SCHOOL ROUTES ANALYSIS

SATURN ELEMENTARY SCHOOL

ASSESSMENT & IMPLEMENTATION REPORT

JANUARY 2024

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School Routes Analysis

Saturn Elementary School

Cocoa, FL

Assessment and Implementation Report

January 2024

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SATURN ELEMENTARY

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 this School Routes Analysis (SRA) project. The nine study schools were selected by the cities of Rockledge and Cocoa 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 follows the methodology of the pilot assessment conducted for the cities of Melbourne and Palm Bay in 2020. This report documents the assessment of the existing conditions and lists recommendations for Saturn Elementary School located at 880 Range Road, Cocoa, Florida 32926.

Purpose

The purpose of this project is to provide safety and mobility improvements within these study areas to improve walking and bicycling routes and safe access to schools for all modes. The goal for the assessment phase of the SRA is to document the observed vehicular, pedestrian, and bicycle circulation routes adjacent to the school site, identify issues associated with pedestrians and bicyclists within the study area, and make recommendations for improvements. The goal for the implementation phase of this study is to develop recommendations from the assessment phase to create a safer environment for students who live within the walk zone and choose to walk or bike 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 SRTS program that explicitly focused on funding projects to enhance pedestrian and bicyclist infrastructure near schools. Fixing America's Surface Transportation Act (FAST) of 2015 reinforced the SRTS program. Federal funding from the FAST Act expired in 2020 and funding for the State of Florida was renewed by the Florida Department of Transportation (FDOT). In 2021, the Infrastructure Investment and Jobs Act reinforced the SRTS program and expanded it to include High Schools. The program is currently funded through the Safe Streets and Roads for All program and includes $1 Billion per year to address roadway safety concerns. The analysis in the report is to identify projects that could be funded by the State of Florida's SRTS program, a Safe Streets and Roads for All grant, or other sources of transportation funding.

Study Process

A study area was identified for the school based on the respective school's two-mile walk zone and overall attendance boundary. The study area is meant to reflect where students walk and bike on their way to or from school. Many of the nine study schools are close to one another and

have walk zones and attendance boundaries that overlap one another. To prevent overlap between school study areas, study areas were split at major roadways.

In the assessment phase of the project, existing conditions, crash data, and student/parent travel survey data were analyzed and/or mapped. A school coordination meeting was held where representatives from the SCTPO, City of Cocoa, Brevard County Public Works, Brevard Public Schools, Saturn Elementary School, and FDOT were invited to share how students travel to/from school and identify issues and opportunities on the school campus and within the study area. Next, a field review was conducted to observe morning and afternoon peak drop-off/pick-up times and tour the major roadways in the study area to review current pedestrian and bicyclist infrastructure and behaviors.

In the implementation phase of the project, a list of issues and recommendations were developed. Recommendations were based on the input received at the school coordination meeting and observations from the field review. The list of recommendations was revised and finalized based on feedback received from project stakeholders. Planning-level cost estimates were calculated for each proposed recommendation. The study process is shown in **Figure 1**. Recommendations for the school campus and study area surrounding Saturn Elementary School are summarized in **Table 1**.

Figure 1: Study Process

School Campus Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
1	School Campus	Flip the parent drop-off/pick-up loop to be on the south side of the school and the bus loop to be on the north side of the school: • Southern proposed parent drop-off/pick-up loop: Widen the entrance/exit driveway and roadway width to comfortably accommodate 2 vehicles side-by-side. Extend the loop further to the east to provide more queue storage for vehicles. Open the proposed parent drop-off/pick-up loop gate at 7:00 AM and 1:30 PM to reduce queueing along Range Road prior to school start and dismissal times. Evaluate the drainage impacts of the swale located on the south side of the school property just east of the loop. • Northern proposed bus loop: Widen the entrance/exit driveway width to comfortably accommodate 2 buses side-by-side. Potentially remove parking spaces near the turnaround point at the east end of the parking lot and near the entrance/exit driveway to accommodate bus turning movements. Due to the northern bus loop area still having staff/visitor/parent parking, there will need to be signage restricting vehicle access from 7:15 AM to 8:00 AM and from 2:00 PM to 2:35 PM.	School Circulation/ Roadway	Long-Term	Further Study Required
2	School Campus	Open the gate on the north side of the school to allow students/parents to walk on the continuous sidewalk connected from the roadway onto the school property and encourage them to use the marked crosswalk across the northern school driveway.	Maintenance	Maintenance	Maintenance

Study Area Recommendations					
No.	**Location**	**Recommendation**	**Type**	**Time-Frame**	**Cost Estimate**
3	Range Road	Increase the frequency of landscaping and maintenance in front of school property to cut the vegetation.	Maintenance	Maintenance	Maintenance
4	Range Road & Palm Drive, Range Road & Stratford Drive, Lake Drive West of Wenner Way, and Lake Drive & Woods Lake Drive	Add RRFBs, in-street pedestrian crossing signage, and pedestrian lighting at the existing crosswalks.	Sign/Signal	Near-Term	$90,000 to $110,000
5	Range Road from Dianne Drive to Delys Street	Create one continuous school zone from Dianne Drive to Delys Street by including the roadway segment from Palm Drive to Palmetto Drive in the Range Road school zone. Add school zone pavement markings, “Speeding Fines Doubled”, and “End School Zone” signage.	Sign/Signal	Near-Term	$10,000 to $20,000
6	School Campus Driveways	Restripe faded crosswalks to high-visibility crosswalks where sidewalks are present.	Crossing	Maintenance	<$10,000
7	Range Road from SR 520 (King Street) to Tiger Trail	Fill sidewalk gap on the west side of the roadway.	Sidewalk	Long-Term	$1,300,000 to $1,525,000
8	Range Road and Lake Drive	Fill bicycle facility gaps prioritized in the 2019 SCTPO Bicycle & Pedestrian Master Plan on: • Range Road from SR 520 (King Street) to Tiger Trail; and • Lake Drive from Cox Road to SR 501 (Clearlake Road).	Bicycle Facility	Long-Term	Further Study Required to Determine Bicycle Facility Type

Study Area Recommendations					
No.	**Location**	**Recommendation**	**Type**	**Time-Frame**	**Cost Estimate**
9	Range Road and Lake Drive	Install/upgrade pedestrian ramps that meet current standards along: • Range Road from SR 520 (King Street) to Tiger Trail; and • Lake Drive from Cox Road to SR 501 (Clearlake Road).	Sidewalk	Near-Term	$250,000 to $290,000

Assessment

This section of the report documents the existing conditions within the Saturn Elementary School study area. Summaries of existing pedestrian and bicycle conditions, student and parent survey data, crash analysis, school coordination meeting, and observations from the field review are presented.

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 areas that have been identified as a hazardous walking condition 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 or where a student would be required to walk on the roadway surface with a posted speed limit of 50 miles per hour or more. Many of the nine study schools are close to one another and have walk zones and attendance boundaries that overlap one another. To prevent overlap between school study areas, study area boundaries were drawn at major roads.

Existing Conditions Mapping and Analysis

A series of maps were prepared to show the existing conditions within the Saturn 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 stakeholders, and observations from the field visit.

Previous and Ongoing Studies

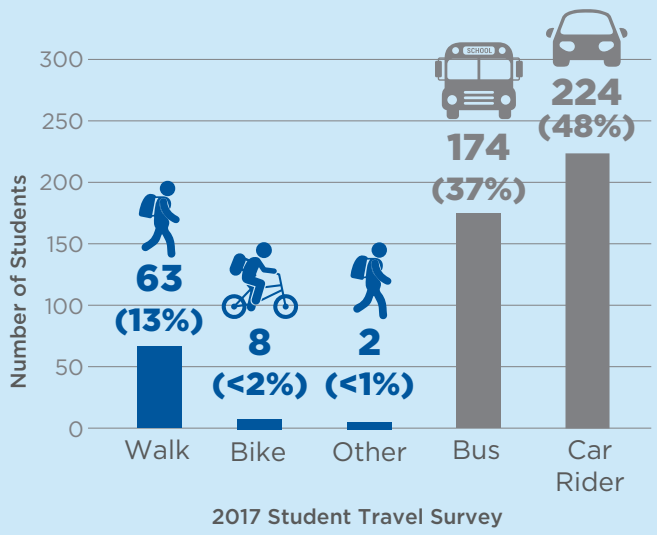
Previous and ongoing studies within the study area were reviewed and the following projects were identified:

- 2019 SCTPO Bicycle & Pedestrian Master Plan
    - Includes filling sidewalk and bicycle facility gaps throughout the county.
    - Near Saturn Elementary School, this includes filling bicycle facility gaps along Range Road, SR 501 (Clearlake Road), and Lake Drive.
- 501 (Clearlake Road) from SR 520 (King Street) to South of Michigan Avenue
    - Adding horizontal deflection and spot medians to slow vehicle speeds.
    - Widening existing sidewalks and adding sidewalks along Broadcast Court from SR 501 (Clearlake Road) to Endeavour Elementary School. Sidewalk will be added on school property from Broadcast Court to the Endeavour Elementary School building.
    - Adding raised midblock crossings with pedestrian signals.

- 2018 SCTPO Transit Bus Stop Accessibility Study
    - Prioritized accessibility and safety improvements needed at each bus stop.

Figure 2 is an infographic summarizing the main background information collected as part of the existing conditions analysis. The student survey, crash data, and existing infrastructure data are discussed later in the report.

Student Travel Modes (2017)



2017 Student Travel Survey

Total Bicycle & Pedestrian Crashes within Study Area

20 Pedestrian

22 Bicycle

School Aged Bicycle & Pedestrian Crashes within Study Area

1 Pedestrian
1 Possible Injury

1 Bicycle
1 Possible Injury

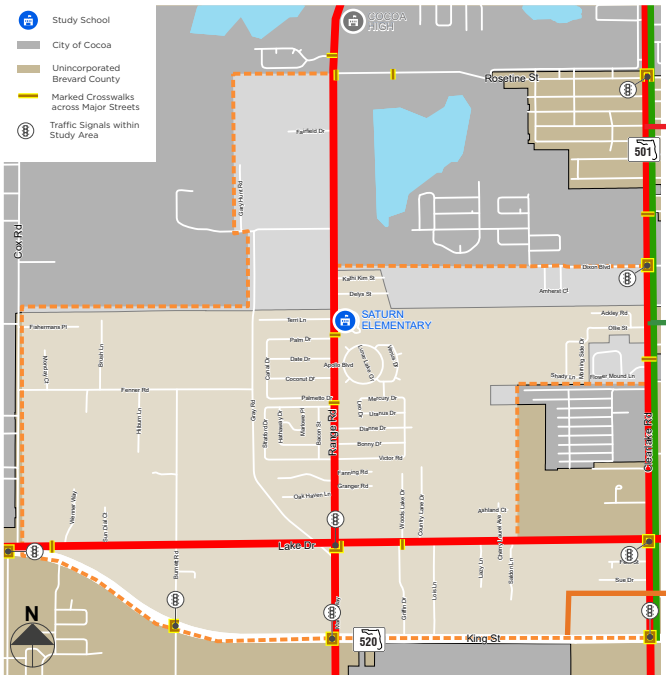
August 2017 to July 2023 Crashes from University of Florida's Signal Four Analytics Database

Signals and Crossings within Study Area

7 Signalized Intersections

5 Unsignalized Marked Crosswalks Across Major Streets

3 Crossing Guards



Previous & Ongoing Plans

2019 SCTPO Bicycle & Pedestrian Master Plan

- Includes filling sidewalk and bicycle facility gaps throughout the county.
- Near Saturn Elementary School, this includes filling bicycle facility gaps along Range Road, SR 501 (Clearlake Road), and Lake Drive.

SR 501 (Clearlake Road) from SR 520 (King Street) to South of Michigan Avenue

- Adding horizontal deflection and spot medians to slow vehicle speeds.
- Widening existing sidewalks and adding sidewalk from Endeavour Elementary to Broadcast Court.
- Adding raised midblock crossings with pedestrian signals.

2018 SCTPO Transit Bus Stop Accessibility Study

- The 2018 Space Coast Area Transit Bus Stop Accessibility Study prioritized accessibility and safety improvements needed at each bus stop.

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Figure 2: Background Information

School Routes Analysis

Saturn Elementary School

Existing and Planned Pedestrian and Bicycle 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 SCTPO as well as utilizing aerial satellite imagery and field review observations.

Range Road, just west of the school campus, has sidewalks along the east side of the roadway throughout the study area from Lake Drive to Tiger Trail. Lake Drive, just south of the school campus has a sidewalk on the southern side of the roadway from Cox Road to SR 501 (Clearlake Road). Several neighborhoods south of the school campus have sidewalks on both sides of the roadway.

There are four-foot bicycle lanes along Cox Road and five-foot wide bicycle lanes along SR 520 (King Street) through the study area. Several roadways are prioritized for future bicycle facilities according to the 2019 SCTPO Bicycle & Pedestrian Master Plan, which include:

- Range Road from SR 520 (King Street) to Tiger Trail;
- Lake Drive SR 520 (King Street) to SR 501 (Clearlake Road); and
- SR 501 (Clearlake Road) from SR 520 (King Street) to Rosetine Street.

Signalized intersections and marked crosswalks across major streets were mapped using data from aerial satellite imagery and verified via field review observations. There is one signalized intersection within the study area at Range Road & Lake Drive. Six signalized intersections are located along the study area boundary at:

- SR 520 (King Street) & Cox Road;
- SR 520 (King Street) & Burnett Road;
- SR 520 (King Street) & Range Road;
- SR 501 (Clearlake Road) & SR 520 (King Street);
- SR 501 (Clearlake Road) & Lake Drive; and
- SR 501 (Clearlake Road) & Dixon Boulevard.

There are six unsignalized marked crosswalks across major roads located at:

- Range Road & Tiger Trail;
- Range Road & Palm Drive;
- Range Road & Stratford Drive;
- Lake Drive & Just West of Wenner Way;
- Lake Drive & Woods Lake Drive; and
- SR 501 (Clearlake Road) & Broadcast Court.

There are three crossing guards present near Saturn Elementary School:

- One at Range Road & Palm Drive;
- One at Range Road & Stratford Drive; and
- One at Range Road & Lake Drive.

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

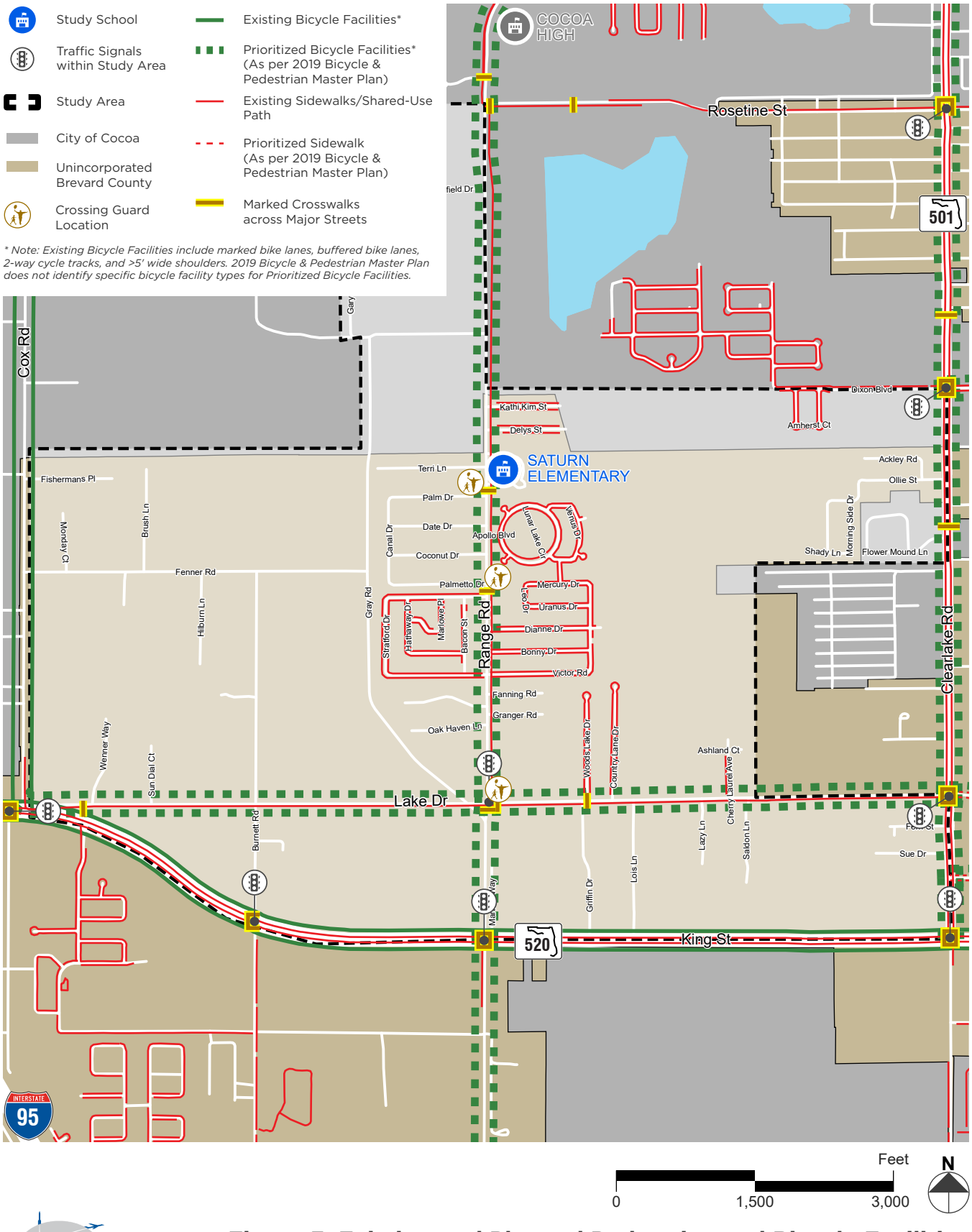

Figure 3: Existing and Planned Pedestrian and Bicycle Facilities

School Routes Analysis

Saturn Elementary School

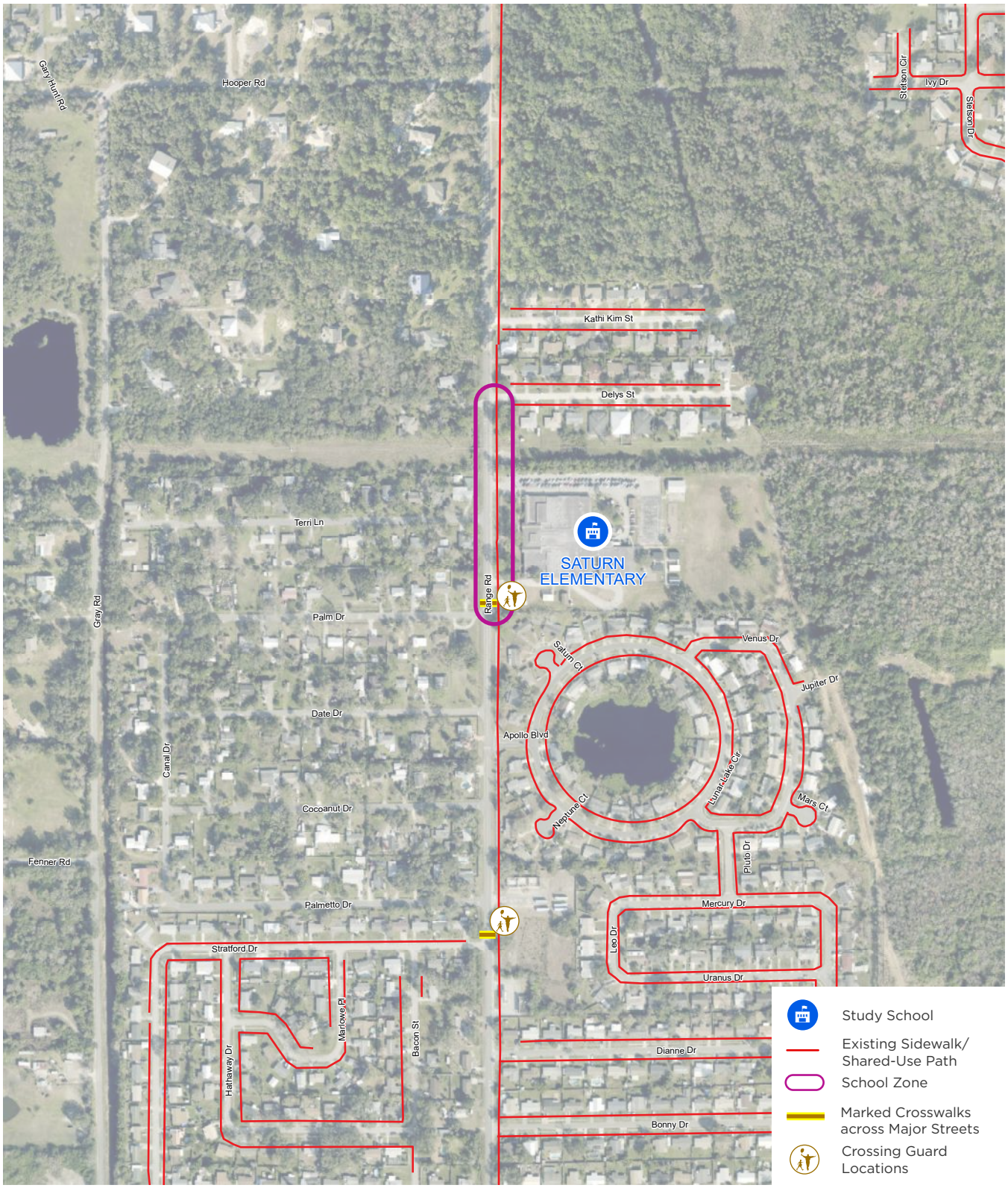

Figure 4: School Context Aerial

School Routes Analysis

Saturn 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 and AADT information was mapped using data from FDOT and the SCTPO's 2021 State of the System Report. Roadways near the school campus had the following speed limits:

- Range Road is 35 miles per hour (MPH);
- Lake Drive has several speed limit changes including:
    - 45 MPH from SR 520 (King Street) to Range Road; and
    - 35 MPH from Range Road to SR 501 (Clearlake Road).

School zones were mapped using data from aerial satellite imagery and field review observations. A school zone is an area of a roadway where the legal speed limit is lowered to 15 MPH or 20 MPH during morning and afternoon school peak-hours. There are two 15 MPH school zones along Range Road, one from Palm Drive to Delys Street and another from Dianne Drive to Palmetto Drive. The school zones are marked with signs and flashing beacons.

Figure 5 shows the existing conditions of traffic data.

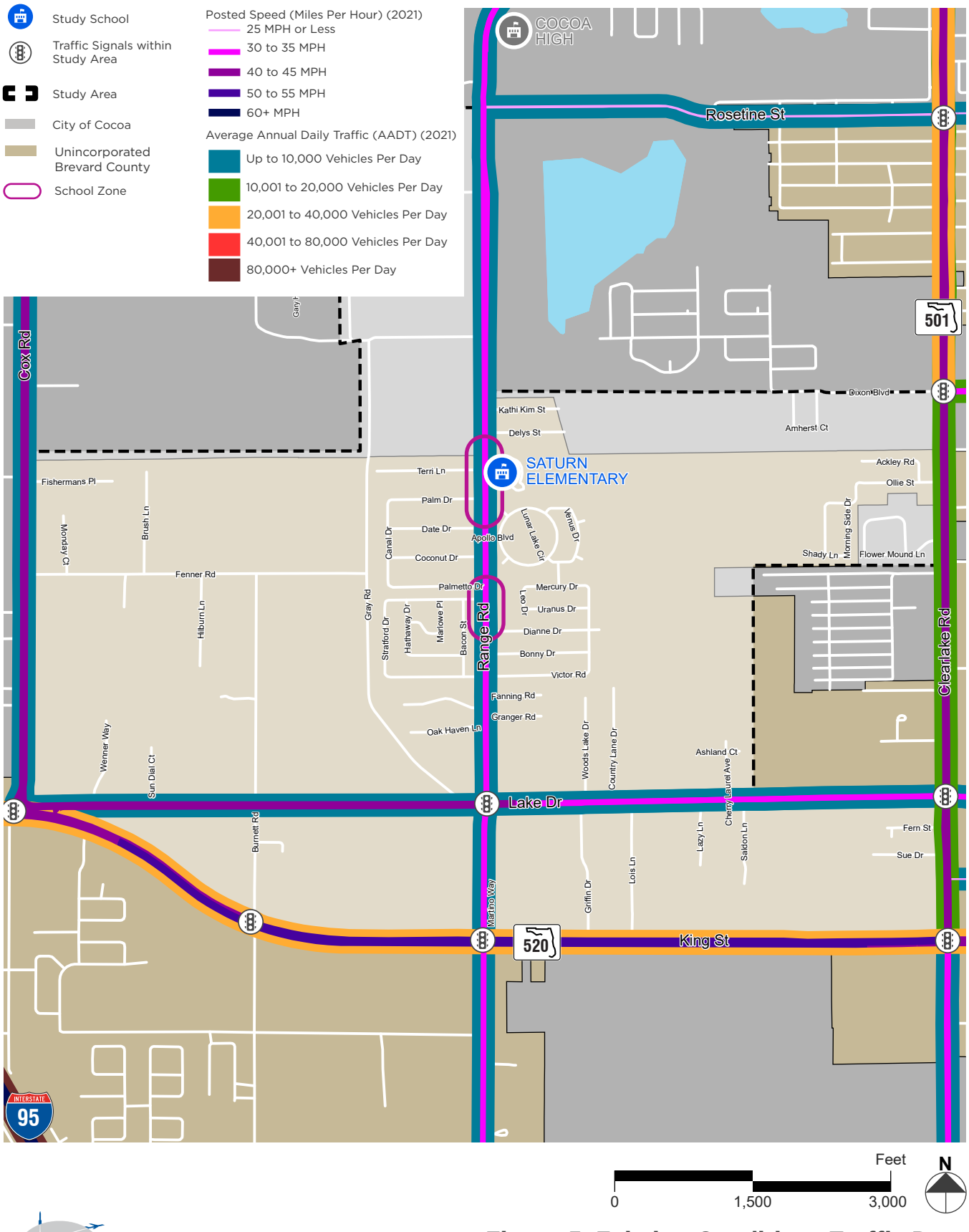

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Figure 5: Existing Conditions Traffic Data

School Routes Analysis

Saturn Elementary School

School Campus Circulation

Circulation patterns for students, staff, and parents were gathered during the school coordination meeting and field review. There are two driveways to the school campus on Range Road. There is one parking area on the school campus for staff and visitor parking just north of the school building.

The southernmost driveway is the entrance/exit for the bus and daycare van loop. The northernmost driveway serves as the entrance/exit for the student drop-off/pick-up and staff/visitor parking area. Students walking and biking from the north use the sidewalk in the northwest corner of the school campus which connects to the parent drop-off/pick-up loop. Students walking and biking from the south use the sidewalk in the southwest corner of the school campus connecting to the intersection of Range Road & Palm Drive.

Figure 6 shows various circulation patterns within the school campus. More detail on existing circulation patterns is provided in the field review section.

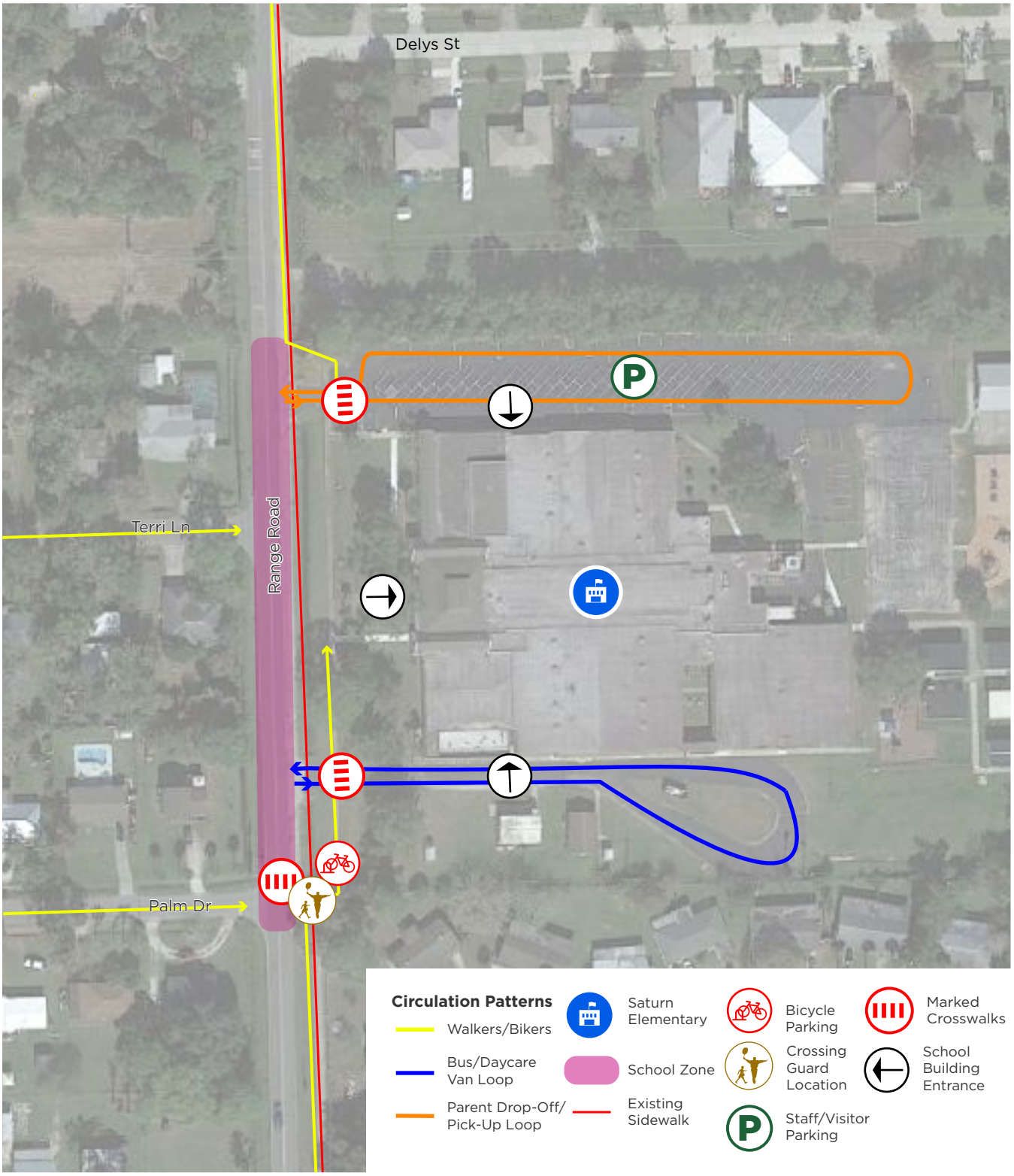


Figure 6: Existing School Circulation Map

School Routes Analysis

Saturn Elementary School

Transportation Disadvantaged Communities

The SCTPO published a Transportation Resiliency Master Plan in April 2023 to define potential transportation-specific shocks and stressors, identify vulnerable corridors in Brevard County, and recommend strategies to improve the adaptability/recoverability of the system. As a part of this work, transportation disadvantaged communities were identified at the census tract level. The following population groups were considered in the analysis:

- Overburdened renters, or people that pay 40% or more of their household income on rent;
- Population under age 18 in a single-parent household;
- Population with a disability;
- Population under age 10;
- Population over age 75;
- Workers without vehicle access;
- Population with limited English proficiency;
- Low-income population, or residents whose income is less than 200% of the Federal Poverty Guidelines; and
- Communities of Color (CoC) (all races and ethnicities other than White, non-Hispanic).

Each of these factors were considered to create a transportation disadvantaged index. The scale ranges from zero to more than 2.0 depending on the number of factors present for each household as compared to other areas within Brevard County, with zero being the least transportation disadvantaged and more than 2.0 being the most transportation disadvantaged. Saturn Elementary School is in a census tract with a transportation disadvantaged index score of 2.1, meaning that it is in a more transportation disadvantaged area in comparison to other areas in Brevard County.

School Student and Parent Survey Summary

The SCTPO conducts student and parent surveys to assess how students get to/from school and what factors affect parent's decisions to allow or not allow their child to walk or bike to school. The Student Travel Mode Survey for Saturn Elementary School was conducted in 2017 and the latest Parent Survey for Brevard County was conducted in 2018. This section summarizes the results of these surveys for Saturn Elementary School. The survey results are based on who responded thus they may not fully represent the daily average mode split. Variables such as weather, day of week, or time of year when the survey is offered may affect the results.

Student Travel Mode Survey

Students at Saturn Elementary School were surveyed about how they traveled to and from school. **Figure 7** shows the total number and percentage of students who walked or biked to

school from 2000 to 2017. **Figure 8** shows the total number and percentage of students who walked or biked to school in 2017 in the morning and afternoon peak-periods.

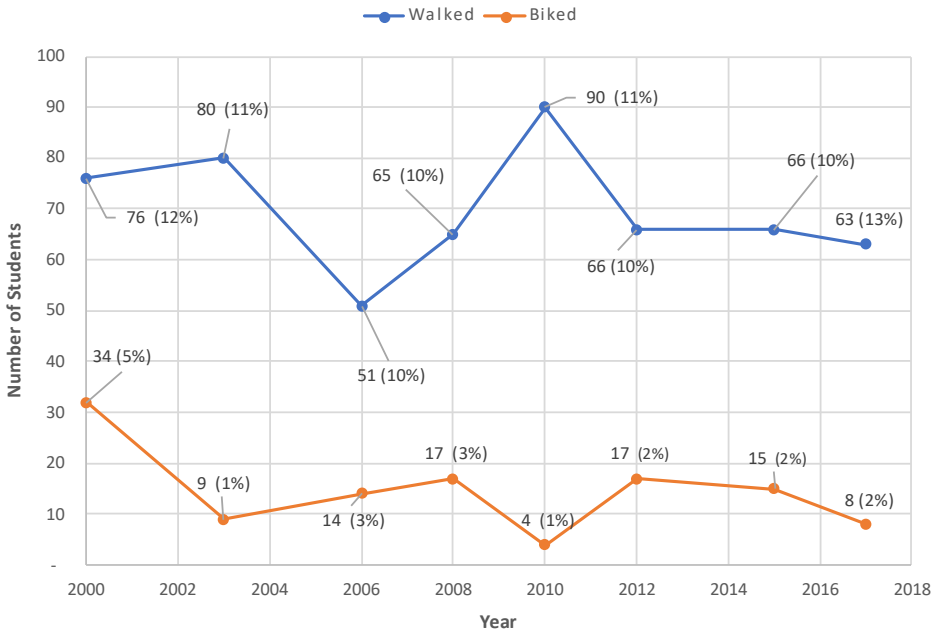


Figure 7: Total Number and Percentage of Students Who Walked or Biked to Saturn Elementary School from 2000 to 2017

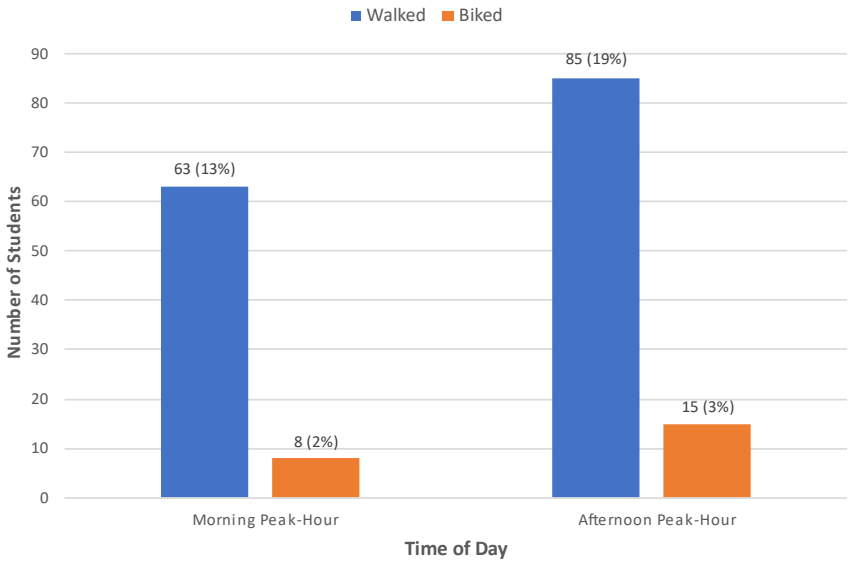


Figure 8: Total Number and Percentage of Students Who Walked or Biked to Saturn Elementary School in 2017 in the Morning and Afternoon Peak-Hours

Summary of the Student Travel Mode Survey

- Based on the survey data from 2000 to 2017, on average approximately 13 percent of total students traveled to Saturn Elementary School by walking (11 percent) or biking (two percent).
- The total number of students who walked to school was highest in 2010 (90 total) and has reduced to approximately 65 since.
- The number of students who biked to school has declined since 2000.

Parent Survey

The following data shows the results from a survey offered to parents of children attending the 104 Brevard Public Schools. There was not enough data from each individual school to draw reasonable conclusions, so the data presented here summarizes responses from all schools.

Figure 9 shows issues reported to affect parents' decision to allow a child to walk or bike to and from school. **Figure 10** shows parent opinions about how healthy walking and biking to and from school is for their child. **Figure 11** shows how much walking or biking is encouraged by schools based on parent opinions.

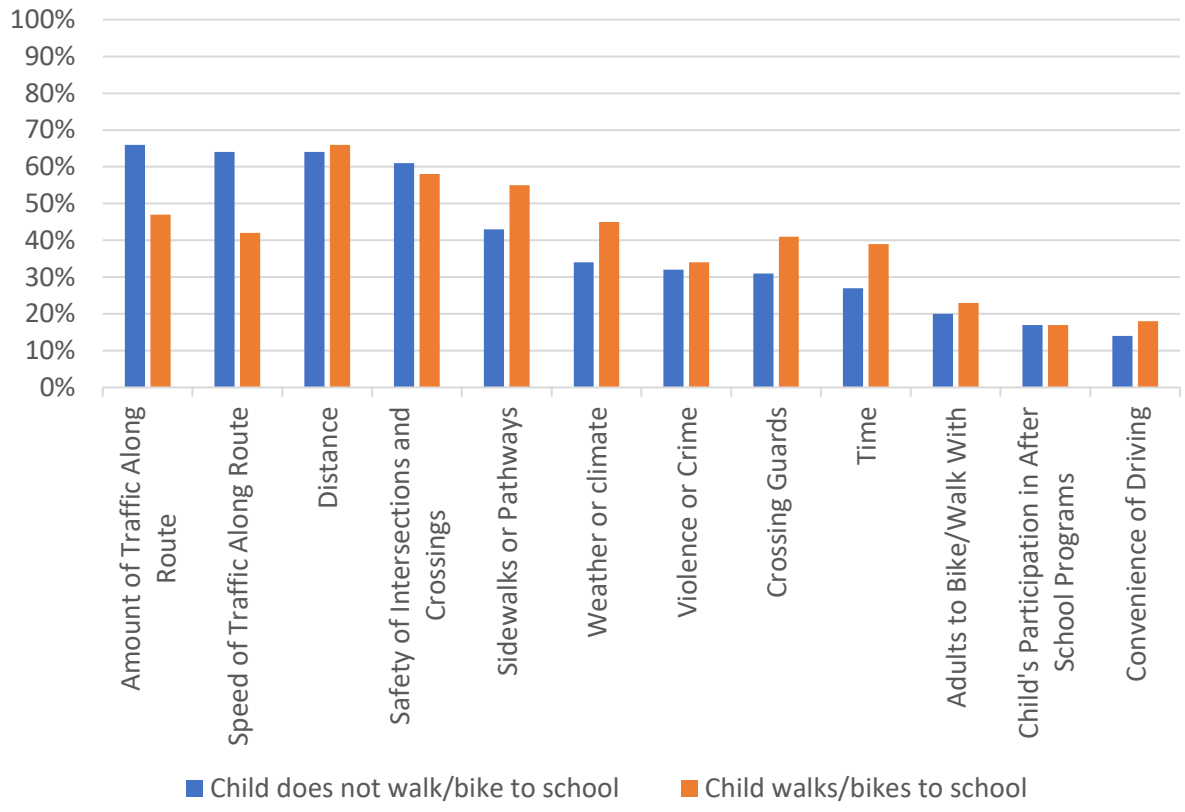


Figure 9: Issues Reported to Affect Parents' Decision to Allow a Child to Walk or Bike to and from School (All Brevard Public Schools, 2018)

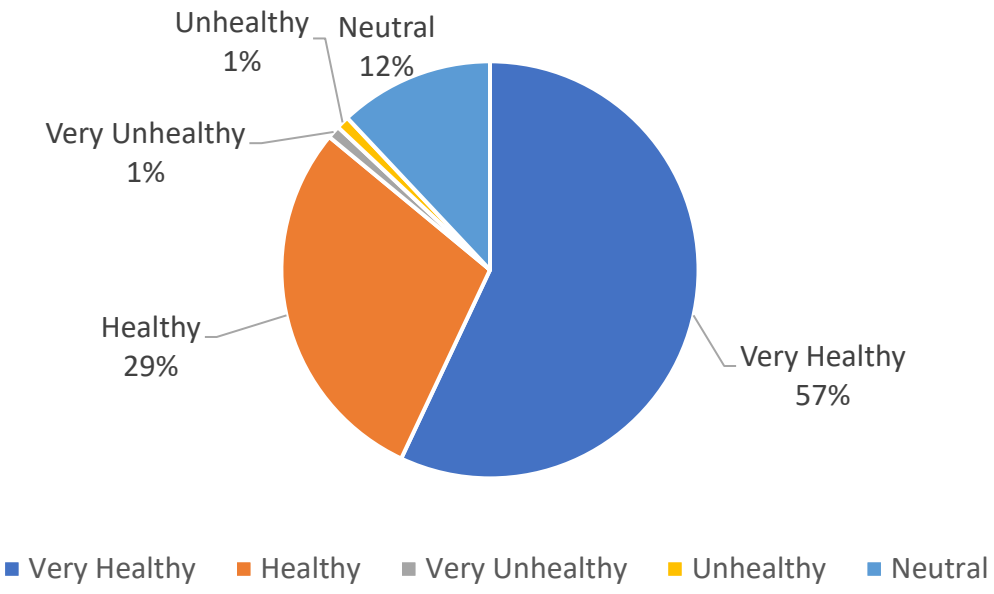


Figure 10: Parents' Opinions about How Healthy Walking and Biking to and from School is for Their Child (All Brevard Public Schools, 2018)

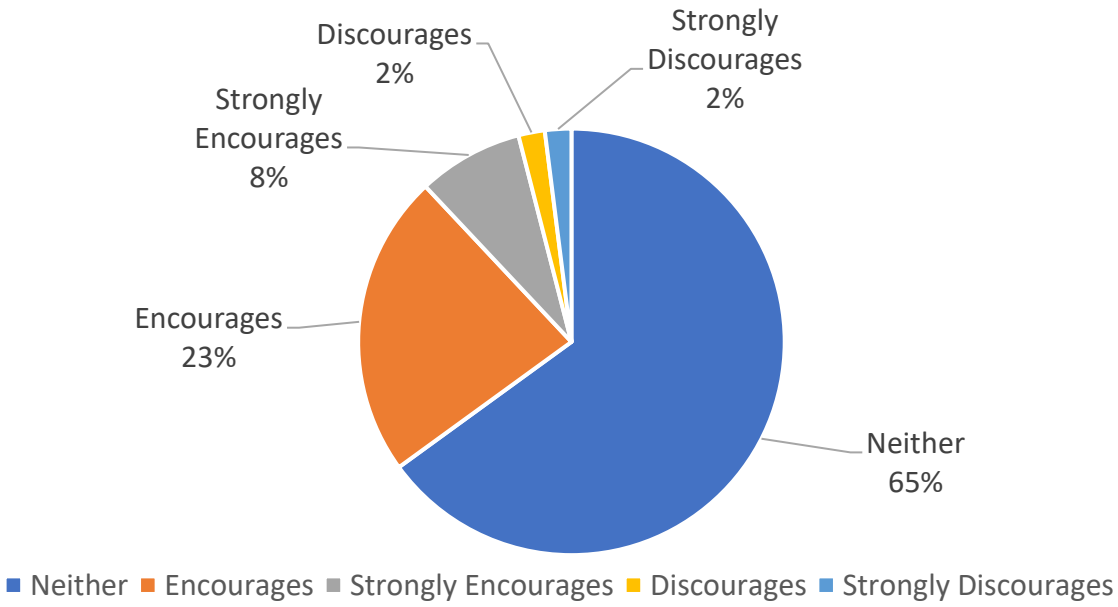


Figure 11: How Much Parents Feel Walking or Biking is Encouraged or Discouraged by Their Child's School (All Brevard Public Schools, 2018)

Main Takeaways from the Parent Survey

- The most common issues that affect parents' decision to allow their student to walk or bike to and from school are:
    - The amount of traffic along the route;

    - The speed of traffic along the route;
    - The distance of the route;
    - The safety of intersections and crossings; and
    - Lack of sidewalks or pathways.
- Most parents responded that walking or biking to school is very healthy for their child.

The SCTPO can be contacted for student and/or parent survey data.

Crash Data Analysis

Crash records were obtained for the Saturn Elementary School study area for the most recent six-year period on record (August 2017 through July 2023) from the University of Florida's Signal Four Analytics Database. Data was pulled for six-years instead of five to account for irregular traffic patterns in 2020 caused by the COVID-19 Pandemic. School aged pedestrian and bicycle crashes were analyzed during student travel hours on weekdays, August through May, from 6:45 AM to 6:30 PM. This section summarizes school aged pedestrian and bicycle crashes and non-school aged pedestrian and bicycle crashes in the Saturn Elementary School study area.

Pedestrian and Bicycle Crash Statistics

There were 42 total pedestrian and bicycle crashes within the study area (20 pedestrian and 22 bicycle). Six of the crashes were property damage only, 30 of the crashes resulted in injury, and six of the crashes resulted in a fatality. Fifty percent of crashes occurred during the day and one of the crashes occurred under wet conditions. There was one school aged pedestrian crash and one school aged bicycle crash within the study area. The reported crashes are displayed by different measures of time (year, month, day, and hour) in **Figure 12**, **Figure 13**, **Figure 14**, and **Figure 15**.

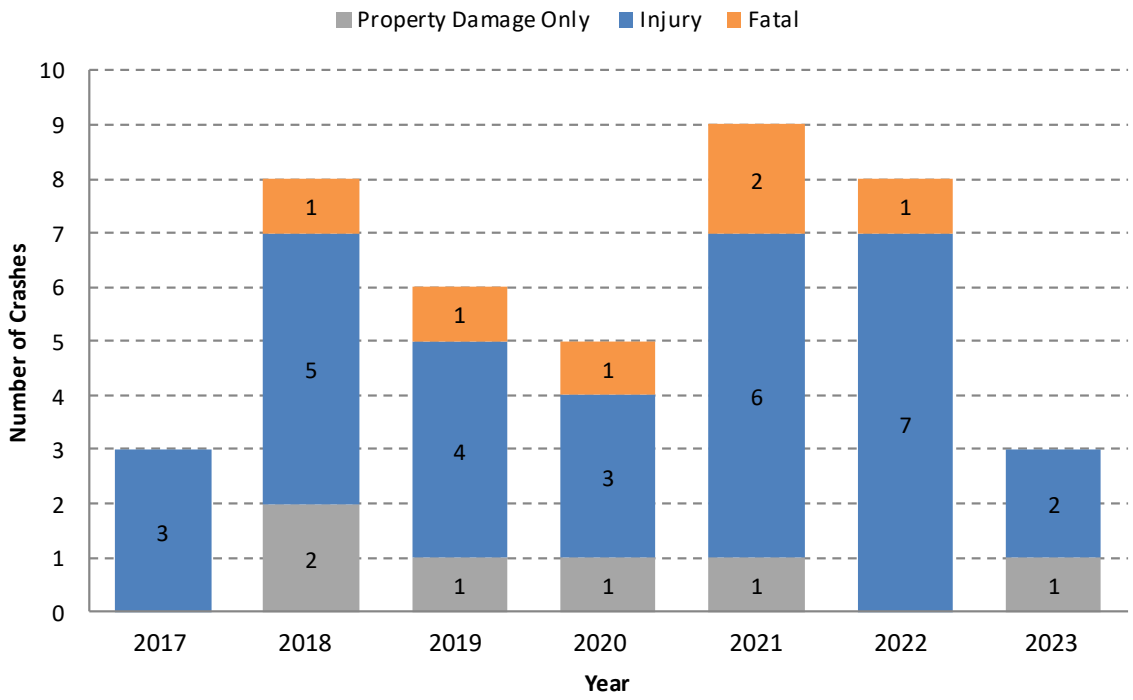


Figure 12: Pedestrian and Bicycle Crashes by Year and Severity

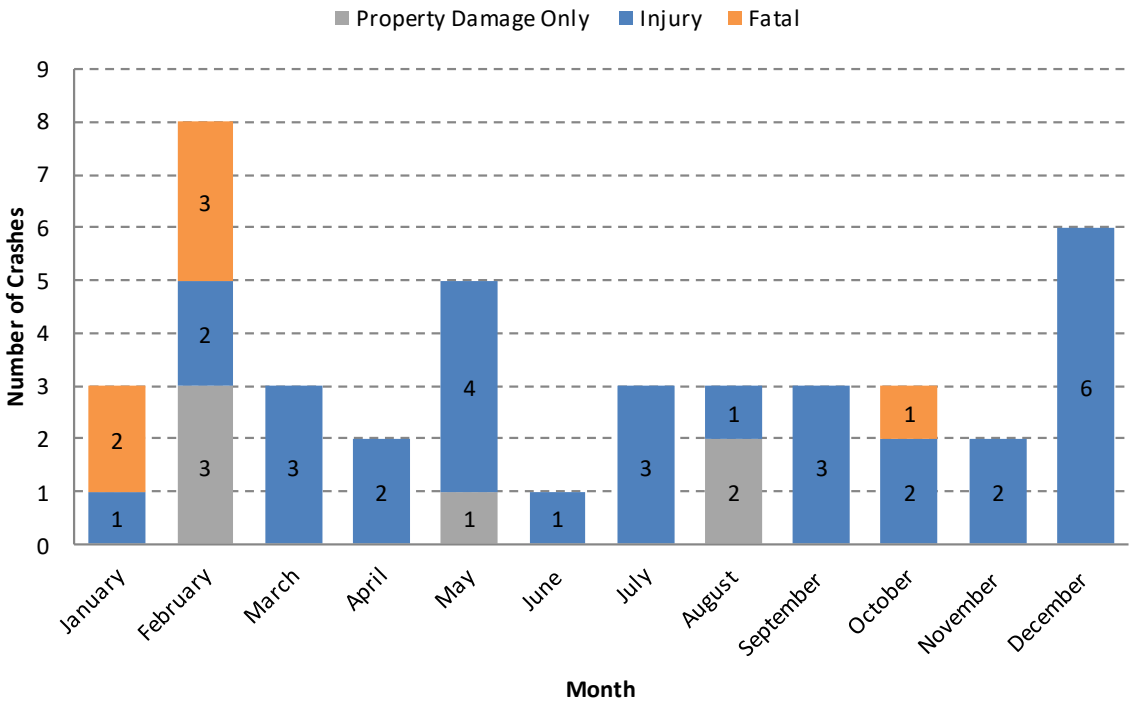


Figure 13: Pedestrian and Bicycle Crashes by Month and Severity

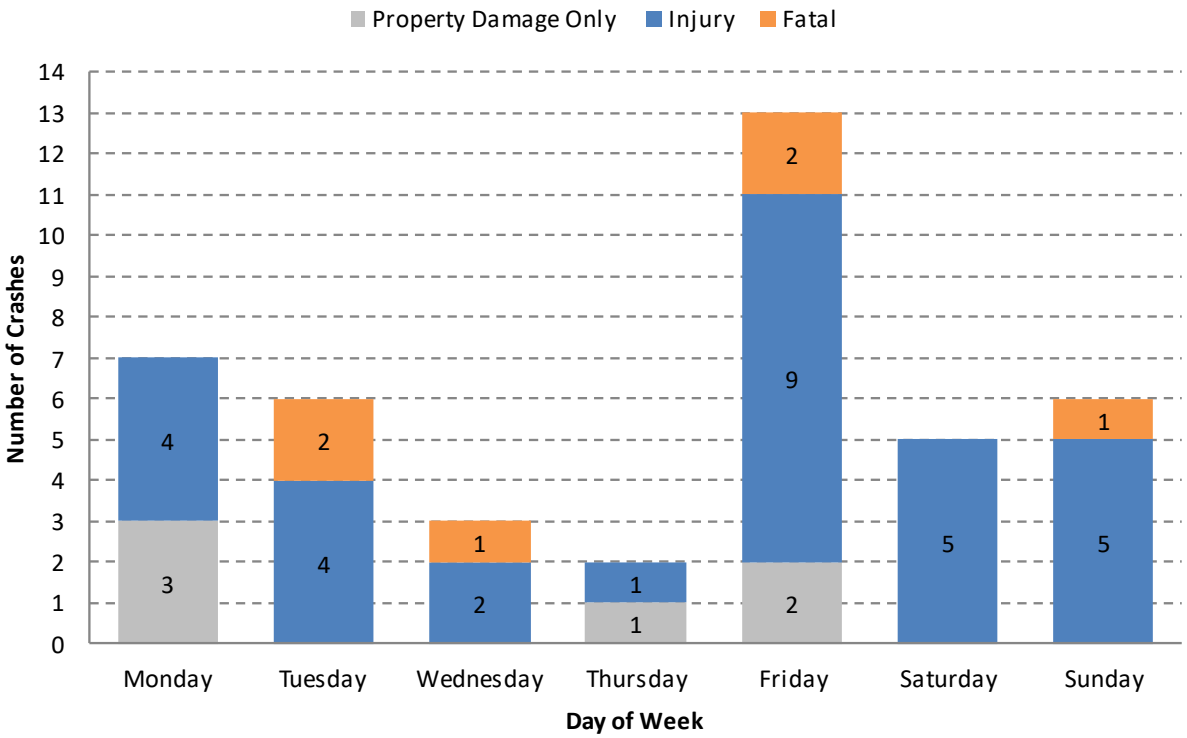


Figure 14: Pedestrian and Bicycle Crashes by Day of Week and Severity

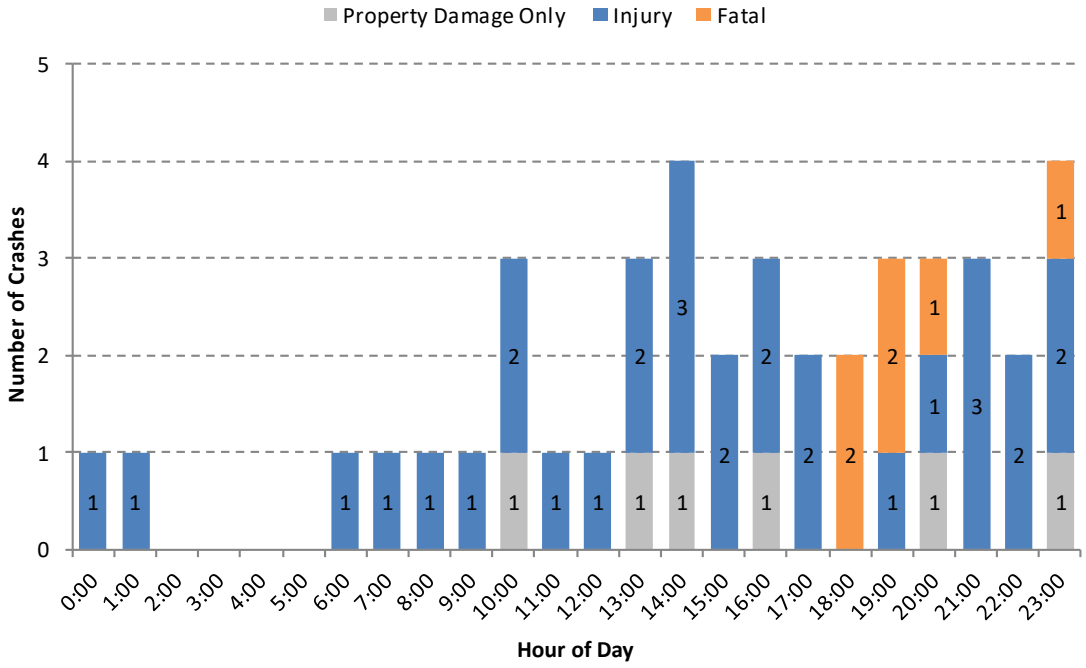


Figure 15: Pedestrian and Bicycle Crashes by Hour of Day and Severity

The highest number of crashes occurred in 2021 (nine) and February was the highest crash month (eight). Friday was the most common day of the week when crashes occurred (average of 13 per day). By time of day, the highest crash hours were from 2:00 PM to 3:00 PM and 11:00 PM to 12:00 AM (average four per hour).

School Aged Pedestrian and Bicycle Crash Summary

There was one school aged pedestrian and one school aged bicycle crash within the study area during student travel hours. The two crashes resulted in possible injuries. Both crashes occurred under dry conditions, one at dawn and one during the day. Below is a summary of the two school aged pedestrian and bicycle crashes:

1. Crash Report Number: 89830634
    - On October 1, 2020 at 6:55 AM, a crash involving a pedestrian occurred at the intersection of SR 501 (Clearlake Road) & Broadcast Court. The pedestrian was traveling eastbound in the south crosswalk when a vehicle traveling northbound on SR 501 (Clearlake Road) struck the pedestrian. The crash resulted in a possible injury. The crash occurred under dry conditions during dawn.
2. Crash Report Number: 25006217
    - On December 7, 2022 at 8:20 AM, a crash involving a bicyclist occurred at the intersection of Range Road & Dianne Drive. The bicyclist was traveling northbound in the east crosswalk when a vehicle travelling westbound on Dianne Drive turning left onto Range Road struck the bicyclist. The crash resulted in a possible injury. The crash occurred under dry conditions during the day.

The location of these crashes is shown in **Figure 16**.

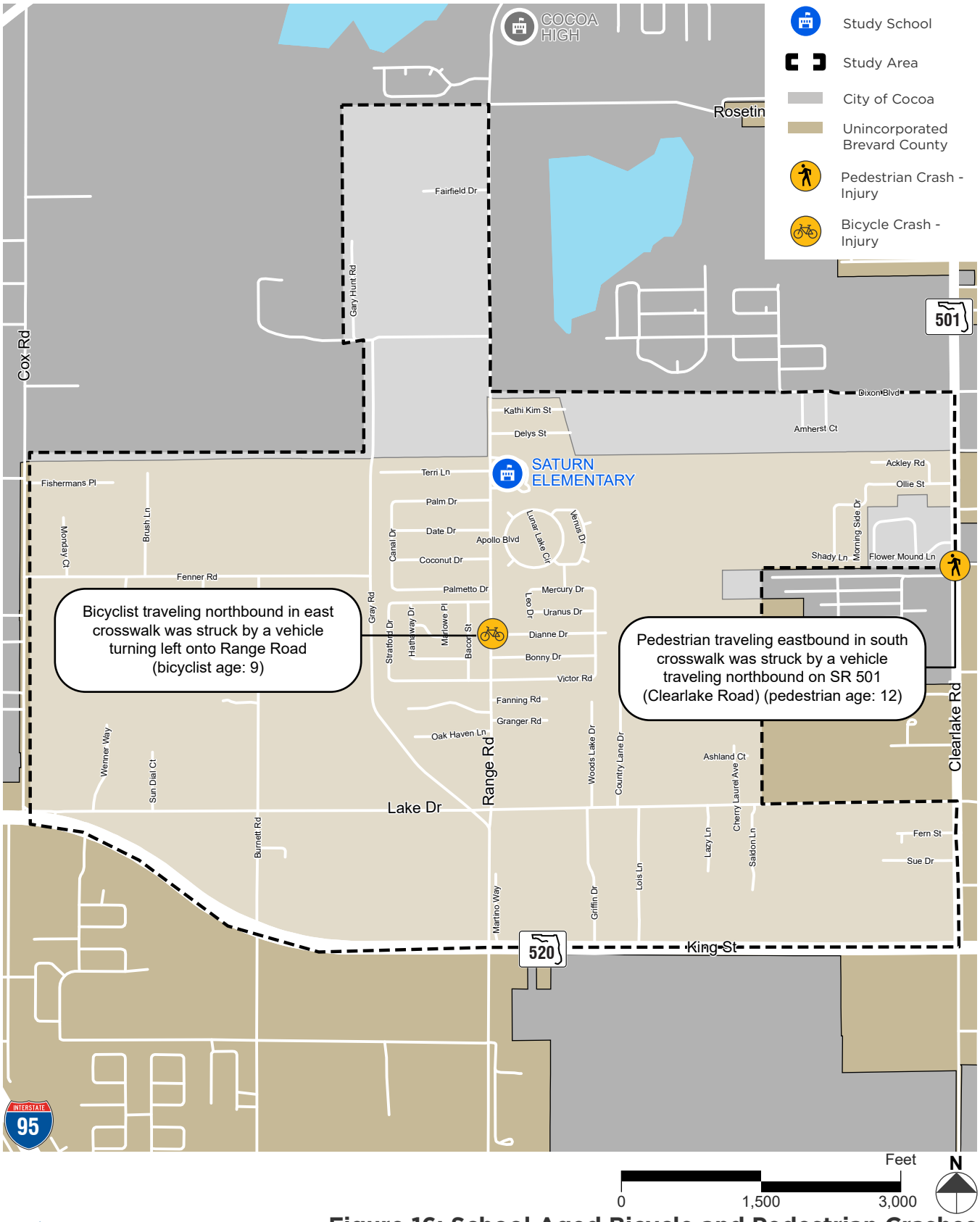


Figure 16: School Aged Bicycle and Pedestrian Crashes (August 2017 - July 2023)

School Routes Analysis

Saturn Elementary School

School Coordination Meeting

A coordination meeting was held on September 18, 2023, at Saturn Elementary School to bring stakeholders together and discuss issues and opportunities related to walking, biking, and other forms of transportation within the Saturn Elementary School study area. Members from Brevard Public Schools, Saturn Elementary School, City of Cocoa, Brevard County, SCTPO, and KAI were present at this meeting. Existing conditions data that had been collected and mapped was verified at the meeting. The meeting also enabled the Study Team, SCTPO, and KAI staff to gather additional location-specific concerns and prepare for the field review.

General Notes

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

- Summary Infographic:
    - Student travel mode split (based on the Student Travel Survey, 2017);
    - Summary of pedestrian and bicycle crashes;
    - Information regarding signals and crossings with the study area; and
    - Summary of previous and ongoing plans within the study area.
- Maps:
    - Existing and planned pedestrian and bicycle facilities;
    - Existing conditions of traffic data; and
    - Bicycle and pedestrian crashes (August 2017 – July 2023).

School Hours and Peak Traffic

The school hours are 8:00 AM to 2:30 PM Monday through Thursday and 8:00 AM to 1:15 PM on Friday.

- The peak period of students arriving in the morning is from 7:15 AM to 7:45 AM with parent drop-off beginning as early as 7:00 AM.
- Parents begin to queue at approximately 1:00 PM for afternoon pick-up.

School Entrances, Parking Lots, and Circulation

The subsequent sections discuss the school entrances, parking areas, and circulation.

School Entrances

- There are two driveways to the school campus along Range Road:
    - The southernmost driveway is the entrance/exit for the bus loop.
    - The northernmost driveway serves as the entrance/exit for Pre-Kindergarten (Pre-K) through Grade 6 parent drop-off/pick-up loop and staff parking areas.
- Students walking/biking use the main pedestrian entrance/exit at the front of the school.

Staff, Student, and Visitor Parking

- Shared staff/visitor parking is located north of the main school entrance adjacent to Range Road.

Bus and Daycare Vans Drop-Off/Pick-Up

- The school is served by eight exceptional student education (ESE) school buses and two daycare vans.
- The primary bus loop is on the south side of the school. The buses enter/exit via the southern driveway along Range Road.

Parent Drop-Off/Pick-Up Loop

- There is one drop-off/pick-up loop located at the northern side of the school adjacent to Range Road. In the morning, the Grade 1 through 6 drop-off location is at the easternmost corner of the parking lot near the pavilion. Pre-K through Kindergarten are dropped off midway through the parking lot on the school's north side. In the afternoon, all students are picked up on the north side of the school roughly midway through the parking lot.
    - Vehicle flow for drop-off/pick-up is counterclockwise. Typically, the School Resource Officer (SRO) is present at the northernmost school driveway along Range Road to help direct traffic for parent drop-off/pick-up loop for drivers who want to turn left or right onto Range Road.
    - In the afternoon, parents begin queueing for student pick-up at approximately 1:00 PM. Parents will idle in the outside travel lane along Range Road prior to afternoon pick-up, creating a conflict with northbound vehicles traveling along Range Road.
    - The gate for the northern school driveway/entrance to the staff/visitor parking lot and parent drop-off/pick-up loop is always open.

Space Coast Area Transit

- There are no Space Coast Area Transit stops near the school and no staff use transit to access the school.

Main Walking and Biking Routes

- The principal noted the mode split reported in the 2017 survey was not reflective of the current travel patterns for students coming to/from school.
- Most of the students walking/biking to school live in the residential neighborhoods south of the school and west of Range Road across from the school.
- Students coming from the north and south on Range Road use the sidewalk on the east side of the roadway.
- The bike rack is located on the south side of the school near the bus entrance at Range Road.
- There are 3 crossing guards:
    - One at Range Road and Palm Drive;
    - One at Range Road and Stratford Drive; and
    - One at Range Road and Lake Drive.
- The SRO helps students cross Range Road where the entrance/exit to the staff/visitor parking and drop-off/pick-up loop is located. This does not apply to the students walking/biking from the north on Range Road.
- Roughly 50 students walk to school in the morning, and 100 students walk home in the afternoon.

Recent and Planned Projects

- 2019 SCTPO Bicycle & Pedestrian Master Plan
    - Includes filling sidewalk and bicycle facility gaps throughout the county.
    - Near Saturn Elementary School, this includes filling bicycle facility gaps along Range Road, SR 501 (Clearlake Road), and Lake Drive.
- 501 (Clearlake Road) from SR 520 (King Street) to South of Michigan Avenue
    - Adding horizontal deflection and spot medians to slow vehicle speeds
    - Widening existing sidewalks and adding sidewalk along Broadcast Court from SR 501 (Clearlake Road) to Endeavour Elementary School. Sidewalk will be added on school property from Broadcast Court to the Endeavour Elementary School building.
    - Adding raised midblock crossings with pedestrian signals.
- 2018 SCTPO Transit Bus Stop Accessibility Study

- Prioritized accessibility and safety improvements needed at each bus stop.

Other Issues/Comments

- Parents use the vacant lot east of Range Road just north of the school property to drop-off/pick-up their student in the afternoon. This vacant lot is not on school property. Roughly 20 parents park there and walk over to pick-up their student(s).
- Most parents drop-off and pick-up their student at school instead of having them walk or bike.
- Parents are required to make a right turn out of the parent drop-off/pick-up loop in the afternoon, therefore forcing parents to make a U-turn at the intersection of Delys Street and Range Road.
- There are perceived speeding issues by the residents. The SRO discussed that when speed enforcement is performed by County sheriff officers, vehicles are rarely observed speeding along the roadway.
- The bicycle parking never reaches capacity.
- When the school needs event parking, they send vehicles as overflow in the bus loop area.
- The aerial has a portable building near the staff/visitor parking lot that has been removed.
- There is a maintenance issue with the fence falling onto parallel parked vehicles on the north side of the staff/visitor parking lot.
- The school staff would like better maintenance of sidewalks, grass mowing, trimming of trees, and general control of vegetation along the corridors leading to the school and directly in front of the school. The trees are overgrown on the side of the roadway and block school zone signage, causing a site distance issue.
- Concerns were raised about students having to cross SR 520 (King Street) to get to school.
- There are roadways with missing sidewalks, making it difficult for students to walk and bike to school.
- The back field to the east of the school floods periodically.

Potential Opportunities and Requests from School Staff

- Filling in sidewalk gaps in the community, specifically along Range Road.
- Evaluate where additional crossings along Range Road can be implemented to improve safety.
- Find a solution for where to have parents park during afternoon pick-up instead of using the unofficial parking lot to the north of the school.

- Bussing for the students who live on A Lane. Currently, five students are forced to walk to school from this neighborhood and cross at the intersection of SR 520 (King Street) & Cox Road.

Field Review

A field review was conducted on the morning and afternoon of September 21, 2023 by the Study Team led by the SCTPO and KAI. The weather conditions were hot with clear skies and the temperatures ranged from the mid-80s to mid-90s. The field review observed the drop-off activity from 7:00 AM to 8:15 AM and pick-up activity from 1:30 PM to 3:00 PM. The field review also included observing and documenting conditions within the school's study area.

The following sections summarize the observations from the field reviews.

Crossing Guards

- There are three crossing guards at Saturn Elementary School. One is located at Range Road and Palm Drive, one is located at Range Road and Stratford Drive, and one is located at Range Road and Lake Drive.
- The SRO helps kids cross Range Road where the entrance/exit to the staff/visitor parking is located. He was not present on the day of the field review but noted that he performs this duty during the School Coordination Meeting.

School Campus

- The school campus is bordered by Range Road to the west, residential development to the north and south, and wooded area to the east.
- School circulation patterns are designed such that students who walk/bike to school utilize Range Road.
- Most commonly, students were observed entering the school campus via two paths to the main entrance of the school:
    - The sidewalk in the southwest corner of the school campus connecting the intersection of Range Road and Palm Drive; and
    - The sidewalk in the northwest corner of the school campus which connects to the parent drop-off/pick-up loop.

Study Area

- There is an eight-foot sidewalk on the east side of Range Road (the same side as Saturn Elementary) that is present from Lake Drive to Cocoa Bay Boulevard before crossing over to the west side of the street continuing northbound. Many students were observed

walking and biking to school using this sidewalk from the north, west, and south sides of the school as it connects to many residential neighborhoods in the area. A handful of students were observed walking along the grassy embankment on the west side of Range Road.

- There is no access to the school from the east side of campus; it is mainly wooded/swampy land.
- Range Road consists of two 11-foot travel lanes. The sidewalk and grass shoulders vary throughout the study area:
    - From SR 520 (King Street) to Lake Drive there is an eight-foot grass shoulder on the west side and 18-foot grass shoulder on the east side.
    - From Lake Drive to Kathi Kim Street there is a 15-foot grass shoulder on the west side and an eight-foot sidewalk on the east side.
    - From Kathi Kim Street to Tiger Trail there is a 15-foot grass shoulder on the west side and a six-foot sidewalk on the east side.
- There are three flashing pedestrian warning signs (15 MPH) along Range Road, one at the northwest corner of campus for southbound traffic, one located near Date Drive for northbound traffic, and one located at Dianne Drive for northbound traffic.
- There are two school zones (15 MPH), the first starting at Delys Street and ending at Palm Drive, and the second starting at Dianne Drive and ending at Palmetto Drive. The school zones are marked with signs and flashing beacons.
- There is a vacant lot to the north of the school campus that parents park at to drop-off/pick-up their student.
- During peak drop-off and pick-up periods, parents are encouraged to turn right out of the loop by the SRO on days when he is directing traffic.
- The SRO noted that there is a perceived speeding issue along Range Road by the local residents. The SRO discussed that when speed enforcement is performed, vehicles are rarely observed speeding along the roadway.

Morning Field Review

- Eight school buses were observed entering the staff/visitor parking loop. A teacher was picked up by an exceptional student education (ESE) school bus at 7:00 AM to chaperone.
- Over 125 vehicles were observed using the parent drop-off loop.
- The queueing begins at approximately 7:00 AM. Vehicle queueing backs out onto Range Road by approximately 7:25 AM and drop-off officially begins at 7:30 AM.
- The vehicle queueing cleared from Range Road by approximately 7:50 AM.
- The majority of drivers make a right turn to head north on Range Road exiting the drop-off loop.

- Vehicle queueing along Range Road extended well south, which was abnormal for the AM drop-off period. This was due to a vehicle in the drop-off queue blocking the inside second drop-off lane, limiting the number of vehicles that could queue on school property.
- The pedestrian gate at the southwest corner of the school campus was unlocked at 7:30 AM and locked at 8:00 AM.
- Ten student walkers were observed coming from the north and entering the school property via the northern school driveway. Thirty-four walkers, ten bikers, two scooters, and one golf cart were observed at the pedestrian entrance at the southwest corner of the school campus. Only one student was wearing a helmet.
- Two parents were observed parking their vehicle in the vacant lot just north of the school to drop-off their student. Seven parents were observed dropping their student off along Palm Drive and walking them to school.

Afternoon Field Review

- Peak traffic occurred between 2:15 PM and 2:40 PM. Approximately 80 vehicles were observed using the car loop in the afternoon. Vehicles were observed queueing in the northbound lane on Range Road extending from the northern school driveway to Victor Road, approximately ½ mile south. Parents began queueing for student pick-up at the north entrance to the school at approximately 1:15 PM. Pick-up officially began at 2:30 PM.
- Due to the queueing along Range Road, vehicles were observed driving northbound the wrong way in the southbound travel lane to bypass the queue. This created multiple conflicts with various road users:
    - Conflicts between the wrong way vehicle and southbound vehicles; and
    - Conflicts between the wrong way vehicle and students crossing Range Road.
- School staff opened the gate in the southwest corner of the school for walkers and bikers to exit school property at 2:25 PM.
- Along Range Road the PE teacher directed traffic to help the buses depart from the school.
- Along Range Road the Principal was on a walkie talkie to inform staff to call students to the parent pick-up/drop-off loop.
- Eight parents parked along Palm Drive and waited or walked to school to pick-up their student. Several other parents parked on Terri Lane to pick-up their student. Informal parent pick-up was observed at Range Road and Apollo Boulevard, and at the abandoned gas station near the corner of Range Road and Dianne Drive.
- Approximately 100 students were observed walking out of the school. Roughly two thirds of the students walking out of school used the pedestrian gate at the southwest corner

of the school. A third of the students were observed being picked up by parents in the vacant lot just north of the school.

- Eight buses and two daycare vans were observed entering the school bus loop on the south side of the school.

Opportunities for Improvement

- The crossing guard located at Range Road and Palm Drive raised concerns about the unkept foliage/bushes and grass. The oak tree is overgrown and hides the school zone signage from vehicles that are approaching the school campus from the northbound lane on Range Road. A solution to this is to trim the tree branches or move the signage. There should be more regular landscaping maintenance at this location. Additionally, this area requires some cleaning due to accumulated trash.
- There is a gap in the school zone signage between Palm Drive and Palmetto Drive. It is recommended to close the gap to provide one consistent school zone along Range Road.
    - Review placement of existing school zone warning signs/flashers for proper distance away from the school property along Range Road.
- Open the gate on the north side of the school to allow students/parents to walk on the continuous sidewalk connected from the roadway onto the school property and encourage them to use the marked crosswalk across the northern school driveway.
- The vacant parcel located north of the school campus is being utilized by parents parking their car and proceed to walk into the school to pick-up their student.
- Provide more on-campus queueing for the parent drop-off/pick-up loop.
    - Flip the car loop and the bus loop so the car loop is on the south side of the school and the bus loop is on the north side of the school.
    - For the southern proposed car loop
        i. Widen the entrance/exit driveway and roadway width to comfortably accommodate two vehicles side-by-side.
        ii. Extend the loop further to the east to provide more queue storage for vehicles.
        iii. Open the proposed parent drop-off/pick-up loop gate at 7:00 AM and 1:30 PM to reduce queueing along Range Road prior to school start and dismissal times.
    - For the northern proposed bus loop
        i. Widen the entrance/exit driveway width to comfortably accommodate two buses side-by-side.
        ii. Potentially remove parking spaces near the turnaround point and near the entrance/exit driveway to accommodate bus turning movements.

iii. Because the northern bus loop area will still have staff/visitor/parent parking, will need to post signage restricting vehicle access from 7:15 AM to 8:00 AM and from 2:00 PM to 2:35 PM.

Implementation

This section of the report recommends improvements for the school study area based on the analysis and observations documented in the assessment section. The purpose of this section is to list and describe the issues and recommendations identified for the Saturn Elementary School study area. Planning-level cost estimates, implementation timeframes, and responsible agencies were also listed for the recommendations.

List and 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. Recommendations on the school campus and larger study area are listed in **Table 2**. Maps showing the locations of these recommendations are shown in **Figure 17** and **Figure 18**.

School Campus Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
1	School Campus	Flip the parent drop-off/pick-up loop to be on the south side of the school and the bus loop to be on the north side of the school: • Southern proposed parent drop-off/pick-up loop: Widen the entrance/exit driveway and roadway width to comfortably accommodate 2 vehicles side-by-side. Extend the loop further to the east to provide more queue storage for vehicles. Open the proposed parent drop-off/pick-up loop gate at 7:00 AM and 1:30 PM to reduce queueing along Range Road prior to school start and dismissal times. Evaluate the drainage impacts of the swale located on the south side of the school property just east of the loop. • Northern proposed bus loop: Widen the entrance/exit driveway width to comfortably accommodate 2 buses side-by-side. Potentially remove parking spaces near the turnaround point at the east end of the parking lot and near the entrance/exit driveway to accommodate bus turning movements. Due to the northern bus loop area still having staff/visitor/parent parking, there will need to be signage restricting vehicle access from 7:15 AM to 8:00 AM and from 2:00 PM to 2:35 PM.	School Circulation/ Roadway	Long-Term	Further Study Required
2	School Campus	Open the gate on the north side of the school to allow students/parents to walk on the continuous sidewalk connected from the roadway onto the school property and encourage them to use the marked crosswalk across the northern school driveway.	Maintenance	Maintenance	Maintenance

Study Area Recommendations					
No.	**Location**	**Recommendation**	**Type**	**Time-Frame**	**Cost Estimate**
3	Range Road	Increase the frequency of landscaping and maintenance in front of school property to cut the vegetation.	Maintenance	Maintenance	Maintenance
4	Range Road & Palm Drive, Range Road & Stratford Drive, Lake Drive West of Wenner Way, and Lake Drive & Woods Lake Drive	Add RRFBs, in-street pedestrian crossing signage, and pedestrian lighting at the existing crosswalks.	Sign/Signal	Near-Term	$90,000 to $110,000
5	Range Road from Dianne Drive to Delys Street	Create one continuous school zone from Dianne Drive to Delys Street by including the roadway segment from Palm Drive to Palmetto Drive in the Range Road school zone. Add school zone pavement markings, “Speeding Fines Doubled”, and “End School Zone” signage.	Sign/Signal	Near-Term	$10,000 to $20,000
6	School Campus Driveways	Restripe faded crosswalks to high-visibility crosswalks where sidewalks are present.	Crossing	Maintenance	<$10,000
7	Range Road from SR 520 (King Street) to Tiger Trail	Fill sidewalk gap on the west side of the roadway.	Sidewalk	Long-Term	$1,300,000 to $1,525,000
8	Range Road and Lake Drive	Fill bicycle facility gaps prioritized in the 2019 SCTPO Bicycle & Pedestrian Master Plan on: • Range Road from SR 520 (King Street) to Tiger Trail; and • Lake Drive from Cox Road to SR 501 (Clearlake Road).	Bicycle Facility	Long-Term	Further Study Required to Determine Bicycle Facility Type

Table 2: Recommendations Summary Cont.

Study Area Recommendations					
No.	**Location**	**Recommendation**	**Type**	**Time-Frame**	**Cost Estimate**
9	Range Road and Lake Drive	Install/upgrade pedestrian ramps that meet current standards along: • Range Road from SR 520 (King Street) to Tiger Trail; and • Lake Drive from Cox Road to SR 501 (Clearlake Road).	Sidewalk	Near-Term	$250,000 to $290,000

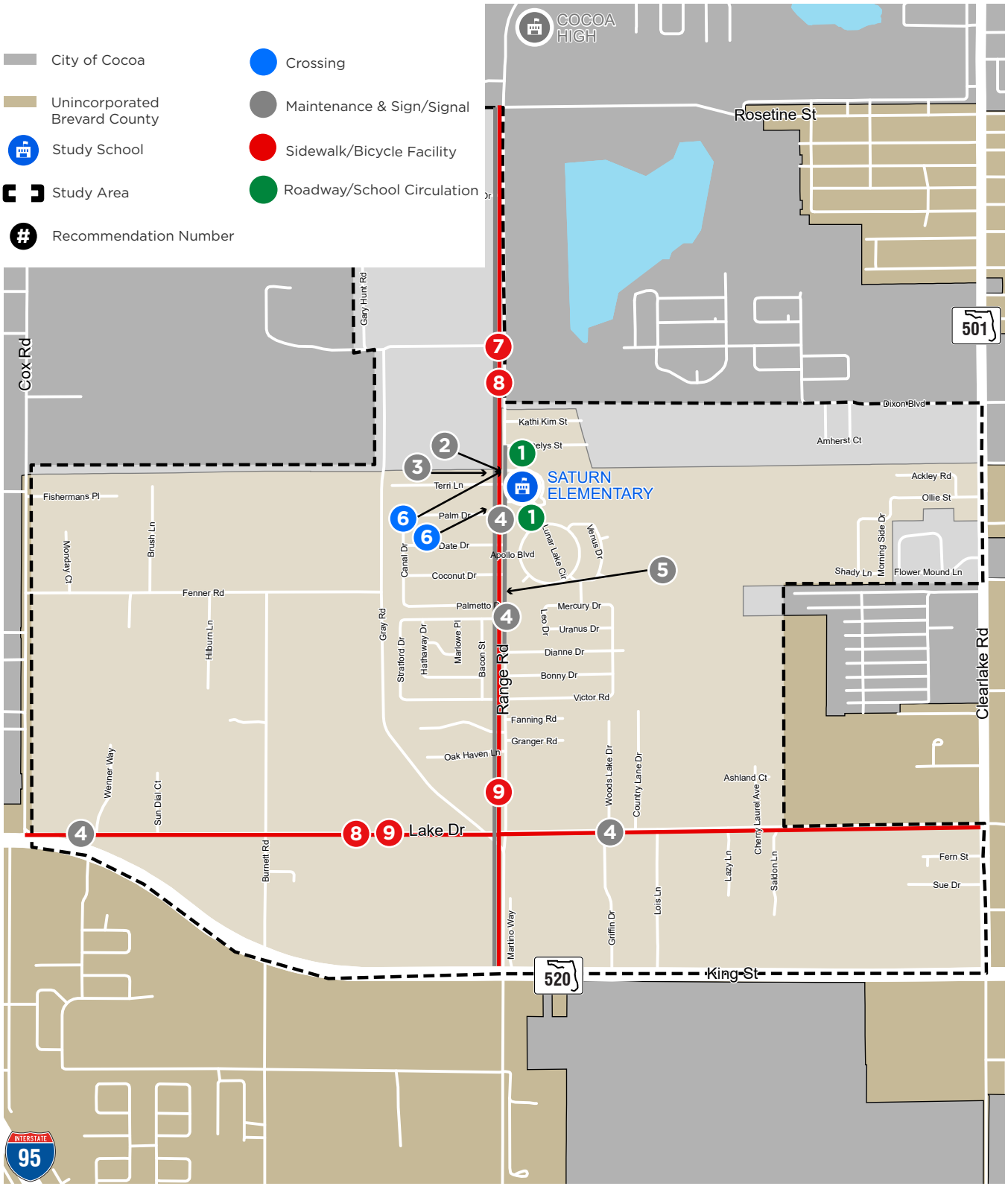


Figure 17: Recommendations
School Routes Analysis
Saturn Elementary School

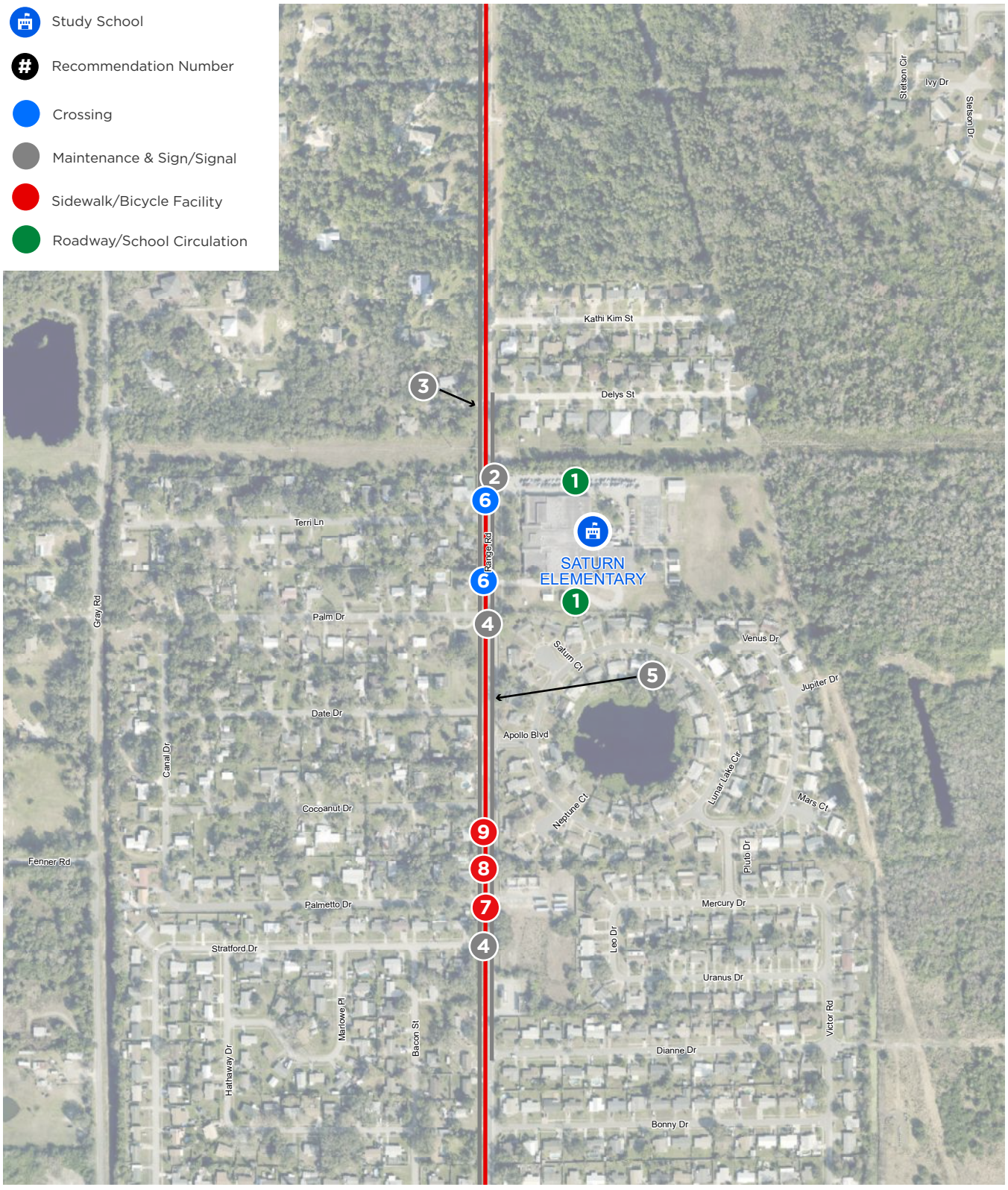


Figure 18: Recommendations: School Context Aerial Map

School Routes Analysis

Saturn Elementary School

Detailed Recommendations

This section lists details for each recommendation including its location, type, issue, recommendation, implementation timeframe, estimated project cost, if right-of-way is needed, if there is anticipated drainage or utility impact, and the responsible agency. The implementation timeframe is listed as "Maintenance", "Near-Term", or "Long-Term" and describes the estimated 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 (January 1, 2022 to December 31, 2022) 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 zero 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 percent) cost and the construction + maintenance of traffic + mobilization + contingency/unknowns (40 percent) cost.
- The total lower range cost estimate for each recommendation was calculated as construction + maintenance of traffic + mobilization + contingency/unknowns (20

percent) + design (based on 20 percent contingency/unknowns) + CEI (based on 20 percent contingency/unknowns). The total upper range cost estimate for each recommendation was calculated as construction + maintenance of traffic + mobilization + contingency/unknowns (40 percent) + design (based on 40 percent contingency/unknowns) + CEI (based on 40 percent 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.
- Drainage, right-of way, and utility considerations were not included in cost estimates.

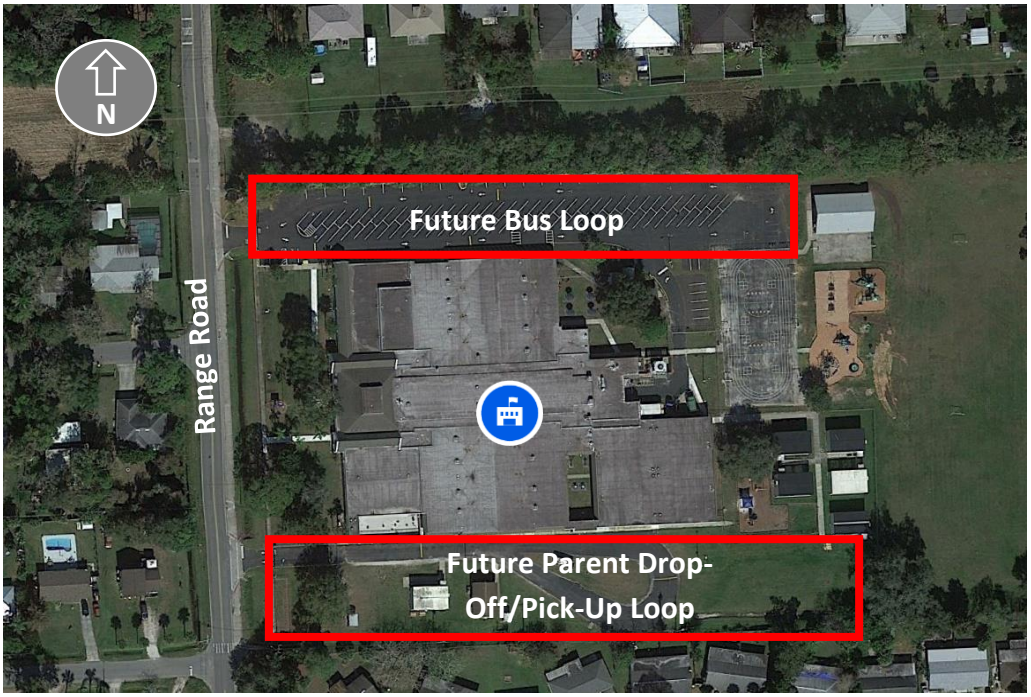
Figure 19 below shows an example of the cost estimate process described above.

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 19: Example Cost Estimate Process

Project 1: Flip the Parent Drop-off/Pick-up & Bus Loops

Location	**School Campus**
Type	**School Circulation/Roadway**
Issues	During peak parent drop-off/pick-up times, the parent drop-off/pick-up loop have congestion that queues onto Range Road.
Recommendations	Flip the parent drop-off/pick-up loop to be on the south side of the school and the bus loop to be on the north side of the school: • Southern proposed parent drop-off/pick-up loop: Widen the entrance/exit driveway and roadway width to comfortably accommodate 2 vehicles side-by-side. Extend the loop further to the east to provide more queue storage for vehicles. Open the proposed parent drop-off/pick-up loop gate at 7:00 AM and 1:30 PM to reduce queueing along Range Road prior to school start and dismissal times. Evaluate the drainage impacts of the swale located on the south side of the school property just east of the loop. • Northern proposed bus loop: Widen the entrance/exit driveway width to comfortably accommodate 2 buses side-by-side. Potentially remove parking spaces near the turnaround point at the east end of the parking lot and near the entrance/exit driveway to accommodate bus turning movements. Due to the northern bus loop area still having staff/visitor/parent parking, there will need to be signage restricting vehicle access from 7:15 AM to 8:00 AM and from 2:00 PM to 2:35 PM.



Future Parent Drop-Off/Pick-Up & Future Bus Loop (Top) and Existing Congestion on Range Road (Bottom)

	Implementation Timeframe	Long-Term
	Estimated Project Cost	Further Study Required
	Right-of Way Needed?	No
	Drainage or Utility Impact?	Yes
	Responsible Agency	Brevard Public Schools

Project 2: Open the Gate on the North Side of the School

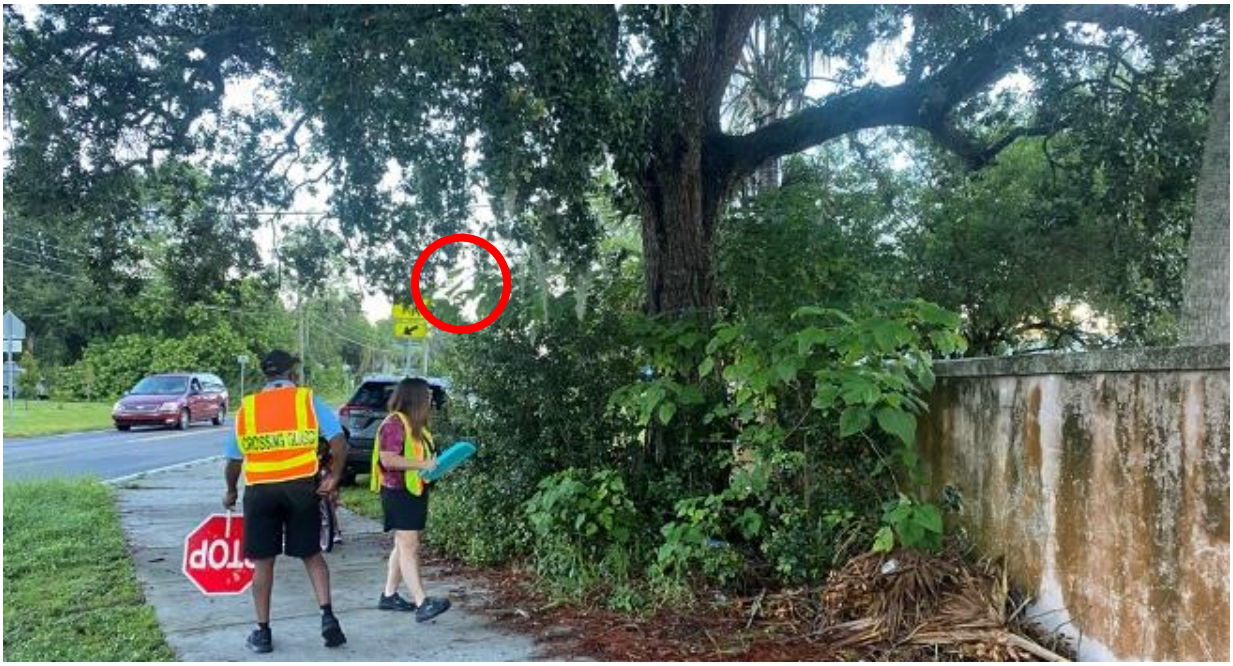
Location	School Campus
Type	Maintenance
Issue	There is a lack of safe pedestrian infrastructure on the north side of the school campus to allow students/parents to safely cross to access the school.
Recommendation	Open the gate on the north side of the school to allow students/parents to walk on the continuous sidewalk connected from the roadway onto the school property and encourage them to use the marked crosswalk across the northern school driveway.

Gate on the North Side of the School

	Implementation Timeframe	Maintenance
	Estimated Project Cost	Maintenance
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard Public Schools

Project 3: Increase Routine Landscaping & Maintenance

Location	Range Road
Type	Maintenance
Issue	Vegetation is overgrown on Range Road in front of the school property and obstructs signage and visibility.
Recommendation	Increase the frequency of landscaping and maintenance in front of school property to cut the vegetation .



Tree Obstructing Pedestrian Crossing Sign

	Implementation Timeframe	Maintenance
	Estimated Project Cost	Maintenance
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard Public Schools and Brevard County

Project 4: Add Rectangular Rapid Flashing Beacons (RRFBs)

Location	**Range Road & Palm Drive, Range Road & Stratford Drive, Lake Drive West of Wenner Way, and Lake Drive & Woods Lake Drive**
Type	**Sign/Signal**
Issue	The existing unsignalized crosswalks within the school study area need safety enhancements.
Recommendation	Add RRFBs, in-street pedestrian crossing signage, and pedestrian lighting at the existing crosswalks.

Existing Crosswalk at Range Road & Palm Drive

	Implementation Timeframe	**Near-Term**
	Estimated Project Cost*	**$90,000 to $110,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**No**
	Responsible Agency	**Brevard County**

** Drainage, right-of way, and utility considerations were not included in cost estimates.*

Project 5: Create One Continuous School Zone on Range Road

Location	**Range Road from Dianne Drive to Delys Street**
Type	**Sign/Signal**
Issue	There are currently two school zones approximately 600 feet apart on Range Road, which makes it confusing for drivers approaching and departing the school zone.
Recommendation	Create one continuous school zone from Dianne Drive to Delys Street by including the roadway segment from Palmetto Drive to Palm Drive in the Range Road school zone. Add school zone pavement markings, "Speeding Fines Doubled", and "End School Zone" signage.

Existing School Zone on Range Road (Left) and Proposed School Zone Signage/Pavement Markings (Right)

	Implementation Timeframe	**Near-Term**
	Estimated Project Cost*	**$10,000 to $20,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**No**
	Responsible Agency	**Brevard County**

** Drainage, right-of way, and utility considerations were not included in cost estimates.*

Project 6: Restripe Faded Crosswalks

Location	School Campus Driveways
Type	Crossing
Issue	Several crosswalks near the school campus driveways are faded and need to be restriped for better visibility.
Recommendation	Restripe faded crosswalks to high-visibility crosswalks where sidewalks are present.

Existing Faded Crosswalk on Range Road at Southern School Driveway

	Implementation Timeframe	Maintenance
	Estimated Project Cost*	<$10,000
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard County

** Drainage, right-of way, and utility considerations were not included in cost estimates.*

Project 7: Fill Sidewalk Gap

Location	**Range Road from SR 520 (King Street) to Tiger Trail**
Type	**Sidewalk**
Issue	There is a sidewalk gap on the west side of Range Road between SR 520 (King Street) and Tiger Trail.
Recommendation	Fill sidewalk gap on the west side of the roadway.

Existing Sidewalk Gap on Range Road

	Implementation Timeframe	**Long-Term**
	Estimated Project Cost*	**$1,300,000 to $1,525,000**
	Right-of Way Needed?	**Potential**
	Drainage or Utility Impact?	**Yes**
	Responsible Agency	**Brevard County and City of Cocoa**

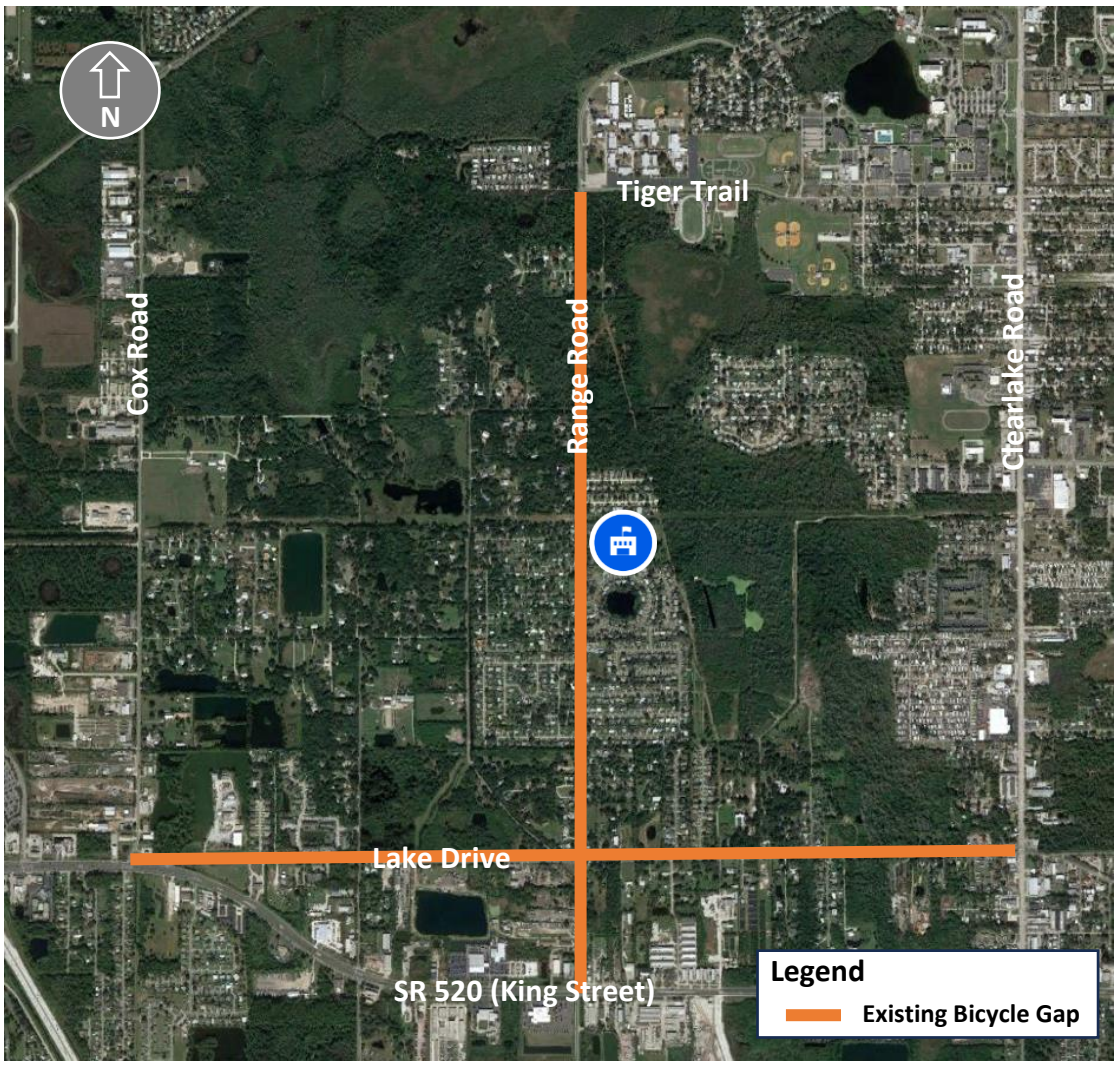
** Drainage, right-of way, and utility considerations were not included in cost estimates.*

Project 8: Fill Bicycle Facility Gaps Prioritized in the 2019 SCTPO Bicycle & Pedestrian Master Plan

Location	**Range Road and Lake Drive**
Type	**Bicycle Facility**
Issue	There are several bicycle facility gaps in the study area that have been prioritized in the 2019 SCTPO Bicycle & Pedestrian Master Plan.
Recommendation	Fill bicycle facility gaps prioritized in the 2019 SCTPO Bicycle & Pedestrian Master Plan on: • Range Road from SR 520 (King Street) to Tiger Trail; and • Lake Drive from Cox Road to SR 501 (Clearlake Road).

Lack of Bicycle Facilities on Range Road

	Implementation Timeframe	**Long-Term**
	Estimated Project Cost	**Further Study Required to Determine Bicycle Facility Type**
	Right-of Way Needed?	**Potential**
	Drainage or Utility Impact?	**Potential**
	Responsible Agency	**Brevard County and City of Cocoa**



Prioritized Bicycle Facility Gaps

Project 9: Install/Upgrade Pedestrian Ramps

Location	**Range Road and Lake Drive**
Type	**Sidewalk**
Issue	Pedestrian ramps along Range Road and Lake Drive do not meet current standards.
Recommendation	Install/upgrade pedestrian ramps that meet current standards along: • Range Road from SR 520 (King Street) to Tiger Trail; and • Lake Drive from Cox Road to SR 501 (Clearlake Road).

Pedestrian Ramps on Lake Drive

	Implementation Timeframe	**Near-Term**
	Estimated Project Cost*	**$250,000 to $290,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**No**
	Responsible Agency	**Brevard County and City of Cocoa**

** Drainage, right-of way, and utility considerations were not included in cost estimates.*

Recommendations for Education and Engagement

A key pillar of the SRTS program is education for and engagement with students, parents, teachers, and administrators on pedestrian and bicycle safety. Below are some ways to consider increasing education and engagement at Saturn Elementary School.

- Provide training to students on pedestrian and bicycle safety, rules of the road, and how to navigate through their community safely;
- Provide helmet fittings for students;
- Engage the community by painting decorative crosswalks, bicycle facility markings, and other pavement markings where feasible; and
- Provide education to parents on how their student can safely walk and/or bike to school in their community.

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