FINAL

PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

District One

SR 659 (Combee Road) PD&E Study

From US 98 to North Crystal Lake Drive

Polk County, Florida

Financial Management Number: 440274-1

ETDM Number: 14326

Date: May 13, 2022

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.

PROFESSIONAL ENGINEER CERTIFICATION

PRELIMINARY ENGINEERING REPORT

Project: SR 659 (Combee Road) PD&E Study

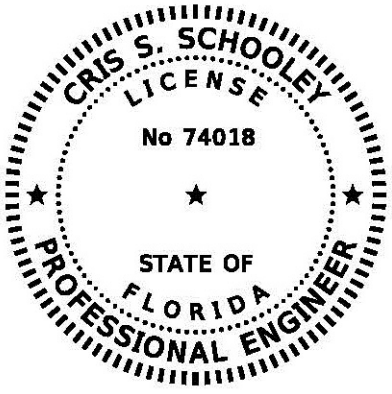
ETDM Number: 14326

Financial Project ID: 440274-1-22-01

Federal Aid Project Number: D117 089 B

This preliminary engineering report contains engineering information that fulfills the purpose and need for SR 659 (Combee Road) Project Development & Environment Study from US 98 to North Crystal Lake Drive in Polk County, Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

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



This item has been digitally signed and sealed by Cris S. Schooley, P.E. on the date adjacent to the seal.

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

TABLE OF CONTENTS

LIST OF FIGURES

Figure | Page Number

LIST OF TABLES

Table | Page Number

APPENDICES

1.0 PROJECT SUMMARY

1.1 Project Description

The Florida Department of Transportation (FDOT) is conducting a Project Development & Environment (PD&E) Study to evaluate a 1.4-mile segment of SR 659 (Combee Road) from US 98 to North Crystal Lake Drive in Polk County, Florida. A project location map is provided in **Figure 1**. Combee Road is a two-lane undivided minor arterial roadway with 4-foot-wide paved shoulders and little to no sidewalk. The area adjacent to the roadway is a mix of industrial, retail/office, and residential land uses. There is an active, at-grade CSX railroad crossing located between McJunkin Road and Crystal Wood Drive. The proposed improvements will enhance multimodal mobility along the roadway with the addition of a two-way left-turn lane (TWLTL) for left-turning traffic and accommodations for pedestrians and bicyclists. Intersection improvements will be made to enhance safety and traffic flow. Additionally, the roadway will be converted from a rural typical section to an urban typical section with curb and gutter and a stormwater collection system to improve drainage conditions.

The project is identified in the Polk Transportation Planning Organization's (TPO's) Long Range Transportation Plan (LRTP) – *Momentum 2045* – as part of the Tier II & III Cost Feasible Complete Street Corridors. Combee Road is also designated as a "constrained" roadway in the LRTP that lists this road as a candidate Congestion Management Plan corridor. The design has been funded, but the right of way (ROW) and construction phases are currently not funded within the Polk TPO's Transportation Improvement Program (TIP) or within FDOT's State Improvement Program (STIP).

1.2 Purpose & Need

The purpose of this project is to enhance safety and multimodal access through a series of complete street strategies along SR 659 (Combee Road) from US 98 to North Crystal Lake Drive in Polk County. Improvements such as sidewalks, safer pedestrian crossings, bicycle facilities, and drainage and lighting improvements were evaluated to enhance the corridor for all types of users. The need for the project is based on the following criteria:

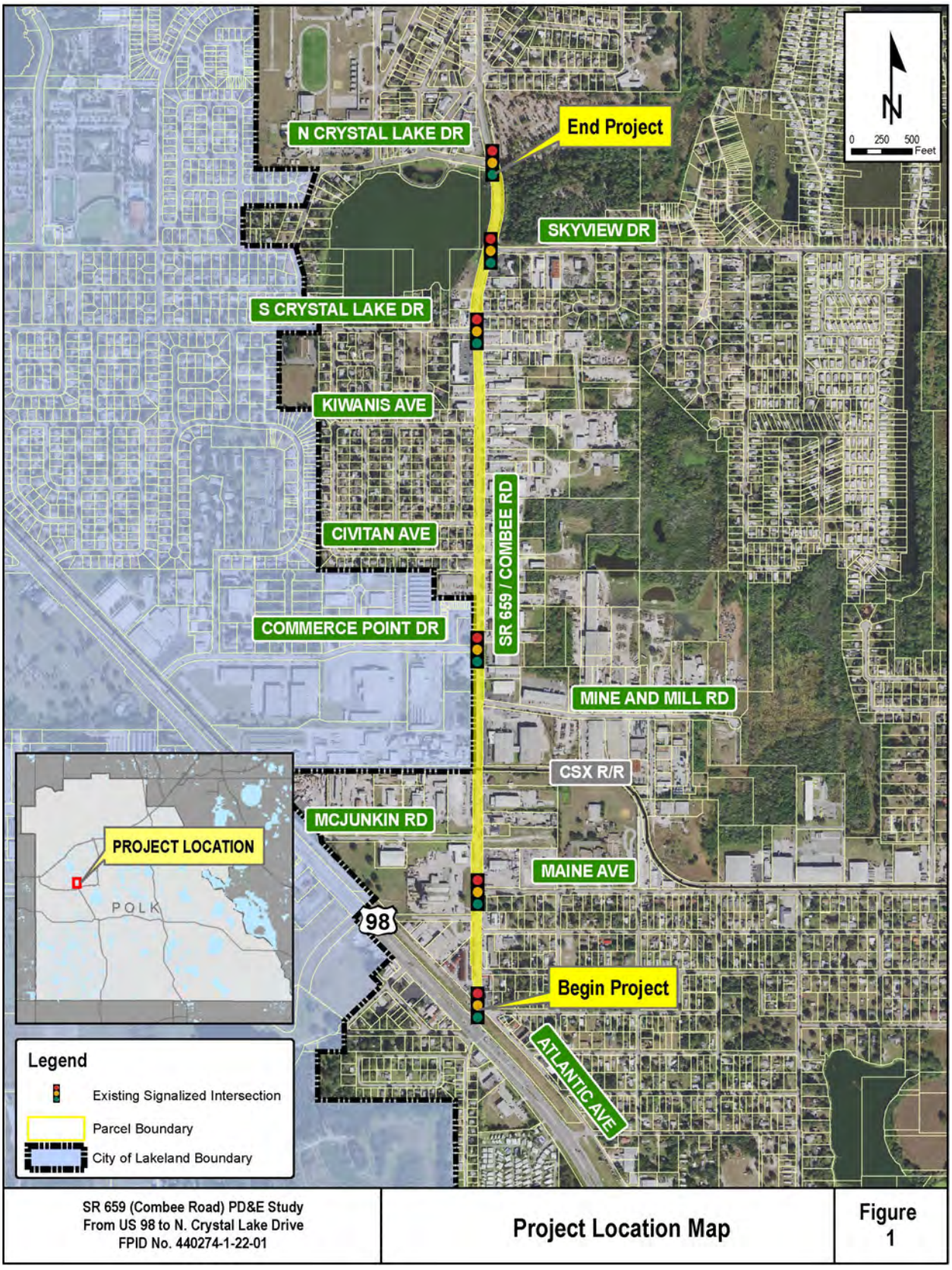


Figure 1: Project Location Map

1.2.1 Modal Interrelationships

The primary purpose of the proposed project is to enhance mobility and access on this corridor for all road users considering context sensitive design opportunities and limitations. SR 659 (Combee Road) includes a mix of industrial, retail/office, and residential land uses. Despite the mixture of land uses and heavy volumes of pedestrian and bicycle traffic, the corridor is not well suited for walking or riding a bicycle. Additionally, there are eight transit stops within the corridor (five on the east side and three on the west side) that have minimal amenities and minimal separation from the roadway. The existing 4-foot-wide paved shoulders can be considered bicycle facilities, but they are unmarked and discontinuous. There are no pedestrian facilities along the roadway within the project limits except for minimal-width sidewalks on the west side near Commerce Point Drive (approximately 250 feet) and from Royal Street to Skyview Drive (approximately 500 feet).

1.2.2 Safety

Between 2014 to 2018, the majority of crashes (52%) on SR 659 (Combee Road) were rear-end crashes. The high rate of this crash type is likely attributed to congestion during peak hours at intersections and where left turning traffic frequently blocks travel lanes. Additionally, the project facility experienced two collisions involving pedestrians and one involving a bicycle. If no improvements occur to the existing roadway, there will be a greater opportunity for vehicle-to-vehicle and vehicle-to-pedestrian/bicycle conflicts as traffic increases along the project facility.

1.2.3 Transportation Demand

The existing roadway is operationally deficient and is not able to safely accommodate the multiple transportation modes that use the corridor, which includes a mix of heavy trucks, passenger vehicles, transit buses, and non-motorized modes. During peak congestion hours, traffic queues build-up due to left-turn vehicles blocking travel lanes. The 2016 annual average daily traffic (AADT) for the corridor ranged from 14,500 near US 98 to 19,000 near North Crystal Lake Drive. SR 659 (Combee Road) serves as a freight route providing access to many industrial businesses in the area. Approximately 10.4% of the 2016 AADT on the roadway is composed of trucks. Not only does this roadway facilitate truck traffic and the distribution of goods to local activity areas, it functions as an important corridor for commuters due to its access to major transportation facilities and surrounding residential and commercial land uses.

1.2.4 Social and Economic Demand

The complete streets improvement project will promote aesthetics and economic activity in the corridor by providing individuals with enhanced alternative transportation options and improved multi-modal access to businesses, residences, and community facilities in the area. Community facilities in the area that will benefit from improved accessibility include Oscar J. Pope Elementary

School, South McKeel Elementary Academy, Crystal Lake Middle School, Southeastern University, churches, and restaurants.

1.2.5 Project Status

The project is identified in the Polk TPO's Long Range Transportation Plan (LRTP) - Momentum 2045 as part of the Tier II & III Cost Feasible Complete Streets Corridors. Combee Road is also designated a "constrained" roadway in the LRTP that lists this road as a candidate Congestion Management Plan corridor. The design was funded for $2,755,000 in Fiscal Year 2020 (FPID 440274-2), but the ROW and construction phases are currently not funded within the Polk TPO's Transportation Improvement Program (TIP) or within FDOT's State Transportation Improvement Program (STIP).

1.3 Commitments

The environmental commitments are:

- The most recent version of the US Fish and Wildlife Service (USFWS) Standard Protection Measures for the Eastern Indigo Snake will be adhered to during construction of the proposed project.
- Impacts to suitable foraging habitat for the federally-protected wood stork will be mitigated through the purchase of credits from a USFWS-approved mitigation bank pursuant to Section 373.4137, F.S. or as otherwise agreed to by FDOT and the appropriate regulatory agencies.
- If Florida sandhill crane nests are observed during future re-surveys prior to construction, then a 400-foot buffer will be used if construction occurs during the nesting season (January through July). FDOT will coordinate with the Florida Fish and Wildlife Conservation Commission (FWC) during the project construction phase, if necessary.
- FDOT will further coordinate with Polk County, including the Parks and Natural Resources Division Director, during the design phase regarding the use of the pond within Crystal Lake Park.

1.4 Alternatives Analysis Summary

The alternatives were developed in consideration of the previous Polk TPO planning study, input from local agencies, and public comments received at the public meetings.

The alternatives analyzed include Alternative 1-with bike lanes, Alternative 2-with wide sidewalks, and a No-Build Alternative. The No-Build Alternative assumes no improvements to the corridor other than routine maintenance. The Intersection Control Evaluation (ICE) process was used to evaluate roundabouts at the five existing signalized intersections within the project limits.

Based on the results of the ICE and comparative alternatives analysis, the preferred alternative is Alternative 2 with wide sidewalks and roundabout intersections at Maine Avenue and Skyview Drive. The traffic signal control at Commerce Point Drive, South Crystal Lake Drive, and North Crystal Lake Drive will remain, but with enhanced multimodal accommodations such as crosswalks and pedestrian signals at all quandrants.

1.5 Description of Preferred Alternative

The preferred alternative is Alternative 2, which will reconstruct the roadway with a 13-foot-wide TWLTL, one lane in each direction, type F curb and gutter, and 8-foot-wide sidewalks (see **Figure 2**). Although the preferred alternative does not include bicycle lanes, cyclists will be accommodated on the road or can utilize the proposed wide sidewalks. This alternative has a 4-foot grass buffer from the road to the sidewalk, reduces the hazard to cyclists from turning trucks, and allows for greater utility avoidance of above-ground utilities.

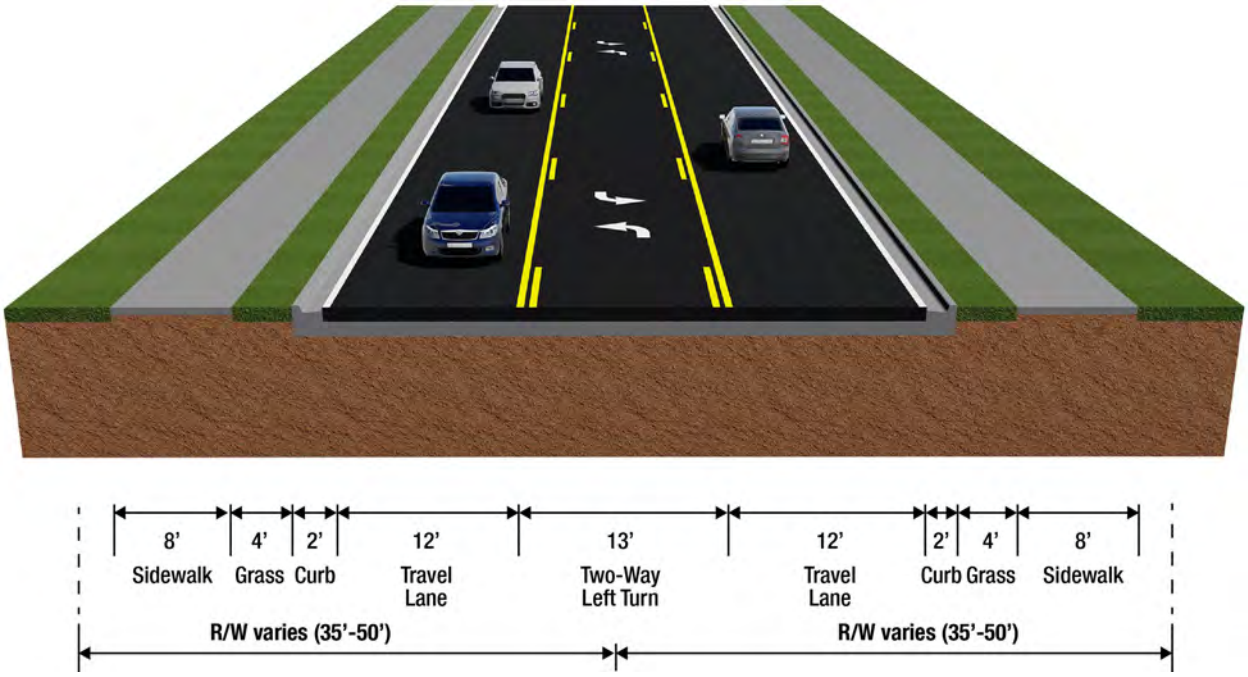


Figure 2: Preferred Alternative Typical Section

1.6 List of Technical Materials

The following technical materials are being or have been prepared to support the project:

- Type 2 Categorical Exclusion
- Cultural Resource Assessment Survey
- Level I Contamination Screening Evaluation Report
- Location Hydraulics Report
- Natural Resource Evaluation
- Pond Siting Report
- Project Traffic Analysis Report
- Context Classification Memorandum
- Noise Study Memorandum
- Water Quality Impact Evaluation
- Intersection Control Evaluations, Stage 1
- Intersection Control Evaluations, Stage 2

2.0 EXISTING CONDITIONS

2.1 Typical Section

Combee Road is a two-lane undivided minor arterial roadway with 12-foot-wide travel lanes, 4-foot-wide paved shoulders, little to no sidewalk, and most drainage conveyed to roadside ditches (see **Figure 3**). The design and posted speed limit is 40 miles per hour. Even though the roadway is undivided, the existing Access Management Class 5 indicates a restrictive median.

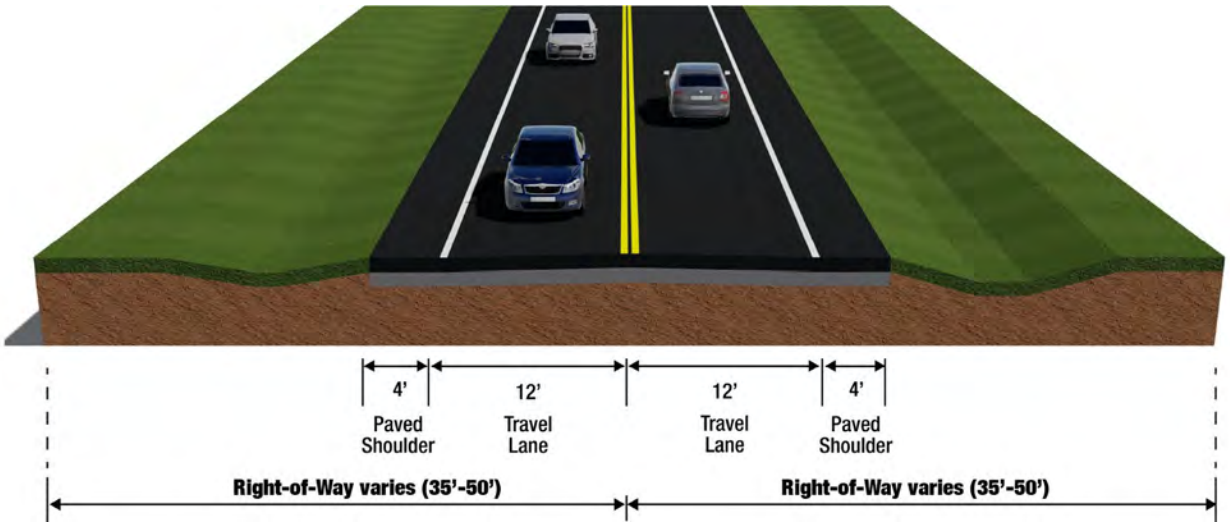


Figure 3: Existing Combee Road Typical Section

2.2 Right of Way (ROW)

The existing ROW along Combee Road varies from 70 to 100 feet. **Table 1** shows the available ROW widths between the cross streets.

Table 1: Existing Right of Way along Combee Road

From	To	Minimum ROW (ft.)
US 98	Maine Ave	70
Maine Ave	Commerce Point Dr	80
Commerce Point Dr	S Crystal Lake Dr	75
S Crystal Lake Dr	N Crystal Lake Dr	90

2.3 Existing Land Use

The existing land use at the southern end of the project is dominated by light industrial and commercial uses. Between East Civitan Avenue and North Crystal Lake Drive, the land use consists of residential and commercial uses. The existing City of Lakeland zoning is shown in **Figure 4**.

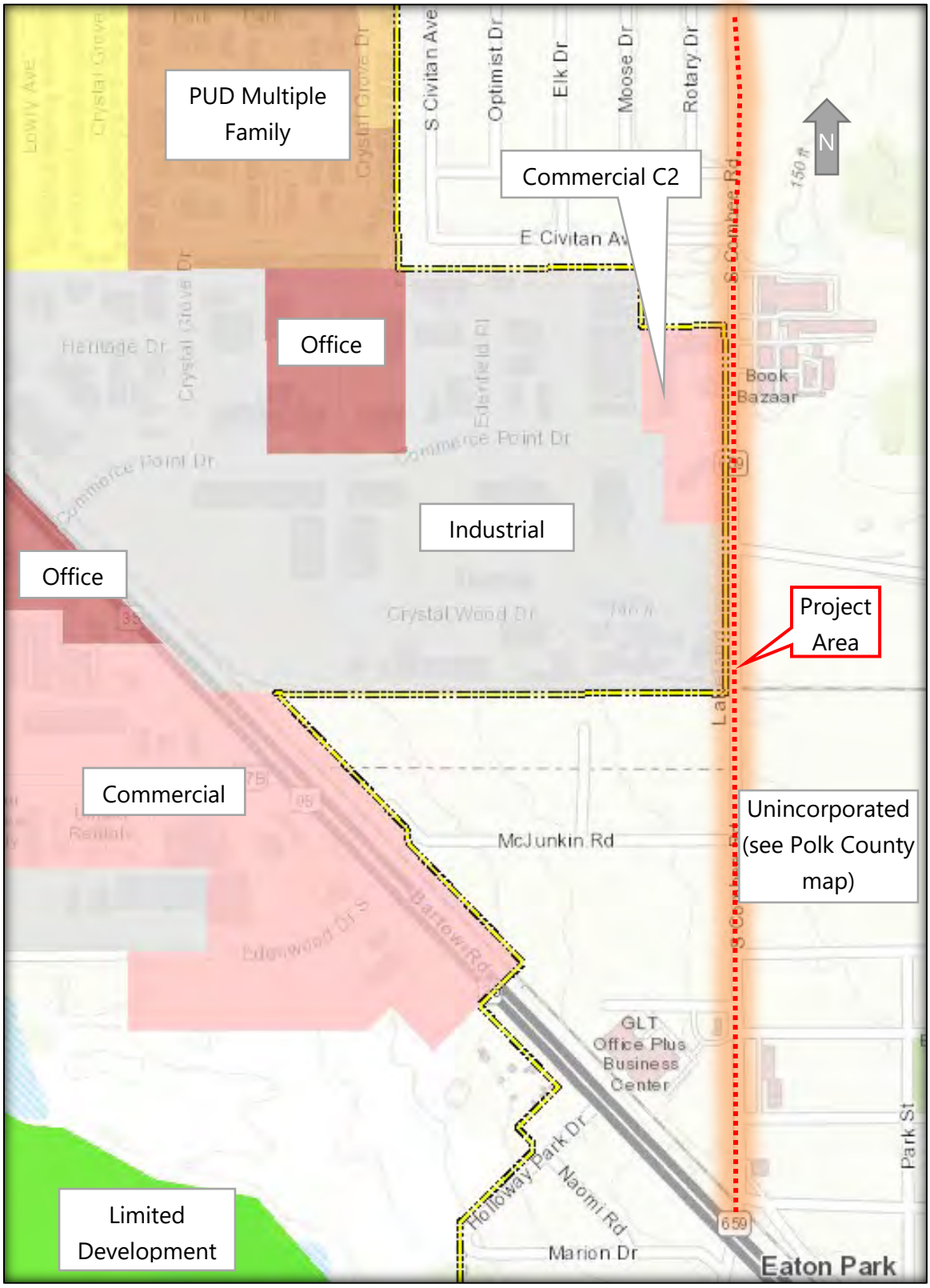


Figure 4: City of Lakeland Zoning (Source: ArcGIS)

Land use in unincorporated Polk County is available online and designated on the Future Land Use Map Series[1] shown in **Figures 5** and **6.**

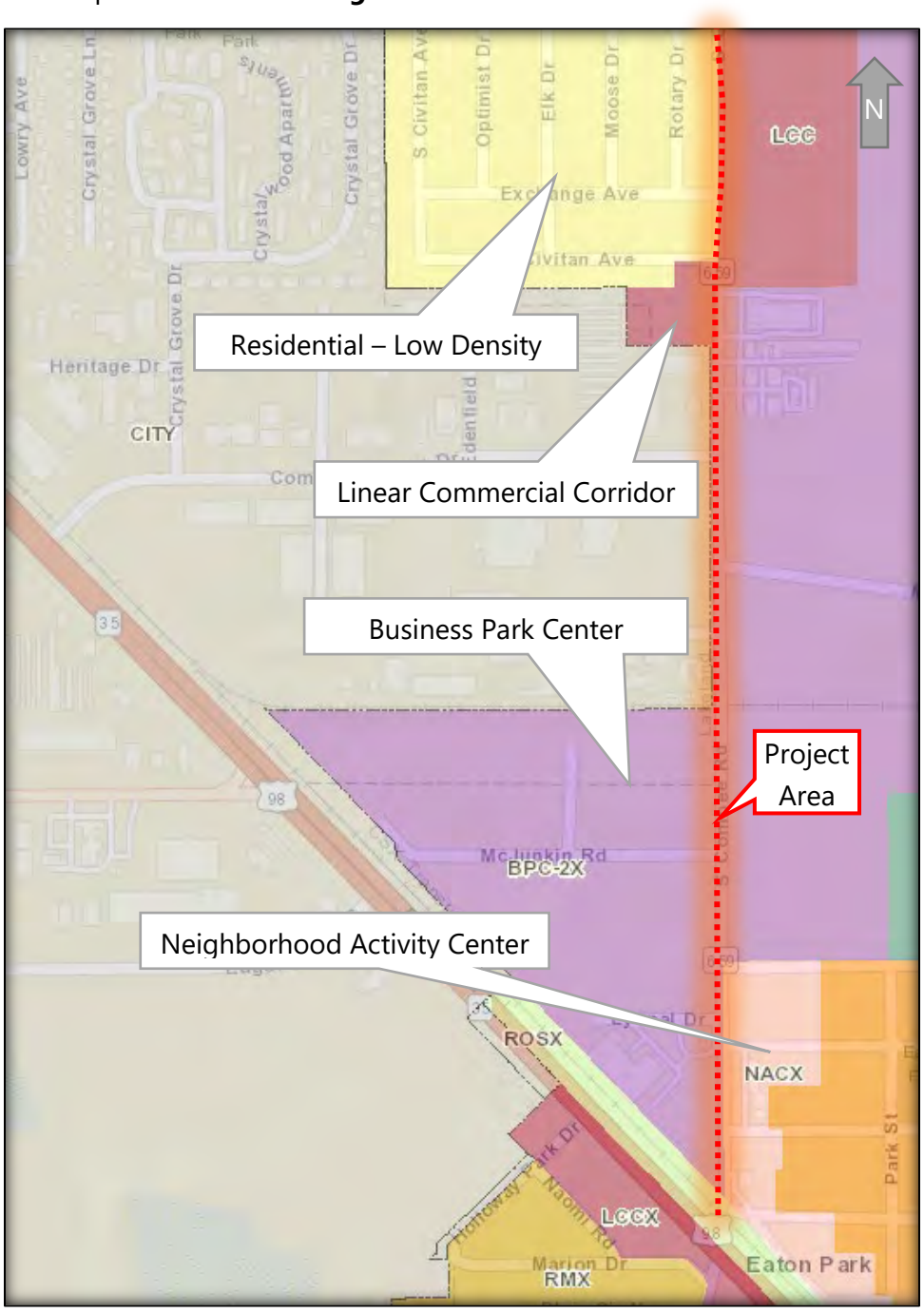


Figure 5: Polk County Future Land Use Map - south (Source: Polk County)

[1] Polk County Land Development Code, Revised March 2019. Section 203. Accessed on August 26, 2020 from https://www.polk-county.net/docs/default-source/land-development/chapter-2-march-2019-(1).pdf

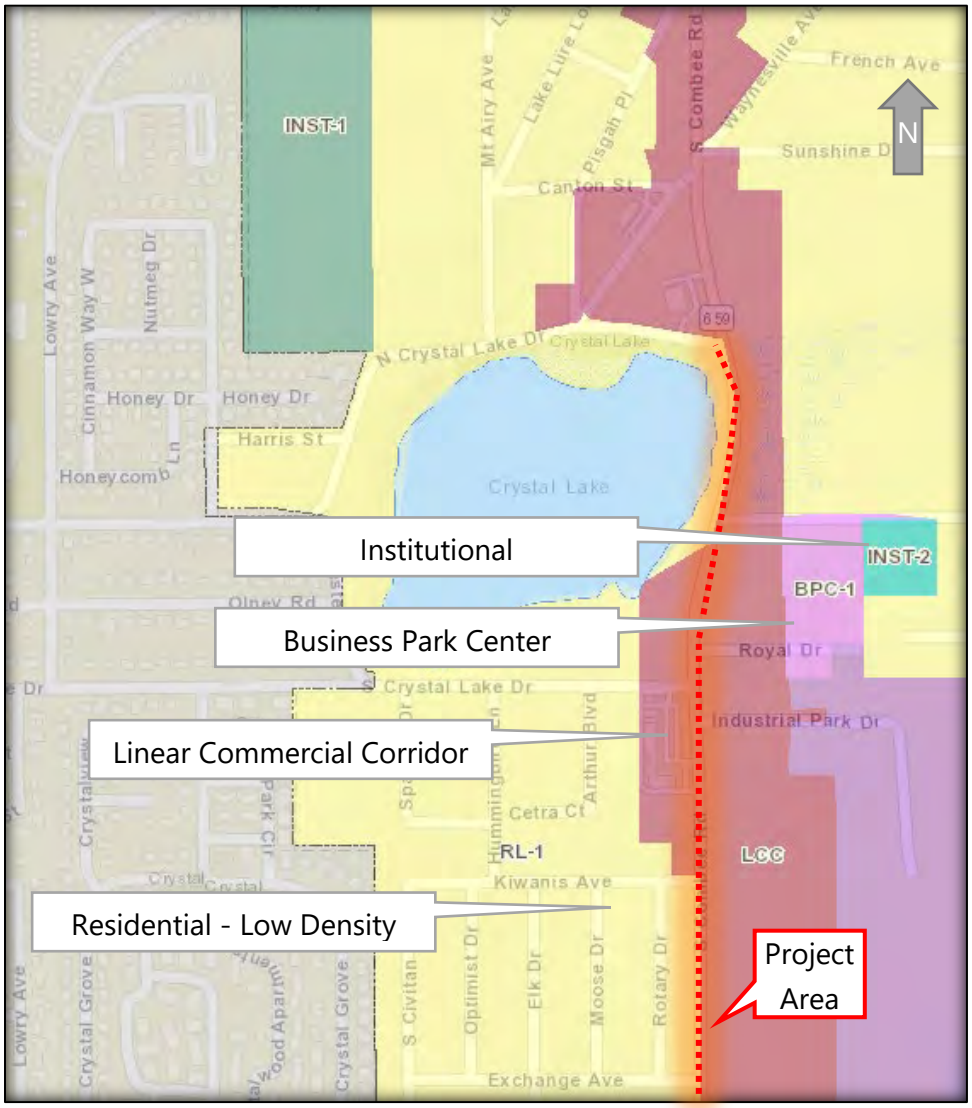


Figure 6: Polk County Future Land Use Map - north (Source: Polk County)

2.4 Roadway Context Classification

The corridor was reviewed for distinguishing characteristics and primary measures as outlined within the FDOT's Context Classification Matrix.[2] These measures were evaluated based on field visits, data from Polk County and the City of Lakeland, and review of aerial photography.

Based on a review of the distinguishing characteristics and primary measures, the following context classification was approved by FDOT:

- C3C for the segment from US 98 to Civitan Avenue
- C3R for the segment from Civitan Avenue to North Crystal Lake Drive

Additional details justifying the context classification were documented in a *Context Classification Memorandum*, dated May 8, 2018.

2.5 Vertical and Horizontal Alignment

The existing vertical geometry was extracted from the 2002 resurfacing plans and CADD files (FPID 197692-1-52-01) with unknown datum and summarized in **Table 2**. Although the centerline grade from Station 73 to 80 is below a desirable minimum for curb and gutter, the road is superelevated in this area and the gutter line follows a different sawtooth profile. Thus, the roadway grade does not appear to be a hinderance to installing curb and gutter with a closed drainage system. Existing vertical curve lengths are adequate for the 40 MPH posted speed.

Table 2: Existing Vertical Alignment

Location	Station	Distance to next VPI (ft)	Elevation	Grade Ahead	VC Length Required (ft)	VC Length Provided (ft)
Begin	6+20	4360	142.80	0.25%	N/A	-
	49+80	1280	153.72	-0.29%	N/A	-
S Crystal Lake Dr	62+60	840	150.00	-0.95%	N/A	120
Skyview Dr	71+00	200	142.00	0.30%	80	540
	73+00	400	142.60	-0.15%	N/A	-
	77+00	300	142.00	0.13%	N/A	-
End	80+00	-	142.40	-	-	-

[2] FDOT 2020. *FDOT Context Classification Guide*. Table 1. Pages 8 and 9. Dated July 2020. Accessed on April 29, 2021 from https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/completestreets/files/fdot-context-classification.pdf?sfvrsn=12be90da_2

Combee Road is a north-south roadway with three horizontal curves within the project limits. The existing horizontal alignment data for Combee Road is shown in **Table 3**. While the existing curves seem to have been designed with the criteria for 10% max superelevation, this project proposes to construct curb and gutter and utilize a 5% max superelevation to help calm traffic speeds. Based on the low-speed criteria, variations would be required for curve lengths less than 400 feet.

Table 3: Existing Horizontal Alignment

Existing Curve Data							Criteria			Variation or Exception
PC	PI	PT	Length	Radius	Δ	e	Speed	e	Desirable Length	
STA.	STA.	STA.	(ft)	(ft)			MPH		(ft)	
56+33.03	57+64.03	58+94.98	261.94	5,730.65	2°	RC	40	NC	800	Length
63+31.70	64+98.39	66+62.75	331.06	1,145.92	16°	0.087	40	RC	600	Length
72+66.01	74+94.39	77+14.34	448.33	954.92	26°	0.073	40	RC	600	-

2.6 Pedestrian Facilities

Most of the Combee Road project limits lack sidewalks. The only existing sidewalks are on the west side north of Commerce Point Drive and on the west side from South Crystal Lake Drive to the end of the project at North Crystal Lake Drive. **Figure 7** shows the typical location of the sidewalk with a 6-foot-tall chain link fence between the sidewalk and Crystal Lake. Although the fence may have been intended to prevent school-aged children from entering the lake or wildlife from entering the roadway, it has the unintended consequence of diminishing the quality and enjoyment of the pedestrian facility around the lake.

Figure 7: Photo of Combee Road (looking south near Skyview Drive)

2.7 Bicycle Facilities

The existing 4-foot shoulders along Combee Road can be considered bicycle facilities, but they are unmarked and discontinuous. The shoulders were likely intended to support vehicle traffic and open drainage since they terminate whenever sections of curb and gutter or right-turn lanes are introduced. Despite the lack of facilities, cyclists have been observed accessing the destinations along Combee Road (see **Figure 8**).

Figure 8: Photo of cyclist on shoulder of Combee Road (looking south)

2.8 Transit

The Lakeland Area Mass Transit District, operating as Citrus Connection, serves Combee Road from ten bus stops in the project area: five on northbound Combee Road, three along southbound Combee Road, one along eastbound North Crystal Lake Drive, and one along westbound Bartow Road (US 98). **Table 4** shows stop locations and existing transit facilities.[3]

Table 4: Transit Facilities

Location	Route Direction	Facility
N Crystal Lk Dr & S Combee Rd - Stop 1467	Green 1- eastbound Orange 2- eastbound	Sign, bench
S Combee Rd & Skyview Dr - Stop 754	Green 2- northbound	Sign, boarding & alighting area
S Combee Rd & S Crystal Lake Dr - Stop 1528	Green 2- northbound	Sign, boarding & alighting area
S Combee Rd & Kiwanis Ave - Stop 1529	Green 1- southbound	Sign, boarding & alighting area
S Combee Rd & Commerce Point Dr - Stop 760	Green 1- southbound	Sign, boarding & alighting area
S Combee Rd & Mine and Mill Rd - Stop 758	Green 2- northbound	Sign
S Combee Rd & N McJunkin Rd - Stop 1524	Green 2- northbound	Sign, bench
S Combee Rd & McJunkin Rd - Stop 757	Green 1- southbound	Sign, boarding & alighting area
S Combee Rd & Ellis Ave - Stop 756	Green 2- northbound	Sign, boarding & alighting area

[3] myStop - Citrus Connection Routes. Accessed May 27, 2020 from https://www.ccbusinfo.com/InfoPoint/

Location	Route Direction	Facility
Bartow Rd & S Combee Rd - Stop 769	Green 1- westbound	Sign, boarding & alighting area, bench, trash receptacle

Although most transit stops have boarding and alighting areas (also known as bus pads), they do not have sidewalk connections (**Figure 9**).

Figure 9: Photo of bus pad along Combee Road (looking south)

The Citrus Connection routes in the study area (see **Figures 10** thru **13**) went into effect October 7, 2019 with seven buses per day on each route.[4] Service is limited to weekdays only. The new Green Route travels along Combee Road from Bartow Road (US 98) to Skyview Drive, and from Skyview Drive to North Crystal Lake Drive. The Green Route turns at Bartow Road, Skyview Drive, and North Crystal Lake Drive instead of traveling straight through these intersections. The Orange Route briefly passes through the project area when it traverses the intersection of Combee Road at North Crystal Lake Drive. The Green 2 and Orange 2 Routes have been temporarily suspended due to the pandemic, but are anticipated to return.

[4] Re-Route 2020 – Citrus Connection. Accessed August 16, 2019 from http://ridecitrus.com/re-route-2020/

Figure 10: Green 1 Bus Route Map (Source: Citrus Connection)

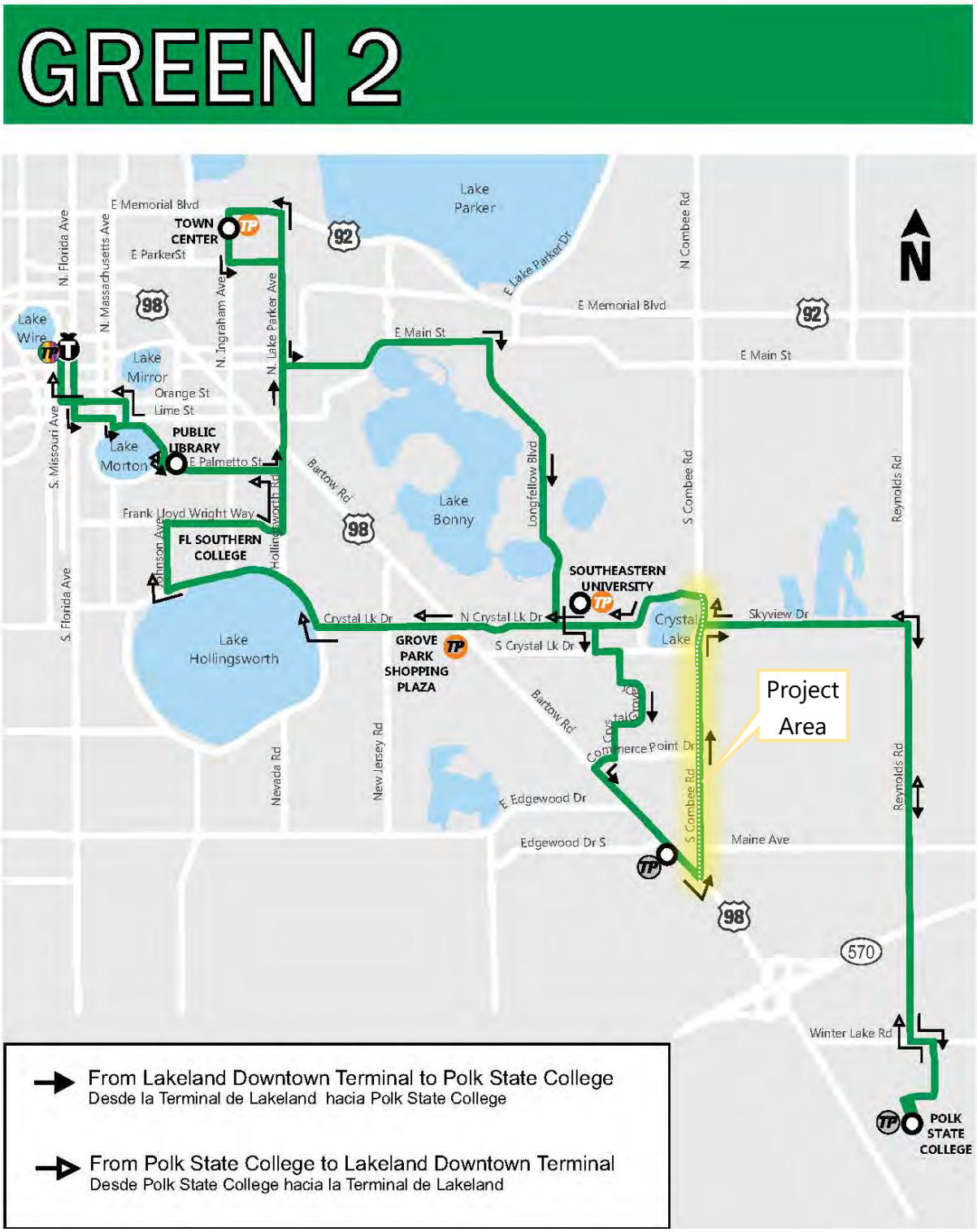


Figure 11: Green 2 Bus Route Map (Source: Citrus Connection)

Figure 12: Orange 1 Bus Route Map (Source: Citrus Connection)

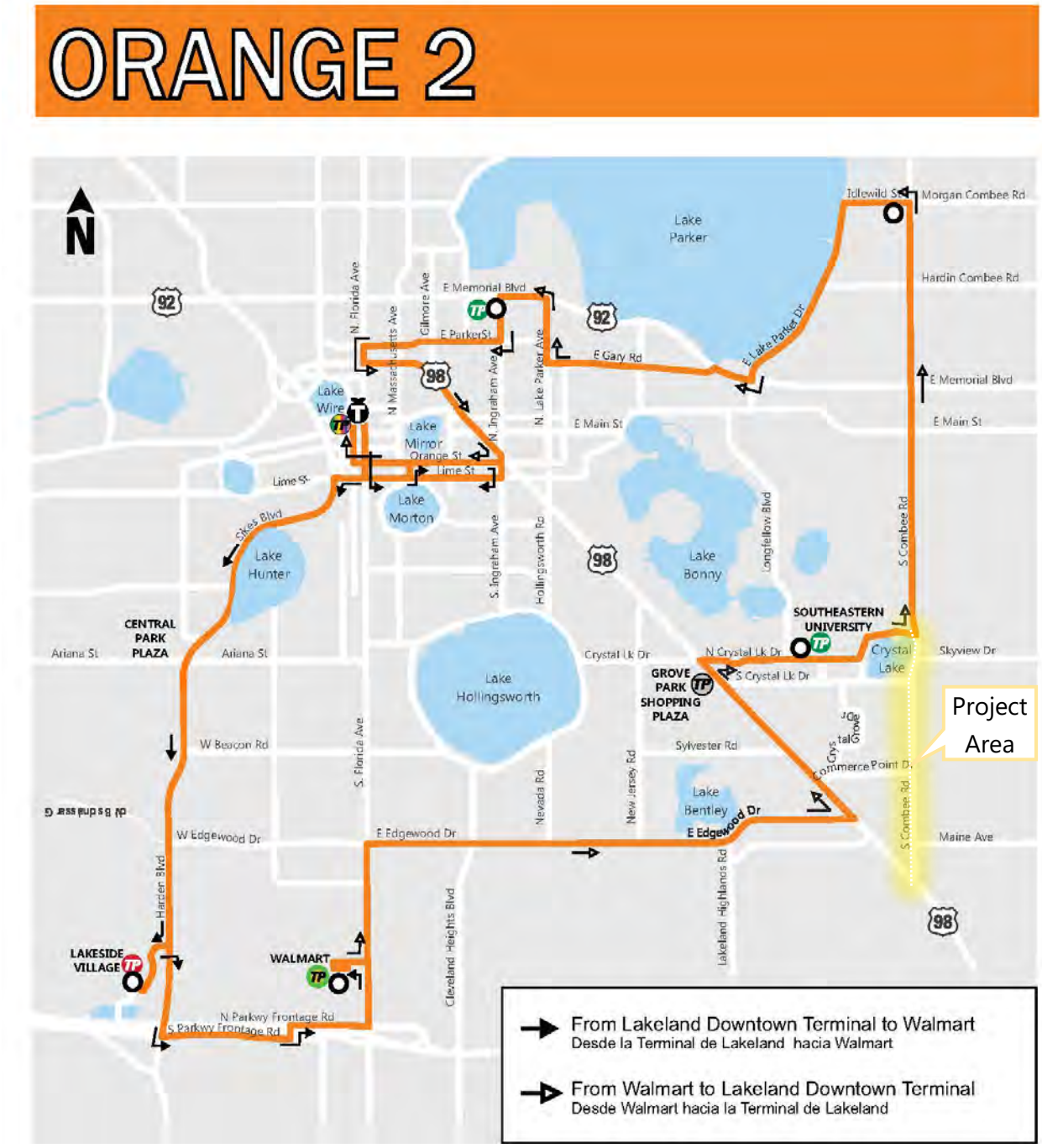


Figure 13: Orange 2 Bus Route Map (Source: Citrus Connection)

2.9 Pavement Condition

According to FDOT's All System Pavement Condition Forecast,[5] the last roadway resurfacing for the corridor was completed in 2004 and the pavement has had satisfactory ratings for Cracking and Ride (8.0 and 6.6, respectively) ever since. These ratings are not projected to become deficient (any rating <=6) within the next five years.

Some localized pavement distress was identified in the left-turn lane of Combee Road north of Skyview Drive, as shown in **Figure 14.** A geotechnical pavement evaluation is recommended during the design phase to determine the cause.

Figure 14: Photo of pavement distress on Combee Road (looking south)

[5]FDOT, accessed July 11, 2019 from https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/pm/pcs/pcscn16a.pdf

2.10 Traffic

This section summarizes the existing traffic characteristics. Detailed traffic information is shown in the *Project Traffic Analysis Report (PTAR),* under separate cover.

Portable Traffic Monitoring Site number 165186 is on Combee Road south of Maine Avenue within the study area. The traffic characteristics at this location are shown in the table below.[6]

Table 5: Portable Traffic Monitoring Site Information

Portable Traffic Monitoring Site Data from 2020:	
Road Name	COMBEE RD
Site	165186
Description	SR 659/COMBEE RD, S OF MAINE AVENUE
Section	16006000
Milepoint	0.185
Lat/Long	28.01097, -81.90775
AADT	14100
Site Type	Portable
Class Data	Yes
K Factor	9
D Factor	53.4
T Factor	13.5

The traffic counts used for the PTAR were collected for the *Phase 1 Corridor Analysis for SR 659* (FPID 436417-1-32-01 Task Work Order 15, dated August 19, 2016) and included three-day 24-hour machine counts, 24-hour approach counts, 4-hour driveway counts, and 8-hour turning movement counts. **Table 6** summarizes the daily counts along Combee Road north of Exchange Avenue.

Table 6: Daily Traffic Count Data

Day of Week	**Northbound**	**Southbound**	**Total**
Tuesday	8,519	8,529	17,048
Wednesday	8,438	8,359	16,797
Thursday	8,363	8,408	16,771
Average	**8,440**	**8,432**	**16,872**

[6] Florida Traffic Online, accessed June 14, 2021 from https://tdaappsprod.dot.state.fl.us/fto/

The Recommended Traffic Data and Factors from the PTAR are shown in **Table 7.** The K value indicates the percentage of daily trips that occur in the peak hour and is a standard value. The directional (D) factor indicates the disproportionality of the traffic direction in the peak hour. The truck (T) percentage is the percent of the vehicles that are heavy vehicles/trucks. The high truck percentage is consistent with the industrial uses and Combee Road's functional classification.

Table 7: Recommended Traffic Data and Factors

Current Year	2016
Opening Year	2025
Design Year	2045
Standard K	9%
D Factor	55.47%
T Daily	10.41%
Design Hour T	5.21%

The 2016 Annual Average Daily Traffic (AADT) on Combee Road is shown in **Table 8.** Traffic volumes are generally lower in the south and higher in the north, with the highest volume between Skyview Drive and North Crystal Lake Drive.

Table 8: Segment Traffic Volume

SR 659 Combee Road Segment	2016 AADT
South of US 98	1,100
US 98 to Maine Avenue	14,500
Maine Avenue to McJunkin Road	15,500
McJunkin Road to Commerce Point Drive	15,500
Commerce Point Drive to South Crystal Lake Drive	16,500
South Crystal Lake Drive to Skyview Drive	18,500
Skyview Drive to North Crystal Lake Drive	19,000
North of North Crystal Lake Drive	18,400

The two-lane undivided Combee Road does not have dedicated lanes to turn into many of the driveways and side streets in the project limits. Thus, left turning vehicles impede traffic and contribute to delays and safety issues. **Figure 15** shows a vehicle using the shoulder to pass a left-turning vehicle at Exchange Avenue.

Figure 15: Photo of Combee Road traffic using shoulder to pass (looking south)

The existing level of service analysis utilized FDOT Generalized LOS tables for State Signalized Arterials in Urbanized Areas. **Table 9** assumes a 40 MPH or higher speed limit with volume adjustments for presence/absence of intersection turn lanes. Most of the segments with failing levels of service in the existing year (except for Skyview Drive to North Crystal Lake Drive) would meet the LOS target of "D" with turn lanes added.

Table 9: Existing Segment Level of Service

SR 659 Combee Road Segment	2016 LOS
South of US 98	C
US 98 to Maine Avenue	C
Maine Avenue to McJunkin Road	C
McJunkin Road to Commerce Point Drive	F
Commerce Point Drive to South Crystal Lake Drive	F
South Crystal Lake Drive to Skyview Drive	D
Skyview Drive to North Crystal Lake Drive	F
North of North Crystal Lake Drive	F

Signalized intersections within the study limits were analyzed for existing level of service, as shown in **Table 10**. The Combee Road intersections with US 98 and North Crystal Lake Drive operate with volume to capacity ratios that exceed 1.0, but only the US 98 intersection fails to meet the LOS target of "D".

Table 10: Existing Signalized Intersection Level of Service

SR 659 (Combee Road) &	Existing Year 2016			
	Overall Delay (Sec/Veh)	Overall LOS	Max V/C	Mvmt.
US 98	75.0	E	1.56	SBL
Maine Avenue	15.5	B	0.71	WBL
Commerce Point Drive	28.0	C	0.93	EBL
South Crystal Lake Drive	18.6	B	0.88	EBL
Skyview Drive	23.9	C	0.84	NBT
North Crystal Lake Drive	40.9	D	1.07	EBL

2.11 Intersections

There are 17 intersections within the project limits, six of which are signalized with traffic signals on steel mast arms. The existing intersections are described in **Table 11,** the existing lane geometry shown in **Figure 16,** and the existing intersection spacing described in **Table 12.** The most common intersection deficiency is lack of pedestrian accommodations and spacing closer than the access management standards: 1,320 feet for signals or 245 feet for connections. FDM 201.4 indicates that although existing connections can generally remain, they should be brought up to standard as changes to roadway design allows. The designer should consider closing non-conforming driveways to improve operations and safety when reasonable alternate access exists.

Table 11: Existing Intersection Features

Combee Road &	Traffic Control	Left-turn Lanes	Right-turn Lanes	Crosswalks	Remarks
US 98	Signalized	SB, EB, WB	WB	N, S, E	Mast arm signals, no sidewalk connection on NE or NW
Atlantic Avenue	Minor Stop	None	None	None	
Fletcher Avenue	Minor Stop	SB	None	None	
Ellis Avenue	Minor Stop	SB	None	None	
Lyonal Drive	Minor Stop	NB	None	None	
Maine Avenue	Signalized	SB	WB	None	Mast arm signals, no sidewalks or ped signals
McJunkin Road	Minor Stop	NB	None	None	
Mine and Mill Road	Minor Stop	None	None	None	
Commerce Point Drive	Signalized	NB, SB, EB, WB	EB, WB	S, W	Mast arm signal w/supplemental signal posts for offset WB, no sidewalk connection on SW or East
Civitan Avenue	Minor Stop	None	None	None	
Exchange Avenue	Minor Stop	None	None	None	
Kiwanis Avenue	Minor Stop	None	None	None	
Industrial Park Drive	Minor Stop	None	None	None	Inlets in curb returns
South Crystal Lake Drive	Signalized	NB, EB	EB	S, W	Mast arm signal, no sidewalk connections
Royal Drive	Stop	None	None	None	Inlets in curb returns
Skyview Drive	Signalized	SB, WB	NB	N, E	Mast arm signals, no sidewalk connection on SE
North Crystal Lake Drive	Signalized	NB	None	S, W	Mast arm signal, no sidewalk connection on east

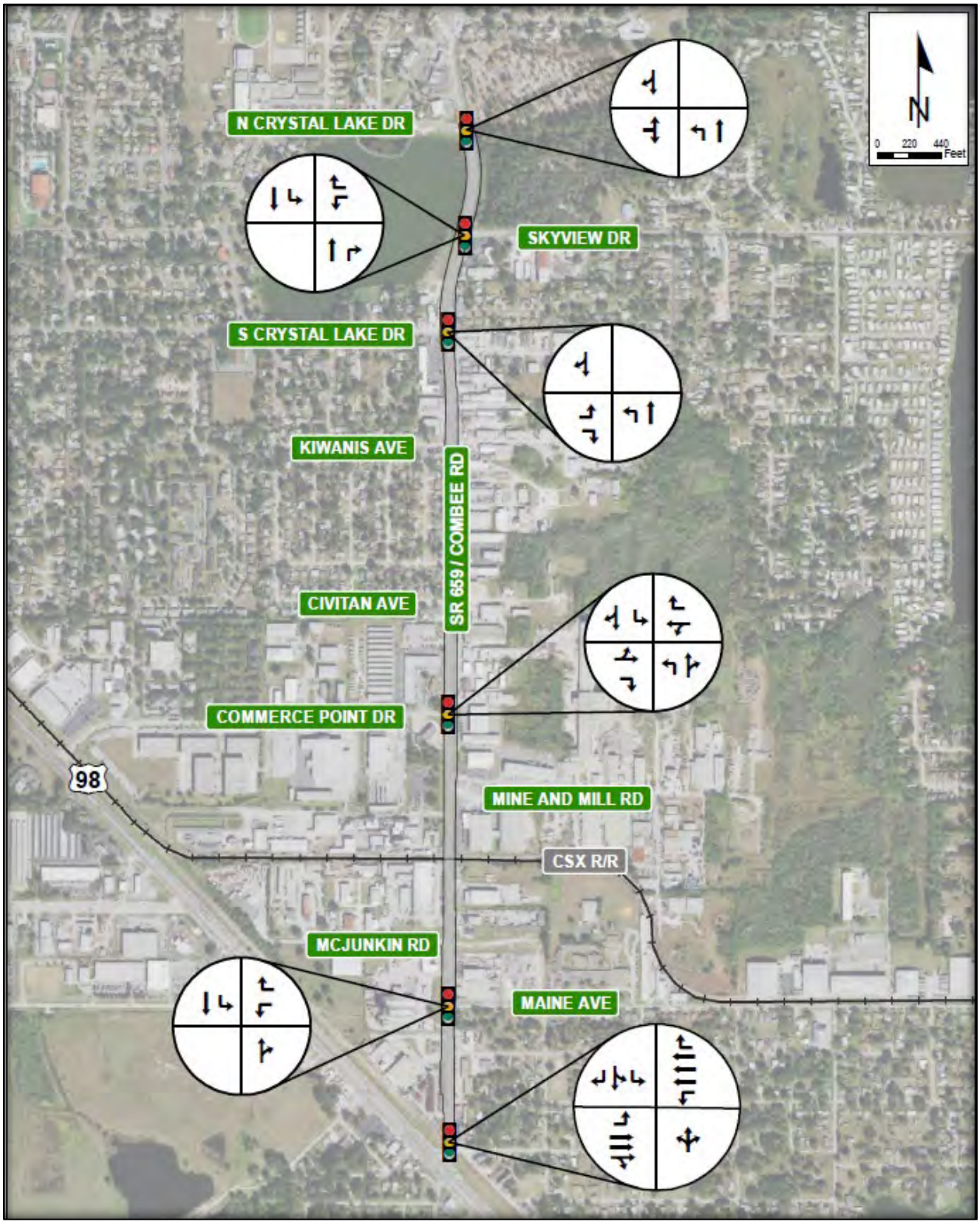


Figure 16: Existing Signalized Intersection Layout

Table 12: Existing Intersection Spacing

Combee Road &	Distance to Next		Standard Met?	Remarks
	Signal	Connection		
US 98	***1,100'***	***106'***	***No***	Unable to meet standard due to geometry
Atlantic Avenue		***75'***	***No***	Consider reducing non-conforming driveway width
Fletcher Avenue		***68'***	***No***	Consider closing non-conforming driveway due to sight distance obstruction caused by fence
Ellis Avenue		***28'***	***No***	Consider closing non-conforming driveway as safer access is available via Ellis Avenue
Lyonal Drive		***42'***	***No***	Consider replacing non-conforming driveway with new access via Lyonal Drive
Maine Avenue	2,000'	***154'***	***No***	Consider closing non-conforming driveway as safer access is available via Ellis Avenue
McJunkin Road		***100'***	***No***	Consider replacing non-conforming driveway with new access via McJunkin Road
Mine and Mill Road		***45'***	***No***	Consider relocating non-conforming driveway farther south or to side street
Commerce Point Drive	2,600'	***151'***	***No***	Unable to meet standard due to lot size
Civitan Avenue		***99'***	***No***	Unable to meet standard due to lot size
Exchange Avenue		***235'***	***No***	Unable to meet standard due to geometry
Kiwanis Avenue		***66'***	***No***	Unable to meet standard due to lot size
Industrial Park Drive		***86'***	***No***	Unable to meet standard due to lot size
South Crystal Lake Drive	***700'***	***46'***	***No***	Consider closing non-conforming driveway since alternate access exists
Royal Drive		***37'***	***No***	Consider closing non-conforming driveway since alternate access exists via Royal Drive
Skyview Drive	***700'***	***150'***	***No***	Unable to meet standard due to lot size
North Crystal Lake Drive	5,900'	***230'***	***No***	Unable to meet standard due to lot size

2.12 Crash History

The Crash Analysis Reporting System (CARS) contains crash data that has been processed by FDOT for location and roadway information accuracy. For this analysis, the most recent and complete five-year crash data is from January 1, 2014 to December 31, 2018. The crash history in **Figure 17** shows Fatal, Injury, and Property Damage Only (PDO) crashes by year. While total crashes have been about the same year to year, injury crashes have been trending down. As corridors become more congested and speeds get reduced, injury crashes tend to decrease, and overall crashes tend to increase.

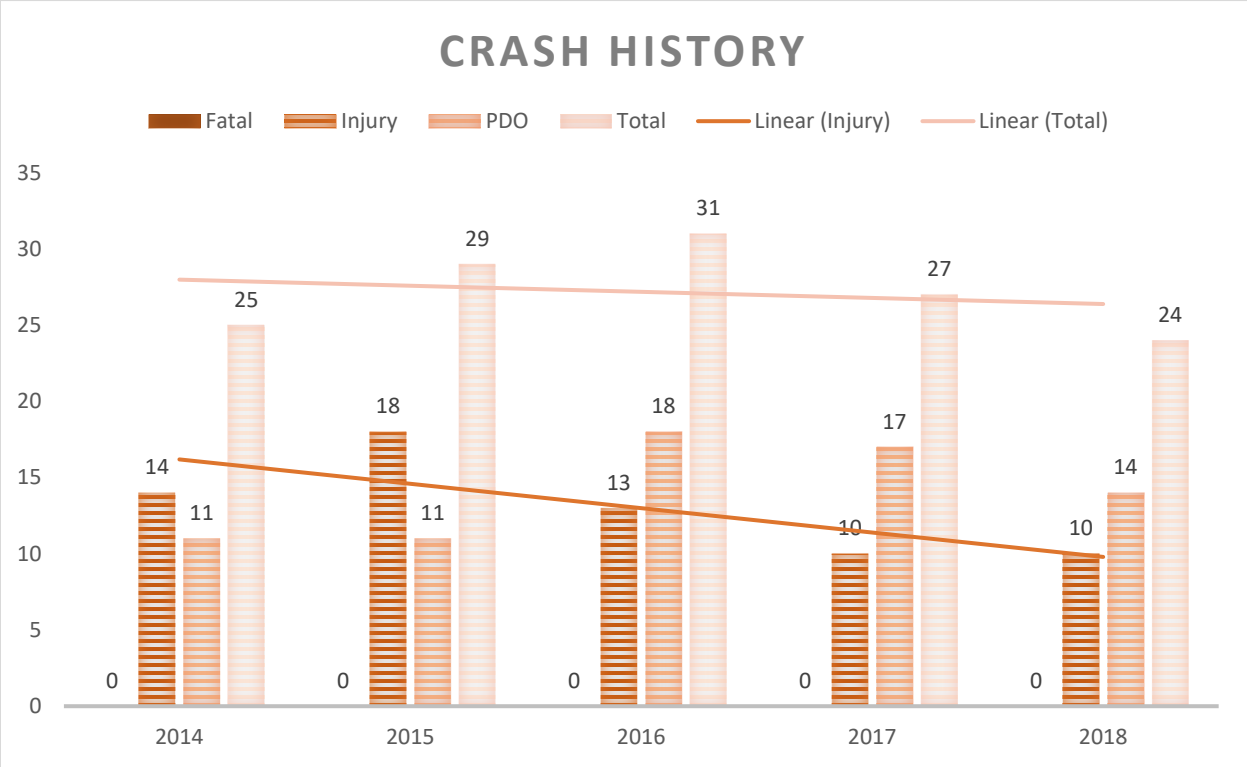


Figure 17: Crash History

The location of the crashes is shown in **Figure 18.**

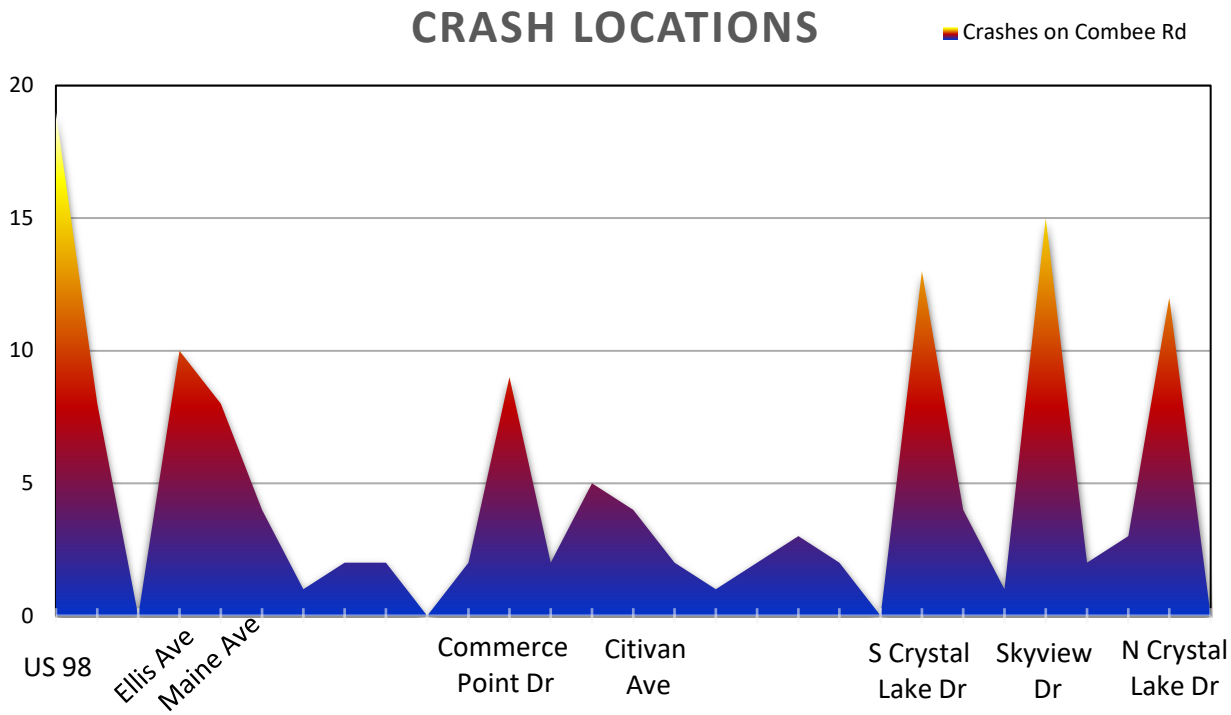


Figure 18: Crash Locations

The crash locations are clustered around the existing signalized intersections, with the highest volume intersections at US 98 and Skyview Drive experiencing the most crashes. The majority of crashes were front to rear or angle crashes that would be anticipated at busy intersections (see **Table 13**).

Table 13: Manner of Collision

Crash Type	Number	Percent
Front to Rear	71	52%
Angle	24	18%
Other	20	15%
Front to Front	10	7%
Sideswipe, Same Direction	8	6%
Sideswipe, Opposite Direction	3	2%

The collision types are shown in **Table 14.** The majority (90%) of crashes involved collisions between motor vehicles. Two crashes involved running into a ditch, two hit pedestrians, and one hit a pedacycle (aka bicycle, tricycle, or unicycle). The bike/ped crashes resulted in non-incapacitating injuries.

Table 14: Collision Type

Collision With:	Number	Percent
MV in Transport	122	90%
Other Non-Fixed	4	3%
Ditch	2	1%
Pedestrian	2	1%
Curb	2	1%
Pedacycle	1	<1%
Parked MV	1	<1%
Tree	1	<1%
Pole	1	<1%

Most crashes occurred on dry road surfaces during daylight conditions, as shown in **Figure 19.** The roadway already has street lighting but could benefit from improved drainage where ponding occurs.

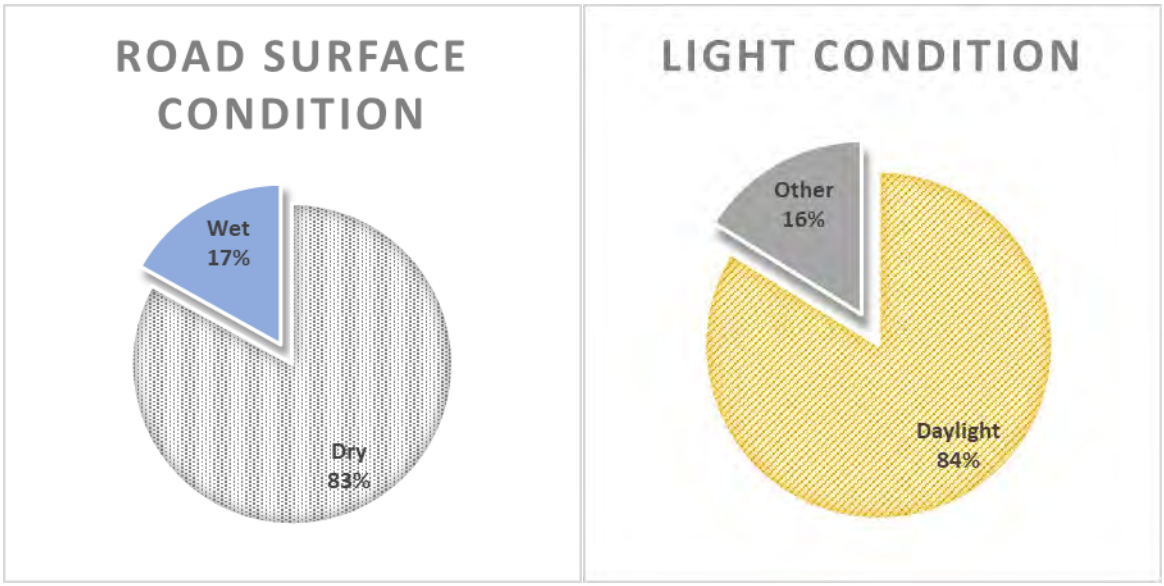


Figure 19: Road Surface and Lighting Condition

2.13 Drainage and Floodplains

This section provides a summary of existing drainage conditions. See the *Location Hydraulics Report* and *Pond Siting Report* for detailed information.

The existing drainage along Combee Road is mostly roadside ditches with some sections of curb and gutter with curb inlets. The project is divided into two basins by a high point between

Exchange Avenue and Kiwanis Avenue. The southern basin drains south and discharges to ditches along US 98. The northern basin drains north and discharges directly to Crystal Lake.

The project sits within the waterbody identification (WBID) areas of Banana Lake Canal WBID 1549A and Saddle Creek WBID 1497, which are impaired for nutrients and bacteria, respectively. The City of Lakeland is studying Crystal Lake WBID 1497A to address total maximum daily load (TMDL) impairment.[7]

Most of the adjacent parking lots have no stormwater collection but drain to the Combee Road collection system (see **Figure 20**). This existing off-site drainage pattern will need to be addressed in the proposed drainage system, possibly with back of sidewalk inlets.

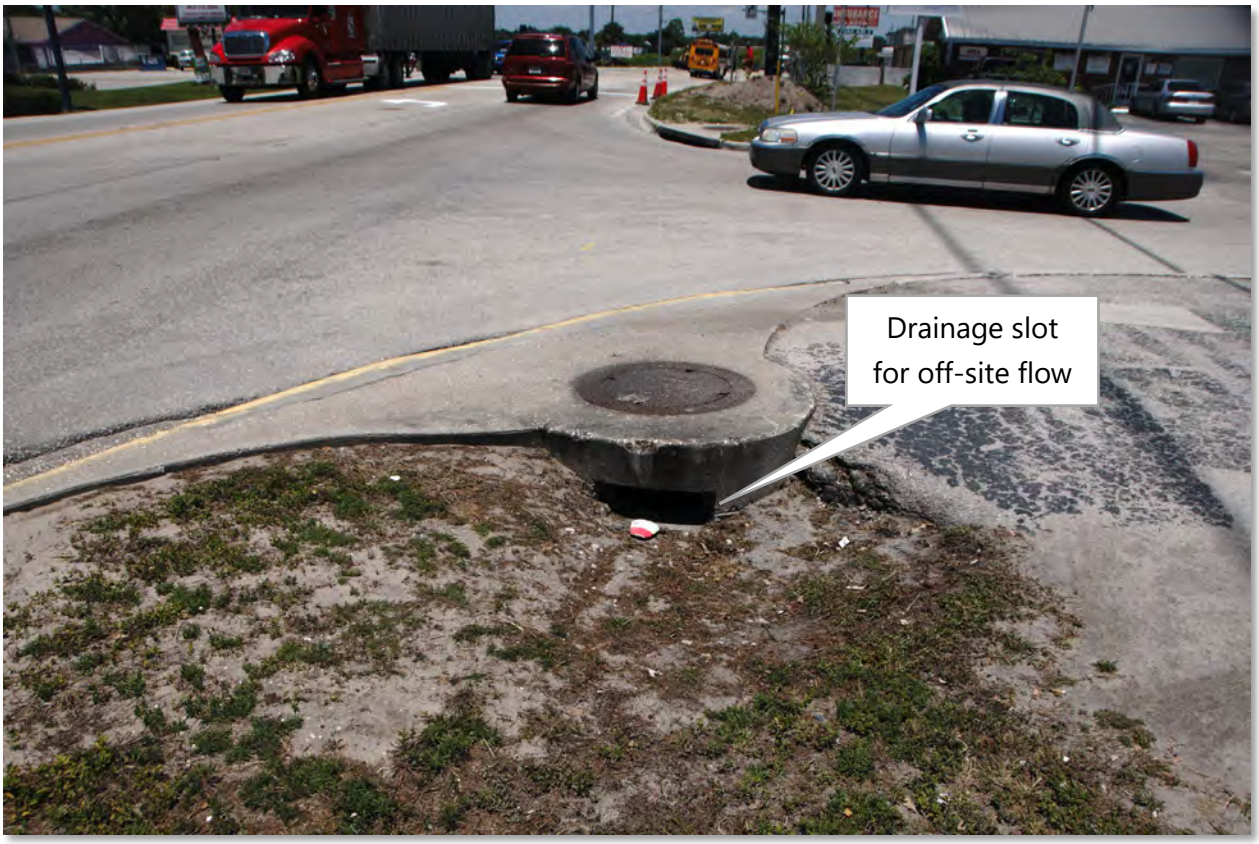


Figure 20: Photo of Combee Road curb inlet at Industrial Park Road (looking north)

[7] Lakeland 2021. *SWFWMD Grant Awarded for Crystal Lake Water Quality Improvement Study*. Accessed on June 11, 2021 from https://www.lakelandgov.net/news/posts/2021/february-2021/swfwmd-grant-awarded-for-crystal-lake-water-quality-improvement-study/

The only floodplain within the project area is at Crystal Lake (**Figure 21**). The base flood elevation at the lake is 139.1, but the elevation of the floodplain on the east side of Combee Road has not been determined.[8] The existing culvert that connects the lake and isolated floodplain means they would likely experience similar flood elevations.

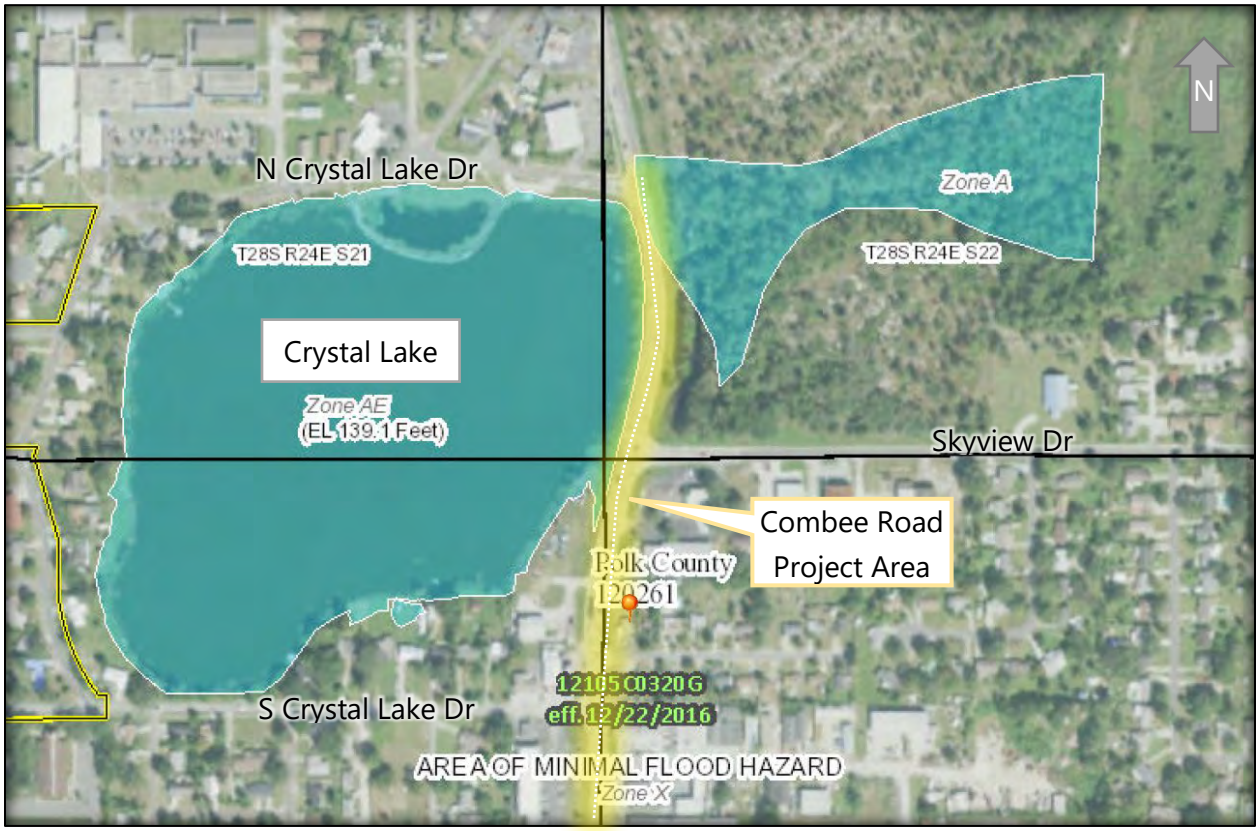


Figure 21: Floodplain Map (Source: FEMA)

[8] FEMA. 2016. Flood Insurance Rate Map 12105C0320G effective 12/22/2016. Accessed May 27, 2020 from https://msc.fema.gov/portal/search

2.14 Soils Classifications

Soil information for the study Area of Interest (AOI) was collected from the Natural Resources Conservation Service.[9] Few natural soils remain after the extensive development in the area, but some well-drained sands remain as well as some clays coincident with wetlands. **Table 15** shows the soil names and a key that corresponds to the soil map in **Figure 22.**

Table 15: Soils in Study Area

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Hydraquents, clayey	17.9	2.4%
11	Arents-Water complex	88.9	11.8%
12	Neilhurst sand, 1 to 5 percent slopes	3.3	0.4%
15	Tavares fine sand, 0 to 5 percent slopes	16.1	2.1%
16	Urban land, 0 to 2 percent slopes	163.3	21.7%
17	Smyrna and Myakka fine sands	23.8	3.2%
21	Immokalee sand	27.6	3.7%
22	Pomello fine sand	15.3	2.0%
25	Placid and Myakka fine sands, depressional	8.0	1.1%
31	Adamsville fine sand, 0 to 2 percent slopes	12.3	1.6%
49	Adamsville-Urban land complex	34.6	4.6%
53	Myakka-Immokalee-Urban land complex	68.6	9.1%
54	Pomello-Urban land complex	34.6	4.6%
63	Tavares-Urban land complex	144.8	19.2%
64	Neilhurst-Urban land complex, 1 to 5 percent slopes	1.1	0.1%
68	Arents, 0 to 5 percent slopes	58.8	7.8%
99	Water	33.7	4.6%
Totals for Area of Interest		**752.7**	**100.0%**

[9] NRCS. Web Soil Survey. Accessed August 30, 2019 from https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Figure 22: Soil Map (Source: NRCS)

2.15 Utilities and Railroad

Utility Agencies/Owners (UAO) were obtained through a Sunshine One-Call design ticket and verified to generate the list of UAO contacts in **Table 16.**

Table 16: Utility Contacts

Utility	First Name	Last Name	Address	City	State	Zip	Phone Number
Charter Communications	Mike	Kiker	30432 SR 54	Wesley Chapel	FL	33643	813-862-0522 x84263
Frontier Florida LLC	Fred	Valdes	120 E Lime St	Lakeland	FL	33801	863-688-9714
City of Lakeland – Utilities	Dalton	Knowles	501 E Lemon St	Lakeland	FL	33801	863-834-6176
City of Lakeland – Fiber	Robert	Smith	3610 Drane Field Rd	Lakeland	FL	33811	863-834-6891
City of Lakeland – Electric	Kris	Hayes	501 E Lemon St LE-ROW	Lakeland	FL	33801	863-834-6486
TECO Peoples Gas	Brent	Litham	1085 W Main St	Avon Park	FL	33825	863-453-3930

Combee Road is an important utility corridor, carrying reclaimed cooling water to the CD Macintosh Jr. Power Plant via two underground 24-inch pipes and feeding electricity from the power plant to a substation and surrounding properties. No less than four different overhead electric line voltages can be found along Combee Road: 3-phase 230kV transmission, 3-phase 69kV transmission, 3-phase 12kV distribution, and 240V service. The typical location of these lines is annotated in **Figure 23.**

Although most utilities occupy FDOT ROW by permit, Lakeland Electric procured a public purpose easement to install and maintain the high-voltage transmission lines and poles mostly on private property along the east side of the Combee Road ROW. This easement varies in width from 0 to 20 feet depending on the parcel. If impacts to this easement cannot be avoided, then a new easement and lines would likely need to be established.

Figure 23: Photo of overhead utilities on Combee Road (looking north)

Railroad crossing 624180-A has a single track belonging to CSX Transportation and crosses Combee Road between McJunkin Road and Crystal Wood Drive. There are four trains per week according to the USDOT Crossing Inventory Form and only three reported incidents, the latest in 1980.[10] The Type II railroad grade crossing traffic control device (per FDOT Design Standards Index 509-070) is a flashing warning device with a cantilever and no gate arms, as shown in **Figure 24.**

[10] FRA – Safety Map. Accessed August 22, 2019 from https://fragis.fra.dot.gov/GISFRASafety/

Figure 24: Photo of railroad crossing Combee Road (looking south)

2.16 Lighting

Existing lighting along Combee Road is a mix of different cobrahead and square luminaires mounted to bracket arms of various lengths on shared and dedicated poles. The lights are spaced at approximately 220 feet throughout the study area and are predominantly on the west side of the roadway, opposite the overhead electric transmission lines. The lighting is in average condition and maintained by Lakeland Electric. While the cobrahead lights emit the familiar orange glow indicative of a high-pressure sodium fixture (see **Figure 25**), some of the rectangular lights seem to have been upgraded to light-emitting diodes (LEDs). The Polk TPO measured the nighttime illuminance at a few locations in the study area and found an average 1.5 horizontal foot-candles,[11] which was above the 1.0 FDOT standard.[12] Signalized intersections have a higher standard due to the potential conflicts at crosswalks. Any change to existing signals should also include lighting upgrades.

[11] Polk TPO. *Complete Street Corridor Feasibility Study*. June 2016. Page 5-7.
[12] FDOT Design Manual Chp. 231, Table 231.2.1 accessed September 3, 2019 from https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2019/2019fdm231lighting.pdf

Figure 25: Photo of existing lighting along Combee Road (looking north)

2.17 Signs and Structures

An overhead right-turn lane sign (R3-5) is located on Combee Road near the northbound right-turn lane to Skyview Drive (**Figure 26**). Per MUTCD standard, this type of sign is optional for a turn lane such as this.[13]

[13] MUTCD. 2009 Ed. pg 62., line 08. Accessed on Sept. 9, 2020 from https://mutcd.fhwa.dot.gov/pdfs/2009r1r2/mutcd2009r1r2edition.pdf

Figure 26: Photo of overhead sign structure on Combee Road (looking north)

Six outdoor advertising sign structures are within the study area per FDOT's Outdoor Advertising Database[14] (**Table 17**). Since the study area is a secondary highway system inside an urban area, it is not a controlled area and no FDOT permits are required for outdoor advertising.

Table 17: Outdoor Advertising Signs

Milepost	Side	Prior (Ft)	Next (Ft)	Sign Reads	Tag	Status	Conforming	Account	Picture
0.130	Left	0	4631	Left	BX192	Cancelled	Yes	LAMAR OTDR ADV - LAKELAND	View
0.130	Left	0	4631	Right	CF593	Cancelled	Yes	LAMAR OTDR ADV - LAKELAND	View
0.328	Right	0	1162	Right	BW438	Cancelled	Yes	KOALA OUTDOOR ADVERTISING LLC	View
0.328	Right	0	1162	Left	BW437	Cancelled	Yes	KOALA OUTDOOR ADVERTISING LLC	View
0.548	Right	1162	2334	Right	BX523	Cancelled	Yes	LAKELAND O/A INC	View
0.548	Right	1162	2334	Left	BX522	Cancelled	Yes	LAKELAND O/A INC	View

[14] FDOT Outdoor Advertising Database accessed July 30, 2019 from http://fdotewp1.dot.state.fl.us/RightOfWay/SectionPermits.aspx?ID=16006000

Milepost	Side	Prior (Ft)	Next (Ft)	Sign Reads	Tag	Status	Conforming	Account	Picture
0.990	Right	2334	3358	Right	CF592	Cancelled	Yes	LAMAR OTDR ADV - LAKELAND	View
0.990	Right	2334	3358	Left	BD237	Cancelled	Yes	LAMAR OTDR ADV - LAKELAND	View
1.007	Left	4631	1014	Left	CD804	Cancelled	Yes	KOALA OUTDOOR ADVERTISING LLC	View
1.007	Left	4631	1014	Right	CD803	Cancelled	Yes	KOALA OUTDOOR ADVERTISING LLC	View
1.199	Left	1014	2175	Right	CF595	Cancelled	Yes	LAMAR OTDR ADV - LAKELAND	View
1.199	Left	1014	2175	Left	CF594	Cancelled	Yes	LAMAR OTDR ADV - LAKELAND	View

According to the Polk County Sign Regulations,[15] billboards are permitted in the Business Park Center, Industrial, Tourism Commercial Center, Regional Activity Center, Community Activity Center, High-Impact Commercial Center, and Leisure/Recreation future land use zones. The only future land use in the study area that allows signs is Business Park Center from US 98 (MP 0) to just south of Civitan Avenue (MP 0.743). Therefore, the three signs outside of these uses may not be compliant with current zoning.

[15] Polk County Land Development Code, Section 760, accessed July 30, 2019 from https://www.polk-county.net/docs/default-source/land-development/chapter-7.pdf?sfvrsn=12

3.0 FUTURE CONDITIONS

3.1 Future Traffic Projections

A *Project Traffic Analysis Report (PTAR)* was prepared under separate cover that includes traffic projections for opening year (2025) and design year (2045). Future traffic forecasts were developed by validating the District One Cost Feasible Regional Planning Model to develop year 2040 Peak Season Weekly Average Daily Traffic Volumes. The volumes were verified for reasonableness using historic trend growth rates and population projections from the Bureau of Economic and Business Research (BEBR). Opening year volumes were determined by interpolating between existing year (2016) volumes and the model forecast (2040) volumes. Design year (2045) volumes were developed by extrapolation. **Table 18** provides future traffic volumes for the corridor. Since this project does not include capacity improvements, the Build and No-Build volumes are the same.

3.2 Future Land Use and Context Classification

The City of Lakeland future land use is shown in **Figure 27**. City of Lakeland future land uses along Combee Road are similar to existing zoning – Mixed Commercial and Industrial. Polk County future land use includes Residential, Commercial, Business Park Center (light industrial), and a Neighborhood Activity Center near Eaton Park (**Figures 5** and **6**). The Neighborhood Activity Center land use is intended to provide for the daily shopping needs of residents (e.g., grocery stores, offices, banks, and community facilities).[16]

While the urban form could be improved through redevelopment, the existing disconnected roadway network along the corridor would remain. The only location on the project that has the potential for a future context classification change is the Eaton Park area between US 98 and Maine Avenue. A change in urban form with reduced setbacks, increased pedestrian access, and rear parking could transform the context to more closely resemble C4-Urban General. The rest of the project limits will remain C3C-Suburban Commercial or C3R-Suburban Residential.

3.3 Adjacent Projects

The Maine Avenue Sidewalk project (FPID 446294-1) will construct a new sidewalk along Maine Avenue from Combee Road to Park Street and Iowa Road to Wanda Way. The project will add approximately 3,000 feet of sidewalk and connect to the existing portions of 5-foot-wide sidewalk along the south side of the road. FDOT's work program shows state funding for engineering in

[16] Polk County Land Development Code. Revised March 2019. https://www.polk-county.net/docs/default-source/land-development/chapter-2-march-2019-(1).pdf

fiscal year 2023 and construction in fiscal year 2025.[17] Since the Combee Road improvements have not yet been funded for construction, it is possible that the Maine Avenue sidewalk will be constructed first.

Table 18: Future Traffic Volumes

Roadway Segment		2025 AADT	2045 AADT
Mainline			
SR 659 (Combee Road)	South of US 98	1,200	1,400
	US 98 to Maine Avenue	16,000	19,000
	Maine Avenue to McJunkin Road	17,000	20,000
	McJunkin Road to Commerce Point Drive	17,000	20,000
	Commerce Point Drive to South Crystal Lake Drive	18,000	22,000
	South Crystal Lake Drive to Skyview Drive	20,500	24,000
	Skyview Drive to North Crystal Lake Drive	21,000	25,000
	North of North Crystal Lake Drive	20,000	24,000
Side Streets			
US 98	West of Combee Road	42,000	50,000
	East of Combee Road	49,000	58,000
Maine Avenue	East of Combee Road	7,100	8,500
Commerce Point Drive	West of Combee Road	8,200	9,800
South Crystal Lake Drive	West of Combee Road	5,300	6,300
Skyview Drive	East of Combee Road	8,200	9,800
North Crystal Lake Drive	West of Combee Road	6,600	7,900

[17] FDOT. *Five-Year Work Program.* Accessed May 26, 2020 from https://fdotewp1.dot.state.fl.us/FMSupportApps/WorkProgram/Support/WPItemRept.ASPX?RF=WP&IT=446294&IS=1&FY=

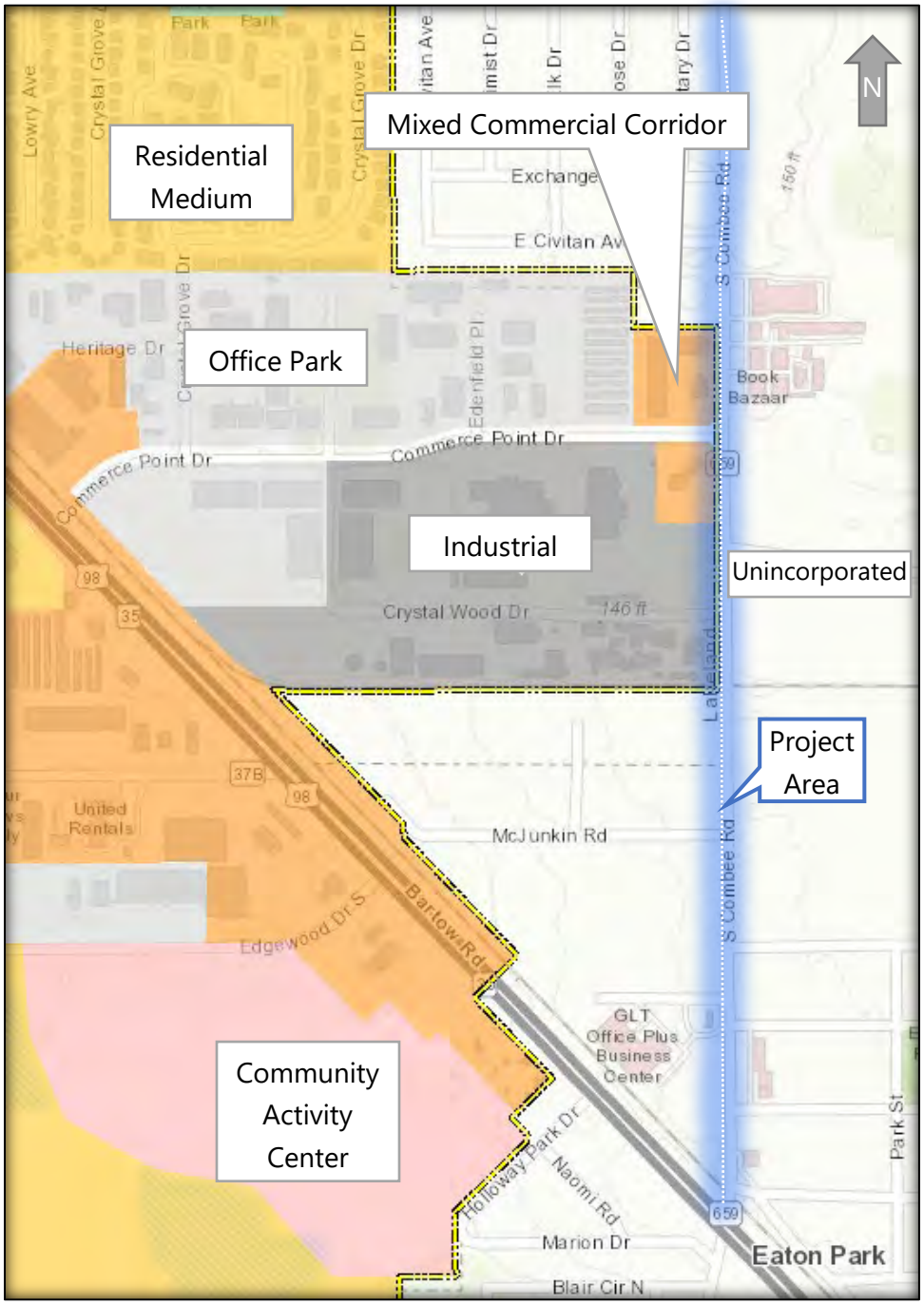


Figure 27: City of Lakeland Future Land Use Map (Source: ArcGIS)

4.0 DESIGN CONTROLS & CRITERIA

The project followed the 2021 edition of FDOT Design Manual (FDM) for state roads and the 2016 edition of FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, commonly known as the Florida Greenbook (FGB) for local streets. The project-specific design criteria are summarized in **Table 19.**

Table 19: Design Criteria

Design Element		SR 659 (Combee Road)	Source
General	Access Management	5	FDOT KMZ file dated 10/16/2018
	Context Classification	C3C/C3R	Context Classification Memo
	Control Vehicle	WB-62FL	FDM 201.6.2
	Design Period	20 years	FDM 201.3
	Design Speed	40 mph	FDM Table 201.5.1
	Design Vehicle	WB-40	FDM 201.6
	Functional Classification	Urban Minor Arterial	FDOT Straight Line Diagram
	Posted Speed	40 mph	-
Typical Section	Number of Lanes	2	Polk TPO 2040 LRTP Fig. 17
	Lane Width	12 ft. (11 ft. min.)	FDM Table 210.2.1
	TWLTL Width	12 ft.	FDM Table 210.2.1
	Median Width	22 ft.	FDM Table 210.3.1
	Bicycle Lane Width	7 ft. (4 ft. min.)	FDM 223.2.1.1
	Border Width	12 ft. (8 ft. min.)	FDM Table 210.7.1
	Lateral Offset	4 ft.	FDM Table 215.2.2
	Sidewalk Width	6 ft.	FDM Table 222.2.1
	ROW Width	70 ft. min.	Existing ROW maps
Horizontal	Min. Stopping Sight Distance	305 ft.	FDM Table 210.11.1
	Max. Deflection w/o Curve	2^{o}	FDM 210.8.1
	Min. Length of Curve	600 ft. (400 ft. min.)	FDM Table 210.8.1
	Max. Curvature (Min. Radius)	10^{o} 45’ (533 ft.)	FDM Table 210.9.2, FGB Table 3-12
	Max. Superelevation	0.05	FDM 210.9
Vertical	Max. Grade	4%	FDM Table 210.10.1, note (1)
	Max. Change in Grade w/o VC	0.80%	FDM Table 210.10.2
	Base Clearance above BCWE	2 ft.	FDM 210.10.3(2)(a)
	Min. Crest Curve K	70	FDM Table 210.10.3
	Min. Sag Curve K	64	FDM Table 210.10.3
	Vertical Clearance	16.5 ft.	FDM Table 260.6.1

While larger corner radii at curbed intersections are easier for large vehicles to navigate, it also increases turning speed, lengthens crosswalks, and is contrary to the pedestrian improvement goals of this project. FDM guidance in 212.12.1 recommends selecting a design vehicle and practical corner radii for each cross street. The single-unit truck with a 30-foot overall length (SU-30) is equivalent to most emergency vehicles and is the minimum recommended control vehicle. Other larger control vehicles are recommended based on the existing land use and transit routes. Recommended corner radii are shown in **Table 20,** with or without bike lanes on Combee Road. Some tapers may be needed based on the configuration of the respective intersections.

Table 20: Recommended Corner Radii

Minor Street	Predominant Vehicle	Occasional Vehicle	Corner Radius W/Bike Lane (ft)	Corner Radius W/O Bike Lane (ft)
Atlantic Avenue	Passenger	SU-30	25	30
Fletcher Avenue	Passenger	SU-30	25	30
Ellis Avenue	Passenger	SU-30	25	30
Lyonal Drive	Passenger	WB-62FL	50	55-60
Maine Avenue	Passenger	WB-62FL	60	60
McJunkin Road	Passenger	WB-62FL	50	60
Mine and Mill Road	Passenger	WB-62FL	50	50
Commerce Point Drive	Passenger	WB-62FL	50	50-60
East Civitan Avenue	Passenger	SU-30	25	30
Exchange Avenue	Passenger	SU-30	25	30
Kiwanis Avenue	Passenger	SU-30	25	30
Industrial Park Drive	Passenger	WB-62FL	50	55
South Crystal Lake Drive	Passenger	SU-30	25	35
Royal Drive	Passenger	SU-30	25	30
Skyview Drive	Passenger	CITY-BUS	35	35-50
North Crystal Lake Drive	Passenger	CITY-BUS	35	35-50

5.0 ALTERNATIVES ANALYSIS

5.1 Previous Planning Studies

The Polk TPO led a Complete Street Corridor Feasibility Study in June 2016 that evaluated eight corridors throughout Polk County including Combee Road. The feasibility study considered multiple typical section options, identified key issues, and recommended a variety of complete streets strategies. The Polk TPO's typical section is illustrated in **Figure 28.** The planning recommendations from the Polk TPO are not incorporated into this PD&E study by reference but were utilized to understand the needs of the corridor and how to best address them. The Polk TPO used the feasibility study recommendations to program the project in their Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP).

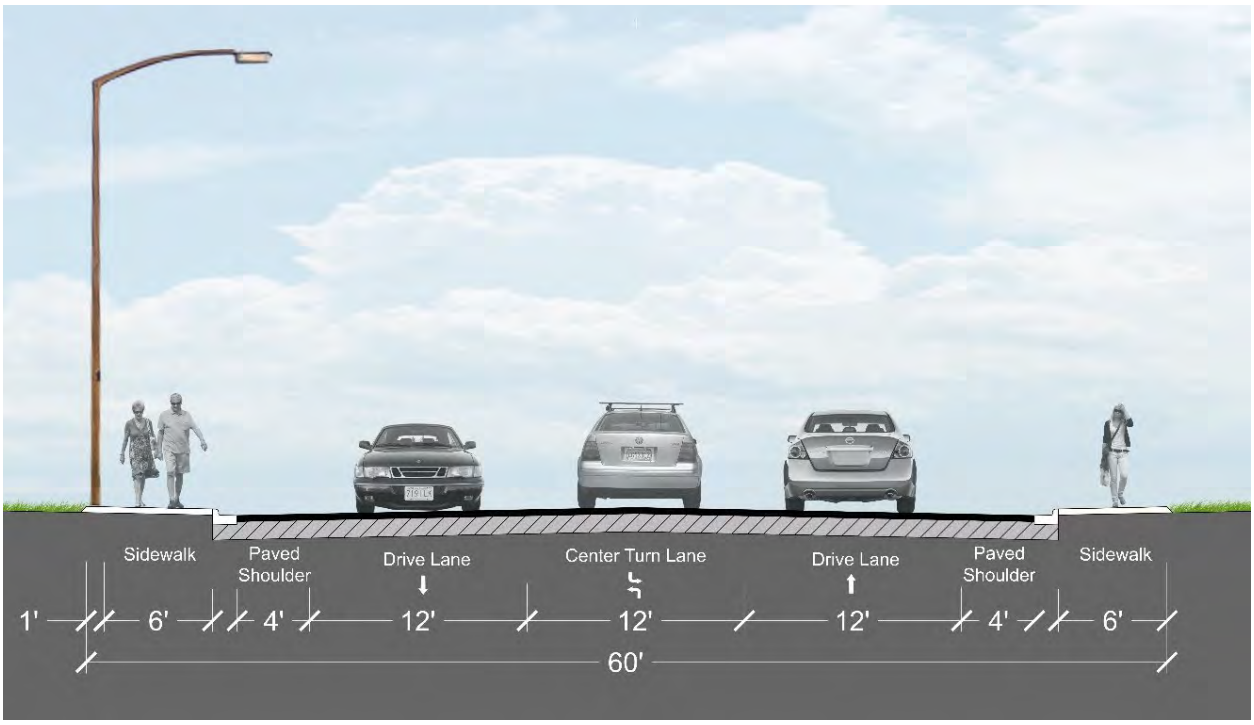


Figure 28: Typical Section from Previous Study (Source: Polk TPO)

5.2 No-Build (No-Action) Alternative

The No-Build (No-Action) Alternative assumes that Combee Road would remain a two-lane facility as it is in the existing condition. No improvements would be constructed. The No-Build Alternative provides a benchmark for comparative purposes with the build alternatives.

The advantages of the No-Build Alternative include:

- No impact to adjacent social, cultural, natural, or physical environments
- No utility impacts
- No expenditure of funds for ROW acquisition, design, or construction

The disadvantages of the No-Build Alternative are:

- Not consistent with Polk TPO's Complete Streets Action Plan
- Does not enhance pedestrian and bicycle accommodations
- Does not improve safety conditions
- Does not improve vehicular traffic operations

The No-Build Alternative remains a viable alternative throughout the study and the public involvement process.

5.3 Initial Alternatives

Some initial alternatives that were considered but dismissed include:

Polk TPO Typical Section – This typical section is based on the recommendation from the Polk TPO Complete Street Feasibility Study that includes 12-foot-wide travel lanes, 4-foot-wide paved shoulders, 6-foot-wide sidewalks, and a 12-foot-wide center TWLTL (Figure 28). After the Polk TPO feasibility study was completed in June 2016, FDOT updated its design standards from 4-foot-wide bicycle lanes to 7-foot-wide buffered bicycle lanes.

Shared-Use Path Typical Section – This typical section provides a 10-foot-wide shared-use path along the west side, a 6-foot-wide sidewalk along the east side, and no bicycle lanes. This alternative was eliminated because applying shared-use path clear zone criteria to the corridor would be extremely difficult given the number of utility poles and would provide minimal benefit above that of a wider sidewalk.

Transportation Systems Management and Operations (TSM&O) Alternative – The TSM&O Alternative was not carried forward for further study as it did not meet the purpose and need. The deficiencies along the corridor include a lack of pedestrian facilities, frequent traffic queues as vehicles stop to make left turns, and congestion at various intersections. The existing signalized intersections already utilize interconnected signal controllers and the use of additional traffic management systems alone would not address all the needs. Instead, TSM&O improvements (like additional turn lanes) can be incorporated into the preferred alternative as needed.

5.4 Viable Alternatives

The viable alternatives included in the comparative evaluation matrix are described below.

5.4.1 Alternative 1 – On-Street Bike Lanes

The Alternative 1 concept is to bring the existing 2-lane roadway up to current FDM standards. This includes constructing 6-foot-wide sidewalks for pedestrians, 7-foot-wide buffered bicycle lanes for cyclists, and a 13-foot-wide center TWLTL for turning trucks and motorists. Curb and gutter with a closed drainage system would be required to replace the roadside stormwater ditches that will be filled to accommodate the new sidewalks. The Alternative 1 typical section is shown in **Figure 29.**

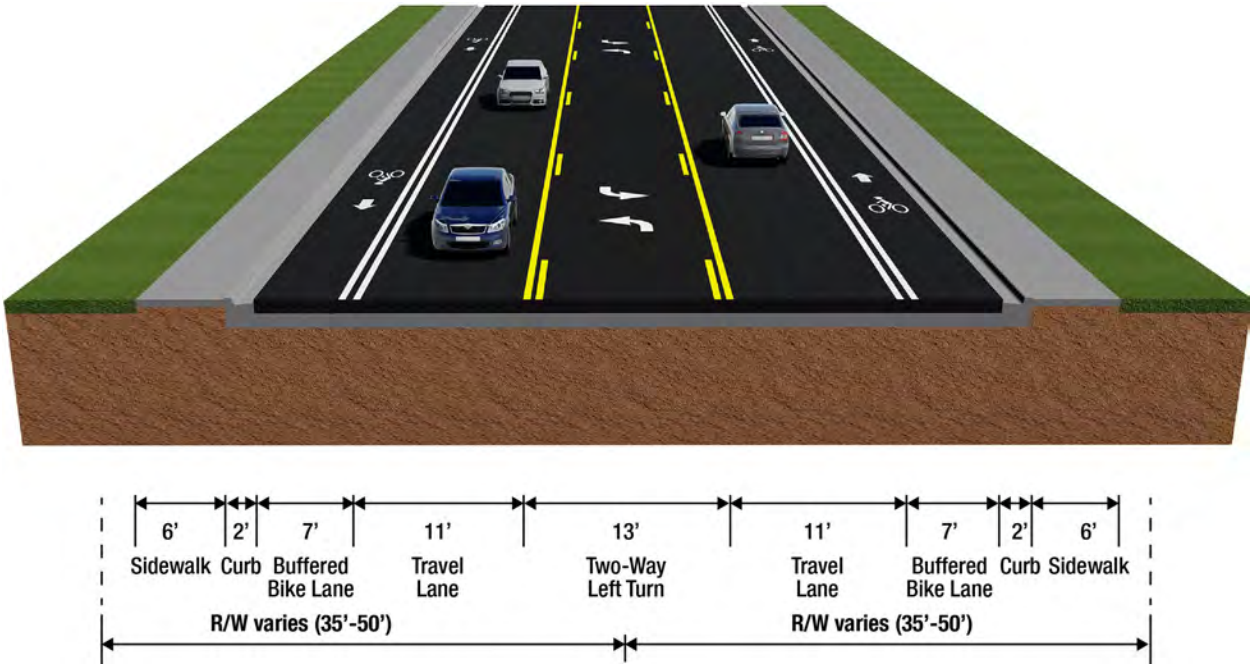


Figure 29: Alternative 1 Typical Section

Although Alternative 1 meets FDM criteria, it may not provide the most comfortable environment for pedestrians and cyclists since:

- The sidewalk has little to no buffer from the back of curb
- Crossing distances are increased
- Cyclists ride adjacent to a high volume of trucks
- The wider pavement area could result in higher vehicle speeds

5.4.2 Alternative 2 – Wide Sidewalks

The Alternative 2 concept provides wider sidewalk and more separation between the sidewalk and roadway. This includes constructing 8-foot-wide sidewalks for pedestrians, a 4-foot minimum buffer between sidewalk and back of curb, and a 13-foot-wide center TWLTL for turning trucks and motorists. Proposed 12-foot travel lanes, instead of the 11-foot minimum, provide greater maneuverability for trucks and transit vehicles that regularly use the corridor. Curb and gutter with a closed drainage system would be required to replace the roadside stormwater ditches that will be filled to accommodate the new sidewalks. The Alternative 2 typical section is shown in **Figure 30**.

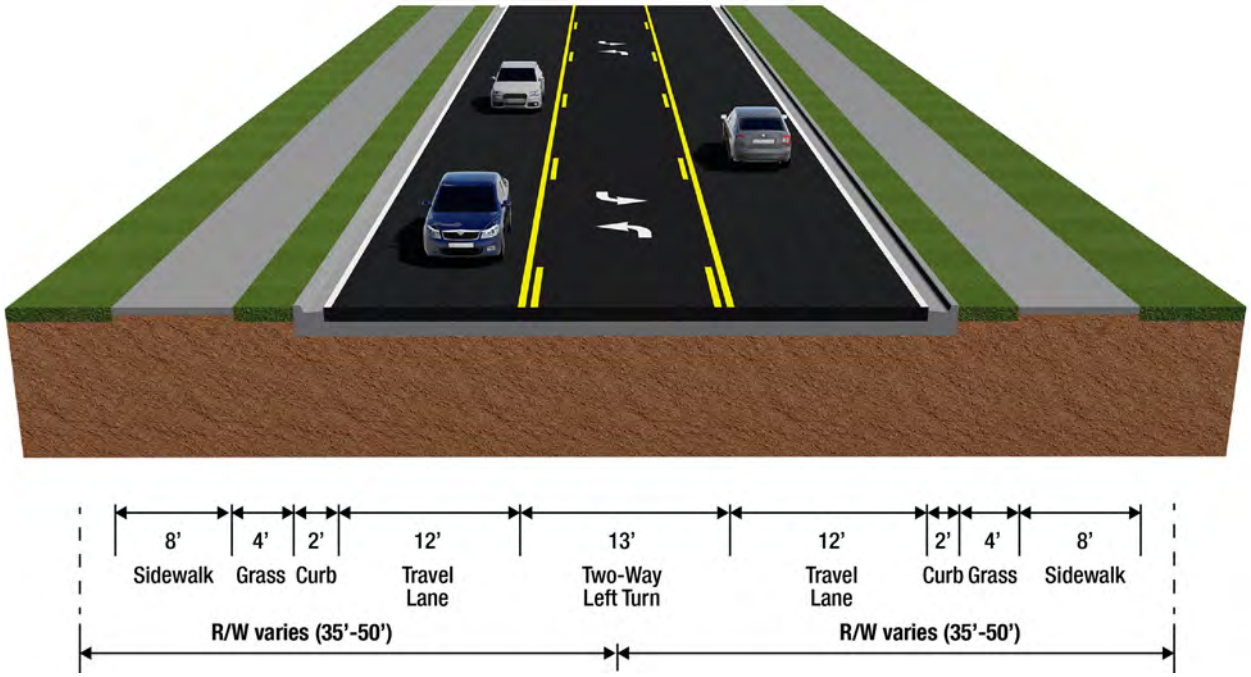


Figure 30: Alternative 2 Typical Section

Although Alternative 2 requires a variation to criteria due to its lack of bicycle lanes, it increases pedestrian comfort with a grass buffer between the sidewalk and curb, better accommodates pedestrians and sidewalk cyclists with a wider sidewalk, and eliminates the "right hook hazard" to on-road cyclists when trucks turn right across their path. This hazard is particularly worrisome on this corridor due to the high truck volumes.

5.5 Intersection Control Evaluation

The Intersection Control Evaluation (ICE) was completed for each of the five signalized intersections requiring reconstruction with the proposed alternatives. An ICE was not required for the US 98 intersection because substantial changes were not proposed.

The result of the Stage 1 ICE was to advance both the signalized intersection and roundabout to Stage 2. A multicriteria evaluation was performed along with the Stage 2 ICE to determine which locations were more suitable for a roundabout based on the project purpose and need. **Figure 31** shows how well the five intersections ranked for roundabouts on a scale of 1 through 5, with 1 being the best. **Table 21** summarizes the completed ICE results which are described in greater detail in the following subsections. Roundabouts are recommended at the Maine Avenue and Skyview Drive intersections based on both the multicriteria evaluation and the benefit-to-cost ratio (B/C).

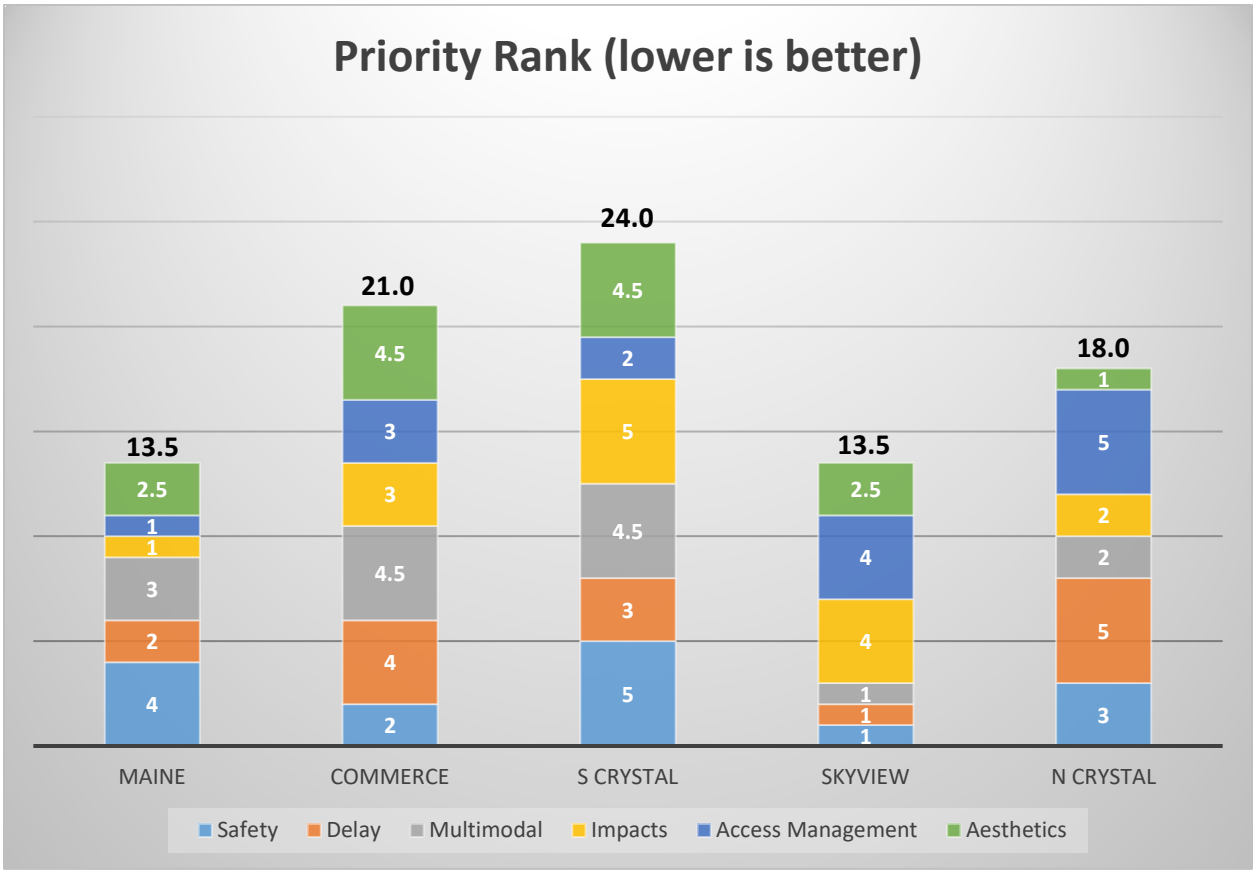


Figure 31: Roundabout Multicriteria Evaluation

Table 21: Intersection Control Evaluation Results

Combee Road at	Stage 1	B/C of Roundabout	Stage 2
Maine Avenue	Signal or Roundabout	9.56	Roundabout
Commerce Point Drive	Signal or Roundabout	0.96	Signal
South Crystal Lake Drive	Signal or Roundabout	-0.27	Signal
Skyview Drive	Signal or Roundabout	26.53	Roundabout
North Crystal Lake Drive	Signal or Roundabout	-18.34	Signal

5.5.1 Maine Avenue Intersection

Although the impacts and costs of a roundabout at Maine Avenue are slightly higher than the base case signal, it provides a significant safety benefit and reduces delay. The roundabout is also expected to reduce the potential for queues to back up into the US 98 intersection and will help mitigate access changes by allowing vehicles to make U-turns.

The impacts of the roundabout at Maine Avenue are the lowest of the five intersections studied. One of the impacted parcels is already under FDOT ownership and two others are undeveloped. A business sign at the northeast corner will most likely require relocation, but business and utility impacts should be minimal.

5.5.2 Commerce Point Drive Intersection

A signal was preferred at Commerce Point Drive because a roundabout would increase overall delays, have more impacts and costs, and not provide significant benefits. Although the safety performance of a roundabout would be superior to a signal, a review of the crash history shows that several crashes occurred at adjacent driveways and not at the actual intersection. Therefore, it is recommended to add access management safety features (e.g. traffic separators) within the influence area of the signalized intersection to improve safety at the Commerce Point Drive intersection.

5.5.3 South Crystal Lake Drive Intersection

A signal was preferred at South Crystal Lake Drive because a roundabout would increase overall delays, have more impacts and costs, and not provide overall benefit. The analysis also considered a potential realignment of Industrial Park Drive to form a 4-leg signal with South Crystal Lake Drive, but it was not recommended. Instead, access management safety features (e.g. traffic separators) are recommended within the influence area of the signalized intersection to address the identified crash hot spot.

In response to public comments requesting a signal at Industrial Park Drive, additional intersection configurations in **Table 22** were analyzed but were found not viable for the following reasons:

Table 22: Intersection configurations considered but eliminated

Configuration	Flaw
Roundabout	Negative benefit-cost ratio
Realigned Industrial Park Drive	Excessive property impacts
Elongated offset signal	Excessive delay
Dual signals	Increase in predicted crashes
Southbound directional left-turn with northbound left-turn prohibited	Diverts more vehicles
Existing configuration	Does not address crash history

Although the proposed traffic separator south of South Crystal Lake Drive will restrict Industrial Park Drive to right-in and right-out only, the proposed roundabouts at Maine Avenue and Skyview Drive will allow cars and large trucks to make U-turns and reach their desired route.

5.5.4 Skyview Drive Intersection

Although the impacts and costs are higher with a roundabout at Skyview Drive, it provides a significant safety benefit and reduces delays compared to the base case of the signal. A northbound right-turn lane has been included in the concept because it serves the highest turning volume on the project and substantially reduces delays. The intersection was the most favorable for a roundabout based on reducing delays, improving safety, and accommodating multimodal bicycles and pedestrians.

The impacts of the roundabout at Skyview Drive include a small area of potential surface water impact to Crystal Lake and a parking lot impact to the adjacent business. A business sign and some utility poles would need to be relocated.

A realignment of Skyview Drive to intersect across from North Crystal Lake Drive was briefly considered, but was not viable due to the high costs and impacts to the natural environment.

5.5.5 North Crystal Lake Drive Intersection

A signal was preferred at North Crystal Lake Drive because a roundabout would increase overall delays, have more impacts and costs, and not provide overall benefit. Improving the roundabout delay by adding turn lanes was not viable due to the nearby high-voltage electric transmission poles and wetlands. A multilane roundabout would also reduce safety performance while increasing costs. Although the safety performance of a single-lane roundabout would be superior to a signal, a review of the existing signal's crash history shows no serious injuries in the last five years. Therefore, it is recommended to implement Leading Pedestrian Intervals (LPI) to improve safety once the new signal is completed.

5.6 Comparative Alternatives Evaluation

The project-specific evaluation matrix considers the alternatives' benefits and costs as well as their impacts to the environment and properties (**Table 23**).

Table 23: Evaluation Matrix

Evaluation Factors		No-Build	Alternative 1 - Bike Lanes	Alternative 2 - Wide Sidewalks
Benefits	Pedestrian Accommodations	Almost none	6-foot sidewalks	8-foot sidewalks
	Bicycle Accommodations	On-road	Buffered bike lanes	On-road or wide sidewalk
	Safety	No improvement	Improvement	Improvement
Potential Environmental Impacts	Archaeological/Historical Probability (potential)	None	Low	Low
	Parks/Recreational Areas	None	Minor*	Minor*
	Wetlands (acres)	0	0.16	0.16
	Surface Waters (acres)	0	0.31	0.31
	Floodplain (acres)	0	0.28	0.32
	Threatened and Endangered Species (potential)	None	Low	Low
	Contamination Sites Ranked High/Medium Risk (number)	0	14	14
Property Impacts	Utilities Relocated	None	Electric, water	Electric, water
	Right of Way (acres)	0	4.6	4.6
	Parcels (number)	0	11	11
	Relocations (number)	0	0	0
Costs (current year $)	Design	$0	$2.75 M	$2.75 M
	Wetland Mitigation	$0	$58 k	$58 k
	Right of way	$0	$2.6 M	$2.6 M
	Construction	$0	$14.1 M	$14.2 M
	Construction Engineering & Inspection	$0	$1.4 M	$1.4 M
	Total Estimated Project Costs	$0	$20.9 M**	$21.0 M**

*Minor impacts to Crystal Lake Park are likely during construction of the drainage outfall pipe and pond improvements.

**Total estimated project costs include engineering, ROW, and construction but do not include utility relocations, environmental permits, or contamination remediation.

5.7 Preferred Alternative

Based on the engineering and environmental comparative analysis documented during this PD&E study, the preferred alternative for Combee Road is Alternative 2 with wide sidewalks. Although Alternative 2 does not include dedicated bicycle facilities, it best meets the project purpose with:

- Wide sidewalks for pedestrians, transit riders, recreational cyclists, and school children
- Buffer space between the road and the sidewalk for pedestrian comfort
- A narrow roadway to reinforce slower speeds
- Shorter crosswalk distances
- Roundabouts for safety and improved traffic flow

Also, Alternative 2 provides continuity of bike/ped features between the typical roadway segments and the roundabout intersections (bike lanes are not allowed through roundabouts).

6.0 PROJECT COORDINATION & PUBLIC INVOLVEMENT

6.1 Agency Coordination

Advanced notification was given to agencies through an Environmental Technical Advisory Team (ETAT) review for the ETDM Programming Screen (No. 14326). The information provided through the ETDM programming screen included the purpose and need, a description of the project, and a preliminary environmental discussion. Recipients were asked to review and comment on the information provided between August 15, 2017 and October 14, 2017. The Programming Screen Summary Report was re-published on March 29, 2018 and includes a summary of the comments received.

ETAT agencies rate the potential environmental impacts of the project from 0 (none) to 5 (potential dispute). The U.S. Environmental Protection Agency (US EPA) was the only agency to rate the project a 4 (substantial) degree of effect to water quality because of concerns about the nutrient-impaired Crystal Lake. The US EPA would like to review the Water Quality Impact Evaluation checklist when available. Other ETAT agencies will review project documents through their respective permitting processes.

Relevant agency correspondence has been included in **Appendix A**.

6.1.1 Southwest Florida Water Management District (SWFWMD)

SWFWMD started Pre-Application File PA# 404836 for District regulatory staff to track the project. This is part of the Water Management Information System (WMIS) available through www.watermatters.org. SWFWMD participated in a pre-application meeting on February 6, 2019 where various drainage treatment options and permit requirements were discussed. Although compensatory treatment along US 98 is possible, the timing of the US 98 improvements mean that the proposed Combee Road project would likely need its own stormwater treatment and environmental resource permit (ERP). The previous ERP 4722081.000 was issued in conjunction with a 2001 Combee Road resurfacing and safety improvement project.

6.1.2 Polk Transportation Planning Organization

The Polk TPO originally identified and studied this corridor as described in **Section 5.1.** Coordination continued during the PD&E Study, which included:

- Presentation to the Technical Advisory Committee – March 21, 2019
- Presentation to the TPO Board – April 11, 2019
- Meeting with TPO Staff – September 12, 2019
- Presentation to the Technical Advisory Committee – April 1, 2021
- Presentation to the TPO Board – April 8, 2021

The TPO has been very supportive of the project and is interested in accelerating its completion.

6.1.3 Polk County

Polk County public works staff attended the following meetings to discuss the project, as described in the *Draft Pond Siting Report*:

- Environmental Look-Around Meeting 1 – October 18, 2018
- Environmental Look Around Meeting 2 – December 17, 2018
- Environmental Look Around Meeting 3 – February 19, 2019

Based on this coordination, the County-owned pond within Crystal Lake Park on the north end of Crystal Lake was considered a viable pond option for stormwater runoff from Combee Road. A maintenance agreement and/or property easement between the County and FDOT would be needed for such a joint-use pond. Additional coordination with the Polk County Parks and Natural Resources Division was held on April 13, 2021 and September 2, 2021 to support a *de minimis* finding in accordance with Section 4(f) of the Department of Transportation Act of 1966 that the use of the pond would have no adverse effect to park activities, features, or attributes.

Polk County Traffic Engineering was contacted on June 22, 2020 to discuss traffic signal preemption for emergency vehicles. Traffic Engineer Matt Gibson indicated that infrared strobe detection is the countywide standard for emergency vehicle preemption at traffic signals. He agreed that since the signals on Combee Road are interconnected, the preemption could trigger green lights ahead of emergency vehicles to clear long queues during peak hours.

6.1.4 City of Lakeland

City of Lakeland staff attended the following meetings to discuss the project as described in the *Draft Pond Siting Report*:

- Environmental Look-Around Meeting 1 – October 18, 2018
- Environmental Look Around Meeting 2 – December 17, 2018
- Environmental Look Around Meeting 3 – February 19, 2019

Based on this coordination, it was determined that the City-owned parcel near the intersection of Combee Road and McJunkin Road is not a viable pond option due to its use by Lakeland Electric.

The City provided a *Crystal Lake TMDL Implementation Final Report* that recommends redirection of untreated stormwater to the County's pond at the north end of Crystal Lake. The report notes this best management practice is unlikely to meet water quality targets but is still recommended to improve the municipal separate storm sewer system to the maximum extent practicable.

6.1.5 Polk County Transit (Citrus Connection)

Polk County Transit, known as Citrus Connection, was consulted on the transit elements of the project. The agency representative noted at a meeting on July 12, 2019 that routes were being reconfigured but there was no intent to change the existing bus stops along Combee Road.

The next meeting with Citrus Connection was on June 9, 2020 after they reconfigured the bus routes. To better support transit, Citrus Connection requested that bus stops in right-turn lanes be located farther back from the stop bar to give buses more space to merge back into the through lanes. Roundabout intersections are not an issue if they are designed to allow buses to navigate smoothly. If possible, they would like sidewalks to be compatible with future bus shelters, noting that clear zone and ROW may be constrained.

6.1.6 Polk County Fire Rescue

Polk County Fire Rescue (PCFR) was contacted to determine the project's effect on emergency response, especially in areas with raised medians that constrict pavement width. Lakeland Fire Department (LFD) was also contacted based on PCFR's suggestion.

Polk County Fire Rescue Station 39 and City of Lakeland Fire Station 5 serve the area around Combee Road. PCFR contributed the following information:

- Median islands do not present an issue
- Passing in confined spaces can cause side mirrors to conflict
- It is not a common practice for fire trucks to traverse raised medians
- The TWLTL is beneficial for emergency response
- Most emergency vehicles would be southbound on Combee Road, but some could be northbound from a different station

LFD was also contacted because the project abuts city limits. LFD contributed the following information:

- LFD is unlikely to utilize Combee Road because City limits end at Combee Road
- Low and mountable median curbs are beneficial to fire trucks with low ground clearance
- Emergency vehicle preemption at traffic signals is the most beneficial to response times

See **Section 7.1.2** for more information on emergency vehicle accommodation.

6.1.7 Polk County Public Schools

Polk County Public Schools was contacted to determine the project's effects on safe routes to school, especially a potential roundabout intersection at Skyview Drive where there is an existing school crossing. Capt. Jill Seymour, Director of Safe Schools, would prefer the school crossing be moved to the signalized intersection at North Crystal Lake Drive so students can utilize a pedestrian signal to cross. She also would like pedestrian signing to encourage students to use a school crossing at North Crystal Lake instead of at a roundabout. Since the route to school will be moved to the other side of the street, there are no issues regarding removal of the chain-link fence along the lake.

6.2 Public Involvement

Public outreach was conducted according to the *Public Involvement Plan*, dated June 2018, to inform the public about the project and obtain input on the proposed alternatives. The public involvement activities included a project website, project newsletters, public meetings, and a public hearing as summarized in the following sections. More detailed information about the public outreach results will be documented in the Comments and Coordination Report under separate cover.

6.2.1 Project Website

A project website was developed and posted on FDOT District One's Southwest Florida Roads webpages. The website homepage (**Figure 32**) included information about the project and links to Public Notices, Documents & Publications, Schedule, and Contact information.[18] The project website was continually updated throughout the study.

[18] FDOT. Combee Road (SR 659) PD&E Study Homepage. Accessed May 11, 2020 from http://www.swflroads.com/sr659/us98toncrystallakedr/

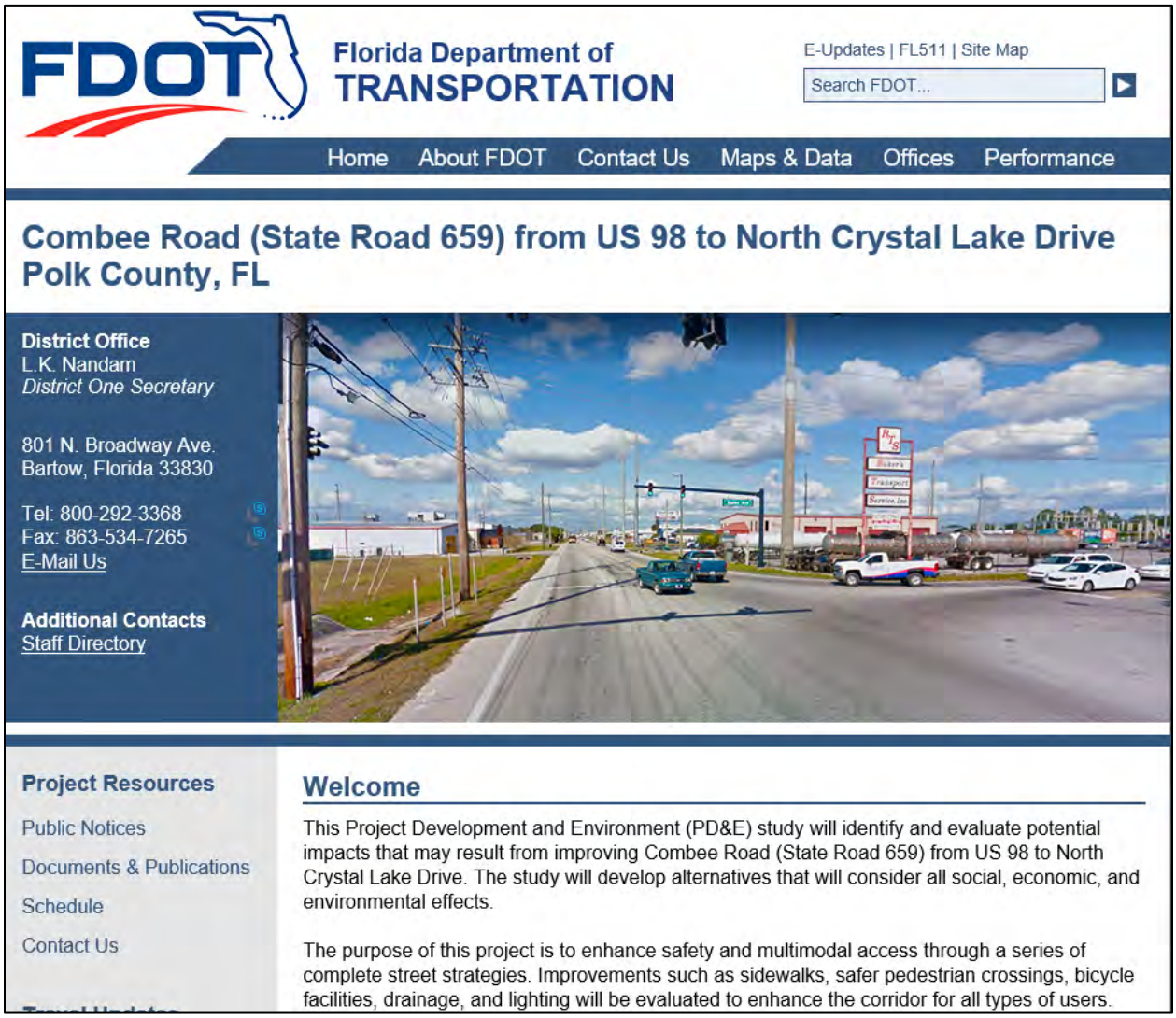


Figure 32: Project Website Homepage

6.2.2 Newsletters

Newsletters were distributed before each public meeting and served as meeting notifications. The newsletters were distributed to the project mailing list, elected officials, and appointed officials, and were posted on the project website.

6.2.3 Public Kickoff Meeting

A public kickoff meeting was held on Thursday, August 23, 2018 at Somos Church from 5:00 p.m. to 7:00 p.m. See **Figure 33**. The meeting was held in an informal, open-house setting where display boards and project materials were available to the public. FDOT staff and consultants were available to answer questions. Large aerial plots illustrating the entire project study limits were provide for people to comment and make recommendations.

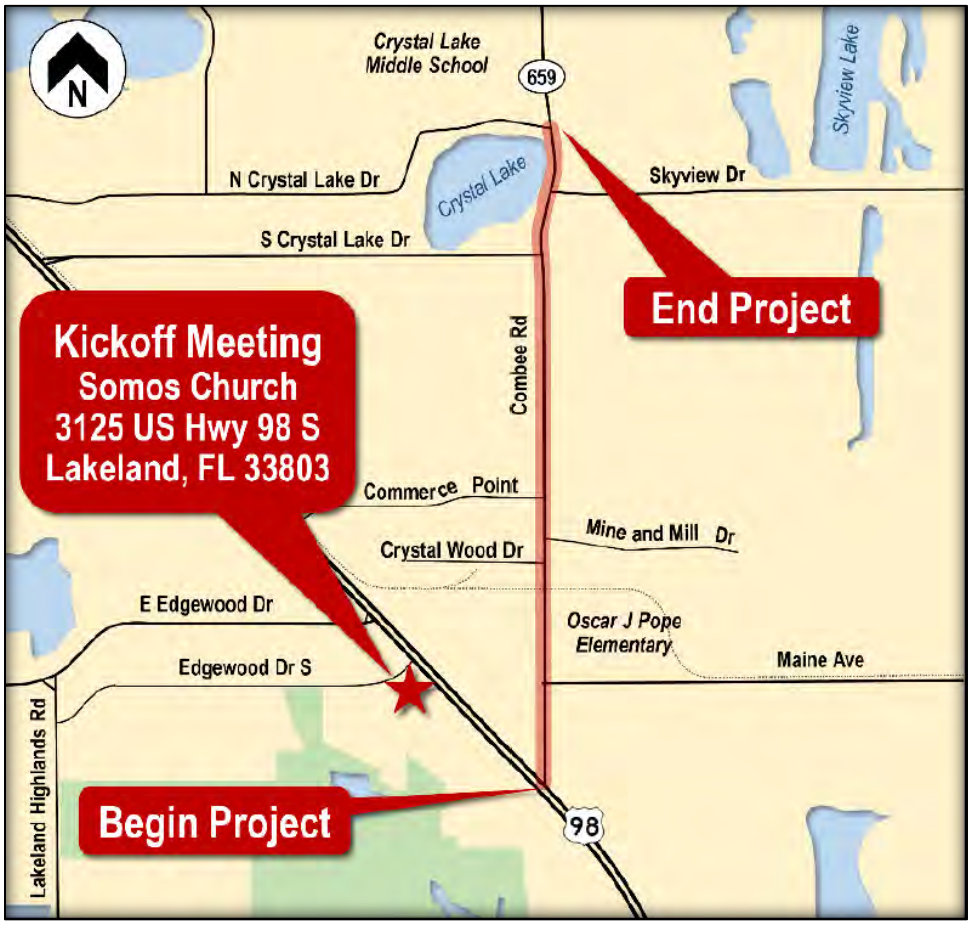


Figure 33: Kickoff Meeting Location Map

6.2.4 Alternatives Public Information Meeting

An Alternatives Public Information Meeting (PIM) was held on Thursday, March 7, 2019 at Somos Church from 5:00 p.m. to 7:00 p.m. See **Figure 34**. The meeting was held in an informal, open-house setting where display boards and project materials were available to the public. FDOT staff and consultants were available to answer questions. A video was played on a running loop that described and explained the No-Build and Alternative 1 (Build Alternative).

Figure 34: Alternatives Public Information Meeting #1 Location Map

Forty-six (46) attendees signed in at the meeting. Attendees received a one-page handout and a comment form. Three comments were received at the meeting and an additional three were received via email after the meeting. The comments generally supported the build alternative, with two comments expressing concern about impacts to private properties, and another suggesting a different configuration for the Combee Road at the Bartow Road intersection.

6.2.5 Alternatives Public Information Meeting 2

An additional Alternatives PIM was held to gain feedback on Alternative 2 and potential roundabout intersections. This PIM was conducted as a Virtual Public Workshop from November 12 to December 3, 2020, due to constraints from the COVID-19 pandemic. The virtual workshop was located on the project website,[19] and included an informational video and downloadable video script, workshop handout, comment form, and informational display boards. The boards included information about safety considerations, build alternative configurations, roundabouts,

[19] FDOT. 2020. *Virtual Public Workshop*. Accessed on May 12, 2021 from http://www.swflroads.com/sr659/us98toncrystallakedr/virtual_wkshp.html

an evaluation matrix, and general project information. Printed copies of these workshop materials were also provided at the Lakeland Public Library, 100 Lake Morton Drive, Lakeland, FL 33801. The public was able to comment and ask questions about the alternatives through a website comment form, email, phone, or mail-in forms. FDOT staff and consultants answered comments and questions.

Of the 81 website views, 11 website visitors provided sign-in information and 48 viewed the video. A total of 43 hard-copy workshop material packets were picked up from the distribution sites.

Thirteen comments were received over the period of the Virtual Public Workshop. Of the comments that stated an alternative preference, opinions were split evenly between Alternative 1 and Alternative 2. Commenters mainly expressed concerns about bicyclists and pedestrians, ROW impacts, the Skyview Roundabout, commercial traffic, and Industrial Park Drive access.

6.2.6 Public Hearing

A Public Hearing was held on Thursday, November 18, 2021. The public was provided three ways to participate: virtually from a computer, tablet, or mobile device; in-person at Somos Church; and through the project website. For the in-person location, an informal, open house began at 5:00 p.m. where display boards and project materials were available for public review. The formal presentation and opportunity for public testimony began at 6:00 p.m. for both in-person and virtual participants. The project video provided an overview of the Preferred Alternative, summary of potential impacts, and information on how to comment. After the project video, a 15-minute intermission was provided to allow in-person and virtual participants an opportunity to review project materials and ask questions. The formal comment period began after the intermission. No one at the in-person location provided a public statement at the microphone. One online attendee provided a verbal comment expressing support for the project.

Printed copies of the PD&E documents were provided from October 28, 2021 to December 2, 2021 at the following locations: online through the project website; City of Lakeland City Hall; and FDOT District One Headquarters. A printed copy of the PD&E documents was also made available at the Public Hearing in-person location. All hearing materials, including the project video, was posted to the project website on November 11, 2021.

Seventeen (17) attendees signed in at the in-person meeting and seven (7) attended virtually. Attendees at the in-person location received a handout and comment form. A copy of the handout was provided through the project website for virtual participants. Five written comments and one spoken comment were received at the Hearing, and an additional comment was received via mail after the Hearing. The public comments included:

- Two comments requested more separation between the sidewalk and fence for the section along the row of houses between Exchange Avenue and Kiwanis Avenue;
- One comment expressed their objection to the roundabouts;

- One comment requested information about the amount of water draining into Crystal Lake;
- One comment requested that the proposed median opening just south of Skyview Drive consider buses making a left turn from the adjacent property to go northbound on Combee Road;
- One comment expressed support for safety improvements on Combee Road;
- One comment expressed concern that the project would impact parking in front of their business.

7.0 DESIGN FEATURES OF THE PREFERRED ALTERNATIVE

7.1 Engineering Considerations

This chapter contains the detailed engineering design features of the preferred alternative, Alternative 2-with wide sidewalks. The preferred alternative Typical Section Package and Concept Plans have been included in **Appendix B** and **C**, respectively.

7.1.1 Typical Sections

The existing two-lane undivided road will be widened to include curb and gutter and a 13-foot TWLTL. The roadside open drainage system will be converted to a closed drainage system to accommodate an 8-foot sidewalk with 4-foot grass buffer. The design speed is 40 MPH. **Figure 35** shows the preferred typical section.

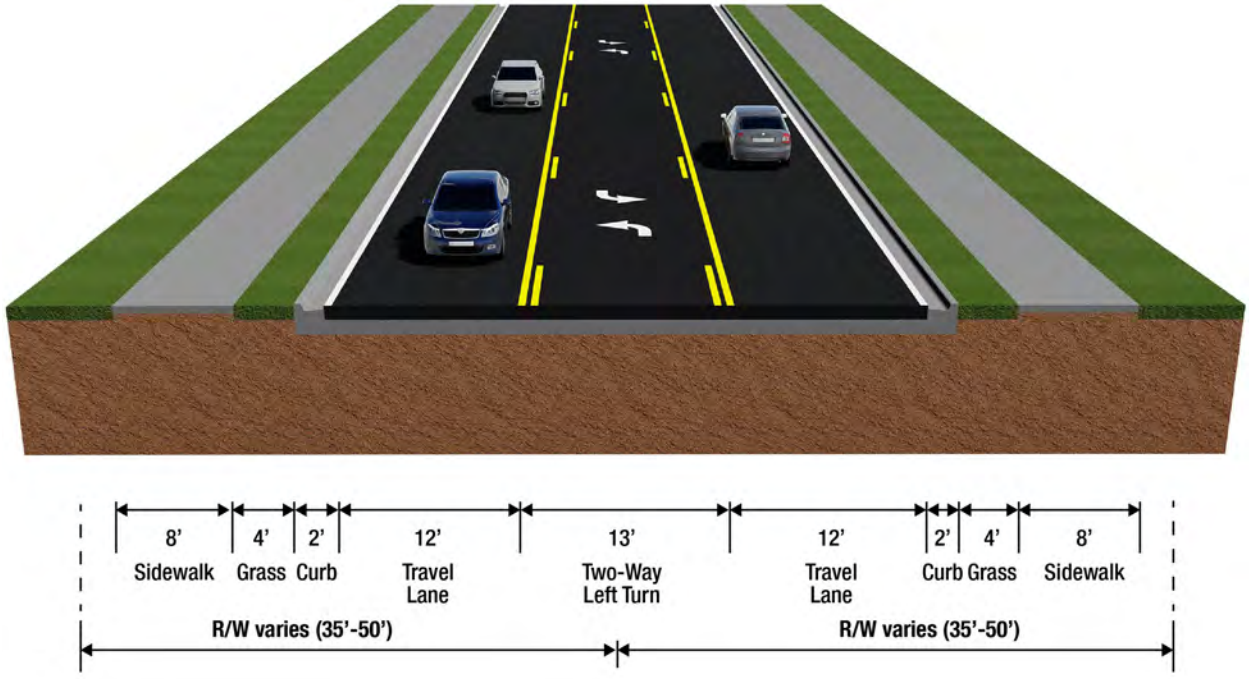


Figure 35: Preferred Typical Section

7.1.2 Emergency Response

It is imperative that first responders be able to pass stopped or disabled vehicles on Combee Road to facilitate emergency access and reduce response times. Since the Florida Fire Prevention Code recommends 20 feet of unobstructed width on fire department access roads,[20] the following treatments are recommended when raised medians restrict pavement widths:

- Mountable Type E (or Type B) median curbs (Index 520-001)
- Mountable Type I traffic separators (Index 520-020)

7.1.3 Right of Way and Business Impacts

Additional ROW will be required for stormwater attenuation as well as at intersections to accommodate the proposed roundabouts. An additional 4.6 acres is anticipated for the intersections at US 98, Maine Avenue, Commerce Point Drive, and Skyview Drive, as well as for stormwater ponds. The amount of ROW needed for stormwater ponds may potentially be reduced during the design phase. Specific locations are shown Appendix C. Business impacts of the preferred alternative will be minimal. Two business signs will need to be relocated as shown in **Figure 36** and **Figure 37**. Some driveways will only be accessible via the safer right-in right-out turning movement, which will add trip length compared to the existing left-turn access. The parking lot at the southeast corner of the Skyview Drive intersection will be impacted but could be reconfigured to avoid a loss of total parking spaces. Since a reconfiguration would benefit the property and is not necessarily required for the project, a license agreement is the preferred approach if FDOT needs to restore the parking.

[20]Patronis, J. 2017. *Florida Fire Prevention Code,* 6th edition. Accessed May 19, 2020 from https://www.myfloridacfo.com/Division/SFM/BFP/FloridaFirePreventionCodePage.htm

Figure 36**: Business Sign Relocation near Maine Avenue**

Figure 37: Business Sign Relocation near Skyview Drive

7.1.4 Horizontal and Vertical Geometry

The proposed horizontal geometry is similar to that of the existing corridor. It varies in locations where the proposed alignment was moved closer to the center of the ROW to avoid utility conflicts and business impacts. Presumably, the existing alignment was not fully centered in the ROW to allow adequate space for an open drainage system on one side. However, the proposed closed drainage system allows the alignment to be centered. **Table 24** details the curve data for the proposed alignment. Tapers or deflections will be used at intersections or to transition the typical sections.

Table 24: Proposed Horizontal Alignment Data

Proposed Curve Data					
PC	**PI**	**PT**	**Length**	**Radius**	**e**
STA.	**STA.**	**STA.**	**(ft)**	**(ft)**	
60+61.06	63+01.64	65+42.04	480.97	7,000.00	NC
67+73.85	70+21.70	72+65.38	491.53	1,550.00	NC
76+71.68	78+84.88	80+89.93	418.25	954.92	RC

The proposed profile will be sloped to match the existing ground as much as possible while using 0.30% minimum gutter slope for proper drainage. The minimum profile elevation will be controlled by a hydraulic grade line from the stormwater management facility to ensure the roadway doesn't flood. This elevation will be determined during the design phase.

7.1.5 Bicycle and Pedestrian Accommodations

The existing school crossing will be moved from the proposed roundabout at Skyview Drive to the traffic signal at North Crystal Lake Drive. To encourage students to use the school crossing instead of the roundabout, custom 12-inch x 18-inch pedestrian wayfinding signage is recommended similar to that shown in **Figure 38.**

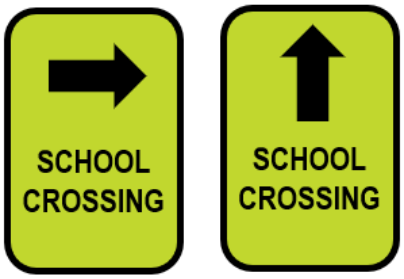


Figure 38: School Crossing Wayfinding Signs

7.1.6 Transit Features

It is recommended that bus stops utilize 8-foot x 10-foot deployment pads and grade for future 8-foot x 20-foot shelter pads where feasible, consistent with City of Lakeland standards.[21] Bus stop locations will remain unless otherwise requested by the transit agency during the design phase.

7.1.7 Intersection Concepts

As discussed in **Section 5.5,** the existing signalized intersections are to remain except at the Maine Avenue and Skyview Drive intersections where roundabouts are proposed.

Additional turn lanes are proposed for the southbound right turn at US 98, the southbound right turn at Commerce Point Drive, and the eastbound right turn at North Crystal Lake Drive because they significantly benefit traffic operations without major impacts. The existing mast-arm signals to be removed could potentially be salvaged for reuse elsewhere.

Roundabouts at Maine Avenue and Skyview Drive will need to balance the competing goals of limiting fastest paths while accommodating truck swept paths. The former seeks to narrow the pavement while the latter needs wider pavement areas. There are two potential options to resolve this dilemma:

(1) Although fastest path guidance in FDM 213.6 says that fastest path does not consider lane markings, other direction states that fastest path vehicle centerline could be 3 feet off a painted edge. A striped-out corner could direct vehicles to a slower path while still accommodating trucks.
(2) Although the swept path guidance in FDM 213.7 requires 1.5 feet from tire track to face of curb, an exception is allowed for type RA curb. In addition to the central truck apron, corner truck aprons could direct vehicles to a slower path while still accommodating trucks.

Option 1 is preferred so that transit vehicles are accommodated without use of the truck apron. Striping has been included in the concepts along with a mountable traffic separator between the northbound through lane and right-turn lane at Skyview Drive to control vehicle fastest paths.

Roundabouts are required to have landscaping in the central island per FDM 213.9. The FDOT standard is for a low maintenance mix of Florida Friendly species.[22] At a coordination meeting on May 8, 2020, Polk County was not interested in pursuing enhanced landscaping that would require county maintenance.

[21] City of Lakeland. 2018. Engineering Standards Manual Details. Volume 2. rev Sept. 15, 2018. Index 900 sheet 1. Accessed on June 24, 2020 from http://www.lakelandgov.net/media/8347/volume-2-details.pdf
[22] FDOT, 2020. *FDOT Design Manual* Section 213.9.1. Accessed on Sept. 22, 2021 from https://www.fdot.gov/roadway/fdm/default.shtm

7.1.8 Turn Lanes

Even though right-turn (RT) lane volumes at study area intersections are below the 300 VPH threshold in the FDM,[23] additional right-turn lanes were reevaluated along the constrained Combee Road as part of the Intersection Control Evaluation. **Table 25** presents the data for seven right-turn locations including 2015 traffic counts (volume and approach percentage), design year (2045) traffic (volume and approach percentage), average delay (with and without the right-turn lane), and turn lane recommendation. Each study area intersection was analyzed in Synchro for AM peak hour design year (2045) traffic with and without the corresponding turn lane.

Table 25: Right-turn Data

Combee Road Intersection Movement		2015 Traffic Counts		2045 Design Traffic		Average Delay (sec.)			Turn Lane Warranted?
		RT Volume	Approach %	RT Volume	Approach %	No Turn Lane	Turn Lane	Diff.	
US 98	SB RT	137	25%	**233**	**25%**	348	309	**-38**	***Yes***
Maine Ave	NB RT	130	20%	181	19%	34	17	-17	No
Commerce Point Drive	SB RT	165	27%	**200**	**22%**	250	114	**-136**	***Yes***
S Crystal Lake Drive	SB RT	86	13%	157	16%	31	19	-12	No
Skyview Drive	NB RT	**226**	**28%**	230	19%	143	63	**-80**	***Yes***
N Crystal Lake Drive	SB RT	14	2%	100	10%	137	126	-11	No
N Crystal Lake Drive	EB RT	139	**68%**	145	32%	137	117	**-20**	***Yes***

Note: Data contributing to turn lane warrant shown in **bold.**

Turn lane recommendations are based on the following observations:

US 98

- Southbound right-turn lane recommended based on high design year volumes, high approach percentage, delay reduction, and the propensity for traffic queues to block right-turning vehicles

Maine Avenue

- Northbound right-turn lane not recommended due to low design year volumes and minimal delay reduction

[23] FDOT, 2020. *FDOT Design Manual* Section 232.2. Accessed on October 21, 2020 from https://www.fdot.gov/roadway/fdm/default.shtm

Commerce Point Drive

- Southbound right-turn lane recommended based on high design year volumes, high approach percentage, and delay reduction

South Crystal Lake Drive

- Southbound right-turn lane not recommended due to low design year volumes and minimal delay reduction

Skyview Drive

- Northbound right-turn lane recommended to remain based on high 2015 volume, high approach percentage, and delay reduction

North Crystal Lake Drive

- Southbound right-turn lane not recommended due to low 2015 and design year volumes, low 2015 and design year approach percentage, and minimal delay reduction
- Eastbound right-turn lane recommended based on high 2015 approach percentage, delay reduction, and because it is the only signalized side street without a dedicated right-turn lane

Turn lanes can be reevaluated and added in the future if conditions change.

7.1.9 Intelligent Transportation System and TSM&O Strategies

Although TSM&O alone cannot meet the purpose and need of the project, some strategies would be beneficial to include as part of the preferred alternative. The designer should consider incorporating LPI, transit signal priority, and queue detection to prevent spillback to roundabouts.

LPI signal timing gives the pedestrians a head start before the corresponding vehicle movement gets a green light. This extra 3 to 7 seconds has been shown to increase vehicle yielding compliance and reduce overall intersection crashes.[24] The North Crystal Lake Drive intersection is the most likely location for LPI implementation because of the proposed school crossing. Other signalized intersections could include LPI if beneficial.

Transit signal priority is different than preemption because it does not interrupt the normal operations of the signal. Instead, the controller detects a transit vehicle and can extend the green phase or truncate the red phase to allow for the priority request without disrupting overall coordination cycles.[25] Special equipment would need to be installed on buses to enable transit signal priority.

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[24] FHWA. 2020. *Proven Safety Countermeasures – Leading Pedestrian Intervals.* Accessed on Sept. 9, 2020 from https://safety.fhwa.dot.gov/provencountermeasures/lead_ped_int/

[25] FHWA. *Traffic Signal Timing Manual.* Section 9.1.4. Accessed on Sept. 9, 2020 from https://ops.fhwa.dot.gov/publications/fhwahop08024/chapter9.htm#:~:text=9.1.,-4%20Traffic%20Signal&text=Transit%20Signal%20Priority%20(TSP)%20is,give%20priority%20to%20transit%20operations

The closely spaced intersections along Combee Road are a concern for potential queue spillback into roundabouts. One way to facilitate traffic operations would be with a queue detector that could request a green signal if the queue length is beginning to encroach into an adjacent roundabout. This is most applicable for the South Crystal Lake Drive and North Crystal Lake Drive intersections due to the proximity of the proposed Skyview Drive roundabout.

7.1.10 Access Management

The existing roadway network and small lot sizes mean that the access management standard for a Class 5 roadway is unlikely to be achieved on Combee Road. However, sections of raised or restrictive median to enhance safety and efficiency are required for roadways with TWLTLs.[26]

The proposed traffic separator from US 98 to Maine Avenue was a safety recommendation from a previous traffic study[27] and is consistent with FDOT guidance to avoid median openings within exclusive turn lanes.[28] Southbound traffic destined for the opposite side of Combee Road will need to use Park Street via a left-turn at Maine Avenue. Traffic restricted from making an eastbound left-turn onto Combee Road south of Maine Avenue will need to take a different route, such as US 98 to Commerce Point Drive. Other movements could utilize the proposed roundabouts at Maine Avenue or Skyview Drive to make U-turns with minimal inconvenience. **Figure 39** shows the number of diverted trips by location and the number of potential U-turns during the existing year (2016) afternoon peak hour. Approximately 168 (about 10%) of the driveway trips would need to utilize the roundabouts to make U-turns and 14 (less than 1%) would need to divert to a different route due to the proposed access changes.

[26] FDOT. 2020. *FDOT Design Manual.* Section 210.2. Accessed May 14, 2020 from https://www.fdot.gov/roadway/fdm/default.shtm
[27] Jardim. 2017. *Intersection Analysis Study, SR 659 (Combee Road) at SR 35 (US 98)*. Page 2.
[28] FDOT. 2019. *Access Management Guidebook*. Page 34. Accessed May 20, 2020 from https://www.fdot.gov/planning/systems/programs/sm/accman/default.shtm

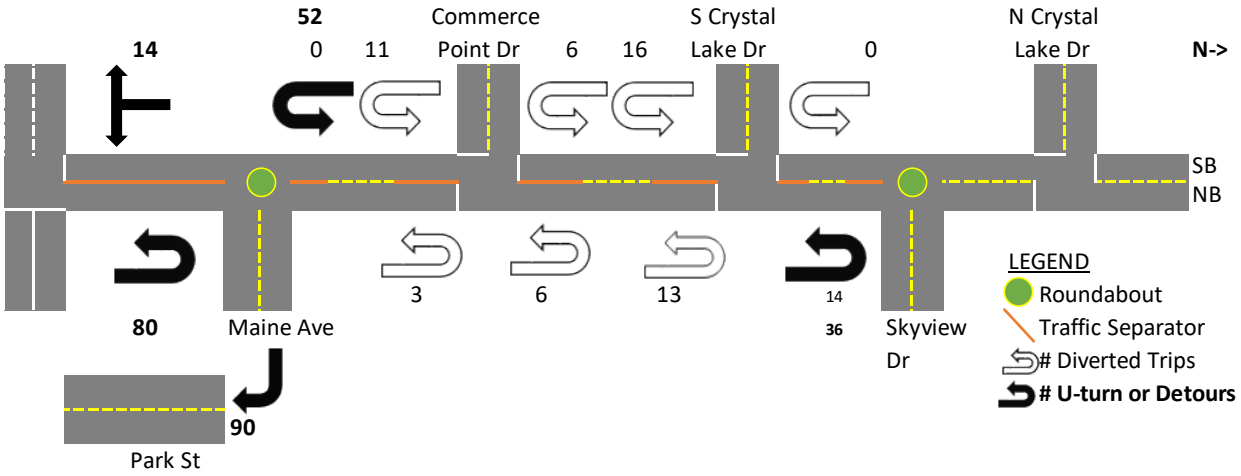


Figure 39: Peak Hour U-turn Diagram

Roundabouts at Maine Avenue and Skyview Drive will have splitter islands that are at least 100 feet long per FDM 213.3.5. U-turns at the roundabouts will help mitigate the access changes at these and other intersections on the project without rerouting traffic to other roads.

Signalized intersections at Commerce Point Drive and South Crystal Lake Drive will have traffic separators adjacent to dedicated turn lanes in the intersection functional area. For this purpose, the intersection functional area includes a 100-foot-long vehicle queue length[29] and a 185-foot-long total deceleration distance[30] for a realistic minimum of 285 feet from the stop bar.

The proposed TWLTL between South Crystal Lake Drive and Skyview Drive is shown because it does not interfere with a dedicated turn lane and does not have an access-related crash in the 5-year analysis period. A restrictive median could be added in the future if crashes increase at this location.

Access management improvements near North Crystal Lake Drive are not proposed because there are no driveway connections between Skyview Drive and North Crystal Lake Drive.

7.1.11 Utilities

For this project, utilities were located by utility records (quality level D) and were not field verified. Verified vertical horizontal's (VVH) are recommended during the design phase to identify or avoid utility conflicts with the proposed drainage structures.

[29] FDOT. 2019. *Access Management Guidebook*. Recommended Queue Storage Requirements. Page 23. Accessed May 20, 2020 from https://www.fdot.gov/planning/systems/programs/sm/accman/default.shtm
[30] FDOT. 2020. *FY 2020-21 Standard Plans for Road Construction*. Index 711-001 sheet 11. Accessed May 20, 2020 from https://www.fdot.gov/design/standardplans/current/default.shtm

Conflicts with Lakeland Electric's large diameter transmission poles will be avoided. However, there are 13 potential conflicts with distribution poles at the locations shown in **Table 26.**

Table 26: Potential Above-ground Utility Conflicts

Station	Side	Pole Material	Conflict With
12+50	Left	Wood	New right-turn lane
15+40	Left	Wood	New right-turn lane
17+20	Left	Wood	New right-turn lane
18+80	Left	Wood	New curb
19+10	Right	Wood	New sidewalk
21+40	Left	Wood	New roundabout
21+80	Left	Wood	New curb
43+20	Left	Metal	New sidewalk
65+10	Right	Wood	New sidewalk
67+30	Left	Metal	New curb
68+00	Right	Wood	New sidewalk
74+60	Right	Concrete	New roundabout
74+90	Left	Metal	New roundabout

The previous Combee Road resurfacing project used flume inlets next to Crystal Lake to avoid a potential water main conflict. The proposed drainage may conflict with this water line at seven locations where the curb and the utility intersect:

- Sta. 13+00, Left
- Sta. 18+40 to 19+00, Left
- Sta. 19+80 to 20+40, Left
- Sta. 21+80, Left
- Sta. 41+00, Left
- Sta. 42+20 to 45+00, Left
- Sta. 73+40 to 81+60, Left

Avoidance of the non-potable water lines and gas line on the right side of the roadway is highly desirable.

7.1.12 Drainage and Stormwater Management

The drainage and stormwater management approach are described in more detail in the *Pond Siting Report*. The project limits are divided into two drainage basins, Basin 1 drains south towards US 98 while Basin 2 drains north into Crystal Lake. For Basin 1, an approximate 1.2-acre pond site is needed. The preferred pond site is located on property owned by Ridley USA on the west side of Combee Road between Lyonal Drive and McJunkin Road. For Basin 2, the preferred stormwater

treatment approach is to use the existing pond on the north side of Crystal Lake and add a control structure to the existing ditch between South Crystal Lake Drive and Skyview Drive. The preferred pond sites, Pond 1 and Pond 2, are shown in **Appendix C** for Basin 1 and Basin 2, respectively.

As an option, the amount of impervious pavement could be reduced if the new sidewalk between Skyview Drive and North Crystal Lake Drive were constructed of pervious concrete.[31] Pervious concrete has more voids that allow water to infiltrate but a reduced strength compared to conventional concrete. Near Crystal Lake, a sidewalk would not be subject to vehicle loads so strength is not a concern. Additionally, the location does not receive offsite flows that would necessitate more frequent maintenance. Pervious concrete sidewalks do not need cross slope and could be designed with a flat profile to maximize stormwater detention. Since FDOT does not have standard specifications for pervious concrete, American Concrete Institute design specifications could be utilized with batches tested before construction to achieve desired material performance.[32]

Slope stabilization along the bank of Crystal Lake should be investigated during the design phase as another potential cost-effective stormwater management best practice. The fence at the back of sidewalk next to the lake is a barrier to maintenance, a viewshed obstruction, and a hindrance to travel on the sidewalk. Fences around FDOT stormwater ponds are no longer standard operating procedure and require a design variation approved by the State Drainage Engineer.[33] Although it is possible that the fence was installed to mitigate concerns about school-aged children going into the lake, the relocation of the route to school to the other side of Combee Road means the fence can be safely removed. The fence was not listed as a permit condition or mentioned in the previous permit application.[34]

7.1.13 Floodplain and Wetlands

The floodplain and wetlands approach is described in more detail in the *Location Hydraulics Report*. The ROW required to construct a roundabout intersection at Skyview Drive will impact the floodplain and wetlands associated with Crystal Lake but not state-owned Sovereign Submerged Lands. The proposed project will impact less than 0.1 acre and is eligible for the U.S. Army Corps

[31] FHWA. 2012. *Pervious Concrete Tech Brief*. FHWA-HIF-13-006. Accessed June 3, 2020 from https://www.fhwa.dot.gov/pavement/concrete/pubs/hif13006/hif13006.pdf
[32] ACI. 2010. *Report on Pervious Concrete*. 522R-10. Accessed June 3, 2020 from https://www.icpi.org/sites/default/files/resources/technical-papers/1809_0.pdf
[33] FDOT. *2020 Drainage Manual*. Section 5.4.4.2.4. Accessed May 27, 2020 from https://www.fdot.gov/roadway/Drainage/default.shtm
[34] SWFWMD. 2001. ERP 22081. Accessed May 27, 2020 from http://www18.swfwmd.state.fl.us/erp/erp/search/ERPSearch.aspx

of Engineers (USACE) Nationwide Permit 14 for linear transportation projects.[35] The project will not require USACE pre-construction notification or delineation since the impact is also below 0.1 acre.

Crystal Lake is non-navigable.

7.1.14 Transportation Management Plan

The preferred alternative will need to be constructed in phases so that traffic can be maintained to the adjacent homes and businesses. Two phases with two subphases have been developed in order to accomplish this. Although the main two phases maintain the pre-construction number of lanes, sub phases that restrict traffic to one lane for both directions will be necessary to complete some of the improvements. A lane closure analysis during the design phase will help determine the least impactful periods for the lane closures. Temporary traffic control phases are described below:

Phase 1: The first phase (**Figure 40**) will place about 4 feet of temporary pavement on the southbound shoulder, shift traffic onto the temporary pavement, and reduce lane widths to the 10-foot minimum. This concept assumes that the drainage trunk line is on the right side of the typical section since it is imperative to construct the drainage system first. The east side drainage structures, curb and gutter, and sidewalk can all be constructed in Phase 1.

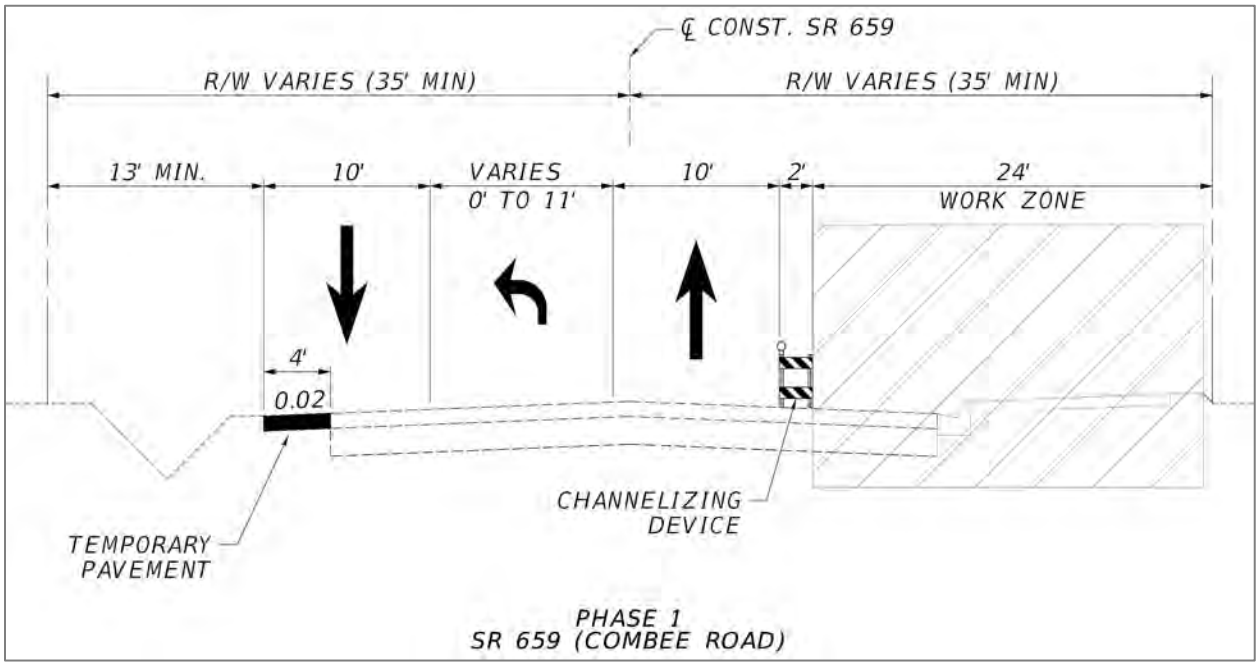


Figure 40: Phase 1 Typical Section

[35] USACE. Summary of the 2017 Nationwide Permits. Accessed on April 6, 2020 from https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll7/id/6711

Phase 1a: The subphase to the first phase (**Figure 41**) will utilize Index 102-603 and flaggers to restrict traffic to one-lane two-way operation. The northbound pavement can then be reconstructed up to the crown line of the road. Any vertical differences between the existing and proposed greater than 3 inches will need to be feathered together. This phase will be limited to off-peak hours identified by the lane closure analysis to avoid excessive traffic delays. Detours could also be investigated, but it is likely that through traffic will divert to other routes to avoid backups anyway.

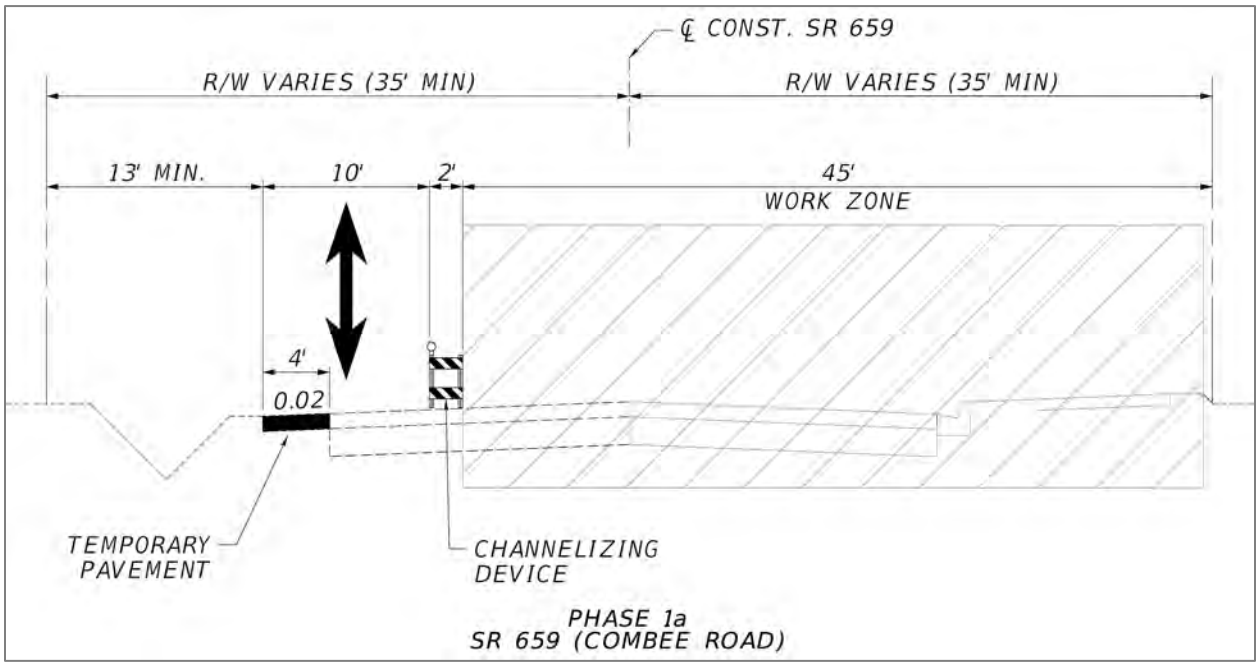


Figure 41: Phase 1a Typical Section

Phase 2: The second phase (**Figure 42**) shifts traffic onto the new pavement constructed in the previous phase. The northbound lane is shown 12 feet wide so the contractor has the option of using permanent instead of temporary lane markings. The west side drainage structures, curb and gutter, and sidewalk can be constructed in Phase 2.

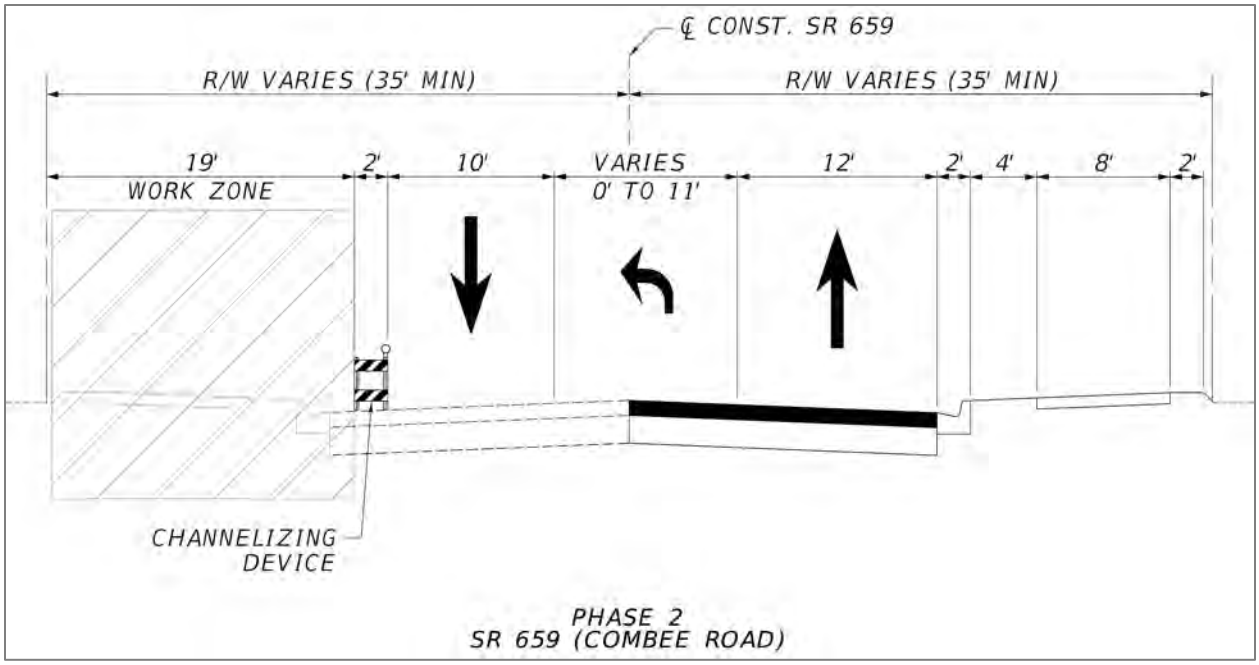


Figure 42: Phase 2 Typical Section

Phase 2a: The subphase to the second phase (**Figure 43**) will utilize Index 102-603 and flaggers to restrict traffic to one-lane two-way operation. The southbound pavement can then be reconstructed up to the crown line of the road. This phase will be limited to off-peak hours identified by the lane closure analysis to avoid excessive traffic delays. Detours were not developed but could be investigated during the design phase. It is likely that through traffic will divert to other routes to avoid backups even without signed detours.

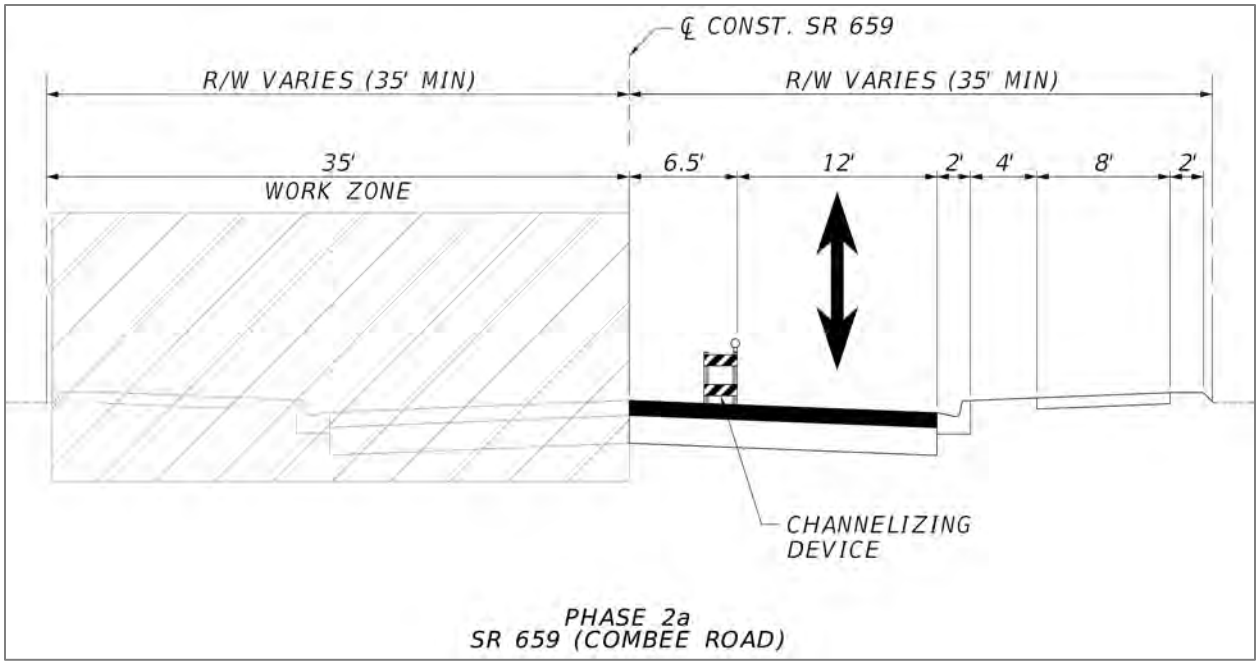


Figure 43: Phase 2a Typical Section

The following recommendations should be a part of the transportation management plan:

- Maintain access to businesses with supplemental BUSINESS ENTRANCE signing
- Maintain existing pedestrian pathways until sidewalks can be built
- Coordinate temporary bus stop relocations with Citrus Connection
- Restore drop-offs within the same work period to avoid the need for temporary barrier
- Ensure queues from lane closures do not extend across the CSX railroad crossing
- Avoid night work near residential areas

Maintain access to businesses with BUSINESS ENTRANCE driveway signing per Index 102-600 Sheet 9. Temporary driveway closures for construction should be phased to allow at least one lane to remain open or occur after business hours if the owner prefers.

Although existing sidewalks are limited within the project limits, a pathway for pedestrians must be maintained either around or through the work zone. Temporary routes for pedestrians and cyclists should be provided per FDM 240.2.1.9.

Special attention should be directed to maintaining access to transit throughout construction. Temporary bus stop relocations must be coordinated with Citrus Connection in advance and clearly signed for pedestrians. All temporary bus stops and pedestrian pathways must be ADA compliant.

Drop-off criteria per Index 102-600 require that any drop-off greater than 5 inches within the clear zone be shielded by a temporary barrier. The preferred approach is to restore excavations are

restored back to existing grade within the same work period to avoid the need for temporary barrier (Index 102-600, Sheet 8, Drop-off Condition, Note 5).

For the existing railroad crossing between Maine Avenue and Commerce Point Road, any temporary lane closures need to follow Index 102-603 Sheet 2, *Temporary Railroad Crossing Buffer Space Extension,* to ensure queuing from the lane closure does not extend across the railroad crossing.

If a lane closure analysis indicates that lane closure periods should be restricted, night work should be limited in areas adjacent to residential land uses.

7.1.15 Construction

Temporary impacts during construction will be minimized to the greatest extent possible pursuant to FDOT Standard Specifications for Road and Bridge Construction. Noise, dust, erosion, and exhaust from construction activities are anticipated in addition to temporary traffic control activities. The contractor will be required to follow a stormwater pollution prevention plan as part of the DEP Generic Permit.[36]

The design engineer is encouraged to minimize changes to the roadway profile that would result in excessive regrading of the site. If the material is suitable, balancing the earthwork cut and fill volumes between the roadway and pond could reduce construction duration and impacts.

Adjacent industrial land uses are conducive to the storing of construction equipment and/or stockpiling of materials. The undeveloped site at the northeast corner of the Combee Road intersection with Skyview Drive has recently been cleared of vegetation but no plans have been submitted for development.

Potential stockpiling and/or reuse of steel mast arms and traffic signal equipment from the Maine Avenue and Skyview Drive signal removal should be coordinated with Polk County.

7.1.16 Safety Analysis

A safety analysis was performed along Combee Road to estimate the crash frequency after the recommended improvements are constructed. The following crash modification factor (CMF) data were obtained from *The Federal Highway Administration (FHWA) Crash Modification Factor Clearinghouse:*

- 0.613 for all rear-end crashed when installing a TWLTL on a two-lane road (5-star rating),
- 0.860 CMF for all crashes when installing a right-turn lane (4-star rating), and

[36] FDOT 2021. FDOT Design Manual. Section 251.1. Dated Jan. 1, 2021. Accessed on April 9, 2021 from https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2021/2021fdm251swpppdev.pdf

- 0.748 CMF for all crashes when installing a left-turn lane (4-star rating).

Table 27 shows the Estimated Crash Frequency over a 5-year period based upon multiplying the CMFs by the 5-year historical number of crashes.

Table 27: Estimated Crash Frequency Over a 5-Year Period

Countermeasure	Location	CMF	Applied To	Historical Number of Crashes	Estimated Number of Crashes
Install Right-Turn Lane	Southbound approach of SR 659 at US 98/ SR 35/SR 700	0.860	All southbound crashes	11	9
	Southbound approach of SR 659 at Commerce Point Drive			7	6
Install Left-Turn Lane	Eastbound approach of North Crystal Lake Drive at SR 659	0.748	All eastbound crashes	3	2
Add TWLTL	North of McJunkin Road to North Crystal Lake Drive	0.613	All northbound and southbound rear-end crashes	55	33

7.1.17 Design Exceptions and Design Variations

No design exceptions are needed for the two controlling elements of low-speed roadways (e.g. design speed or structural capacity).

Project design variation memorandum for lack of bicycle lanes and median width are attached in **Appendix D**.

The lack of bicycle lanes on the preferred typical section is a tradeoff to provide a wider sidewalk and buffer space while calming traffic and improving the pedestrian environment. The high volume of traffic, high percentage of trucks, and the constrained ROW justify the use of wide sidewalks instead of on-street bicycle lanes. Bicyclists will be able to ride on the road or the wide sidewalk if it makes them more comfortable.

The proposed median width (15.5 feet) at the approaches to US 98, Commerce Point Drive, and South Crystal Lake Drive intersections is below the 22-foot standard in the FDM. This applies to where there is a turn lane and traffic separator in the median, and not to the TWLTL. Although FDM Table 210.3.1 notes that 15.5 feet is allowed where existing curb locations are fixed due to ROW constraints, this does not apply because Combee Road does not have existing curb.

It should be noted that the superelevated curve around Crystal Lake will be challenging to reconstruct from its existing 7% superelevation to a reverse crown (2%) cross slope. FDM guidance for superelevation on low-speed curves would require a design variation if this deficient

superelevation is left in place.[37] This should be examined during the design phase because the grade difference is more than 1.8 feet and could necessitate base reconstruction and temporary traffic detours.

7.1.18 Long Range Estimate

The Long Range Estimate (LRE) was developed using the FDOT LRE application unit prices and project-specific quantity take-offs. The preferred alternative was Version 7 of the LRE and is summarized in the Table 28. The LRE cost was rounded up to $14.2 million for the comparative evaluation.

Table 28: Long Range Estimate

Component	Cost
Roadway	$ 9,317,319.16
Signing and Pavement Marking	$ 83,464.60
Signals	$ 1,313,394.64
Lighting	$ 518,642.24
MOT (10%)	$ 1,123,282.06
Mobilization (8%)	$ 988,488.22
Project Unknowns (5%)	$ 667,229.55
Contingency	$ 140,118.20
TOTAL	**$ 14,151,938.67**

[37] FDOT 2021. *FDOT Design Manual*. Section 210.9.2. Dated Jan. 1, 2021. Accessed on April 9, 2021 from https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/roadway/fdm/2021/2021fdm210arterialscollectors.pdf

7.2 Environmental Considerations

7.2.1 Section 4(f)

Crystal Lake Park and boat ramp will have minimal impacts from construction of the preferred alternative. This is due to the proposed joint-use pond improvements inside the park and the proposed drainage pipe. After construction of the drainage pipe, the walkway and driveways will be restored to the pre-construction condition. Due to the minor nature of these impacts, the preferred alternative will have "no adverse effect" on the park. A *de minimis* finding was approved on March 8, 2022. A commitment was added (Section 1.3) to address the need for additional coordination with the Polk County Parks and Natural Resources Division Director regarding this resource.

7.2.2 Cultural Resources

A *Cultural Resources Assessment Survey* was performed for the study. No previously recorded archaeological sites are present within the Area of Potential Effect (APE), and the probability for unrecorded site occurrence varies. The historic/architectural research indicated five historic resources within the APE, none of which are eligible for listing in the National Register of Historic Places. Based on background research and field survey, no cultural resources that are listed, eligible for listing, or that appear potentially eligible were located within the APE.

7.2.3 Wetlands

A *Natural Resource Evaluation* (NRE) was prepared for the study. Impacts resulting from the preferred alternative totaled 0.47 acres and include 0.16 acres of wetlands and 0.31 acres of surface waters. There are no practicable alternatives to the proposed impacts due to the need for roadway improvements and safety considerations. Furthermore, all wetland impacts have been avoided and minimized to the greatest extent possible, limited to those areas of previous disturbance, and are required to meet minimum safety requirements. Compensatory mitigation for this project will be completed through the use of mitigation banks and any other mitigation options that satisfy state and federal requirements. Both the Peace River and the Boran Ranch Mitigation Banks have service areas that overlap the project limits.

7.2.4 Protected Species and Habitat

Per the Protected Species and Habitat Assessment in the NRE, 20 federally-listed species and 22 state-listed species have been reviewed for the potential to occur within the Combee Road study area. There will be no adverse impacts to listed species from this project. The project is not within any US Fish and Wildlife Service (USFWS) designated critical habitat. An effect determination was made for each of these federal- and state-listed species based on an analysis of the potential impacts of the proposed project on each species. Based on evaluation of collected data and field reviews, the federal- and state-listed species listed **Table 29** have been reviewed for the potential to occur within or adjacent to the project area.

Table 29: Protected Species Impact

Project Impact Determination	Federal Listed Species
"No effect"	Florida bonamia (*Bonamia grandiflora)*
	Pygmy fringe tree *(Chionanthus pygmaeus)*
	Scrub pigeon-wing (*Clitoria fragrans*)
	Short-leaved rosemary (*Conradina brevifolia)*
	Scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium)*
	Britton's beargrass (*Nolina brittoniana)*
	Papery nailwort (*Paronychia chartacea* ssp. *chartacea)*
	Lewton's polygala (*Polygala lewtonii)*
	Florida jointweed *(Polygonella basiramia)*
	Carter's warea (*Warea carteri)*
	Blue-tailed mole skink (*Plestiodon egregius lividus*)
	Sand skink (*Plestiodon reynoldsi*)
	Florida grasshopper sparrow (*Ammodramus savannarum floridanus*)
	Florida scrub-jay *(Aphelocoma coerulescens*)
	Crested caracara (*Caracara cheriway*)
	Red-cockaded woodpecker (*Picoides borealis*)
	Everglade snail kite (*Rostrhamus sociabilis plumbeus*)
"May affect, but is not likely to adversely affect"	Eastern indigo snake (*Drymarchon couperi*)
	Wood stork (*Mycteria americana*)
No impacts to primary or secondary buffer zones	Bald eagle (*Haliaeetus leucocephalus*)
Project Impact Determination	**State Listed Species**
"No effect anticipated"	Ashe's savory (*Calamintha ashei)*
	Many-flowered grass-pink (*Calopogon multiflorus)*
	Chapman's sedge (*Carex chapmannii*)
	Sand butterfly pea (*Centrosema arenicola)*
	Cutthroat grass (*Panicum abscissum*)
	Hartwrightia (*Hartwrightia floridana)*
	Nodding pinweed (*Lechea cernua*)
	Florida spiny-pod (*Matelea floridana)*
	Celestial lily (*Nemastylis floridana)*
	Florida beargrass (*Nolina atopocarpa)*
	Yellow fringeless orchid (*Platanthera integra)*
	Giant orchid (*Pteroglossaspis ecristata)*
	Florida willow (*Salix floridana)*
"No adverse effect anticipated"	Gopher tortoise (*Gopherus polyphemus)*
	Florida burrowing owl (*Athene cunicularia floridana*)
	Little blue heron (*Egretta caerulea*)
	Tricolored heron (*Egretta tricolor*)
	Florida sandhill crane (*Antigone canadensis pratensis*)
	Roseate spoonbill *(Platalea ajaja)*
	Florida pine snake (*Pituophis melanoleucus mugitus*)
	Short-tailed snake (*Lampropeltis extenuate*)
	Southeastern American Kestrel (*Falco sparverius paulus*)

7.2.5 Highway Traffic Noise

The traffic noise requirements for the proposed project have been reviewed and a detailed noise study is not required because the project does not substantially change the existing horizontal or vertical alignment or add through lanes. A noise study memorandum was completed and is provided as technical material in the file. The proposed addition of sidewalks and operational improvements are considered a Type III project.

7.2.6 Contamination

A *Contamination Screening Evaluation Report* was prepared for the study. A total of 31 potentially contaminated and/or known to be contaminated sites were identified within 500 feet of the project corridor with risk evaluation ratings of: 17 (low risk), 12 (medium risk), and 2 (high risk). Level II Contamination Assessment investigations are recommended for any areas that have proposed dewatering or subsurface work activities (e.g., pole foundations, drainage features) occurring adjacent to or at any of the medium/high risk sites identified.

7.2.7 Farmlands

Lands within the project vicinity do not meet the definition of farmland as defined in 7 CFR § 658. The provisions of the Farmland Protection Policy Act of 1981 do not apply because the entire project area is located in the urbanized area of Lakeland with no designated farmlands adjacent to the project corridor.

7.2.8 Air Quality

This project is not expected to create adverse impacts to air quality since the project area is in attainment for all National Ambient Air Quality Standards (NAAQS) and because the project is not expected to change the level of service (LOS), delay, or 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. Although the ETDM referenced an Air Quality Technical Memorandum as supporting documentation, the preferred alternative does not warrant an evaluation for Type 2 CE documents that improve delay.

APPENDIX A – AGENCY CORRESPONDENCE

FINAL

Concept Review Meeting

SUBJECT:	Combee Road (SR 659) PD&E Study, from US 98 to N Crystal Lake Drive FPID No. 440274-1-22-01; FAP No.: D117 089 B; Contract No. C9Y32; ETDM 14326; Polk County FL
MEETING DATE:	Thursday 5/14/2020
MEETING TIME:	11:00 AM – 12:00 PM
LOCATION:	https://global.gotomeeting.com/join/990248173 +1 (646) 749-3122 Access Code: 990-248-173
ATTENDEES:	***See attached Sign-In***

1) Introductions

2) PD&E Study Update Presentation
   - ***a) Are conflicts with driveways a concern? Consolidating the many driveways to reduce conflict points is not feasible due to small lots. The addition of a buffer space between the road and the sidewalk will be beneficial.***
   - ***b) Was a 10' sidewalk considered? The FDOT guidance at roundabouts is 10' sidewalk desirable or 8' minimum. A 10' sidewalk throughout the corridor may be justifiable since it is accommodating bikes and peds (FDM Table 222.1.1 allows 6' to 8'), but an 8' width provides better accommodation of utilities while maintaining a 4' minimum buffer from back of curb for pedestrian comfort.***
   - ***c) How would southbound vehicles access opposite side of the road if there is a raised traffic separator south of Maine Avenue? Park Street via Maine Avenue is an alternate route to replace the southbound left turns. The eastbound left turns would need to use US-98 as an alternate route.***
   - ***d) Any chance for a southbound U-turn at US-98? The proximity to Eaton Avenue and the size of a potential bulb-are prohibitive and would not be conducive to pedestrians.***
   - ***e) Could the traffic separator be used as a pedestrian refuge? The width is constrained to 4' and FDOT median handbook section 4.1.5 says 6' is the minimum width for a pedestrian refuge.***
   - ***f) The county has a new sidewalk project for the south side of Maine Avenue that could connect to the sidewalks around the roundabout.***
   - ***g) Can we add a high-emphasis crosswalk on the east leg of Commerce Point Drive intersection? Yes, we will add that high-emphasis crosswalk as suggested.***
   - ***h) Can we extend the traffic separator on the south approach to South Crystal Lake Drive so drivers are not as tempted to travel the wrong way for access to Industrial Park Drive? We will look into extending that traffic separator as suggested.***
   - ***i) Were there angle crashes at Industrial Park Drive? Yes, crash analysis shows crash frequency, separate from South Crystal Lake Drive, on par with the signalized intersections.***
   - ***j) Can we widen the existing sidewalk north of Skyview Drive and possibly into the utility strip? Widening into lake or reconstructing existing curb would be prohibitively expensive. We will***

evaluate widening sidewalk by holding the back of sidewalk and eliminating utility strip.

k) Will the U-turns cause capacity issues at proposed roundabouts? Traffic forecasts show this corridor will be congested anyway and U-turns for business access will be a small percentage of the traffic using the roundabout, so no issue.

l) Have you looked at the need for right-turn lanes? Yes, although this is principally a bike/ped improvement project we looked at adding right-turn lanes where there was considerable benefit to doing so. Right now, that is southbound right-turn at US-98, southbound right-turn at Commerce Point Drive, northbound right-turn at Skyview Drive (existing right-turn lane), and eastbound right-turn at North Crystal Lake Drive.

m) Will the raised median shown between South Crystal Lake drive and Skyview Drive and no bike lane hinder emergency vehicles ability to pass a queue? Not sure, we will look into this more and get back to you.

n) Is one typical section better for lighting? Existing corridor lighting will remain for both typical sections.

o) Is mixing signals and roundabouts an issue? The close intersection spacing at the north end of the project would be a queue spillback issue if multiple roundabouts were utilized. However, a SimTraffic simulation shows that a single roundabout at Skyview would not have spillback from adjacent signals.

3) Local agency feedback
   a) Any concerns with Alternative 2 typical section or roundabout concepts?
   No fatal flaws as far as local agencies are concerned.
   b) Would local agencies like to pursue enhanced landscaping via maintenance agreement?
   Polk County is not interested in being responsible for enhanced landscaping at this time.
   c) Any other thoughts or concerns?
      i) The traffic separators/access changes are likely to be the biggest concern for adjacent property owners. Be prepared to explain the safety need/benefits at the public meeting.
      ii) Have you coordinated with Citrus Connection? We met last year before this new typical section and roundabout concepts were developed. We will reach out to them again and discuss the desired treatments at transit stops.
      iii) Do you plan to present this concept to the TPO Board or County commission? We presented to the MPO board after the last public meeting. We would present a study update after the next public meeting, per their preference.
      iv) City can help distribute meeting notifications and exhibits if desired.

4) Next Steps
   a) Incorporate local agency feedback
   b) Hold Alternatives Public Information Meeting #2 (when possible)
   c) Refine concepts through Preliminary Design
   d) Hold Public Hearing

5) New Action Items

Action Item	Person Responsible	Due Date	Notes	Status
Evaluate widening sidewalk on west side, north of Skyview, by paving over utility strip	***Cris Schooley/KHA***			
Consider emergency vehicle access where raised medians are present	***Cris Schooley/KHA***			
Discuss roundabouts with Citrus Connection	***Cris Schooley/KHA***			
Prepare materials to demonstrate safety need/benefits for public meeting	***Cris Schooley/KHA***			
Show future sidewalk (by others) on south side of Maine Avenue	***Cris Schooley/KHA***			

Concept Review Meeting

SUBJECT: Combee Road (SR 659) PD&E Study, from US 98 to N Crystal Lake Drive
FPID No. 440274-1-22-01; FAP No.: D117 089 B; Contract No. C9Y32; ETDM 14326; Polk County FL

MEETING DATE: Thursday 5/14/2020

MEETING TIME: 11:00 AM – 12:00 PM

LOCATION: https://global.gotomeeting.com/join/990248173
+1 (646) 749-3122 Access Code: 990-248-173

Name	Initial	Organization	E-mail
Jennifer Marshall	***Online***	FDOT	Jennifer.Marshall@dot.state.fl.us
Angelo Rao	***Online***	Lakeland	Angelo.Rao@lakelandgov.net
Chandra Frederick		Polk County	chandrafrederick@polk-county.net
Chuck Barmby	***Online***	Lakeland	charles.barmby@lakelandgov.net
Cris Schooley	***Online***	Kimley-Horn	Cris.Schooley@kimley-horn.com
Greg James	***Online***	Lakeland	greg.james@lakelandgov.net
Jay Jarvis	***Online***	Polk County	JayJarvis@polk-county.net
Lauren Peters		FDOT	Lauren.Peters@dot.state.fl.us
Mark Hales	***Online***	Inwood	mhales@inwoodinc.com
Matt Dockins	***Online***	FDOT (RK&K)	mdockins@rkk.com
Michael Garau	***Online***	Kimley-Horn	Michael.Garau@kimley-horn.com
Millie Brown	***Online***	FDOT	Millie.Brown@dot.state.fl.us
Patrick Bateman	***Online***	FDOT	Patrick.Bateman@dot.state.fl.us
Phil Irven		Polk County	PhilIrven@polk-county.net
Rick Grube		Lakeland	Rick.Grube@lakelandgov.net

Name	Initial	Organization	E-mail
Ryan Kordek		Polk TPO	ryankordek@polk-county.net
Ryan Lazenby	***Online***	Lakeland	ryan.lazenby@lakelandgov.net
Ryan Weeks		FDOT	Ryan.Weeks@dot.state.fl.us
Steven Davis	***Online***	FDOT	steven.davis@dot.state.fl.us
Susan Joel	***Online***	FDOT (Atkins)	susan.joel@dot.state.fl.us
Tarra Keating	***Online***	Kimley-Horn	Tarra.Keating@kimley-horn.com
Jay Patel	***Online***	Inwood	jpatel@inwoodinc.com

From:	Jarvis, Jay
To:	Schooley, Cris
Cc:	Montoya, Joe; Gable, Doug; Lorenzo, William; Skelton, Bill
Subject:	FW: 440274-1 Combee Rd PD&E
Date:	Friday, May 22, 2020 11:15:32 AM
Attachments:	image002.png FDOT D1 WP Maine Ave OBM Webpage Snip.JPG Polk Draft Tent Work Program FY21-FY25.pdf Polk TPO Priority Project Applications- Polk County (Maine Ave).pdf FW EXTERNAL Polk TPO Priority Project Applications- Polk County (Maine Ave).msg

Cris,

Please see email below and attached documents.

Thanks,

Jay M. Jarvis, P.E., Director
Polk County Roads & Drainage Division
3000 Sheffield Road
Winter Haven, FL 33880
(863) 535-2200 Office
(863) 534-7339 Fax

From: Skelton, Bill <BillSkelton@polk-county.net>
Sent: Friday, May 22, 2020 10:46 AM
To: Jarvis, Jay <JayJarvis@polk-county.net>; Montoya, Joe <JoeMontoya@polk-county.net>; Gable, Doug <DougGable@polk-county.net>; Lorenzo, William <WilliamLorenzo@polk-county.net>
Subject: RE: 440274-1 Combee Rd PD&E

Jay,

Refer to Bill Lorenzo's email (attached) regarding status; as well as other attachments related to the FDOT's Tentative 5-Year Work Program (see page 19), including the project's Detail Item Report snipped from the FDOT Office of Work Program and Budget webpage (last update on 1/15/2020).

It appears design engineering is funded for $183,848 in FDOT FY 20-21 and construction is funded for $1,173,995 in FY 24-25. These figures are close, but differ from amounts referenced in Bill Lorenzo's email chain.

Despite the inclusion in the FDOT WP, it appears there hasn't been any staff interaction since August 2019. The last related exchange may have been between you and Millie Brown.

Bill says nothing has been mentioned recently during D1 coordination meetings. Perhaps we need to contact Millie for the latest. Xi or Ryan might know something as well.

Regards,

Bill Skelton
Project Management Liaison

Roads & Drainage Division
3000 Sheffield Road
Winter Haven, FL 33880
863-535-2200
www.polk-county.net

From: Jarvis, Jay <JayJarvis@polk-county.net>
Sent: Thursday, May 21, 2020 4:10 PM
To: Montoya, Joe <JoeMontoya@polk-county.net>; Gable, Doug <DougGable@polk-county.net>; Skelton, Bill <BillSkelton@polk-county.net>
Subject: FW: 440274-1 Combee Rd PD&E

Joe, Doug and Bill;

Someone brought this up during a conference call for the above subject project. I went back and looked and did not see that Maine Avenue is one of the approved sidewalk projects. Please verify that it is not.

Thanks,

Jay M. Jarvis, P.E., Director
Polk County Roads & Drainage Division
3000 Sheffield Road
Winter Haven, FL 33880
(863) 535-2200 Office
(863) 534-7339 Fax

From: Schooley, Cris <Cris.Schooley@kimley-horn.com>
Sent: Thursday, May 21, 2020 3:20 PM
To: Jarvis, Jay <JayJarvis@polk-county.net>
Subject: [EXTERNAL]: 440274-1 Combee Rd PD&E

Jay,
The County's sidewalk project along Maine Avenue was introduced at our last meeting. Do you have a CIP detail sheet or other information for me to document for future coordination?

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912 | www.kimley-horn.com
Connect with us: Twitter | LinkedIn | Facebook | Instagram

Office of Work Program and Budget Lisa Saliba - Director

Five Year Work Program

Selection Criteria	
District 01 (Updated: 1/15/2020-21.15.01) Category: Highways	2020-2025 GY Polk County Item Number: 446294 1

Display current records in a Report Style
Display current records in an Excel Document

Project Summary

Transportation System: OFF STATE HWY SYS/OFF FED SYS
Description: MAINE AVE SIDEWALK FROM COMBEE RD TO PARK ST & IOWA RD TO WANDA WAY
Type of Work: SIDEWALK
Item Number: 446294-1
Length: 0.120

District 01 - Polk County
View Scheduled Activities
View Map of Item

Project Detail

Fiscal Year:	2020	2021	2022	2023	2024	2025
Highways/Preliminary Engineering						
Amount:			$183,848			
Highways/Construction						
Amount:						$1,173,995
Item Total:			$183,848			$1,173,995

FPN : 4371071 **Project/Location :** LAKELAND TMC OPS FUND CITY WIDE

Desc: OTHER ITS

Project Length : 0.001 Begin Mile Post : 0.000 End Mile Post: 0.001

Comments :

Phase	Fund	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025
OPS	DS	$159,000	$159,000	$159,000	$159,000	$159,000
Project Total:		$159,000	$159,000	$159,000	$159,000	$159,000

FPN : 4466901 **Project/Location :** LINCOLN AVE FROM EAST ST TO A ST

Desc: RAIL SAFETY PROJECT

Project Length : 0.500 Begin Mile Post : 0.000 End Mile Post: 0.500

Comments :

Phase	Fund	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025
RRU	RHH	$209,890	$0	$0	$0	$0
Project Total:		$209,890	$0	$0	$0	$0

FPN : 4462941 **Project/Location :** MAINE AVE SIDEWALK FROM COMBEE RD TO PARK ST & IOWA RD TO WANDA WAY

Desc: SIDEWALK

Project Length : 0.120 Begin Mile Post : 0.000 End Mile Post: 0.120

Comments :

Phase	Fund	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025
CST	SU	$0	$0	$0	$0	$1,173,995
PE	SU	$0	$183,848	$0	$0	$0
Project Total:		$0	$183,848	$0	$0	$1,173,995

FPN : 4416791 **Project/Location :** N CRYSTAL LAKE DR FROM WILLOW POINT DR TO LONGFELLOW BLVD

Desc: SIDEWALK

Project Length : 0.284 Begin Mile Post : 0.000 End Mile Post: 0.284

Comments :

Phase	Fund	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025
CST	SU	$260,000	$0	$0	$0	$0
Project Total:		$260,000	$0	$0	$0	$0

FPN : 4421072 **Project/Location :** POLK COUNTY COMMUNICATIONS FROM POLK TMC TO US 17

Desc: ITS COMMUNICATION SYSTEM

Project Length : 1.030 Begin Mile Post : 0.000 End Mile Post: 1.030

Comments :

Phase	Fund	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025
CST	SA	$507,109	$0	$0	$0	$0
Project Total:		$507,109	$0	$0	$0	$0

FPN : 4126751 **Project/Location :** POLK COUNTY TRAFFIC SIGNALS REIMBURSEMENT

Desc: TRAFFIC SIGNALS

Project Length : 12.175 Begin Mile Post : 2.300 End Mile Post: 14.475

Comments :

Phase	Fund	2020/ 2021	2021/ 2022	2022/ 2023	2023/ 2024	2024/ 2025
OPS	DDR	$372,668	$936,121	$0	$998,597	$1,025,555
OPS	DITS	$531,184	$0	$969,512	$0	$0
Project Total:		$903,852	$936,121	$969,512	$998,597	$1,025,555

PHASE CODES ADM – Administration ● CAP – Capitol Improvement ● CS – Construction ● DSB – Design Build ● ENV – Environmental ● INC – Contract Incentives ● LAR – Local Government Reimbursement ● MNT – Bridge/Rdway/Contract Maint ● MSC – Miscellaneous ● OPS – Operations ● PE – Prelim Engineering ● PDE – Project Dev and Enviro ● PLN – Planning ● RES – Research ● ROW – Right of Way ● RRU – Railroad Utilities

FINAL

Concept Review Meeting

SUBJECT: Combee Road (SR 659) PD&E Study, from US 98 to N Crystal Lake Drive
FPID No. 440274-1-22-01; FAP No.: D117 089 B; Contract No. C9Y32; ETDM 14326; Polk County FL

MEETING DATE: Tuesday 6/09/2020

MEETING TIME: 3:00 PM – 4:00 PM

LOCATION: Microsoft Teams Meeting

(833) 779-7795 Conference ID: 233 939 079#

ATTENDEES: ***See Sign-in (attached)***

1) PD&E Study Update Presentation ***(attached)***

2) Local agency feedback
   a) Any concerns with Alternative 2 typical section or roundabout concepts?
   No concerns with Alternative 2. If roundabouts are designed to accommodate large trucks then there should be no issue for buses.
   b) What is Citrus Connection preference on transit stop location and features?
   Citrus Connection does NOT want bus pull outs because it is difficult for the bus to merge back into traffic. It is typical for Citrus Connection stops to be in right-turn lanes, but leave room for the bus to merge back in away from the intersection (this applies to Commerce Point Drive and North Crystal Lake Drive bus stops). The bus stop near Skyview Drive needs to be located where the bus can pull completely out of the through lane. Perhaps move the taper back.
   c) Any other thoughts or concerns?
   Citrus Connection would like the bus pads replaced, like what they have today. It would be nice to locate the sidewalks so that bus shelters or other amenities could be added in the future. City of Lakeland and Citrus Connection will provide details of typical stop designs.

3) Next Steps
   a) Incorporate local agency feedback
   b) Hold Alternatives Public Information Meeting #2 (when possible)
   c) Refine concepts through Preliminary Design
   d) Hold Public Hearing

4) New Action Items

Action Item	Person Responsible	Due Date	Notes	Status
Update bus stop concepts as discussed	*Cris Schooley/KHA*			*Completed*
Send bus stop design details	*Chuck Barmby/Lakeland*			*Received 6/24/2020*
Send bus stop design details	*Rod Wetzel/Citrus Connection*			*Completed*

Concept Review Meeting

SUBJECT: Combee Road (SR 659) PD&E Study, from US 98 to N Crystal Lake Drive
FPID No. 440274-1-22-01; FAP No.: D117 089 B; Contract No. C9Y32; ETDM 14326; Polk County FL

MEETING DATE: Tuesday 6/09/2020

MEETING TIME: 3:00 PM – 4:00 PM

LOCATION: Microsoft Teams Meeting

(833) 779-7795 Conference ID: 233 939 079#

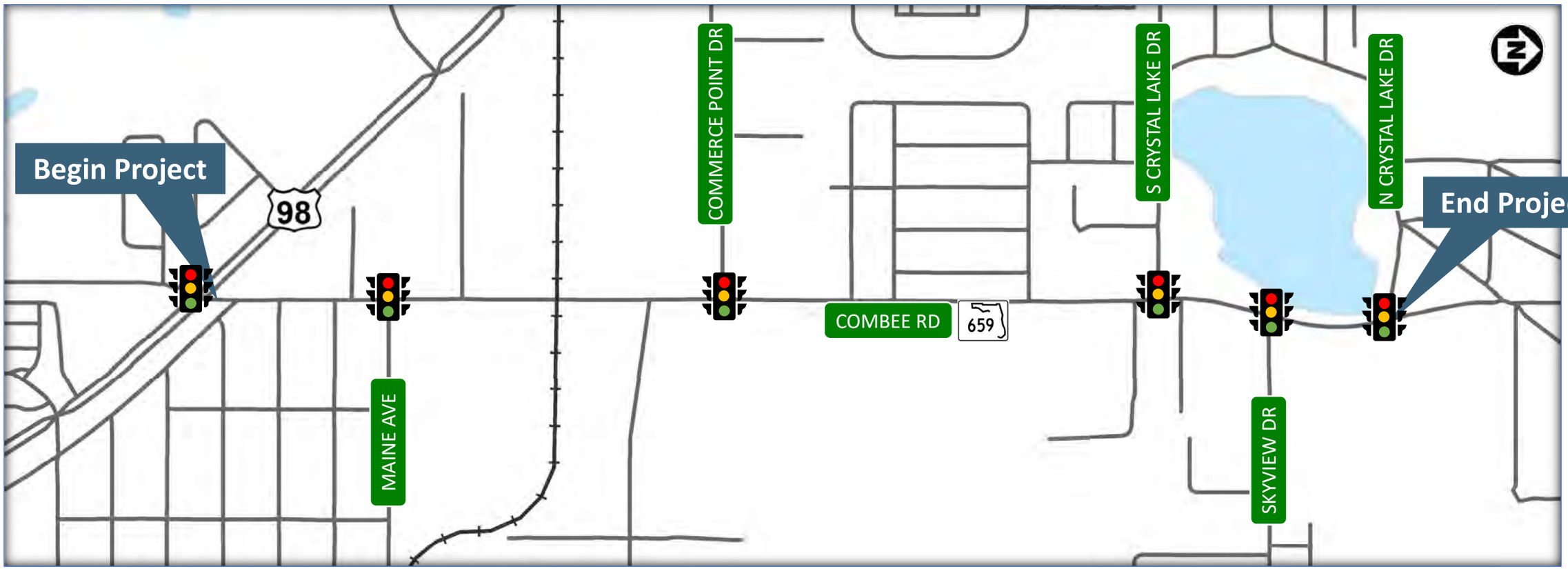
Name	Initial	Organization	E-mail
Chuck Barmby	***Online***	Lakeland	charles.barmby@lakelandgov.net
Cris Schooley	***Online***	Kimley-Horn	Cris.Schooley@kimley-horn.com
Mark Hales	***Online***	Inwood	mhales@inwoodinc.com
Matt Dockins	***Online***	FDOT (RK&K)	mdockins@rkk.com
Michael Garau	***Online***	Kimley-Horn	Michael.Garau@kimley-horn.com
Patrick Bateman	***Online***	FDOT	Patrick.Bateman@dot.state.fl.us
Ryan Weeks	***Online***	FDOT	Ryan.Weeks@dot.state.fl.us
Rodney Wetzel	***Online***	Citrus Connection	RWetzel@ridecitrus.com
Jay Patel	***Online***	Inwood	jpatel@inwoodinc.com

Combee Road (SR 659) PD&E
FPID 440274-1-22-01

PD&E Study Update

June 9, 2020

Project Background



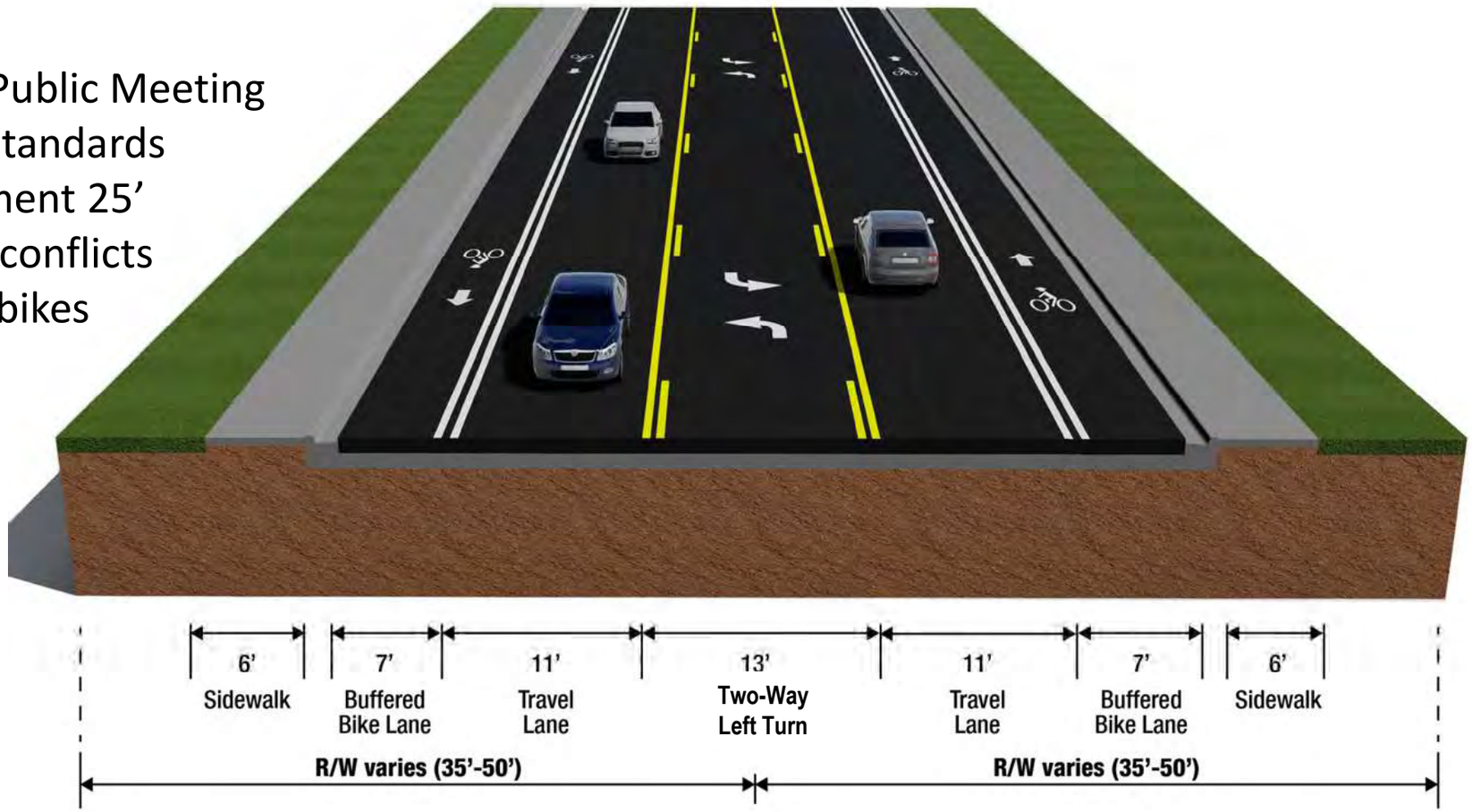
- Constrained corridor
- Little to no pedestrian facilities
- Traffic back-ups from left-turns
- Polk TPO Complete Street project
- Local coordination on pond sites
- 2 public meetings held

FPID No. 440274-1-22-01

PD&E Proposed Typical Sections

- Presented at Public Meeting
- Meets FDOT Standards
- Widens Pavement 25’
- Concern over conflicts w/trucks and bikes

Alternative 1 Typical Section
Combee Road (SR 659)

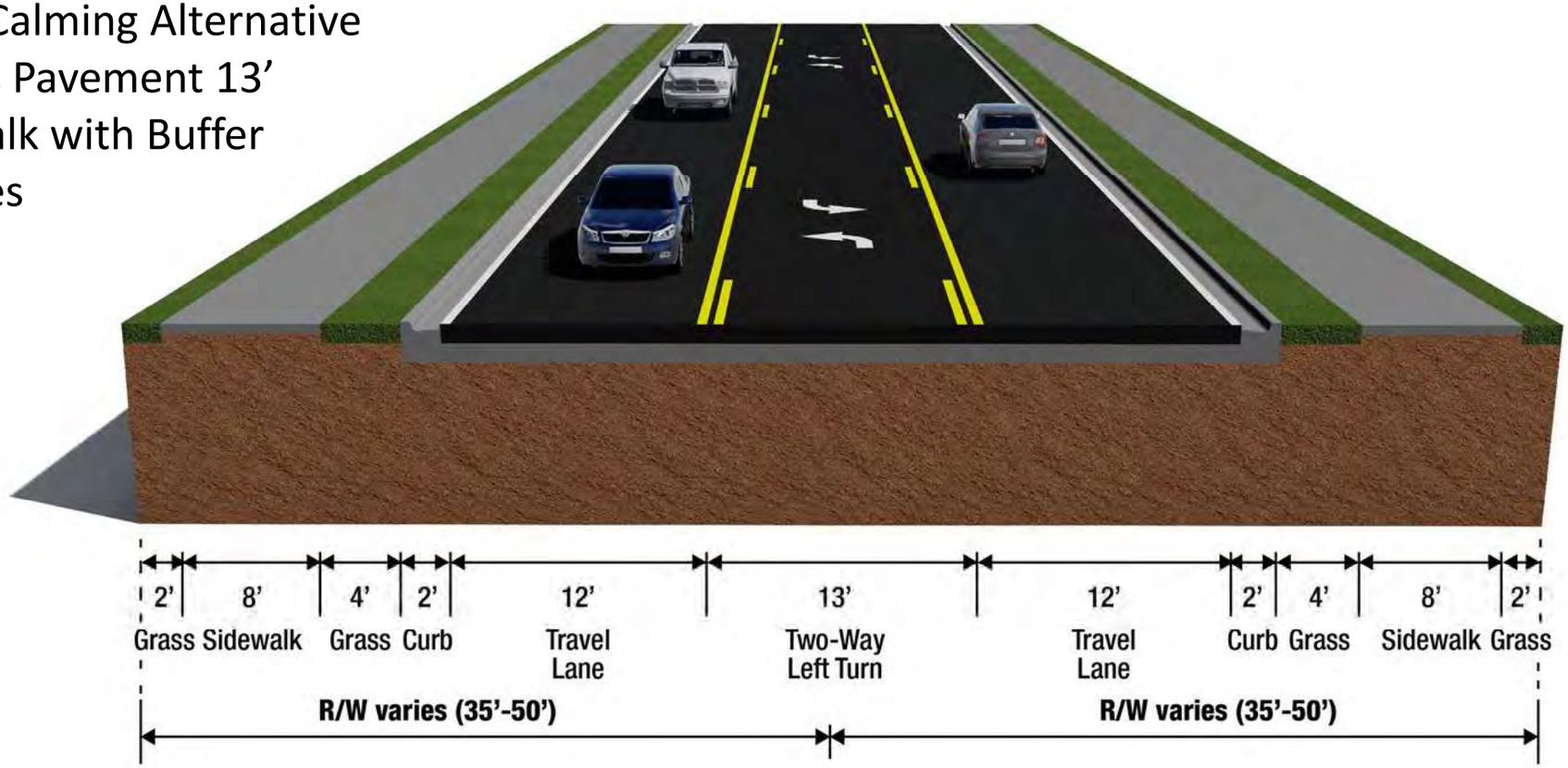


FPID No. 440274-1-22-01

PD&E Proposed Typical Sections

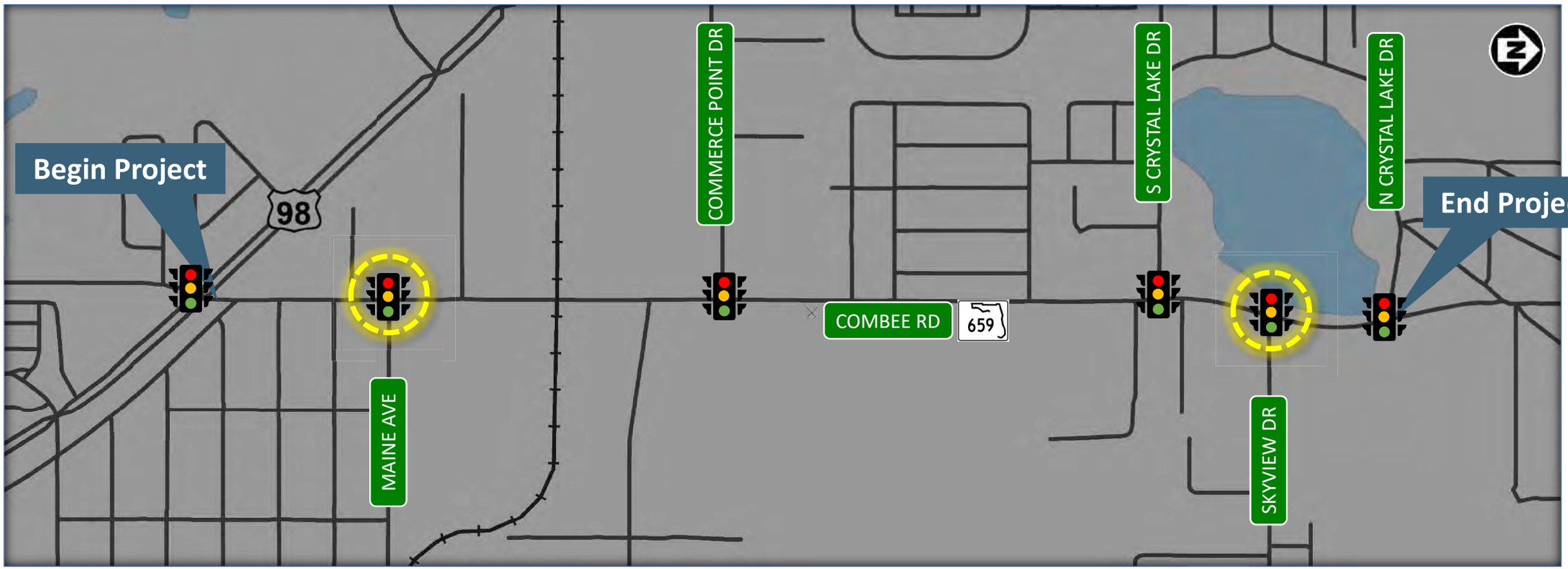
Alternative 2 Typical Section
Combee Road (SR 659)

- New Traffic Calming Alternative
- Only Widens Pavement 13’
- Wide Sidewalk with Buffer
- No Bike Lanes



FPID No. 440274-1-22-01

Intersection Control Evaluations



- New ICE process required as of 2020
- Replaces old roundabout evaluation policy
- Local agency and public feedback included

- Roundabouts favored at Maine Avenue and Skyview Drive

FPID No. 440274-1-22-01

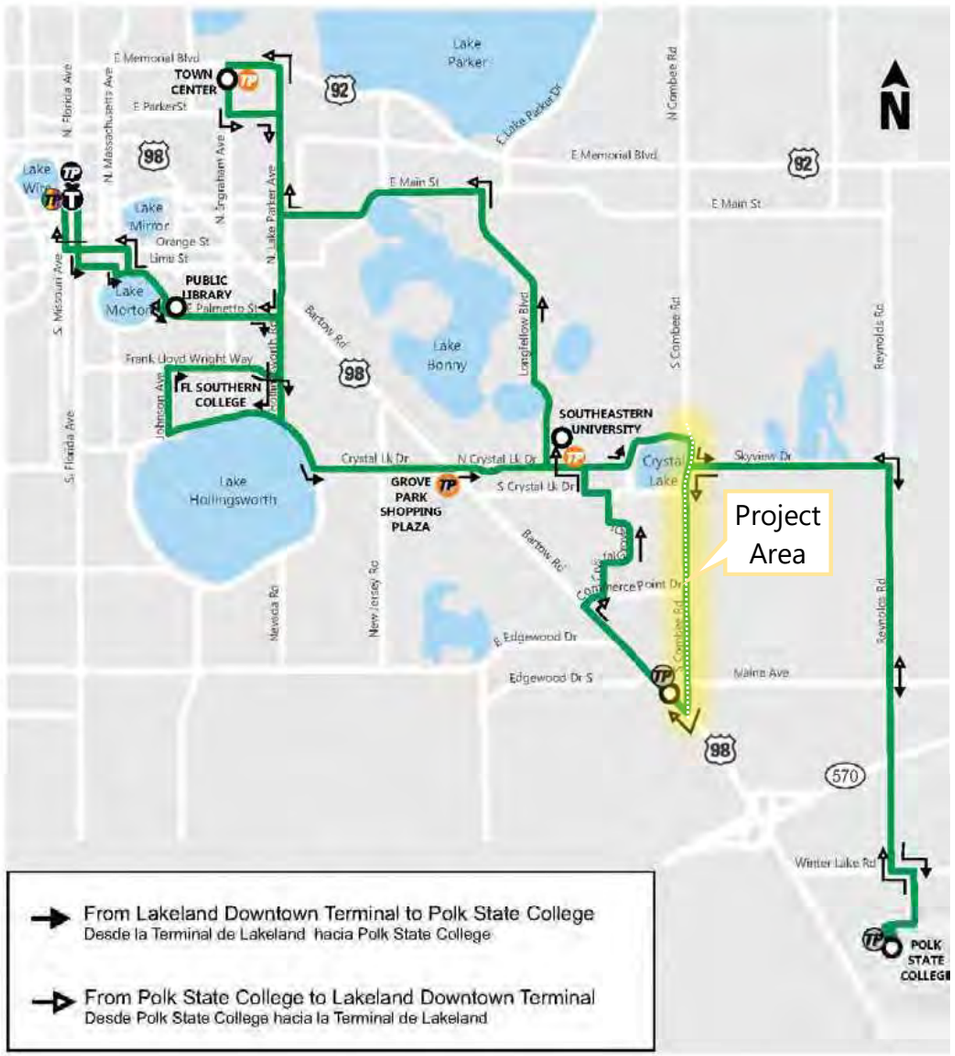
Citrus Connection

ORANGE 1

ORANGE 2

Citrus Connection

GREEN 1



GREEN 2

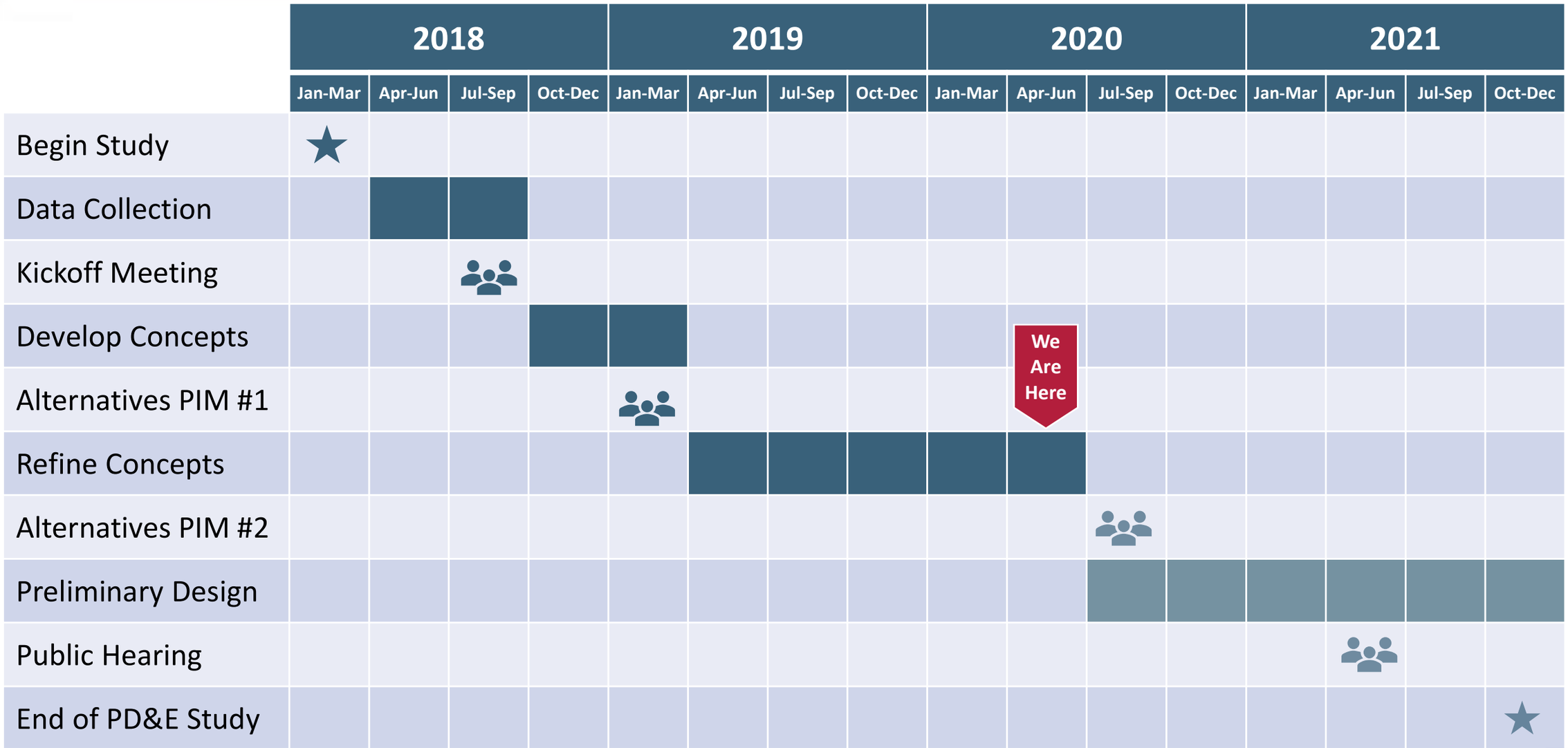
Existing Stops

Location	Route Direction	Facility
N Crystal Lk Dr & S Combee Rd - Stop 1467	Green 1- eastbound Orange 2- eastbound	Sign, Bench
S Combee Rd & Skyview Dr - Stop 754	Green 2- northbound	Sign, Boarding and alighting area
S Combee Rd & S Crystal Lake Dr - Stop 1528	Green 2- northbound	Sign, Boarding and alighting area
S Combee Rd & Kiwanis Ave - Stop 1529	Green 1- southbound	Sign, Boarding and alighting area
S Combee Rd & Commerce Point Dr - Stop 760	Green 1- southbound	Sign, Boarding and alighting area
S Combee Rd & Mine and Mill Rd - Stop 758	Green 2- northbound	Sign
S Combee Rd & N McJunkin Rd - Stop 1524	Green 2- northbound	Sign, Bench
S Combee Rd & McJunkin Rd - Stop 757	Green 1- southbound	Sign, Boarding and alighting area
S Combee Rd & Ellis Ave - Stop 756	Green 2- northbound	Sign, Boarding & alighting area
Bartow Rd & S Combee Rd - Stop 769	Green 1- westbound	Sign, Boarding & alighting area, bench, trash receptacle

Intersection Concepts

DSGNRD01_Alt2.kmz

Schedule



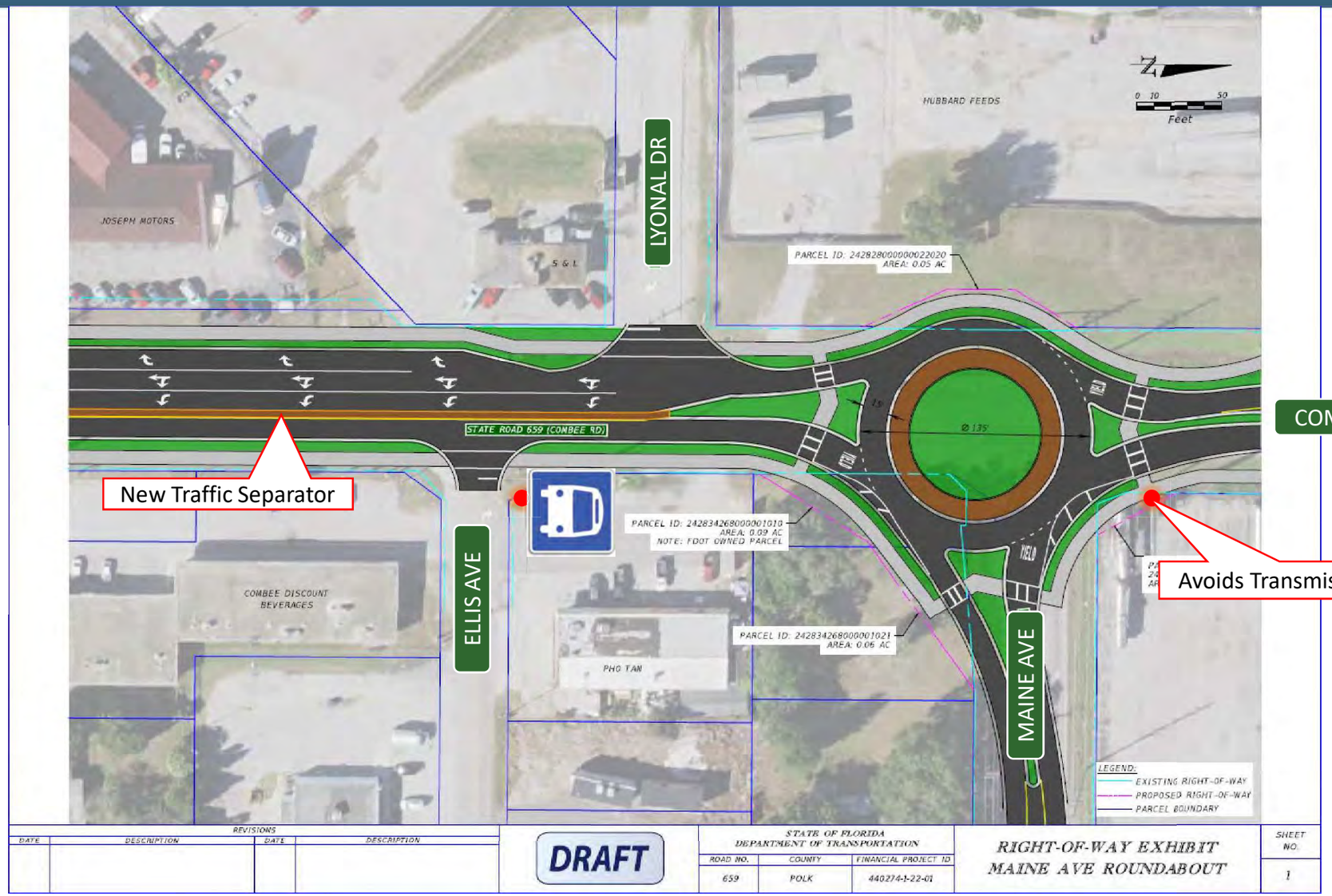
Preliminary Design will begin after the Alternatives PIM #2

Next Steps

- Incorporate Local Agency Feedback
- Hold Alternatives Public Information Meeting #2

  (Postponed until late 2020 due to COVID)
- Refine concepts through Preliminary Design
- Hold Public Hearing

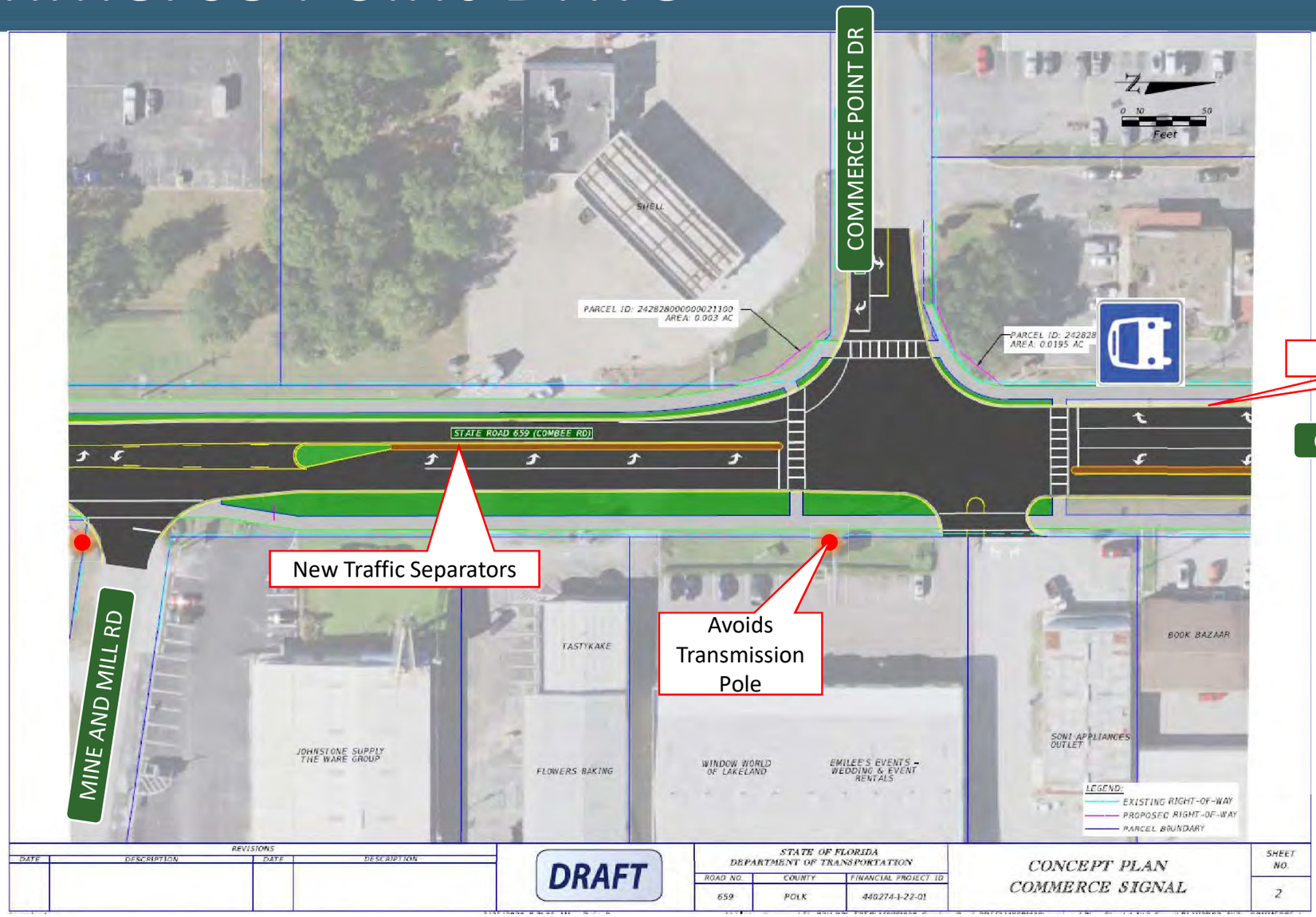
Maine Avenue



Bus stop on near side of roundabout; no issues

FPID No. 440274-1-22-01

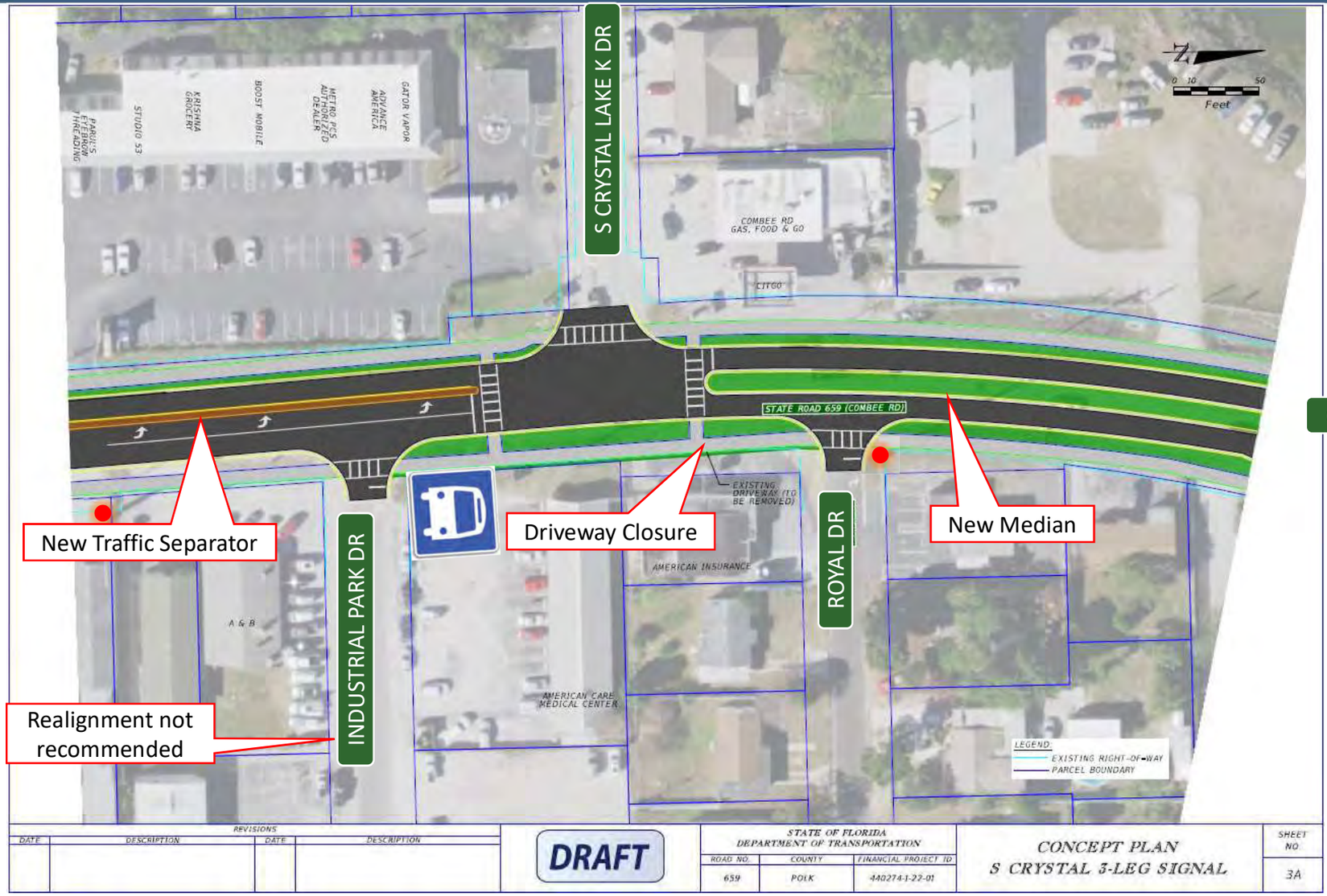
Commerce Point Drive



Bus stop in new right-turn lane; move stop away from intersection

FPID No. 440274-1-22-01

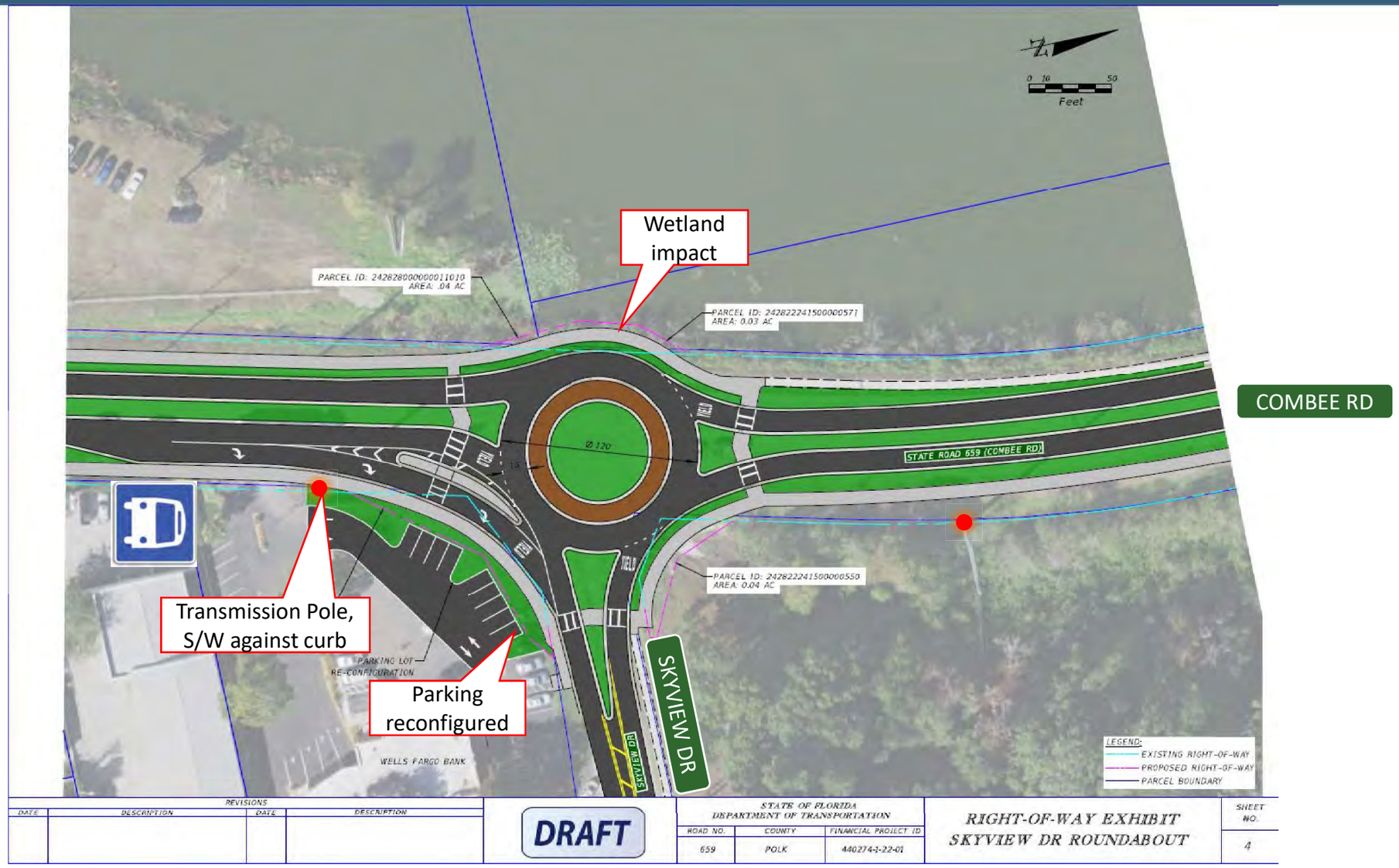
South Crystal Lake Drive



Bus stop on near side of signal; no issues

FPID No. 440274-1-22-01

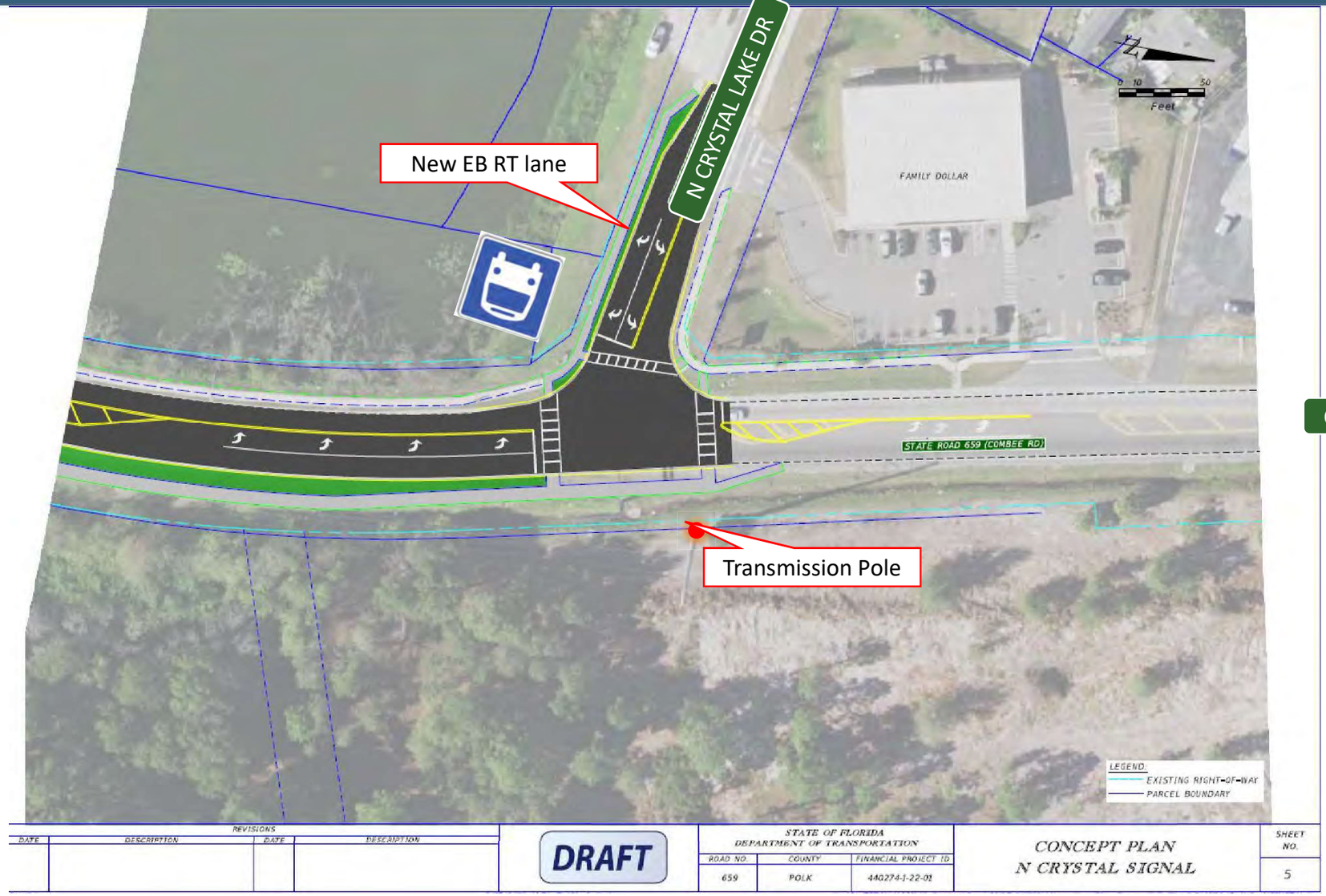
Skyview Drive



Bus stop in right-turn lane but route turns right; bus needs to be out of thru lane

FPID No. 440274-1-22-01

North Crystal Lake Drive



Bus stop in new right-turn lane with routes turning left and right; move stop away from intersection

FPID No. 440274-1-22-01

From: Schooley, Cris
To: Matt Dockins
Cc: Garau, Michael
Subject: 440274-1 Combee Rd PD&E: Emergency Response
Date: Monday, June 22, 2020 4:06:00 PM

Matt, I spoke with Matt Gibson, traffic engineer at Polk County today. He said they use infrared strobe detection as the countywide standard for emergency vehicle preemption at traffic signals. He agreed that since the signals on Combee are interconnected the preemption could trigger green lights ahead of the emergency vehicle to clear long queues during peak hours.

I think that is probably the best single thing we could do to benefit emergency vehicles. We'll see what the Fire Rescue people have to say regarding the typical section.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912 | www.kimley-horn.com
Connect with us: Twitter | LinkedIn | Facebook | Instagram

From: Schooley, Cris
To: jill.seymour@polk-fl.net
Cc: Garau, Michael; Matt Dockins
Subject: RE: 440274-1 SR 659 (Combee Rd) PD&E: School Input
Date: Tuesday, June 23, 2020 4:01:00 PM

Jill, thank you for returning my call.

Per our discussion, your preference is that the school crossing be moved to the signalized intersection at North Crystal Lake Drive so that the students can utilize a pedestrian signal to cross. I will look into pedestrian signing options to encourage students to use a school crossing at North Crystal Lake instead of the roundabout. And with the route to school moved to the other side of the street, you see no issues with removing the chain-link fence along the lake.

As I mentioned, the schedule is to begin preliminary design before the end of the year, and have a public hearing next fall. Construction has not been funded so this project is at least several years away.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912 | www.kimley-horn.com

---

From: Schooley, Cris
Sent: Tuesday, June 23, 2020 11:49 AM
To: jill.seymour@polk-fl.net
Cc: Garau, Michael <Michael.Garau@kimley-horn.com>; Matt Dockins <mdockins@rkk.com>
Subject: 440274-1 SR 659 (Combee Rd) PD&E: School Input

Jill,
Would you have any concerns with a proposed roundabout intersection at Combee Road at Skyview Drive? A school crossing is there today but you indicated no crossing guard is assigned.

FDOT is also looking at removing the existing fence along Crystal Lake to improve the pedestrian environment. It's unclear why the fence was installed but it could have been related to the route to school. Since the project will also construct a new sidewalk along the east side of Combee Road, the route to school could be moved to the other side of the road and the school crossing to the signalized intersection at North Crystal Lake Drive. Do you agree with that approach?

The project website is: http://www.swflroads.com/sr659/us98toncrystallakedr/

I'm available if you'd like to discuss.

Regards,

Cris Schooley, PE, AICP

Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912 | www.kimley-horn.com
Connect with us: Twitter | LinkedIn | Facebook | Instagram

Celebrating 12 years as one of FORTUNE's 100 Best Companies to Work For

From: Schooley, Cris
To: Cassista, Ben
Subject: RE: 440274-1 Combee Rd PD&E: Emergency Response
Date: Monday, June 29, 2020 4:28:00 PM

Thank you, Chief.

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912 | www.kimley-horn.com

---

From: Cassista, Ben <bencassista@polk-county.net>
Sent: Monday, June 29, 2020 12:20 PM
To: Schooley, Cris <Cris.Schooley@kimley-horn.com>
Subject: RE: 440274-1 Combee Rd PD&E: Emergency Response

From: Schooley, Cris [mailto:Cris.Schooley@kimley-horn.com]
Sent: Monday, June 22, 2020 3:47 PM
To: Cassista, Ben <bencassista@polk-county.net>
Cc: Matt Dockins <mdockins@rkk.com>; Garau, Michael <Michael.Garau@kimley-horn.com>
Subject: [EXTERNAL]: 440274-1 Combee Rd PD&E: Emergency Response

Chief Ben Cassista,
Thank you for speaking with me today regarding the Combee Road project in Polk County. Per your request, I have attached some project information to help you determine the potential effect on emergency response.

The Combee Road project is primarily a pedestrian improvement and safety project. Additional through lanes are not proposed. We have two alternative typical sections; Alternative 1 with bike lanes and Alternative 2 without bike lanes. The alternative with bike lanes would have ample pavement for cars to yield for emergency vehicles. Alternative 2 however, would be more restrictive where raised medians and median islands are proposed. Although traffic signals will include preemption to give emergency vehicles the green light, we would like your feedback on the following:

1. What is Fire Rescue's experience with traffic calming such as median island and has it been an issue for response? No known issues.
2. Is there a certain length above which narrow roadway widths become an issue? We are to drive with due regard at all times. One issue that has happened in the past it with mirror that extend well beyond the vehicles and they are sometimes clipped by the fire truck when passing.
3. Is it acceptable practice to traverse raised medians or traffic separators to pass cars that pull over? What about to access side streets or businesses? This is not a common practice that we promote.

4. What are your thoughts on the three options shown in the attached PDF to make the medians more traversable? I believe that alternative 1 would be the best as the middle lane can be utilized, there is also a lot of foot/bike traffic along this roadway.
5. Since Station 39 is north of the project area, could we assume emergency vehicles will mostly be southbound on Combee Road? That would be most of the time, there will be times were other apparatus will be driving northbound coming from other stations.
6. Would Lakeland Fire need to serve the project area and use Combee Road? Most of the area is unincorporated but there is a pocket of City Limits at Commerce Point Drive. I would contact them to get their input on the matter.

Let me know if you would prefer a conference call/virtual meeting to discuss the project and your feedback. I would be happy to set something up with everybody.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912 | www.kimley-horn.com
Connect with us: Twitter | LinkedIn | Facebook | Instagram

From: Williams, Michael
To: Schooley, Cris
Subject: RE: 440274-1 Combee Rd PD&E: Emergency Response
Date: Tuesday, July 14, 2020 10:46:40 AM
Attachments: image002.png

Thank you again. We certainly appreciate being included during the planning phases of construction. I don't see any issues with the proposed intersection of Combee Road and Commerce Point Drive.

Thank you again.

Michael Williams
Assistant Fire Chief of Operations
Lakeland Fire Department
City of Lakeland
p. 863.834.8296
f. 863.834.8295
facebook.com/LakelandFD
@LakelandFD

From: Schooley, Cris [mailto:Cris.Schooley@kimley-horn.com]
Sent: Tuesday, June 30, 2020 4:58 PM
To: Williams, Michael <Michael.Williams@lakelandgov.net>
Cc: Matt Dockins <mdockins@rkk.com>; Garau, Michael <Michael.Garau@kimley-horn.com>
Subject: 440274-1 Combee Rd PD&E: Emergency Response

Chief Williams,
Thank you for speaking with me today regarding the Combee Road project in Polk County. Per your request, I have attached the latest concept is google earth kmz format. These concepts are preliminary and subject to change.

As we discussed, the city limits along Commerce Point Drive end at Combee Road so it would be unlikely that City of Lakeland Fire vehicles would need to travel on Combee Road. If they were to utilize Combee Road, low mountable curbs on the median islands would be preferable due to low ground clearance of the trucks. Emergency vehicle preemption at traffic signals would remain with the proposed concepts.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
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APPENDIX B – TYPICAL SECTION PACKAGE

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

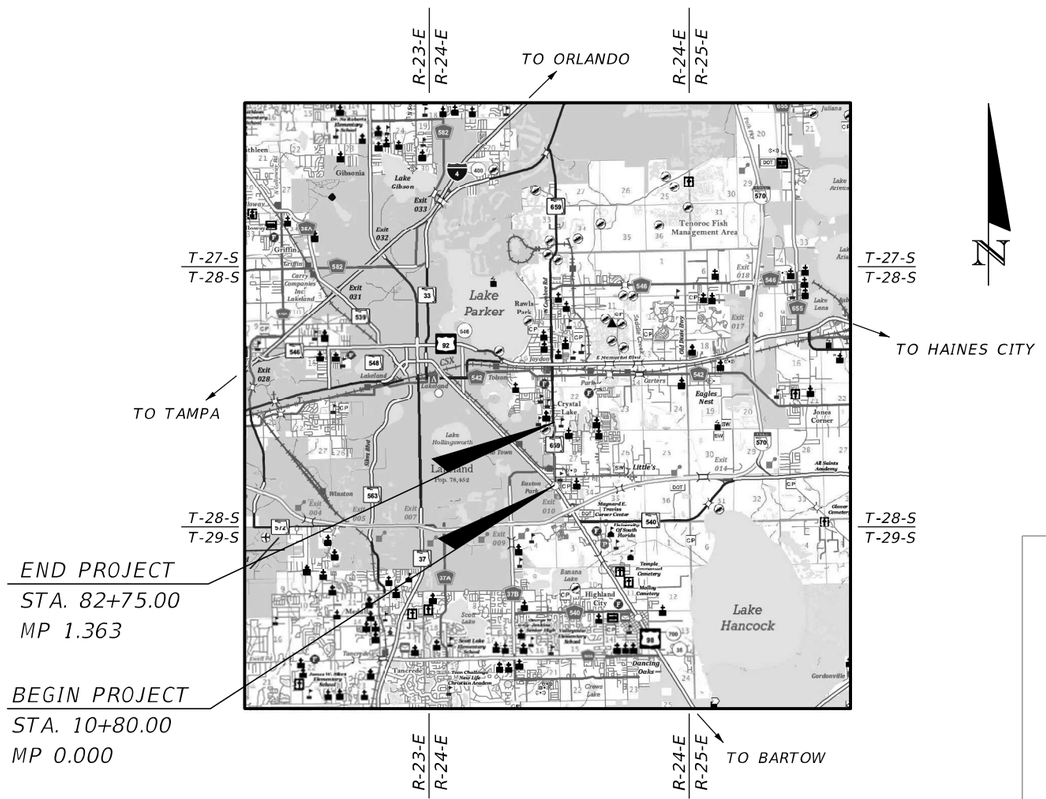
TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 440274-1-22-01

POLK COUNTY (16006)

STATE ROAD NO. 659 (COMBEE ROAD)

COMPLETE STREET IMPROVEMENTS



APPROVED BY:

CRIS S. SCHOOLEY
LICENSE
No 74018
STATE OF FLORIDA
PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

Cris S Schooley

Digitally signed by Cris S Schooley
Date: 2021.08.20 12:51:22 -04'00'

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES

CRIS SCHOOLEY, P.E. NO.: 74018
KIMLEY-HORN AND ASSOCIATES
189 S. ORANGE AVE., SUITE 1000
ORLANDO, FL 32801
(407) 898-1511
CONTRACT NO.: C9Y32
VENDOR NO.: 696

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

TYPICAL SECTION PACKAGE

Mark L Peronto
Digitally signed by Mark L Peronto
Date: 2021.08.28 08:20:57 -04'00'

FDOT DISTRICT DESIGN ENGINEER

TYPICAL SECTION CONCURRENCE

Richard M Oujevolk
Digitally signed by: Richard M Oujevolk
DN: CN = Richard M Oujevolk C = US O = Florida Department of Transportation OU = A01410C0000017497FB2D0900009B37
Date: 2021.08.23 14:12:45 -04'00'

FDOT DISTRICT PROJECT DEVELOPMENT MANAGER

DESIGN SPEED AND POSTED SPEED CONCURRENCE:

Mark Mathes
Date: 2021.08.27 14:18:09 -04'00'

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

Mark L Peronto
Digitally signed by Mark L Peronto
Date: 2021.08.28 08:21:27 -04'00'

FDOT DISTRICT DESIGN ENGINEER

CONTEXT CLASSIFICATION CONCURRENCE:

nicole.mills@dot.state.fl.us
2021.08.23 14:29:57 -04'00'

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

SHEET NO.
1

6/22/2021 4:24:52 PM

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
(X)	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- (X) STATE HIGHWAY SYSTEM
- ( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- ( ) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- ( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

CRITERIA

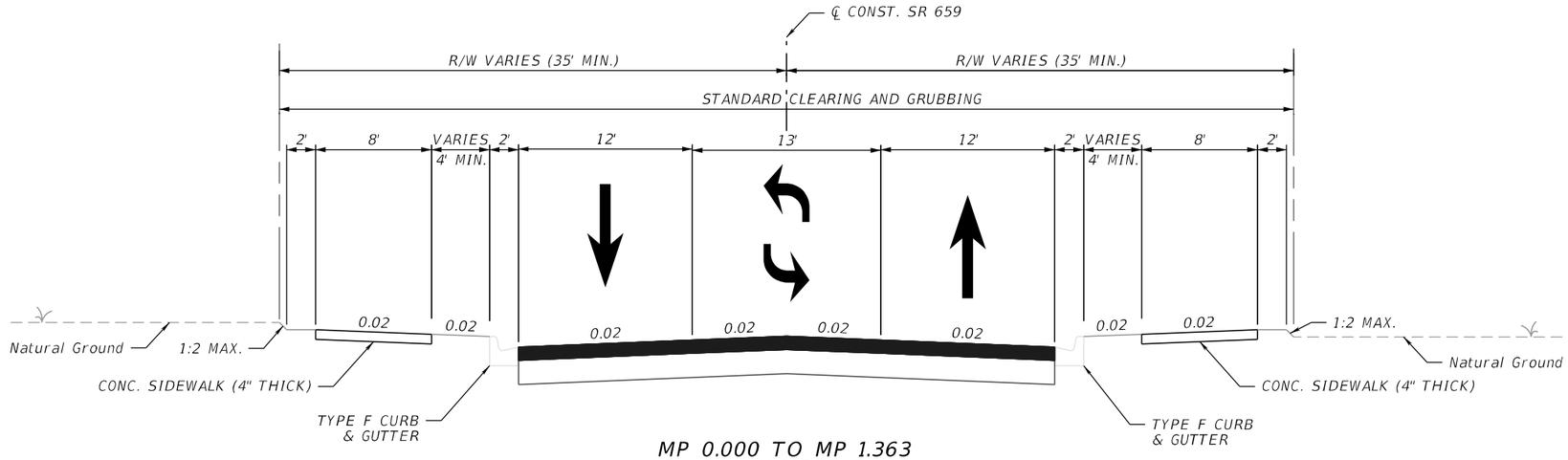
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

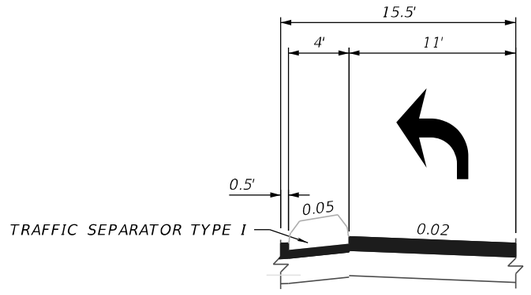
DESIGN VARIATIONS

1. NO BIKE LANES
2. MEDIAN WIDTH

TYPICAL SECTION No. 1



MP 0.000 TO MP 1.363
SR 659 (COMBEE ROAD)



TRAFFIC SEPARATOR DETAIL

INTERSECTIONS OF:
US-98
COMMERCE POINT DRIVE
SOUTH CRYSTAL LAKE DRIVE

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2016 AADT = 19,000
ESTIMATED OPENING YEAR = 2025 AADT = 21,000
ESTIMATED DESIGN YEAR = 2045 AADT = 25,000
K = 9% D = 55.47% T = 10.4% (24 HOUR)
DESIGN HOUR T = 5.21%
DESIGN SPEED = 40 MPH
POSTED SPEED = 40 MPH
TARGET SPEED = 40 MPH

FINANCIAL PROJECT ID	SHEET NO.
440274-1-22-01	2

8/20/2021 12:44:37 PM

APPENDIX C – CONCEPT PLANS

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

CONCEPT PLANS

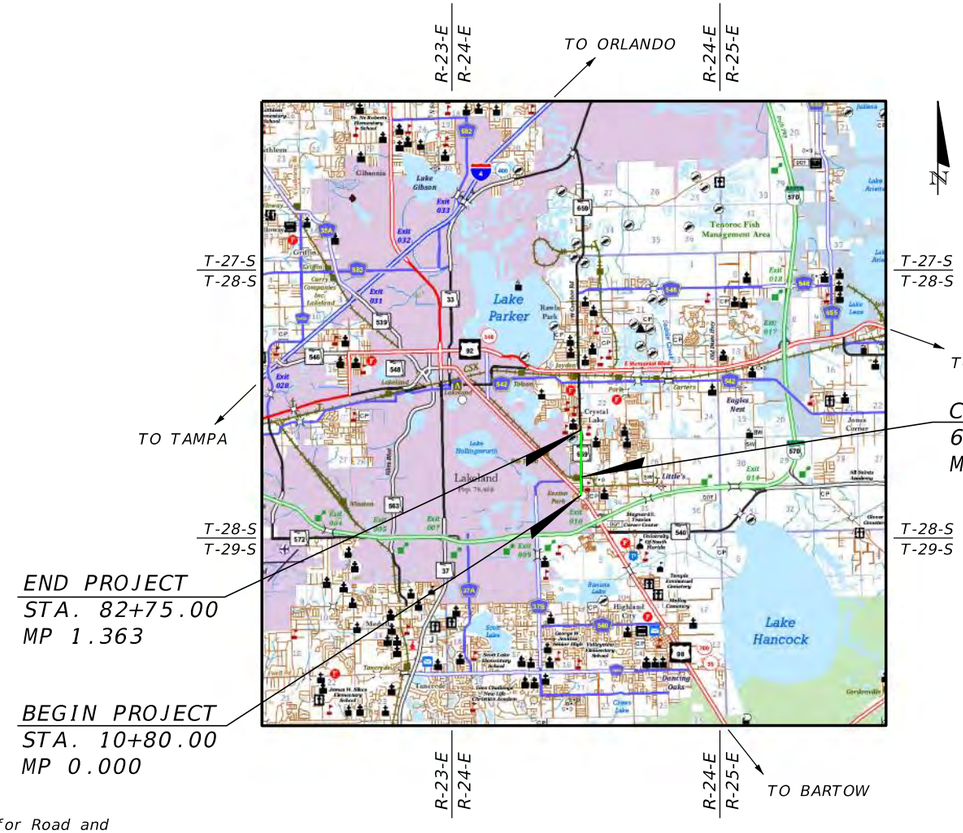
FINANCIAL PROJECT ID 440274-1-22-01

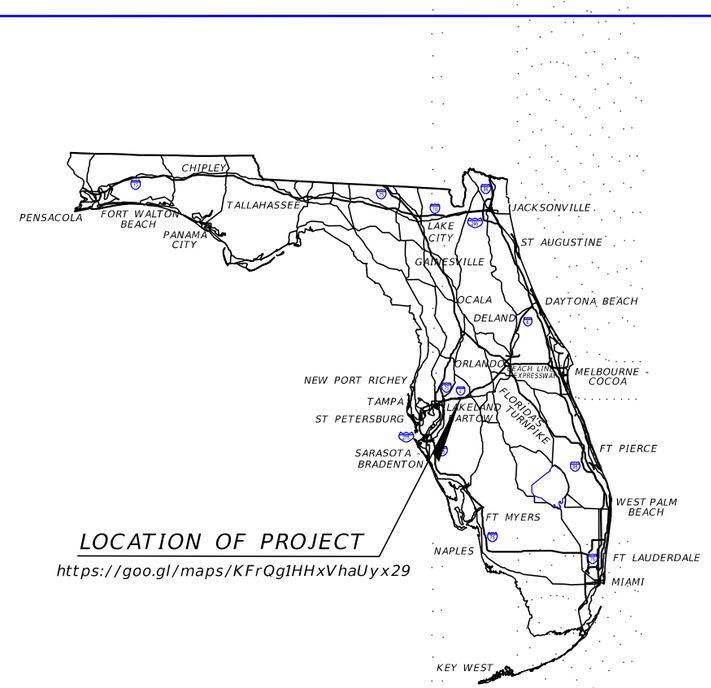
(FEDERAL FUNDS)

POLK COUNTY (16006)

STATE ROAD NO. 659 (COMBEE ROAD)

INDEX OF CONCEPT PLANS





LOCATION OF PROJECT

https://goo.gl/maps/KFrQg1HHxVhaUyx29

GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY2021-22 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

APPLICABLE IRs: IR509-070, IR711-001

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, JULY 2021 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

PRELIMINARY AND SUBJECT TO CHANGE
DATE: 5/10/22

CONCEPT PLANS PREPARED BY:

CRIS SCHOOLEY P.E. NO.:74018
KIMLEY-HORN AND ASSOCIATES
189 S. ORANGE AVE., SUITE 1000
ORLANDO FL, 32801
(407) 898-1511
CONTRACT NO.: C9Y32
VENDOR NO.: 696

FDOT PROJECT MANAGER:

MATT DOCKINS, P.E.

FISCAL YEAR	SHEET NO.
21	1

NOTES:

1. FDOT APLUS AERIAL FROM FEBUARY 2020
2. LOCATION OF EASEMENT LINES ARE APPROXIMATE
3. EXISTING RIGHT-OF-WAY LINES ARE BASED ON SURVEY FILES
4. LOCATION OF PARCEL LINES ARE FROM POLK COUNTY GIS AND ARE APPROXIMATE
5. LOCATION OF TRANSMISSION POLES ARE APPROXIMATE
6. LOCATION OF THE GAS LINE IS APPROXIMATE BASED ON SURFACE MARKERS ONLY
7. DRIVEWAY SIZE AND LOCATION TO BE DETERMINED DURING DESIGN

N

0 10 50

Feet

BEGIN PROJECT
STA. 10+80.00

US 98

COMBEE RD (SR 659)

N 0° 24' 22" W

10 11 12 13 14 15

JOSEPH MOTORS

CAREPLUS PHARMACY

YG TIRES

NEW INDIA BAZAR

J & J TACK SHACK

ATLANTIC AVE

EATON AVE

FLETCHIER AVE

W(D) 6" WATER MAIN

12 KV OE

69 KV OE

230 KV OE

OE

W(D)

LEGEND:

- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PARCEL BOUNDARY
- EASEMENT LINE
- LOW RISK POTENTIAL CONTAMINATION SITE
- MED/HIGH RISK POTENTIAL CONTAMINATION SITE
- EXISTING BUS STOPS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

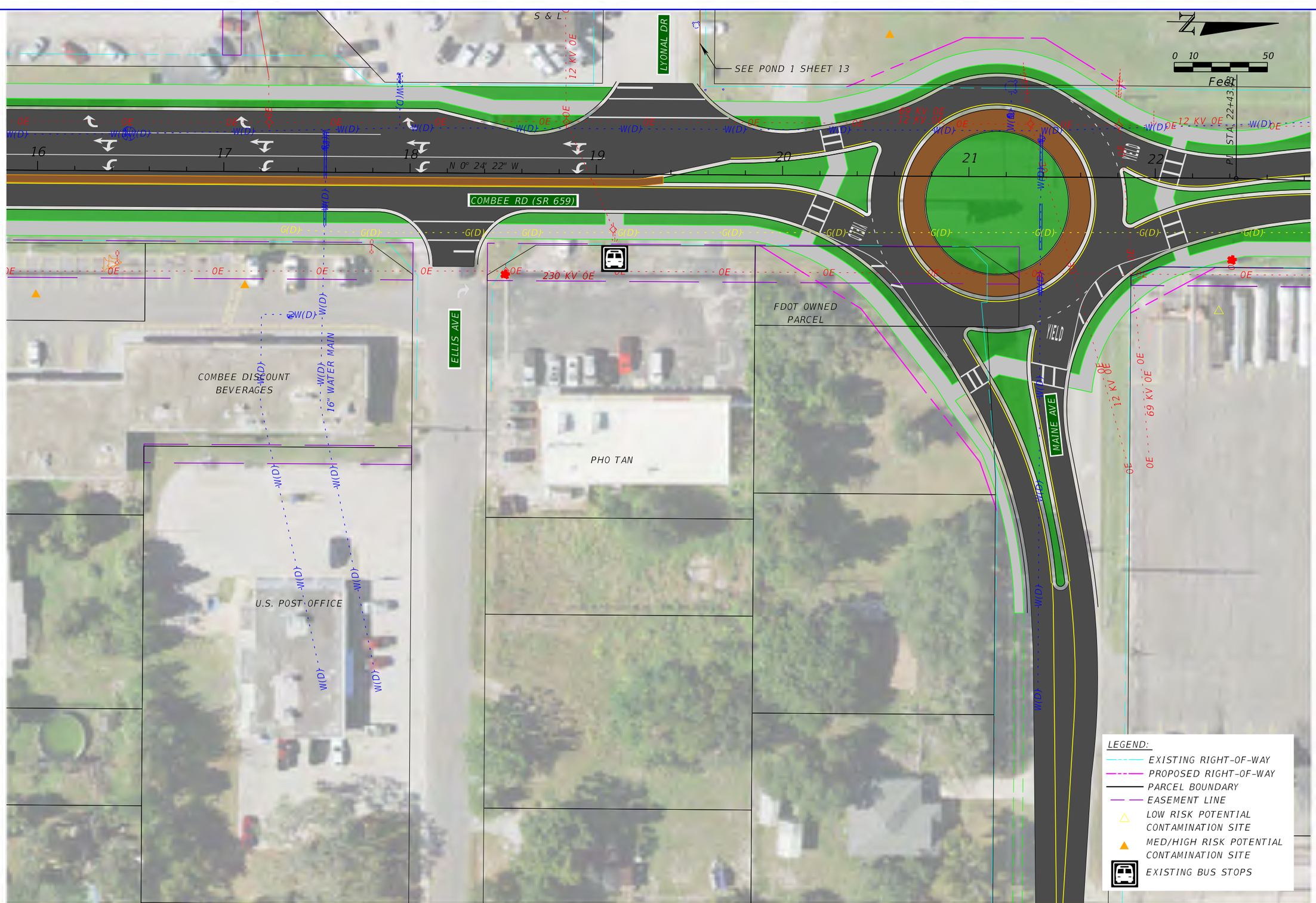
Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 2



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 3

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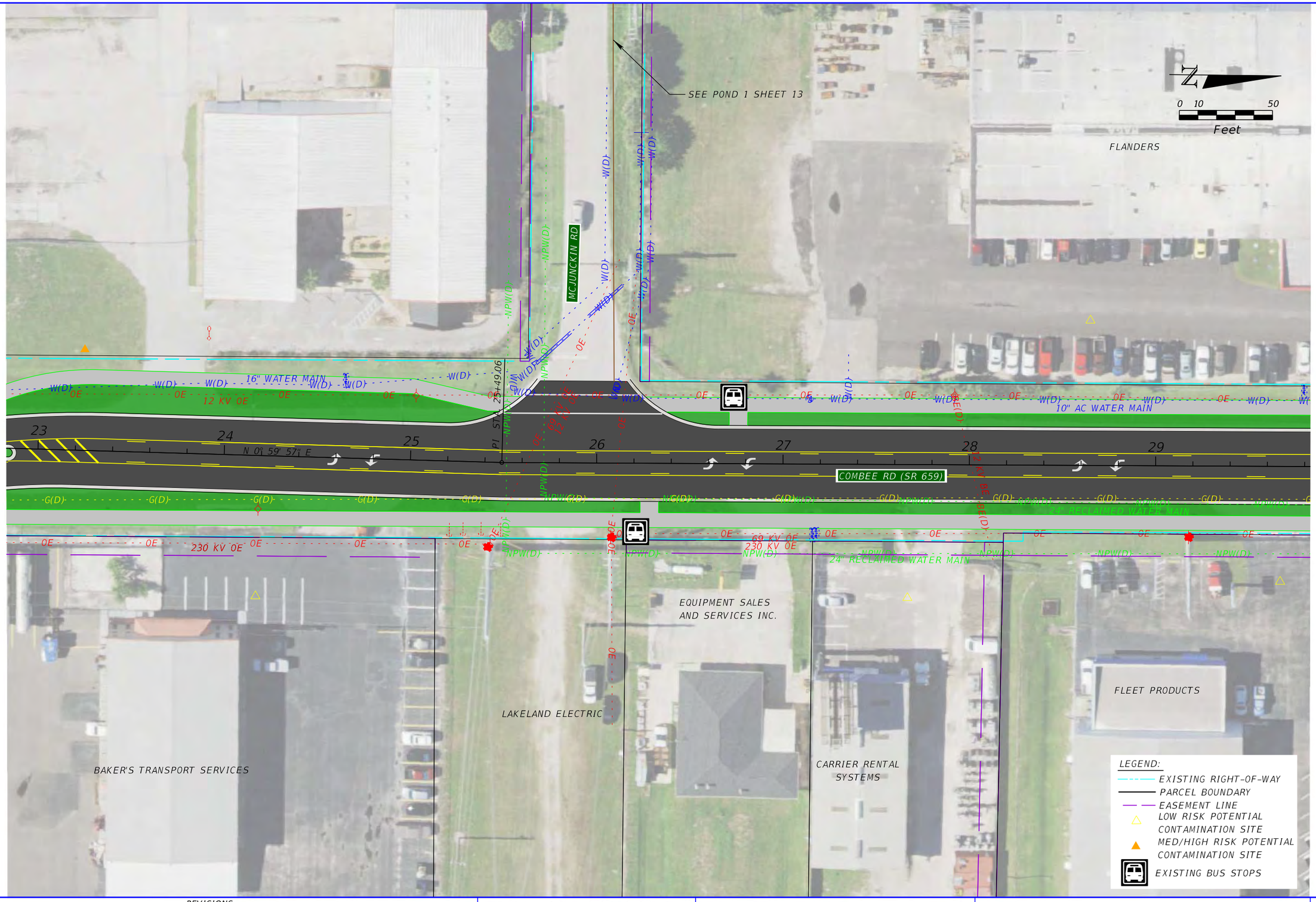

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
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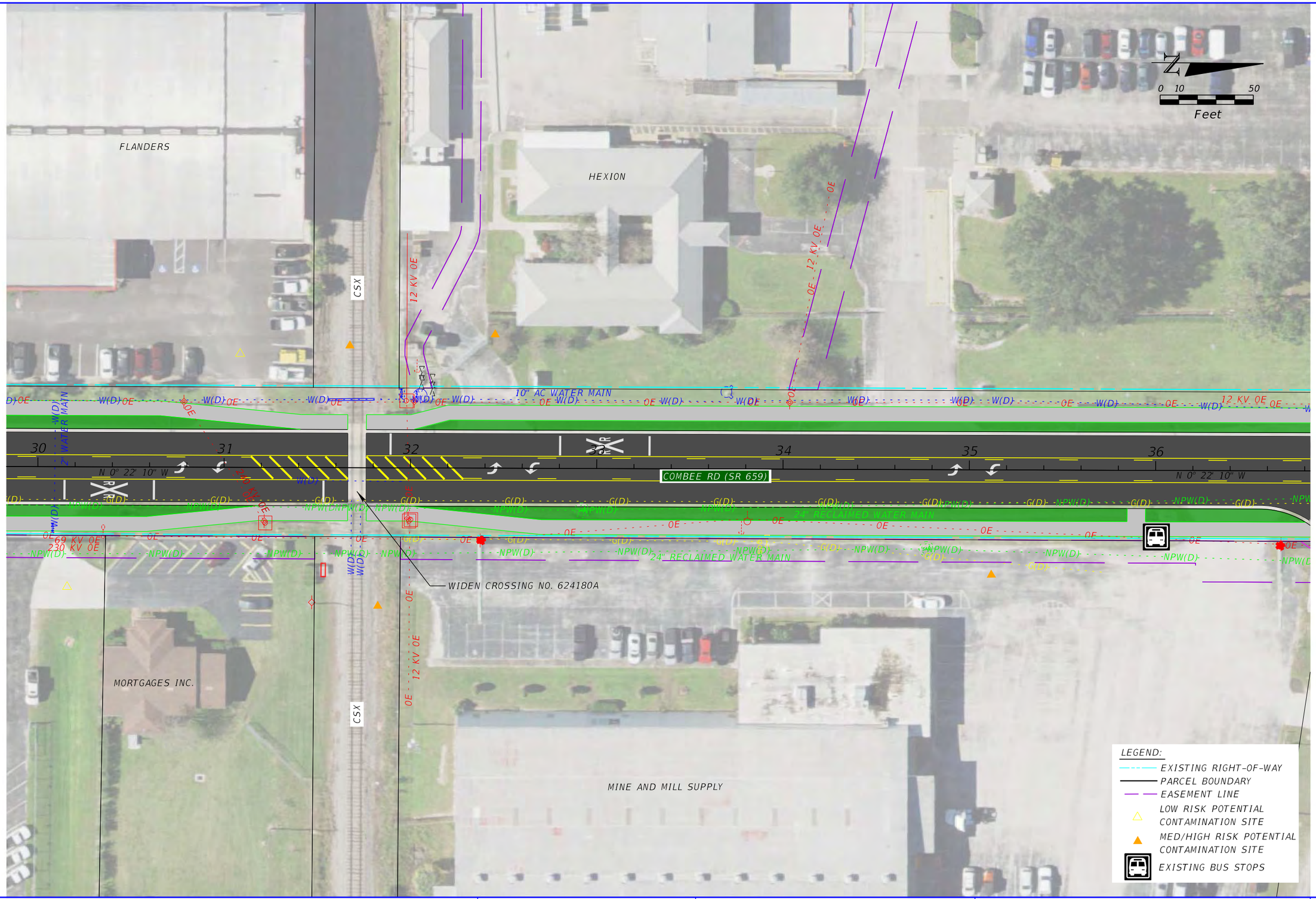
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 4



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
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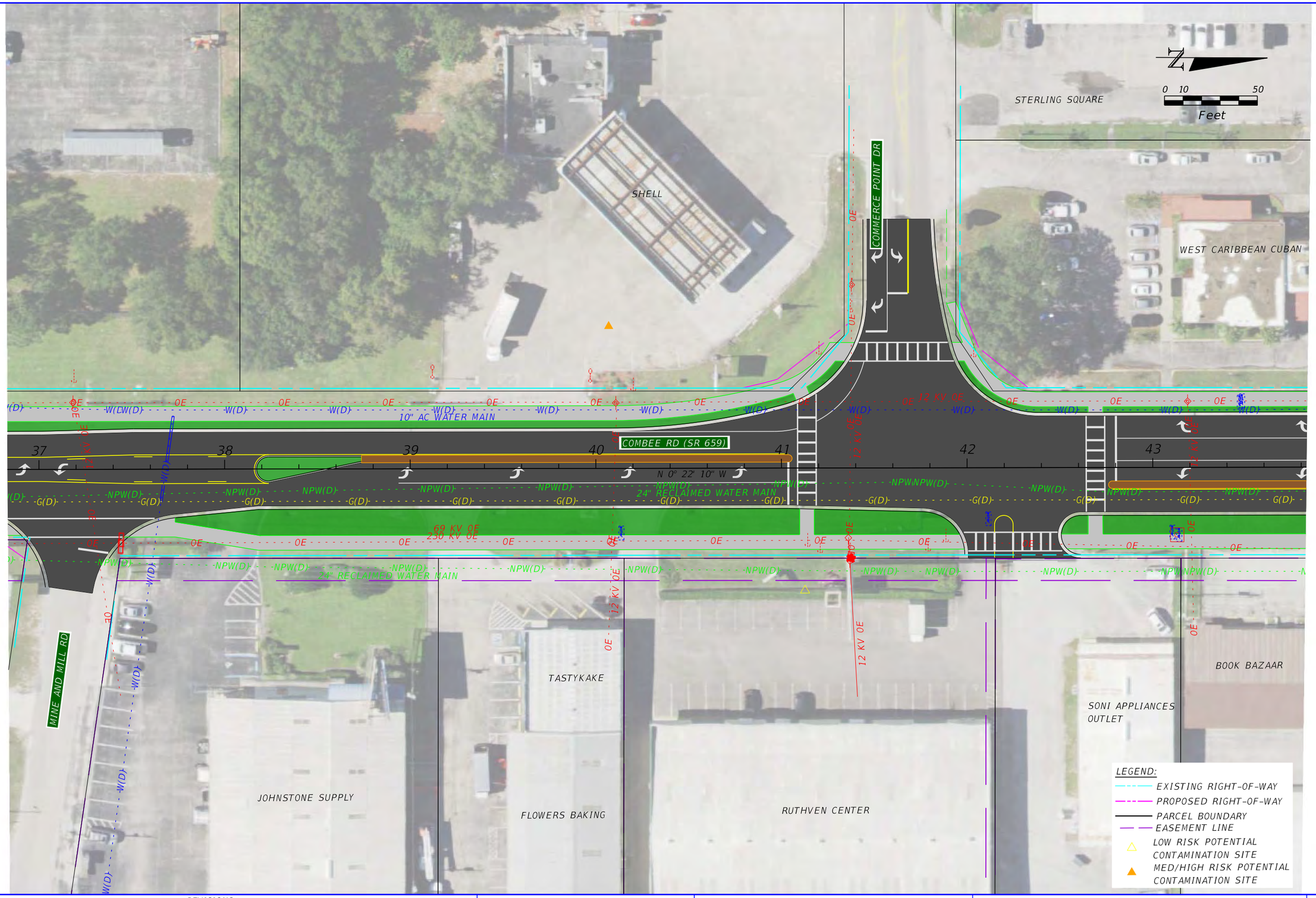
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 5



REVISIONS			
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Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 6

Brian.Mayer 5/10/2022 10:59:08 AM c:\pw\kh1\d0108247\PLANRD06.dgn

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

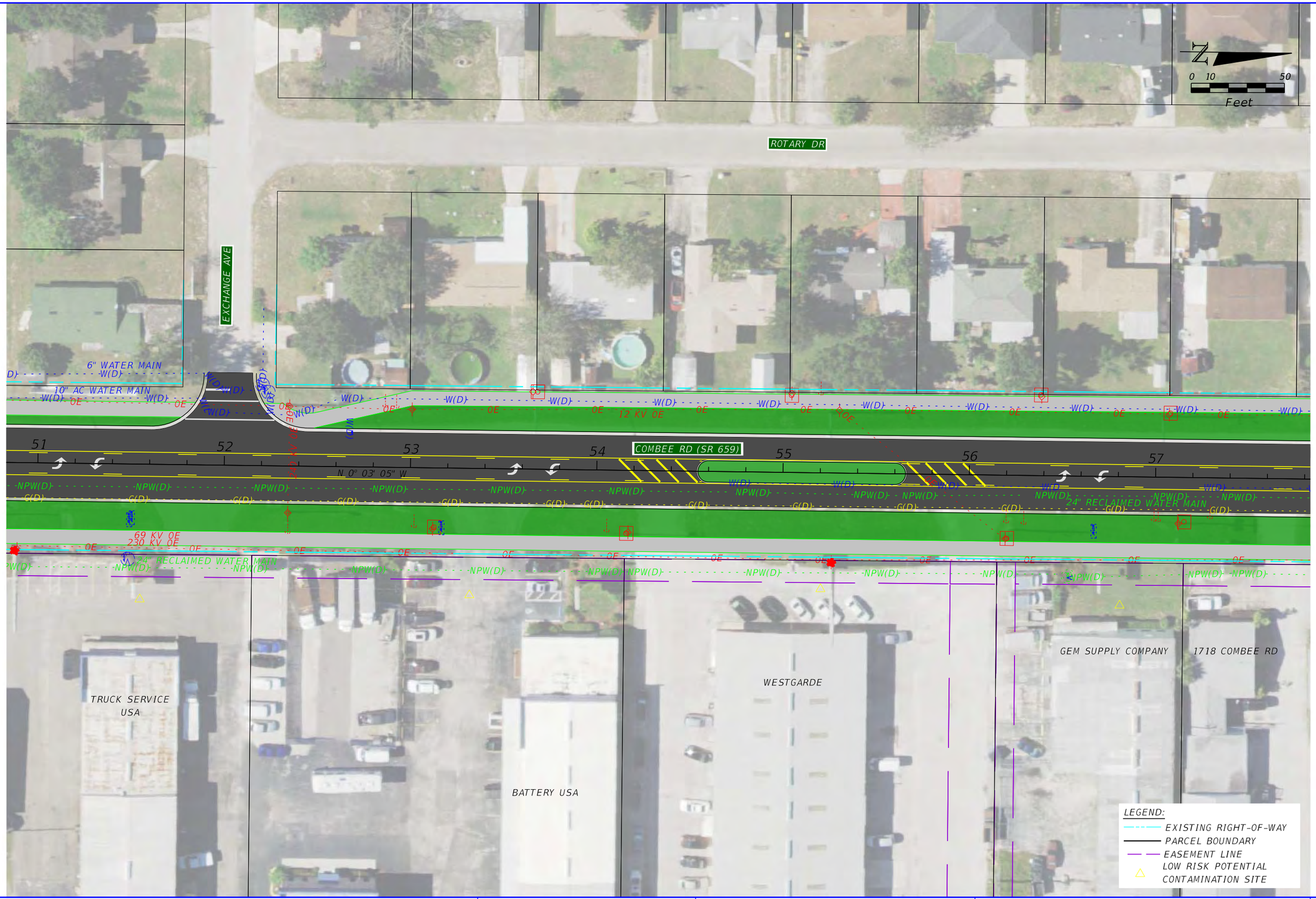
Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 7



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 8

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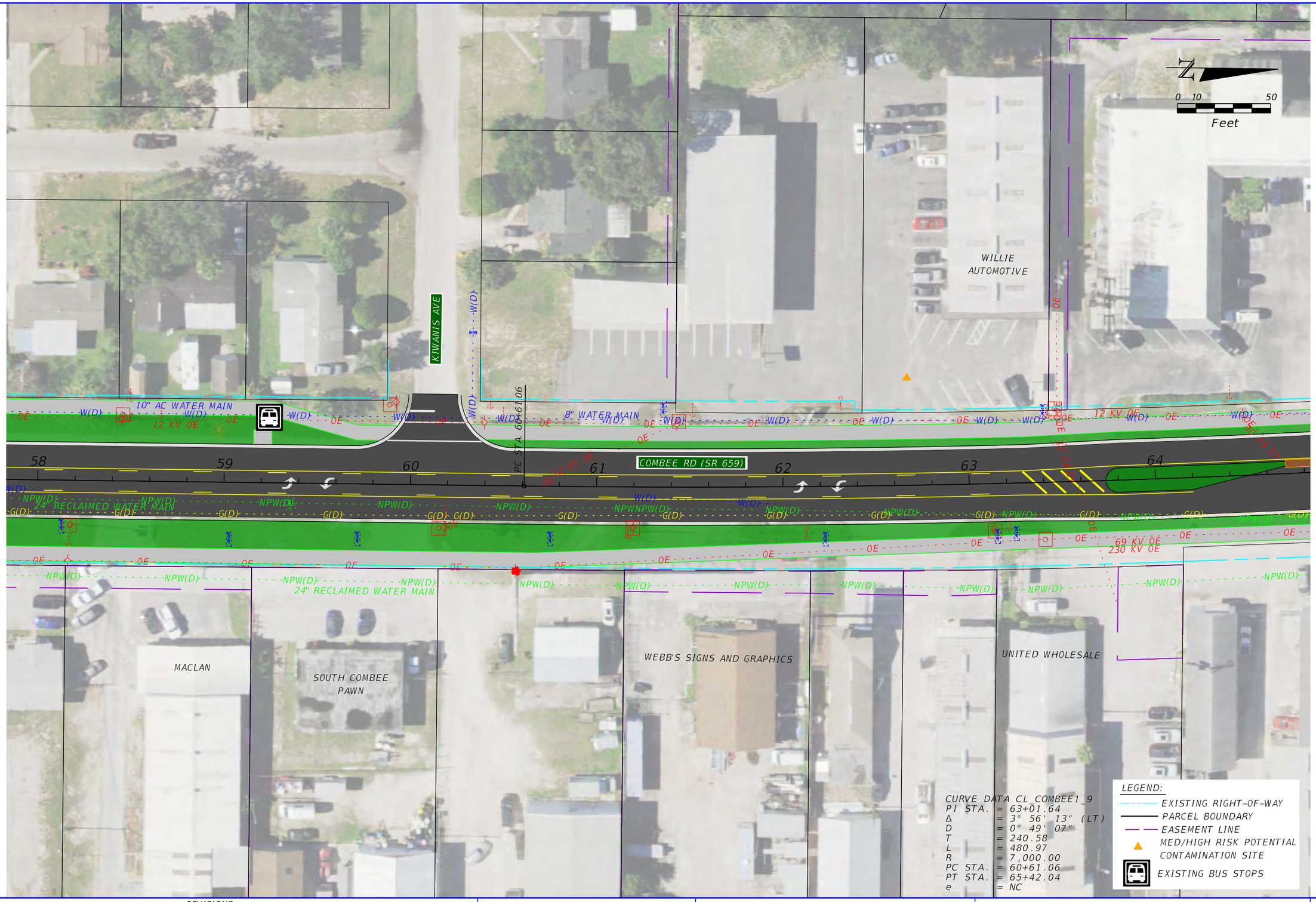

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 9

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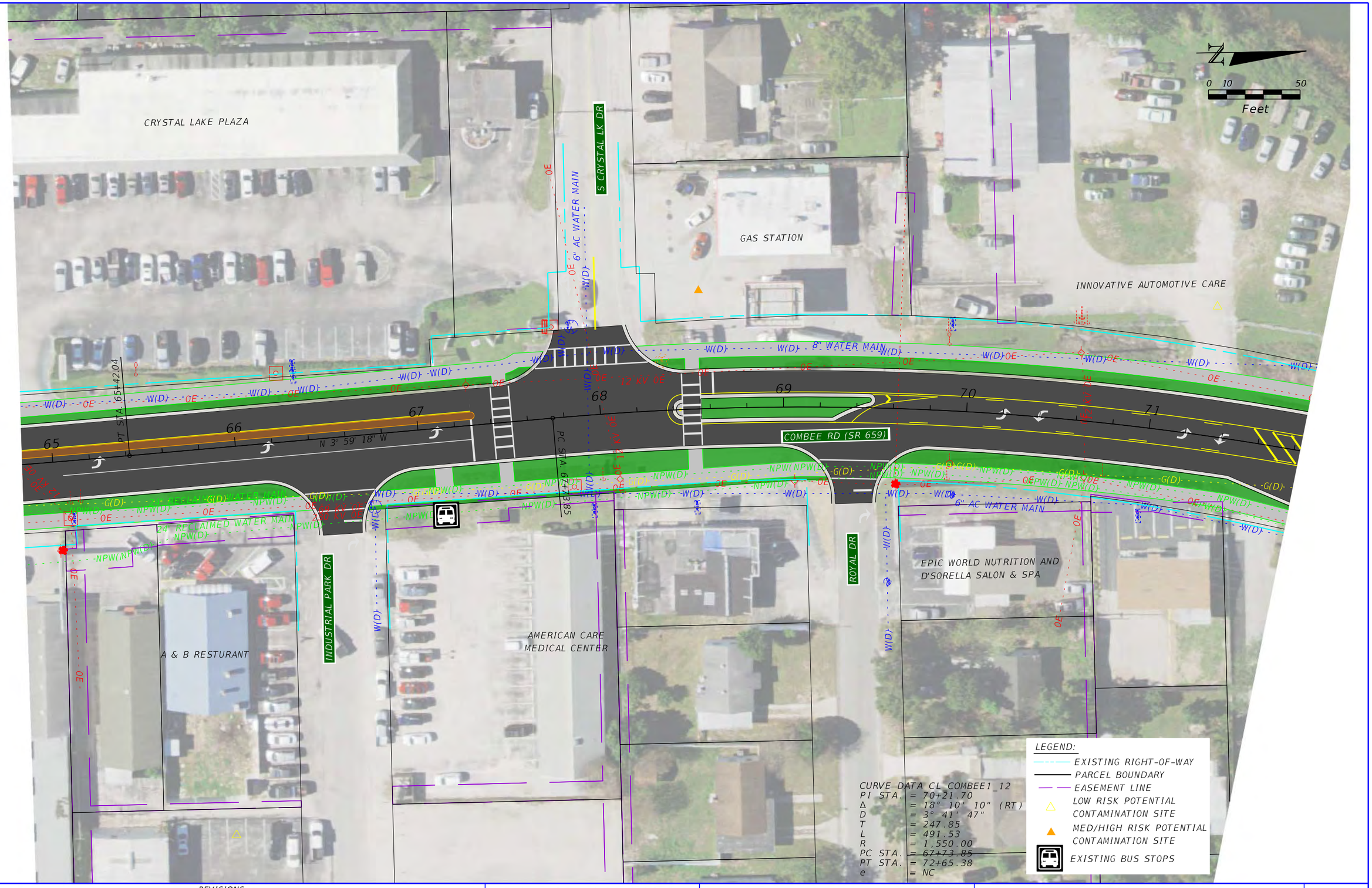


REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

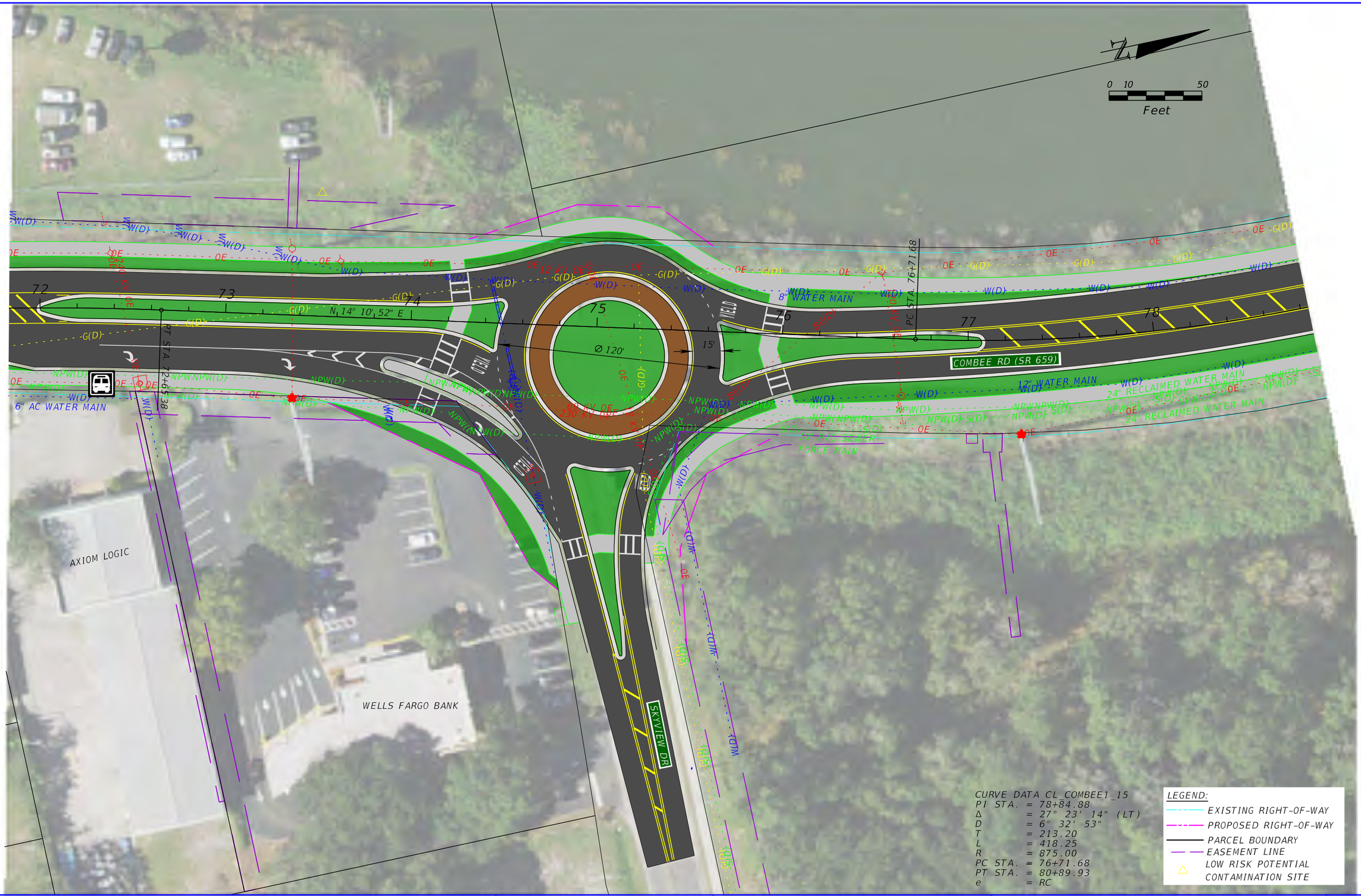
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 10

Brian.Mayer 5/10/2022 11:00:04 AM c:\pw\kh1\d0108247\PLANRD10.dgn



CURVE DATA CL COMBEE1_15
PI STA. = 78+84.88
Δ = 27° 23' 14" (LT)
D = 6° 32' 53"
T = 213.20
L = 418.25
R = 875.00
PC STA. = 76+71.68
PT STA. = 80+89.93
e = RC

LEGEND:
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PARCEL BOUNDARY
- EASEMENT LINE
- LOW RISK POTENTIAL CONTAMINATION SITE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 11

CRYSTAL LAKE PARK

SEE POND 2 SHEET 14

POTENTIAL TRUNK LINE TBD

N CRYSTAL LK DR

FAMILY DOLLAR

0 10 50

Feet

COMBEE RD (SR 659)

PT STA 80+89.93

PT STA 85+61.18

N 13° 12' 22" W

END PROJECT
STA. 82+75.00

LEGEND:
- EXISTING RIGHT-OF-WAY
- PARCEL BOUNDARY
- EASEMENT LINE
- MED/HIGH RISK POTENTIAL CONTAMINATION SITE

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 12

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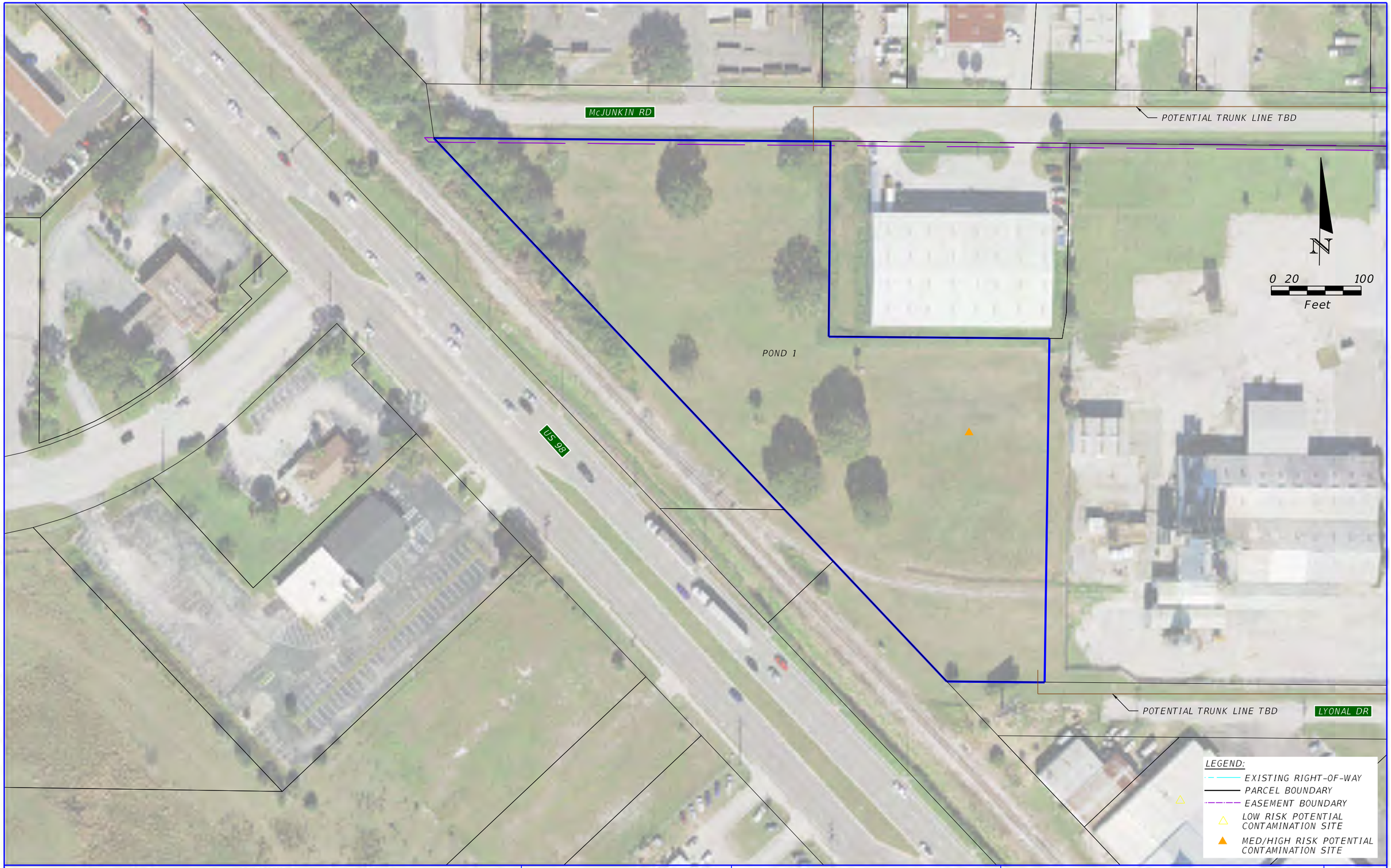

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN POND 1

SHEET NO. 13

Cris.Schooley 5/14/2021 1:49:01 PM c:\pwworking\kha\pwprod\cris.schooley\d0108247\PLANRD13.dgn

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN POND 2

SHEET NO. 14

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APPENDIX D
PROJECT DESIGN VARIATION MEMORANDUM

Project Design Variation Memorandum

To: Kevin Ingle, PE
District or Turnpike Design Engineer

Date: December 22, 2021

Financial Project ID: 440274-1-22-01 New Const. ☑ RRR ☐

Federal Aid Number: D117 089 B

Project Name: SR 659 (Combee Road)

State Road Number: 659 Co./Sec./Sub. Polk (16006)

Begin Project MP: 0.000 End Project MP: 1.363

Request for: Design Variation

	Design Element	MP: Beg-End	Existing	Proposed	Required	Attr. Crashes	Approved	Denied	Addl. Docum.
1.	Bike Lanes	0 to 1.363	none	none	yes	☐	☐	☐	☐
2.	Median Width	0 to 1.363	0-ft	15.5-ft	22-ft	☐	☐	☐	☐
3.						☐	☐	☐	☐
4.						☐	☐	☐	☐

1. Justification: Bicycle lanes are not proposed due to the high volume of thru and turning trucks. Instead, 8-ft wide sidewalks are proposed on both sides. The one bike crash in the 5 year analysis period may be attributed to lack of bike facilities.

2. Justification: FDM Table 210.3.1 allows 15.5-ft median where existing curb locations are fixed. This does not apply since Combee Road doesn't have existing curb. Instead of a flush median, the proposed 15.5-ft median at intersections has a turn lane with 4-ft traffic separator to reduce crashes without ROW impacts.

3. Justification:

4. Justification:

Design Element	MP: Beg-End	Existing	Proposed	Required	Attr. Crashes	Approved	Denied	Addl. Docum.
5. _____	_____	_____	_____	_____	☐	☐	☐	☐
6. _____	_____	_____	_____	_____	☐	☐	☐	☐

Justification: _____

_____

_____

Justification: _____

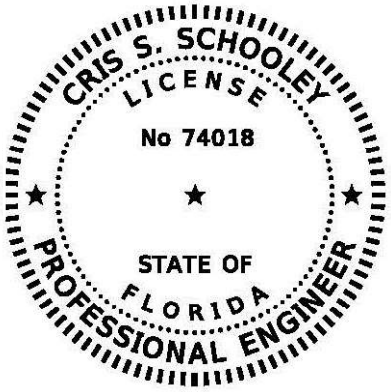
_____

_____

_____

Appendices: Yes ☐ No ☐

This Item has been digitally signed and sealed by Cris S. Schooley on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.



Recommended by:

Cris S Schooley Digitally signed by Cris S Schooley Date: 2021.12.22 16:04:35 -05'00'

_____ Date _____

Name:

Responsible Professional Engineer or Landscape Architect (Landscape-Only Project

Approvals:

_____Date _____

Name:

District or Turnpike Traffic Operations Engineer

Kevin Ingle Digitally signed by Kevin Ingle DN: CN=Kevin Ingle, dnQualifier=A01410D000017888657540001129E, OH=FLORIDA DEPARTMENT OF TRANSPORTATION, C=US Date: 2021.12.27 09:04:51 -05'00'

_____Date _____

Name:

District or Turnpike Design Engineer

PROJECT CONTROLS

CONTEXT CLASSIFICATION

( )	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
( )	C2 : RURAL	( )	C4 : URBAN GENERAL
( )	C2T : RURAL TOWN	( )	C5 : URBAN CENTER
(X)	C3R : SUBURBAN RES.	( )	C6 : URBAN CORE
( )	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

( )	INTERSTATE	( )	MAJOR COLLECTOR
( )	FREEWAY/EXPWY.	( )	MINOR COLLECTOR
( )	PRINCIPAL ARTERIAL	( )	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

- ( ) NATIONAL HIGHWAY SYSTEM
- ( ) STRATEGIC INTERMODAL SYSTEM
- (X) STATE HIGHWAY SYSTEM
- ( ) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- ( ) 1 - FREEWAY
- ( ) 2 - RESTRICTIVE w/Service Roads
- ( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- ( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- ( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- ( ) 7 - BOTH MEDIAN TYPES

CRITERIA

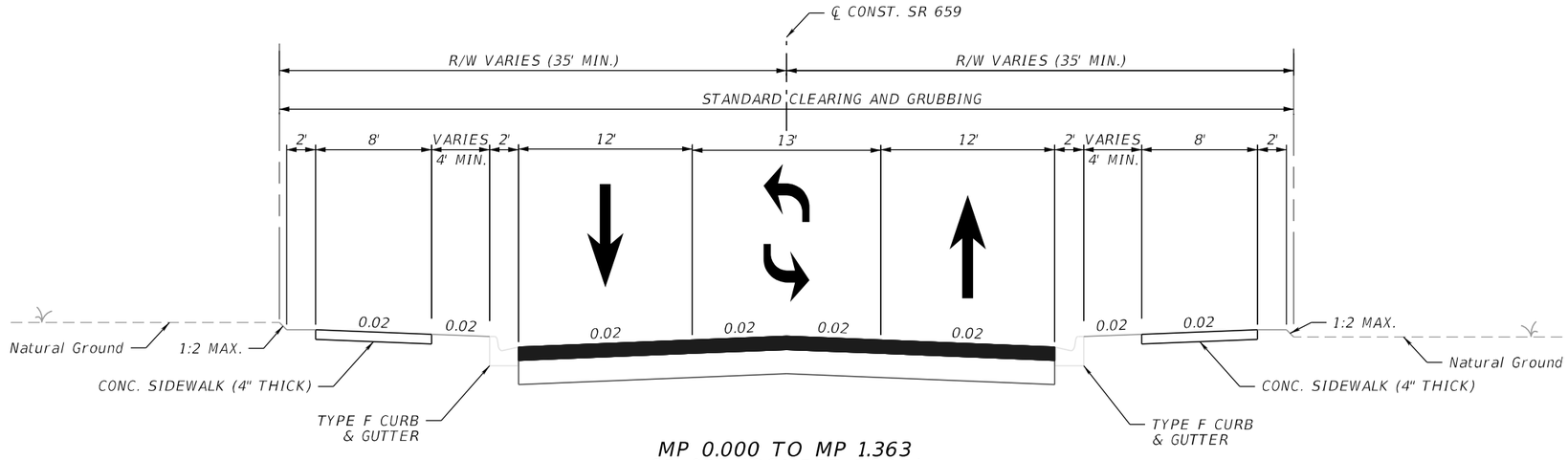
- (X) NEW CONSTRUCTION / RECONSTRUCTION
- ( ) RESURFACING (LA FACILITIES)
- ( ) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

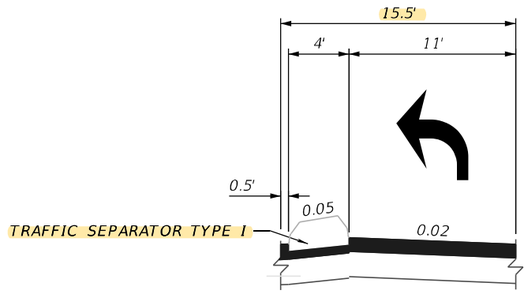
DESIGN VARIATIONS

1. NO BIKE LANES
2. MEDIAN WIDTH

TYPICAL SECTION No. 1



MP 0.000 TO MP 1.363
SR 659 (COMBEE ROAD)



TRAFFIC SEPARATOR DETAIL

INTERSECTIONS OF:
US-98
COMMERCE POINT DRIVE
SOUTH CRYSTAL LAKE DRIVE

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2016 AADT = 19,000
ESTIMATED OPENING YEAR = 2025 AADT = 21,000
ESTIMATED DESIGN YEAR = 2045 AADT = 25,000
K = 9% D = 55.47% T = 10.4% (24 HOUR)
DESIGN HOUR T = 5.21%
DESIGN SPEED = 40 MPH
POSTED SPEED = 40 MPH
TARGET SPEED = 40 MPH

FINANCIAL PROJECT ID	SHEET NO.
440274-1-22-01	2

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NOTES:

1. FDOT APLUS AERIAL FROM FEBUARY 2020
2. LOCATION OF EASEMENT LINES ARE APPROXIMATE
3. EXISTING RIGHT-OF-WAY LINES ARE BASED ON SURVEY FILES
4. LOCATION OF PARCEL LINES ARE FROM POLK COUNTY GIS AND ARE APPROXIMATE
5. LOCATION OF TRANSMISSION POLES ARE APPROXIMATE
6. LOCATION OF THE GAS LINE IS APPROXIMATE BASED ON SURFACE MARKERS ONLY
7. DRIVEWAY SIZE AND LOCATION TO BE DETERMINED DURING DESIGN

0 10 50
Feet

BEGIN PROJECT
STA. 10+80.00

US 98

COMBEE RD (SR 659)

N 0° 24' 22" W

4' TRAFFIC SEPARATOR,
15.5' MEDIAN

JOSEPH MOTORS

CAREPLUS PHARMACY

YG TIRES

NEW INDIA BAZAR

J & J TACK SHACK

ATLANTIC AVE

EATON AVE

FLETCHER AVE

12" WATER MAIN

LEGEND:

- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PARCEL BOUNDARY
- EASEMENT LINE
- LOW RISK POTENTIAL CONTAMINATION SITE
- MED/HIGH RISK POTENTIAL CONTAMINATION SITE
- EXISTING BUS STOPS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

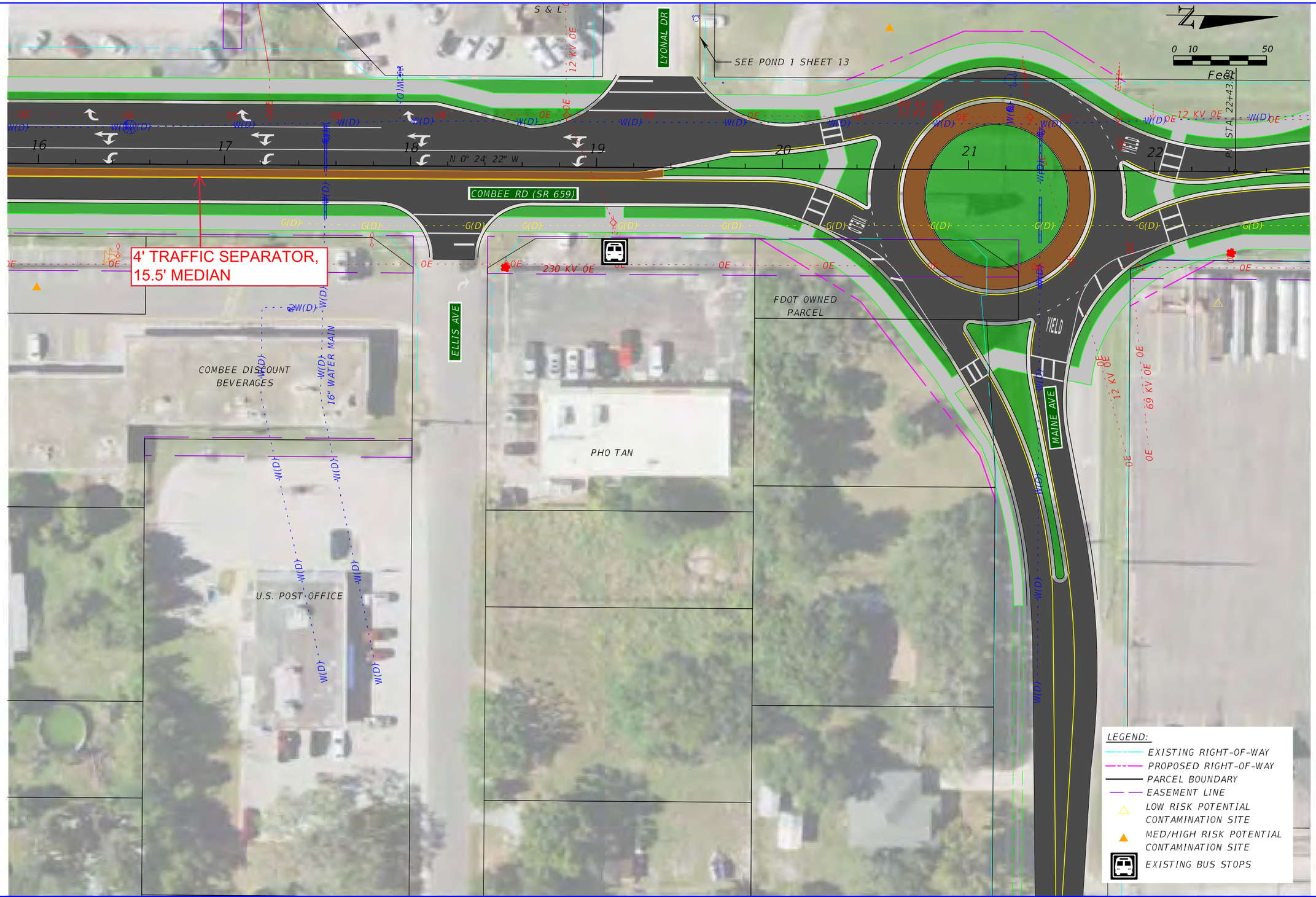
Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 2



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
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Vendor No. 696

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 3

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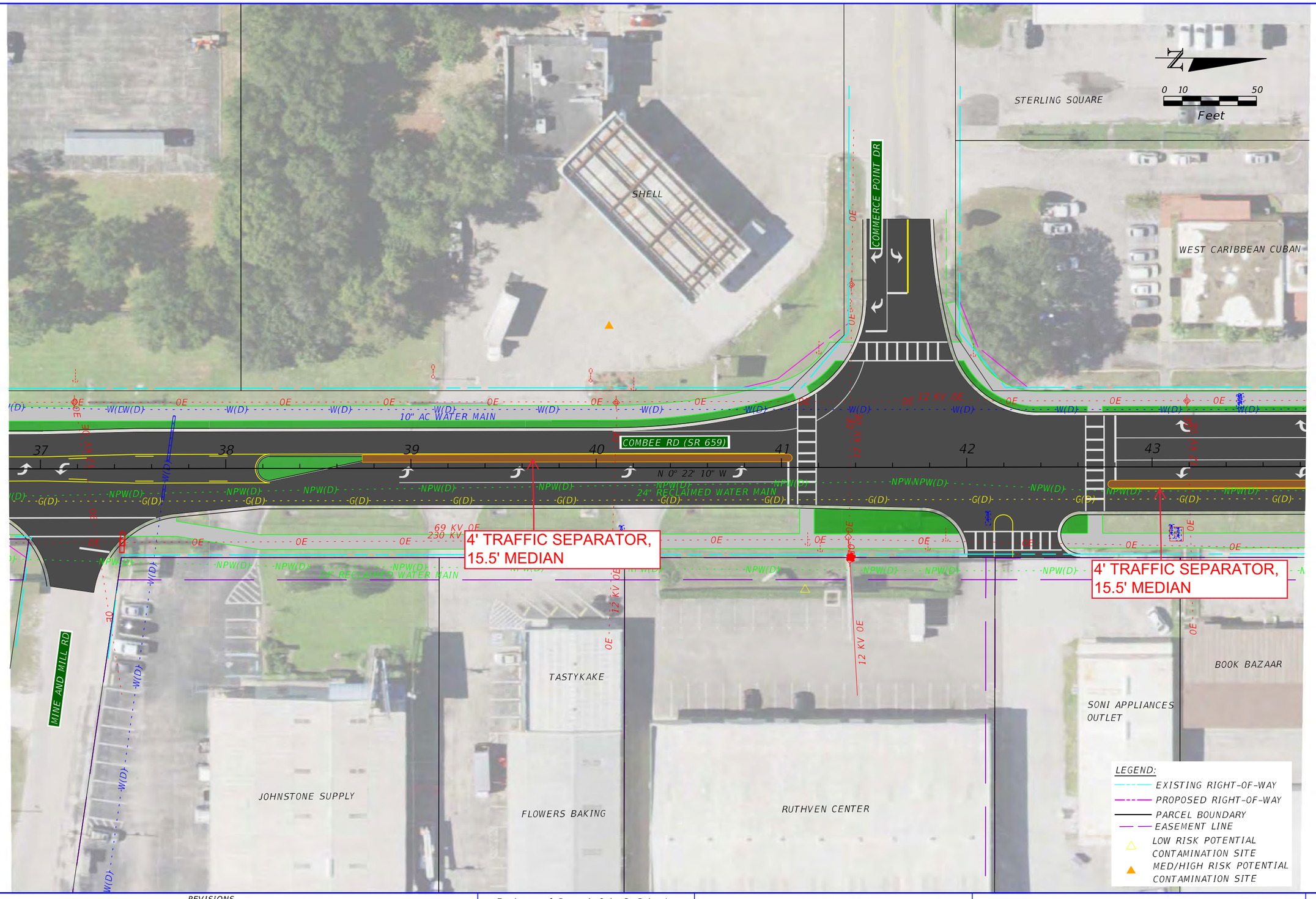


REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

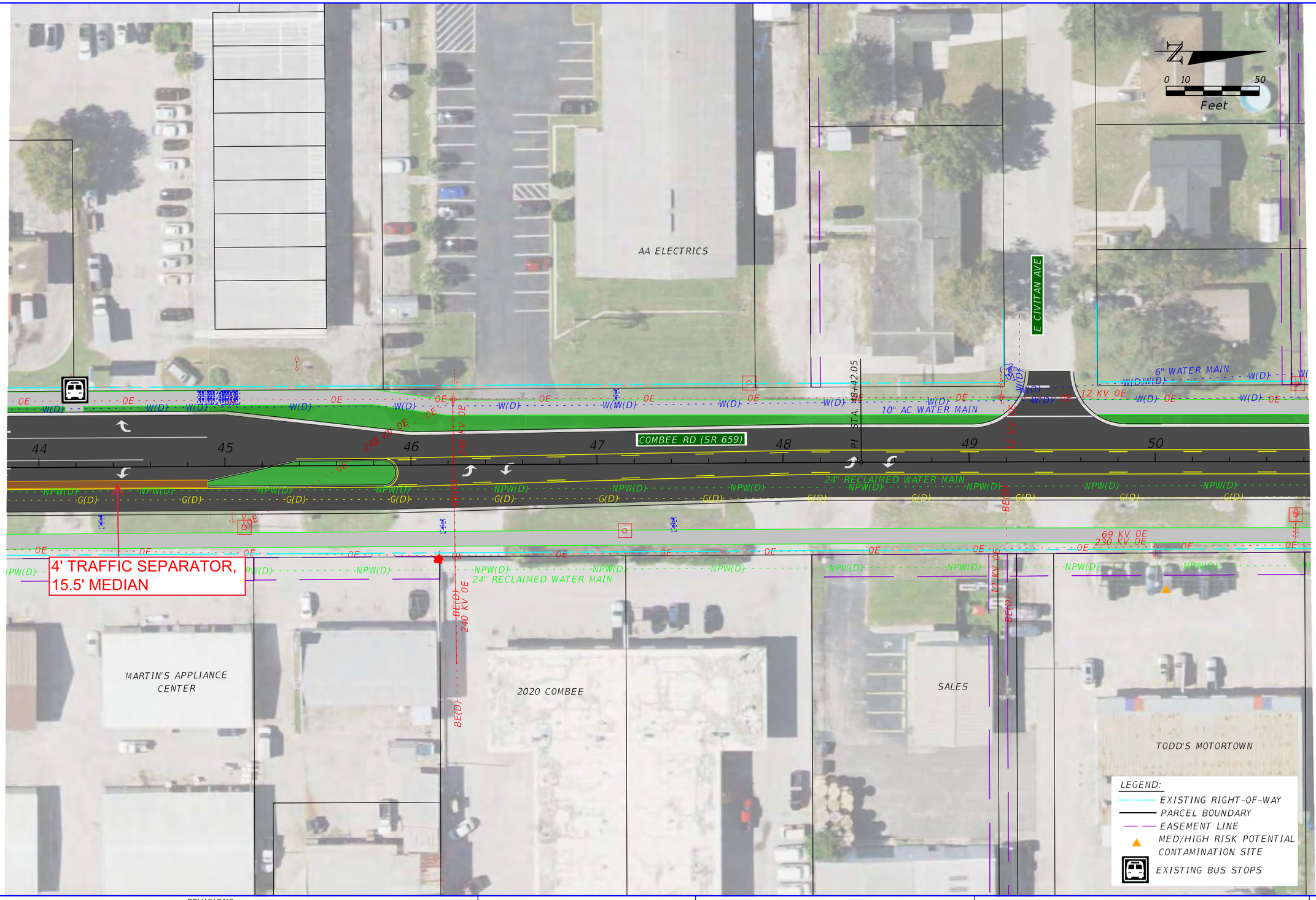
Engineer of Record: Cris S. Schooley
P.E. License No. 74018
Kimley-Horn and Associates, Inc.
189 South Orange Avenue, Suite 1000
Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 6



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
P.E. License No. 74018
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189 South Orange Avenue, Suite 1000
Orlando, FL 32801
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STATE OF FLORIDA
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659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 7

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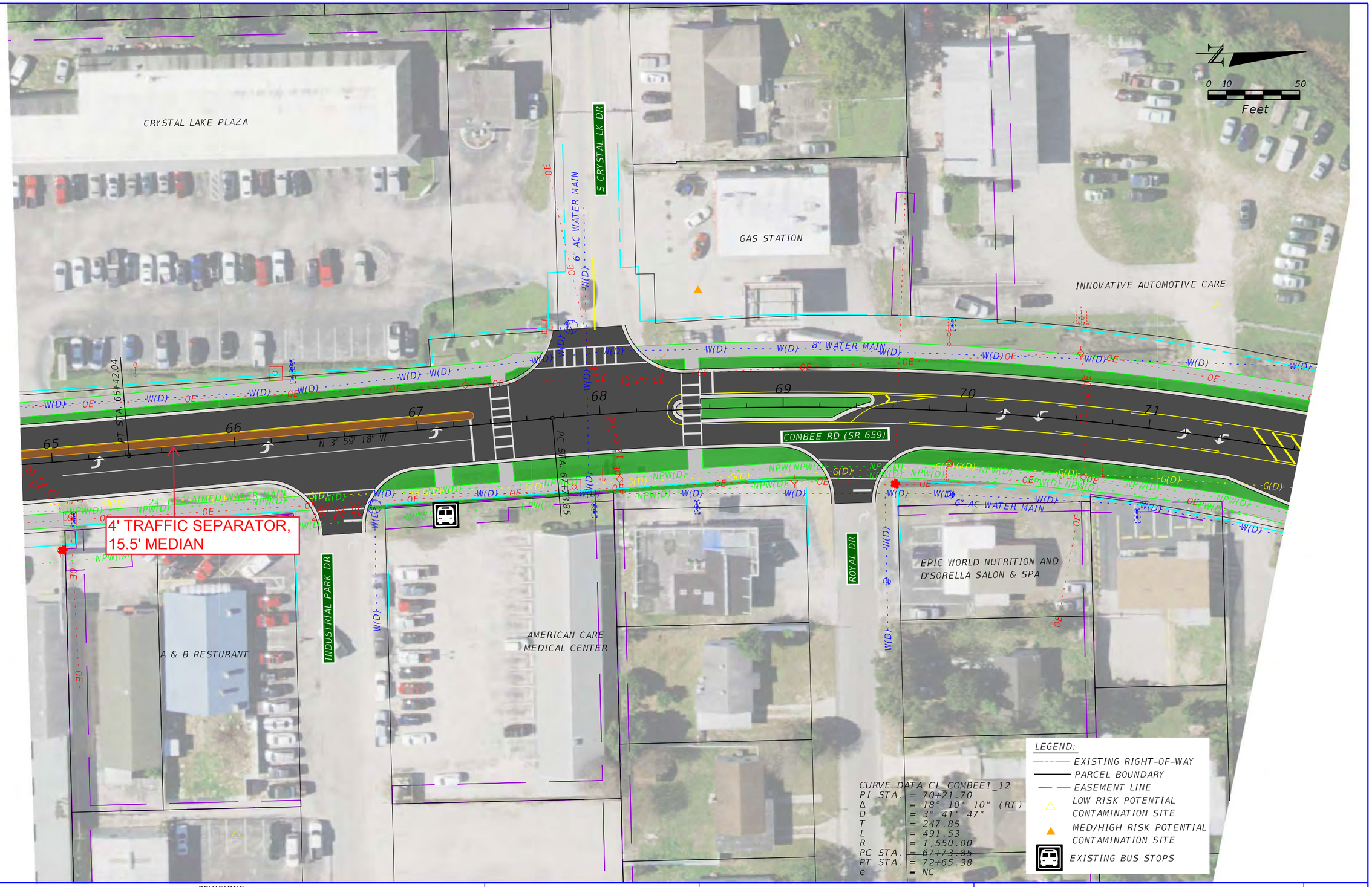

CURVE DATA CL_COMBEE1_12
PI STA. = 70+21.70
Δ = 18° 10' 10" (RT)
D = 3° 41' 47"
T = 247.85
L = 491.53
R = 1,550.00
PC STA. = 67+73.85
PT STA. = 72+65.38
e = NC

LEGEND:
- EXISTING RIGHT-OF-WAY
- PARCEL BOUNDARY
- EASEMENT LINE
- LOW RISK POTENTIAL CONTAMINATION SITE
- MED/HIGH RISK POTENTIAL CONTAMINATION SITE
- EXISTING BUS STOPS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

Engineer of Record: Cris S. Schooley
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Kimley-Horn and Associates, Inc.
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Orlando, FL 32801
Vendor No. 696

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
659	POLK	440274-1-22-01

CONCEPT PLAN

SHEET NO. 10

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