

TECHNICAL MEMORANDUM

To: Florida Department of Transportation – District 5
719 S Woodland Boulevard
DeLand, FL 32720

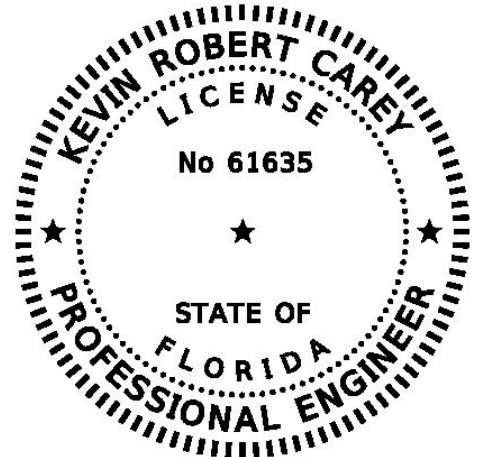
From: Kevin R Carey
P.E. No. 61635
(407) 644-2116
Faller, Davis & Associates, Inc.
2301 Maitland Center Parkway
Suite 265
Maitland, Florida 32751
Vendor No.: 59-2594956

THIS ITEM HAS BEEN DIGITALLY
SIGNED AND SEALED BY

Kevin Carey 2025.02.28
12:32:
10-05'00'

ON THE DATE ADJACENT TO THE SEAL.

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Date: February 28, 2025

Subject: US 192 at Old Town – Benefit Cost Analysis
Osceola County
Section 92090000 MP 7.236
Financial Project No.: 237974-1-32-22
Contract No.: C-AV80
Task Work Order (TWO) 1 - Study 1
Consultant No.: 754.01

Faller, Davis & Associates, Inc. (FDA) has been retained by the Florida Department of Transportation (FDOT) to perform a benefit cost analysis for the installation of a pedestrian hybrid beacon at the intersection of US 192 at Old Town in Osceola County. The analysis methods used in conducting this project are consistent with those set forth in the current State of Florida adopted editions of the Manual on Uniform Traffic Control Devices (MUTCD), Traffic Engineering Manual (TEM) and FDOT District 5 guidelines and procedures. The purpose of this effort is to determine if the safety benefits of the construction of a mid-block crosswalk, installation of a pedestrian hybrid beacon, and addition of pedestrian lighting improvements outweigh the estimated cost of construction.

Existing Conditions

US 192 is a six-lane divided urban facility with a closed drainage system and a posted speed limit of 45 mph. The entrance to Old Town and the frontage road on the north side of the intersection are undivided two lane urban facilities with closed drainage systems and unposted speed limits. A directional median opening at the intersection allows mainline east and westbound left turn movements.

Proposed Conditions

The proposed improvements include installing a pedestrian hybrid beacon and a high emphasis pedestrian crossing across the center of the intersection from the southwest quadrant to the northeast quadrant. The existing street lighting at the crossing will be enhanced to meet minimum FDOT pedestrian lighting criteria for new construction.

Collision Data

As part of the analysis, collision data was obtained from the University of Florida Signal Four Analytics for the intersection of US 192 at Old Town for the five-year period ending December 31, 2023. A summary of collision statistics, collision summaries, and collision diagrams are provided in Attachment 3.

Benefit Cost Analysis

A fifteen-year service life was used for the pedestrian hybrid beacon installation and lighting improvements, and a twenty-year service life was used for the crosswalk improvements for the benefit cost analysis. Over the service lives, the proposed improvements result in an annual crash reduction of 1.44 crashes with an annual benefit of \$285,211. For the Concrete Pile supported pedestrian hybrid beacon, the annualized cost of improvements is \$116,780 with a resulting benefit-cost ratio of 2.44 to 1. For the Mast Arm supported pedestrian hybrid beacon, the annualized cost of improvements is \$137,578 and a benefit-cost ratio of 2.07 to 1.

Net Present Value Analysis

In order to determine the benefit over the life of the improvements, a Net Present Value (NPV) analysis was performed. A four percent interest rate was used to calculate the present value of the realized benefit over the life of the project. The NPVs of the proposed mid-block crosswalk, the installation of a pedestrian hybrid beacon, and the addition of pedestrian lighting improvements are \$1,885,116 for Concrete Pile signal supports, and \$1,675,182 for Mast Arm signal supports.

The Benefit Cost and Net Present Value Analysis are further summarized on the following table and are detailed in Attachments 1 and 2.

Pedestrian Hybrid Beacon Structure	Total Cost	Overall B/C	Net Present Value
Concrete Pile	\$1,285,967.05	2.44 to 1	\$1,885,116
Mast Arm	\$1,495,901.26	2.07 to 1	\$1,675,182

**Attachment 1 – Pedestrian Hybrid Beacon (Concrete Pile)
Conceptual Improvement Diagram, BC Summary, NPV Summary, and Cost
Estimate**

Net Present Value													
Roadway	US 192				City	Unincorporated							
District	Five				County	Osceola							
Analyst	KRC				Section No.	92090000							
Date Performed	2/5/25				Milepoint	7.236							
Roadway Type	Urban 6+Ln 2Wwy Divd				Major Street Name	US 192							
Cost Per Crash	\$198,063		Interest Rate	4.0%		Minor Street Name	Old Town Entrance						
Improvement Description	Install pedestrian hybrid beacon (Concrete Pile) and pedestrian street lighting upgrades												
Number of Certified Crashes			2019	2020	2021	2022	2023	Total	Average				
			4	4	6	5	3	22	4.4				
			2	1	5	5	1	14	2.8				
No.	Countermeasure	Crash Modification Factors Clearinghouse ID	Direction	Crash Type Reduced	Total No. of Crashes by Type (X)	Cumulative Crashes Corrected with Previous CRFs (Y)	CRF (Z)	No. of Crashes Reduced with CRF (N)	Number of Crashes Corrected per Year	Current Year	Project Opening Year	Analysis Period (Service Life) (Years)	NPV of Crash Reduction
1	Install pedestrian hybrid beacon	10594	All	All	14	0.0	31.5%	4.4	0.880	2025	2026	15	\$1,937,884
2	Improve Street Lighting Illuminance and Uniformity	11026	All	Night	13	4.4	32.1%	2.8	0.560	2025	2026	15	\$1,233,199
Total													\$3,171,083
Cost of Countermeasures													\$1,285,967
Net Present Value of Project													\$1,885,116
Total No. of Crashes Reduced									7.2	Total No. of Crashes Reduced N = (X - Y) * Z Composite CRF = Σ N / Total No. of Crashes at Intersection			
Total No. of Correctable Crashes at Intersection									14.0				
Composite CRF									51.4%				

FDOT Cost Estimate					
Roadway	US 192	City	Unincorporated		
District	Five	County	Osceola		
Analyst	KRC	Section No.	92090000		
Agency or Company	FDA	Milepoint	7.236		
Date Performed	2/5/25	Major Street Name	US 192		
Market Area	AREA 8	Minor Street Name	Old Town Entrance		
Improvement Description	Install pedestrian hybrid beacon (Concrete Pile) and pedestrian street lighting upgrades				
Pay Item	Description	Unit	Quantity	Unit Price	Total Cost
Roadway, Drainage, Structures, Foundations & Incidental Construction					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$34,931.35	\$34,931.35
102-14	TRAFFIC CONTROL OFFICER	HR	32	\$77.65	\$2,484.80
102-60	WORK ZONE SIGN	ED	1920	\$0.27	\$518.40
102-74-1	CHANNELIZING DEVICE- TYPES I, II, DI, VP, DRUM, OR LCD	ED	4400	\$0.12	\$528.00
102-74-8	CHANNELIZING DEVICE- PEDESTRIAN LCD (LONGITUDINAL CHANNELIZING DEVICE)	FD	720	\$0.05	\$36.00
102-76	ARROW BOARD / ADVANCE WARNING ARROW PANEL	ED	120	\$5.91	\$709.20
102-99	PORTABLE CHANGEABLE MESSAGE SIGN, TEMPORARY	ED	120	\$11.73	\$1,407.60
110-1-1	CLEARING & GRUBBING	AC	1	\$64,069.09	\$64,069.09
110-4-10	REMOVAL OF EXISTING CONCRETE	SY	2	\$47.87	\$95.74
120-1	REGULAR EXCAVATION	CY	24	\$14.89	\$357.36
455-34-5	PRESTRESSED CONCRETE PILING, 24" SQ	LF	292	\$293.00	\$85,556.00
520-2-2	CONCRETE CURB, TYPE B	LF	78	\$66.10	\$5,155.80
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	SY	125	\$109.91	\$13,738.75
Construction Cost					\$209,588.09
Contingency - 10% of Construction Cost					\$20,958.81
Maintenance of Traffic - 0% of Construction Cost					\$0.00
Erosion Control - 5% of Construction Cost					\$10,479.40
Total for Roadway, Drainage, Structures, Foundations & Incidental Construction					\$241,026.30
Traffic Signals & ITS					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$80,205.58	\$80,205.58
611-1-1	ITSFM SUBSURFACE DOCUMENTATION- PROJECT LENGTH	MI	1	\$3,602.47	\$3,602.47
611-2-1	ITSFM LOCATION DOCUMENTATION- INTERSECTION	EA	1	\$2,746.80	\$2,746.80
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	553	\$17.73	\$9,804.69
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	447	\$41.75	\$18,662.25
630-2-14	CONDUIT, FURNISH & INSTALL, ABOVEGROUND	LF	70	\$43.75	\$3,062.50
632-7-1	SIGNAL CABLE- NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1	\$13,923.07	\$13,923.07
633-1-121	FIBER OPTIC CABLE, F&I, UNDERGROUND,2-12 FIBERS	LF	785	\$4.84	\$3,799.40
633-2-31	FIBER OPTIC CONNECTION, INSTALL, SPLICE	EA	4	\$61.30	\$245.20
633-3-12	FIBER OPTIC CONNECTION HARDWARE, F&I, SPLICE TRAY	EA	2	\$83.21	\$166.42
633-3-13	FIBER OPTIC CONNECTION HARDWARE, F&I, PRETERMINATED CONNECTOR ASSEMBLY	EA	2	\$66.81	\$133.62
633-3-15	FIBER OPTIC CONNECTION HARDWARE, F&I, PRETERMINATED PATCH PANEL	EA	2	\$1,859.82	\$3,719.64
633-6	FIBER OPTIC CABLE LOCATOR	DA	60	\$304.53	\$18,271.80
634-4-151	SPAN WIRE ASSEMBLY, F&I, TWO POINT, PERPENDICULAR	PI	2	\$8,961.67	\$17,923.34
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	16	\$1,631.51	\$26,104.16
635-2-12	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	6	\$3,031.45	\$18,188.70
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER PURCHASED BY CONTRACTOR	AS	1	\$6,461.51	\$6,461.51
639-2-1	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	182	\$12.20	\$2,220.40
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	1	\$2,819.50	\$2,819.50
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	4	\$3,019.23	\$12,076.92
653-1-11	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN, 1 WAY	AS	4	\$1,156.81	\$4,627.24
654-1-10	MIDBLOCK CROSSWALK: IN ROADWAY LIGHT ASSEMBLY, FURNISH & INSTALL- AC POWERED, COMPLETE CROSSING	AS	2	\$59,503.15	\$119,006.30
654-3-10	MIDBLOCK CROSSWALK: PEDESTRIAN HYBRID BEACON ASSEMBLY, FURNISH & INSTALL COMPLETE ASSEMBLY	AS	6	\$2,197.42	\$13,184.52
665-1-12	PEDESTRIAN DETECTOR, FURNISH & INSTALL, ACCESSIBLE	EA	4	\$2,100.99	\$8,403.96
670-5-111	TRAFFIC CONTROLLER ASSEMBLY, F&I, NEMA, 1 PREEMPTION	AS	1	\$57,812.10	\$57,812.10
676-1-500	TRAFFIC SIGNAL CONTROLLER CABINET, ADJUST/MODIFY	EA	1	\$3,580.83	\$3,580.83
682-1-113	ITS CCTV CAMERA, F&I, DOME PTZ ENCLOSURE - PRESSURIZED, IP, HIGH DEFINITION	EA	1	\$7,290.43	\$7,290.43
684-1-1	MANAGED FIELD ETHERNET SWITCH, FURNISH & INSTALL	EA	1	\$6,234.25	\$6,234.25
685-1-13	UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND INSTALL, LINE INTERACTIVE WITH CABINET	EA	1	\$15,502.97	\$15,502.97
685-2-1	REMOTE POWER MANAGEMENT UNIT- RPMU, FURNISH AND INSTALL	EA	1	\$1,452.89	\$1,452.89
Construction Cost					\$481,233.46
Contingency - 10% of Construction Cost					\$48,123.35
Maintenance of Traffic - 0% of Construction Cost					\$0.00
Erosion Control - 5% of Construction Cost					\$24,061.67
Total for Traffic Signals & ITS					\$553,418.47
Signing & Pavement Markings					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$7,326.24	\$7,326.24
700-1-11	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	AS	12	\$622.44	\$7,469.28
700-1-12	SINGLE POST SIGN, F&I GROUND MOUNT, 12-20 SF	AS	2	\$2,001.60	\$4,003.20
700-1-60	SINGLE POST SIGN, REMOVE	AS	2	\$133.94	\$267.88
700-3-201	SIGN PANEL, FURNISH & INSTALL OVERHEAD MOUNT, UP TO 12 SF	EA	6	\$1,016.47	\$6,098.82
705-11-1	DELINEATOR, FLEXIBLE TUBULAR	EA	2	\$103.53	\$207.06
706-1-3	RAISED PAVEMENT MARKER, TYPE B	EA	24	\$4.99	\$119.76
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12" FOR CROSSWALK AND ROUNDABOUT	LF	192	\$4.16	\$798.72
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24" FOR STOP LINE AND CROSSWALK	LF	75	\$7.98	\$598.50
711-14-125	THERMOPLASTIC, PREFORMED, WHITE, SOLID, 24" FOR CROSSWALK	LF	221	\$17.64	\$3,898.44
711-16-101	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	GM	1	\$5,867.39	\$5,867.39
711-16-201	THERMOPLASTIC, STANDARD-OTHER SURFACES, YELLOW, SOLID, 6"	GM	1	\$6,088.13	\$6,088.13
711-17-1	THERMOPLASTIC, REMOVE EXISTING THERMOPLASTIC PAVEMENT MARKINGS- SURFACE TO REMAIN	SF	369	\$3.29	\$1,214.01
Construction Cost					\$43,957.43
Contingency - 10% of Construction Cost					\$4,395.74
Maintenance of Traffic - 0% of Construction Cost					\$0.00

Erosion Control - 5% of Construction Cost					\$2,197.87
Total for Signing & Pavement Markings					\$50,551.04
Lighting					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$39,599.48	\$39,599.48
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	104	\$17.73	\$1,843.92
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	125	\$41.75	\$5,218.75
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	4	\$1,631.51	\$6,526.04
715-1-12	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	LF	312	\$2.72	\$848.64
715-500-1	POLE CABLE DISTRIBUTION SYSTEM, FURNISH AND INSTALL, CONVENTIONAL	EA	4	\$890.01	\$3,560.04
715-511-140	LIGHT POLE COMPLETE- SPECIAL DESIGN, F&I, SINGLE ARM SHOULDER MOUNT, ALUMINUM, 40'	EA	4	\$45,000.00	\$180,000.00
Construction Cost					\$237,596.87
Contingency - 10% of Construction Cost					\$23,759.69
Maintenance of Traffic - 0% of Construction Cost					\$0.00
Erosion Control - 5% of Construction Cost					\$11,879.84
Total for Lighting					\$273,236.40
Construction Total					\$1,118,232.22
P.E.C.E.I. - 15% of Construction Total					\$167,734.83
Design Total					\$167,734.83
Project Total					\$1,285,967.05

Benefit-Cost Analysis

District: **Five**

County: **Osceola**

Date Prepared: **02/05/25**

Location: **US 192 at Old Town Entrance**

Section: **92090000**

Beg. Milepost: **7.236**

End Milepost: **7.236**

Roadway Type: **Urban 6+Ln 2Wy Divd**

Interest Rate: **4%**

Improvement Description:

Install pedestrian hybrid beacon (Concrete Pile) and pedestrian street lighting upgrades

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW	\$ -	100	0.0408	\$ -
P.E.C.E.I.	\$ 167,734.83	15	0.0899	\$ 15,079.36
Roadway & Drainage	\$ 241,026.30	20	0.0736	\$ 17,739.54
Signals & ITS	\$ 553,418.47	15	0.0899	\$ 49,752.32
Signing & Markings	\$ 50,551.04	6	0.1908	\$ 9,645.14
Lighting	\$ 273,236.40	15	0.0899	\$ 24,563.95
Other		20	0.0736	\$ -
Sub-Total	\$ 1,285,967.05			\$ 116,780.31
Annual Cost =				\$ 116,780.31

Total number of crashes = **22**
 # of correctable crashes, PC = **14**
 # of years of crash data, YD = **5**
 PC/YD = **2.80**
 Crash reduction factor, CRF = **51.40%**
 CRF x (PC/YD) = **1.44**
 Cost per crash, CPC = **\$198,063.00**
 Benefit = **\$285,211**

Primary crash reduction factor (%): **51.4**

Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$285,210.72}{\$116,780.31} = \mathbf{2.44}$$

Additional Comments

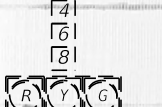
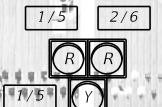
Prepared by: **KRC**

Attachment 2 – Pedestrian Hybrid Beacon (Mast Arm)
Conceptual Improvement Diagram, BC Summary, NPV Summary, and Cost
Estimate

LEGEND

- PROPOSED CONTROLLER CABINET
PROPOSED UPS CABINET
PROPOSED DELINEATOR
13" X 24" PULL BOX
24" X 36" PULL BOX
OPEN TRENCH CONDUIT
DIRECTIONAL BORE CONDUIT
PEDESTRIAN POLE AND PUSH BUTTON
BI-DIRECTIONAL PEDESTRIAN ACTUATED FLASHING YELLOW PUCK
CCTV CAMERA

SIGNAL HEAD DETAILS



FUTURE 2' X 9'
STREET NAME SIGN
TO BE MOUNTED TO
POLES 1 AND 2 ON
CANTILEVER ARM

3-SECT., 1-WAY
654-3-10

PED. SIGNAL
COUNT-DOWN
1-SECT., 1-WAY
653-1-11

4-SECT., 1-WAY
FOR FUTURE USE
PROVIDE FLEXIBLE
BACKPLATES ONLY

3-SECT., 1-WAY
FOR FUTURE USE
PROVIDE FLEXIBLE
BACKPLATES ONLY

0 12 60
Feet

HOLIDAY TRAIL

1 EA - ITS CCTV CAMERA, F&I, DOME
ENCLOSURE-NON-PRESSURIZED,
IP, HIGH DEFINITION

POLE 4
STA. 10+06, 102' LT
ELEV. 100.25
X:490158.68
Y:1454150.59
682-1-113

FUTURE SIGNAL SPAN

ELEV. 100.23

1 RUN @ 9'
(1 PUCK)

PEDESTRIAN POLE
STA. 10+80, 82' LT
2 RUNS @ 11'
(SIGNAL HIGH/LOW)

646-1-11 1 EA - PEDESTRIAN POLE
653-1-11 1 AS - PEDESTRIAN SIGNAL, ONE WAY
665-1-12 1 EA - PEDESTRIAN PUSH BUTTON - ACCESSIBLE

2 RUNS @ 31' (SIGNAL (HIGH), CCTV)
FRONTAGE ROAD

POLE 2
STA. 10+98, 102' LT
ELEV. 100.00

X: 490250.79
Y: 1454150.59

24" PREFORMED WHITE
REMOVE UNDERLYING
EXISTING MARKINGS

STA 15+00
SEE GENERAL NOTES
MESSAGE DETAIL 2

BI DIRECTIONAL FLASHING YELLOW
PUCK. FOR DETAILS SEE SHEET 6
654-1-10 1 AS

US 192

6" WHITE WITH W/R RPMS @
20' OC. REMOVE UNDERLYING
EXISTING MARKINGS

PEDESTRIAN POLE
STA. 10+66, 20' LT
2 RUNS @ 5'
(SIGNAL HIGH/LOW)

646-1-11 1 EA - PEDESTRIAN POLE
653-1-11 1 AS - PEDESTRIAN SIGNAL, ONE WAY
665-1-12 1 EA - PEDESTRIAN PUSH BUTTON - ACCESSIBLE

POLE 3
STA. 11+10, 60' RT
ELEV. 100.57
X:490261.93
Y:1453988.98

EXIST. R/W LINE

EXISTING POWER POLE / PROPOSED POWER SOURCE

2 RUNS @ 125' (POWER, SPARE)

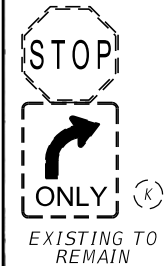
SIGNAL PAY ITEMS (CTD.)

685-1-13 UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND
INSTALL, LINE INTERACTIVE WITH CABINET - 1 EA
685-2-1 REMOTE POWER MANAGEMENT UNIT, F&I - 1 EA

STRIPING PAY ITEMS

705-11-1 DELINEATOR, FLEXIBLE TUBULAR - 2 EA
706-1-3 RETRO-REFLECTIVE PAVEMENT
MARKERS - 24 EA (W/R)
711-11-123 12" WHITE, THERMOPLASTIC STANDARD - 192 LF
711-11-125 24" WHITE, THERMOPLASTIC STANDARD - 75 LF
711-14-125 24" WHITE, THERMOPLASTIC PREFORMED - 221 LF
711-16-101 6" WHITE, THERMOPLASTIC STANDARD - 0.076 GM
711-16-201 6" YELLOW, THERMOPLASTIC STANDARD - 0.026 GM
711-17-1 REMOVE EXISTING MARKINGS - 369 SF

SIGNALIZATION PLAN



R10-23a
30"X36"
700-3-201 4 EA

R10-3i
SIGN TO BE PLACED
ABOVE PED DETECTOR
BUTTON
SEE NOTE 8

STATE LAW
STOP
FOR
PEDESTRIANS
IN
CROSSWALKS
700-1-11 2 AS



W11-2
36"X36"
700-3-201 2 EA

4 AS



W11-2
36" X 36"
W16-9P
24" X 12"
700-1-11

2 AS

R1-5BL
36"X36"
700-1-11 2 AS
STA. 9+83
STA. 11+17

W11-2
36" X 36"
W16-7PR
24" X 12"
700-1-11

2 AS

STA. 10+28
STA. 10+70

W11-2
36" X 36"
W16-7PL
24" X 12"
700-1-11

2 AS

STA. 10+15
STA. 10+84

ONE WAY
DO NOT
ENTER
R6-1R
48" X 18"
R5-1
36" X 36"
700-1-12 2 AS
700-1-60 2 AS
STA. 10+45
STA. 10+60

SIGNAL PAY ITEMS

611-1 ITSFM SUBSURFACE DOCUMENTATION - 0.141 MI
611-2 ITSFM LOCATION DOCUMENTATION, INTERSECTION - 1 EA
630-2-11 CONDUIT OPEN TRENCH - 553 LF
630-2-12 CONDUIT DIRECTIONAL BORE - 540 LF
630-2-12 CONDUIT ABOVEGROUND - 70 LF
632-7-1 SIGNAL CABLE- NEW OR RECONSTRUCTED
INTERSECTION, FURNISH & INSTALL - 1 PI
633-6 FIBER OPTIC LOCATER - 60 EA
635-2-11 PULL BOX 13"X24" - 18 EA
639-1-122 ELECTRICAL POWER SERVICE, F&I, UNDERGROUND,
METER PURCHASED BY CONTRACTOR - 1 AS
639-2-1 ELECTRICAL SERVICE WIRE, FURNISH & INSTALL - 182 LF
639-3-11 ELECTRICAL SERVICE DISCONNECT, F&I,
POLE MOUNT - 1 EA
649-21-21 STEEL MAST ARM ASSEMBLY, FURNISH AND
INSTALL, SINGLE ARM 78"
670-5-111 TRAFFIC CONTROLLER ASSEMBLY, F&I, NEMA,
1 PREEMPTION - 1 AS
682-5-133 ITS CCTV CAMERA - 1 EA

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

KEVIN R. CAREY, P.E.
P.E. LICENSE NUMBER: 61635
FALLER, DAVIS & ASSOCIATES, INC.
2301 MAITLAND CENTER PARKWAY - SUITE 265
MAITLAND, FL 32751

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 192	OSCEOLA	

US 192 AT OLD TOWN SECTION 92090000 MP 7.236		SHEET NO.

Net Present Value													
Roadway	US 192				City	Unincorporated							
District	Five				County	Osceola							
Analyst	KRC				Section No.	92090000							
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			4	4	6	5	3	22	4.4				
			Number of Correctable Crashes			2	1	5	5				
No.	Countermeasure	Crash Modification Factors Clearinghouse ID	Direction	Crash Type Reduced	Total No. of Crashes by Type (X)	Cumulative Crashes Corrected with Previous CRFs (Y)	CRF (Z)	No. of Crashes Reduced with CRF (N)	Number of Crashes Corrected per Year	Current Year	Project Opening Year	Analysis Period (Service Life) (Years)	NPV of Crash Reduction
1	Install pedestrian hybrid beacon	10594	All	All	14	0.0	31.5%	4.4	0.880	2025	2026	15	\$1,937,884
2	Improve Street Lighting Illuminance and Uniformity	11026	All	Night	13	4.4	32.1%	2.8	0.560	2025	2026	15	\$1,233,199
Total													\$3,171,083
Cost of Countermeasures													\$1,495,901
Net Present Value of Project													\$1,675,182
Total No. of Crashes Reduced									7.2	Total No. of Crashes Reduced N = (X - Y) * Z Composite CRF = Σ N / Total No. of Crashes at Intersection			
Total No. of Correctable Crashes at Intersection									14.0				
Composite CRF									51.4%				

FDOT Cost Estimate					
Roadway	US 192	City	Unincorporated		
District	Five	County	Osceola		
Analyst	KRC	Section No.	92090000		
Agency or Company	FDA	Milepoint	7.236		
Date Performed	2/5/25	Major Street Name	US 192		
Market Area	AREA 8	Minor Street Name	Old Town Entrance		
Improvement Description	Install pedestrian hybrid beacon (Mast Arm) and pedestrian street lighting upgrades				
Pay Item	Description	Unit	Quantity	Unit Price	Total Cost
Roadway, Drainage, Structures, Foundations & Incidental Construction					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$17,820.15	\$17,820.15
102-14	TRAFFIC CONTROL OFFICER	HR	32	\$77.65	\$2,484.80
102-60	WORK ZONE SIGN	ED	1920	\$0.27	\$518.40
102-74-1	CHANNELIZING DEVICE- TYPES I, II, DI, VP, DRUM, OR LCD	ED	4400	\$0.12	\$528.00
102-74-8	CHANNELIZING DEVICE- PEDESTRIAN LCD (LONGITUDINAL CHANNELIZING DEVICE)	FD	720	\$0.05	\$36.00
102-76	ARROW BOARD / ADVANCE WARNING ARROW PANEL	ED	120	\$5.91	\$709.20
102-99	PORTABLE CHANGEABLE MESSAGE SIGN, TEMPORARY	ED	120	\$11.73	\$1,407.60
110-1-1	CLEARING & GRUBBING	AC	1	\$64,069.09	\$64,069.09
110-4-10	REMOVAL OF EXISTING CONCRETE	SY	2	\$47.87	\$95.74
120-1	REGULAR EXCAVATION	CY	24	\$14.89	\$357.36
520-2-2	CONCRETE CURB, TYPE B	LF	78	\$66.10	\$5,155.80
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	SY	125	\$109.91	\$13,738.75
Construction Cost					\$106,920.89
Contingency - 10% of Construction Cost					\$10,692.09
Maintenance of Traffic - 0% of Construction Cost					\$0.00
Erosion Control - 5% of Construction Cost					\$5,346.04
Total for Roadway, Drainage, Structures, Foundations & Incidental Construction					\$122,959.02
Traffic Signals & ITS					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$123,773.51	\$123,773.51
611-1-1	ITSFM SUBSURFACE DOCUMENTATION- PROJECT LENGTH	MI	1	\$3,602.47	\$3,602.47
611-2-1	ITSFM LOCATION DOCUMENTATION- INTERSECTION	EA	1	\$2,746.80	\$2,746.80
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	553	\$17.73	\$9,804.69
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	540	\$41.75	\$22,545.00
630-2-14	CONDUIT, FURNISH & INSTALL, ABOVEGROUND	LF	70	\$43.75	\$3,062.50
632-7-1	SIGNAL CABLE- NEW OR RECONSTRUCTED INTERSECTION, FURNISH & INSTALL	PI	1	\$13,923.07	\$13,923.07
633-1-121	FIBER OPTIC CABLE, F&I, UNDERGROUND,2-12 FIBERS	LF	785	\$4.84	\$3,799.40
633-2-31	FIBER OPTIC CONNECTION, INSTALL, SPLICE	EA	4	\$61.30	\$245.20
633-3-12	FIBER OPTIC CONNECTION HARDWARE, F&I, SPLICE TRAY	EA	2	\$83.21	\$166.42
633-3-13	FIBER OPTIC CONNECTION HARDWARE, F&I, PRETERMINATED CONNECTOR ASSEMBLY	EA	2	\$66.81	\$133.62
633-3-15	FIBER OPTIC CONNECTION HARDWARE, F&I, PRETERMINATED PATCH PANEL	EA	2	\$1,859.82	\$3,719.64
633-6	FIBER OPTIC CABLE LOCATOR	DA	60	\$304.53	\$18,271.80
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	18	\$1,631.51	\$29,367.18
635-2-12	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	6	\$3,031.45	\$18,188.70
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER PURCHASED BY CONTRACTOR	AS	1	\$6,461.51	\$6,461.51
639-2-1	ELECTRICAL SERVICE WIRE, FURNISH & INSTALL	LF	182	\$12.20	\$2,220.40
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	1	\$2,819.50	\$2,819.50
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	4	\$3,019.23	\$12,076.92
649-21-21	STEEL MAST ARM ASSEMBLY, FURNISH AND INSTALL, SINGLE ARM 78'	EA	2	\$114,308.63	\$228,617.26
653-1-11	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN, 1 WAY	AS	4	\$1,156.81	\$4,627.24
654-1-10	MIDBLOCK CROSSWALK: IN ROADWAY LIGHT ASSEMBLY, FURNISH & INSTALL- AC POWERED, COMPLETE CROSSING	AS	2	\$59,503.15	\$119,006.30
654-3-10	MIDBLOCK CROSSWALK: PEDESTRIAN HYBRID BEACON ASSEMBLY, FURNISH & INSTALL COMPLETE ASSEMBLY	AS	6	\$2,197.42	\$13,184.52
665-1-12	PEDESTRIAN DETECTOR, FURNISH & INSTALL, ACCESSIBLE	EA	4	\$2,100.99	\$8,403.96
670-5-111	TRAFFIC CONTROLLER ASSEMBLY, F&I, NEMA, 1 PREEMPTION	AS	1	\$57,812.10	\$57,812.10
676-1-500	TRAFFIC SIGNAL CONTROLLER CABINET, ADJUST/MODIFY	EA	1	\$3,580.83	\$3,580.83
682-1-113	ITS CCTV CAMERA, F&I, DOME PTZ ENCLOSURE - PRESSURIZED, IP, HIGH DEFINITION	EA	1	\$7,290.43	\$7,290.43
684-1-1	MANAGED FIELD ETHERNET SWITCH, FURNISH & INSTALL	EA	1	\$6,234.25	\$6,234.25
685-1-13	UNINTERRUPTIBLE POWER SUPPLY, FURNISH AND INSTALL, LINE INTERACTIVE WITH CABINET	EA	1	\$15,502.97	\$15,502.97
685-2-1	REMOTE POWER MANAGEMENT UNIT- RPMU, FURNISH AND INSTALL	EA	1	\$1,452.89	\$1,452.89
Construction Cost					\$742,641.08
Contingency - 10% of Construction Cost					\$74,264.11
Maintenance of Traffic - 0% of Construction Cost					\$0.00
Erosion Control - 5% of Construction Cost					\$37,132.05
Total for Roadway, Drainage, Structures, Foundations & Incidental Construction					\$122,959.02
Traffic Signals & ITS					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$7,326.24	\$7,326.24
700-1-11	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	AS	12	\$622.44	\$7,469.28
700-1-12	SINGLE POST SIGN, F&I GROUND MOUNT, 12-20 SF	AS	2	\$2,001.60	\$4,003.20
700-1-60	SINGLE POST SIGN, REMOVE	AS	2	\$133.94	\$267.88
700-3-201	SIGN PANEL, FURNISH & INSTALL OVERHEAD MOUNT, UP TO 12 SF	EA	6	\$1,016.47	\$6,098.82
705-11-1	DELINEATOR, FLEXIBLE TUBULAR	EA	2	\$103.53	\$207.06
706-1-3	RAISED PAVEMENT MARKER, TYPE B	EA	24	\$4.99	\$119.76
711-11-123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12" FOR CROSSWALK AND ROUNDABOUT	LF	192	\$4.16	\$798.72
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24" FOR STOP LINE AND CROSSWALK	LF	75	\$7.98	\$598.50
711-14-125	THERMOPLASTIC, PREFORMED, WHITE, SOLID, 24" FOR CROSSWALK	LF	221	\$17.64	\$3,898.44
711-16-101	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	GM	1	\$5,867.39	\$5,867.39
711-16-201	THERMOPLASTIC, STANDARD-OTHER SURFACES, YELLOW, SOLID, 6"	GM	1	\$6,088.13	\$6,088.13
711-17-1	THERMOPLASTIC, REMOVE EXISTING THERMOPLASTIC PAVEMENT MARKINGS- SURFACE TO REMAIN	SF	369	\$3.29	\$1,214.01
Construction Cost					\$43,957.43
Contingency - 10% of Construction Cost					\$4,395.74
Maintenance of Traffic - 0% of Construction Cost					\$0.00

Erosion Control - 5% of Construction Cost					\$2,197.87
Total for Signing & Pavement Markings					\$50,551.04
Lighting					
101-1	MOBILIZATION (20% CONSTRUCTION MATERIALS)	LS	1	\$39,599.48	\$39,599.48
630-2-11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	104	\$17.73	\$1,843.92
630-2-12	CONDUIT, FURNISH & INSTALL, DIRECTIONAL BORE	LF	125	\$41.75	\$5,218.75
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24" COVER SIZE	EA	4	\$1,631.51	\$6,526.04
715-1-12	LIGHTING CONDUCTORS, F&I, INSULATED, NO.8 - 6	LF	312	\$2.72	\$848.64
715-500-1	POLE CABLE DISTRIBUTION SYSTEM, FURNISH AND INSTALL, CONVENTIONAL	EA	4	\$890.01	\$3,560.04
715-511-140	LIGHT POLE COMPLETE- SPECIAL DESIGN, F&I, SINGLE ARM SHOULDER MOUNT, ALUMINUM, 40'	EA	4	\$45,000.00	\$180,000.00
Construction Cost					\$237,596.87
Contingency - 10% of Construction Cost					\$23,759.69
Maintenance of Traffic - 0% of Construction Cost					\$0.00
Erosion Control - 5% of Construction Cost					\$11,879.84
Total for Lighting					\$273,236.40
Construction Total					\$1,300,783.71
P.E.C.E.I. - 15% of Construction Total					\$195,117.56
Design Total					\$195,117.56
Project Total					\$1,495,901.26



Modified by FDA 03/2021

Benefit-Cost Analysis

District: **Five**

County: **Osceola**

Date Prepared: **02/05/25**

Location: **US 192 at Old Town Entrance**

Section: **92090000**

Beg. Milepost: **7.236**

End Milepost: **7.236**

Roadway Type: **Urban 6+Ln 2Wy Divd**

Interest Rate: **4%**

Improvement Description:

Install pedestrian hybrid beacon (Mast Arm) and pedestrian street lighting upgrades

Night 13

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW	\$ -	100	0.0408	\$ -
P.E.C.E.I.	\$ 195,117.56	15	0.0899	\$ 17,541.07
Roadway & Drainage	\$ 122,959.02	20	0.0736	\$ 9,049.78
Signals & ITS	\$ 854,037.25	15	0.0899	\$ 76,777.95
Signing & Markings	\$ 50,551.04	6	0.1908	\$ 9,645.14
Lighting	\$ 273,236.40	15	0.0899	\$ 24,563.95
Other		20	0.0736	\$ -
Sub-Total	\$ 1,495,901.26			\$ 137,577.89
Annual Cost =				\$ 137,577.89

Total number of crashes = **22**
 # of correctable crashes, PC = **14**
 # of years of crash data, YD = **5**
 PC/YD = **2.80**
 Crash reduction factor, CRF = **51.40%**
 CRF x (PC/YD) = **1.44**
 Cost per crash, CPC = **\$198,063.00**
 Benefit = **\$285,211**

Primary crash reduction factor (%): **51.4**

Additional crash reduction factor:

Additional crash reduction factor:

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$285,210.72}{\$137,577.89} = \mathbf{2.07}$$

Additional Comments

Prepared by: **KRC**

Attachment 3 – Collision Diagrams and Summaries

[illegible]



⊗ FATAL	←→ REAR END	↘ RIGHT TURN	↙ LEFT TURN	→ HIT TREE
○ INJURY	↔ SIDESWIPE	↘ HIT BIKE	↙ OVERTURNED	→ HIT SIGN
ⓧ COLLISION NUMBER	⋈ OUT OF CONTROL	↘ ANGLE	↙ HEAD ON	→ HIT FENCE
	↔ BACKED INTO		→ OTHER FIXED OBJECT	→ RAN INTO DITCH/CULVERT

FALLER, DAVIS & ASSOCIATES, INC.
2301 MAITLAND CENTER PARKWAY
SUITE 265
MAITLAND, FL 32751

YEAR 1 (1/1/2019-12/31/2019)
COLLISION DIAGRAM
CONTINUING SERVICES CONTRACT
FOR DISTRICTWIDE TRAFFIC ENGINEERING

[illegible]

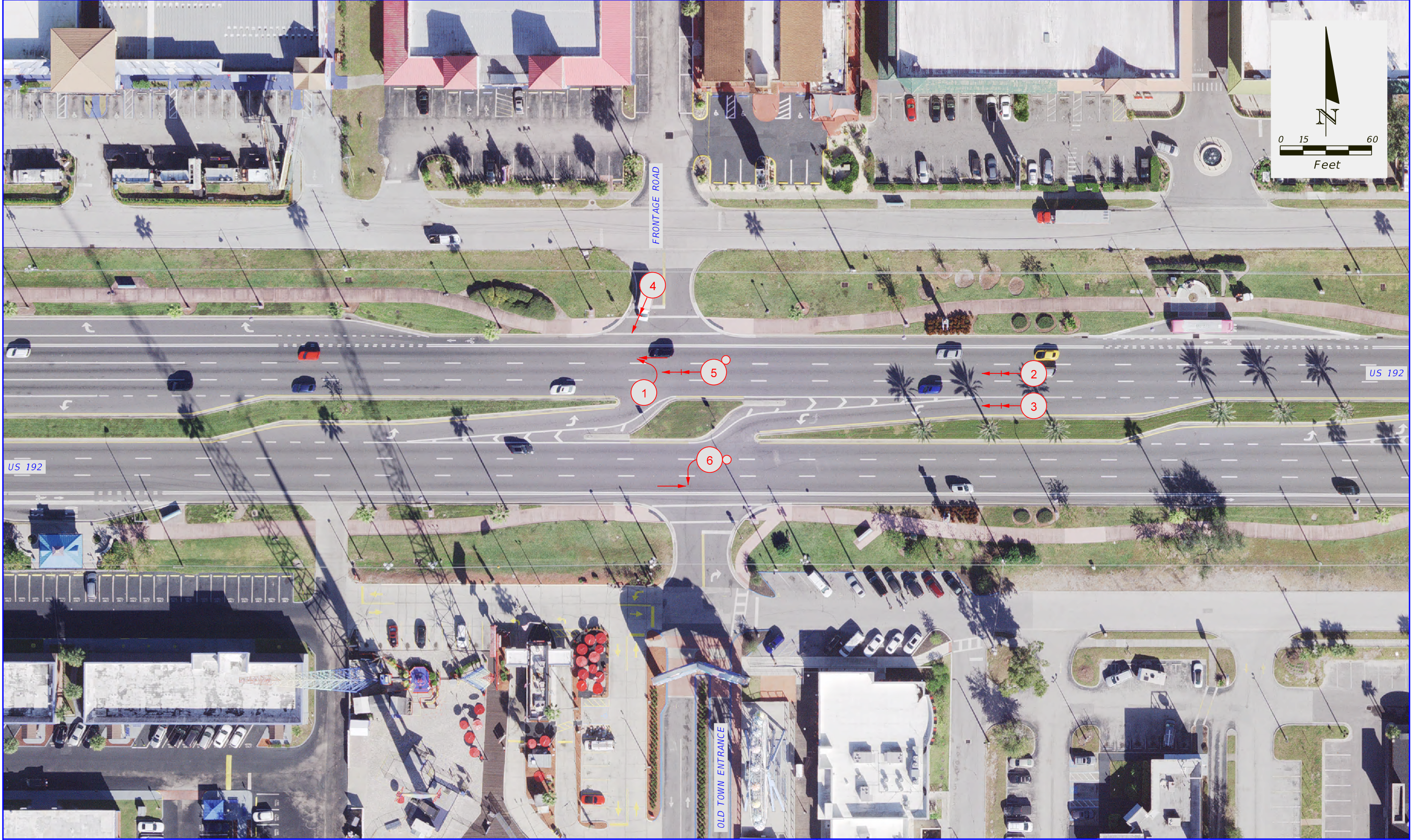


- | | | | | |
|--------------------|------------------|--------------|----------------------|--------------------------|
| ⊗ FATAL | ↔ REAR END | ↗ RIGHT TURN | ↖ LEFT TURN | → HIT TREE |
| ○ INJURY | ↔ SIDESWIPE | ↘ HIT BIKE | ↖ OVERTURNED | → HIT SIGN |
| ⓧ COLLISION NUMBER | ↔ OUT OF CONTROL | ↘ ANGLE | ↖ HEAD ON | → HIT FENCE |
| | ↔ BACKED INTO | | → OTHER FIXED OBJECT | → RAN INTO DITCH/CULVERT |

FALLER, DAVIS & ASSOCIATES, INC.
2301 MAITLAND CENTER PARKWAY
SUITE 265
MAITLAND, FL 32751

YEAR 2 (1/1/2020-12/31/2020)
COLLISION DIAGRAM
CONTINUING SERVICES CONTRACT
FOR DISTRICTWIDE TRAFFIC ENGINEERING

[illegible]

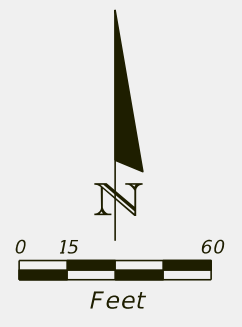


⊗ FATAL	↔ REAR END	↘ RIGHT TURN	↙ LEFT TURN	→🌳 HIT TREE
○ INJURY	↔ SIDESWIPE	↘ HIT BIKE	↙ OVERTURNED	→🚦 HIT SIGN
ⓧ COLLISION NUMBER	⚡ OUT OF CONTROL	↘ ANGLE	↙ HEAD ON	→🚧 HIT FENCE
	↔ BACKED INTO		→○ OTHER FIXED OBJECT	→🕒 RAN INTO DITCH/CULVERT

FALLER, DAVIS & ASSOCIATES, INC.
2301 MAITLAND CENTER PARKWAY
SUITE 265
MAITLAND, FL 32751

YEAR 3 (1/1/2021-12/31/2021)
COLLISION DIAGRAM
CONTINUING SERVICES CONTRACT
FOR DISTRICTWIDE TRAFFIC ENGINEERING

[illegible]



- | | | | | |
|--------------------|------------------|---------------|----------------------|--------------------------|
| ⊗ FATAL | ←→ REAR END | →→ RIGHT TURN | → LEFT TURN | → HIT TREE |
| ○ INJURY | ↔ SIDESWIPE | →→ HIT BIKE | → OVERTURNED | → HIT SIGN |
| ⓧ COLLISION NUMBER | → OUT OF CONTROL | → ANGLE | → HEAD ON | → HIT FENCE |
| | → BACKED INTO | | → OTHER FIXED OBJECT | → RAN INTO DITCH/CULVERT |

FALLER, DAVIS & ASSOCIATES, INC.
2301 MAITLAND CENTER PARKWAY
SUITE 265
MAITLAND, FL 32751

YEAR 4 (1/1/2022-12/31/2022)
COLLISION DIAGRAM
CONTINUING SERVICES CONTRACT
FOR DISTRICTWIDE TRAFFIC ENGINEERING

[illegible]



⊗ FATAL	↔ REAR END	↗ RIGHT TURN	↙ LEFT TURN	→🌳 HIT TREE
○ INJURY	↔ SIDESWIPE	↘ HIT BIKE	↙ OVERTURNED	→🚦 HIT SIGN
ⓧ COLLISION NUMBER	⚡ OUT OF CONTROL	↘ ANGLE	↘ HEAD ON	→🚧 HIT FENCE
	↔ BACKED INTO		→○ OTHER FIXED OBJECT	→🕳 RAN INTO DITCH/CULVERT

FALLER, DAVIS & ASSOCIATES, INC.
2301 MAITLAND CENTER PARKWAY
SUITE 265
MAITLAND, FL 32751

YEAR 5 (1/1/2023-12/31/2023)
COLLISION DIAGRAM
CONTINUING SERVICES CONTRACT
FOR DISTRICTWIDE TRAFFIC ENGINEERING