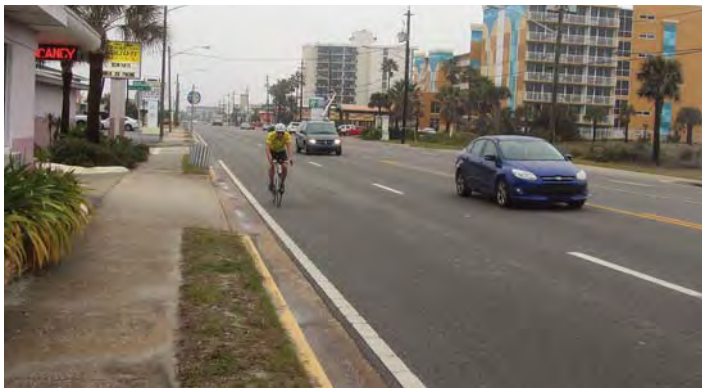
RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

SR/CR A1A PEDESTRIAN SAFETY & MOBILITY STUDY

PEDESTRIAN / BICYCLE SAFETY REVIEW

Focus Area B / Park Avenue to Ribault Avenue (Daytona Beach Shores/Daytona Beach



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October 2016

SR/CR A1A
Pedestrian Safety & Mobility Study

Pedestrian/Bicycle Safety Review Report for
Focus Area B: SR A1A from Park Avenue to Ribault Avenue (Daytona Beach Shores/Daytona Beach)

Section Number: 79180000
Mile Post: 5.094 – 6.035
Volusia County

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

Field Review Dates: January 28th and 29th, 2016 (daytime/nighttime reviews and follow up meeting)

Participants:
Ryan Cunningham – Kittelson & Associates, Inc. – Team Leader
Stephan Harris – River to Sea Transportation Planning Organization
Chad Lingenfelter – Florida Department of Transportation, District 5
Jon Cheney – Volusia County (January 28th only)
Mike Marcum – City of Daytona Beach
Rich Walton – City of Daytona Beach (January 29th only)
Amy Boyd – City of Daytona Beach
Sergeant Mike Uleski – Daytona Beach Shores PD
Officer Jason Kilker – Daytona Beach PD
John Cotton - VoTran
Travis Hills – Kittelson & Associates, Inc.

Project Characteristics:
Field Review Type: Pedestrian, Bicycle, Existing Road
Adjacent Land Use: Urban, Commercial, Hotels, Residential
Posted Speed Limit: 35 miles per hour (mph) along the length of the study corridor
Opposite Flow Separation: Center Two-Way Left-Turn Lane (TWLTL)
Service Function: Urban Principal Arterial
Terrain: Flat
Climatic Conditions: Cloudy, Raining, Cold

Figure 1 – Focus Area B 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 Park Avenue to Ribault Avenue (**Figure 1**), a 1.00 mile corridor in Daytona Beach Shores/Daytona Beach, 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, Daytona Beach Shores, Daytona 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 January 28th, 2016. The team met in the morning at the Volusia County Lifeguard Headquarters 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 north and south sides of the roadway. The team reassembled in the evening, after sunset, to make observations in nighttime conditions. A follow-up debrief meeting was held at Volusia County Lifeguard Headquarters the following morning (January 29th) to discuss the corridor's issues and potential improvements identified by the team. Study corridor characteristics are reviewed below:

- Park Avenue to Ribault Avenue – 1.00 miles.
- Typical cross section – Five-lane roadway with a center two-way left-turn lane (TWLTL).
- The posted speed along the study corridor limits is 35 MPH.
- Two (2) signalized intersections at Botefuhr Avenue and SR 441/Silver Beach Avenue:
    - Botefuhr Avenue
        - Old special emphasis crosswalk markings along the north and south legs.
        - Standard crosswalk markings on the east and west legs.
    - SR 441/Silver Beach Avenue
        - Old special emphasis crosswalk markings along the four legs.
- The distance between signalized intersections is approximately 0.7 miles. There are no other marked crossings along the study corridor.
- Continuous sidewalks along both sides of the roadway for the length of the study corridor;
- No bicycle lanes or paved shoulders are provided along the length of the study corridor;
- Type F curb and gutter along the length of the study corridor;
- Votran, Volusia County's public transit system, serves SR A1A within the study limits;
- Overhead street lighting is present along both sides of the study corridor; and
- The study corridor has experienced an average AADT of 11,200 vehicles/day 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, 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, maintained by University of Florida from 2009 to 2014. The 2014 CARS data was not yet FDOT certified at the time this study was initiated, 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.

Eight (8) pedestrian or bicycle-related crashes were reported over the six-year study period, seven (7) involved pedestrians and one (1) involved a bicyclist. All eight (8) pedestrian and bicycle crashes were injury crashes. No fatal pedestrian or bicycle crashes were reported during the analysis period.

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, signalized intersection crashes, and locations with more than one crash, are provided below:

- Sixty-three (63) percent of the crashes occurred in dark lighting conditions;
- All reported crashes occurred under dry roadway conditions;
- Seventy-five (75) percent of the crashes occurred between 2009 and 2010. No crashes occurred in 2013 or 2014.
- The Average Annual Daily Traffic (AADT) along the corridor decreased slightly between 2009 and 2010 and began to increase in 2012. The corridor has experienced an average AADT of 11,200 over the six year analysis period;
- All eight (8) crashes occurred between Wednesday and Saturday. There were three (3) crashes on Saturday;
- There were two (2) crashes in October, the only month with more than one crash;
- Five (5) of the eight (8) crashes occurred between 9:00 PM and 1:00 AM;
- Four (4) of the pedestrians or bicyclists were not from the state of Florida based upon their provided zip codes;
- None of the reported crashes involved alcohol or drugs;
- The vehicle had the right-of-way in four (4) of the seven (7) pedestrian crashes, all of them occurring when a pedestrian was attempting to cross SR A1A at a mid-block location;
- The vehicle had the right-of-way in the one (1) bicycle crash occurring just south of Silver Beach Avenue;
- One (1) pedestrian crash occurred at the signalized intersection of Botefuhr Avenue when a pedestrian crossing the north leg crosswalk was struck by a westbound right turning vehicle. This crash occurred at night; and
- One (1) pedestrian crash occurred at the signalized intersection of SR 441/ Silver Beach Avenue when a pedestrian crossing the north leg crosswalk was struck by an eastbound left turning vehicle.

FIELD REVIEW FINDINGS

Location: Corridor-Wide

Issue #1: Lighting

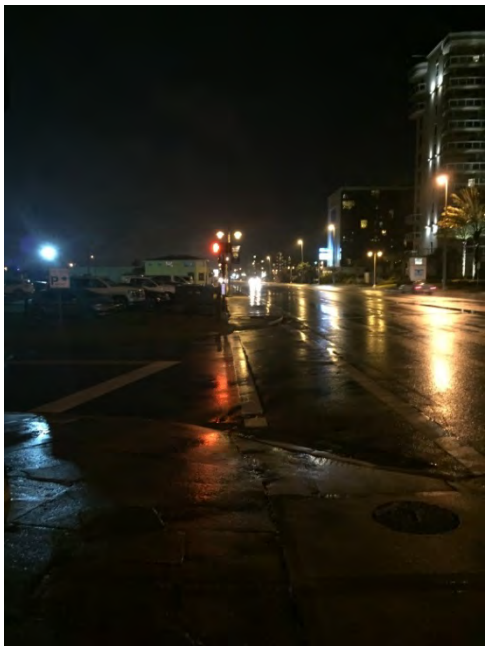


Figure 2

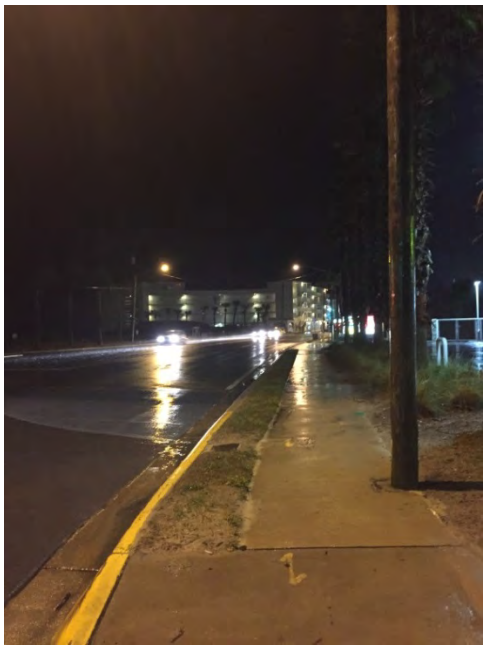


Figure 3

Description of Issue:
Daytona Beach Shores and Daytona Beach 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. Shutting street lights off or using a shield on the street light poles to minimize light emittance are two measures utilized on SR A1A during the sea turtle nesting season.

While the five nighttime crashes occurred outside of turtle season, the turtle season lighting measures were still in effect along the corridor. Shutting off lights or using the turtle 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 2** and **Figure 3** illustrate the lighting levels the safety team observed. The safety study team observed the roadway lighting conditions at night and had the following observations:

- Lighting levels and spacing were inconsistent along the corridor;
- Inconsistent turtle lighting treatments, some light poles on the west side were outfitted with turtle shielding while others were not;
    - Shields were still installed on west side poles even though it was not turtle season.
- Some of the street lights were either off or not working properly;
    - Between Silver Beach Avenue and Frances Terrace, the street lights on both sides of the roadway were completely shut off.

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

- Replace the lights on the corridor that are burnt out.
- 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 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 #2: Mid-Block Crossings

Figure 4

Figure 5

Figure 6

Description of Issue:

As noted in the background, only two signalized marked crossing locations are present along the corridor at Botefuhr Avenue and Silver Beach Avenue but these signals are spaced approximately 0.70 miles apart. Without the provision of marked crosswalks at regular intervals and the five-lane roadway cross section (**Figure 4**), pedestrians cross SR A1A wherever it is convenient or desirable and they tend to utilize the TWLTL for refuge. Five of the eight (63 percent) pedestrian crashes occurred outside of a marked crosswalk between Botefuhr Avenue and Ribault Avenue.

Current land uses along the corridor encourage pedestrians to cross SR A1A at unmarked locations. Some hotels on the east side of the roadway have their parking on the west side of the roadway. Bus stops are also placed at mid-block locations and pedestrian/bicycle beach access points are located throughout the corridor. The study team counted approximately 20 parcels along the corridor that were vacant with no buildings or had buildings that were unoccupied by a tenant (**Figure 5**). When these parcels develop or new tenants move into the unoccupied buildings, pedestrian/bicycle activity may increase across and along the corridor. On the east side of the corridor near Ribault Avenue, a Hard Rock Hotel is in the planning stages with parking proposed on the west side of SR A1A (**Figure 6**).

Suggestions for Improvement:
The study team discussed the need for more marked crosswalks to cross SR A1A along the study corridor. The following locations could be considered for mid-block crossing locations:

- Near the beach access just south of the Holiday Inn Resort, between Ocean Dunes Road and Old Trail Road. Two bus stops are located in this block and it would be approximately 1/4 to 1/3 of a mile north of the Botefuhr Avenue signal.
- Near the beach access just south of the Catalina Beach Club, between Temko Terrace and Bostwick Avenue. Two pedestrian crossing crashes occurred in this section and bus stops are located along this segment. This crossing would be approximately 1/4 mile north of the above suggestion and approximately 0.15 to 0.20 miles south of Silver Beach Avenue.
- Near the beach access just south of where the new Hard Rock Hotel is planning to be constructed, between Frances Terrace and Ribault Avenue. Bus stops are present within this segment and it would be approximately 0.15 to 0.20 miles north of the Silver Beach Avenue signal.

At the above locations, the following suggestions should be considered where a mid-block crossing is desired and warranted:

- 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.
    - Ideal locations would be where a beach access is located across the street from commercial development, where a hotel/major land use generator on the east side has parking on the west side, or where bus stops are located near beach access points or major land use generators along the corridor.
    - As land uses along the corridor develop/redevelop, evaluate if a mid-block crossing is feasible.
- Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk.
- Provide a median refuge island with a minimum length of 90 feet for pedestrians in the TWLTL.
- Install lighting at the crosswalk.
    - 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: Corridor-Wide

Issue #3: Lighting at Signalized Intersections

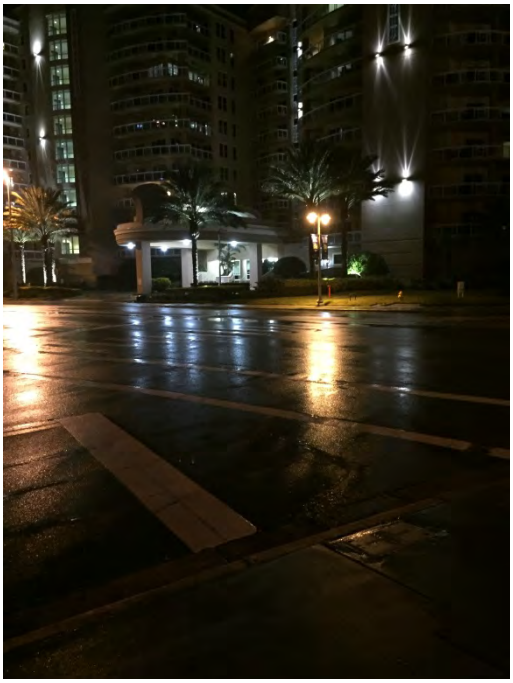


Figure 7

Figure 8

Description of Issue:
Intersection lighting is not provided at all corners of the Botefuhr Avenue (**Figure 7**) and Silver Beach Avenue (**Figure 8**) intersections leaving portions of the marked crosswalks unlit. One pedestrian crash involving a westbound right turning vehicle occurred on the north leg of the Botefuhr Avenue intersection under dark lighting conditions.

Suggestions for Improvement:
Consider upgrading the lighting at the two 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. FDOT is also considering lighting installed underneath mast arms that hang directly over marked crosswalks at signalized intersections. These two options should be evaluated to see which best meets the lighting requirements for each intersection.

Location: Corridor-Wide

Issue #4: Lack of Bicycle Facilities

Figure 9

Figure 10

Description of Issue:
The SR A1A roadway width within the project limits ranges from 57' (four 11.5' travel lanes with an 11' TWLTL) to 61' (four 12.5' travel lanes with an 11' TWLTL). With this configuration, there are no paved shoulders or marked bicycle lanes so bicyclists either ride on the sidewalk (**Figure 9**) or ride in the outside lane near the edge of the roadway (**Figure 10**). Due to rainy field review conditions, not many bicycles were observed by the field review team but team members familiar with the corridor noted that on a nice day, there is a good amount of bicycle traffic along this section of SR A1A.

Suggestions for Improvement:
Based upon the existing pavement and without adjusting the existing curb line, there is not adequate width to accommodate buffered bicycle lanes or 4' striped bicycle lanes on each side of the roadway even if the lane widths are reduced to 11'. Because right-of-way is not available to provide a bicycle lane or paved shoulder, consider posting BIKES MAY USE FULL LANE (R4-11) signs along the study corridor to encourage bicycles to use the street rather than the sidewalks. As stated in Section 9B.06 of the Manual of Uniform Traffic Control Devices (MUTCD):

01 *The Bicycles May Use Full Lane (R4-11) sign (see Figure 9B-2) may be used on roadways where no bicycle lanes or adjacent shoulders usable by bicyclists are present and where travel lanes are too narrow for bicyclists and motor vehicles to operate side by side.*
02 *The Bicycles May Use Full Lane sign may be used in locations where it is important to inform road users that bicyclists might occupy the travel lane.*

Because the posted speed along this section of SR A1A is 35 MPH, consider installing shared lane markings (sharrows) in addition to the R4-11 signs, as specified on pages 1 and 2 of FDOT Standard Index 17347.

Location: Corridor-Wide

Issue #5: Minor Street Crosswalks and Stop Bars

Figure 11

Figure 12

Description of Issue:
Overall, the existing crosswalk markings and stop bars at minor street intersections along the corridor were faded, as displayed in **Figure 11** and **Figure 12**. The study team observed limited retro reflectivity of the crosswalk markings during nighttime conditions. While there were no pedestrian or bicycle crashes at minor street intersections, emphasizing the pedestrian walking area and vehicle stop location is important for a driver approaching one of these intersections.

Suggestions for Improvement:
As a maintenance activity, consider emphasizing the pedestrian realm across minor street approaches by restriping crosswalk markings as shown on sheet 9 of FDOT Standard Index 17346. Also consider restriping the stop bar as shown on sheets 2 and 4 of FDOT Standard Index 17346 to emphasize where the vehicle needs to stop before making their turning movement. Locations the study team noted during the review included:

- Crosswalks at Old Trail Road, Poinsettia Road, Wisteria Road, Bostwick Avenue, and Mobile Avenue; and
- Stop bar at Bostwick Avenue.

Location: Corridor-Wide

Issue #6: Driveways

Figure 13

Figure 14

Description of Issue:
At some driveways throughout the corridor, the sidewalk merges into the existing driveway as displayed in **Figure 13** and **Figure 14**. At many of these locations, a level path with less than two (2) percent cross slope is not provided across the driveway. Per section R302.6 in the ADA PROWAG guidance, the maximum cross slope for a sidewalk across a driveway is two (2) percent.

Along the study corridor, properties were observed as having multiple driveways onto SR A1A (**Figure 13**). A number of driveways were also noted to be longer than the 36' maximum driveway width (**Figure 14**) as specified per FDOT Standard Index 515. While there were no pedestrian/bicycle crashes at driveways, driveways are conflict points between pedestrians/bicyclists utilizing the sidewalk and vehicles exiting the property or turning from SR A1A.

Suggestions for Improvement:
Consider driveway reconstruction during the roadway's next 3R project to provide a level path for the sidewalk and meet ADA guidance. As part of this construction, consider reducing the driveway widths down to the 36' maximum per FDOT Standard Index 515.

As properties redevelop along the corridor, consider rebuilding the driveways. It appears these improvements can be done without negatively impacting parking or site circulation on the subject parcels. To address the issue of multiple driveways for the same property, consider driveway consolidation during potential redevelopments where feasible.

Location: Corridor-Wide Daytona Beach Section

Issue #7: Sidewalk Walkability

Figure 15

Figure 16

Figure 17

Description of Issue:
The study team observed the following sidewalk walkability issues along the study corridor. These issues are more general in nature and applied to multiple locations. Sidewalk walkability issues related to one specific location, such as missing sidewalk, are detailed in **Issue #15: Sidewalk Walkability**.

- Trip hazards were present at multiple inlets along the corridor (**Figure 15**) where the top of the inlet is raised above the sidewalk. According to section R302.7.2 of the Americans with Disabilities Act Public Rights of Way Accessibility Guidelines (ADA PROWAG), vertical surface discontinuities shall be ½" maximum.
    - Specific inlets with this issue were noted south of Eastwood Lane and south of Temko Terrace.
- Curb ramps at minor street intersections (**Figure 16**) were greater than the 8.3 percent maximum running slope discussed in section R304.3.2 of the ADA PROWAG. There is also no turning space at the top of the ramps. According to section R304.2.1 of the ADA PROWAG, a turning space of 4' minimum by 4' minimum shall be provided at the top of the curb ramp.
- Power poles (**Figure 17**) and trash cans were located in the sidewalk (mainly on the east side), reducing the sidewalk width to less than the minimum 4' according to ADA PROWAG section R302.3.

Suggestions for Improvement:
At the locations where trip hazards are present at inlets, consider beveling/grinding the inlet top near the sidewalk joint to reduce/eliminate the trip hazard.

As a maintenance activity, consider moving the trash cans so they are located off the sidewalk.

During the next roadway resurfacing project, consider rebuilding the curb ramps for the minor streets to meet ADA guidance and provide turning spaces at the top of the ramps.

Daytona Beach Shores completed a streetscape project in 2013 where the sidewalks were rebuilt and the utilities along the corridor were put underground, as displayed in **Figure 18**. As a long term suggestion, consider rebuilding the sidewalk in the Daytona Beach section and underground the utilities along the corridor to remove the sidewalk obstructions.

Figure 18

Location: Corridor-Wide Daytona Beach Section

Issue #8: Bus Stops

Figure 19

Figure 20

Description of Issue:
Votran bus stops (**Figure 19** and **Figure 20**) are present along the study corridor on both the east and west sides of the roadway. A 5' wide by 8' deep concrete landing pad is not present on the west side due to the landscape buffer strip or on the east side because the sidewalk adjacent to the curb is only 5' to 6' deep.

Note the landing pad issue can be applied to most bus stops along the corridor. More specific bus stop issues relating to specific bus stop locations are discussed in **Issue #14: Bus Stops**.

Suggestions for Improvement:
Consider providing a 5' x 8' bus stop landing pad at each bus stop per section R308.1.1.1 of the ADA PROWAG during the next resurfacing project.

Location: Corridor-Wide Daytona Beach Section

Issue #9: Minor Streets with Driveway Connections

Figure 21

Figure 22

Description of Issue:
The study team observed the named public minor streets of Temko Terrace (**Figure 21**), Eastwood Lane (**Figure 22**), and Frances Terrace having driveway connections to SR A1A instead of paved asphalt connections. At many of these locations, a level path with less than two (2) percent cross slope is not provided across the driveway. Per section R302.6 in the ADA PROWAG guidance, the maximum cross slope for a sidewalk across a driveway is two (2) percent. These minor streets did not have marked crosswalks or detectable warning surfaces.

Suggestions for Improvement:
Consider removing the driveway connection during the roadway's next 3R project and construct an asphalt connection from these minor streets to SR A1A. Doing so will provide a level path for the sidewalk and meet ADA guidance. As discussed in **Issue #5: Minor Street Crosswalks and Stop Bars**, consider marking the crosswalk across the minor street and restriping the stop bars. Consider installing detectable warning surfaces at the two curb ramps of the intersection per FDOT Standard Index 304.

Location: Mid-Block between Park Avenue and Botefuhr Avenue

Issue #10: Sidewalk Sign Obstruction

Figure 23

Description of Issue:
The secondary sign below the Adopt-A-Highway sign just south of Park Avenue (**Figure 23**) is less than 7' above the sidewalk. Section 2A.18 of the MUTCD states that if a secondary sign mounted below another sign is less than 7' above the sidewalk, the sign shall not project more than 4" into the pedestrian facility.

Suggestions for Improvement:
Consider reinstalling the sign so the secondary sign either does not project more than 4" into the sidewalk or is greater than 7' above the sidewalk. This may be done by moving the sign off the sidewalk or installing the signs on a taller sign post.

Location: Mid-Block between Park Avenue and Botefuhr Avenue

Issue #11: Sight Distance at Bahama House

Figure 24

Figure 25

Description of Issue:
Shrubbery is present on the corners of the Bahama House Hotel driveway, restricting sight distance between vehicles exiting onto SR A1A and sidewalk users (pedestrians/bicyclists) to the south (**Figure 24**) and to the north (**Figure 25**).

Suggestions for Improvement:
Consider working with the property owner to trim back or remove the shrubbery to improve sight distance between exiting vehicles and pedestrians/bicyclists approaching the driveway on the sidewalk.

Location: Botefuhr Avenue Intersection

Issue #12: Street Name Signage and Pavement Markings

Figure 26

Figure 27

Description of Issue:
No street name sign is present for SR A1A at the intersection (**Figure 26**). Pedestrians at the intersection may get confused as to which pedestrian detector to push in order to cross SR A1A.

No stop bar is present on the westbound approach (east leg) at the intersection (**Figure 27**). One pedestrian crash occurred in the north leg crosswalk with a westbound right turning vehicle.

Suggestions for Improvement:
Consider installing an interior illuminated, overhead LED SR A1A street name sign at Botefuhr Avenue, per Table 2A-1 of the MUTCD.

Consider striping a stop bar on the westbound approach as shown on sheet 4 of FDOT Standard Index 17346 to emphasize where the vehicle needs to stop on red.

Location: Botefuhr Avenue Intersection

Issue #13: Pedestrian Facilities

Figure 28

Figure 29

Figure 30

Figure 31

Figure 32

Figure 33

Description of Issue:
The crosswalks were faded on the four legs of the intersection and the crosswalk striping style was inconsistent between the Botefuhr Avenue approach standard markings (**Figure 28**) and the SR A1A old special emphasis markings (**Figure 29**). One pedestrian crash occurred in the north leg crosswalk with a westbound right turning vehicle. No detectable warning surfaces were present for any of the curb ramps at the intersection (**Figure 30** and **Figure 31**).

Due to the skew of Botefuhr Avenue, crosswalks on the north and south (**Figure 32**) legs across SR A1A are skewed and do not align with the curb ramps on the corners of the intersection. The curb ramps were observed to be steep and did not meet the 4' minimum clear width according to ADA PROWAG section R304.5.1 (**Figure 33**).

The pedestrian detector signage did not have an arrow leading to the crosswalk and the street name font was not MUTCD standard.

The study team also observed the pedestrian signal head on the southwest corner for the south leg crosswalk was not working.

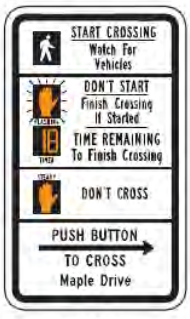
Suggestions for Improvement:
Consider re-striping the four crosswalk markings with special emphasis crosswalk markings consistent with sheet 9 of the FDOT Design Standard Index 17346. Consider installing detectable warning surfaces at the four curb ramps of the intersection per FDOT Standard Index 304.

Contact the maintenance department to fix the countdown timers on the southwest corner for the south leg crosswalk.

Consider realigning the north and south leg crosswalks to be more perpendicular with SR A1A. This would require constructing new curb ramps for those two crosswalks. Consider rebuilding the existing curb ramps so they meet the 4' minimum clear width as stated in the ADA PROWAG.

As part of separating the curb ramps, consider individual pedestrian detector poles for each crosswalk at the intersection. Consider replacing the pedestrian detector signs with R10-3i pedestrian plaques which includes an arrow and MUTCD street name font indicating which street the pedestrian detector corresponds with.

Consider implementing a leading pedestrian interval for the north and south leg crosswalks prior to the onset of the eastbound/westbound green phase.



R10-3i

Location: Mid-Block between Botefuhr Avenue and Silver Beach Avenue

Issue #14: Bus Stops

Figure 34

Figure 35

Description of Issue:
During the review, the study team noticed the following issues with specific bus stops along the corridor:

- A Votran sign was missing for the stop between Botefuhr Avenue and Flamingo Avenue on the west side of the roadway (**Figure 34**).
- Landscaping was obstructing the Votran sign between Botefuhr Avenue and Flamingo Avenue on the east side of the roadway (**Figure 35**).
- A Votran sign was missing for the stop just north of the beach access at Frazar Road on east side of the roadway.

Suggestions for Improvement:
As per the date of this report, Votran has worked with the City of Daytona Beach Shores to install a bus stop sign for the stop between Botefuhr Avenue and Flamingo Avenue.

Consider trimming the palm tree from in front of the Votran sign on the east side between Botefuhr Avenue and Flamingo Avenue. Consider adding a Votran sign for the stop on the east side at Frazar Road.

Location: Mid-Block between Botefuhr Avenue and Silver Beach Avenue

Issue #15: Sidewalk Walkability

Figure 36

Figure 37

Figure 38

Figure 39

Description of Issue:
The study team observed the following sidewalk walkability issues related to one specific location between Botefuhr Avenue and Silver Beach Avenue.

- The sidewalk was cracked and formed a small dip on the east side of the roadway north of Poinsettia Road.
- The speed limit sign is less than 7' above the sidewalk on the west side of the roadway north of Wisteria Road (**Figure 36**). Section 2A.18 of the MUTCD states the minimum height from the bottom of the sign to the sidewalk shall be 7'.
- A trip hazard from a tie down cable on the east side of the roadway north of Wisteria Road (**Figure 37**).
- A metal pole from a previous sign was protruding from the sidewalk on the east side of the roadway near Temko Terrace.
- A grate for the private property on east side of the roadway is not level with sidewalk near Bostwick Avenue (**Figure 38**).

- North of Bostwick Avenue on the west side of the roadway, the landscape buffer strip is raised approximately ½" to 1" higher than the sidewalk which does not allow for water to properly drain into the grass, thus creating ponding/sand on the sidewalk (**Figure 39**).
- One of the sidewalk panels was gravel instead of concrete on the east side of the roadway north of Bostwick Avenue.

Suggestions for Improvement:
Consider the following suggestions to address the sidewalk walkability issues between Botefuhr Avenue and Silver Beach Avenue:

- Replace the sidewalk panels that are cracked on the east side of SR A1A north of Poinsettia Road.
- Reinstall the speed limit sign on the west side of SR A1A north of Wisteria Road by moving the sign off the sidewalk or installing the sign on a taller sign post.
- Remove the tie down cable trip hazard on the east side of SR A1A north of Wisteria Road.
- Grind down or cut away the remaining protruding metal pole on the east side of SR A1A near Temko Terrace.
- Work with the property owner to install a grate that is level with the sidewalk on east side of the near Bostwick Avenue.
- For the sidewalk maintenance north of Bostwick Avenue on the west side of SR A1A:
    - Consider regular sidewalk maintenance (sweeping debris/sand) along this section. The maintenance may be scheduled regularly or may be performed after a heavy rain event.
    - Consider reducing the height of landscape strip to be level or just below the sidewalk and replace with new sod. The landscape strip could also be replaced with concrete to create a wider sidewalk in this area.
    - In lieu of regular sidewalk maintenance by a local jurisdiction, local businesses along the corridor could apply for the FDOT Adopt-A-Highway program. According to the website (found at http://www.dot.state.fl.us/statemaintenanceoffice/aah.shtm), volunteers would "*enter into a two-year agreement with DOT, during which they agree to conduct litter removal at regularly scheduled intervals. Many miles of highway are adopted statewide by various organizations, allowing civic-minded people to make a difference in their communities. This eases the load of DOT work crews, enabling them to devote more time to other road maintenance and special highway projects.*"
- Replace the gravel sidewalk panel on the east side of the roadway north of Bostwick Avenue with concrete.

Location: Silver Beach Avenue Intersection

Issue #16: Pedestrian Facilities

Figure 40

Figure 41

Figure 42

Description of Issue:
The crosswalks were faded on the four legs of the intersection (**Figure 40**) and the crosswalk striping was not retro reflective. One pedestrian crash occurred in the north leg crosswalk with an eastbound left turning vehicle.

Due to the skew of Silver Beach Avenue, crosswalks on all four legs (**Figure 40** and **Figure 41**) are skewed creating longer crossing distances for pedestrians.

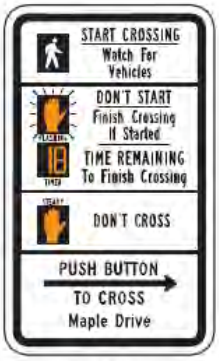
Pedestrian detector signage at the intersection was faded as displayed in **Figure 42**.

Suggestions for Improvement:
Consider re-striping the four crosswalk markings with special emphasis crosswalk markings consistent with sheet 9 of the FDOT Design Standard Index 17346. Consider removing the decorative pavers and research an approved roadway material that thermoplastic crosswalk markings will adhere to. Possibly redesign the intersection and change the pattern to following driving lanes.

Consider realigning the west and south leg crosswalks to be more perpendicular with Silver Beach Avenue and SR A1A. For the west crosswalk, a new curb ramp could be constructed on the south side of Silver Beach Avenue in the southwest corner of the intersection. For the south crosswalk, a new curb ramp could be constructed on the west side of SR A1A in the southwest corner of the intersection. As part of this suggestion, consider implementing a leading pedestrian interval for all four crosswalks prior to the onset of their respective conflicting green phases. The north and east crosswalks are not suggested to be moved due to the potential impacts to drainage inlets on the northeast corner of the intersection.

As part of separating the curb ramps, consider individual pedestrian detector poles on the southwest corner of the intersection and building the curb ramps so they are ready for accessible pedestrian signals.

Consider replacing all of the faded pedestrian detector signs with R10-3i pedestrian plaques.



R10-3i

Location: Silver Beach Avenue Intersection

Issue #17: Southwest Corner Accessibility

Figure 43

Figure 44

Description of Issue:
The mast arm in the southwest corner of the intersection is located within the sidewalk/curb ramp area as displayed in **Figure 43** and **Figure 44**. Adequate 4' continuous clear width for the sidewalk is not provided based on ADA PROWAG section R302.3.

Suggestions for Improvement:
In order to minimize the cost for providing an accessible path around this corner, consider constructing a sidewalk on the back (west) side of the pole that is level with the height of the poles base. From field observations, this improvement may impact right-of-way for the Sunoco gas station so working with the property owner to construct this sidewalk may be needed. If the crosswalks are realigned as described in **Issue #16: Pedestrian Facilities**, the pedestrian detectors and signals will be on separate poles near the new ramp locations.

Location: Silver Beach Avenue Intersection

Issue #18: Southbound Channelized Right Turn Lane

Figure 45

Figure 46

Description of Issue:
A marked pedestrian crosswalk is located across the channelized southbound right turn lane in the northwest corner of the intersection (**Figure 45**). This movement is a relatively high speed turn and the crosswalk markings are difficult to see from the driver's perspective (**Figure 46**).

Pedestrians standing on the corner waiting to cross to the channelized island are visually obstructed by the palmetto tree (yellow circle in **Figure 46**).

Suggestions for Improvement:
To emphasize the pedestrian crosswalk across the channelized southbound right turn lane in the northwest corner, consider adding YIELD HERE FOR PEDESTRIANS (R1-5 or R1-5a) signage to both the Yield sign post on the right side of the roadway and the mast arm located in the channelized island. Yield lines could be installed per section 3B.16 of the MUTCD prior to the crosswalk to give the driver a visual in-pavement cue that they are approaching a crosswalk.

Consider removing the palmetto tree on the northwest corner to improve sight distance between southbound right turning vehicles and crosswalk users.

Location: Mid-Block between Silver Beach Avenue and Ribault Avenue

Issue #19: Sidewalk Maintenance

Figure 47

Description of Issue:
Between Mobile Avenue and Phoenix Avenue, the sidewalk was observed as having walkability issues due to sand partially covering the sidewalk (**Figure 47**). The landscape buffer strip was raised approximately ½" to 1" higher than the sidewalk which does not allow for water to properly drain into the grass, thus creating the ponding/sand on the sidewalk.

Suggestions for Improvement:
Consider regular sidewalk maintenance (sweeping debris/sand) along this section. The maintenance may be scheduled regularly or may be performed after a heavy rain event.

Consider reducing the height of the landscape strip to be level or just below the sidewalk and replace with new sod. The landscape strip could also be replaced with concrete to create a wider sidewalk in this area.

In lieu of regular sidewalk maintenance by a local jurisdiction, local businesses along the corridor could apply for the FDOT Adopt-A-Highway program. According to the website (found at http://www.dot.state.fl.us/statemaintenanceoffice/aah.shtm), volunteers would "*enter into a two-year agreement with DOT, during which they agree to conduct litter removal at regularly scheduled intervals. Many miles of highway are adopted statewide by various organizations, allowing civic-minded people to make a difference in their communities. This eases the load of DOT work crews, enabling them to devote more time to other road maintenance and special highway projects.*"

Summary of Suggestions

This pedestrian/bicycle safety review considers operational and safety related issues for pedestrians and bicyclists on SR A1A from Park Avenue to Ribault Avenue. 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 suggestions should be prioritized for implementation before the other suggestions identified in this report:

- Issue #7: Sidewalk Walkability on page 13
- Issue #15: Sidewalk Walkability on page 23
    - Replace the sidewalk panels that are cracked on the east side of SR A1A north of Poinsettia Road.
    - Remove the tie down cable trip hazard on the east side of SR A1A north of Wisteria Road.
    - Grind down or cut away the remaining protruding metal pole on the east side of SR A1A near Temko Terrace.
    - Work with the property owner to install a grate that is level with the sidewalk on east side of the near Bostwick Avenue.
    - Replace the gravel sidewalk panel on the east side of the roadway north of Bostwick Avenue with concrete.

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	Lighting	Replace the lights on the corridor that are burnt out.
Corridor Wide	5	Minor Street Crosswalks and Stop Bars	Consider emphasizing the pedestrian realm across minor street approaches by restriping crosswalk markings as shown on sheet 9 of FDOT Standard Index 17346. Also consider restriping the stop bar as shown on sheets 2 and 4 of FDOT Standard Index 17346 to emphasize where the vehicle needs to stop before making their turning movement. Locations the study team noted during the review included: • Crosswalks at Old Trail Road, Poinsettia Road, Wisteria Road, Bostwick Avenue, and Mobile Avenue; and • Stop bar at Bostwick Avenue.
Corridor Wide Daytona Beach Section	7	Sidewalk Walkability	At the locations where trip hazards are present at inlets, consider beveling/grinding the inlet top near the sidewalk joint to reduce/eliminate the trip hazard. Consider moving the trash cans so they are located off the sidewalk.
Mid-Block between Park Avenue and Botefuhr Avenue	10	Sidewalk Sign Obstruction	Consider reinstalling the sign so the secondary sign either does not project more than 4" into the sidewalk or is greater than 7' above the sidewalk. This may be done by moving the sign off the sidewalk or installing the signs on a taller sign post.
Mid-Block between Park Avenue and Botefuhr Avenue	11	Sight Distance at Bahama House	Consider working with the property owner to trim back or remove the shrubbery to improve sight distance between exiting vehicles and pedestrians/bicyclists approaching the driveway on the sidewalk.
Botefuhr Avenue Intersection	12	Street Name Signage and Pavement Markings	Consider installing an interior illuminated, overhead LED SR A1A street name sign at Botefuhr Avenue, per Table 2A-1 of the MUTCD. Consider striping a stop bar on the westbound approach as shown on sheet 4 of FDOT Standard Index 17346 to emphasize where the vehicle needs to stop on red.
Botefuhr Avenue Intersection	13	Pedestrian Facilities	Consider re-striping the four crosswalk markings with special emphasis crosswalk markings consistent with sheet 9 of the FDOT Design Standard Index 17346. Consider installing detectable warning surfaces at the four curb ramps of the intersection per FDOT Standard Index 304. Contact the maintenance department to fix the countdown timers on the southwest corner for the south leg crosswalk.
Mid-Block between Botefuhr Avenue and Silver Beach Avenue	14	Bus Stops	As per the date of this report, Votran has worked with the City of Daytona Beach Shores to install a bus stop sign for the stop between Botefuhr Avenue and Flamingo Avenue. Consider trimming the palm tree from in front of the Votran sign on the east side between Botefuhr Avenue and Flamingo Avenue. Consider adding a Votran sign for the stop on the east side at Frazar Road.
Mid-Block between Botefuhr Avenue and Silver Beach Avenue	15	Sidewalk Walkability	Consider the following suggestions to address the sidewalk walkability issues between Botefuhr Avenue and Silver Beach Avenue: • Replace the sidewalk panels that are cracked on the east side of SR A1A north of Poinsettia Road. • Reinstall the speed limit sign on the west side of SR A1A north of Wisteria Road by moving the sign off the sidewalk or installing the sign on a taller sign post. • Remove the tie down cable trip hazard on the east side of SR A1A north of Wisteria Road. • Grind down or cut away the remaining protruding metal pole on the east side of SR A1A near Temko Terrace. • Work with the property owner to install a grate that is level with the sidewalk on east side of the near Bostwick Avenue. • For the sidewalk maintenance north of Bostwick Avenue on the west side of SR A1A: o Consider regular sidewalk maintenance (sweeping debris/sand) along this section. The maintenance may be scheduled regularly or may be performed after a heavy rain event. o Consider reducing the height of landscape strip to be level or just below the sidewalk and replace with new sod. The landscape strip could also be replaced with concrete to create a wider sidewalk in this area. o In lieu of regular sidewalk maintenance by a local jurisdiction, local businesses along the corridor could apply for the FDOT Adopt-A-Highway program. • Replace the gravel sidewalk panel on the east side of the roadway north of Bostwick Avenue with concrete.

Location	Issue Number	Issue	Suggestion
SHORT-TERM MAINTENANCE			
Silver Beach Avenue	16	Pedestrian Facilities	Consider re-striping the four crosswalk markings with special emphasis crosswalk markings consistent with sheet 9 of the FDOT Design Standard Index 17346. Research and install an approved thermoplastic material that will maintain adhesiveness to the colored pavement at the intersection. Consider replacing all of the faded pedestrian detector signs with R10-3i pedestrian plaques.
Silver Beach Avenue	18	Southbound Channelized Right Turn Lane	To emphasize the pedestrian crosswalk across the channelized southbound right turn lane in the northwest corner, consider adding YIELD HERE FOR PEDESTRIANS (R1-5 or R1-5a) signage to both the Yield sign post on the right side of the roadway and the mast arm located in the channelized island. Yield lines could be installed per section 3B.16 of the MUTCD prior to the crosswalk to give the driver a visual in-pavement cue that they are approaching a crosswalk. Consider removing the palmetto tree on the northwest corner to improve sight distance between southbound right turning vehicles and crosswalk users.
Mid-Block between Silver Beach Avenue and Ribault Avenue	19	Sidewalk Maintenance	Consider regular sidewalk maintenance (sweeping debris/sand) along this section. The maintenance may be scheduled regularly or may be performed after a heavy rain event. Consider reducing the height of the landscape strip to be level or just below the sidewalk and replace with new sod. The landscape strip could also be replaced with concrete to create a wider sidewalk in this area. In lieu of regular sidewalk maintenance by a local jurisdiction, local businesses along the corridor could apply for the FDOT Adopt-A-Highway program.

Location	Issue Number	Issue	Suggestion
NEAR-TERM IMPROVEMENT			
Corridor Wide	1	Lighting	The following are considerations for lighting along the corridor: • 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 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	2	Mid-Block Crossings	The following locations could be considered for mid-block crossing locations: • Near the beach access just south of the Holiday Inn Resort, between Ocean Dunes Road and Old Trail Road. Two bus stops are located in this block and it would be approximately 1/4 to 1/3 of a mile north of the Botefuhr Avenue signal. • Near the beach access just south of the Catalina Beach Club, between Temko Terrace and Bostwick Avenue. Two pedestrian crossing crashes occurred in this section and bus stops are located along this segment. This crossing would be approximately 1/4 mile north of the above suggestion and approximately 0.15 to 0.20 miles south of Silver Beach Avenue. • Near the beach access just south of where the new Hard Rock Hotel is planning to be constructed, between Frances Terrace and Ribault Avenue. Bus stops are present within this segment and it would be approximately 0.15 to 0.20 miles north of the Silver Beach Avenue signal. The following suggestions should be considered at select locations where a mid-block crossing is desired and warranted: • 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. o Ideal locations would be where a beach access is located across the street from commercial development, where a hotel/major land use generator on the east side has parking on the west side, or where bus stops are located near beach access points or major land use generators along the corridor. o As land uses along the corridor develop/redevelop, evaluate if a mid-block crossing is feasible. • Consider an active warning device, such as Rapid Rectangular Flashing Beacons (RRFB), at the crosswalk. • Provide a median refuge island with a minimum length of 90 feet for pedestrians in the TWLTL. • Install lighting at 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. • Stripe the crosswalk with special emphasis crosswalk markings consistent with sheet 10 of the FDOT Design Index 17346.
Corridor Wide	3	Lighting at Signalized Intersections	Consider upgrading the lighting at the two 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. FDOT is also considering lighting installed underneath mast arms that hang directly over marked crosswalks at signalized intersections. These two options should be evaluated to see which best meets the lighting requirements for each intersection.
Corridor Wide	4	Lack of Bicycle Facilities	Because right-of-way is not available to provide a bicycle lane or paved shoulder, consider posting BIKES MAY USE FULL LANE (R4-11) signs along the study corridor to encourage bicycles to use the street rather than the sidewalks. Because the posted speed along this section of SR A1A is 35 MPH, consider installing shared lane markings (sharrows) in addition to the R4-11 signs, as specified on pages 1 and 2 of FDOT Standard Index 17347.

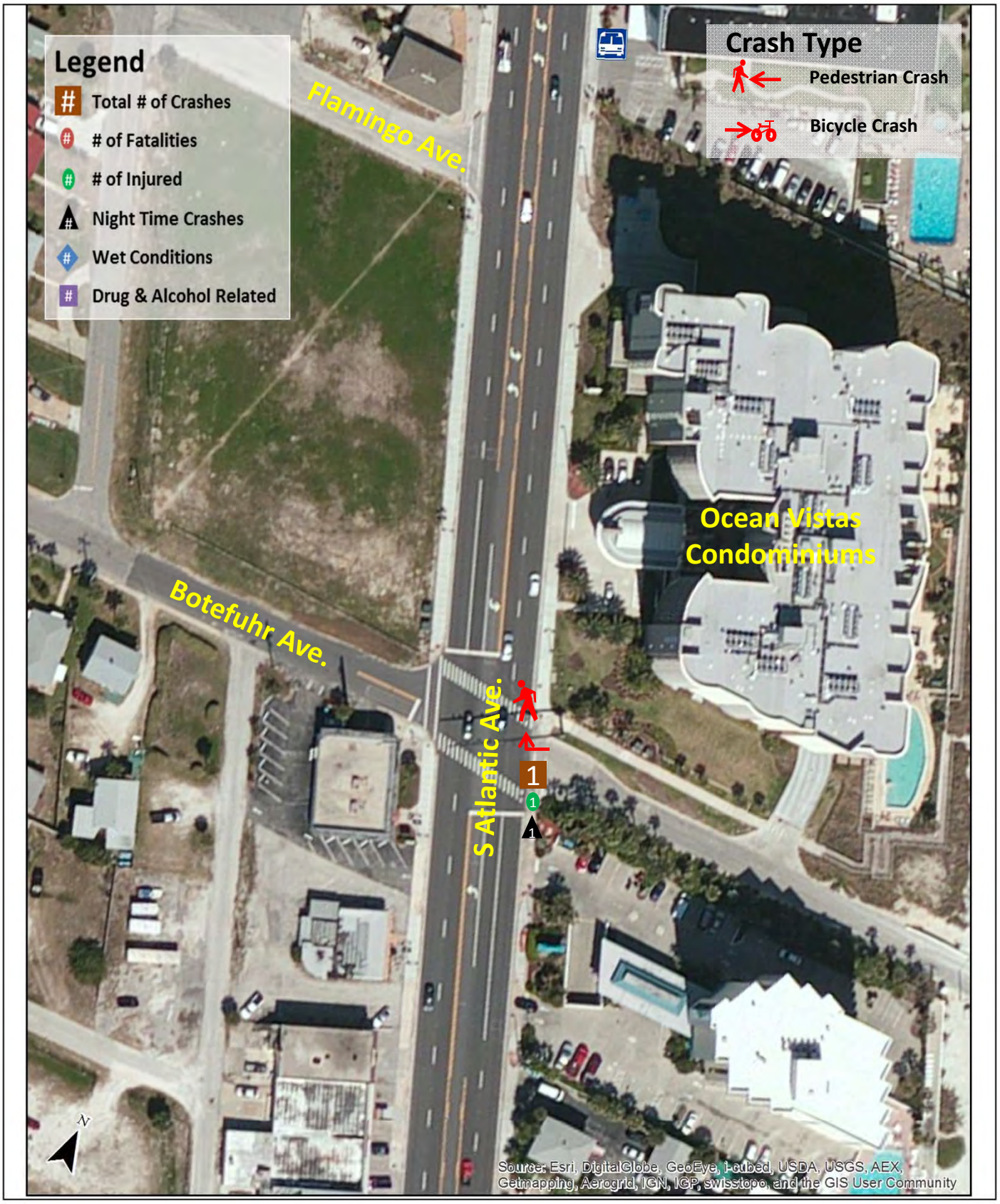
Location	Issue Number	Issue	Suggestion
NEAR-TERM IMPROVEMENT			
Corridor Wide Daytona Beach Section	8	Bus Stops	Consider providing a 5' x 8' bus stop landing pad at each bus stop per section R308.1.1.1 of the ADA PROWAG during the next resurfacing project.
Botefuhr Avenue Intersection	13	Pedestrian Facilities	Consider realigning the north and south leg crosswalks to be more perpendicular with SR A1A. This would require constructing new curb ramps for those two crosswalks. Consider rebuilding the existing curb ramps so they meet the 4' minimum clear width as stated in the ADA PROWAG. As part of separating the curb ramps, consider individual pedestrian detector poles for each crosswalk at the intersection. Consider replacing the pedestrian detector signs with R10-3i pedestrian plaques which includes an arrow and MUTCD street name font indicating which street the pedestrian detector corresponds with. Consider implementing a leading pedestrian interval for the north and south leg crosswalks prior to the onset of the eastbound/westbound green phase.
Silver Beach Avenue	16	Pedestrian Facilities	Consider realigning the west and south leg crosswalks to be more perpendicular with Silver Beach Avenue and SR A1A. For the west crosswalk, a new curb ramp could be constructed on the south side of Silver Beach Avenue in the southwest corner of the intersection. For the south crosswalk, a new curb ramp could be constructed on the west side of SR A1A in the southwest corner of the intersection. As part of this suggestion, consider implementing a leading pedestrian interval for all four crosswalks prior to the onset of their respective conflicting green phases. The north and east crosswalks are not suggested to be moved due to the potential impacts to drainage inlets on the northeast corner of the intersection. As part of separating the curb ramps, consider individual pedestrian detector poles on the southwest corner of the intersection and building the curb ramps so they are ready for accessible pedestrian signals.
Silver Beach Avenue	17	Southwest Corner Accessibility	Consider constructing a sidewalk on the back (west) side of the pole that is level with the height of the poles base. From field observations, this improvement may impact right-of-way for the Sunoco gas station so working with the property owner to construct this sidewalk may be needed. If the crosswalks are realigned as described in **Issue #16: Pedestrian Facilities**, the pedestrian detectors and signals will be on separate poles near the new ramp locations.

Location	Issue Number	Issue	Suggestion
LONG-TERM IMPROVEMENT			
Corridor Wide	1	Lighting	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. This could be coupled with replacing the current high pressure sodium lighting with LED lighting.
Corridor Wide	6	Driveways	Consider driveway reconstruction during the roadway's next 3R project to provide a level path for the sidewalk and meet ADA guidance. As part of this construction, consider reducing the driveway widths down to the 36' maximum per FDOT Standard Index 515. As properties redevelop along the corridor, consider rebuilding the driveways. It appears these improvements can be done without negatively impacting parking or site circulation on the subject parcels. To address the issue of multiple driveways for the same property, consider driveway consolidation during potential redevelopments where feasible.
Corridor Wide Daytona Beach Section	7	Sidewalk Walkability	During the next roadway resurfacing project, consider rebuilding the curb ramps for the minor streets to meet ADA guidance and provide turning spaces at the top of the ramps. Daytona Beach Shores completed a streetscape project in 2013 where the sidewalks were rebuilt and the utilities along the corridor were put underground. Consider rebuilding the sidewalk in the Daytona Beach section and underground the utilities along the corridor to remove the sidewalk obstructions.
Corridor Wide Daytona Beach Section	9	Minor Streets with Driveway Connections	Consider removing the driveway connection during the roadway's next 3R project and construct an asphalt connection from these minor streets to SR A1A. Doing so will provide a level path for the sidewalk and meet ADA guidance. As discussed in **Issue #5: Minor Street Crosswalks and Stop Bars**, consider marking the crosswalk across the minor street and restriping the stop bars. Consider installing detectable warning surfaces at the two curb ramps of the intersection per FDOT Standard Index 304.

Appendix A – Crash Analysis Reference Materials

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Sunrise Blvd. to Park Ave.

Figure **1**



SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Park Ave. to Flamingo Ave.

Figure **2**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Flamingo Ave. to Frazar Ave.

Figure **3**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Frazar Ave. to Old Trail Rd.

Figure **4**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Old Trail Rd. to Tempko Terr.

Figure **5**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Tempko Terr. To Bostwick Ave.

Figure **6**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Bostwick Ave. to Phoenix Ave.

Figure **7**

SR/CR A1A Pedestrian Safety & Mobility Study
Collision Diagram (2009 – 2014)
Location B: Phoenix Ave. to Ribault Ave.

Figure **8**