

PEDESTRIAN SAFETY STUDY

SR A1A from US 192 to SR 518
Section 70060: SR A1A (MP17.536 TO 20.909)
Brevard County

Prepared for:

THE FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT 5 TRAFFIC OPERATIONS
719 South Woodland Boulevard, MS 3-562
DeLand, Florida 32720



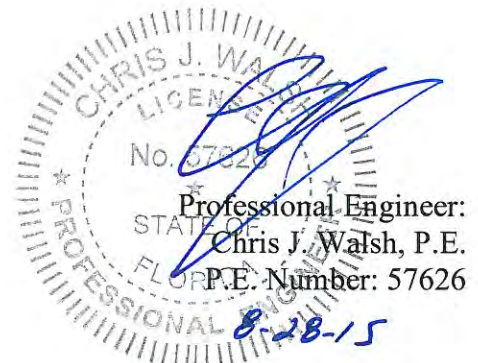
Districtwide Community Traffic Safety Program (CTSP)
Financial Project ID: 237995-1-32-90
Contract No.: C-9803
Consultant No.: 10445
Task Work Order: 9-Amendment 4
Study: 4

Prepared by:

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Certificate of Authorization License Number: 27392
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May 2015

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Chris J. Walsh, P.E.
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EXECUTIVE SUMMARY

Traffic Engineering Data Solutions, Inc. (TEDS) was retained on behalf of the Florida Department of Transportation (FDOT) to conduct a Safety Study on State Road A1A from US 192 to State Road 518 in Brevard County, Florida.

Over a five-year period there were a total of 24 pedestrian/bicycle-related crashes that were documented. These crashes resulted in two (2) fatalities, 22 injuries, and \$9,470 in estimated property damage. Based on engineering judgement, a review of crash history, the location of pedestrian generators and attractors, the proximity to bus stops, beach access locations, and adjacent signals, as well as field observations, 10 locations have been identified for the consideration of installing a midblock pedestrian crosswalk. The locations are summarized below:

- North of Watson Drive
- North of Niemira Avenue
- North of Flug Avenue
- North of Boskind Road
- North of Del Flora
- North of Terrace Shores Drive
- North of Pine Tree Drive
- North of Poinsetta Street
- North of Harris Boulevard
- South of Coral Way

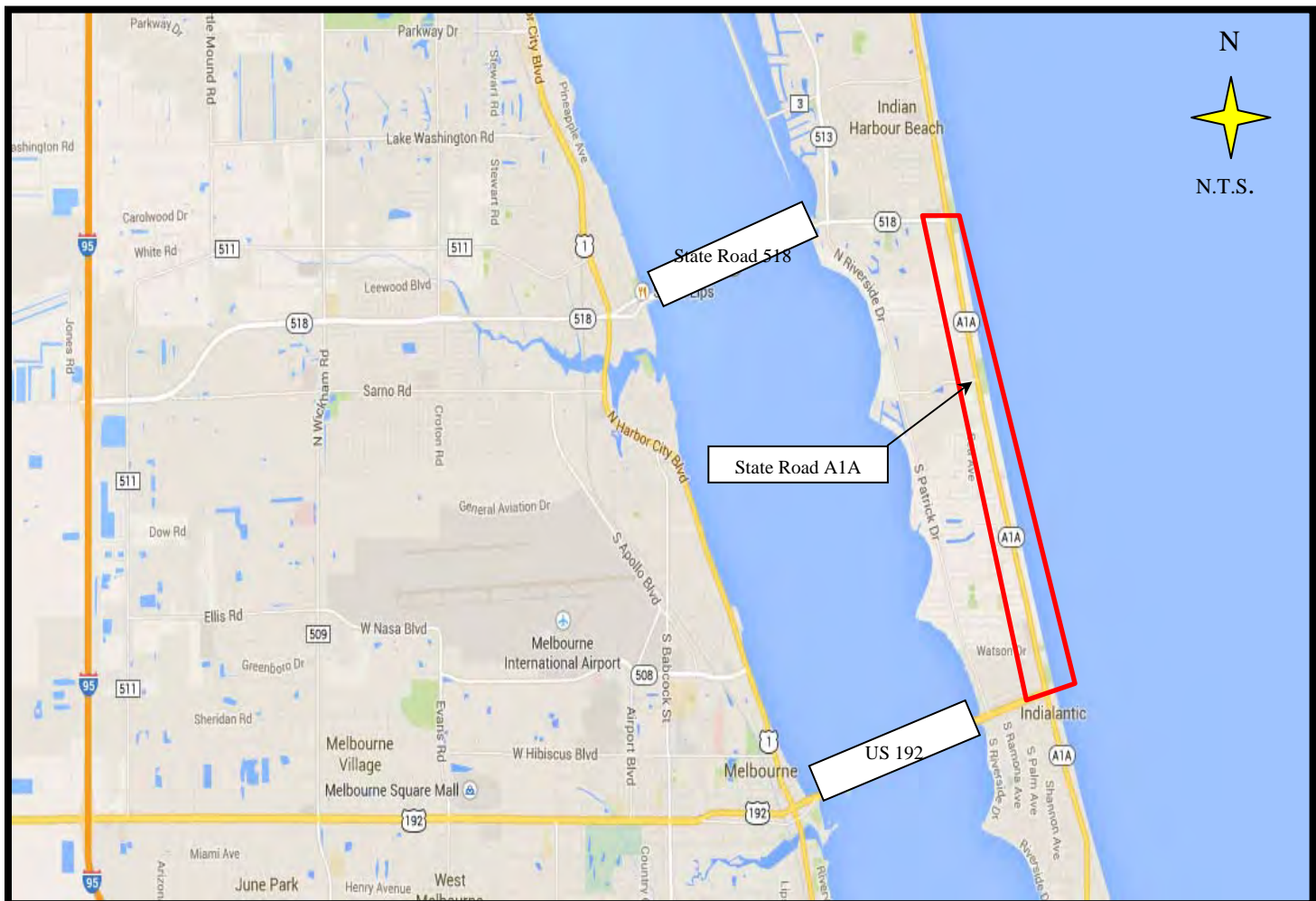
One (1) existing midblock crosswalk with a pedestrian refuge island, south of Second Avenue, was also evaluated and is recommended for retention. The total cost for installing the 10 midblock crosswalks and modifying the existing midblock crosswalk is estimated at approximately \$394,900.

INTRODUCTION

Traffic Engineering Data Solutions, Inc. (TEDS) was retained on behalf of the Florida Department of Transportation (FDOT) to conduct a Safety Study on State Road A1A from US 192 to State Road 518 within Indianalantic and unincorporated Brevard County, Florida. The purpose of this study is to review the State Road A1A corridor to identify the location for midblock pedestrian crossings to enhance pedestrian safety along the corridor. A location map of the study corridor is shown below as **Figure 1**.

The analysis methods used in completing this study are consistent with the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD 2009), the American Association of State Highway and Transportation Officials' (AASHTO) Highway Safety Manual, 2010, District 5 guidelines / procedures, and engineering judgment. This document contains existing conditions, crash analysis, qualitative assessment, improvement alternatives, a benefit-to-cost analysis, and final recommendations.

Figure 1
General Location Map
State Road A1A from US 192 to SR 518



(Source: Google Maps)

EXISTING CONDITIONS

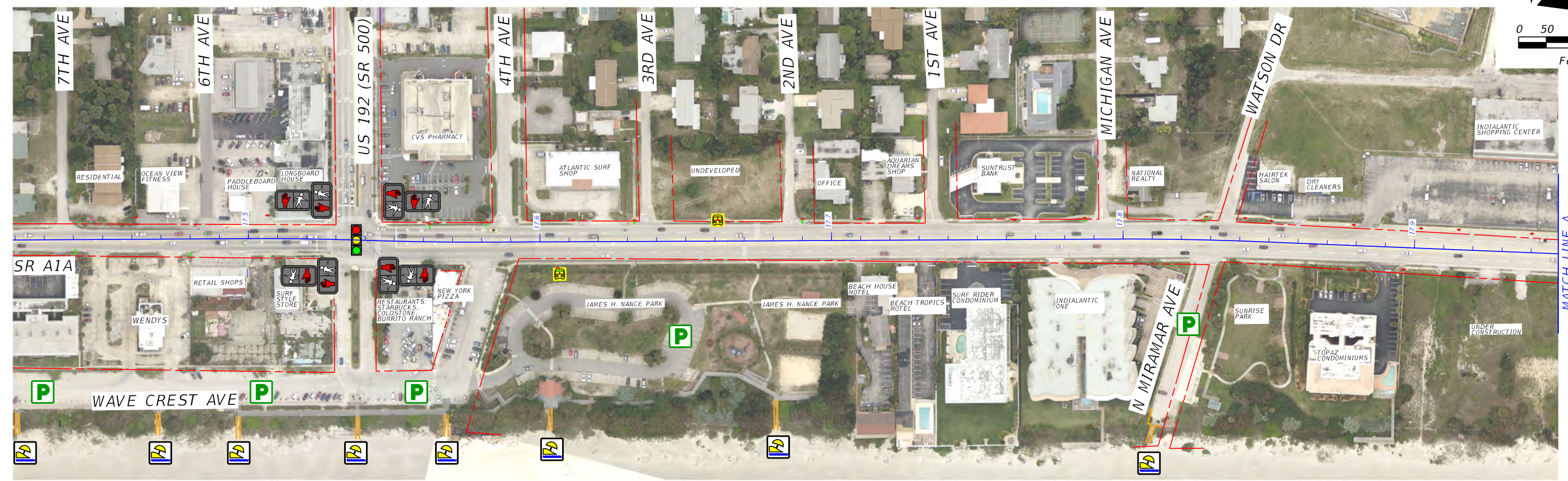
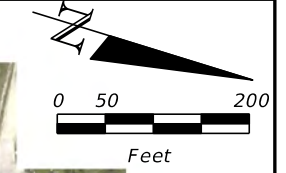
State Road A1A is a north-south arterial that extends along the coastline of Brevard County, Florida. Within the study limits, State Road A1A extends from US 192 through Indialantic to State Road 518 for a total distance of approximately 3.37 miles.

The majority of the land uses along the study corridor are comprised of condominiums, hotels, motels, restaurants, retail shops, public service facilities and public recreational parks. Space Coast Area Transit, Brevard County's public transit provider, has numerous bus stops along State Road A1A, providing service to adjacent communities such as Melbourne Beach, Melbourne, Indian Harbour Beach and Satellite Beach, as well as to other locations within the County.

An aerial photograph showing the study corridor and the surrounding area is depicted in **Figure 2**. Existing conditions for State Road A1A are shown in **Table 1**. A straight line diagram is attached in **Appendix A**.

Table 1
Summary of Existing Conditions
State Road A1A from US 192 to SR 518

Feature	Description
Main Line	<ul style="list-style-type: none"> • State Road A1A
Area Location	<ul style="list-style-type: none"> • Town of Indialantic and unincorporated Brevard County
State Road A1A	<ul style="list-style-type: none"> • <u>Cross Section:</u> <ul style="list-style-type: none"> ○ From US 192 to Flug Avenue - five-lane undivided urban section (curb and gutter) with a continuous two-way left-turn lane and shoulders ○ From Flug Avenue to 500 feet south of State Road 518 - five-lane undivided rural section (open drainage) with a continuous two-way left-turn lane and shoulders ○ From 500 feet south of State Road 518 to State Road 518 - four-lane divided rural section (open drainage) with shoulders and a grass median which transitions to a northbound left-turn lane with a concrete separator • <u>Access:</u> Class 6 • <u>Posted Speed Limit:</u> 40 miles per hour (mph) from US 192 to Palmetto Avenue; 45 mph from Palmetto Avenue to State Road 518 • <u>2013 AADT:</u> 24,000-26,500 vehicles per day (vpd) • <u>Alignment:</u> Straight • <u>Sidewalks:</u> <ul style="list-style-type: none"> ○ US 192 to Grosse Pointe Avenue - both sides ○ Grosse Pointe Avenue to just north of North Court – west side ○ Just north of North Court to Holy Name Way - both sides ○ Holy Name Way to State Road 518 - west side • <u>General Street Lighting:</u> Luminaires predominantly on the west side of the road approximately every 200' • <u>Utilities:</u> Overhead utilities stationed regularly on the west side of the road
Signalized Intersections	<ul style="list-style-type: none"> • US 192 – M.P. 17.536 (pedestrian features on all legs) • Grosse Pointe - M.P. 18.036 (pedestrian features on the south and west legs) • Paradise Boulevard - M.P. 19.770 (pedestrian features on the south and north legs) • Holy Name Way - M.P. 20.648 (pedestrian features on the south and west legs) • State Road 518 - M.P. 20.909 (pedestrian features on the south and east legs)
Midblock Pedestrian Crosswalks	<ul style="list-style-type: none"> • One (1) existing midblock pedestrian crosswalk with a pedestrian refuge island, approximately 50 feet south of Second Avenue



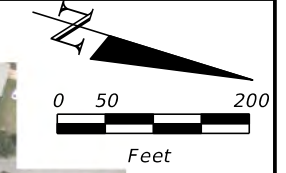
**SECTION 70060 - MP 17.536 - MP 20.909
SR A1A FROM US 192 TO SR 518
BREVARD COUNTY - FLORIDA**

Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 2 (SHEET 1 OF 4)
EXISTING CONDITION DIAGRAM



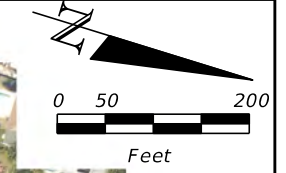
**SECTION 70060 - MP 17.536 - MP 20.909
SR A1A FROM US 192 TO SR 518
BREVARD COUNTY - FLORIDA**

Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
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FIGURE 2 (SHEET 2 OF 4)
EXISTING CONDITION DIAGRAM



**SECTION 70060 - MP 17.536 - MP 20.909
SR A1A FROM US 192 TO SR 518
BREVARD COUNTY - FLORIDA**

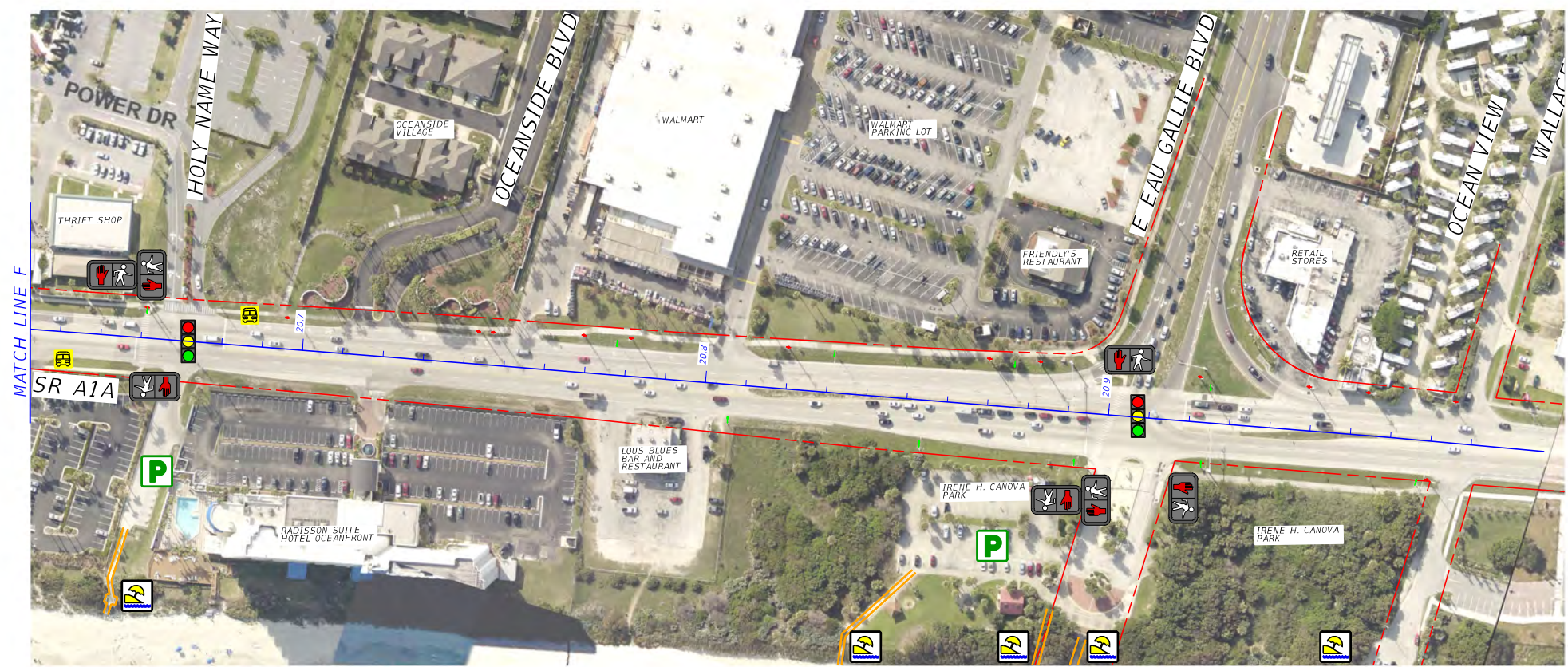
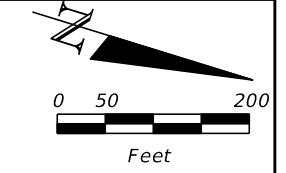
Symbols:	
	Beach Access
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FIGURE 2 (SHEET 3 OF 4)
EXISTING CONDITION DIAGRAM

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SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:					

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FIGURE 2 (SHEET 4 OF 4)
 EXISTING CONDITION DIAGRAM

COLLISION ANALYSIS

Pedestrian and bicyclist safety along the corridor was assessed through review of crash reports and field observations. Crash data for State Road A1A within the study limits was obtained from FDOT's CARS database and the University of Florida's *Signal Four Analytics* for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were 24 bicyclist and pedestrian crashes reported along the study corridor as summarized below:

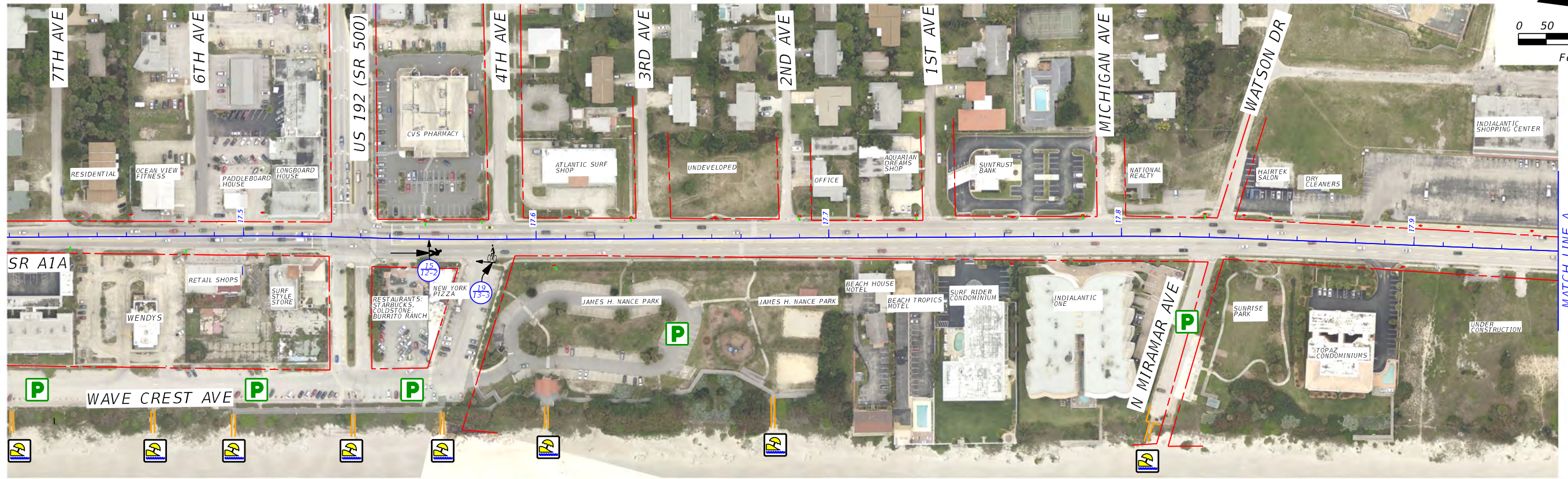
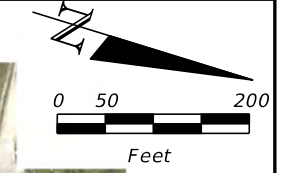
- The 24 crashes resulted in two (2) fatalities, 22 injuries, and \$9,470 in estimated property damage.
- Twelve (12) of the crashes occurred during the day while 12 crashes occurred at night.
- One (1) of the 24 crashes occurred under wet pavement conditions.
- Ten (10) of the 24 crashes occurred when pedestrian/bicyclists were crossing State Road A1A.
- Eight (8) pedestrian crashes occurred:
 - All eight (8) crashes involved a pedestrian crossing eastbound or westbound on State Road A1A.
 - None of the crashes occurred within a marked pedestrian crosswalk.
 - Two (2) of the crashes resulted in fatalities which are summarized below:
 - A fatality occurred at State Road A1A immediately adjacent to Waters Edge Lane on March 1, 2010 at 7:25 pm. The pedestrian walked westbound into the southbound lane in the path of the vehicle. The pedestrian tested positive for alcohol. There are no marked crosswalks across State Road A1A in close proximity to the crash location.
 - A fatality occurred on State Road A1A just south of Pine Tree Drive on February 18, 2011 at 10:55 pm. The pedestrian walked westbound into the southbound lane in the path of a vehicle. The driver fled the scene but was later arrested. The driver was suspected of alcohol use. There are no marked crosswalks across State Road A1A in close proximity to the crash location.
- Sixteen (16) bicyclist crashes occurred:
 - Two (2) crashes occurred while bicyclists were crossing State Road A1A, one (1) crash of which occurred just north of a marked pedestrian crosswalk.
 - Eleven (11) bicyclist crashes occurred when bicyclists were crossing side streets or driveways northbound or southbound.
 - Three (3) crashes involved bicyclists riding northbound or southbound on the shoulders of State Road A1A.

A detailed collision summary is provided in **Table 2** on the following pages and graphically depicted as **Figure 3**.

**Table 2
Summary of Collision Data
State Road A1A from US 192 to SR 518**

FLORIDA DEPARTMENT OF TRANSPORTATION														
COLLISION SUMMARY														
Section: 70060			County Road: SR A1A						County: Brevard					
Intersecting route: US 192 to SR 518			Milepost: 17.536 to 20.909						Data by: KJM					
Study period: 1/1/2010			to 12/31/2014						Date: 3/6/2015					
NO.	DATE	DAY	TIME	FATAL	INJURY	INJURY SEVERITY	PROPERTY DAMAGE	HARMFUL EVENT	Approximate Mile Post	DUI	DAY / NIGHT	WET / DRY	Form	CONTRIBUTING CAUSE
1	03/01/10	Monday	19:25	1	0	5	\$750	Pedestrian	19.17	N	Night	Dry	Long	Ped/Bike FTYRW of Veh
2	03/20/10	Saturday	10:27	0	1	3	\$50	Pedestrian	20.75	N	Day	Dry	Long	Ped/Bike FTYRW of Veh
3	03/30/10	Tuesday	20:20	0	1	3	\$50	Bicycle	18.76	N	Night	Dry	Long	Veh FTYRW of Ped/Bike
4	05/29/10	Saturday	21:05	0	1	2	\$0	Bicycle	18.46	N	Night	Dry	Long	Ped/Bike FTYRW of Veh
5	07/16/10	Friday	21:57	0	1	2	\$0	Pedestrian	19.77	N	Night	Dry	Long	Ped/Bike FTYRW of Veh
6	02/17/11	Thursday	2:20	0	1	2	\$200	Bicycle	19.80	N	Night	Dry	Long	Veh FTYRW of Ped/Bike
7	02/18/11	Friday	22:55	1	0	5	\$1,500	Pedestrian	19.11	N	Night	Dry	Long	Ped/Bike FTYRW of Veh
8	07/24/11	Sunday	19:00	0	1	2	\$60	Bicycle	18.76	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
9	12/18/11	Sunday	2:05	0	1	4	\$250	Pedestrian	20.80	Y	Night	Dry	Long	Veh FTYRW of Ped/Bike
10	12/19/11	Monday	8:40	0	1	3	\$100	Bicycle	20.08	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
11	03/09/12	Friday	20:50	0	1	2	\$700	Bicycle	18.38	N	Night	Wet	Long	Veh FTYRW of Ped/Bike
12	03/28/12	Wednesday	14:18	0	1	3	\$450	Bicycle	19.70	N	Day	Dry	Long	Failed To Stop at STOP Sign
13	05/01/12	Tuesday	16:50	0	1	3	\$300	Bicycle	20.54	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
14	10/12/12	Friday	17:30	0	0	1	\$400	Bicycle	20.72	N	Day	Dry	Short	Ped/Bike FTYRW of Veh
15	11/13/12	Tuesday	19:35	0	1	2	\$200	Pedestrian	17.56	N	Night	Dry	Long	Ped/Bike FTYRW of Veh
16	11/24/12	Saturday	22:15	0	1	3	\$2,100	Bicycle	20.54	N	Night	Dry	Long	Veh FTYRW of Ped/Bike
17	06/04/13	Tuesday	12:15	0	1	3	\$200	Pedestrian	18.51	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
18	06/25/13	Tuesday	9:30	0	1	2	\$100	Bicycle	20.54	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
19	10/04/13	Friday	12:53	0	1	3	\$0	Bicycle	17.58	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
20	10/17/13	Thursday	15:29	0	1	3	\$1,000	Bicycle	19.53	Y	Day	Dry	Long	Ped/Bike FTYRW of Veh
21	12/15/13	Sunday	15:00	0	1	3	\$50	Bicycle	20.86	N	Day	Dry	Long	Ped/Bike FTYRW of Veh
22	02/13/14	Thursday	8:00	0	1	3	\$300	Bicycle	18.27	N	Day	Dry	Long	Veh FTYRW of Ped/Bike
23	09/13/14	Saturday	20:00	0	1	3	\$510	Bicycle	20.66	Y	Night	Dry	Long	Ped/Bike FTYRW of Veh
24	10/17/14	Friday	2:08	0	2	4	\$200	Pedestrian	20.11	Y	Night	Dry	Long	Veh FTYRW of Ped/Bike
TOTAL				2	22		\$9,470							
Total No.	Fatal	Injury	Property Damage Only	Pedestrian	Bicycle	INJURY SEVERITY					Long	Short		
24	2	21	1	8	16	1=None 2=Possible injury 3=Non-incapacitating					16	1		
PERCENT	8%	88%	4%	33%	67%	4=Incapacitating 5=Fatality					67%	4%		
CONTRIB-CAUSE	Day	Night	PAVEMENT CONDITION			DUI	Ped/Bike FTYRW of Veh	Veh FTYRW of Ped/Bike	Lost Control	Failed To Stop at STOP Sign	Ran Red Light	Bike Travelling Wrong Way On Shoulder		
TOTAL	12	12	1	23	0	4	10	13	0	1	0	0		
PERCENT	50%	50%	4%	96%	0%	17%	42%	54%	0%	4%	0%	0%		

Source: Florida Department of Transportation and University of Florida's Signal Four Analytics



- SHORT FORM CRASHES
- LONG FORM CRASHES

SYMBOLS:

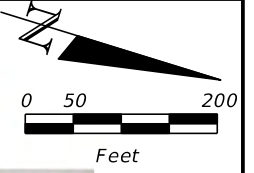
	CRASH NUMBER		LEFT TURN COLLISION		REAR END COLLISION		SIDE SWIPE COLLISION
	INJURY SEVERITY		PEDESTRIAN COLLISION		LOSS OF CONTROL		OTHER
	1=NO INJURY		ANGLE COLLISION		BACKED INTO COLLISION		OVERTURNED VEHICLE
	2=POSSIBLE INJURY		FIXED OBJECT				
	3=NON-INCAPACITATING						
	4=INCAPACITATING						
	5=FATALITY						

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FIGURE 3 (SHEET 1 OF 4)
 COLLISION DIAGRAM
 (01/01/2010 TO 12/31/2014)

SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA



- SHORT FORM CRASHES
- LONG FORM CRASHES

SYMBOLS:

INJURY SEVERITY
 1=NO INJURY
 2=POSSIBLE INJURY
 3=NON-INCAPACITATING
 4=INCAPACITATING
 5=FATALITY

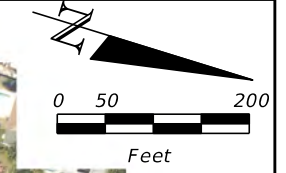
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FIGURE 3 (SHEET 2 OF 4)
 COLLISION DIAGRAM
 (01/01/2010 TO 12/31/2014)

SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

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 12



SECTION 7060 - MP 17.536 - MP 20.909
SR A1A FROM US 192 TO SR 518
BREVARD COUNTY - FLORIDA

- SHORT FORM CRASHES
- LONG FORM CRASHES

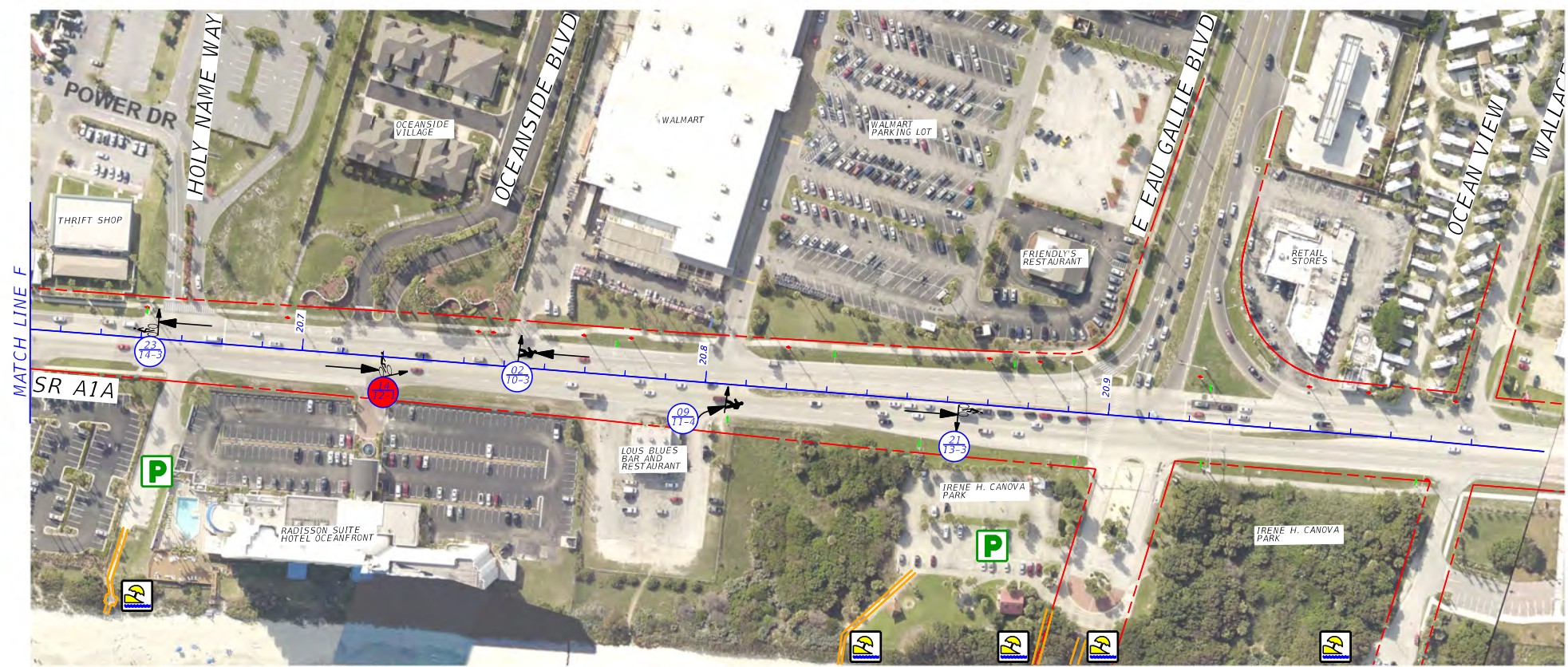
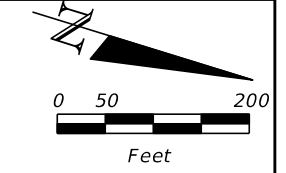
SYMBOLS:

	CRASH NUMBER		LEFT TURN COLLISION		REAR END COLLISION		SIDE SWIPE COLLISION
	INJURY SEVERITY		PEDESTRIAN COLLISION		LOSS OF CONTROL		OTHER
	1=NO INJURY		ANGLE COLLISION		BACKED INTO COLLISION		OVERTURNED VEHICLE
	2=POSSIBLE INJURY		FIXED OBJECT				
	3=NON-INCAPACITATING						
	4=INCAPACITATING						
	5=FATALITY						

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FIGURE 3 (SHEET 3 OF 4)
 COLLISION DIAGRAM
 (01/01/2010 TO 12/31/2014)



- SHORT FORM CRASHES
- LONG FORM CRASHES

SYMBOLS:

	LEFT TURN COLLISION		REAR END COLLISION		SIDE SWIPE COLLISION
	PEDESTRIAN COLLISION		LOSS OF CONTROL		OTHER
	ANGLE COLLISION		BACKED INTO COLLISION		OVERTURNED VEHICLE
	FIXED OBJECT				

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FIGURE 3 (SHEET 4 OF 4)
 COLLISION DIAGRAM
 (01/01/2010 TO 12/31/2014)

SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

QUALITATIVE ASSESSMENT

Operations: Operations include the efficiency of operation and interaction of motor vehicles, pedestrians and bicycles along the corridor. The study corridor of A1A was observed mid-day to evaluate pedestrian/bicyclist activity along the corridor by a registered professional engineer. The weather was warm and slightly cloudy. The goal of the observations was to determine the need for any improvements to enhance the safety and efficiency of the corridor.

- Brevard County Schools were on spring break and parking lots at the beachfront parks were generally full.
- Beach activity appeared to be at a high level.
- Throughout the study corridor, State Road A1A is mostly a five-lane section with a two-way continuous left-turn lane. Throughout the study corridor pedestrians were observed to use both a one-stage and two-stage crossing. A pedestrian conducts a two-stage crossing by first crossing one direction of traffic, and then waiting within the two-way continuous turn lane for a gap in the other direction of traffic before crossing the other direction of traffic.
- Pedestrians were observed jogging/running across State Road A1A.
- Bicyclists were observed travelling along State Road A1A as well as along the sidewalks of State Road A1A.
- Along the corridor, motorists on State Road A1A (both northbound and southbound) generally have a clear line of sight of any pedestrians located on either side of State Road A1A.
- Based on driving with the flow of traffic, vehicular speeds were noted to be relatively consistent with the posted speed limit.
- Vehicular traffic was busy with frequent platoons of cars created by the signalized intersections.
- No evasive maneuvers were identified with regard to potential vehicular-pedestrian or bicycle conflicts, however, numerous vehicles did apply brakes slowly when passing a pedestrian staged within the two-way left-turn lane.

Safety: Vehicle, pedestrian, and bicycle safety along the study corridor was assessed through review of crash reports, identification of significant crash trends, and correlation to field conditions. The following are observations related to the safety of the corridor based on the various field reviews:

- No signs of skid marks, broken glass, plastic, or other indication of a crash were observed along the corridor.
- Based on a review of crash data for State Road A1A within the study limits for the five-year period between January 1, 2010 and December 31, 2014, no specific trend was identified. Bicycle crashes occurred at driveways or side streets but did not repeatedly occur at any one particular location.
- Two (2) fatalities occurred within approximately 370 feet of each other. **It is recommended to provide a midblock pedestrian crosswalk in close proximity to Pine Tree Drive/Waters Edge Lane.**

- Four bicycle/pedestrian crashes occurred between Holy Name Way and State Road 518. Due to signals located at Holy Name Way and State Road 518 and the heavy vehicular activity to/from the Walmart, the inclusion of a midblock pedestrian crossing is not recommended for the following reasons:
 - Vehicular queues at a midblock pedestrian crossing could extend into the influence area of adjacent signalized intersections.
 - The installation of a refuge island would either reduce northbound left-turn lane storage length at the Walmart's northern driveway or restrict access for trucks entering/exiting the Walmart's southern driveway on State Road A1A.

Maintenance: During the various field reviews the condition of the study corridor's asphalt, striping, signing and lighting were observed. The following are observations related to the maintenance of the study corridor based on the various field reviews:

- The signs, pavement markings, and pavement conditions along State Road A1A are in good condition.

MIDBLOCK PEDESTRIAN CROSSING EVALUATION

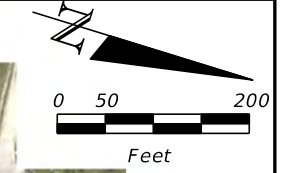
Midblock pedestrian crosswalks are utilized for the purposes of enhancing pedestrian connectivity and providing for pedestrian crossings at predictable locations in an effort to promote pedestrian/bicycle safety.

Based on engineering judgement, a review of crash history, the location of pedestrian generators and attractors, the proximity to bus stops, beach access locations, and adjacent signals, as well as field observations, 10 locations have been identified for the consideration of installing a midblock pedestrian crosswalk. When identifying midblock crosswalk locations, consideration was also given to minimizing impacts to driveway and side street access. The following summarizes the list of proposed midblock crosswalk locations:

- North of Watson Drive
- North of Niemira Avenue
- North of Flug Avenue
- North of Boskind Road
- North of Del Flora
- North of Terrace Shores Drive
- North of Pine Tree Drive
- North of Poinsetta Street
- North of Harris Boulevard
- South of Coral Way

One (1) existing midblock crosswalk with a pedestrian refuge island, approximately 50 feet south of Second Avenue, was also evaluated for retention, relocation or removal.

An aerial photograph showing the study corridor, crossing locations and distances in between crossing locations or signals is depicted in **Figure 4**.



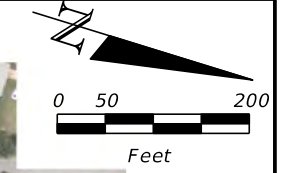
SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:

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 DelBary, FL 32715
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 Fax: 386.753.0778

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION

FIGURE 4 (SHEET 1 OF 4)
 OVERALL IMPROVEMENT DIAGRAM



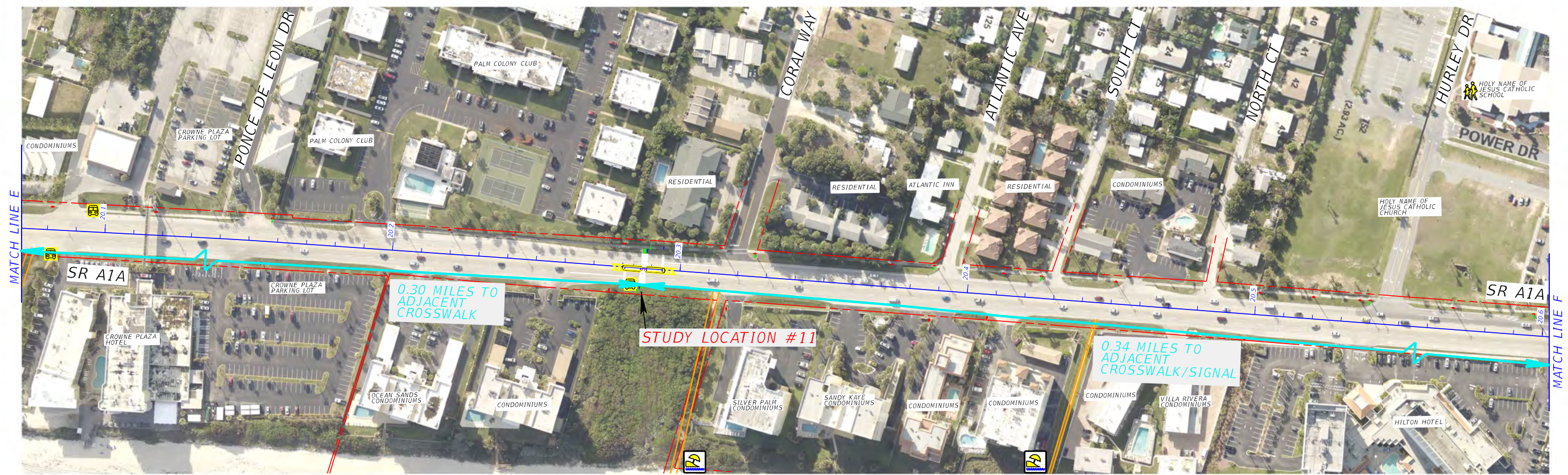
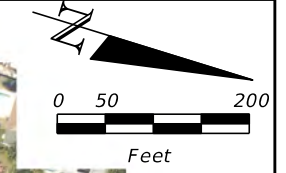
SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 4 (SHEET 2 OF 4)
 OVERALL IMPROVEMENT DIAGRAM



SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

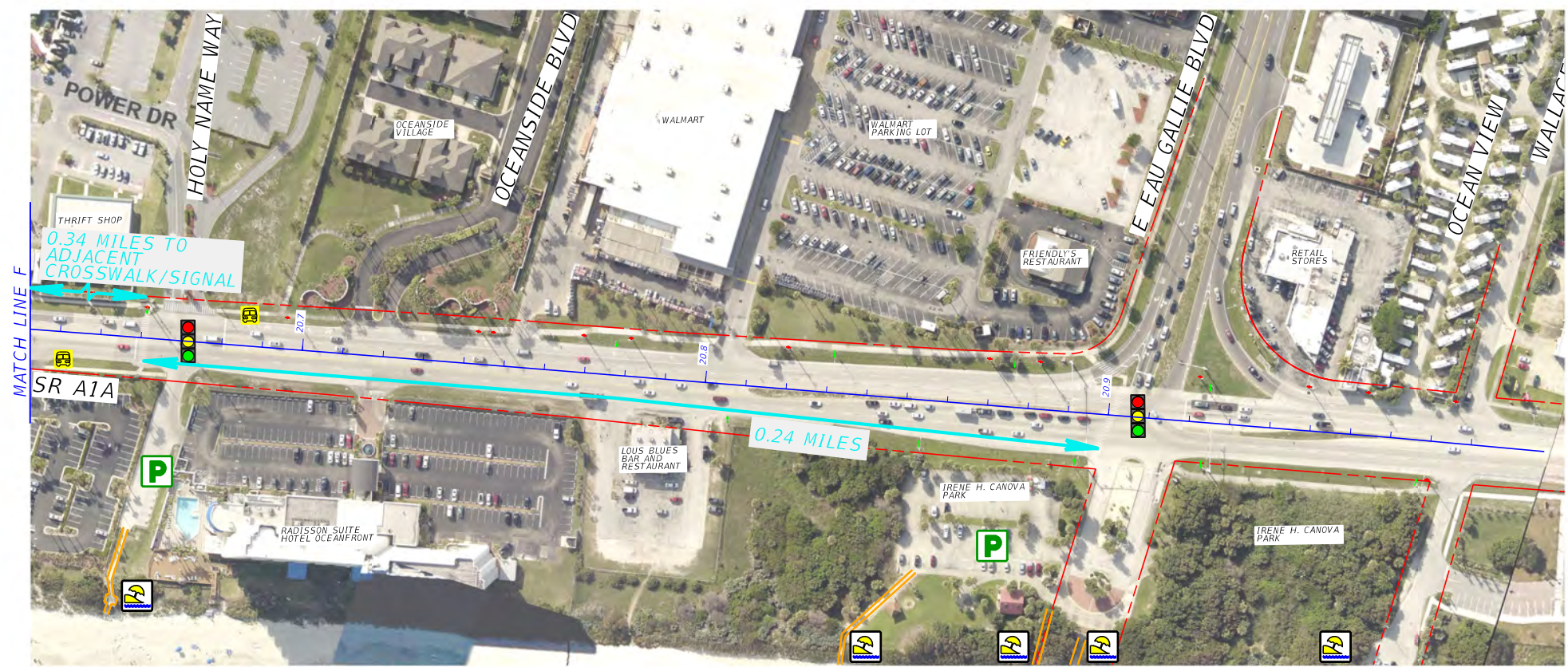
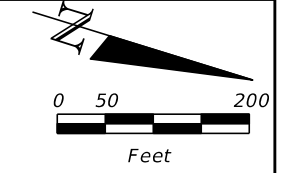
Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 4 (SHEET 3 OF 4)
 OVERALL IMPROVEMENT DIAGRAM

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SECTION 70060 - MP 17.536 - MP 20.909
 SR A1A FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

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FIGURE 4 (SHEET 4 OF 4)
 OVERALL IMPROVEMENT DIAGRAM

Crossing Location #1

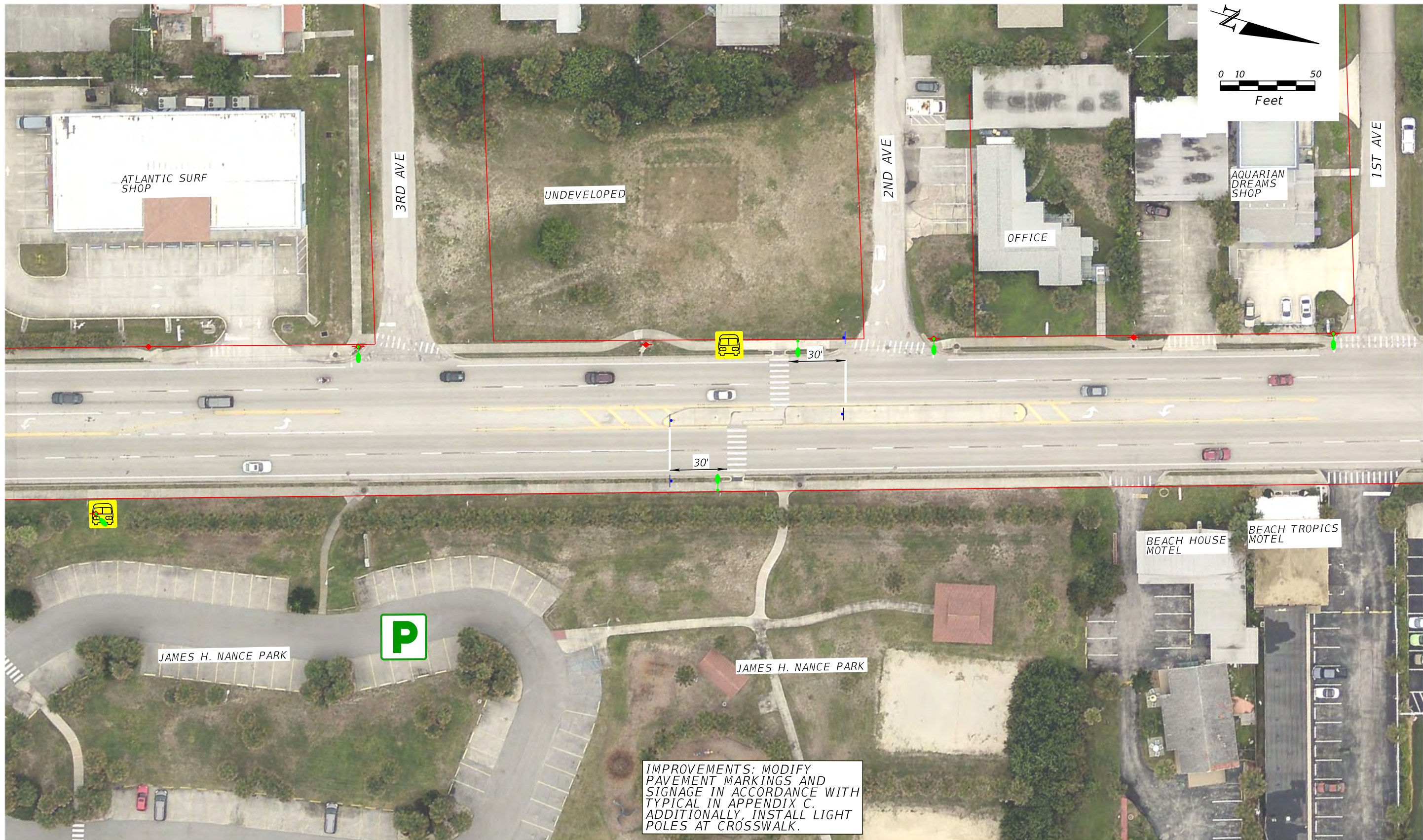
Existing Conditions

Crossing location #1 is on State Road A1A south of Second Avenue where an existing midblock pedestrian crosswalk with a refuge island is located. **Table 3** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 5**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and James H. Nance Park and the beach. Public beach access is provided within the park.

Table 3
Summary of Existing Conditions
Crossing location #1

Feature	Description
Main Line	<ul style="list-style-type: none"> State Road A1A
Location of Crossing	<ul style="list-style-type: none"> 50' south of Second Avenue
Adjacent Land Uses	<ul style="list-style-type: none"> <u>Southwest</u>: Undeveloped <u>Southeast</u>: James H. Nance Park <u>Northwest</u>: Certon Engineering <u>Northeast</u>: James H. Nance Park
Traffic Control	<ul style="list-style-type: none"> State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <u>South</u>: US 192 – 0.13 miles <u>North</u>: Gross Pointe Avenue – 0.38 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> <u>South</u>: US 192 – 0.13 miles <u>North</u>: Gross Pointe Avenue – 0.38 miles
State Road A1A	<ul style="list-style-type: none"> <u>Cross Section</u>: 5-lane undivided urban section with a continuous bi-directional left-turn lane <u>Access</u>: Class 6 <u>Posted Speed Limit</u>: 40 mph <u>AADT</u>: 24,000 vehicles per day (year 2013) <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Sidewalks</u>: Both sides <u>Street Lighting</u>: one (1) luminaire 90' north on the northwest corner of the intersection with Second Avenue; None within 200' south <u>Bus Stops</u>: 10' south (west side), 320' south (east side), 1,700' north (west side) & 1,870' north (east side)



SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Traffic Signal
	Bus Stop
	Power Pole
	Public Parking
	Pedestrian Signal
	School
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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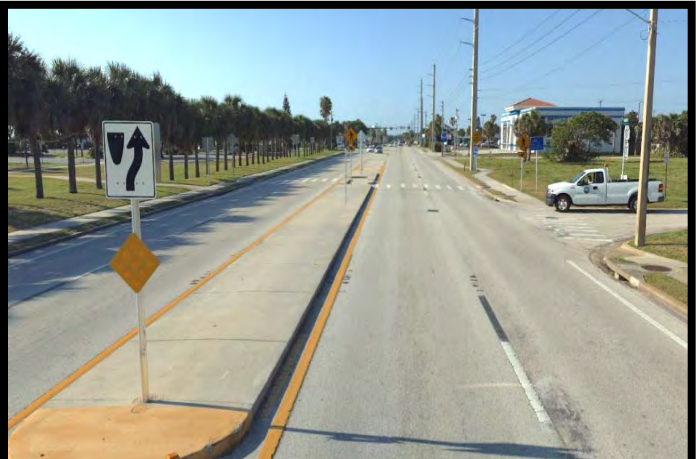
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FIGURE 5
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #1

Photographs of Crossing location #1



On State Road A1A looking north at the existing crossing location south of Second Avenue



On State Road A1A looking south at the existing crossing location south of Second Avenue (Bing Maps)



On State Road A1A looking east at existing crossing location #1 just south of Second Avenue (Bing Maps)



On State Road A1A looking south at existing crossing location #1 just south of Second Avenue (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that the midblock pedestrian crosswalk and refuge island be retained south of Second Avenue for the following reasons:

- There are significant pedestrian generators (residences) to the west of State Road A1A and pedestrian attractors (the beach and James H. Nance Park) to the east of State Road A1A.
- Beach access is provided in close proximity to the proposed crosswalk location.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.
- The proposed midblock crossing location is within 100 feet of a bus stop.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is also recommended that the refuge island be retained. However, it is proposed to modify the pavement markings and signage in the vicinity of the existing midblock crosswalk to feature a 30-foot distance between the northbound/southbound stop bars and crosswalks. Additionally, street lighting is proposed to be installed in the vicinity of the existing midblock crosswalk. A typical midblock pedestrian crosswalk showing the standard pavement markings and signage is included in **Appendix B**. Pavement markings for the typical midblock pedestrian crosswalks are in accordance with Index 17346 of FDOT's Design Standards, 2015. These improvements are shown in **Figure 5**. The costs associated with the signage and pavement marking modifications and street lighting installation are estimated at approximately \$25,400 per the typical cost estimate in **Appendix C**.

Crossing location #2

Existing Conditions

Crossing location #2 is on State Road A1A north of the intersection with Watson Drive and adjacent to Sunrise Park. **Table 4** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 6**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the beach, as public beach access is provided across from Watson Drive through Miramar Avenue and also provided in Sunrise park. Also, pedestrians/bicyclists would utilize this crosswalk to travel between retail businesses on the west side of State Road A1A and condominiums/hotels on the east side of State Road A1A.

Table 4
Summary of Existing Conditions
Crossing location #2

Feature	Description
Main Line	<ul style="list-style-type: none"> State Road A1A
Location of Crossing	<ul style="list-style-type: none"> North of Watson Drive
Adjacent Land Uses	<ul style="list-style-type: none"> <u>Southwest</u>: National Realty <u>Southeast</u>: Sunrise Park <u>Northwest</u>: Hairtek salon/dry cleaners <u>Northeast</u>: Sunrise Park/Topaz condominiums
Traffic Control	<ul style="list-style-type: none"> State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <u>South</u>: US 192 – 0.31 miles <u>North</u>: Gross Pointe Avenue – 0.20 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> <u>South</u>: 180' north of 3rd Avenue – 0.18 miles <u>North</u>: Gross Pointe Avenue – 0.20 miles
State Road A1A	<ul style="list-style-type: none"> <u>Cross Section</u>: 5-lane undivided urban section with a continuous bi-directional left-turn lane <u>Access</u>: Class 6 <u>Posted Speed Limit</u>: 40 mph <u>AADT</u>: 24,000 vehicles per day (year 2013) <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Sidewalks</u>: Both sides <u>Street Lighting</u>: One (1) luminaire 100' south on the southwest corner of the intersection with Watson Drive; none within 200' north <u>Bus Stops</u>: 965' south (west side), 1,270' south (east side), 745' north (west side) & 900' north (east side)



SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Traffic Signal
	Bus Stop
	Power Pole
	Public Parking
	Pedestrian Signal
	School
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 6
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #2

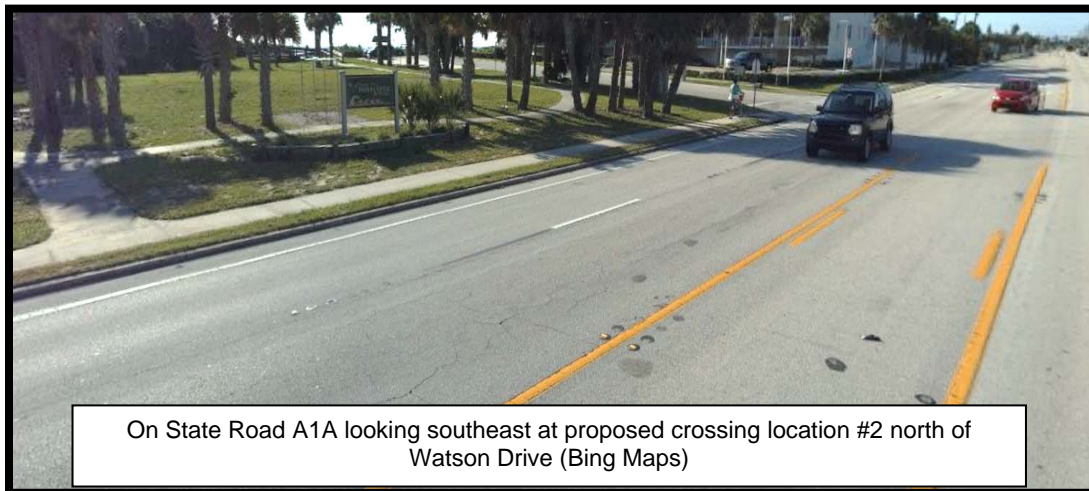
Photographs of Crossing location #2



On State Road A1A looking northeast at the proposed crossing location north of Watson Drive



On State Road A1A looking northwest at the proposed crossing location north of Watson Drive



On State Road A1A looking southeast at proposed crossing location #2 north of Watson Drive (Bing Maps)



On State Road A1A looking south at proposed crossing location #2 north of Watson Drive (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Watson Drive for the following reasons:

- There are significant pedestrian attractors (Sunrise Park and the beach) and pedestrian generators (Indialantic One and Topaz Condominiums) to the east of State Road A1A.
- Beach access is provided within 100 feet of the proposed crosswalk location.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Although such an island would restrict driveway access to the Hairtek Salon/Dry Cleaners driveway on the west side of the road, full access to these facilities is available via Watson Drive or via another driveway 160 feet to the north of the proposed midblock pedestrian crossing. These improvements are shown in **Figure 6**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$37,300, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #3

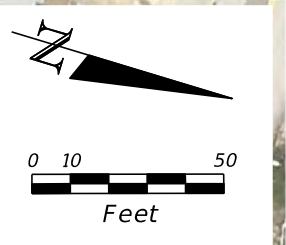
Existing Conditions

Crossing location #3 is on State Road A1A north of the intersection with Niemira Avenue. **Table 5** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 7**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the condominiums and beach on the east side of the road. There is a public beach access 230 feet south of proposed crossing location #3.

Table 5
Summary of Existing Conditions
Crossing location #3

Feature	Description
Main Line	<ul style="list-style-type: none"> State Road A1A
Location of Crossing	<ul style="list-style-type: none"> North of Niemira Avenue
Adjacent Land Uses	<ul style="list-style-type: none"> <u>Southwest</u>: Cantina Dos Amigos Restaurant <u>Southeast</u>: Commodore Club <u>Northwest</u>: ABC Liquor Store <u>Northeast</u>: Commodore Club
Traffic Control	<ul style="list-style-type: none"> State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <u>South</u>: Gross Pointe Avenue – 0.13 miles <u>North</u>: Paradise Boulevard – 1.58 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> <u>South</u>: Gross Pointe Avenue – 0.13 miles <u>North</u>: Paradise Boulevard – 1.58 miles
State Road A1A	<ul style="list-style-type: none"> <u>Cross Section</u>: 5-lane undivided urban section with a continuous bi-directional left-turn lane <u>Access</u>: Class 6 <u>Posted Speed Limit</u>: 40 mph <u>AADT</u>: 24,000 vehicles per day (year 2013) <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Sidewalks</u>: West side of the road <u>Street Lighting</u>: None within 200' <u>Bus Stops</u>: 880' south (west side), 710' south (east side), 480' north (west side) & 1,860' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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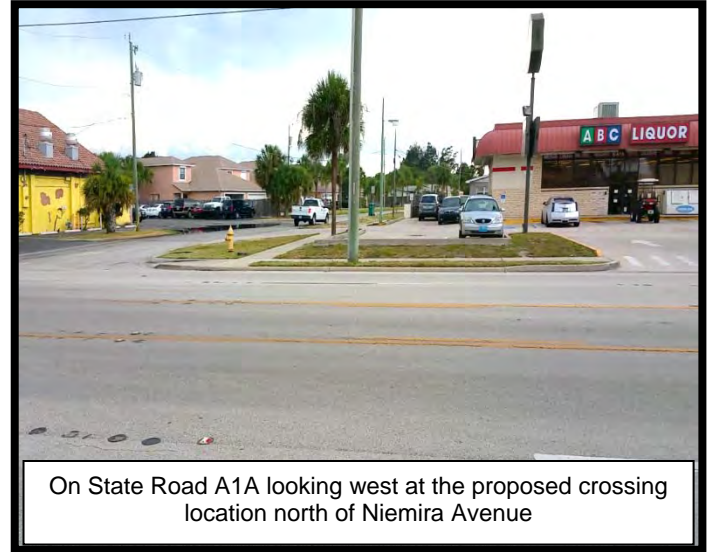
FIGURE 7
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #3

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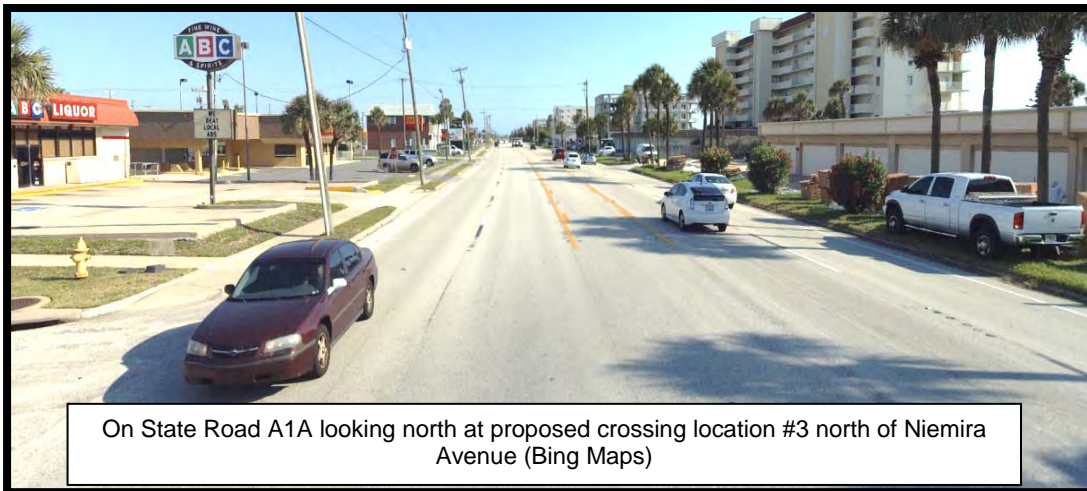
Photographs of Crossing location #3



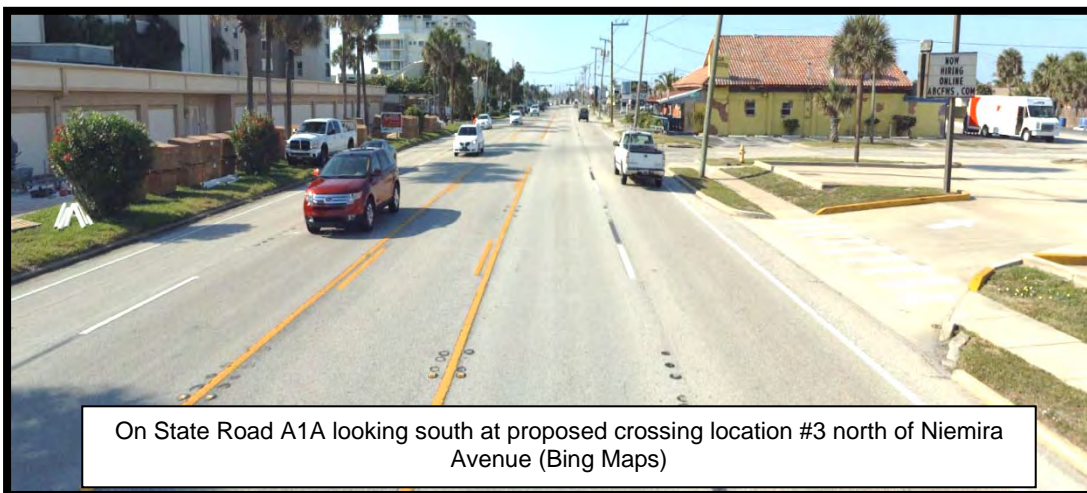
On State Road A1A looking east at the proposed crossing location north of Niemira Avenue



On State Road A1A looking west at the proposed crossing location north of Niemira Avenue



On State Road A1A looking north at proposed crossing location #3 north of Niemira Avenue (Bing Maps)



On State Road A1A looking south at proposed crossing location #3 north of Niemira Avenue (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Niemira Avenue for the following reasons:

- There are significant pedestrian attractors (Cantina Dos Amigos Restaurant, ABC Liquor Store, Wells Fargo) to the west of State Road A1A, and pedestrian generators (Commodore Club) and pedestrian attractors (beach) to the east of State Road A1A.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island would not restrict driveway access as the ABC Liquor Store driveway on the west side of the road is right-in only. These improvements are shown in **Figure 7**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$37,300, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #4

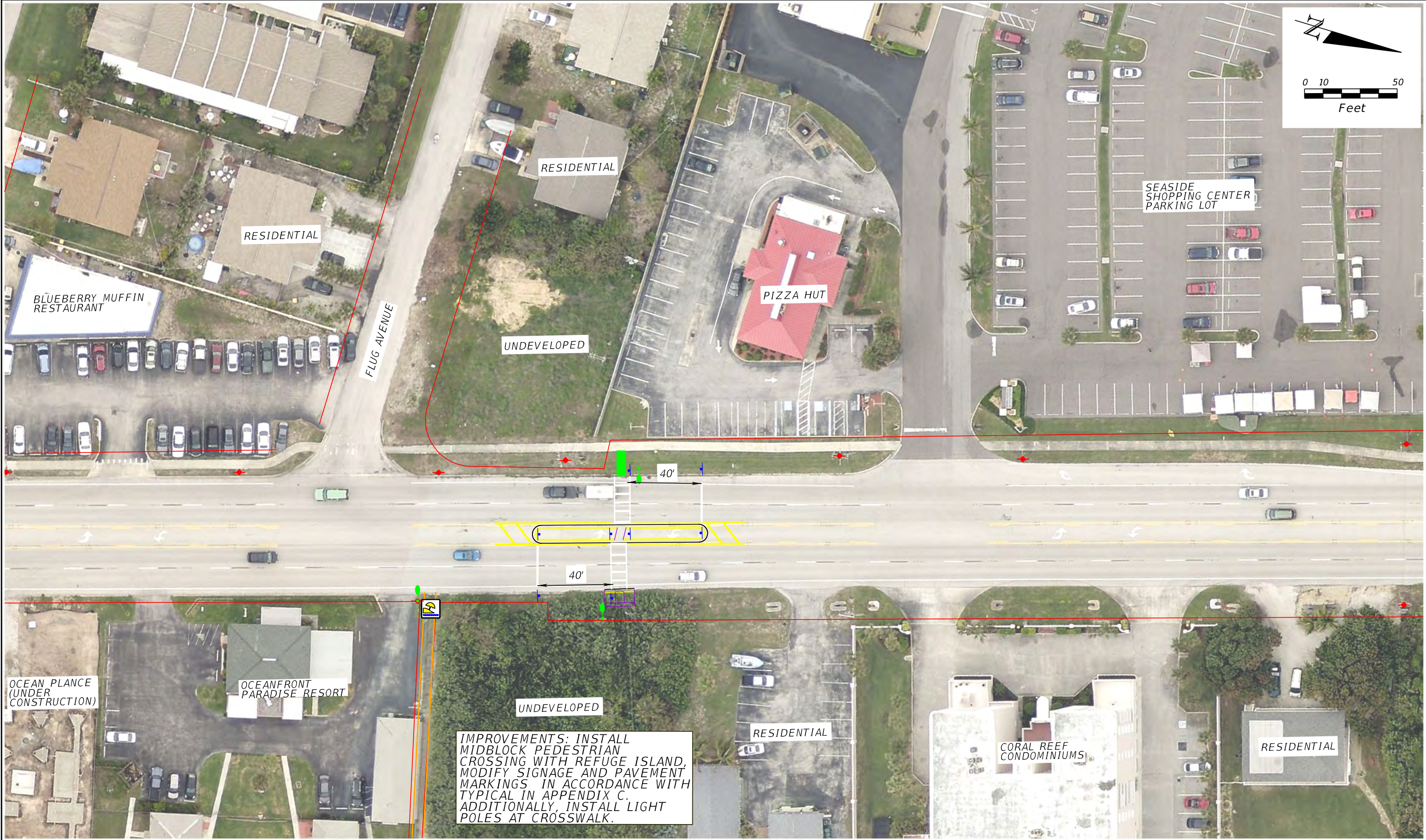
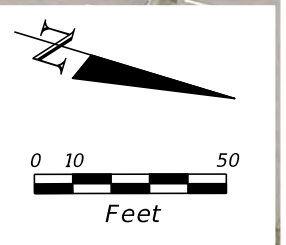
Existing Conditions

Crossing location #4 is on State Road A1A north of the intersection with Flug Avenue. **Table 6** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 8**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the beach. Public beach access is provided 90 feet south of proposed crossing location #4. Also, pedestrians/bicyclists would utilize this crosswalk to travel between retail businesses on the west side of State Road A1A and condominiums/hotels on the east side of State Road A1A.

Table 6
Summary of Existing Conditions
Crossing location #4

Feature	Description
Main Line	<ul style="list-style-type: none"> • State Road A1A
Location of Crossing	<ul style="list-style-type: none"> • North of Flug Avenue
Adjacent Land Uses	<ul style="list-style-type: none"> • <u>Southwest</u>: Undeveloped • <u>Southeast</u>: Undeveloped • <u>Northwest</u>: Pizza Hut • <u>Northeast</u>: Residential
Traffic Control	<ul style="list-style-type: none"> • State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 0.30 miles • <u>North</u>: Paradise Boulevard – 1.41 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 0.30 miles • <u>North</u>: Paradise Boulevard – 1.41 miles
State Road A1A	<ul style="list-style-type: none"> • <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane • <u>Access</u>: Class 6 • <u>Posted Speed Limit</u>: 45 mph • <u>AADT</u>: 24,000 vehicles per day (year 2013) • <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Sidewalks</u>: West side of the road • <u>Street Lighting</u>: One (1) luminaire 110' south; none within 200' north • <u>Bus Stops</u>: 550' south (west side), 1,750' south (east side), 2,980' north (west side) & 830' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

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 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:

Beach Access	Traffic Signal	Bus Stop	Power Pole	Existing Beach Access
Public Parking	Pedestrian Signal	School	Light Pole	Existing Apparent Right-of-Way

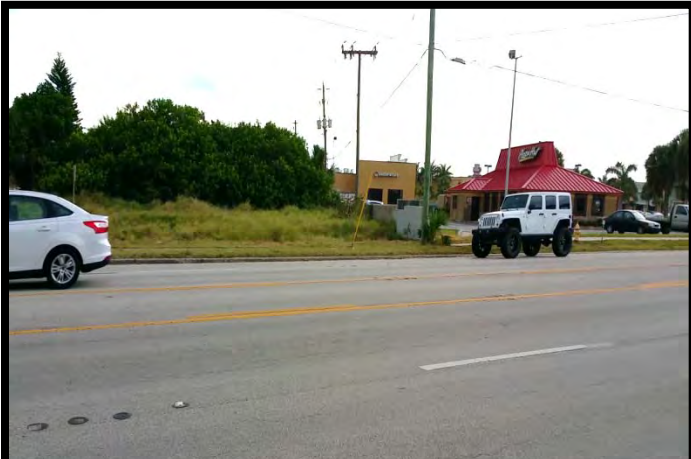
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FIGURE 8
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #4

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Photographs of Crossing location #4



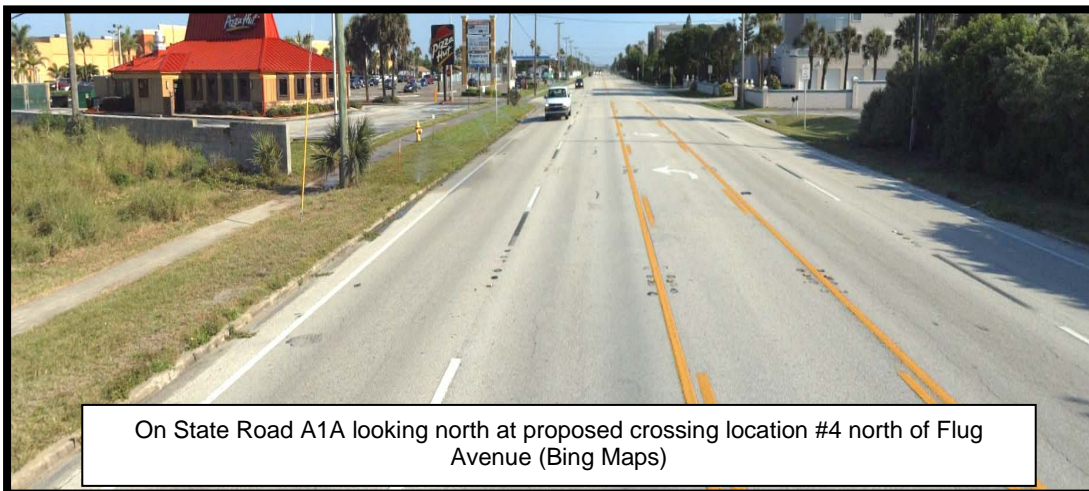
On State Road A1A looking northwest at the proposed crossing location north of Flug Avenue



On State Road A1A looking east at the proposed crossing location north of Flug Avenue



On State Road A1A looking south at proposed crossing location #4 north of Flug Avenue (Bing Maps)



On State Road A1A looking north at proposed crossing location #4 north of Flug Avenue (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no pedestrian or bicycle crashes involving pedestrians/bicyclists crossing State Road A1A at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Flug Avenue for the following reasons:

- There are significant pedestrian attractors (Pizza Hut, Seaside Shopping Center) to the west of State Road A1A, and pedestrian generators (Coral Reef Condominiums) and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided within 100 feet of the proposed crosswalk location.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island would not restrict driveway access. These improvements are shown in **Figure 8**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$37,300, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #5

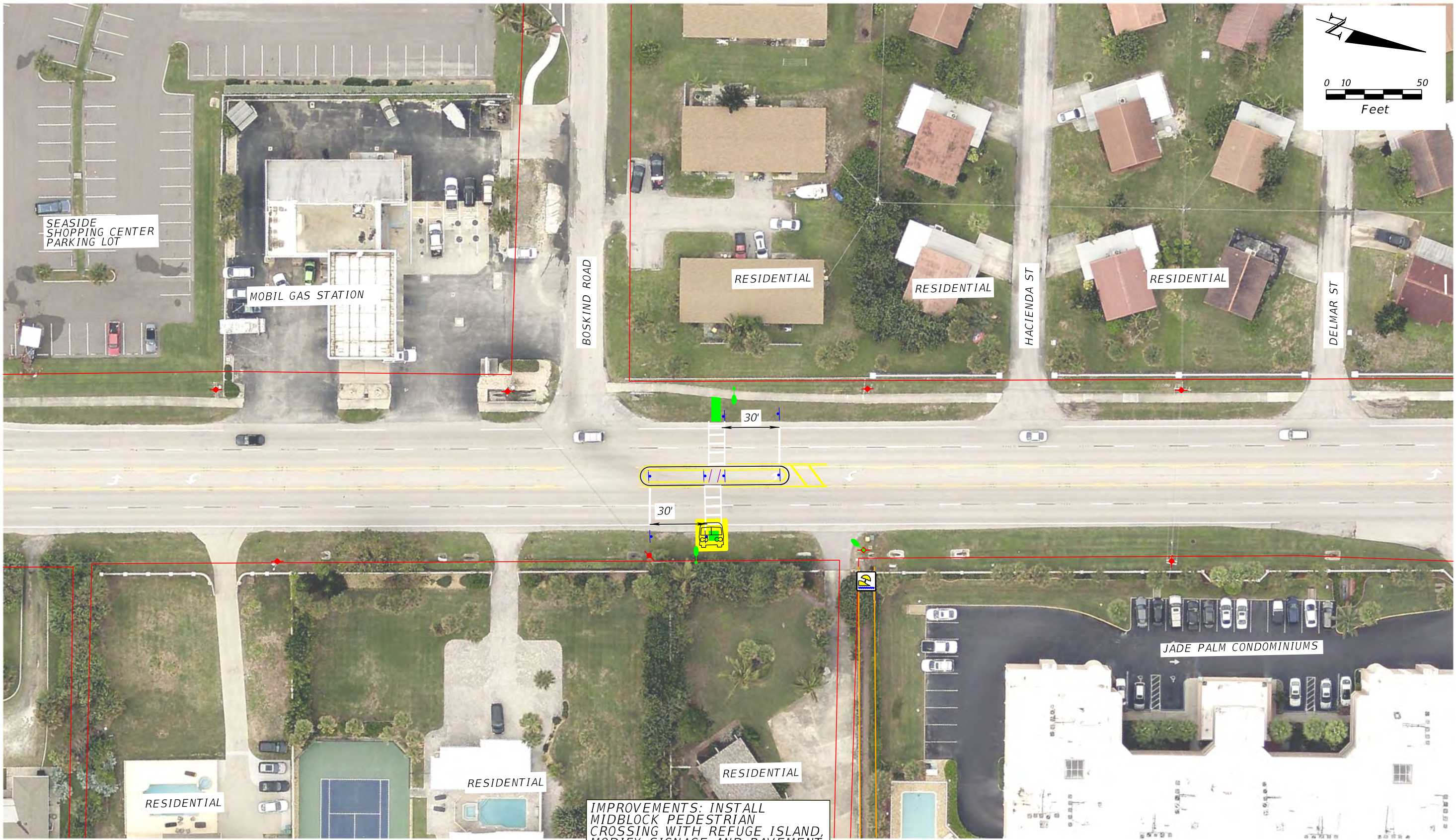
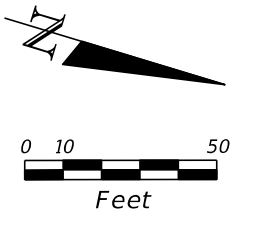
Existing Conditions

Crossing location #5 is on State Road A1A north of the intersection with Boskind Road. **Table 7** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 9**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the beach, as public beach access is provided 80 feet north of proposed crossing location #5. Also, pedestrians/bicyclists would utilize this crosswalk to travel between retail businesses on the west side of State Road A1A and condominiums on the east side of State Road A1A.

Table 7
Summary of Existing Conditions
Crossing location #5

Feature	Description
Main Line	<ul style="list-style-type: none"> State Road A1A
Location of Crossing	<ul style="list-style-type: none"> North of Boskind Road
Adjacent Land Uses	<ul style="list-style-type: none"> <u>Southwest</u>: Mobil Gas Station <u>Southeast</u>: Residential <u>Northwest</u>: Residential <u>Northeast</u>: Jade Palm Condominiums
Traffic Control	<ul style="list-style-type: none"> State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <u>South</u>: Gross Pointe Avenue – 0.46 miles <u>North</u>: Paradise Boulevard – 1.26 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> <u>South</u>: Gross Pointe Avenue – 0.46 miles <u>North</u>: Paradise Boulevard – 1.26 miles
State Road A1A	<ul style="list-style-type: none"> <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane <u>Access</u>: Class 6 <u>Posted Speed Limit</u>: 45 mph <u>AADT</u>: 24,000 vehicles per day (year 2013) <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Sidewalks</u>: West side of the road <u>Street Lighting</u>: None within 200' south; one (1) luminaire for the driveway on the east side of the road 60' north <u>Bus Stops</u>: 1,390' south (west side), 5' south (east side), 2,220' north (west side) & 2,370' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:

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 80 Spring Vista Drive
 DelBary, FL 32715
 Phone: 386.753.0558
 Fax: 386.753.0778

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FIGURE 9
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #5

Photographs of Crossing location #5



On State Road A1A looking northeast at the proposed crossing location north of Boskind Road



On State Road A1A looking southwest at the proposed crossing location north of Boskind Road



On State Road A1A looking south at proposed crossing location #5 north of Boskind Road (Bing Maps)



On State Road A1A looking north at proposed crossing location #5 north of Boskind Road (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, one (1) pedestrian crash occurred when a westbound pedestrian crossing State Road A1A was struck by a northbound vehicle just north of Boskind Road. The crash resulted in one (1) injury and \$200 in estimated property damage.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Boskind Road for the following reasons:

- There are significant pedestrian generators (residences, Seaside Shopping Center) to the west of State Road A1A, and pedestrian generators (Jade Palm Condominiums, residences) and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided within 100 feet of the proposed crosswalk location.
- One (1) pedestrian crash occurred just north of Boskind Road.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island would not restrict driveway access. These improvements are shown in **Figure 9**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. It should be noted that there may not be adequate right-of-way on the east side to provide proper clear zone between the roadway and the street light. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #6

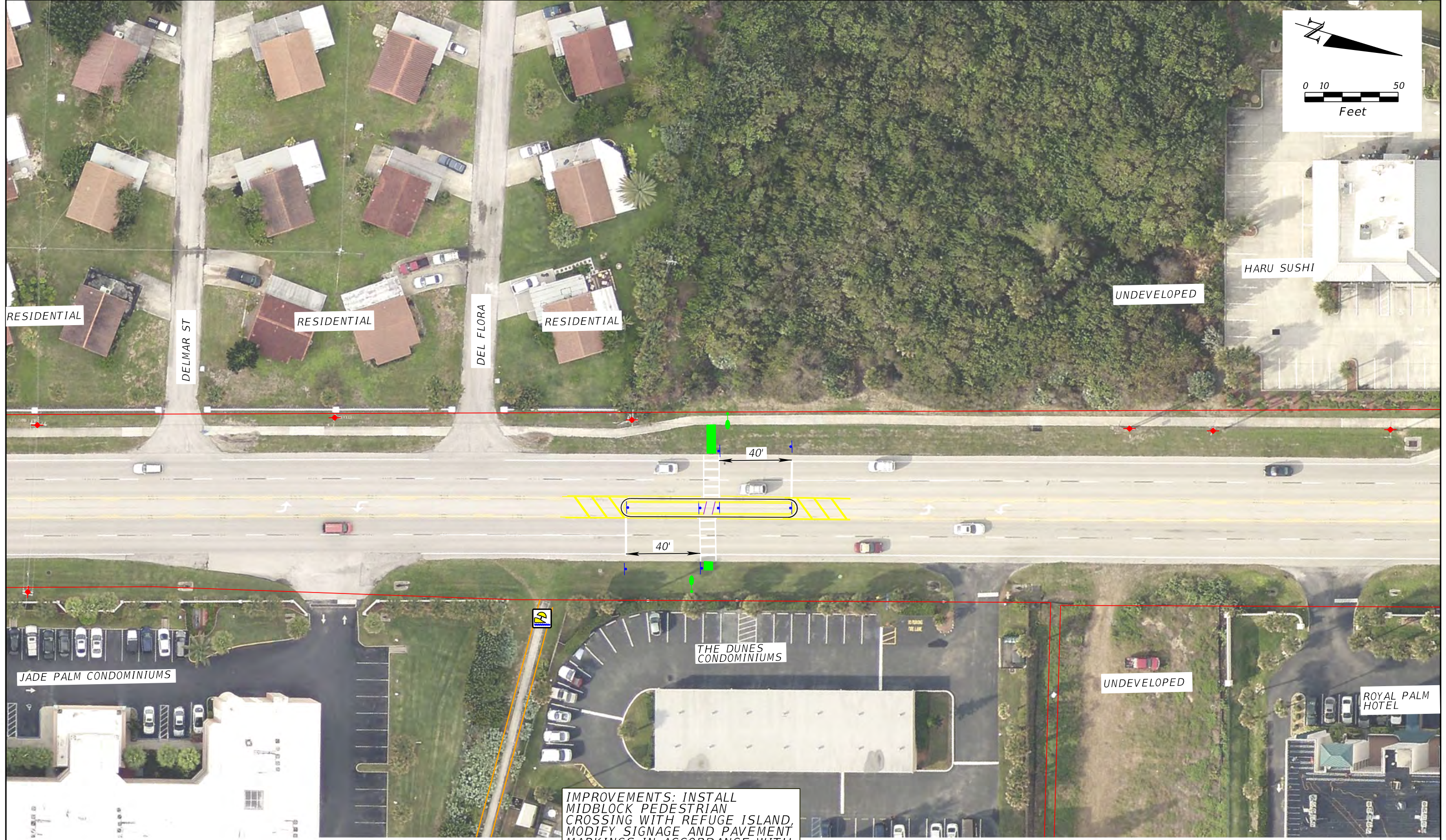
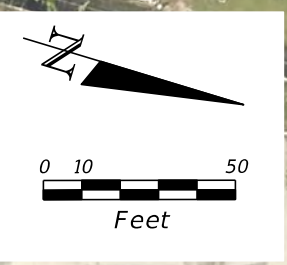
Existing Conditions

Crossing location #6 is on State Road A1A north of the intersection with Del Flora. **Table 8** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 10**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the beach, as public beach access is provided within 100 feet south of proposed crossing location #6. Also, pedestrians/bicyclists would utilize this crosswalk to travel between retail businesses on the west side of State Road A1A and condominiums/hotels on the east side of State Road A1A.

Table 8
Summary of Existing Conditions
Crossing location #6

Feature	Description
Main Line	<ul style="list-style-type: none"> • State Road A1A
Location of Crossing	<ul style="list-style-type: none"> • North of Del Flora
Adjacent Land Uses	<ul style="list-style-type: none"> • <u>Southwest</u>: Residential • <u>Southeast</u>: The Dunes Condominiums • <u>Northwest</u>: Undeveloped • <u>Northeast</u>: The Dunes Condominiums
Traffic Control	<ul style="list-style-type: none"> • State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 0.59 miles • <u>North</u>: Paradise Boulevard – 1.13 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 0.59 miles • <u>North</u>: Paradise Boulevard – 1.13 miles
State Road A1A	<ul style="list-style-type: none"> • <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane • <u>Access</u>: Class 6 • <u>Posted Speed Limit</u>: 45 mph • <u>AADT</u>: 24,000 vehicles per day (year 2013) • <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Sidewalks</u>: West side of the road • <u>Street Lighting</u>: None within 200' • <u>Bus Stops</u>: 2,050' south (west side), 660' south (east side), 1,570' north (west side) & 1,700' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

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Symbols:	
	Beach Access
	Traffic Signal
	Bus Stop
	Power Pole
	Public Parking
	Pedestrian Signal
	School
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 10
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #6

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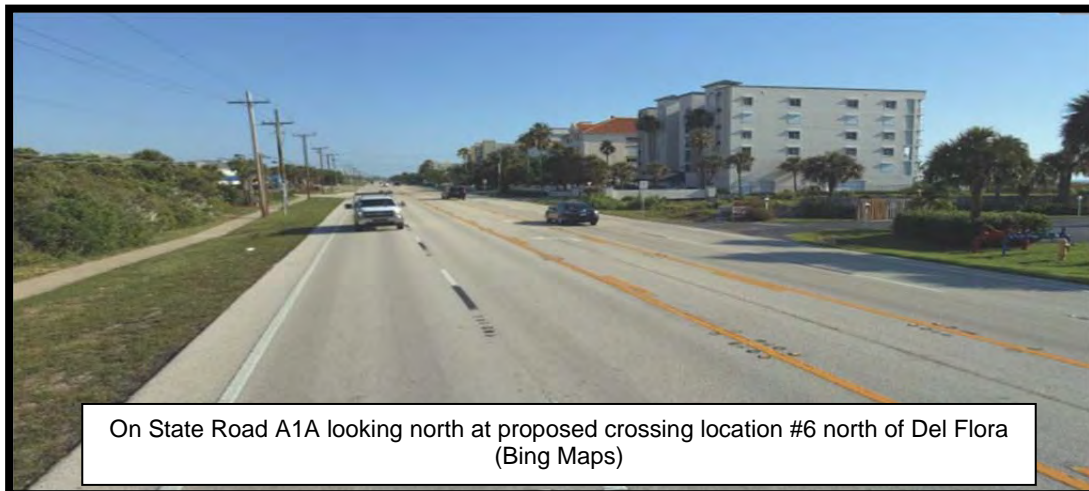
Photographs of Crossing location #6



On State Road A1A looking east at the proposed crossing location north of Del Flora



On State Road A1A looking southwest at the proposed crossing location north of Del Flora



On State Road A1A looking north at proposed crossing location #6 north of Del Flora (Bing Maps)



On State Road A1A looking south at proposed crossing location #6 north of Del Flora (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no pedestrian or bicycle crashes involving pedestrians/bicyclists crossing State Road A1A at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Del Flora for the following reasons:

- There are significant pedestrian generators (residences) to the west of State Road A1A, and pedestrian generators (Royal Palm Hotel, The Dunes Condominiums, Jade Palm Condominiums) and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided 100 feet south of the proposed crosswalk location.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island would not restrict driveway access. These improvements are shown in **Figure 10**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #7

Existing Conditions

Crossing location #7 is on State Road A1A north of the intersection with Terrace Shores Drive. **Table 9** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 11**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the beach, as public beach access is provided immediately adjacent to proposed crossing location #7. Also, pedestrians/bicyclists would utilize this crosswalk to travel between retail businesses on the west side of State Road A1A and condominiums/hotels on the east side of State Road A1A.

Table 9
Summary of Existing Conditions
Crossing location #7

Feature	Description
Main Line	<ul style="list-style-type: none"> • State Road A1A
Location of Crossing	<ul style="list-style-type: none"> • North of Terrace Shores Drive
Adjacent Land Uses	<ul style="list-style-type: none"> • <u>Southwest</u>: Re/max Realty Parking Lot • <u>Southeast</u>: Undeveloped • <u>Northwest</u>: Re/max Realty • <u>Northeast</u>: Double Tree Guest Suites
Traffic Control	<ul style="list-style-type: none"> • State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 0.85 miles • <u>North</u>: Paradise Boulevard – 0.88 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 0.85 miles • <u>North</u>: Paradise Boulevard – 0.88 miles
State Road A1A	<ul style="list-style-type: none"> • <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane • <u>Access</u>: Class 6 • <u>Posted Speed Limit</u>: 45 mph • <u>AADT</u>: 24,000 vehicles per day (year 2013) • <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Sidewalks</u>: West side of the road • <u>Street Lighting</u>: One (1) luminaire 125' south at the northwest corner of the intersection with Terrace Shores Drive; one (1) luminaire 180' north at the northwest corner of the intersection with Coconut Drive • <u>Bus Stops</u>: 3,400' south (west side), 2,030' south (east side), 200' north (west side) & 340' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:

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 DelBary, FL 32715
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FIGURE 11
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #7

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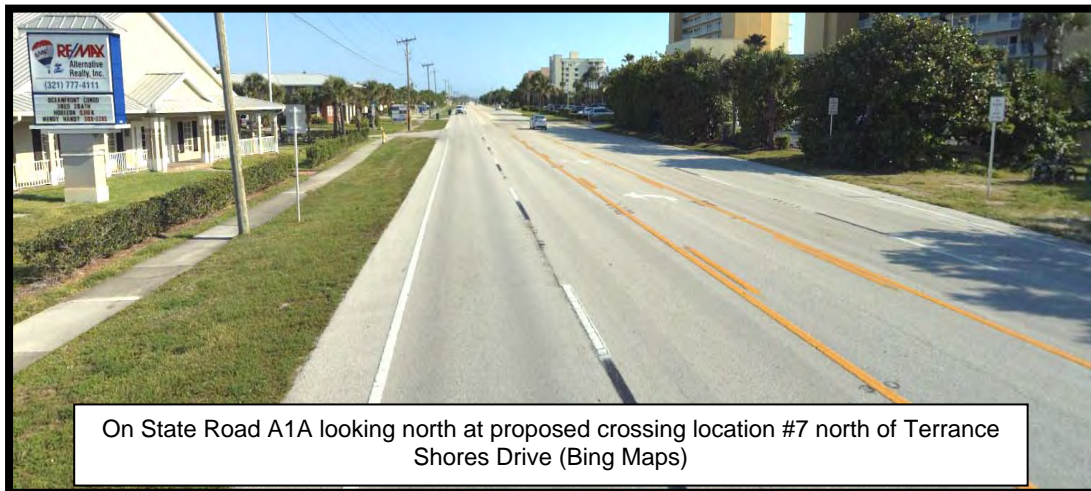
Photographs of Crossing location #7



On State Road A1A looking northeast at the proposed crossing location north of Terrance Shores Drive



On State Road A1A looking west at the proposed crossing location north of Terrance Shores Drive



On State Road A1A looking north at proposed crossing location #7 north of Terrance Shores Drive (Bing Maps)



On State Road A1A looking south at proposed crossing location #7 north of Terrance Shores Drive (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A south of Ocean Oaks Drive for the following reasons:

- There are significant pedestrian generators (residences) to the west of State Road A1A, and pedestrian generators (Sea Pearl Condominiums, Double Tree Guest Suites) and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided immediately adjacent to the proposed crosswalk location.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island will not restrict driveway access. These improvements are shown in **Figure 11**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #8

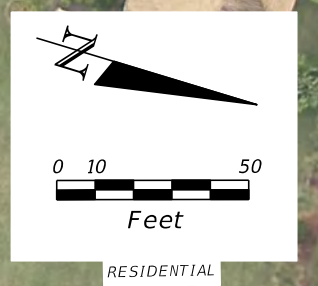
Existing Conditions

Crossing location #8 is on State Road A1A north of the intersection with Pine Tree Drive. **Table 10** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 12**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences on the west side of State Road A1A and the condominiums/motels and beach on the east side of the road. There is a public beach access 325 feet south of proposed crossing location #8.

Table 10
Summary of Existing Conditions
Crossing location #8

Feature	Description
Main Line	<ul style="list-style-type: none"> • State Road A1A
Location of Crossing	<ul style="list-style-type: none"> • North of Pine Tree Drive
Adjacent Land Uses	<ul style="list-style-type: none"> • <u>Southwest</u>: Residential • <u>Southeast</u>: Undeveloped • <u>Northwest</u>: Residential • <u>Northeast</u>: Barringer Condominiums
Traffic Control	<ul style="list-style-type: none"> • State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 1.10 miles • <u>North</u>: Paradise Boulevard – 0.62 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> • <u>South</u>: Gross Pointe Avenue – 1.10 miles • <u>North</u>: Paradise Boulevard – 0.62 miles
State Road A1A	<ul style="list-style-type: none"> • <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane • <u>Access</u>: Class 6 • <u>Posted Speed Limit</u>: 45 mph • <u>AADT</u>: 24,000 vehicles per day (year 2013) • <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Sidewalks</u>: West side of the road • <u>Street Lighting</u>: one (1) luminaire 65' south at the northwest corner of the intersection with Pine Tree Drive; none within 200' north • <u>Bus Stops</u>: 1,110' south (west side), 970' south (east side), 3,370' north (west side) & 3,440' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
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Symbols:	
	Beach Access
	Traffic Signal
	Bus Stop
	Power Pole
	Public Parking
	Pedestrian Signal
	School
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 12
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #8

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Photographs of Crossing location #8



Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, one (1) pedestrian crash occurred when a westbound pedestrian crossing State Road A1A was struck by a southbound vehicle just south of Pine Tree Drive. The crash resulted in one (1) fatality and \$1,500 in estimated property damage. The crash occurred at night and pavement was dry. It was reported that the pedestrian walked into the path of the vehicle. Another fatal pedestrian crash occurred approximately 175 feet north in the intersection of State Road A1A and Waters Edge Lane. A pedestrian walked westbound into the southbound lane in the path of a vehicle. The crash resulted in one (1) fatality and \$750 in estimated property damage.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Pine Tree Drive for the following reasons:

- There are significant pedestrian generators (residences) to the west of State Road A1A, and pedestrian generators (Barringer Condominiums) and pedestrian attractors (beach) to the east of State Road A1A.
- Two (2) pedestrian crash fatalities occurred in close proximity to the proposed crossing location #9.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island will not restrict driveway access. These improvements are shown in **Figure 12**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #9

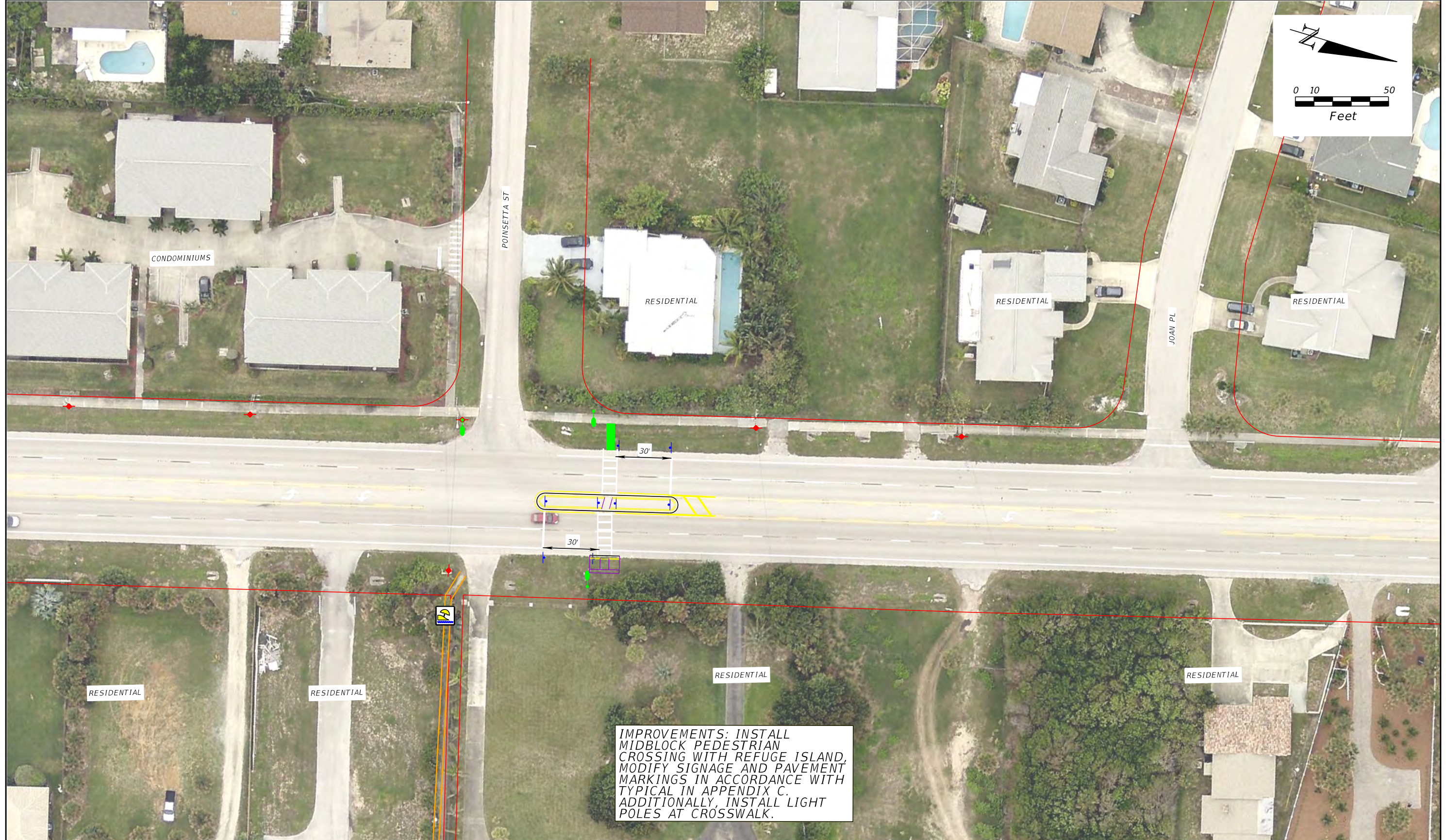
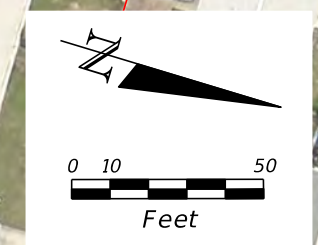
Existing Conditions

Crossing location #9 is on State Road A1A north of the intersection with Poinsetta Street. **Table 11** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 13**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/condominiums on the west side of State Road A1A and the beach, as public beach access is provided 80 feet south of proposed crossing location #9.

Table 11
Summary of Existing Conditions
Crossing location #9

Feature	Description
Main Line	<ul style="list-style-type: none"> State Road A1A
Location of Crossing	<ul style="list-style-type: none"> North of Poinsetta Street
Adjacent Land Uses	<ul style="list-style-type: none"> <u>Southwest</u>: Condominiums <u>Southeast</u>: Residential <u>Northwest</u>: Residential <u>Northeast</u>: Residential
Traffic Control	<ul style="list-style-type: none"> State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <u>South</u>: Gross Pointe Avenue – 1.29 miles <u>North</u>: Paradise Boulevard – 0.43 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> <u>South</u>: Gross Pointe Avenue – 1.29 miles <u>North</u>: Paradise Boulevard – 0.43 miles
State Road A1A	<ul style="list-style-type: none"> <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane <u>Access</u>: Class 6 <u>Posted Speed Limit</u>: 45 mph <u>AADT</u>: 24,000 vehicles per day (year 2013) <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Sidewalks</u>: West side of the road <u>Street Lighting</u>: one (1) luminaire 75' south at the southwest corner of the intersection with Poinsetta Street; none within 200' north <u>Bus Stops</u>: 2,150' south (west side), 2,010' south (east side), 2,330' north (west side) & 2,410' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Traffic Signal
	Bus Stop
	Power Pole
	Public Parking
	Pedestrian Signal
	School
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

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FIGURE 13
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #9

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Photographs of Crossing location #9



On State Road A1A looking north from the proposed crossing location north of Poinsetta Street



On State Road A1A looking southwest from the proposed crossing location north of Poinsetta Street



On State Road A1A looking north at proposed crossing location #9 north of Poinsetta Street (Bing Maps)



On State Road A1A looking southeast at proposed crossing location #9 north of Poinsetta Street (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A north of Poinsetta Street for the following reasons:

- There are significant pedestrian generators (residences) to the west of State Road A1A, and pedestrian generators (residences) and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided within 80 feet of the proposed crosswalk location.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island will not restrict driveway access. These improvements are shown in **Figure 13**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #10

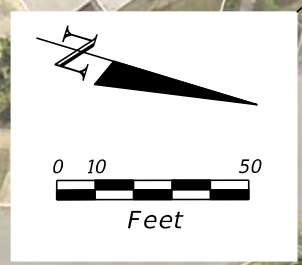
Existing Conditions

Crossing location #10 is on State Road A1A south of the intersection with Harris Boulevard. **Table 12** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 14**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences/businesses on the west side of State Road A1A and the beach. Public beach access is provided within 100 feet to the north of the proposed crossing location.

Table 12
Summary of Existing Conditions
Crossing location #10

Feature	Description
Main Line	<ul style="list-style-type: none"> • State Road A1A
Location of Crossing	<ul style="list-style-type: none"> • South of Harris Boulevard
Adjacent Land Uses	<ul style="list-style-type: none"> • <u>Southwest</u>: Retail and Restaurants • <u>Southeast</u>: Undeveloped • <u>Northwest</u>: Condominiums • <u>Northeast</u>: Undeveloped
Traffic Control	<ul style="list-style-type: none"> • State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> • <u>South</u>: Paradise Boulevard – 0.24 miles • <u>North</u>: Holy Name Way – 0.63 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> • <u>South</u>: Paradise Boulevard – 0.24 miles • <u>North</u>: Holy Name Way – 0.63 miles
State Road A1A	<ul style="list-style-type: none"> • <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane • <u>Access</u>: Class 6 • <u>Posted Speed Limit</u>: 45 mph • <u>AADT</u>: 24,000 vehicles per day (year 2013) • <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane • <u>Sidewalks</u>: West side of the road • <u>Street Lighting</u>: None within 200' south; one (1) luminaire 150' north on the median of the intersection with Harris Boulevard • <u>Bus Stops</u>: 1,170' south (west side), 1,110' south (east side), 550' north (west side) & 460' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

Traffic Engineering Data Solutions, Inc.
 80 Spring Vista Drive DeBary, FL 32715
 Phone: 386.753.0558 Fax: 386.753.0778

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION

FIGURE 14
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #10

Photographs of Crossing location #10



On State Road A1A looking northeast at the proposed crossing location south of Harris Boulevard



On State Road A1A looking southwest at the proposed crossing location south of Harris Boulevard



On State Road A1A looking north at proposed crossing location #10 south of Harris Boulevard (Bing Maps)



On State Road A1A looking south at proposed crossing location #10 south of Harris Boulevard (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A south of Harris Boulevard for the following reasons:

- There are significant pedestrian generators (residences and condominiums) to the west of State Road A1A, and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided within 100 feet to the north of proposed crossing location #10
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island will not restrict driveway access. These improvements are shown in **Figure 14**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crosswalk is provided in **Appendix B**.

Crossing location #11

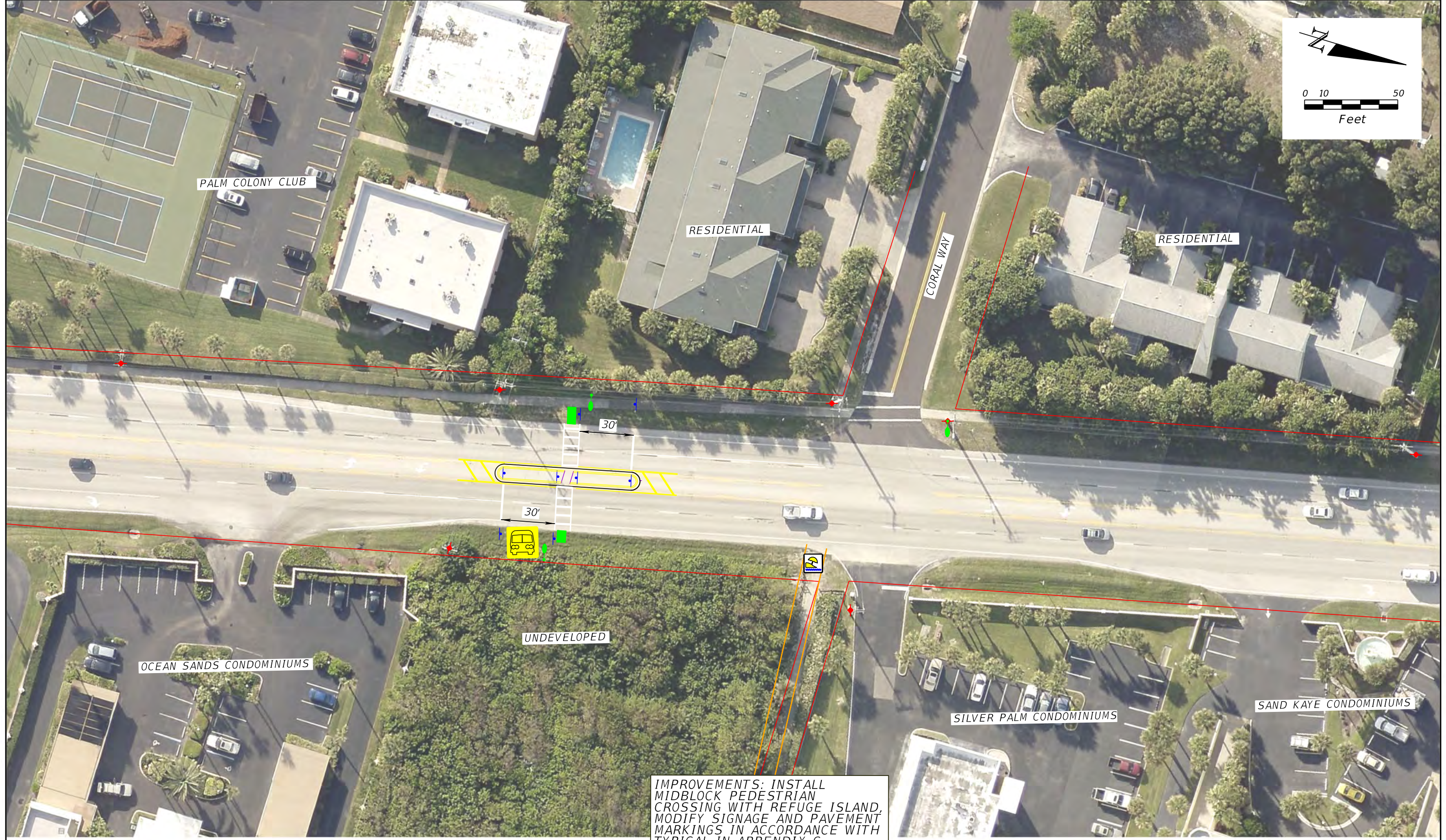
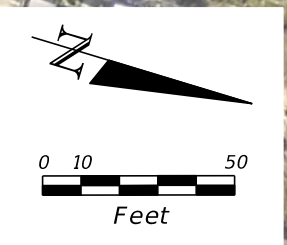
Existing Conditions

Crossing location #11 is on State Road A1A south of the intersection with Coral Way. **Table 13** provides a summary of the existing conditions at the crossing location. Photographs in the vicinity of the crossing location are also provided. An aerial image displaying the crossing location and improvements with respect to adjacent land uses is shown in **Figure 15**.

A midblock pedestrian crossing at this crossing location would predominantly serve pedestrians/bicyclists traveling between residences on the west side of State Road A1A and the beach, as public beach access is provided 140 feet north of proposed crossing location #11.

Table 13
Summary of Existing Conditions
Crossing location #11

Feature	Description
Main Line	<ul style="list-style-type: none"> State Road A1A
Location of Crossing	<ul style="list-style-type: none"> South of Coral Way
Adjacent Land Uses	<ul style="list-style-type: none"> <u>Southwest</u>: Palm Colony Club <u>Southeast</u>: Ocean Sands Condominiums/undeveloped <u>Northwest</u>: Residential <u>Northeast</u>: Undeveloped/Siler Palm Condominiums
Traffic Control	<ul style="list-style-type: none"> State Road A1A is uncontrolled at the crossing location
Adjacent Signalized Intersections	<ul style="list-style-type: none"> <u>South</u>: Paradise Boulevard – 0.52 miles <u>North</u>: Holy Name Way – 0.35 miles
Adjacent Crosswalks	<ul style="list-style-type: none"> <u>South</u>: Paradise Boulevard – 0.52 miles <u>North</u>: Holy Name Way – 0.35 miles
State Road A1A	<ul style="list-style-type: none"> <u>Cross Section</u>: 5-lane undivided rural section with a continuous bi-directional left-turn lane <u>Access</u>: Class 6 <u>Posted Speed Limit</u>: 45 mph <u>AADT</u>: 24,000 vehicles per day (year 2013) <u>Northbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Southbound Approach Lanes</u>: 2 through lanes, 1 continuous bi-directional left-turn lane <u>Sidewalks</u>: West side of the road <u>Street Lighting</u>: None within 200' south; one (1) luminaire 200' north at the northwest corner of the intersection with Coral Way <u>Bus Stops</u>: 1,030' south (west side), 1,120' south (east side), 1,920' north (west side) & 1,630' north (east side)



IMPROVEMENTS: INSTALL MIDBLOCK PEDESTRIAN CROSSING WITH REFUGE ISLAND, MODIFY SIGNAGE AND PAVEMENT MARKINGS IN ACCORDANCE WITH TYPICAL IN APPENDIX C. ADDITIONALLY, INSTALL LIGHT POLES AT CROSSWALK.

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

Symbols:	
	Beach Access
	Public Parking
	Traffic Signal
	Pedestrian Signal
	Bus Stop
	School
	Power Pole
	Light Pole
	Existing Beach Access
	Existing Apparent Right-of-Way

Traffic Engineering Data Solutions, Inc.
 80 Spring Vista Drive
 DelBary, FL 32715
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 Fax: 386.753.0778

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION

FIGURE 15
 IMPROVEMENT DIAGRAM
 CROSSING LOCATION #11

PAGE NO.
 63

Photographs of Crossing location #11



On State Road A1A looking northeast at the proposed crossing location south of Coral Way



On State Road A1A looking southeast at the proposed crossing location south of Coral Way



On State Road A1A looking north at proposed crossing location #11 south of Coral Way (Bing Maps)



On State Road A1A looking southeast at proposed crossing location #11 south of Coral Way (Bing Maps)

Collision Analysis

Crash data for State Road A1A within the study limits was obtained from the FDOT's CARS database and the University of Florida's *Signal Four Analytics* obtained for the five-year period between January 1, 2010 and December 31, 2014. Based on a review of the data, there were no bicycle or pedestrian crashes reported at or in close proximity to this crossing location.

Recommendations

Based on the data collected, field observations, and engineering judgment, it is recommended that a midblock pedestrian crosswalk be installed on State Road A1A south of Coral Way for the following reasons:

- There are significant pedestrian generators (residences) to the west of State Road A1A, and pedestrian generators (condominiums) and pedestrian attractors (beach) to the east of State Road A1A.
- Beach access is provided within 140 feet to the north of proposed crossing location #11.
- The daily traffic volume on State Road A1A is 24,000 vehicles per day (year 2013).
- The nearest alternative crossing on State Road A1A is over 300 feet in either direction.
- The proposed crossing is not within the influence area of adjacent signalized intersections.
- Adequate stopping sight distance is provided at the crossing location.

Because a pedestrian/bicyclist needs to utilize a two-stage movement, whereby they stage in the middle of the road, and because the daily volume on State Road A1A exceeds 12,000 vpd, it is recommended that a refuge island be provided. Such an island will not restrict driveway access. These improvements are shown in **Figure 15**.

Cost Estimate

A cost estimate for a typical midblock crossing, including the addition of street lighting immediately adjacent to the crossing, was generated from the FDOT's 12-Month Moving Statewide Averages spreadsheet using the weighted average costs. The proposed typical midblock crosswalk improvement is estimated to cost (engineering, construction, and CEI) \$36,800, as shown in the "Engineer's Opinion of Probable Costs" table in **Appendix C**. A typical midblock pedestrian crossing is provided in **Appendix B**.

SUMMARY OF RECOMMENDATIONS

Traffic Engineering Data Solutions, Inc. (TEDS) was retained on behalf of the Florida Department of Transportation (FDOT) to conduct a Safety Study on State Road A1A from US 192 to State Road 518 in Brevard County, Florida. The purpose of this study is to review the State Road A1A corridor to identify the location for midblock pedestrian crossings to enhance pedestrian safety along the corridor.

Based on engineering judgement, a review of crash history, the location of pedestrian generators and attractors, the proximity to bus stops, beach access locations, and adjacent signals, as well as field observations, the following 10 locations have been identified for the installation of midblock pedestrian crosswalks with refuge islands:

- North of Watson Drive
- North of Niemira Avenue
- North of Flug Avenue
- North of Boskind Road
- North of Del Flora
- North of Terrace Shores Drive
- North of Pine Tree Drive
- North of Poinsetta Street
- North of Harris Boulevard
- South of Coral Way

One (1) existing midblock crosswalk with a pedestrian refuge island, south of Second Avenue, was also evaluated for retention, relocation or removal. It is recommended that the refuge island be retained, but the pavement markings and signage in the vicinity of the existing midblock crosswalk should be modified to be in accordance with Index 17346 of FDOT's Design Standards, 2015.

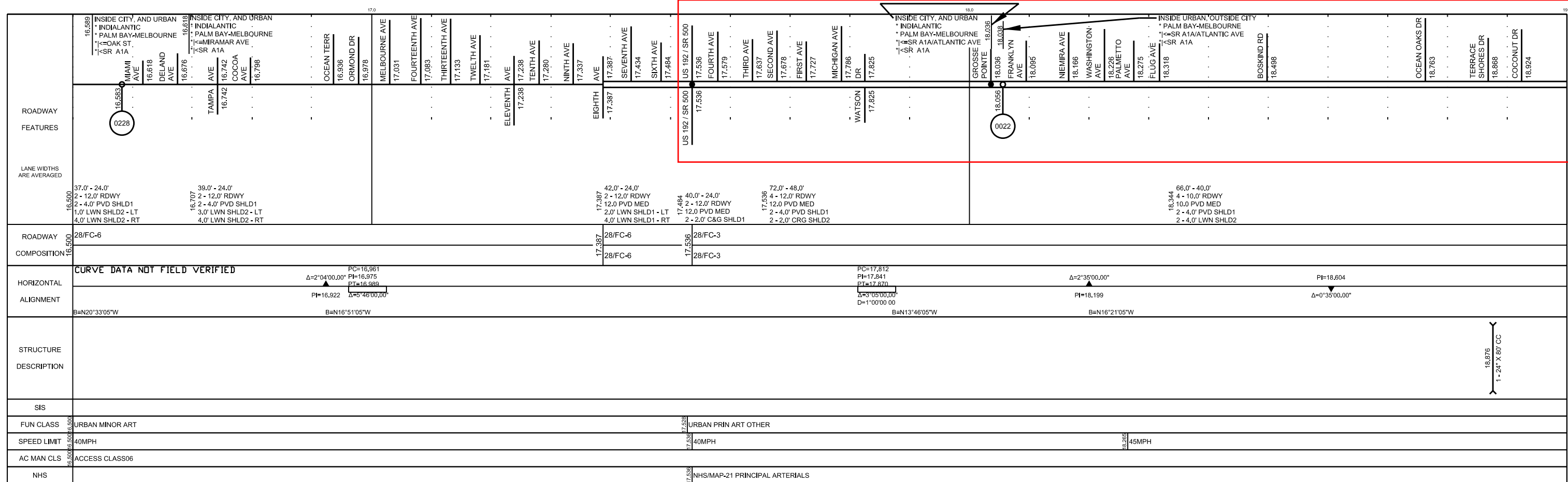
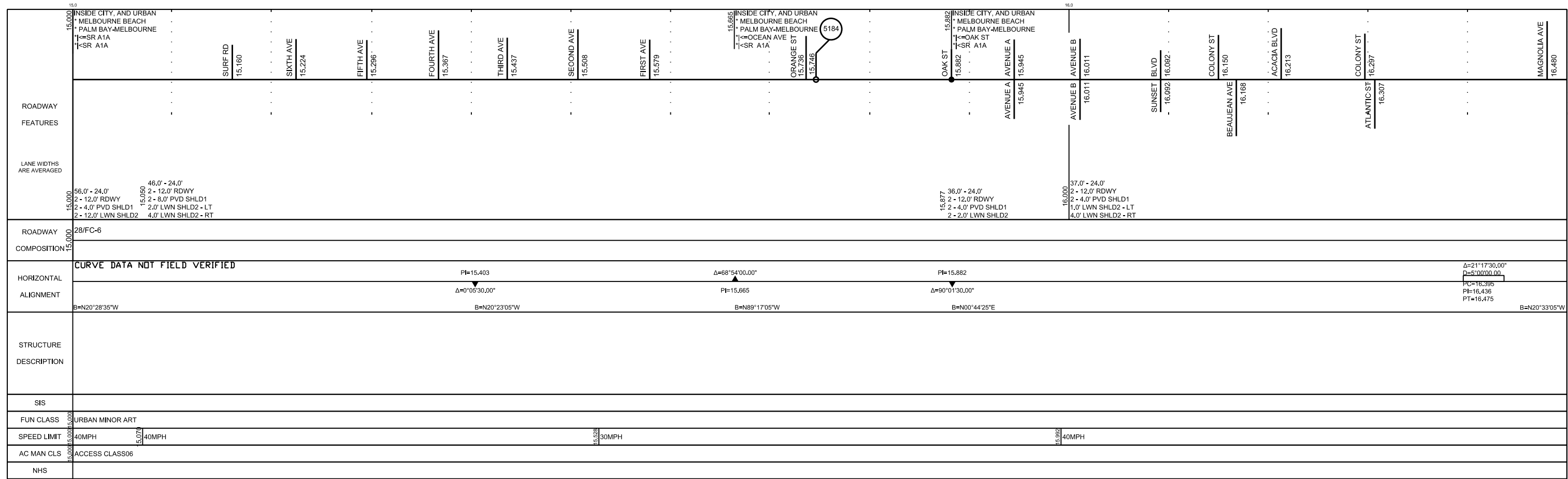
The total cost for the 11 midblock crossings is estimated at approximately \$394,900:

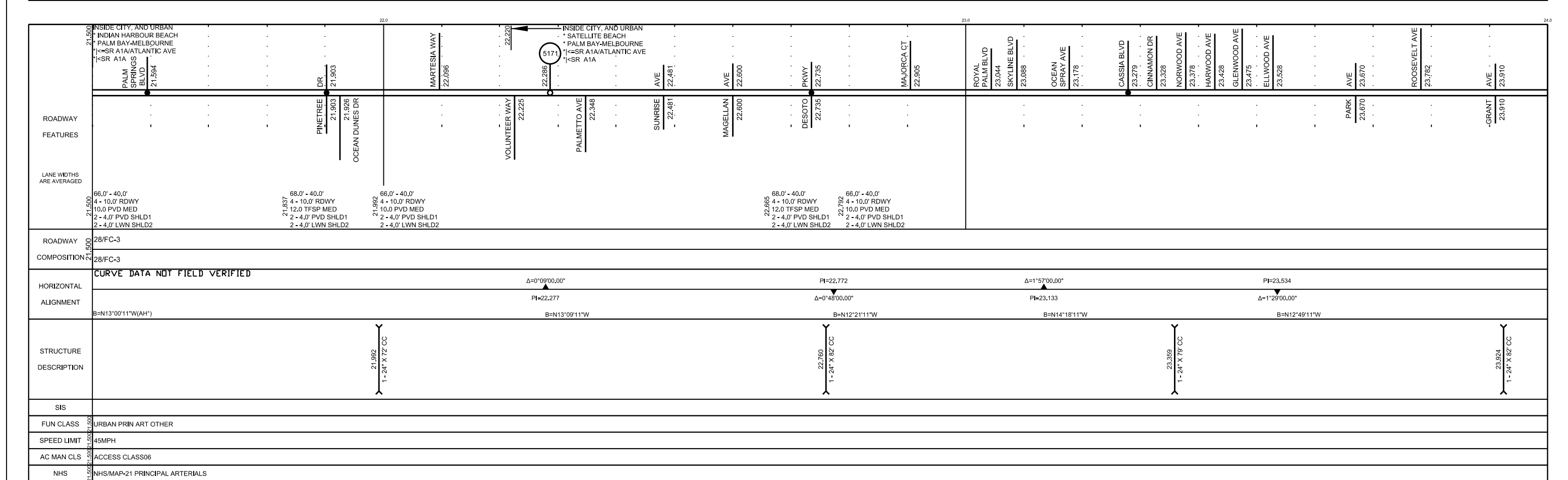
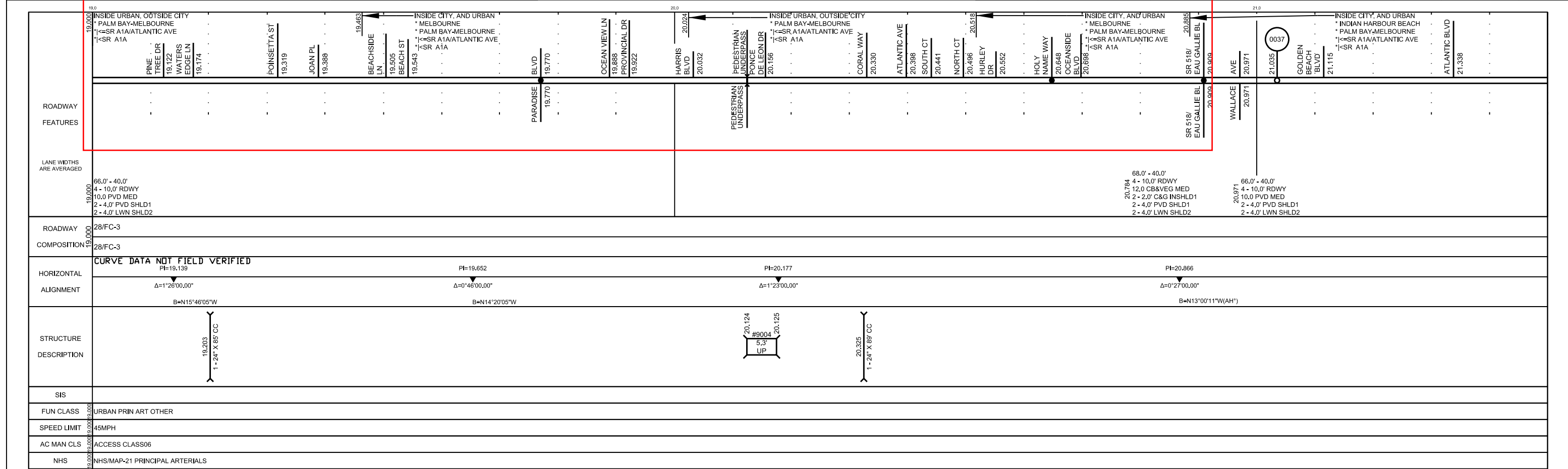
- \$25,400 for the modification of the pavement markings and signage and street lighting installation in the vicinity of the existing midblock crosswalk located south of Second Avenue.
- \$36,800 for each of the seven (7) proposed midblock pedestrian crossings, including the addition of street lighting immediately adjacent to the crossing, located within the rural section of the study corridor.
- \$37,300 for each of the three (3) proposed midblock pedestrian crossings, including the addition of street lighting immediately adjacent to the crossing, located within the urban section of the study corridor.

APPENDIX

APPENDIX A

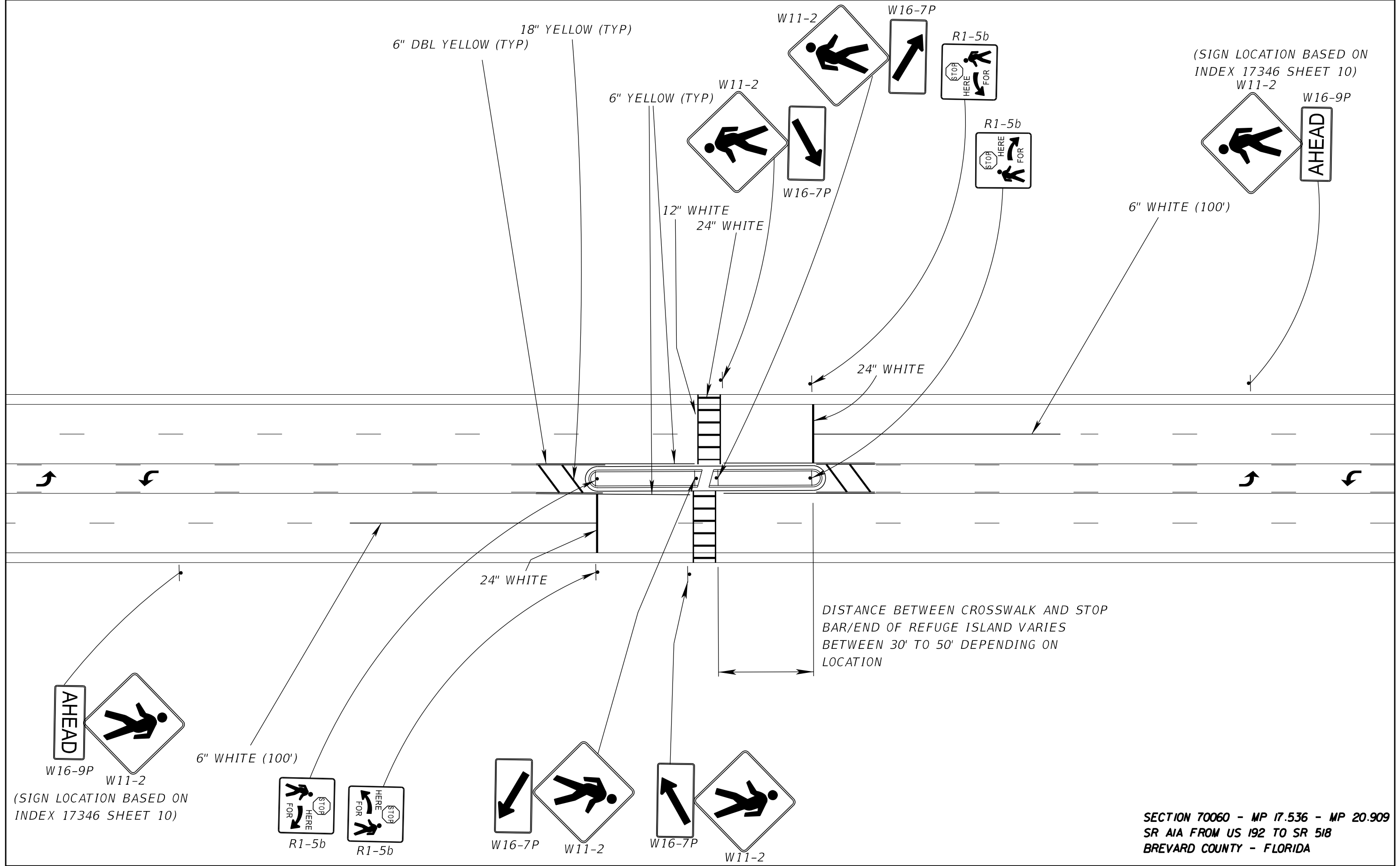
STRAIGHT LINE DIAGRAM





APPENDIX B

**TYPICAL MIDBLOCK PEDESTRIAN CROSSING WITH
REFUGE ISLAND**



(SIGN LOCATION BASED ON INDEX 17346 SHEET 10)

(SIGN LOCATION BASED ON INDEX 17346 SHEET 10)

DISTANCE BETWEEN CROSSWALK AND STOP BAR/END OF REFUGE ISLAND VARIES BETWEEN 30' TO 50' DEPENDING ON LOCATION

SECTION 70060 - MP 17.536 - MP 20.909
 SR AIA FROM US 192 TO SR 518
 BREVARD COUNTY - FLORIDA

APPENDIX C

COST ESTIMATES

**ENGINEER'S OPINION OF PROBABLE COSTS
STATE ROAD A1A – SIGNING AND PAVEMENT MARKING MODIFICATION (ONLY)
LOCATION 1**

PAY ITEM	PAY ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	TOTAL
0700 1 40	SINGLE POST SIGN, INSTALL	AS	10.0	\$42.75	\$427.50
0700 1 40	SINGLE POST SIGN, RELOCATE	AS	2.0	\$190.59	\$381.18
				SIGNING SUBTOTAL	\$808.68
				SIDEWALK/CONCRETE SUBTOTAL	\$0.00
0711 12 111	THERMOPLASTIC, REFURB, WHITE, SOLID, 6"	NM	0.04	\$13,149.47	\$498.09
0711 11 125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	LF	48.0	\$3.96	\$190.08
				PAVEMENT MARKING SUBTOTAL	\$688.17
0630 2 11	CONDUIT, F& I, OPEN TRENCH	LF	200.00	\$6.04	\$1,208.00
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	80.0	\$14.81	\$1,184.80
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	4.00	\$498.42	\$1,993.68
0715 1 12	LIGHTING CONDUCTORS, F&I, INSUL, NO.8-6	LF	280.00	\$1.30	\$364.00
0715 4 121	LIGHT POLE COMP, F&I, WS130, 40'	EA	2.00	\$4,013.97	\$8,027.94
0715 7 21	LOAD CENTER, REWORK, SECONDARY VOLTAGE	EA	1.00	\$768.50	\$768.50
0715 500 1	POLE CABLE DIST SYS, CONVENTIONAL	EA	2.00	\$955.48	\$1,910.96
				LIGHTING SUBTOTAL	\$15,457.88
				SUBTOTAL	\$16,954.73
0101 1				MOBILIZATION(5%)	\$847.74
0102 1				MAINTENANCE OF TRAFFIC (10%)	\$1,695.47
				CONSTRUCTION TOTAL	\$19,497.93
				ENGINEERING (20%)	\$3,899.59
				CEI (10%)	\$1,949.79
				PROJECT TOTAL FOR EACH CROSSWALK	\$25,347.32

ENGINEER'S OPINION OF PROBABLE COSTS
STATE ROAD A1A – TYPICAL MIDBLOCK PEDESTRIAN CROSSWALK WITH REFUGE ISLAND
URBAN SECTION

PAY ITEM	PAY ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	TOTAL
0700 1 40	SINGLE POST SIGN, INSTALL	AS	10.0	\$42.75	\$427.50
0700 1 40	SINGLE POST SIGN, RELOCATE	AS	2.0	\$190.59	\$381.18
				SIGNING SUBTOTAL	\$808.68
0527 2	DETECTABLE WARNINGS	SF	32.0	\$28.53	\$912.96
0520 1 10	CONCRETE CURB & GUTTER, TYPE F	LF	20.0	\$18.96	\$379.20
0522 1	CONC SIDEWALK AND DRIVEWAYS, 4" THICK	SY	8.3	\$33.21	\$276.75
0520 70	CONCRETE TRAFFIC SEPARATOR, SP-VAR WIDT	SY	100.0	\$49.17	\$4,917.00
				SIDEWALK/CONCRETE SUBTOTAL	\$6,485.91
0711 12 111	THERMOPLASTIC, REFURB, WHITE, SOLID, 6"	NM	0.04	\$13,149.47	\$498.09
0711 11 125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	LF	208.0	\$3.96	\$823.68
0711 11 123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	LF	96.00	\$4.42	\$424.32
0711 152 11	THERMOPLASTIC, STD-OP, YELLOW, SOLID, 6"	NM	0.06	\$4,391.46	\$266.15
0711 112 24	THERMOPLASTIC, STD, YELLOW, SOLID, 18"	LF	56.00	\$3.10	\$173.60
				PAVEMENT MARKING SUBTOTAL	\$2,185.84
0630 2 11	CONDUIT, F& I, OPEN TRENCH	LF	200.00	\$6.04	\$1,208.00
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	80.0	\$14.81	\$1,184.80
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	4.00	\$498.42	\$1,993.68
0715 1 12	LIGHTING CONDUCTORS, F&I, INSUL, NO.8-6	LF	280.00	\$1.30	\$364.00
0715 4 121	LIGHT POLE COMP, F&I, WS130, 40'	EA	2.00	\$4,013.97	\$8,027.94
0715 7 21	LOAD CENTER, REWORK, SECONDARY VOLTAGE	EA	1.00	\$768.50	\$768.50
0715 500 1	POLE CABLE DIST SYS, CONVENTIONAL	EA	2.00	\$955.48	\$1,910.96
				LIGHTING SUBTOTAL	\$15,457.88
				SUBTOTAL	\$24,938.30
0101 1				MOBILIZATION(5%)	\$1,246.92
0102 1				MAINTENANCE OF TRAFFIC (10%)	\$2,493.83
				CONSTRUCTION TOTAL	\$28,679.05
				ENGINEERING (20%)	\$5,735.81
				CEI (10%)	\$2,867.91
				PROJECT TOTAL FOR EACH CROSSWALK	\$37,282.77

ENGINEER'S OPINION OF PROBABLE COSTS
STATE ROAD A1A – TYPICAL MIDBLOCK PEDESTRIAN CROSSWALK WITH REFUGE ISLAND
RURAL SECTION

PAY ITEM	PAY ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	TOTAL
0700 1 40	SINGLE POST SIGN, INSTALL	AS	10.0	\$42.75	\$427.50
0700 1 40	SINGLE POST SIGN, RELOCATE	AS	2.0	\$190.59	\$381.18
				SIGNING SUBTOTAL	\$808.68
0527 2	DETECTABLE WARNINGS	SF	32.0	\$28.53	\$912.96
0522 1	CONC SIDEWALK AND DRIVEWAYS, 4" THICK	SY	8.3	\$33.21	\$276.75
0520 70	CONCRETE TRAFFIC SEPARATOR, SP-VAR WIDT	SY	100.0	\$49.17	\$4,917.00
				SIDEWALK/CONCRETE SUBTOTAL	\$6,106.71
0711 12 111	THERMOPLASTIC, REFURB, WHITE, SOLID, 6"	NM	0.04	\$13,149.47	\$498.09
0711 11 125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	LF	208.0	\$3.96	\$823.68
0711 11 123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	LF	96.00	\$4.42	\$424.32
0711 152 11	THERMOPLASTIC, STD-OP, YELLOW, SOLID, 6"	NM	0.06	\$4,391.46	\$266.15
0711 112 24	THERMOPLASTIC, STD, YELLOW, SOLID, 18"	LF	56.00	\$3.10	\$173.60
				PAVEMENT MARKING SUBTOTAL	\$2,185.84
0630 2 11	CONDUIT, F& I, OPEN TRENCH	LF	200.00	\$6.04	\$1,208.00
0630 2 12	CONDUIT, F& I, DIRECTIONAL BORE	LF	80.0	\$14.81	\$1,184.80
0635 2 11	PULL & SPLICE BOX, F&I, 13" x 24"	EA	4.00	\$498.42	\$1,993.68
0715 1 12	LIGHTING CONDUCTORS, F&I, INSUL, NO.8-6	LF	280.00	\$1.30	\$364.00
0715 4 121	LIGHT POLE COMP, F&I, WS130, 40'	EA	2.00	\$4,013.97	\$8,027.94
0715 7 21	LOAD CENTER, REWORK, SECONDARY VOLTAGE	EA	1.00	\$768.50	\$768.50
0715 500 1	POLE CABLE DIST SYS, CONVENTIONAL	EA	2.00	\$955.48	\$1,910.96
				LIGHTING SUBTOTAL	\$15,457.88
				SUBTOTAL	\$24,559.10
0101 1				MOBILIZATION(5%)	\$1,227.96
0102 1				MAINTENANCE OF TRAFFIC (10%)	\$2,455.91
				CONSTRUCTION TOTAL	\$28,242.97
				ENGINEERING (20%)	\$5,648.59
				CEI (10%)	\$2,824.30
				PROJECT TOTAL FOR EACH CROSSWALK	\$36,715.86