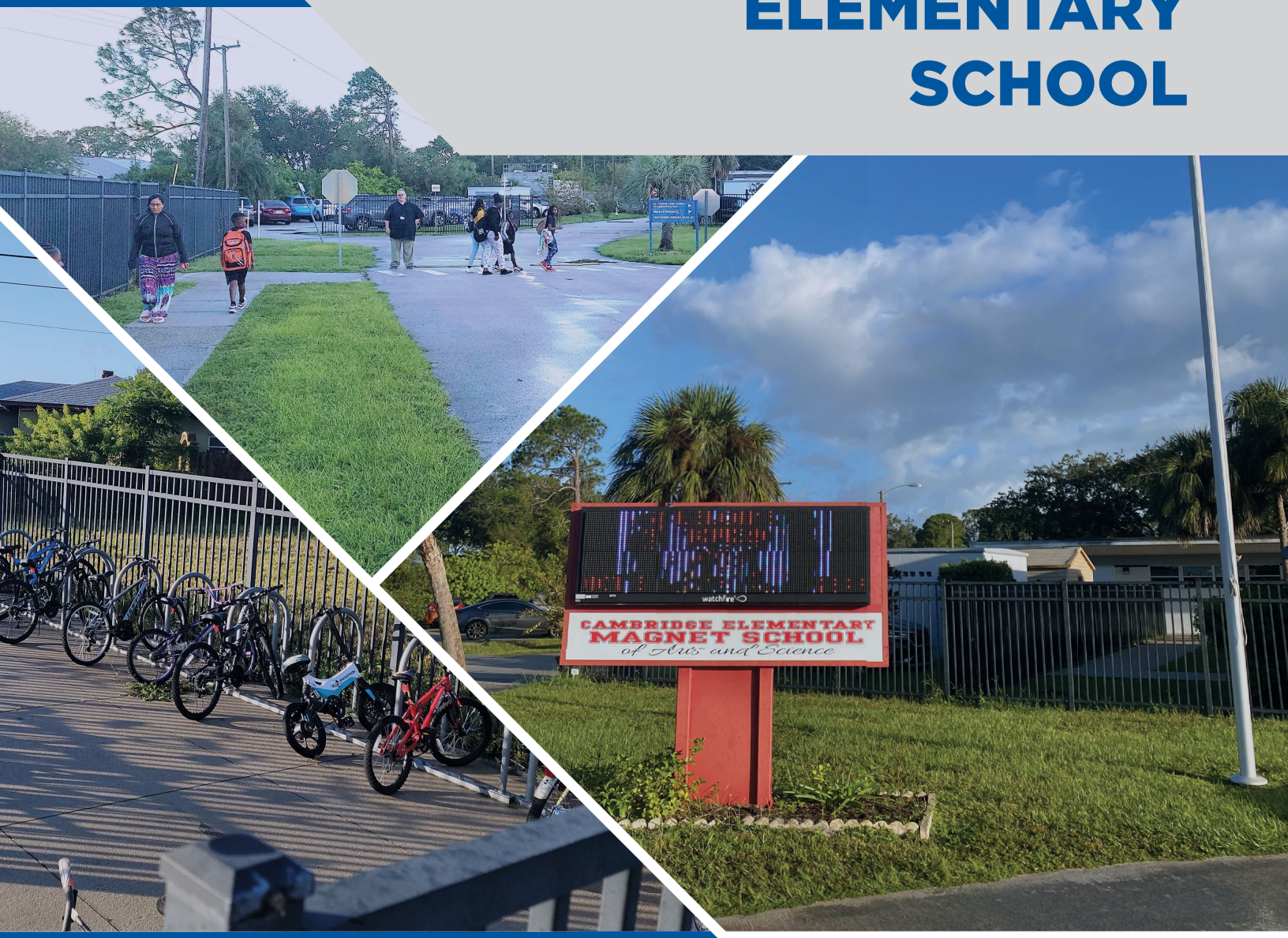
SCHOOL ROUTES ANALYSIS

CAMBRIDGE ELEMENTARY SCHOOL



ASSESSMENT & IMPLEMENTATION REPORT

FEBRUARY **2024**

SPACE COAST TPO

KITTELSON & ASSOCIATES

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School Routes Analysis

Cambridge Elementary School

Cocoa, FL

Assessment and Implementation Report

February 2024

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CAMBRIDGE ELEMENTARY
MAGNET SCHOOL
of Arts and Science

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 Cambridge Elementary School located at 2000 Cambridge Drive, Cocoa, Florida 32922.

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, Cambridge 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 Cambridge 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	Restripe high-visibility crosswalk.	Crossing	Maintenance	<$10,000
2	School Campus	Update stop signage and restripe stop bars and markings.	Sign/Signal	Maintenance	<$10,000
3	School Campus	Restripe faded directional arrows in the one-way car loop.	Maintenance	Maintenance	<$10,000
4	Western Fence of School Campus	Maintain vegetation along the western fence on School Campus.	Maintenance	Maintenance	Maintenance
5	School Campus	Reconstruct the speed bumps on the school campus.	Roadway	Near-Term	Further Study Required to Design Speed Bumps

Study Area Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
6	SR 501 (Clearlake Road) & Michigan Avenue	Employ two additional crossing guards at SR 501 (Clearlake Road) & Michigan Avenue.	Enforcement	Near-Term	Enforcement
7	Pineda Street, Tate Street, Cambridge Drive, Yale Lane, and Harvard Lane	Fill sidewalk gaps on: • The west side of Pineda Street from Dixon Boulevard to Vanderbilt Lane; • The south side of Tate Street from SR 501 (Clearlake Road) to Cambridge Drive; • The east side of Cambridge Drive from Harvard Drive to the Southwest School Entrance/Exit; • Both sides of Yale Lane from Cambridge Drive to Pineda Street; and • Both sides of Harvard Drive from Cambridge Drive to Pineda Street. Add high-visibility crosswalks at cross-street locations.	Sidewalk/ Crossing	Long-Term	Further Study Required to Evaluate Drainage Potential Impacts

Table 1: Recommendations Summary

Study Area Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
8	Pineda Street and Tate Street & Cambridge Drive	Add school zone pavement markings, advance school zone warning signs, flashing beacon signage, and "End School Zone" signage at the existing school zone on Pineda Street from Yale Lane to the Southeast School Entrance/Car Loop Entrance and at Tate Street & Cambridge Drive.	Sign/Signal	Near-Term	$70,000 to $80,000
9	Pineda Street and Point Drive/ Cambridge Drive	Conduct a speed study and if justified, implement speed humps and/or raised crossings/intersections along: • Pineda Street from Dixon Boulevard to Southeast School Entrance; and • Point Drive/Cambridge Drive from Dixon Boulevard to the Southwest School Entrance.	Traffic Calming	Near-Term/ Long-Term	Further Study Required to Perform Speed Study
10	Tate Street, Cambridge Drive, and Pineda Street	Install/upgrade pedestrian ramps that meet current standards along: • Tate Street from SR 501 (Clearlake Road) to Cambridge Drive; • Cambridge Drive from Harvard Drive to Southwest School Entrance; and • Pineda Street from Dixon Boulevard to Southwest School Entrance.	Sidewalk	Near-Term	$400,000 to $470,000
11	Cambridge Drive and Rosetine Street/Tate Street	Conduct a drainage analysis on: • Cambridge Drive from Harvard Drive to the Southwest School Entrance; • Pineda Street from Dixon Boulevard to Vanderbilt Lane; • Vanderbilt Lane from Cambridge Drive to Pineda Street; and • Rosetine Street/Tate Street from Walter Street to Cambridge Drive.	Roadway	Near-Term	Further Study Required for Drainage Analysis

Assessment

This section of the report documents the existing conditions within the Cambridge 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 Cambridge 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

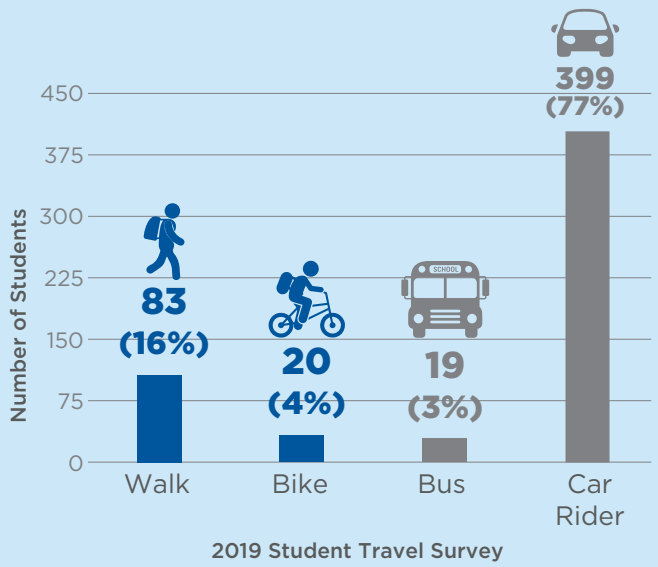
Previous and ongoing studies within the study area were reviewed and the following projects were identified:

- SR 524 from Friday Road to Industry Road
    - PD&E study to improve roadway capacity, safety, and enhance multimodal opportunities with improved bicycle and pedestrian facilities.
    - Current alternatives consider widening SR 524 from two to four lanes and adding a six-foot sidewalk on the south side of the roadway, an eight-foot sidewalk on the north side of the roadway, and buffered bicycle lanes.
- 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 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.
- Dixon Boulevard from SR 501 (Clearlake Road) to US 1
    - Complete Street Feasibility Study to evaluate and identify improvements to improve pedestrian and bicyclist safety and mobility.
- 2019 SCTPO Bicycle & Pedestrian Master Plan
    - The 2019 SCTPO Bicycle & Pedestrian Master Plan includes filling sidewalk and bicycle facility gaps throughout the county.
    - Near Cambridge Elementary School, this includes filling pedestrian and bicycle facility gaps along Dixon Boulevard, SR 501 (Clearlake Road), Michigan Avenue, Industry Road, and Fiske Boulevard.
    - An alternative alignment of the East Coast Greenway is proposed along the railroad west of US 1.
- A shared use path is planned along Michigan Avenue from SR 501 (Clearlake Road) to US 1.
- The 2018 Space Coast Area Transit Bus Stop Accessibility Study prioritized accessibility and safety improvements needed at each bus stop.
- An onsite drainage project is scheduled for the School Campus.

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 (2019)



2019 Student Travel Survey

Total Bicycle & Pedestrian Crashes within Study Area

17 Pedestrian

14 Bicycle

School Aged Bicycle & Pedestrian Crashes within Study Area

1 Pedestrian

1 Non-Incapacitating Injury

0 Bicycle

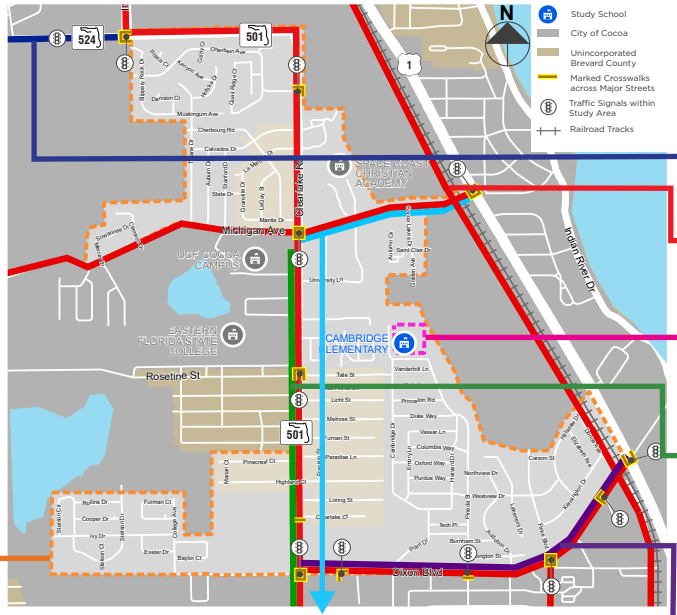
August 2017 to July 2023 Crashes from University of Florida's Signal Four Analytics Database

Signals and Crossings within Study Area

11 Signalized Intersections

1 Unsignalized Marked Crosswalk Across Major Street

3 Crossing Guards



Previous & Ongoing Plans

SR 524 from Friday Road to Industry Road

- PD&E study to improve roadway capacity, safety, and enhance multimodal opportunities with improved bicycle and pedestrian facilities.
- Current alternatives consider widening SR 524 from two to four lanes and adding a six-foot sidewalk on the south side of the roadway, an eight-foot sidewalk on the north side of the roadway, and buffered bicycle lanes.

2019 SCTPO Bicycle & Pedestrian Master Plan

- Includes filling sidewalk and bicycle facility gaps throughout the county.
- Near Cambridge Elementary School, this includes filling pedestrian and bicycle facility gaps along Dixon Boulevard, SR 501 (Clearlake Road), Michigan Avenue, Industry Road, and Fiske Boulevard.
- An alternative alignment of the East Coast Greenway is proposed along the railroad west of US 1.

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 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.

School Campus Drainage

- An onsite drainage project is scheduled for the School Campus.

Dixon Boulevard from SR 501 (Clearlake Road) to US 1

- Complete Street Feasibility Study to evaluate and identify improvements to improve pedestrian and bicyclist safety and mobility.

Michigan Ave Trail from SR 501 (Clearlake Road) to US 1

- Adding a trail for bicyclists and pedestrians.

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.

Figure 2: Background Information

School Routes Analysis

Cambridge 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. SR 501 (Clearlake Road), just west of the school campus, has sidewalks along both sides of the roadway from Dixon Boulevard to Michigan Avenue and along the east and north sides of the roadway from Michigan Avenue to Industry Road. Dixon Boulevard, just south of the school, has sidewalk gaps along both sides of the roadway from College Avenue to SR 501 (Clearlake Road) and along both sides of the roadway from SR 501 (Clearlake Road) to US 1.

Cambridge Elementary School is surrounded by local roadways that connect to major roadways within the study area. Tate Street, just west of the school, has sidewalk on the north side of the roadway from SR 501 (Clearlake Road) to Cambridge Drive. Cambridge Drive, just south of the school, has sidewalk on the west side of the roadway from Point Drive to the School Entrance. Pineda Street just south of the school, has sidewalk on the east side of the roadway from Dixon Boulevard to the School Entrance. Most of the other local streets to the south of the school have sidewalk gaps.

The 2019 SCTPO Bicycle & Pedestrian Master Plan includes prioritized sidewalk gaps within the study area. These include filling gaps along the west and south sides of SR 501 (Clearlake Road) from Michigan Avenue to Industry Road and the north side of Michigan Avenue from SR 501 (Clearlake Road) to US 1. The East Coast Greenway has an alternative alignment proposed along the railroad west of US 1.

There are dedicated four-foot wide bicycle lanes along US 1. The 2019 SCTPO Bicycle & Pedestrian Master Plan prioritizes bicycle facilities along SR 501 (Clearlake Road), Michigan Avenue, and Dixon Boulevard within the study area.

Signalized intersections and marked crosswalks across major streets were mapped using data from aerial satellite imagery and verified via field review observations. Eleven signalized intersections are located along the study area boundary at:

- SR 501 (Clearlake Road) & Industry Road;
- SR 501 (Clearlake Road) & Otterbein Avenue;
- SR 501 (Clearlake Road) & Michigan Avenue;
- SR 501 (Clearlake Road) & Rosetine Street/Tate Street;
- SR 501 (Clearlake Road) & Dixon Boulevard;
- Michigan Avenue & US 1;
- Dixon Boulevard & Westminster Asbury Driveway;
- Dixon Boulevard & Pineda Street;
- Dixon Boulevard & Fiske Boulevard;
- Dixon Boulevard & Byrd Plaza Driveway; and
- Dixon Boulevard & US 1

There is one unsignalized marked crosswalk across SR 501 (Clearlake Road) at Clearlake Court.

There are three crossing guards present near Cambridge Elementary School:

- One at Cambridge Drive & Tate Street; and
- Two at SR 501 (Clearlake Road) & Tate Street.

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

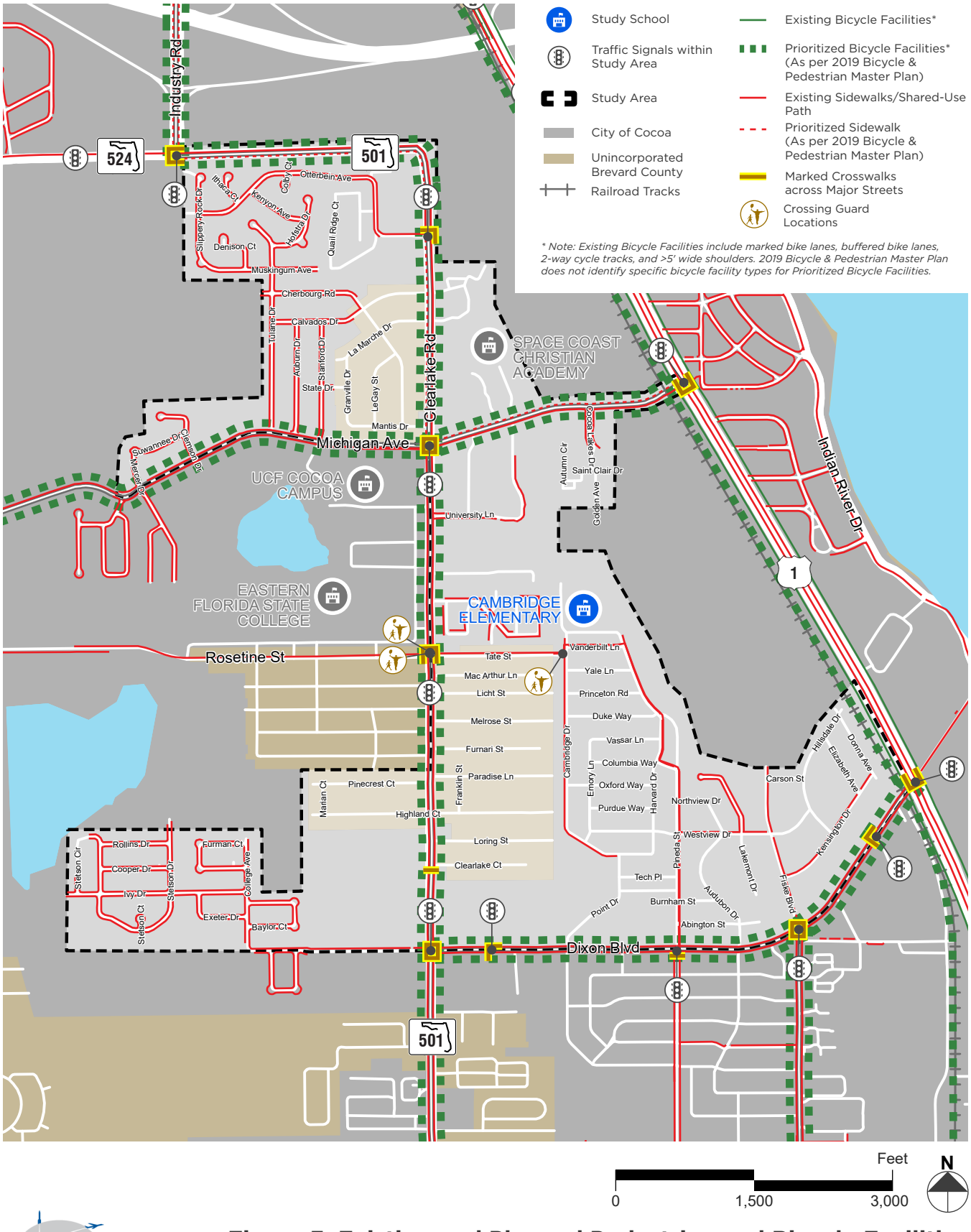


Figure 3: Existing and Planned Pedestrian and Bicycle Facilities

School Routes Analysis

Cambridge Elementary School

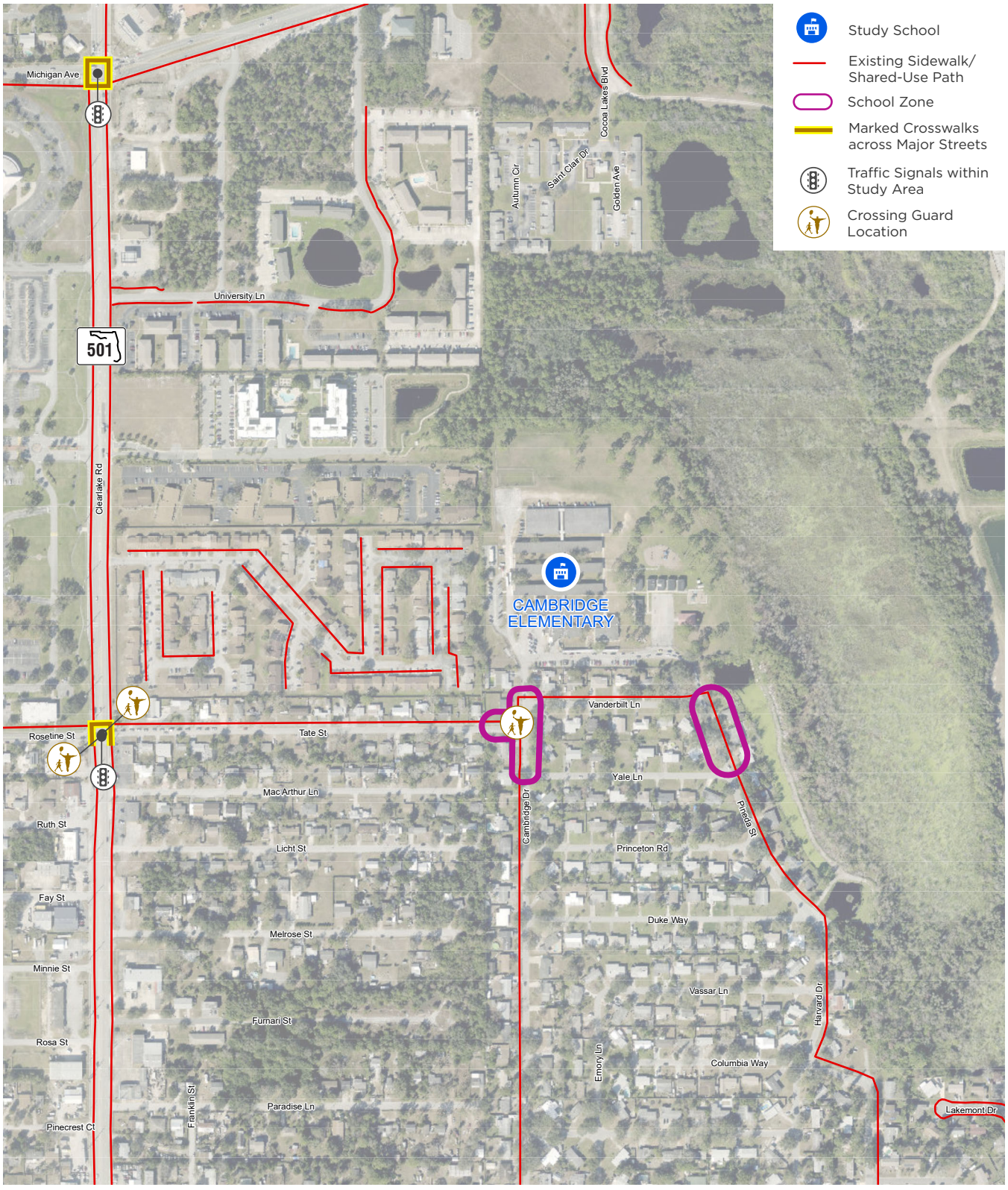


Figure 4: School Context Aerial

School Routes Analysis

Cambridge 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:

- SR 501 (Clearlake Road) is 45 miles per hour (MPH);
- Tate Street is 20 MPH; and
- Cambridge Drive, Vanderbilt Lane, Princeton Road, and Pineda Street are 25 MPH.

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 is a 15 MPH school zone at the intersection of Cambridge Drive & Tate Street and along Cambridge Drive from Tate Street to the school entrance. There is another 15 MPH school zone along Pineda Street from Yale Lane to the car loop entrance of the school.

Figure 5 shows the existing conditions of traffic data.

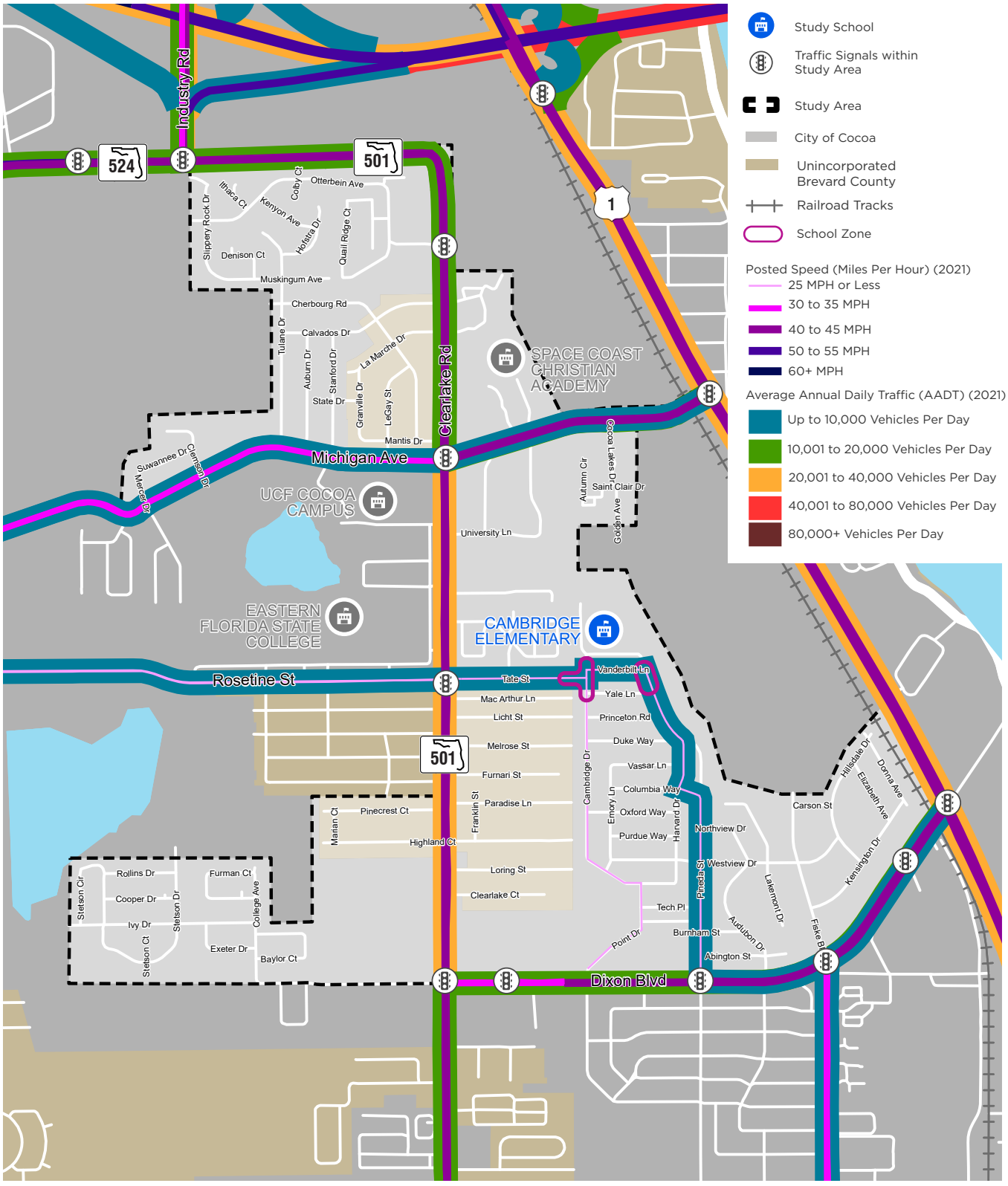


Figure 5: Existing Conditions Traffic Data

School Routes Analysis

Cambridge 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: one at the northern termini of Cambridge Drive and the other at the northern termini of Pineda Street. There are three parking areas on the school campus for staff and visitor parking.

The driveway on Cambridge Drive is the main entrance/exit to the staff/visitor parking lots and for parents during non-pick-up/drop-off times. It also serves as the entrance/exit for the bus and daycare vans. There is one school bus and three daycare vans that serve the school. Students walking/biking to/from school use the sidewalk on the west side of Cambridge Drive to access the main school entrance. The driveway on Pineda Street is the entrance to the student drop-off/pick-up loop. Car riders from Pre-K through Grade 6 use this loop.

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

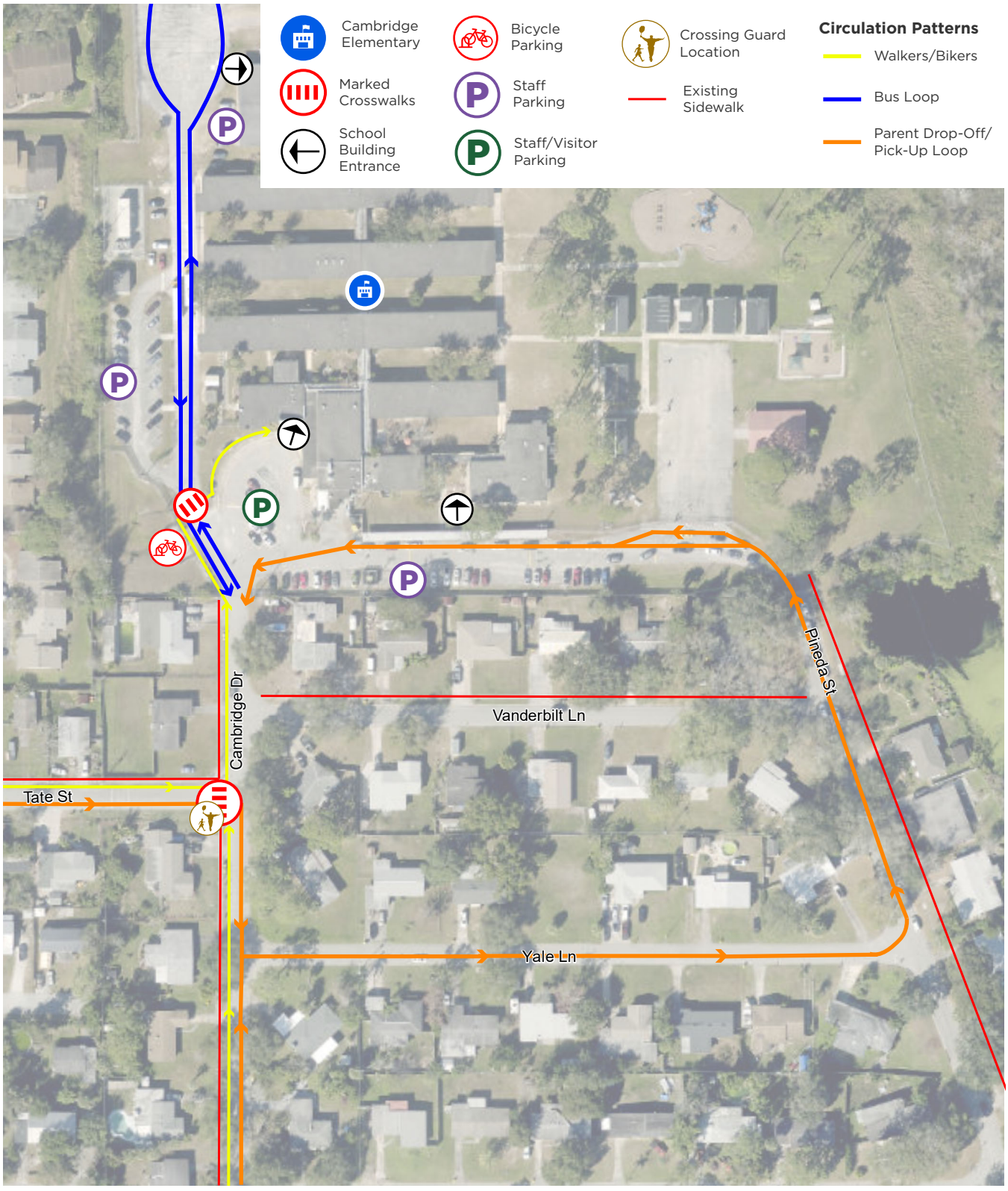


Figure 6: Existing School Circulation Map

School Routes Analysis

Cambridge 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. Cambridge Elementary School is in a census tract with a transportation disadvantaged index score of 2.5, meaning that it is in a more transportation disadvantaged area as compared 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 Cambridge Elementary School was conducted in 2019 and the latest Parent Survey for Brevard County was conducted in 2018. This section summarizes the results of these surveys for Cambridge 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 Cambridge 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 2019. **Figure 8** shows the total number and percentage of students who walked or biked to school in 2019 in the morning and afternoon peak-periods.

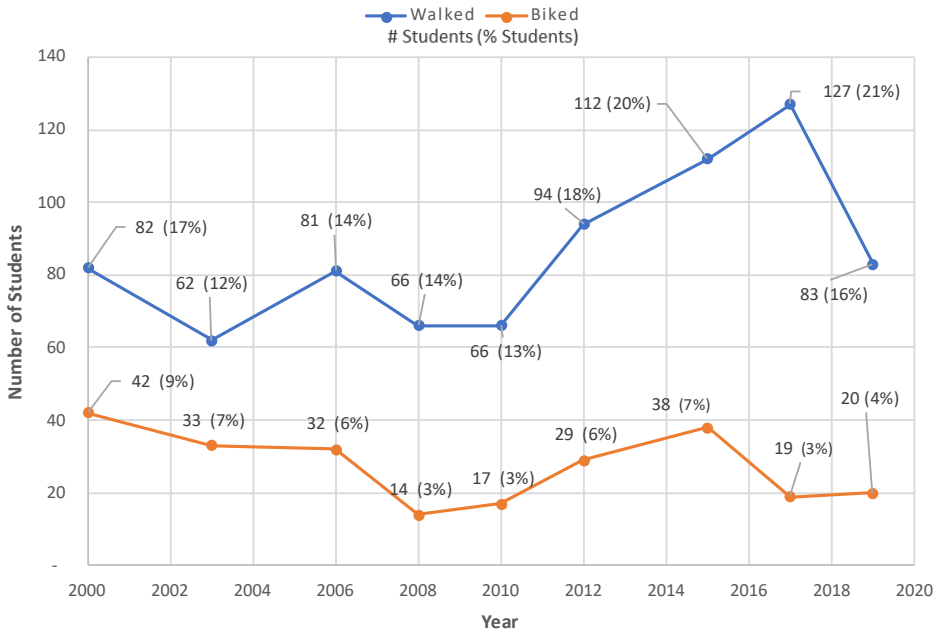


Figure 7: Total Number and Percentage of Students Who Walked or Biked to Cambridge Elementary School from 2000 to 2019

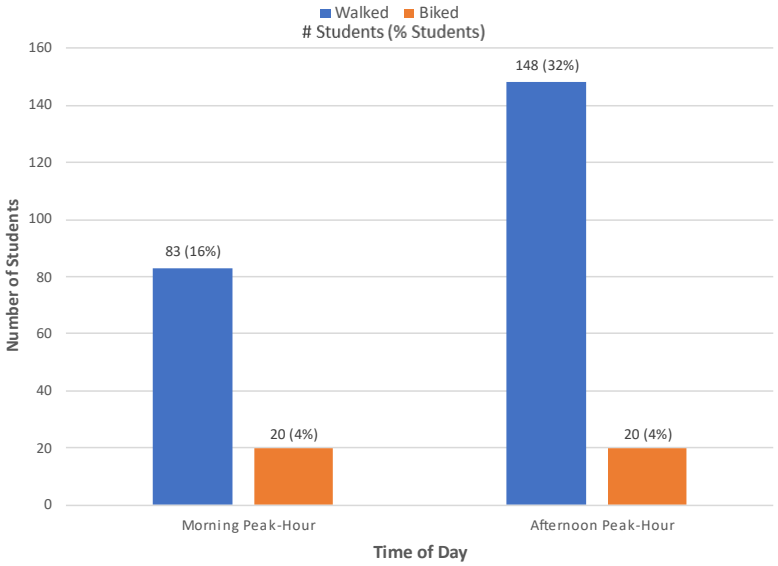


Figure 8: Total Number and Percentage of Students Who Walked or Biked to Cambridge Elementary School in 2019 in the Morning and Afternoon Peak-Hours

Summary of the Student Travel Mode Survey

- Based on the survey data from 2000 to 2019, on average approximately 21 percent of total students traveled to Cambridge Elementary School by walking (16 percent) or biking (five percent).
- The total number of students who walked to school has increased from 2000 to 2017 but decreased by five percent in 2019.
- The number of students who biked to school was the highest in 2000 and has fluctuated between three percent and nine percent over the survey period.

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.

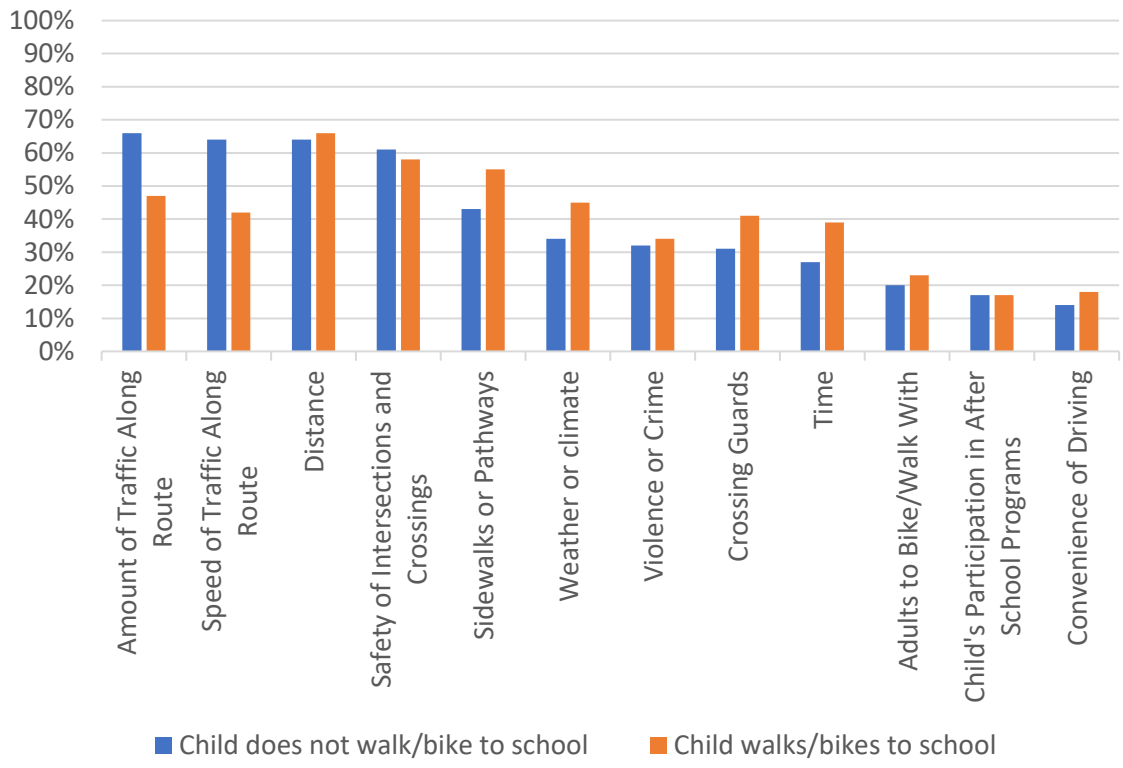


Figure 9: Issues Reported to Affect Parents' Decision to Allow a Child to Walk or Bike to and from School (All Brevard Public Schools, 2018)

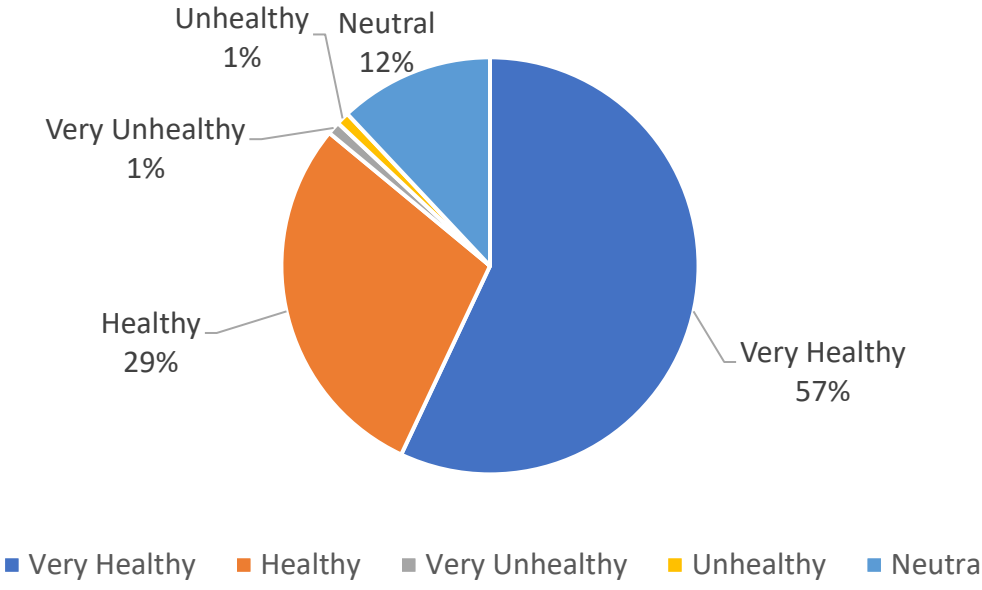


Figure 10: Parents' Opinions about How Healthy Walking and Biking to and from School is for Their Child (All Brevard Public Schools, 2018)

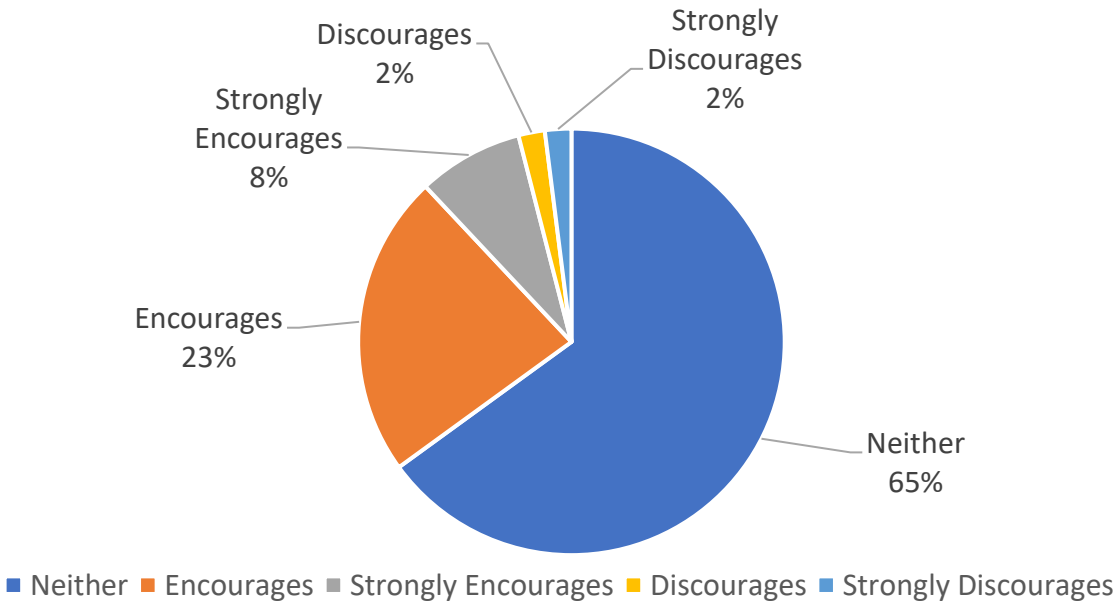


Figure 11: How Much Parents Feel Walking or Biking is Encouraged or Discouraged by Their Child's School (All Brevard Public Schools, 2018)

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 Cambridge 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 Cambridge Elementary School study area.

Pedestrian and Bicycle Crash Statistics

There were 31 total pedestrian and bicycle crashes within the study area (17 pedestrian and 14 bicycle). Four of the crashes were property damage only, 25 of the crashes resulted in injury, and two of the crashes resulted in a fatality. Forty-eight percent of crashes occurred during the day and three of the crashes occurred under wet conditions. There was one school aged pedestrian 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**.

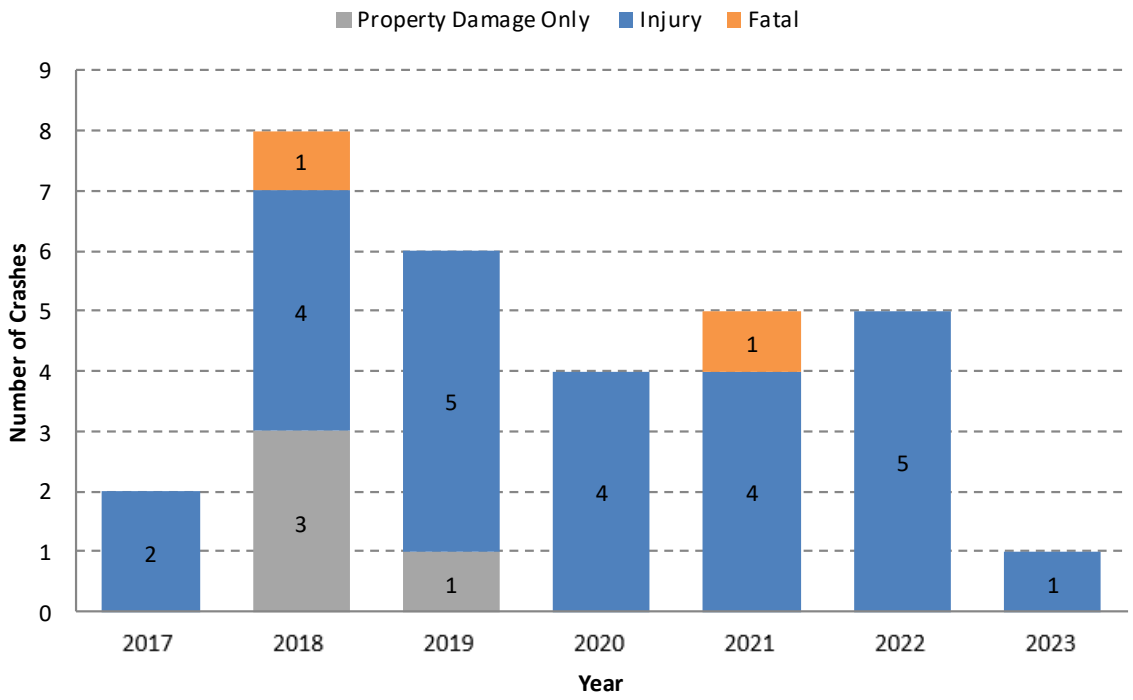


Figure 12: Pedestrian and Bicycle Crashes by Year and Severity

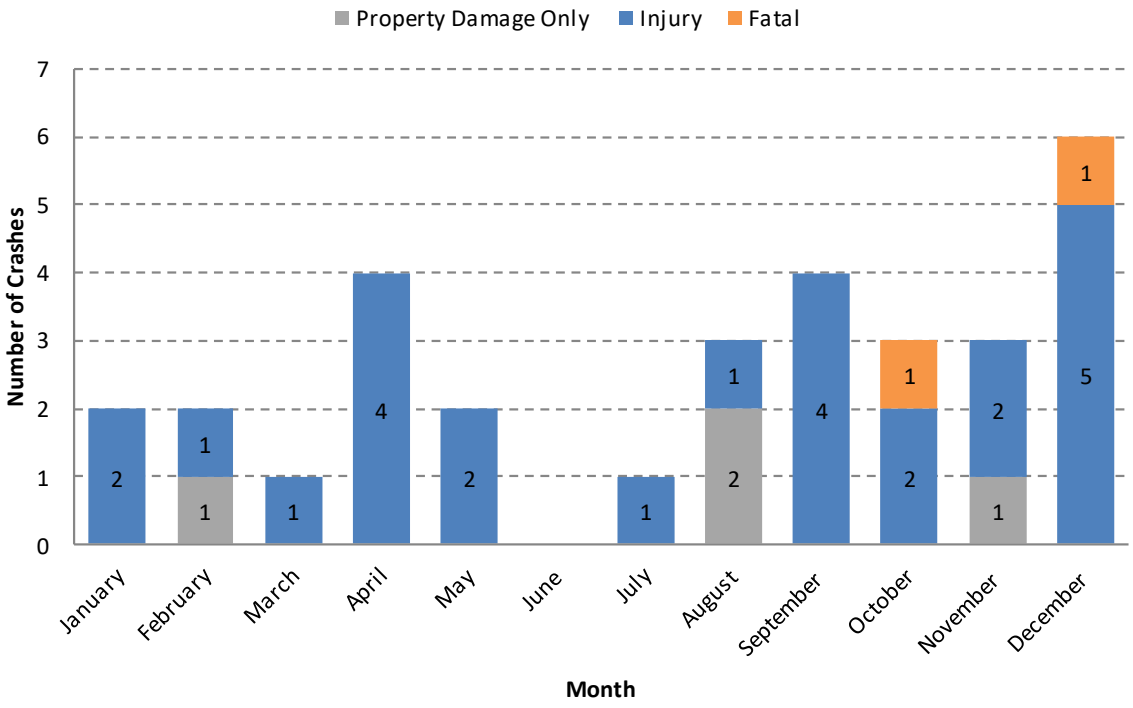


Figure 13: Pedestrian and Bicycle Crashes by Month and Severity

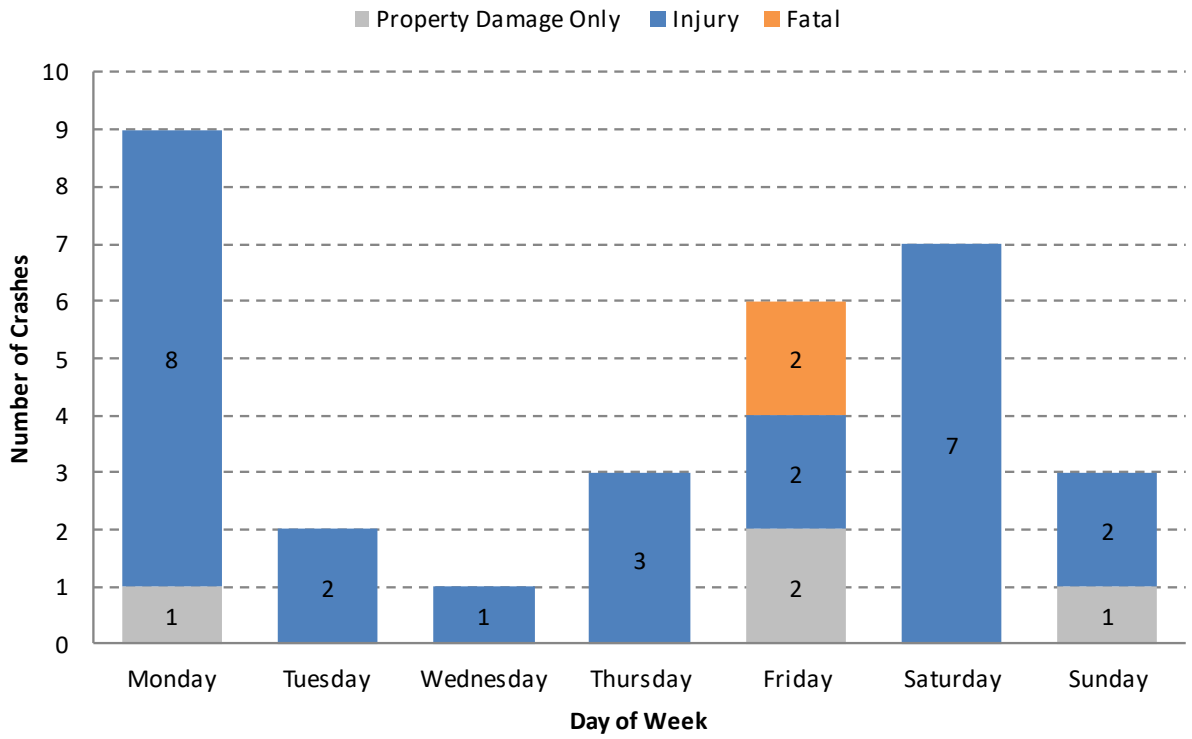


Figure 14: Pedestrian and Bicycle Crashes by Day of Week and Severity

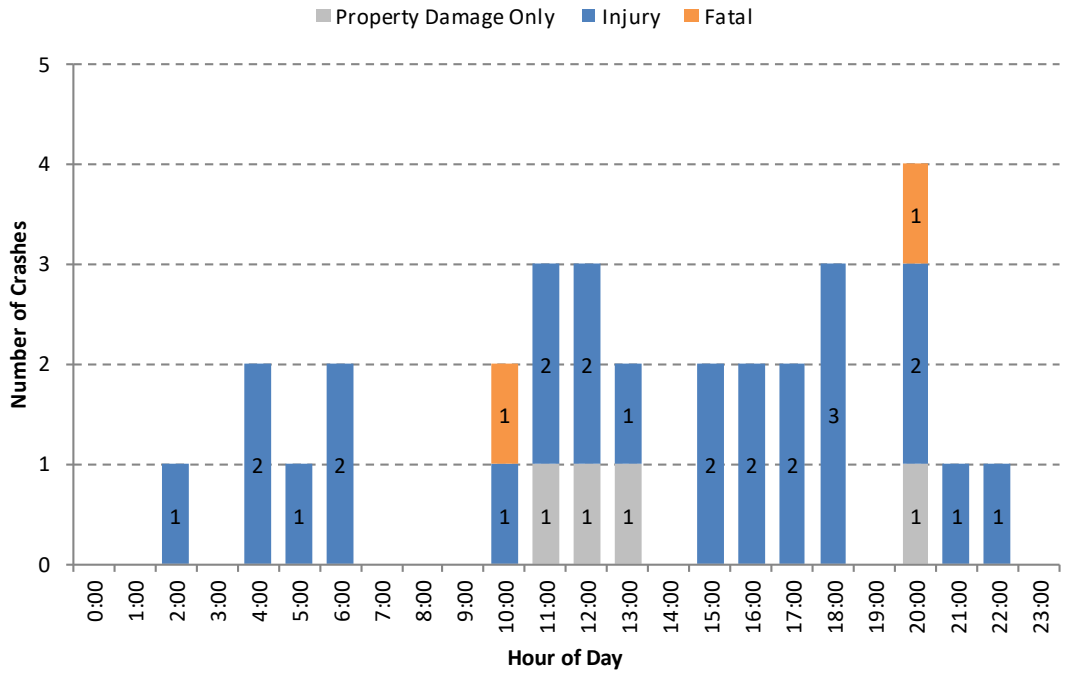


Figure 15: Pedestrian and Bicycle Crashes by Hour of Day and Severity

The highest number of crashes occurred in 2018 (eight) and December was the highest crash month (six). Monday was the most common day of the week when crashes occurred (average nine per day). By time of day, the highest crash hour was from 8:00 PM to 9:00 PM with four crashes, including one fatal.

School Aged Pedestrian and Bicycle Crash Summary

There was one school aged pedestrian crash within the study area during student travel hours. The crash resulted in a non-incapacitating injury. The crash occurred under dry conditions during dusk. Below is a summary of the school aged pedestrian crash:

1. Crash Report Number: 87272841
    - On December 3, 2018 at 6:25 PM, a crash involving a pedestrian occurred at SR 501 (Clearlake Road) & Tate Street. The pedestrian was crossing SR 501 (Clearlake Road) just south of the intersection when a vehicle traveling southbound on SR 501 (Clearlake Road) crossed the center line driving the wrong way and struck the pedestrian in the northbound travel lane. The crash resulted in a non-incapacitating injury. The crash occurred under dry conditions during dusk.

The location of the crash is shown in **Figure 16**.

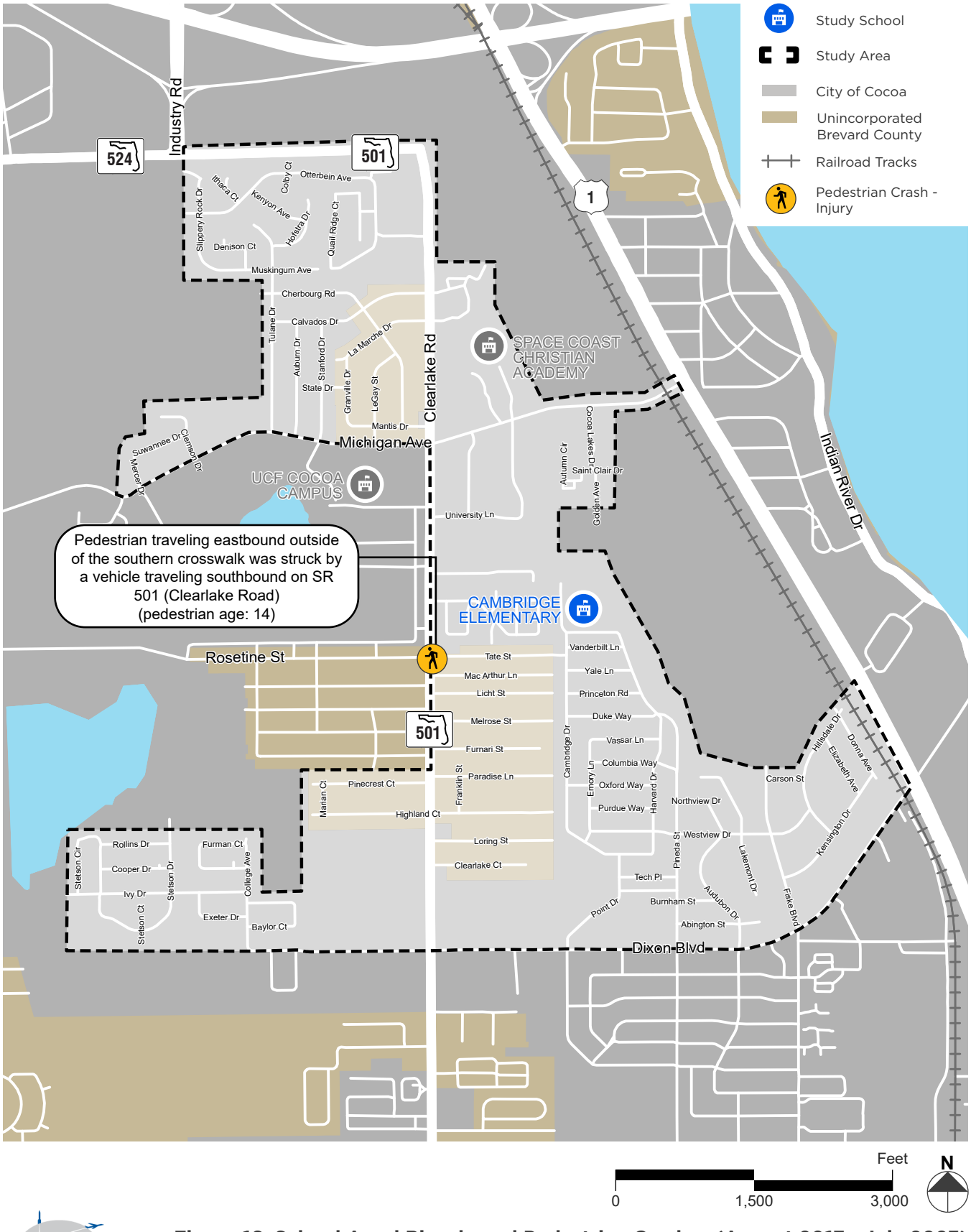


Figure 16: School Aged Bicycle and Pedestrian Crashes (August 2017 - July 2023)

School Routes Analysis

Cambridge Elementary School

School Coordination Meeting

A coordination meeting was held on October 3, 2023, at Cambridge Elementary School to bring stakeholders together and discuss issues and opportunities related to walking, biking, and other forms of transportation within the Cambridge Elementary School study area. Members from Cambridge Elementary School, City of Cocoa, 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, 2019);
    - 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 school allows students to enter the cafeteria for breakfast starting at 7:30 AM.
- The peak period of students arriving in the morning is from 7:30 AM to 8:00 AM with parent drop-off beginning as early as 7:00 AM.
- Parents begin to queue around 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; one at the northern termini of Cambridge Drive and the other at the northern termini of Pineda Street:
    - The driveway on Cambridge Drive is the main entrance/exit to the staff/visitor parking lots and for parents during non-pick-up/drop-off times. The bus also enters and exits through this driveway.
    - The driveway on Pineda Street is the entrance to the student drop-off/pick-up loop. Car riders from Pre-K through Grade 6 use this loop.
- Students walking/biking to/from school use the sidewalk on the west side of Cambridge Drive to access the main school entrance.

Staff, Student, and Visitor Parking

- Staff parking areas include:
    - The parking lot located within the parent drop-off/pick-up area.
    - The parking lot along the west side of the school campus.
- Visitor parking is located in front of the main office.
- School staff noted that there were concerns with the lack of formal parking and that many staff members were parking on the grass.

Bus and Daycare Vans Drop-Off/Pick-Up

- The school is served by one school bus and three daycare vans.
- The primary bus/van loop is on the west side of the school. The bus and van enter via the entrance on Cambridge Drive, drop-off students at the school entrance by main office, and exit back onto Cambridge Drive.
- The bus and daycare vans drop-off/pick-up students on the west side of the school campus.
- Approximately 20 students ride the bus.

Parent Drop-Off/Pick-Up Loop

- The Pre-K through Grade 6 parent drop-off/pick-up area begins at the Pineda Street driveway entrance to the school and continues west along the south side of the school campus.

    - Vehicle flow for drop-off/pick-up is counterclockwise through the residential streets. One crossing guard is present at Tate Street & Cambridge Drive to direct parents dropping-off and picking-up students to enter the school campus via Yale Lane and Pineda Street. Parents are prohibited to use Vanderbilt Lane to enter Pineda Street.
    - In the afternoon, parents begin queueing for student pick-up around 1:00 PM. Parents will park or idle along Pineda Street.
    - The gate for the parent drop-off/pick-up loop is open from 6:30 AM to 8:00 AM in the morning and 2:00 PM to approximately 3:00 PM when parent pick-up is completed in the afternoon.
- Pre-K students get picked up at the basketball court gate whereas Kindergarten through Grade 6 is picked up along the covered breezeway.
- The School Resource Office (SRO) noted that parents informally drop-off/pick-up students in the surrounding neighborhood streets, especially on Tate Street.

Space Coast Area Transit

- Space Coast Area Transit Route 6 has several bus stops on both sides of SR 501 (Clearlake Road) approximately ¼ mile west of the school site.
- School staff noted that no staff or students use Space Coast Area Transit.

Main Walking and Biking Routes

- The school principal noted the mode split reported in the survey was not reflective of the current travel patterns for students coming to/from school. Approximately 50 percent of the students walk/bicycle and 40 percent of the students are car riders.
- Most of the students live in the residential neighborhoods south and west of the school campus.
- Students walking/biking will use the west side of Cambridge Drive to access the main school entrance. A teacher helps students cross the staff parking lot entrance on school campus to enter the main school entrance during peak drop-off/pick-up times.
- One fenced bicycle rack is located on the school campus, west of the visitor parking lot.
- One crossing guard is present at Cambridge Drive & Tate Street. School staff noted that up to three teachers will also walk out to this intersection to monitor students in the residential streets adjacent to the school.
- Two crossing guards are present at SR 501 (Clearlake Road) & Tate Street, one at the southwest corner and one at the southeast corner.

Recent and Planned Projects

- SR 524 from Friday Road to Industry Road
    - PD&E study to improve roadway capacity, safety, and enhance multimodal opportunities with improved bicycle and pedestrian facilities.
    - Current alternatives consider widening SR 524 from two to four lanes and adding a six-foot sidewalk on the south side of the roadway, an eight-foot sidewalk on the north side of the roadway, and buffered bicycle lanes.
- SR 501 (Clearlake Road) from south of Michigan Avenue to west of Industry Road
    - Widening of SR 501 (Clearlake Road) from two/three to four lanes.
    - Adding seven-foot buffered bicycle lanes and five-to-six-foot sidewalks on both sides of the road.
- 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 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.
- Dixon Boulevard from SR 501 (Clearlake Road) to US 1
    - Complete Street Feasibility Study to evaluate and identify improvements to improve pedestrian, bicyclist safety and mobility.
- A shared use path is planned along Michigan Avenue from SR 501 (Clearlake Road) to US 1.
- The 2019 SCTPO Bicycle & Pedestrian Master Plan prioritizes filling sidewalk and bicycle facility gaps within the school study area.
- The 2018 Space Coast Area Transit Bus Stop Accessibility Study prioritized accessibility and safety improvements needed at each bus stop.
- An onsite drainage project is scheduled for the School Campus.

Other Issues/Comments

- According to the principal, the school has over 500 students.
- There are concerns with wrong way drivers in the Pre-K through Grade 6 parent drop-off/pick-up loop.
- The SRO expressed interest in reconstructing speed bumps on school campus and installing them in the residential streets around the school.

- School staff noted safety concerns along the west fence of the school campus due to a lack of maintenance. The SRO requested tree/shrubbery clearance within 5 feet on the west side of the fence since the school is next to residential properties.

Potential Opportunities and Requests from School Staff

- To address parent parking along Tate Street and Pineda Street prior to pick-up in the afternoon, install "No Parking, Standing, or Stopping" signage along the Tate Street, Pineda Street, Vanderbilt Street, Cambridge Drive, and Yale Street.
- Enhance pavement markings and add signage to discourage wrong way driving behavior in the drop-off/pick-up loop.
- A new residential development planned for the southwest corner of Michigan Avenue & University Lane, Orchid Lakes, may bring in more students to the school.

Field Review

A field review was conducted on the morning and afternoon of October 5, 2023 by the Study Team led by SCTPO and KAI. The weather conditions were warm and cloudy with light rain and the temperatures ranged from the mid-70s to mid-80s. The field review observed the drop-off activity from 7:00 AM to 8:15 AM and pick-up activity from 2:00 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 for Cambridge Elementary School. One is located at Cambridge Drive & Tate Street and two are located at SR 501 (Clearlake Road) & Tate Street.
- The SRO directs parents to turn right from Tate Street onto Cambridge Drive then left onto Yale Lane to access the parent drop-off/pick-up loop entrance on Pineda Street.

School Campus

- The school campus is bordered by residential development to the west and south, and undeveloped land to the north and east.
- School circulation patterns are designed such that students who walk/bicycle to school utilize the sidewalk on the west side of Cambridge Drive.

Study Area

- Drainage issues were observed along SR 501 (Clearlake Road), Tate Street, Pineda Street, and Cambridge Drive that prevented students from using the existing sidewalks to travel to school.
- Sidewalk gaps exist along SR 501 (Clearlake Road), Tate Street, Cambridge Drive, Vanderbilt Lane, Yale Lane, Princeton Road, and Duke Way.
- Maintenance concerns with existing sidewalks were observed within the study area.
- There are school zones along Tate Street, Cambridge Drive, and Pineda Street.
- Vehicles were observed speeding along Tate Street, Cambridge Drive, and Pineda Street.

Morning Field Review

- One school bus arrived at 7:30 AM to drop-off students and one daycare van arrived at 7:40 AM to drop-off students.
- Students dropped-off before 7:30 AM were dropped-off at the main entrance of the school and parents utilized the Cambridge Drive entrance/exit.
- Approximately 200 vehicles were observed using the parent drop-off/pick-up loop.
- Parent drop-off officially begins at 7:30 AM (this is when the Pineda Street gate is opened) but several parents were already parked in the drop-off/pick-up loop before 7:00 AM. Parents who were already in the drop-off loop before the gate opened entered through Cambridge Drive. The rest of the parents parked or idled behind the gate along Pineda Street to wait for the official drop-off to start.
- A “Road Closed” sign is placed at the entrance along Cambridge Drive from 7:30 AM to 8:00 AM to force parents to drop-off using the Pineda Street entrance.
- Kindergarten through Grade 6 were dropped off along the covered breezeway. Pre-K students were dropped off at the basketball court gate.
- The majority of drivers made a right turn from Tate Street onto Cambridge Drive, left turn onto Yale Lane, then left turn onto Pineda Street to enter vehicle queue for the drop-off/pick-up loop.
- The pedestrian gate at the main entrance of the school campus was unlocked at 7:30 AM. Three teachers were present on school campus just south of the visitor parking lot to help students cross the school campus and direct vehicle traffic out of the drop-off loop from 7:30 AM to 8:00 PM.
- Approximately 115 pedestrians, 30 bicyclists, three scooters, and one e-bicycle were observed entering the Cambridge Drive entrance to the school campus.
- Approximately 20 parents were observed stopping along Tate Street and dropping their students off to walk the remainder of the way to the main entrance of the school campus

at Cambridge Drive. The SRO noted that he would like "No Parking or Standing" signage on Tate Street to prevent parents from doing this.

Afternoon Field Review

- One school bus arrived at 2:05 PM and left at approximately 2:30 PM. One Brevard Public Schools van arrived at the front of the school at 2:15 PM and a daycare van arrived at 2:40 PM. Conflicts with vehicles leaving the parent drop-off/pick-up loop and the vans entering the entrance on Cambridge Drive were observed.
- School staff put out a "Road Closed" sign at 2:20 PM in the northbound travel lane of Cambridge Drive between Vanderbilt Lane and the school entrance to prevent vehicles entering the main entrance of the school. Parents are directed to Pineda Street for pick-up. The "Road Closed" sign was removed at approximately 2:55 PM.
- The SRO was parked at Vanderbilt Lane & Cambridge Drive on the southeast corner with lights on at 2:20 PM to direct parents to utilize Yale Lane to enter the parent pick-up loop along Pineda Street.
- Approximately 100 students were observed walking out of the school. Approximately 25 bicyclists and one e-bicyclist were observed leaving the school. Approximately 40 percent of the pedestrians/bicyclists traveled westbound on Tate Street and the other approximately 60 percent traveled southbound on Cambridge Drive.
- Approximately five vehicles picked up students on Vanderbilt Lane.
- Three teachers were observed by the bicycle racks, visitor parking, and along Cambridge Drive to direct pedestrians and vehicles. Two teachers left at 2:45 PM and the third left at approximately 2:55 PM.
- Three safety patrols arrived at Tate Street & Cambridge Drive to direct pedestrians and bicyclists with the SRO and a crossing guard.
- Students were observed in the northwest corner of Tate Street & Cambridge Drive walking through private property.
- Peak pedestrian/bicyclist times were from 2:30 PM to 2:40 PM. After a majority of the pedestrians/bicyclists left the area, the SRO helped direct vehicle traffic at Tate Street & Cambridge Drive to provide more efficient intersection operations. Traffic cleared by 2:45 PM. The maximum queue on Tate Street to turn right onto Cambridge Drive was approximately six vehicles.
- Approximately 120 vehicles were observed using the parent pick-up loop. School staff noted that there was an abnormal number of early pick-ups that day.
    - More than ten vehicles were queued in the parent pick-up loop along Pineda Street at 2:00 PM before the gate was open. Several driveways were blocked due to queuing.

- The gate was opened at 2:00 PM and approximately 20 vehicles queued in the parent pick-up loop once it opened at 2:30 PM.
- Peak queuing on Pineda Street occurred at approximately 2:35 PM with vehicles lined up south to Duke Way, an approximate 1,000 foot queue.
- After the gate on Pineda Street was locked at 2:55 PM, students were taken to a late pick-up holding area in the school cafeteria.

Opportunities for Improvement

- The SRO expressed maintenance concerns along the west fence of the school campus. The SRO requested tree/shrubbery clearance within 5 feet on the west side of the fence since the school is next to residential properties. Coordination with Brevard Public Schools landscaping contractors and verification of property lines will inform the feasibility for this clearance.
- To address parent parking along Tate Street and Pineda Street prior to pick-up in the afternoon, install "No Parking, Standing, or Stopping" signage along the Tate Street, Pineda Street, Vanderbilt Street, Cambridge Drive, and Yale Street.
- Enhance pavement markings and add signage to discourage wrong way driving behavior in the parent drop-off/pick-up loop.
- Extend the parent drop-off/pick-up loop into the basketball court on the east side of the school campus to increase the amount of vehicle queueing space on school campus.
- Address drainage concerns along Cambridge Drive and Tate Street.

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 Cambridge 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	Restripe high-visibility crosswalk.	Crossing	Maintenance	<$10,000
2	School Campus	Update stop signage and restripe stop bars and markings.	Sign/Signal	Maintenance	<$10,000
3	School Campus	Restripe faded directional arrows in the one-way car loop.	Maintenance	Maintenance	<$10,000
4	Western Fence of School Campus	Maintain vegetation along the western fence on School Campus.	Maintenance	Maintenance	Maintenance
5	School Campus	Reconstruct the speed bumps on the school campus.	Roadway	Near-Term	Further Study Required to Design Speed Bumps

Study Area Recommendations

No.	Location	Recommendation	Type	Time-Frame	Cost Estimate
6	SR 501 (Clearlake Road) & Michigan Avenue	Employ two additional crossing guards at SR 501 (Clearlake Road) & Michigan Avenue.	Enforcement	Near-Term	Enforcement
7	Pineda Street, Tate Street, Cambridge Drive, Yale Lane, and Harvard Lane	Fill sidewalk gaps on: • The west side of Pineda Street from Dixon Boulevard to Vanderbilt Lane; • The south side of Tate Street from SR 501 (Clearlake Road) to Cambridge Drive; • The east side of Cambridge Drive from Harvard Drive to the Southwest School Entrance/Exit; • Both sides of Yale Lane from Cambridge Drive to Pineda Street; and • Both sides of Harvard Drive from Cambridge Drive to Pineda Street. Add high-visibility crosswalks at cross-street locations.	Sidewalk/ Crossing	Long-Term	Further Study Required to Evaluate Drainage Potential Impacts

Table 2: Recommendations Summary

Study Area Recommendations					
No.	**Location**	**Recommendation**	**Type**	**Time-Frame**	**Cost Estimate**
8	Pineda Street and Tate Street & Cambridge Drive	Add school zone pavement markings, advance school zone warning signs, flashing beacon signage, and "End School Zone" signage at the existing school zone on Pineda Street from Yale Lane to the Southeast School Entrance/Car Loop Entrance and at Tate Street & Cambridge Drive.	Sign/Signal	Near-Term	$70,000 to $80,000
9	Pineda Street and Point Drive/ Cambridge Drive	Conduct a speed study and if justified, implement speed humps and/or raised crossings/intersections along: • Pineda Street from Dixon Boulevard to Southeast School Entrance; and • Point Drive/Cambridge Drive from Dixon Boulevard to the Southwest School Entrance.	Traffic Calming	Near-Term/ Long-Term	Further Study Required to Perform Speed Study
10	Tate Street, Cambridge Drive, and Pineda Street	Install/upgrade pedestrian ramps that meet current standards along: • Tate Street from SR 501 (Clearlake Road) to Cambridge Drive; • Cambridge Drive from Harvard Drive to Southwest School Entrance; and • Pineda Street from Dixon Boulevard to Southwest School Entrance.	Sidewalk	Near-Term	$400,000 to $470,000
11	Cambridge Drive and Rosetine Street/Tate Street	Conduct a drainage analysis on: • Cambridge Drive from Harvard Drive to the Southwest School Entrance; • Pineda Street from Dixon Boulevard to Vanderbilt Lane; • Vanderbilt Lane from Cambridge Drive to Pineda Street; and • Rosetine Street/Tate Street from Walter Street to Cambridge Drive.	Roadway	Near-Term	Further Study Required for Drainage Analysis

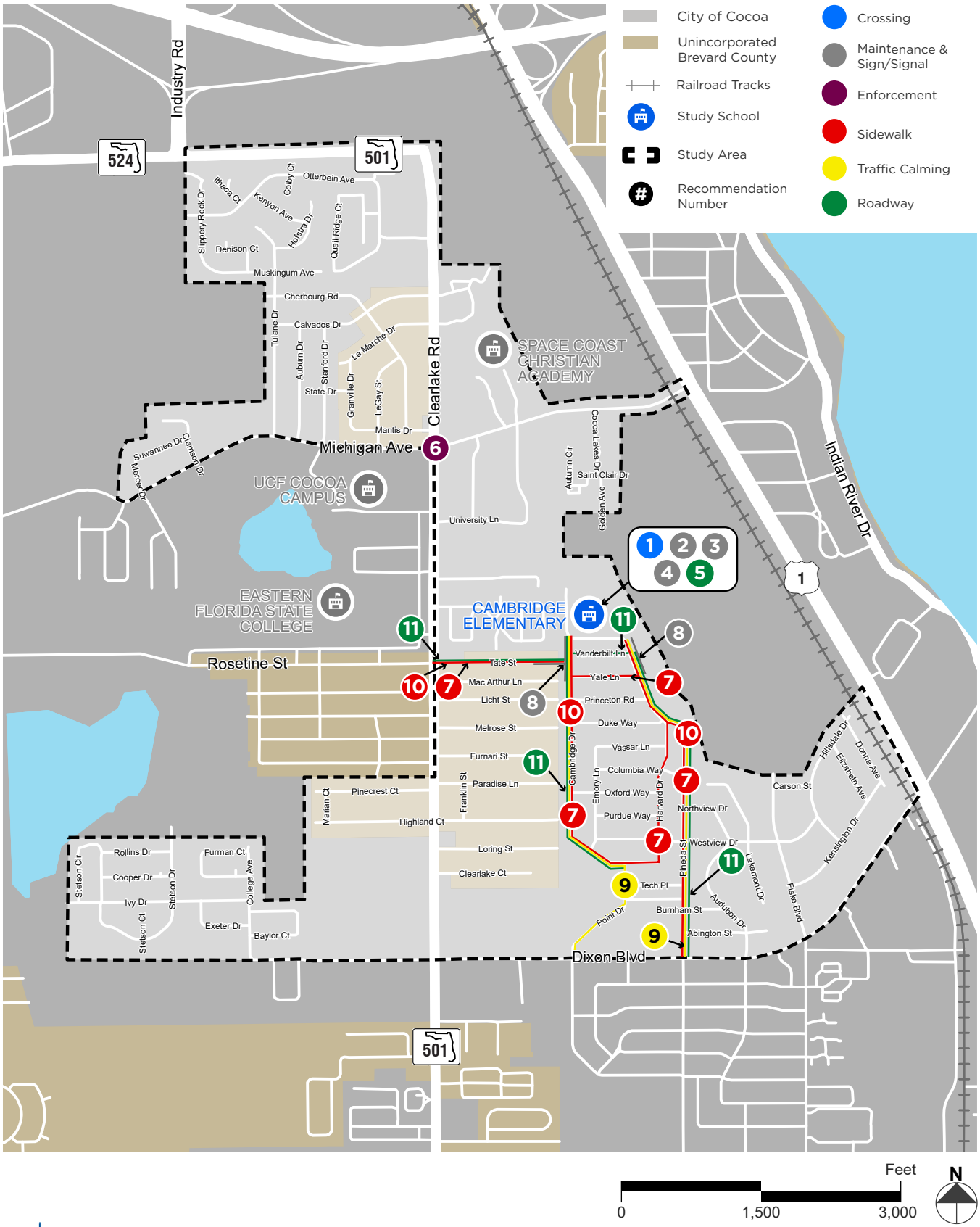


Figure 17: Recommendations

School Routes Analysis

Cambridge Elementary School

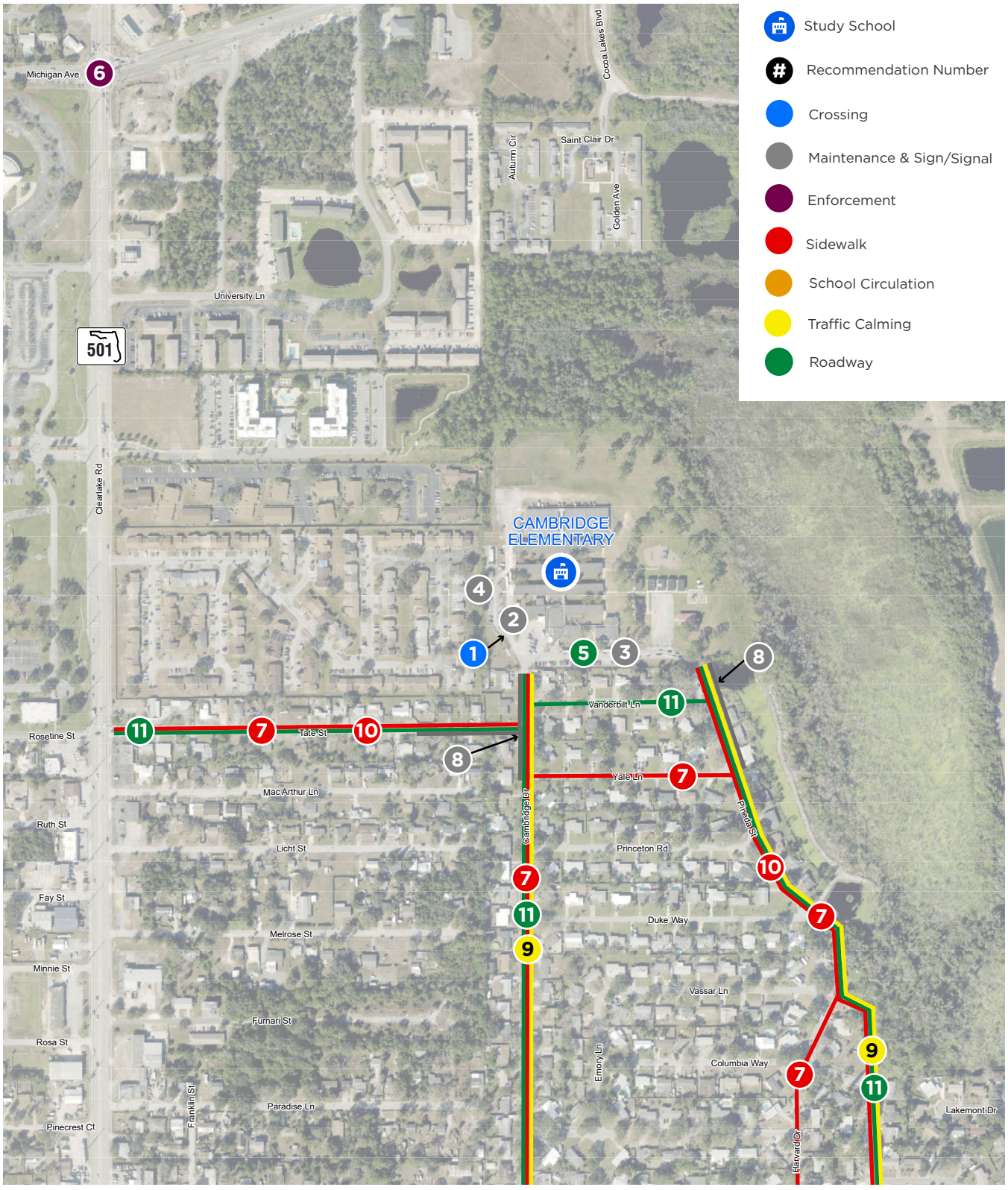


Figure 18: Recommendations: School Context Aerial

School Routes Analysis

Cambridge 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.

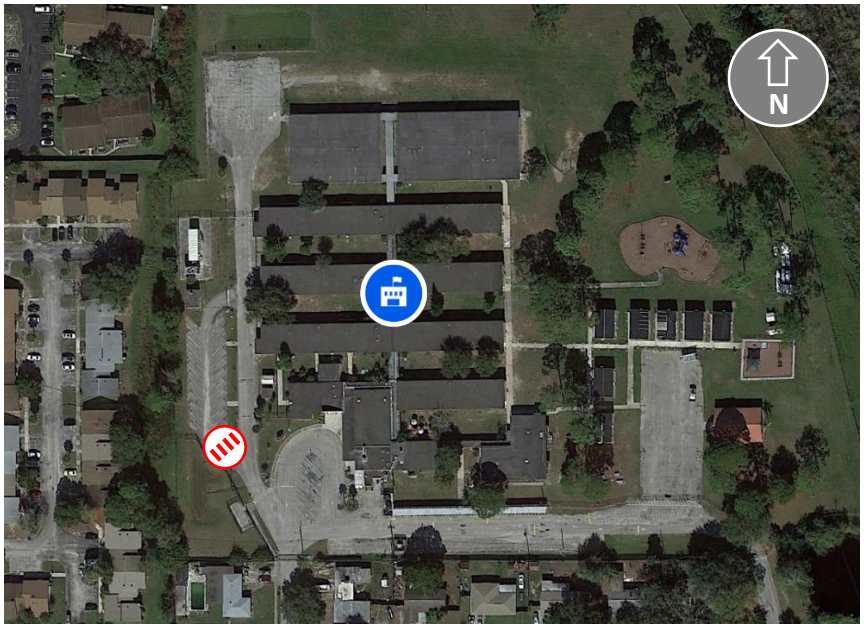
Figure 19 below shows an example of the cost estimate process described above.

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: Restripe high visibility crosswalk

Location	School Campus
Type	Crossing
Issue	Crosswalk marking on the school campus is faded and vehicles were observed stopping in the crosswalk.
Recommendation	Restripe high visibility crosswalk on school campus.



Existing Crosswalk on School Campus

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

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

Project 2: Update stop signage and restripe stop bars and markings

Location	School Campus
Type	Sign/Signal
Issue	Stop signs do not meet current standards and stop bars are faded.
Recommendation	Update stop signage and restripe stop bars and markings.

Existing Stop Signage and Stop Bar Locations

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

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

Project 3: Restripe faded directional arrows in the one-way car loop

Location	School Campus
Type	Maintenance
Issue	Directional arrows in the one-way car loop on school campus are faded.
Recommendation	Restripe faded directional arrows in the one-way car loop.

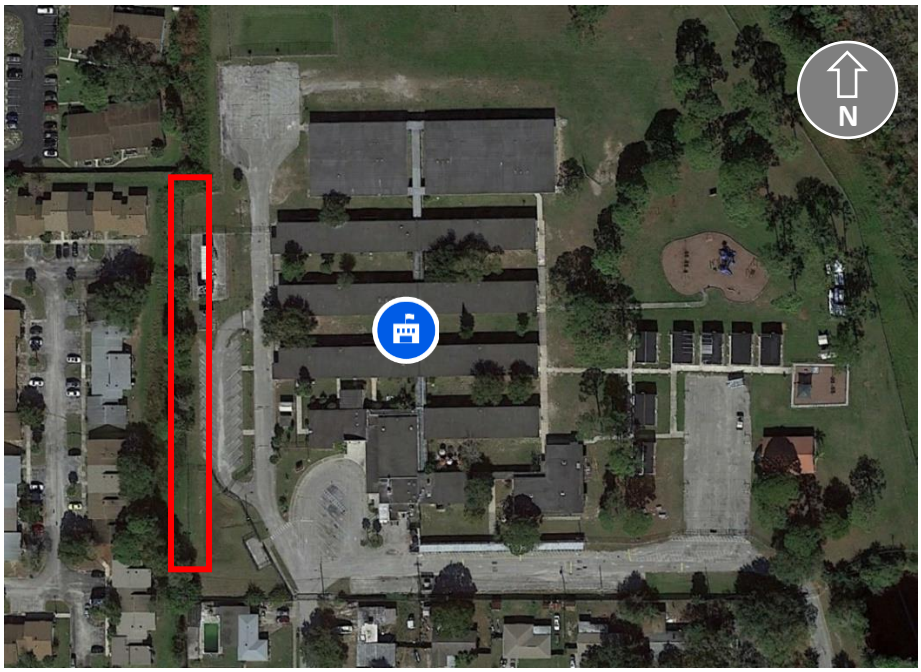
Existing Directional Arrows in One-Way Car Loop

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

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

Project 4: Maintain vegetation along the western fence line

Location	**Western Fence of School Campus**
Type	**Maintenance**
Issue	School staff noted safety concerns along the west fence of the school campus due to a lack of maintenance. The SRO requested tree/shrubbery clearance within 5 feet on the west side of the fence since the school is next to residential properties.
Recommendation	Clear and maintain vegetation along the western fence line of the school campus.



Vegetation Maintenance Zone

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

Project 5: Reconstruct the speed bumps on the school campus

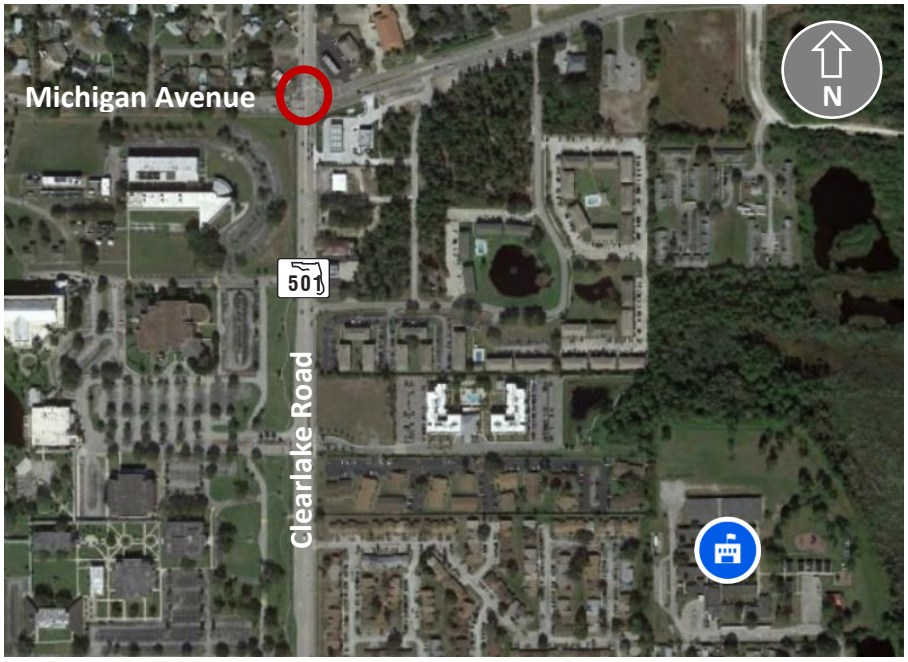
Location	School Campus
Type	Roadway
Issue	The SRO expressed interest in reconstructing speed bumps on school campus as vehicles drive around them.
Recommendation	Reconstruct the speed bumps on the school campus.

Existing Speed Bumps

	Implementation Timeframe	Near-Term
	Estimated Project Cost	Further Study Required to Design Speed Bumps
	Right-of Way Needed?	No
	Drainage or Utility Impact?	No
	Responsible Agency	Brevard Public Schools

Project 6: Employ two additional crossing guards at SR 501 (Clearlake Road) & Michigan Avenue

Location	SR 501 (Clearlake Road) & Michigan Avenue
Type	Enforcement
Issue	Students traveling southbound from neighborhoods north of the school campus cross the intersection at SR 501 (Clearlake Road) & Michigan Avenue, which currently does not have crossing guards.
Recommendation	Employ two additional crossing guards at SR 501 (Clearlake Road) & Michigan Avenue.



Proposed Crossing Guard Location

Implementation Timeframe	Near-Term
Estimated Project Cost	Enforcement
Right-of Way Needed?	No
Drainage or Utility Impact?	No
Responsible Agency	City of Cocoa Police Department

Project 7: Fill sidewalks gaps along neighborhood streets

Location	**Pineda Street, Tate Street, Cambridge Drive, Yale Lane, and Harvard Drive**
Type	**Sidewalk/Crossing**
Issue	There are gaps in the sidewalk near the school. Bicyclists and pedestrians were observed walking in the grass or on the road.
Recommendation	Fill sidewalk gaps on: • The west side Pineda Street from Dixon Boulevard to the Vanderbilt Lane; • The south side of Tate Street from SR 501 (Clearlake Road) to Cambridge Drive; • The east side of Cambridge Drive from Harvard Drive to the Southwest School Entrance/Exit; • Both sides of Yale Lane from Cambridge Drive to Pineda Street; and • Both sides of Harvard Drive from Cambridge Drive to Pineda Street. Add high-visibility crosswalks at crossing locations.

Existing Sidewalk Gap on Tate Street

	Implementation Timeframe	**Long-Term**
	Estimated Project Cost	**Further Study Required to Evaluate Drainage Potential Impacts**
	Right-of Way Needed?	**Potential**
	Drainage or Utility Impact?	**Yes**
	Responsible Agency	**City of Cocoa**

Proposed Sidewalks along Tate Street, Cambridge Drive, Yale Lane, Harvard Drive, and Pineda Street

Project 8: Update school zone signage and pavement markings

Location	**Pineda Street and Tate Street & Cambridge Drive**
Type	**Sign/Signal**
Issue	There school zone signs (15 MPH) along Tate Street, Cambridge Drive, and Pineda Street. However, these signs are not currently up to standard. Students were observed walking and biking along and across these roadways during student drop-off/pick-up times.
Recommendation	Add school zone pavement markings, advance school zone warning signs, flashing beacon signage, and "End School Zone" signage at the existing school zone on Pineda Street from Yale Lane to the Southeast School Entrance/Car Loop Entrance and at Tate Street & Cambridge Drive.

Existing School Zone Sign along Cambridge Drive

	Implementation Timeframe	**Near-Term**
	Estimated Project Cost*	**$70,000 to $80,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**No**
	Responsible Agency	**City of Cocoa**

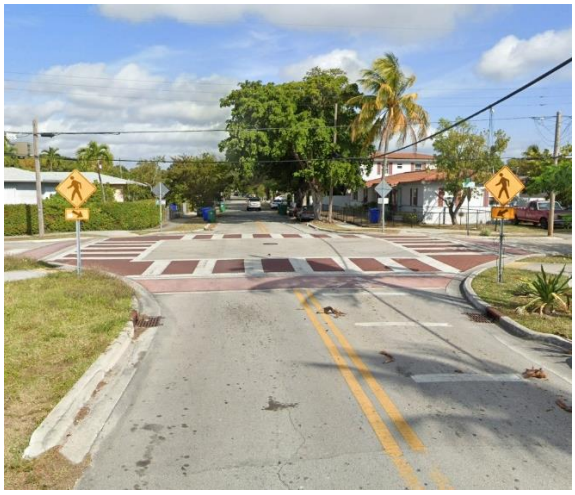
* Drainage, right-of way, and utility considerations were not included in cost estimates.

Example of Flashing Beacon, Marked School Crossing, End School Zone, and School Pavement Markings

Project 9: Conduct a speed study along Pineda Street and Point Drive/ Cambridge Drive

Location	**Pineda Street and Point Drive/Cambridge Drive**
Type	**Traffic Calming**
Issue	Conflicts were observed between pedestrians, bicyclists, and vehicles along Pineda Street and Point Drive/Cambridge Drive. The SRO noted speeding concerns along these roadways.
Recommendation	Conduct a speed study and if justified, implement speed humps and/or raised crossings/intersections along Pineda Street from Dixon Boulevard to Southeast School Entrance and Point Drive/Cambridge Drive from Dixon Boulevard to the Southwest School Entrance.

Student Crossing Pineda Street



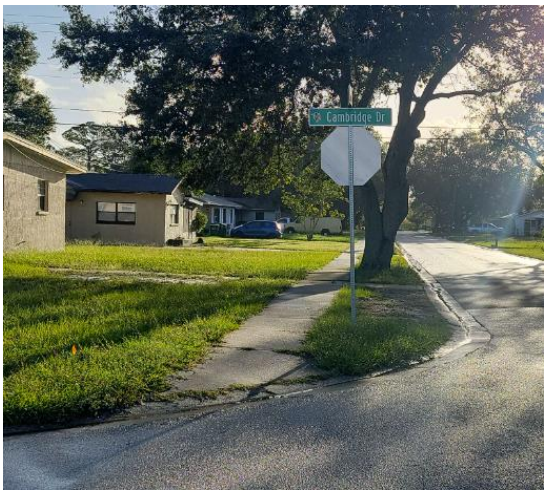
Example of Raised Crossings

	Implementation Timeframe	**Near-Term/Long-Term**
	Estimated Project Cost	**Further Study Required to Perform Speed Study**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**Potential**
	Responsible Agency	**City of Cocoa**

Project 10: Install/upgrade pedestrian ramps to meet current standards

Location	**Tate Street, Cambridge Drive, and Pineda Street**
Type	**Sidewalk**
Issue	Many of the pedestrian ramps along Tate Street, Cambridge Drive, and Pineda Street do not meet current standards.
Recommendation	Install/upgrade pedestrian ramps that meet current standards along: • Tate Street from SR 501 (Clearlake Road) to Cambridge Drive; • Cambridge Drive from Harvard Drive to Southwest School Entrance; and • Pineda Street from Dixon Boulevard to Southeast School Entrance.

Pedestrian Ramp at Cambridge Drive & Tate Street



Pedestrian Ramp at Cambridge Drive & Vanderbilt Lane

	Implementation Timeframe	**Near-Term**
	Estimated Project Cost*	**$400,000 to $470,000**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**No**
	Responsible Agency	**City of Cocoa**

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

Project 11: Conduct a drainage analysis

Location	**Cambridge Drive, Pineda Street, Vanderbilt Lane, and Tate Street**
Type	**Roadway**
Issue	Drainage concerns were observed within the study area. Students were observed walking in the roadway or grass to avoid flooded areas. The are flood prone roadways within the study area per the 2023 SCTPO Transportation Resiliency Master Plan.
Recommendation	Conduct a drainage analysis on: • Cambridge Drive from Harvard Drive to the Southwest School Entrance; • Pineda Street from Dixon Boulevard to Vanderbilt Lane; • Vanderbilt Lane from Cambridge Drive to Pineda Street; and • Tate Street from Walter Street to Cambridge Drive.

Flooding in Sidewalk along Cambridge Drive (left), roadway along Vanderbilt Lane (middle), and roadway along Pineda Street (right)

	Implementation Timeframe	**Near-Term**
	Estimated Project Cost	**Further Study Required for Drainage Analysis**
	Right-of Way Needed?	**No**
	Drainage or Utility Impact?	**Yes**
	Responsible Agency	**City of Cocoa and Brevard County**

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 Cambridge 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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