

FINAL VICTORIA GARDENS BOULEVARD SIDEWALK FEASIBILITY STUDY

CITY OF PORT ORANGE, FLORIDA



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Prepared For:



Prepared By:

Kimley»Horn

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1 EXECUTIVE SUMMARY

The River to Sea Transportation Planning Organization (R2CTPO) recognizes the importance of developing a cohesive transportation network that provides safe, efficient, and accessible pedestrian and bicycle facilities. One way to accomplish this goal is to expand the integrated bicycle and pedestrian transportation system by continuing the feasibility studies of prioritized projects. The Victoria Gardens Boulevard Sidewalk Feasibility Study is a R2CTPO 2011 prioritized XU Bicycle/Pedestrian project as requested by the City of Port Orange.

The purpose of this project was to conduct a limited corridor study that will assess the feasibility of providing a minimum five (5) foot wide concrete sidewalk extending approximately 1,600 feet along the east side of Victoria Gardens Boulevard from the intersection of Clyde Morris Boulevard to Applevue Way. The objective of the project is to determine the feasibility of this path within the existing right-of-way to provide a safe alternative for school-aged children walking to and from Spruce Creek High School and Sweetwater Elementary School. The study will focus on identifying the width of the path and its location in an effort to design a cost-effective path that fits within the existing right-of-way.

This project was identified as a need in the Sweetwater Elementary School Safe Routes to School Study conducted in 2010 for increasing safety to and from the school. The City Council approved submittal of this project to the R2CTPO as part of the call for 2011 prioritized XU Bicycle/Pedestrian projects. The City has also received a letter of support from the Principal of Sweetwater Elementary School and the Volusia County Schools Facilities Services Director. The City's support for pedestrian safety and facilities is evident in their Comprehensive Plan and Land Development Codes and Victoria Gardens Boulevard is considered a "complete street" in accordance with the City's updated July 2010 Complete Streets map.

A feasibility study was previously completed in February 2013. However, in February 2015, FDOT issued comments on the previously finalized study. In order to address FDOT's comments, new field investigations were completed, and the study was updated to incorporate current features and design recommendations.

This project will provide a safer pedestrian and bicycle route on along Victoria Gardens Boulevard, particularly for school children who cross the street between Sweetwater Elementary School and the Lake Victoria Subdivision. The sidewalk will provide a formal route to direct children to the crosswalks and is expected to be constructed within the existing apparent right-of-way. However, it is noted that a corridor specific survey should be conducted prior to development of a sidewalk design and engineering drawings.

Coordination with St. Johns River Water Management District will be necessary to obtain an exemption verification letter, however no drainage permitting is anticipated to be required. It is also noted that a gopher tortoise was observed during the original field observations in 2012. It is recommended that a full species study be conducted 90 days prior to construction

commencement to verify the presence of gopher tortoises, and identify (if necessary) options for relocation in accordance with FWC permitting procedures.

This report contains the recommended conceptual alignment for the study corridors, as well as a planning level estimate of the anticipated costs associated with the recommended improvements.

2 INTRODUCTION

The River to Sea Transportation Planning Organization (R2CTPO) recognizes the importance of developing a cohesive transportation network that provides safe, efficient, and accessible pedestrian and bicycle facilities. One way to accomplish this goal is to expand the integrated bicycle and pedestrian transportation system by continuing the feasibility studies of prioritized projects.

The Victoria Gardens Boulevard Sidewalk Feasibility Study was identified as a R2CTPO (formerly the Volusia Transportation Planning Organization) 2011 prioritized XU Bicycle/Pedestrian project as requested by the City of Port Orange, Volusia County, Florida.

PURPOSE AND OBJECTIVES

The purpose of this project is to conduct a limited corridor study that will assess the feasibility of providing a minimum five (5) foot wide concrete sidewalk extending approximately 1,600 feet along the east side of Victoria Gardens Boulevard (Boulevard) from the intersection of Clyde Morris Boulevard to Applevue Way. A location map is include as Figure 1. The objective of the project is to determine the feasibility of this path within the existing right-of-way to provide a safe alternative for school-aged children walking to and from Spruce Creek High School and Sweetwater Elementary School. The study will focus on identifying the width of the path and its location in an effort to design a cost-effective path that fits within the existing right-of-way.

The proposed sidewalk is located near many community facilities including Sweetwater Elementary School and Spruce Creek High School. An eight foot wide sidewalk now exists on the west side of the Boulevard adjacent to the elementary school property. The project will provide a safer

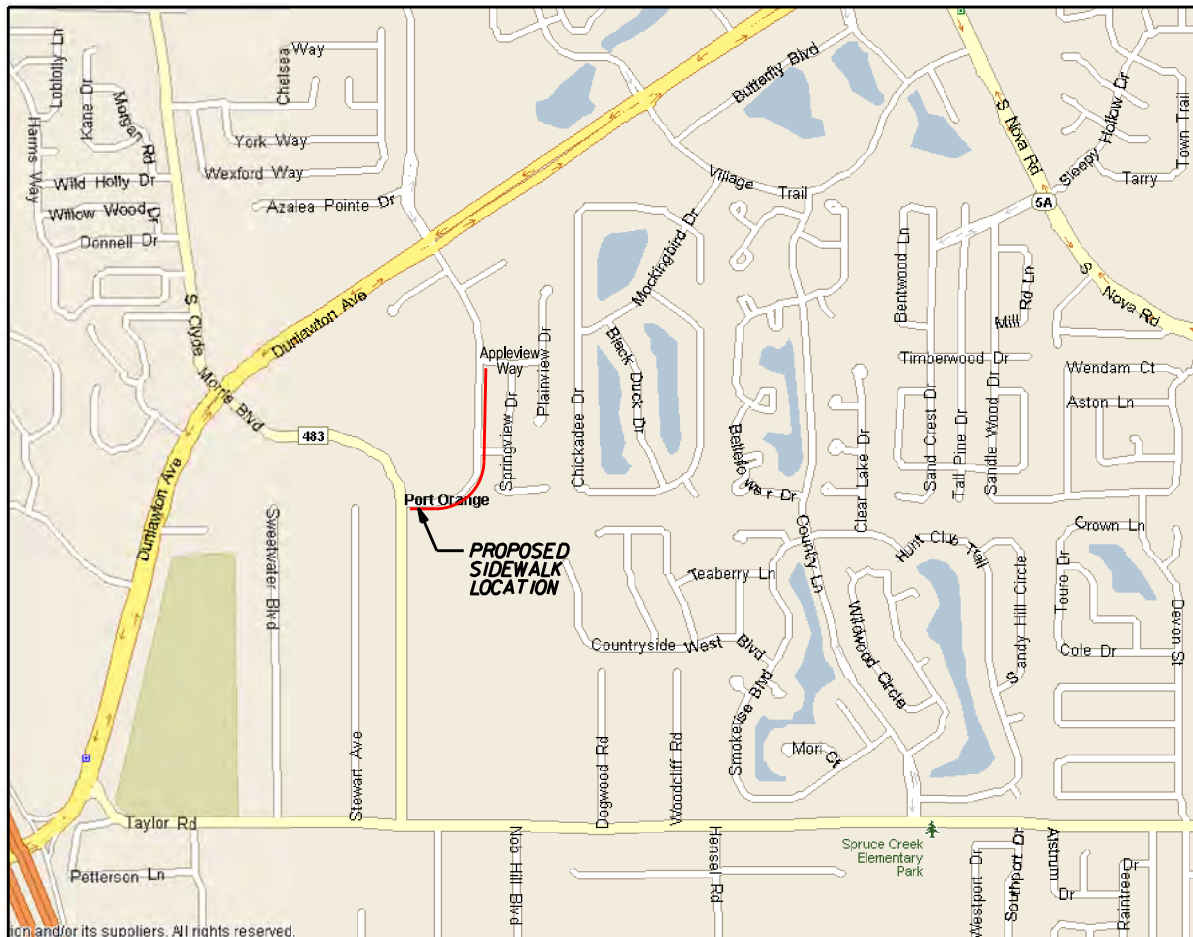
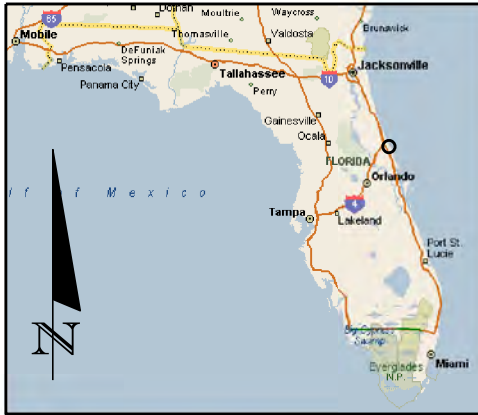
pedestrian and bicycle route on the east side of the Boulevard, particularly for school children who cross the street to access the residential developments on the east side.

During school drop-off and pick-up times, many parents park on the east shoulder of Victoria Gardens Boulevard. To reach the school, parents who park on the eastern side of Victoria Gardens Boulevard dart through traffic with their children or have their children dart through traffic alone. This is an unsafe practice since Victoria Gardens Boulevard periodically has motorists driving over the restricted speed limit or drivers who may not be paying attention to



Image Excerpted from Sweetwater Elementary School Assessment Report (Lassiter Transportation Group, Inc. September 2011)

pedestrians. The existing crossing guard location only serves to cross walkers and bicyclists coming from the north of Sweetwater Elementary School and from the northeast quadrant of the Lake Victoria Subdivision at Appleview Way. The proposed sidewalk will provide a formal route to direct children to the relocated and proposed crosswalks. The proposed crosswalk location will cross students coming from the north, south, and east, including students who are parked across from the school on the eastern side of Victoria Gardens Boulevard. The sidewalk would also improve direct access to Clyde Morris Boulevard for residents of the nearby Lake Victoria Subdivision.



LEGEND

— **PROPOSED SIDEWALK LOCATION**

CITY OF PORT ORANGE

The City of Port Orange was incorporated in 1926 in Volusia County and consists of 28 square miles with a population of approximately 56,048 according to the 2010 census data. Port Orange is one of the major urban areas within the county and according to the city web page, it contains 150 distinct neighborhoods. Victoria Gardens Boulevard is a City of Port Orange owned and maintained right-of-way.

This project was identified as a need in the Sweetwater Elementary School Safe Routes to School Study conducted in 2010 for increasing safety to and from the school. Excerpts from the Study are included in **Appendix A**. The City Council approved submittal of this project to the R2CTPO as part of the call for 2011 prioritized XU Bicycle/Pedestrian projects. The City has also received a letter of support from the Principal of Sweetwater Elementary School and the Volusia County Schools Facilities Services Director.

The City's support for pedestrian safety and facilities is evident in their Comprehensive Plan. The City's Transportation Element and Future Land Use Element include policies to develop a "complete streets" strategy to include multiple transportation modes into proposed plans for road improvements and to expand transportation choices by ensuring an efficient network of roads, sidewalks, and bike paths that are safe for pedestrians, bicyclists and vehicular traffic. Victoria Gardens Boulevard is currently considered a "complete street" in accordance with the City's July 2010 Complete Streets map.

The City requested the following considerations as part of the feasibility project:

- Preserve the ability for vehicles to stack on the shoulder of Victoria Gardens Blvd during school pick up times. This area provides additional queue storage for the school's operations.
- Add a new crosswalk along Victoria Gardens Boulevard.
- Determine the feasibility of two sidewalk widths (5 feet and 8 feet),
- Set the sidewalk as far from the road as possible.

PROJECT HISTORY

A feasibility study was conducted in 2012, with a Draft Report prepared in December 2012. Comments were received from the City of Port Orange, and the TPO, and the study was finalized in February 2013.

In February 2015, FDOT issued additional comments on the previously finalized study. In order to address FDOT's comments and move forward with the project, the R2CTPO decided to update the study to incorporate FDOT's concerns. Additional field investigations were conducted in July 2015, and the original study recommendations were reviewed and updated. The revised conceptual alignment is presented in this study.

3 STUDY METHODOLOGY AND DESIGN PRINCIPALS

ORIGINAL STUDY METHODOLOGY

For the study completed in 2013, the following tasks were completed per the project scope to provide an informed feasibility report in accordance with R2CTPO policies, procedures, guidelines and rules.

1. A project coordination meeting was held with the R2CTPO's Project Manager, FDOT representative, and the City of Port Orange staff representatives on September 5, 2012 for the purpose of scoping the project and obtaining relevant project information.
2. Data collection for the project consisted of obtaining copies of readily available planning, land use, and engineering information, including the following:
 - a. City of Port Orange, Unatin (Lake Victoria) Subdivision As-built Drawings, March 26, 1992. These plans depict the existing apparent right of way (ROW) limits, topography and drainage system along the corridor.
 - b. City of Port Orange, Victoria Gardens Boulevard, Elementary School "U", construction plan as-built, Zev Cohen & Associates, Inc. dated November 10, 1993. These plans depict the existing ROW plan and profile, cross section, utilities, sidewalk.
 - c. City of Port Orange, Unatin Subdivision Plats and Victoria Gardens Boulevard Plat, November 2, 1994.
 - d. City of Port Orange, LIDAR.
 - e. Volusia County Property Appraisers parcel maps were downloaded to further delineate the area. This information serves as the most current apparent ROW data available at the time of this evaluation. All measurements are assumed and for planning purposes only.
 - f. Data also consisted of referencing readily available information from a variety of sources, including: R2CTPO, Volusia County, City of Port Orange, and FDOT.
3. A site visit was conducted on September 5 and September 26, 2012 which consisted of traversing the project corridor in order to document the current constraints and opportunities within the apparent right of way. Photographic documentation, graphic depiction and measurements, and aerial maps assisted in recording the important details of the project and to note obstacles that might impede the project's constructability. Members of the evaluation team collected information on field conditions and located potential constraints and opportunities associated with the proposed project. Together,

with engineering and professional planning-level judgment, this information serves as the foundation for the recommendations included in this study.

4. A concept plan and typical cross sections were formulated based on the results of the previous tasks and applicable design guidelines. The concept plan and the typical section are based on design criteria for pedestrian facilities contained in the Florida Department of Transportation (FDOT) Pedestrian Facilities Planning and Design Handbook; the FDOT Plans Preparation Manual (PPM); and the Manual on Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, The Florida Greenbook. In accordance with these reference manuals, a feasible design for the project was determined.
5. An Engineer's Opinion of Probable Costs (EOPC) for Construction based on the refined conceptual design was prepared to construct a sidewalk within the proposed corridor. The EOPC was formulated based on FDOT District Five standards using their historical cost data.
6. Preparation of a Final Report followed receipt of comments by the R2CTPO, FDOT, and the City of Port Orange.

REVISED STUDY METHODOLOGY

Because of the length of time between the finalization of the study and the comments provided by FDOT, a complete review of the study was warranted. In order to update the study, the following tasks were completed:

1. Discussions were held with the R2CTPO's Project Manager, FDOT representatives, and the City of Port Orange representatives in March 2015, for the purpose of scoping the project and obtaining relevant project information.
2. A site visit was conducted on July 14, 2015, to verify existing conditions along the project corridor and review the specific locations.
3. Additional data collection consisted of updating the information previously obtained for the corridor.
4. The FDOT comments were reviewed in conjunction with the conceptual design. Adjustments were made to the alignment to reflect existing conditions and to address FDOT's concerns with the previous alignment.
5. The OPC was updated with current historical costs, pay item numbers, and inflation factors
6. The Report was updated to include the revised analysis and conceptual plan.

GENERAL DESIGN PRINCIPALS

The concept plan and typical cross sections included within this report were formulated based on the results of compiling data regarding existing conditions and applicable FDOT design guidelines. Study recommendations are based on design criteria for pedestrian facilities contained in the FDOT Pedestrian Facilities Planning and Design Handbook, the FDOT Plans Preparation Manual (PPM) and the Manual on Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, The Florida Greenbook. The following summarizes design guidelines applicable to this feasibility report.

HORIZONTAL SEPARATION

Sidewalks, according to the Florida Pedestrian Planning and Design Handbook, are defined as “paved area (typically concrete) which normally runs parallel to vehicular traffic and is separated from the road surface by at least a curb and gutter.” A sidewalk is designed for preferential or exclusive use by pedestrians. The number one goal in designing sidewalks shall be the elimination of vehicle-pedestrian conflicts. Though it is not possible to eliminate all vehicle-pedestrian conflicts within the typical roadway corridor, steps should be taken to minimize the effects of all vehicle-pedestrian conflicts through proper design.

1. The effective minimum width of a sidewalk within a residential area is 5 feet. A minimum width of 6 feet of horizontal clear zone is recommended for urban facilities where no curb and gutter is present. If 6 feet is not available, a “barrier” is recommended between the pedestrian way and the vehicular travel way. The definition of “barrier” may consist of curb and gutter, landscaping, or a permanent structure, such as railing or fencing.
2. To properly account for horizontal separation between the roadway and sidewalk, the design must, at a minimum, meet Florida Greenbook requirements. The Florida Greenbook states that sidewalks shall be separated from the travel lane of a rural (non-curbed) roadway based on the following criteria listed in order of desirability:
 - a. Outside of the highway right-of-way in a separately dedicated corridor
 - b. At or near the right-of-way line
 - c. Outside of the designed roadside clear zone.
 - d. Outside of the minimum required roadside clear zone
 - e. As far from the edge of the driving lane as possible.
3. On curbed roadways, the minimum width of a sidewalk shall be 5 ft. when separated from the curb by a buffer strip. The minimum separation for a 5 ft. sidewalk from the back of curb is 2 ft. The buffer strip should be 6 ft. where possible to eliminate the need

to narrow or reroute sidewalks around driveways. If the sidewalk is located adjacent to the curb, the minimum width of sidewalk is 6 ft.

4. The following guidelines will be useful in standardizing the identification and treatment of drop-off hazards for pedestrians and bicyclists. There are two cases that require shielding...a drop-off greater than 10 inches that is closer than 2 feet from the pedestrians' or bicyclists' pathway or edge of sidewalk is considered a hazard and shall be shielded. Also, a slope steeper than 1:2 (as called for in the plans) that begins closer than 2 feet from the pedestrians' or bicyclists' pathway or edge of sidewalk is considered a hazard and shall be shielded when the total drop-off is greater than 60 inches.... Installing fencing or railings are two ways to shield the drop-offs. Fencing is generally intended for use in rural areas along paths and trails. Standard railing is generally intended for urbanized areas, locations attaching to bridge rail or along concrete walkways.

ACCESSIBILITY/SAFETY

Curb ramps, maximum slopes, minimum widths, clear zones, and design treatments for the visually impaired, such as truncated domes, are design features that result in part from the Americans with Disabilities Act (ADA). These design features, when included in pedestrian facility planning, produce "ADA-compliant" facilities.

1. The Florida Greenbook states that curb ramps meeting the requirements of ADA Accessibility Guidelines and the Florida Accessibility Code for Building Construction shall be constructed at crosswalks at all intersections where curbs and sidewalks are constructed in order to give persons with disabilities safe access.
2. In general, proper design of pedestrian crossings shall consider the following:
 - a. Crossings should be placed at locations with ample sight distances
 - b. At crossings, the roadway should be free from changes in alignment or cross section
 - c. The entire length of the crosswalk shall be visible to drivers at a sufficient distance to allow a stopping maneuver
 - d. STOP bars shall be provided adjacent to all signalized crosswalks to inform drivers of the proper location to stop. The STOP bar should be well separated from the crosswalk, but should not be closer than 4 feet.
 - e. All crosswalks shall be easily identified and clearly delineated, in accordance with Manual on Uniform Traffic Control Devices (MUTCD) (Rule 14-15.010)

3. The single most important design consideration for persons with disabilities is curb cuts. Therefore, new and retrofitted streets with sidewalks should have curb cuts installed at all delineated crossings and it is desirable to provide separate ramps for each crosswalk at intersections with perpendicular approaches. Two curb cuts at each corner with a curb separating each ramp provides a greater amount of information to visually impaired pedestrians in street crossing designs. However a single uniform diagonal ramp including both crossings is also acceptable, when installed with truncated dome warning strips along the edge of the curb line.
4. Crossings shall also meet the same grade and cross slope requirements as sidewalks where the grade should not exceed 5%, and the maximum cross slope shall be no more than 2%.
5. Marked crosswalks shall be provided at all side streets where a pedestrian facility meets the roadway.
6. Marked crosswalks on an uncontrolled leg of an intersection or midblock shall be supplemented with other treatments (including beacons, curb extensions, raised medians, raised traffic islands, or enhanced overhead lighting) when any of the following conditions exist: 1. Where posted speeds are greater than 40 miles per hour (MPH), 2. Inadequate stopping sight distance exists such as on hills or curves, 3. Block length is shorter than 600 feet and high pedestrian volumes exist, and 4. Multiple conflict points that demand driver attention away from the crosswalk.
7. All new facilities (and existing when possible) should have some degree of access control, since each point of access produces a traffic conflict. The control of access is one of the most effective, efficient, and economical methods for improving the capacity and safety characteristics of streets and highways. The reduction of the frequency of access points and the restriction of turning and crossing maneuvers, which should be primary objectives, is accomplished more effectively by the design of the roadway geometry than by the use of traffic control devices.

SIGNAGE

Pedestrian safety is maximized when drivers are aware of the crosswalk location and know when a pedestrian is attempting to cross. Signs and markings should be utilized whenever possible to provide the pedestrian clear direction. The signs and markings should conform to the standards set forth in the MUTCD.

1. School pavement markings and crosswalk markings should be clear and visible in order to warn motorists that they are entering a school zone and children are crossing the road.

2. The FDOT's current standard (Index No. 17346) uses a special emphasis crosswalk that lengthens the life of the crosswalk marking.
3. Crosswalks should align with sidewalk ramps and should be installed where walkers and bicyclists are in the pavement for the shortest distance and time possible.
4. Pavement markings should be accompanied by the required signage standards set forth in the MUTCD.
5. Walkers and bicyclists should be dissuaded from crossing at intersections or mid-block crossings where heavy traffic exists unless accompanied by crossing guards.
6. Finally, illumination of the roadway should also provide sufficient lighting for the pedestrian facility. This is particularly important at pedestrian crossings or other areas of potential vehicle-pedestrian conflict.

4 EXISTING CONDITIONS

The project is located within the City of Port Orange along Victoria Gardens Boulevard from Clyde Morris Boulevard to Applevue Way. Within a ½ mile radius of the project corridor are retail businesses, restaurants and a High School; however the majority of the surrounding area consists of single family residential developments. Safety is of paramount concern for the consideration of this project. Due to the number and variety of residential land uses in the area and the proximity to both Sweetwater Elementary School and Spruce Creek High School, it is recommended that a designated pedestrian path be provided for the residents and students. No known road improvement projects are currently scheduled for Victoria Gardens Boulevard.

General observations of the corridor include the following:

- Victoria Gardens Blvd is a two-lane undivided City collector through the project limits.
- The grassed and gravel shoulders along the eastern edge of pavement indicate that pedestrians and vehicles frequently utilize this area in an undefined manner.
- The corridor includes a two foot “environmental curb” outside of the travel lanes.
- The speed limit is 30 miles per hour (MPH) along the entire project length. The speed limit becomes 15 MPH in the school zone when flashing.
- Utilities along the corridor include: water, storm water, and overhead lighting.
- There is an existing eight foot concrete pathway along the west side of the road.
- There is an existing crosswalk located near the intersection with Applevue Way.

Photos of the corridor are included in **Appendix B**. Additional details on specific locations within the corridor are detailed below.

INTERSECTION WITH CLYDE MORRIS BOULEVARD

- Rural section of road adjacent to stormwater pond and Volusia County School Board Preserve.
- ROW approximately 80 feet in accordance with plat. Approximately 20 feet of ROW available from edge of pavement.
- Pedestrian crossings are located on the south, west, and east sides of the intersection. Crosswalk striping is not continuous or consistent at the intersection, and sidewalk ramps do not have detectable warning surfaces.
- Existing utilities within the proposed path of the sidewalk are anticipated to be routed around.

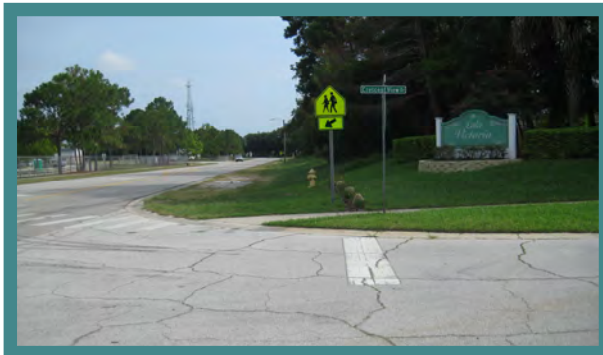
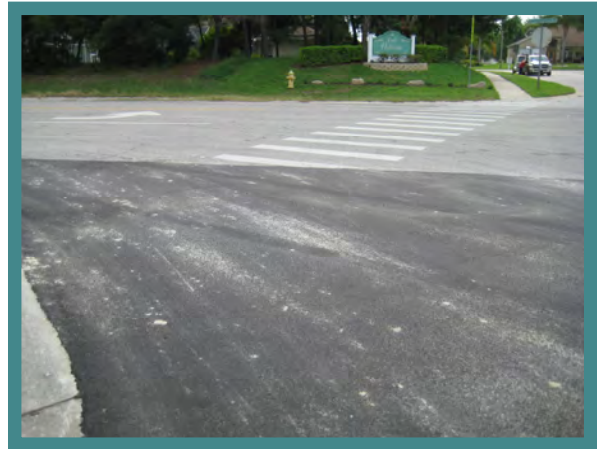


- Drainage structures with connecting swale runs north/south within ROW. Sidewalk construction is not anticipated to significantly change drainage
- Grade change is relatively minor at this location.
- School Board Preserve consists of scrub habitat, a protected natural community, which provides habitat to several protected species, including the Gopher Tortoise (*Gopherus polyphemus*). The Gopher Tortoise was observed during 2012 field observations, but not during the 2015 field observations.



INTERSECTION WITH CRESCENT VIEW DRIVE/SCHOOL ENTRANCE

- ROW section adjacent to Sweetwater Elementary School and Lake Victoria residential subdivision south entrances.
- ROW approximately 80 feet in accordance with plat. Approximately 20 feet of ROW available from edge of pavement.
- Existing utilities within the proposed path of the sidewalk are anticipated to be routed around. Drainage structures with connecting swale runs north/south within ROW.
- Existing sidewalk connection along both sides of Crescent View Drive within the residential subdivision.
- There is an existing crosswalk along the north side of the intersection only. It appears that the school driveway was recently repaved, and the existing crosswalk was not fully restriped through this area. The intersection also does not contain detectable warning surfaces.
- Protected community habitat ends before Crescent View Drive.
- Some areas within the vicinity of Crescent View Drive have significant cross slopes.



INTERSECTION WITH APPLEVIEW WAY

- ROW section adjacent to Sweetwater Elementary School and Lake Victoria residential subdivision north entrances. ROW approximately 80' in accordance with plat, with approximately 20 feet of ROW available from edge of pavement.
- Existing utilities within the proposed path of the sidewalk are anticipated to be routed around.
- There is an existing crosswalk on the north side of the intersection, however, there are no detectable warning surfaces. The existing striping at the intersection is not up to the current standard.



- There is an existing paved area on the west side of the intersection, adjacent to the crosswalk.
- Existing sidewalk connection along both sides of Appleview Way within the residential subdivision
- There is existing sidewalk from Appleview Way north along the east side of Victoria Gardens Boulevard.
- Significant slopes were observed in between Crescent View Drive and Appleview Way.

5 CONCEPTUAL DESIGN RECOMMENDATIONS

In accordance with the opportunities and constraints described above and applicable industry design standards, a conceptual alignment was developed for Victoria Gardens Boulevard. Details of the recommended conceptual alignment are detailed below and further illustrated in the Conceptual Design Plans included in **Appendix C**.

CORRIDOR RECOMMENDATIONS

Generally, sidewalks may be field relocated to route around existing utility structures as shown in the Conceptual Design Plans. A corridor specific survey for the study area should be completed prior to the development of a sidewalk design and engineering drawings in order to identify the placement and limits of these obstructions.

The following lists conceptual design recommendations for the corridor:

- Construct longitudinal grade of the sidewalk to be at grade or less than five percent in accordance with ADA Guidelines.
- Replace the existing crosswalk at Crescent View Drive with a special emphasis crosswalk and associated signing.
- Relocate existing crosswalk at Applevue Way and replace with special emphasis crosswalk markings. Add school safety signage in accordance with MUTCD.
- Utilize additional signs and markings whenever possible to provide the pedestrian and motorist clear direction.
- Provide ADA compliant sidewalk ramps and detectable warning surfaces at all new crosswalk locations.
- Route around existing utilities within the proposed path of the sidewalk.
- Provide minor regrading of drainage swale within apparent right of way to accommodate new sidewalk construction.
- Some sections of the corridor may require walls and pedestrian railings depending on the specific placement of sidewalk within the slope.
- Perform protected species survey along corridor prior to final design placement of sidewalk.
- Construct the sidewalk in accordance with the City of Port Orange Standard Construction requirements utilizing fiberglass rebar

RIGHT OF WAY COORDINATION

Right-of-way width and encroachments dictate the most feasible and cost effective location of a sidewalk. Adequate room exists along the corridor and few conflict points have been identified within the apparent right of way. Based on the data gathered, a 5 foot or 8 foot, concrete sidewalk may be located approximately three feet offset from the edge of right-of-way, leaving approximately 9 to 12 feet from the back of curb. This design allows for adequate clear zone between the travel way and pedestrian traffic. Potential conflicts may arise along this proposed path that can be resolved by field relocation of the sidewalk. For instance, the sidewalk may be routed around utility structures as shown in the corridor design plans. Potential encroachment of private property was not noted during the site reconnaissance of the corridor. However a corridor specific survey for the study area should be completed prior to the development of a sidewalk design and engineering drawings.

PERMITTING

Environmental conditions were considered as part of the feasibility study. Conditions that may require additional design or permitting costs include wetland or other surface water impacts/encroachments or protected species habitat.

1. The proposed recommendations along the corridor may result in minor modifications to existing drainage ditches and structures. Typically this work falls under St. Johns Water Management District exemption criteria. As such, an exemption verification letter could be obtained during design development. This process usually takes approximately 30 days and is anticipated to be accommodated within design schedule for the project
2. The Volusia County School Board Preserve consists of scrub habitat, a protected natural community, which provides habitat to several protected species, including the Gopher Tortoise (*Gopherus polyphemus*). The gopher tortoise is listed by Florida Fish and Wildlife Conservation Commission (FWC) as threatened and prefers dry upland habitats such as pine flatwoods, xeric oak hammocks, open sandy pastures, and disturbed areas. The subject site contains suitable habitat; therefore, a 15 percent gopher tortoise survey was conducted at the time of 2012 site reconnaissance. During the survey, a live gopher tortoise (*Gopherus polyphemus*) was observed foraging within the apparent right of way. Therefore, **a 100% gopher tortoise survey will be required no more than 90 days prior to construction commencement** within areas proposed for development and within 25 feet of the limits of construction. If it is determined that gopher tortoises will be impacted by the proposed development, a permit to relocate the tortoises and any commensal species associated with that burrow would be required from the FWC if the burrow apron cannot be avoided. Generally for transportation and/or linear projects such as sidewalks, the route is varied to avoid the burrow opening by 25 feet and therefore relocation of the species is not required. It is anticipated that the sidewalk can be rerouted to avoid the burrow apron if it is determined during the species survey that

an active burrow is located within 25 feet of the limits of construction. ***Relocation costs may range between approximately \$1500 per tortoise including application fees, mitigation bank fees, and relocation costs.***

LOCATION SPECIFIC RECOMMENDATIONS

FDOT's concerns focused primarily on the area in the vicinity of the intersection with Crescent View Drive. They were concerned that, based on the conceptual recommendations, some slope stabilization may be required outside of the right-of-way, requiring an easement or additional right-of-way to be acquired. In order to address FDOT's concerns, additional field observations were conducted to approximate the existing cross slopes and identify locations where a wall may be used to keep the project modifications within the right-of-way.

The cross slopes along the corridor vary. Within approximately 10 feet of the back of curb, the slope is mostly flat, with a few sections of negative slopes along the corridor. Between 10 and 20 feet from the back of curb, the slopes are mostly positive, ranging from approximately 5% to approximately 15% at the time of the 2015 field visits. Based on the slope measurements, the conceptual recommendations along the corridor were updated to include a gravity wall and pedestrian railing in the areas of more severe slopes.



Full FDOT comments and responses are included in ***Appendix D.***

6 FINANCIAL FEASIBILITY

Table 1 provides a planning level Opinion of Probable Cost to construct the proposed corridor based on the conceptual alignment. The item numbers and units of measure are based on the FDOT 2015 Basis of Estimates Manual. Inflation factors provided by FDOT were used to adjust the total project cost on an annual basis from 2016 to 2019.

Explanations of the key items included in the cost estimate are included below. Additional detail is included in Table 1.

- *Mobilization* – Consists of work and operations necessary to begin work on a project. Includes moving in equipment and personnel, establishing temporary offices, safety equipment and sanitary facilities. May include surveying, bond and insurance expenses.
- *Maintenance of Traffic* – Includes all items required to safely maintain traffic throughout a transportation work zone with minimal inconvenience to the public and fit into one of the following categories: 1) cannot reasonably be quantified; 2) cannot be addressed under current pay items; 3) are incidental to the operation necessary to safely maintain traffic throughout a work zone.
- *Clearing and Grubbing* – This Item is included to account for the clearing that is necessary to build the sidewalk.
- *Pedestrian/Bicycle Railing – Tubular Railing* – This item is included to account for the construction of a pedestrian railing to guard against hazardous field conditions.
- *Earthwork/Embankment* – The bid price for this item shall include, but not be limited to, the requirements of Section 120 Excavation and Embankment of the Standard Specifications.
- *Sidewalk Concrete* – These items are included to account for the cost of placing sidewalk along the proposed route. The sidewalk ramps are also included in this cost as well as the Fiberglass Rebar in accordance with the City of Port Orange Standard Construction Sidewalk requirements.
- *Detectable Warning Surface* – This item is included as an ADA compliant feature included within all sidewalk ramps. This item accounts for retrofitting existing sidewalk ramps with detectable warning surfaces.
- *Performance Turf, Sod* – This item is included to sod all areas disturbed by construction of the proposed sidewalk.
- *Single Post Sign, F&I, Relocate, Remove* – These items are included for the pedestrian crosswalk signage, as well as the installation, relocation and removal of various additional signs throughout the project.
- *Thermoplastic, Std, White, Solid, 12" and 24"* – These items are included to mark the special emphasis crosswalks, as detailed in the FDOT Design Standards, Index 17346.

Table 1 – Engineer's Estimate Opinion of Probable Costs

Pay Item Number	Description	Estimated Quantity	Unit of Measure	2015 Unit Price	Total Cost
0101-1	Mobilization	1	LS	10%	\$ 26,827.37
0102-1	Maintenance of Traffic	1	LS	15%	\$ 40,241.06
0110-1-1	Clearing and Grubbing	0.735	AC	\$ 12,500.00	\$ 9,182.74
400-1-2	Regular Excavation	593	CY	\$ 20.00	\$ 11,860.00
0400-0-011	Concrete Class NS, Gravity Wall	190	CY	\$ 670.00	\$ 127,300.00
0515-1-2	Pipe Handrail - Guiderail, Aluminum	950	LF	\$ 32.00	\$ 30,400.00
0522-1	Concrete 5' Sidewalk, 4" Thick (w/ Fiberglass Rebar)	604	SY	\$ 40.00	\$ 24,160.00
0522-2	Concrete 5' Sidewalk, 6" Thick (w/ Fiberglass Rebar)	741	SY	\$ 60.00	\$ 44,460.00
0527-2	Detectable Warning on Existing Walking Surface	200	SF	\$ 33.50	\$ 6,700.00
0570-1-2	Performance Turf, Sod	2100	SY	\$ 3.00	\$ 6,300.00
0700-1-11	Single Post Sign, F&I, Less than 12 SF	8	AS	\$ 330.00	\$ 2,640.00
0700-1-50	Single Post Sign, Relocate	3	AS	\$ 200.00	\$ 600.00
0711-11-123	Thermoplastic, Std, White, Solid, 12"	400	LF	\$ 3.00	\$ 1,200.00
0711-11-125	Thermoplastic, Std, White, Solid, 24"	450	LF	\$ 5.70	\$ 2,565.00
0711-14-160	Pavement Message	3	EA	\$ 42.00	\$ 126.00
0711-17	Thermoplastic, Remove	260	SF	\$ 3.00	\$ 780.00
CONSTRUCTION COSTS SUBTOTAL					\$ 335,342.17
-	Design (Including Bid Package)	1	LS	30%	\$ 100,602.65
-	CEI	1	LS	12%	\$ 40,241.06
-	100% Gopher Tortoise Survey	1	LS	\$ 1,500.00	\$ 1,500.00
DESIGN / CEI SUBTOTAL					\$ 142,343.71
TOTAL PROJECT COST					\$ 477,685.88
FDOT Inflation-Adjusted Estimate			Inflation Factor		Adj. Cost
2016 Estimated Project Cost			1.027		\$ 490,583.40
2017 Estimated Project Cost			1.053		\$ 503,003.23
2018 Estimated Project Cost			1.079		\$ 515,423.07
2019 Estimated Project Cost			1.106		\$ 528,320.59

NOTES:

1) THIS OPC IS BASED ON CONCEPTUAL DESIGN.

PREDOMINANTLY DERIVED FROM THE CURRENT 12-MONTH MOVING AREA AVERAGE FOR AREA 06, BUT STATEWIDE AVERAGE UNIT PRICES MAY BE UTILIZED IN SOME INSTANCES. UNIT PRICES OF SOME QUANTITIES MAY HAVE BEEN INFLATED TO ACCOUNT FOR THE SMALL NATURE OF THE PROJECT. ACTUAL CONSTRUCTION COSTS WILL VARY.

3) THIS OPC DOES NOT INCLUDE THE COSTS ASSOCIATED WITH OBTAINING PERMITS.

4) THE ESTIMATE FOR DESIGN FEE INCLUDES 20% FOR ENGINEERING DESIGN & PERMITTING AND 10% FOR SURVEY. THE LIMITS OF SURVEY ARE ANTICIPATED TO BE FROM THE BACK OF CURB TO THE RIGHT OF WAY LINE FOR THE LENGTH OF THE PROJECT.

5) THE ENGINEER HAS NO CONTROL OVER THE COST OF LABOR, MATERIALS, EQUIPMENT, OR OVER THE CONTRACTOR'S METHODS OF DETERMINING PRICES OR OVER COMPETITIVE BIDDING OR MARKET CONDITIONS. OPINIONS OF PROBABLE COSTS PROVIDED HEREIN ARE BASED ON THE INFORMATION KNOWN TO ENGINEER AT THIS TIME AND REPRESENT ONLY THE ENGINEER'S JUDGMENT AS A DESIGN PROFESSIONAL FAMILIAR WITH THE CONSTRUCTION INDUSTRY. THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT PROPOSALS, BIDS, OR ACTUAL CONSTRUCTION COSTS WILL NOT VARY FROM ITS OPINIONS OF PROBABLE COSTS.

7 CONCLUSION AND SUMMARY OF RECOMMENDATIONS

The purpose of this project was to conduct a limited corridor study to assess the feasibility of providing sidewalk along Victoria Gardens Boulevard from the intersection of Clyde Morris Boulevard to Applevue Way. The conceptual alignment for the proposed sidewalk is included in **Appendix C**. Constructing sidewalk along the specified limits appears to be feasible.

The key issues on the project corridor are noted below. Appropriate time should be allotted within the project schedule to address these issues either before or during design as appropriate.

PUBLIC INVOLVEMENT

The project corridor is located in mainly residential areas. Although it is anticipated that all improvements will be accommodated within the existing right of way, it is noted that the modifications may require re-grading of existing drainage areas, new pavement markings, and other modifications that may impact the existing property owners.

Although there are no private residential driveways located along the corridor, a coordination effort should be conducted to reach out to the property owners along McDonald Road regarding the planned improvements prior to making any changes. It is anticipated that reception to the sidewalk will be positive. From field observations and discussions, many people are concerned about the lack of sidewalk along Victoria Gardens Boulevard.

RIGHT OF WAY

A right of way map was provided by the City of Port Orange. Based on the conceptual alignment identified, the improvements are anticipated to be accommodated within the existing right of way, with no right of way acquisition needed. However, it is noted that right of way lines are apparent, and a corridor specific survey should be conducted prior to full design.

PERMITTING

The proposed recommendations along the corridor result in minor modifications to existing drainage ditches and structures. Typically this work falls under St. Johns Water Management District exemption criteria. As such, an exemption verification letter could be obtained during design development. This process usually takes less than 30 days and is anticipated to be accommodated within design schedule for the project.

A gopher tortoise was observed during the 2012 observations along the corridor. Although there was no evidence of gopher tortoises during the 2015 observations, a 100% gopher tortoise survey should be conducted no less than 90 days prior to construction commencement in order to verify the presence of gopher tortoises, and identify (if necessary) options for relocation in accordance with FWC permitting procedures

8 DATA COLLECTION REFERENCES

Data collection consisted of referencing readily available information including:

- The Volusia County MPO Bicycle/Pedestrian Plan, January 25, 2005
- Volusia County, <http://www.volusia.org/>
- River to Sea TPO, <http://www.r2ctpo.org/>
- Florida Department of Transportation (FDOT), <http://www.dot.state.fl.us/>
- Florida Pedestrian Planning and Design Handbook, FDOT, 1999
- Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, May 2011, (Florida Greenbook")
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2004
- FDOT Plans Preparation Manual (PPM), January 2015
- FDOT 2015 Basis of Estimates Handbook
 - ADA Standards for Accessible Design, Code of Federal Regulations, 28 CFR Part 36,
 - Manual on Uniform Traffic Control Devices (MUTCD), 2009
 - FDOT Roadway and Traffic Design Standards, 2016
 - Bicycle and Pedestrian School Safety Review Study, Sweetwater Elementary School, Port Orange, FL, 2011
 - City of Port Orange Comprehensive Plan Policy Document 2010-2025, October 2010

APPENDIX A

Sweetwater Elementary School Safe Routes to School Study Excerpts

Bicycle and Pedestrian School Safety Review Study

Implementation Report Sweetwater Elementary School *Port Orange, FL*



September 2011

**Volusia Transportation Planning Organization
Bicycle and Pedestrian School Safety Review Study**

**Implementation Report
Sweetwater Elementary
*Port Orange, FL***

Project Manager: Stephan C. Harris
Volusia TPO
Bicycle & Pedestrian Coordinator
2570 West International Speedway Boulevard, Suite 100
Daytona Beach, FL 32114-8145
Phone: 386-226-0422 Extension 34
Fax: 386-226-0428
Email: sharris@volusiatpo.org

Consultant: **Lassiter Transportation Group, Inc.**
123 Live Oak Avenue
Daytona Beach, FL 32114-4911
Phone: 386-257-2571
Fax: 386-257-6996
Email: rlassiter@lassitertransportation.com

6

RECOMMENDED PRIORITY PROJECTS

The recommended projects, prioritized in Table 1, were ranked and rated with regards to safety, benefits associated with the improvement, constructability, and cost. This section of the report provides additional information about each project in ranking order.

Project No. 1a: Victoria Gardens Boulevard Crossing Guard Station Relocation (Alternate to 1b)

Submitting Agency: City of Port Orange or Volusia County
Project Location: Victoria Gardens Boulevard and Applevue Way
School Served: Sweetwater Elementary School
Project Description: Installation of Sidewalks and Pedestrian Landings and Relocation of the Only Crossing Guard Station to the Intersection of Victoria Gardens Boulevard and Applevue Way
LAP Coordinator: Volusia County
Maintaining Agency: City of Port Orange

Background: The Volusia TPO is continuing in its capacity to improve the safety of the school walk zone for walkers and bicyclists who live within the school walk zone. The safety issues addressed within this report will be reviewed by the TPO for potential funding to implement the recommended changes and, thereby, improve the safety of the school walk zone, where possible.

Safety Issue: To reach the school, parents who park on the eastern side of Victoria Gardens Boulevard dart through traffic with their children or have their children dart through traffic alone. This is an unsafe practice since Victoria Gardens Boulevard periodically has motorists driving over the restricted speed limit or are not paying attention to pedestrians. The existing crossing guard location (Illustration 9) only serves to cross walkers and bicyclists coming from the north of Sweetwater Elementary School and from the northeast quadrant of Victoria Gardens Boulevard and Applevue Way. The proposed crossing guard location will cross students coming from the north, east, and as well as students who are parked across from the school on the eastern side of Victoria Gardens Boulevard. This recommendation will utilize the same crossing guard, who will now be available to cross more students safely by assisting students coming from three different areas.



Illustration 9: Existing crossing guard location north of Applevue Way

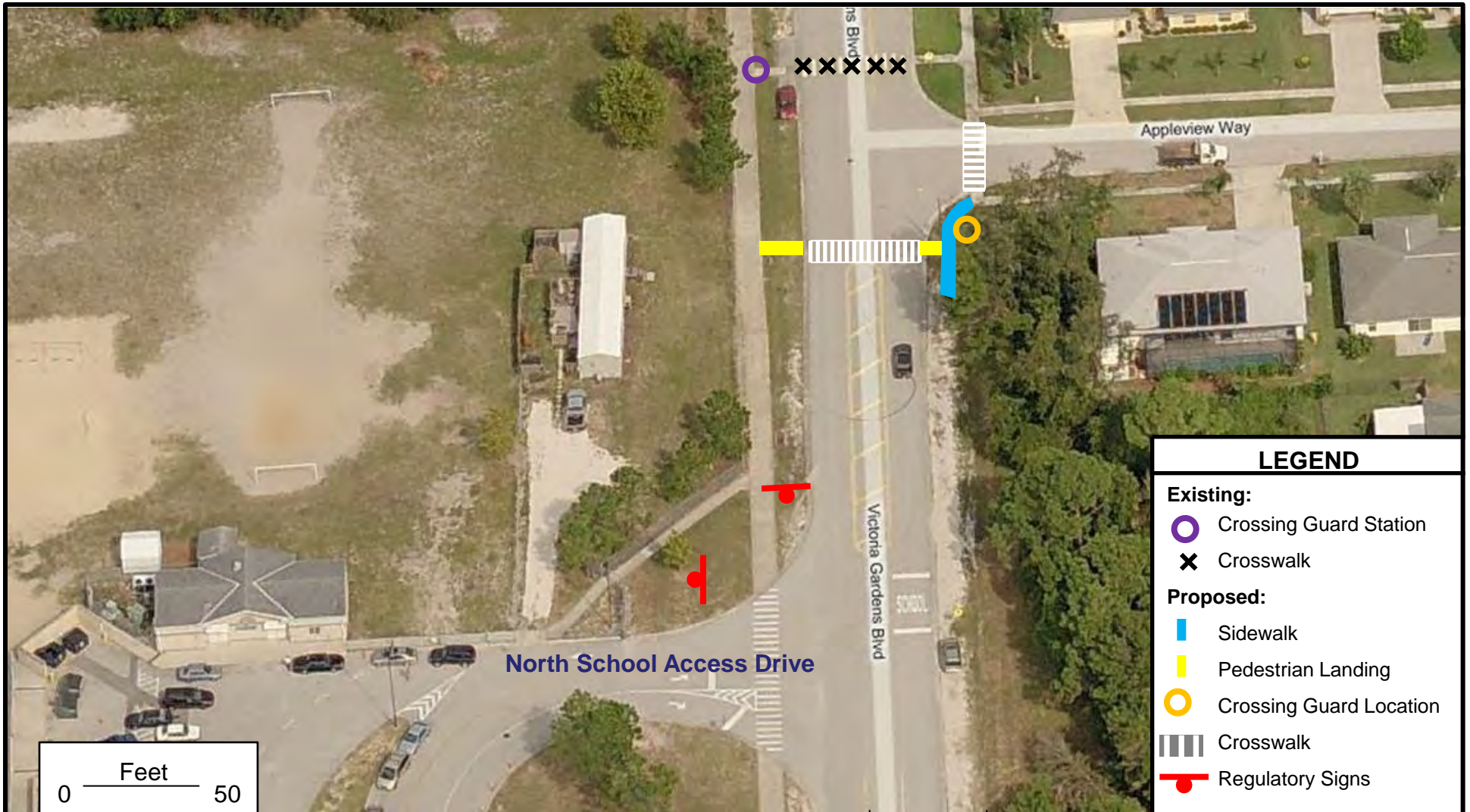
Project Description: This project will include the installation of five-foot sidewalks, approximately 40 feet in length, and pedestrian landings on both side of Victoria Gardens Boulevard. Each pedestrian landing should be approximately 14 feet long by 5 feet wide. The existing crosswalk on Victoria Gardens Boulevard must be removed, along with its current signage, and special emphasis crosswalk markings must be applied to Victoria

Gardens Boulevard and Appleview Way, along with new signage, to demarcate the new crossing location. The new pedestrian landings should also have detectable warning strips.

See Figure 2 for an illustration of this recommendation. Appendix C shows right-of-way description for Victoria Gardens Boulevard and Appleview Way. This data was taken from the *Volusia County Property Appraiser* website.

Existing Conditions: The sidewalk will connect to an existing sidewalk network from the southeastern quadrant of Victoria Gardens Boulevard and Appleview Way. Currently, pedestrian landings exist on either side of Appleview Way.

Estimated Cost: The estimated cost for this project is \$6,703.16. See Appendix B for a detailed constructability matrix.



Sweetwater Elementary School

Bicycle and Pedestrian Safety Study

Port Orange, Florida



Lassiter Transportation Group, Inc.
Engineering and Planning

Crosswalk/Crossing Guard Proposed Improvements

Figure 2

Project No. 1b: Renovation of Existing Crossing Guard Location (Alternate to 1a)

Submitting Agency: City of Port Orange or Volusia County
Project Location: Existing Crossing Guard Location North of Appleview Way on Victoria Gardens Boulevard
School Served: Sweetwater Elementary School
Project Description: Renovation of Existing Crossing Guard Location
LAP Coordinator: Volusia County
Maintaining Agency: City of Port Orange

Background: The Volusia TPO is continuing in its capacity to improve the safety of the school walk zone for walkers and bicyclists who live within the school walk zone. The safety issues addressed within this report will be reviewed by the TPO for potential funding to implement the recommended changes and, thereby, improve the safety of the school walk zone, where possible.

Safety Issue: If the proposed crossing guard location project is not accepted then the existing crossing guard location should be refurbished. The crosswalk markings are cracked and faded (Illustration 10). Also, the crossing guard does not use a STOP paddle to safely cross students.



Illustration 10: Existing crossing guard location crosswalk markings north of Appleview Way

Project Description: This project will include the removal and application of the crosswalk markings north of the intersection of Victoria Gardens Boulevard and Appleview Way. It will also include the provision of a STOP Paddle that will be used by the crossing guard to safely cross students who are coming from the North of the school.

Existing Conditions: The crosswalks markings are faded and cracked and the crossing guard primarily used hand signals to cross students at this crossing location.

Estimated Cost: The estimated cost for this project is \$1,010.72.

APPENDIX B

Existing Corridor Photos



MATCHLINE A-A



FIG. 2A - INTERSECTION OF CLYDE MORRIS BLVD. AND VICTORIA GARDENS BLVD.



Kimley»Horn
3660 Maguire Boulevard, Suite 200
Orlando, Florida 32803

EXISTING CORRIDOR PHOTOS
Bicycle/Pedestrian Feasibility Study
Victoria Gardens Boulevard Sidewalk
City of Port Orange, Florida

SCALE: NTS PROJECT NO. 149127104



MATCHLINE B-B

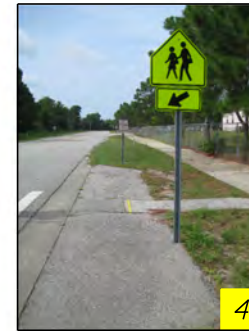


FIG. 2C - INTERSECTION OF VICTORIA GARDENS BLVD. AND
APPLEVIEW WAY



Kimley»Horn
3660 Maguire Boulevard, Suite 200
Orlando, Florida 32803

EXISTING CORRIDOR PHOTOS
Bicycle/Pedestrian Feasibility Study
Victoria Gardens Boulevard Sidewalk
City of Port Orange, Florida

SCALE: NTS PROJECT NO. 149127104

APPENDIX C

Conceptual Design Plans

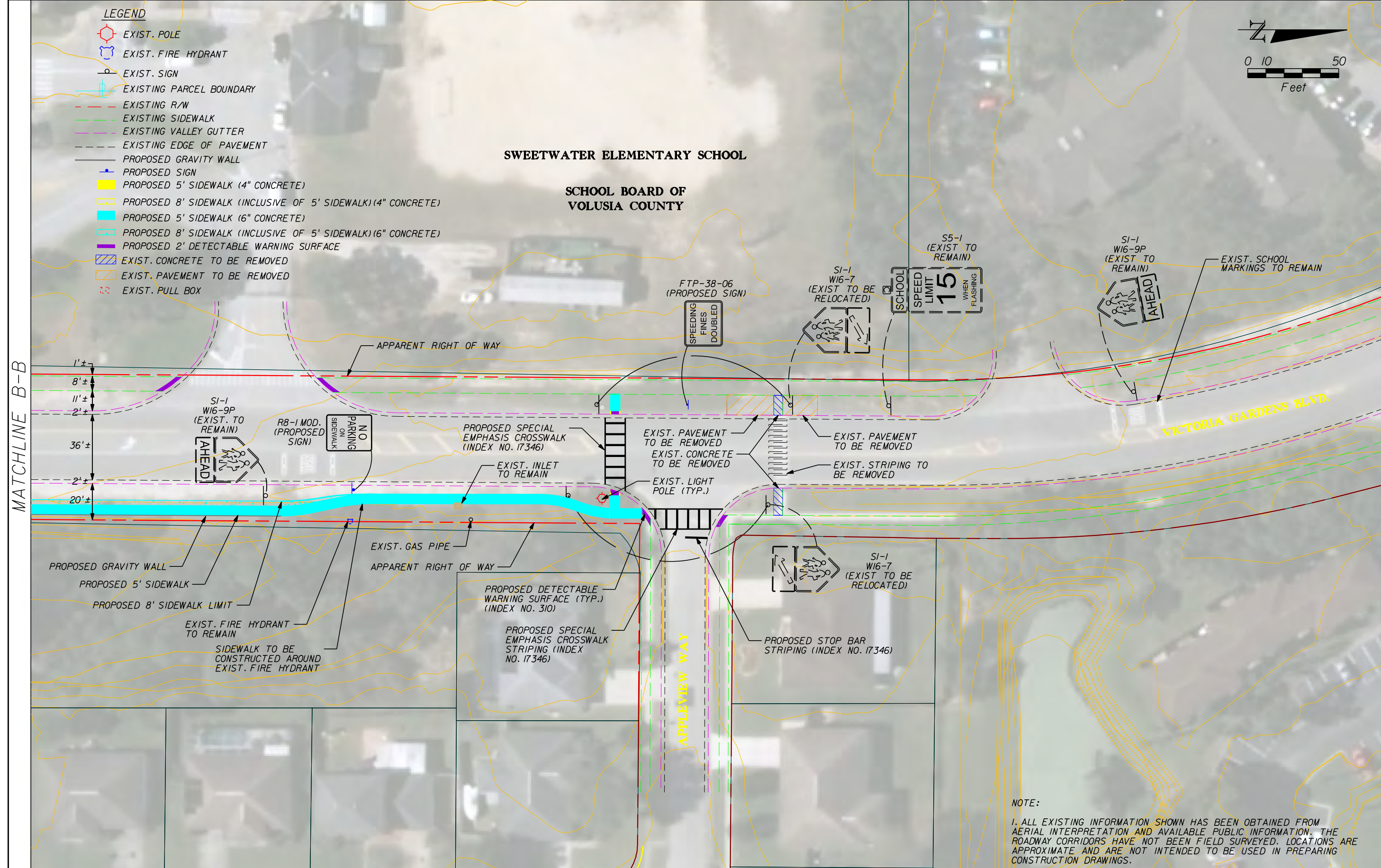


MAP 1 - PLAN LAYOUT SHEET



Kimley»Horn
3660 Maguire Boulevard, Suite 200
Orlando, Florida 32803

PROJECT CORRIDOR DESIGN PLANS			
Bicycle/Pedestrian Feasibility Study			
Victoria Gardens Boulevard Sidewalk			
City of Port Orange, Florida			
SCALE: NTS	PROJECT NO. 149127104		

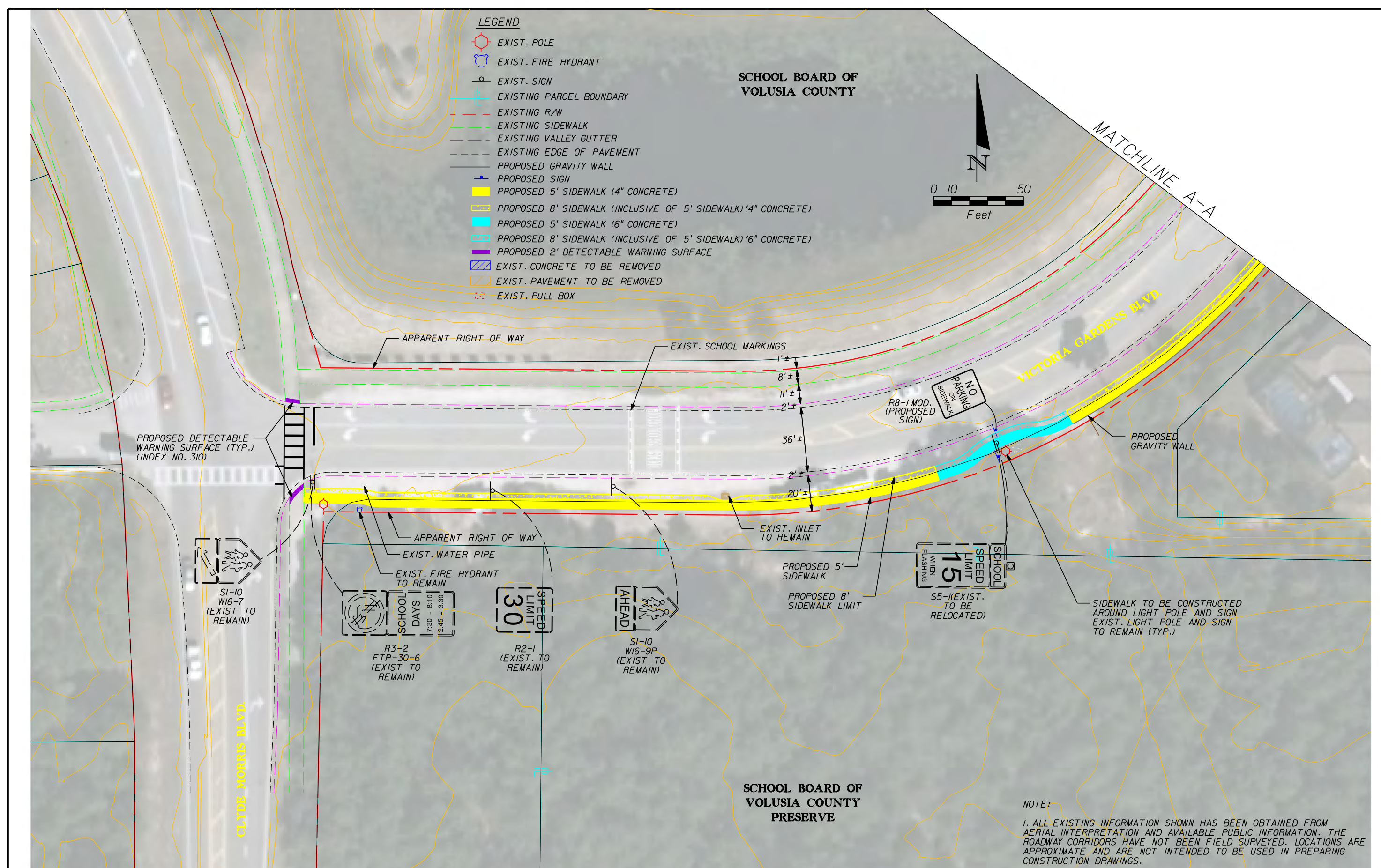


MATCHLINE B-B

MAP 4 - INTERSECTION OF VICTORIA GARDENS BLVD.
AND APPLEVIEW WAY



PROJECT CORRIDOR DESIGN PLANS
Bicycle/Pedestrian Feasibility Study
Victoria Gardens Boulevard Sidewalk
City of Port Orange, Florida



**MAP 2 - INTERSECTION OF CLYDE MORRIS BLVD.
AND VICTORIA GARDENS BLVD.**



Kimley»Horn
3660 Maguire Boulevard, Suite 200
Orlando, Florida 32803

PROJECT CORRIDOR DESIGN PLANS
Bicycle/Pedestrian Feasibility Study
Victoria Gardens Boulevard Sidewalk
City of Port Orange, Florida

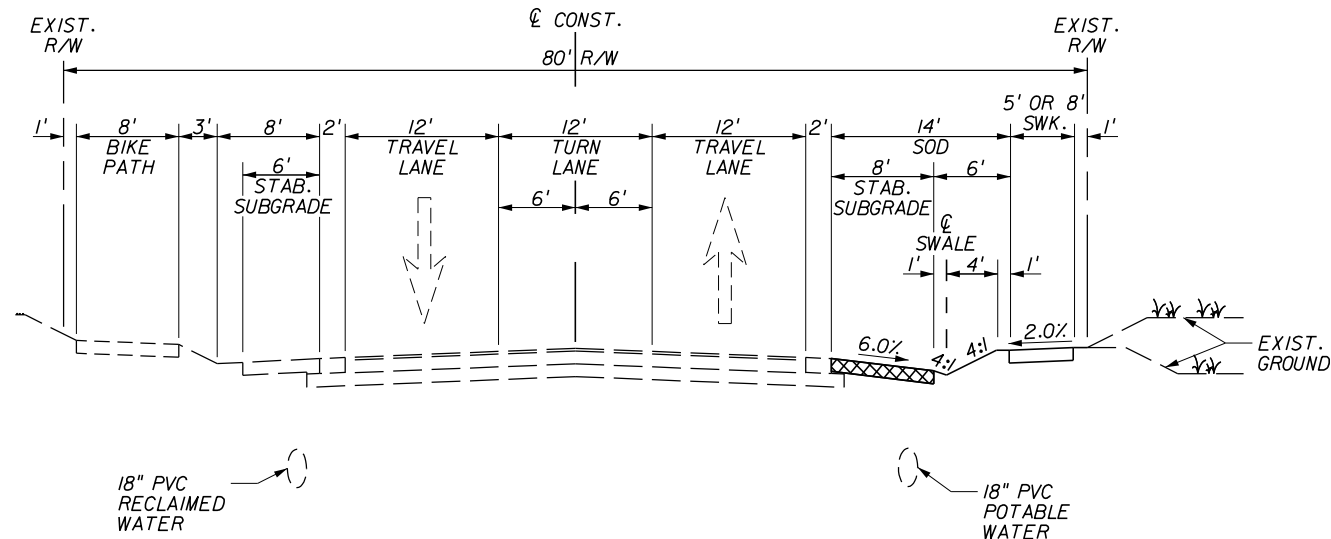
SCALE: AS SHOWN PROJECT NO. 149127104

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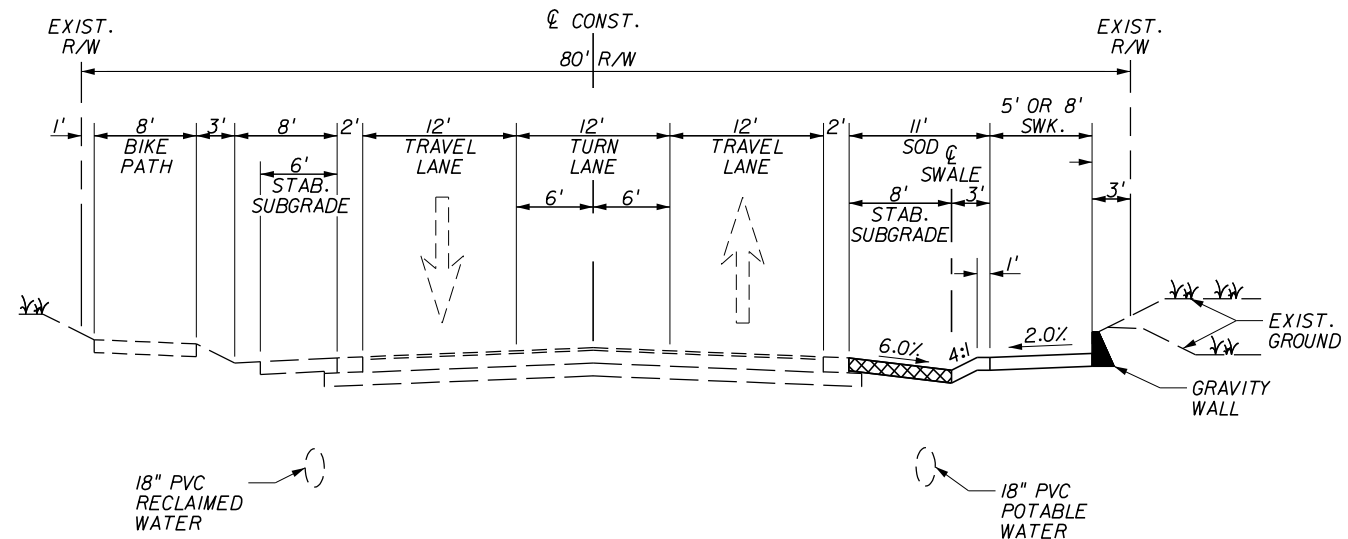
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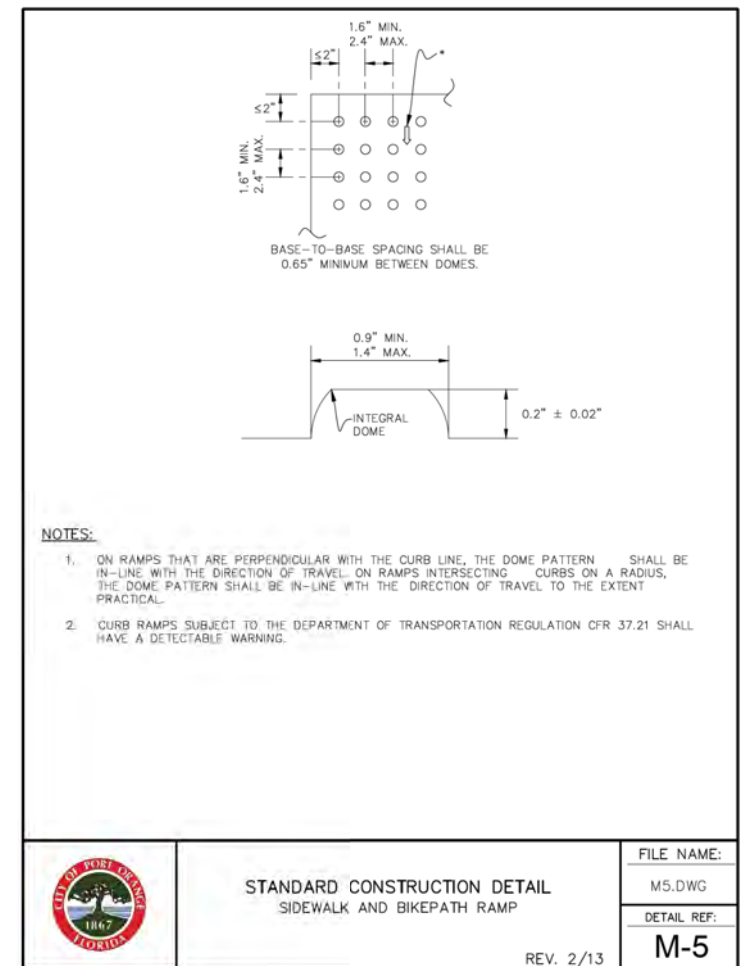
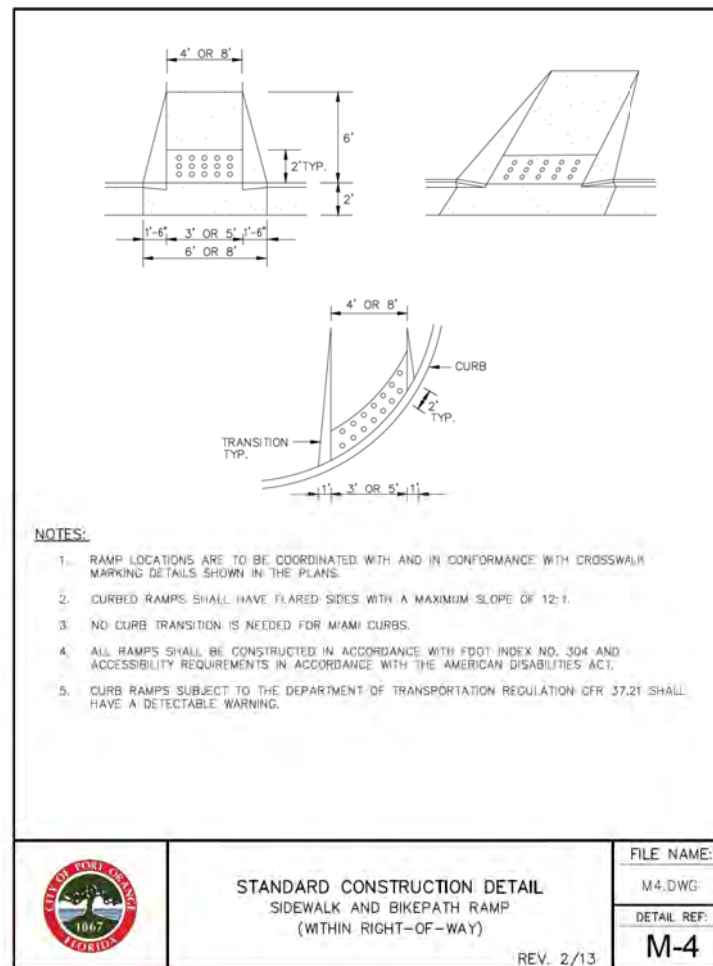
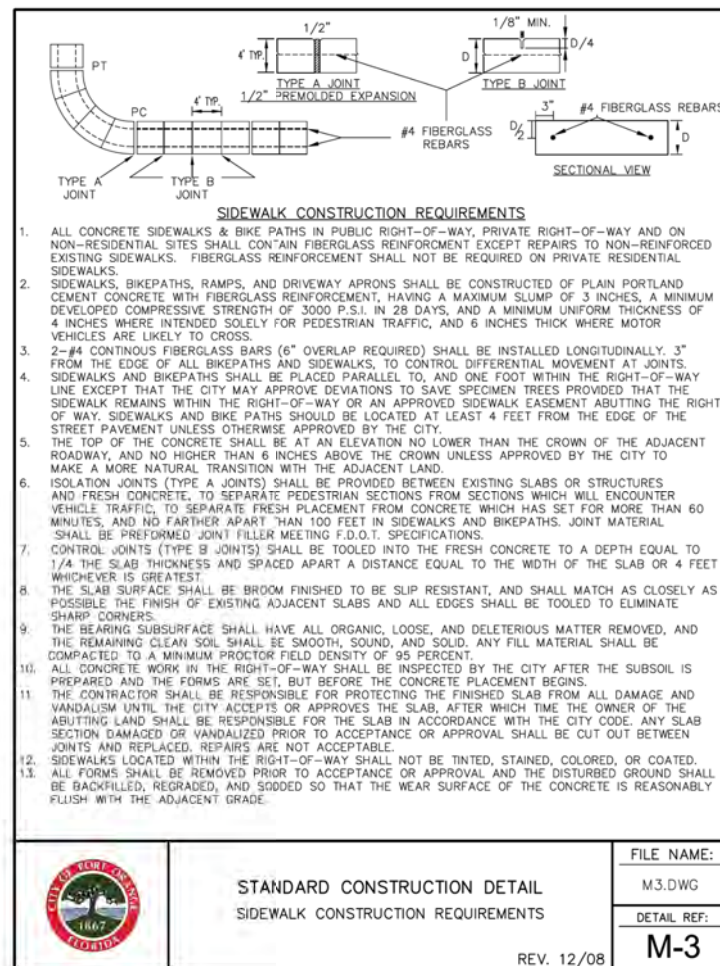
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VICTORIA GARDENS BOULEVARD TYPICAL SECTION
OPTION 1 - 5' OR 8' SIDEWALK



VICTORIA GARDENS BOULEVARD TYPICAL SECTION
OPTION 2 - 5' OR 8' SIDEWALK WITH GRAVITY WALL



APPENDIX D

Response to FDOT Comments

Roberts, Heather (Orlando)

From: Stephan Harris <SHarris@r2ctpo.org>
Sent: Thursday, March 05, 2015 6:20 PM
To: Roberts, Heather (Orlando)
Subject: FW: 435536-1 Victoria Gardens Sidewalk

Hi Heather:

F.Y.I. – this is in reference to the Victoria Gardens Sidewalk Feasibility Study completed in February 2013.

Stephan C. Harris
Bicycle & Pedestrian Coordinator
River to Sea Transportation Planning Organization
(formerly Volusia Transportation Planning Organization)



2570 W. International Speedway Blvd., Suite 100
Daytona Beach, FL 32114-8145
Phone: 386-226-0422, Extension 20428
Fax: 386-226-0428
Email: sharris@r2ctpo.org
www.r2ctpo.org

PUBLIC RECORDS NOTICE: The River to Sea Transportation Planning Organization is governed by the State of Florida public records law.

This means e-mail messages, including your e-mail address and any attachments and information we receive online might be disclosed to any person making a public records request.

If you have any question about the Florida public records law refer to Chapter 119 Florida Statutes.

From: Nieto, Luis [mailto:Luis.Nieto@dot.state.fl.us]
Sent: Friday, February 13, 2015 1:15 PM
To: Burman, Tim; Stephan Harris
Cc: Ho, Kenny; Asgarinik, Amir; Momberger, Margaret; Bizzio, Mario; Brule, Eric; Schoelzel, Mary; Ferguson, Gene
Subject: RE: 435536-1 Victoria Gardens Sidewalk

Good Morning Steve/Tim,

We noticed that this project is programmed for design FY 16 and for construction FY 17. In the feasibility study, it is suggested that the project has sufficient R/W to construct the proposed facilities (See page 1 of Feasibility Study). But when examining the concept plans (See page 24 and 25 of feasibility Study), we noticed that slope stabilization outside of the R/W may be required to tie in to existing ground. If this is the case, the programmed funds for FY 17 construction may be at risk from a schedule point of view due to R/W acquisition/easements needed for the construction of the sidewalk.

Please provide advice on what approach you would like us to take with respect to this issue.

Thank you.

Luis Nieto, P.E.

HNTB Corporation
Consultant of Florida Department of Transportation
Program Management Department
719 South Woodland Blvd.
Deland, Florida 32724-6834
Tel. 386.943.5365 (FDOT)

From: Burman, Tim [<mailto:tburman@port-orange.org>]
Sent: Tuesday, February 03, 2015 9:03 AM
To: Nieto, Luis
Cc: Ho, Kenny; Momberger, Margaret
Subject: 435536-1 Victoria Gardens Sidewalk

Luis,

Attached is the completed revised Phase 38 (Scope, Schedule, and Estimate for design) form for the Victoria Gardens Boulevard Sidewalk project.

Tim Burman
Planning Manager
tburman@port-orange.org

CITY OF PORT ORANGE
Department of Community Development
1000 City Center Circle • Port Orange, FL 32129
T • 386.506.5675 F • 386.506.5699

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Response to FDOT Comment (Dated February 13, 2015)

Comment #1: In the feasibility study, it is suggested that the project has sufficient R/W to construct the proposed facilities. But when examining the concept plans, we noticed that slope stabilization outside of the R/W may be required to tie in to existing ground.

Response: The conceptual recommendations along the corridor have been revised to include a wall to be constructed within the right-of-way to remove the need for work outside of the right-of-way. The planning level cost estimate has been updated accordingly.