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Victoria Gardens Boulevard Sidewalk Feasibility Study City of Port Orange, Florida

Prepared for:
Volusia TPO

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I. EXECUTIVE SUMMARY

The Volusia Transportation Planning Organization (VTPO) 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 VTPO 2011 prioritized XU Bicycle/Pedestrian project as requested by the City of Port Orange.

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 1600 feet along the east side of Victoria Gardens Boulevard (Boulevard) from the intersection of Appleview Way to Clyde Morris Boulevard (**See *Location Map - 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.

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 VTPO 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 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.

- *Adequate right-of-way exists along the corridor to construct the desired facilities without the need for encroachment outside the apparent right-of-way boundaries. This segment of Victoria Gardens Boulevard measures 80 feet along the entire extent of the project.*
- *Victoria Gardens Boulevard is a city collector roadway. All plans and plats were provided by the City.*
- *Public involvement has occurred for the project through the City of Port Orange. Support letters have been provided endorsing the project.*

- *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.*
- *Based on the data gathered, a 5 foot or 8 foot, concrete sidewalk may be located one foot offset along the backside of the apparent right-of-way leaving approximately 11 to 14 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.*
- *Environmental conditions were considered as part of the feasibility study. Due diligence performed during the field reconnaissance and data review revealed conditions that may require additional design or permitting costs including protected species survey and permitting requirements.*
- *Parts of the schedule which may be impacted by the findings include up to an additional 90 days for a protected species survey and permitting requirements outlined by FWC.*
- *Generally, the water management districts consider sidewalk projects exempt from stormwater permitting. The sidewalk construction will not significantly change drainage and will be built in uplands therefore it appears as if the project qualifies for exemption to permitting.*
- *The sidewalk will be constructed in accordance with the City of Port Orange Standard Construction requirements utilizing fiberglass rebar.*
- *An Opinion of Probable Cost was developed that fully considers project development requirements and costs.*

The results of the study identified that the recommended width of the sidewalk and its location was feasible in order to design a cost-effective path that fits within the existing right-of-way. This Study provides appropriate, constructible, and cost effective solutions to a significant traffic operation and or safety issue.

II. INTRODUCTION

The Volusia Transportation Planning Organization (VTPO) 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 VTPO 2011 prioritized XU Bicycle/Pedestrian project as requested by the City of Port Orange, Volusia County, Florida.

The City will continue to further improve its pedestrian system in support of the "walkable community" concept. The City will look for ways to enhance its existing "Complete Streets" to increase their use by pedestrians, bicyclists and transit riders. This is part of a larger effort to create a "lifelong community" that is more sustainable and energy efficient. As part of the effort for making improvements to the transportation system, the City will include the evaluation of alternative technologies and facility design standards. This will ensure that these efforts will enhance multi-modal choice, increase energy efficiencies in the system, and create a more livable urban environment. *City of Port Orange, Comprehensive Plan, 2010*

III. 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 1600 feet along the east side of Victoria Gardens Boulevard (Boulevard) from the intersection of Appleview Way to Clyde Morris Boulevard (See ***Location Map - 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. Additionally, 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 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 Unatin Subdivision at Appleview

Way. The proposed sidewalk will provide a formal route to direct children to the relocated and proposed crosswalks. The proposed crossing guard 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 Unatin Subdivision.

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.

TRANSPORTATION ELEMENT

GOAL 1: MOBILITY IMPROVEMENT
ESTABLISH A TRANSPORTATION SYSTEM THAT PROVIDES MOBILITY, ACCESS AND CHOICES, THAT ENCOURAGES INFILL DEVELOPMENT AND ENERGY-EFFICIENT MULTI-MODAL TRANSPORTATION THROUGH THE DESIGNATION MOBILITY IMPROVEMENT ZONES.

Objective 1.5: *Community Design*. The City shall seek to create a more pedestrian-oriented and transit-friendly transportation network by utilizing a variety of context-sensitive designs for transportation facilities and urban design standards for new development, as may be applicable within each MI zone.
Policy 1.5.2: By 2013, the City will develop a "complete streets" strategy to include multiple transportation modes into proposed plans for road improvements. The intent of this policy is to develop a comprehensive, integrated, multi-modal street network by coordinating transportation planning strategies and private development activities as follows:
-Provide safe and convenient on- site pedestrian circulation.

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 VTPO 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. The City requested the following considerations as part of the feasibility project: the ability for parents to continue to parallel park along the Boulevard, an additional cross walk along the Boulevard, determine feasibility of two sidewalk widths (5 feet and 8 feet), and set the sidewalk as far from road as possible.

FUTURE LAND USE ELEMENT

GOALS, OBJECTIVES AND POLICIES
GOAL 1: SUSTAINABILITY
PROVIDE FOR DEVELOPMENT THAT MEETS THE NEEDS OF THE PRESENT WITHOUT COMPROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR OWN NEEDS.

Objective 1.2: *Smart Growth.* Future land use designations, requests for rezoning, and development approval shall be in accordance with the following principals of smart growth in order to maintain a sense of place and community.

Policy 1.2.6: Expand transportation choices by ensuring an efficient network of roads, sidewalks, and bike paths that are safe for pedestrians, bicyclists and vehicular traffic.

IV. STUDY METHODOLOGY

The following tasks were completed per the project scope to provide an informed feasibility report in accordance with VTPO policies, procedures, guidelines and rules. In addition, the tasks will meet the procedures currently used by the Florida Department of Transportation (FDOT), District Five Office to evaluate Enhancement (XU funded) bicycle and pedestrian corridor projects.

1. A project coordination meeting was held with the VTPO'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 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: VTPO, 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 VTPO, FDOT, and the City of Port Orange.

V. EXISTING CONDITIONS

The project is located within the City of Port Orange along Victoria Gardens Boulevard (Boulevard) from the intersection of Appleview Way to Clyde Morris Boulevard (See ***Location Map – Figure 1***). This section of Victoria Gardens Boulevard serves mainly residential and recreational land uses. The roadway is currently a two-lane undivided City collector with an eight foot pathway along the west side of the road. The grassed and gravel shoulders along the edge of pavement indicate that pedestrians and vehicles frequently utilize this area in an undefined manner creating safety issues. In addition, erosion is occurring along the areas with the highest vehicular use.

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 electric. No known road improvement projects are currently scheduled for the Boulevard.

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 imperative a safe passage be provided for the residents and students. Properly planned and constructed sidewalks can address pedestrian safety by separating pedestrians from vehicle traffic, providing a safe and functional space for all users of the corridor.

Bicyclists riding on sidewalks are common in residential areas with young children. Sidewalks are generally not acceptable for commuter bicyclists; however inexperienced recreational bicyclists often use sidewalks if a bike lane is perceived as unsafe. The City of Port Orange does not prohibit bicycle usage on sidewalks.

The following describes the Victoria Gardens Boulevard corridor's existing conditions and constraints. Refer to ***Existing Corridor Photos – Figure 2A-C*** for visual images relating to the existing corridor**.** The corridor presents different opportunities and constraints best described in sections starting from the south end and ending in the north.

Intersection of Clyde Morris Blvd. and Victoria Gardens Blvd. (Refer to photo's 1 - 7, Figure 2-A)

- Rural section of road adjacent to stormwater pond and Volusia County School Board Preserve
- ROW approximately 80' in accordance with plat

- ROW contains a flat (environmental) curbing along entire length of corridor
- Approximately 20 feet of ROW available from edge of pavement
- The apparent right of way width can accommodate sidewalks
- Pedestrian crossing at intersection
- Sidewalk ramp does not have detectable warning surfaces
- No obstructions located within proposed path of the sidewalk that would require relocation
- Existing utilities within the proposed path of the sidewalk can be routed around
- Drainage structures with connecting swale runs north/south within ROW
- Sidewalk construction will not significantly change drainage
- Grade change from edge of pavement to natural area, elevation change +/- 3 feet
- School Board Preserve consists of scrub habitat, a protected natural community, which provides habitat to several protected species, including the Gopher Tortoise (*Gopherus polyphemus*)
- Erosion is evident along this section due to vehicular parking along the ROW

Intersection Victoria Gardens Blvd. and Crescent View Dr. (Refer to photo's 1 - 7, Figure 2-B)

- ROW section adjacent to Sweetwater Elementary School and Unatin residential subdivision south entrances
- ROW approximately 80' in accordance with plat
- ROW contains flat (environmental) curbing along entire length of corridor
- Approximately 20 feet of ROW available from edge of pavement
- The apparent ROW width can accommodate sidewalks

- No obstructions located within proposed path of the sidewalk that would require relocation
- Existing utilities within the proposed path of the sidewalk can be routed around
- Drainage structures with connecting swale runs north/south within ROW
- Intersection does not contain sidewalk ramps and detectable warning surface
- Existing sidewalk connection along Crescent

View Drive within the residential subdivision

- Erosion is evident along this section due to vehicular parking along the ROW
- Elevation grade change and protected community habitat ends before Crescent View Drive.

Intersection of Victoria Gardens Blvd. and Appleview Drive (Refer to photo's 1-5, Figure 2-C)

- ROW section adjacent to Sweetwater Elementary School and Unatin residential subdivision north entrances
- ROW approximately 80' in accordance with plat
- ROW contains curbing along entire length of corridor
- Approximately 20 feet of ROW available from edge of pavement
- The apparent ROW width can accommodate sidewalks
- No obstructions located within proposed path of the sidewalk that would require relocation

- Existing utilities within the proposed path of the sidewalk can be routed around
- Drainage structures with connecting swale runs north/south within ROW
- Intersection does not contain sidewalk ramps and detectable warning surface
- Existing sidewalk connection along Appleview Drive within the residential subdivision
- Existing sidewalk from Appleview Drive north along the east side of Victoria Gardens Boulevard
- Existing School Crosswalk marking north of Appleview Drive requires maintenance and should be replaced

VI. 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.

5. Ideally, a 3 foot "shy" width should be provided behind the sidewalk for above ground utilities.

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 uncontrolled marked crosswalks at intersections or mid-block crossings where there are high numbers of students crossing (40 or more students cross a street where there are more than 350 vehicles per hour during each of two hour crossing periods) or when speed limits exceed 40 mph unless accompanied by a crossing guard.

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. Sidewalk construction will not significantly change drainage therefore no permit should be required in accordance with St. Johns River Water Management District Compliance Coordinator, Bill Carlie. As long as the sidewalk is constructed within the uplands, a permit exemption letter may be requested at time of design and construction. The following email response was received on 12/12/12 per a request to review the corridor for any known projects or issues.

"Thank you for the inquiry this morning. I searched the District's GIS database regarding the proposed sidewalk projects along Victoria Gardens Boulevard from Clyde Morris to Appleview Way and Madeline Avenue/McDonald Road to 6th Street. Based on my search, I have not identified any issues. Should you need additional information, please do not hesitate to contact me."

Cathy

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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 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.***

VII. CONCEPTUAL DESIGN RECOMMENDATIONS

In accordance with the opportunities and constraints described above and applicable industry design standards, the preferred sidewalk location and improvements has been determined for Victoria Gardens Boulevard. The following outlines the feasible design recommendations for the project corridor depicted on ***Project Corridor Design Plans, Maps 1 – 4,*** *and* ***Typical Sections and Miscellaneous Details, Map 5.***

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 one foot offset along the backside of the apparent right-of-way leaving approximately 11 to 14 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.

The following lists conceptual design recommendations for the corridor:

- Construct longitudinal grade of the sidewalk to be less than five percent if practicable. In the event that the longitudinal grade exceeds five percent, then the sidewalk should be designed in accordance with chapter four of the ADA guidelines (28 CFR part 36).
- Provide high-visibility crosswalk markings at all side street roadway crossings. All crosswalks should be six-feet wide at a minimum.
- Install pedestrian signage and a special emphasis crosswalk at Crescent View Drive to prevent uncontrolled crossing of students/parents during school hours.
- Relocate existing crosswalk 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 at all new crosswalk locations.
- Include detectable warning surface on curb cuts at all 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.
- Stabilization may be required in erosion areas and areas of elevation change as noted on the conceptual design drawings.
- 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

VIII. FINANCIAL FEASIBILITY

The following provides an ***Engineer's Opinion of Probable Cost*** **(EOPC)** to construct and maintain the proposed corridor improvements based on FDOT 2012 Basis of Estimates Handbook. ***Table 1*** provides an EOPC for the proposed sidewalk. The item number and unit of measure are based on the FDOT Basis of Estimates manual. The following definitions were utilized to determine cost basis for the estimated work. The estimate does not include utility relocations that are found to be necessary during the final design process. This estimate is based primarily upon the FDOT 12 Month Moving Average Item Unit Cost Report for Area 6, with costs through 11/30/2012. The unit costs from the FDOT report were then increased based on an inflation factor of five percent to bring them to year 2013 costs. Cost projections

have been shown for sequential years up to 2016 based on a unit cost annual increase based on an inflation factor of five percent. As shown on ***Table 1***, the total estimated cost for design and construction of the 5 foot sidewalk along the Victoria Gardens Boulevard corridor as discussed in this report for the year 2013 is **$161,729.00** and the estimated cost for the 8 foot sidewalk alternative is shown as **$172,282.00.**

- *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.
- *Erosion Control* – The contractor shall be required to provide Turbidity and Pollution Control Devices in accordance with all State, Local, and Federal Standards, Section 104 Prevention, Control, and Abatements of Erosion and Water Pollution of the Standard Specifications, and applicable FDOT Roadway and Traffic Design Standards for this project.
- *Clearing and Grubbing* – This Item is included to account for the clearing that is necessary to build the sidewalk and replace existing crosswalk.
- *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.
- *Type "B" Stabilization* – Consists of stabilizing designated portions of the right-of-way to provide a firm and unyielding subgrade for parking. Stabilizing material can be obtained from existing base material, or from commercial and local materials.
- *Slope Stabilization* – Consists of stabilizing designated portions of tie-in slopes. Stabilizing material can be obtained from existing base material, or from commercial and local materials. Existing soil conditions may require slope stabilization.
- *Sidewalk Conc (4" Thick)* –This item is included to account for the cost of placing the majority of the 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.
- *Sidewalk Conc (6" Thick)* – This item is included to account for the cost of placing the sidewalk in areas with traffic bearing situations. 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 on Existing surface* – This pay item is to be used for detectable warnings applied to existing walking surfaces (retrofit for previous projects), used in coordination with index 304.

- *Performance Turf, Sod* – This item is included to sod all areas disturbed by construction of the proposed sidewalk.
- *Single Post Sign, F&I, Less than 12 SF* – This item is included for the pedestrian crosswalk signage, and various additional signs throughout the project
- *Single Post Sign, Relocate* – Includes the removal of the sign assembly in accordance with the specifications, and relocation/installation of the sign within the project limits, in accordance with the current design standards.
- *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.
- *Pavement Message* – Each word is paid as one message.

Table 1 - Engineer's Opinion of Probable Costs

Victoria Gardens Boulevard Sidewalk

(For Design and Construction of Sidewalk & Pedestrian Safety Features along Victoria Gardens Boulevard)

Port Orange, FL

Pay Item Number	Description	Estimated Quantity	Unit of Measure	2012 Unit Price	Average Number of Units	Adjusted Price	Inflation Factor	Extended Cost Year 2013	2014	2015	2016
0101-1	Mobilization	1	LS	-	-	$ 15,000.00	5%	$ 15,750.00	$ 16,537.50	$ 17,364.38	$ 18,232.59
0102-1	Maintenance of Traffic	1	LS	$ 206.00	478	$ 10,000.00	5%	$ 10,500.00	$ 11,025.00	$ 11,576.25	$ 12,155.06
104-10-3	Erosion Control	1	LS	-	-	$ 5,000.00	5%	$ 5,250.00	$ 5,512.50	$ 5,788.13	$ 6,077.53
0110-1-1	Clearing and Grubbing	0.72	AC	$ 7,974.87	21	$ 16,000.00	5%	$ 12,096.00	$ 12,700.80	$ 13,335.84	$ 14,002.63
120-6	Earthwork/Embankment	476	CY	$ 3.55	42306	$ 10.00	5%	$ 4,993.80	$ 5,243.49	$ 5,505.66	$ 5,780.95
160-4	Type "B" Stabilization	1341	SY	$ 2.79	79606	$ 2.75	5%	$ 3,872.14	$ 4,065.74	$ 4,269.03	$ 4,482.48
160-4A	Slope Stabilization	443	SY	-	-	$ 10.00	5%	$ 4,651.50	$ 4,884.08	$ 5,128.28	$ 5,384.69
0522-1	Concrete 5' Sidewalk, 4" Thick (w/ Fiberglass Rebar	896	SY	$ 20.19	7335	$ 30.00	5%	$ 28,224.00	$ 29,635.20	$ 31,116.96	$ 32,672.81
0522-2	Concrete 5' Sidewalk, 6" Thick (w/ Fiberglass Rebar	240	SY	$ 26.14	8603	$ 35.00	5%	$ 8,820.00	$ 9,261.00	$ 9,724.05	$ 10,210.25
527-1	Detectable Warning on Existing Walking Surface	9	EA	$ 364.78	12	$ 405.00	5%	$ 3,827.25	$ 4,018.61	$ 4,219.54	$ 4,430.52
0570-1-2	Performance Turf, Sod	3000	SY	$ 1.95	57929	$ 2.50	5%	$ 7,875.00	$ 8,268.75	$ 8,682.19	$ 9,116.30
0700-20-11	Single Post Sign, F&I, Less than 12 SF	10	AS	$ 226.53	33	$ 240.00	5%	$ 2,520.00	$ 2,646.00	$ 2,778.30	$ 2,917.22
0700-20-40	Single Post Sign, Relocate	2	AS	$ 75.21	6	$ 75.00	5%	$ 157.50	$ 165.38	$ 173.64	$ 182.33
0711-11-123	Thermoplastic, Std, White, Solid, 12'	564	LF	$ 1.58	3214	$ 2.00	5%	$ 1,184.40	$ 1,243.62	$ 1,305.80	$ 1,371.09
0711-11-125	Thermoplastic, Std, White, Solid, 24'	297	LF	$ 3.51	2417	$ 4.00	5%	$ 1,247.40	$ 1,309.77	$ 1,375.26	$ 1,444.02
0711-14-160	Pavement Message	5	EA	$ 178.00	42	$ 220.00	5%	$ 1,155.00	$ 1,212.75	$ 1,273.39	$ 1,337.06
0711-17	Thermoplastic, Remove	120	SF	$ 7.00	90	$ 7.00	5%	$ 882.00	$ 926.10	$ 972.41	$ 1,021.03
							CONSTRUCTION COSTS TOTAL	$ 113,006.00	$ 118,656.00	$ 124,589.00	$ 130,819.00
							8' SIDEWALK DESIGN ALTERNATIVE				
0522-1	Concrete Sidewalk, 4" Thick (w/ Fiberglass Rebar	390	SY	$ 20.19	7335	$ 30.00	5%	$ 12,285.00	$ 12,899.25	$ 13,544.21	$ 14,221.42
0522-2	Concrete Sidewalk, 6" Thick (w/ Fiberglass Rebar	130	SY	$ 26.14	8603	$ 35.00	5%	$ 4,777.50	$ 5,016.38	$ 5,267.19	$ 5,530.55
0570-1-2	Performance Turf, Sod	-2480	SY	$ 1.95	57929	$ 2.50	5%	$ (6,510.00)	$ (6,835.50)	$ (7,177.28)	$ (7,536.14)
							ALTERNATIVE CONSTRUCTION COSTS SUBTOTAL	$ 10,553.00	$ 11,080.00	$ 11,634.00	$ 12,216.00
							ALTERNATIVE CONSTRUCTION COSTS TOTAL	$ 123,559.00	$ 129,736.00	$ 136,223.00	$ 143,035.00
-	Design (Including Bid Package	1	LS	30%				$ 33,902.00	$ 35,597.00	$ 37,377.00	$ 39,246.00
-	CEI	1	LS	12%				$ 13,561.00	$ 14,239.00	$ 14,951.00	$ 15,698.00
-	100% Gopher Tortoise Survey	1	LS	$ 1,200.00	-	$ 1,200.00	5%	$ 1,260.00	$ 1,323.00	$ 1,389.15	$ 1,458.61
							DESIGN COSTS	$ 48,723.00	$ 51,159.00	$ 53,717.15	$ 56,402.61
							TOTAL PROJECT COST	$ 161,729.00	$ 169,815.00	$ 178,306.15	$ 187,221.61
							ALTERNATIVE TOTAL PROJECT COST	$ 172,282.00	$ 180,895.00	$ 189,940.15	$ 199,437.61

NOTES:

1) THIS OPC IS BASED ON CONCEPTUAL DESIGN.
2) THIS OPC IS BASED ON HISTORICAL COST INFORMATION MADE AVAILABLE BY THE FDOT. UNIT PRICES ARE 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 QUANITIES MAY HAVE BEEN INFLATED TO ACCOUNT FOR THE SMALL NATURE OF THE PROJECT. ACTUAL CONSTRUCTION COSTS WILL VARY.
3) THE COSTS FOR YEARS 2013 THROUGH 2016 WERE GENERATED USING A 5% INFLATION RATE.
4) THIS OPC DOES NOT INCLUDE THE COSTS FOR ANY RIGHT-OF-WAY OR EASEMENT ACQUISITIONS, AS THEY ARE NOT ANTICIPATED TO BE REQUIRED.
5) THIS OPC DOES NOT INCLUDE THE COSTS ASSOCIATED WITH OBTAINING PERMITS.
6) 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.
7) COST OF PRE/POST CONSTRUCTION VIDEO AND AS-BUILTS ARE INCLUDED IN THE CEI COSTS.

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.

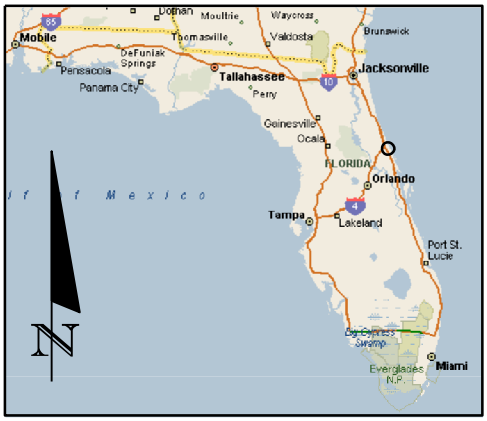
IX. DATA COLLECTION REFERENCES

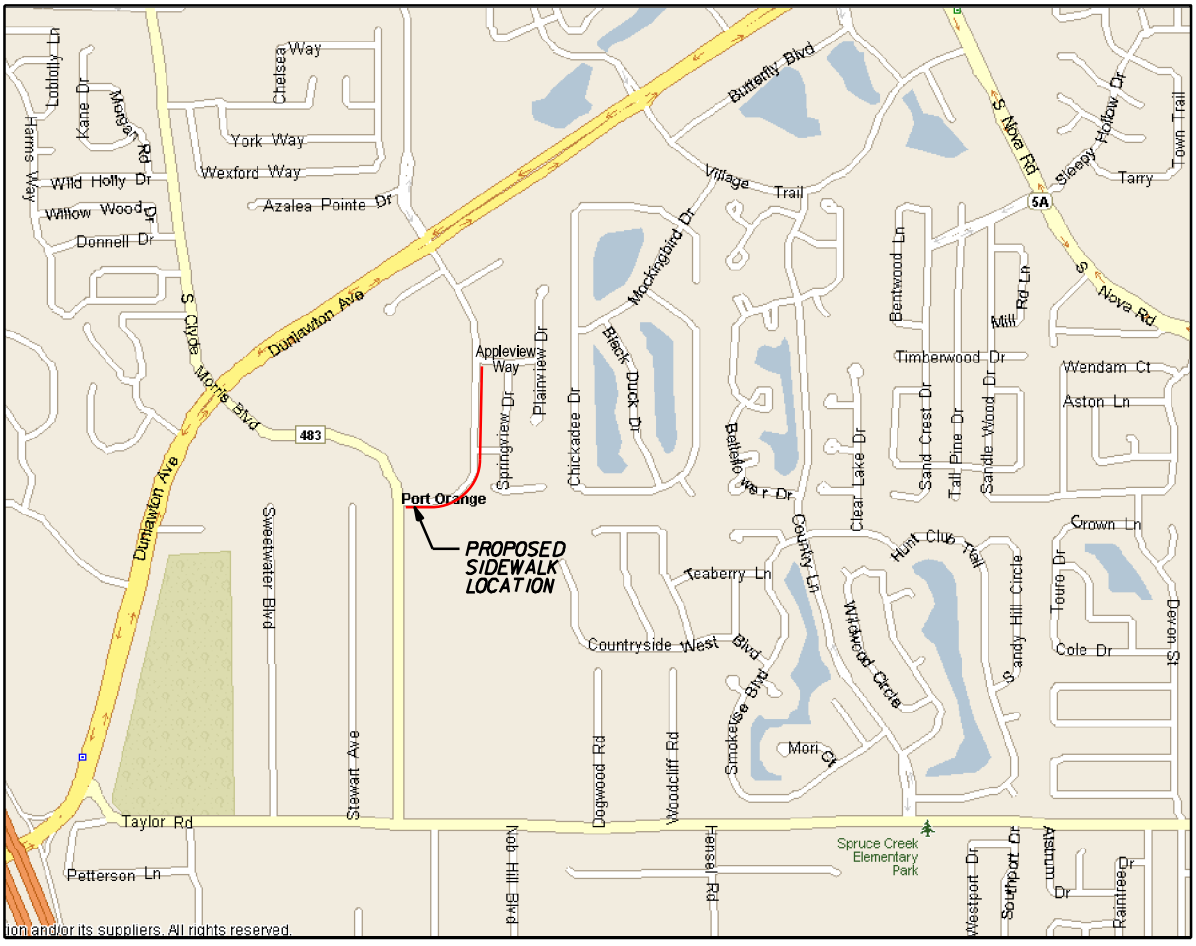
Data collection consisted of referencing readily available information including:

- The Volusia County MPO Bicycle/Pedestrian Plan, January 25, 2005
- Volusia County, http://www.volusia.org/
- Volusia TPO, http://www.volusiatpo.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 2012
- FDOT 2012 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, 2012
- 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

FIGURES AND MAPS

SOURCE: MICROSOFT STREETS AND TRIPS, 2011





LEGEND

PROPOSED SIDEWALK LOCATION

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

Kimley-Horn and Associates, Inc.
445 24th STREET, SUITE 200
VERO BEACH, FL 32960
PHONE (772)794-4100
FAX (772)794-4130

FIGURE 1 - LOCATION MAP

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

SCALE: NTS	PROJECT NO. 147269002	DECEMBER 2012	PAGE


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

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

Kimley-Horn and Associates, Inc.
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VERO BEACH, FL 32960
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FAX (772)794-4130

EXISTING CORRIDOR PHOTOS

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

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FIG 2B - INTERSECTION VICTORIA GARDENS BLVD. AND CRESCENT VIEW DR.

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

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EXISTING CORRIDOR PHOTOS

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

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MATCHLINE B-B

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

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EXISTING CORRIDOR PHOTOS

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

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MAP 1 - PLAN LAYOUT SHEET

VOLUSIA TPO
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VISION - PLAN - IMPLEMENT

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PROJECT CORRIDER DESIGN PLANS

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

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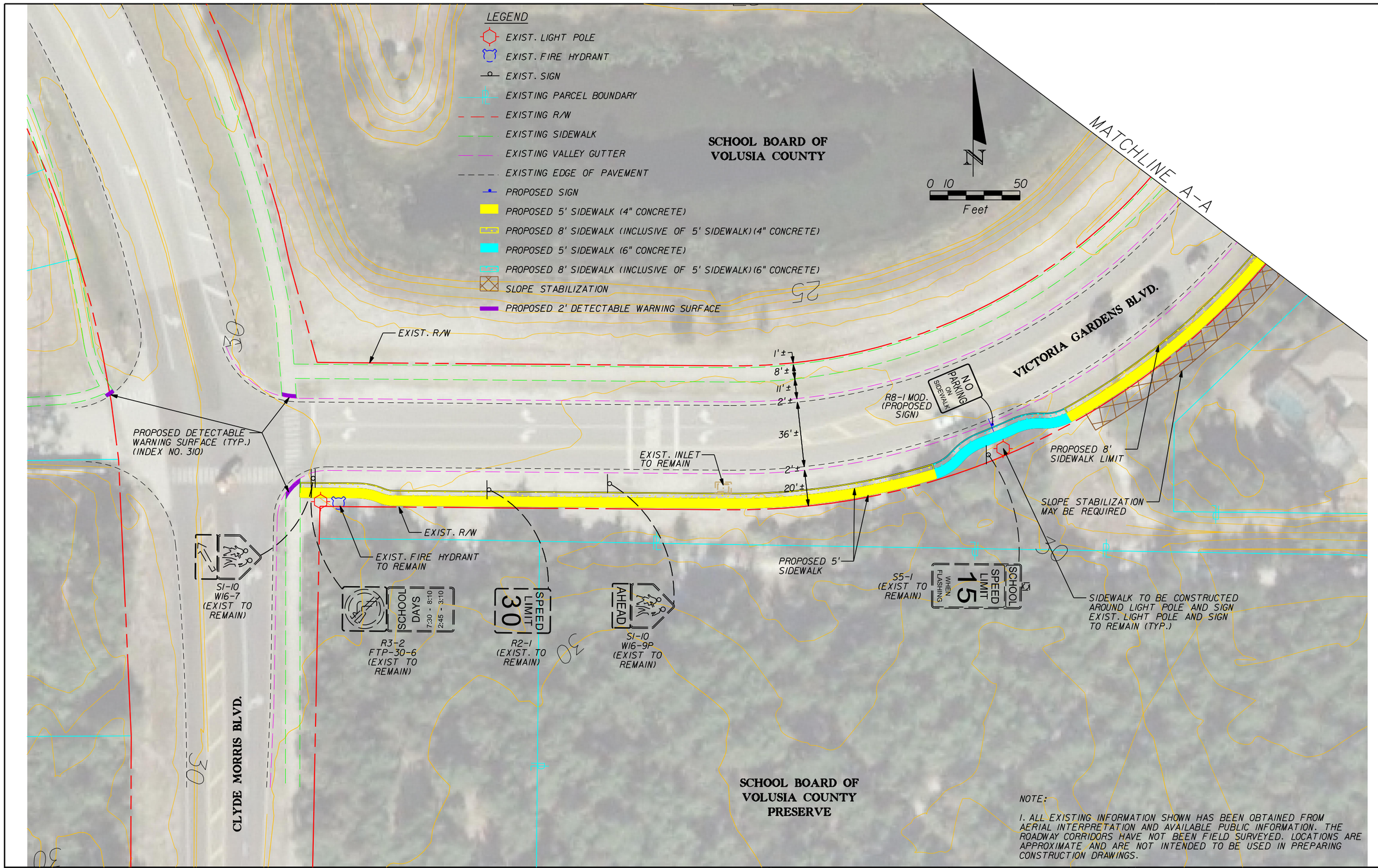

MAP 2 - INTERSECTION OF CLYDE MORRIS BLVD. AND VICTORIA GARDENS BLVD.

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

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PROJECT CORRIDOR DESIGN PLANS

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

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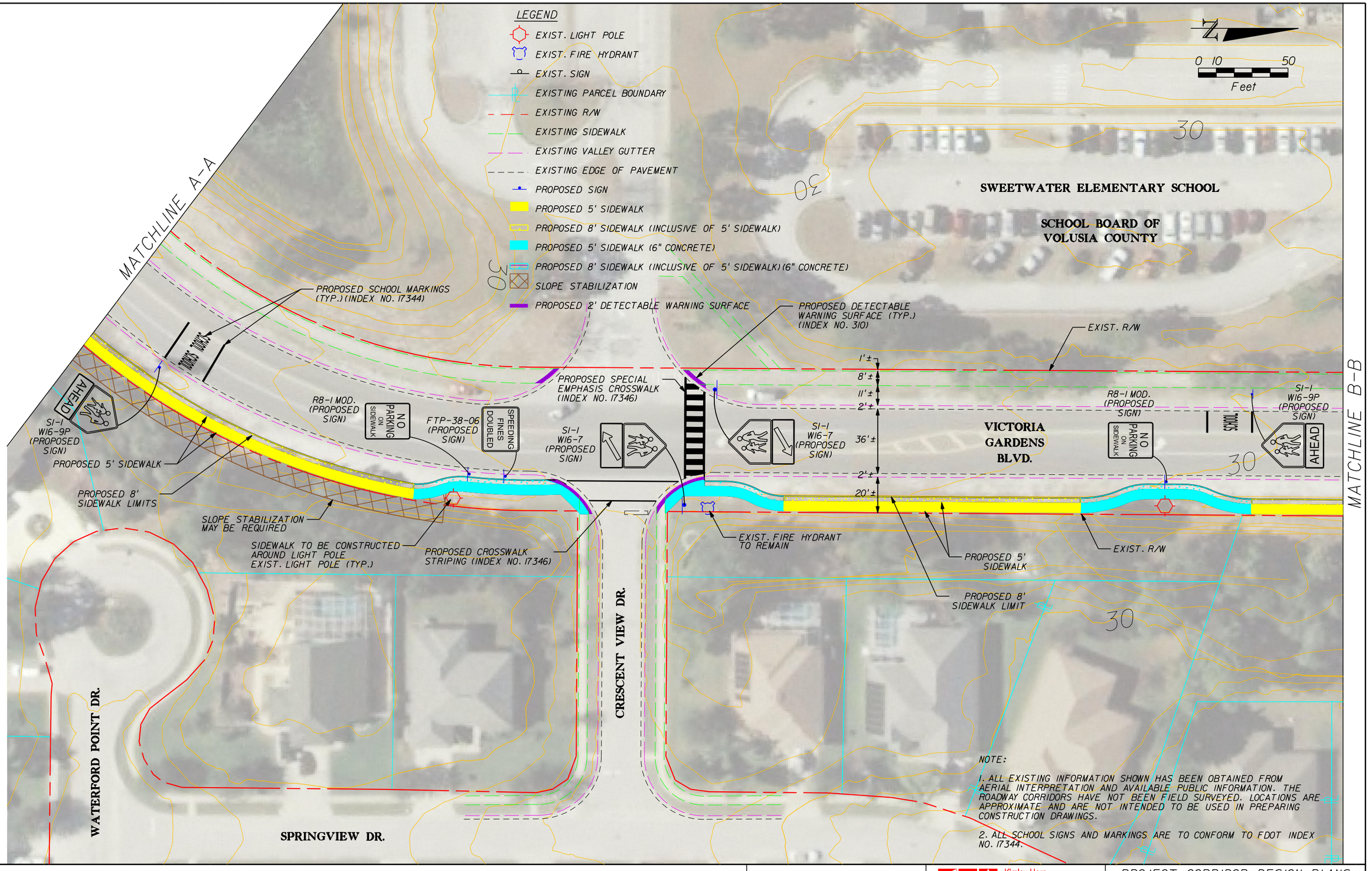

MAP 3 - INTERSECTION VICTORIA GARDENS BLVD. AND CRESCENT VIEW DR.

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

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PROJECT CORRIDOR DESIGN PLANS

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

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LEGEND

- EXIST. LIGHT POLE
- EXIST. FIRE HYDRANT
- EXIST. SIGN
- EXISTING PARCEL BOUNDARY
- EXISTING R/W
- EXISTING SIDEWALK
- EXISTING VALLEY GUTTER
- EXISTING EDGE OF PAVEMENT
- PROPOSED SIGN
- PROPOSED 5' SIDEWALK
- PROPOSED 8' SIDEWALK (INCLUSIVE OF 5' SIDEWALK)
- PROPOSED 5' SIDEWALK (6" CONCRETE)
- PROPOSED 8' SIDEWALK (INCLUSIVE OF 5' SIDEWALK)(6" CONCRETE)
- SLOPE STABILIZATION
- PROPOSED 2' DETECTABLE WARNING SURFACE

N

0 10 50

Feet

MATCHLINE B-B

SWEETWATER ELEMENTARY SCHOOL

SCHOOL BOARD OF VOLUSIA COUNTY

VICTORIA GARDENS BLVD.

APPLEVIEW DR.

1'±
8'±
11'±
2'±
36'±
2'±
20'±

EXIST. R/W

S1-1 W16-9P (EXIST. TO REMAIN) AHEAD

R8-1 MOD. (PROPOSED SIGN) NO PARKING ON SIDEWALK

PROPOSED SPECIAL EMPHASIS CROSSWALK (INDEX NO. 17346)

EXIST. INLET TO REMAIN

FTP-38-06 (PROPOSED SIGN) SPEEDING FINES DOUBLED

S1-1 W16-7 (EXIST TO BE RELOCATED)

S5-1 (EXIST TO REMAIN) SCHOOL SPEED LIMIT 15 WHEN FLASHING

S1-1 W16-9P (EXIST TO REMAIN) AHEAD

EXIST. PAVEMENT TO BE REMOVED

EXIST. CONCRETE TO BE REMOVED

EXIST. STRIPING TO BE ERADICATED

EXIST. LIGHT POLE (TYP.)

PROPOSED DETECTABLE WARNING SURFACE (TYP.) (INDEX NO. 310)

PROPOSED CROSSWALK STRIPING (INDEX NO. 17346)

PROPOSED STOP BAR STRIPING (INDEX NO. 17346)

S1-1 W16-7 (EXIST TO BE RELOCATED)

EXIST. R/W

PROPOSED 5' SIDEWALK

PROPOSED 8' SIDEWALK LIMIT

EXIST. FIRE HYDRANT TO REMAIN

SIDEWALK TO BE CONSTRUCTED AROUND EXIST. FIRE HYDRANT

NOTE:

1. ALL EXISTING INFORMATION SHOWN HAS BEEN OBTAINED FROM AERIAL INTERPRETATION AND AVAILABLE PUBLIC INFORMATION. THE ROADWAY CORRIDORS HAVE NOT BEEN FIELD SURVEYED. LOCATIONS ARE APPROXIMATE AND ARE NOT INTENDED TO BE USED IN PREPARING CONSTRUCTION DRAWINGS.

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

VOLUSIA TPO TRANSPORTATION PLANNING ORGANIZATION VISION - PLAN - IMPLEMENT

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PROJECT CORRIDOR DESIGN PLANS

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

SCALE: AS SHOWN	PROJECT NO. 147269002	DECEMBER 2012	PAGE

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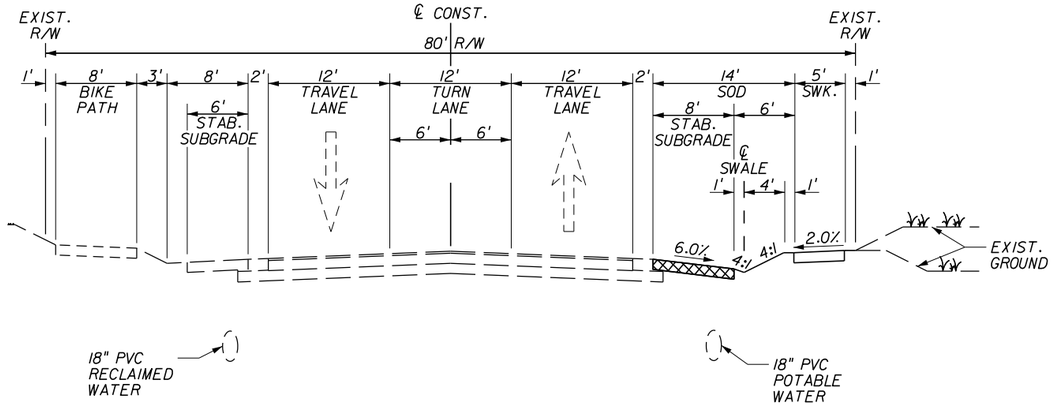
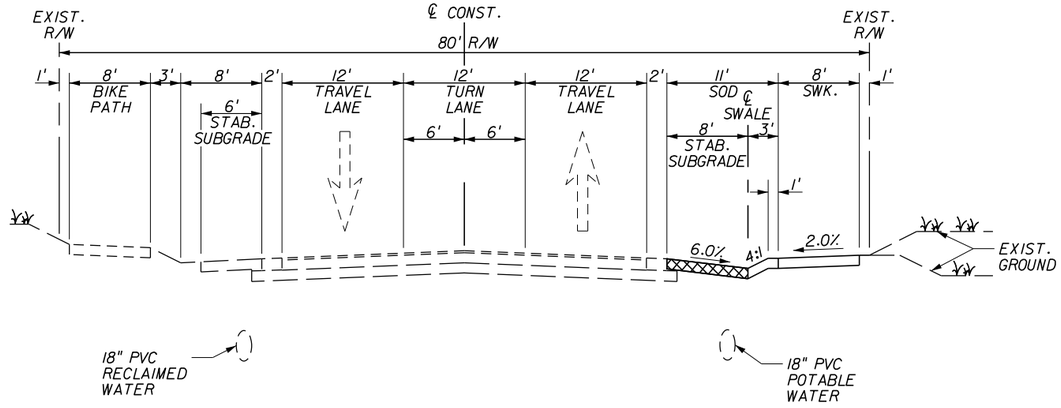
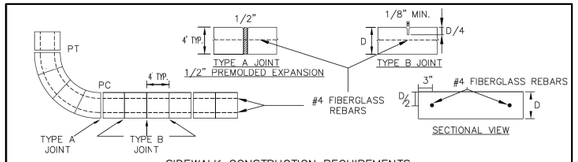


VICTORIA GARDENS BOULEVARD TYPICAL SECTION
OPTION 1 - 5' SIDEWALK



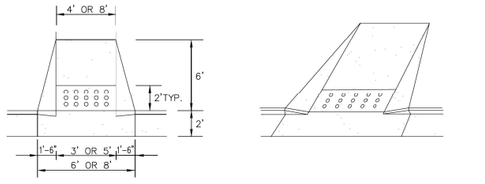
VICTORIA GARDENS BOULEVARD TYPICAL SECTION
OPTION 2 - 8' SIDEWALK

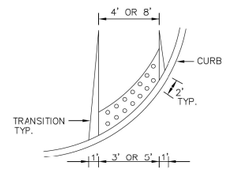


SIDEWALK CONSTRUCTION REQUIREMENTS

1. ALL CONCRETE SIDEWALKS & BIKE PATHS IN PUBLIC RIGHT-OF-WAY, PRIVATE RIGHT-OF-WAY AND ON NON-RESIDENTIAL SITES SHALL CONTAIN FIBERGLASS REINFORCMENT EXCEPT REPAIRS TO NON-REINFORCED EXISTING SIDEWALKS. FBERGLASS REINFORCEMENT SHALL NOT BE REQUIRED ON PRIVATE RESIDENTIAL SIDEWALKS.
2. SIDEWALKS, BIKEPATHS, RAMPS, AND DRIVEWAY APRONS SHALL BE CONSTRUCTED OF PLAIN PORTLAND CEMENT CONCRETE WITH FIBERGLASS REINFORCEMENT, HAVING A MAXIMUM SLUMP OF 3 INCHES, A MINIMUM DEVELOPED COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS, AND A MINIMUM UNIFORM THICKNESS OF 4 INCHES WHERE INTENDED SOLELY FOR PEDESTRIAN TRAFFIC, AND 6 INCHES THICK WHERE MOTOR VEHICLES ARE LIKELY TO CROSS.
3. 2-#4 CONTINOUS FIBERGLASS BARS (6" OVERLAP REQUIRED) SHALL BE INSTALLED LONGITUDINALLY. 3" FROM THE EDGE OF ALL BIKEPATHS AND SIDEWALKS, TO CONTROL DIFFERENTIAL MOVEMENT AT JOINTS.
4. SIDEWALKS AND BIKEPATHS SHALL BE PLACED PARALLEL TO, AND ONE FOOT WITHIN THE RIGHT-OF-WAY LINE EXCEPT THAT THE CITY MAY APPROVE DEVIATIONS TO SAVE SPECIMEN TREES PROVIDED THAT THE SIDEWALK REMAINS WITHIN THE RIGHT-OF-WAY OR AN APPROVED SIDEWALK EASEMENT ABUTTING THE RIGHT OF WAY. SIDEWALKS AND BIKE PATHS SHOULD BE LOCATED AT LEAST 4 FEET FROM THE EDGE OF THE STREET PAVEMENT UNLESS OTHERWISE APPROVED BY THE CITY.
5. THE TOP OF THE CONCRETE SHALL BE AT AN ELEVATION NO LOWER THAN THE CROWN OF THE ADJACENT ROADWAY, AND NO HIGHER THAN 6 INCHES ABOVE THE CROWN UNLESS APPROVED BY THE CITY TO MAKE A MORE NATURAL TRANSITION WITH THE ADJACENT LAND.
6. ISOLATION JOINTS (TYPE A JOINTS) SHALL BE PROVIDED BETWEEN EXISTING SLABS OR STRUCTURES AND FRESH CONCRETE, TO SEPARATE PEDESTRIAN SECTIONS FROM SECTIONS WHICH WILL ENCOUNTER VEHICLE TRAFFIC, TO SEPARATE FRESH PLACEMENT FROM CONCRETE WHICH HAS SET FOR MORE THAN 60 MINUTES, AND NO FARTHER APART THAN 100 FEET IN SIDEWALKS AND BIKEFATHS. JOINT MATERIAL SHALL BE PREFORMED JOINT FILLER MEETING F.D.O.T. SPECIFICATIONS.
7. CONTROL JOINTS (TYPE B JOINTS) SHALL BE TOOLED INTO THE FRESH CONCRETE TO A DEPTH EQUAL TO 1/4 THE SLAB THICKNESS AND SPACED APART A DISTANCE EQUAL TO THE WIDTH OF THE SLAB OR 4 FEET WHICHEVER IS GREATEST.
8. THE SLAB SURFACE SHALL BE BROOM FINISHED TO BE SLIP RESISTANT, AND SHALL MATCH AS CLOSELY AS POSSIBLE THE FINISH OF EXISTING ADJACENT SLABS AND ALL EDGES SHALL 3E TOOLED TO ELIMINATE SHARP CORNERS.
9. THE BEARING SUBSURFACE SHALL HAVE ALL ORGANIC, LOOSE, AND DELETERIOUS MATTER REMOVED, AND THE REMAINING CLEAN SOIL SHALL BE SMOOTH, SOUND, AND SOLID. ANY FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM PROCTOR FIELD DENSITY OF 95 PERCENT.
10. ALL CONCRETE WORK IN THE RIGHT-OF-WAY SHALL BE INSPECTED BY THE CITY AFTER THE SUBSOIL IS PREPARED AND THE FORMS ARE SET, BUT BEFORE THE CONCRETE PLACEMENT BEGINS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE FINISHED SLAB FROM ALL DAMAGE AND VANDALISM UNTIL THE CITY ACCEPTS OR APPROVES THE SLAB, AFTER WHICH TIME THE OWNER OF THE ABUTTING LAND SHALL BE RESPONSIBLE FOR THE SLAB IN ACCORDANCE WITH THE CITY CODE. ANY SLAB SECTION DAMAGED OR VANDALIZED PRIOR TO ACCEPTANCE OR APPROVAL SHALL BE CUT OUT BETWEEN JOINTS AND REPLACED. REPAIRS ARE NOT ACCEPTABLE.
12. SIDEWALKS LOCATED WITHIN THE RIGHT-OF-WAY SHALL NOT BE TINTED, STAINED, COLORED, OR COATED.
13. ALL FORMS SHALL BE REMOVED PRIOR TO ACCEPTANCE OR APPROVAL AND THE DISTURBED GROUND SHALL BE BACKFILLED, REGRADED, AND SODDED SO THAT THE WEAR SURFACE OF THE CONCRETE IS REASONABLY FLUSH WITH THE ADJACENT GRADE.

CITY OF PORT ORANGE 1867 FLORIDA	STANDARD CONSTRUCTION DETAIL SIDEWALK CONSTRUCTION REQUIREMENTS REV. 12/08	FILE NAME: M3.DWG DETAIL REF: M-3

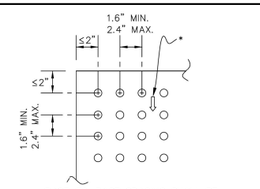




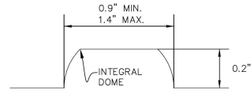
NOTES:

1. RAMP LOCATIONS ARE TO BE COORDINATED WITH AND IN COMFORMANCE WITH CROSSWALK MARKING DETAILS SHOWN IN "HE PLANS.
2. CURBED RAMPS SHALL HAVE FLARED SIDES WITH A MAXIMUM SLOPE OF 12:1.
3. RAMPS SHALL HAVE A CETECTABLE WARNING SURFACE AS SHOWN.
4. RAMPS ARE TO BE CONSTRUCTED AT ALL LOCATIONS SHOWN IN THE PLANS EVEN WHEN A SIDEWALK IS NOT CONSTRUCTED CONCURRENTLY.
5. NO CURB TRANSITION IS NEEDED FOR MIAMI CURBS.
6. ALL RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FDOT INDEX NO. 304 AND HANDICAPPED ACCESSIBILITY REQUIREMENTS IN ACCORDANCE WITH THE AMERICAN DISABLITIES ACT.

CITY OF PORT ORANGE 1867 FLORIDA	STANDARD CONSTRUCTION DETAIL SIDEWALK AND BIKEPATH RAMP REV. 12/08	FILE NAME: M4.DWG DETAIL REF: M-4



BASE-TO-BASE SPACING SHALL BE 0.65" MINIMUM BETWEEN DOMES.



NOTES:

* ON RAMPS TAT ARE PERPENDICULAR WITH THE CURB LINE, THE DOME PATTERN SHALL BE IN-LINE WITH THE DIRECTION OF TRAVEL. ON RAMPS INTERSECTING CURBS ON A RADIUS, THE DOME PATTERN SHALL BE IN-LINE WITH THE DIRECTION OF TRAVEL TO THE EXTENT PRACTICAL.

CITY OF PORT ORANGE 1867 FLORIDA	STANDARD CONSTRUCTION DETAIL SIDEWALK AND BIKEPATH RAMP REV. 12/08	FILE NAME: M5.DWG DETAIL REF: M-5