SCHOOL ROUTES ANALYSIS

RIVIERA ELEMENTARY SCHOOL

ASSESSMENT & IMPLEMENTATION REPORT

JULY 2020

SPACE COAST TPO

KITTELSON & ASSOCIATES

School Routes Analysis

Riviera Elementary School

Palm Bay, FL

Assessment & Implementation Report

July 2020

Prepared for:

Space Coast Transportation Planning Organization (SCTPO)
2725 Judge Fran Jamieson Way,
Bldg. B, Room 105,
Melbourne, FL 32940

Prepared by:

Kittelson and Associates, Inc.
225 E Robinson Street,
Suite 355,
Orlando, FL 32801

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Executive Summary

Space Coast Transportation Planning Organization (SCTPO) with assistance from Kittelson & Associates, Inc. (KAI) documented existing conditions and developed Safe Routes to School (SRTS) recommendations for nine schools as part of the School Routes Analysis (SRA) project. The nine study schools were selected by the cities of Melbourne and Palm Bay prior to this project. The analysis reviewed the 'study areas' that were identified based on walk zones and attendance boundaries around the nine study schools. This SRA project is intended to serve as a pilot to establish a study methodology that can be replicated at other schools within Brevard County. This report documents the assessment of the existing conditions and lists recommendations for Riviera Elementary School located at 351 Riviera Drive, Palm Bay, FL 32905.

Purpose

The purpose of this project is to create a safe environment for students to walk or bike to school. The goal for the assessment phase of the SRA is to provide the SCTPO with a comprehensive study that will document the observed pedestrian and bicycle circulation routes adjacent to the school site, identify issues associated with student pedestrians and bicyclists within the study area, and make recommendations for improvement. The goal for the implementation phase of this study is to develop recommendations from the assessment phase to create a safer environment for children who live within the walk zone and choose to walk or bicycle to and from the school.

Many local, state, and federal laws require transportation agencies to focus on pedestrian and bicyclist infrastructure as part of the overall transportation network. The Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU) of 2005 established the Safe Routes to School program that explicitly focused on funding projects to enhance pedestrian and bicyclist infrastructure near schools. Fixing America's Surface Transportation Act (FAST) of 2015 reinforces the Safe Routes to School program. The analysis in the report is to identify projects that could be funded by the State of Florida's Safe Routes to School program or other transportation funding.

Study Process

A study area was identified for the school based on the respective school's walk zone and attendance boundary to determine where students walk and bike. As part of stakeholder engagement, a Technical Committee (TC) was established. The TC was comprised of representatives from the City of Melbourne, the City of Palm Bay, Brevard County Planning, Public Works, and Public Schools, and the Florida Department of Transportation (FDOT). The TC functioned as a sounding board for the Project Team and acted as liaisons for their respective agencies throughout the planning process.

As part of the Assessment Phase of the project, existing conditions, crash data, and survey data were analyzed and mapped prior to the school coordination meeting. The school coordination meeting, comprising of relevant TC members and school administration, was conducted a day prior to the field review at the school campus. A field review of the school's study area was conducted to observe current pedestrian and bicyclist behaviors.

As part of the Implementation Phase of the project, a list of draft issues and recommendations were developed. Recommendations were based on the input received at the school coordination meeting and field review observations. The draft list of recommendations was revised and finalized based on feedback received from TC members. Planning-level cost estimates were calculated for the final recommendations. **Figure 1** graphically shows the study process. Recommendations for Riviera Elementary School are summarized in **Table 1**.

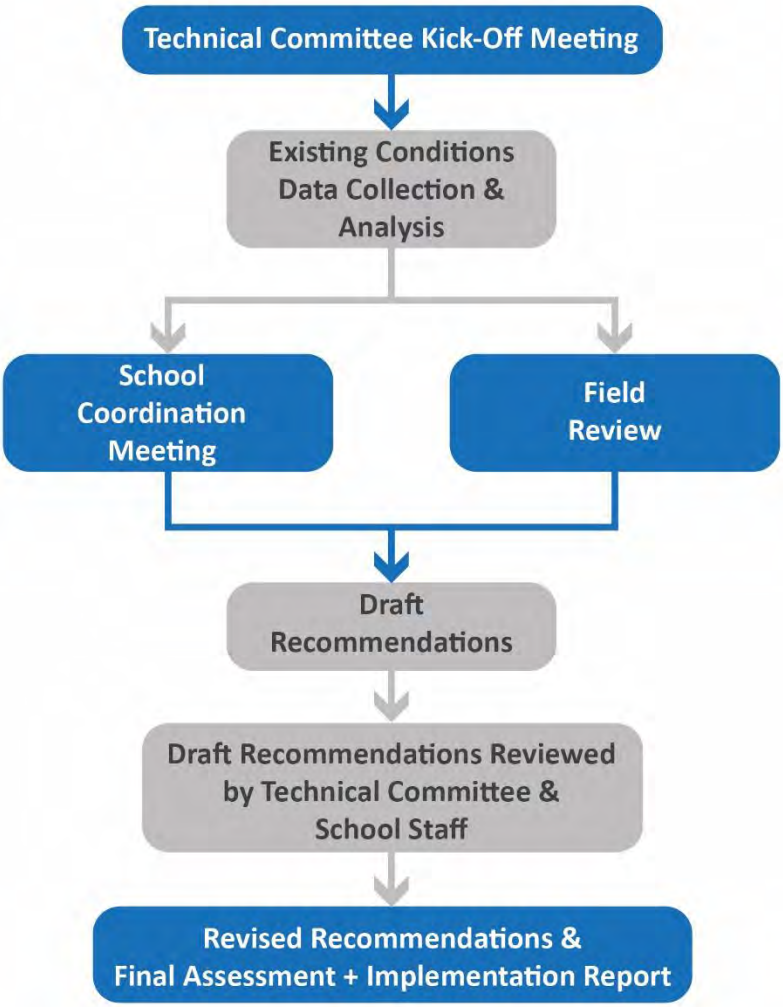


Figure 1: Study Process

Table 1: Recommendations Summary

School Campus Recommendations					
No.	**Location**	**Recommendation**	**Type**	**Time-Frame**	**Cost Estimate**
1	Bus loop and parent drop-off/pick-up loop	Switch the bus loop and parent drop-off/pick-up loop to provide more space for cars to stack during student drop-off/pick-up.	School Circulation	Near-Term	No Anticipated Cost
2	Between bus loop driveway and parent drop-off/pick-up entrance driveway	Extend the concrete separator between the two southern driveways west to the crosswalk to prevent the northbound right turning vehicles from driving in the crosswalk while turning into the school. Construct a pedestrian ramp at the concrete separator to provide a connection for students traveling northbound along Riviera Drive to the school campus.	Crossing	Near-Term	<$10,000
3	Grass area between Riviera Drive and the staff/parent parking lot in front of the school	Add wooden "fairground style" fencing along the edge of the sidewalk to prevent vehicles from parking in the grass to drop-off/pick-up their student.	School Circulation	Near-Term	$15,000 to $20,000
4	School campus	Restripe the crosswalks to be high-visibility crosswalks.	Crossing	Near-Term	<$10,000

Study Area Recommendations					
No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
5	Mariposa Drive and Mascot Street	Restripe crosswalks to be high-visibility crosswalks. Upgrade/install ADA compliant pedestrian ramps. Construct a raised intersection.	Crossing	Near-Term	$90,000 to $105,000
6	Riviera Drive from Tavernier Circle to just south of Craftsland Lane and Riviera Drive from just north of Lash Street to just south of Dawn Street	Build 5 to 6 foot wide sidewalks on both sides of roadway to fill in sidewalk gaps along Riviera Drive.	Sidewalk	Near-Term	$515,000 to $600,000
7	Riviera Drive just south of first school entrance/driveway	Construct a right turn lane for vehicles turning right into the bus loop and parent drop-off/pick-up loop to stack in.	Roadway	Near-Term	$305,000 to $360,000
8	Riviera Drive from Palm Bay Road to Port Malabar Boulevard	Add traffic calming elements along Riviera Drive.	Traffic Calming	Long-Term	Further Study Required
9	Mariposa Drive from Riviera Drive to Port Malabar Boulevard	Add traffic calming elements along Mariposa Drive.	Traffic Calming	Long-Term	Further Study Required

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
10	Sidewalk from Mariposa Drive to the eastern entrance to school	Add lighting along the sidewalk to increase visibility and safety.	Lighting	Long-Term	Further Study Required
11	Sidewalk from Mariposa Drive to the eastern entrance to school	Clear understory vegetation in the vicinity of the sidewalk and increase enforcement for homeless camps near the sidewalk.	Enforcement	Near-Term	Clearing Vegetation is Routine Maintenance and Enforcement Requires Staff Coordination
12	Mid-block crossing along Riviera Drive just west of Meadowbrook Road	Construct a RRFB at the mid-block crossing.	Crossing	Long-Term	$25,000 to $30,000
13	Driveways to school along Riviera Drive	Restripe crosswalks at the three driveways along the school to be high-visibility crosswalks.	Crossing	Near-Term	$15,000 to $20,000

Assessment

This section of the report documents the existing conditions within the Riviera Elementary School study area and summarizes the student and parent survey data, crash analysis, school coordination meeting, and observations from the field review.

A study area was developed for each school. The study area is the walk zone defined as the two mile walking radius within the school's attendance boundary around the school where no school bus service is provided. The study area excludes pedestrian hazardous areas within the two mile walking radius. Pedestrian hazardous areas are generally identified as areas that are separated from the school by major physical barriers such as highways or rivers.

Existing Conditions Mapping & Analysis

A series of maps were prepared to show the existing conditions within the Riviera Elementary School study area including existing and proposed pedestrian and bicycle infrastructure, traffic data, crash data, and school circulation patterns. These maps were developed through GIS data collection, review of previous studies and plans, aerial satellite imagery, input from the TC, and observations from the field visit.

Previous and Ongoing Studies

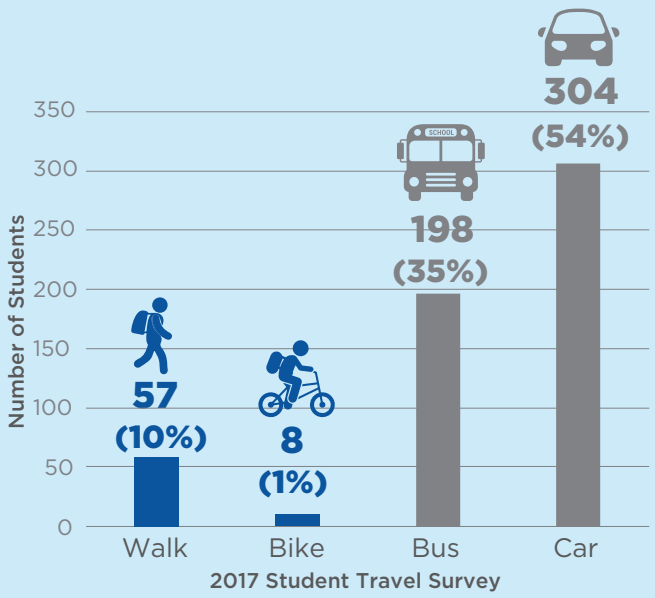
The SR 507 (Babcock Street) Corridor Planning Study is an ongoing study by FDOT and spans along Babcock Street from Palm Bay Road to US 192. This study is currently evaluating and making recommendations for operational, safety, and multi-modal improvements along the corridor.

The Palm Bay Road Pedestrian and Bicycle Safety Review was completed in 2016 by SCTPO and spans along Palm Bay Road from Babcock Street to Lipscomb Street. This study evaluated pedestrian and bicycle safety issues along the corridor and listed recommendations for improvement.

The SR 507 (Babcock Street) Widening project is an FDOT project which spans along Babcock Street from Malabar Road to Palm Bay Road. This project plans to widen Babcock Street from four-lanes to six-lanes. The design phase of the project has been completed. Right-of-way acquisition and construction are currently unfunded. The SCTPO preformed a Road Safety Audit on the six-lane design in 2016.

Figure 2 is an info-graphic summarizing the main background information collected as part of the existing conditions analysis.

Student Travel Modes (2017)



2017 Student Travel Survey

Total Bicycle & Pedestrian Crashes within Study Area

3 Pedestrian

12 Bicycle

School Aged Bicycle & Pedestrian Crashes within Study Area

1 Pedestrian

2 Bicycle

1 Fatal

1 Property Damage Only

1 Injury

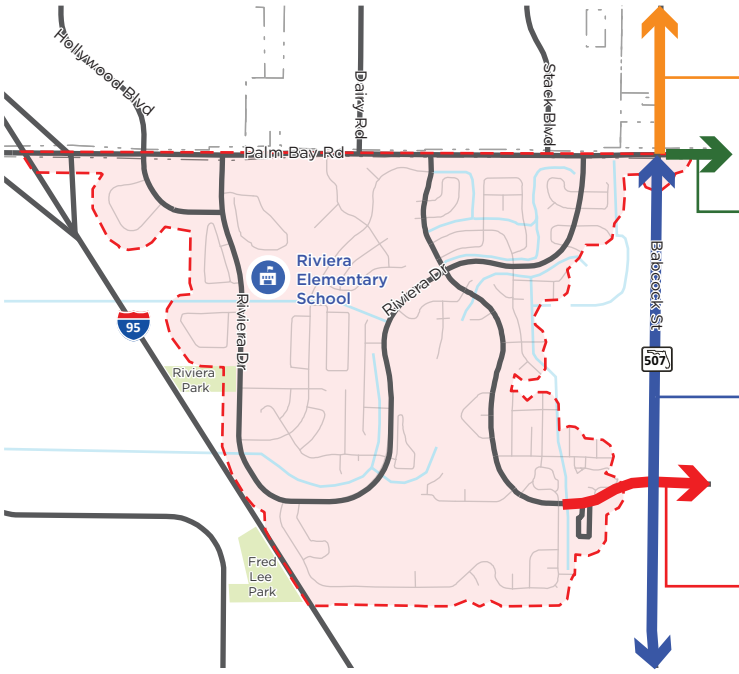
2014 to 2018 Crashes from University of Florida's Signal Four Analytics Database

Signals and Crossings within Study Area

9 Signalized Intersections

6 Unsignalized Marked Crosswalks Across Major Streets

2 Crossing Guards at Larch Cir. & Riviera Dr. Mascot St. & Mariposa Dr.



Previous & Ongoing Plans

SR 507 (Babcock Street) Corridor Planning Study

- Evaluate operational, safety, and multi-modal improvements from Palm Bay Road to US 192.

Palm Bay Road Pedestrian/Bicycle Safety Review

- Evaluated pedestrian/bicycle safety and provided suggestions for improvement from Babcock Street to Lipscomb Street.

SR 507 (Babcock Street) Widening

- Widen existing four-lane roadway to six-lane, divided roadway.
- SCTPO performed Road Safety Audit on 6-lane design plans in 2016.

Bicycle & Pedestrian Master Plan (2019)

- Bicycle facilities prioritized along Port Malabar Boulevard.

Figure 2: Background Information

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Riviera Elementary School

Existing and Planned Bicycle and Pedestrian Facilities

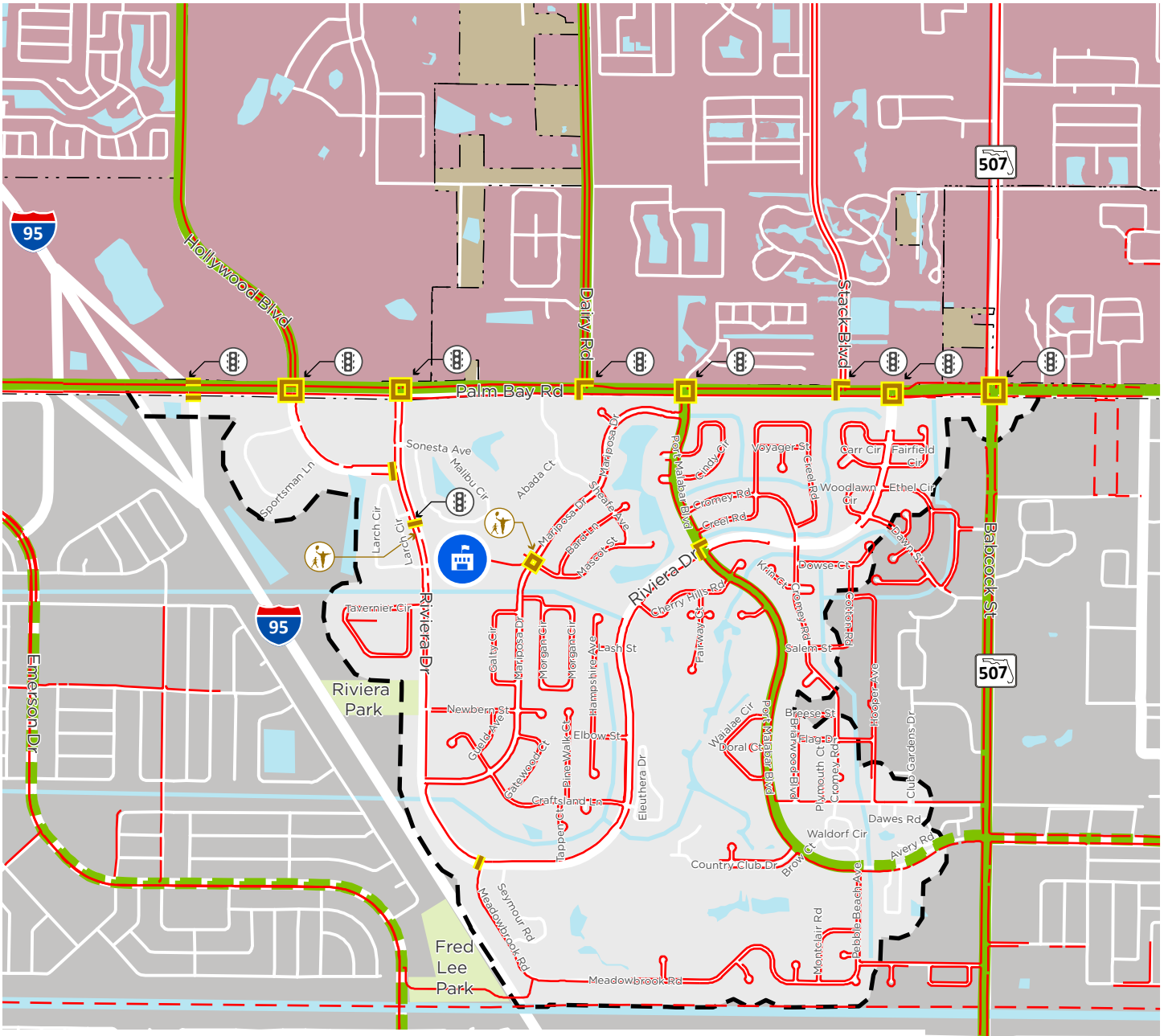
Existing and planned pedestrian and bicycle facilities including sidewalks, bike lanes, trails, crosswalks, signals, and crossing guard locations were mapped and analyzed. The datasets were mapped using GIS data provided by the City of Palm Bay and SCTPO as well as utilizing aerial satellite imagery and field review observations.

Palm Bay Road and Mariposa Drive have sidewalks on both sides of the roadway. Riviera Drive and Port Malabar Boulevard have sidewalks on at least one side of the roadway within the study area. The neighborhoods east of the school have sidewalks on both sides of the roadway.

Bicycle facilities located within the study area are along Palm Bay Road and along Port Malabar Boulevard from Palm Pay Road to Pebble Beach Avenue. Currently proposed bicycle facilities were mapped using recommendations from the SCTPO Bicycle and Pedestrian Master Plan. Bicycle facilities are proposed along Port Malabar Road from Pebble Beach Avenue to the eastern boundary of the study area.

Signalized intersections and marked crosswalks across major streets were mapped using data from aerial satellite imagery. There are eight signalized intersections and one signalized pedestrian crossing within the study area. There are unsignalized marked crosswalks at the intersection of Mariposa Drive and Mascot Street and Port Malabar Road and Riviera Drive. Crossing guard information was provided by the City of Palm Bay. Crossing guards are present at the intersections of Riviera Drive and just south of Larch Circle and Mariposa Drive and Mascot Street.

Figure 3 shows the existing and planned bicycle and pedestrian facilities within and around the study area. **Figure 4** shows the existing planned bicycle and pedestrian facilities within the immediate context surrounding the school campus.

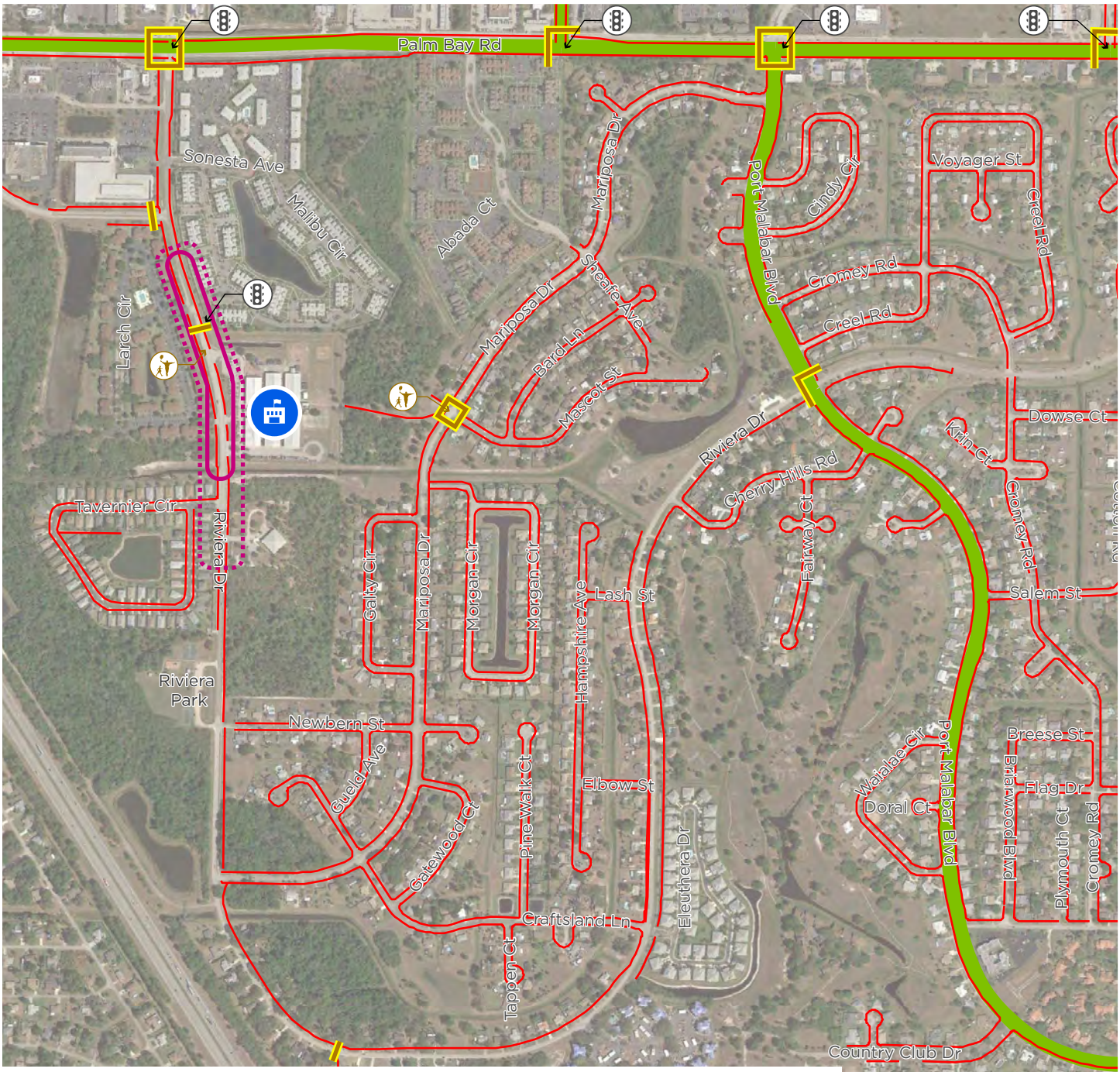


** Note: Existing Bicycle Facilities include marked bike lanes, buffered bike lanes, 2-way cycle tracks, and ≥5' wide shoulders. Draft Bicycle and Pedestrian Master Plan does not identify specific bicycle facility types for Prioritized Bicycle Facilities.*

Figure 3: Existing and Planned Bicycle and Pedestrian Facilities

School Routes Analysis

Riviera Elementary School



Riviera Elementary School

Crossing Guard Location

Existing Sidewalk

Prioritized Sidewalk (As per Draft Bicycle & Pedestrian Master Plan)

Existing Bicycle Facilities*

Prioritized Bicycle Facilities* (As per Draft Bicycle & Pedestrian Master Plan)

** Note: Existing Bicycle Facilities include marked bike lanes, buffered bike lanes, 2-way cycle tracks, and ≥5′ wide shoulders.*

School Zone

School Zone Advance Warning Area

Traffic Signals within Study Area

Marked Crosswalks across Major Streets

Feet

0 800 1,600

N

Figure 4: Existing Conditions: School Context Aerial Map

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Riviera Elementary School

Existing Conditions Traffic Data

Posted speeds, annual average daily traffic (AADT), and school zones were mapped as part of existing conditions traffic data analysis. Speed limit information was mapped using data from FDOT and Open Streets Map. The speed limit along Riviera Drive near the school campus is 35 miles per hour (MPH). AADT information was mapped using data from SCTPO's 2018 State of the System (SOS) and FDOT.

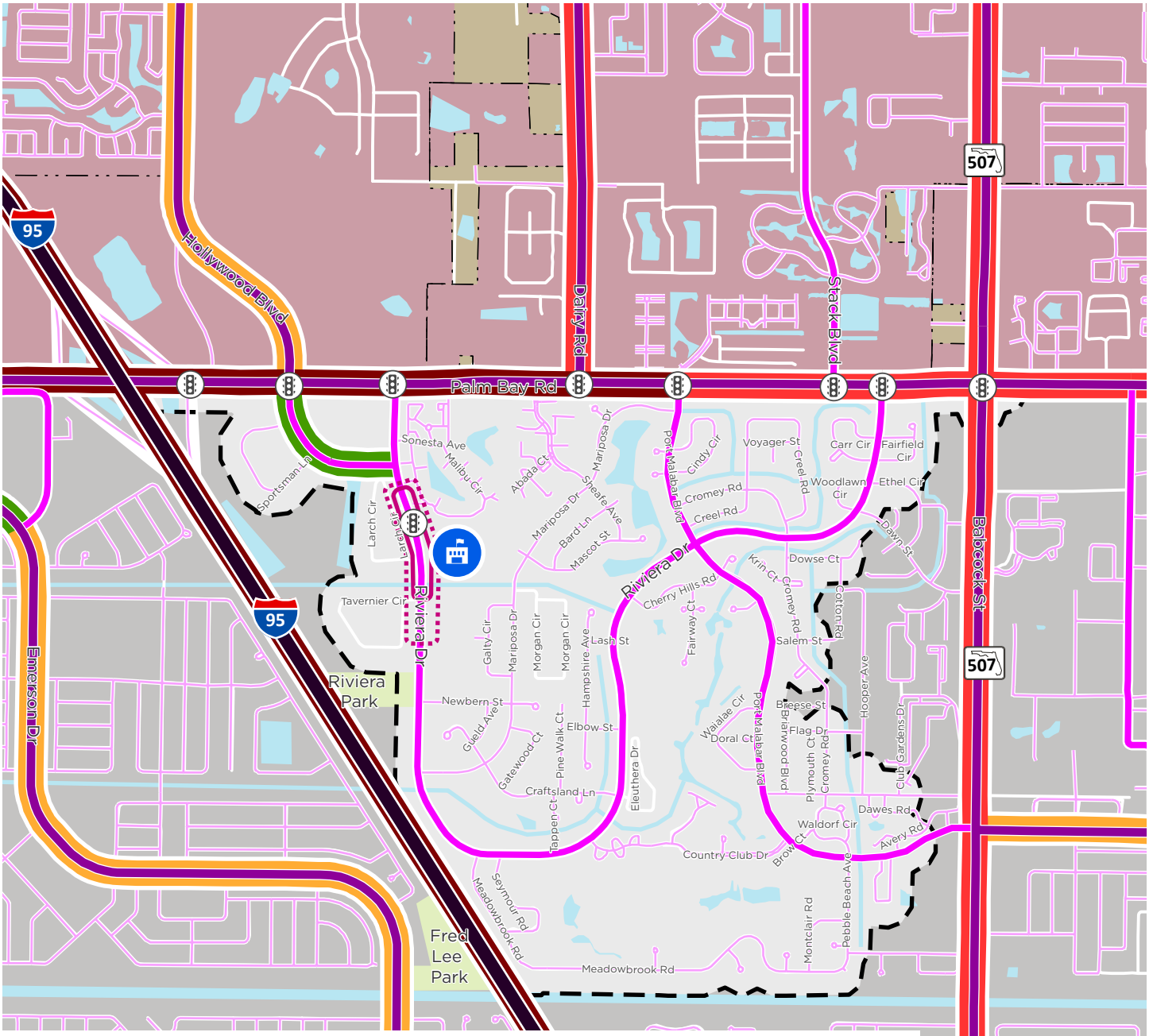
School zone and school zone advance warning areas were mapped using data from aerial satellite imagery and field review observations. The only school zone within the study area is located along Riviera Drive from Larch Circle to Tavernier Circle.

Figure 5 shows the existing conditions of traffic data.

School Campus Circulation

Circulation patterns were gathered during the school coordination meeting and field review. There are three entrances to the school campus located along Riviera Drive. The southernmost entrance is used for bus and daycare drop-off/pick-up. There is a parking lot along this loop. The middle entrance to the school is used for parent drop-off/pick-up. The entrance is also used by pedestrians and bicyclists. There is parking along the west side of the loop. The northernmost entrance to the school is a parking lot loop. The northernmost exit to the school campus along Riviera Drive serves as the egress for the parent drop-off/pick-up loop and the parking lot loop. This driveway also serves as entrance for pedestrians and bicyclists and has a bicycle rack on the north side of the school building.

There is one entrance to the school along the eastern side of the school campus. A trail connects Mariposa Drive to the eastern entrance to the school campus. The trail is used by pedestrians and bicyclists and has a bicycle rack at the entrance gate. **Figure 6** shows various circulation patterns within the school campus.



Riviera Elementary School

Traffic Signal within Study Area

Study Area

School Zone

School Zone Advance Warning Area

City of Palm Bay

Other Incorprated Jurisdictions

Unincorporated Brevard County

Posted Speed (Miles Per Hour) (2018)

- 30 MPH or Less
- 35 MPH
- 40 to 45 MPH
- 50 MPH and Above

Average Annual Daily Traffic (AADT) (2018)

- Less than 10,000 Vehicles Per Day
- 10,001 to 20,000 Vehicles Per Day
- 20,001 to 40,000 Vehicles Per Day
- 40,001 to 80,000 Vehicles Per Day

Feet

0 2,000 4,000

N

Figure 5: Existing Conditions Traffic Data

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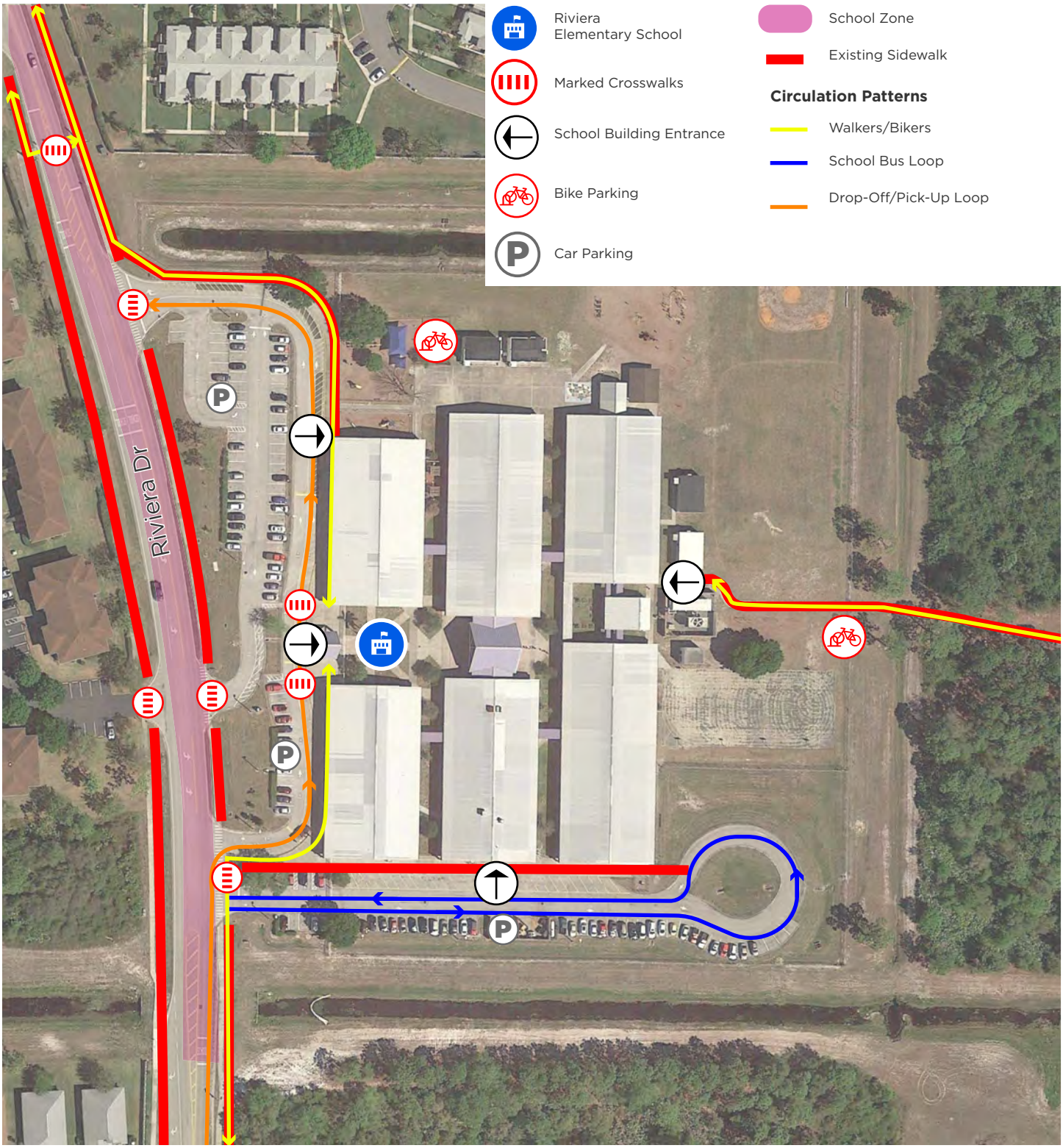

Figure 6: Existing School Circulation Map

School Routes Analysis

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School Student & Parent Survey Summary

The SCTPO conducts student and parent surveys alternating every other year to assess how students get to school and what factors affect parent's decisions to allow or not allow their child to walk or bike to school. The latest Student Travel Mode Survey was conducted in 2017 and the latest Parent Survey was conducted in 2018. This section summarizes the results of these surveys for Riviera Elementary School. These surveys are conducted once every two years and provide a snapshot of conditions when the respondents fill out the survey. The survey results may not truly represent the daily average. Variables such as weather, day of week, time of year when the survey is taken, all play into the results of these surveys.

Student Travel Mode Survey

Students at Riviera Elementary School were surveyed asking how they traveled to and from school.

Figure 7 shows the percentage of students walking or biking to school from 2000 to 2017. **Figure 8** shows total number of students walking of biking to school from 2000 to 2017. **Figure 9** shows percentage of students walking or biking to school in 2017 in AM and PM. **Figure 10** shows total number of students walking or biking to school in 2017 in AM and PM.

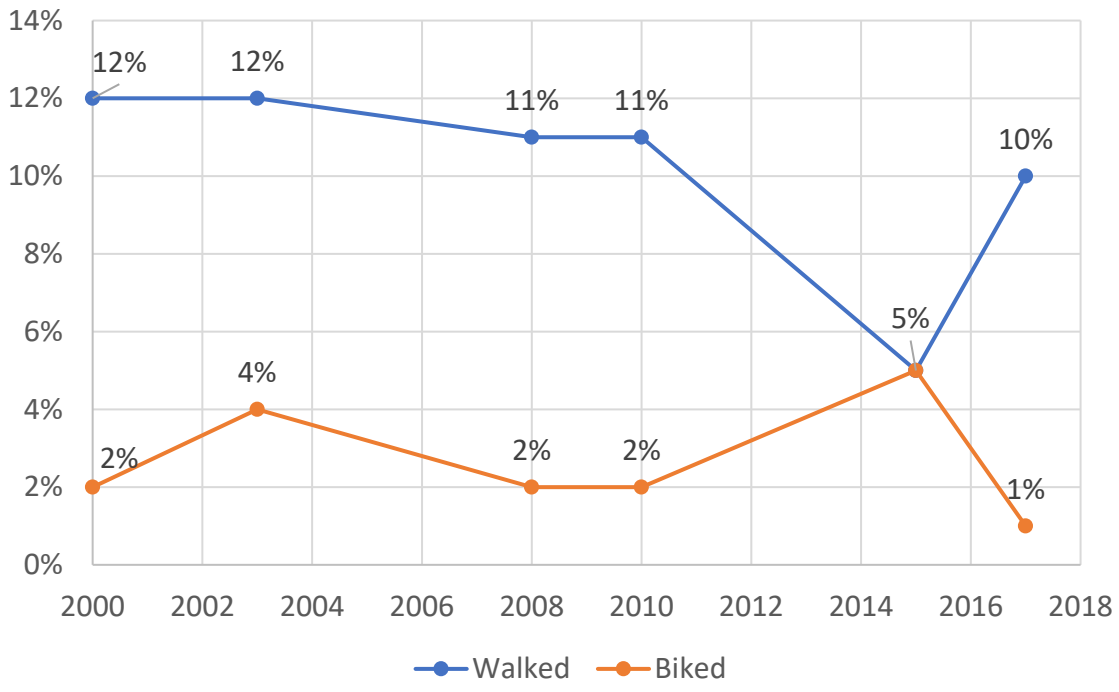

Figure 7: Percentage of Students Walking or Biking to School from 2000 to 2017

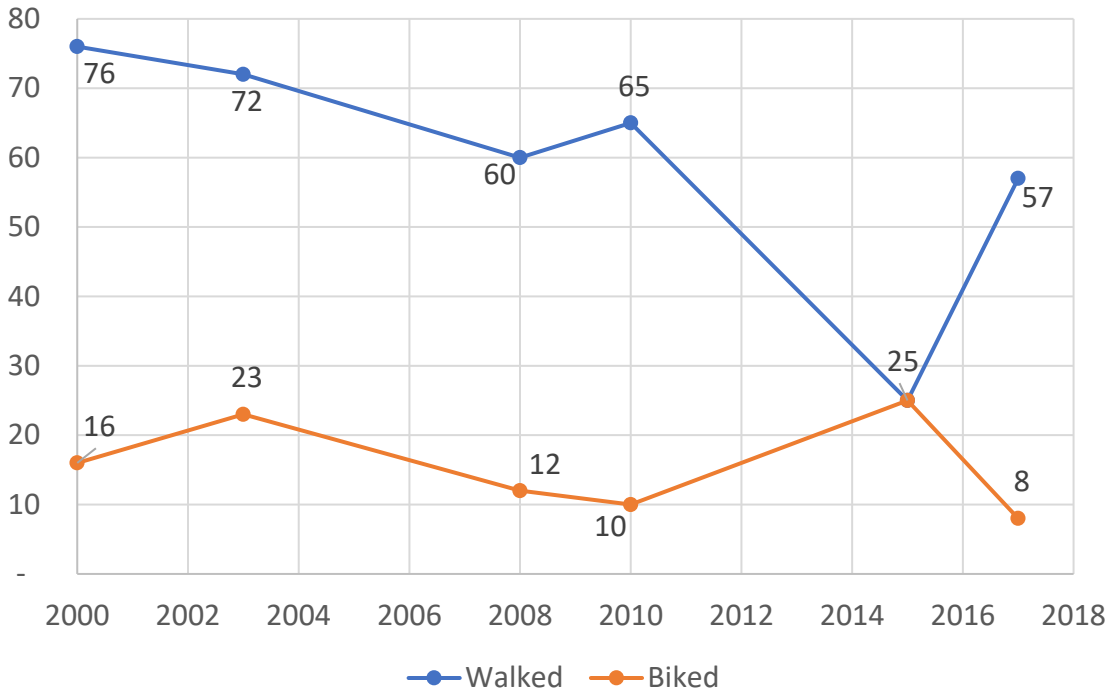

Figure 8: Total Number of Students Walking or Biking to School from 2000 to 2017

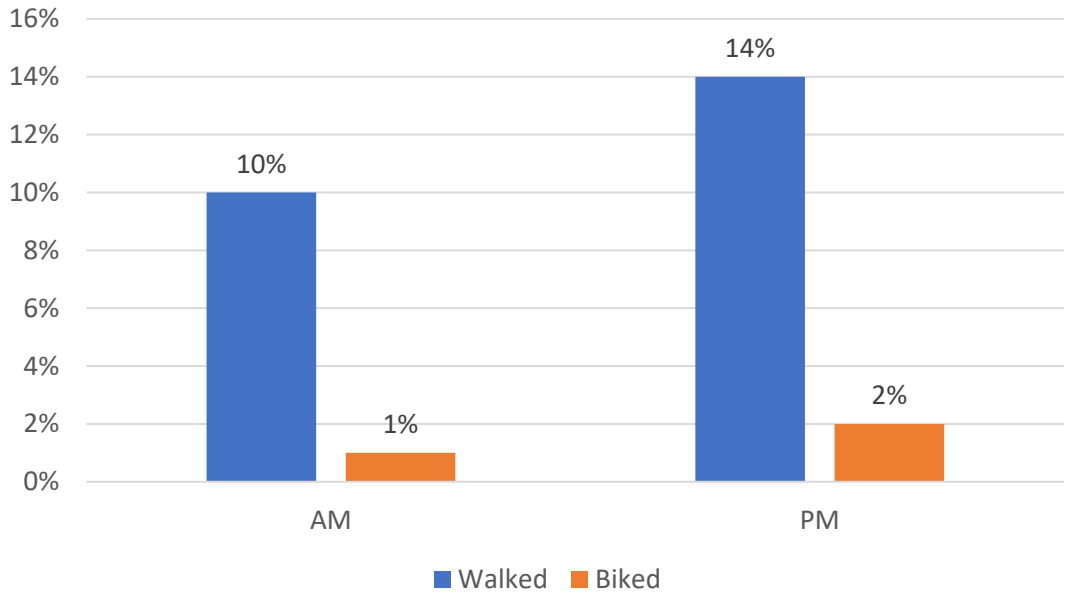

Figure 9: Percentage of Students Walking or Biking to School in 2017 in AM and PM

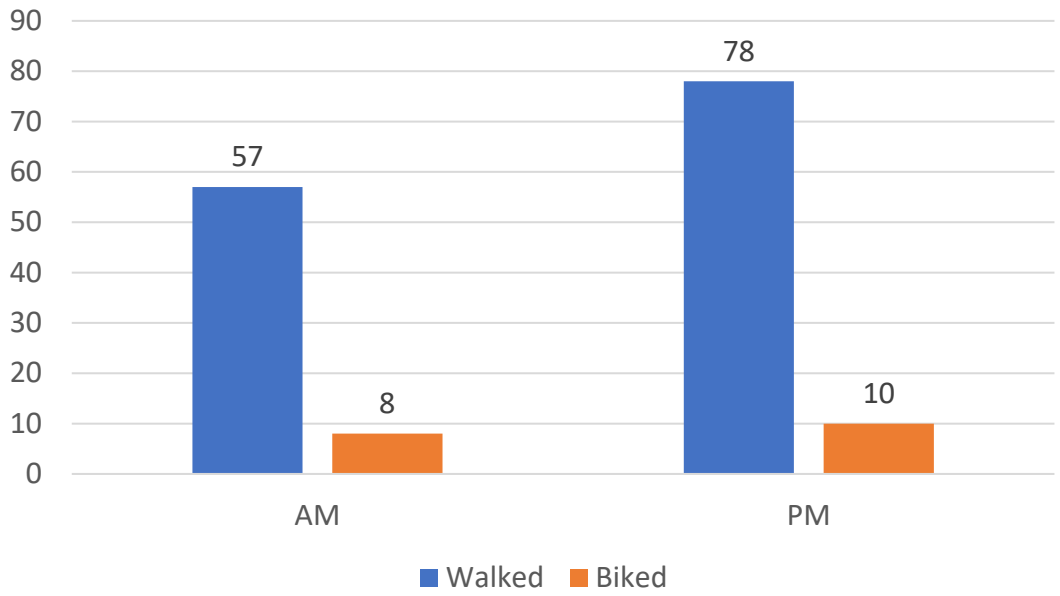

Figure 10: Total Number of Students Walking or Biking to School in 2017 in AM and PM

Main takeaways from the Student Travel Mode Survey:

- Based on the survey data from year 2000 to 2017, on average about 13 percent of total students travel by walking (ten percent) or biking (three percent).
- The total number of students seen walking or biking to school has decreased from 2000 to 2017.
- On average, more students walk or bike to school in the afternoon than in the morning. Most students either travel by car (54 percent) or bus (35 percent) to school as shown in **Figure 2**.

Parent Survey

The following data shows the results from surveys taken from parents with students attending 86 different schools in the area. Data was used from all the schools that responded to the survey because there was not enough data from each individual school to draw reasonable conclusions.

Figure 11 shows issues reported to affect the decision to allow a child to walk or bike to/from school by parents.

Figure 12 shows the parent's opinions about how healthy walking and biking to/from school is for their child.

Figure 13 parent's opinions about how much their child's school encourages or discourages walking and biking to/from school.

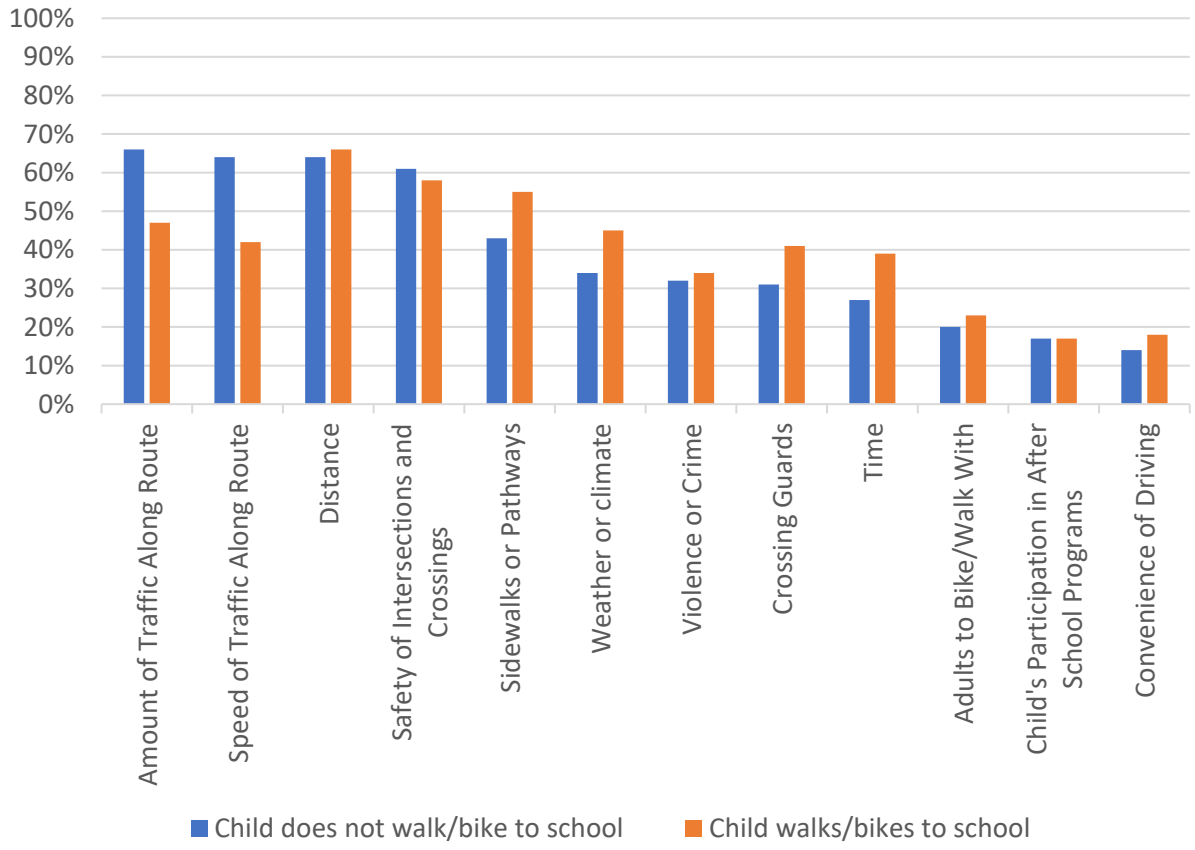

Figure 11: Issues Reported to Affect the Decision to Allow a Child to Walk or Bike to/from School by Parents (Based on 2018 Survey)

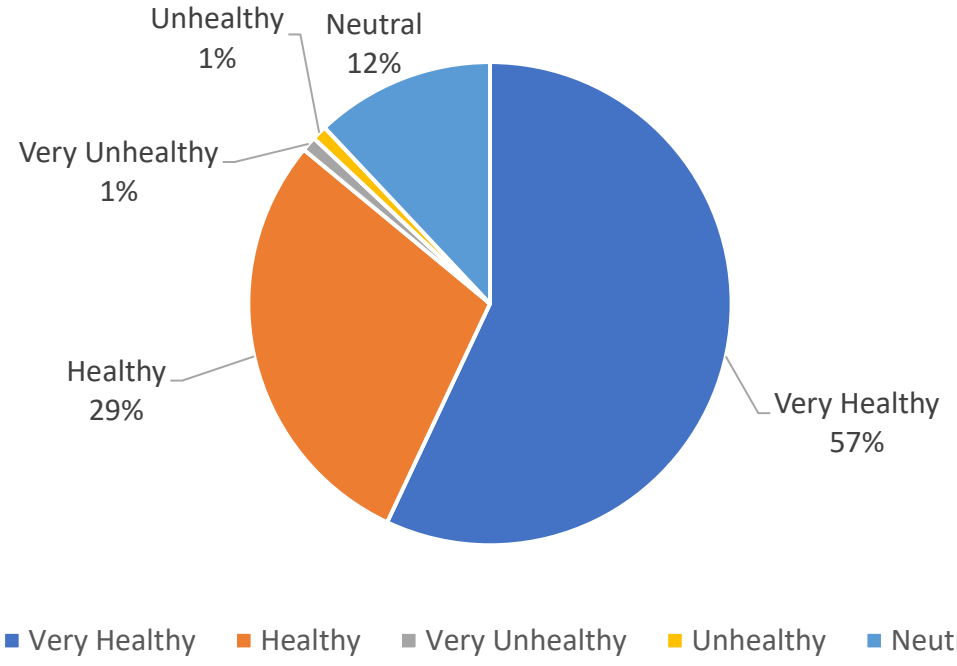

Figure 12: Parent's Opinions about How Healthy Walking and Biking to/from School is for Their Child (Based on 2018 Survey)

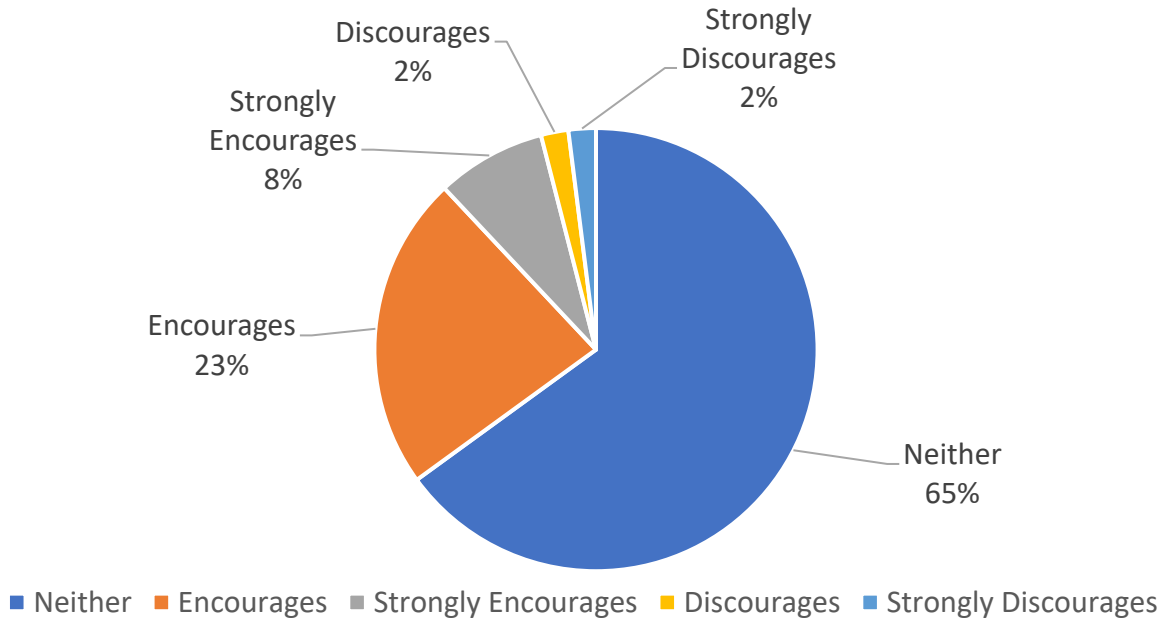

Figure 13: Parent's Opinions about How Much their Child's School Encourages or Discourages Walking and Biking to/from School (Based on 2018 Survey)

Main takeaways from the Parent Survey:

- The most common issues that affect both parents of children who already bike or walk to school and parents' of children that do not currently walk or bike to school decision to allow their child to walk or bike to school are:
    - The amount of traffic along the route
    - The speed of traffic along the route
    - Distance
    - The safety of intersections and crossings
    - Sidewalks or pathways
- Most parents think that walking or biking to school is very healthy for their child but think their child's school neither encourages nor discourages children to walk or bike to school.

For full or updated student or parent surveys please contact SCTPO.

Crash Data Analysis

Crash records were obtained for the Riviera Elementary School study area for the most recent five-year period on record (2014 through 2018) from the University of Florida's Signal Four Analytics Database. This section summarizes both the school aged and non-school aged pedestrian/bicycle crashes in the Riviera Elementary School study area.

Pedestrian/Bicycle Crash Statistics

There were 15 total pedestrian and bicycle crashes within the study area (three pedestrian and 12 bicycle). Three of the crashes were property damage only, 11 of the crashes resulted in injury, and one crash resulted in a fatality. Sixty-seven percent of crashes occurred during the day and 87 percent of crashes occurred under dry conditions. The reported crashes are displayed by different measures of time (year, month, day, and hour) in **Figure 14**, **Figure 15**, **Figure 16**, and **Figure 17**.

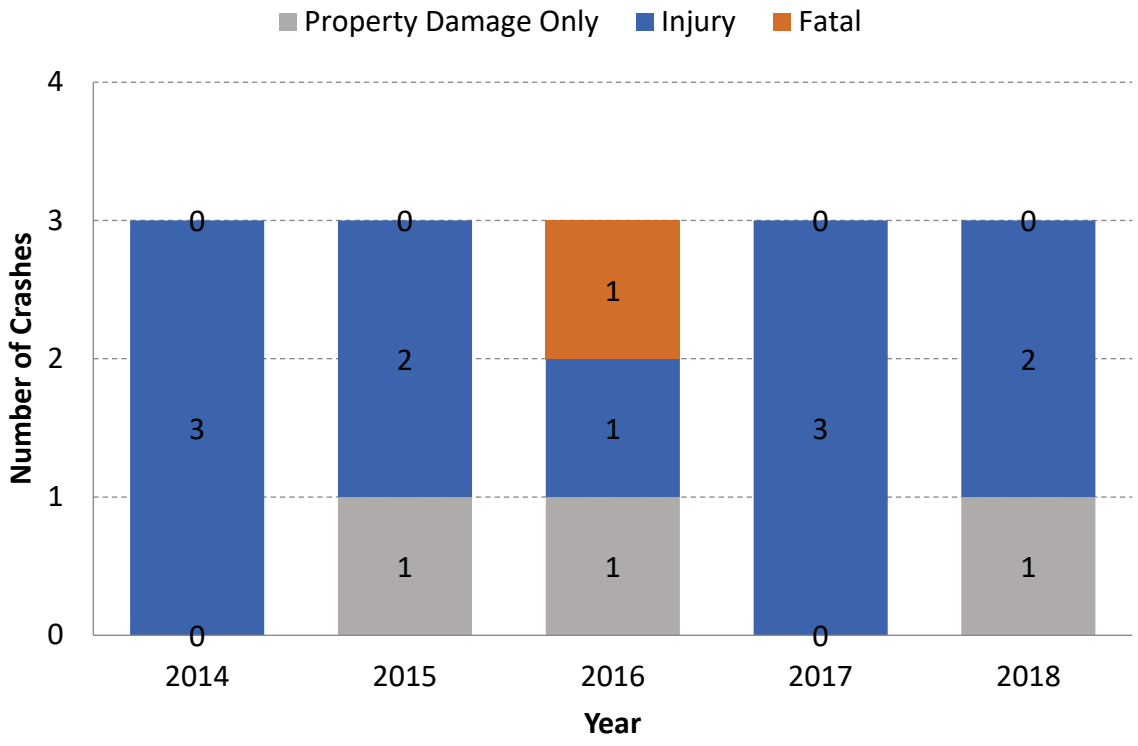

Figure 14: Crashes by Year and Severity

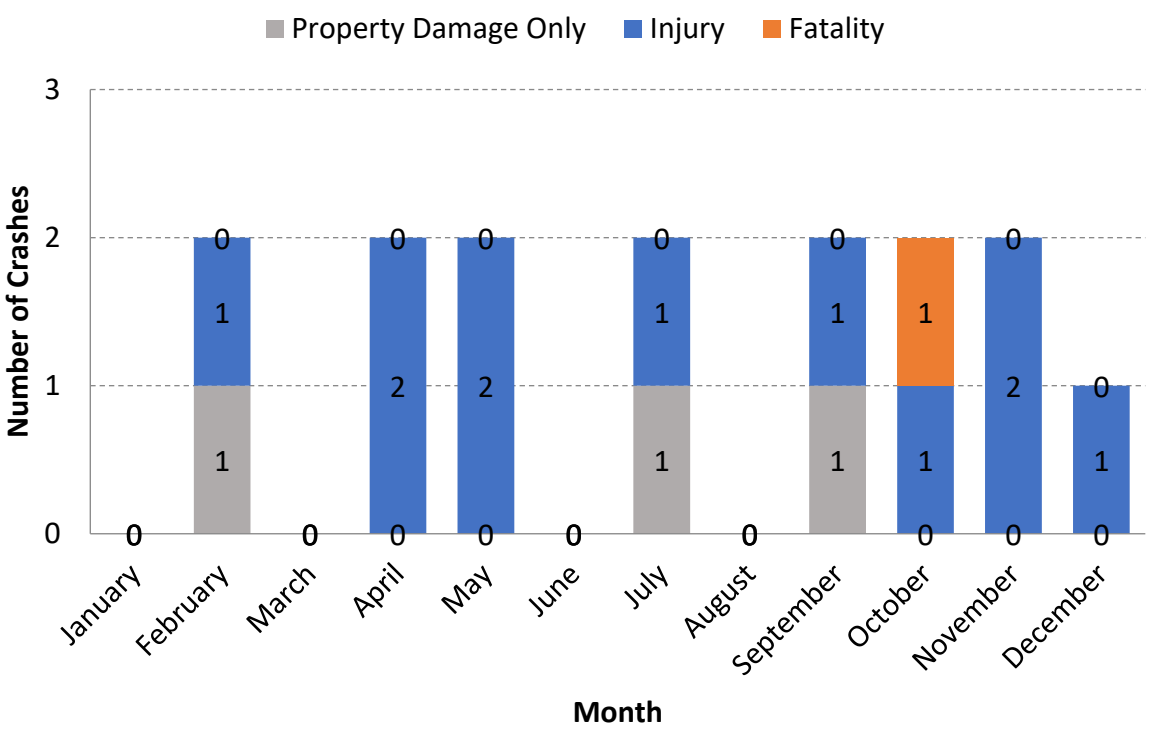

Figure 15: Crashes by Month and Severity

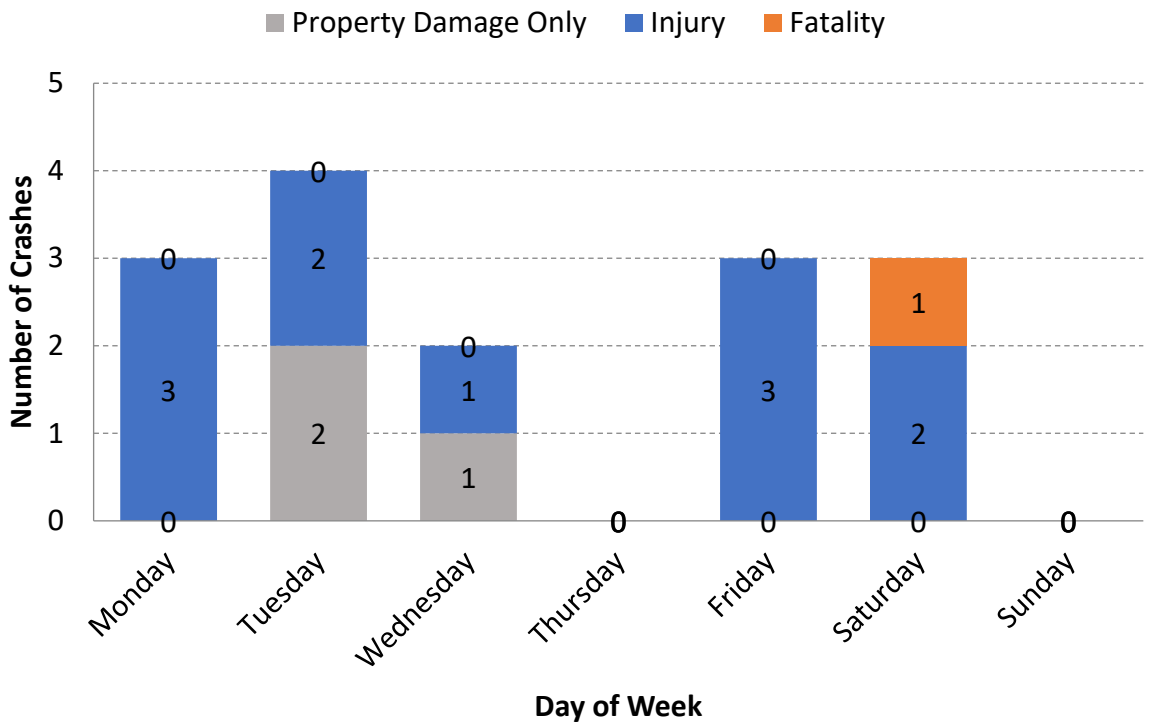

Figure 16: Crashes by Day of Week and Severity

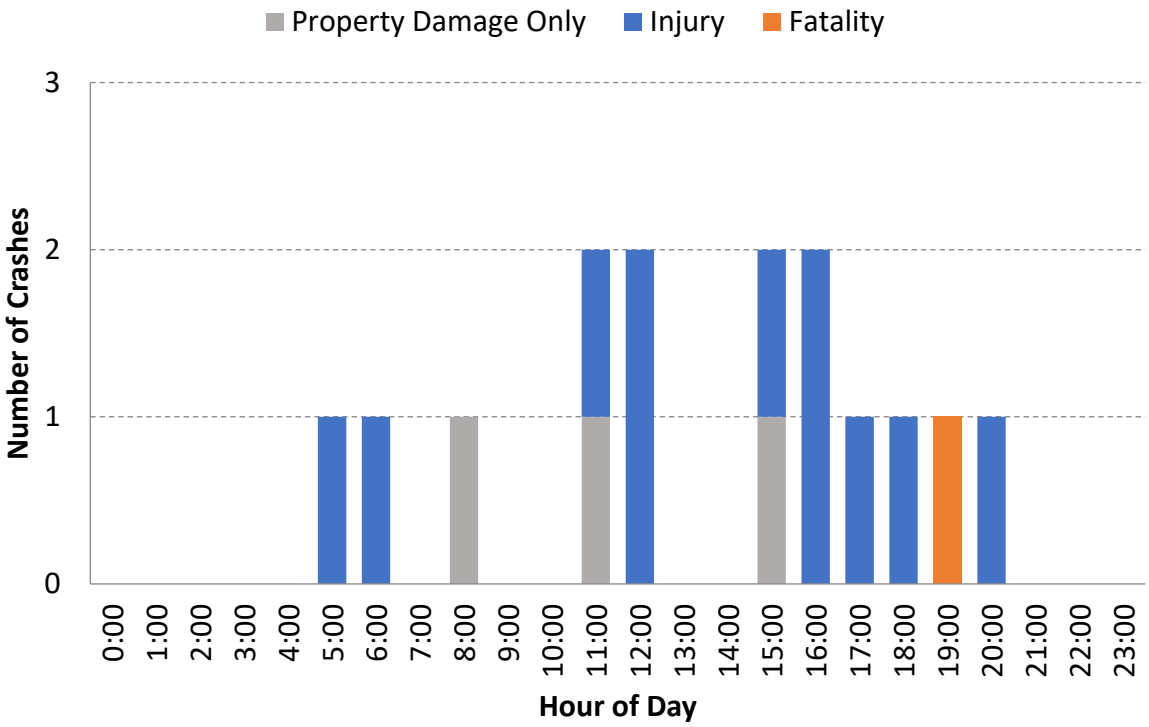

Figure 17: Crashes by Hour of Day and Severity

There were three crashes per year from 2014 to 2018. The highest number of crashes occurred from September to November (six) and Tuesday was the most common day of the week when crashes occurred (four). By time of day, the highest crash hours were from 11 AM to 1 PM and 3 PM to 5 PM (four). Alcohol and/or drug involved accounted for one crash.

School Aged Pedestrian/Bicycle Crash Statistics

There were three total school aged pedestrian and bicycle crashes within the study area (one pedestrian and two bicycle). One of the crashes was property damage only, one crash resulted in injury, and one resulted in a fatality. One of the crashes occurred during the day and all occurred under dry conditions. **Figure 18** maps the locations of the school-aged pedestrian and bicycle crashes. The reported crashes are displayed by different measures of time (year, month, day, and hour) in **Figure 19**, **Figure 20**, **Figure 21**, and **Figure 22**.

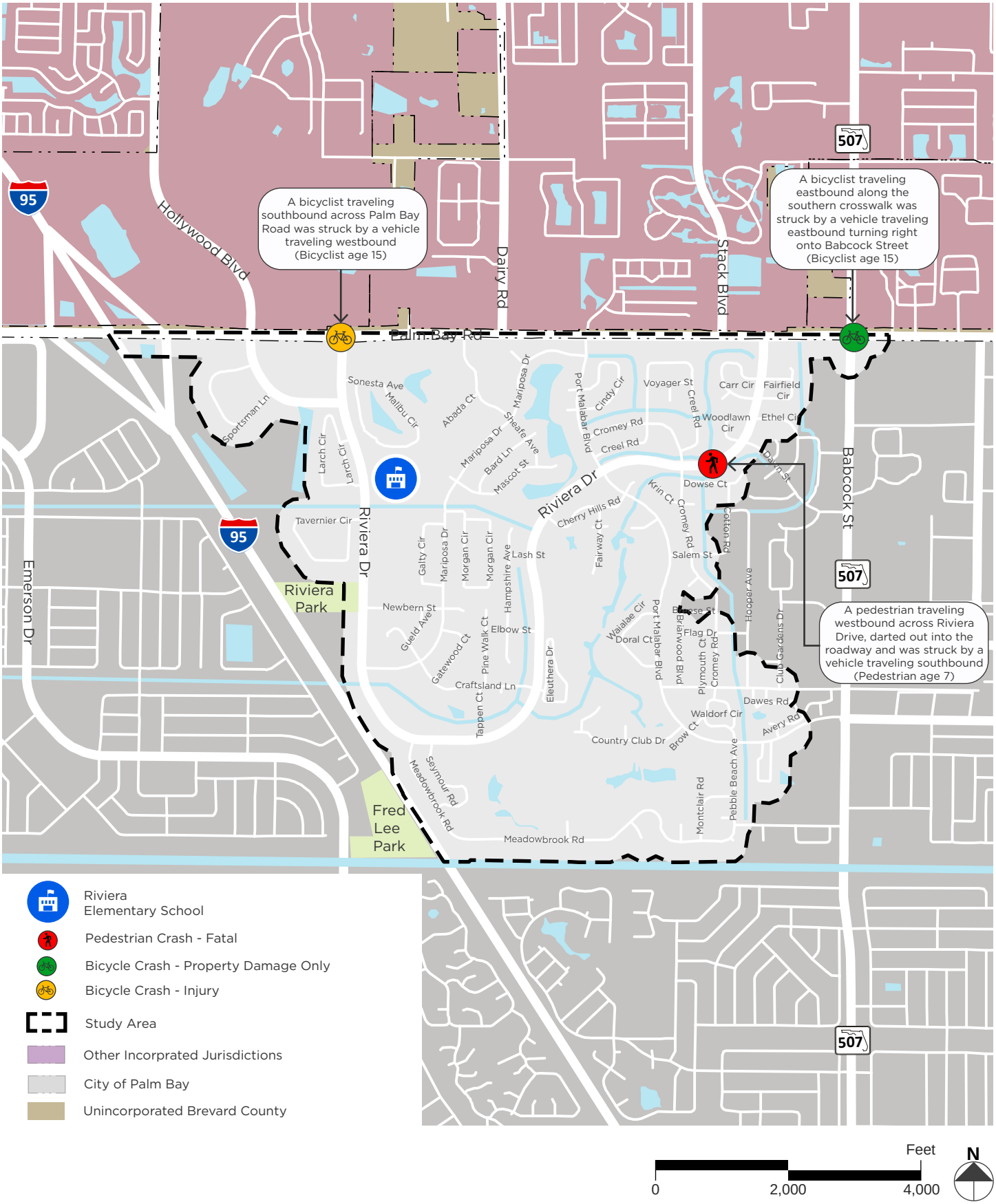

Figure 18: Bicycle and Pedestrian Crashes (2014 - 2018)

School Routes Analysis

Riviera Elementary School

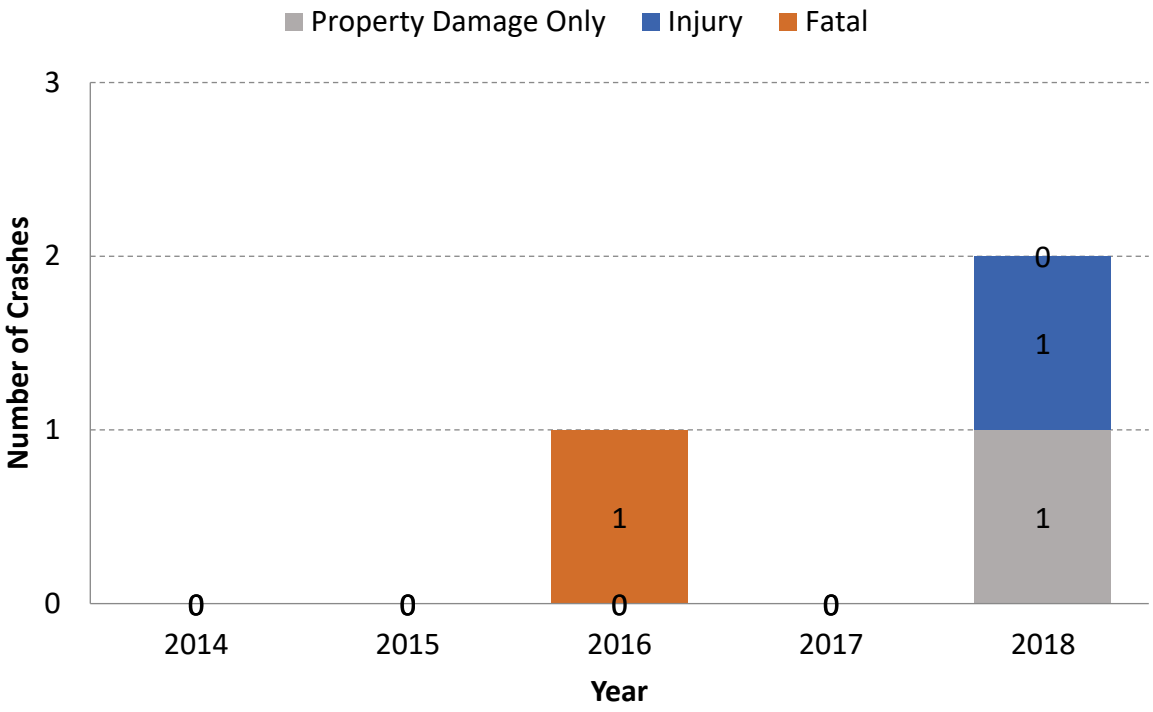

Figure 19: School-Aged Crashes by Year and Severity

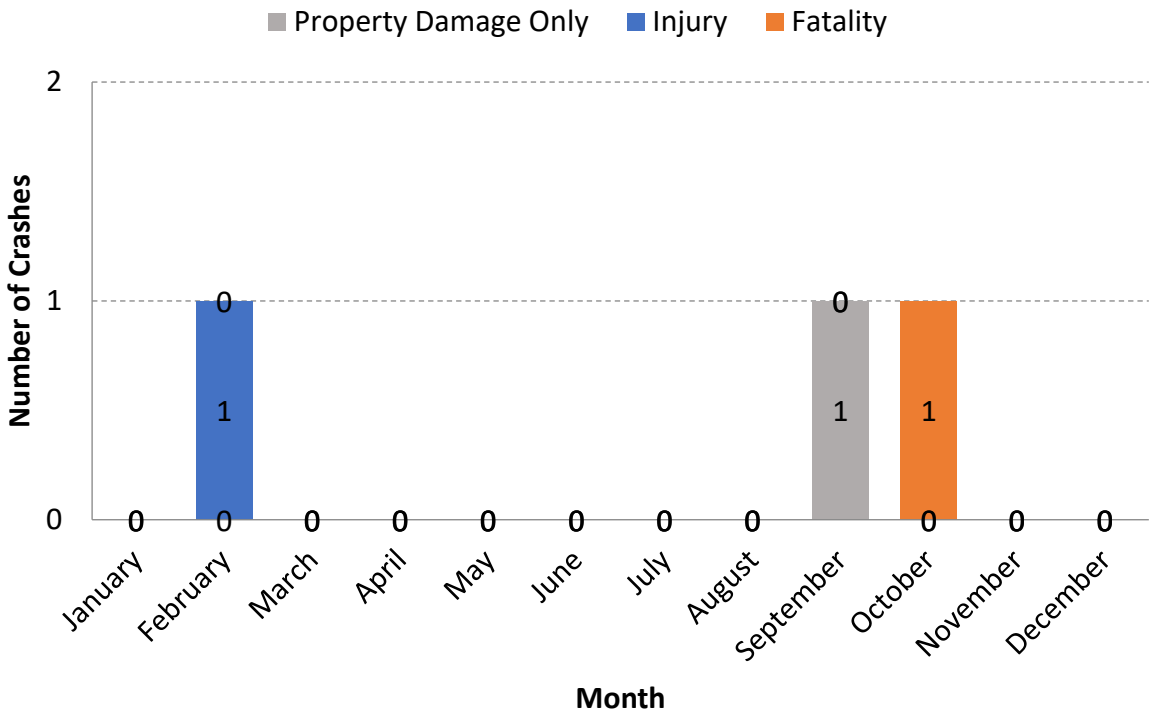

Figure 20: School-Aged Crashes by Month and Severity

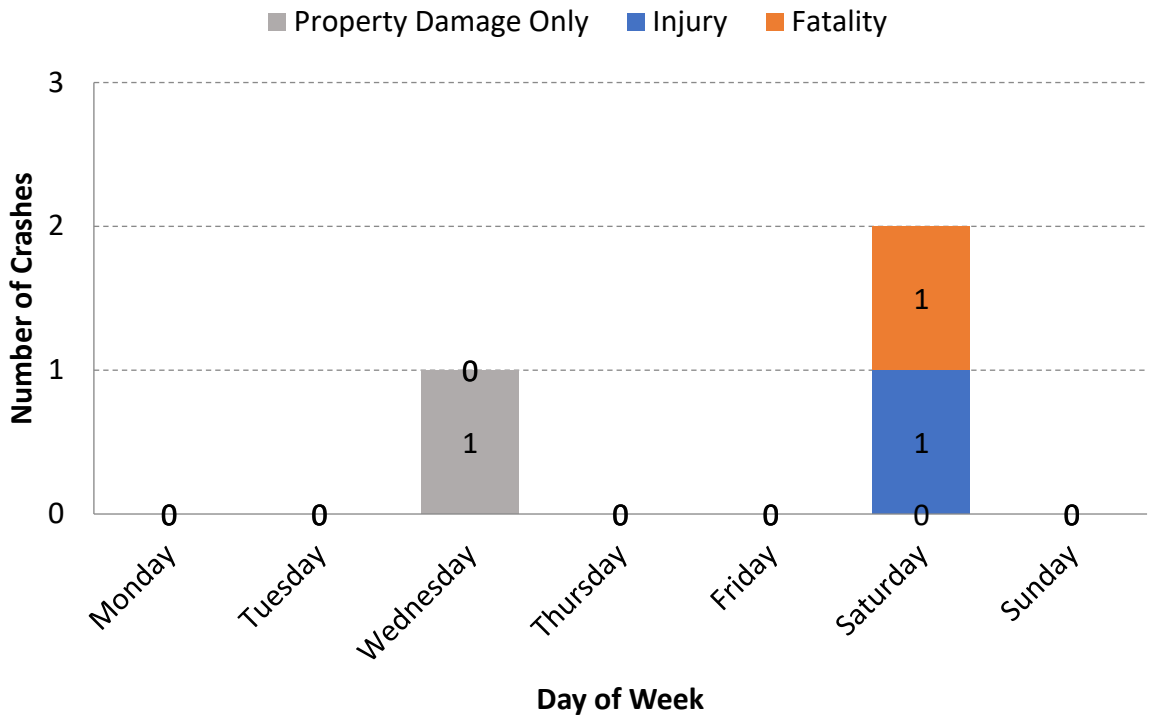

Figure 21: School-Aged Crashes by Day of Week and Severity

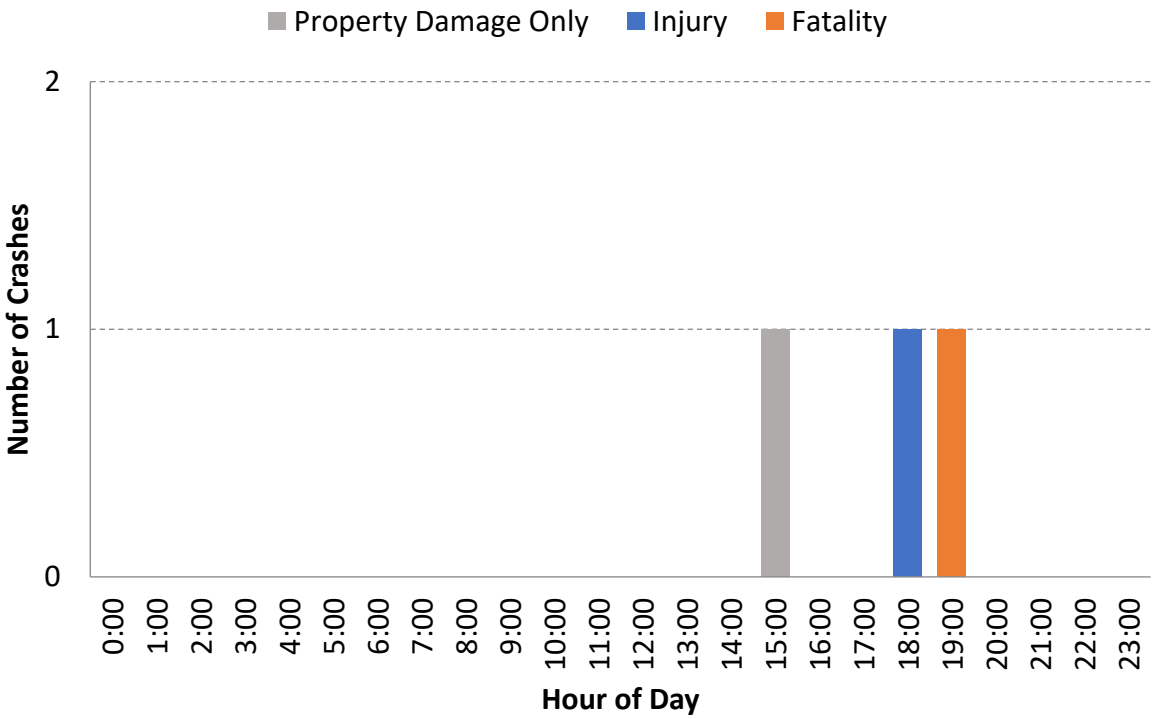

Figure 22: School-Aged Crashes by Hour of Day and Severity

The reported school aged pedestrian and bicycle crashes occurred in 2016 (one) and 2018 (two). Crashes occurred in the months of February, September, and October (one) and two of the crashes occurred on a Saturday. By time of day, most crashes occurred in the afternoon/evening.

A few other crash statistics worthy to note:

- Alcohol and/or drug involved did not account for any of the crashes; and
- Two crashes involved pedestrians/bicyclists crossing roadways mid-block between intersections, not crossing at the intersections themselves (based on the crash reports).

School-Aged Crash Report Summaries

Pedestrian Crashes:

1. Crash Number: 86755166
    - On October 22, 2016 at 7:06 PM, a crash involving a pedestrian occurred along Riviera Drive just south of Dawn Street. The pedestrian was traveling westbound across Rivera Drive, darted out into the roadway, and was struck by a vehicle traveling southbound on Rivera Drive. The pedestrian was not at a marked crosswalk. The crash resulted in a fatality. The crash occurred under dry conditions at dusk.

Bicycle Crashes:

1. Crash Number: 87789916
    - On February 10, 2018 at 6:26 PM, a crash involving a bicyclist occurred along Palm Bay Road just west of Riviera Drive. The bicyclist was traveling southbound across Palm Bay Road and was struck by a vehicle traveling westbound along Palm Bay Road. The crash resulted in a possible injury. The crash occurred under dry conditions at night.
2. Crash Number: 87791447
    - On September 5, 2018 at 3:53 PM, a crash involving a bicyclist occurred at the intersection of Palm Bay Road and Babcock Street. The bicyclist was traveling eastbound along the southern crosswalk and was struck by a vehicle traveling eastbound on Palm Bay Road turning right onto Babcock Street. The crash did not result in injury. The crash occurred under dry conditions during the day.

Non-School Aged Pedestrian/Bicycle Crash Statistics

There were 12 total non-school aged pedestrian and bicycle crashes within the study area (two pedestrian and 10 bicycle). Seventy-five percent of the crashes occurred in daylight conditions, and 83 percent occurred with dry roadway conditions. The reported crashes are displayed by different measures of time (year, month, day, and hour) in **Figure 23**, **Figure 24**, **Figure 25**, and **Figure 26**.

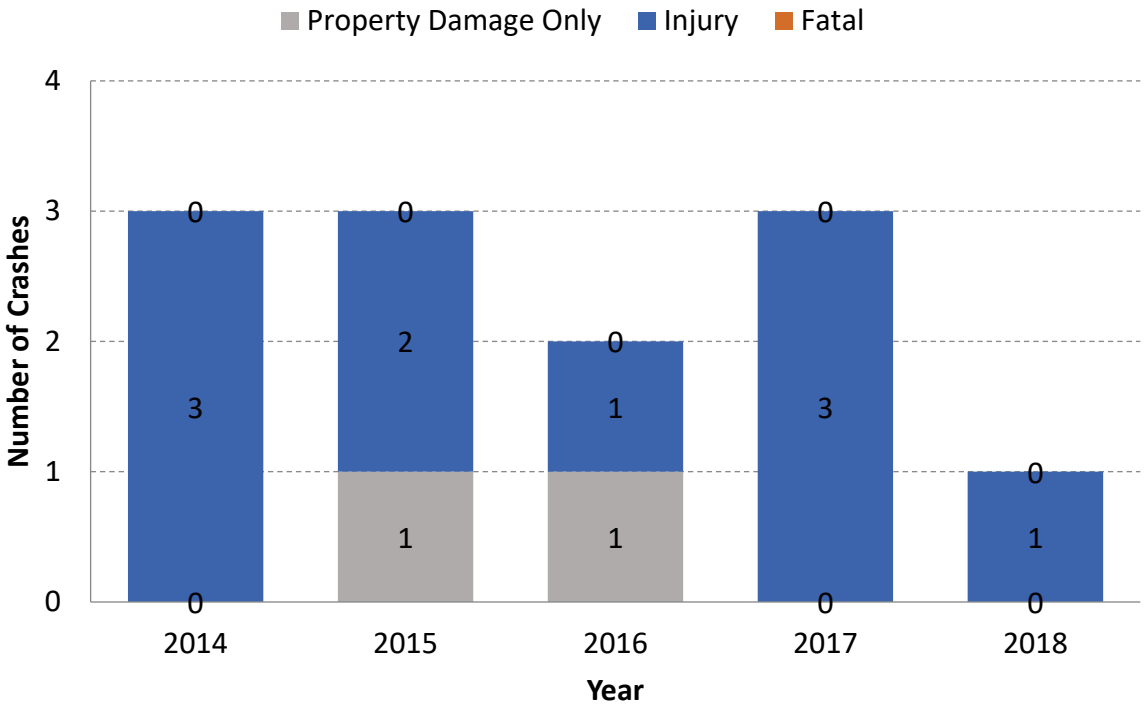

Figure 23: Non-School Aged Crashes by Year and Severity

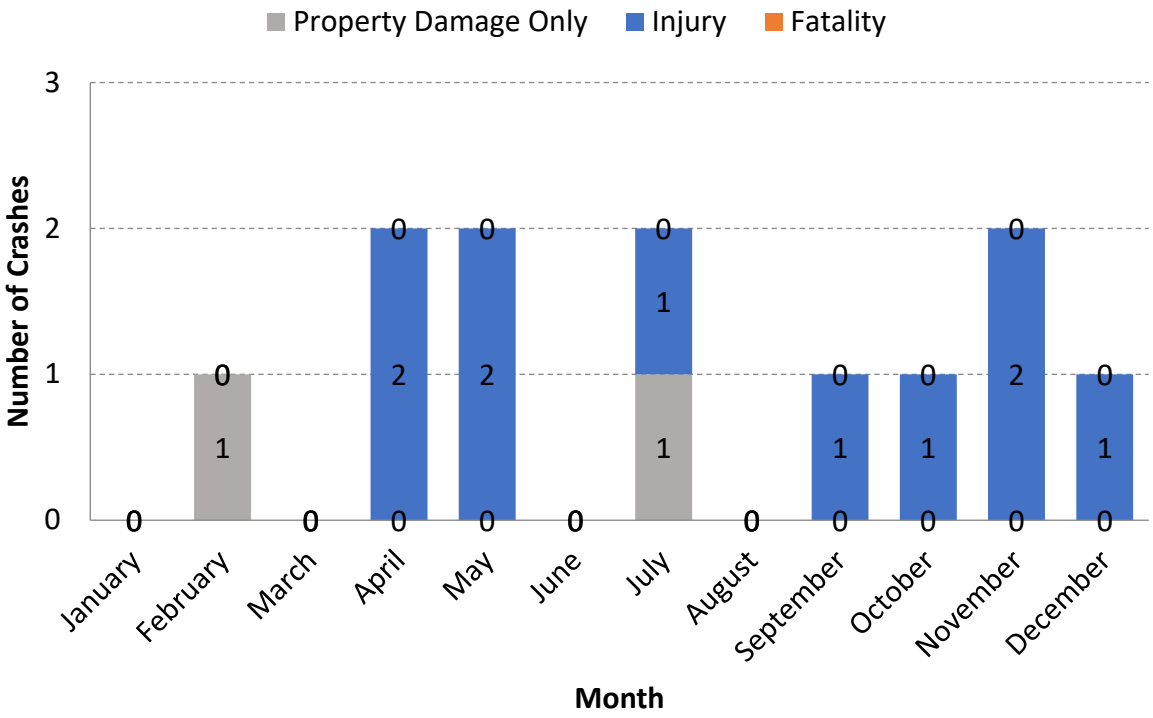

Figure 24: Non-School Aged Crashes by Month and Severity

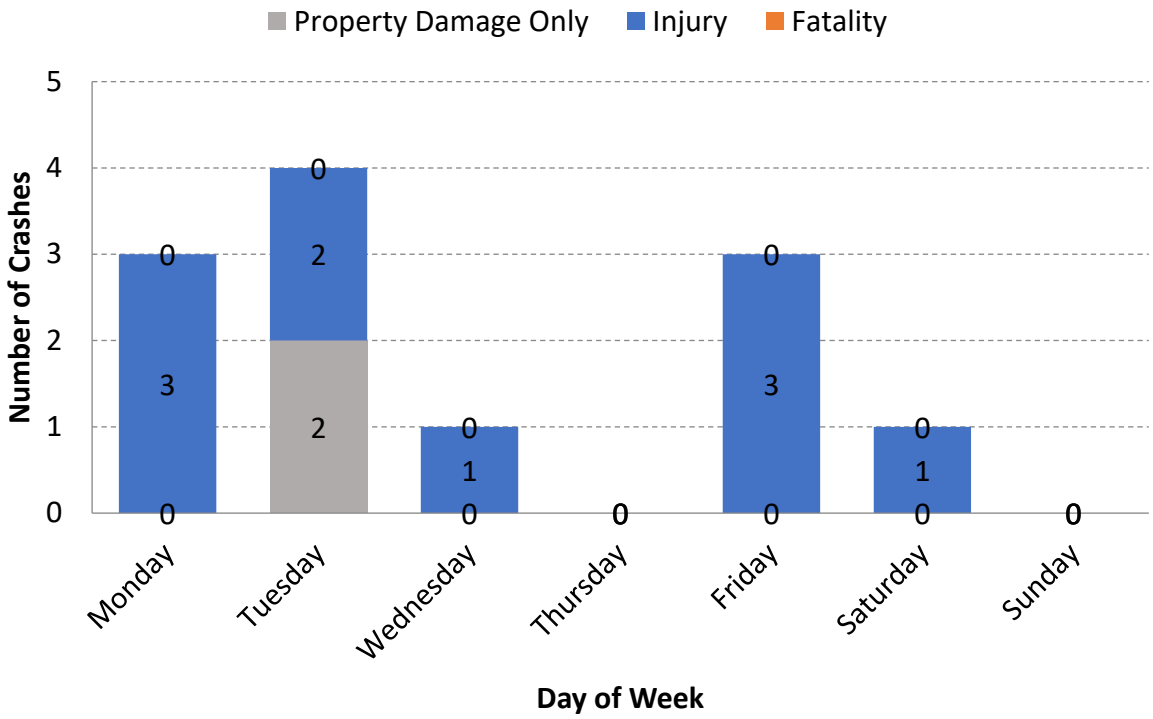

Figure 25: Non-School Aged Crashes by Day of Week and Severity

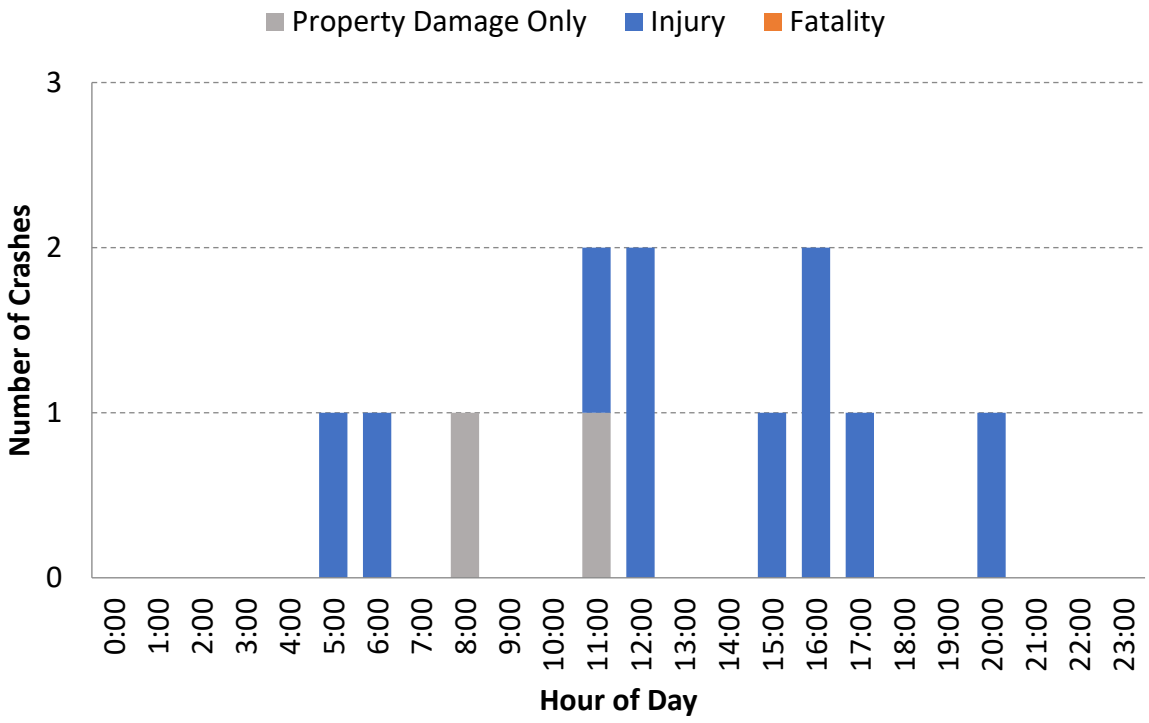

Figure 26: Non-School Aged Crashes by Hour of Day and Severity

The highest crash years were 2014, 2015, and 2017 (three crashes per year). April, May, July, and November were the highest crash months with a total of two crashes per month. Most crashes occurred during the week with the highest crash day being Tuesday (four). By time of day, the two highest crash hours were from 11 AM to 1 PM (four) and 4 PM to 5 PM (two). Alcohol and/or drug involved accounted for one crash.

Comparison between School Aged and Non-School Aged Pedestrian/Bicycle Crash Statistics

There were more non-school aged crashes than school aged crashes from 2014 to 2017 and there were more school aged crashes than non-school aged crashes in 2018. School aged crashes only occurred during months when school is in session while two non-school aged crashes occurred during the summer months. More school aged crashes occurred on Saturday than non-school aged crashes. The peak time of the day for non-school aged crashes occurred from 11:00 AM to 1:00 PM (four) while the peak time of day for school aged crashes occurred from 6:00 PM to 8:00 PM (two).

Figure 27, **Figure 28**, **Figure 29**, and **Figure 30** show a comparison of the number of school aged and non-school aged pedestrian and bicycle crashes by different measures (year, month, day, and hour).

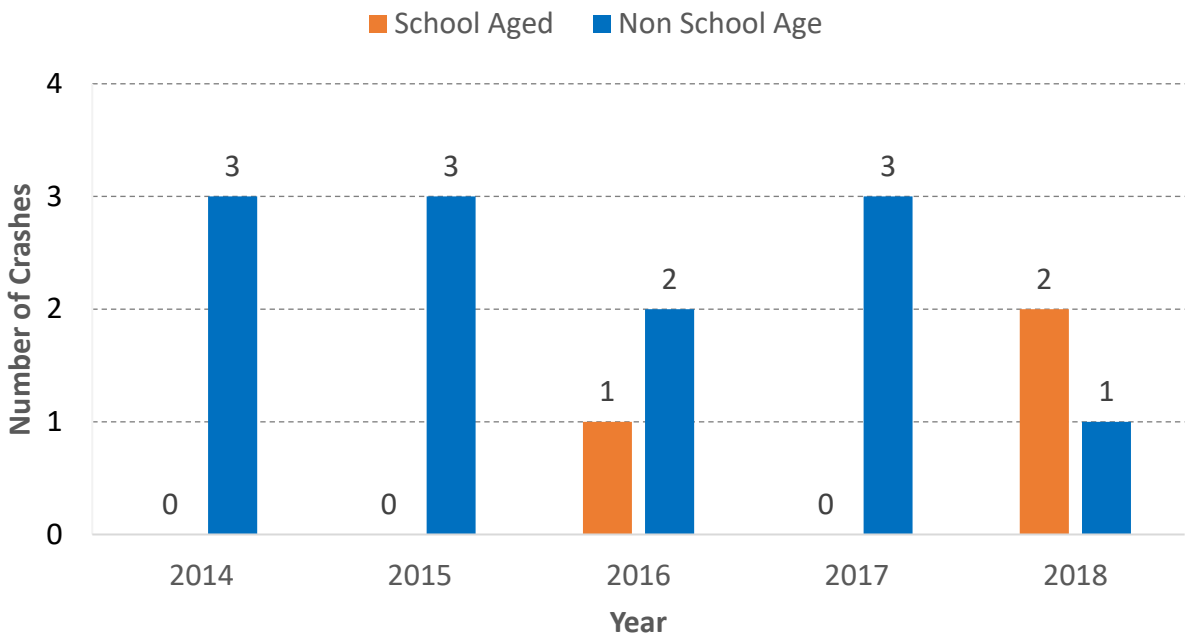

Figure 27: Comparison of School Aged and Non-School Aged Crashes by Year

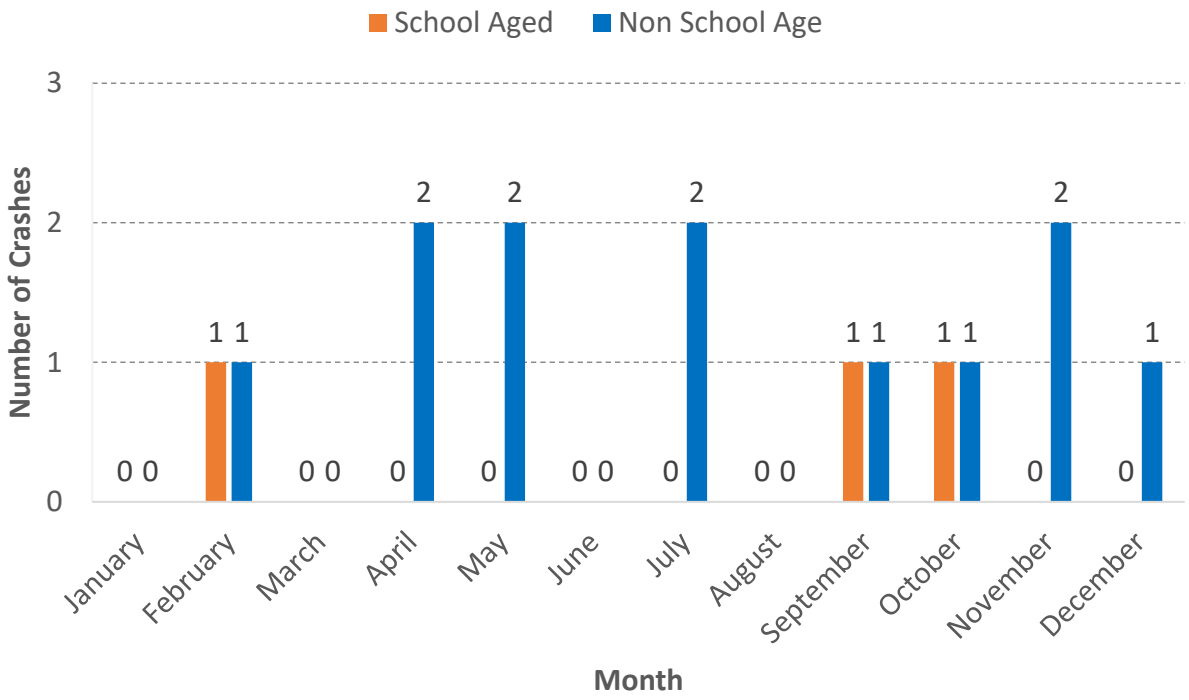

Figure 28: Comparison of School Aged and Non-School Aged Crashes by Month

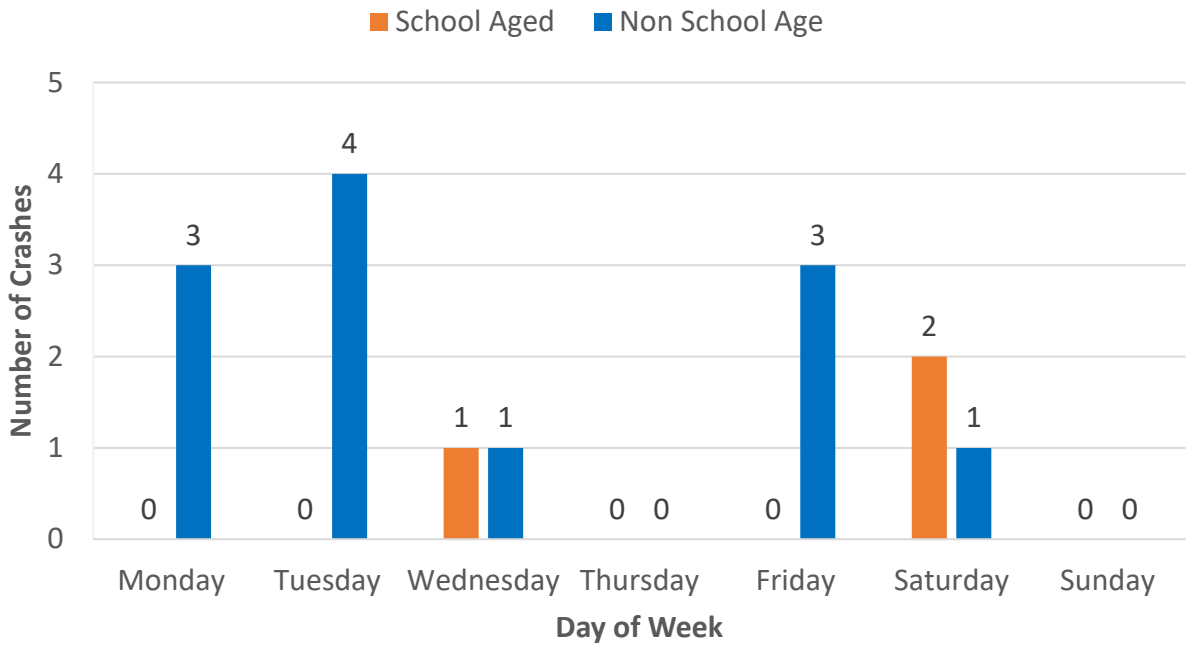

Figure 29: Comparison of School Aged and Non-School Aged Crashes by Day of Week

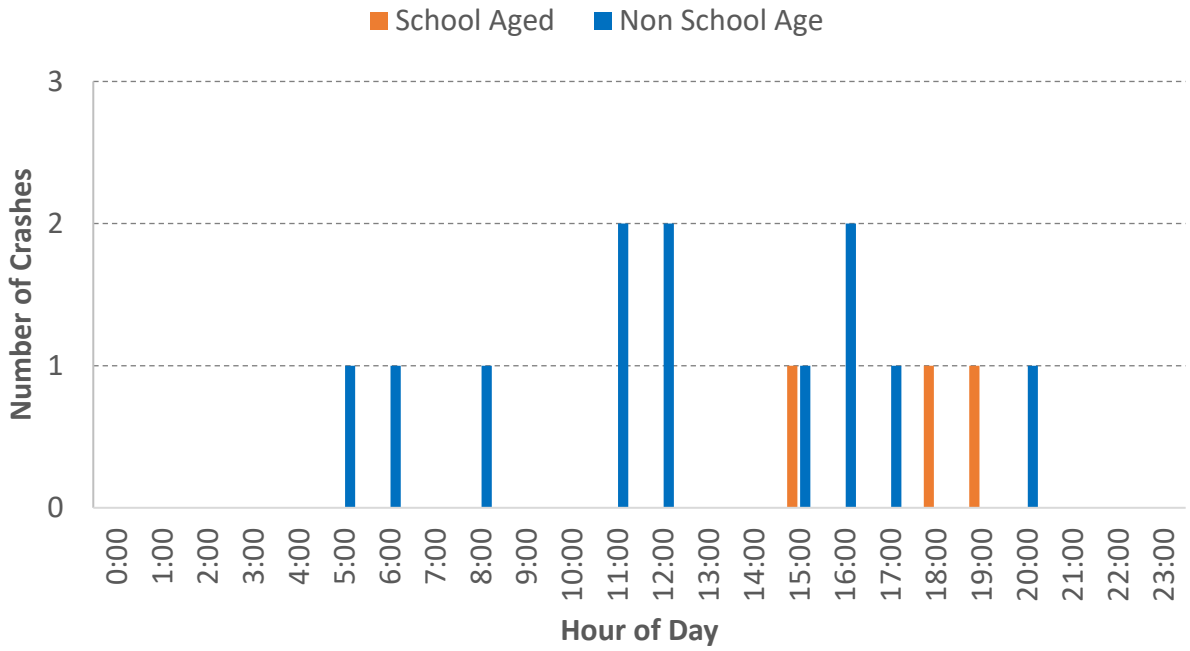

Figure 30: Comparison of School Aged and Non-School Aged Crashes by Hour of Day

School Coordination Meeting

A coordination meeting was held on January 21, 2020 to bring stakeholders together and discuss issues and opportunities related to students walking and biking to the school. Members from Brevard County Schools, FDOT, Riviera Elementary School, SCTPO, and KAI were present at this meeting. Notes from this meeting are summarized below.

General Notes

Sarah Kraum began the meeting with a short background about the project and initiated introductions. After brief introductions by the attendees, Sarah Kraum began the discussion with an overview of the project and work conducted to date. She briefly introduced the meeting materials included in the attendee handout package. The materials shared with attendees includes the following documents:

- Summary Infographic that included:
    - Student travel mode split based on the Student Travel Survey
    - Pedestrian and bicycle crash summary
    - Information regarding signals and crossings with the study area
    - Summary of previous and ongoing plans within the study area
- Map showing existing and planned bicycle and pedestrian facilities
- Map showing existing conditions traffic data
- Map showing school-aged bicycle and pedestrian crashes (2014 - 2018)

The following section summarizes the discussions during and after the group discussion.

School Timings

- The school hours are as follows:
    - 8:00 AM to 2:30 PM – Monday through Thursday
    - 8:00 AM to 1:15 PM – Friday
- Before school care runs Monday through Friday, 6:30 AM to 7:30 AM.
- The peak period of students arriving in the morning is from 7:20 AM to 8:00 AM. Buses arrive by 7:45 AM.
- The peak period of students leaving in the afternoon is from 2:30 PM to 3:00 PM. Parents begin to queue around 1:00 PM for afternoon pick-up even though the dismissal time is 2:30 PM for the students.

School Entrances and Circulation

- There are four driveways within 400 feet of each other along Riviera Drive.
    - The southernmost driveway (one entrance and one egress) serves as the bus and daycare van drop-off/pick-up loop with a 46-space staff/parent parking lot along

the southern side of the loop. Daycare vans park along the western end of the loop in front of the school to load students.
    - Another driveway just north of the bus drop-off/pick-up loop serves as the entrance to the parent drop-off/pick-up loop for the students.
    - Another driveway just north of the entrance to the parent drop-off/pick-up loop serves as the entrance to a 58-space staff/parent parking lot loop.
    - The northernmost driveway serves as the egress to the parent drop-off/pick up loop and staff/parent parking lot loop.
- There are three separate circulation patterns for students walking or biking to/from the school.
    - Students walking/biking southbound along Riviera Drive north of the school enter the school campus along the sidewalk located adjacent to the parent drop-off/pick-up loop.
    - Students walking/biking northbound along Riviera Drive south of the school enter the school campus between the bus drop-off/pick-up loop and parent drop-off/pick-up loop driveways.
    - Students walking/biking along Mariposa Drive enter the school campus from a sidewalk which connects Mariposa Drive to the eastern entrance to the school.
- There are three entrances to the school.
    - The main entrance to the school is located at the western edge of the school building and serves as an entrance for students walking, biking, or being dropped off at the parent drop-off/pick-up loop.
    - A second entrance is located at the northwest corner of the school building and serves as an entrance for students walking or biking to school.
    - The third entrance is located at the eastern edge of the school property and serves as the back entrance for pedestrians and bicyclists. This entrance is gated and only open during student drop-off/pick-up times.
    - The gates are closed during school hours and are staffed by a school faculty member during morning drop-off and afternoon pick-up times.

Main Walking and Biking Routes

- Staff noted that most students who walk or bike to school come from neighborhoods along Mariposa Drive. Some students come from the apartments just north and west of the school campus or the neighborhoods south of the school along Riviera Drive.
- There are two crossing guard locations within the study area, one at the mid-block crossing along Riviera Drive just north of the school campus, and one at the intersection of Mariposa Drive and Mascot Street. Staff noted that the crossing guard at the intersection of Mariposa Drive and Mascot Street is not often present.

- There is a signalized, marked mid-block crossing 200 feet north of the school campus. There are no marked crosswalks across Riviera Drive south of the school campus. Staff noted that some students cross Riviera Drive at the intersection of Riviera Drive and the south entrance to Larch Circle.
- There are two bicycle racks located on the school campus, one at the eastern entrance to the school and another at the northwest entrance to the school.
- Staff repeatedly noted safety concerns for students walking along the path from Mariposa Drive to the eastern entrance to the school. There is a homeless community that lives in the woods surrounding the path and staff noted that there have been safety concerns for students walking along this path. Staff recommended adding a fence along the sidewalk. Sarah Kraum noted a safety concern for students hopping a fence here. Staff also noted a lack of lighting along this path and suggested the addition of lighting.

Drop-Off/Pick Up

- The school is served by 10 buses and six daycare vans. Buses drop off students from 7:30 AM to 7:45 AM. Staff noted that some buses drop-off students a little before 7:30 AM to stay on time for their other school routes.
- If parents wish to drop-off their children before 7:30 AM, they must enroll in before care which runs from 6:30 AM to 7:30 AM. There are approximately 15 students enrolled in before care.
- The morning peak drop-off period is from 7:30 AM to 8:00 AM with the highest number of parents dropping off at 7:45 AM. Staff noted that traffic does back up northbound and southbound along Riviera Drive at the school entrance but not during the AM peak period.
- In the afternoon, vehicle stacking occurs in the southbound left turn lane along Riviera Drive to turn into the parent drop-off/pick-up loop. Staff noted that vehicles leave gaps to allow vehicles and buses to enter/exit the school driveways along Riviera Drive and the stacking rarely extends beyond the turn lane. Vehicle stacking also occurs northbound along Riviera Drive to turn right into the parent drop-off/pick-up loop. There is no right turn lane so parents waiting to drop-off/pick-up their students stack in the grass shoulder. The afternoon pick-up peak period is from 2:30 PM to 2:45 PM.
- Many parents will park in the grass area between Riviera Drive and the staff/parent parking lot in front of the school to walk their student to/from the school entrance. Staff noted this as a safety concern because cars must cross a sidewalk to back out onto the roadway and parents must walk across the parking lot loop and drop-off/pick-up loop to drop-off/pick-up their student.
- Parents also park in the staff/parent parking lot loop to walk their student to/from the school.

Recent and Planned Projects

- FDOT plans to widen Hollywood Boulevard from two to four lanes between Palm Bay Road and US 192.
- FDOT is conducting a Corridor Planning Study for SR 507/Babcock Street from Palm Bay Road to US 192 to evaluate potential operational, safety, and multi-modal improvements along the corridor.
- The SCTPO performed a Pedestrian/Bicycle Safety Review along Palm Bay Road from Babcock Street to Lipscomb Street to evaluate pedestrian/bicycle safety along the corridor and provide recommendations for improvements.
- The SCTPO performed a Road Safety Audit along SR 507/Babcock Street from Malabar Road to Palm Bay Road. FDOT has plans to widen this corridor from four lanes to six lanes.
- The SCTPO performed a Bicycle and Pedestrian Master Plan which prioritized bicycle facilities along Port Malabar Boulevard.

Other Issues

- The school has a total of 700 students. 100 students participate in after school care.
- The County has implemented the 30/30 rule, which means students may not be released from school for 30 minutes if thunder is heard within 30 seconds of a lightning strike.
- The parking on the school campus is not sufficient for school events. When there is an event parents will often park in the grass area between Riviera Drive and the staff/parent parking lot in front of the school.
- Staff does not have keys to the school gates and can only enter through the front office at the front of the school during school hours or when the gates are open. This causes staff parking to be split between the two parking areas depending on what time they arrive/depart the school campus.
- Speeding is an issue along Riviera Drive and vehicles are observed driving faster than the 20 MPH speed limit in the school zone.
- Staff noted there is a new development under construction south of the school campus, which is likely to increase the number of students walking/biking to/from the school campus. Further research denoted that this is a single family residential development.
- During field review check for the following issues:
    - Safety of the sidewalk connection between Mariposa Drive and the eastern entrance to the school.
    - Stacking lengths for vehicles turning into the parent drop-off/pick-up loop during morning and afternoon peak periods.

Field Review

A field review was conducted on January 22, 2020 to review the existing conditions and to observe student drop-off activity from 7:15 AM to 8:15 AM and student pick-up activity from 1:30 PM to 3:00 PM. Members from Brevard County Schools, FDOT, SCTPO, and KAI were present at this field review. The field review also included interacting with the crossing guard and observing and documenting conditions within the school's study area. Notes from this field review are summarized below.

Crossing Guards

- There is one crossing guard present along Riviera Drive just north of the school campus at a mid-block crossing.
- There is another crossing guard that is supposed to be present at the intersection of Mariposa Drive and Mascot Street, which serves the eastern pedestrian/bicyclist entrance to the school campus; however, the crossing guard was not present during the morning or afternoon during the field review.

School Campus

- Pedestrians and bicyclists traveling southbound along Riviera Drive do not have to cross driveways to enter the school campus.
- Students traveling northbound along Riviera Drive have to cross the bus loop driveway and walk on the concrete area between the bus loop driveway and parent drop-off/pick-up loop driveway to enter the school campus. There is no ADA pedestrian ramp to access this concrete area between the two driveways.
- Parents were observed parking in the grass area between Riviera Drive and the staff/parent parking lot in front of the school to walk their student to/from the school entrance. There is a safety concern for vehicles backing out onto Riviera Drive.
- A school staff member stops traffic for pedestrians and bicyclists crossing the parent drop-off/pick-up loop during the morning and afternoon peak hours.
- Crosswalk markings across the parent drop-off/pick-up loop and parking lots are faded and require re-striping.
- There is an eight foot sidewalk connecting Mariposa Drive to the eastern entrance gate to the school. There is approximately 50 feet of grass between the sidewalk and forest on each side of the sidewalk. You can see most of the path from the eastern entrance gate.

Study Area

- The speed limit is 35 MPH along Riviera Drive and Port Malabar Boulevard, and 30 MPH along Mariposa Drive. Vehicles traveling higher than the posted speed limit was observed along these roadways.

- Most of the neighborhoods within the study area have sidewalks that appear to be well maintained. Most of the intersections within these surrounding neighborhoods do not have pedestrian ramps leading from the sidewalk to the marked/unmarked crosswalks at these intersections.
- Crosswalk markings at the intersection of Mariposa Drive and Mascot Street are faded and need to be restriped.
- There are sidewalk gaps along Riviera Drive.
- There is a single family residential development under construction just south of the school campus and another development south of Riviera Drive just west of Malabar Lakes Drive.

Morning Observations

- Five pedestrians were observed crossing at the mid-block crossing across Riviera Drive just north of the school campus.
- Few students were observed walking/biking to school during the morning. This may be less than normal due to the unusually cold temperatures during the field review.
- A high number of vehicles were observed traveling northbound along Riviera Drive.
- The crossing guard at the mid-block crossing across Riviera Drive was present from 7:15 AM to 8:00 AM. No crossing guard was present at the intersection of Mariposa Drive and Mascot Street.
- Students walking/biking southbound along Rivera Drive utilized the mid-block crossing and sidewalk facilities to enter the school campus.
- Eight buses and five daycare vans were observed dropping students off at the bus loop. The first bus was observed to arrive at 7:10 AM and the last bus arrived at 7:35 AM. The first daycare van arrived at 7:27 AM and the last daycare van arrived at 7:40 AM.
- Daycare vans and staff members parking (seven) were observed passing busses while unloading students.
- Parents were observed parking in the parent/staff parking lot loop and in the grass area between Riviera Drive and the staff/parent parking lot in front of the school and walking their student into school.
- Stacking along Riviera Drive occurred around 7:40 AM to turn right and left into the parent drop-off/pick-up loop.
    - The southbound traffic remained in the left turn lane and did not block southbound traffic along Riviera Drive.
    - Northbound traffic turning right into the parent drop-off/pick-up loop stacked in the grass shoulder or in the northbound travel lane of Riviera Drive. Vehicles were observed driving in the striped median or the southbound travel lane around these stacked vehicles to continue northbound on Riviera Drive.

- Vehicles were observed parking in the grassy areas surrounding the southwest quadrant of the intersection of Mariposa Drive and Mascot Street to drop students so they could walk on the sidewalk to the eastern entrance to the school.
- Twenty pedestrians and nine bicyclists were observed using the eastern entrance to the school. Students were observed to begin arriving at this gate just before 7:30 AM.
- Vehicles were observed rolling through the stop signs at the intersection of Mariposa Drive and Mascot Street.
- Interview with the teacher at the eastern gate.
    - Expressed concern for student safety due to homeless population nearby.
    - Noted the woods surrounding the eastern edge of the school would likely never be developed because it is a Scrub Jay Sanctuary.
    - There was a request to bus students who lived east of Riviera Elementary School because of the safety concern along the sidewalk connecting Mariposa Drive and the eastern gate to the school.
    - There are usually 60 to 70 students who enter through the eastern gate. However due to the colder than average temperatures the number of students observed during the field review was much less.

Afternoon Observations

- Vehicles began stacking in the parent drop-off/pick-up loop around 1:00 PM.
- Stacking along Riviera Drive started at approximately 2:00 PM for southbound traffic and approximately 2:15 PM for northbound traffic. The southbound traffic remained in the left turn lane and did not block southbound traffic along Riviera Drive. Northbound traffic turning right into the parent drop-off/pick-up loop stacked in the grass shoulder south of the school. Vehicles did not block driveways and allowed traffic along Riviera Drive to flow normally.
- The stacking along Riviera Drive dissipated by approximately 2:45 PM.
- Approximately 125 total vehicles went through the parent drop-off/pick-up loop.
- The crossing guard at the mid-block crossing along Riviera Drive was present from 2:30 PM to 3:00 PM. No crossing guard was present at the intersection of Mariposa Drive and Mascot Street.
- Eight buses and five daycare vans were observed picking students up at the bus loop. The first bus was observed to arrive at 1:41 PM and the last bus arrived at 2:18 PM. The first daycare van arrived at 1:47 PM and the last daycare van arrived at 2:15 PM.
- Two daycare vans were observed preforming a three point turn in the bus loop to park in front of the buses, instead of using the loop to make the U-turn to then go park.

- One daycare van was observed to leave the school, turn around, and returned to the school to pick up a missing student. The daycare van blocked the buses from leaving on time.
- Approximately 25 parents were observed parking in the parent/staff parking lot loop or in the grass area between Riviera Drive and the staff/parent parking lot in front of the school and walking their student from the school to their vehicle.
- Thirteen (one southbound and 12 northbound) pedestrians and no bicyclists were observed along Riviera Road.
- 27 pedestrians and seven bicyclists were observed walking/biking along the sidewalk from the eastern school exit to Mariposa Drive. Students were observed cutting south across the grass to travel southbound on Mariposa Drive. Some parents were observed walking to the eastern exit of the school to walk home with their student.
- The eastern gate to the school closed at 2:40 PM.
- Vehicles were observed parking in the grassy areas surrounding the southwest quadrant of the intersection of Mariposa Drive and Mascot Street to pick up students.

Opportunities

- There is opportunity to construct a trail along the canal that runs from Craftsland Lane to Riviera Boulevard.
- Extend the concrete separator between the two southern driveways to the crosswalk to prevent the northbound right turning vehicles from driving in the crosswalk while turning into the school. Construct a pedestrian ramp at the concrete separator to provide a connection for students traveling northbound on Riviera Road to the school campus.
- Add wooden fencing along the grass area between Riviera Drive and the staff/parent parking lot in front of the school to prevent vehicles from parking in the grass to drop-off/pick-up their student.
- Construct six foot sidewalks to fill in sidewalk gaps along Riviera Drive.
- Construct a right turn lane for vehicles turning into the bus loop and parent drop-off/pick-up loop to stack in.
- Add traffic calming elements along Riviera Drive.
- Add lighting along the sidewalk from Mariposa Drive to the eastern entrance to the school to increase visibility and safety.
- Add enforcement for homeless camps near the eastern entrance to the school.

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Implementation

This section of the report will build on the analysis and observations documented in the Assessment Section to make recommendations. The purpose of this section is to list and describe the issues and recommendations identified for the Riviera Elementary School study area. Planning level cost estimates, implementation time-frames, and responsible agencies were also listed for the recommendations.

List & Maps of Recommendations

A list of issues and recommendations was developed based on the input received at the school coordination meeting and field review observations. Planning level cost estimates, implementation time-frame and responsible agency were identified for the recommendations.

Recommendations on the school campus are listed in **Table 2**. Recommendations in the larger study area are listed in **Table 3**. Maps showing the locations of these recommendations are shown in **Figure 31**, **Figure 32**, and **Figure 33**.

Table 2: School Campus Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
1	Bus loop and parent drop-off/pick-up loop	Switch the bus loop and parent drop-off/pick-up loop to provide more space for cars to stack during student drop-off/pick-up.	School Circulation	Near-Term	No Anticipated Cost
2	Between bus loop driveway and parent drop-off/pick-up entrance driveway	Extend the concrete separator between the two southern driveways west to the crosswalk to prevent the northbound right turning vehicles from driving in the crosswalk while turning into the school. Construct a pedestrian ramp at the concrete separator to provide a connection for students traveling northbound along Riviera Drive to the school campus.	Crossing	Near-Term	<$10,000

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
3	Grass area between Riviera Drive and the staff/parent parking lot in front of the school	Add wooden "fairground style" fencing along the edge of the sidewalk to prevent vehicles from parking in the grass to drop-off/pick-up their student.	School Circulation	Near-Term	$15,000 to $20,000
4	School campus	Restripe the crosswalks to be high-visibility crosswalks.	Crossing	Near-Term	<$10,000

Table 3: Study Area Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
5	Mariposa Drive and Mascot Street	Restripe crosswalks to be high-visibility crosswalks. Upgrade/install ADA compliant pedestrian ramps. Construct a raised intersection.	Crossing	Near-Term	$90,000 to $105,000
6	Riviera Drive from Tavernier Circle to just south of Craftsland Lane and Riviera Drive from just north of Lash Street to just south of Dawn Street	Build 5 to 6 foot wide sidewalks on both sides of roadway to fill in sidewalk gaps along Riviera Drive.	Sidewalk	Near-Term	$515,000 to $600,000
7	Riviera Drive just south of first school entrance/driveway	Construct a right turn lane for vehicles turning right into the bus loop and parent drop-off/pick-up loop to stack in.	Roadway	Near-Term	$305,000 to $360,000

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
8	Riviera Drive from Palm Bay Road to Port Malabar Boulevard	Add traffic calming elements along Riviera Drive.	Traffic Calming	Long-Term	Further Study Required
9	Mariposa Drive from Riviera Drive to Port Malabar Boulevard	Add traffic calming elements along Mariposa Drive.	Traffic Calming	Long-Term	Further Study Required
10	Sidewalk from Mariposa Drive to the eastern entrance to school	Add lighting along the sidewalk to increase visibility and safety.	Lighting	Long-Term	Further Study Required
11	Sidewalk from Mariposa Drive to the eastern entrance to school	Clear understory vegetation in the vicinity of the sidewalk and increase enforcement for homeless camps near the sidewalk.	Enforcement	Near-Term	Clearing Vegetation is Routine Maintenance and Enforcement Requires Staff Coordination
12	Mid-block crossing along Riviera Drive just west of Meadowbrook Road	Construct a RRFB at the mid-block crossing.	Crossing	Long-Term	$25,000 to $30,000
13	Driveways to school along Riviera Drive	Restripe crosswalks at the three driveways along the school to be high-visibility crosswalks.	Crossing	Near-Term	$15,000 to $20,000

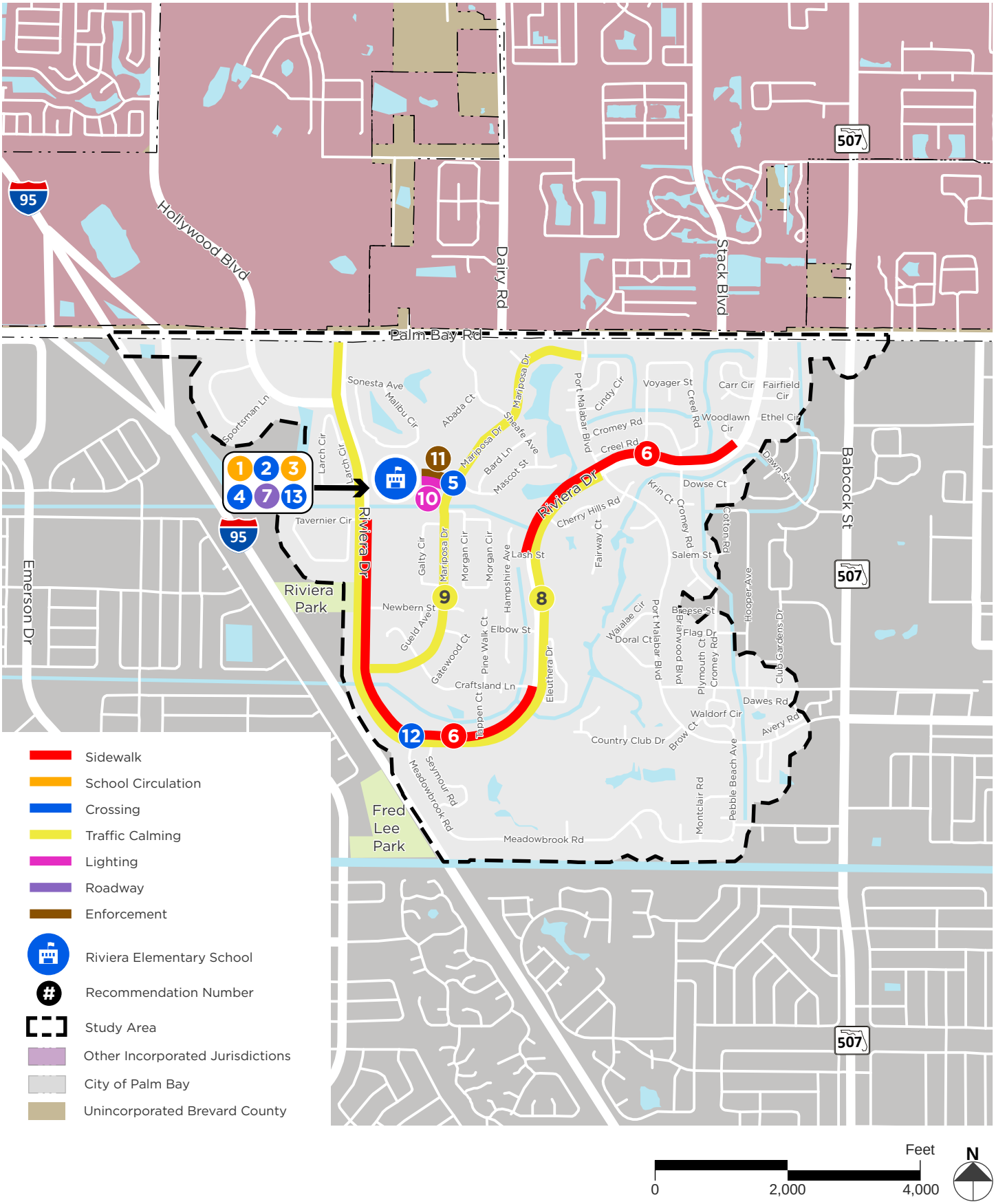


Figure 31: Recommendations

School Routes Analysis

Riviera Elementary School

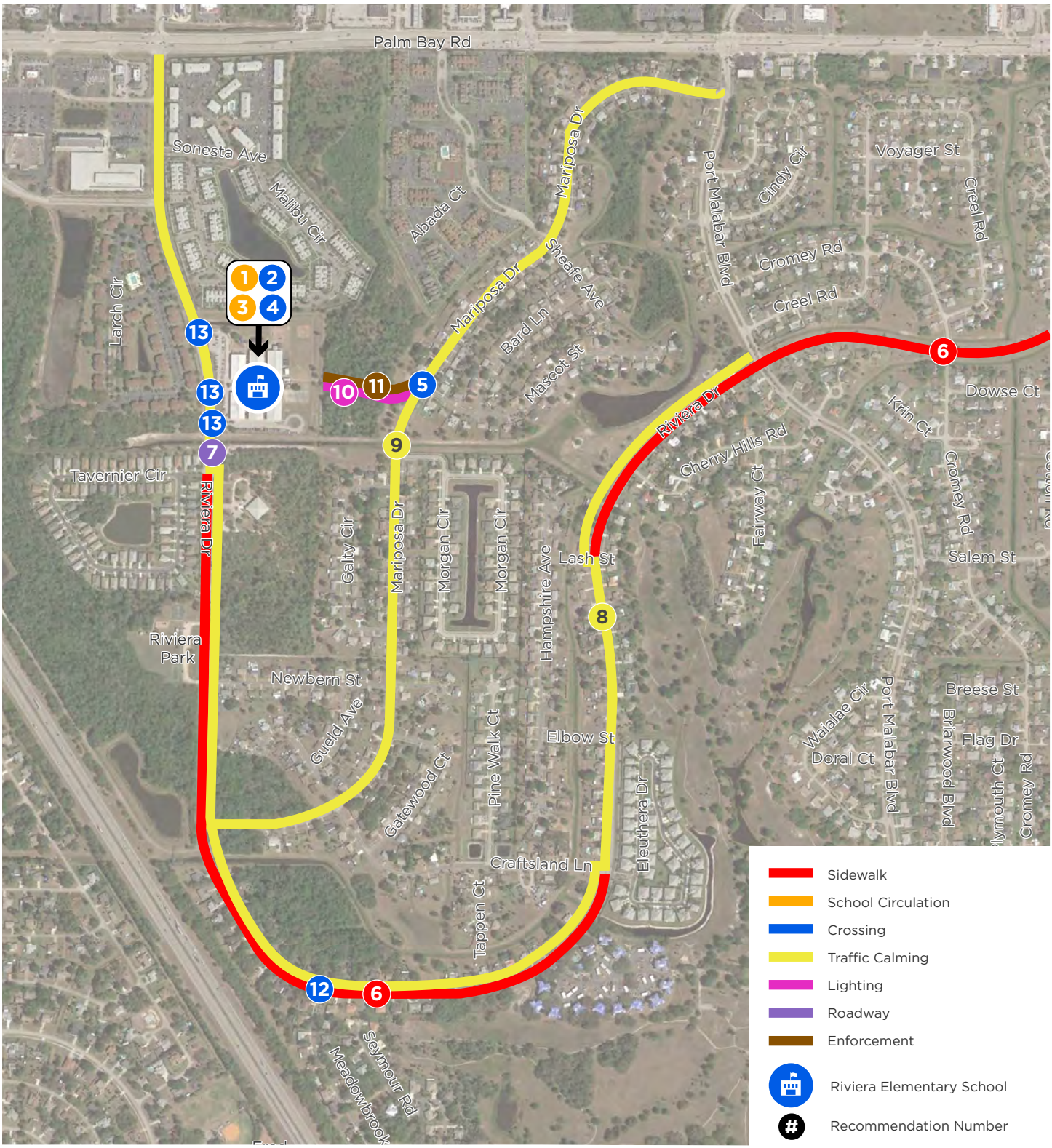


Figure 32: Recommendations: School Context Aerial Map

School Routes Analysis

Riviera Elementary School

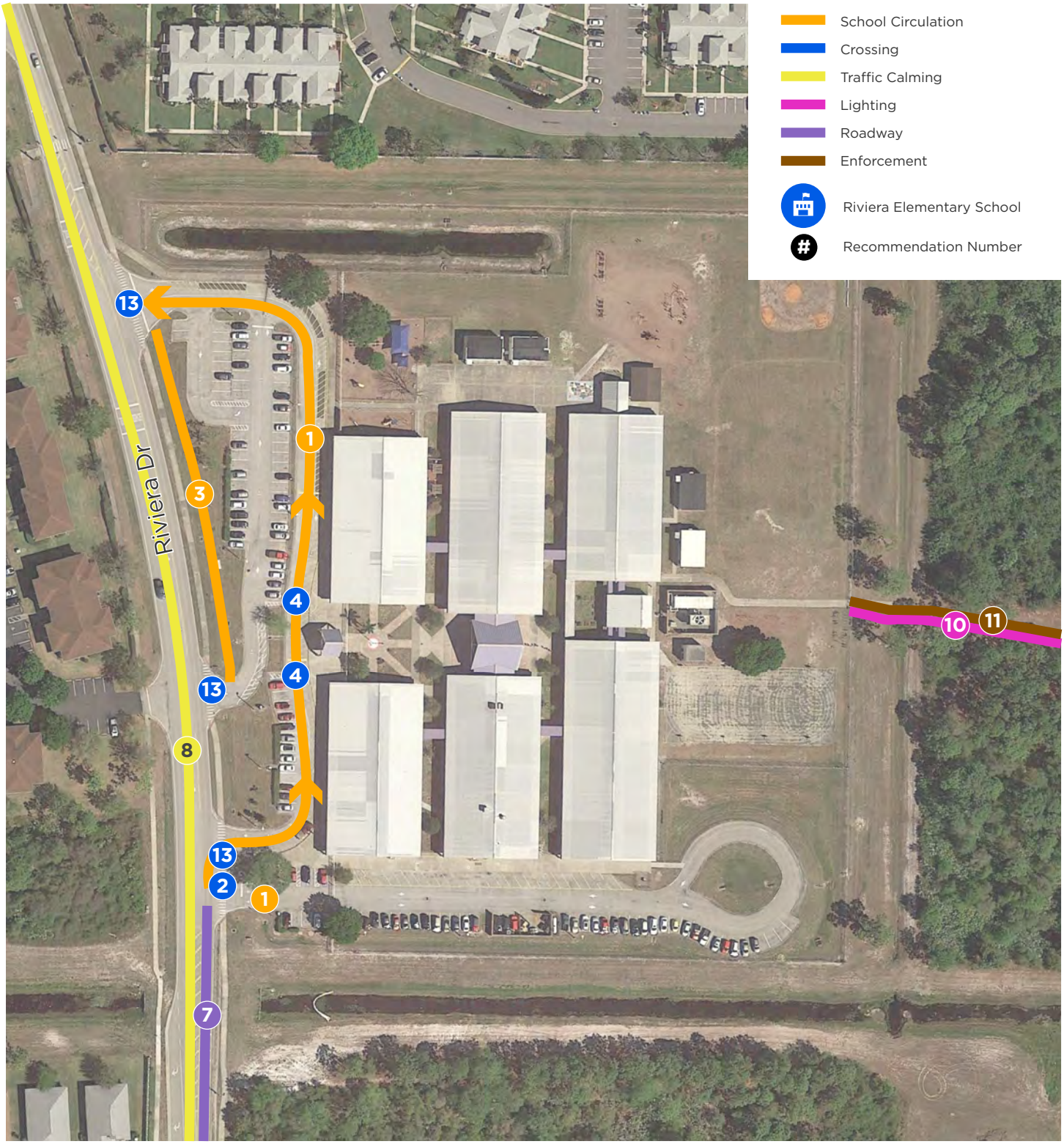


Figure 33: Recommendations: School Campus Aerial Map

School Routes Analysis

Riviera Elementary School

Detailed Recommendations

This section lists details for each recommendation including its location, type, issue, recommendation, implementation time-frame, estimated project cost, if right-of-way is needed, if there is anticipated drainage or utility impact, and the responsible agency. The implementation time-frame is listed as "Maintenance", "Near-Term", or "Long-Term" and describes the amount of time it will take for a project to be complete. The responsible agency is the public agency that will be responsible for the implementation of the recommendation.

Methodology to Calculate Cost Estimates

Cost estimates were calculated for the recommended projects in this section, unless otherwise noted. Cost estimates were not prepared for projects where more information was needed, or further follow up study should be undertaken. The bullets below describe the assumptions made for the cost estimating of the recommended projects:

- Pay items and pay item unit costs were obtained from the FDOT Historical Cost website: *https://www.fdot.gov/programmanagement/estimates/historicalcostinformation/historicalcost.shtm*
    - The most current 12 month (12/01/18 – 11/30/19) moving Statewide and Area 8 (which includes Brevard County) pay item average unit costs were utilized
- Maintenance of traffic was assumed to be 10 percent to 15 percent of the construction cost, depending on the level of impact the recommendation has on adjacent roadway traffic. Maintenance of traffic was assumed to be 0 percent for recommendations on the school campus.
- The mobilization of construction equipment to the work site was assumed to be 15 percent of the construction + maintenance of traffic cost.
- Concepts were not prepared for these recommendations so there is a high degree of unknowns that may affect the project cost once it is designed. To account for these unknowns, a 20 percent and 40 percent "contingency/unknowns" cost was calculated for each project to provide a cost estimate "range" for each project. These contingency/unknown calculations were based on the construction + maintenance of traffic + mobilization cost.
- Design and construction engineering inspection (CEI) were assumed to be 15 percent each. These costs were calculated based on the construction + maintenance of traffic + mobilization + contingency/unknowns (20%) cost and the construction + maintenance of traffic + mobilization + contingency/unknowns (40%) cost.
- The total lower range cost estimate for each recommendation was calculated as construction + maintenance of traffic + mobilization + contingency/unknowns (20%) + design (based on 20% contingency/unknowns) + CEI (based on 20%

contingency/unknowns). The total upper range cost estimate for each recommendation was calculated as construction + maintenance of traffic + mobilization + contingency/unknowns (40%) + design (based on 40% contingency/unknowns) + CEI (based on 40% contingency/unknowns).

- The final lower and upper range were rounded up to the nearest $5K or $10K to provide a conservative estimate of the total project cost.

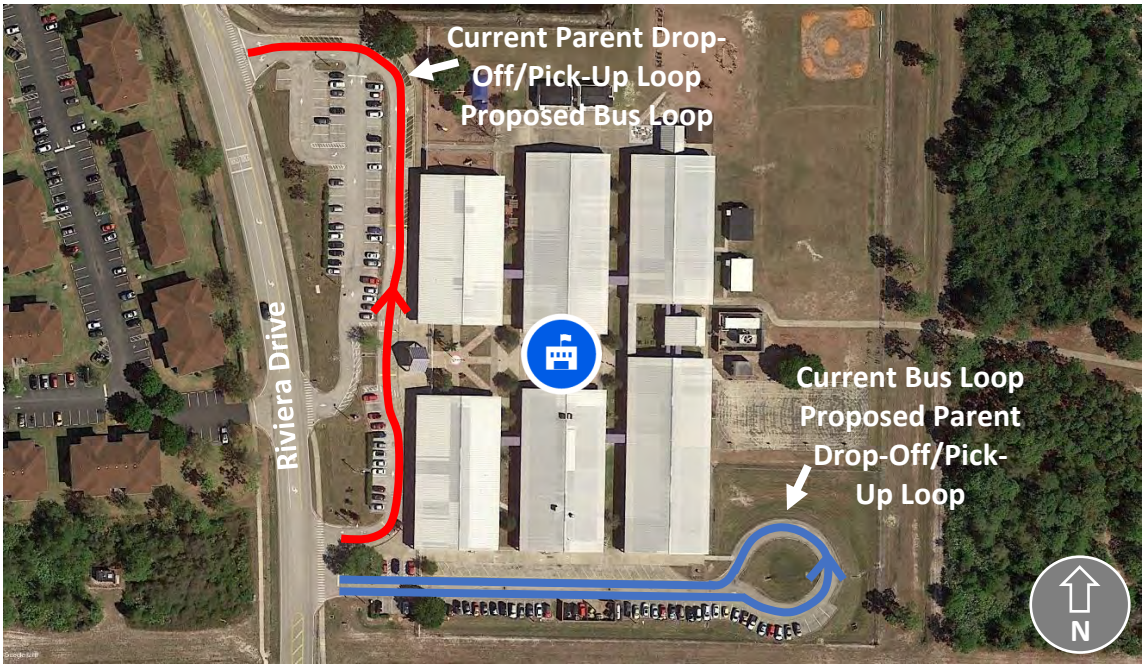
Figure 34 below shows an example of the cost estimate process described above.

Item No.	Description	Unit	Total Quantity	Weighted Average Unit Price	Total Amount
Roadway Items					
110-1-1	CLEARING & GRUBBING	AC	0.27	$9,219.13	$2,516.82
522-1	SIDEWALK CONCRETE, 4" THICK	SY	570.00	$44.53	$25,382.10
Subtotal					$27,898.92
102-1	MAINTENANCE OF TRAFFIC	LS	15%		$4,184.84
Subtotal					$32,083.76
101-1	MOBILIZATION	LS	15%		$4,812.56
Subtotal					$36,896.32
	CONTINGENCY	LS	20%		$7,379.26
	CONTINGENCY	LS	40%		$14,758.53
Total Construction Cost (20%)					$44,275.58
Total Construction Cost (40%)					$51,654.85
	DESIGN (20%)	LS	15%		$6,641.00
	DESIGN (40%)	LS	15%		$7,748.00
	C.E.I (20%)	LS	15%		$6,641.00
	C.E.I (40%)	LS	15%		$7,748.00
Total Cost (20%)					$57,557.58
Total Cost (40%)					$67,150.85
Total Cost (20%) - Rounded					$60,000.00
Total Cost (40%) - Rounded					$70,000.00

Figure 34: Example Cost Estimate Process

Project 1: Switch the bus loop and parent drop-off/pick-up loop

Location	Bus loop and parent drop-off/pick-up loop
Type	School Circulation
Issue	Vehicles were observed stacking along Riviera Drive during parent drop-off/pick-up times.
Recommendation	Switch the bus loop and parent drop-off/pick-up loop to provide more space for cars to stack during student drop-off/pick-up.



Switch Parent Drop-Off/Pick-Up Loop and Bus Loop

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	No Anticipated Cost
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard County Public Schools

Project 2: Extend concrete separator

Location	**Between bus loop driveway and parent drop-off/pick-up entrance driveway**
Type	**Crossing**
Issue	Vehicles were observed driving in the crosswalk while turning right into the school from Riviera Drive.
Recommendation	Extend the concrete separator between the two southern driveways west to the crosswalk to prevent the northbound right turning vehicles from driving in the crosswalk while turning into the school. Construct a pedestrian ramp at the concrete separator to provide a connection for students traveling northbound along Riviera Drive to the school campus.

Existing Concrete Separator Between Bus Loop Driveway and Parent Drop-Off/Pick-Up Entrance Driveway

	Implementation Time-Frame	**Near-Term**
	Estimated Project Cost	**Less than $10,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**No**
	Responsible Agency	**Brevard County Public Schools**

Extend Concrete Separator Between Bus Loop Driveway and Parent Drop-Off/Pick-Up Entrance Driveway

Project 3: Add fencing along edge of sidewalk

Location	Grass area between Riviera Drive and the staff/parent parking lot in front of the school
Type	School Circulation
Issue	Vehicles were observed parking in the grass area between Riviera Drive and the staff/parent parking lot in front of the school to drop-off/pick-up their student.
Recommendation	Add wooden "fairground style" fencing along the edge of the sidewalk to prevent vehicles from parking in the grass to drop-off/pick-up their student.

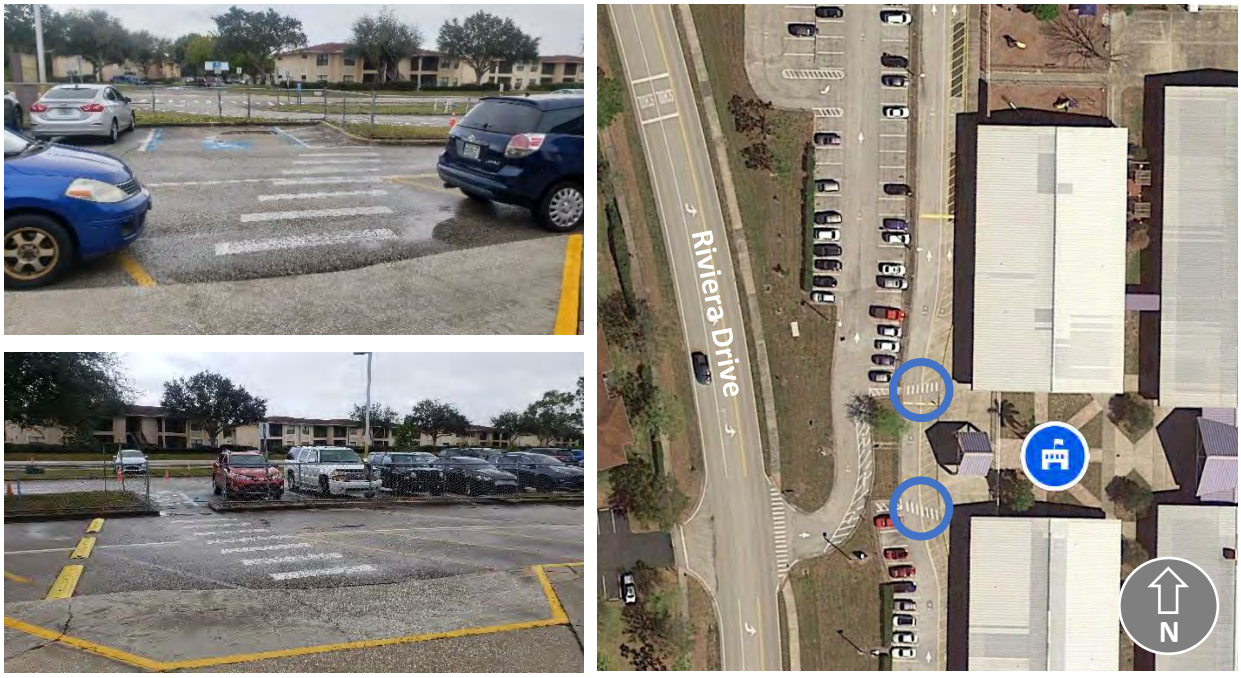
Add Fencing Along Grass Area Between Rivera Drive and the Staff/Parent Parking Lot in Front of the School

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	$15,000 to $20,000
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard County Public Schools

“Fairground Style” Fencing

Project 4: Restripe crosswalks to be high-visibility crosswalks

Location	School campus
Type	Crossing
Issue	Crosswalks on campus were observed to be faded.
Recommendation	Restripe the crosswalks to be high-visibility crosswalks.



Restripe Crosswalks Along the Parent Drop-Off/Pick-Up Loop

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	Less than $10,000
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard County Public Schools

Project 5: Upgrade pedestrian ramps to be ADA compliant, re-stripe crosswalk, and install a raised intersection

Location	Mariposa Drive and Mascot Street
Type	Crossing
Issue	Speeding was observed along Mariposa Drive at the intersection of Mariposa Drive and Mascot Street.
Recommendation	Restripe crosswalks to be high-visibility crosswalks. Upgrade/install ADA compliant pedestrian ramps. Construct a raised intersection.

Intersection of Mariposa Drive and Mascot Street

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	$90,000 to $105,000
	Right-of Way Needed?	No
	Drainage or Utility Impact?	Unknown
	Responsible Agency	City of Palm Bay

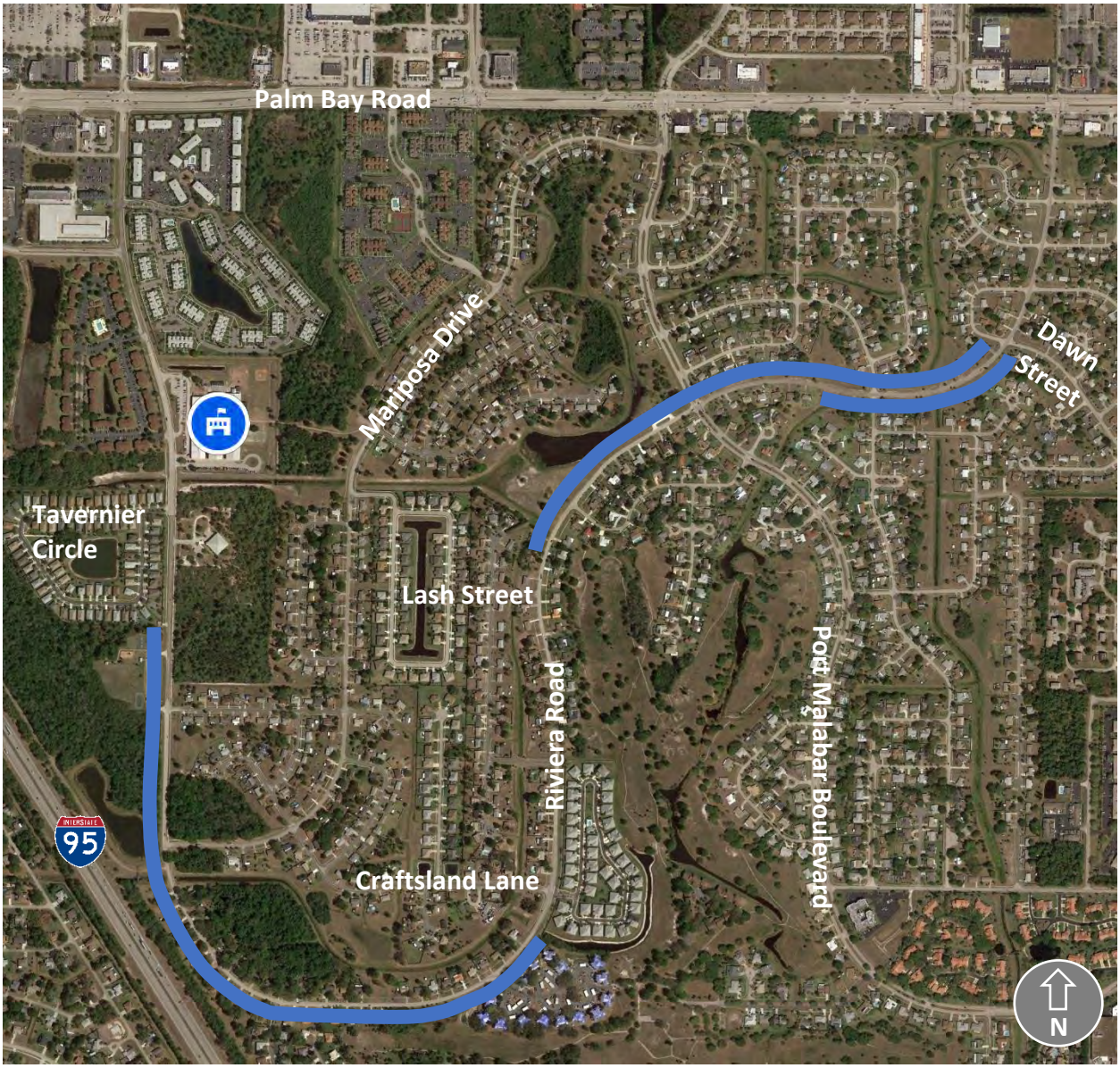
Example of a Raised Intersection

Project 6: Construct a five to six foot sidewalk along Riviera Drive on both sides of the roadway where there are sidewalk gaps

Location	**Riviera Drive from Tavernier Circle to just south of Craftsland Lane and Riviera Drive from just north of Lash Street to just south of Dawn Street**
Type	**Sidewalk**
Issue	There are sidewalk gaps along Riviera Drive.
Recommendation	Build 5 to 6 foot wide sidewalks on both sides of roadway to fill in sidewalk gaps along Riviera Drive.

Sidewalk Gap Along Riviera Drive

	Implementation Time-Frame	**Near-Term**
	Estimated Project Cost	**$515,000 to $600,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**Drainage Impact**
	Responsible Agency	**City of Palm Bay**



Add Sidewalk Along Rivera Drive

Project 7: Construct a right turn lane at southern school driveway

Location	Riviera Drive just south of first school entrance/driveway
Type	Roadway
Issue	Vehicle stacking was observed along Rivera Drive from vehicles turning right into the southern school driveway. They were observed stacking along the grass shoulder.
Recommendation	Construct a right turn lane for vehicles turning right into the bus loop and parent drop-off/pick-up loop to stack in.

Vehicles Stacking Along Riviera Drive

Add Right Turn Lane

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	$305,000 to $360,000
	Right-of Way Needed?	Unknown
	Drainage or Utility Impact?	Drainage Impact
	Responsible Agency	City of Palm Bay

Project 8: Add traffic calming elements along Riviera Drive

Location	**Riviera Drive from Palm Bay Road to Port Malabar Boulevard**
Type	**Traffic Calming**
Issue	Speeding was observed along Riviera Drive.
Recommendation	Add traffic calming elements along Riviera Drive.

Install Traffic Calming Along Riviera Drive

	Implementation Time-Frame	**Long-Term**
	Estimated Project Cost	**Further Study Required**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**Unknown**
	Responsible Agency	**City of Palm Bay**

Typical Traffic Calming Treatments

Speed Cushion

Speed Hump

Street Trees

Curb Extension

Project 9: Add traffic calming elements along Mariposa Drive

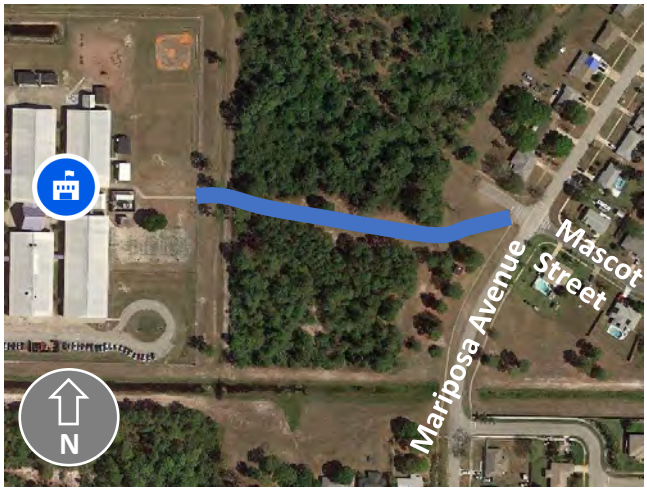
Location	Mariposa Drive from Riviera Drive to Port Malabar Boulevard
Type	Traffic Calming
Issue	Speeding was observed along Mariposa Drive.
Recommendation	Add traffic calming elements along Mariposa Drive.

Install Traffic Calming Along Mariposa Drive

	Implementation Time-Frame	Long-Term
	Estimated Project Cost	Further Study Required
	Right-of Way Needed?	No
	Drainage or Utility Impact?	Unknown
	Responsible Agency	City of Palm Bay

Project 10: Add lighting along the sidewalk from Mariposa Drive to the eastern entrance to the school

Location	**Sidewalk from Mariposa Drive to the eastern entrance to school**
Type	**Lighting**
Issue	The sidewalk entering the eastern entrance to the school lacks lighting for students using the sidewalk during dark mornings.
Recommendation	Add lighting along the sidewalk to increase visibility and safety.



Sidewalk from Mariposa Drive to the Eastern Entrance to the School

	Implementation Time-Frame	**Long-Term**
	Estimated Project Cost	**Further Study Required**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**Utility Impact**
	Responsible Agency	**City of Palm Bay**

Project 11: Clear vegetation and increase enforcement for homeless camps

Location	Sidewalk from Mariposa Drive to the eastern entrance to school
Type	Enforcement
Issue	Vegetation was observed in the vicinity of the sidewalk. Staff noted that homeless live in the area.
Recommendation	Clear understory vegetation in the vicinity of the sidewalk and increase enforcement for homeless camps near the sidewalk.

Sidewalk from Mariposa Drive to the Eastern Entrance to the School

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	Clearing Vegetation is Routine Maintenance and Enforcement Requires Staff Coordination
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	City of Palm Bay

Project 12: Add Rectangular Rapid Flashing Beacon (RRFB) at the midblock crossing on Riviera Drive

Location	Mid-block crossing along Riviera Drive just west of Meadowbrook Road
Type	Crossing
Issue	Speeding was observed along Riviera Drive.
Recommendation	Construct a RRFB at the mid-block crossing.

Mid-Block Crossing Along Riviera Drive

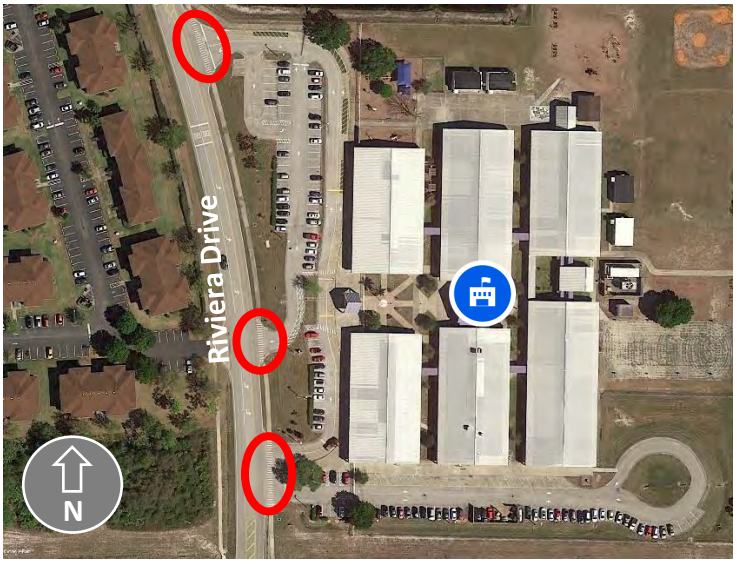
	Implementation Time-Frame	Long-Term
	Estimated Project Cost	$25,000 to $30,000
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	City of Palm Bay

Typical RRFB At A Mid-Block Crossing

Typical RRFB Sign

Project 13: Restripe crosswalks to be high-visibility crosswalks

Location	Driveways to school along Riviera Drive
Type	Crossing
Issue	The crosswalks at the driveways to the school along Riviera Drive were observed to be faded.
Recommendation	Restripe crosswalks at the three driveways along the school to be high-visibility crosswalks.



Restripe Crosswalks Along Driveways to the School Along Riviera Drive

	Implementation Time-Frame	Near-Term
	Estimated Project Cost	$15,000 to $20,000
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	City of Palm Bay

Prepared For:

2725 Judge Fran Jamieson Way,
Bldg. B, Room 105,
Melbourne, FL 32940

Prepared By:

KITTELSON & ASSOCIATES

225 E Robinson Street,
Suite 355,
Orlando, FL 32801