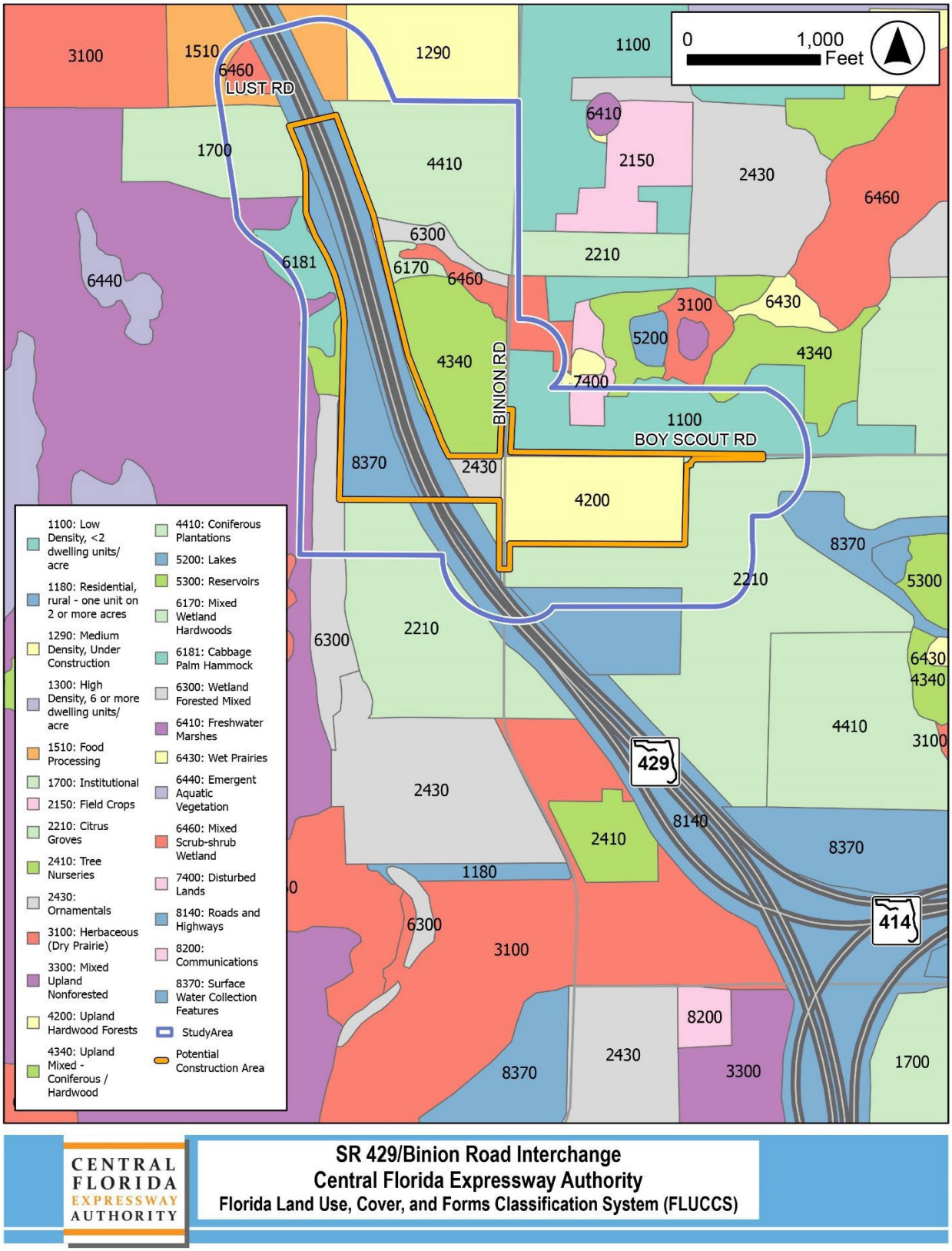
Adjacent land includes parcels within Apopka City Limits and within unincorporated Orange County. The zonings of the parcels include A-1 (Agricultural), MU-ES-GT (Mixed-Use East Shore Gateway Subdistrict), PD (Planned Development), RSF-1A (Residential Single-Family Estate), RSF-1B (Residential Single Family – Large Lot), and T (Transitional).

Land uses adjacent to the study area consist of a diverse mixture of developed properties, natural and altered uplands, wetlands and surface water. The Florida Department of Environmental Protection (FDEP) Florida Land Use Cover Classification System (FLUCCS) was used to classify the various land uses and land covers within the study area. **Table 3** summarizes the land uses and the locations are depicted on **Figure 3**.

Table 3: FLUCCS Codes Within Project Area

FLUCCS Code	Description
1100	Residential Low Density
1180	Residential, Rural
1290	Residential Medium Density
1300	Residential High Density
1510	Food Processing
1700	Institutional
2150	Field Crops
2210	Citrus Groves
2410	Tree Nurseries
2430	Ornamentals
3100	Herbaceous (Dry Prairie)
3300	Mixed Upland
4200	Upland Hardwood Forests
4340	Upland Mixed Coniferous/Hardwood
4410	Coniferous Plantations
5200	Lakes
5300	Reservoirs
6170	Mixed Wetland Hardwoods
6181	Cabbage Palm Hammock
6300	Wetland Forested Mixed
6410	Freshwater Marshes
7400	Disturbed Lands
8300	Utilities
8200	Communications
8100	Transportation

Figure 3: FLUCCS Within Project Area



CENTRAL FLORIDA EXPRESSWAY AUTHORITY

SR 429/Binion Road Interchange
Central Florida Expressway Authority
Florida Land Use, Cover, and Forms Classification System (FLUCCS)

2.A.4 - MOBILITY

There are no existing transit routes or paratransit access in the immediate project vicinity. To the southeast of the SR 414/429 interchange, there are sidewalks and a transit route (Lynx Link 405 – Apopka Circulator). A review of the LYNX Transit Development Plan FY 2020–2029 indicates there are no proposed transit improvements along Binion Rd, Boy Scout Rd, or SR 429 within the project study area.

There are limited sidewalks in the project area, located only along both sides of the Binion Rd bridge and within nearby subdivisions. There are currently no designated bicycle facilities within the immediate study area. Though to the southeast, Harmon Road includes a paved shoulder. The MetroPlan Orlando Metropolitan Transportation Plan identifies safety improvements on Binion Road from Lakeview Drive to Ocoee-Apopka Road as an unfunded need.

This project's proposed improvements will increase automobile access in the area and provide more efficient connections to places of employment, services, and recreation. Additionally, the intersection will include sidewalks and designated pedestrian crossings to support future mobility improvements in the area. Construction of the Preferred Alternative will positively impact the project area and surrounding area.

2.A.5 - AESTHETIC EFFECTS

Aesthetic impacts of the proposed improvements may include opportunities for landscaping and hardscaping enhancements or establishing a gateway or theme. By providing local access to SR 429 in this rapidly-developing area, there is robust opportunity to support the developments with landscaping or design elements and create a gateway into the area that is largely residential in nature.

There is potential that noise walls may be added. However, in the context of the existing limited-access facility of SR 429, it is not anticipated that this project will negatively impact the overall aesthetics of the area.

2.A.6 – RELOCATION POTENTIAL

The City of Apopka is providing all R/W necessary for the construction of this project. Construction of the Preferred Alternative by CFX is not anticipated to cause significant impact.

2.B – Cultural Environment Analysis

2.B.1 - HISTORIC SITES/DISTRICTS & 2.B.2 - ARCHAEOLOGICAL SITES

This project will not have significant impacts to cultural resources. Below is a summary of the evaluation performed:

A review was conducted to identify any previously recorded cultural resources within the project area. The study area was defined as the parcels where the proposed interchange will be built (the potential construction area) in addition to a 152-meter (500-foot) buffer to address any potential viewshed effects to historic resources (see **Figure 4**). The entire parcels were included in the construction area to accommodate potential lay down or storage areas which have the potential to disturb subsurface deposits. This analysis 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.

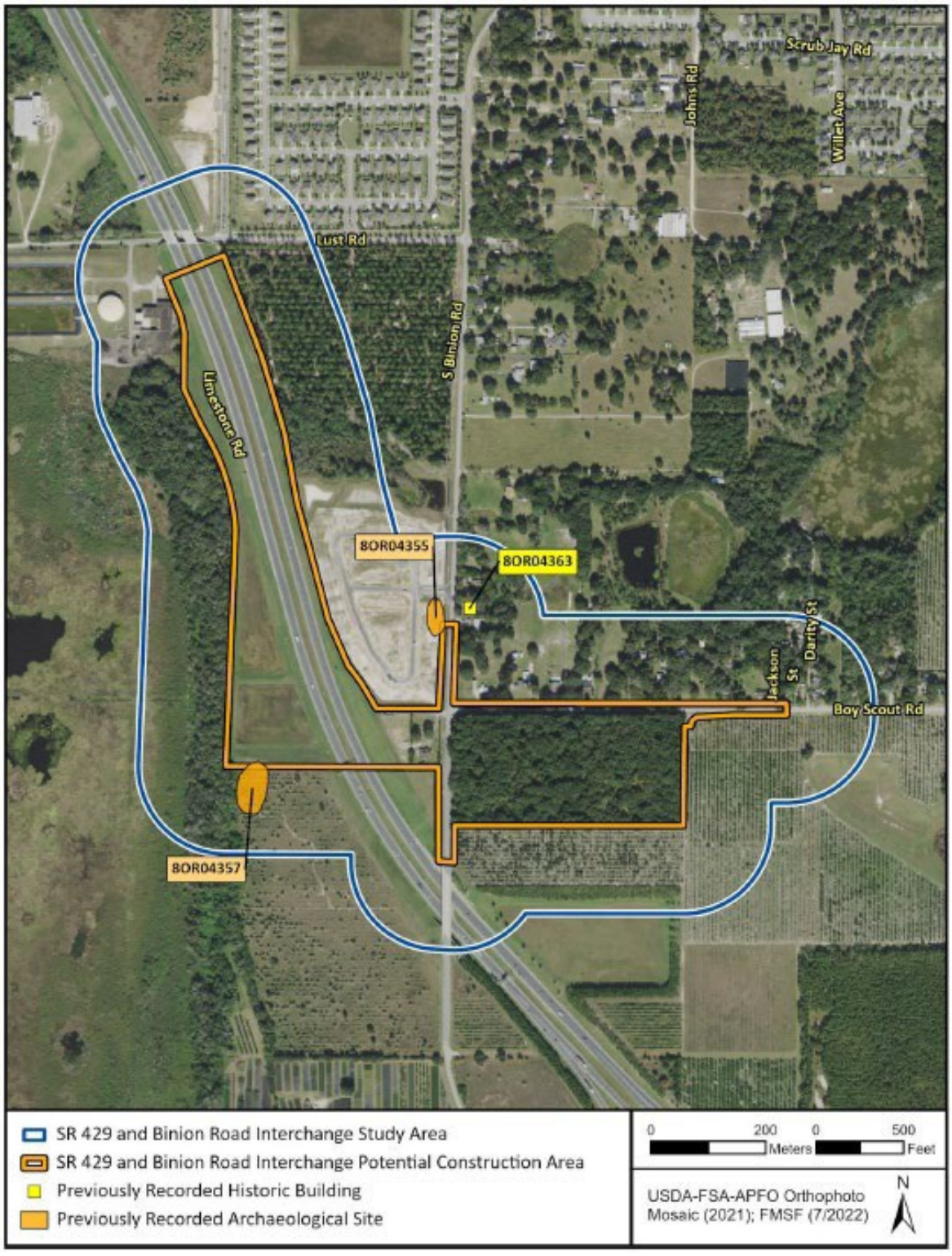
Two previously recorded archaeological sites (8OR04357 and 8OR04355) and one building (8OR04363) have been recorded within the SR 429 and Binion Road Interchange Study Area (**Table 4**; see **Figure 4**). All three resources have been previously recommended ineligible for the National Register of Historic Places (NRHP) by the State Historic Preservation Officer (SHPO).

Table 4: Previously Recorded Resources in the SR 429 and Binion Road Interchange Study Area

Archaeological Sites			
FMSF No.	**Name**	**Time Period**	**NRHP Eligibility Recommendation**
8OR04355	Rabbit Slough	Precontact; St. Johns II, AD 800-1500	Ineligible for NRHP
8OR04357	Exploding Melon	Precontact	Ineligible for NRHP
Historic Buildings			
FMSF No.	**Address**	**Year Built**	**NRHP Eligibility Recommendation**
8OR04363	1085 South Binion Road	1930	Ineligible for NRHP

Review of the FMSF database indicates that the current study area has only been partially surveyed by prior studies that meet the current Module Three standards for cultural resource surveys. Given the proximity of the Study Area to the Lake Apopka shoreline (indicating a high potential for precontact archaeological sites), the presence of nearby cultural resources (which could indicate additional resources may be present), and the lack of sufficient cultural resource survey throughout the Study Area, the need for a Phase I Cultural Resource Assessment Survey (CRAS) will be re-evaluated as part of the design phase for this project.

Figure 4: Previously Recorded Resources in the SR 429 and Binion Road Interchange Study Area



2.B.3 - RECREATIONAL AREAS AND PROTECTED LANDS

The nearest recreational area is the Lake Apopka Wildlife Drive, a St. Johns River Water Management District restoration area. The drive is accessed via Lust Road, west-northwest of the project. No direct impacts are anticipated to any recreational areas or protected lands.

2.C - Natural Environment Analysis

The project will not have significant impacts to natural resources. Below is a summary of the evaluation performed.

2.C.1 - 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) FLUCCS and the National Wetland Inventory (NWI) GIS datasets. The project study area contains five (5) potential wetlands, primarily adjacent to SR 429 as shown on **Figure 5**. Within the CFX R/W, wetland impacts have been previously permitted and mitigated. Due to the hydrologic connections of the onsite wetlands, these wetlands may fall under the jurisdiction of the SJRWMD and FDEP 404. The potential direct wetland impact of the Preferred Alternative as of the current design, is approximately 0.49 acres. CFX has undertaken all actions to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. Nonetheless, CFX has determined that there is no practicable alternative to construction impacts occurring in wetlands. Any unavoidable wetlands will be mitigated to achieve no net loss of wetland function.

2.C.2 – AQUATIC PRESERVES AND OUTSTANDING FLORIDA WATERS

There are no aquatic preserves or Outstanding Florida Waters (OFWs) within the project study area and therefore, the Preferred Alternative will not directly impact either of these resources.

2.C.3 - WATER RESOURCES

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 (WQIE)** was conducted for the project to comply with the Clean Water Act, and is available under separate cover. The results of the WQIE indicate that the project will not result in significant impacts to water quality.

2.C.4 – WILD & SCENIC RIVERS

There are no designated Wild and Scenic Rivers or other protected rivers in the project area and therefore, the Preferred Alternative will not impact this resource.

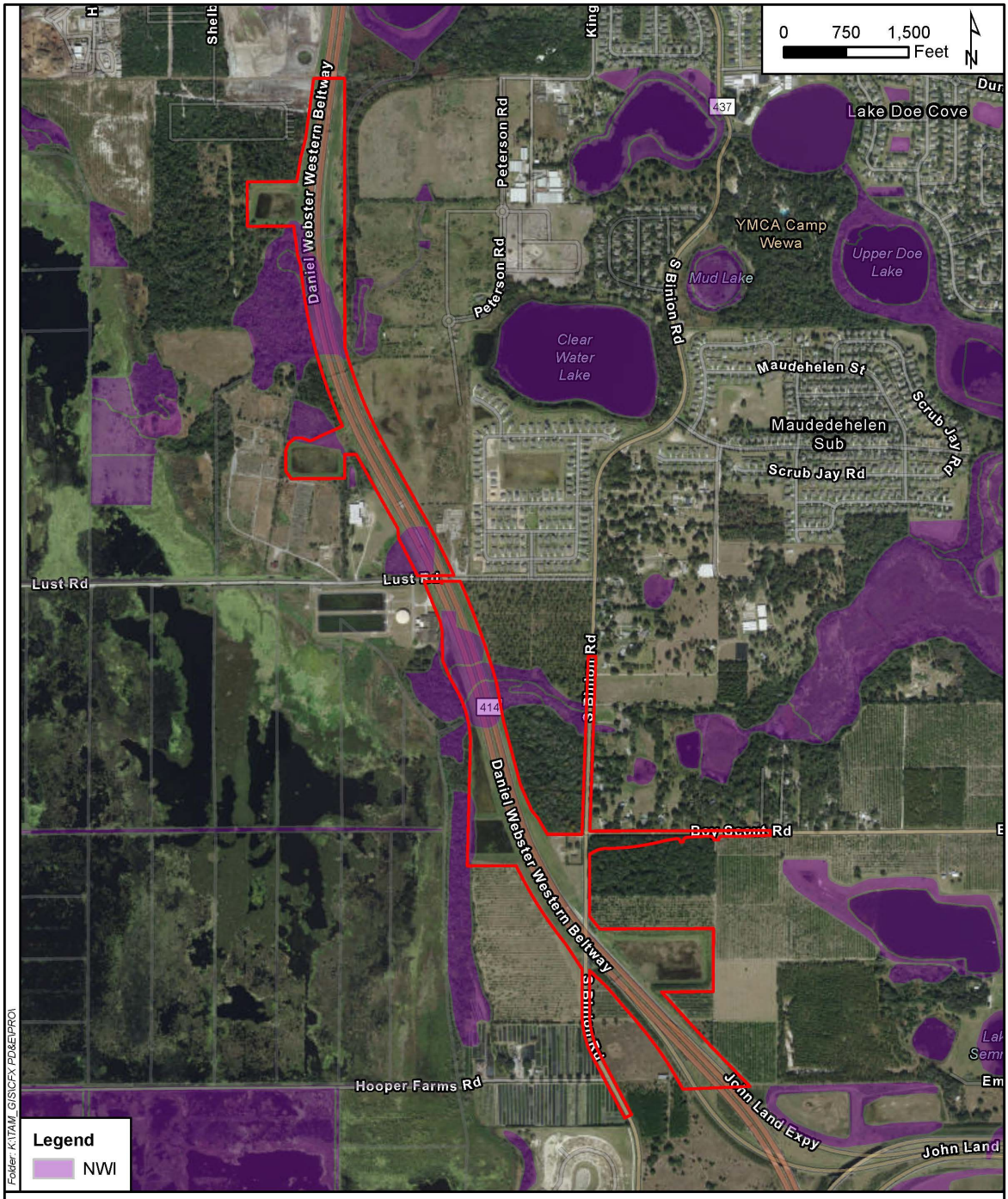
2.C.5 - FLOODPLAINS

Approximately 23 acres of the ±156-acre project site (14.7%) are classified as being within the Federal Emergency Management Agency (FEMA) Flood Zone AE, within the Special Flood Hazard Areas, where an established Base Flood Elevation (BFE) has been determined, as shown on **Figure 6**. The remaining approximately 133 acres of the project site are classified as being within FEMA Flood Zone X, areas of minimal flood hazard. There is no FEMA Regulatory Floodway within the project study area.

The FEMA flood hazard GIS data for Orange County was used to determine proposed impacts to floodplain. The FEMA GIS data reported approximately 23 acres of floodplain within the proposed project; however, this data did not account for the current alignment of SR 429. Excluding the constructed roadway, the proposed impact to floodplain is approximately 1.84 acres.

This new interchange project will have encroachments into the floodplain. Proposed cross drains and bridges will perform hydraulically in a manner equal to or greater than the existing condition, and backwater surface elevations are not expected to increase. Floodplain encroachments will either be mitigated for in floodplain compensation sites and treatment/attenuation pond sites or calculations will be provided showing no increase to the floodplain elevations. These changes will not result in any adverse impacts on the natural and beneficial floodplain values or any changes in flood risk or damage. There will not be a change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that the encroachment type for this project is classified as "minimal".

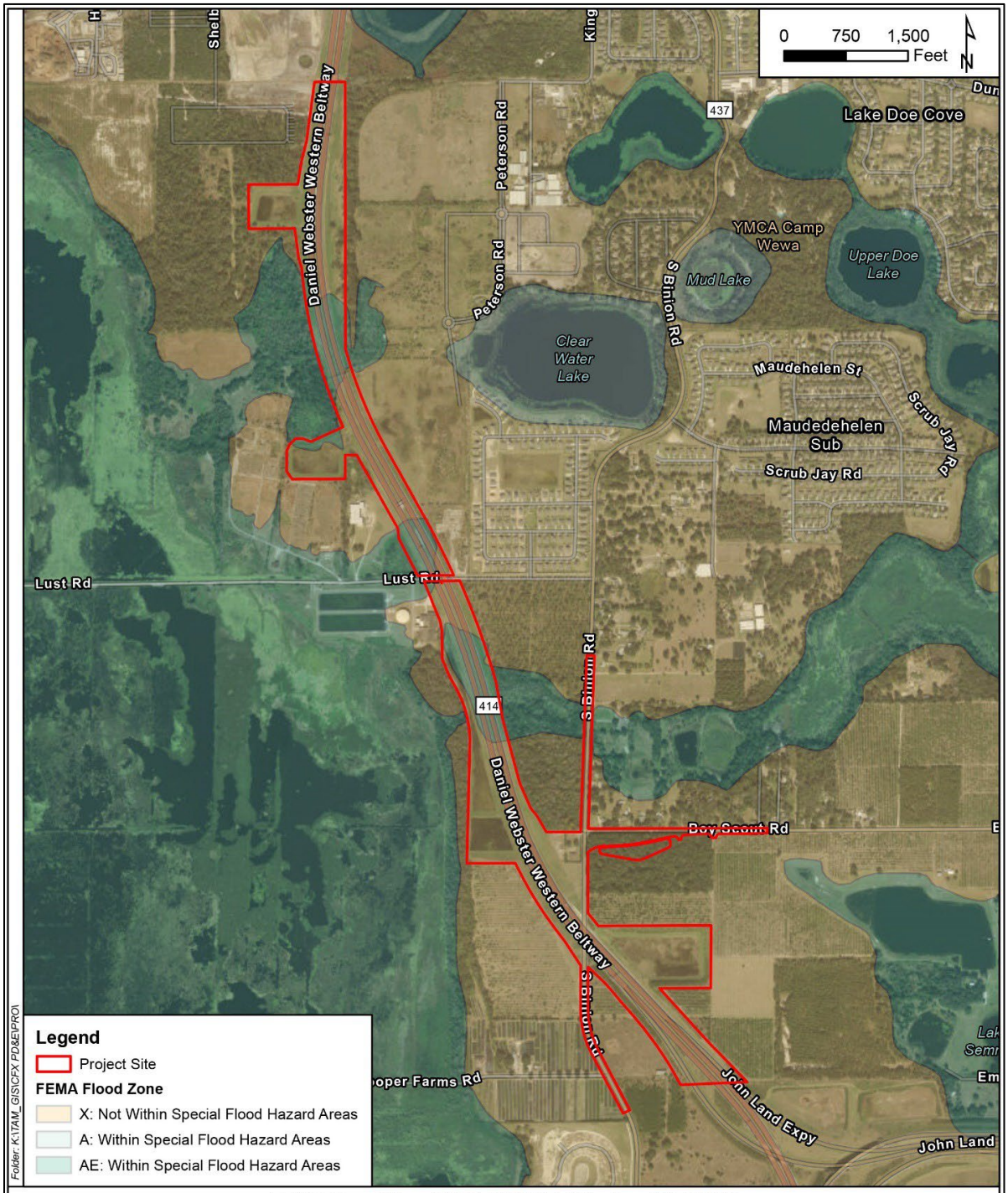
Figure 5: National Wetlands Inventory



National Wetlands Inventory Map

CFX PD&E
Orange County, Florida

Figure 6: FEMA Flood Map



FEMA Flood Map (12095C0120F, Effective 9/25/2009)

CFX PD&E
Orange County, Florida

2.C.6 – COASTAL BARRIER RESOURCES

There are no Coastal Barrier Resources in the project area and therefore, the Preferred Alternative will not impact this resource.

2.C.7 - 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. For more information on protected species and habitat, refer to the **Environmental Assessment Technical Memorandum**, available under separate cover.

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 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 Florida Natural Areas Inventory (FNAI) and USFWS IPaC data, no listed plant or wildlife species have been documented near the project site; however, the wood stork (*Mycteria americana*) was listed as likely to occur within one (1) mile of the project site. The project site lies within the Core Foraging Area (CFA) of two (2) active wood stork colonies. The project site also lies within the USFWS consultation area for the Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida scrub-jay (*Aphelocoma coerulescens*), sand skink (*Plestiodon reynoldsi*), 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*), eastern indigo snake (*Drymarchon couperi*), red-cockaded woodpecker (*Dryobates borealis*), gopher tortoise (*Gopherus polyphemus*), short-tailed snake (*Lampropeltis extenuata*), eastern black rail (*Laterallus jamaicensis ssp. jamaicensis*). There are no known wading bird rookeries or bald eagle nests within the project study area or within one (1) mile of the project site.

Table 5 below lists species that may occur and their likelihood of occurrence. Likelihood of occurrence is based on potential habitat presence and documented occurrences of the species within various databases. A Low ranking indicates that suitable habitat is not likely within the proposed project site and the species has not been documented within one (1) mile of the proposed project site. A Moderate ranking indicates that either suitable habitat is likely within the proposed project site, or the species has been documented within one (1) mile of the proposed project site. A High ranking indicates suitable habitat exists within the proposed project site and the species has been documented within one (1) mile of the proposed project site. Any species with a Moderate or higher Likelihood of Occurrence designation within the project area will be evaluated with the Florida Fish & Wildlife Service early in the design phase, where permitting and construction techniques will be identified.

Table 5: Listed Species with the Potential to Occur Within the Project Site

Common Name	Scientific Name	Status	Documented (<1 mile)	Habitat Present	Likelihood of Occurrence
Avian					
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	FE	No	No	Low
Florida scrub-jay	*Aphelocoma coerulescens*	FT	No	No	Low
Wood stork	*Mycteria americana*	FT	No	Yes	Moderate
Florida sandhill crane	*Grus canadensis pratensis*	ST	No	Yes	Moderate
Bald eagle	*Haliaeetus leucocephalus*	NL*	Yes	Yes	High
Reptilian					
Eastern indigo snake	*Drymarchon corais couperi*	FT	No	Yes	Moderate
Sand skink	*Neoseps reynoldsi*	FT	No	No	Low
Gopher tortoise	*Gopherus polyphemus*	C/ST	No	Yes	Moderate

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
NL - Not Listed, but have other regulatory protections
*Protected by the Bald and Golden Eagle Protection Act
Note: Coordination is not required with FWC for federally listed species

2.C.8 – ESSENTIAL FISH HABITAT

There is no Essential Fish Habitat in the project area and therefore, the Preferred Alternative will not impact this resource.

2.D – Physical Environment Analysis

2.D.1 - 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, five sites (four Category B and one Category C) are currently affected by traffic noise. The noise levels associated with the 2045 No-Build Alternative are predicted to meet or exceed the 66.0 dB(A) FDOT noise abatement criteria (NAC) at nine Category B residences and one Category C site.

Once the interchange project is built, the overall traffic noise levels will increase by an average of 3.1 dB(A), with the average project-related noise level, predicted to be 63.2 dB(A). The 2050 Build Alternative's noise levels are predicted to meet or exceed the 66.0 dB(A) FDOT NAC at 18 Category B and one Category C receptor. The highest noise level is predicted to be 74.0 dB(A) in NSA 3. 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 19 impacted sites. Noise Barrier NB1 was evaluated to mitigate the impacts. Of the three analyzed options, Option 2 and Option 3 were found to meet all FDOT acoustic and cost criteria. Thus, the two options, summarized in **Table 6,** are recommended for further consideration in the project's final design phase.

Table 6: Noise Barrier Recommendations

Noise Study Area	Impacted Development	Barrier ID	Barrier Height (ft)*2	Barrier Length (ft)	Barrier Location	Estimated Barrier Cost*1	Recommended for further evaluation?
NSA 3	Binion Reserve Ivy Trails	NB1 Option 2	14	2,385	Shoulder	$1,001,700	Yes
		NB1 Option 3	14	2,005	Shoulder	$1,089,720	Yes
			10/12/14/16	604	ROW		

**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*

Construction of the Preferred Alternative is not anticipated to cause adverse impact. Additional information is available in the **Highway Traffic Noise and Noise Study Report** available under separate cover.

2.D.2 - 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. Construction of the Preferred Alternative is not anticipated to cause adverse impact.

2.D.3 - CONTAMINATION

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,** available under separate cover, includes a site figure indicating the location of potential contamination sites and brief summaries of the most recent assessment information available through Map Direct. Level II Impact to Construction Assessments (ICAs) or construction support will be required for the Preferred Alternative and ponds improvements east of SR 429 and south of Boy Scout Road due to the potential for residual agricultural chemicals from historical grove and agricultural land uses. Additionally, a site review should be performed early in the design to identify other possible contamination issues.

2.D.4 – UTILITIES & RAILROADS

A Utilities Analysis was prepared per the project scope as a part of the Evaluation of Physical Resources. For the Preferred Alternative, utility relocation is anticipated. Cost and scheduling as well as any Utility Agency Owner dispositions and agreements pertaining to the relocation of any facilities will be further investigated as part of the design phase for this project. Additionally, it was determined that there was no railroad property or facilities within the project area, therefore no impacts to Railroads are anticipated. For the Preferred Alternative, utility relocation is anticipated. Cost and scheduling as well as any Utility Agency Owner dispositions and agreements pertaining to the relocation of any facilities will be further investigated as part of the design phase for this project. Additional information on utilities in the study area is contained in the **Utility Assessment Technical Memorandum**, available under separate cover.

2.D.5 - 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.

Construction of the Preferred Alternative is not anticipated to cause adverse impact.

2.D.6 – BICYCLES AND PEDESTRIANS

As stated earlier in this memo, there are limited sidewalks in the project area, located only along both sides of the Binion Rd bridge and within nearby subdivisions. There are currently no designated bicycle facilities within the immediate study area; however, Harmon Road includes a paved shoulder.

The MetroPlan Orlando Metropolitan Transportation Plan identifies safety improvements on Binion Road from Lakeview Drive to Ocoee-Apopka Road as an unfunded need.

The Orange County Comprehensive Plan 2010-2030 identifies a future Lake Apopka trail that travels along the northern shore of the lake, west of the project. Additionally, the Orange County Transportation Initiative assessment has identified a pedestrian and safety lighting project along Binion Rd as a need.

The Preferred Alternative will provide bicycle and pedestrian facilities in coordination with the City of Apopka within the project area, improving the current conditions.

2.D.6 – NAVIGATION

There are no navigable waterways located within the study area and therefore, the Preferred Alternative will not impact this resource.

Attachment 2 – Alternatives Cost Estimate

ENGINEER'S ESTIMATE - ALTERNATIVE 1
CFX Project No. 429-309
SR 429 / BINION ROAD INTERCHANGE

ITEM	DESCRIPTION	UNIT	QTY	UNIT COST	Total	NOTES:
			ROADWAY			
0101-001-00	MOBILIZATION	LS	1	10%	$ 2,573,776.03	
0102-001-00	MAINTENANCE OF TRAFFIC	LS	1	10%	$ 2,339,796.39	
0110-001-001	CLEARING & GRUBBING	LS	1	-	$ 700,000.00	
0120-001-000	REGULAR EXCAVATION	CY	5,741	$ 25.00	$ 143,537.00	
0120-006-000	EMBANKMENT	CY	53,942	$ 35.00	$ 1,887,970.00	
0104-020-000	EROSION CONTROL	LS	1	-	$ 100,000.00	
0160-004-000	TYPE B STABILIZATION	SY	34,666.9	$ 7.00	$ 242,668.26	
0285-007-009	OPTIONAL BASE GROUP 09 (TYPE B-12.5)	SY	34,666.9	$ 45.00	$ 1,560,010.22	
0334-001-054	SUPERPAVE ASPHALTIC CONCRETE, TRAFFIC D, PG76 22	TN	6,673.4	$ 150.00	$ 1,001,006.56	Assume 3.5" thick Type SP layer for entire project
0337-007-080	ASPHALT CONCRETE FC ,TRAFFIC B, FC-12.5, PG76 22	TN	2,860.0	$ 250.00	$ 715,004.69	Assume 1.5" thick layer for entire project
0400-004-011	CONC CALSSS IV, RETAINING WALLS	CY	879	$ 1,500.00	$ 1,319,050.00	Retaining wall for ponds; assume 10" thic CIP wall similar to CFX 429-153
0440-001-050	UNDERDRAIN, TYPE V	LF	920.0	$ 90.00	$ 82,800.00	It is assumed that 1/2 of the Pond 201A underdrain pipes will need to be replaced
0520-072-101	SOUND/NOISE BARRIER-INC FOUNDATION, PERM	LF	2,527	$ 40.00	$ 101,088.69	
0521-072-040	SHLD CONC BARRIER, 38" OR 44" HT	LF	7922	$ 300.00	$ 2,376,600.00	
0530-074-000	BEDDING STONE	TN	50	$ 200.00	$ 10,000.00	Bedding stone for underdrain replacement
0548-012-000	RETAINING WALL SYSTEM, PERMANENT, EXCLUDING BARRIER	SF	103,755	$ 45.00	$ 4,668,975.00	
0570-001-002	PERFORMANCE TURF, SOD	SY	62,766	$ 6.00	$ 376,595.91	
	DRAINAGE	LS	1	-	$ 500,000.00	Assumed cost per CFX 528-160 sum of drainge pay item totals
	SIGNING AND PAVEMENT MARKING	LS	1	-	$ 1,000,000.00	
	STRUCTURES	LS	1	-	$2,579,162.04	Box Girder Bridge Option
	AET TOLLING POINT	EA	2	$ 680,000.00	$ 1,360,000.00	Per CFX 429-316A + %20 for inflation
	UTILITY RELOCATION	LS	1	-	$ 500,000.00	Conservative cost estimate
0999-001-000	ALLOWANCE FOR DISPUTE REVIEW BOARD	LS	1	$ 50,000.00	$ 50,000.00	
0999-002-000	WORK ORDER ALLOWANCE	LS	1	$ 500,000.00	$ 500,000.00	
				ROADWAY SUBTOTAL =	**$ 26,688,040.78**	
			LIGHTING			
0630-002-011	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	7092	$ 13.00	$ 92,196.00	
0630-002-012	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	500	$ 30.00	$ 15,000.00	
0635-002-011	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	46	$ 1,000.00	$ 46,000.00	
0639-001-112	ELECTRICAL POWER SERVICE, F&I, OVERHEAD METER PURCHASED BY CONTRACTOR FROM POWER COMPANY	AS	2	$ 6,500.00	$ 13,000.00	
0639-002-001	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	500	$ 15.00	$ 7,500.00	
0639-003-011	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	2	$ 1,825.00	$ 3,650.00	
0641-002-012	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II SERVICE POLE	EA	4	$ 1,900.00	$ 7,600.00	
0715-001-012	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	LF	22776	$ 2.75	$ 62,634.00	
0715-007-011	LOAD CENTER, F&I, SECONDARY VOLTAGE	EA	2	$ 18,500.00	$ 37,000.00	
0715-061-221	LIGHT POLE COMPLETE, F&I, STANDARD POLE STANDARD FOUNDATION, 35' MOUNTING HEIGHT, 10' ARM LENGTH	EA	28	$ 10,000.00	$ 280,000.00	
0715-513-135	LIGHT POLE COMPLETE SPECIAL DESIGN, F&I, SINGLR ARM WALL MOUNT, ALUMINUM 3	EA	15	$ 6,000.00	$ 90,000.00	
0715-500-001	POLE CABLE DISTRIBUTION SYSTEM, FURNISH AND INSTALL, CONVENTIONAL	EA	28	$ 755.00	$ 21,140.00	
0715-500-003	POLE CABLE DISTRIBUTION SYSTEM, FURNISH AND INSTALL, WALL MOUNT	EA	15	$ 730.00	$ 10,950.00	
	Contingency (15%)				$ 103,000.50	
				LIGHTING SUBTOTAL =	**$ 789,670.50**	
			INTELLIGENT TRANSPORTATION SYSTEMS (ITS)			
0630-002-011	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	4000	$ 13.00	$ 52,000.00	
0630-002-012	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	1000	$ 30.00	$ 30,000.00	
0630-002-014	CONDUIT, FURNISH & INSTALL, ABOVEGROUND	LF	100	$ 35.14	$ 3,514.00	

ENGINEER'S ESTIMATE
CFX Project No. 429-309
SR 429 / BINION ROAD INTERCHANGE

ITEM	DESCRIPTION	UNIT	QTY	UNIT COST	Total	NOTES:
0633-001-121	FIBER OPTIC CABLE, F&I, UNDERGROUND, 2-12 FIBERS	LF	5100	$ 3.75	$ 19,125.00	
0633-002-031	FIBER OPTIC CONNECTION, INSTALL, SPLICE	EA	20	$ 56.00	$ 1,120.00	
0633-002-032	FIBER OPTIC CONNECTION, INSTALL, TERMINATION	EA	20	$ 92.00	$ 1,840.00	
0633-003-012	FIBER OPTIC CONNECTION HARDWARE, F&I, SPLICE TRAY	EA	4	$ 179.00	$ 716.00	
0633-003-013	FIBER OPTIC CONNECTION HARDWARE, F&I, PRETERMINATED CONNECTOR ASSEMBLY	EA	48	$ 74.00	$ 3,552.00	
0633-003-016	FIBER OPTIC CONNECTION HARDWARE, F&I, PATCH PANEL- FIELD TERMINATED	EA	4	$ 2,024.00	$ 8,096.00	
0633-003-017	FIBER OPTIC CONNECTION HARDWARE, F&I, CONNECTOR PANEL	EA	4	$ 155.00	$ 620.00	
0633-008-001	MULTI-CONDUCTOR COMMUNICATION CABLE, FURNISH & INSTALL	LF	140	$ 6.00	$ 840.00	
0635-002-011	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	10	$ 1,120.00	$ 11,200.00	
0635-002-012	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	15	$ 2,500.00	$ 37,500.00	
0639-002-001	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	5057	$ 16.00	$ 80,912.00	
0639-003-011	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	2	$ 1,800.00	$ 3,600.00	
0639-006-001	ELECTRICAL POWER SERVICE- TRANSFORMER FURNISH & INSTALL	EA	4	$ 3,000.00	$ 12,000.00	
0641-002-012	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II SERVICE POLE	EA	4	$ 2,178.00	$ 8,712.00	
0660-007-022	VEHICLE DETECTION SYSTEM- WRONG WAY FOR EXIT RAMP, 3 OR MORE LANES, AC POV	EA	2	$ 80,000.00	$ 160,000.00	
0676-002-122	ITS CABINET, FURNISH & INSTALL, POLE MOUNT WITH SUNSHIELD, 336S, 24" W X 46" H	EA	2	$ 9,500.00	$ 19,000.00	
0684-001-001	MANAGED FIELD ETHERNET SWITCH, FURNISH & INSTALL	EA	6	$ 5,000.00	$ 30,000.00	
0684-002-001	DEVICE SERVER, FURNISH & INSTALL	EA	1	$ 1,660.00	$ 1,660.00	
0685-001-012	UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND INSTALL, ONLINE/DOUBLE CONVERSI	EA	4	$ 8,800.00	$ 35,200.00	
0685-002-001	REMOTE POWER MANAGEMENT UNIT- RPMU, FURNISH AND INSTALL	EA	4	$ 18,202.00	$ 72,808.00	
0695-003-011	TRAFFIC MONITORING SITE SPEED/CLASSIFICATION UNIT, FURNISH & INSTALL, VOLUME	AS	1	$ 7,100.00	$ 7,100.00	
0700-001-011	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	AS	4	$ 500.00	$ 2,000.00	
0700-006-011	HIGHLIGHTED SIGN, F&I GROUND MOUNT- AC POWERED, UP TO 12 SF	AS	8	$ 7,000.00	$ 56,000.00	
0700-013-012	RETROREFLECTIVE SIGN STRIP- FURNISH AND INSTALL, 2'	EA	6	$ 108.00	$ 648.00	
0700-013-015	RETROREFLECTIVE SIGN STRIP- FURNISH AND INSTALL, 5'	EA	6	$ 95.00	$ 570.00	
	Contingency (25%)				$ 165,083.25	
	INTELLIGENT TRANSPORTATION SYSTEMS (ITS) SUBTOTAL =				**$ 825,416.25**	
	SIGNALIZATION					
0630-002-011	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	400	$ 13.00	$ 5,200.00	
0630-002-012	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	600	$ 30.00	$ 18,000.00	
0632-007-001	SIGNAL CABLE- NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1	$ 8,527.00	$ 8,527.00	
0635-02-011	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	18	$ 1,120.00	$ 20,160.00	
0639-002-001	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	500	$ 16.00	$ 8,000.00	
0639-003-011	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	1	$ 1,800.00	$ 1,800.00	
0649-021-006	STEEL MAST ARM ASSEMBLY, FURNISH AND INSTALL, SINGLE ARM 50'	EA	4	$ 73,000.00	$ 292,000.00	
0650-001-014	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 3 SECTION, 1 WAY	AS	8	$ 1,459.00	$ 11,672.00	
0650-001-016	VEHICULAR TRAFFIC SIGNAL, FURNISH & INSTALL ALUMINUM, 4 SECTION, 1 WAY	AS	4	$ 1,592.00	$ 6,368.00	
0660-004-011	VEHICLE DETECTION SYSTEM- VIDEO, FURNISH & INSTALL CABINET EQUIPMENT	EA	1	$ 15,000.00	$ 15,000.00	
0660-004-012	VEHICLE DETECTION SYSTEM- VIDEO, FURNISH & INSTALL ABOVE GROUND EQUIPMENT	EA	3	$ 6,000.00	$ 18,000.00	
0670-511-000	TRAFFIC CONTROLLER ASSEMBLY, F&I, NEMA, 1 PREEMPTION	AS	1	$ 42,000.00	$ 42,000.00	
	Contingency (25%)				$ 111,681.75	
	SIGNALIZATION SUBTOTAL =				**$ 558,408.75**	
				SUBTOTAL	**$ 28,861,536.3**	

ENGINEER'S ESTIMATE - ALTERNATIVE 2
CFX Project No. 429-309
SR 429 / BINION ROAD INTERCHANGE

ITEM	DESCRIPTION	UNIT	QTY	UNIT COST	Total	NOTES:
			ROADWAY			
0101-001-00	MOBILIZATION	LS	1	10%	$ 2,503,821.45	
0102-001-00	MAINTENANCE OF TRAFFIC	LS	1	10%	$ 2,276,201.32	
0110-001-001	CLEARING & GRUBBING	LS	1	-	$ 700,000.00	
0120-001-000	REGULAR EXCAVATION	CY	5,741	$ 25.00	$ 143,537.00	
0120-006-000	EMBANKMENT	CY	53,942	$ 35.00	$ 1,887,970.00	
0104-020-000	EROSION CONTROL	LS	1	-	$ 100,000.00	
0160-004-000	TYPE B STABILIZATION	SY	31,052.8	$ 7.00	$ 217,369.62	
0285-007-009	OPTIONAL BASE GROUP 09 (TYPE B-12.5)	SY	31,052.8	$ 45.00	$ 1,397,376.14	
0334-001-054	SUPERPAVE ASPHALTIC CONCRETE, TRAFFIC D, PG76 22	TN	5,977.7	$ 150.00	$ 896,649.69	Assume 3.5" thick Type SP layer for entire project
0337-007-080	ASPHALT CONCRETE FC ,TRAFFIC B, FC-12.5, PG76 22	TN	2,561.9	$ 250.00	$ 640,464.06	Assume 1.5" thick layer for entire project
0400-004-011	CONC CALSSS IV, RETAINING WALLS	CY	879	$ 1,500.00	$ 1,319,050.00	Retaining wall for ponds; assume 10" thic CIP wall similar to CFX 429-153
0440-001-050	UNDERDRAIN, TYPE V	LF	920.0	$ 90.00	$ 82,800.00	It is assumed that 1/2 of the Pond 201A underdrain pipes will need to be replaced
0520-001-010	CONCRETE CURB & GUTTER, TYPE F	LF	6,546.0	$ 45.00	$ 294,570.00	
0520-072-101	SOUND/NOISE BARRIER-INC FOUNDATION, PERM	LF	2,527	$ 40.00	$ 101,088.69	
0521-072-040	SHLD CONC BARRIER, 38" OR 44" HT	LF	7922	$ 300.00	$ 2,376,600.00	
0530-074-000	BEDDING STONE	TN	50	$ 200.00	$ 10,000.00	Bedding stone for underdrain replacement
0548-012-000	RETAINING WALL SYSTEM, PERMANENT, EXCLUDING BARRIER	SF	103,755	$ 45.00	$ 4,668,975.00	
0570-001-002	PERFORMANCE TURF, SOD	SY	62,766	$ 6.00	$ 376,595.91	
	DRAINAGE	LS	1	-	$ 500,000.00	Assumed cost per CFX 528-160 sum of drainge pay item totals
	SIGNING AND PAVEMENT MARKING	LS	1	-	$ 1,000,000.00	
	STRUCTURES	LS	1	-	$2,579,162.04	Box Girder Bridge Option
	AET TOLLING POINT	EA	2	$ 680,000.00	$ 1,360,000.00	Per CFX 429-316A + %20 for inflation
	UTILITY RELOCATION	LS	1	-	$ 350,000.00	Conservative cost estimate
0999-001-000	ALLOWANCE FOR DISPUTE REVIEW BOARD	LS	1	$ 50,000.00	$ 50,000.00	
0999-002-000	WORK ORDER ALLOWANCE	LS	1	$ 500,000.00	$ 500,000.00	
				ROADWAY SUBTOTAL =	**$ 26,332,230.92**	
			LIGHTING			
0630-002-011	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	7092	$ 13.00	$ 92,196.00	
0630-002-012	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	500	$ 30.00	$ 15,000.00	
0635-002-011	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	46	$ 1,000.00	$ 46,000.00	
0639-001-112	ELECTRICAL POWER SERVICE, F&I, OVERHEAD METER PURCHASED BY CONTRACTOR FROM POWER COMPANY	AS	2	$ 6,500.00	$ 13,000.00	
0639-002-001	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	500	$ 15.00	$ 7,500.00	
0639-003-011	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	2	$ 1,825.00	$ 3,650.00	
0641-002-012	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II SERVICE POLE	EA	4	$ 1,900.00	$ 7,600.00	
0715-001-012	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	LF	22776	$ 2.75	$ 62,634.00	
0715-007-011	LOAD CENTER, F&I, SECONDARY VOLTAGE	EA	2	$ 18,500.00	$ 37,000.00	
0715-061-221	LIGHT POLE COMPLETE, F&I, STANDARD POLE STANDARD FOUNDATION, 35' MOUNTING HEIGHT, 10' ARM LENGTH	EA	25	$ 10,000.00	$ 250,000.00	
0715-062-121	LIGHT POLE COMPLETE, F&I, STANDARD POLE SPECIAL FOUNDATION, 30' MOUNTING H	EA	16	$ 15,436.06	$ 246,976.96	
0715-500-001	POLE CABLE DISTRIBUTION SYSTEM, FURNISH AND INSTALL, CONVENTIONAL	EA	41	$ 755.00	$ 30,955.00	
	Contingency (15%)				$ 121,876.79	
				LIGHTING SUBTOTAL =	**$ 934,388.75**	
			INTELLIGENT TRANSPORTATION SYSTEMS (ITS)			
0630-002-011	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	4000	$ 13.00	$ 52,000.00	
0630-002-012	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	1000	$ 30.00	$ 30,000.00	
0630-002-014	CONDUIT, FURNISH & INSTALL, ABOVEGROUND	LF	100	$ 35.14	$ 3,514.00	

ENGINEER'S ESTIMATE
CFX Project No. 429-309
SR 429 / BINION ROAD INTERCHANGE

ITEM	DESCRIPTION	UNIT	QTY	UNIT COST	Total	NOTES:
0633-001-121	FIBER OPTIC CABLE, F&I, UNDERGROUND, 2-12 FIBERS	LF	5100	$ 3.75	$ 19,125.00	
0633-002-031	FIBER OPTIC CONNECTION, INSTALL, SPLICE	EA	20	$ 56.00	$ 1,120.00	
0633-002-032	FIBER OPTIC CONNECTION, INSTALL, TERMINATION	EA	20	$ 92.00	$ 1,840.00	
0633-003-012	FIBER OPTIC CONNECTION HARDWARE, F&I, SPLICE TRAY	EA	4	$ 179.00	$ 716.00	
0633-003-013	FIBER OPTIC CONNECTION HARDWARE, F&I, PRETERMINATED CONNECTOR ASSEMBLY	EA	48	$ 74.00	$ 3,552.00	
0633-003-016	FIBER OPTIC CONNECTION HARDWARE, F&I, PATCH PANEL- FIELD TERMINATED	EA	4	$ 2,024.00	$ 8,096.00	
0633-003-017	FIBER OPTIC CONNECTION HARDWARE, F&I, CONNECTOR PANEL	EA	4	$ 155.00	$ 620.00	
0633-008-001	MULTI-CONDUCTOR COMMUNICATION CABLE, FURNISH & INSTALL	LF	140	$ 6.00	$ 840.00	
0635-002-011	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	10	$ 1,120.00	$ 11,200.00	
0635-002-012	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	15	$ 2,500.00	$ 37,500.00	
0639-002-001	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	5057	$ 16.00	$ 80,912.00	
0639-003-011	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	2	$ 1,800.00	$ 3,600.00	
0639-006-001	ELECTRICAL POWER SERVICE- TRANSFORMER FURNISH & INSTALL	EA	4	$ 3,000.00	$ 12,000.00	
0641-002-012	PRESTRESSED CONCRETE POLE, F&I, TYPE P-II SERVICE POLE	EA	4	$ 2,178.00	$ 8,712.00	
0660-007-022	VEHICLE DETECTION SYSTEM- WRONG WAY FOR EXIT RAMP, 3 OR MORE LANES, AC POV	EA	2	$ 80,000.00	$ 160,000.00	
0676-002-122	ITS CABINET, FURNISH & INSTALL, POLE MOUNT WITH SUNSHIELD, 336S, 24" W X 46" H	EA	2	$ 9,500.00	$ 19,000.00	
0684-001-001	MANAGED FIELD ETHERNET SWITCH, FURNISH & INSTALL	EA	6	$ 5,000.00	$ 30,000.00	
0684-002-001	DEVICE SERVER, FURNISH & INSTALL	EA	1	$ 1,660.00	$ 1,660.00	
0685-001-012	UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND INSTALL, ONLINE/DOUBLE CONVERSI	EA	4	$ 8,800.00	$ 35,200.00	
0685-002-001	REMOTE POWER MANAGEMENT UNIT- RPMU, FURNISH AND INSTALL	EA	4	$ 18,202.00	$ 72,808.00	
0695-003-011	TRAFFIC MONITORING SITE SPEED/CLASSIFICATION UNIT, FURNISH & INSTALL, VOLUME	AS	1	$ 7,100.00	$ 7,100.00	
0700-001-011	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	AS	4	$ 500.00	$ 2,000.00	
0700-006-011	HIGHLIGHTED SIGN, F&I GROUND MOUNT- AC POWERED, UP TO 12 SF	AS	8	$ 7,000.00	$ 56,000.00	
0700-013-012	RETROREFLECTIVE SIGN STRIP- FURNISH AND INSTALL, 2'	EA	6	$ 108.00	$ 648.00	
0700-013-015	RETROREFLECTIVE SIGN STRIP- FURNISH AND INSTALL, 5'	EA	6	$ 95.00	$ 570.00	
	Contingency (25%)				$ 165,083.25	
	INTELLIGENT TRANSPORTATION SYSTEMS (ITS) SUBTOTAL =				**$ 825,416.25**	
				SUBTOTAL	**$ 28,092,035.9**	