

December 23rd, 2022

Anastasia Drive Shared Use Path Feasibility Study

City of South Daytona





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FINAL

December 23rd, 2022

City of South Daytona, Florida

Prepared by RS&H, Inc. at the
direction of River to Sea TPO



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1 Executive Summary

The City of South Daytona submitted an Application for Project Prioritization to the River to Sea Transportation Planning Organization for a shared use path along the western side of Anastasia Drive from Big Tree Road to Ridge Boulevard, a distance of approximately 0.5 miles. Both sides of the corridor were evaluated for a shared use path and it was determined that the western side of the corridor had right-of-way constraints that would greatly limit the feasibility of proposing a 10-foot path. Based on the corridor's current existing conditions, including the presence of various types of utilities including power poles, fire hydrants, water meters, and cable pull boxes, and based on current design guidelines and criteria for shared use paths, it was determined that a 10-foot wide path on the eastern side of the corridor would be appropriate and financially feasible within the area of study. After evaluation of field information and information provided by the City, conceptual plans for the new 10-foot wide shared use path along the eastern side of Anastasia Drive from Big Tree Road to Ridge Boulevard were developed. This concept, presented in **Appendix A**, can be implemented within right-of-way and has minimal conflicts with existing utilities within the corridor. Per coordination with the City of South Daytona, it was determined that the existing water main would need to be replaced along the eastern side of the corridor as reflected in the concept. There are no wetland impacts and no listed animal species within the corridor. The preliminary probable cost estimate for this concept is \$1,555,581 in 2022 dollars.

2 Introduction

This study is provided at the request of the River to Sea Transportation Planning Organization (R2CTPO) in response to an Application for Project Prioritization submitted by the City of South Daytona. The City currently has and maintains shared use paths along Big Tree Road and Ridge Boulevard. A segment of the Florida Department of Transportation (FDOT) Shared Use Nonmotorized (SUN) Trail program is planned along Carmen Drive just to the west of the southern terminus of this feasibility study corridor. The proposed improvements will serve residents of South Daytona, as well as serve destinations such as South Daytona Elementary School, Joe M. Piggotte Community Center, Riverfront Park, Honor Park, James Street Park, and Sunshine Plaza, which contains a grocery store, United States postal service, a bowling alley, an ice-skating arena, and other means of commercial use for residents of the surrounding area. This proposed project will fill a critical gap in the City of South Daytona's shared use path network and provide residents and students in the center of the City access to Ridge Boulevard and Big Tree Road through existing portions of the network that further connect to Ridgewood Avenue (US 1) and Nova Road (SR 5A).

3 Project Purpose and Scope

The purpose of this study is to evaluate the feasibility of providing a 10-foot wide concrete shared use path along Anastasia Drive from Big Tree Road to Ridge Boulevard. The proposed shared use path will fill a gap identified by the City of South Daytona in their Shared Use Path Network. The proposed path ties into existing 10-foot paths that run along Ridge Boulevard and Big Tree Road. At the time of this study, two SUN Trail Program network projects were identified within the vicinity of the limits of this project study. One of the projects is fully funded for construction in Fiscal Year 2023 (FDOT Project # 439865-2) and is proposed to begin 300 feet to the east of the southern terminus of this study's proposed layout on Ridge Boulevard. The proposed SUN Trail project runs east to Palmetto Avenue and turns north to run along Palmetto Avenue to its northern terminus at Beville Road (SR 400), for a total project length of approximately 1.6 miles. The other SUN Trail Project is only partially funded and is not in the FDOT work program for construction. It was partially funded for preliminary engineering (FDOT Project # 439865-4) and is proposed to end 300 feet to the east of the southern terminus of this study's proposed layout and run south along Carmen Drive to Reed Canal Road where it turns west and runs along Reed Canal Road to Sauls Street. Anastasia Drive will not be part of the SUN Trail network. A project location map, with limits of this study is provided in **Figure 1**.



Figure 1: Location Map

Field reviews were conducted for the purposes of data collection, concept development, corridor evaluation and cost estimation. The concept plans, analysis and cost estimate are based on field observations and available project information provided by the City. As such, this document should only be used for planning, estimating, and budgeting purposes. If the project is advanced to final design additional work, including the preparation of a detailed right-of-way survey, construction plans, and an updated cost estimate will be required.

The City of South Daytona requested the analysis of a 10-foot wide shared use path along the western side of Anastasia Drive. During the field reviews and coordination with the City, it was determined that a 10-foot wide path would not be feasible on the western side of the corridor primarily due to right-of-way constraints for the northern tie-in to the existing shared use path along Big Tree Road. Due to the right-of-way and other factors described later in this report, it was further determined that a 10-foot wide concrete path is feasible along the eastern side of the corridor. The proposed shared use path is reflected on the Concept Plans presented in **Appendix A**. The preliminary cost estimate for this concept is \$1,555,581 in 2022 dollars.

The graphics within this report include notes, diagrams and callouts identifying the apparent right-of-way, existing utilities, location of the proposed shared use path, and street names. Considerations include conformance to the requirements of the Americans with Disabilities Act (ADA), Florida Department of Transportation (FDOT) Florida Design Manual, American Association of State Highway and Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devices (MUTCD).

4 Existing Conditions

4.1 General Description

The project corridor is located within the City of South Daytona on Anastasia Drive starting at Ridge Boulevard and ending at Big Tree Road. The project spans approximately 0.5 miles. Anastasia Drive is a two-lane residential street with 11-foot wide travel lanes, **Figure 2**. There are 10-foot wide shared use paths located on the north side of Ridge Boulevard and south side of Big Tree Road. The posted speed limit is 25 mph with portions of the corridor that have school zone speed limit signs on the southern end of the project where the speed limit drops to 15 mph when children are present on school days. The west side of the corridor has multiple residential street connections, some with extreme skew angles with Anastasia Drive. There is a continuous 4-foot wide sidewalk located along the west side of the roadway, however the 4-foot sidewalk on the east side is isolated to certain portions of the corridor. Mailboxes are present in front of each residence along Anastasia Drive. A small gazebo is located within the City's apparent right-of-way at the corner of Anastasia Drive and Garfield Drive as shown in **Figure 3**. Anastasia Drive has multiple residential driveway connections along both sides of the roadway with two commercial driveways in the northeast area of the corridor serving a commercial plaza of 4-5 businesses shown in **Figure 4**. The width of the apparent right-of-way is a constant 60 feet throughout the corridor. The Anastasia Drive existing typical section is provided in **Appendix B**.



Figure 2: Anastasia Drive Looking North

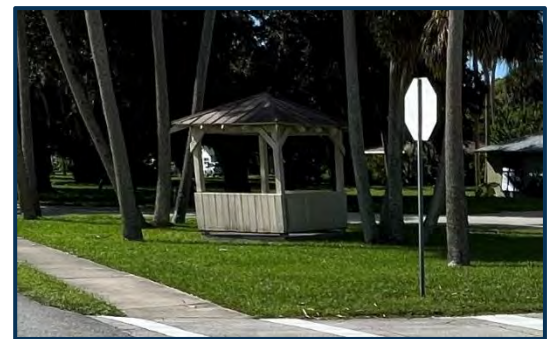


Figure 3: Gazebo at Anastasia Drive and Garfield Drive



Figure 4: Commercial Driveways Servicing Local Businesses

4.2 Traffic Controls

Anastasia Drive's intersection with Ridge Boulevard has a single stop sign stopping traffic on Anastasia Drive at the southern terminus, where Ridge Boulevard has one-way free flow westbound traffic. There is a crosswalk connecting the existing shared use path along Ridge Boulevard at the intersection. At the northern terminus, Anastasia Drive has a stop sign for traffic on Anastasia Drive intersecting with Big Tree Road which has free flow traffic and a median turn lane into Anastasia Drive. There is an existing shared use path running alongside the south side

of Big Tree Road at the intersection with Anastasia Drive with a special painted crosswalk along Anastasia Drive, **Figure 5**. Anastasia Drive also has 6 intersections along the west side of the corridor serving other residential streets. Anastasia does not have any stop controls between Ridge Boulevard and Big Tree Road as all side streets have single stop signs to yield to Anastasia Drive. All six side street intersections have painted stop bars and sidewalk crossings. Crosswalk pavement markings are only present at Garfield Drive along Anastasia Drive.



Figure 5: Intersection of Anastasia Drive and Big Tree Road

4.3 Drainage

Based on a utility survey provided by the City of South Daytona, the existing drainage system along Anastasia Drive consists of two separate systems. The first system collects runoff in an existing 2-foot drop curb and several drainage inlets along Anastasia Drive. The drainage system consists of an 18- to 24-inch trunkline that flows from Anastasia Drive and Elizabeth Place north to Big Tree Road and discharges into a swale-pipe system flowing east along the north side of Big Tree Road. This system outfalls into the Halifax River through a 36" x 81" drainage culvert at the South Palmetto Avenue and Big Tree Road intersection. The second system collects sheet flow from Anastasia Drive south of the Elizabeth Place intersection in an existing 2-foot drop curb along the eastern side of Anastasia Drive. The runoff

in the drop curb is collected in an inlet at the Garfield Drive and Anastasia Drive intersection. The inlet is connected to a drainage system that collects water from the surrounding area and discharges to Stevens Canal, located west of Anastasia Drive.



Figure 6: Type C Ditch Bottom Inlet



Figure 7: Gutter Inlet

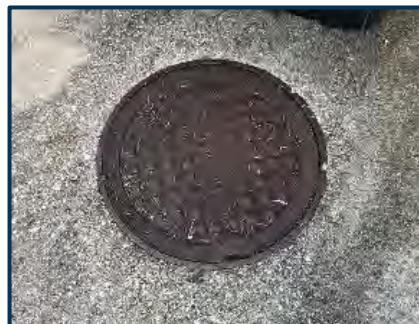


Figure 8: Manhole

The typical drainage structures along Anastasia Drive consists of Type C ditch bottom inlets, gutter inlets, and manholes. See **Figures 6, 7, & 8** for examples of these drainage structures.

During a field review on September 13, 2022, it was observed that a portable pump was installed at the Duck Pond control structure. Coordination with the City of South Daytona determined the pump is operated as needed during the wet season to prevent the pond from over-topping as shown in **Figure 9**. According to the St. Johns River Water Management District, there are no existing permits for Anastasia Drive or the surrounding area.



Figure 9: City of South Daytona Pump at Duck Pond

4.4 FEMA/Floodplains

According to the FEMA FIRM Panel 12127C0367J, effective September 29, 2017, the project area is within Zone X and Shaded Zone X floodplains. The FEMA FIRM panel is provided in **Appendix C**. No impacts to floodplains are anticipated.

4.5 Apparent Right-of-Way

Based off the CADD files provided from the City of South Daytona, the right-of-way appears to be 60 feet wide throughout the corridor. The provided files also indicate that Anastasia Drive is off-center by about 5 feet and favors the western side of the corridor.

4.6 Utilities

A utilities assessment was made during a field review and supplemented with information provided by the City. There are various utilities located on both sides of the roadway above and below ground. Most utility poles present in the corridor are wooden poles that carry overhead electric lines and occasionally have lights affixed on them. Other concrete utility poles exist in the corridor on both sides of Anastasia Drive. The poles are located approximately eight to sixteen feet behind the edge of pavement. Conduit pull boxes for communications are located along portions of eastern side of the roadway. There are various water meters located on both sides of the roadway. The corridor contains a 2" water main along a majority of the western side of the corridor and a 6" water main along the entire east side of the corridor. A 4" gas main also runs along the northern half of the western side of the corridor. A 12" sanitary sewer pipe runs down the center of the roadway. A 10" force main exists along the eastern side of the corridor. One fire hydrant



Figure 10: Existing Fire Hydrant on Anastasia Drive

is located within the corridor on the eastern side of the corridor as shown in **Figure 10**.

4.7 Wetlands and Surface Waters

The study corridor was evaluated by a qualified biologist. There are no wetlands meeting the criteria established by Florida Administrative Code 62-340 within the proposed improvements. Duck Pond, located east of the intersection of Elizabeth Place and Anastasia Drive, is a surface water. Review of historical aerials from 1963 show that Duck Pond was excavated from uplands.

4.8 Threatened and Endangered Species

Land use within the study corridor is single family residential. The study corridor does not include any suitable habitat for listed species and no state or federally-listed species were documented during field reviews. This project is not anticipated to affect any state or federally-listed species.

While no longer listed under the U.S. Endangered Species Act or the Florida Endangered and Threatened Species rules, bald eagles remain protected by both the state eagle rule (68A-16.002, F.A.C.) and federal law. The nearest documented bald eagle nest (Nest VO148) is located approximately 2,000 feet southeast of the study corridor, and will not be affected by the project.

4.9 Soils and Contamination

The study corridor consists only of moderately well drained soil (Daytona-Urban land complex, 0 to 5 percent slopes) as depicted on the soils survey map prepared from United States Department of Agriculture Natural Resources Conservation Service, **Appendix D**.

The study corridor was reviewed for documented contamination on FDEP's Contamination Locator Map. No documented contaminated sites are located within the study corridor.

5 Shared Use Path Concept Plan

The City's application requested evaluation of a 10-foot wide shared use path on Anastasia Drive from Ridge Boulevard to Big Tree Road. Prior to field observations of the corridor, the City's request of the proposed path specified the feasibility of the western side of the corridor. It was determined that due to constraints, the path would be most feasible along the eastern side of Anastasia Drive. Development of the concept plan began with an evaluation of the east and west sides of Anastasia Drive to determine the most appropriate location for the path. As mentioned previously, the roadway within the apparent right-of-way of Anastasia Drive is not centered within the right-of-way. Along Anastasia Drive, the roadway favors the west side of the right-of-way, providing slightly more space between the edge of pavement and the apparent right-of-way line along the eastern side of the road. At the northern tie in point to the existing shared use path at Big Tree Road, apparent right-of-way between the edge of the existing roadway and the western right-of-way line tapers to a point that made the feasibility of constructing even a reduced width shared use path not feasible without right-of-way agreements or purchase. Another consideration for the placement of the shared use path was the multiple crossings of the 6 side streets present along the western side of Anastasia Drive. Two cross streets in particular, Garfield Drive and Harvard Road, have skew angles of

Conflict		Number of Conflicts	
		Western Side	Eastern Side
Signs		5	3
Pull Boxes		0	2
Drainage	Inlets	7	5
	Manholes	0	3
Poles	Wooden	1	5
	Concrete	0	2
Mailboxes		4	5
Water Meters		1	4
Fire Hydrants		0	1
Driveways	Decorative	0	1
	Normal	28	15

Table 1: Anastasia Drive Conflict Matrix

approximately 34 and 46 degrees, respectively, to Anastasia Drive. With the placement of the shared use path across these side streets, sight distance from the proposed stop bars would have been made worse than the existing condition and possibly require removal of additional landscaping and the gazebo discussed earlier in this report. Additional conflicts were identified and potential impacts to the major corridor features were estimated for each side of the roadway and documented in **Table 1**.

As previously mentioned, the western side of the corridor currently has a 4-foot sidewalk along the entire length of the corridor. Although the existing sidewalk is less than the favorable width of five or six feet, consideration was given during this study to the fact that the existing sidewalk would have been removed to build the proposed 10-foot shared use path while less than half of the eastern side of the corridor had any pedestrian features. In proceeding with the path along

the eastern side of the corridor, the corridor would have a continuous pedestrian network on both sides of the corridor.

The FDOT Design Manual, January 1, 2022 (FDM) provides various guidelines and criteria for shared use paths. Chapter 224 of the FDM provides the following description:

“Shared use paths are paved facilities physically separated from motorized vehicular traffic by an open space or barrier and are either within the highway right of way or an independent right of way. The term “shared use paths,” as used in this manual is synonymous with trails, multiuse trails, or other similar terms used in other Department manuals.”

Key features of the FDM Shared Use Paths sections relevant to this project are provided below:

- 224.4 Widths - ...Widths range from a minimum 10 feet to 14 feet, with a standard width of 12-feet. SUN Trail network facilities that are less than 12-feet require approval by the Chief Planner. For shared use paths not in the SUN Trail network:
 - 10-feet wide may be used where there is limited R/W.
 - Short 8-feet wide sections may be used in constrained conditions.
- 224.7 Horizontal Clearance - Provide a 4-foot clear area adjacent to both sides of the path, including placement of signs. Maintain a 2-foot wide graded area with a maximum 1:6 slope adjacent to both sides of the path. For restricted conditions, bridge abutments, sign columns, fencing and railing may be located within 4 feet of the edge of pavement.
- 224.12 Separation from Roadway - On flush shoulder roadways with design speed 45 mph or less, the edge of the path is to be at least 5 feet from the edge of the paved shoulder.

Using these criteria as guides, a conceptual shared use path plan was generated. The following sections describe the elements that make up the concept for this project. All proposed elements are depicted graphically on the Concept Plans (**Appendix A**) and Typical Sections (**Appendix B**).

5.1 Shared Use Path Plan

The shared use path is proposed to be located along the eastern side of Anastasia Drive throughout the area of study. The key features described previously as it relates to design of shared use paths as well as the City's request for a 10-foot wide shared use path aligns with the proposed layout in the concept plans. Due to the offset of the roadway within the right-of-way favoring the western side of the corridor, it was determined that the eastern side of the corridor was the most feasible option to propose the 10-foot shared use path. Horizontal clearance on either side of the trail is typically four feet from each edge, however, some restricted locations will have objects within the prescribed four feet. The proposed layout also has a five-foot separation from the existing roadway in all locations.

The proposed shared use path will impact minimal water meters observed in the field in front of the homes as well as existing communication pull boxes and one fire hydrant. Wooden utility poles were also identified to be relocated at least 4 feet away from the back of the proposed path, but within the right-of-way.

A small commercial plaza with 4 or 5 businesses exists at the northern end of Anastasia Drive and an island exists today that channelizes traffic with parking along the plaza between two commercial driveways on the east side of the corridor. The proposed shared use path utilizes a similar layout with a wider island to have the path raised with curb protecting pedestrians from traffic within the parking lot and detectable warnings placed at the approaches of the driveways on the shared use path. The space between the proposed curb and the existing parking spots is approximately 24 feet, which should be enough to continue channelization of traffic within the plaza without any disruption to current business operations.

It was observed in the field that the elevation difference between the existing roadway (Anastasia Drive) and the adjacent homes would allow the proposed typical section in Appendix B to be constructed with enough distance to the adjacent properties to tie into the existing ground. However, due to the close proximity in certain areas of the shared use path to the property lines, it is possible that the City of South Daytona may need to obtain temporary right-of-entry agreements with adjacent homeowners. Otherwise, if during final design and coordination with adjacent property owners find it would be too difficult, the City may choose to add additional reductions in path width as needed.

5.2 Drainage

Construction of approximately 725 feet of drop curb is proposed where drop curb is not present along the east side of Anastasia Drive. The proposed path will impact the existing inlets and manholes that are connected to the trunkline along Anastasia Drive and these existing drainage

structures will need to be modified or replaced. Five type F ditch bottom inlets with J-bottom structures are proposed to convey runoff to the trunkline without adding manhole covers in the shared use path. The tops of two existing manholes will be adjusted and fitted with wheel-friendly covers. Additionally, the existing trunkline will be extended to the south with construction of approximately 753 feet of 18" Reinforced Concrete Pipe (RCP) and six Type F ditch bottom inlets with J-bottom to satisfy spread requirements. The existing trunkline has sufficient capacity and is of adequate condition to accommodate runoff from the proposed shared use path. Construction of the proposed RCP will require areas of roadway reconstruction along the eastern side of Anastasia Drive as shown in the proposed concept.

5.3 Environmental Permitting

The project does not affect Waters of the United States, as outlined in Section 404 of the Clean Water Act. Therefore, a Section 404 permit will not be required from FDEP.

This project does not impact wetlands or surface waters. Construction of shared use paths up to 14 feet or less is exempt from permitting requirements of the St. Johns River Water Management District, as outlined by Florida Administrative Code, Chapter 62-330-.051(10).

As this project may disturb more than one acre of soil during construction, a Notice of Intent (NOI) form submitted to the FDEP will be required to acquire coverage under the Generic Permit for Stormwater Discharge from Large and Small Construction Activities. This form is provided in Chapter 62-621.300(4), Florida Administrative Code.

6 Proposed Water Main

Per coordination with the City of South Daytona, the existing water main along the eastern side of Anastasia Drive will be replaced during construction of the shared use path. Temporary construction easements may be required in some areas where the proposed water main is close to the apparent right-of-way of Anastasia Drive. The proposed water main requires roadway reconstruction along portions of the edge of Anastasia Drive between Ridge Boulevard and Garfield Drive as well as a portion of Ridge Boulevard. A cost estimate to construct a new 6" PVC water main is provided in **Appendix E** and is shown in the proposed concept in **Appendix A**.

7 Financial Feasibility

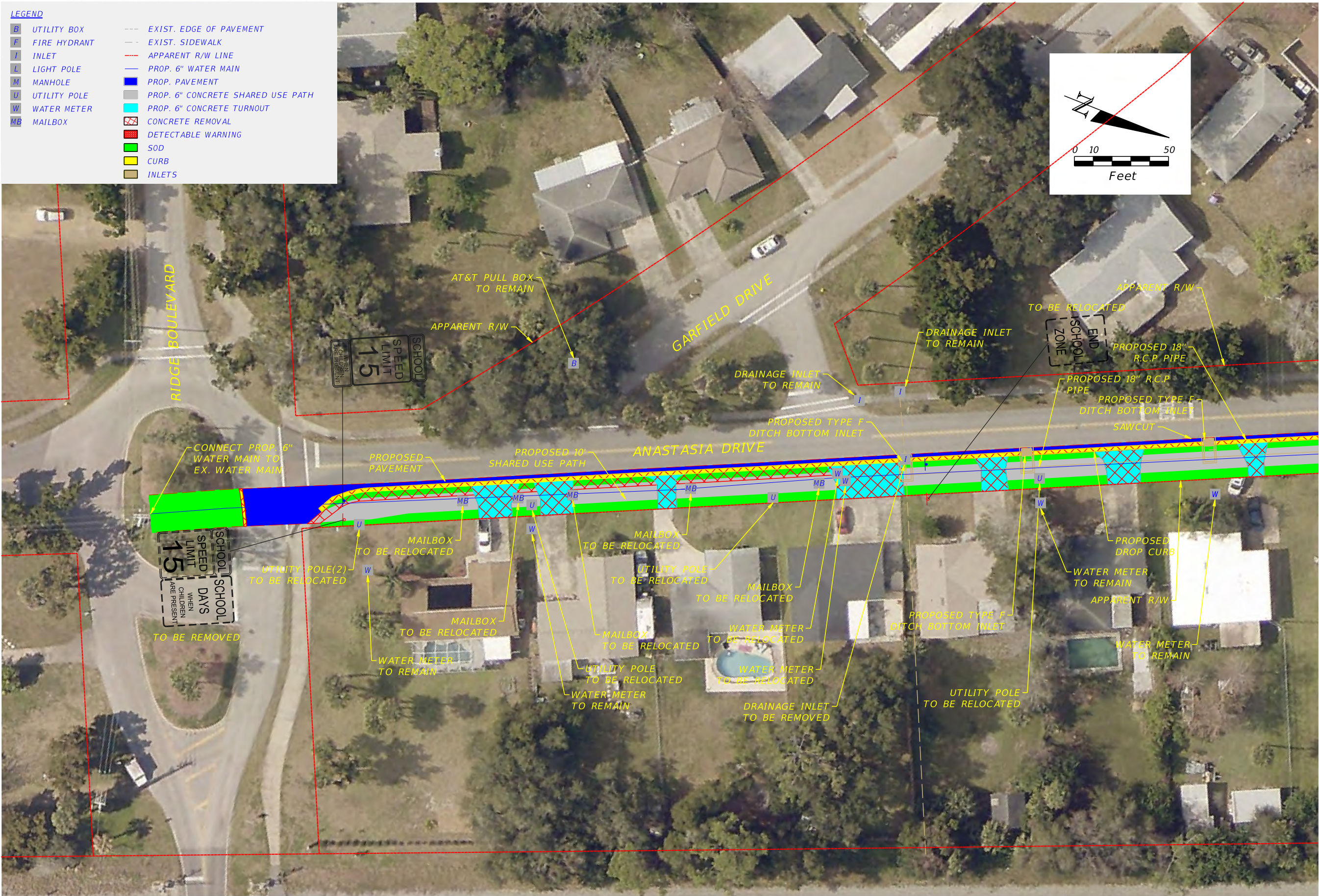
A preliminary cost estimate for the design and construction of the proposed shared use path is presented in **Appendix E**. This cost estimate is to be considered an opinion of probable costs based solely on the results of this feasibility study. The item numbers and units of measure are based on the FDOT Basis of Estimates Manual. The unit prices are based on historical average costs for each pay item as provided by FDOT. Based on the results of this study, no additional right-of-way will need to be purchased to accommodate the proposed conceptual design.

To adjust for potential future increases in the project's cost estimate, an annual inflationary factor may be applied. The FDOT provides annual inflation factors for roadway construction costs which may be used as a guideline for this shared use path project. The cost estimate provided herein has been adjusted by the FDOT inflationary factors noted in **Appendix F** to determine inflation-adjusted cost estimates for the proposed shared use path concept. The total cost estimate in 2022 dollars for the shared use path concept presented in **Appendix A** is \$1,555,581. The inflation-adjusted cost estimates for 2023, 2024, and 2025 are \$1,597,581, \$1,642,693, and \$1,689,361, respectively.

8 Conclusion

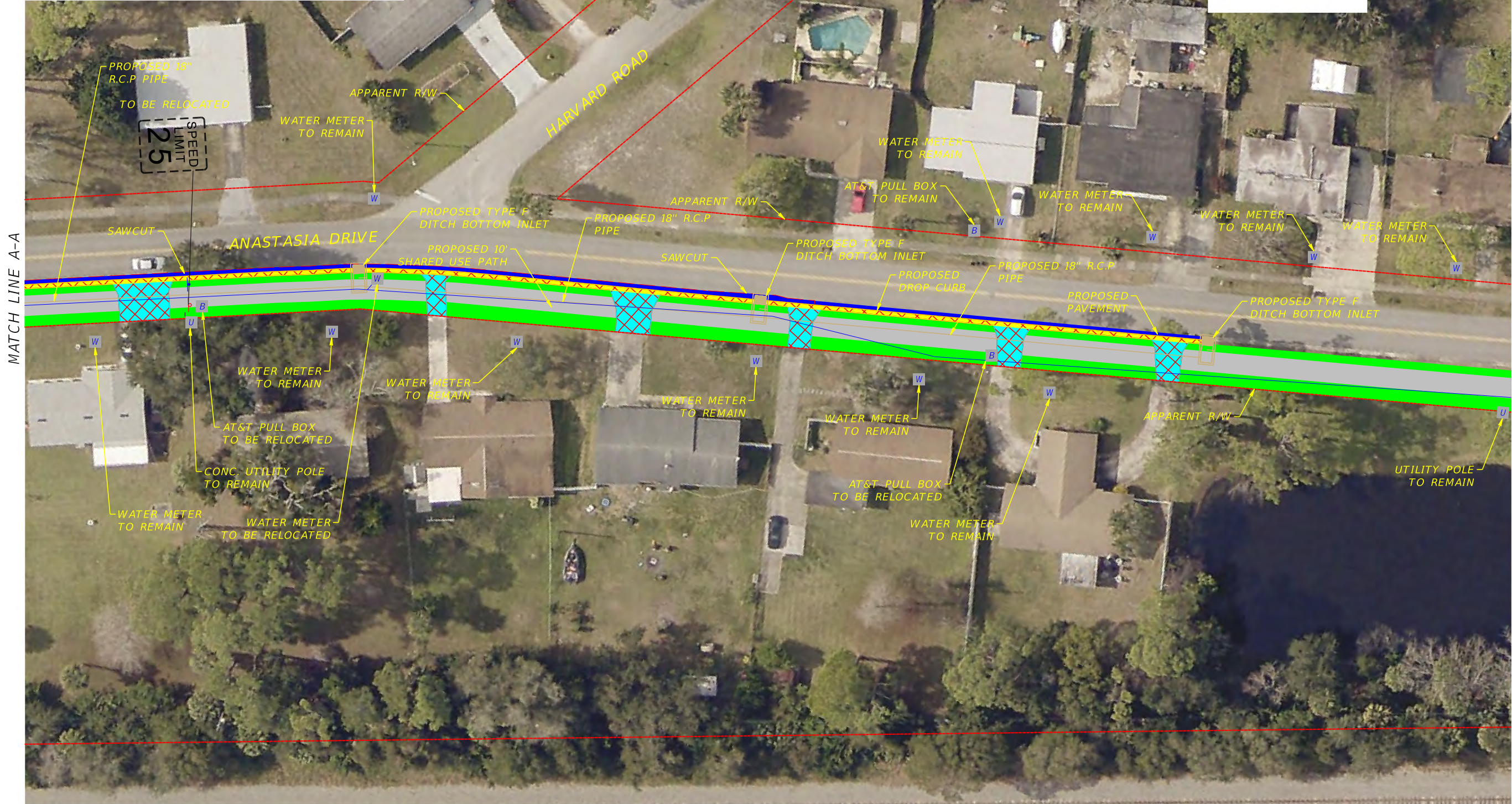
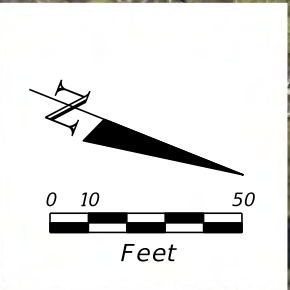
The purpose of this study was to evaluate the feasibility of constructing a 10-foot wide shared use path along the western side of Anastasia Drive from Ridge Boulevard and Big Tree. Due to right-of-way constraints and the existing conditions of the adjacent properties, it was determined that the western side of the corridor would not be feasible and, instead, coordinated with the City of South Daytona to consider the feasibility of a 10-foot wide shared use path along the eastern side of Anastasia Drive. No right-of-way will need to be purchased to accommodate the shared use path. Moderate impacts to existing utilities are anticipated. No wetland impacts or impacts to threatened and endangered species will occur. As a result of this study, it has been determined that constructing this shared use path is feasible.

APPENDIX A: CONCEPT PLAN



LEGEND

B	UTILITY BOX	---	EXIST. EDGE OF PAVEMENT
F	FIRE HYDRANT	---	EXIST. SIDEWALK
I	INLET	---	APPARENT R/W LINE
L	LIGHT POLE	---	PROP. 6" WATER MAIN
M	MANHOLE	---	PROP. PAVEMENT
U	UTILITY POLE	---	PROP. 6" CONCRETE SHARED USE PATH
W	WATER METER	---	PROP. 6" CONCRETE TURNOUT
MB	MAILBOX	---	CONCRETE REMOVAL
		---	DETECTABLE WARNING
		---	SOD
		---	CURB
		---	INLETS



LEGEND

B

UTILITY BOX

F

FIRE HYDRANT

I

INLET

L

LIGHT POLE

M

MANHOLE

U

UTILITY POLE

W

WATER METER

MB

MAILBOX

EXIST. EDGE OF PAVEMENT

EXIST. SIDEWALK

APPARENT R/W LINE

PROP. 6" WATER MAIN

PROP. PAVEMENT

PROP. 6" CONCRETE SHARED USE PATH

PROP. 6" CONCRETE TURNOUT

CONCRETE REMOVAL

DETECTABLE WARNING

SOD

CURB

INLETS



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H
 301 E. PINE ST. SUITE 350
 ORLANDO, FLORIDA 32801



**ANASTASIA DRIVE SHARED-USE
 PATH FEASIBILITY STUDY**

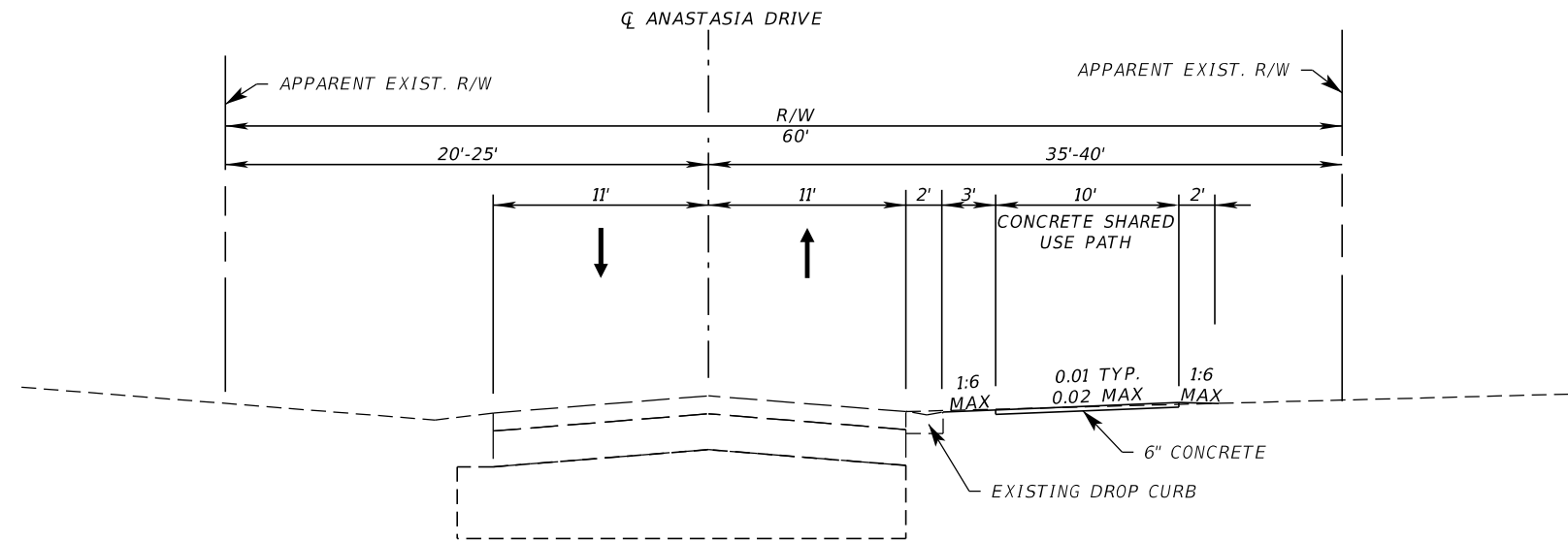
SHEET NO.
 A-4

LEGEND

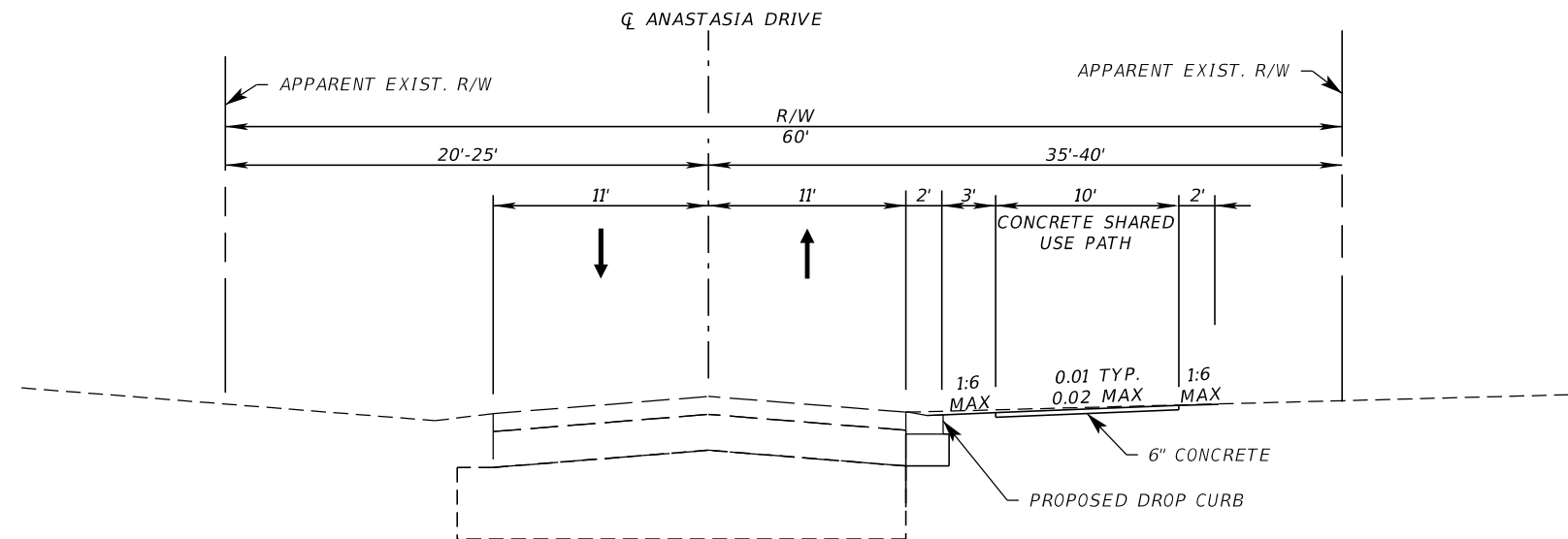
B	UTILITY BOX	---	EXIST. EDGE OF PAVEMENT
F	FIRE HYDRANT	---	EXIST. SIDEWALK
I	INLET	---	APPARENT R/W LINE
L	LIGHT POLE	---	PROP. 6" WATER MAIN
M	MANHOLE	---	PROP. PAVEMENT
U	UTILITY POLE	---	PROP. 6" CONCRETE SHARED USE PATH
W	WATER METER	---	PROP. 6" CONCRETE TURNOUT
MB	MAILBOX	---	CONCRETE REMOVAL
		---	DETECTABLE WARNING
		---	SOD
		---	CURB
		---	INLETS




APPENDIX B: TYPICAL SECTIONS



TYPICAL SECTION #1
ANASTASIA DRIVE
RIDGE BOULEVARD TO GARFIELD DRIVE
375' NORTH OF HARVARD ROAD TO 150' SOUTH OF LAMBRIGHT ROAD



TYPICAL SECTION #2
ANASTASIA DRIVE
GARFIELD DRIVE TO 375' NORTH OF HARVARD ROAD
150' SOUTH OF LAMBRIGHT ROAD TO BIG TREE ROAD

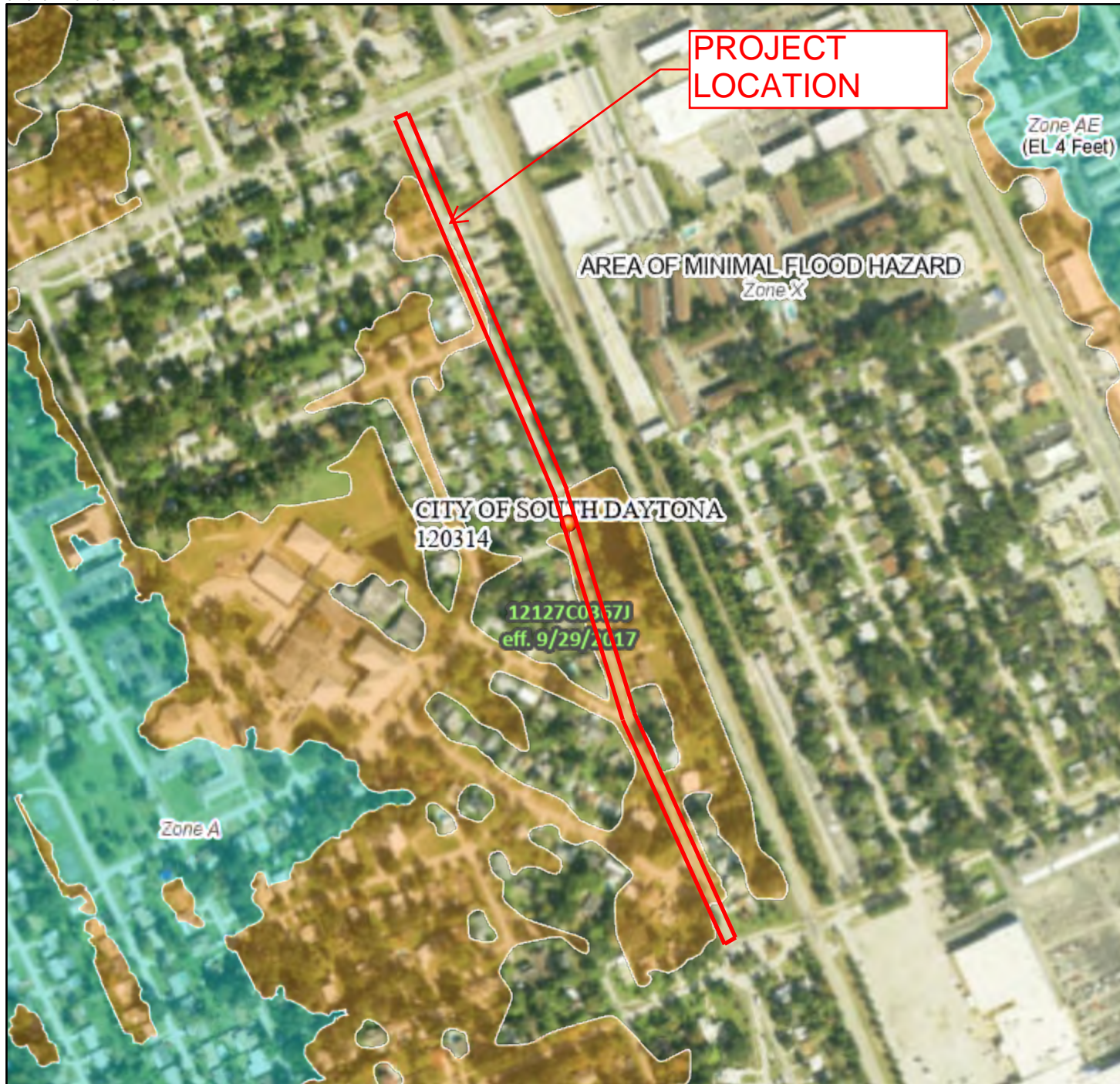
REVISIONS				 301 E. PINE ST. SUITE 350 ORLANDO, FLORIDA 32801	 RIVER TO SEA TPO Transportation Planning Organization VISION - PLAN - IMPLEMENT	ANASTASIA DRIVE SHARED-USE PATH FEASIBILITY STUDY	SHEET NO. B-2
DATE	DESCRIPTION	DATE	DESCRIPTION				

APPENDIX C: FEMA MAPS

National Flood Hazard Layer FIRMette



81°0'40"W 29°10'25"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

81°0'2"W 29°9'53"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **10/26/2022 at 9:38 AM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX D: SOIL SURVEY MAPS

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Volusia County, Florida
Survey Area Data: Version 20, Aug 27, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 6, 2022—Feb 10, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
18	Daytona-Urban land complex, 0 to 5 percent slopes	30.0	100.0%
Totals for Area of Interest		30.0	100.0%

APPENDIX E: COST ESTIMATE

Multi-Use Trail Concept
Anastasia Drive
Feasibility Study
Cost Estimate

PAY ITEM NO.	ITEM DESCRIPTION	UNIT	BASE QTY	BASE UNIT COST	TOTAL COST
104-10-3	SEDIMENT BARRIER	LF	1,339	\$ 3.31	\$ 4,432.09
110-1-1	CLEARING AND GRUBBING	AC	1,3181	\$ 47,079.60	\$ 62,055.62
110-4-10	REMOVAL OF EXISTING CONCRETE	SY	1,855	\$ 32.03	\$ 59,415.12
110-7-1	MAILBOX, F&I SINGLE	EA	5	\$ 184.78	\$ 923.90
160-4	TYPE B STABILIZATION	SY	890.1533	\$ 12.23	\$ 10,886.57
285-706	OPTIONAL BASE, BASE GROUP 06	SY	822.8	\$ 25.85	\$ 21,270.13
334-1-12	SUPERPAVE ASPHALTIC CONC, TRAFFIC B	TN	27.7	\$ 123.94	\$ 3,429.51
425-1563	INLETS, DITCH BOTTOM, TYPE F, J BOT, <10'	EA	11	\$ 11,740.00	\$ 129,140.00
425-2-43	MANHOLES, P-7, PARTIAL	EA	2	\$ 6,360.02	\$ 12,720.04
430-174-118	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 18"SD	LF	753	\$ 131.38	\$ 98,929.14
520-1-10	CONCRETE CURB & GUTTER, TYPE F	LF	1,059	\$ 38.72	\$ 40,991.70
520-2-4	CONCRETE CURB, TYPE D	LF	114	\$ 46.96	\$ 5,353.44
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	SY	3,523	\$ 74.75	\$ 263,317.81
527-2	DETECTABLE WARNING SURFACE	SF	81	\$ 35.57	\$ 2,881.17
570-1-2	PERFORMANCE TURF, SOD	SY	2,238	\$ 5.53	\$ 12,377.35
700-1-11	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	AS	1	\$ 454.17	\$ 454.17
700-1-50	SINGLE POST SIGN, RELOCATE	AS	2	\$ 160.74	\$ 321.48
700-1-60	SINGLE POST SIGN, REMOVE	AS	1	\$ 84.03	\$ 84.03
715-4-60	LIGHT POLE COMPLETE, RELOCATE	EA	5	\$ 2,662.48	\$ 13,312.40
1080-21-400	UTILITY FIXTURE, VALVE/METER BOX, RELOCATE	EA	7	\$ 1,250.00	\$ 8,750.00
				SHARED USE PATH SUBTOTAL	\$ 751,045.67
	PROPOSED WATER MAIN				
1050-31-206	UTILITY PIPE- POLY VINYL CHLORIDE, FURNISH & INSTALL, WATER/SEWER, 6"	LF	2,718	\$ 102.61	\$ 278,893.98
1050-18-003	UTILITY PIPE, PLUG & PLACE OUT OF SERVICE, 5- 7.9"	LF	2,702	\$ 20.20	\$ 54,580.40
1080-24-106	UTILITY FIXTURE, VALVE ASSEMBLY, FURNISH AND INSTALL, 6"	EA	9	\$ 3,065.86	\$ 27,592.74
1080-23-106	UTILITY FIXTURE- TAPPING SADDLE/SLEEVE, FURNISH & INSTALL, 6"	EA	2	\$ 10,465.33	\$ 20,930.66
1080-32-106	UTILITY FIXTURE- SAMPLE POINT, FURNISH & INSTALL, 6"	EA	2	\$ 1,442.19	\$ 2,884.38
1644-116-08	FIRE HYDRANT, STANDARD, F&I, 3 WAY, 2 HOSE, 1 PUMPER, 6"	EA	1	\$ 8,946.77	\$ 8,946.77
				WATER MAIN SUBTOTAL	\$ 393,828.93
				PROJECT SUBTOTAL	\$ 1,144,874.60
101-1	MOBILIZATION	LS	1	10.00%	\$ 114,487.46
102-1	MAINTENANCE OF TRAFFIC	LS	1	10.00%	\$ 114,487.46
N/A	ENGINEERING AND DESIGN	LS	1	15.00%	\$ 171,731.19
N/A	SURVEY	LS	1	\$ 10,000.00	\$ 10,000.00
				TOTAL	\$ 1,555,580.71
	FDOT Inflation-Adjusted Estimate		<i>Inflation Factor</i>	<i>PDC Multiplier</i>	<i>Adjusted Cost Estimate</i>
	Year 1 Inflation-adjusted Estimate (2023)		2.7%	1.027	\$ 1,597,581.39
	Year 2 Inflation-adjusted Estimate (2024)		2.8%	1.056	\$ 1,642,693.23
	Year 3 Inflation-adjusted Estimate (2025)		2.9%	1.086	\$ 1,689,360.65

APPENDIX F: FDOT INFLATION FACTORS



FLORIDA DEPARTMENT OF TRANSPORTATION

TRANSPORTATION COSTS REPORTS

Work Program Highway Construction Cost Inflation Factors

Fiscal Year	Inflation Factor	PDC Multiplier
2022	Base	1.000
2023	2.7%	1.027
2024	2.8%	1.056
2025	2.9%	1.086
2026	3.0%	1.119
2027	3.1%	1.154
2028	3.2%	1.191
2029	3.3%	1.230
2030	3.3%	1.270
2031	3.3%	1.312
2032	3.3%	1.356
2033	3.3%	1.400
2034	3.3%	1.447
2035	3.3%	1.494
2036	3.3%	1.544
2037	3.3%	1.595
2038	3.3%	1.647
2039	3.3%	1.702
2040	3.3%	1.758
2041	3.3%	1.816
2042	3.3%	1.876
2043	3.3%	1.938
2044	3.3%	2.002
2045	3.3%	2.068
2046	3.3%	2.136
2047	3.3%	2.206
2048	3.3%	2.279
2049	3.3%	2.354
2050	3.3%	2.432
2051	3.3%	2.512
2052	3.3%	2.595
2053	3.3%	2.681
2054	3.3%	2.769
2055	3.3%	2.861
2056	3.3%	2.955
2057	3.3%	3.053
2058	3.3%	3.153
2059	3.3%	3.257