



SR/CR A1A PEDESTRIAN SAFETY & MOBILITY STUDY

PEDESTRIAN / BICYCLE SAFETY REVIEW

Focus Area I / 19th Road to Apache Drive (Flagler County)



Prepared for:
**River to Sea Transportation
Planning Organization**
2570 West International
Speedway Boulevard, Suite 100
Daytona Beach, FL 32114

Prepared by:
Kittelson & Associates, Inc.
225 E. Robinson Street, Suite 450
Orlando, FL 32801
407.540.0555
kittelson.com

May 2017

SR/CR A1A Pedestrian Safety & Mobility Study

Pedestrian/Bicycle Safety Review Report for SR A1A from 19th Road to Apache Drive (Flagler County)

Section Number: 73030000 (SR A1A)

Mile Post: 13.095 to 14.771

Flagler County

Prepared for:



River to Sea Transportation Planning Organization
2570 West International Speedway Boulevard, Suite 100
Daytona Beach, FL 32114

Prepared by:



Kittelson & Associates, Inc.
225 E Robinson St., Suite 450
Orlando, FL, 32801

May 2017

Project Title: Focus Area I Pedestrian/Bicycle Safety Field Review

Field Review Dates: November 17 and 18, 2016 (daytime/nighttime reviews and follow up meeting)

Participants:

Travis Hills – Kittelson & Associates, Inc. – Team Leader
Stephan Harris – River to Sea Transportation Planning Organization
Chad Lingenfelter – Florida Department of Transportation, District 5
Kris Torres – Flagler County
Sergeant David Williams – Flagler County Sheriff
Miranda Barrus – Kittelson & Associates, Inc.

Project Characteristics:

Field Review Type: Pedestrian, Bicycle, Existing Road
Adjacent Land Use: Rural, Residential
Posted Speed Limit: 50 miles per hour (MPH)
Opposite Flow Separation: None
Service Function: Urban Minor Arterial
Terrain: Flat
Climatic Conditions: Sunny

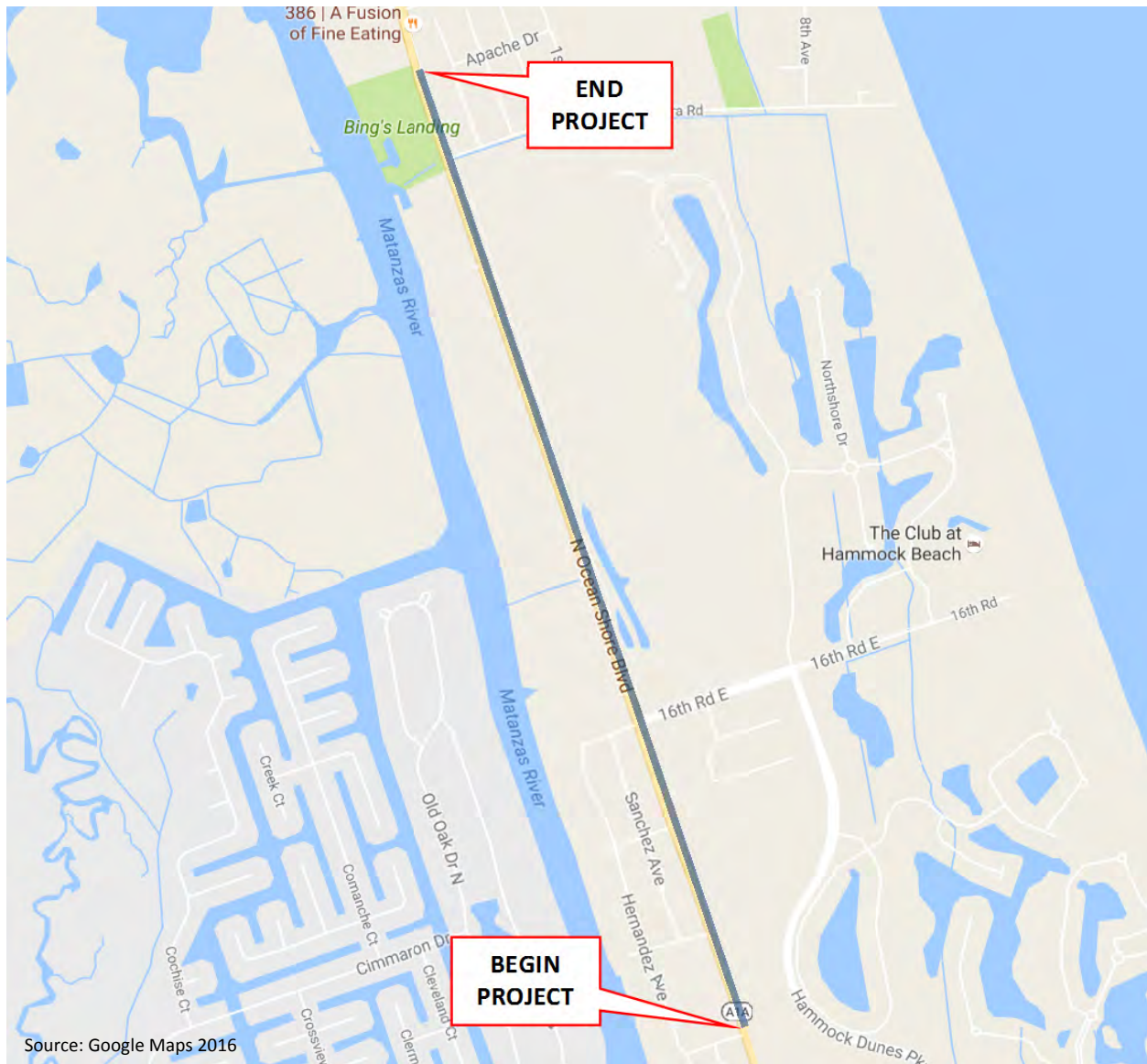


Figure 1 – Focus Area I Study Corridor

Background

Volusia County is ranked in Florida’s top 10 counties for pedestrian injuries and fatalities. Pedestrians and bicyclists are identified as Vulnerable Road Users in the Florida Strategic Highway Safety Plan (SHSP). The goal of the SR/CR A1A Pedestrian Safety & Mobility Study is to generate a list of suggested improvements at high pedestrian/bicycle crash locations to address the growing need for pedestrian/bicycle safety along SR A1A in Volusia and Flagler Counties. SR A1A from 19th Road to Apache Drive (**Figure 1**), a 1.7 mile corridor in Flagler County, is one of these high crash locations. In order to suggest improvements along this high crash corridor, the crash history was evaluated and a field review was conducted. The methodology for selecting high crash corridors is explained in the SR A1A Pedestrian Safety and Mobility Study Final Report. This report will be available on the River to Sea TPO’s website upon the completion of the study: <http://www.r2ctpo.org/bicycle-pedestrian-program/overview/>.

The pedestrian/bicycle safety review process involves multi-disciplinary representatives from various stakeholders, potentially including representatives from transportation planning, traffic operations, roadway design, safety, and law enforcement. Pedestrian/bicycle safety reviews are conducted to identify potential safety issues and provide improvement suggestions in a team collaborative environment. This pedestrian/bicycle safety review was commissioned by the Florida Department of Transportation (FDOT) District Five in coordination with the River to Sea Transportation Planning Organization (R2CTPO) to develop short-term, near-term, and long-term suggestions to improve pedestrian and bicyclist safety within the study limits. This safety review is limited in scope and should not be construed as a comprehensive safety study; nor is it a formal Road Safety Audit. It is intended to identify potential operational and safety related improvements related to pedestrians and bicyclists to be considered by FDOT staff, R2CTPO staff, and partner agencies (i.e. Flagler County, local law enforcement). Some improvements presented in this report may be implemented in the short-term while other suggested safety improvements may be considered for future study. Each suggestion identified in this study is classified into one of three categories:

- Short-Term Maintenance – it is anticipated that issues identified for maintenance may be addressed by public agency staff on a short timeframe and at a relatively low cost.
- Near-Term Improvement – activities that may be incorporated into an upcoming construction project in the area, including 3R milling and resurfacing projects.
- Long-Term Improvement – activities that may be incorporated into upcoming construction projects and may need to be programmed for funding as separate projects.

The field review was conducted on Thursday, November 17, 2016. The team met in the morning in the Flagler County Financial Department at the Government Complex to discuss the study corridor and crash history. Before the lunch break, the study team drove the entire corridor south to north, and then north to south, to gain an understanding of the facility characteristics from a driver’s perspective. The team walked the length of the sidewalk along the east side of the roadway (no sidewalks present on west side). The team members reassembled in the evening, after sunset, to make observations in nighttime conditions. A follow-up debrief meeting occurred the following morning (November 18) in the Flagler County Financial Department to discuss the corridor’s issues and potential improvements identified by the team. Below is a list of the study corridor characteristics:

- 19th Road to Apache Drive – 1.70 miles.
- Two-lane, undivided cross-section with no passing zones from 0.25 miles south to 0.12 miles north of 16th Road and from 0.12 miles south of Mala Compra Road to Apache Drive.
- The posted speed along the study corridor is 50 MPH.
- There are no signalized intersections along the study limits.
- One unsignalized crosswalk with special emphasis markings is located on the south leg of SR A1A at Mala Compra Road.
- The Flagler Beach to Marineland Trail is present along the east side of the study corridor, offset 4 to 80 feet from the east edge of pavement. The trail is 6 to 8 feet wide south of 16th Road and 10 feet wide north of 16th Road. No sidewalk is present along the west side of the corridor.
- Marked 5-foot bicycle lanes provided along the length of the study corridor on the east and the west sides of SR A1A. At intersections where a right turn lane is present, bicycle lane “keyhole” striping is present.
- Flagler County does not operate public transit along SR A1A within the study limits.
- Overhead street lighting is not present on either side of the road within the project limits.

- The corridor has experienced an average AADT of 6,700 over the last six years (2009-2014).

Crash History (2009 – 2014):

Six (6) years of available pedestrian and bicycle related crash data, 2009 to 2014, supported the SR A1A crash analysis. Crash data originated from two sources: 1. The FDOT Crash Analysis Reporting System (CARS) database from 2009 to 2014, and 2. The Signal Four Analytics database maintained from 2009 to 2014 by the University of Florida. The crashes from the Signal Four database supplemented the CARS data along SR A1A.

One (1) pedestrian and two (2) bicycle-related crashes were reported over the five-year study period. One of the bicycle crashes resulted in an injury while the one pedestrian crash and second bicycle crash resulted in two (2) fatalities. The fatal crashes are summarized below:

- Crash Number 77262466
 - On September 18, 2010 at 11:25 PM, a crash involving a bicyclist occurred on SR A1A under dark lighting conditions. The bicyclist was traveling northbound in the southbound lanes just south of 18th Road when he crossed into the northbound lanes, where a northbound pickup truck collided with him. The bicyclist was intoxicated at the time of the crash. He was transported to the hospital where he was later pronounced deceased.
- Crash Number 82026278
 - On February 14, 2011 at 7:25 PM, a crash involving a pedestrian occurred on SR A1A under dark lighting conditions. The pedestrian was walking southbound along the west shoulder of the road when he was struck by a vehicle traveling in the southbound direction. No sidewalk is present on the west side of the roadway but a trail is present on the east side. The pedestrian was pronounced deceased at the crash scene.

Crash diagrams were created along the corridor to summarize the pedestrian/bicycle-related crash history. The crash diagrams are included in **Appendix A**. The pedestrian/bicycle crash data was also summarized by the crash metrics displayed in the charts in **Appendix A**. A summary of these metrics is provided below:

- Two (2) of the three (3) crashes (67 percent) occurred in dark lighting conditions, with both resulting in a fatality.
- One (1) of the three (3) crashes (33 percent) was alcohol related.
- Two (2) of the three (3) drivers (67 percent) involved in crashes were above the age of 60 and one (1) of the pedestrian/bicyclists was below the age of 19.
- Two (2) of the three (3) drivers (67 percent) involved in crashes were driving at the posted speed limit of 50 MPH.
- Two (2) of the three (3) crashes (67 percent) occurred with a pedestrian or bicycle traveling along the side of the roadway. In all 3 (three) of the crashes the vehicle had the right of way.
- Two (2) of the three (3) pedestrians and bicyclists (67 percent) were not from the local area based upon their provided zip codes.

FIELD REVIEW FINDINGS

Location: Corridor-Wide

Issue #1: Debris on Sidewalk/Shared-Use Path

Figure 2



Figure 3

Description of Issue:

Debris covers the following sections of the sidewalk/shared-use path within the study section:

- 19th Road to Hammock Community Church (**Figure 2**); and
- Shared use path north of 16th Road to south of Flagler Fire & Rescue (**Figure 3**).

Suggestions for Improvement:

As a maintenance-type improvement, consider dispatching a maintenance crew to remove the debris on the sidewalk/shared-use path.

Location: Corridor-Wide

Issue #2: Vegetation Encroaching on Sidewalk/Shared-Use Path



Figure 4



Figure 5



Figure 6



Figure 7

Description of Issue:

Vegetation, landscaping, and overhanging trees were observed to be encroaching onto the sidewalk/shared-use path along the following sections:

- 19th Road to SunTrust driveway;
- SunTrust driveway to 16th Road (**Figure 4**);
- 16th Road to south of Flagler Fire & Rescue (**Figure 5** and **Figure 6**); and
- North of Adult & Community Education center to south of Malacompra Road (**Figure 7**).

Suggestions for Improvement:

As a maintenance-type improvement, consider dispatching a maintenance crew to trim vegetation so it is not encroaching on the sidewalk/shared-use path and prune overhanging trees to provide an eight-foot vertical clearance. Also, consider clearing the trees that have fallen onto the sidewalk/shared-use path.

Location: Corridor-Wide

Issue #3: Shared-Use Path Signage and Striping



Figure 8



Figure 9



Figure 10



Figure 11

Description of Issue:

The shared-use path from 16th Road north to Apache Drive has inconsistent signage/markings at the crossing locations with driveways and stop-controlled minor streets. In some locations, just a stop bar is present, whereas in other locations only a stop sign is present. Specific locations with inconsistent signs and/or markings are as follows:

- 16th Road (**Figure 8**);
- Driveways at the Adult & Community Education Center (**Figure 9**);
- Malacompra Road (**Figure 10**); and
- Apache Drive (**Figure 11**).

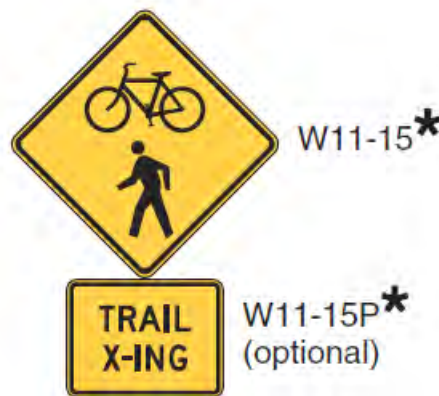
According to Florida Statute 316.130(7), motorists are required to stop or yield to pedestrians in crosswalks, which would include trail crossings. As stated in the American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bicycle Facilities, 4th Edition,

“attempts to require bicyclists to yield or stop at each cross street driveway are inappropriate and typically not effective” (p. 5-8). The Guide also notes, “Installing unwarranted or unrealistically restrictive controls on path approaches in an attempt to ‘protect’ path users can result in path users disregarding the signs and other traffic control devices at the intersection. This can lead to a loss of respect for traffic control at more critical locations” (p. 5-34).

Suggestions for Improvement:

As a maintenance-type improvement, consider dispatching a maintenance crew to replace the stop signs/bars with yield signs/markings at unsignalized intersections and driveways (where appropriate). The yield signs/markings will help inform bicyclists they are approaching an intersection and should be cautious of vehicles turning to/from the minor street that may not see them.

In addition to the yield signage/markings for the trail, consider installing trail crossing warning signs (W11-15) and plaques (W11-15P) that would draw the motorist’s attention to the presence of pedestrians or bicycles on the shared use path.



Location: Corridor-Wide

Issue #4: Unsignalized Intersection and Driveway Crosswalk Markings

Figure 12



Figure 13



Figure 14



Figure 15

Description of Issue:

The study team observed crosswalks at minor streets and driveways were faded. Certain driveways have crosswalk markings for pedestrians, such as the SunTrust and Publix driveway in **Figure 12**, while other driveways do not have markings. Specific locations with faded crosswalk markings are below:

- SunTrust driveway (**Figure 12**);
- 16th Road (**Figure 13**);
- Driveways at the Adult & Community Education Center (**Figure 14**);
- Malacompra Road (**Figure 15**); and
- Apache Drive.

Suggestions for Improvement:

As a maintenance-type improvement, consider restriping the current crosswalk markings at unsignalized intersections (standard or special emphasis determined on a case-by-case basis) as shown on sheet 12 of FDOT Design Standard Index 17346 to provide consistency along the corridor. To emphasize the pedestrian realm at frequently used driveways, consider striping standard crosswalk markings as shown on sheet 12 of FDOT Design Standard Index 17346.

Location: Corridor-Wide

Issue #5: Raised Audible Pavement Markings

Figure 16



Figure 17

Description of Issue:

During the field review, the team observed vehicles driving on the raised audible pavement markings, disregarding their purpose to warn drivers about driving on the shoulder. **Figure 16** and **Figure 17** show drivers driving close/on the line, one near a bicyclist while he was utilizing the shoulder bicycle facility.

Suggestions for Improvement:

As a near-term improvement, consider implementing ground-in rumble strips or profiled thermoplastic to more effectively alert drivers when they are crossing into the shoulder.

If rumble strips are utilized, consider repaving the shoulders and adding pavement to create space for the strips and provide a homogenous surface for bicyclists. If the shoulder is repaved, consider adding enough pavement to provide a 7' buffered bicycle lane.

Location: Corridor-Wide

Issue #6: Lighting



Figure 18



Figure 19



Figure 20



Figure 21

Description of Issue:

With the exception of roadway lighting along the north side of 16th Road E (Figure 20), no roadway lighting is present along the study corridor. Two of the three crashes (67 percent) occurred in dark lighting conditions, with both resulting in a fatality.

Suggestions for Improvement:

Consider conducting a lighting justification study along unlit portions of the corridor to determine if additional lighting is justified. Also, consider implementation of pedestrian-level lighting to supplement areas where roadway lighting is not able to provide adequate illumination along the shared-use path between 16th Road and Malacompra Road.

Location: Corridor-Wide

Issue #7: Detectable Warning Surfaces



Figure 22



Figure 23



Figure 24



Figure 25

Description of Issue:

The detectable warning surfaces at certain intersections are concrete-stamped, as displayed in **Figure 22** and **Figure 23**, or destroyed as shown in **Figure 24** and **Figure 25**.

Suggestions for Improvement:

As a maintenance-type improvement, consider dispatching a maintenance crew to install new detectable warning surfaces per FDOT Design Standard Index 304.

Location: 19th Road to 18th Road

Issue #8: Damaged Concrete Panels



Figure 26



Figure 27

Description of Issue:

Sections of the concrete sidewalk between 19th Road and 18th Road are cracked and/or broken (**Figure 26** and **Figure 27**) creating a possible tripping hazard for pedestrians.

Suggestions for Improvement:

As a maintenance-type improvement, consider dispatching a maintenance crew to reconstruct the damaged concrete panels.

Location: 17th Road to 16th Road**Issue #9: Church Parking**

Figure 28



Figure 29

Description of Issue:

Hammock Community Church has created parking spaces in their lawn adjacent to the sidewalk (**Figure 28**). Vehicles can access this parking via the exit driveway, prior to the DO NOT ENTER sign (**Figure 29**), or from the roadway over the grass shoulder and sidewalk. A vehicle traversing the sidewalk is a safety issue for pedestrians that may be using the path while also causing cracks in the concrete panels because they are not designed to support the weight of a vehicle.

Suggestions for Improvement:

As a near-term improvement, consider coordinating with Hammock Community Church to remove the parking or to create another on-site access point to the parking area. This would eliminate the need for vehicles to traverse the sidewalk to access the parking area.

Location: SunTrust Bank Driveway just South of 16th Road

Issue #10: Southeast Curb Return Radius



Figure 30



Figure 31

Description of Issue:

The southeast corner of the SunTrust driveway (**Figure 30**) has a large curb return radius (**Figure 31**), which enables drivers to make northbound right-turn movements at higher rates of speed. Vehicles that are traveling faster may not see pedestrians/bicyclists utilizing the crosswalk, thus creating a conflict.

Suggestions for Improvement:

As a near-term improvement, consider reconstructing the southeast corner curb return radius based on FDOT Standard Index 515 so the driveway throat width is reduced.

Location: 16th Road Intersection

Issue #11: Intersection Sight Distance



Figure 32



Figure 33



Figure 34

Description of Issue:

The existing stop bar is located approximately 38' from the edge of pavement along SR A1A (Figure 32) due to the setback distance of the crosswalk. In combination with the vegetation along the path (Figure 33), intersection sight distance is limited for westbound drivers departing 16th Road. Figure 34 displays a dump truck that had to stop over the crosswalk in order to obtain the sight distance needed to turn onto SR A1A.

Suggestions for Improvement:

As a near-term improvement, consider realigning the sidewalk/shared-use path closer to the roadway and restriping the crosswalk as discussed in Issue #4: **Unsignalized Intersection and Driveway Crosswalk Markings**. In doing so, the stop bar could be brought closer to the roadway thus increasing sight distance. When reconstructing the sidewalk south of 16th Road, widen from 8' to 10' so the sidewalk to shared-use path transition takes place south of 16th Road instead of at the crosswalk for the intersection.

Location: 16th Road Intersection**Issue #12: Northeast and Southeast Curb Return Radii**

Figure 35

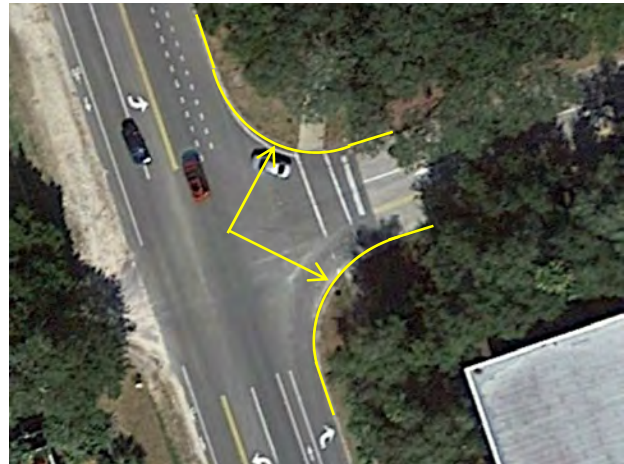


Figure 36

Description of Issue:

The northeast and southeast corners at 16th Road (**Figure 35**) have large curb return radii (**Figure 36**), which enables drivers to make northbound and westbound right turn movements at higher rates of speed. Vehicles that are traveling faster may not see pedestrians/bicyclists utilizing the crosswalk, thus creating a conflict.

Suggestions for Improvement:

As a near-term improvement, consider reconstructing the northeast and southeast corner curb return radius based on FDOT Standard Index 515 so the driveway throat width is reduced.

Location: 16th Road Intersection**Issue #13: Intersection Traffic Control**

Figure 37



Figure 38

Description of Issue:

The existing intersection traffic control is two-way stop for 16th Road with crosswalk markings on the east leg, as discussed in **Issue #11: Intersection Sight Distance**. During the daytime field review, the study team observed a pedestrian crossing SR A1A westbound at 16th Road (**Figure 37** and **Figure 38**), in addition to steady vehicular traffic turning from 16th Road E. 16th Road E provides resort and beach access, as well as access to Publix, attracting motorists, pedestrians, and bicyclists.

Suggestions for Improvement:

As a near-term improvement, consider conducting a signal warrant evaluation at this intersection. If the intersection warrants a signal and a signal is constructed, consider installing crosswalks and pedestrian features on the north and south legs to provide crossings across SR A1A for pedestrians and bicyclists.

Location: Adult & Community Education Center

Issue #14: Crosswalk Alignment



Figure 39



Figure 40

Description of Issue:

The existing crosswalks at the Adult & Community Education Center driveways are adjacent to the edge of pavement without any buffer (**Figure 39** and **Figure 40**) creating an uncomfortable walking/cycling experience for a non-motorist on the shared-use path.

Suggestions for Improvement:

As a near-term improvement, consider realigning the crosswalk to the east and providing a 5' landscape buffer between the crosswalk and roadway if right-of-way is available.

Location: Malacompra Road Intersection

Issue #15: Pedestrian Signage Retro-Reflectivity

Figure 41



Figure 42

Description of Issue:

The pedestrian warning signs along SR A1A for the crosswalk markings at Malacompra Road (**Figure 41**) have limited retro-reflectivity. This is primarily an issue during non-daytime hours because no roadway lighting is present along the corridor to illuminate the crosswalks (**Figure 42**).

Suggestions for Improvement:

As a maintenance-type improvement, consider dispatching a maintenance crew to replace the existing signs (W11-2) and plaques (W16-7P) to enhance their visibility. Due to the lack of roadway lighting near the crossing, consider replacing the standard yellow background with those having the fluorescent yellow-green background with Type 11 sheeting.

Location: Malacompra Road Intersection

Issue #16: Intersection Lighting

Figure 43



Figure 44

Description of Issue:

The intersection of SR A1A and Malacompra Road has special emphasis crosswalk markings on the east and south legs which are visible during the daytime but are difficult to see at night (**Figure 43** and **Figure 44**), even with ambient lighting.

Suggestions for Improvement:

As a long-term improvement, consider one of the following options to enhance the lighting at this intersection:

1. Implement pedestrian activated overhead lighting to illuminate crosswalks. When a pedestrian approaches the crosswalk, he/she can push a button to activate the lighting which will help alert drivers of a pedestrian utilizing the crosswalk. The lighting would then turn off once the pedestrian has crossed the roadway, based on the MUTCD walking speed of 3.5 feet/second.
2. Install in-pavement lighting along the crosswalk bars, either LED-powered discs or activated lights that can be activated when a pedestrian pushes a button to cross the roadway. These in-pavement lights would also help alert drivers to pedestrians in the crosswalk.

Location: Malacompra Road Intersection

Issue #17: North Leg Crosswalk



Figure 45



Figure 46

Description of Issue:

The intersection of SR A1A and Malacompra Road has special emphasis crosswalk markings on the east (**Figure 45**) and south (**Figure 46**) legs, but none on the north leg. The crosswalk on the south leg connects to a trail network but a crossing on the north leg, if marked, would connect Captains BBQ and Bings Landing with the bike store/ice cream shop on the northeast corner of the intersection and the sidewalk on the north side of Malacompra Road, which leads to the beach.

Suggestions for Improvement:

As a near-term improvement, consider adding a special emphasis crosswalk to the north leg of the intersection per sheet 12 of FDOT Design Standard Index 17346. In addition to the crosswalk, consider installing pedestrian warning signage (W11-2) and arrow plaques (W16-7P) for this crossing.

Location: Apache Drive Intersection

Issue #18: Sand in Crosswalk Area



Figure 47



Figure 48

Description of Issue:

Apache Drive is a dirt/sand roadway (Figure 47), thus, sand is tracked onto the crosswalk area at this intersection (Figure 48).

Suggestions for Improvement:

As a near-term improvement, consider paving Apache Drive 50 to 100 feet east from the crosswalk to minimize sand debris tracking onto the crosswalk area.

Summary of Suggestions

This pedestrian/bicycle safety review considers operational and safety related issues for pedestrians and bicyclists on SR A1A from 19th Road to Apache Drive. This study was commissioned by the Florida Department of Transportation (FDOT) District Five in coordination with the River to Sea Transportation Planning Organization (R2CTPO) to develop suggestions to improve the safety of pedestrians and bicyclists within the study limits. Each suggestion identified in this study classifies into one of three categories:

- Short-Term Maintenance – it is anticipated that issues identified for maintenance may be addressed by public agency staff on a short timeframe and at a relatively low cost.
- Near-Term Improvement – activities that may be incorporated into an upcoming construction project in the area, including 3R milling and resurfacing projects.
- Long-Term Improvement – activities that may be incorporated into upcoming construction projects and may need to be programmed for funding as separate projects.

The following Short-Term Maintenance suggestions should be prioritized for implementation before the other suggestions identified in this report:

- Issue #1: Debris on Sidewalk/Shared-Use Path on page 5
- Issue #2: Vegetation Encroaching on Sidewalk/Shared-Use Path on page 6
- Issue #7: Detectable Warning Surfaces on page 12
- Issue #8: Damaged Concrete Panels on page 13

The following tables summarize the suggestions of this study by priority (maintenance, near-term, or long-term).

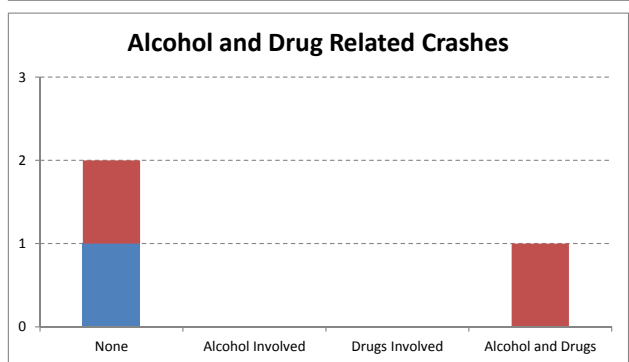
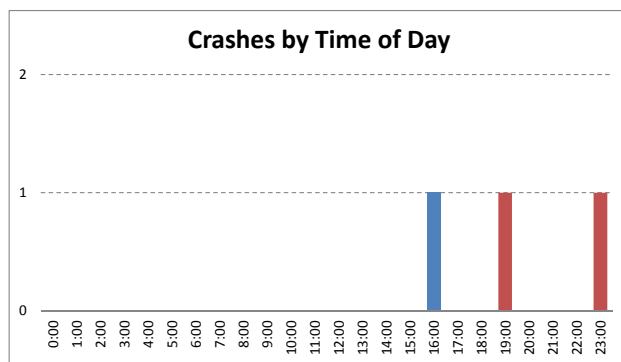
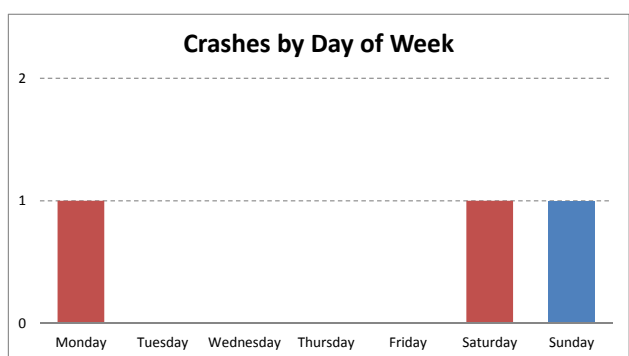
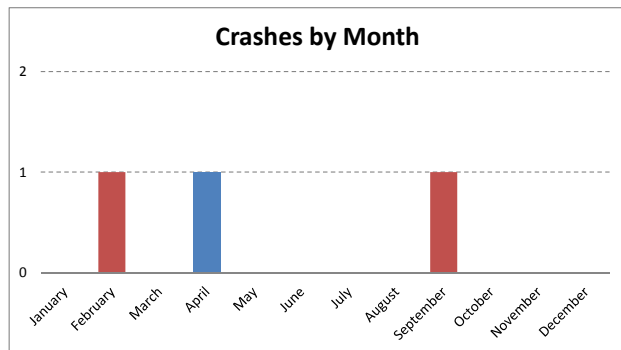
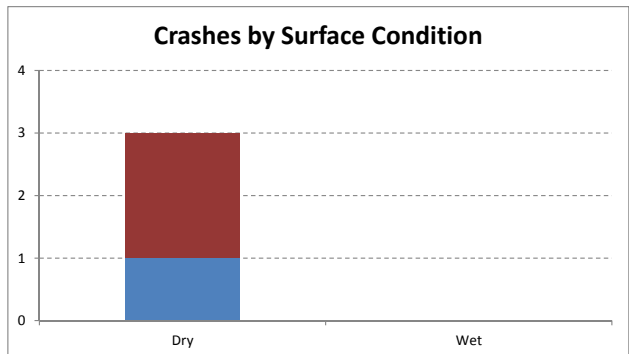
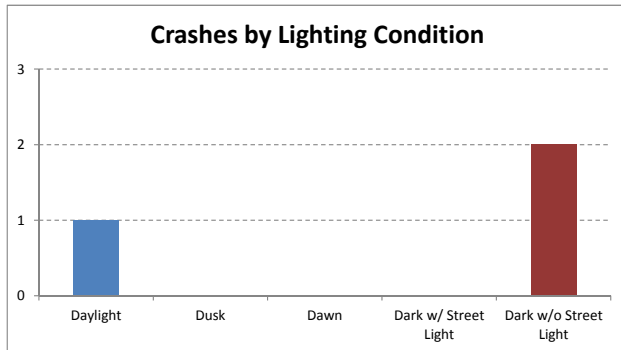
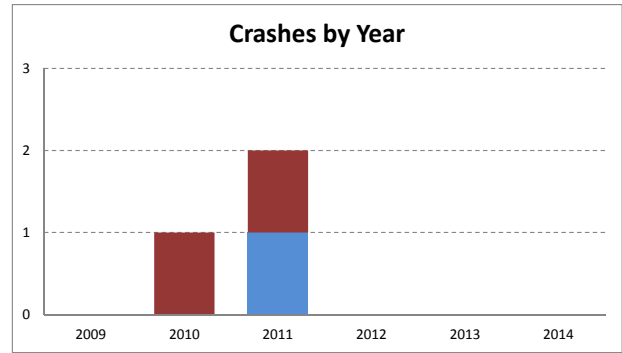
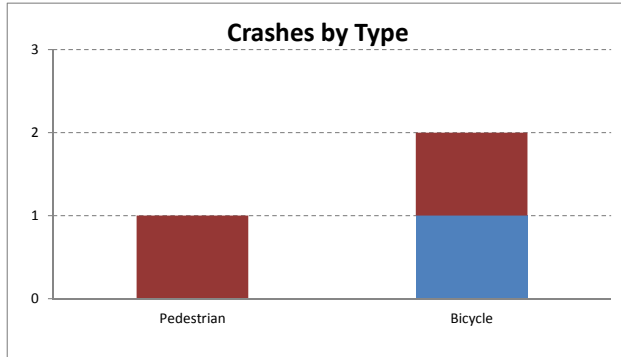
Location	Issue Number	Issue	Suggestion
SHORT-TERM MAINTENANCE			
Corridor-Wide	1	Debris on Sidewalk/Shared-Use Path	Consider dispatching a maintenance crew to remove the debris on the sidewalk/shared-use path.
Corridor-Wide	2	Vegetation Encroaching on Sidewalk/Shared-Use Path	Consider dispatching a maintenance crew to trim vegetation so it is not encroaching on the sidewalk/shared-use path and prune overhanging trees to provide an eight-foot vertical clearance. Consider clearing the trees that have fallen onto the sidewalk/shared use path.
Corridor-Wide	3	Shared-Use Path Signage and Striping	Consider dispatching a maintenance crew to replace the stop signs/bars with yield signs/markings at unsignalized intersections and driveways (where appropriate). In addition to the yield signage/markings for the trail, consider installing trail crossing warning signs (W11-15) and plaques (W11-15P) that would draw the motorist's attention to the presence of pedestrians or bicycles on the shared use path.
Corridor-Wide	4	Unsignalized Intersection and Driveway Crosswalk Markings	Consider restriping the current crosswalk markings at unsignalized intersections (standard or special emphasis determined on a case-by-case basis) as shown on sheet 12 of FDOT Design Standard Index 17346 to provide consistency along the corridor. To emphasize the pedestrian realm at frequently used driveways, consider striping standard crosswalk markings as shown on sheet 12 of FDOT Design Standard Index 17346.
Corridor-Wide	7	Detectable Warning Surfaces	Consider dispatching a maintenance crew to install new detectable warning surfaces per FDOT Design Standard Index 304.
19 th Road to 18 th Road	8	Damaged Concrete Panels	Consider dispatching a maintenance crew to reconstruct the damaged concrete panels.
Malacompra Road Intersection	15	Pedestrian Signage Retro-Reflectivity	Consider dispatching a maintenance crew to replace the existing signs (W11-2) and plaques (W16-7P) to enhance their visibility. Due to the lack of roadway lighting near the crossing, consider replacing the standard yellow background with those having the fluorescent yellow-green background with Type 11 sheeting.

Location	Issue Number	Issue	Suggestion
NEAR-TERM IMPROVEMENT			
Corridor-Wide	5	Raised Audible Pavement Markings	Consider implementing ground-in rumble strips or profiled thermoplastic to more effectively alert drivers when they are crossing into the shoulder. If rumble strips are utilized, consider repaving the shoulders and adding pavement to create space for the strips and provide a homogenous surface for bicyclists. If the shoulder is repaved, consider adding enough pavement to provide a 7' buffered bicycle lane.
17 th Road to 16 th Road	9	Church Parking	Consider coordinating with Hammock Community Church to remove the parking or to create another on-site access point to the parking area.
SunTrust Bank Driveway just South of 16 th Road	10	Southeast Curb Return Radius	Consider reconstructing the southeast corner curb return radius based on FDOT Standard Index 515 so the driveway throat width is reduced.
16 th Road Intersection	11	Intersection Sight Distance	Consider realigning the sidewalk/shared-use path closer to the roadway and restriping the crosswalk as discussed in Issue #4: Unsignalized Intersection and Driveway Crosswalk Markings . When reconstructing the sidewalk south of 16th Road, widen from 8' to 10' so the sidewalk to shared-use path transition takes place south of 16th Road instead of at the crosswalk for the intersection.
16 th Road Intersection	12	Northeast and Southeast Curb Return Radii	Consider reconstructing the northeast and southeast corner curb return radius based on FDOT Standard Index 515 so the driveway throat width is reduced.
16 th Road Intersection	13	Intersection Traffic Control	Consider conducting a signal warrant evaluation at this intersection. If the intersection warrants a signal and a signal is constructed, consider installing crosswalks and pedestrian features on the north and south legs to provide crossings across SR A1A for pedestrians and bicyclists.
Adult & Community Education Center	14	Crosswalk Alignment	Consider realigning the crosswalk to the east and providing a 5' landscape buffer between the crosswalk and roadway if right-of-way is available.
Malacompra Road Intersection	17	North Leg Crosswalk	Consider adding a special emphasis crosswalk to the north leg of the intersection per sheet 12 of FDOT Design Standard Index 17346. In addition to the crosswalk, consider installing pedestrian warning signage (W11-2) and arrow plaques (W16-7P) for this crossing.
Apache Drive	18	Sand in Crosswalk Area	Consider paving Apache Drive 50 to 100 feet east from the crosswalk to minimize sand debris tracking onto the crosswalk area.

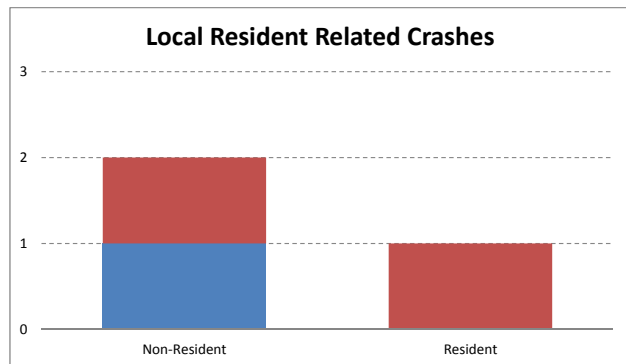
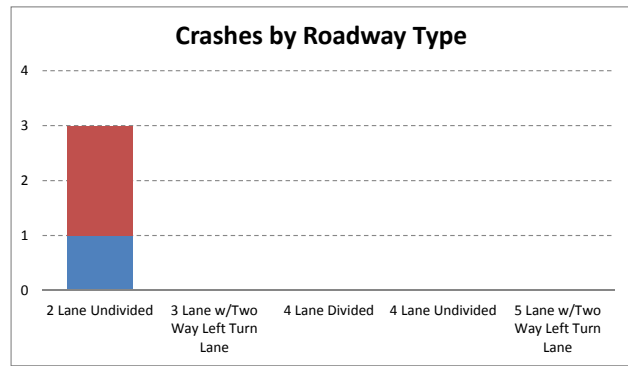
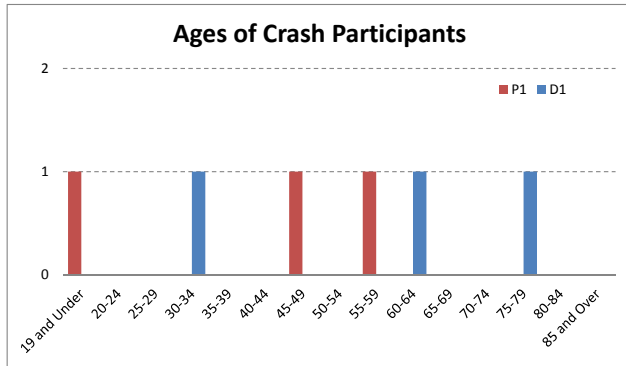
Location	Issue Number	Issue	Suggestion
LONG-TERM IMPROVEMENT			
Corridor-Wide	6	Lighting	Consider conducting a lighting justification study along unlit portions of the corridor to determine if additional lighting is justified. Consider implementation of pedestrian-level lighting to supplement areas where roadway lighting is not able to provide adequate illumination along the shared-use path between 16th Road and Malacompra Road.
Malacompra Road Intersection	16	Intersection Lighting	Consider implementing pedestrian activated overhead lighting or installing in-pavement lighting along the crosswalk bars to illuminate crosswalk the crosswalk. See report text for details.

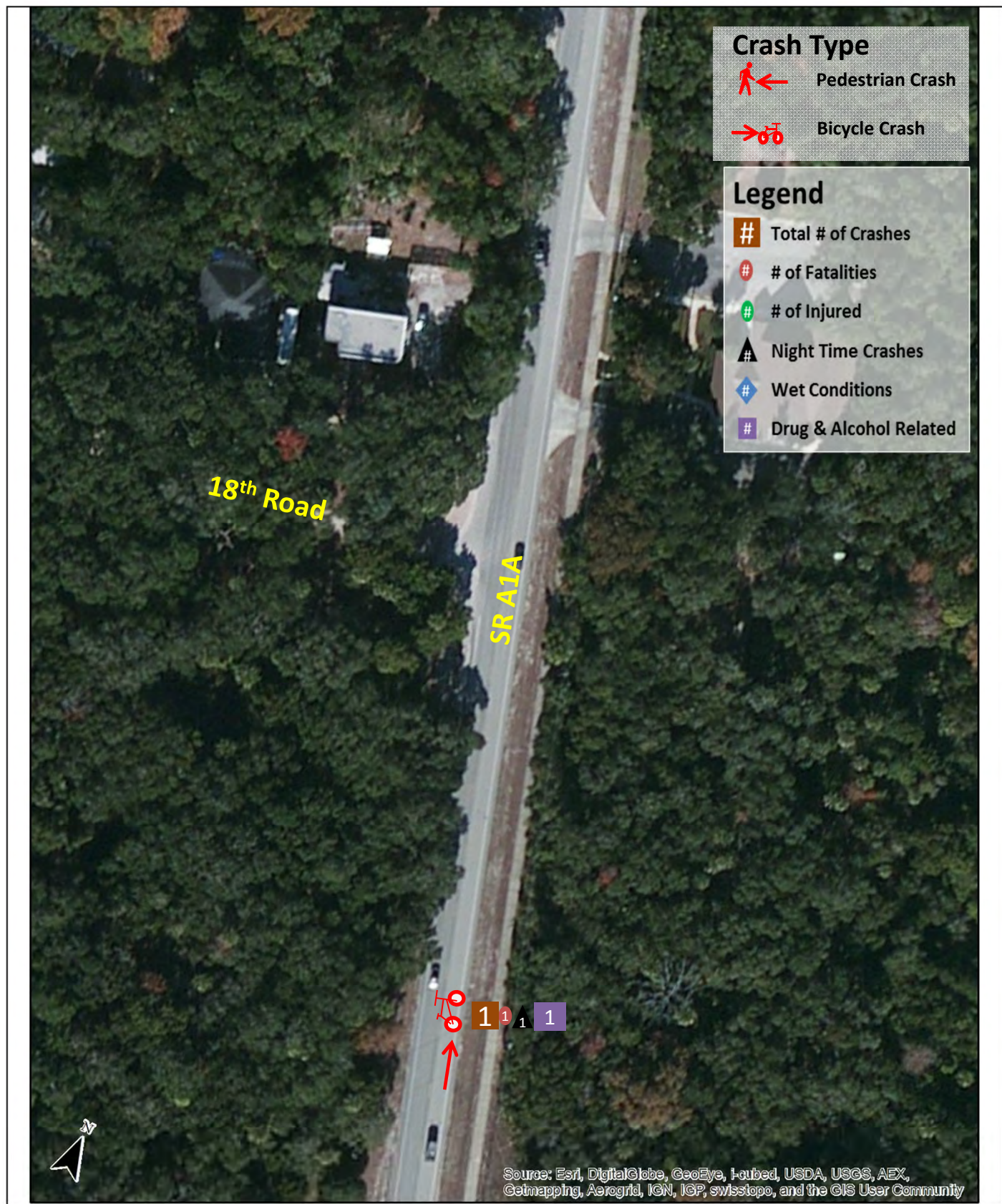
Appendix A – Crash Analysis Reference Materials

CRASH ANALYSIS - Focus Area I - Flagler County from 19th Rd. to Apache Dr.



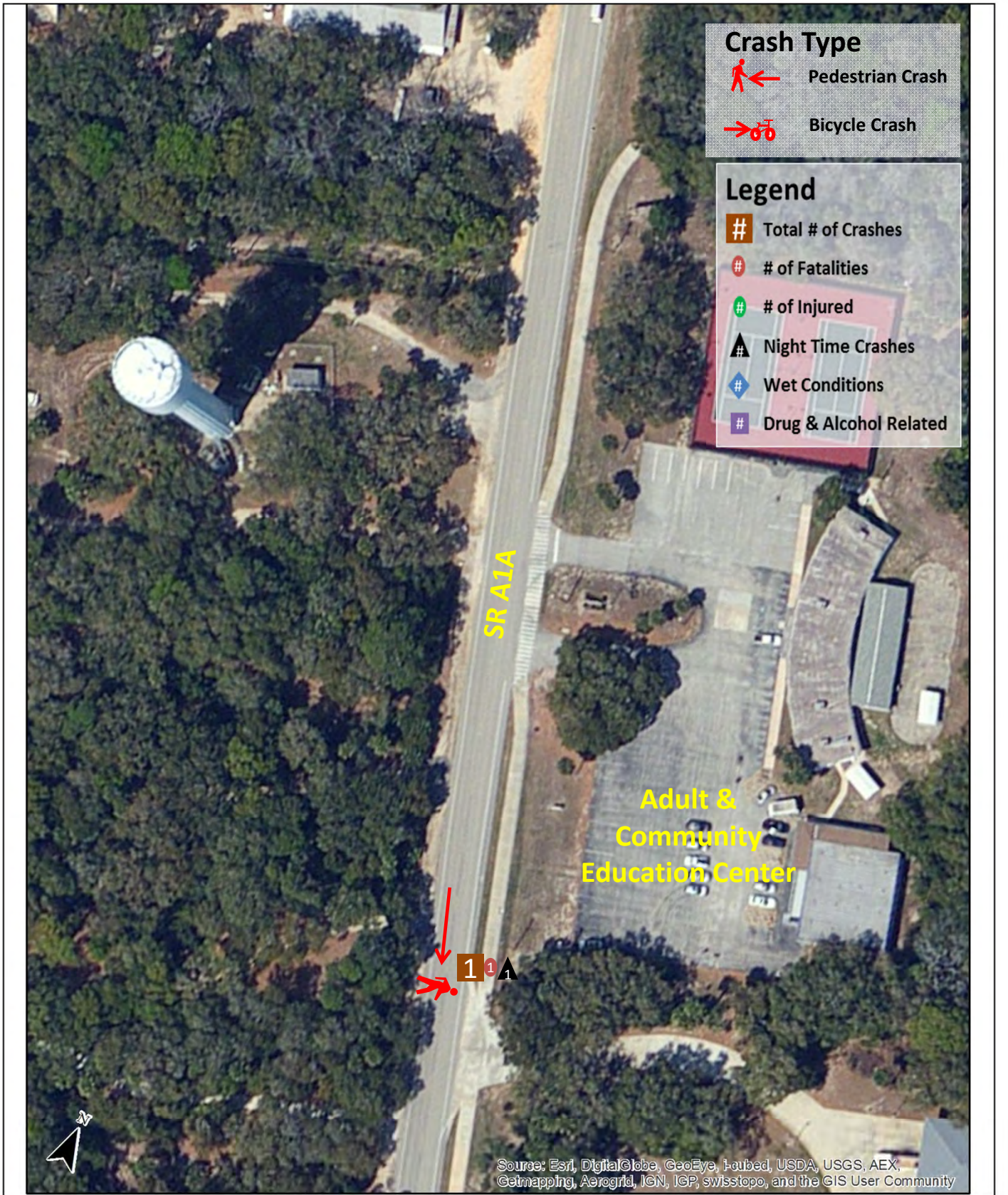
CRASH ANALYSIS - Focus Area I - Flagler County from 19th Rd. to Apache Dr.





SR/CR A1A Pedestrian Safety & Mobility Study
 Collision Diagram (2009 – 2014)
 Focus Area I: Between 19th Rd. and 18th Rd.

Figure
1



SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area I: Near 5633 North Oceanside Blvd.

Figure
2



SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area I: At Apache Dr.

Figure
3