

Bicycle/Pedestrian Safety Technical Memorandum

August 2024

Project Limits:

Auburndale Trailhead on the Auburndale TECO Trail and
Haines City Trailhead on the Haines City Trail
Polk County, Florida

Financial Project ID: 435391-1-22-01

Prepared for:



Florida Department of Transportation
District One
801 N. Broadway Avenue
Bartow, Florida 33830

Prepared by:

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Tampa, FL 33602

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

PROFESSIONAL ENGINEER ENDORSEMENT

I hereby certify that I am a Registered Professional Engineer in the State of Florida and practicing with HNTB Corporation. HNTB Corporation is authorized via Certificate Number EB-0006500 to operate as an Engineering Business by the Florida State Board of Professional Engineers, State of Florida Department of Professional Regulation. I have prepared or supervised the preparation of the evaluation, findings, conclusions, recommendations, or professional opinions/advice contained in this document. My endorsement constitutes my approval of these items.

PROJECT: Old Dixie Trail Bicycle/Pedestrian Safety Technical
Memorandum
FPN: 435391-1-22-01

LOCATION: Auburndale Trailhead on the Auburndale TECO Trail and
Haines City Trailhead on the Haines City Trail
Polk County, Florida

CLIENT: Florida Department of Transportation
District One

The results contained in this report were developed using procedures and references standard to the transportation engineering practice. These references and procedures were applied using professional judgment and experience.

Name: Benjamin S. Rodgers, PE

P.E. No.: 80350

Date: August 2024

Signature: _____



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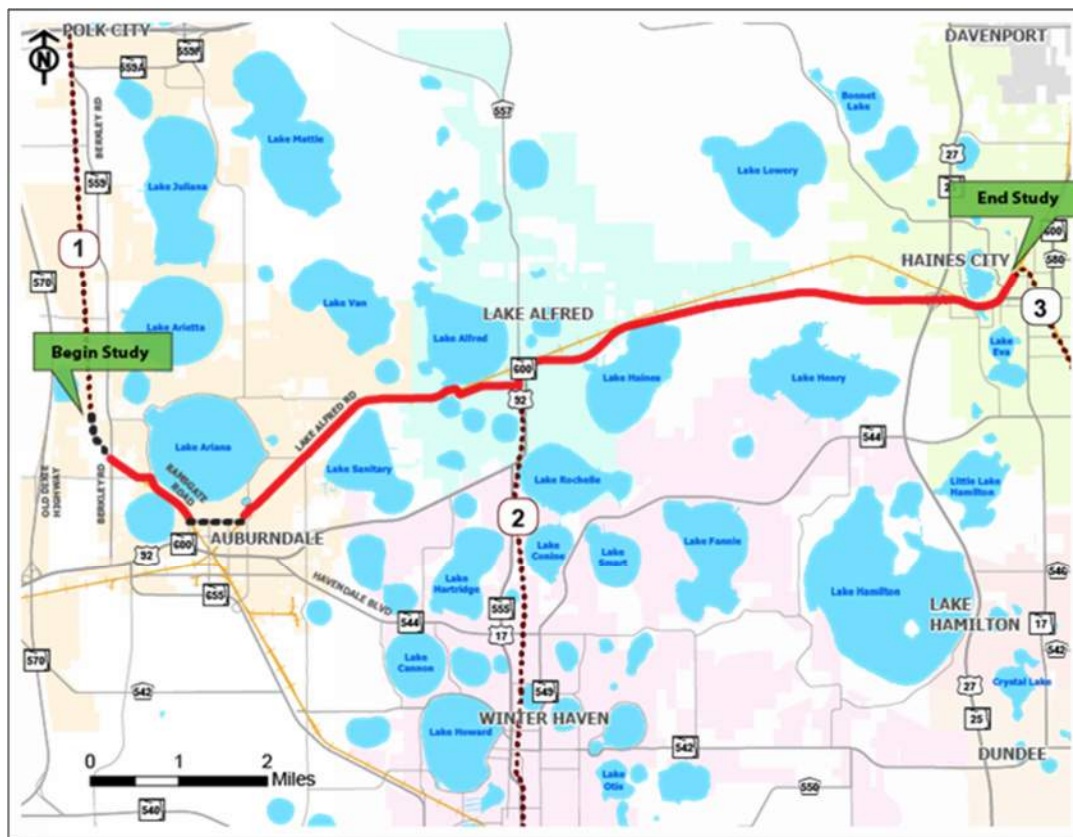
1.0 INTRODUCTION

As part of the Florida Department of Transportation's (FDOT) commitment to providing multimodal facilities and connectivity throughout the state, they have embarked on a two-phase process to determine feasibility for a multi-use trail from Auburndale to Haines City. Phase 1 of the project is a Feasibility Study in which existing conditions data were collected and analyzed for the project study area in an effort to identify end-to-end trail alternatives that best meet the project's goals and objectives of providing regional connectivity, contributing to safe multimodal access to community and recreational destinations, enhancing quality of life, and fostering economic development in the area. Phase 2 of the project is the Project Development and Environment (PD&E) Study in which the trail alignments identified in Phase 1 will be further analyzed to select a preferred alternative for the multi-use trail connecting the Auburndale TECO trailhead in Auburndale to the Haines City trailhead in Haines City.

1.1 Project Description

The purpose of this technical memorandum is to serve as an abbreviated safety study to determine if improvements can be made to reduce the quantity and severity of bicycle/pedestrian collisions occurring along the road within the limits of the planned Old Dixie Trail in Polk County, Florida. The trail is proposed to be 12 feet wide, but will narrow to 8' or 10' in some areas. The path of the trail is shown below in **Figure 1**.

Figure 1: Trail Map



2.0 QUALITATIVE ASSESSMENT

2.1 Crash Data

Bicycle/pedestrian only crash data was taken from both CAR on-line and SignalFour Analytics during a 5-year period from 2015 to 2019. For locations where the trail will run along the state highway system (SHS), data was pulled from both CAR on-line and SignalFour Analytics. For locations where the trail will not run along the SHS, data was only pulled from SignalFour Analytics. The collision diagrams and summaries are found in **Appendix A, Crash Data**.

2.2 Crash Analysis

A total of 18 bicycle and pedestrian collisions were reported along the entire trail. Six (33%) of the collisions were involving a bicycle and 12 (67%) of the collisions were involving a pedestrian. The severity of the collisions was as follows: 1 (5.6%) fatal collision, 16 (88.8%) injury collisions, and 1 (5.6%) property damage collision. Of the total collisions, 11 (61%) were during nighttime and 2 (11%) was during wet weather.

The following observations were reached based on a desktop-level evaluation of the crash history and existing conditions.

- The crash reports for ten (56%) of the collisions stated that the bicyclist/pedestrian was riding/walking on the paved or unpaved shoulder. The construction of the Old Dixie Trail will allow bicyclists/pedestrians a safe space to ride/walk after completion.
- A bicycle collision occurred on the south side of the unsignalized intersection of Pilaklakaha Avenue at McKean Street in 2019 (post-construction of Pilaklakaha Avenue road diet and trail). **Consider exchanging the existing pedestrian warning sign (W11-2) with a bicycle/pedestrian warning sign (W11-15) and supplemental trail x-ing plaque (W11-15P) to warn motorists that there are both bicyclists and pedestrians crossing and there is a trail with more than typical bicycle/pedestrian traffic crossing at this location. Consider an evaluation to tighten the radii of the curbs at this intersection to slow motorists when making right turns.**
- A pedestrian collision occurred on the north side of the unsignalized intersection of Stadium Road at Hampton Street. The construction of the Old Dixie Trail would mitigate similar crashes because the new trail is proposed to be closer to the intersection, there will be crossing pavement markings, and proper curb ramps.
- A student pedestrian was struck crossing Stadium Road, east of Bennett Street, not using the existing marked crosswalk. The collision occurred at 6:40 am, with the bell schedule starting at 7:00 am. The existing school zone signs are spaced for the criteria distance upstream of the existing crosswalk. **Consider relocating the existing westbound S5-1 sign approximately 150' further upstream to alert motorists in advance of where this student crossed the road. Relocate the existing westbound S1-1 sign as well to be 100' in advance of the new location of the S5-1 sign.** The existing midblock crosswalk markings are a standard crosswalk style. **Consider special emphasis markings at the existing marked midblock crosswalk per the FDOT TEM, Figure 5.2-**

13. The existing school zone does not have SCHOOL pavement messages in either direction. **Consider adding SCHOOL pavement messages to the school zone per the FDOT Speed Zoning Manual, Section 15.5.**

- A pedestrian was struck on the southern crosswalk at the intersection of US 17/Shinn Boulevard at East Pomelo Street, which will be part of the proposed path of the trail. **Consider a leading pedestrian interval when the southern crosswalk pushbuttons are activated to give pedestrians an opportunity to get into the crosswalk and be visible to motorists making an eastbound approach right turn. Consider a “turning vehicles stop for peds” (R10-15a) blank-out sign on the eastbound mast arm when the pedestrian signal is activated for the southern crosswalk to alert motorists of pedestrians. The mast will need a structural evaluation for the addition of this blank-out sign. The blank-out sign should be ground mounted if the mast arm cannot support the added loading. Consider special emphasis markings throughout the entire intersection to increase crosswalk visibility.**
- A bicyclist collision occurred within the eastern crosswalk of US 17/East Hinson Avenue at North 6th Street. The crash report stated that the bicyclist was at fault from crossing during a red light. **Consider programming the signal timing parameters to give pedestrians priority when the pushbutton is activated and decrease crossing wait times. Consider replacing the pedestrian push buttons with two-tone audible and visual confirmation buttons to let pedestrians know that the actuation has been made. Separate the pedestrian signals by having separate standalone poles for all curb ramps at the intersection and replace with new pedestrian countdown signals. Consider special emphasis markings throughout the entire intersection to increase crosswalk visibility. Consider a leading pedestrian interval when the eastern crosswalk pushbuttons are activated to give pedestrians an opportunity to a get into the crosswalk and be visible to motorists in anticipation of the trail.**

2.3 Best Practices

In addition to the safety recommendations, correctible engineering best practice items and general observations from existing conditions with no crash history were identified. The following is a list of these items.

- Berkley Road at Deen Blvd: If a pedestrian bridge is not being proposed at this location, a signal warrant should be considered at this intersection to give trail users an opportunity to safely cross within this intersection. If a signal is not warranted, a pedestrian hybrid beacon (PHB) should be studied for implementation. The closest traffic count data available on the major approach, Berkey Road, was collected approximately 1300’ south of the intersection located just north of Old Dixie Highway. The count showed an afternoon peak volume of 1428 vehicles/hour in 2019. Twenty or more trail users per hour would warrant a PHB per MUTCD, Figure 4F-2. Per TEM 5.2.5.1, crosswalks threshold at midblock or unsignalized intersection connecting a shared-use path may apply a 50 percent reduction to the recommended pedestrian threshold. A rectangular rapid flashing beacon (RRFB) would not meet criteria per TEM 5.2.5.2 since Berkley Road is above 45 mph.

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- Old Dixie Highway at Lake Ariana Boulevard: The northern leg crossing is approximately 60 feet. A roundabout is planned at this intersection, which will improve the safety of this crossing shortening it.
 - Ramsgate Road at Pearl Street: There is a white painted gore on the north side of this intersection. The gore should be yellow since the two lanes are opposing directions of traffic. Additionally, the trail is planned to cross Pilaklakha Avenue on the east side of this intersection. Consider moving the trail crossing of Pilaklakha Avenue to the existing RRFB midblock crossing east of Alberta Avenue/Hawthorne Road because of the eastbound curvature of the road and intersection geometry at Pearl Street. The existing RRFB will be upgraded to include back-to-back signs on both sides of the road per MUTCD. Consider a stop line with the STOP HERE FOR PEDESTRIANS signs to further enhance safety.
 - Stadium Road at Old Lake Alfred Road: Consider moving this crossing west across Old Lake Alfred Road and add an RRFB with special emphasis markings within the crosswalk.
 - West Pierce Street, west of Lake Cummings Boulevard: Consider an RRFB at this midblock crossing with special emphasis markings within the crosswalk. Consider locating this crossing a safe distance from the roadway curve. If it's not feasible to place the proposed midblock crossing far from the curve, then consider installing additional advanced warning signs (with flashing beacon) before to the midblock crossing.
 - Lake Shore Way at E Polmelo St: Consider special emphasis markings throughout the entire intersection. Consider "turning vehicles stop for peds" (R10-15a) signs for the northbound and westbound approaches. Consider a leading pedestrian interval for the eastern crosswalk.
 - US 17 at US 27 on/off ramps: Consider crosswalks with RRFBs at all ramp crossings. Install signs and pavement markings per FDOT FDM Exhibits 230-17a.
 - Proposed midblock crossings with PHB or RRFB on the state roads need to follow the TEM 5.2 criteria and obtain DTOE's approval.
 - Pedestrian lighting will be provided/evaluated at new midblock crossings to ensure proper crosswalk illumination.
 - Per TEM 5.2.7.3, an audible warning message that states "WAIT FOR TRAFFIC TO STOP THEN CROSS WITH CAUTION" when activated for all RRFB installations.

3.0 CONCLUSION

A construction cost estimate was calculated as part of this technical memorandum using the twelve-month FDOT Statewide Moving Averages. Overall, the cost estimate for the proposed improvements totaled to \$125,320.77 or \$14,805.64 annually. A net present value analysis and benefit-cost analysis were also calculated. The results from the analyses of the overall improvements are as follows.

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- Number of crashes potentially reduced: total 4
 - Monetary Value of Benefits: \$403,561.44
 - Monetary Value of Cost: \$ 150,562.39
 - Benefit-cost ratio: 2.43
 - Net present Value: \$252,999.05

Based on the benefit-cost ratio and net present value, these improvements are expected to have a beneficial impact along this corridor. The **Construction Cost Estimate, Benefit-Cost Analysis, and Net Present Value Analysis** are found in **Appendices B through D**.

APPENDICES

**Appendix A:
Crash Data**

COLLISION SUMMARY

Section: 1
 Location: Ramsgate Rd from Denton Ave to US 92
 Study Period: 1/1/2015 to 12/31/2019
 No. of Years: 5

State Route: _____
 M.P.: -
 County: Polk
 Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	11/26/2015	Thu.	18:18	Pedestrian		x		Day	Dry	FTYRW	85620241	
2	2/16/2019	Sat.	17:05	Bicycle			x	Day	Dry	FTYRW	85895281	
3	9/11/2019	Wed.	0:11	Bicycle		x		Night	Dry	Other	85895623	

Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Ran Into Ditch	Rear End	Side Swipe	Collision w/ Sign	Overtuned	Collision w/ Pole	Hit Animal	Run Off Road	Other
3	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
%	0	67	33	0	0	0	0	0	0	0	0	0	0	0	0
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	3	2	1	3	0	0	2	0	0	0	0	0	0	0	1
0	100	67	33	100	0	0	67	0	0	0	0	0	0	0	33

Notice:

Please be aware that the records you requested contain information compiled and collected for the purpose of obtaining Federal-aid funding for safety improvement projects. Under Federal law (23 U.S.C. § 409), these records are not subject to discovery or admissible into evidence in any court proceeding and may not be considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in the records.

COLLISION DIAGRAM

LOCATION RAMSGATE RD FROM DENTON AVE TO US 92
 COUNTY POLK CITY AUBURNDALE
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
1

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	1	1	0	2
NIGHTTIME	0	1	0	1
TOTAL	1	2	0	3

COLLISION DIAGRAM

LOCATION RAMSGATE RD FROM DENTON AVE TO US 92
 COUNTY POLK CITY AUBURNDALE
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
2

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	1	1	0	2
NIGHTTIME	0	1	0	1
TOTAL	1	2	0	3

COLLISION DIAGRAM

LOCATION RAMSGATE RD FROM DENTON AVE TO US 92
 COUNTY POLK CITY AUBURNDALE
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SYMBOLS

<p> OVERTURNED VEHICLE</p> <p> BACKING VEHICLE</p> <p> OUT OF CONTROL</p>	<p> HEAD-ON COLLISION</p> <p> ANGLE COLLISION</p> <p> RIGHT TURN COLLISION</p>	<p> COLLISION W/ PED.</p> <p> COLLISION W/ BIKE</p> <p> LEFT TURN COLLISION</p>	<p> REAR-END COLLISION</p> <p> SIDE SWIPE</p> <p> PERSONAL INJURY</p> <p> FATALITY</p>
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CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	1	1	0	2
NIGHTTIME	0	1	0	1
TOTAL	1	2	0	3

COLLISION SUMMARY

Section: 2
 Location: Lake Alfred Rd from Pilaklakaha Ave to CR 555
 Study Period: 1/1/2015 to 12/31/2019
 No. of Years: 5

State Route: _____
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	2/28/2017	Tue.	6:20	Pedestrian		x		Night	Dry	FTYRW	85621093	
2	3/13/2017	Mon.	9:02	Bicycle		x		Day	Dry	No Improper Driving	85621123	
3	2/13/2018	Tue.	6:40	Pedestrian		x		Night	Dry	No Improper Driving	85621697	

Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Ran Into Ditch	Rear End	Side Swipe	Collision w/ Sign	Overturned	Collision w/ Pole	Hit Animal	Run Off Road	Other
3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
%	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Turn	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	3	1	2	3	0	0	1	0	0	0	0	0	0	2	0
0	100	33	67	100	0	0	33	0	0	0	0	0	0	67	0

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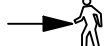




COLLISION DIAGRAM

LOCATION LAKE ALFRED RD FROM PILAKLAKAHA AVE TO CR 555
 COUNTY POLK CITY AUBURDALE
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
1

SYMBOLS

<p> OVERTURNED VEHICLE</p> <p> BACKING VEHICLE</p> <p> OUT OF CONTROL</p>	<p> HEAD-ON COLLISION</p> <p> ANGLE COLLISION</p> <p> RIGHT TURN COLLISION</p>	<p> COLLISION W/ PED.</p> <p> COLLISION W/ BIKE</p> <p> LEFT TURN COLLISION</p>	<p> REAR-END COLLISION</p> <p> SIDE SWIPE</p> <p> PERSONAL INJURY</p> <p> FATALITY</p>
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CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	1	0	1
NIGHTTIME	0	2	0	2
TOTAL	0	3	0	3

COLLISION DIAGRAM

LOCATION LAKE ALFRED RD FROM PILAKLAKAHA AVE TO CR 555
 COUNTY POLK CITY AUBURNDALE
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	1	0	1
NIGHTTIME	0	2	0	2
TOTAL	0	3	0	3

COLLISION SUMMARY

Section: 9
 Location: US 17/92 from Pierce St to Lily Ave
 Study Period: 1/1/2015 to 12/31/2019
 No. of Years: 5

State Route: _____
 M.P.: -
 County: Polk

Engineer: HNTB

No.	Date	Day	Time	Type	Fatal	Injury	Prop. Damage	Day/Night	Wet/Dry	Contributing Cause	Crash Report Number	Comments
1	4/3/2015	Fri.	21:21	Pedestrian		x		Night	Dry	FTYRW	84065506	
2	10/2/2015	Fri.	21:05	Bicycle		x		Night	Wet	FTYRW	84065986	
3	7/25/2016	Mon.	8:46	Bicycle		x		Day	Dry	FTYRW	85833939	
4	7/4/2017	Tue.	23:15	Pedestrian		x		Night	Dry	Other	86939140	
5	9/26/2017	Tue.	5:03	Pedestrian		x		Night	Dry	Other	85834158	
6	2/8/2018	Thu.	22:49	Pedestrian		x		Night	Dry	Other	87666449	
7	12/22/2018	Sat.	2:10	Pedestrian	x			Night	Dry	FTYRW	88752930	
8	1/12/2019	Sat.	16:50	Bicycle		x		Day	Dry	FTYRW	87869181	
9	3/2/2019	Sat.	8:17	Pedestrian		x		Day	Dry	Careless Driving	85834411	
10	11/29/2019	Fri.	17:56	Pedestrian		x		Day	Dry	Improper Lane Change	89372323	
11	12/16/2019	Mon.	19:00	Pedestrian		x		Night	Dry	Improper Backing	89372347	
12	12/28/2019	Sat.	19:31	Pedestrian		x		Night	Wet	FTYRW	89094192	

Total No.	Fatal	Injury	Property Damage	Angle	Left Turn	Head On	Ran Into Ditch	Rear End	Side Swipe	Collision w/ Sign	Overtaken	Collision w/ Pole	Hit Animal	Run Off Road	Other
12	1	11	0	0	0	0	0	0	0	0	0	0	0	0	0
%	8	92	0	0	0	0	0	0	0	0	0	0	0	0	0
One Vehicle	Ped/Bike	Day	Night	Dry	Wet	Careless Driving	FTYRW	Improper Backing	DUI	Improper Lane Change	Disregarded Traffic Signal	Failed to Maintain Vehicle	Improper Load	No Improper Driving	Other
0	12	4	8	10	2	1	6	1	0	1	0	0	0	0	3
0	100	33	67	83	17	8	50	8	0	8	0	0	0	0	25

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
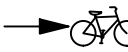





COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
1

SYMBOLS

<p> OVERTURNED VEHICLE</p> <p> BACKING VEHICLE</p> <p> OUT OF CONTROL</p>	<p> HEAD-ON COLLISION</p> <p> ANGLE COLLISION</p> <p> RIGHT TURN COLLISION</p>	<p> COLLISION W/ PED.</p> <p> COLLISION W/ BIKE</p> <p> LEFT TURN COLLISION</p>	<p> REAR-END COLLISION</p> <p> SIDE SWIPE</p> <p> PERSONAL INJURY</p> <p> FATALITY</p>
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CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SYMBOLS

<p> OVERTURNED VEHICLE</p> <p> BACKING VEHICLE</p> <p> OUT OF CONTROL</p>	<p> HEAD-ON COLLISION</p> <p> ANGLE COLLISION</p> <p> RIGHT TURN COLLISION</p>	<p> COLLISION W/ PED.</p> <p> COLLISION W/ BIKE</p> <p> LEFT TURN COLLISION</p>	<p> REAR-END COLLISION</p> <p> SIDE SWIPE</p> <p> PERSONAL INJURY</p> <p> FATALITY</p>
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CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
4

SYMBOLS

<p> OVERTURNED VEHICLE</p> <p> BACKING VEHICLE</p> <p> OUT OF CONTROL</p>	<p> HEAD-ON COLLISION</p> <p> ANGLE COLLISION</p> <p> RIGHT TURN COLLISION</p>	<p> COLLISION W/ PED.</p> <p> COLLISION W/ BIKE</p> <p> LEFT TURN COLLISION</p>	<p> REAR-END COLLISION</p> <p> SIDE SWIPE</p> <p> PERSONAL INJURY</p> <p> FATALITY</p>
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CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
5

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
6

SYMBOLS

- | | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> OVERTURNED VEHICLE BACKING VEHICLE OUT OF CONTROL | <ul style="list-style-type: none"> HEAD-ON COLLISION ANGLE COLLISION RIGHT TURN COLLISION | <ul style="list-style-type: none"> COLLISION W/ PED. COLLISION W/ BIKE LEFT TURN COLLISION | <ul style="list-style-type: none"> REAR-END COLLISION SIDE SWIPE PERSONAL INJURY FATALITY |
|--|---|--|---|

CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
7

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
8

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
9

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
10

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

COLLISION DIAGRAM

LOCATION US 17/92 FROM W PIERCE ST TO LILY AVE
 COUNTY POLK CITY LAKE ALFRED
 DATE RANGE 01/01/2015 TO 12/31/2019 PREPARED BY HNTB



SHEET
11

SYMBOLS



CRASH SUMMARY

	PROPERTY DAMAGE ONLY	INJURY	FATAL	TOTAL
DAYTIME	0	4	0	4
NIGHTTIME	0	7	1	8
TOTAL	0	11	1	12

**Appendix B:
Construction Cost Estimate**

ENGINEER'S ESTIMATE
Old Dixie Trail Bicycle/Pedestrian Safety Improvements
Polk County, FL

ITEM NUMBER	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COST
0110 1 1	CLEARING & GRUBBING	AC	0.02	\$68,454.21	\$1,369.08
0110 4 10	REMOVAL OF EXISTING CONCRETE	SY	8	\$30.78	\$246.24
0120 1	REGULAR EXCAVATION	CY	8	\$14.96	\$119.68
0120 6	EMBANKMENT	CY	26	\$26.01	\$676.26
0520 1 10	CONCRETE CURB & GUTTER, TYPE F	LF	200	\$51.71	\$10,342.00
0522 1	CONCRETE SIDEWALK AND DRIVEWAY, 4" THICK	SY	8	\$57.53	\$460.24
0570 1 2	PERFORMANCE TURF, SOD	SY	700	\$4.53	\$3,171.00
0630 2 11	CONDUIT, FURNISH & INSTALL, OPEN TRENCH	LF	120	\$15.41	\$1,849.20
0632 7 2	SIGNAL CABLE- REPAIR/REPLACE/OTHER, FURNISH & INSTALL	LF	120	\$8.10	\$972.00
0646 1 11	ALUMINUM SIGNALS POLE, PEDESTAL	EA	8	\$1,936.29	\$15,490.32
0646 1 40	ALUMINUM SIGNALS POLE, RELOCATE	EA	1	\$1,509.12	\$1,509.12
0653 1 11	PEDESTRIAN SIGNAL, FURNISH & INSTALL LED COUNTDOWN, 1 W	AS	8	\$826.32	\$6,610.56
0665 1 12	PEDESTRIAN DETECTOR, FURNISH & INSTALL, ACCESSIBLE	EA	8	\$2,393.04	\$19,144.32
0671 2 40	TRAFFIC CONTROLLER, MODIFY	EA	2	\$3,203.40	\$6,406.80
0700 1 12	SINGLE POST SIGN, F&I GROUND MOUNT, 12-20 SF	AS	1	\$1,526.08	\$1,526.08
0700 1 50	SINGLE POST SIGN, RELOCATE	AS	1	\$283.38	\$283.38
0700 1 60	SINGLE POST SIGN, REMOVE	AS	1	\$44.36	\$44.36
0700 3502	SIGN PANEL, RELOCATE, 12-20 SF	EA	1	\$484.25	\$484.25
0700 11391	ELECTRONIC DISPLAY SIGN, FURNISH & INSTALL OVERHEAD MOU	EA	1	\$6,072.80	\$6,072.80
0711 11123	THERMOPLASTIC, STANDARD, WHITE, SOLID, 12" FOR CROSSWAL	LF	860	\$3.19	\$2,743.40
0711 11125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24" FOR STOP LINE	LF	100	\$5.68	\$568.00
0711 11160	THERMOPLASTIC, STANDARD, WHITE, MESSAGE OR SYMBOL	EA	2	\$162.96	\$325.92
0711 14125	THERMOPLASTIC, PREFORMED, WHITE, SOLID, 24"	LF	720	\$16.31	\$11,743.20
0711 17 1	THERMOPLASTIC, REMOVE EXISTING THERMOPLASTIC PAVEMEN	SF	860	\$1.58	\$1,358.80
	COMPONENT SUB-TOTAL				\$93,517.01
	PROJECT UNKNOWNNS (15%)				\$14,027.55
	SUB-TOTAL				\$107,544.57
	MAINTENANCE OF TRAFFIC (10%)				\$10,754.46
	SUB-TOTAL				\$118,299.02
	MOBILIZATION (10%)				\$10,754.46
	SUB-TOTAL				\$129,053.48
	DESIGN (20%)				\$21,508.91
	SUB-TOTAL				\$150,562.39
	PROJECT GRAND TOTAL				\$150,562.39

**Appendix C:
Benefit-Cost Analysis**

Benefit-Cost Analysis

District: **One** County: **16 - Polk** Date Prepared: **09/29/22**

Location: **Old Dixie Trail Bicycle/Pedestrian Safety Improvements**

Section : **N/A** Beg. Milepost : **N/A** End Milepost :
Rdway Type: **ALL CRASH RATE CATEGORIES**

Control Element: **Other (describe in box below)**

Recommendations: Trail warning sign, special emphasis crosswalks, school zone adjustments/improvements, yield to peds sign, LPI, and pedestrian signal improvements.

ANNUAL COST OF IMPROVEMENTS

Type	Cost	Service Life	Capital Recovery Factor	Total
ROW		100	0.0408	\$ -
P.E.C.E.I.	\$ 21,508.91	15	0.0899	\$ 1,933.65
Structure		75	0.0425	\$ -
Roadway	\$ 22,610.62	20	0.0736	\$ 1,664.14
Drainage		20	0.0736	\$ -
Signal	\$ 71,735.60	10	0.1233	\$ 8,845.00
Other	\$ 34,707.26	5	0.2246	\$ 7,795.25
Sub-Total	\$ 150,562.39			\$ 20,238.04
Annual Cost =				\$ 20,238.04

Total number of crashes =	18	Primary crash reduction factor (%):	19
# of correctable crashes, PC =	4	implement a leading pedestrian interval	
# of years of crash data, YD =	5	Additional crash reduction factor:	18
PC/YD =	0.80	Install High-Visibility Crosswalk	
Crash reduction factor, CRF =	39.42%	Additional crash reduction factor:	8.8
CRF x (PC/YD) =	0.32	Pedestrian Countdown Signal	
Cost per crash, CPC =	\$155,695.00		
Benefit =	\$49,106		

BENEFIT/COST RATIO

$$\frac{\text{Benefit}}{\text{Cost}} = \frac{\$49,106.15}{\$20,238.04} = \mathbf{2.43}$$

Comments: Crash reduction factors are provided from the CMF Clearinghouse.

**Appendix D:
Net Present Value Analysis**

Net Present Value Evaluation (Old Dixie Trail Bicycle/Pedestrian Safety Improvements)

Year	CRF x (PC/YD)	Cost per Crash	(P/A,I,y) Factor	Present Value
1	0.32	\$155,695.00	0.96	\$47,829.50
2	0.32	\$155,695.00	0.92	\$45,836.61
3	0.32	\$155,695.00	0.89	\$44,341.94
4	0.32	\$155,695.00	0.85	\$42,349.04
5	0.32	\$155,695.00	0.82	\$40,854.37
6	0.32	\$155,695.00	0.79	\$39,359.70
7	0.32	\$155,695.00	0.76	\$37,865.02
8	0.32	\$155,695.00	0.73	\$36,370.35
9	0.32	\$155,695.00	0.70	\$34,875.68
10	0.32	\$155,695.00	0.68	\$33,879.23
Total Present Value				
Benefit				\$403,561.44
Cost				\$150,562.39
Net Present Value				\$252,999.05