



West Orange Trail Extension Study



Corridor Study Report

West Orange Trail (Phase 4)

Rock Springs Road

From Lester Road to Kelly Park Road

Ponkan Road

From Wolf Lake Elementary and Middle Schools to Rock Springs Road

Welch Road

From Rock Springs Road to Wekiwa Springs State Park Entrance

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Introduction

MetroPlan Orlando is conducting a Trail Extension study for the West Orange Trail (Phase 4) in Apopka, Florida. The Orange County Trails Master Plan identifies a gap in the regional trail network between the northern terminus of the existing West Orange Trail (at the intersection of Rock Springs Road with Lester Road) and the southern terminus of the Wekiva Trail (at the interchange of SR 429 with Mount Plymouth Road). The proposed West Orange Trail (Phase 4) extension will run along Rock Springs Road to the intersection with Kelly Park Road where it will meet the proposed Wekiva Trail extension, thus closing the gap in the trail network.

This trail study covers a total corridor length of approximately 8.29 miles along the following three corridors:

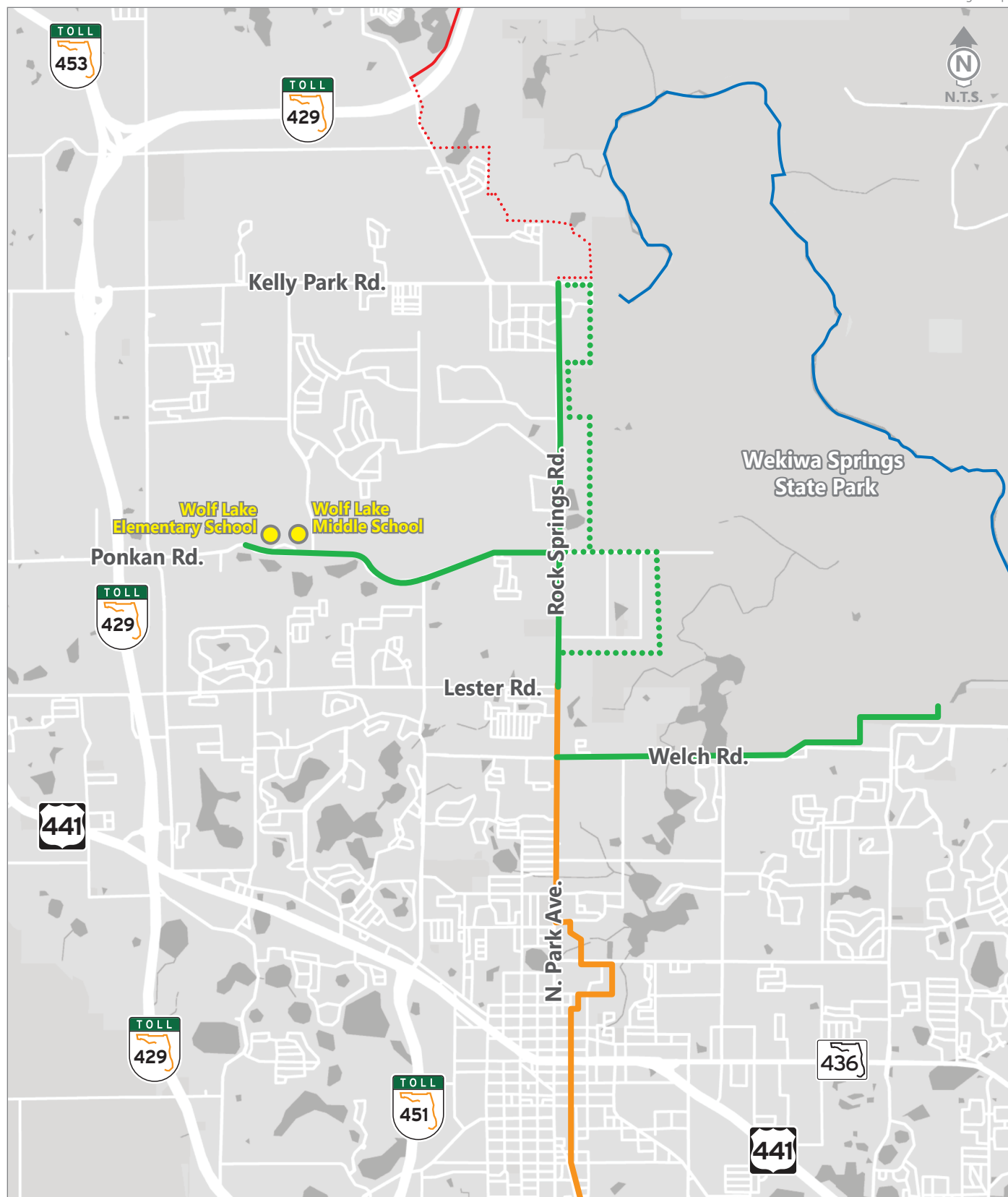
- Rock Springs Road
 - From Lester Road (the existing termination of the West Orange Trail) to Kelly Park Road, tying into the proposed Wekiva Trail.
 - Approximately 3.31 miles
- Welch Road and Wekiwa Springs Road
 - From the existing West Orange Trail at Rock Springs Road to the Seminole County Wekiva River Blueway Trail at the Wekiwa State Park entrance, located at Wisteria Street and Wekiwa Springs Road.
 - Approximately 3.00 miles
- Ponkan Road
 - From west of Jason Dwelley Parkway to connect Wolf Lake Elementary and Middle Schools, as well as the City of Apopka's Northwest Recreation Complex to the proposed West Orange Trail (Phase 4) at Rock Springs Road
 - Approximately 2.27 miles

Rock Springs Road, Welch Road, and Ponkan Road are all urban major collectors serving the surrounding residential and commercial properties. They provide access to US 441 to the south and both US 441 and SR 429 to the west.

The study area location map is shown in **Figure 1**. As can be seen in the map, there are several alternative routes being considered for the trail along Rock Springs Road; these alternatives were developed as part of the Orange County Trails Master Plan (2021). Each of the alternatives will be considered in this study, and additional route alternatives will be identified.

Purpose and Need

The purpose of this study is to evaluate the feasibility of extending the West Orange Trail to the proposed Wekiva Trail while providing connections to the Wekiva River Blueway Trail and Wolf Lake Elementary and Middle Schools, as well as the City of Apopka's Northwest Recreation Complex. This study determined and evaluated potential routes for the trail within the study area. The primary extension is proposed along Rock Springs Road with spurs along Welch Road and Ponkan Road. Based on the findings of the analysis, recommendations have been made for the optimal alignment of the trail as described in the Recommended Trail Alternatives chapter.



- West Orange Trail - Phase 4
- West Orange Trail - Phase 4 Alternative
- Existing West Orange Trail
- Wekiwa River Blueway Trail
- Proposed Wekiwa Trail
- Existing Wekiwa Trail



Figure 1

Study Area Location
West Orange Trail
Extension Study

Conformance with Transportation and Long-Range Plans

Funding for the West Orange Trail Phase 4 extension is identified in the MetroPlan Orlando Metropolitan Transportation Plan Cost Feasible Plan (MTP Revised March 2022) and is separated between the mainline along Rock Springs Road (MTP ID #5077), a spur along Welch Road (MTP ID# 5014), and a spur along Ponkan Road (MTP ID #5021).

For the mainline, the design (PE) phase is cost feasible in Planning Period II (2031 – 2035) for \$3.08M (2035 dollars); the right-of-way (ROW) phase is partially cost feasible in Planning Period II (2031 – 2035) for \$4.00M (2035 dollars) with an additional \$2.20M needed from local funding; the Environmental Mitigation (ENV) phase is cost feasible in Planning Period III (2036 – 2045) for \$2.04M (2045 dollars); the Construction (CST) phase is partially cost feasible in Planning Period III (2036 – 2045) for \$4.00M (2045 dollars) with an additional \$4.20M needed from local funding; and Construction Engineering and Inspection (CEI) phase is funded for Planning Period III (2036 – 2045) for \$1.36M (2045 dollars).

For the Welch Road spur, the PE, ROW, and ENV phases are cost feasible in Planning Period III (2036 – 2045) for \$4.97M (2045 dollars); the CST and CEI phases are unfunded at this time.

For the Ponkan Road spur, the PE, ROW, ENV, CST, and CEI phases are all currently unfunded.

An Access Management and Intersection study for Rock Springs Road from Welch Road to Lester Road and at the intersection of Park Avenue at Sandpiper Street is being conducted in parallel with this West Orange Trail Extension Study under a separate cover. The intersection improvements at Park Avenue and Sandpiper Street are currently in design by the City of Apopka and funding for construction has been allocated by the City of Apopka in Fiscal Year (FY) 2023. No future phases are funded for the improvements along Rock Springs Road from Welch Road to Lester Road.

Existing Conditions

West Orange Trail

The West Orange Trail is an approximately 22-mile-long pedestrian/bicycle trail running from Killarney Station at the intersection of SR 50 with Lake Boulevard in Winter Garden, around the east side of Lake Apopka into Clarcona Road, then turning north to run along Clarcona Road, Old Apopka Road, Forest Avenue, and Park Avenue/Rock Springs Road to where it terminates at the intersection of Rock Springs Road with Lester Road. Within the study area, the West Orange Trail runs along the east side of Rock Springs Road from south of Welch Road to where it terminates at Lester Road.

The West Orange Trail is one of the most popular trails in the Orlando metropolitan area due to its length; at its southern end the trail connects to the South Lake and Lake Minneola Scenic Trail as well as the Hancock Trail, increasing the effective length to approximately 41.5 miles. The existing and projected growth of the population living along or near the West Orange Trail, the trail's popularity, and the projected growth of residential properties in the area surrounding the study area indicate the need to extend the trail at its northern end. Extending the West Orange Trail will also serve to improve the pedestrian/bicycle transportation network in the City of Apopka.

Roadway Characteristics

Within the study area limits, Rock Springs Road from Lester Road to Kelly Park Road is a four-lane divided urban major collector, part of the corridor is divided by a Two-Way-Left-Turn-Lane (TWLTL) and part of the corridor is divided by a Raised Median. Welch Road from Rock Springs Road to Wekiwa Springs Road is a major two-lane urban collector. Welch Road from Rock Springs Road to Cedar Glen Drive it is divided with a TWLTL, from Cedar Glen Drive to Wekiwa Springs Road it is undivided. Ponkan Road from west of Jason Dwelley Parkway to Rock Springs Road is a two-lane undivided urban major collector.

The existing roadway characteristics that are relevant to this study are shown in **Table 1** through **Table 3**.

Table 1 | Roadway Characteristics of Rock Springs Road Corridor

Characteristic	Observation
Roadway Maintaining Agency	City of Apopka – Lester Road to Disalvo Place and Spring Hollow Boulevard to Kentucky Blue Circle Orange County – Disalvo Place to Spring Hollow Boulevard and Kentucky Blue Circle to Kelly Park Road
Functional Classification	Urban Major Collector
Level of Service (LOS) Target	LOS E
Posted Speed Limit	45 mph
Jurisdiction	Orange County
Signalized Study Intersections from south to north	Lester Road Ponkan Road Rock Ridge Boulevard Kelly Park Road
Land Uses	Residential and commercial
Lane Width	11 feet
Median	Two-Way-Left-Turn-Lane: 14 feet Raised Median: Varies 14 – 18 feet
Sidewalks	5-foot-wide concrete sidewalk on both sides of the roadway
Shared Use Path and Bicycle Lanes	Bicycle lanes on both sides of the road from Ponkan Road to Kelly Park Road
Access Management Type	Non-Restrictive: <ul style="list-style-type: none"> Lester Road to Ponkan Road West Road to Holly Street Restrictive: <ul style="list-style-type: none"> Ponkan Road to West Road Holly Street to Kelly Park Road

Table 2 | Roadway Characteristics of Welch Road Corridor

Characteristic	Observation
Roadway Maintaining Agency	City of Apopka – Rock Springs Road to west of Northfield Drive Orange County – West of Northfield Drive to Wekiwa Springs Road
Functional Classification	Urban Major Collector
Level of Service (LOS) Target	LOS E
Posted Speed Limit	45 mph
Jurisdiction	Orange County
Signalized Study Intersections from west to east	Rock Springs Road Thompson Road Wekiwa Springs Road
Land Uses	Residential
Lane Width	11 feet
Median	Rock Springs Road to Cedar Glen Drive: Two-Way Left Turn Lane, 14 feet Cedar Glen Drive to Wekiwa Springs Road: None
Sidewalks	5-foot-wide concrete sidewalk on north side of the roadway: Rock Springs Road to Cedar Glen Drive 5-foot-wide concrete sidewalk on south side of the roadway: Rock Springs Road to east end of Wekiva Plaza Wellsprings Residence entrance to Wekiwa Springs Road
Shared Use Path and Bicycle Lanes	4-foot-wide paved shoulders from Cedar Glen Drive to Thompson Road
Access Management Type	Non-Restrictive

Table 3 | Roadway Characteristics of Ponkan Road Corridor

Characteristic	Observation
Roadway Maintaining Agency	City of Apopka
Functional Classification	Urban Major Collector
Level of Service (LOS) Target	LOS E
Posted Speed Limit	35 mph
Jurisdiction	Orange County
Signalized Study Intersections from west to east	Jason Dwelley Parkway Vick Road Rock Springs Road
Land Uses	Commercial, residential and vacant
Lane Width	11 feet
Median	None
Sidewalks	5-foot-wide concrete sidewalk on north side of the roadway: West of Jason Dwelley Parkway to Vick Road 5-foot-wide concrete sidewalk on south side of the roadway: Vick Road to Rock Springs Road
Shared Use Path and Bicycle Lanes	None
Access Management Type	Non-Restrictive

Lighting

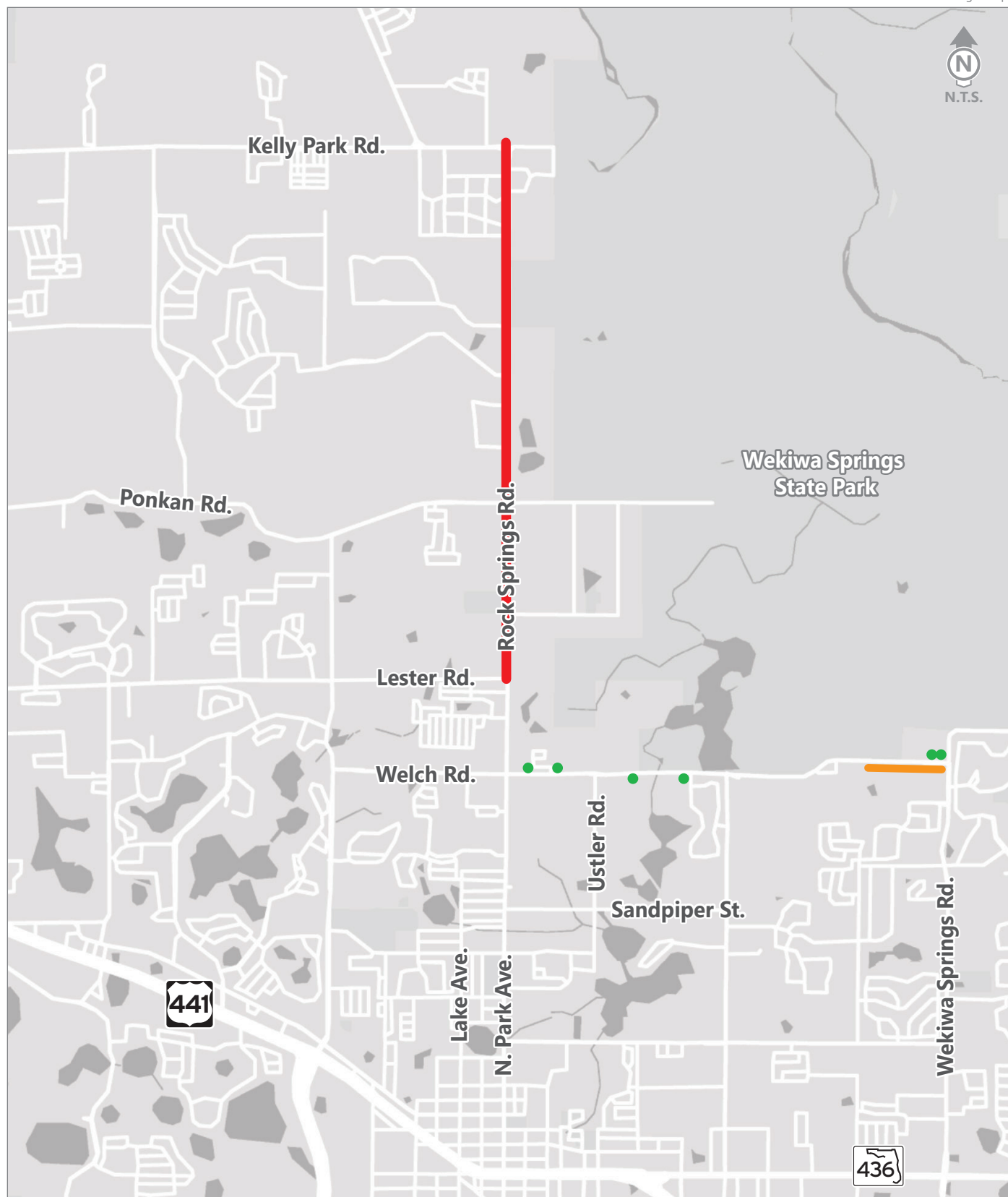
On Rock Springs Road from Lester Road to Kelly Park Road, lighting is present on both sides of the roadway. All of the lighting fixtures along the corridor are LED cantilever lights mounted to either pre-existing utility poles (on the west side of the roadway), or to stand alone lighting poles (on the east side of the roadway) and spaced at regular intervals of approximately 150 feet. The intersection of Rock Springs Road with Ponkan Road has lights present at each corner. The intersections of Rock Springs Road with Lester Road, Rock Ridge Boulevard, and Kelly Park Road do not have any additional lighting.

On Welch Road, consistent lighting is only present along the 0.5-mile-long segment immediately west of Wekiwa Springs Road. Along this segment, lighting is present on the south side of the roadway. The lighting fixtures are cobra head cantilever lights mounted to pre-existing utility poles and spaced at regular intervals of approximately 200 feet. Individual lights are present at the following locations along the corridor:

- Just east of Wekiva Plaza: north side of road, cobra head mounted to utility pole
- Just east of Creekline Lane: north side of road, cobra head mounted to utility pole
- Wellsprings Residence entrance: south side of road, cantilever cobra head mounted to utility pole
- Crown Isle Circle: south side of road, cantilever cobra head mounted to utility pole
- Deer Lake Circle: south side of road, cantilever cobra head mounted to utility pole
- 300 feet west of Wekiwa Springs Road: north side of road, cantilever cobra head mounted to utility pole
- 100 feet west of Wekiwa Springs Road: north side of road, cantilever cobra head mounted to utility pole

The intersection of Welch Road with Rock Springs Road has shoebox light fixtures mounted to the mast arm support poles on all four corners. The intersections of Welch Road with Thompson Road and Wekiwa Springs Road do not have any additional lighting. No lighting is present along Ponkan Road within the study area.

The existing lighting locations are illustrated in **Figure 2**.



- Existing Lighting on Both Sides of Corridor
- Existing Lighting on South Side of Corridor
- Existing Individual Lighting



Figure 2

Existing Lighting Location Map
West Orange Trail
Extension Study

Intersections

The following signalized intersections are present in the study area:

- Rock Springs Road at Lester Road
- Rock Springs Road at Ponkan Road
- Rock Springs Road at Rock Ridge Boulevard
- Rock Springs Road at Kelly Park Road
- Welch Road at Rock Springs Road
- Welch Road at Thompson Road
- Welch Road at Wekiwa Springs Road
- Ponkan Road at Jason Dwelley Parkway
- Ponkan Road at Vick Road

Access Management Classification

The Florida Department of Transportation (FDOT) classifies access on state roadways using a seven-tier access management system established in Chapter 14-97, Administrative Rule of the Department of Transportation, State Highway System Access Management Classification System and Standards (Rule 14-97). The classification system ranges from Access Class 1, reserved for limited access freeway, to Access Class 7, assigned to lower priority state highways in areas that are already highly urbanized. This classification system assigns standards for driveway connections, spacing, median opening spacing, and signal spacing.

None of the three project corridors have officially assigned FDOT Access Classes. However, Rock Springs Road fits the guidelines for classification as Access Class 7, Welch Road fits the guidelines for classification as Access Class 6, and Ponkan Road fits the guidelines for classification as Access Class 4.

According to Rule 14-97; Access Class 4 roadways are controlled access facilities where direct access to abutting land is controlled to maximize the operation of the through traffic movement. The land adjacent to these roadways is generally not extensively developed and/or the probability of significant land use change exists. These roadways are distinguished by existing or planned non-restrictive median treatments. Access Class 6 roadways are controlled access facilities where adjacent land has been extensively developed, and the probability of major land use change is not high. These roadways are distinguished by existing or planned non-restrictive medians or centerlines. Access Class 7 roadways are controlled access facilities where adjacent land is generally developed to the maximum feasible intensity and roadway widening potential is limited. This classification is only assigned to roadway segments where there is little intent or opportunity to provide high speed travel. These roadways can have either restrictive or non-restrictive medians.

The spacing requirements for both access classes are shown in **Table 4**.

Table 4 | Access Class Requirements

Access Class	Minimum Spacing (feet)		
	Signal	Connection	
		≤45mph	>45mph
4	2,640	440	660
6	1,320	245	440
7	1,320	125	125

Source: Administrative Rule of the Department of Transportation, Rule 14-97

Railroad Crossings

There are no railroad crossings within the study area, nor are there any railroad tracks located within one mile of the study area.

Right-of-Way

The right-of-way (ROW) was identified for the study area using the following two sources:

- Rock Springs Road: FDOT ROW maps obtained from the FDOT District 5 Survey and Mapping Unit.
- Welch Road and Ponkan Road: Orange County Property Appraiser parcel records.

The existing ROW for Rock Springs Road, Welch Road, and Ponkan Road are shown in **Table 5**. The ROW maps for Rock Springs Road are included in **Appendix A**.

Table 5 | Welch Road ROW Summary

Segment	ROW Width (feet)
Rock Springs Road¹	
Lester Road to 550 feet north of Faye Street	100
550 feet north of Faye Street to James Avenue	Varies 100 - 130
James Avenue to Kelly Park Road	100
Welch Road²	
Rock Springs Road to the east end of Wekiva Plaza	120
East end of Wekiva Plaza to Ustler Road	90
Ustler Road to the Wellsprings Residence entrance	Varies 60 - 80
Wellsprings Residence entrance to 800 feet east of Litchem Road	90
800 feet east of Litchem Road to Citrus Avenue	Varies 65 - 170
Citrus Avenue to Lake Avenue	65
Lake Avenue to 620 feet west of Falconhill Drive	90
620 feet west of Falconhill Drive to Falconhill Drive	60
Falconhill Drive to Wekiwa Springs Road	70
Ponkan Road²	
West of Jason Dwelley Parkway to 550 feet west of Pinenut Drive	60
550 feet west of Pinenut Drive to 160 feet east of Pinenut Drive	80
160 feet east of Pinenut Drive to 450 feet west of Raeth Road	60
450 feet west of Raeth Road to 460 feet east of Raeth Road	80
460 feet east of Raeth Road to Rock Springs Road	60

Sources:

1. FDOT District 5 Survey and Mapping Unit
2. Orange County Property Appraiser

Land Use and Context Classification

Land Use

The discrepancy in the total acreage for existing and future land uses is due to slight differences in mapping the land uses by the different agencies.

Comparing the land uses shown in **Table 6** and **Table 7**, the future development within the study areas can be expected to be primarily residential, as it only makes up 43.4% of the existing land use but is projected to make up 71.7% of the future land use. Agricultural land uses are expected to decrease significantly in the future from 22% to 0.4% as most of the Agricultural land will be converted to Residential. Parks/Recreational, and Protected land uses are expected to increase from 4.3% to 12.4%. Public/Semi-Public and Institutional land uses are expected to decrease significantly from 13.2% to 6.9%, while Commercial and Retail/Office land uses are expected to decrease slightly from 3.3% to 2.1%.

Existing Land Use

The existing land uses within 300 feet of the study areas are summarized in **Table 6** and illustrated in **Figure 3**.

Table 6 | Generalized Existing Land Use

General Land Use	Parcel Count	Acres (within 300')	Percent Total
Acreage not Zoned for Agriculture	14	25.12	5.4%
Agricultural	9	103.02	22.0%
Industrial	4	7.09	1.5%
Institutional	5	7.62	1.6%
Other	1	1.30	0.3%
Public / Semi-Public	13	61.61	13.2%
Recreation	1	20.20	4.3%
Residential	50	203.13	43.4%
Retail / Office	10	15.34	3.3%
ROW	1	0.17	0.0%
Vacant Nonresidential	8	8.20	1.7%
Vacant Residential	20	15.37	3.3%
Total	136	468.17	100.0%

Source: GeoPlan Florida's Generalized Land Use Data for Florida (2018)

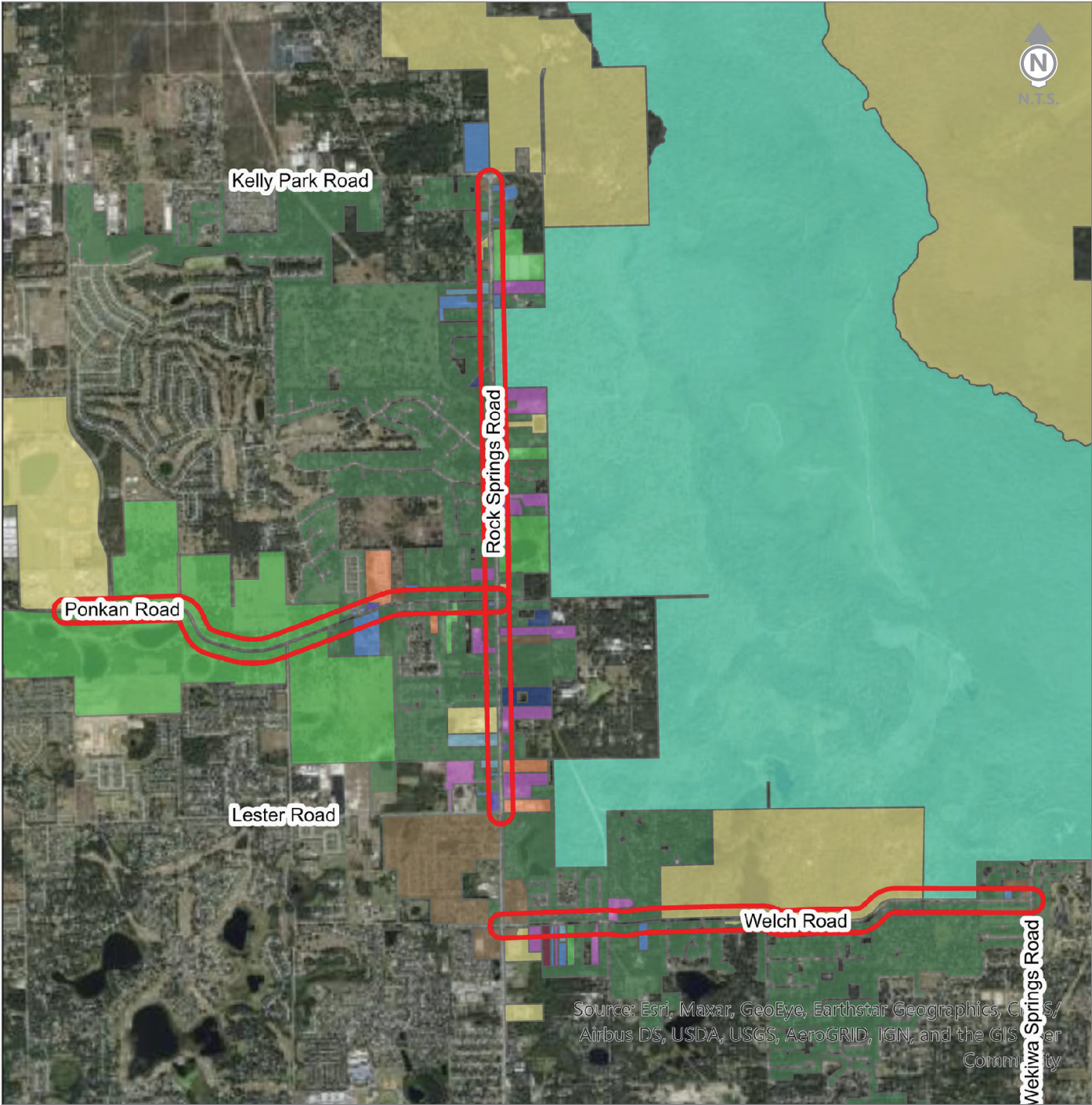
Future Land Use

The projected future land uses within 300 feet of the study areas are summarized in **Table 7** and illustrated in **Figure 4**.

Table 7 | Future Land Use

Future Land Use	Parcel Count	Acres (within 300')	Percent Total
Agricultural	1	1.72	0.4%
Commercial	8	9.29	2.0%
Institutional	4	32.14	6.9%
Mixed Use	3	26.08	5.6%
Office	1	0.26	0.1%
Parks/Recreation	2	37.87	8.1%
Protected	2	20.31	4.3%
Residential	4	9.93	2.1%
Residential - Low-Medium Density	1	0.98	0.2%
Residential - Low Density	77	324.03	69.4%
Water	1	3.99	0.9%
Total	104	466.60	100%

Source: Orange County, City of Apopka



Existing Land Uses















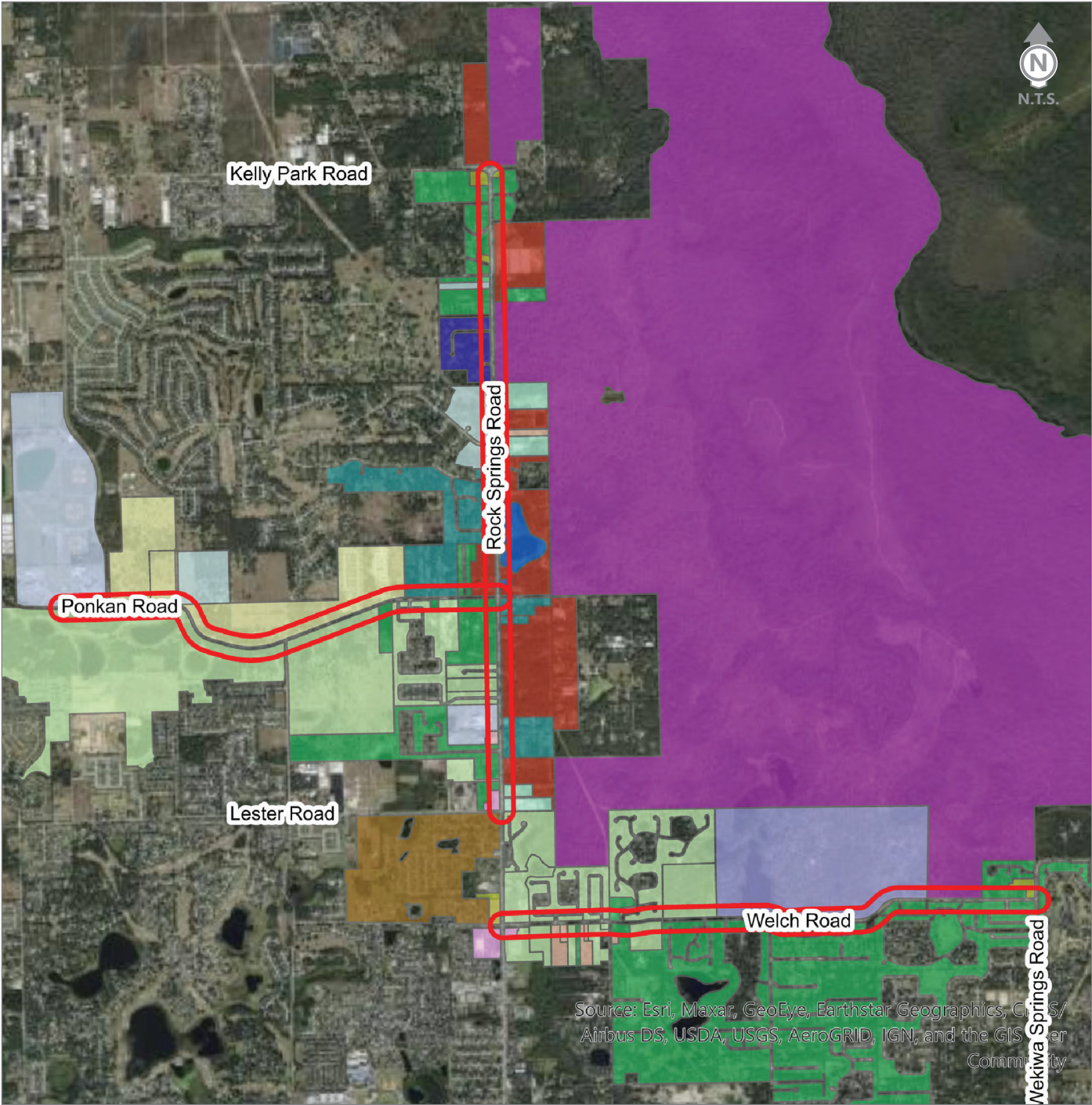
	Acreage Not Zoned for Agriculture		Recreation
	Agricultural		Residential
	Industrial		Retail/Office
	Institutional		ROW
	Other		Vacant Nonresidential
	Parcels with No Values		Vacant Residential
	Public Semi-Public		300 ft Buffer Area



Figure 3
Existing Land Use
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Orange County Future Land Uses

- Commercial
- Industrial
- Low-Medium Density Residential
- Protected
- Water
- Low Density Residential 1/2
- Low Density Residential 1/1
- Low Density Residential 1/5
- Low Density Residential

City of Apopka Future Land Uses

- Agricultural
- Commercial
- Institutional FLU-IP
- Institutional PU
- Mixed Use
- Office
- Parks/Recreation
- Residential
- Low Density Residential
- 300 ft Buffer Area



Figure 4
Future Land Use
West Orange Trail
Extension Study

Zoning

Zoning data for the study area was provided by Orange County. The land along Rock Springs Road within the study area limits is zoned primarily as rural with some residential on the west side of the road. The land along Welch Road is zoned almost exclusively as residential, with several small areas of commercial and rural. The land along Ponkan Road is zoned primarily as rural with some residential. Zoning maps for the study area are included in **Appendix B**.

Schools and Public Facilities

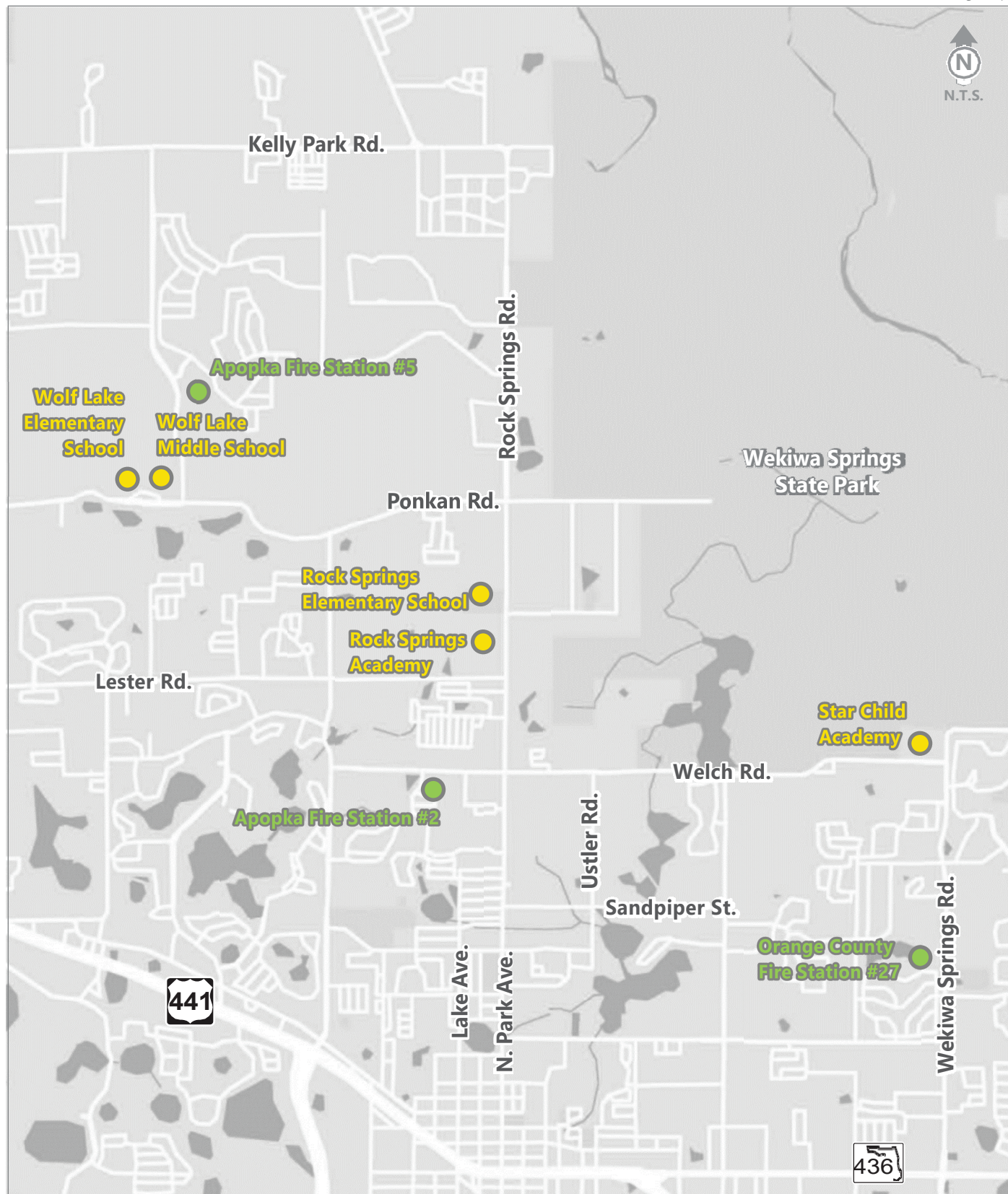
There are four schools and one preschool/daycare located along the study area. **Table 8** provides a summary of the locations and age groups served by each school. A 700-foot-long school zone is present on Rock Springs Road at Rock Springs Elementary School, with a 20 mph (miles per hour) speed limit indicated by a flashing signal.

Table 8 | Schools Near Study Corridor

School	Location	Age Group
Rock Springs Academy	Rock Springs Road @ Alexandria Place Drive – Southwest corner	2-years-old – 4-years-old
StarChild Academy	Welch Road @ Wekiwa Springs Road – Northwest corner	6-weeks-old – 5 th Grade
Rock Springs Elementary School	Rock Springs Road @ Wekiwa Pointe Circle – Southwest corner	Kindergarten – 5 th Grade
Wolf Lake Elementary School	Ponkan Road @ Jason Dwelley Parkway – Northwest corner	Kindergarten – 5 th Grade
Wolf Lake Middle School	Ponkan Road @ Jason Dwelley Parkway – Northwest corner	6 th Grade – 8 th Grade

In addition to the schools, there are three Fire & Rescue Stations within one mile of the project area. The first is Apopka Fire Station #2 located on the south side of Welch Road approximately 1,500 feet west of the Rock Springs Road, the second is Apopka Fire Station #5 located on the east side of Jason Dwelley Parkway approximately 3,000 feet north of Ponkan Road, and the third is Orange County Fire Station #27 located on the west side of Wekiwa Springs Road approximately one mile south of Welch Road. There are no law enforcement facilities located within one mile of the study area.

The locations of the schools and public facilities near the study area are shown in **Figure 5**.



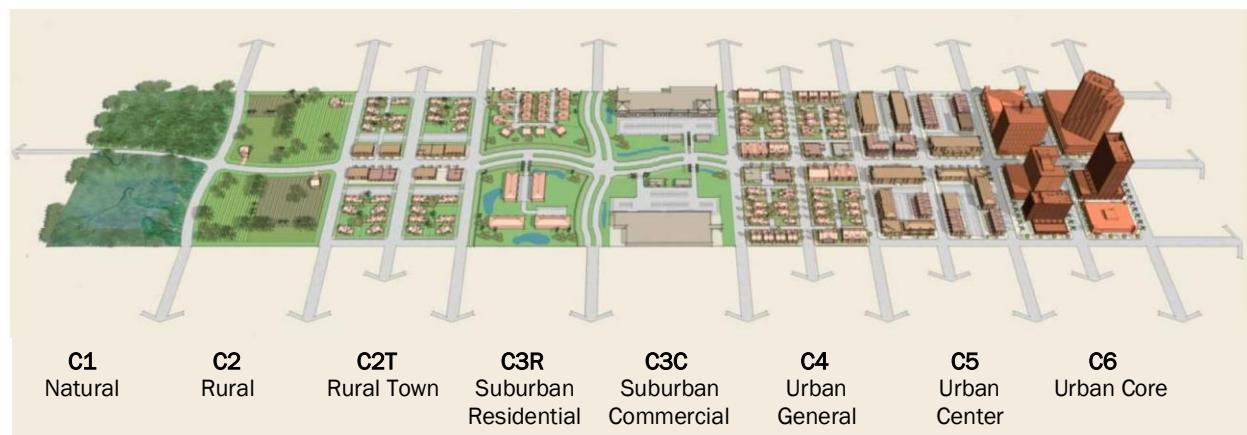
- School
- Fire Station

Context Classification and Functional Classification

The FDOT assigns context classifications to roadways based on their surrounding environments, ranging from Natural (C1) to Urban Core (C6). The full range of FDOT context classifications is illustrated in **Figure 6**.

Rock Springs Road, Welch Road, and Ponkan Road within the study area do not have an officially assigned context class, but all three corridors have the characteristics correlating to context class C3R (Suburban Residential). The C3R classification is described as having mostly residential land uses with large blocks and a disconnected or sparse roadway network.

Figure 6 | FDOT Context Classifications



Development Patterns

Based on the existing and future land uses along the project area, development in the area is expected to be primarily residential with some commercial development surrounding the intersection of Rock Springs Road and Welch Road.

Planned Developments

There are ten planned developments located within one mile of the study area. A summary of the developments is shown in **Table 9**. A map showing the development locations is included in **Appendix C**.

Not included in the map or table are two new planned developments. One is located in the northwest corner of the Rock Springs Road and Welch Road intersection, and one is located in the southeast corner of the Park Avenue and Sandpiper Street Intersection. One additional area (located on the south side of Faye Street east of Rock Springs Road) is zoned for a planned development but does not have a development project underway (see the Zoning Map in **Appendix B**).

Table 9 | Development Project Summary

Development Name	Location	Type/Description	Acreage	Dwelling Units
Retail at Rock Springs & Tanglewood	Southwest corner of Rock Springs Road at Tanglewood Drive	Subdivision Plan – Retail Center	4.59	0
Gateway Plaza	Northwest corner of Rock Springs Road at Lester Road	Site Plan – Shopping Plaza	3.36	0
San Sebastian Reserve	North side of Lester Road, west of Rock Springs Road	Subdivision Plan – Single Family Subdivision	23	112
Hammock at Rock Springs	West side of Rock Springs Road, north of Wekiva Pointe Circle	Planned Unit Development – Single Family Subdivision	9.59	19
Bridlewood	North side of Lester Road, west of Rock Springs Road	Subdivision Plan – Single Family Subdivision	20	52
Carriage Hill Phase 1	South side of Ponkan Road, at Jason Dwelley Parkway	Subdivision Plan – Single Family Subdivision	30.58	72
Vista Reserve	South side of Ponkan Road, at Jason Dwelley Parkway	Subdivision Plan – Single Family Subdivision	61	153
Country Crossing Estates	South side of Ponkan Road, east of Jason Dwelley Parkway	Subdivision Plan – Single Family Subdivision	7	24
Rock Springs Reserve	North side of Ponkan Road, west of Vick Road	Subdivision Plan – Single Family Subdivision	35	111
Ponkan Reserve	South side of Ponkan Road, west of Rock Springs Road	Subdivision Plan – Single Family Subdivision	7.47	14

Source: City of Apopka Developments Map

Pedestrian and Bicycle Facilities

Bicycle Facilities

Four-foot-wide bicycle lanes are present on both sides of Rock Springs Road from Ponkan Road to Kelly Park Road.

There are no paved shoulders or separated bicycle lanes on either side of Ponkan Road throughout the length of the study area. For most of its length through the study area, Welch Road also does not have paved shoulders or separated bicycle lanes on either side of the roadway. However, on Welch Road there are four-foot-wide paved shoulders from about 400 feet east of Cedar Glen Drive to Thompson Road on both sides of the corridor. Grass has grown over the edge of the pavement along Welch Road at many points effectively reducing the shoulder width.

Sidewalks

Along Rock Springs Road, there is a five-foot-wide concrete sidewalk present along both sides of the roadway throughout the length of the study corridor. The sidewalk is generally separated from the roadway by a three-foot-wide utility strip although there are locations where the sidewalk is at the back of the curb and other locations where the separation from the roadway is over 15-feet.

Along Welch Road, there is a five-foot-wide concrete sidewalk on the south side of the roadway between Rock Springs Road, from east of the driveway of Wekiva Plaza to the entrance of Duke Energy, and between the Wellsprings Residence entrance (1,300 feet east of Ustler Road) and Wekiwa Springs Road. A five-foot-wide concrete sidewalk is also present on the north side of the roadway between Rock Springs Road and Cedar Glen Drive, and for two very short segments (150 feet and 215 feet) just west of Wekiwa Springs Road.

Along Ponkan Road, a five-foot-wide concrete sidewalk runs along the north side of the roadway from the Wolf Lake Elementary and Middle Schools to just east of Pinenut Drive, and along the south side of the roadway from Vick Road to Rock Springs Road.

Midblock Crossings

One midblock crossing is present on Rock Springs Road located at Faye Street, just inside the school zone that serves Rock Springs Elementary School. The crossing is marked with a special emphasis crosswalk. Stop bars and signage are present to alert drivers to potential pedestrians.

Pedestrian Accommodation at Signalized Intersections

Crosswalks are present on the following approaches of the signalized intersections within the study area:

- **Rock Springs Road at Lester Road** – eastbound, northbound, southbound approach
- **Rock Springs Road at Ponkan Road** – all approaches
- **Rock Springs Road at Kelly Park Road** – westbound, south bound approach
- **Rock Springs Road at Rock Ridge Boulevard** – westbound, northbound approach
- **Welch Road at Rock Springs Road** – all approaches
- **Welch Road at Thompson Road** – northbound approach
- **Welch Road at Wekiwa Springs Road** – eastbound, southbound approach
- **Ponkan Road at Jason Dwelley Parkway** – southbound approach
- **Ponkan Road at Vick Road** – eastbound, northbound approach

Utilities

A Sunshine One Call ticket was processed in March 2021 to identify a list of potential utility providers within the study area. A 500-foot-wide buffer was applied around the Rock Springs Road, Welch Road, and Ponkan Road corridors to identify the utility companies located adjacent to the corridors. The identified utility companies were contacted to obtain information about their infrastructure or facilities present within the study area; each company's response is summarized in **Table 10**. The information obtained on utilities is provided in **Appendix D**.

Table 10 | Utility Agencies and Contact Information

Utility Company	Service Provided	Summary of Infrastructure/Facilities within Study Area
AT&T/Distribution Dino Farruggio (561) 997-0240	Telephone	No information provided.
Black & Veatch Orlando 1F Chad Arnett (813) 207-7931	Fiber	No facilities are present within the study area.
Century Link Bill McCloud (850) 599-1444	Fiber, Telephone	Local assets (fiber and telephone) are present along Rock Springs Road, Welch Road, and Ponkan Road throughout the study area.
Charter Communications Ramon Nunez (407) 215-5870	CATV, Fiber, Telephone	No information provided.
City of Apopka Vladimir Simonovski (407) 703-1731	Sewer, Water	No information provided.
Duke Energy Jeffrey Trauth, Todd Khilmire, Sam Evans (407) 905-3376	Electric	<p>Aerial transmission lines run along the west side of Rock Springs Road between Lester Road and Kelly Park Road, also crossing the roadway at the Rock Ridge Boulevard intersection and at the Kelly Park Road intersection.</p> <p>Aerial transmission lines run along Welch Road throughout the study area. Aerials cross all four approaches to the intersection with Rock Springs Road. From Rock Springs Road to Ustler Road, the facilities run along the north side of the roadway. At Ustler Road, the aerials cross to the south side of the roadway, running along the south side of the roadway from there to the Wellsprings Residence entrance. From the entrance to Wellsprings Residence to 650 feet west of Litchem Road, aerials run along both sides of the corridor, occasionally crossing over the roadway. From 650 feet west of Litchem Road to 900 feet east of Litchem Road, the facilities are only on the north side of the roadway; at the location 900 feet east of Litchem Road, one set of aerials cross over the roadway and from there to Wekiwa Springs Road, the facilities run along both sides of the road, occasionally crossing over the roadway.</p> <p>Aerial transmission lines run along the north side of Ponkan Road from Jason Dwelley Parkway to 400 feet east of Pittman Road where they cross to the south side of the roadway and continue along the south side of the corridor to Rock Springs Road.</p>
Florida Gas Transmission - Orlando Joseph Sanchez (407) 838-7171	Gas	26" and 24" natural gas transmission pipelines run along the west side of Rock Springs Road, starting just south of Spring Hollow Boulevard where they cross under the roadway from the east to the west side before turning north to run along the west side of the roadway until Kentucky Blue Circle. Farther south, the same two pipelines cross under Welch Road at the intersection with Ustler Road.

Utility Company	Service Provided	Summary of Infrastructure/Facilities within Study Area
		A 3.5" natural gas transmission pipeline runs along the south side of Ponkan Road from Vick Road to Rock Springs Road, where it passes under Rock Springs Road to continue east.
Lake Apopka Natural Gas District Patrick Nguyen (407) 656-2734	Gas	A 6" poly gas main runs along the east side of Rock Springs Road from south of Lester Road to Kelly Park Road. A 4" poly gas main runs along the west side of Rock Springs Road from the intersection with Lester Road for approximately 200 feet before passing under Rock Springs Road and running south along the east side of the roadway. A 2" gas main passes under the south and east sides of the intersection of Rock Springs Road with Welch Road. A 6" poly gas main runs along the north side of Welch Road from Rock Springs Road to the east end of Wekiva Plaza. Another 6" poly gas main runs along the north side of Welch Road from Parkglen Circle to Thompson Road.
MCI Verizon MCIU01 Investigations (469) 886-4091	Communication Lines, Fiber	No information provided.
Orange County Public Works Matthew Shipley (407) 836-7814	Fiber, Traffic Signals	No information provided.
Orange County Utilities Victor Gonzalez (407) 836-6869 x66869	Water, Wastewater	8" PVC water mains run along the south side of Welch Road from west of Falconhill Drive to Wekiwa Springs Road. 4" PVC force mains pass under Welch Road approximately 400 feet west of Falconhill Drive and turn east to run along the north side of Welch Road from west of Falconhill Drive to Wekiwa Springs Road. No information provided concerning fiber and traffic signals.
Zayo Group/Formerly Lightwave, LLC Henry Klobucar (406) 496-6510	Fiber	No information provided.

Environmental Characteristics

Social

Demographics

Preliminary demographics data was gathered for the City of Apopka to determine the population characteristics for the area surrounding the study area. The data gathered includes population characteristics, socioeconomic data, and major employers and activity centers and was collected from the US Census Bureau, ESRI's Tapestry, and the Florida Department of Health (DOH).

ESRI's Tapestry classifies neighborhoods and ZIP codes into 67 different types of segments based on socioeconomic characteristics as well as standard demographics data. According to the ESRI Tapestry profile for the neighborhoods in Apopka, the primary "Tapestry Segments" found around the study area and their key features are listed in **Table 11**.

Table 11 | ESRI Tapestry Summaries

Segment Name	Description
Workday Drive	<ul style="list-style-type: none"> Residents prefer the suburban periphery of metropolitan areas Predominantly single family, owner-occupied homes <ul style="list-style-type: none"> Most households are married couples with children Average household size: 2.97 Homes are in newer neighborhoods: <ul style="list-style-type: none"> 34% built in the 1990s 31% built since 2000 High rate of mortgages - 68% Low rate of vacancy - 4% Median home value: \$257,400 Most households have 2 or 3 vehicles <ul style="list-style-type: none"> Long travel time to work Disproportionate number commuting from a different county
Middleburg	<ul style="list-style-type: none"> Semirural locales within metropolitan areas Neighborhoods changed rapidly in the previous decade <ul style="list-style-type: none"> Single family homes Mobile homes Primarily young couples, many with children Average household size: 2.75 Median home value: \$175,000 Low vacancy rate
Home Improvement	<ul style="list-style-type: none"> Low density suburban neighborhoods Primarily traditional, owner-occupied, single-family dwellings (80%) <ul style="list-style-type: none"> Over 50% married-couple families Approximately 12% single-parent families Majority of homes built between 1970 and 2000
Green Acres	<ul style="list-style-type: none"> Rural enclaves in metropolitan areas <ul style="list-style-type: none"> Older market Primarily married couples, most with no children Primarily (not exclusively) older homes with acreage New housing growth in the past 15 years <ul style="list-style-type: none"> Single-family, owner-occupied housing Median home value: \$235,500

In addition to the primary segments, two affluent segments (“Top Tier” and “Savvy Suburbanites”) are found at the far east end of the Welch Road corridor. Profiles for each segment, including age, race and ethnicity, income, housing, and occupation data are included in **Appendix E**.

Population Characteristics

Population data was collected from the City of Apopka and the US Census Bureau. The total population, number of households, average household size, and number of housing units were provided by the City of Apopka. The other population characteristic data was gathered from the 2019 American Community Survey (ACS) 5-Year Estimates. Due to the impacts of the COVID-19 pandemic, the US Census Bureau did not release ACS estimates for 2020.

An overview of the demographics in Apopka is provided in **Table 12** below. The demographics data provided by the City of Apopka is included in **Appendix E**.

Table 12 | Apopka Demographics Overview

Category	Measure
Population	
Total Population	56,727
Population Density (Persons per Acre)	2.49
Households	
Total Households	20,311
Average Household Size	2.79
Household Density (Households per Acre)	0.893
Age	
Median Age	37.3 years
Population over 65	12.8%
Sex	
Male	50.7%
Female	49.3%
Race/Ethnicity	
White	65.0%
Hispanic or Latino	21.6%
Not Hispanic or Latino	43.4%
Black or African American	25.2%
Hispanic or Latino	2.1%
Not Hispanic or Latino	23.1%
Asian	4.2%
Other	5.6%
Income	
Median Household Income	\$66,057
Persons Below Poverty	9.4%
Housing	
Total Housing Units	20,204
Owner-Occupied	70.2%
Renter-Occupied	28.5%
Vacant	1.3%
Limited English Proficiency (LEP)	
Block groups with >5% LEP (Spanish Speaking) surrounding study area	2 (7.56%, 5.24%)
Vehicle Ownership	
Households with No Vehicles	4.4%

Source: City of Apopka, US Census Bureau 2019 ACS

Age

Age data was gathered from the US Census Bureau 2019 ACS Estimates. The median age in Apopka is 37.3 years, 62.4% of the population falling between the ages of 18 and 65. Out of the total population in Apopka, 12.8% of the people in Apopka are over 65 years old, and 24.8% are under 18.

Race/Ethnicity

Race and ethnicity data was gathered from the US Census Bureau 2019 ACS Estimates. The majority race in Apopka is White (65.0%), followed by Black or African American (25.2%), and Asian (4.2%). The remaining 5.6% of people in Apopka identify as Two or More Races (3.3%), or as some other race

(2.3%). In total, 23.7% of the population are Hispanic, with 21.6% identifying as White Hispanic and 2.1% identifying as Black Hispanic.

Income

Income data was gathered from the US Census Bureau 2019 ACS Estimates. Apopka has a median household income of \$66,057 and a poverty rate of 9.4% (the population which falls under the federal poverty line); 4.1% of households have an income less than \$10,000, and 7.6% of households have an income between \$10,000 and \$25,000.

Education

Educational attainment data was gathered from the US Census Bureau 2019 ACS Estimates and is summarized in **Table 13**.

Table 13 | Educational Attainment Data Summary

Demographic	Percentage of High School Graduates	Percentage of Bachelor's Degree Attainment
Age		
18 – 24	80.8%	12.6%
25 and older	86.4%	27.5%
Race/Ethnicity		
White	89.2%	30.2%
Not Hispanic or Latino	93.0%	34.5%
Black or African American	89.5%	19.0%
Hispanic or Latino Origin	67.4%	13.9%
Asian	89.0%	52.4%
Native Hawaiian and Other Pacific Islander	73.7%	28.9%
Other	61.7%	11.0%

Source: US Census Bureau 2019 ACS

Limited English Proficiency

Limited English Proficiency (LEP) data for the area surrounding the study area was gathered from the US Census Bureau 2019 ACS Estimates. Eight census block groups surround the study area. A summary of the percentages of LEP (Spanish Speaking) households by block group is shown in **Table 14**.

Table 14 | LEP (Spanish Speaking) Household Percentages

Block Group #	Location	Percentage of LEP (Spanish Speaking) Households
120950178042	West side of Rock Springs Road between Welch Road and Ponkan Road	7.56%
120950177011	West side of Park Avenue, south of Welch Road	5.24%
120950178081	South side of Welch Road, between Thompson Road and Wekiwa Springs Road	4.51%
120950178021	South side of Ponkan Road, west of Vick Road	3.82%
120950178061	South side of Welch Road, between Ustler Road and Thompson Road	3.25%
120950178041	North side of Ponkan Road, west of Rock Springs Road	3.13%
120950178051	East side of Rock Springs Road and north side of Welch Road	1.97%
120950178021	South side of Welch Road, between Rock Springs Road and Ustler Road	1.00%

Source: US Census Bureau 2019 ACS Estimates

As can be seen in the table, two block groups have LEP household percentages greater than 5%, four block groups have LEP household percentages between 2% and 5%, and two block groups have LEP household percentages less than 2%. No block groups surrounding the study area have significant LEP household populations for any other language group. A map showing the percentage of LEP (Spanish Speaking) households by block group is included in **Appendix E**.

Health

Health data was gathered from the DOH. The average life expectancy for the census tract surrounding the project area is 80.0 years, for Orange County overall it is 80.1 years. This is slightly higher than the statewide life expectancy of 79.7 years. In Orange County, 12.4% of adults are active smokers (lower than the national rate of 17.1%), and 27.5% of adults are clinically obese (lower than the national rate of 31.9%). Death rates for the most common illness-related causes of death are also lower in Apopka than nationally, as shown in **Table 15**.

Table 15 | Apopka Common Illness Related Death Rates

Cause of Death	Death Rate per 100,000	
	Apopka	National
Cardiovascular	186.1	200
Cancer	153.7	185
Respiratory Disease	37.0	53
Diabetes	24.7	25

Source: Florida Department of Health (<http://www.flhealthcharts.com>) (2021)

Transportation

Transportation data was gathered from the US Census Bureau 2019 ACS Estimates. Zero-car households make up 4.4% of the households within Apopka. Of the 25,773 workers in Apopka, 4.6% rely on multi-modal transportation (biking, walking, public transit, etc.) to get to work.

Major Employers and Activity Centers

Major employers and activity centers within the study area were determined based on a desktop review on December 6, 2021. Two of the largest activity centers are located at the intersection of Rock

Springs Road with Welch Road. Wekiva Plaza is located in the northeast quadrant of the intersection and comprises approximately 20 businesses, while Rock Springs Plaza is located in the southwest quadrant of the intersection and comprises approximately 10 businesses. Wolf Lake Elementary School, Wolf Lake Middle School, and the Northwest Recreation Complex at the west end of the Ponkan Road corridor, as well as Rock Springs Elementary School on the west side of Rock Springs Road at Faye Street also form major activity centers.

Cultural and Social Facilities

Cultural and social facilities include, but are not limited to, trails, parks, schools and recreational areas as well as the neighborhoods they serve. Many of these features are protected under the Department of Transportation Act (DOT Act) of 1966, Section 4(f) which limits the use of public land. **Table 16** summarizes the number of sites that are in public ownership or use. A 300-foot-wide buffer along the centerline of the study corridors was used to determine the locations of social resources within the study area; these are provided as Exhibit A in **Appendix F**.

Table 16 | Summary of Cultural and Social Resources

Social Resources	Within Study Area
Cemetery	0
Conservation Lands	2
Cultural Center	0
Existing Trails	2
Fire Station	0
Government Building	0
Health Care Facility	1
Hospital	0
Park	3
Religious Center	2
School	3
Social Service Facility	0
Veteran Facility	0

Source: Florida Geographic Data Library (FGDL),
Efficient Transportation Decision Making (ETDM) Tool

As shown in **Appendix F**, Exhibit A, there are three parks, Camp Joy, Kelly Park, and Wekiwa Springs State Park, that contain campgrounds, multi-use trails, natural areas, and water access. All three parks also are classified as conservation lands; however, Camp Joy is bundled with Kelly Park as a single conservation land given their adjacency. The smaller of two conservation lands, Kelly Park/Rock Springs, is owned and managed by Orange County and is classified as scrub with two natural springs and 10 acres of developed land for active recreation such as swimming or camping. The other conservation land, Wekiwa Springs State Park, is owned by the state of Florida and managed by the Florida Department of Environmental Protection (FDEP). The Park includes different types of habitats such as a spring-run stream, scrub oak, mesic flatwoods, and wet prairies. Two existing trails associated with Orange County and Wekiwa Springs State Park are shown to intersect with the study area. However, the existing trails are part of a proposed project to improve and expand to the

connection with other existing trails outside of the study area. There are three schools, Rock Springs Elementary School, Wolf Lake Elementary and Middle School, that are within the study area, each with plans to connect to the proposed West Orange Trail (Rock Springs Academy and Star Child Academy fall just outside of the buffer area). In addition, the area encompasses two religious centers (Rock Springs First Baptist Church and Crossroads Church), and one healthcare center (Walgreens Health Care Clinic).

Historical and Archaeological Resources

Archaeological and historical resources are defined by the National Historic Preservation Act (NHPA) of 1966 and governed by federal and state regulations. Section 106 of the NHPA provides a general process for historical resource assessments and requires historic and archaeological resources be considered in project planning for federally funded or permitted projects. Cultural resources or “historic properties” include any “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP).”

Archaeological sites or historic resources that are listed, determined eligible, or considered potentially eligible by the State Historic Preservation Office (SHPO) for listing in the NRHP are identified in **Table 17**. These sites, along with other state recorded sites and survey locations, are graphically depicted in Exhibit B found in **Appendix F**.

Table 17 | Summary of Archaeological and Historical Resources

Historical Resources	Within Study Area
SHPO Structures	17
SHPO Bridges	0
SHPO Resource Groups	1
National Register (Site, District, Building)	0
Archaeological Sites	0
SHPO Surveys	3

Source: FGDL, Florida Master Site File (FMSF)

According to the Florida Master Site File (FMSF), there are 17 historic sites within the study area. All 17 sites are listed as ineligible for inclusion in the NRHP, but one of the 17 sites has not been evaluated by SHPO. This site is listed as a private residence and is classified as being a potential contributor to the National Register District due to the potential ability of meeting the required criteria put forth by SHPO. One historic resource group can be found within the study area and is associated with the Wekiwa Springs State Park. This resource group is classified as former logging tram roads associated with early 1900’s logging activities and has since been used as natural trails for hiking and equestrian purposes. In addition, three historical resource assessment surveys have been conducted within and in the vicinity of the study area.

Natural

Existing literature and publicly available Geographic Information System (GIS) data sources including, but not limited to, the data and maps of the following were used to evaluate hydrologic and other natural features found within the study area:

- US Army Corps of Engineers
- Florida Natural Areas Inventory
- St. Johns River Water Management District
- Florida Department of Environmental Protection
- Florida Land Use and Cover Classification Systems
- Natural Resources Conservation Service
- Orange County Stormwater
- Federal Emergency Management Agency basin studies
- Florida Fish and Wildlife Conservation Commission Habitat Model Data
- US Fish and Wildlife IPaC tool
- Specific site indicators such as:
 - Topography
 - Vegetation
 - Soils data
 - Floodplain information
 - Other field observations

Soils

Soil types were mapped within the study area using GIS data obtained from the Natural Resources Conservation Service (NRCS). **Table 18** provides an overview of the soils found onsite. The study area NRCS soils map can be found as Exhibit C in **Appendix F**.

Table 18 | Summary of Soil Types

Map Unit Symbol	Map Unit Name	Study Area Acreage	Percent of Study Area	Hydric Status
2	Archbold fine sand, 0 to 5 percent slopes	11.19	1.18%	Non-Hydric Soil
3	Basinger fine sand, depressional	38.14	4.02%	Hydric Soil
4	Candler fine sand, 0 to 5 percent slopes,	236.63	24.95%	Non-Hydric Soil
5	Candler fine sand, 0 to 12 percent slopes	127.51	13.44%	Non-Hydric Soil
6	Candler-Apopka fine sands, 5 to 12 percent slopes	46.03	4.85%	Non-Hydric Soil
20	Immokalee fine sand	5.70	0.60%	Hydric Inclusions
28	Florahome fine sand, 0 to 5 percent slopes	7.96	0.84%	Non-Hydric Soil
34	Pomello fine sand, 0 to 5 percent slopes	17.40	1.83%	Hydric Inclusions
35	Pomello- urban land complex, 0 to 5 percent slopes	0.87	0.09%	Hydric Inclusions
37	St. Johns fine sand	5.56	0.59%	Hydric Inclusions
44	Smyrna Fine sand	37.43	3.95%	Hydric Inclusions
45	Smyrna-Urban land complex	0.79	0.08%	Hydric Inclusions
46	Tavares fine sand, 0 to 5 percent slopes	53.50	5.64%	Non-Hydric Soil
47	Tavares-Millhopper fine sands, 0 to 5 percent slopes	353.68	37.29%	Non-Hydric Soil
54	Zolfo fine sand	5.43	0.57%	Non-Hydric Soil
99	Water	0.66	0.07%	Unranked
Totals for Area of Interest		948.48	100.00%	

Source: NRCS and US Department of Agriculture (USDA)

The following are general descriptions of the soil types and their characteristics, taken from the *US Department of Agriculture (USDA) Soil Conservation Service's Soil Survey of Orange County, Florida* (March 1990). Hydric and non-hydric soil designations are based on the *Hydric Soils of Florida Handbook*. Non-hydric soils are typically associated with uplands and hydric soils are generally associated with wetlands.

Archbold Fine Sand, 0 to 5 percent slopes (2) – This nearly level to gently sloping and moderately well drained soil is typically found on low ridges and knolls on the flatwoods. Slopes are smooth and convex. The seasonal high-water table is at depth of 42 to 60 inches of the surface for about six months, and it recedes to a depth of 60 to 80 inches for the rest of the year. It is at a depth of 24 to 40 inches for about one month to four months during extended wet periods. It recedes to a depth of more than 80 inches during extended dry periods. The permeability is very rapid throughout. The available water capacity is very low. This is considered a non-hydric soil and can be indicative of marine terraces on coastal plains and associated with uplands.

Basinger Fine Sand, depressional (3) – This nearly level and very poorly drained soil is found on shallow depressions and sloughs and along the edges of freshwater marshes and swamps. Slopes range from 0 to 2 percent. Under natural conditions, the water table is above the surface for six to nine months or more each year and is within 12 inches of the surface for the rest of the year. Permeability is rapid throughout. The available water capacity is low in the surface and subsurface layers and in the substratum and is medium in the subsoil. This is considered a hydric soil associated with wetlands.

Candler Fine Sand, 0 to 5 percent slopes (4) – This is a nearly-level to gently sloping and excessively drained soil. Slopes are nearly smooth to convex. The seasonal high-water table is typically at a depth of more than 80 inches. The permeability is rapid in the surface and subsurface layers, and it is rapid to moderately rapid in the subsoil. The available water capacity is very low in the surface and subsurface layers and low in the subsoil. This is considered a non-hydric soil and is indicative of uplands.

Candler Fine Sand, 5 to 12 percent slopes (5) – This sloping to strongly sloping and excessively drained soil is typically located on ridges. The seasonal high-water table is typically at a depth of more than 80 inches. The permeability is rapid in the surface and subsurface layers, and it is rapid to moderately rapid in the subsoil. The available water capacity is very low in the surface and subsurface layers, and low in the subsoil. This is considered a non-hydric soil and is indicative of uplands.

Candler-Apopka Fine Sands, 5 to 12 percent slopes (6) – This sloping to strongly sloping and excessively drained soil is typically located on ridges or sandhills. The seasonal high-water table is typically at a depth more than 80 inches for Candler soil and a depth of more than 72 inches for Apopka soil. The permeability is rapid in the surface and subsurface layer and rapid to moderately rapid in the subsoil for Candler soil, while the permeability is rapid in the surface and subsurface layers and moderate in the subsoil for Apopka soil. The available water capacity is very low in the surface and subsurface and low in the subsoil of Candler soil, while the available water capacity is very low in the surface and subsurface layers, and medium to high in the subsoil of Apopka soil. This is considered a non-hydric soil and is indicative of uplands.

Immokalee Fine Sand (20) – This nearly level and poorly drained soil is typically located on broad flatwoods. Slopes are smooth and range from 0 to 2 percent. The seasonal high-water table is within

10 inches of the surface for one month to three months, and it recedes to a depth of 10 to 40 inches for more than six months. The permeability is rapid in the surface and subsurface layers and in the substratum and is moderate in the subsoil. The available water capacity is very low in the surface and subsurface layers and in the substratum and is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Florahome fine sand, 0 to 5 percent slopes (28) – This nearly level to gently sloping and moderately well drained soil is typically located on uplands. The seasonal high-water table is typically at a depth of 48 to 72 inches for four to six months and recedes to a depth of 72 inches or more during extended dry periods. It is also within 30 to 48 inches of the surface for up to two weeks during periods of heavy rains. The permeability is rapid throughout. The available water capacity is low in the upper part of the surface layer and very low in the lower part and the underlying material. This is considered a non-hydric soil and is indicative of uplands.

Pomello Fine Sand, 0 to 5 percent slopes (34) – This nearly level to gently sloping and moderately well drained soil is typically located on low ridges and knolls on the flatwoods. Slopes are smooth to convex. The seasonal high-water table is at a depth to 24 to 40 inches for one month to four months and recedes to a depth of 40 to 60 inches during dry periods. The permeability is very rapid in the surface layer and subsurface layers, moderately rapid in the subsoil, and rapid in the substratum. The available water capacity is very low in the surface and subsurface layers and in the substratum, and it is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Pomello-Urban Land Complex, 0 to 5 percent slopes (35) – This nearly level to gently sloping and moderately well drained soil is associated with urban areas but can be located on low ridges and knolls on the flatwoods. The urban land part of this complex is covered by concrete, asphalt, buildings, or another impervious surface. Slopes are smooth to convex. The seasonal high-water table is at a depth to 24 to 40 inches for one month to four months and recedes to a depth of 40 to 60 inches during dry periods. The permeability is very rapid in the surface layer and subsurface layers, moderately rapid in the subsoil, and rapid in the substratum. The available water capacity is very low in the surface and subsurface layers and in the substratum, and it is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

St. Johns Fine Sand (37) – This nearly level and poorly drained soil is typically located on broad flats in the flatwoods. Slopes are smooth to concave and range from 0 to 2 percent. The seasonal high-water table is within 10 inches of the surface for six to 12 months and between depths of 10 and 40 inches for more than six months. In rainy periods, it rises to the surface for brief periods. The permeability is rapid in surface layer and subsurface layers and the substratum, and it is moderately slow to moderate in the subsoil. The available water capacity is medium in the surface layer, very low to low in the subsurface layer and substratum, and medium to very high in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Smyrna Fine Sand (44) – This nearly level and poorly drained soil is typically located on broad flatwoods. Slopes are smooth to concave and range from 0 to 2 percent. The seasonal high-water table is within 10 inches of the surface for one month to four months. It recedes to a depth of 10 to 40 inches for more than six months. The permeability is rapid in the surface and subsurface layers and in the substratum, and it is moderate to moderately rapid in the subsoil. The available water capacity is low to very low in the surface and subsurface layers and in the substratum, and it is medium in the subsoil. This is considered soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Smyrna-Urban Land Complex (45) – This complex contains nearly level and poorly drained soil and areas of urban land. It is typically located on the flatwoods. Slopes are smooth to concave and range from 0 to 2 percent. The seasonal high-water table is within 10 inches of the surface for one month to four months. The permeability is rapid in the surface and subsurface layers and in the substratum, and it is moderate to moderately rapid in the subsoil. The available water capacity is low to very low in the surface, subsurface, and in the substratum layers, and it is medium in the subsoil. This is considered a soil with hydric inclusions and can be indicative of uplands or wetlands depending on where it lies in the landscape.

Tavares Fine Sand, 0 to 5 percent slopes (46) – This nearly level to gently sloping and moderately well drained soil is typically located on low ridges and knolls on the uplands. Slopes are smooth to concave. The seasonal high-water table is at a depth of 40 to 80 inches for more than six months, and it recedes to a depth of more than 80 inches during extended dry periods. The permeability is very rapid throughout. The available water capacity is very low. This is considered a non-hydric soil and can be indicative of uplands.

Tavares-Milhopper Fine Sands, 0 to 5 percent slopes (47) – This nearly level to gently sloping and moderately well drained soil is typically located on low ridges and knolls on the uplands and flatwoods. Slopes are smooth to concave. The seasonal high-water table in Tavares soil is at a depth of 40 to 72 inches for more than six months and it recedes to a depth of more than 80 inches during extended dry periods. The seasonal high-water table in Millhopper soil is at a depth of 40 to 60 inches for one to four months and recedes to a depth of 60 to 72 inches for two to four months. During periods of high rainfall, it reaches to a depth of 30 to 40 inches for cumulative periods of one to three weeks. The permeability is very rapid throughout for Tavares soil and the permeability is rapid in the surface and subsurface layers and moderately rapid or moderate in the subsoil for Millhopper soil. The available water capacity is very low throughout Tavares soil and the available water capacity is low in the surface and subsurface layers and medium in the subsoil of Millhopper soil. This is considered a non-hydric soil and is indicative of uplands.

Zolfo Fine Sand (54) – This nearly level and somewhat poorly drained soil is typically located on broad, slightly higher positions adjacent to the flatwoods. Slopes are smooth to convex and range from 0 to 5 percent. The seasonal high-water table is at a depth of 24 to 40 inches for two to six months, and it is a depth of 10 to 24 inches during periods of heavy rains. It recedes to a depth of about 60 inches during extended dry periods. The permeability is rapid in the surface and subsurface layers, and it is moderate in the subsoil. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. This is considered a non-hydric soil and is indicative of uplands.

Water (99) – Water is a miscellaneous area including areas of open water, lakes, ponds, rivers, and streams. There is no hydric soil classification associated with open water and, therefore, it is an unranked category.

Wetlands and Other Surface Waters

The wetland and surface water analysis used the 2020 US Fish and Wildlife Service’s (USFWS) National Wetlands Inventory (NWI) data, 2019 SJRWMD Land Use and Cover data and aerial interpretation based on satellite imagery dated 2019. The data shows that there are natural wetland systems and surface waters (lakes, rivers and permitted stormwater ponds) within the study area as identified in **Table 19**. A map of wetlands and surface waters can be found as Exhibit D in **Appendix F**.

Table 19 | Summary of Wetland and Surface Water Acreage within Study Acreage

FLUCFCS Code	FLUCFCS Description	Acres
5200 - 5300	Open Water	2.98
6300	Wetland Forested Mixed	3.94
6410	Freshwater Marshes	4.49
6430	Wet Prairies	7.26
6440	Emergent Aquatic Vegetation	3.10

Source: FGDL, USFWS, SJRWMD

The proposed project is expected to use the majority of the existing road ROW for construction and extension of the West Orange Trail; however, if wetland or surface water impacts cannot be avoided, mitigation may be required in accordance with state and federal wetland permitting requirements. The study area falls within the Wekiva River Nested drainage basin. Two mitigation banks serve the Wekiva River Nested drainage basin, the Wekiva River Mitigation Bank and Blackwater Creek Mitigation Bank.

Floodplain

According to the Federal Emergency Management Agency (FEMA) Digital Flood Insurance Rate Map (DFIRM) dated October 2020, the majority of the study area is located within Floodplain Zone X. This zone is also known as “low-risk flood zone” and has a 0.2% annual chance of flood; areas of 1% chance of flood with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance of flood. Areas in the central, western, and south-eastern portion of the study area buffer are within the 100-year floodplain where there is a 1% annual chance of flood. This floodplain Zone (AE) has determined base flood elevations of 88 North American Vertical Datum (NAVD) and is associated with Club Lake, Lake Merrill, Wolf Lake, Lake Cora, Lake Coroni, and Prevatt Lake. One small area in the north-central section is also within the 100-year floodplain where there is a 1% annual chance of flood; however, this floodplain Zone (A) does not have detailed analysis performed, therefore no depths or elevations are determined. This zone is associated with Fox Lake.

Any fill of floodplain occurring between the Seasonal Highwater Level (SHWL) and the floodplain elevation will require floodplain compensation. No net encroachment into the floodplain is allowed between the SHWL and the floodplain elevation. It is anticipated that floodplain encroachment will be avoided and minimized to the extent practicable. The location of floodplain that falls within the study area is illustrated on Exhibit E in **Appendix F**.

Contamination

Contaminated sites within the study area were identified using data made available by the DOH and the FDEP. **Table 20** summarizes the number of sites that have the potential for contamination or are being monitored, while a map depicting the locations of these sites can be found as Exhibit F in **Appendix F**. It must be noted that the facilities shown are regulated facilities which have the potential for contamination or environmental concern but are not necessarily contaminated.

Table 20 | Summary of Contamination Analysis

Analysis Type	Within Study Area
Biomedical Waste Facility	4
Brownfield Area	0
Hazardous Waste Facility	4
National Pollutant Discharge Elimination System (NPDES)	19
Petroleum Contamination Monitoring Site (PCMS)	2
Storage Tank Contamination Monitoring (STCM)	2
SUPER Act Risk Sources	2
US Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCA) Regulated Facilities	4
Toxic Release Inventory Sites	0
Waste Cleanup Responsible Party Sites - Open	0

Source: FGDL, DOH, FDEP, USEPA

As shown in **Appendix F**, Exhibit E, there are four biomedical waste facilities that are classified as facilities that generate, transport, store, or treat biomedical waste. There are also four hazardous waste facilities which are facilities that possess wastes that are characterized by Chapter 40 of the Code of Federal Regulations (CFR) Part 261, Subpart C as hazardous by exhibiting one of the four characteristics such as, ignitability, corrosivity, reactivity, or toxicity.

The National Pollutant Discharge Elimination System (NPDES) was created in 1972 by the Clean Water Act to address water pollution by regulating point sources that discharge pollutants to waters of the US of which 19 sites are in the study area; however, 17 have been terminated while two remain effective/active NPDES locations. The first is located near the intersection of West Ponkan Road and Pinenut Drive and the second near the Rock Springs Road and Disalvo Place intersection.

Petroleum Contamination Monitoring Sites (PCMS) are sites with a storage tank history, or petroleum clean up activity and the study area contain two such facilities with one being closed and the other not requiring clean up; these facilities are associated with refueling structures such as gas stations (Circle K Gas Station). There are also two Storage Tank Contamination Monitoring (STCM) sites, which are being tracked by petroleum storage tank registration, compliance, and clean up; however, while only one of these sites (Circle K Gas Station) is open, they both are associated with refueling structures.

The State Underground Petroleum Environmental Response (SUPER) Act was created to conduct drinking water well sampling and investigations around known or suspected contaminated petroleum facilities of which two are located within the study area and both being associated with Handy Way Food Store.

There are four US Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCA) regulated facilities which include the generation, transportation, treatment, storage, and/or the

disposal of hazardous waste within the study area. These facilities include three schools (two elementary and one middle) and an agricultural product/plant nursery wholesaler.

Wildlife Corridors and Crossings

Wildlife corridors typically consist of a large area of natural preserved habitats in the form of wetlands, forests, and prairies that support a range of wildlife that are separated by structures such as roads and housing development. Wildlife corridors usually support the movement and range of different species to promote diversity and access to resources such as surface waters and suitable foraging habitats. Improved habitat connectivity, road permeability, and deterrents onto roads are all important factors when developing mitigation strategies for wildlife on future road projects.

Wekiwa Springs State Park is located to the northeast of the study area and runs along nearly the entire extent of the northeastern boundary of the study area. The park has the potential to act as a large wildlife corridor since the park also encompasses two other park systems, Rock Springs Run State Reserve and Lower Wekiva River Preserve State Park, which serves as a wildlife corridor to the Seminole State Forest which in turn also connects to the Ocala National Forest to the north. While the probability of wildlife utilizing the area is moderate to low, the density of urban growth and development to the south and west most likely further reduces the frequentation of crossing by wildlife. With that in mind, five locations were identified as having an increased potential to warrant a wildlife crossing or habitat connectivity enhancements (Exhibit G, **Appendix F**).

Rock Springs Road near West Road

Wekiwa Springs State Park abuts Rock Springs Road near West Road in the northern study area. West Road is only partially paved and contains native tree cover. Given the proximity of the park to the east, there is an increased likelihood for wildlife crossing in this area. Further, a powerline easement to the northwest provides for additional wildlife movement north. Bears have been recorded in this area; however further investigation is warranted to determine the viability of this area for a wildlife crossing.

Rock Springs Road near Kentucky Blue Circle

Wekiwa Springs State Park abuts Rock Springs Road just north of Fox Lake (located approximately 850 feet to the west) near Kentucky Blue Circle. The location of Fox Lake and natural cover surrounding Kentucky Blue Circle could allow for wildlife to traverse to the north by travelling northwest along open lands and the powerline easement. The proximity to Wekiwa Springs State Park to the east increases the likelihood of numerous species utilizing Rock Springs Road as a crossing. However, further investigation will need to be completed to determine the viability of any increased accommodations for wildlife movement.

Ponkan Road east of Jason Dwelley Parkway

Due to the undeveloped area on both sides of West Ponkan Road, a potential wildlife corridor was identified. The north side consists of a large undeveloped woodland pasture and the south side consists of several lakes, Lake Merril, Wolf Lake, and Lake Cora, that may contribute to an increased migration of numerous species between both areas. Increased accommodations and considerations for wildlife crossings in this section require further investigation as future development to the north and the isolated nature of the lakes to the south may preclude the necessity for wildlife crossings.

Welch Road west of Crown Isle Circle

This location provides opportunity to facilitate wildlife movement between nearby Prevatt Lake which is within the state park and Lake Coroni. Existing wetlands are located to the north and south of Welch Road which may increase migration of certain species. Upon initial review, this is the most viable location for a wildlife crossing as native cover is present further south which allows for larger wetland and surface water connections. Further investigation will need to be completed to determine the viability of any increased accommodations for wildlife movement in this area.

Welch Road east of Thompson Road

Prevatt Lake, located within the state park, has been identified to connect to numerous branches of surface waters that are found to the north. However, development to the south which includes residential homes and fencing, may limit the need for wildlife crossing in this area. However, numerous bears have been reported in the area as sufficient tree canopy is present to provide cover. Further investigation will need to be completed to determine the viability of any increased accommodations for wildlife movement as the potential crossing to the west may result in fewer human-wildlife conflicts.

Threatened and Endangered Species

The Florida Natural Areas Inventory (FNAI) and GIS data from the USFWS and the Florida Fish and Wildlife Conservation Commission (FWC) identified protected species with the potential to occur, and Core Foraging Area (CFA) and Consultation Areas (CA) for threatened and endangered species within the study area. Consultation areas, identified by USFWS, encompass all areas where populations are known to exist and where agency involvement may be necessary. The study area buffer does not include any critical or strategic habitat. **Table 21** provides a summary of protected species with the potential to occur within the study area. A map depicting the potential locations of these species can be found as Exhibit H in **Appendix F**.

Table 21 | Summary of Protected Species with the Potential to Occur

Fauna	Federal Status	State Status
<u>Avian</u>		
Florida Sandhill Crane (<i>Antigone canadensis pratensis</i>)	NL	T
Florida Scrub-jay (<i>Aphelocoma coerulescens</i>)	T	T
American Bald Eagle (<i>Haliaeetus leucocephalus</i>)*	NL*	NL*
Eastern Black Rail (<i>Laterallus jamaicensis</i>)	T	T
Wood Stork (<i>Mycteria americana</i>)	T	T
Audubon's Crested Caracara (<i>Polyborus plancus audubonii</i>)	T	T
Everglade snail kite (<i>Rostrhamus sociabilis plumbeus</i>)	E	E
<u>Reptiles</u>		
Eastern Indigo Snake (<i>Drymarchon couperi</i>)	T	T
Gopher Tortoise (<i>Gopher polyphemus</i>)	C	T
Short-tailed Snake (<i>Lampropeltis extenuata</i>)	NL	T
Sand Skink (<i>Plestiodon reynoldsi</i>)	T	T
<u>Mammals</u>		
Florida Black Bear (<i>Ursus americanus floridanus</i>)**	NL**	NL**
Flora		

Fauna	Federal Status	State Status
Incised Grove-burr (<i>Agrimonia incisa</i>)	T	T
Variable-leaved Indian-plantain (<i>Arnoglossum diversifolium</i>)	NL	T
Florida Bonamia (<i>Bonamia grandiflora</i>)	T	T
Many-flowered Grass-pink (<i>Calopogon multiflorus</i>)	NL	T
Chapmans's Sedge (<i>Carex chapmanii</i>)	NL	T
Sand butterfly pea (<i>Centrosema arenicola</i>)	NL	E
Pigeon wings (<i>Clitoria fragrans</i>)	T	T
Piedmont Jointgrass (<i>Coelorachis tuberculosa</i>)	NL	T
Cutthroat Grass (<i>Coleataenia abscissum</i>)	NL	E
Beautiful Pawpaw (<i>Deeringothamnus pulchellus</i>)	E	E
Scrub Buckwheat (<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>)	T	T
Hartwrightia (<i>Hartwrightia floridana</i>)	NL	T
Star Anise (<i>Illicium parviflorum</i>)	NL	E
Nodding Pinweed (<i>Lechea cernua</i>)	NL	T
Scrub Lupine (<i>Lupinus aridorum</i>)	E	E
Florida Spiny-pod (<i>Matelea floridana</i>)	NL	E
Pinesap (<i>Monotropa hypopithys</i>)	NL	E
Celestial Lily (<i>Nemastylis floridana</i>)	NL	E
Florida Beargrass (<i>Nolina atopocarpa</i>)	NL	T
Britton's Beargrass (<i>Nolina brittoniana</i>)	E	E
Papery Whitlow-wort (<i>Paronychia chartacea</i>)	T	T
Lewton's Polygala (<i>Polygala lewtonii</i>)	E	E
Sandlace (<i>Polygonella myriophylla</i>)	E	E
Scrub Plum (<i>Prunus geniculata</i>)	E	E
Giant Orchid (<i>Pteroglossaspis ecristata</i>)	NL	T
Florida Willow (<i>Salix floridana</i>)	NL	E
Scrub Stylisma (<i>Stylisma abdita</i>)	NL	E
Clasping Warea (<i>Warea amplexifolia</i>)	E	FE
Carter's Warea (<i>Warea carteri</i>)	E	FE

Source: USFWS; FNAI.

F = Federally

E = Endangered: species in danger of extinction throughout all or a significant portion of its range.

T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

C = Candidate for listing at the Federal level by the USFWS

NL = Not currently listed

*Protected by the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act of 1918.

**FAC 68A-4.009

Drainage Analysis

Welch Road, Ponkan Road, Rock Springs Road, and the segments of Wekiwa Springs Road that are in the project area are within the jurisdiction of the SJRWMD and are located within the Wekiwa River Hydrological Basin. The above listed roads are maintained by Orange County and the City of Apopka. A drainage map of the study area is included in **Appendix G**.

Rock Springs Road

All ponds referenced in this section are shown on the drainage map in **Appendix G**.

Rock Springs Road from Ponkan Road to Kelly Park Road was permitted under Environmental Resource Permit (ERP) 27569-2. Rock Springs Road's runoff from approximately 550 feet north of Sabastian Springs Lane to Ponkan Road, drains north and is collected with the runoff from Rock Springs Road from Ponkan Road to Oak Hallow Drive. This runoff drains to a pond (Pond AB) located approximately 1,000 feet east of Rock Springs Road between Kentucky Blue Circle and Rock Ridge Blvd.

Rock Springs Road from Oak Hallow Drive to Kelly Park Road drains to a pond (Pond C) located south-east of the intersection of Rock Springs Road and James Avenue.

There are two locations where offsite drainage crosses from the west side of Rock Springs Road to the east side, following natural drainage patterns to the Wekiwa River Hydrological Basin. One is located approximately 450 feet south of the intersection of Rock Springs Road and Westford Drive through three existing 19" x 30" ERCPs. The second location is between Kentucky Blue Circle and Rock Ridge Boulevard, approximately 200 feet north of the pipe that runs from the road to Pond AB, through an existing 30" cross drain. Runoff flows east towards Pond AB and is conveyed by a shallow swale around the south edge of the pond, which then discharges east following natural drainage patterns to the Wekiwa River Hydrological Basin.

Welch Road

Welch Road in the vicinity of Thompson Road was permitted under the SJRWMD (ERP 119437 - 1) in 2009. The system consists of curb inlets that drain to three elongated ponds.

Approximately 400 feet east of Thompson Road, there is a high point and the runoff from this segment of Welch Road drains to two elongated ponds that are hydraulically connected to each other and the swales east of these ponds. The swales east of the ponds have check dams, but a permit for this system was not located. The two ponds and swales outfall to a cross drain located approximately 50 feet east of the ponds. The cross-drain discharges to the Prevatt Lake Drainage Basin. The third pond is located south-east of the intersection of Welch Road and Thompson Road. This pond outfalls north through a 24-foot cross drain that discharges to the Prevatt Lake Drainage Basin (see **Appendix G**).

A permit was not located for the segment of Welch Road from Rock Springs Road to west of Thompson Road. However, based on a review of the Drainage Master Plan prepared for this area (Lakes McCoy, Coroni, and Prevatt Drainage Basin Study), by PEC in 1997, these segments of Welch Road also drain to the Prevatt Lake Drainage Basin.

Wekiwa Springs Road

Piedmont-Wekiwa Springs Road was permitted under the SJRWMD (ERP 20656 - 1) in 1990. The segment of Wekiwa Springs Road that is included in the project area, was designed to drain to a dry pond located on the south side of Wekiwa Springs Road, east of Acacia Road. This pond was designed to retain the 100-year storm event (see **Appendix G**).

Ponkan Road

A SJRWMD ERP was not located for Ponkan Road, except for the segment east of Rock Springs Road. The ERP located was for the conversion of the original dirt road to an asphalt paved road. The drainage system for this segment is listed as swales, and the segment is noted to drain to the Wekiwa River Hydrological Basin.

Ponkan Road, west of Rock Springs Road, does not have an identifiable drainage system. Based on quad maps, the western segment of Ponkan Road closest to Rock Springs Road drains south then east toward Rock Springs Road. The segment of Ponkan Road from Carmona Road to the end of the project limits drains south to several lakes and depressional areas located along the roadway corridor.

SJRWMD and Orange County Drainage Criteria

Proposed improvements to Welch Road, Ponkan Road, Rock Springs Road, and the segments of Wekiwa Springs Road which are in the project area, are subject to the SJRWMD and Orange County criteria that are current at the time of the improvements. The improvements along the drainage easement and State-owned lands are subject to the SJRWMD criteria.

SJRWMD

If a standard general permit is required from the SJRWMD, it shall adhere to the applicable Florida Administrative Code (F.A.C.) See the applicable criteria below:

62-330.405 General Conditions for All General Permits.

62-330.451 General Permit to Counties, Municipalities, and other Agencies to Conduct Stormwater Retrofit Activities:

- (1) A general permit is granted to counties, municipalities, state agencies and water management districts to construct, operate, and maintain stormwater retrofit activities as authorized below for improving existing surface water and stormwater systems. This general permit may be used in conjunction with exempt activities.
- (2) (a) Construction or alteration that will add additional treatment or attenuation capacity and capability to an existing stormwater management system.
- (2)(b) The modification, reconstruction, or relocation of an existing stormwater management system or stormwater discharge facility.

Orange County

Roadway Drainage Design

Curbs and gutters:

All roadway drainage not considered suitable for swale and/or ditch type drainage shall be designed as one of the following:

- Median: Type E Curb per FDOT Index 502-001, current edition.
- Outer travel lane: Type F Curb per FDOT Index 502-001, current edition.

Runoff determination:

The peak rates of runoff for which the pavement drainage system must be designed shall be determined by the rational method. The time of concentration, individual drainage areas and rainfall intensity amounts shall be submitted as part of the drainage plans. A separate Rational Runoff Coefficient (C) shall be determined for the specific contributing area to each inlet/catch basin within the proposed storm sewer system. A composite C value shall be computed for each contributing area based on an individual C value of 0.9 for the estimated impervious portion of the actual area and an individual C value of 0.2 for the remaining pervious (grassed) portion of the actual area.

Stormwater spread into traveled lane:

Inlets shall be located at all low points, intersections, and along continuous grades to prevent the spread of water from exceeding tolerable limits. The acceptable tolerable spread for a roadway with a design speed of 45 mph or less, includes keeping one-half ($\frac{1}{2}$) the traveled lane width clear.

Inlet types:

The curb inlet types to be used shall be the latest version of the FDOT inlet types 1 and 2. Ditch bottom inlets shall be FDOT inlet types C, D, E and H. All ditch bottom inlets located within the ROW shall have traffic-bearing grates.

Low point inlets:

The following criteria are applicable to the low point inlets:

- Inlets shall be placed at all low points in the gutter grade and/or ditch, and as appropriate at intersections, median breaks, and on side streets where drainage would adversely flow onto the highway pavement.
- Inlets shall also be placed ten to twenty feet prior to the level section in superelevation transitions, to avoid concentrated flows across the pavement.
- Curb inlets, including inlet transitions shall not be located within handicap drop curb locations or on curb returns.
- Inlets in sag vertical curves that have no overflow outlet other than the storm drain system, (i.e., barrier wall, bridge abutment, cut sections) must have flanking inlets on one or both sides. The flanking inlets shall be located to satisfy spread criteria when the sag inlet is blocked.

Storm Sewer Design

Design storm drain frequency:

The design storm frequency to be utilized for the design of pavement drainage shall set the hydraulic gradient line at 12 inches below gutter for a ten-year frequency storm.

Hydraulic gradient line computations:

The hydraulic gradient line for the storm sewer system shall be computed taking into consideration the design tailwater on the system and the energy losses associated with entrance into and exit from the system, friction through the system, and turbulence in the individual manholes/catch-basins/junction boxes within the system. The energy losses associated with the turbulence in the individual manholes are minor for an open channel or gravity storm sewer system and can typically be

overcome by adjusting (increasing) the upstream pipe invert elevations in a manhole by a small amount. However, the energy losses associated with the turbulence in the individual manholes can be significant for a pressure or surcharged storm sewer system and must be accounted for in establishing a reasonable hydraulic gradient line.

Minimum pipe size:

The minimum size of pipe to be used in storm sewer systems is 18 inches. Designs shall be based upon six-inch increments in sizes above 18 inches.

Pipe grade:

All storm sewers shall be designed and constructed to produce a minimum velocity of 2.5 feet per second (fps) when flowing full. No storm sewer system or portion thereof will be designed to produce velocities in excess of 20 fps for reinforced concrete pipe or 10 fps for metal pipe, and these maximums shall only be used when these outlet ends have sufficient erosion protection and/or energy dissipators.

Maximum lengths of pipe:

The following maximum runs of pipe shall be used when spacing access structures of any type:

- 18 inches = 300 feet
- 24 inches to 36 inches = 400 feet
- 42 inches and larger = 200 feet

Design tailwater:

All storm sewer systems shall be designed taking into consideration the tailwater of the receiving facility. In the case where the detention pond is the receiving facility, the design tailwater level can be estimated from the information generated by routing through the pond the hydrograph resulting from a ten-year frequency storm of duration equal to that used in designing the pond. The design tailwater level can be assumed to be the ten-year pond level corresponding to the time at which peak inflow occurs from the storm sewer into the pond.

Allowable materials:

Storm sewers shall be reinforced concrete pipe (RCP) in accordance with the latest version of the *FDOT Standard Specifications for Road and Bridge Construction*.

Culvert Design

No new culverts, or culvert extensions are anticipated.

City of Apopka

The following criteria are applicable to the City of Apopka:

- The post-development peak rate of discharge shall not exceed the predevelopment peak rate of discharge for the 25-year, 24-hour storm.
- Pollution abatement volume shall be in accordance with the SJRWMD criteria.
- The City shall receive a copy of the SJRWMD permit before the City grants an approval of final engineering plans.

- The 25-year/24-hour rainfall amount of 8.6 inches and the 100-year/24-hours rainfall amount of 11.3 inches shall be used in runoff calculations.
- Retention ponds and detention ponds shall meet the following requirements based on type:
 - No retention ponds or detention ponds are anticipated. Work is expected to be exempt.

Traffic Analysis

Existing Travel Demand

Existing traffic data for the study area corridors were collected from Florida Traffic Online (FTO). A summary of the characteristics of each corridor is shown in **Table 22**.

Table 22 | Study Area Traffic Characteristics Summary

Corridor	AADT	K Factor	D Factor	T Factor	Peak Hour Volume
Rock Springs Road	16,000	9.0	53.0	5.7	763*
Welch Road	17,600	9.0	53.0	6.4	1278
Ponkan Road	5,800	9.0	53.0	6.4	617

Source: FTO

*Calculated volume – no synopsis report is available for Rock Springs Road

Historical daily volume counts for the study corridors were also provided by the City of Apopka. The counts from 2018, 2019, and 2020 were used to determine the impact of the Covid-19 pandemic on traffic along the corridors, and to calculate an adjustment factor to account for the uncharacteristic change in traffic volumes. The historical volumes and Covid 19 adjustment factors are shown in **Table 23**.

Table 23 | Study Area Historical Daily Volumes

Segment	Daily Volume			% Volume Change			Covid 19 Adjustment Factor
	2018	2019	2020	2018-2019	2019-2020	2018-2020	
Rock Springs Road Welch Road to Ponkan Road	20,180	24,304	23,065	+20.4%	-5.1%	+14.3%	1.054
Rock Springs Road Ponkan Road to Kelly Park Road	17,102	17,338	17,338	+1.4%	0%	+1.4%	1.000
Welch Road Rock Springs Road to Ustler Road	17,595	19,816	17,346	+12.6%	-12.5%	-1.4%	1.142
Welch Road Ustler Road to Thompson Road	17,576	18,301	34,829	+4.1%	+90.3%	+98.2%	1.000
Welch Road Thompson Road to Wekiwa Springs Road	15,405	15,785	14,798	+2.5%	-6.4%	-3.9%	1.067
Ponkan Road Plymouth-Sorrento Road to Vick Road	4,787	4,721	4,375	-1.4%	-7.3%	-8.6%	1.079
Ponkan Road Vick Road to Rock Springs Road	5,442	5,520	4,863	+1.4%	-11.9%	-10.6%	1.135

Source: City of Apopka

Existing Multimodal Analysis

Table 24 shows the multimodal Level of Service (LOS) including pedestrian, bicycle, and transit LOS for the study corridors.

The roadway segment bicycle LOS is based on a combination of paved shoulder/bicycle lane coverage and roadway volumes. Pedestrian LOS is based on a combination of sidewalk coverage and roadway volumes. Transit LOS is based on a combination of sidewalk coverage and the number of buses in the peak hour peak direction.

As shown in **Table 24**, Rock Springs Road and Welch Road do not meet the standard LOS D for bicycle travel, and all the corridors have a failing LOS for transit due to the lack of any transit services through the study area.

Table 24 | Existing Multimodal LOS Analysis (Segments)

2020 AADT		Bicycle Mode LOS		Pedestrian Mode LOS		Transit Mode LOS	
	Paved Shoulder/Bicycle Lane Coverage	LOS	Sidewalk Coverage	LOS	Sidewalk Coverage (0 buses per hour)	LOS	
Rock Springs Road between Lester Road and Kelly Park Road							
16,000	0-49%	E	85-100%	C	85-100%	F	
Welch Road between Rock Springs Road and Wekiwa Springs Road							
17,600	0-49%	E	85-100%	C	85-100%	F	
Ponkan Road between Jason Dwelley Parkway and Rock Springs Road							
5,800	0-49%	C	85-100%	B	85-100%	F	

Notes:

1. Segment multimodal LOS is based on Generalized Service Volume Table 1 of the 2020 Q/LOS

Safety Analysis

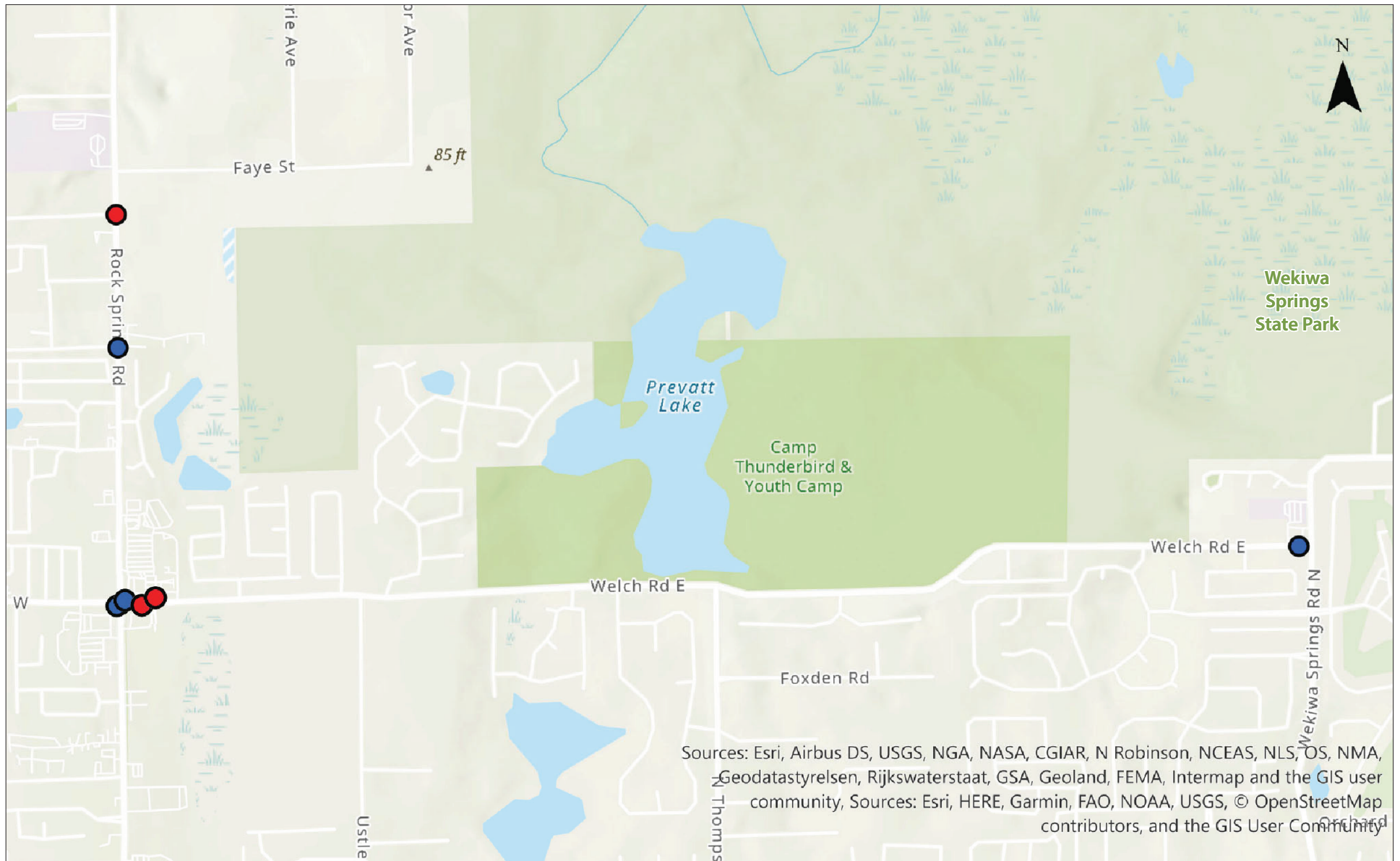
Bicycle and pedestrian crash data were obtained from Signal Four Analytics for a five-year period (January 01, 2016, to December 31, 2020) along Rock Springs Road, Ponkan Road, and Welch Road within the study area limits.

A total of seven crashes involving bicycles and pedestrians have occurred in the study area: three involving bicycles and four involving pedestrians. **Table 25** provides a summary of the locations and conditions of each crash and **Figure 7** shows the locations of the crashes. Of the seven crashes, four caused injuries, all the crashes occurred in daylight and dry conditions, one was distraction related, and none were alcohol or drug related. None of the pedestrian/bicycle crashes were fatal.

Table 25 | Bicycle and Pedestrian Crash Summary

Crash Type	Severity	Report Number	Location	Weather Condition	Lighting Condition	Road Surface Condition	Alcohol/Drug Related	Distraction Related
Pedestrian	Injury	8537729	Rock Springs Rd at Welch Rd	Clear	Daylight	Dry	No	Yes
		8746823	Rock Springs Rd at Welch Rd	Clear	Daylight	Dry	No	No
	Property Damage Only	8809351	Rock Springs Rd at Lester Rd	Clear	Daylight	Dry	No	No
		8840030	Welch Road at Wekiwa Springs Road	Clear	Daylight	Dry	No	No
Bicycle	Injury	8625158	Rock Springs Rd at Welch Road	Clear	Daylight	Dry	No	No
		8801025	Rock Springs Rd at Welch Road	Clear	Daylight	Dry	No	No
	Property Damage Only	8526312	Rock Springs Road at Alexandria Place Drive	Cloudy	Daylight	Dry	No	No

Source: Signal 4 Analytics



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



Crash Type



Bicycle



Pedestrian

0 0.17 0.35 0.7 Miles



Figure 7

**Bicycle and Pedestrian
Crash Locations**
West Orange Trail Extension Study

Build Alternatives

No-Build Alternative

The No-Build Alternative, carried as a viable option throughout the corridor study process, assumes no construction of a new trail facility. The advantages of the No-Build Alternative include no additional ROW acquisition, no impacts to the environment from construction, no disruption of traffic during construction, and no project cost. The disadvantages of the No-Build Alternative are the purpose and need for the project are not satisfied: existing and future pedestrian and bicyclist demand is not accommodated, safety for pedestrians and bicyclists is not improved, and the current gap in the regional trail network is not closed.

Alternatives Development

Results from the existing conditions analysis of the study area, combined with feedback from local stakeholders, were used to develop seven total trail route alternatives throughout the study area for further evaluation. Three alternatives were developed for the trail along Rock Springs Road, two alternatives for the trail along Welch Road, and two alternatives for the trail along Ponkan Road. The seven route alternatives are described in this chapter.

Design Criteria

The design criteria for the shared-use path is provided in **Table 26**, as defined in the 2018 Florida Greenbook. Unlike design criteria for roadways, design criteria for shared-use paths are not dependent on context classification or functional classification. All criteria are subject to change, and only the most current criteria should be used during the final design phase.

Table 26 | 2018 Florida Greenbook Design Criteria

Design Control	West Orange Trail	Source
Design Speed	18 mph	Florida Greenbook Chapter 9 Section C.3
Shared-Use Path Width	12 feet	Florida Greenbook Chapter 9 Section C.1 / Selected by Study
Back of Shared-Use Path Graded Area Width	2 feet	Florida Greenbook Chapter 9 Section C.1
Maximum Cross Slope	0.02	Florida Greenbook Chapter 9 Section C.5
Front Slope	1:6	Florida Greenbook Chapter 9 Section C.1
Separation Between Shared-Use Path and Roadway	Curb and Gutter: 5 feet between path and face of curb Flush Shoulder: 5 feet between path and edge of paved shoulder	Florida Greenbook Chapter 9 Section C.2
Minimum Radius	60 feet	2012 AASHTO Guide for the Development of Bicycle Facilities Table 5-2
Max Profile Grade	5%	Florida Greenbook Chapter 9 Section C.5
Minimum Stopping Sight Distance	130 feet	2012 AASHTO Guide for the Development of Bicycle Facilities Figure 5-6
Minimum Crest Curve Length	0 feet (<3% Grade) 0 feet (3% Grade) 55 feet (4% Grade) 100 feet (5% Grade)	2012 AASHTO Guide for the Development of Bicycle Facilities Figure 5-8

Potential Easement Areas

The ROW along much of Rock Springs Road and Welch Road is too narrow to provide enough lateral space for the addition of a trail. For these corridors, where possible, a recreational easement (up to 50-foot-wide) from the Wekiwa Springs State Park has been sought as an alternative to provide a full width trail with better separation from the roadway and fewer impacts on the ROW. The easement has been sought primarily for Welch Road between Deer Lake Circle and the Wekiwa Springs State Park entrance (see **Figure 1**).

Trail Route Alternatives

Through the existing conditions analysis, public involvement feedback, and input from local agency stakeholders, several alternatives were identified to extend the West Orange Trail to the proposed Wekiwa Trail while providing connections to the Wekiwa River Blueway Trail and Wolf Lake Elementary and Middle Schools, as well as the City of Apopka's Northwest Recreation Complex.

The following subsections explain the remaining route alignments considered as part of the West Orange Trail Extension Study.

Rock Springs Road

Alternative 1

Rock Springs Road Alternative 1 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Lester Road, continuing north along the east side of Rock Springs Road, east along the south side of Kelly Park Road, and north along the east side of Baptist Camp Road, and ending at the entrance to Kelly Park on Baptist Camp Road. The entirety of the alternative is located just off Rock Springs Road, East Kelly Park Road, and Baptist Camp Road. This alternative is the shortest of the three Rock Springs Road alternatives. The length of the trail is 3.32 miles, with 2.95 miles along Rock Springs Road, and 0.37 miles along Wekiwa Springs State Park.

This alternative has the most crossings of any of the alternatives, with 58 driveway crossings and five street crossings. However, this alternative has the least amount of anticipated total ROW required for the trail compared to the other two alternatives. See **Figure 8** for the location of Rock Springs Road Alternative 1.



- Rock Springs Road Trail Route Alternative 1
- Existing West Orange Trail
- Wekiva River Blueway Trail
- Proposed Wekiva Trail



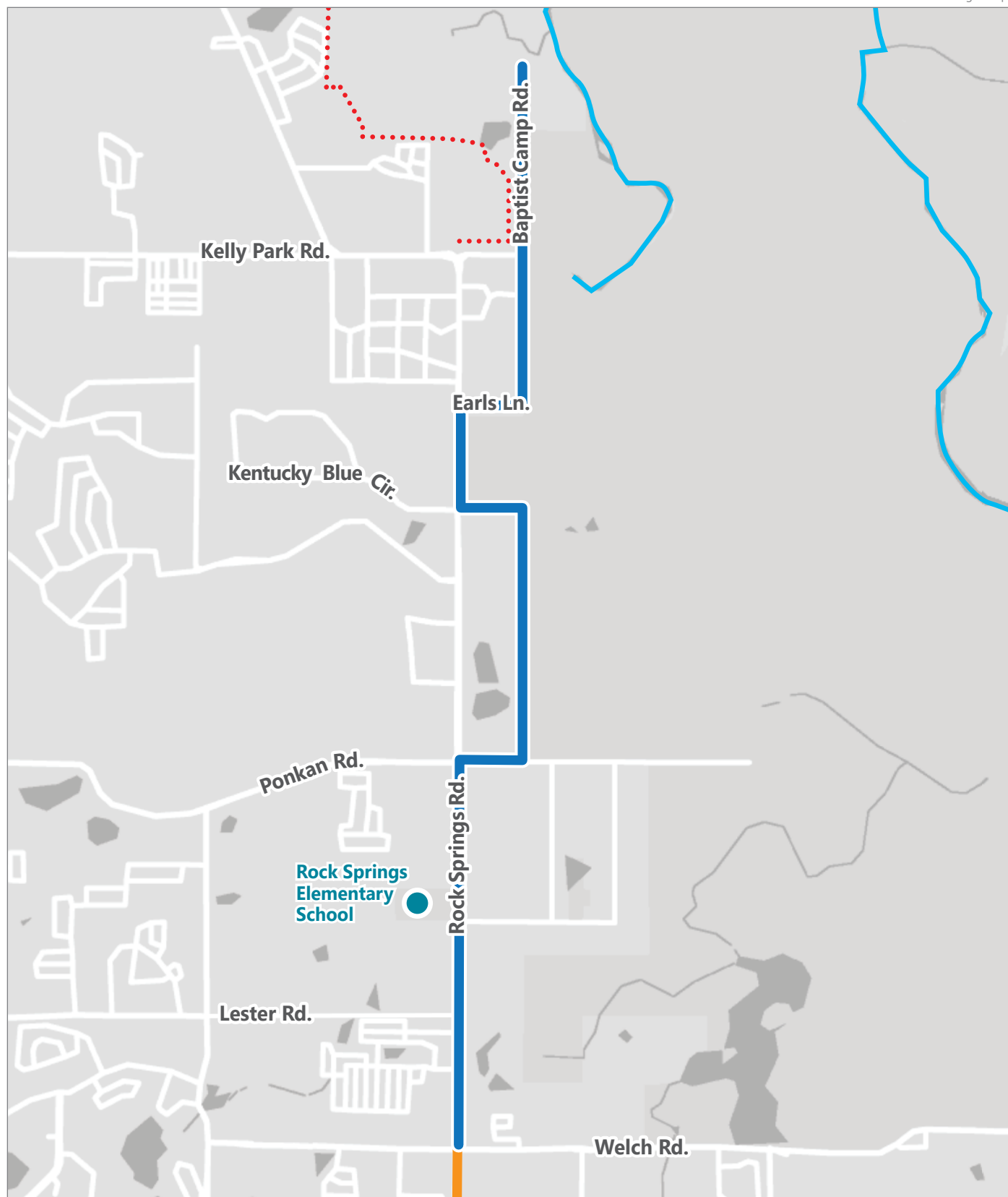
Figure 8

**Rock Springs Road Trail Route
Alternative 1**
West Orange Trail
Extension Study

Alternative 2

Rock Springs Road Alternative 2 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Lester Road, continuing north along the east side of Rock Springs Road, and east side of Baptist Camp Road, ending at the entrance to Kelly Park on Baptist Camp Road. Some of the alternative is located just off Rock Springs Road and Baptist Camp Road. However, there are two segments where Alternative 2 deviates from Rock Springs Road. These occur between Ponkan Road and Kentucky Blue Circle, and between just south of Earls Lane and East Kelly Park Road. This alternative is the second shortest of the three Rock Springs Road alternatives. The length of the trail is 3.81 miles, with 1.25 miles along Rock Springs Road, and 2.56 miles along Wekiwa Springs State Park.

This alternative has the second highest crossings of any of the alternatives, with 24 driveway crossings and two street crossings. However, this alternative has the least amount of anticipated privately-owned ROW required for the trail compared to the other two alternatives. The ROW along much of Rock Springs Road is too narrow to provide enough lateral space for the addition of a trail. For this alternative, where possible, a recreational easement (up to 50-foot-wide) from the Wekiwa Springs State Park has been sought as an alternative to provide a full width trail with better separation from the roadway and fewer impacts on the ROW. See **Figure 9** for the location of Rock Springs Road Alternative 2.



- Rock Springs Road Trail Route Alternative 2
- Existing West Orange Trail
- ... Wekiva River Blueway Trail
- Proposed Wekiva Trail



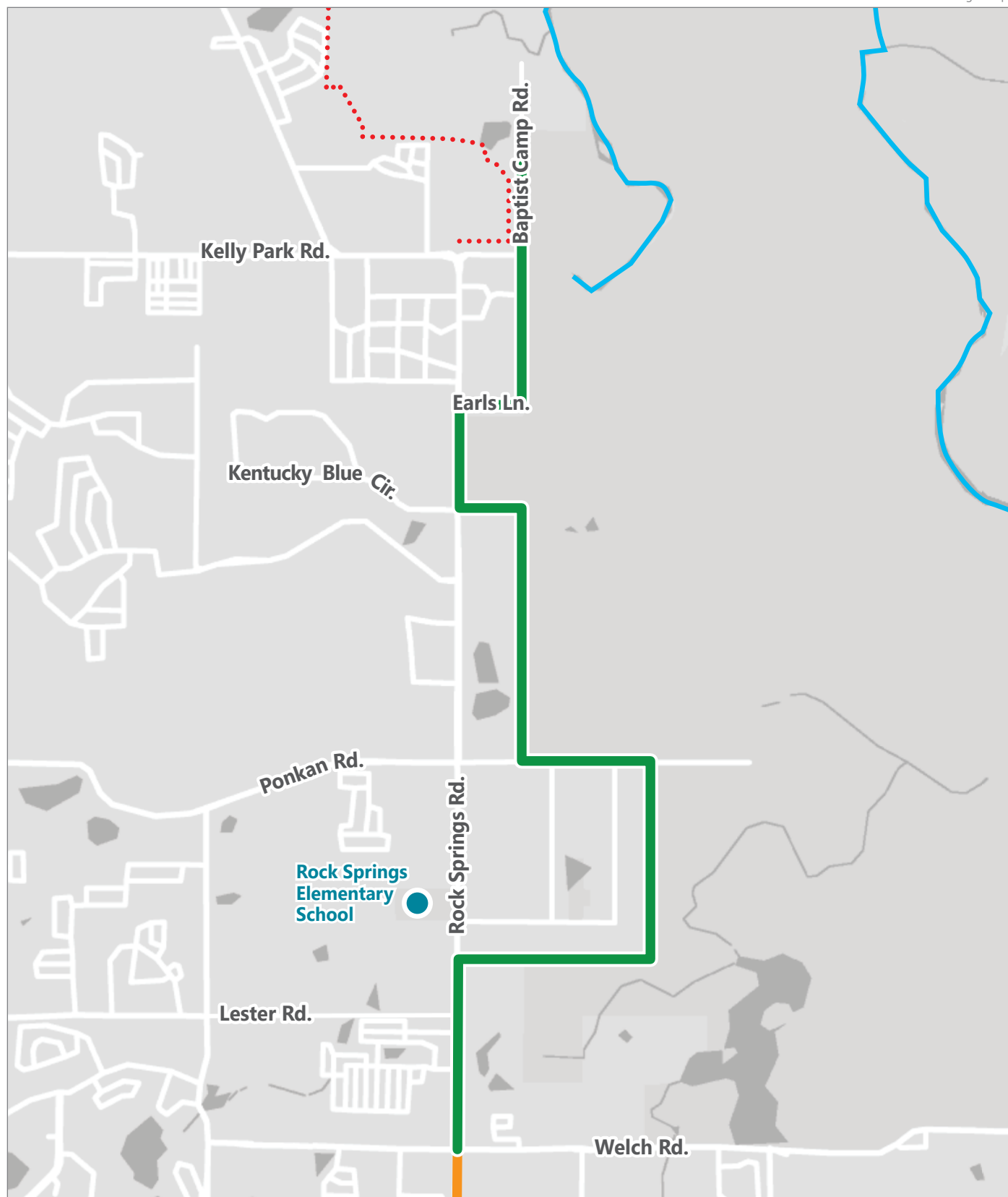
Figure 9

**Rock Springs Road Trail Route
Alternative 2**
West Orange Trail
Extension Study

Alternative 3

Rock Springs Road Alternative 3 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Lester Road, continuing north along the east side of Rock Springs Road and east side of Baptist Camp Road, ending at the entrance to Kelly Park on Baptist Camp Road. Some of the alternative is located just off Rock Springs Road and Baptist Camp Road. However, there are two segments where Alternative 2 deviates from Rock Springs Road. These occur between Faye Street and Kentucky Blue Circle, and between just south of Earls Lane and East Kelly Park Road. This alternative is the longest of the three Rock Springs Road alternatives. The length of the trail is 4.82 miles, with 0.57 miles along Rock Springs Road, and 4.25 miles along Wekiwa Springs State Park.

This alternative has the fewest crossings of any of the alternatives, with only five driveway crossings and a street crossing. However, this alternative has the most anticipated total ROW required for the trail compared to the other two alternatives. The ROW along much of Rock Springs Road is too narrow to provide enough lateral space for the addition of a trail. For this alternative, where possible, a recreational easement (up to 50-foot-wide) from the Wekiwa Springs State Park has been sought as an alternative to provide a full width trail with better separation from the roadway and fewer impacts on the ROW. See **Figure 10** for the location of Rock Springs Road Alternative 3.



- Rock Springs Road WOT Alternative 3
- Existing West Orange Trail
- ... Wekiva River Blueway Trail
- Proposed Wekiva Trail



Figure 10

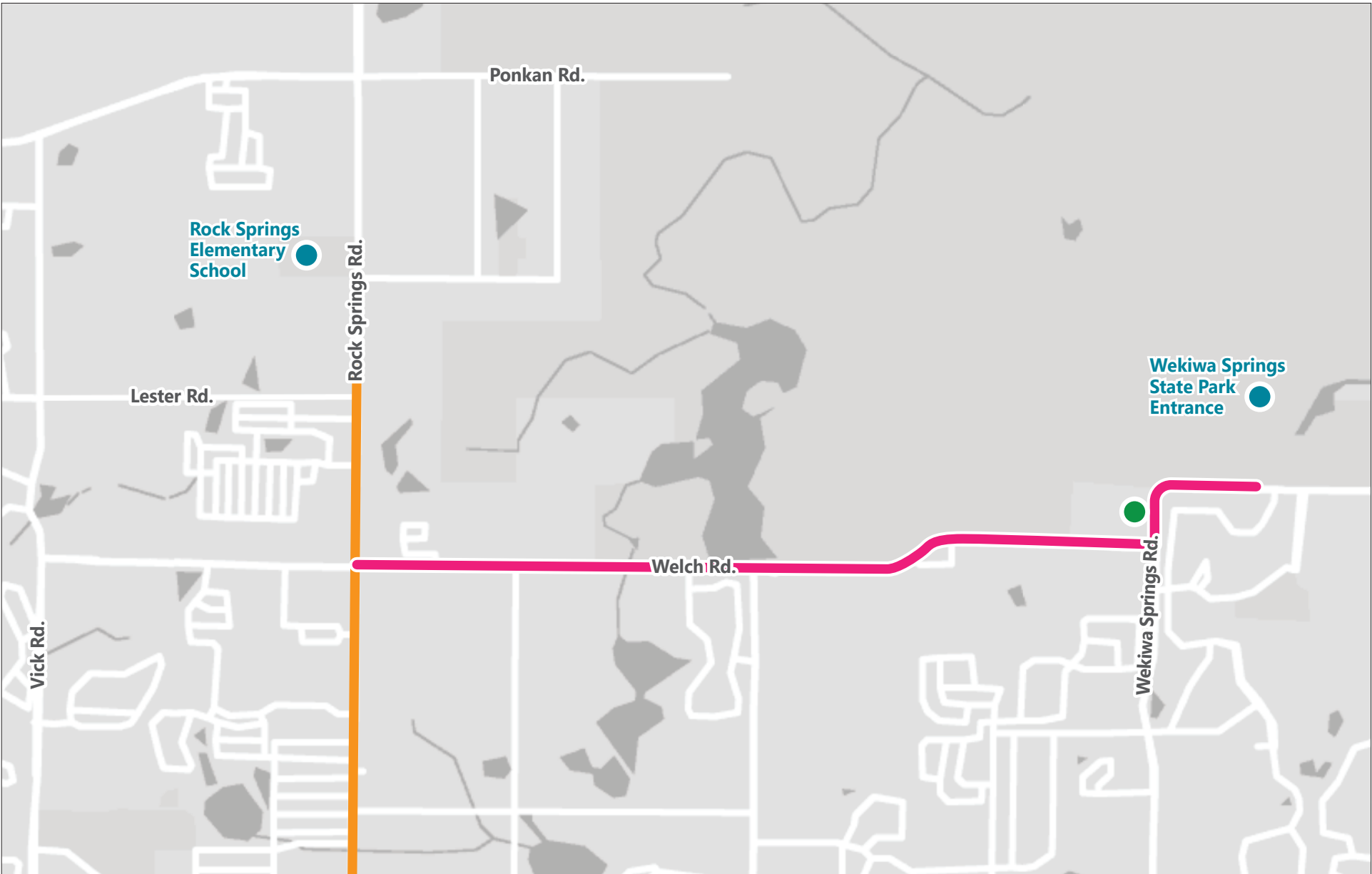
**Rock Springs Road Trail Route
Alternative 3**
West Orange Trail
Extension Study

Welch Road and Wekiwa Springs Road

Alternative 1

Welch Road Alternative 1 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Welch Road, continuing east along the north side of Welch Road, north along the west side of Wekiwa Springs Road, and east along the north side of Wekiwa Springs Road, ending at the entrance to Wekiwa Springs State Park on Wekiwa Springs Road. The entirety of the alternative is located just off Welch Road and Wekiwa Springs Road. This alternative is the shorter of the two Welch Road alternatives. The length of the trail is 2.99 miles, with 1.19 miles along Welch Road and Wekiwa Springs Road, and 1.80 miles along Wekiwa Springs State Park.

This alternative has the most crossings of the two alternatives, with 23 driveway crossings and four street crossings. However, this alternative has the least amount of anticipated total ROW required for the trail compared to the other alternative. The ROW along much of Welch Road is too narrow to provide enough lateral space for the addition of a trail. For this alternative, where possible, a recreational easement (up to 50-foot-wide) from the Wekiwa Springs State Park has been sought as an alternative to provide a full width trail with better separation from the roadway and fewer impacts on the ROW. See **Figure 11** for the location of Welch Road Alternative 1.



-  Welch Road WOT Alternative 1
-  Existing West Orange Trail
-  Sweetwater Park Village

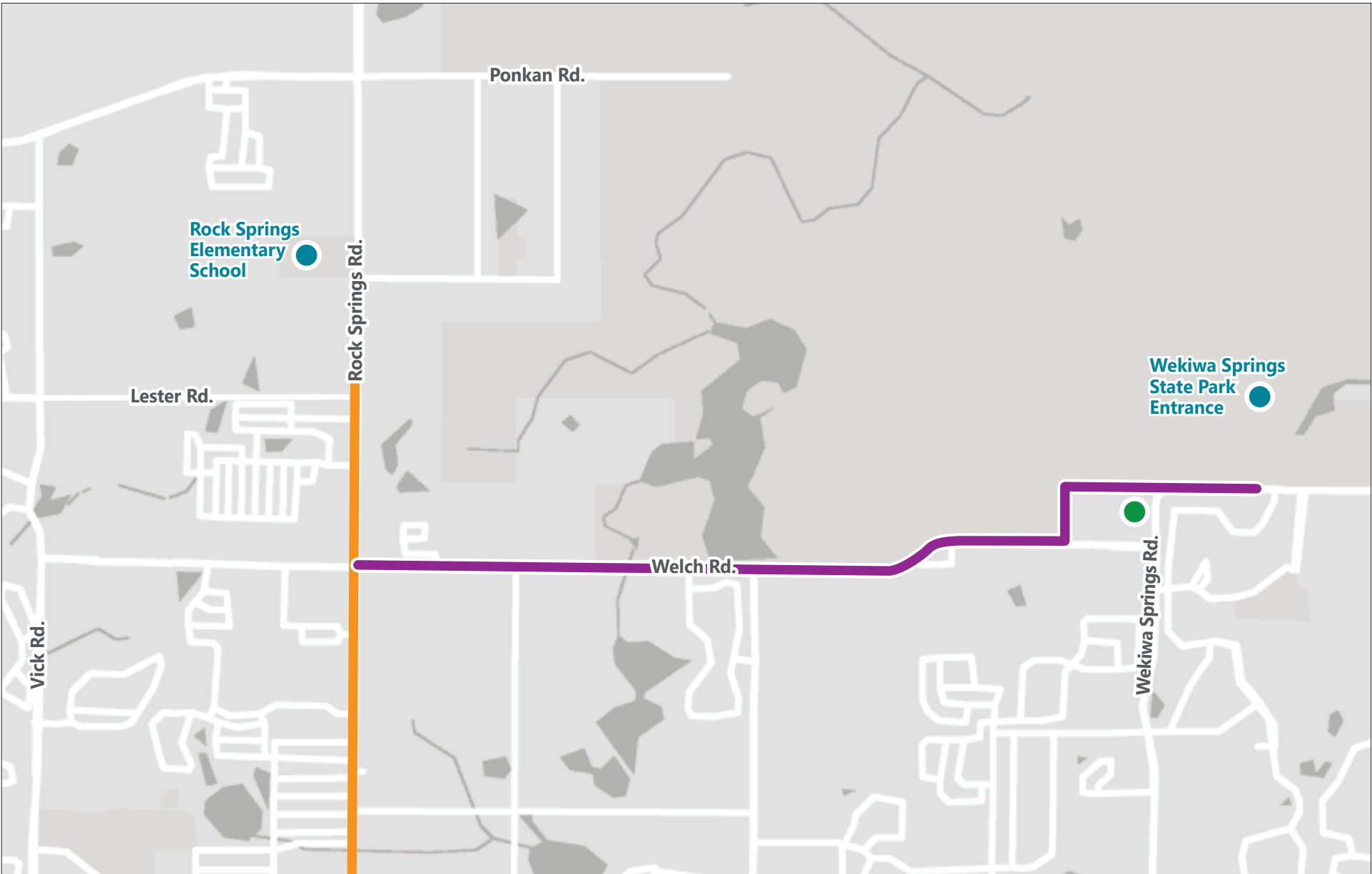


Figure 11
Welch Road Trail Route
Alternative 1
West Orange Trail Extension Study

Alternative 2

Welch Road Alternative 2 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Welch Road, continuing east along the north side of Welch Road, north along the west side of Sweetwater Park Village, and east along the north side of Wekiwa Springs Road, ending at the entrance to Wekiwa Springs State Park on Wekiwa Springs Road. Most of this alternative is located just off Welch Road and Wekiwa Springs Road. However, the trail avoids the intersection of Welch Road and Wekiwa Springs Road by winding behind Sweetwater Park Village. This alternative is the slightly longer alternative of the two Welch Road alternatives. The length of the trail is 3.00 miles, with 0.75 miles along Welch Road and Wekiwa Springs Road, and 2.25 miles along Wekiwa Springs State Park.

This alternative has the fewest crossings of the two alternatives, with only seven driveway crossings and three street crossings. However, this alternative has a higher amount of anticipated total ROW required for the trail compared to the other alternative. The ROW along much of Welch Road is too narrow to provide enough lateral space for the addition of a trail. For this alternative, where possible, a recreational easement (up to 50-foot-wide) from the Wekiwa Springs State Park has been sought as an alternative to provide a full width trail with better separation from the roadway and fewer impacts on the ROW. See **Figure 12** for the location of Welch Road Alternative 2.





-  Welch Road WOT Alternative 2
-  Existing West Orange Trail
-  Sweetwater Park Village



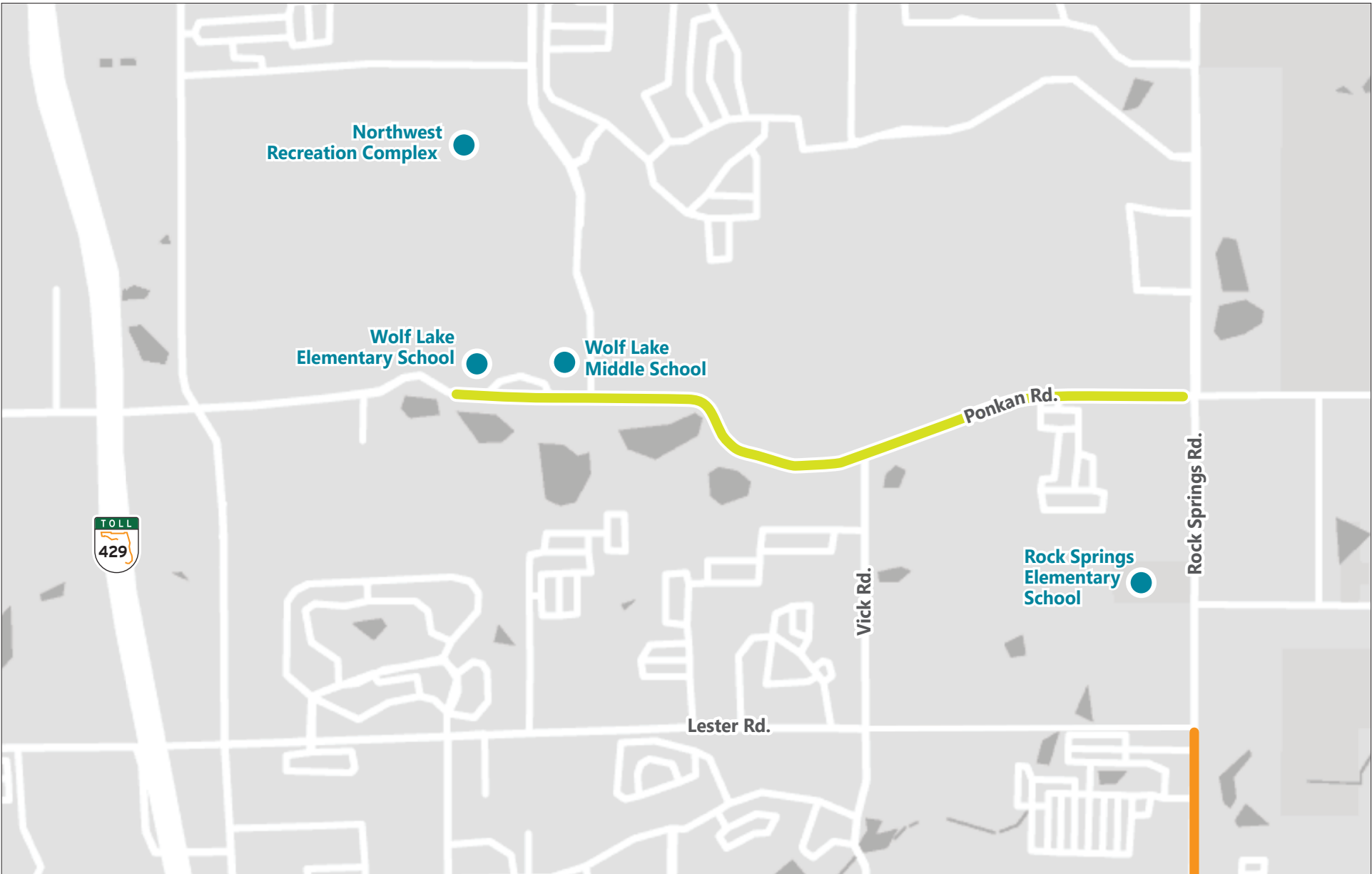
Figure 12
Welch Road Trail Route
Alternative 2
West Orange Trail Extension Study

Ponkan Road

Alternative 1

Ponkan Road Alternative 1 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Ponkan Road, continuing west along the south side of Ponkan Road until Vick Road. At the Vick Road intersection, the trail crosses over Ponkan Road at the east leg of the intersection, and continues west along the north side of Ponkan Road, ending at the entrance to Wolf Lake Elementary School on Ponkan Road. The entirety of the alternative is located just off Ponkan Road. At 2.28 miles in length, this alternative is the shortest of the two Ponkan Road alternatives.

This alternative has the most crossings of the two alternatives, with 16 driveway crossings and six street crossings. See **Figure 13** for the location of Ponkan Road Alternative 1.





-  Ponkan Road Trail Route Alternative 1
-  Existing West Orange Trail

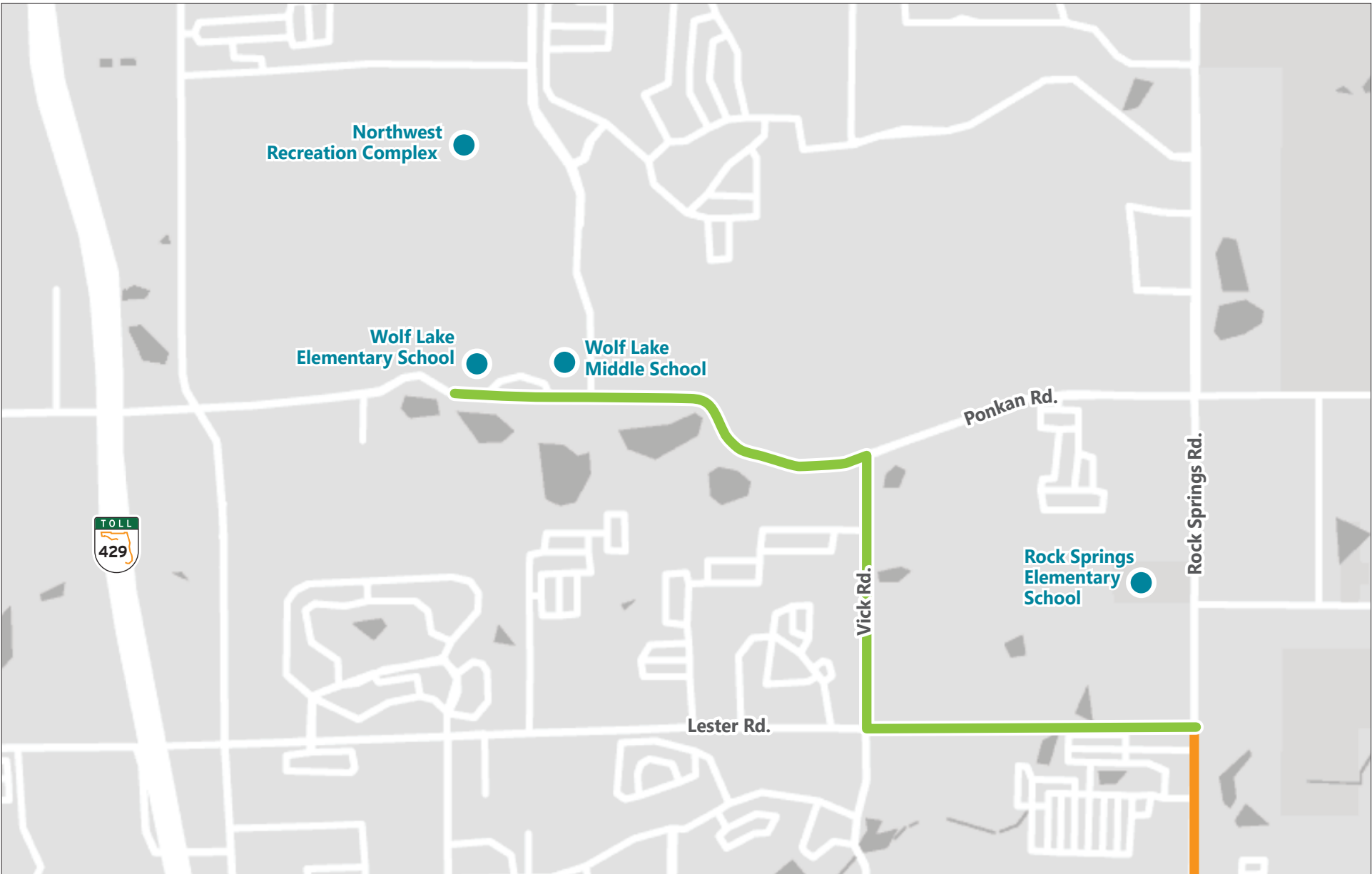


Figure 13
Ponkan Road Trail Route
Alternative 1
West Orange Trail Extension Study

Alternative 2

Ponkan Road Alternative 2 is a 12-foot wide shared-use path beginning at the intersection of Rock Springs Road and Lester Road, continuing west along the south side of Lester Road to the intersection of Lester Road and Vick Road. From here, Alternative 2 continues north along the west side of Vick Road to the intersection of Vick Road and Ponkan Road. From this intersection, the alternative crosses Ponkan Road and continues west along the north side of Ponkan Road, ending at the entrance to Wolf Lake Elementary School on Ponkan Road. At 3.05 miles in length, this alternative is the longest of the two Ponkan Road alternatives. However, 0.98 miles of this alternative would utilize the existing trail along Lester Road, meaning only 2.07 miles of new trail would be constructed.

This alternative has fewer driveway crossings of the two alternatives, with 9 driveway crossings and 7 street crossings. However, during the Virtual Public Meeting held on January 27th, 2022, this alternative was the least preferred alternative by the public. See **Figure 14** for the location of Ponkan Road Alternative 2.





-  Ponkan Road Trail Route Alternative 2
-  Existing West Orange Trail



Figure 14
Ponkan Road Trail Route
Alternative 2
West Orange Trail Extension Study

Build Alternatives Analysis

Drainage Analysis

Proposed improvements in the project corridor are subject to the SJRWMD, the Wekiwa River Hydrological Basin and Orange County criteria that are current at the time of the improvements (detailed in the Existing Conditions Drainage Analysis section). The improvements along the drainage easement and State-owned lands are subject to the SJRWMD criteria.

There is a possibility of obtaining an exemption from permitting from SJRWMD, if the proposed improvements adhere to F.A.C. 62-330.051. The applicable exemption criteria below:

62-330.051 Exempt Activities:

- (4)(c) *Minor Roadway Safety Construction Alteration, Maintenance and Operation, provided:*
 1. *There is no work in, on, or over wetlands other than those in drainage ditches constructed in uplands;*
 2. *There is no reduction in the capacity of existing swales, ditches, or other systems legally in existence under Chapter 403 or Part IV of Chapter 373, F.S;*
 3. *All work is conducted in compliance with subsection 62-330.050(9), F.A.C.; and*
 4. *The work is limited to:*
 - a) *Sidewalks having a width of six feet or less;*
 - b) *Turn lanes less than 0.25 mile in length, and other safety-related intersection improvements; and*
 - c) *Road widening and shoulder paving that does not create additional traffic lanes and is necessary to meet current, generally accepted roadway design and safety standards.*
- (4)(d) *Resurfacing and Repair of Existing Paved Roads, and Grading of Existing Unpaved Roads, provided:*
 1. *Travel lanes are not paved that are not already paved;*
 2. *No substantive changes occur to existing road surface elevations, grades, or profiles; and*
 3. *All work is conducted in compliance with subsection 62-330.050(9), F.A.C.*

However, other similar projects have been issued permits by SJRWMD. These include:

- West Orange Trail Phase III South of Welch Road (REG_46934(1))
- Welch Road / Shoulder Improvements (REG_788120)

Therefore, the need for permitting this project shall be determined during the pre-application meeting with SJRWMD. If a permit exemption is not granted and a standard general permit is the next permitting option, it shall adhere to the applicable F.A.C. – the applicable criteria are detailed in the Existing Conditions Drainage Analysis section.

A summary of potential culvert extensions and impact of swales is included in **Table 27**.

Table 27 | Potential Culvert Extensions and Impact of Swales

No.	Description Type	Approximate Location	Description
1	3 - 19"x30" ERCP	Approximately 450 feet south of the intersection of Rock Springs Road and Westford Drive	The three 19"x30" ERCPs are approximately 90 feet long
2	30" Cross Drain	Approximately 750 feet north of the intersection of Rock Springs Road and Rock Ridge Boulevard	The 30" Cross Drain is approximately 85 feet long
3	Elongated Pond	Approximately 750 feet east of the intersection of Thompson Road and Welch Road	A dry pond that extends approximately 150 feet along the right side of Welch Road
4	Two Elongated Ponds	The two elongated Ponds are located at the intersection of Welch Road and Litchem Road	Two segmented dry ponds, each pond extending approximately 150 feet along the right side of Welch Road
5	Swales with Check Dams	Approximately 300 feet east of the intersection of Welch Road and Litchem Road	Approximately 1,000-foot-long swales extending between Litchem Road and Wekiwa Drive
6	24" Cross Drain	Located at the intersection of Welch Road and Thompson Road	The 24" Cross Drain is approximately 70 feet long
7	Cross Drain	Approximately 590 feet east of the intersection of Welch Road and Litchem Road, next to the Swale with check dams	The Cross Drain is approximately 50 feet long

Specific nutrient requirements may apply to the project since the Study Area outfalls to Class III water bodies. Stormwater may need to be treated prior to its discharge to the respective water bodies and adequate erosion and turbidity barriers will be needed during the proposed construction activities. Since most of the roadway isn't formally treated prior to its outfall, SJRWMD may only require treatment of any new impervious areas.

If treatment volumes are required and off-line dry retention systems are used, the project will need to provide retention for the water quality volume equal to runoff from 0.5-inch runoff from the contributing area or 1.25-inches of runoff from the impervious area, per the requirements set forth by SJRWMD. On-line dry retention will require an additional 0.5-inch of runoff from the contributing area over the volume specified for off-line treatment. On-line treatment that provides for percolation from runoff from the three-year, one-hour storm can be substituted for the previous criteria.

If treatment volumes are required, and wet detention systems are used, the project will need to provide storage for the water quality volume equal to 1-inch of runoff over the contributing area, or 2.5-inches times the impervious area (excluding water bodies). The outfall structure shall be designed to drawdown one-half the required treatment volume within 24 and 30 hours following a storm event, but no more than one-half this volume will be discharged within the first 24 hours.

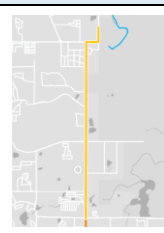

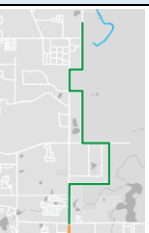
Stormwater management systems must be designed to treat and attenuate the 25-year, 24-hour storm for open basin.

In addition, the Wekiva River Hydrological Basin and Outstanding Florida Waters (OFW) design criteria must be satisfied.

Evaluation Matrix

A preliminary evaluation of the Build alternatives for each trail route option was performed to evaluate accessibility, safety, community, and environmental impacts, as well as project cost for comparison. An evaluation matrix, provided in **Table 28**, **Table 29**, and **Table 30**, was prepared for a side-by-side assessment of each trail route option and its estimated impacts. Each topic within the evaluation matrix is described further in the sections below.

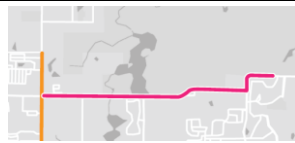
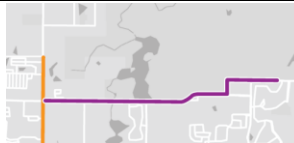
Table 28 | Evaluation Matrix - Rock Springs Road Trail Route Alternatives

Evaluation Criteria	Rock Springs Road Alternatives		
	Alternative 1	Alternative 2	Alternative 3
			
Project Length			
Trail segment length (miles)	3.32	3.81	4.82
Variance from shortest option (%)	Shortest Option	15%	45%
Trail segment along roadway (miles)	2.95	1.25	0.57
Trail segment along Wekiwa Springs State Park (miles)	0.37	2.56	4.25
Travel Service / Accessibility / Safety Characteristics			
Number of street crossings	5	2	1
Number of driveway crossings	58	24	5
Number of school connections accommodated	1	1	1
Community features served by trail ¹	4	3	1
Potential Environmental Effects / Agency and Local Support			
Potential impacts anticipated to listed species / habitat (Low/Moderate/High)	Low	Moderate	Moderate
Potential impacts to wetlands (Low/Moderate/High)	Low	Low	Low
Potential impacts to 100-year floodplains (Low/Moderate/High)	Moderate	Moderate	Moderate
Potential impacts to contamination sites (Low/Moderate/High)	Moderate	Low	Low
Potential impact to archaeological and historical resources (Low/Moderate/High)	Low	Moderate	Moderate
Support from Wekiwa Springs State Park	N/A	Yes	Yes
Public preference ²	3 rd	2 nd	1 st
Estimated ROW Needs			
Number of parcels from which ROW is required for the trail (Privately Owned)	50	20	17
Number of parcels from which ROW is required for the trail (Publicly Owned)	3	3	4
Number of parcels from which ROW is required (Total)	53	23	21
Acres of ROW required for the trail (Privately Owned)	1.9	0.3	0.8
Acres of ROW required for the trail (Publicly Owned)	0.1	1.0	1.1
Acres of ROW required for the trail (State Park Owned)	0.5	7.3	13.7
Acres of ROW required for the trail (Total)	2.5	8.5	15.6
Relocation potential (anticipated residential / business displacements)	None Anticipated	None Anticipated	None Anticipated
Estimated Project Cost			
Estimated design cost (in millions)	\$1.7	\$1.3	\$1.1
Estimated ROW cost (relative)	\$\$\$	\$	\$
Estimated construction cost (in millions)	\$6.9	\$5.0	\$4.3

Note:

1. Community features include schools, parks, religious facilities, and fire stations.
2. Public preference based on Virtual Public Meeting survey results ranked in order of popularity.


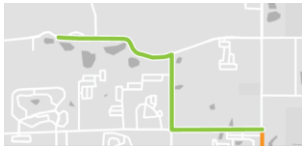
Table 29 | Evaluation Matrix - Welch Road and Wekiwa Springs Road Trail Route Alternatives

Evaluation Criteria	Welch Road Alternatives	
	Alternative 1	Alternative 2
		
Project Length		
Trail segment length (miles)	2.99	3.0
Variance from shortest option (%)	Shortest Option	0.33%
Trail segment along roadway (miles)	1.19	0.75
Trail segment along Wekiwa Springs State Park (miles)	1.80	2.25
Travel Service / Accessibility / Safety Characteristics		
Number of street crossings	4	3
Number of driveway crossings	23	7
Number of school connections accommodated	1	0
Community features served by trail ¹	3	2
Potential Environmental Effects / Agency and Local Support		
Potential impacts anticipated to listed species / habitat (Low/Moderate/High)	Low	Moderate
Potential impacts to wetlands (Low/Moderate/High)	Moderate	Moderate
Potential impacts to 100-year floodplains (Low/Moderate/High)	Moderate	Moderate
Potential impacts to contamination sites (Low/Moderate/High)	Moderate	Low
Potential impact to archaeological and historical resources (Low/Moderate/High)	Low	Low
Support from Wekiwa Springs State Park	Yes	Yes
Public preference ²	2 nd	1 st
Estimated ROW Needs		
Number of parcels from which ROW is required for the trail (Privately Owned)	23	12
Number of parcels from which ROW is required for the trail (Publicly Owned)	2	2
Number of parcels from which ROW is required (Total)	25	14
Acres of ROW required for the trail (Privately Owned)	0.3	0.1
Acres of ROW required for the trail (Publicly Owned)	4.7	4.7
Acres of ROW required for the trail (State Park Owned)	1.1	2.7
Acres of ROW required for the trail (Total)	5.8	7.3
Relocation potential (anticipated residential / business displacements)	None Anticipated	None Anticipated
Estimated Project Cost		
Estimated design cost (in millions)	\$1.3	\$0.8
Estimated ROW cost (relative)	\$\$	\$\$
Estimated construction cost (in millions)	\$5.2	\$4.4

Note:

1. Community features include parks, religious facilities, and health care facilities.
2. Public preference based on Virtual Public Meeting survey results ranked in order of popularity.

Table 30 | Evaluation Matrix - Ponkan Road Trail Route Alternatives

Evaluation Criteria	Ponkan Road Alternatives	
	Alternative 1	Alternative 2
		
Project Length		
Trail segment length (miles)	2.28	3.05
Variance from shortest option (%)	Shortest Option	34%
Length of existing trail utilized (miles)	0.00	0.98
Travel Service / Accessibility / Safety Characteristics		
Number of street crossings	7	7
Number of driveway crossings	16	9
Number of school connections accommodated	2	2
Community features served by trail ¹	3	3
Potential Environmental Effects / Agency and Local Support		
Potential impacts anticipated to listed species / habitat (Low/Moderate/High)	Moderate	Low
Potential impacts to wetlands (Low/Moderate/High)	Low	Moderate
Potential impacts to 100-year floodplains (Low/Moderate/High)	Moderate	Moderate
Potential impacts to contamination sites (Low/Moderate/High)	Moderate	Moderate
Potential impact to archaeological and historical resources (Low/Moderate/High)	Low	Low
Public preference ²	1 st	2 nd
Estimated ROW Needs		
Number of parcels from which ROW is required for the trail (Privately Owned)	28	12
Number of parcels from which ROW is required for the trail (Publicly Owned)	3	4
Number of parcels from which ROW is required (Total)	31	16
Acres of ROW required for the trail (Privately Owned)	1.3	0.8
Acres of ROW required for the trail (Publicly Owned)	0.8	0.9
Acres of ROW required for the trail (Total)	31	16
Relocation potential (anticipated residential / business displacements)	None Anticipated	None Anticipated
Estimated Project Cost		
Estimated design cost (in millions)	\$1.4	\$0.8
Estimated ROW cost (relative)	\$\$	\$\$
Estimated construction cost (in millions)	\$5.4	\$4.7

Note:

1. Community features include schools and parks. Both alternatives provide access to the two schools on Ponkan Road.
2. Public preference based on Virtual Public Meeting survey results ranked in order of popularity.



Project Length

Rock Springs Road

The three Rock Springs Road trail route alternatives range from 3.32 to 4.82 miles in length, with Alternative 1 being the shortest option. Additionally, the three trail route alternatives have varying segments adjacent to the roadway. Alternative 1 includes a 2.95-mile segment adjacent to the roadway, while Alternative 2 includes a 1.25-mile segment and Alternative 3 includes a 0.57-mile segment adjacent to the roadway. Lastly, the Rock Springs Road alternatives have varying segments along the Wekiwa Springs State Park boundary. Alternative 1 includes a 0.37-mile segment along the boundary, Alternative 2 includes a 2.56 segment along the boundary, and Alternative 3 includes a 4.25-mile segment along the boundary.

Welch Road and Wekiva Springs Road

The two Welch Road and Wekiva Springs Road trail route alternatives range from 2.99 to 3.0 miles in length, with Alternative 1 being the shortest option. Additionally, the trail route alternatives have varying segments adjacent to the roadway. Alternative 1 includes a 1.19-mile segment adjacent to the roadway, while Alternative 2 includes a 0.75-mile segment adjacent to the roadway. Lastly, the Welch Road and Wekiva Springs Road alternatives have varying segments along the Wekiwa Springs State Park boundary. Alternative 1 includes a 1.80-mile segment along the boundary and Alternative 2 includes a 2.25-mile segment along the boundary.

Ponkan Road

The two Ponkan Road trail route alternatives range from 2.28 to 3.05 miles in length, with Alternative 1 being the shortest option. Alternative 2 utilizes 0.98 miles of an existing trail along Lester Road.

Accessibility and Safety Characteristics

Rock Springs Road

The Rock Springs Road trail route alternatives enhance accessibility and safety for bicycles and pedestrians within the study area. Alternative 1 requires five street crossings and 58 driveway crossings, Alternative 2 requires two street crossings and 24 driveway crossings, and Alternative 3 requires one street crossing and five driveway crossings. Lastly, each alternative accommodates one school connection. Alternative 1 serves three additional community features and Alternative 2 serves two additional community features. Alternative 3 does not serve any additional community features.

Welch Road and Wekiva Springs Road

The Welch Road and Wekiva Springs Road trail alternatives enhance accessibility and safety for bicycles and pedestrians within the study area. Alternative 1 requires four street crossings and 23 driveway crossings. Alternative 2 requires three street crossings and seven driveway crossings. Alternative 1 serves three community features by trail, including one school connection to Star Child Academy. Alternative 2 serves two community features by trail, however, does not include any school connections.

Ponkan Road

The Ponkan Road trail alternatives enhance accessibility and safety for bicycles and pedestrians within the study area. Alternative 1 requires seven street crossings and 16 driveway crossings. Alternative 2 requires seven street crossings and nine driveway crossings. Each alternative accommodates two school connections and serves one additional community feature by trail.

Potential Environmental Effects Including Agency and Local Support

The preliminary findings are based on information available in the Environmental Characteristics section in the Existing Conditions chapter of this report.

Rock Springs Road

The three Rock Springs Road trail route alternatives anticipate potential environmental effects ranging from low to moderate. Alternative 1 anticipates low impacts to listed species, wetlands, and archaeological and historical resource, but anticipates moderate impacts to 100-year floodplains and contamination sites. Alternatives 2 and 3 both anticipate moderate impacts to listed species, 100-year floodplains, and archaeological and historical resources, but anticipate low impacts to wetlands and contamination sites. It was determined that Alternative 3 ranked highest in public preference, while Alternative 1 ranked lowest in public preference among the trail route options.

Welch Road and Wekiva Springs Road

The two Welch Road and Wekiva Springs Road trail route alternatives anticipate potential environmental effects ranging from low to moderate. Alternative 1 anticipates moderate impacts to wetlands, 100-year floodplains, and contamination sites, but anticipates low impacts to listed species and archaeological and historical sites. Alternative 2 anticipates moderate impacts to listed species, wetlands, and 100-year floodplains, but anticipates low impacts to contamination sites and archaeological and historical resources. Support from Wekiwa Springs State Park was given for both alternatives, however, Alternative 2 ranked highest in public preference among the two trail route options.

Ponkan Road

The two Ponkan Road trail route alternatives anticipate potential environmental effects ranging from low to moderate. Alternative 1 anticipates moderate impacts to listed species, 100-year floodplains, and contamination sites, but anticipates low impacts to wetlands and archaeological and historical resources. Alternative 2 anticipates low impacts to listed species and archaeological and historical resources, but anticipates moderate impacts to wetlands, 100-year floodplains, and contamination sites. Lastly, Alternative 1 ranked highest in public preference among the two trail route options.

Estimated Right-of-Way Needs

Rock Springs Road

The three Rock Springs Road trail route alternatives have ROW impacts ranging from 21 to 53 parcels, which includes private, public, and state park owned parcels. In total, Alternative 1 requires 2.5 acres of ROW, Alternative 2 requires 8.5 acres of ROW, and Alternative 3 requires 15.6 acres of ROW. More

details regarding the public ROW and private ROW needs are included in **Table 28**. There are no relocations anticipated for the three Rock Springs Road trail route alternatives.

Welch Road and Wekiva Springs Road

The two Welch Road and Wekiva Springs Road trail route alternatives have ROW impacts on 14 and 25 parcels, for Alternative 1 and Alternative 2 respectively, including private and publicly owned parcels. In total, Alternative 1 requires 5.8 acres of ROW, and Alternative 2 requires 7.3 acres of ROW. More details regarding the public ROW and private ROW needs are included in **Table 29**. There are no relocations anticipated for the two Welch Road and Wekiva Springs Road trail route alternatives.

Ponkan Road

The two Ponkan Road trail route alternatives have ROW impacts on 16 and 31 parcels, for Alternative 1 and Alternative 2 respectively, which includes both private and publicly owned parcels. In total, Alternative 1 requires 2.1 acres of ROW, and Alternative 2 requires 1.7 acres of ROW. More details regarding public ROW and private ROW needs are included in **Table 30**. There are no relocations anticipated for the two Ponkan Road trail route alternatives.

Estimated Project Cost

The estimated project cost for each of the trail segments for each of their alternatives are broken down in the sections below.

Rock Springs Road

The three Rock Springs Road trail route alternatives have an estimated total project cost that ranges from \$4.8 million to \$8.6 million, which includes costs for final design and construction. Estimated ROW costs have not yet been determined and will be analyzed during the design phase of this project. **Table 31** provides a summary of the cost estimates for the three Rock Springs Road trail route alternatives. The detailed construction cost estimates are included in **Appendix H**.

Table 31 | Preferred Sites Cost Estimates Summary

Recommended Alternative Segment	Estimated Design Cost (millions)	Estimated Construction Cost (millions)
Rock Springs Road Alternative 1	\$1.7	\$6.9
Rock Springs Road Alternative 2	\$1.3	\$5.0
Rock Springs Road Alternative 3	\$1.1	\$4.3

Notes:

Project Costs are in 2022 dollars.

Welch Road and Wekiwa Springs Road

The two Welch Road and Wekiwa Springs Road trail route alternatives have an estimated total project cost that ranges from \$5.2 million to \$6.5 million, which includes costs for final design and construction. Estimated ROW costs have not yet been determined and will be analyzed during the design phase of this project. **Table 32** provides a summary of the cost estimates for the two Welch Road and Wekiwa Springs Road trail route alternatives. The detailed construction cost estimates are included in **Appendix H**.

Table 32 | Preferred Sites Cost Estimates Summary

Recommended Alternative Segment	Estimated Design Cost (millions)	Estimated Construction Cost (millions)
Welch Road and Wekiwa Springs Road Alternative 1	\$1.3	\$5.2
Welch Road and Wekiwa Springs Road Alternative 2	\$0.8	\$4.4

Notes:

Project Costs are in 2022 dollars.

Ponkan Road

The two Ponkan Road trail route alternatives have an estimated total project cost that ranges from \$5.5 million to \$6.8 million, which includes costs for final design and construction. Estimated ROW costs have not yet been determined and will be analyzed during the design phase of this project. **Table 33** provides a summary of the cost estimates for the two Ponkan Road trail route alternatives. The detailed construction cost estimates are included in **Appendix H**.

Table 33 | Preferred Sites Cost Estimates Summary

Recommended Alternative Segment	Estimated Design Cost (millions)	Estimated Construction Cost (millions)
Ponkan Road Alternative 1	\$1.4	\$5.4
Ponkan Road Alternative 2	\$0.8	\$4.7

Notes:

Project Costs are in 2022 dollars.

Selection of Recommended Alternative

After developing the seven viable trail alternatives, analyzing the impacts of each alternative, and gathering public feedback, one recommended alternative was chosen for each segment of the trail. The Recommended Alternative for each segment, along with the reasons it was selected, are described below.

Rock Springs Road

The recommended alternative for the Rock Springs Road section of the trail is Alternative 1. Alternative 1 is the shortest of the three Rock Springs Road alternatives. Alternative 1 requires an estimated 2.5 acres of proposed ROW, which is significantly less than the 8.5 and 15.6 acres required for Alternative 2 and Alternative 3, respectively. Alternative 1 also serves four community features, which is more than the other Rock Springs Road alternatives. Finally, Alternative 1 has the least anticipated potential environmental impacts of the three Rock Springs Road alternatives. Support from Wekiwa Springs State Park was given for Alternatives 2 and 3, however, following the public alternatives meeting, Orange County Board of County Commissioner Resolution No. 98-M-09 was discovered. The resolution specifically requires the West Orange Trail be extended along Rock Springs Road. Further discussion on the resolution can be found in the Public Involvement section.

Welch Road and Wekiwa Springs Road

The recommended alternative for the Welch Road and Wekiwa Springs Road section of the trail is Alternative 2. Unlike Alternative 1, Alternative 2 wraps around the western and northern edges of Sweetwater Park Village within Wekiwa Springs State Park property, which reduces the amount of trail length along the Welch Road. Because of this, Alternative 2 only has 10 total street and driveway crossings, while Alternative 1 has 27 total street and driveway crossings. Additionally, Alternative 2 requires proposed ROW from an estimated 14 parcels, as compared to 25 parcels for Alternative 1. Finally, during the Virtual Public Meeting held on January 27th, 2022, Alternative 2 was the preferred alternative by the public.

Ponkan Road

The recommended alternative for the Ponkan Road section of the trail is Alternative 1. This alternative is the shortest of the two Ponkan Road alternatives. Additionally, Alternative 1 has less anticipated potential wetlands impacts compared to Alternative 2. Finally, during the Virtual Public Meeting held on January 27th, 2022, Alternative 1 was the preferred alternative by the public.

Recommended Trail Alternatives

Recommendations

The recommended trail alternatives include a preferred trail alternative for each section of the trail – Rock Springs Road; Welch Road and Wekiwa Springs Road; and Ponkan Road. The preferred trail alternative for each section is described below. See **Appendix I** for the concept plans for the preferred trail alternative.

Rock Springs Road

The recommended alternative for the Rock Springs Road section of the trail is Alternative 1. The recommended alternative is a 12' wide shared-use path that begins at the intersection of Rock Springs Road and Welch Road, continuing north along the east side of Rock Springs Road until Kelly Park Road. Here, the trail heads east along the south side of Kelly Park Road until Baptist Camp Road, where the trail heads north along the east side of Baptist Camp Road until it reaches the entrance to Kelly Park.

Welch Road and Wekiwa Springs Road

The recommended alternative for the Welch Road and Wekiwa Springs Road section of the trail is Alternative 2. The recommended alternative is a 12' wide shared-use path that begins at the intersection of Rock Springs Road and Welch Road, continuing east along the north side of Welch Road until just west of Sweetwater Park Village. Here, the trail heads north along the west side of Sweetwater Park Village, then continues east, wrapping around the north edge of Sweetwater Park Village within Wekiwa Springs State Park property. Finally, the trail connects with the north side of Wekiwa Springs Road, continuing east on Wekiwa Springs Road until the entrance to Wekiwa Springs State Park.

Ponkan Road

The recommended alternative for the Ponkan Road section of the trail is Alternative 1. The recommended alternative is a 12' wide shared-use path located along Ponkan Road. The trail begins on the south side of Ponkan Road at the intersection of Rock Springs Road and Ponkan Road. The trail heads west along the south side of Ponkan Road until the east leg of the intersection of Ponkan Road and Vick Road, where the trail crosses to the north side of Ponkan Road. From here, the trail continues west along the north side of Ponkan Road until it reaches the entrance to Wolf Lake Elementary School.

Right-of-Way Needs

The total amount of anticipated ROW required for the Recommended Alternatives is 11.9 acres. The recommended alternative is anticipated to require ROW from 98 parcels. These amounts are further broken down by trail segment in **Table 34** below. No relocations are anticipated for any segment of the Recommended Alternatives.

The concept plans shown in **Appendix I** provide an overview of the anticipated impacts for the Recommended Alternative. **Table 34** summarizes the ROW impacts for the Recommended Alternative.

Table 34 | Preferred Alternative ROW Impacts

Preferred Trail Segment	Impact (acres)				Parcels Impacted			Relocations
	Total	Privately-owned	Publicly-owned	Wekiwa Springs State Park	Total	Privately-owned	Publicly-owned	
Rock Springs Road	2.5	1.9	0.1	0.5	53	50	3	0
Welch Road and Wekiwa Springs Road	7.3	0.1	4.7	2.7	14	12	2	0
Ponkan Road	2.1	1.3	0.8	N/A	31	28	3	0

Drainage Recommendations

Based on the drainage analysis of the proposed improvements to the study area, there is a possibility of obtaining an exemption from permitting from SJRWMD, if the proposed improvements adhere to F.A.C. 62-330.051 as detailed in Section 5.1.

Should a permit exemption or a standard general permit not be accepted, the SJRWMD might require full treatment and attenuation volumes of the previously untreated existing road.

Per the SJRWMD Permit Information Manual, water quantity criteria for the project area includes, at a minimum that:

1. The post-development peak discharge rate must not exceed the pre-development peak rate of discharge for the mean annual 24-hour storm for systems serving both of the following:
 - a. New construction area greater than 50% impervious (excluding waterbodies).
 - b. Projects for the construction of new developments that exceed the thresholds in paragraphs 62-330.020(2)(b) or (c), F.A.C.
2. The post-development peak rate of discharge must not exceed the pre-development peak rate of discharge for the 25-year frequency, 24-hour duration storm.

The SJRWMD might require special criteria for proposed projects resulting from this study. Proposed projects in the Wekiva River Hydrologic Basin that do not qualify for a permit exemption or general permit may have to provide the following:

- A surface water management system that provides retention storage for 3-inches of runoff from all impervious area proposed to be constructed on soils defines as Type 'A'.
- A system that can infiltrate this storage volume within 72 hours, or the post-development recharge capacity of the system is greater than or equal to the pre-development recharge capacity.
- A system that does not cause a net reduction in flood storage within the 100-year floodplain of a stream or other watercourse which has a drainage area upstream of more than one square

mile and which has a direct hydrologic connection to the Wekiva or Little Wekiva Rivers or Black Water Creek.

- A Water Quality Protection Zone that extends one half mile from the Wekiva River, Little Wekiva River north of State Road 436, Black Water Creek, Rock Springs Run, Seminole Creek, and Sulphur Run, and also extends one quarter mile from any wetland abutting an OFW.
- Reasonable assurance through an erosion and sediment control plan that during construction or alteration of the system (including revegetation and stabilization), erosion will be minimized, and sediment will be retained on-site. The plan must be in conformance with the erosion and sediment control principles set forth in *Section 13.8.2* and must contain the information set forth in *Section 13.8.3*.
- Reasonable assurance that projects located wholly or partially within 100 feet of an OFW or within 100 feet of any wetland abutting such a water will not have a system that will cause sedimentation within these wetlands and waters, and that filtration of runoff will occur prior to discharge to these wetlands and waters.
- Reasonable assurance that the construction, alteration, operation, and maintenance of any part of a system located within the Water Quantity Protection Zone of Black Water Swamp and the wetlands abutting the Wekiva River, Little Wekiva River, Rock Springs Run, Black Water Creek, Sulphur Run, Seminole Creek, Lake Norris, and Lake Dorr will not cause ground water table drawdowns which would adversely affect the function provided by these wetlands.
- Reasonable assurance that the construction or alteration of a system will not adversely affect the abundance, food sources, or habitat of aquatic or wetland dependent species provided by the following Riparian Habitat Protection Zones:
 - The wetlands abutting the Wekiva River, Little Wekiva River downstream of Maitland Boulevard, Rock Springs Run, Black Water Creek, Sulphur Run, or Seminole Creek.
 - The uplands within 50 feet landward of the landward extent of the wetlands above.
 - The uplands which are within 550 feet landward of the stream's edge, as defined as the waterward extent of the forested wetlands abutting the Wekiva River, Little Wekiva River downstream of the northernmost crossing of the Little Wekiva River with S.R. 434, Rock Springs Run, Black Water Creek, Sulphur Run or Seminole Creek. In the absence of forested wetlands abutting these streams, the stream's edge shall be defined, for the purpose of this subsection, as the mean annual surface water elevation of the stream; however, if hydrologic records are unavailable, the landward extent of the herbaceous emergent wetland vegetation growing in these streams shall be the stream's edge.

Any impacts to existing permitted facilities will require permit modifications and additional stormwater treatment and attenuation.

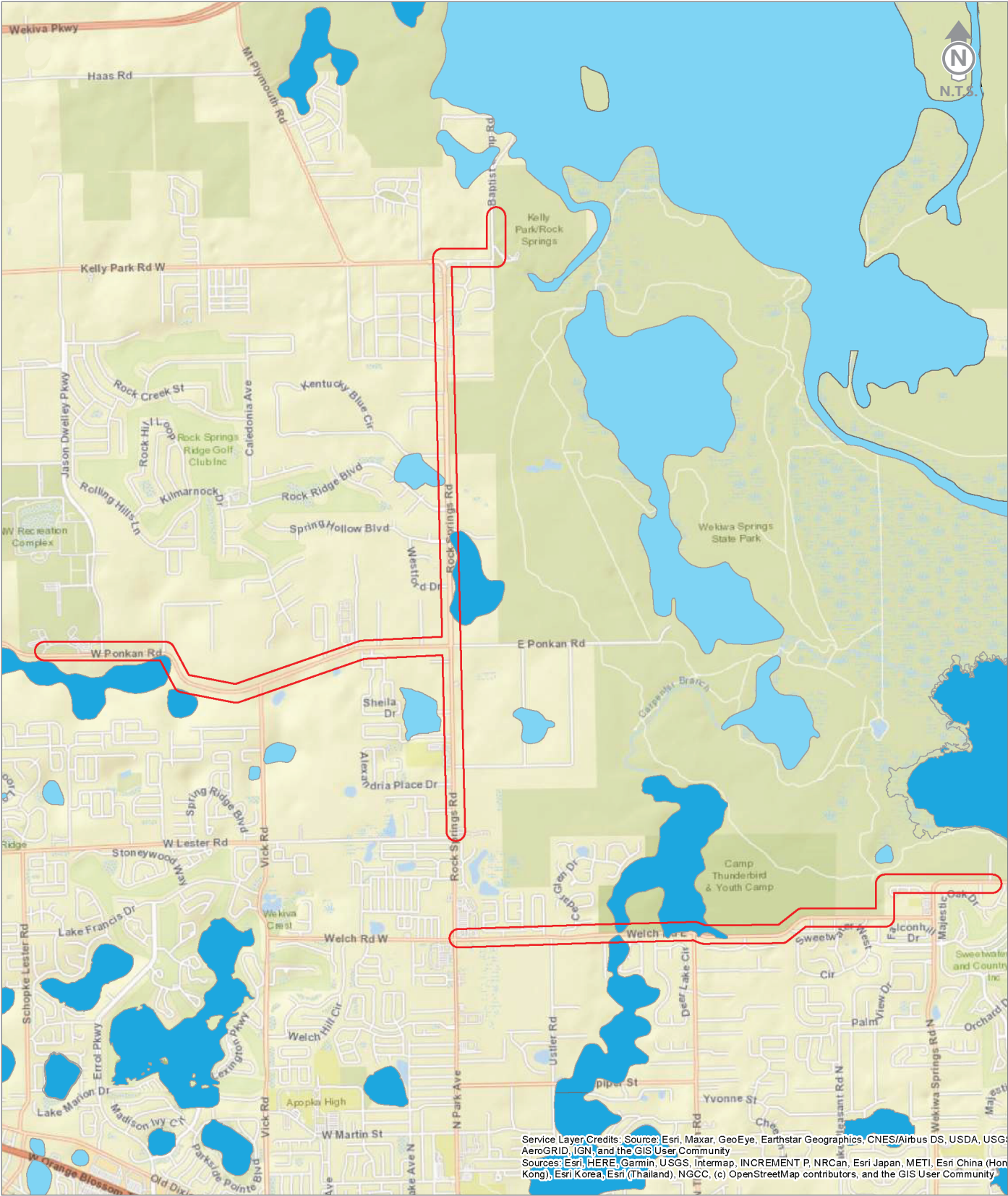
Wekiva River is an OFW. For direct discharges to OFWs, retention systems must provide at least an additional 50% of treatment volume. Detention systems must provide either an additional 50% of treatment and attenuation volume, or pretreatment of the stormwater prior to wet detention.

Floodplains

According to the FEMA DFIRM dated October 2020, the majority of the study area of West Orange Trail is located within Floodplain Zone X. This zone is also known as a “low-risk flood zone” and has a 0.2% annual chance of flood; areas of 1% chance of flood with drainage areas less than one square mile; and areas protected by levees from 1% annual chance of flood. Areas in the north, and south-eastern portion of the study area buffer are within the 100-year floodplain where there is a 1% annual chance of flood. This floodplain Zone (AE) has determined base flood elevations of 88 feet NAVD and is associated with Prevatt and Club Lakes.





Any fill of floodplain occurring between the SHWL and the floodplain elevation will require floodplain compensation. No net encroachment into the floodplain is allowed between the SHWL and the floodplain elevation.

A high-level analysis was performed to quantify the floodplain areas with the ROW of the trail and the total area was found to be approximately 1.2 acres. It is anticipated that floodplain encroachment will be minimized to the extent practicable. The location of floodplain that falls within the study area is illustrated in **Figure 15**.



Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Legend

-  300 Foot Study Buffer
- Flood Zone**
-  A (High-Risk)
-  AE (High-Risk)
-  X (Low-Risk)

Note: GIS data downloaded from FGD July 2021 and sourced to FEMA



Figure 15
Floodplain Impact Map
West Orange Trail
Extension Study

Environmental Impacts

Contamination Sites

Contaminated sites within the recommended alternatives were identified using the DOH and the FDEP GIS data.

Rock Springs Road Recommended Alternative

There are no documented potentially contaminated or NPDES sites located within the Rock Springs Road recommended alternative (Exhibit A in **Appendix J**). However, there are numerous contamination and NPDES sites located adjacent to this recommended alternative. These sites include two storage tank contamination monitoring, ten NPDES sites, one biomedical waste facility, two USEPA RCRA sites, two hazardous waste facility, two SUPER Act risk sources, and two PCMS.

Welch Road Recommended Alternative

There are no documented potentially contaminated or NPDES sites located within the Welch Road recommended alternative (Exhibit A in **Appendix J**). However, there are numerous sites adjacent to this recommended alternative, including eight NPDES sites and three biomedical waste facilities.

Ponkan Road Recommended Alternative

There are no documented potentially contaminated or NPDES sites located within the Ponkan Road recommended alternative (Exhibit A in **Appendix J**). There are several sites adjacent to this recommended alternative, including three NPDES sites, two EPA RCRA sites, and two hazardous waste facilities.

It is unlikely that contamination would affect completion of any of the recommended alternatives. **Table 35** lists the contamination and NPDES sites immediately adjacent to each recommended alternative.

Table 35 | Contamination and NPDES Site near Recommended Alternative

Recommended alternative	Contamination Sites	NPDES Sites
Rock Springs Road	11	10
Welch Road	3	8
Ponkan Road	4	3

No Phase I Environmental Assessment has been completed for any of the recommended alternatives, and it is anticipated that the recommended alternatives will not impact any potentially contaminated sites.

Cultural and Social Facilities

Cultural and social facilities include, but are not limited to, trails, parks, schools, healthcare, and recreational areas, as well as the neighborhoods they serve. Many of these features are protected under the DOT Act of 1966, section 4(f), which limits the use of public land for federally funded transportation projects. The locations of cultural and social facilities are provided as Exhibit B in **Appendix J**. The recommended alternatives are primarily located within the existing ROWs of the adjacent roads. No social or cultural facilities are located within the recommended alternatives, and

these alternatives would improve and expand connections between these facilities and existing trails, benefiting the surrounding communities and neighborhoods.

Rock Springs Road Recommended Alternative

As shown in **Appendix J**, Exhibit B, there are three parks adjacent to the Rock Springs Road recommended alternative, Camp Joy, Kelly Park, and Wekiwa Springs State Park. These parks contain campgrounds, multi-use trails, natural areas, and water access. All three parks also are classified as conservation lands. Camp Joy is bundled with Kelly Park as a single conservation land given their adjacency, and these parks are owned and managed by Orange County. The other conservation land, Wekiwa Springs State Park (Park), is owned by the Trustees of the Internal Improvement Trust Fund (TIITF), and it is operated by FDEP. The Park includes different types of habitats such as a spring-run stream, scrub oak, mesic flatwoods, and wet prairies. Two existing trails intersect the Rock Springs Road recommended alternative. In addition to the parks, there are two religious centers (Rock Springs First Baptist Church and Palabra Miel of Orlando, Florida) one school (Rock Springs Elementary) adjacent to the west side of Rock Springs Road. No school property is located within the Rock Springs Road recommended alternative. This recommended alternative is being constructed to improve and expand the connections with West Orange Trail and other existing trails in the region. It is likely to benefit adjacent cultural and social facilities and the communities they serve.

Welch Road Recommended Alternative

As shown in **Appendix J**, Exhibit B, there is one religious center (Crossroads Church) and one healthcare center (the Walgreens owned Take Care Health Services), that are adjacent to Welch Road recommended alternative. The Welch Road recommended alternative would connect the church and healthcare center to the West Orange Trail. This recommended alternative is not likely to negatively impact the adjacent facilities.

Ponkan Road Recommended Alternative

For the Ponkan Road recommended alternative, there are two adjacent schools, Wolf Lake Elementary and Wolf Lake Middle School (Exhibit B in **Appendix J**). The Ponkan Road recommended alternative would improve the connection of these schools to the West Orange Trail. It is unlikely that the proposed project would negatively impact either of these facilities.

Archaeological and Historical Resources

Archaeological and historical resources are defined by the NHPA of 1966 and governed by federal and state regulations. Section 106 of the NHPA provides a general process for historical resource assessments and requires that historic and archaeological resources be considered in project planning for federally funded or permitted projects. Cultural resources or “historic properties” include any “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the NRHP.”

As depicted in Exhibit C of **Appendix J**, no archaeological sites or historic resources that are listed in the NRHP, determined eligible for listing, or considered potentially eligible for listing by the SHPO in the NRHP are located within the Rock Springs Road, Ponkan Road, or Welch Road recommended alternatives.

Rock Springs Road Recommended Alternative

No Cultural Resource Assessment Surveys (CRAS) have been completed within the boundaries of the Rock Springs Road recommended alternative, which is located on the east side of Rock Springs Road (Exhibit C of **Appendix J**). However, a survey was completed on the west side of Rock Springs Road in 2015 for the Central Florida Expressway Authority (CFX) (then known as the Orlando-Orange County Expressway Authority (OOCEA)), and multiple buildings in the vicinity of this recommended alternative have been evaluated for inclusion in the NRHP. No buildings adjacent to the west side of Rock Springs Road are listed in the NRHP, determined eligible for listing, or considered potentially eligible for listing by the SHPO. All of these structures have been evaluated for inclusion in the NRHP, and all have been determined to be ineligible for listing. One structure (site ID # OR07825, 3707 North Rock Springs Road) on the east side of the road is listed as a potential contributor to a National Register Historic District but ineligible for listing in the NRHP. It has not been evaluated by SHPO. The Rock Springs Road recommended alternative is unlikely to negatively impact historic or archaeological sites.

Welch Road Recommended Alternative

A small portion of the Welch Road Recommended alternative located immediately west of Majestic Oak Drive was included in a CRAS conducted in 2010 for the Orange County Wastewater System Improvements, Phase II (Exhibit C of **Appendix J**). No structures or archaeological sites were identified for evaluation during this survey. An additional CRAS was conducted south of Welch Road, but it did not include the Welch Road recommended alternative. One building adjacent to the south side of Welch Road was evaluated for inclusion in the NRHP, and it was determined to be ineligible for listing. The Welch Road recommended alternative is unlikely to negatively impact historic or archaeological resources.

Ponkan Road Recommended Alternative

The portion of the Ponkan Road recommended alternative located west of Vick Road was included in the CRAS conducted in 2015 for the OOCEA (Exhibit C of **Appendix J**). Multiple structures in the vicinity of this recommended alternative have been evaluated for inclusion in the NRHP, and all have been determined to be ineligible for listing. The Ponkan Road recommended alternative is unlikely to negatively impact historic or archaeological sites.

Hydraulic and Natural Features

Existing literature and publicly available GIS data sources includes, but not limited to, the data and maps of the US Army Corps of Engineers (USACE), FNAI, SJRWMD, FDEP, Florida Land Use, Cover, and Forms Classification System (FLUCFCS), NRCS, FWC Habitat Model Data, USFWS.

Soils

Soil types were mapped for the three recommended alternatives using GIS data obtained from the NRCS. **Table 36** provides an overview of the soils found within the three recommended alternatives. The NRCS soils map for the recommended alternatives can be found as Exhibit D in **Appendix J**.

Table 36 | Summary of Soil Types Within the Recommended Alternatives

Map Unit Symbol	Map Unit Name	Total Acreage	Percent of Total	Hydric Status	Recommended Alternative
2	Archbold fine sand, 0 to 5 percent slopes	0.87	3.12%	Non-Hydric Soil	Rock Springs Road Welch Road
3	Basinger fine sand, depressional	1.12	4.01%	Hydric Soil	Rock Springs Road Welch Road
4	Candler fine sand, 0 to 5 percent slopes	5.40	19.35%	Non-Hydric Soil	Rock Springs Road Ponkan Road Welch Road
5	Candler fine sand, 5 to 12 percent slopes	4.71	16.88%	Non-Hydric Soil	Rock Springs Road Ponkan Road Welch Road
6	Candler-Apopka fine sands, 5 to 12 percent slopes	1.83	6.56%	Non-Hydric Soil	Rock Springs Road Ponkan Road Welch Road
28	Florahome fine sand, 0 to 5 percent slopes	0.71	2.54%	Non-Hydric Soil	Welch Road
34	Pomello fine sand, 0 to 5 percent slopes	0.53	1.90%	Hydric Inclusions	Rock Springs Road
37	St. Johns fine sand	0.15	0.54%	Hydric Inclusions	Rock Springs Road
44	Smyrna fine sand	0.57	2.04%	Hydric Inclusions	Rock Springs Road Welch Road
46	Tavares fine sand, 0 to 5 percent slopes	2.98	10.68%	Non-Hydric Soil	Rock Springs Road Ponkan Road Welch Road
47	Tavares-Millhopper fine sands, 0 to 5 percent slopes	8.68	31.13%	Non-Hydric Soil	Rock Springs Road Ponkan Road Welch Road
54	Zolfo fine sand	0.35	1.25%	Non-Hydric Soil	Welch Road
Totals for Area of Interest		27.90	100.00%		

Source: NRCS and USDA

A description of soil types found within the recommended alternatives can be found in the environmental characteristics section of the existing conditions chapter in this report.

Wetlands and Other Surface Waters

The wetland and surface water analysis used the 2019 SJRWMD Land Use and Cover data. The data shows that there are two wetland areas mapped within the Welch Road recommended alternative as identified in **Table 37**. No wetlands or surface waters are mapped within the Rock Springs Road or Ponkan Road recommended alternatives. A map of wetlands and surface waters can be found as Exhibit F in **Appendix J**.

Table 37 | Summary of Wetland and Surface Water Acreage within Welch Road Recommended Alternative

FLUCFCS Code	FLUCFCS Description	Acres
630	Wetland Forested Mixed	0.19
641	Freshwater Marshes	0.23

Source: FGDL, USFWS, SJRWMD

The recommended alternative is expected to use the existing road ROW for construction and extension of the West Orange Trail; however, if wetland or surface water impacts cannot be avoided, then permits from the SJRWMD and FDEP will be required. For the unavoidable wetland impacts, wetland mitigation will be required in accordance with state and federal wetland permitting requirements. The recommended alternatives fall within the Wekiva River Nested drainage basin. Two mitigation banks serve the Wekiva River Nested drainage basin, the Wekiva River Mitigation Bank and Blackwater Creek Mitigation Bank. Both mitigation banks have available credits.

Wildlife Corridors and Crossings

Wildlife corridors typically consist of a large area of natural preserved habitats in the form of wetlands, forests, and prairies that support many wildlife species. Structures such as roads and housing development separate the corridors. Wildlife corridors usually support the movement of multiple species to promote diversity and provide access to resources such as surface waters and suitable foraging habitats. Improved habitat connectivity, road permeability, and deterrents to crossing roads are all important factors when developing mitigation strategies for wildlife on road projects. In the existing conditions, five potential wildlife crossings were identified for further analysis. Therefore, a review of the FDOT Wildlife Crossing Guidelines (2018) was conducted, and the location of the potential wildlife crossings were deemed inappropriate for these recommended alternatives because there are no conservation areas, public lands, or other lands protected from development present on both sides of the recommended alternatives that would facilitate wildlife movement through the area.

Threatened and Endangered Species

The FNAI and GIS data and an Information for Planning and Conservation (IPaC) from the USFWS and the FWC identified protected species with the potential to occur and CFA and Consultation Areas for threatened and endangered species within the recommended alternatives. Consultation Areas, identified by USFWS, encompass all areas where populations are known to exist and where agency involvement may be necessary.

Table 38 provides a summary of threatened and endangered species with the potential to occur within and adjacent to the recommended alternatives. A map of protected species can be found as Exhibit G in **Appendix J**.

Table 38 | Summary of Protected Species with the Potential to Occur

Fauna	Federal Status	State Status	Probability of Occurrence
<u>Avian</u>			
Florida Sandhill Crane (<i>Antigone canadensis pratensis</i>)	NL	T	Low
Florida Scrub-jay (<i>Aphelocoma coerulescens</i>)	T	T	Low
American Bald Eagle (<i>Haliaeetus leucocephalus</i>)*	NL	NL	Low
Eastern Black Rail (<i>Laterallus jamaicensis</i>)	T	T	Low
Wood Stork (<i>Mycteria americana</i>)	T	T	Moderate
Audubon's Crested Caracara (<i>Polyborus plancus audubonii</i>)	T	T	Low
Everglade snail kite (<i>Rostrhamus sociabilis plumbeus</i>)	E	E	Low
<u>Reptiles</u>			
Eastern Indigo Snake (<i>Drymarchon couperi</i>)	T	T	Low
Gopher Tortoise (<i>Gopher polyphemus</i>)	C	T	Moderate
Short-tailed Snake (<i>Lampropeltis extenuata</i>)	NL	T	Low
Sand Skink (<i>Plestiodon reynoldsi</i>)	T	T	Low
<u>Mammals</u>			
Florida Black Bear (<i>Ursus americanus floridanus</i>)**	NL*	NL*	Moderate
<u>Flora</u>			
Incised Grove-burr (<i>Agrimonia incisa</i>)	T	T	Low
Variable-leaved Indian-plantain (<i>Arnoglossum diversifolium</i>)	NL	T	Low
Florida Bonamia (<i>Bonamia grandiflora</i>)	T	T	Low
Many-flowered Grass-pink (<i>Calopogon multiflorus</i>)	NL	T	Low
Chapmans's Sedge (<i>Carex chapmanii</i>)	NL	T	Low
Sand butterfly pea (<i>Centrosema arenicola</i>)	NL	E	Low
Pigeon wings (<i>Clitoria fragrans</i>)	T	T	Low
Piedmont Jointgrass (<i>Coelorachis tuberculosa</i>)	NL	T	Low
Cutthroat Grass (<i>Coleataenia abscissum</i>)	NL	E	Low
Beautiful Pawpaw (<i>Deeringothamnus pulchellus</i>)	E	E	Low
Scrub Buckwheat (<i>Eriogonum longifolium</i> var. <i>gnaphalifolium</i>)	T	T	Low
Hartwrightia (<i>Hartwrightia floridana</i>)	NL	T	Low
Star Anise (<i>Illicium parviflorum</i>)	NL	E	Low
Nodding Pinweed (<i>Lechea cernua</i>)	NL	T	Low
Scrub Lupine (<i>Lupinus aridorum</i>)	E	E	Low
Florida Spiny-pod (<i>Matelea floridana</i>)	NL	E	Low
Pinesap (<i>Monotropa hypopithys</i>)	NL	E	Low
Celestial Lily (<i>Nemastylis floridana</i>)	NL	E	Low

Fauna	Federal Status	State Status	Probability of Occurrence
Florida Beargrass (<i>Nolina atopocarpa</i>)	NL	T	Low
Britton's Beargrass (<i>Nolina brittoniana</i>)	E	E	Low
Papery Whitlow-wort (<i>Paronychia chartacea</i>)	T	T	Low
Lewton's Polygala (<i>Polygala lewtonii</i>)	E	E	Low
Sandlace (<i>Polygonella myriophylla</i>)	E	E	Low
Scrub Plum (<i>Prunus geniculata</i>)	E	E	Low
Giant Orchid (<i>Pteroglossaspis ecristata</i>)	NL	T	Low
Florida Willow (<i>Salix floridana</i>)	NL	E	Low
Scrub Stylisma (<i>Stylisma abdita</i>)	NL	E	Low
Clasping Warea (<i>Warea amplexifolia</i>)	E	FE	Low
Carter's Warea (<i>Warea carteri</i>)	E	FE	Low

Source: US Fish and Wildlife Service (USFWS); Florida Natural Areas Inventory (FNAI).

F = Federally

E = Endangered: species in danger of extinction throughout all or a significant portion of its range.

T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service

NL = Not currently listed

*Protected by the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act of 1918.

**FAC 68A-4.009

Based on the IPaC and FNAI searches, twelve (12) protected wildlife species have the potential to occupy habitats within and immediately adjacent to the recommended alternatives, and some species have a higher probability of occurrence than others. The types of habitats found in the vicinity of the recommended alternatives were assessed to determinate the likelihood of occurrence of each listed species as described below.

Federally Protected Species

Avian

Audubon's Crested Caracara – The Audubon's crested caracara is listed as Threatened by the USFWS, but the recommended alternatives do not lie within the USFWS Consultation Area for this species. The crested caracara typically inhabits prairies and pastures with scattered cabbage palms, wooded areas with scattered saw palmetto, cypress, and scrub oaks. The recommended alternatives primarily include ROW for existing roadway. It is unlikely that crested caracara would nest or forage within the recommended alternatives, and it is unlikely that formal consultation for this species would be required by USFWS. Because the recommended alternatives are not within the Consultation Area, it is anticipated that the recommended alternatives will have no effect on the Audubon's crested caracara.

Eastern Black Rail – The eastern black rail is listed as Threatened by the USFWS and FWC. The black rail prefers dense marshes where they can remain undetected and elusive. They are usually located by their vocalizations, but the full extent of their habitat remains unknown. Due to their elusive nature and habitat preference, the likelihood of this species utilizing the recommended alternatives is low.

Because the recommended alternatives are located predominately on existing road ROWs, it is anticipated that they will have no effect on the eastern black rail.

Everglade snail kite – The Everglade snail kite is listed as Endangered by the USFWS, and the project falls within the USFWS Consultation Area for this species. Snail kites are generally found in lowland freshwater marshes and the shallow vegetated edges of lakes where they feed almost exclusively on apple snails (*Pomacea* spp.). Freshwater marshes or shallow vegetated lakes are located outside of the recommended alternatives in several locations (Prevatt Lake, Wolf Lake, Lake Cora, and Lake Merrill). Due to the density of urban growth and development in the area and the presence of more suitable habitat within Wekiwa Springs State Park, the likelihood of this species utilizing habitats within the recommended alternative is low. It is anticipated that the recommended alternatives will have no effect on the everglade snail kite.

Florida Scrub-jay – The Florida scrub jay is listed as Threatened by the USFWS and FWC. The scrub-jay prefers relict oak-dominated scrub or xeric oak scrub habitat and requires a permanent 25-acre territory. While the recommended alternatives are within the USFWS Consultation Area for scrub jays, there appears to be no scrub or suitable habitat for the scrub-jay located within or adjacent to the recommended alternatives. The likelihood of scrub-jays utilizing the area is low due to urbanized nature of the land use surrounding the recommended alternatives, and these alternatives will be constructed predominately within existing maintained ROW. According to the FDOT Programmatic Approach for Minor Transportation Activities (2021), because the recommended alternatives are not occupied, the project will have no effect on the Florida scrub-jay.

Wood Stork – The wood stork is listed as Threatened by the USFWS and FWC and consultation with the USFWS is required for any proposed work that impacts wood stork core foraging habitat (primarily shallow, non-forested wetlands and surface waters) within defined CFA. The recommended alternatives are located within the designated CFA for this species, with the closest known nest (Lawne Lake) located approximately 12.05 miles to the south. There is potential suitable foraging habitat (SFH) in the Welch Road recommended alternative in the form of wetlands and surface waters, so the likelihood of this species utilizing this recommended alternative for foraging is moderate. Below lists the sequence of selections when following The Corps of Engineers, Jacksonville District, USFWS, Jacksonville Ecological Services Field Office and State of Florida Effect Determination Key for the Wood Stork in Central and North Peninsular Florida (2008):

- A. The proposed recommended alternative is located more than 2,500 feet from a colony site;
- B. Project may impact suitable foraging habitat (SFH); and
- C. Project impacts to SFH are less than or equal to 0.5 acre.

Therefore, the Welch Road recommended alternatives may affect, but is not likely to adversely affect, the wood stork. The Rock Springs Road and Ponkan Road recommended alternatives will not impact any SFH, therefore, it is anticipated that these recommended alternatives would have no effect on the wood stork.

Reptiles

Eastern Indigo Snake – The eastern indigo snake is listed as Threatened by the USFWS and FWC. The indigo snake prefers pine flatwoods, hardwood forests, moist hammocks, and areas that surround cypress swamps. Their habitat is also closely associated with gopher tortoise burrows. If any gopher tortoise burrows are found in the recommended alternatives, the Standard Protection Measures for the eastern Indigo Snake (revised August 12, 2013) will be followed during construction activities. Since the recommended alternatives mainly consist of maintained road ROW, the likelihood of indigo snakes utilizing the area is low. Below lists the sequence of selections following The Corps of Engineers, Jacksonville District, USFWS, Jacksonville Ecological Services Field Office and State of Florida Eastern Indigo Snake Programmatic Effect Determination Key (2013):

- A. Project is not located in open water or salt marsh;
- B. Permit will be conditioned for use of the Service's *Standard Protection Measures for the Eastern Indigo Snake* during site preparation and project construction;
- C. There are gopher tortoise burrows, holes, cavities, or other refugia where a snake could be buried or trapped and injured during project activities;
- D. The project will impact less than 25 acres of xeric habitat or less than 25 active and inactive gopher tortoise burrows;
- E. Any permit will be conditioned such that all gopher tortoise burrows, active or inactive, will be evacuated prior to site manipulation in the vicinity of the burrow. If an indigo snake is encountered, the snake must be allowed to vacate the area prior to additional site manipulation in the vicinity. Any permit will also be conditioned such that holes, cavities, and refugia will be inspected each morning before planned site manipulation.

Therefore, it is anticipated that the recommended alternatives may affect, but are not likely to adversely affect, the eastern indigo snake. Each recommended alternative lies predominately within the maintained road ROW, and it is assumed there are fewer than 25 gopher tortoise burrows. If subsequent surveys indicate there are greater than 25 gopher tortoise burrows within any of the recommended alternatives, then the recommended alternative may affect the eastern indigo snake.

Sand Skink – The sand skink is listed as Threatened by the USFWS and FWC. All recommended alternatives lie within the USFWS Consultation Area for this species. Sand skinks are endemic to ridge habitats including rosemary scrub, scrubby flatwoods, sand pine and oak scrubs, and turkey oak ridge. Suitable habitat is found within the Mount Dora Ridge in Orange County and in well drained sandy soils that include the Apopka, Archbold, Candler, Florahome, Immokalee, Pomello, Smyrna, and Tavares soil series at elevations above 82 feet. All recommended alternatives contain suitable soils, with elevations ranging from 70 to 130 feet. In areas with surrounding development, existing roadways, and construction of the recommended alternative within maintained ROWs, the likelihood of sand skink utilizing the recommended alternative is low. Where open lands exist along undeveloped portions of the recommended alternatives, the potential for sand skink occurrence may be higher. A pedestrian survey should be conducted during the design phase to determine if the recommended alternative contains suitable habitats for sand skinks. If suitable habitat is located within the recommended alternatives, then coordination with USFWS will be required. Given that all three recommended alternatives will be constructed predominately within the maintained ROW, it is

anticipated that the recommended alternatives may affect, but are not likely to adversely affect, the sand skink.

Flora

Thirteen (13) federally listed plants may occur within the recommended alternatives based on the results of an IPaC and FNAI search. The recommended alternatives primarily include maintained ROW for an existing road, and no listed plant species are expected to occur or be disturbed during construction. Coordination with the USFWS to address listed plant occurrence may be necessary if listed plant species are found during subsequent surveys. It is anticipated that construction of the project will have no effect on federally listed plant species.

Critical Habitat

Based on the review of the USFWS IPaC search and USFWS GIS data and literature, the recommended alternatives are not located within any USFWS designated critical habitats. Therefore, no coordination with USFWS with regards to critical habitat is anticipated.

State Protected Species

Avian

Florida Sandhill Crane – The Florida sandhill crane is listed as Threatened by the FWC. The sandhill crane prefers freshwater marshes, prairies, and pastures. Their breeding season falls between December and August, and they may be found foraging within recommended alternatives due to the presence of surface waters, wetlands, and pasture grasses. Due to the density of urban growth and development, the likelihood of sandhill cranes nesting and occupying the area is low; however, the likelihood of this species utilizing the area for foraging is moderate. The recommended conservation practices provided in the FWC Florida Sandhill Crane Species Conservation Measures and Permitting Guidelines (2016) will be followed to the extent practicable, and potential habitat (surface waters, marshes, and prairies) impacts will either be avoided or minimized (less than 0.5 acres). Most of the recommended practices will not be applicable due to the scope of the project, which is a multi-use trail located within an existing maintained ROW. It is anticipated that there will be no take of sandhill cranes or their nests, and construction can be phased to avoid nesting season, if practicable. If sandhill cranes enter the construction area, construction will cease until the crane has exited of its own accord. If the recommended conservation practices are followed, it is anticipated that there will be no impacts to the Florida sandhill crane.

Reptiles

Gopher Tortoise – The gopher tortoise is listed as Threatened by the FWC, and it is a candidate for listing by the USFWS. They require well-drained, sandy soils for burrowing and can be found in scrub, dry hammock, pine flatwoods, dry prairies, mixed hardwood-pine communities, and a variety of other habitats including power line easements and roadside ROW. In accordance with FWC guidelines, a gopher tortoise survey will be required prior to the commencement of work. Should burrows be identified within 25 feet of areas that would be affected by proposed construction, a FWC permit will be needed for relocation of affected individuals. If no burrows are found, burrows can be avoided, or relocation guidelines are followed, no adverse impacts to gopher tortoises are anticipated.

Short-tailed Snake – The short-tailed snake is listed as Threatened by the FWC. The short-tailed snake prefers sandy soils, particularly longleaf pine and xeric oak sandhills, but it also may be found in scrub and xeric hammock habitats. Because the density of urban development and the construction of the recommended alternatives will primarily occur within the maintained ROW of adjacent roadways, the likelihood of this species using the recommended alternatives is low and there will be no habitat loss. Due to these factors, it is anticipated that the recommended alternative will not impact the short-tailed snake.

Flora

Sixteen (16) state-listed plants may occur within the recommended alternatives based on the results of a FNAI review. The recommended alternatives primarily include the maintained ROW for an existing road, and no listed plant species are expected to occur or be disturbed. Coordination with the Florida Department of Agricultural and Consumer Services (FDACS) to address listed plant occurrence may be necessary if listed plant species are found in subsequent surveys. However, there are no restrictions on the removal of state listed plant species for landowners unless the sale of plants is involved.

Other Protected Species

Avian

American Bald Eagle – The American bald eagle is protected under the Federal Bald and Golden Eagle Protection Act. According to the Audubon Center for Birds of Prey EagleWatch Program database and the FWC GIS database of known bald eagle nests, there are no eagle nests within 1.5 miles of the recommended alternatives. The closest known active nest (OR058) is located approximately 1.56 miles northeast of the northernmost extent of the Rock Street Road Recommended alternative, and it was recorded as active for the 2021 nesting season. The USFWS indicates that all projects greater than 660 feet from a bald eagle nest do not require USFWS coordination, and given the distance to the nest, there should be no need for USFWS consultation or review. Also, the likelihood of this species using the recommended alternatives is low; therefore, it is anticipated that the recommended alternative will have no adverse effect on bald eagles.

Mammals

Florida Black Bear - The Florida black bear has been de-listed from Florida's imperiled species list, although it still receives protection under the state's Florida Black Bear Conservation Rule; 68A- 4.009, F.A.C. This rule protects bears from intentional "take", which includes pursuing, hunting, molesting, capturing, or killing, or attempting those actions, whether or not such actions result in possession of the bear. Records for nuisance black bear reporting identify a high number of reports in proximity to the recommended alternatives. As provided in the Florida Black Bear Management Plan (2019), the recommended alternatives are located in the Central Bear Management Unit, and bear occurrences in the area around the recommended alternatives are described as frequent. FWC-established black bear best management practices for construction sites, but recommendations include temporarily halting operations until the bear has left the construction area and providing regular gaps in safety fences or other barriers to travel. Daily removal of trash from the site is also recommended. Due to the location of Wekiwa Springs State Park and the rate of bear nuisance reports in the area, the likelihood of this species using the recommended alternatives mainly for migratory movement, is moderate to

high. Due to the mobility of this species and passive use of the recommended alternatives after construction, it anticipated that the recommended alternatives would have no adverse effect to the Florida black bear.

Cost Estimates

The recommended alternative has an estimated total project cost (Rock Springs Road, Welch Road, and Ponkan Road segments) of \$20.6 million, which includes costs for final design and construction. Estimated ROW cost has not yet been determined and will be analyzed during the design phase of this project. **Table 39** provides a summary of the Recommended Alternative cost estimates by segment. The detailed construction cost estimates are included in **Appendix H**.

Table 39 | Preferred Sites Cost Estimates Summary

Recommended Alternative Segment	Estimated Design Cost (millions)	Estimated Construction Cost (millions)	Estimated Total Cost* (millions)
Rock Springs Road	\$1.7	\$6.9	\$8.6
Welch Road and Wekiwa Springs Road	\$0.8	\$4.4	\$5.2
Ponkan Road	\$1.4	\$5.4	\$6.8

Notes:

Project Costs are in 2022 dollars.

* Does not include ROW

Public Involvement

Local input was sought throughout the study process to ensure that the needs and desires of the surrounding community were accounted for. Engagement with local stakeholders and the community began early on with a survey and questions for input on the issues and opportunities. The local stakeholders and community were also engaged during the alternatives development process to guide the selection and refinement of the recommendations for the study. This section provides a summary of public outreach regarding the West Orange Trail held over the course of the study. Public involvement for the West Orange Trail Extension Study was held concurrently with the Rock Springs Road Study, also being conducted by MetroPlan Orlando.

Public Participation Plan

At the start of the study, a public participation program was developed and documented in the *Public Participation Plan (PPP)*, under separate cover. The fundamental objectives of the PPP were to:

- Allow people living and working within the study area and those who travel through the opportunity to contribute to the decision-making process
- Ensure that the concerns and issues of those with a stake in the project are identified and given opportunities to review and comment on the findings of the alternatives
- Ensure that stakeholder concerns are addressed

The PPP ensured the study's recommendation meets the needs and had greater support of the community.

Agency and Stakeholder Meetings

The following agency and stakeholder meetings took place over the course of the study. All materials associated with the stakeholder meetings including meeting summaries are included in **Appendix K**.

Agency Kickoff Meeting

An Agency Kickoff Meeting was held on April 8, 2021. The purpose of this meeting was to introduce the study to local agencies and also to gather feedback on any considerations that should be made during the study process. The meeting was attended by representatives of MetroPlan Orlando, City of Apopka, Orange County, Bike/Walk Central Florida, and the study team.

Agency Coordination Meeting #2

The second Agency Coordination Meeting was held on November 9, 2021. The purpose of this meeting was to give a presentation covering a review of survey responses, working concepts, and next steps for the West Orange Trail Extension study and to gather input from the agency stakeholders prior to the public meeting held on January 27, 2022. The meeting was attended by representatives of MetroPlan Orlando, City of Apopka, Orange County, Bike/Walk Central Florida, FDEP, Wekiwa River Basin State Park, LYNX, and the study team.

Agency Coordination Meeting #3

The final Agency Coordination Meeting was held on August 1, 2022. The purpose of this meeting was to give a presentation covering a review of public engagement, recommended alternatives, and next steps for the West Orange Trail Extension study and gather input from the agency stakeholders prior to the public meeting being held on September 22, 2022. The meeting was attended by representatives of MetroPlan Orlando, City of Apopka, Orange County, Bike/Walk Central Florida, FDEP, Wekiwa River Basin State Park, LYNX, and the study team.

Wekiwa Springs State Park Meeting

A Park Meeting was held on May 26, 2021. The purpose of this meeting was to introduce the West Orange Trail Extension Study to FDEP and also gather input and feedback on any considerations that should be made during the study process.

Business Owners Coordination Meeting

A Business Owners Coordination Meeting was held on July 19, 2021. The purpose of this meeting was to introduce the study to business owners along the study corridor and also gather input and feedback on any considerations that should be made during the study process. No participants joined the meeting.

School Meeting

A school meeting was held on November 1, 2021. The purpose of this meeting was to give a brief overview of the proposed West Orange Trail Extension Study alignments and to gather input on how students use the corridor. The meeting was by representatives of Wolf Lake Elementary and Middle Schools, Orange County Public Schools (OCPS) Transportation Services, OCPS Safety Department, OCPS Occupational Safety and Health, OCPS District 7 board, and the study team. An update email was sent to meeting attendees on December 6, 2022, to provide an update on the project progress prior to the finalization of the study.

Wekiwa Springs State Park Update Meeting

A Park Update Meeting was held on March 8, 2022. The purpose of this meeting was to present a project overview, including study purpose, alignment alternatives, public meeting overview, review of survey responses, and the study schedule, in order to gather feedback on the preferred West Orange Trail alignments bordering Wekiwa Springs State Park. FDEP was open to the idea of the trail alignment along the perimeter of the park, behind Sweetwater Village Park neighborhood, and noted that it would require an easement.

West Orange Trail Extension Resolution Meeting

A West Orange Trail Extension Resolution Meeting was held on March 8, 2022. The purpose of this meeting was to discuss Resolution No. 98-M-09, regarding trail routing along the Wekiwa Springs State Park boundary, with Orange County Parks and Recreation. The county recommendation was to adhere to the Orange County Board of County Commissioners' resolution to locate the trail along Rock Springs Road.

West Orange Trail Alternatives Selection Meeting

A West Orange Trail Alternatives Selection Meeting was held on May 3, 2022. The purpose of this meeting was to present the West Orange Trail Extension Study alternatives and analysis results for selection of preferred alternatives to move forward in the study process. Members from MetroPlan Orlando, Orange County, Orange County Parks and Recreation, City of Apopka, and the study team attended the meeting.

Project Partner Update Meeting

A Project Partner Update Meeting was held on November 4, 2022. The purpose of this meeting was to give a presentation reviewing the public feedback received during the second public meeting and survey #3 and to garner support for the final study recommendations. Members from MetroPlan Orlando, Orange County, Orange County Parks and Recreation, City of Apopka, and the study team attended the meeting.

Orange County Commissioner Briefing

An Orange County Commissioner Briefing was held on November 14, 2022. The purpose of this meeting was to review the public feedback received during the second public meeting and survey #3 and to garner support for the final study recommendations. The meeting was attended by representatives of MetroPlan Orlando, Orange County Commissioner Christine Moore, and the study team.

Wekiwa Springs State Park Update Meeting #2

A second Park Update Meeting was held on December 12, 2022. The purpose of this meeting was to review the public feedback received during the second public meeting regarding the West Orange Trail Extension and Welch Road Trail Spur, and to receive final input from staff prior to completion of the study.

Small Group Meetings

In addition to the scheduled stakeholder outreach activities, small group meetings were held during the study when necessary. **Table 40** provides a summary of the small group meetings held during the study.

Table 40 | Small Group Meetings

Participants	Date	Purpose/Outcome
Friends of Wekiva River	12/5/2022	Present overview and discuss the study recommendations, particularly proposed impacts to Wekiwa Springs State Park.
People of Wekiva Springs	12/6/2022	Present overview of study recommendations for input, particularly the Welch Road Trail Spur, to garner support from the local community for the study recommendations.

Public Meetings

Two public meetings were held during the study to solicit input from any and all interested parties that wished to engage in the planning process. The public meetings were held at two key milestones in the study (1) during the Alternatives development and selection stage and (2) during the recommended improvements refinement and documentation stage.

The following is a summary of the two public meetings.

Alternatives Community Meeting

The first public meeting was held on January 27, 2022. The purpose of the public meeting was to present the West Orange Trail Extension Study to the public and explain the alternatives developed for the trail route options in order to receive public feedback. The meeting was comprised of two elements: a live presentation, and a virtual meeting room.

The live presentation was streamed live via Zoom and on MetroPlan Orlando's YouTube page on January 27, 2022, at 6:00 p.m. Virtual attendees using Zoom were given the opportunity to ask questions to available project team panelists in a live question and answer forum. A virtual meeting room remained open to the public from January 27 to February 28, 2022. In the virtual meeting room, visitors could view a recording of the live presentation, project displays and interactive webmaps, review study documents, sign up for project update emails, and provide feedback about the study.

There were several ways the public could provide feedback on the study:

- Participating in the live Q&A session following the live presentation
- Filling out a comment form in the virtual meeting room
- Email or phone call to the project manager
- Sharing feedback in the free response sections included in the survey

The following is a summary of questions and feedback received during the Q&A session of the first public meeting:

- Questions about trailheads/facilities being proposed for the West Orange Trail
- Questions about separate bike lanes being included with the project in addition to the shared-use path
- Desire for the trail to be located along the border of Wekiwa Springs State Park
- Request for pedestrian/cycling safety and comfort to be integrated into the design process
- Questions about potential pedestrian/bicyclist safety improvements at intersections of the trail and driveways/side streets

An Alternatives Community Meeting summary is included in **Appendix K**.

Recommended Alternative Community Meeting

The second public meeting was held September 22, 2022. The purpose of the public meeting was to share the West Orange Trail Extension Study's recommended alternatives in order to receive public feedback. The meeting comprised of two elements, an in-person meeting, and an online live-stream of the presentation.

The in-person meeting was held at the City of Apopka Council Chambers and streamed live via Zoom and on MetroPlan Orlando's YouTube page on January 27, 2022, at 6:00 p.m.

There were several ways the public could provide feedback on the study:

- Participating in the live Q&A session following the live presentation (in-person and virtual)
- Attending the in-person public meeting
- Filling out a comment form
- Email or phone call to the project manager
- Sharing feedback in the free response sections included in the survey

The following is a summary of questions and feedback received during the Q&A session of the second public meeting:

- Questions about impacts of the trails to Wekiwa Springs State Park
- Questions about fencing/barriers to keep trail users out of both the state park and the homes within Sweetwater Park Village
- Desire for the Welch Road trail to continue along Welch Road and not travel behind the houses in Sweetwater Park Village
- Questions about connectivity of the West Orange Trail to other nearby trails and Wekiwa Springs State Park
- Request for trees and landscaping to be provided along the trails to provide a buffer from the roadway and protection from the sun
- Questions about the timeline and funding for the project

A Recommended Alternatives Community Meeting summary is included in **Appendix K**.

Agency Updates

Several update presentations were given to various entities during the study. Local agencies to receive an update include Apopka City Council, Apopka Development Review Committee (DRC), MetroPlan Orlando Committees, and the Orange County Commissioner Christine Moore. The following is a summary of the Agency Update presentations given during the study.

City Council Update Presentations

City Council Update #1

A presentation was given to the Apopka City Council during the January 19, 2022, regularly scheduled meeting. The presentation included an introduction to the study and an overview of the proposed West Orange Trail route options for input from the City Council prior to the Alternatives Community Meeting. Input received from the City Council following the presentation included questions regarding the cost of the project and overall timeline.

A summary of this meeting is included in **Appendix K**.

City Council Update #2

A second presentation was given to the Apopka City Council during the August 17, 2022, regularly scheduled meeting. The presentation included an overview of the study progress West Orange Trail

recommended alternatives for input from the City Council prior to the second public meeting. Input received from the City Council following the presentation include the following:

- Questions regarding the realignment of Welch Road near Ustler Road
- Questions about the trail's proximity to Wekiwa Springs State Park
- Overall support of the project and recommended trail spurs

DRC Committee Update

DRC Presentation

A presentation was given to the DRC during the January 19, 2022, regularly scheduled meeting. The presentation included an introduction to the study and an overview of the proposed West Orange Trail route options for input from the DRC Committee prior to the Alternatives Community Meeting. Input received from the DRC regarding the West Orange Trail extension study includes the following:

- Concerns about the tight spacing through the Wekiwa Springs Road and Welch Road intersection
- Comments regarding preferences for trail route alternatives
- Concern for relocating the stone wall near Cedar Glen Drive on Welch Road

A summary of this meeting is included in **Appendix K**.

MPO Committee Updates

Table 41 summarizes the update presentations given to MPO committees during the study.

Table 41 | MPO Committee Update Presentations

Committee	Date	Purpose/Outcome
MPO TSM&O Advisory Meeting	1/7/2022	To present the study alternatives for input from the Committee members prior to the Alternatives Community Meeting.
MPO Technical Advisory Committee Meeting	1/7/2022	To present the study alternatives for input from the Committee members prior to the Alternatives Community Meeting.
MPO TSM&O Advisory Meeting	12/2/2022	To present the recommended study alternatives for input from the Committee members prior to finalizing the study.
MPO Technical Advisory Committee Meeting	12/2/2022	To present the recommended alternatives for input from the Committee members prior to finalizing the study.
MPO Community Advisory Committee Meeting	12/7/2022	To present the recommended alternatives for input from the Committee members prior to finalizing the study.
MPO Municipal Advisory Committee Meeting	12/8/2022	To present the recommended alternatives for input from the Committee members prior to finalizing the study.

Additional Community Engagement

Community engagement was encouraged throughout the duration of the study. The following sections summarize the methods of additional engagement.

Website

A study website was developed and made live at the start of the study. The website was frequently updated and a constant contact list, populated by email sign up, was used through the study to provide up to date information on changes to the website and information relating to upcoming events including public meetings to the public. Reports from the study were also made available for download on the website. A record of all communication received outside of scheduled meetings was documented throughout the study.

Yard signs were placed throughout the study area along Rock Springs Road, Welch Road, and Ponkan Road for the website launch and prior to the two public meetings. The signs contained a quick response (QR) code which directed to the study website. Additionally, a mailer was distributed to all property owners adjacent to the study area for the website launch.

Public Survey

Three public surveys were conducted over the course of the study. The surveys were developed to provide the opportunity for the public to view proposed concepts and give feedback on the preferred West Orange Trail study alternatives. A copy of survey questions and responses are included in the public meeting summaries found in **Appendix K**.

Additional Coordination

A record of all communication received outside of scheduled meetings was documented throughout the study. **Table 41** provides a summary of all additional coordination.

Table 42 | Additional Coordination

Name	Date	Method	Notes
Daniel Buchholz	4/20/2022	E-Mail	Comment about Rock Springs Road Trail Alternative
Stephanie Carels	9/9/2022	Phone Call	Request for information about the proposed Welch Road Trail Spur connecting to Wekiwa Springs State Park
William Smith	9/21/2022	Phone Call	Request for information about the proposed Welch Road Trail Spur and comment expressing preference for the trail to continue along Welch Road to Wekiwa Springs Road
Reggie Kornegay	9/21/2022	Phone Call	Request for information about the proposed Welch Road Trail Spur and potential impacts to properties along Welch Road
Deborah Green	9/21/2022	E-Mail	Request for information about the potential impacts to Wekiwa Springs State Park as a result of the West Orange Trail Extension Study
John Sabo	9/25/2022	E-Mail	Request for information on next steps for property owners in Sweetwater Park Village who oppose the proposed Welch Road Trail Spur
Craig Pasek	10/5/2022	Phone Call	Comment expressing support for the West Orange Trail proposed alignments and request for bike lanes along Rock Springs Road
Brianna Dickey	10/20/2022	E-Mail	Comment opposing the Welch Road Trail Spur and potential impacts to Wekiwa Springs State Park
Joni Keams	10/20/2022	E-Mail	Comment expressing concerns for congestion, homeowner safety, and wildlife impacts as a result of the Welch Road Trail Spur wrapping around the Sweetwater Park Village
Leigh Ann Whalen	10/20/2022	Phone Call	Expressed concerns for homeowner safety and requested information about a potential barrier between the Welch Road Trail Spur and residential properties
Anthony Mancuso	10/20/2022	Phone Call	Comment expressing opposition to the Welch Road Trail Spur running behind Sweetwater Park Village
Aaron Blaise	10/20/2022	Phone Call	Comment expressing opposition to the Welch Road Trail Spur running behind Sweetwater Park Village due to concerns about negative impacts to wildlife and residential properties
Tim O'Connor	10/21/2022	E-Mail	Comment expressing concerns for congestion and homeowner safety as a result of the proposed Welch Road Trail wrapping around Sweetwater Park Village

Next Steps

The next steps for the West Orange Trail Phase 4 Trail Extension are design and ROW acquisition. The design phase will refine the conceptual plans recommended in this corridor study to provide implementable construction plans for the trail. Based on the current MetroPlan Orlando MTP, the design phase (and subsequent phases) for the different segments will occur at different times.

For the segment along Rock Springs Road, both the design and ROW acquisition phases are included in the MetroPlan Orlando MTP for Plan Period II (2031-2035) (with additional local funding still needed for ROW acquisition). Following design and ROW acquisition, the environmental, construction, and CEI phases are included in Planning Period III (2036 – 2045) of the MTP (with additional local funding still needed for construction).

For the Welch Road spur, the design, ROW acquisition, and environmental phases are included in Planning Period III (2036 – 2045); the construction and CEI phases are unfunded at this time.

For the Ponkan Road spur, no future phases are currently funded.