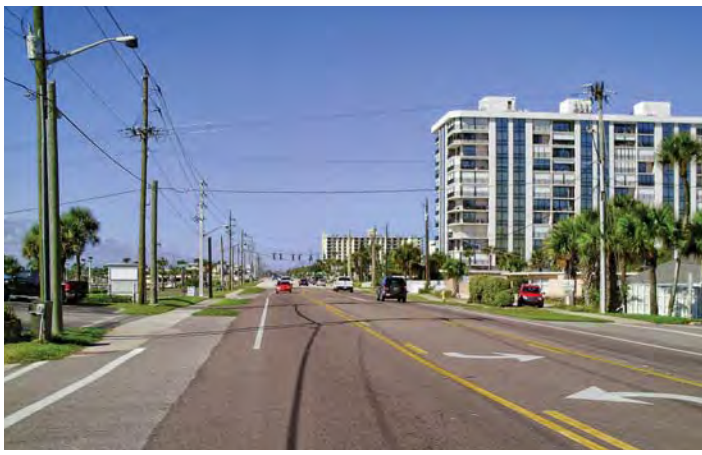
RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

SR/CR A1A PEDESTRIAN SAFETY & MOBILITY STUDY

PEDESTRIAN / BICYCLE SAFETY REVIEW

Focus Area E / Sandcastle Drive to Holland Road (Ormond Beach/Ormond-by-the-Sea)



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October 2016

SR/CR A1A
Pedestrian Safety & Mobility Study

Pedestrian/Bicycle Safety Review Report for
Focus Area E: SR A1A from Sandcastle Drive to Holland Road (Ormond Beach/Ormond-by-the-Sea)

Section Number: 79080000
Mile Post: 8.461 – 9.990
Volusia County

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

Field Review Dates: November 5th and 6th, 2015 (daytime/nighttime reviews and follow up meeting)

Participants:
Jack Freeman – Kittelson & Associates, Inc. – Team Leader
Stephan Harris – River to Sea Transportation Planning Organization
Chad Lingenfelter – Florida Department of Transportation, District 5
Joan Carter – Florida Department of Transportation, District 5
Jon Cheney – Volusia County (November 5th only)
John Noble – City of Ormond Beach
Shawn Finley – City of Ormond Beach
Ric Goss – City of Ormond Beach
John Cotton - VoTran
Sergeant Bandell – Ormond Beach PD
Deputy Bryan – Volusia County Sheriff
Adam Burghdoff – Kittelson & Associates, Inc.

Project Characteristics:
Field Review Type: Pedestrian, Bicycle, Existing Road
Adjacent Land Use: Urban, Commercial, Residential
Posted Speed Limit: 40 miles per hour (MPH) along the length of the study corridor
Opposite Flow Separation: Undivided roadway from Sandcastle Drive to Essex Drive, center two-way left-turn lane (TWLTL) from Essex Drive to Palm Drive, undivided roadway from Palm Drive to Holland Road
Service Function: Urban Principal Arterial
Terrain: Flat
Climatic Conditions: Sunny, 75-80 degrees

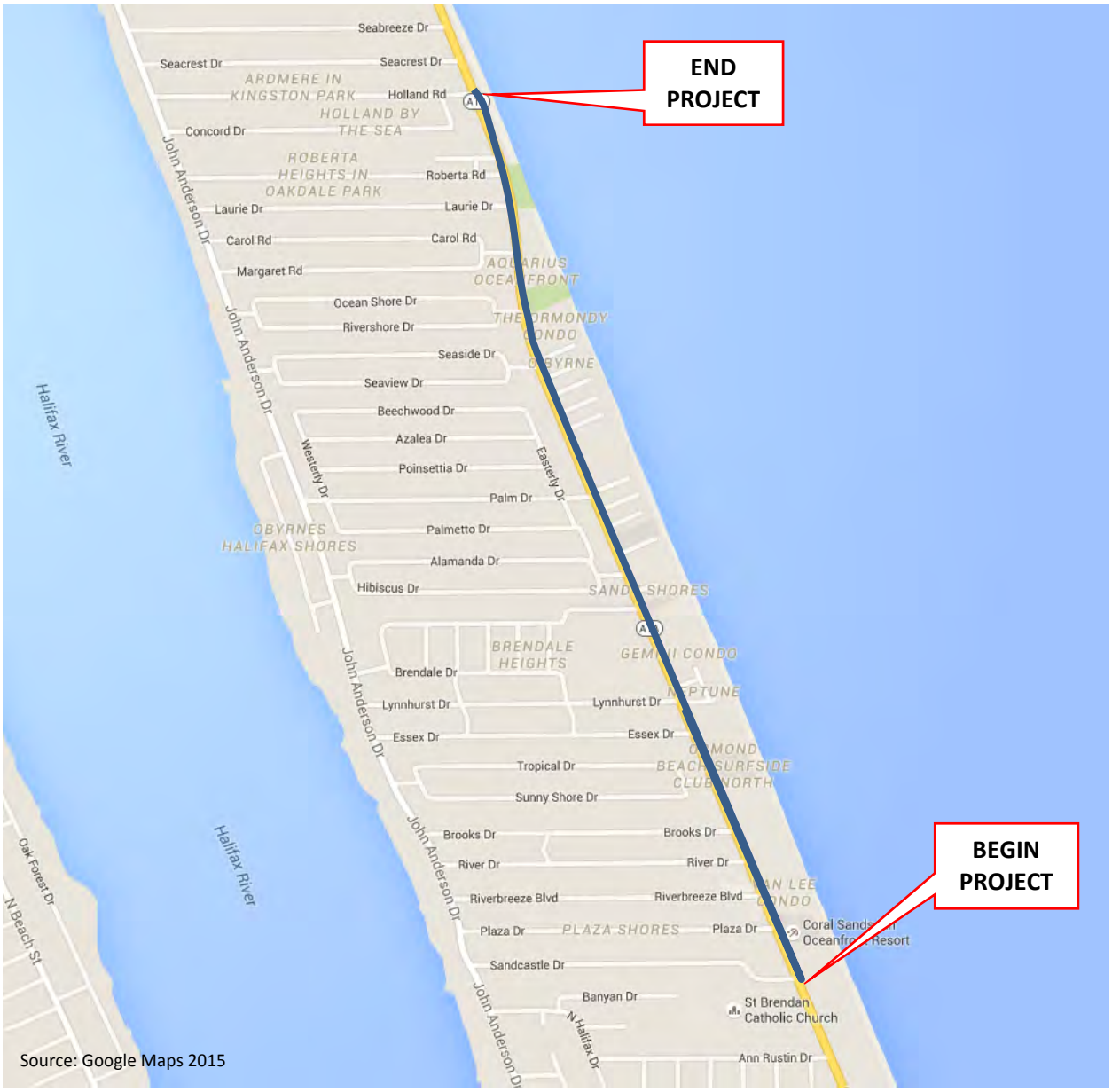


Figure 1 – Focus Area E Study Corridor

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 Sandcastle Drive to Holland Road (**Figure 1**), a 1.55 mile corridor in Ormond Beach/Ormond-by-the-Sea, was identified as 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 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 R2CTPO staff and partner agencies (i.e. FDOT District Five (D5), Volusia County, Ormond Beach, VoTran, 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 5th, 2015. The team met in the morning at the Human Resources Training Room at the Ormond Beach City Hall to discuss the study corridor and crash history. After lunch, the study team drove the entire corridor, south to north then north to south, to gain an understanding of the facility characteristics from a driver's perspective. The team then walked the length of sidewalk along the west side of the roadway and the portions on the east side where sidewalks were present. The team reassembled in the evening, after sunset, to make observations in nighttime conditions. A follow-up debrief meeting was held at Ormond Beach City Hall the following morning (November 6th) to discuss the corridor's issues and potential improvements identified by the team. Study corridor characteristics are reviewed below:

- Sandcastle Drive to Holland Road – 1.55 miles;
- Typical cross section as follows:
    - Three-lane roadway with a center two-way left-turn lane (TWLTL) from Essex Drive to Palm Drive – 0.40 miles.
    - Two-lane, undivided roadway for the remainder of the corridor.
- The posted speed along the study corridor is 40 MPH;
- One (1) signalized intersection at the Ormond Mall;
    - Crosswalks with special emphasis markings on the west and south legs.
- Unsignalized crosswalks at the following locations:
    - North leg of Brooks Drive;
        - Old special emphasis markings with flashing beacons above pedestrian warning signs.

  - North leg of Ocean Shore Drive/River Shore Drive;
    - Special emphasis markings with pedestrian warning signs.
  - South leg of Margaret Road;
    - Special emphasis markings with fluorescent pedestrian warning signs.
  - No locations with active traffic control devices except for the signal at SR A1A and the Ormond Mall
- Continuous sidewalk along the west side of the study corridor and intermittent sidewalk along the east side of the corridor;
- No marked bike lanes are provided along the length of the study corridor but four to six foot paved shoulders are provided;
- Overhead street lighting is present along the west side of the roadway; and
- The corridor has experienced an average AADT of 16,000.
- Transit service is provided via VOTRAN Route 1

Crash History (2009 – 2014)

Six (6) years of available pedestrian and bicycle related crash data, 2009 to 2014, were utilized for the SR A1A crash analysis. Crash data was obtained from two sources: 1. The FDOT Crash Analysis Reporting System (CARS) database from 2009 to 2013 and 2. The Signal Four Analytics database was maintained by University of Florida from 2009 to 2014. At the time of the analysis, the 2014 CARS data was not yet FDOT certified thus the reason for six years of crash data instead of the traditional five. The additional crashes from the Signal Four database supplemented the CARS data along SR A1A.

Ten (10) pedestrian or bicycle-related crashes were reported over the six-year study period, 60 percent of which involved pedestrians (6). Of the ten (10) pedestrian and bicycle crashes, there were three (3) fatal crashes (30 percent) and seven (7) injury crashes (70 percent) during the study period. The three fatal pedestrian crashes are summarized below (summarized from south to north):

- Crash Number 837123460
  - On April 19, 2010 at 8:36 PM a crash involving a pedestrian occurred approximately 150 feet north of the intersection of SR A1A and Brooks Drive under dark lighting conditions. The pedestrian was walking eastbound across SR A1A and failed to yield the right-of-way to a northbound vehicle. The vehicle was traveling northbound on SR A1A when it collided with the pedestrian. The pedestrian had a blood alcohol content (BAC) of 0.157 and was transported to the hospital where he was later pronounced deceased.
- Crash Number 776867290
  - On February 2, 2010 at 6:57 PM a crash involving a pedestrian occurred approximately 200 feet south of the intersection of SR A1A and Longwood Drive under dark lighting conditions. The pedestrian failed to yield the right-of-way to the vehicle and attempted to cross SR A1A from east to west. The vehicle was traveling south on SR A1A when it collided with the pedestrian. The pedestrian was transported to the hospital where he was later pronounced deceased.
- Crash Number: 806370560
  - On September 25, 2010 at 11:38 AM, a crash involving a pedestrian occurred approximately 40 feet north of Town and Country Lane under daylight conditions. The pedestrian attempted to cross SR A1A from west to east at an unmarked location. The vehicle was traveling north on SR A1A when its front right side and passenger mirror

struck the pedestrian. The pedestrian was transported to the hospital where she was later pronounced deceased. The pedestrian had been drinking before the incident occurred.

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:

- Fifty percent of the crashes occurred in dark lighting conditions, and the majority (90 percent) occurred under dry roadway conditions;
- The corridor experienced four crashes in 2010, three of which were fatal. No crashes occurred in 2011 and 2014;
- Thirty percent (3 crashes) occurred on the weekend;
- Five (5) of the 10 crashes occurred between 6:00 PM and 12:00 AM with two (2) of the three (3) fatal crashes occurring within that timeframe;
- April and May accounted for forty percent (2 crashes each) of the total pedestrian/bicycle crashes;
- Two (2) of the 10 crashes involved alcohol and two (2) of the three (3) fatal crashes involved pedestrians under the influence of alcohol;
- No pedestrian/bicycle related crashes occurred at the signalized intersection at the Ormond Mall;
- One bicycle crash involved a bicyclist on the sidewalk and two crashes involved a bicyclist traveling along SR A1A;
- One bicyclist was struck crossing SR A1A in the marked crosswalk on the north leg of the Brooks Drive intersection;
- The vehicle had the right-of-way in all six (6) pedestrian crashes;
- The bicyclist had the right-of-way in three (3) of the four (4) bicycle crashes; and
- 4 pedestrians and 1 bicyclist were not from the State of Florida based upon their provided zip codes.

FIELD REVIEW FINDINGS

Location: Corridor-Wide

Issue #1: Speed Consistency

Figure 2

Figure 3

Description of Issue:
Posted speed limit within the study corridor is 40 MPH, but 35 MPH approximately one mile south near Neptune Avenue (see **Figure 2**). The land uses (retail, service, schools, and parking on the west and residential, hotel, and parks on the east) within the study corridor contribute to greater bicycle and pedestrian traffic as compared to the segments south of Neptune Avenue (residential on the east and limited uses on the west); however, the increased posted speed does not inform the motorist of this type of community character.

In addition to the higher posted speed limits, the corridor widens from a two-lane cross section to a three-lane cross section (see **Figure 3**). The additional roadway pavement and the wider right-of-way to accommodate it contribute to higher motorist speeds.

Suggestions for Improvement:
In order to improve speed consistency of the corridor, a few treatments were identified by the study team:

- Near Term
  - Reduce width of the roadway section for traffic calming benefits
    - For parcels with the ability to facilitate onsite circulation of parking maneuvers, consider working with the private property owner to install wheel stops or curbing to direct motorists to access SR A1A via defined driveway locations only.
    - Consider pedestrian refuge islands or spot medians where feasible.

- Long Term
    - Implement complete streets strategies such as curbing, bioswales, repurposing wide shoulder areas to improve parking areas with wide driveways, implement buffered bike lanes.

If these treatments are effective in reducing vehicle speeds, consider a speed study to assess if the posted speeds can be reduced to 35 MPH and speed feedback devices can be used to increase driver awareness of their travel speed.

Location: Corridor-Wide

Issue #2: Sidewalk Inconsistency on East Side

Figure 4

Description of Issue:
Sidewalks are present along the entire length of the corridor on the west side. Sidewalks are only present on the east side of SR A1A in the areas noted in **Figure 4**.

Suggestions for Improvement:
Near Term: Consider providing sidewalk, as properties redevelop, on the east side of SR A1A to fill in the gaps.

Long Term: Consider providing sidewalk on the east side of SR A1A to fill in the gaps as part of a complete streets project or other construction effort.

Location: Corridor-Wide

Issue #3: Detectable Warning Surfaces

Figure 5

Figure 6

Description of Issue:
Along the corridor, the study team observed the detectable warning surfaces to be missing, covered, or in disrepair at multiple crosswalks at minor street intersections as illustrated in **Figure 5**. At some of the mid-block crossings, the study team noted no paved landing areas as illustrated in **Figure 6**.

Suggestions for Improvement:
Consider installing detectable warning surfaces where missing at signalized/unsignalized intersections and crosswalks per the FDOT Design Standard Index 304. Consider constructing a landing pad with detectable warning surfaces at the mid-block locations where no landing pad is present.

Location: Corridor-Wide

Issue #4: Lighting Inconsistency

Figure 7

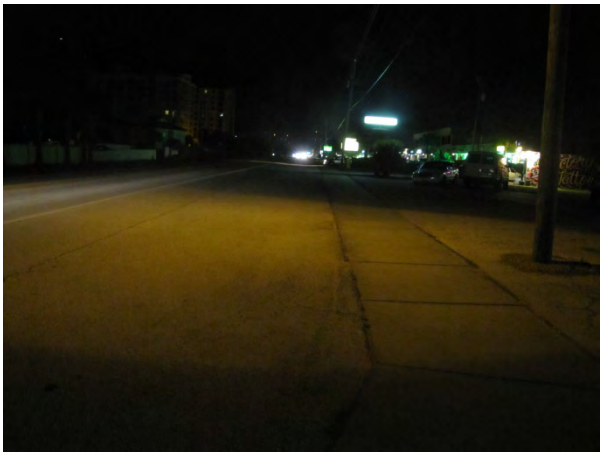


Figure 8

Description of Issue:
The study team observed poor roadway lighting in areas along the corridor. Some of the street lighting was fitted with amber lenses and/or shields which limit ambient light within the roadway and pedestrian environment. The study team also observed lighting on poles along the west side of SR A1A.

Eastern Volusia and Flagler Counties are destinations for sea turtle nesting. Sea turtles are a protected species in Volusia County. Volusia County has developed a Beach Lighting Management Plan and issued a lighting ordinance to minimize light reaching the beach and potentially disrupting the sea turtle nesting. The sea turtle nesting season is from May 1 to October 31. **Figure 7** shows measures put into place such as an amber lens and using a shield to minimize light emittance toward the beachfront.

Shutting off lights or using the barrier shields negatively impact the lighting conditions for the roadway users. Reducing the light can make it difficult for drivers to see pedestrians or bicyclists at night, especially those wearing dark clothing. **Figure 8** illustrates the lighting levels the safety team observed. The safety study team observed the roadway lighting conditions at night and had the following observations:

- Inconsistent lighting levels along the corridor
- Some of the street lights were either off or not working properly
- Shields cause street light to only illuminate half of the roadway.
- Intersection and ambient lighting helped illuminate the roadway at some locations

Suggestions for Improvement:
The following are considerations for lighting along the corridor:

- Consider upgrading lighting at the signalized intersections to meet the requirements of section 7.3.2.2 in Volume 1 of the FDOT Plans Preparation Manual (PPM). This may require the existing lighting to be replaced.
- Consider conducting field measurements of existing lighting levels to evaluate lighting

uniformity levels and add lighting where necessary. Consider light poles on the east side that are angled westerly away from the beach. These light poles cast their light to the west and illuminate the roadway as needed. The light bulb is not seen by the turtles due to the angle and orientation of the light fixture.

- Consider implementing a lighting plan for the time the sea turtle nesting season is not active as roadway lighting levels should not be reduced at this time.
- 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, with less visibility from the beach, to supplement areas where street lighting is not able to provide adequate lamination.
- As a long-term consideration, upgrade to an adaptive roadway lighting system along the corridor. Lighting levels could be programmed to be reduced during the sea turtle nesting season and increased to normal levels outside of the nesting season. This could be coupled with replacing the current high pressure sodium lighting with LED lighting.

Location: Corridor-Wide

Issue #5: Drop-Off Hazards

Figure 9

Figure 10

Description of Issue:
Numerous drop-off hazards were observed adjacent to sidewalks presenting tripping hazards to pedestrians and overturning hazards to wheelchair users.

Suggestions for Improvement:
Consider filling areas with soil adjacent to sidewalks to remove drop-off hazard. At locations where drainage inlets are present as displayed in **Figure 10**, consider constructing sloped concrete off the edge of the sidewalk, meeting ADA guidance, to reduce the risk of a maintenance problem with loose soil entering the drainage inlet.

Location: Corridor-Wide

Issue #6: Signage Material

Figure 11

Figure 12

Description of Issue:
Pedestrian crosswalk signage material is not consistent throughout the corridor. Some signs have the yellow-orange coloration illustrated within **Figure 11**. Other crosswalk signage uses the newer high-visibility yellow-green coloration illustrated within **Figure 12**. The retro-reflectivity levels of the two types of sign coatings described above is very different, which could contribute to greater compliance at the crosswalks with higher retro-reflectivity levels at night and less compliance at the crosswalks with lower retro-reflectivity levels.

Suggestions for Improvement:
During next signage update or resurfacing project, consider replacing all crosswalk signage with signs using high-visibility, high retro-reflectivity coatings (Type 11 sheeting).

Location: Corridor-Wide

Issue #7: Driveways and Parking Areas Not Defined

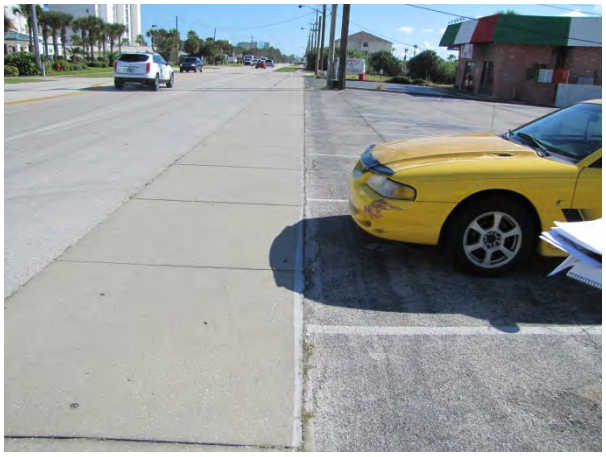


Figure 13

Figure 14

Figure 15

Description of Issue:
As illustrated in **Figure 13** and **Figure 14**, multiple parking areas to commercial properties do not have defined driveways and allow access to their parking spaces for the entire width of the parcel. This issue introduces numerous unexpected conflict points for bicyclists and pedestrians to negotiate. Some sites do not have sufficient set-backs to allow for onsite circulation for parking maneuvers. The study team identified multiple locations where parked vehicles in these areas encroached onto sidewalk facilities as illustrated in **Figure 15**.

Suggestions for Improvement:
For parcels with the ability to facilitate onsite circulation of parking maneuvers, consider working with the private property owner to install wheel stops or curbing to direct motorists to access SR A1A via defined driveway locations only.

For parcels without the ability to facilitate onsite circulation of parking maneuvers, consider relocating parking to areas with better parking access and circulation.

Some parcels may not have the ability to relocate parking areas. However, many of these parcels are located in areas with wide shoulders; implementation of complete streets strategies (**Issue #1: Speed Consistency**) could allow for opportunities to right-size the motorist, bicyclist, and pedestrian facilities and reduce conflicts between bicyclists and pedestrians with parking motorists while making use of available space indicated in **Figure 14**.

Location: Brooks Drive Intersection

Issue #8: Flashing Beacon at Brooks Drive Crosswalk

Figure 16

Figure 17

Description of Issue:
Flashing beacon at Brooks Drive facing north is not functional and is located approximately 150 feet upstream (see **Figure 17**) of its crosswalk on SR A1A leading to motorist's confusion about where to expect pedestrian crossings.

Suggestions for Improvement:
Repair flashing beacon and consider relocating the sign as a maintenance improvement.

If the sign cannot be relocated, the following near-term improvements could be considered at this location:

- Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.
- Provide a median refuge island with a minimum length of 90 feet and minimum four-foot wide pedestrian access route for pedestrians in the TWLTL.
- Install lighting on each side of the crosswalk.
    - Directional lighting oriented towards the crosswalk could be provided; or
    - LED lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop.
- Restripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.

Location: Riverbreeze Boulevard and Plaza Drive Intersections

Issue #9: Sight Distance

Figure 18

Figure 19

Description of Issue:
Decorative walls block motorist's view of pedestrians and bicyclists at Riverbreeze Boulevard and Plaza Drive. Traditional sight triangles used at intersections are typically measured from the vehicle path of the intersecting roadway.

Suggestions for Improvement:
Consider working with the property owners to relocate or remove the decorative walls to improve intersection sight distance between eastbound vehicles and pedestrians/bicyclists on the sidewalk.

Location: Essex Drive Intersection

Issue #10: Essex Drive Sidewalk Connectivity

Figure 20

Description of Issue:
Sidewalks are provided on both sides of Essex Drive, but do not connect to the sidewalks along SR A1A.

Suggestions for Improvement:
Consider installing sidewalks or designating a clear pedestrian access route (PAR) compliant with the PROWAG.

Location: Between Brooks Drive and Rivershore Drive

Issue #11: Crosswalk Spacing

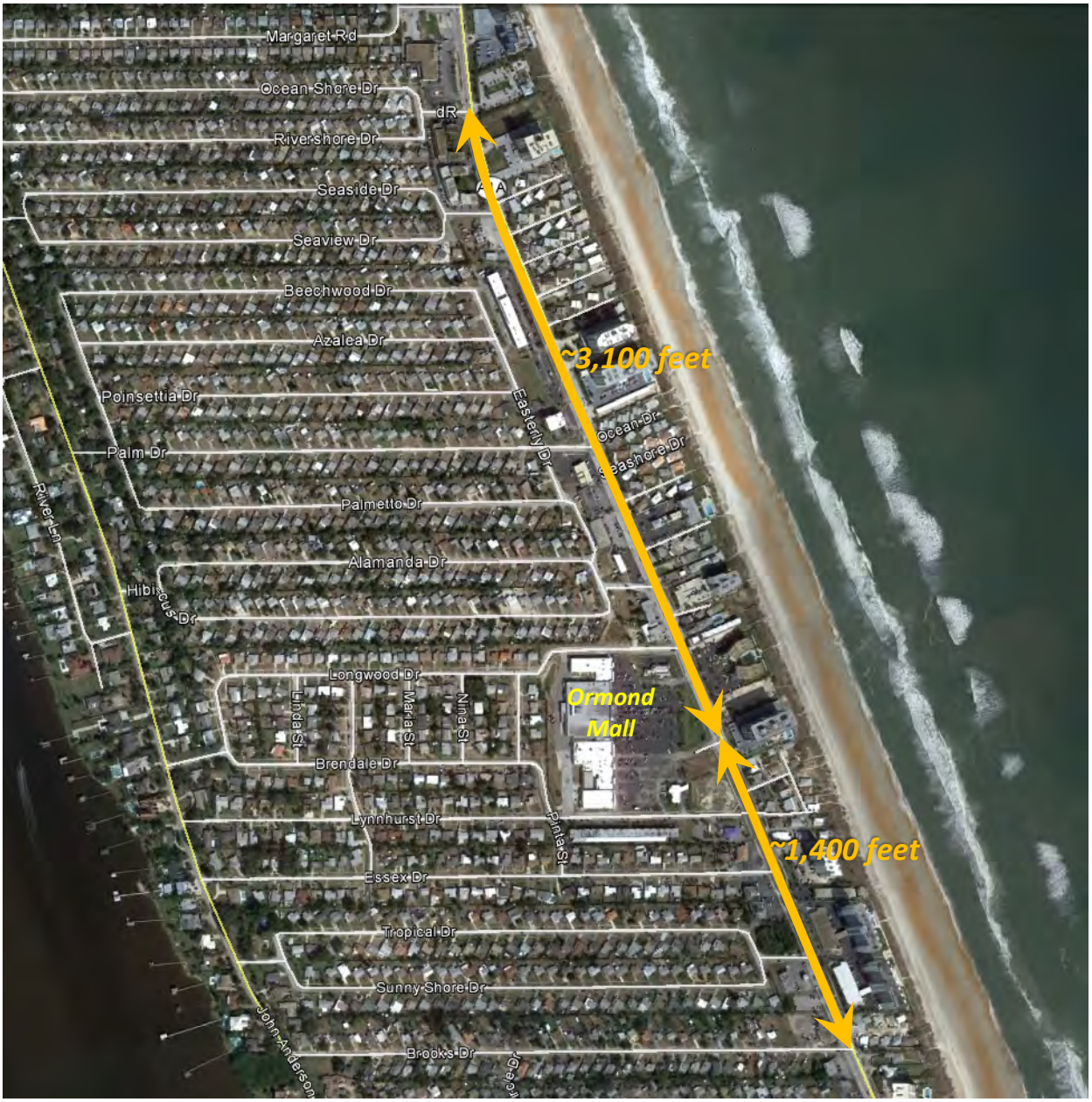


Figure 21

Description of Issue:

There are no marked mid-block crosswalks between Brooks Drive and the Ormond Mall signal; a distance of approximately 1,400 feet as depicted in Figure 21. Continuing further north, the next marked crosswalk to the north of Ormond Mall traffic signal is located approximately 3,100 feet north. Without the provision of marked crosswalks at regular intervals, pedestrians cross SR A1A wherever it is convenient or desirable and they tend to utilize the center TWLTL.

Suggestions for Improvement:
As illustrated in **Figure 22**, consider providing the following on the north side of the Essex Drive intersection, between Hibiscus Drive and Sandy Beach Drive, and the north side of the Palm Drive intersection:

- Conduct a mid-block crossing study per Section 3.8 of the FDOT *Traffic Engineering Manual (TEM)* to evaluate if a crosswalk is warranted based upon existing demands.
- Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.
- Where feasible, provide a median refuge island with a minimum length of 90 feet and minimum four-foot wide pedestrian access route for pedestrians in the TWLTL.
- Install lighting on the crosswalk's east side.
    - Directional lighting oriented towards the crosswalk could be provided; or
    - Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop.
- Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.

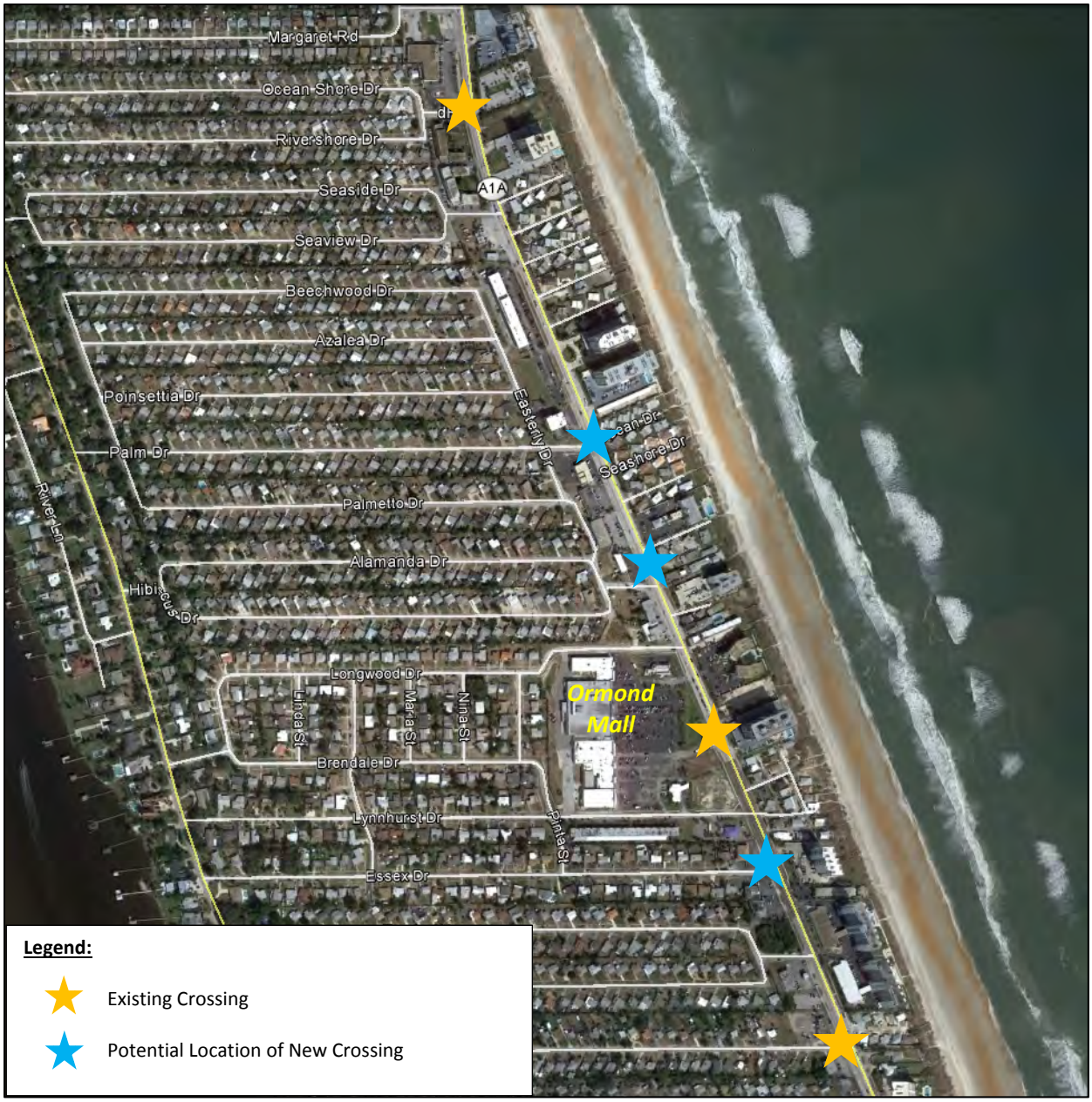

Margaret Rd
Ocean Shore Dr
Rivershore Dr
Seaside Dr
Seaview Dr
Beechwood Dr
Azalea Dr
Poinsettia Dr
Palm Dr
Palmetto Dr
Alamanda Dr
Hibiscus Dr
River Ln
Longwood Dr
Linda St
Maria St
Nina St
Brendale Dr
Lynnhurst Dr
Essex Dr
Pinta St
Easterly Dr
Seashore Dr
A1A
Ormond Mall
Legend:
Existing Crossing
Potential Location of New Crossing

Figure 22

Location: Ormond Mall Intersection

Issue #12: Pedestrian Signal Timings/Equipment

Figure 23

Figure 24

Description of Issue:
The field review observed the countdown pedestrian signals on the southeast (**Figure 23**) and northwest (**Figure 24**) corner of the intersection are not functioning properly. The walk indication is properly illuminated; however, the countdown numbers did not illuminate when crossing eastbound on the south leg.

The walk phase associated with crossing the west leg and the intersection's northbound/southbound phases is only seven seconds. The pedestrian clearance interval terminates before the end of the northbound/southbound phases and the walk phase will not reactivate even if there is sufficient green time remaining on the northbound/southbound phase to allow for another pedestrian phase. As a result, pedestrians arriving after the start of green for the northbound/southbound phases experienced unnecessary delay.

Suggestions for Improvement:
Dispatch a signal technician to review if all pedestrian countdown signals are working properly.

Consider options to improve the response of walk phases during the northbound and southbound phases. Options to consider include:

- Extend the pedestrian WALK phase to better utilize the full northbound/southbound vehicular phase beyond seven seconds. The current Walk + Flash Don't Walk time is 19 seconds, but the Max Green time is 40 seconds.
    - Consider leading pedestrian phase.
    - Consider setting NB/SB vehicular signal phase to Max Recall
    - Consider programming signal to begin Flash Don't Walk phase when NB/SB vehicular phase gaps out.
- Volusia County Traffic Engineering should request a revision to the signal timings to FDOT for review and concurrence.

Location: Ormond Mall Intersection

Issue #13: Pedestrian Facilities

Figure 25

Figure 26

Figure 27

Figure 28

Description of Issue:
The pedestrian push button in the southwest corner (**Figure 25**) is located on the strain pole more than 15 feet from the curb ramp. The maximum allowable distance as defined in section 4E.08 of the 2009 MUTCD is 10 feet.

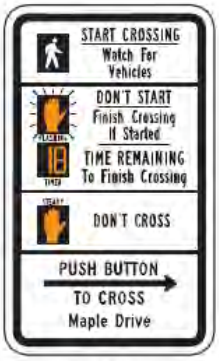
The grass on the east side of the intersection (**Figure 26**) has been worn by pedestrian foot traffic. Additionally, no crosswalk is present on the north leg of the intersection as shown in **Figure 27**.

The sign legend shown in **Figure 28** directs pedestrians to cross SR A1A. The roadway signs provided at the signal indicate SR A1A as Oceanshore Boulevard. The discrepancy may lead to pedestrian confusion about which push button to use.

Suggestions for Improvement:
Consider installing a two separate push button poles that are less than ten feet from the pedestrian ramp, one for the south leg crosswalk and one for the west leg crosswalk. On these poles, install the push buttons parallel to the crosswalk to be used, as discussed in section 4E.08 of the MUTCD.

Consider providing pedestrian facilities on all three legs of the intersection. To do this, extend the sidewalk on the east side of SR A1A northward to the north side of the intersection. Also consider the addition of a special emphasis marked crosswalk, as shown on sheet 9 of the FDOT Design Standard Index 17346, on the north leg of the intersection. Along with the marked crosswalk, pedestrian push buttons and countdown timers should also be installed.

Consider installing **R10-3i** pedestrian plaques on all corners of the intersection indicating the respective pedestrian push button's corresponding street name.



R10-3i

Location: Ormond Mall

Issue #14: Sidewalk Connectivity to Retail

Figure 29

Description of Issue:
At the Ormond Mall, pedestrian access from SR A1A is only provided on the north and south sides of the site via Longwood Drive and Lynnhurst Drive, respectively (see **Figure 29**). Pedestrians crossing SR A1A at the Ormond Mall traffic signal do not have a pedestrian walkway to access the site.

Suggestions for Improvement:
Consider working with the property owner to provide pedestrian connectivity between the traffic signal and the retail shops. Examples of projects that could incorporate this type of project include redevelopment and parking lot resurfacing/restriping.

Location: Hibiscus Drive Intersection

Issue #15: Crossing to Beach Access

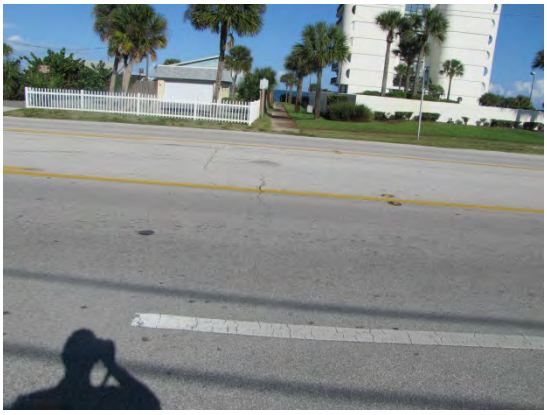


Figure 30

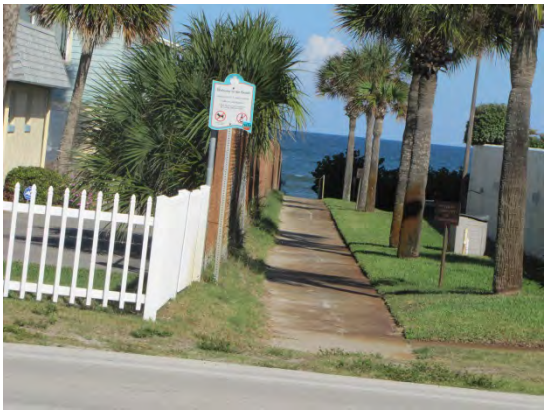


Figure 31

Figure 32

Description of Issue:
A public beach access walkway is provided at the intersection of Hibiscus Drive and SR A1A. The beach walkway does not connect to SR A1A and a crosswalk is not provided at this location which has a high potential for pedestrian crossings due to the beach access.

Suggestions for Improvement:
The following could be considered at this location (see **Figure 32**):

- Conduct a mid-block crossing study per Section 3.8 of the FDOT *Traffic Engineering Manual (TEM)* to evaluate if a crosswalk is warranted based upon existing demands.
- Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.
- Install lighting on the crosswalk's east side.
    - Directional lighting oriented towards the crosswalk could be provided; or
    - Lighting could turn on when the RRFB is activated and flashing and could turn off when

the flashers stop.

- Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.
- Connect crosswalk to beach access with sidewalk.

Location: North of Palm Drive

Issue #16: Regions Bank Driveways

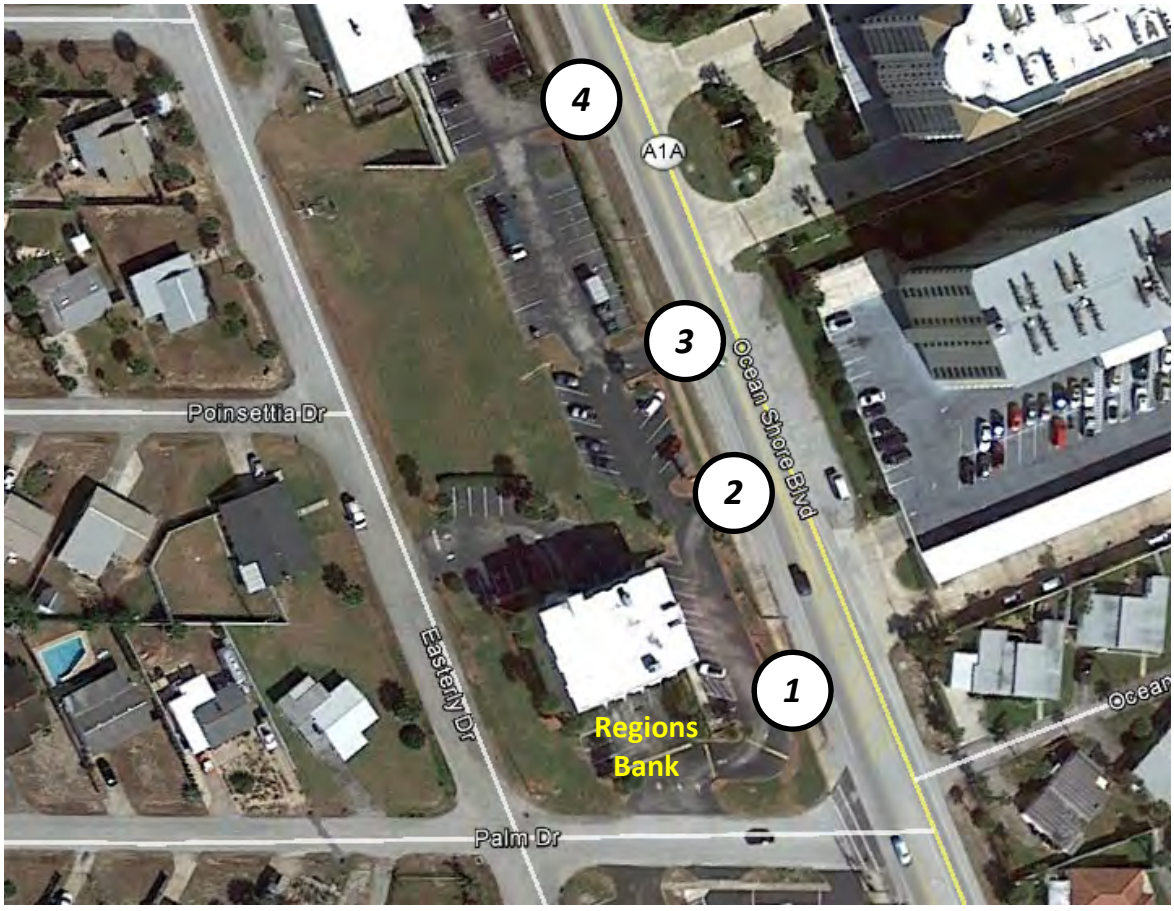


Figure 33

Figure 34

Description of Issue:
The Regions Bank has three exclusive driveways on SR A1A and shared access to an additional driveway just north of the site, for a total of four access points to SR A1A (see **Figure 33**). The site also has driveways on Palm Drive and Easterly Drive. Driveways are conflict points between pedestrians/bicyclists utilizing the sidewalk and vehicles exiting the property or turning from SR A1A. The higher the number of driveways along a corridor, the higher the potential for crashes between a pedestrian/bicycle utilizing the sidewalk and a vehicle exiting/entering a property.

As shown in **Figure 34**, driveway crossings at this location have asphalt mounded up where the sidewalks connect.

Suggestions for Improvement:
To address the same property, multiple driveways issue, consider driveway consolidation during potential redevelopments where feasible. For currently undeveloped properties, consolidating these driveways during redevelopment will reduce the amount of conflict areas between pedestrians/bicyclists and vehicles. Some local government agencies around Central Florida have incorporated land use policies encouraging pedestrian cross access between adjacent commercial and office properties. Cross-access between adjacent parcels within a block should be a focus on the SR A1A corridor as properties redevelop which would help eliminate unused or underutilized driveways.

Consider grinding potential trip hazards along the corridor as part of regular maintenance.

Location: Southwest Corner of Seaside Drive

Issue #17: Driveway/Parking Area Delineation and Stop Sign Location

Figure 35

Figure 36

Description of Issue:
The southwest corner of Seaside Drive and SR A1A no clear definition of driveways, roadway edge, or parking areas. Additionally, the STOP sign on the eastbound approach is located approximately 50 feet from the intersection which may lead to motorists traveling eastbound on Seaside Drive yielding to parking lot traffic.

Suggestions for Improvement:
Short/Near Term: Consider working with the property owner to clearly mark driveway and parking locations. These types of improvements could be implemented through striping and landscaping. Consider moving the STOP sign nearer to the stop bar to reduce right-of-way uncertainty.

Also consider restriping the stop bar on the eastbound approach at the intersection.

Long Term: Consider complete-streets improvements as discussed in **Issue #1: Speed Consistency**.

Location: Just North of Seaside Drive

Issue #18: Sidewalk Stub to Roadway

Figure 37

Figure 38

Description of Issue:
A new transit stop was recently installed on the east side of SR A1A just north of Seaside Drive. On the west side of SR A1A is a sidewalk stub that at one time was a transit stop. The sidewalk stub on the west side could confuse pedestrians to think that this is an appropriate crossing location

Suggestions for Improvement:
Short Term: Remove the sidewalk stub on the west side of the roadway.

Near Term: The following could be considered at this location (see **Figure 38**):

- Conduct a mid-block crossing study per Section 3.8 of the FDOT *Traffic Engineering Manual*

(TEM) to evaluate if a crosswalk is warranted based upon existing demands.

- Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.
- Install lighting on the crosswalk's east side.
    - Directional lighting oriented towards the crosswalk could be provided; or
    - Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop.
- Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.

Location: Between Oceanshore Drive and Town and Country Lane

Issue #19: Connectivity between Parking Areas and Beach Access

Figure 39

Description of Issue:
As shown in **Figure 39**, public parking on the west side of SR A1A can serve as overflow parking when the parking areas to the east are full. However, the crosswalks on SR A1A do not connect to sidewalks on the east side of SR A1A.

Suggestions for Improvement:
Consider installing sidewalk on the east side of SR A1A connecting the public parks and beach access points.

Consider constructing a sidewalk access between the north side of the western public parking lot and the existing sidewalk on the west side of SR A1A.

Consider an additional crossing of SR A1A near Laurie Drive or Roberta Road:

- Conduct a mid-block crossing study per Section 3.8 of the FDOT *Traffic Engineering Manual*

(TEM) to evaluate if a crosswalk is warranted based upon existing demands.

- Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.
- Install lighting on the crosswalk's east side.
    - Directional lighting oriented towards the crosswalk could be provided; or
    - Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop.
- Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.

Location: Ocean Shore Drive Intersection

Issue #20: Crosswalk Sign Location and Crosswalk Visibility

Figure 40

Figure 41

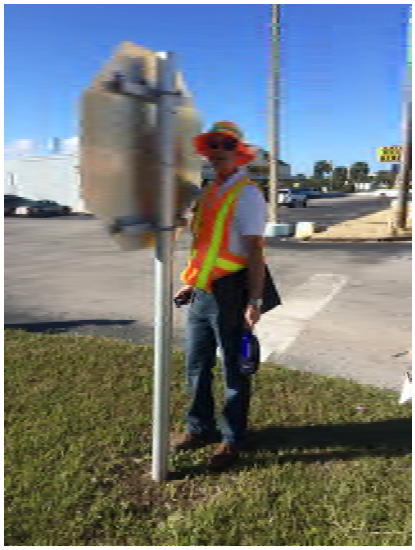


Figure 42

Description of Issue:
The pedestrian crossing signs at the existing crosswalk serving Tom Renick Park are not located at the crosswalk and the STOP sign on the eastbound approach of Rivershore Drive & SR A1A is shorter than standard and potentially blocks motorist view of pedestrians in the crosswalk (see **Figure 42**). The crosswalk markings are also faded.

Suggestions for Improvement:
Consider moving the crosswalk signage to be located at the crosswalk. Also consider restriping the crosswalk with the same special emphasis markings. Consider installing a new STOP sign at the appropriate height.

Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.

Location: Margaret Road Intersection

Issue #21: Margaret Road Beach Walkway Access

Figure 43

Figure 44

Description of Issue:
A public beach walkway is designated on the east side of the Margaret Road and SR A1A intersection. This location, with a marked crosswalk, does not have sidewalk or a hard surface to serve the beach walkway.

Suggestions for Improvement:
Consider providing a hard surface or sidewalk within the designated beach walkway so the crosswalk can be connected to the beach access point.

Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.

Location: Just North of Roberta Road

Issue #22: Beach Crossing Sight Distance and Connectivity

Figure 45

Description of Issue:
A beach crossover is present, but vegetation shields the stairs, obstructing motorist view of pedestrians (**Figure 45**).

Suggestions for Improvement:
Consider trimming or removing the shrubbery to improve sight distance between northbound vehicles and pedestrians on the crossover.

Consider connecting this beach crossover to the crosswalk discussed in Issue #19 via new sidewalk on the east side of SR A1A.

Summary of Suggestions

This pedestrian/bicycle safety review considers operational and safety related issues for pedestrians and bicyclists on SR A1A from Sandcastle Drive to Holland Road. This study was commissioned by the R2CTPO to develop suggestions to improve the safety of pedestrians and bicyclists within the study limits. 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 following Short-Term Maintenance suggestion should be prioritized for implementation before the other suggestions identified in this report:

- Trip hazards as noted in Issue #16: Regions Bank Driveways on page 29

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

Location	Issue Number	Issue	Suggestion
SHORT-TERM MAINTENANCE			
Corridor-Wide	3	Detectable Warning Surfaces	Consider installing detectable warning surfaces where missing at signalized/unsignalized intersections and crosswalks per the FDOT Design Standard Index 304. Consider constructing a landing pad with detectable warning surfaces at the mid-block locations where no landing pad is present.
Corridor-Wide	5	Drop-Off Hazards	Consider filling areas adjacent to sidewalks to remove drop-off hazard. Consider material impacts to drainage structures.
Brooks Drive Intersection	8	Flashing Beacons at Brooks Drive Crosswalk	Repair flashing beacon and consider relocating the sign.
Ormond Mall Intersection	12	Pedestrian Signal Timings/Equipment	Dispatch a signal technician to review if all pedestrian countdown signals are working properly.
Ormond Mall Intersection	13	Pedestrian Facilities	Consider installing R10-3i pedestrian plaques on all corners of the intersection indicating the respective pedestrian push button's corresponding street name.
North of Palm Drive	16	Regions Bank Driveways	Consider grinding potential trip hazards along the corridor as part of regular maintenance.
Southwest Corner of Seaside Drive	17	Stop Sign Location	Consider moving the STOP sign nearer to the stop bar to reduce right-of-way uncertainty. Consider restriping the stop bar on the eastbound approach at the intersection.
Just North of Seaside Drive	18	Sidewalk Stub to Roadway	Remove the sidewalk stub on the west side of the roadway.
Ocean Shore Drive Intersection	20	Crosswalk Sign Location and Crosswalk Visibility	Consider moving the crosswalk signage to be located at the crosswalk. Consider restriping the crosswalk with the same special emphasis markings. Consider installing a new STOP sign at the appropriate height.
Just North of Roberta Road	22	Beach Crossing Sight Distance and Connectivity	Consider trimming or removing the shrubbery to improve sight distance between northbound vehicles and pedestrians on the crossover.

Location	Issue Number	Issue	Suggestion
NEAR-TERM PRIORITY			
Corridor-Wide	1	Speed Consistency	Reduce width of the roadway section for traffic calming benefits - For parcels with the ability to facilitate onsite circulation of parking maneuvers, consider working with the private property owner to install wheelstops or curbing to direct motorists to access SR A1A via defined driveway locations only. - Consider pedestrian refuge islands or spot medians where feasible.
Corridor-Wide	2	Sidewalk Inconsistency on East Side	Consider providing sidewalk, as properties redevelop, on the east side of SR A1A to fill in the gaps.
Corridor-Wide	4	Lighting Inconsistency	• Consider upgrading lighting at the signalized intersections to meet the requirements of section 7.3.2.2 in Volume 1 of the FDOT Plans Preparation Manual (PPM). This may require the existing lighting to be replaced. • Consider conducting field measurements of existing lighting levels to evaluate lighting uniformity levels and add lighting where necessary. Consider light poles on the east side that are angled westerly away from the beach. These light poles cast their light to the west and illuminate the roadway as needed. The light bulb is not seen by the turtles due to the angle and orientation of the light fixture. • Consider implementing a lighting plan for the time the sea turtle nesting season is not active as roadway lighting levels should not be reduced at this time. • 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, with less visibility from the beach, to supplement areas where street lighting is not able to provide adequate lamination.
Corridor-Wide	6	Signage Material	During next signage update or resurfacing project, consider replacing all crosswalk signage with signs using high-visibility, high retro-reflectivity coatings (Type 11 sheeting).
Mid-Block between Sandcastle Drive and Ormond Mall	7	Driveways and Parking Areas Not Defined	For parcels with the ability to facilitate onsite circulation of parking maneuvers, consider working with the private property owner to install wheelstops or curbing to direct motorists to access SR A1A via defined driveway locations only.
Brooks Drive Intersection	8	Flashing Beacons at Brooks Drive Crosswalk	If the sign cannot be relocated, the following improvements could be considered at this location: • Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum. • Provide a median refuge island with a minimum length of 90 feet and minimum four-foot wide pedestrian access route for pedestrians in the TWLTL. • Install lighting on each side of the crosswalk. o Directional lighting oriented towards the crosswalk could be provided; or o Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop. • Restripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.

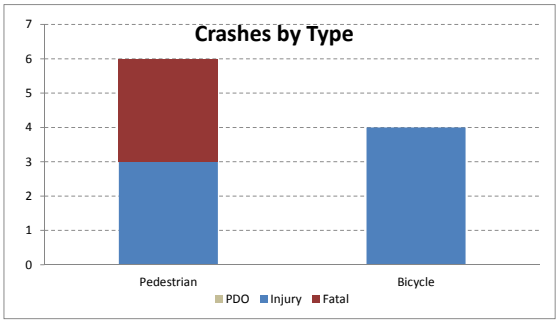
Location	Issue Number	Issue	Suggestion
NEAR-TERM PRIORITY			
Riverbreeze Boulevard and Plaza Drive Intersections	9	Sight Distance	Consider working with the property owners to relocate or remove the decorative walls to improve intersection sight distance between eastbound vehicles and pedestrians/bicyclists on the sidewalk.
Essex Drive Intersection	10	Essex Drive Sidewalk Connectivity	Consider installing sidewalks or designating a clear pedestrian access route (PAR) compliant with the PROWAG.
Between Brooks Drive and Rivershore Drive	11	Crosswalk Spacing	Consider providing the following on the north side of the Essex Drive intersection, between Hibiscus Drive and Sandy Beach Drive, and the north side of the Palm Drive intersection: • Conduct a mid-block crossing study per Section 3.8 of the FDOT Traffic Engineering Manual (TEM) to evaluate if a crosswalk is warranted based upon existing demands. • Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum. • Where feasible, provide a median refuge island with a minimum length of 90 feet for pedestrians in the TWLTL. • Install lighting on the crosswalk's east side. o Directional lighting oriented towards the crosswalk could be provided; or o Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop. • Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.
Ormond Mall Intersection	12	Pedestrian Signal Timings/Equipment	Consider options to improve the response of walk phases during the northbound and southbound phases. Options to consider include: • Extend the pedestrian WALK phase to take better utilize the full northbound/southbound vehicular phase; or • Allow the Walk phase to activate at the start of green and extend the northbound/southbound phase to accommodate the pedestrian clearance time, if needed. beyond seven seconds. The current Walk + Flash Don't Walk time is 19 seconds, but the Max Green time is 40 seconds. o Consider leading pedestrian phase. o Consider setting NB/SB vehicular signal phase to Max Recall o Consider programming signal to begin Flash Don't Walk phase when NB/SB vehicular phase gaps out. • Volusia County Traffic Engineering should request a revision to the signal timings to FDOT for review and concurrence.
Ormond Mall Intersection	13	Pedestrian Facilities	Consider installing a two separate push button poles that are less than ten feet from the pedestrian ramp, one for the south leg crosswalk and one for the west leg crosswalk. On these poles, install the push buttons parallel to the crosswalk to be used, as discussed in section 4E.08 of the MUTCD. Consider providing pedestrian facilities on all four legs of the intersection. To do this, extend the sidewalk on the east side of SR A1A northward to the north side of the intersection. Also consider the addition of a special emphasis marked crosswalk, as shown on sheet 9 of the FDOT Design Standard Index 17346, on the north leg of the intersection. Along with the marked crosswalk, pedestrian push buttons and countdown timers should also be installed. Consider installing R10-3i pedestrian plaques on all corners of the intersection indicating the respective pedestrian push button's corresponding street name.
Ormond Mall	14	Sidewalk Connectivity to Retail	Consider working with the property owner to provide pedestrian connectivity between the traffic signal and the retail shops. Examples of projects that could incorporate this type of project include redevelopment and parking lot resurfacing/restriping.

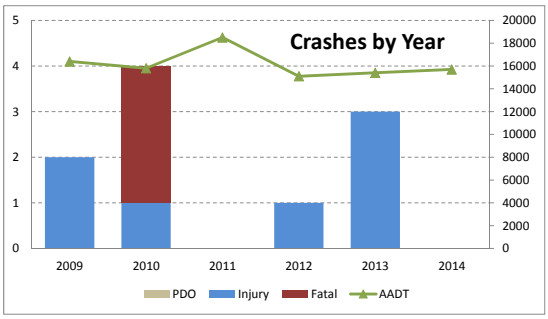
Location	Issue Number	Issue	Suggestion
NEAR-TERM PRIORITY			
Hibiscus Drive Intersection	15	Crossing to Beach Access	• Conduct a mid-block crossing study per Section 3.8 of the FDOT Traffic Engineering Manual (TEM) to evaluate if a crosswalk is warranted based upon existing demands. • Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum. • Install lighting on the crosswalk's east side. o Directional lighting oriented towards the crosswalk could be provided; or o Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop. • Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346. • Connect crosswalk to beach access with sidewalk.
Southwest Corner of Seaside Drive	17	Driveway/parking Area Delineation	Consider working with the property owner to clearly mark driveway and parking locations. These types of improvements could be implemented through striping and landscaping. Consider moving the STOP sign nearer to the stop bar.
Just North of Seaside Drive	18	Sidewalk Stub to Roadway	• Conduct a mid-block crossing study per Section 3.8 of the FDOT Traffic Engineering Manual (TEM) to evaluate if a crosswalk is warranted based upon existing demands. • Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum. • Install lighting on the crosswalk's east side. o Directional lighting oriented towards the crosswalk could be provided; or o Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop. • Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.
Between Oceanshore Drive and Town and Country Lane	19	Connectivity between Parking Areas and Beach Access	Consider installing sidewalk on the east side of SR A1A connecting the public parks and beach access points. Provide a northern connection between the existing sidewalk and the parking area on the west side of SR A1A. Consider an additional crossing of SR A1A near Laurie Drive or Roberta Road: • Conduct a mid-block crossing study per Section 3.8 of the FDOT Traffic Engineering Manual (TEM) to evaluate if a crosswalk is warranted based upon existing demands. • Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum. • Install lighting on the crosswalk's east side. o Directional lighting oriented towards the crosswalk could be provided; or o Lighting could turn on when the RRFB is activated and flashing and could turn off when the flashers stop. • Stripe the crosswalk with Special Emphasis Crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.
Ocean Shore Drive Intersection	20	Crosswalk Sign Location and Crosswalk Visibility	Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. RRFBs may also be used on the advance crosswalk signs per FHWA's interim approval memorandum.
Margaret Road Intersection	21	Margaret Road Beach Walkway Access	Consider providing a hard surface or sidewalk within the designated beach walkway so the crosswalk can be connected to the beach access point.
Just North of Roberta Road	22	Beach Crossing Sight Distance and Connectivity	Consider connecting this beach crossover to the crosswalk discussed in Issue #19 on the east side of SR A1A.

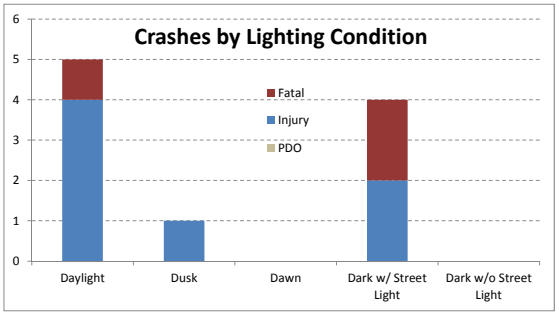
Location	Issue Number	Issue	Suggestion
LONG-TERM PRIORITY			
Corridor-Wide	1	Speed Consistency	Implement complete streets strategies such as curbing, bioswales, repurposing wide shoulder areas to improve parking areas with wide driveways, implement buffered bike lanes. Consider a speed study to assess if the posted speeds can be reduced to 35 MPH and speed feedback devices can be used to increase driver awareness of their travel speed.
Corridor-Wide	2	Sidewalk Inconsistency on East Side	Consider constructing sidewalk on the east side of SR A1A to fill in the gaps as part of a complete streets project or other construction effort.
Corridor-Wide	4	Lighting Inconsistency	Consider upgrading to an adaptive roadway lighting system along the corridor. Lighting levels could be programmed to be reduced during the sea turtle nesting season and increased to normal levels outside of the nesting season.
Corridor-Wide	7	Driveways and Parking Areas Not Defined	For parcels without the ability to facilitate onsite circulation of parking maneuvers, consider relocating parking to areas with better parking access and circulation. Some parcels may not have the ability to relocate parking areas. However, many of these parcels are located in areas with wide shoulders; implementation of complete streets strategies could allow for opportunities to right-size the motorist, bicyclist, and pedestrian facilities and reduce conflicts between bicyclists and pedestrians with parking motorists while making use of available space.
North of Palm Drive	16	Regions Bank Driveways	To address the issue of multiple driveways for the same property, consider driveway consolidation during potential redevelopments where feasible. For currently undeveloped properties, consolidating these driveways during development will reduce the amount of conflict areas between pedestrians/bicyclists and vehicles. Some local government agencies around Central Florida have incorporated land use policies encouraging pedestrian cross access between adjacent commercial and office properties. Cross-access between adjacent parcels within a block should be a focus on the SR A1A corridor as properties redevelop which would help eliminate unused or underutilized driveways.
Southwest Corner of Seaside Drive	17	Driveway/parking Area Delineation	Consider complete-streets improvements as discussed in Issue #1.

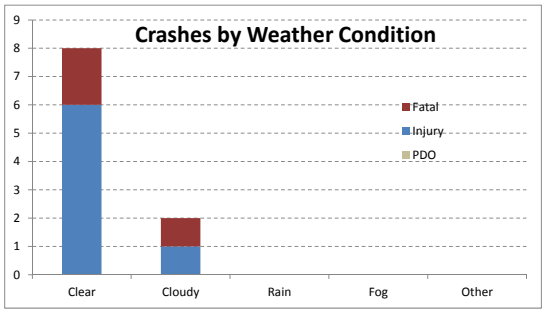
Appendix A – Crash Analysis Reference Materials

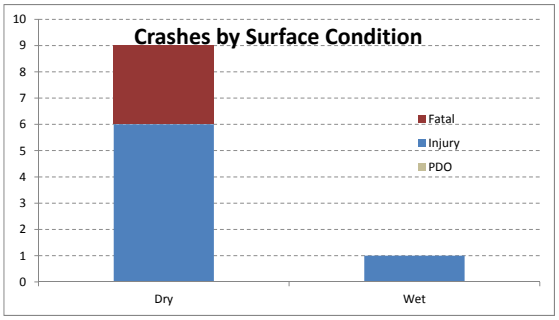
CRASH ANALYSIS - SR A1A from Sandcastle Dr. to Holland Rd.

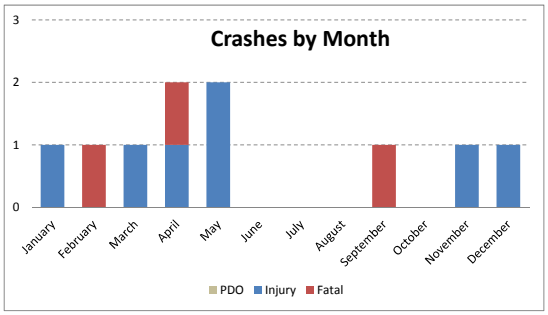


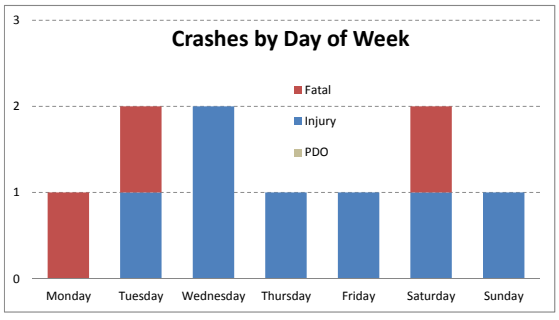


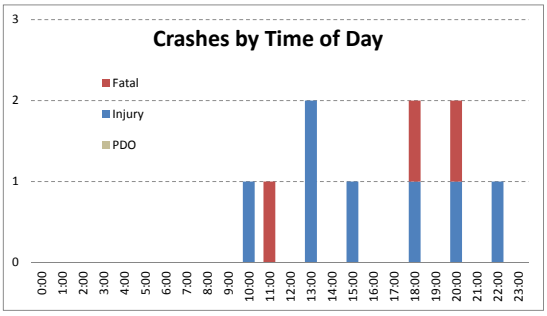


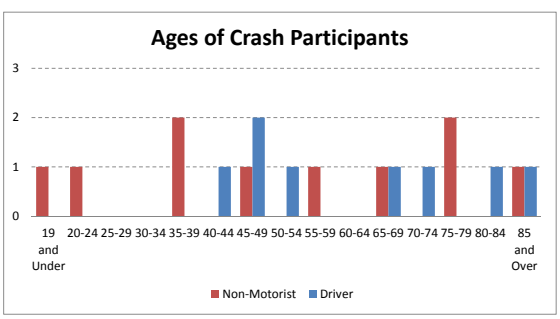


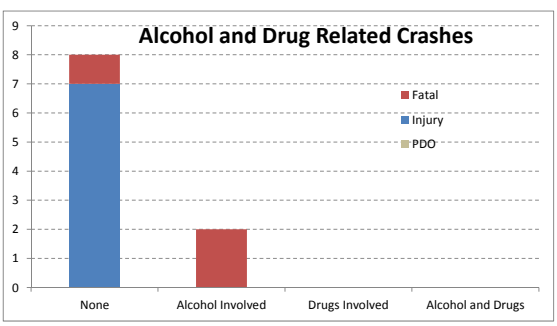










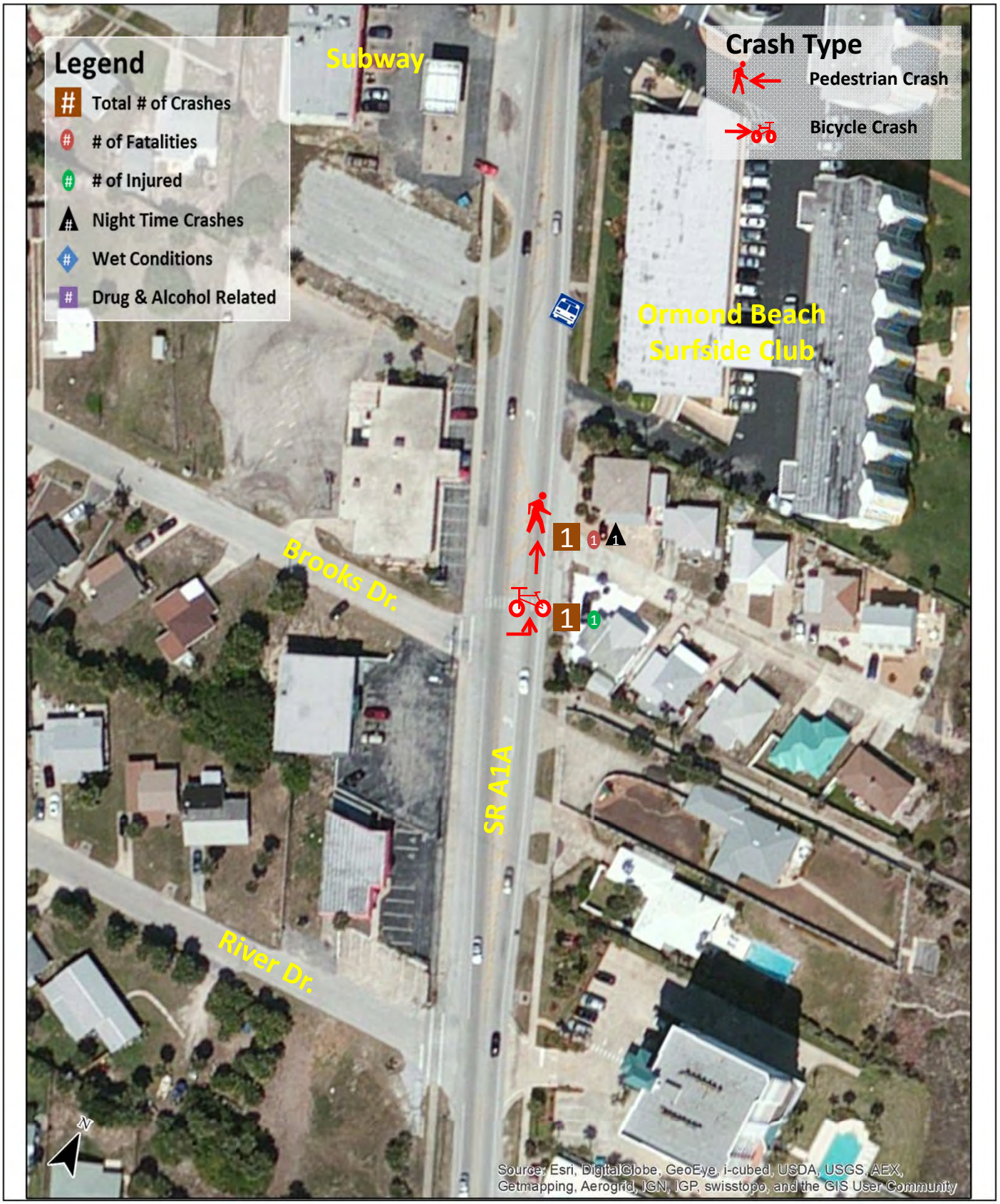


SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Ann Rustin Dr. to Sandcastle Dr.

Figure **1**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Sandcastle Dr. to Riverbreeze Blvd.

Figure **2**

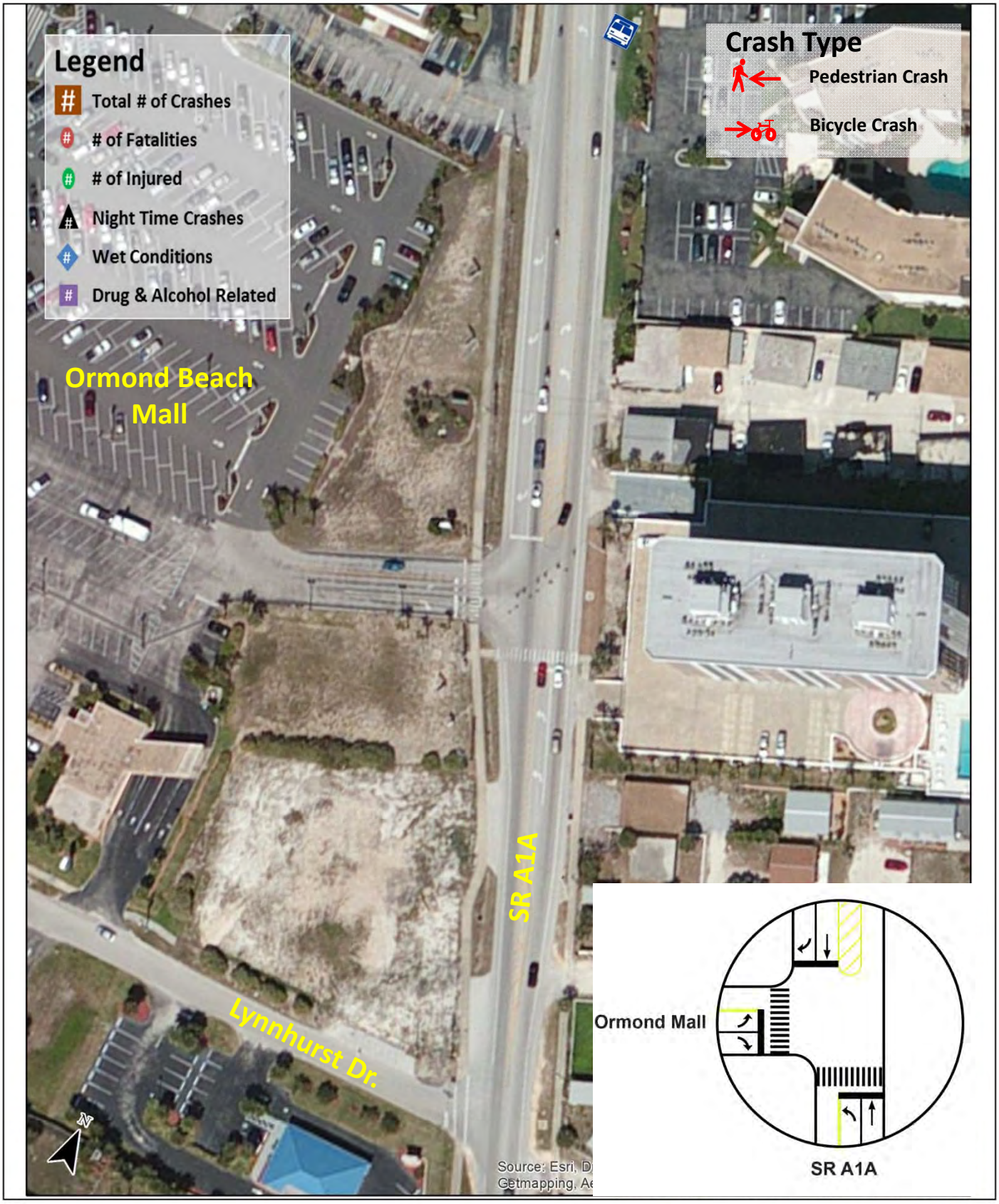


SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Riverbreeze Blvd. to Brooks Dr.

Figure **3**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Brooks Dr. to Essex Dr.

Figure **4**



SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Essex Dr. to Lynnhurst Dr.

Figure **5**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Lynnhurst Dr. to Hibiscus Dr.

Figure **6**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Hibiscus Dr. to Palm Dr.

Figure **7**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Palm Dr. to Ocean View Dr.

Figure **8**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Ocean View Dr. to Ocean Shore Dr.

Figure **9**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Ocean Shore Dr. to Laurie Dr.

Figure **10**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Laurie Dr. to Town and Country Ln.

Figure **11**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Focus Area E: Town and Country Ln. to Seabreeze Dr.

Figure **12**