Bicycle and Pedestrian School Safety Review Study

Implementation Report Sweetwater Elementary School

Port Orange, FL

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

Lassiter Transportation Group, Inc.
Engineering and Planning

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Volusia Transportation Planning Organization
Bicycle and Pedestrian School Safety Review Study

Implementation Report
Sweetwater Elementary
Port Orange, FL

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EXECUTIVE SUMMARY

Lassiter Transportation Group, Inc. (LTG) was contracted by the Volusia Transportation Planning Organization (TPO) to prepare an Implementation Report for the Bicycle and Pedestrian School Safety Review Study for 17 Volusia County schools. The Implementation Report for the Pedestrian and Bicycle School Safety Review Study is based on observations and recommendations of the Assessment Report and includes cost data, ranking criterion for the recommended improvements, and the best practices to follow on old and new developments. The subject of this Implementation Report is Sweetwater Elementary School.

Purpose

The purpose of this study is to create a safe environment for students to walk or bicycle to school. The goal for the implementation phase of the Bicycle and Pedestrian School Safety Review Study is to provide the Volusia TPO with an analysis of the findings and recommendations that was supplied in the Assessment Report. This analysis will include constructability issues, a cost estimate, and a list of priority projects.

Creating a safer environment for students to walk or ride their bicycles to school should promote a healthier lifestyle for children. The U.S. Department of Health and Human Services Center for Disease Control (CDC) and Prevention has determined that students are not as active as they were 10 years ago when physical activity was incorporated into each student's schedule (KidsWalk-to-School, CDC). It is, therefore, important for students to integrate physical activity into their schedules as applicable. The CDC has determined that the following are benefits associated with students who walk or ride their bicycle to school.

- Increased practice of safe bicycle, pedestrian, and traffic skills
- Knowledge of their environment
- Improve childhood health
- Improve sense of self-image and autonomy
- Reduce childhood obesity
- Contributes to a healthy social and emotional development
- More alert students who do better in school
- Increased likelihood that students will grow up to lead a healthy lifestyle

Recommended Improvement Programs

Once the issues within Sweetwater Elementary School's walk zone were identified then each recommendation was evaluated. The evaluation was focused on the following items:

- Safety severity
    - Distance from the school
    - Crashes
    - Traffic flow (how it affects walkers and bicyclists)
- Benefits associated with improvement
    - Walker and bicyclist traffic
    - Walking and bicycling network/connectivity
- Constructability
- Cost

Each safety issue was rated, ranked, and placed on a prioritized list. A preliminary cost estimate was completed using the FDOT's *2010 Basis of Estimates Manual*. Actual construction costs may vary based on detailed engineering. It is noted that an in-depth engineering constructability analysis of the project should be conducted to determine if the recommendation can be constructed at the suggested estimated cost since recommendations are based on field observations.

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INTRODUCTION

Purpose

The purpose of the Implementation Report for the Bicycle and Pedestrian School Safety Review Study is to conduct a constructability review and develop a cost feasibility plan that is based upon the recommendations from Sweetwater Elementary School's Assessment Report. Ultimately, the Implementation Report should create a safer environment for children who live within the walk zone that choose to walk or bicycle to and from school.

Overview

The Bicycle and Pedestrian School Safety Review's main goal is to encourage students to walk or bicycle to school by improving unsafe walking and bicycling conditions. Sweetwater Elementary School has a student population of 653 students. Mostly, students are picked-up/dropped-off by a family vehicle, ride the bus, carpool, or make use of a day care van. Approximately two percent of the students walk home in the mornings and less than one percent bicycle or walk home in the afternoons.

Illustration 1: Cars parked on the east side of Victoria Gardens Boulevard

Parents and staff at Sweetwater Elementary School listed several concerns with the safety of the school walk zone. The following bullets describe some of the safety concerns found at the study school through interviews and observations.

- Speeding drivers and high school students were observed along Victoria Gardens Boulevard, Taylor Road, and Clyde Morris Boulevard.
- Parents parked on the eastern side of Victoria Gardens Boulevard, across from the school campus, to drop students off or pick them up in the mornings and afternoons (Illustration 1).
- Students dart across traffic to access the school campus when they exit vehicles parked on the eastern side to Victoria Gardens Boulevard.
- It was observed that students were

Illustration 2: Restrictive signs at the intersection of Clyde Morris Boulevard and Victoria Gardens Boulevard

dropped-off at the curb by the teacher's parking lot and on the western side of Victoria Gardens Boulevard, in front of the school campus.

- Three restrictive left-turn signs at the intersection of Clyde Morris Boulevard and Victoria Gardens Boulevard were disregarded by motorists (Illustration 2).
- The southwest quadrant of Taylor Road and Boggs Ford Road has a sidewalk that ends at a flume drainage feature (Illustration 3).
- A damaged utility box cover is located in the southwest quadrant of Taylor Road and Boggs Ford Road.
- A missing guiderail section was found on Taylor Road, approximately 275 feet west of the intersection of Taylor Road and Boggs Ford Road (Illustration 4).
- Some students must cross the Student Parking Lot entrance of Spruce Creek High School if they chose to walk or bicycle in the mornings to partake in extra-curricular activities.

Illustration 3: Sidewalk ends at a flume inlet drainage feature at the intersection of Taylor Road and Boggs Ford Road

Illustration 4: Pedestrian and bicyclist bridge on Taylor Road, east of Boggs Ford Road

To make walking and bicycling a chosen mode of transportation for students at Sweetwater Elementary School, remedial measures have been recommended that should make the school walk zone safer. Local and state laws like the *Intermodal Surface Transportation Efficiency Act* (ISTEA) *of 1991* require transit agencies to work towards incorporating walking and bicycling into the transit system and the *Transportation Efficiency Act for the 21st Century* (TEA-21) reinforces the ISTEA. In creating walkable communities, streets should become safer for children since more people will be using the sidewalks to walk or bicycle to work or to shop. The following sections of this report endeavors to create a safer environment for roads adjacent to Sweetwater Elementary School and recommends best practices for older and new developments.

Recommendations

Table 1 summarizes the recommendations documented within the Assessment Report and will be the primary focus of this report.

Table 1
Findings and Recommendations
Sweetwater Elementary School Implementation Report

Location	Observations	Recommendations
On-Campus		
East of School Campus on Victoria Gardens Boulevard	Pedestrians park in right-of-way & cross Victoria Gardens Boulevard without aid of crossing guard	Intersection should be monitored for safety concerns; crossing guard should be provided at this intersection
	Collection of vehicles in right-of-way on the east side of Victoria Gardens Boulevard	Crossing guard should be provided at this location
Entrance to Teachers' Parking Lot/Bus Loop on Victoria Gardens Boulevard	Illegal U-turns	NO U-TURN (R3-4) signs should be installed, facing northbound traffic on Victoria Gardens Boulevard
Existing Crossing Guard Location North of Appleview Way and Victoria Gardens Boulevard	Crossing guard uses hand signals to direct traffic	Crossing guards should use a STOP paddles while directing traffic
	School crosswalk marking has faded	Refurbish school crosswalk with thermoplastic paint **OR** consider the following proposed crossing location
	Existing location does not provide for northbound drop-off	Relocate crossing guard to south of Appleview Way at the intersection of Victoria Gardens Boulevard and Appleview Way
Off-Campus		
Clyde Morris Boulevard and Victoria Gardens Boulevard	Three restrictive signs are being disregarded	Implement law enforcement periodically to reduce violations
Taylor Road and Clyde Morris Boulevard	High congestion during arrival and dismissal times for Spruce Creek High School students	No walk route recommended that would avoid the entrances to high school students' parking lot
Southwest quadrant of Taylor Road and Boggs Ford Road	Damaged utility pull box cover	Damaged utility pull box cover should be replaced
	Sidewalk has no landing	Landing, along with detectable warnings, should be installed
	Southwest quadrant sidewalk ends at flume drainage feature	Curb ramp should be installed at the intersection of the two sidewalks; crosswalk markings should be installed to connect the ramps on either side of Boggs Ford Road; relocate STOP line
Southeast quadrant of Taylor Road and Boggs Ford Road	No detectable warnings at curb ramp	Detectable warnings should be installed at the curb ramp to meet ADA and FDOT standards
Pedestrian and Bicycling Bridge on Taylor Road	No protection at drop-off gap between headwall guiderail and bridge guiderail	Aluminum guardrail (FDOT Index No. 850) should be installed to connect the headwall guiderail to the bridge guiderail

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BEST PRACTICES

This section of the report will deal with the best practices to make walking and bicycling a safer mode of transportation for students. These practices are not only applicable to the walk zone but to any new or old development that supports walking and bicycling. The data gathered for this section of the report comes from the Federal Highway Administration (FHWA), Americans with Disabilities Act of 1990 (ADA), and other documents that are supported by the FDOT.

Sidewalk Design for New Roadways and Developments

Findings

Sidewalk design for new roadways and developments are usually based on anticipated pedestrian demand, the type of development, whether residential, industrial, or commercial, and the jurisdiction. Developers may not want to construct sidewalks because the adjoining properties may not have sidewalks. In some cases, development requirements did not address sidewalk construction or connectivity. These conditions have led to developments that do not include sidewalk connectivity.

Best Practices

When planning a development that resides within the walk zone of a school, safe, connected networks of sidewalks that can be easily navigated by students should be required. If it is not possible to have safe sidewalks then multi-use trails should be considered.

All sidewalks should provide for disabled pedestrians and accessibility and ought to be incorporated into the planning process for all new roadways and developments. The FHWA has established the following guidelines to assist local jurisdiction with determining when and where pedestrian facilities are needed.

- Develop sidewalks as integral parts of all city streets
- If land use plans anticipate pedestrian activity then sidewalks should be constructed as part of the street development
- Sidewalks should connect nearby urban communities
- Provide sidewalks in rural and suburban areas at schools, local businesses, and industrial plants that result in pedestrian concentrations
- Provide sidewalks whenever the roadside and land development conditions are such that pedestrians regularly move along a main or high-speed highway
- Incorporate sidewalks in rural areas with higher traffic speeds and the general absence of lighting
- Construct sidewalks along any street or highway without shoulders, even if there is light pedestrian traffic

The FHWA went on to say that to initiate the sidewalk installation guidelines above and to promote accessible sidewalk facilities, municipalities should consider the following recommendations:

- Agencies should accept bids from contractors who understand and construct accessible facilities
- Require employees and contractors to demonstrate their knowledge of accessibility topics. If, at any stage of the development process (i.e., planning, design, or installation) accessibility is not addressed, hold the responsible party accountable and make improvements.

- Engineering, transportation, and public policy decision makers should partner with transit providers on projects and programs, and require that transit systems include accessible pedestrian facilities
- Consult with representatives from disability agencies and organizations during all phases of project development
- Include people with disabilities in the first phases of programming, planning, designing, operating, and constructing pedestrian facilities
- Agencies should ensure that accessible guidelines are followed throughout planning, project development, and construction of pedestrian facilities

Other local agencies, such as the school board within which the development falls, and the city or county planner, should make sure that the sidewalks are within the minimum set requirements, have good connectivity between residential and commercial developments, increases the allowable densities near major intersections (wider sidewalks), are near major shopping areas and transit lines, and ensure pedestrian friendly sidewalk designs. However, specific design principles must be in place before these options can be exercised. Planning for pedestrian sidewalk usage should be one of the primary goals for developers and should be an integral part of planning for walkable communities.

Appendix A presents the FHWA's guidelines of best practices for the installation of new sidewalks. New developments should consider the following sidewalk safety features to plan for walkers and bicyclists:

- Sidewalks should be constructed on both sides of the road
- Wide pathways
- Acceptable lighting
- No obstacles within walkway
- Sidewalk connectivity
- Sidewalk network
- ADA compliant
- Pedestrian facilities (e.g., shaded benches)
- Changes in grade and slope should be moderate

Sidewalk Retrofit

Findings

Cities, counties, and states have codes and regulations that determine how wide a sidewalk must be and how much shoulder should exist between the sidewalk and pavement. The cities and counties must also follow regulations, set by the ADA, to aid disabled pedestrians. These codes have changed as a result of society working towards consuming less energy and promoting safety and healthier lifestyles. In some older neighborhoods, sidewalks are not up to standards since ADA guidelines were not developed and implemented until the 1990s. These older neighborhoods must then be retrofitted to be compliant with ADA standards.

Issues with retrofitting sidewalks may include right-of-way costs, conflicting drainage features or swales in the right-of-way, and steep grades. Some sidewalks may have all the aforementioned issues but insufficient right-of-way for retrofitting.

Best Practices

It is best to create developments with school routes, pedestrian transit routes, and amenities within close walking distances. However, retrofitting sidewalks should be considered in older, noncomplying developments. Additional right-of-way may be required to implement retrofit recommendations.

Projects aimed at retrofitting older sidewalks should research data pertaining to what type of right-of-way exists, a cost analysis of the right-of-way purchase, cost of construction, the condition of existing sidewalks, and the benefits associated with the project. The right-of-way acquisitions process is detailed in *The Real Estate Acquisition Handbook* and is produced by the FDOT.

Existing Substandard Sidewalk

Findings

Older neighborhoods and developments that did not plan for pedestrians may have existing substandard sidewalks. Substandard sidewalk issues include the following (Pedestrian and Bicycle Information Center):

- Sidewalks are buckled, lifted, or cracked due to tree roots or other causes
- Sidewalks are blocked due to the placement of utility poles, sign posts, potholes, fire hydrants, bus benches, newspaper racks, parked cars, or other obstructions
- Sidewalks are blocked by bushes or low tree branches
- Sidewalks lack curb ramps at street corners, crosswalks, and driveways
- The driveway side slopes are steep and hard to cross
- Sidewalk shoulders and adjacent drop-offs are excessive

Any of these existing conditions may make walking and bicycling hazardous. When sidewalks are obstructed or do not have curb ramps, it is unsafe for walkers and bicyclists to get off the sidewalk and on to the pavement to walk around the obstruction. Driveways with steep side slopes may cause walkers to trip or bicyclists to lose

Best Practices

It is important to determine what sidewalks are substandard and those sidewalks should be placed on a prioritized list to be repaired or brought up to current standards. Maintaining existing sidewalks is paramount to providing a safe walking and bicycling environment.

The restriction of heavy vehicles on the sidewalk, installing root barriers if trees are planted too close to a sidewalk, and removing obstacles will keep sidewalks safe for students who are walking or bicycling to school. Depending on the average width of tree root spread, there should be rules that determine what species, and how far, trees must be planted from the sidewalk to prevent cracks and buckling. Trees and bushes should be kept trimmed to avoid blocking the sidewalk and to maximize the mobility of pedestrians. For obstacles that cannot be moved, regulations should be developed that prevent future installations affecting the sidewalk.

Driveways that have steep slopes should be re-graded to conform to ADA approved practices. This will allow for an easy transition between the sidewalk and the driveway for all pedestrians and bicyclists.

Curb ramps should be installed at all crossings, wherever applicable, such as at an intersection or at a mid-block crossing. Sidewalks should end at a detectable warning strip or whenever the sidewalk changes, such as at a mid-block crossing, and should conform to standards approved by the ADA. Standards set by the ADA include the width, length, slope, and texture of curb ramps and the width and length of landings, if they are needed.

Sidewalk Maintenance

Findings

A sidewalk that clearly has maintenance issues may inhibit pedestrian and bicyclist usage. Existing sidewalks may be hazardous to pedestrians and bicyclists if the following issues exist (FHWA):

- Step separation - a vertical displacement of 13 mm (0.5 in) or greater that could cause pedestrians to trip or prevent the wheels of a wheelchair or stroller from rolling smoothly (Illustration 5 shows a displacement of less than 13mm)
- Badly cracked concrete - holes and rough spots ranging from hairline cracks to indentations wider than 13 mm (0.5 in)
- Spalled areas - fragments of concrete or other building material detached from larger structures
- Settled areas that trap water - sidewalk segments with depressions, reverse cross slopes, or other indentations that make the sidewalk path lower than the curb; these depressions trap silt and water on the sidewalk and reduce the slip resistant nature of the surface.
- Tree root damage - roots from trees growing in adjacent landscaping that cause the walkway surface to buckle and crack
- Vegetation overgrowth - ground cover, trees, or shrubs on properties or setbacks adjacent to the path that have not been pruned can encroach onto the path and create obstacles
- Obstacles - objects located on the sidewalk, in setbacks, or on properties adjacent to the sidewalk that obstruct the passage space or the visibility of sidewalk users; obstacles commonly include trash receptacles, utility poles, newspaper vending machines, and mailboxes
- Blocked or inadequately protected drainage inlets and inadequate flow planning
- Temporary construction interruptions
- Inadequate patching after utility installation

Illustration 5: School sidewalk at north entrance of school

Sidewalks are typically in the public right-of-ways and are the sole responsibility of the city or county, depending on who has jurisdiction over that roadway. In some cases, sidewalks are provided along privately maintained roads and common spaces and are the responsibility of a Homeowners Association (HOA) or other property management entity.

Best Practices

- A division of the city or county should be solely dedicated to sidewalk maintenance or, if in the case of privately maintained sidewalks, should be addressed through code enforcement procedures.
- Sidewalk maintenance issues should be addressed immediately and should be placed on a prioritized list of sidewalk projects to be completed.
- Maintenance issues should be solved by using strategies standard to road maintenance. This will minimize the risk of walkers and bicyclists on their way to and from school; and all maintenance issues should be handled consistently throughout the jurisdiction.

Improving Existing Roadway Conditions

Findings

Existing roadway conditions may not offer enough safety for walkers and bicyclists. Motorists may speed within school walk zones and not pay attention to their surroundings. Motorists pulling out of driveways may look for oncoming vehicles but may not look for walkers and bicyclists crossing the driveway.

Best Practices

Roadway conditions can be improved to maintain safety and accessibility for walkers and students who may want to ride their bicycles to school. The following are best practices that should improve existing roadway conditions for walkers and students who choose to ride their bicycles to school.

- Signage and pavement markings should be highly visible and current
- Traffic calming devices should be considered to reduce speeds
- Speed studies should be conducted to lower speed limits year-round
- ADA standards should be adhered to
- Consider one-way streets if traffic is too congested during the arrival and dismissal times
- Strict police enforcement should be imposed to deter illegal and unsafe parking practices as well as moving violations within the school zone

Pavement Markings

Findings

Pavement markings are essential to the transportation system to communicate and enhance the messages of roadway operational conditions by augmenting other traffic control devices. School pavement markings and crosswalk markings are especially important since they alert the motorist of walkers and bicyclists entering the pavement at crosswalks and intersections. Pavement markings can easily fade or become obliterated over time. It was observed that SCHOOL markings which warn motorists that they will soon enter into a school zone are often faded, cracked, or chipped (Illustration 6). At some intersections, the crosswalk did not align with the sidewalks and did not allow for the shortest-distance crossing.

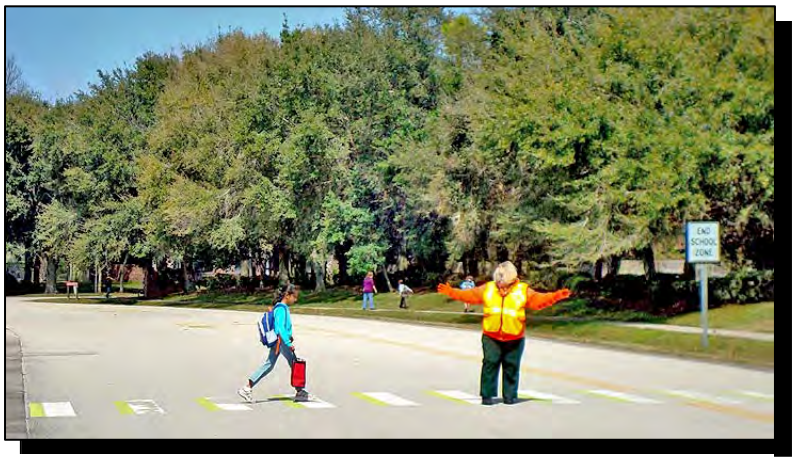

Illustration 6: Crosswalk markings are faded and worn at the crossing guard station north of Appleview Way

Best Practices

The following best practices are recommended to improve the safety, life, and effectiveness of pavement markings.

- SCHOOL pavement markings and crosswalk markings should be clear and visible in order to warn motorists that they are entering a school zone and/or children are crossing.
- The FDOT's current standard (Index No. 17346) uses a special emphasis crosswalk that lengthens the life of the crosswalk marking.
- Thermoplastic paint should be used for all pavement and school markings to enhance the visibility of walkers and bicyclists. Thermoplastic paint should be used since it is durable, retro-reflective, and slip resistant.
- The crosswalk should align with the sidewalk ramps.
- Crosswalks should be installed where walkers and bicyclists are in the pavement for the shortest distance and time possible.
- Pavement markings should be accompanied by the proper signage.
- Pedestrian median refuges should be installed for long crosswalks with interim medians.
- Walkers and bicyclists should be dissuaded from crossing at intersections or mid-block crossings where heavy traffic exists unless accompanied by crossing guards.

Traffic Signal Control

Findings

Traffic signalization has an important role in promoting safety for students who walk or bicycle to school. Drivers at busy intersections can easily overlook students trying to cross a street; consequently, signals allow students the necessary time to safely cross busy intersections.

School flashing beacons (Illustration 7) also play an important role in safety. Flashing beacons alert drivers that they are entering a school zone and indicates that the displayed speed limit is in effect. It was observed that school flashing beacons can be operated manually or can be pre-set to turn off/on during pre-programmed timeframes. Manually run school flashing beacons are usually operated by school crossing guards, who are primarily assigned to cross elementary school students. Unfortunately, this does not address the needs of middle school students.

Illustration 7: Flashing beacon traffic signal control north of Victoria Gardens Boulevard and Appleview Way

Best Practices

- Pedestrian signal heads should be considered at all intersections that utilize traffic control signals for motor vehicles within the school walk zones.
- Pedestrian signal buttons should be placed such that it is obvious to elementary and middle school students which buttons to press to access the desired sidewalk.
- Pedestrian signal heads should employ the countdown display which exhibits the symbols of the WALKING MAN beside the numerical countdown. This will help students to decide if they have enough time to cross or if they should wait for the next pedestrian signal phase.
- Students should be educated on the proper ways to cross an intersection when using a pedestrian signal head.
- For students who must cross more than two lanes of traffic, the assignment of crossing guards or overhead pedestrian bridges should be considered.
- U-turns and right-on-reds should be prohibited at intersections where students utilize pedestrian crossings.
- School attendance zones that have crossings at heavily congested intersections should have their walk zones re-evaluated so that students can either walk to another school or transportation could be provided.

Enforcement and Education

Findings

Walkers and bicyclists do not always follow proper crossing procedures. Students may dart through traffic to access the school in the mornings or access a vehicle parked across the road from the school in the afternoons. Students may also cross streets at mid-block without the aid of a crosswalk or an adult. When crosswalks do exist, students do not always follow proper crossing procedures.

Regulations are not always followed by adults dropping off/picking up students (Illustration 8). Motorists were observed to park in No Parking areas and make prohibited vehicular movements, including u-turns. Some motorists were observed to be speeding within the reduced-speed zone.

Illustration 8: Student accessing car on Victoria Gardens Boulevard instead of parent loop

Students who choose to ride their bicycles to school do not always wear helmets. Also, bicycle storage facilities may not always be in the best of conditions or secured during the school day. This may cause students to chain their bicycles to the school fence on the outer perimeter of the school.

Best Practices

- Students and parents should be educated on proper crossing procedures. Parents, crossing guards, and School Resource Officers (SRO) should be the main resources for safety.
- Parents should receive flyers or recorded messages on a school-wide basis to inform them of the proper drop-off/pick-up procedures. Strict enforcement of these procedures should eventually deter parents from practicing unsafe drop-off/pick-up actions.
- Prohibited vehicular movements should be strictly handled and higher fines could be considered, where allowable by law, during the arrival and dismissal times of school.
- Helmets should always be worn by bicycling students. Parents, school staff, crossing guards, and school resource officers should encourage helmet usage. Non-compliant helmet users should be dealt with consistently and strictly.
- Encourage walking and bicycling by providing free helmets, stickers, reflective gear, or create an incentive program.
- Schools should provide a safe and secure bicycle storage facility for students who choose to ride their bicycles to school.
- Parents should be informed about the different walking and bicycling programs available and the school and its volunteers should assist in planning and implementing those programs.
- Students who are regular walkers and bicyclists should be paired with other walkers and bicyclists who live in the same area.
- Crossing guards should be involved in the re-zoning of walk zones since they have a better understanding of the distribution of the walker and bicyclist population.

School Board Considerations

Findings

Most school districts employ the two-mile walk route to determine the walk zone. This is not always the best option to promote safety. Students may have to cross congested intersections, too many intersections, and/or busy driveways.

Sidewalks are not always located on both sides of the road. This may encourage unsafe crossings where no crosswalks exist. Walk zones can also include sidewalks that end at an unsignalized intersection with no safe alternative to gain access to the sidewalk on the opposite side of the roadway.

It was noted that schools prefer to have one controlled point of entry that is monitored by school staff. In these cases, students who walk or ride their bicycles to school may have to cross busy driveways including drop-off/pick-up loops, bus loops, and even parent and teacher parking lots, to enter/exit the controlled point of entry.

Best Practices

- The school board should create a walk zone based on the safest routes that avoids congested intersections and busy driveways.
- School arrival and dismissal times should be established to avoid the inter-mingling of elementary, middle, and high school traffic.
- The school board should consider reviewing all new development plans within the school walk zone to ensure that developers are providing sidewalks on either side of the road and maintaining sidewalk connectivity and networking to the school.
- Sidewalks should be constructed on both sides of the road.
- For sidewalks that end at an unsignalized intersection, crosswalks and proper signage should be in place to safely cross walkers and bicyclists.
- All new schools should be planned with good sidewalk connectivity/network to all neighborhoods and developments within its walk zone.
- Alternative sidewalk routes should be available to areas that do not support enough right-of-way to install sidewalks or hazardous courtesy transportation should be evaluated.
- Buses should be provided to students who do not have access to safe routes to school.
- The school district should implement programs that promote walking and bicycling to school (Walking School Bus, SAFE KIDS Walk This Way, International Walk to School Day, etc.).
- A No Backpack policy could be considered to encourage walking and bicycling to school and consideration to the following is recommended:
    - All textbooks should be accessible on-line
    - A set of textbooks should be available at the local library
    - Provide students with a set of textbooks to keep at home
- Each school should enforce bicycle safety, and helmet usage should be closely monitored for compliance.
- All teachers assisting during arrival/dismissal should wear safety vests when they are crossing students or interacting with vehicular traffic.

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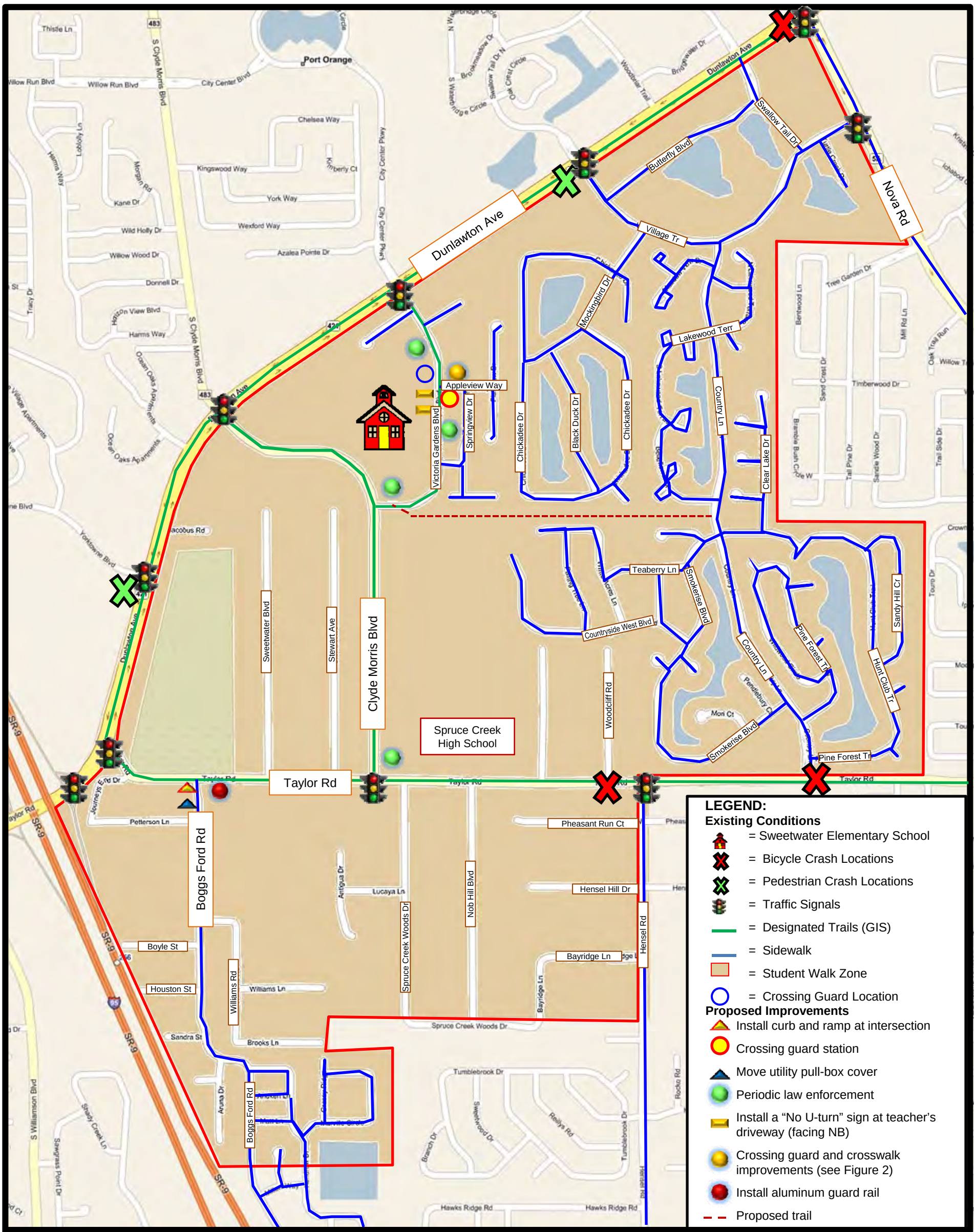
MASTER IMPROVEMENT PLAN

The recommended Master Improvement Plan is presented in Figure 1. It highlights the locations of existing conditions as well as proposed improvements. The following sections will provide more details on each of the recommendations shown in Figure 1.



Sweetwater Elementary School

Bicycle and Pedestrian Safety Study

Port Orange, Florida

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VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

Master Improvement Plan: Sweetwater Elementary School

Figure 1

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CONSTRUCTABILITY MATRIX

The matrix in Table 2 shows the estimated cost of projects that are recommended for improvement. Appendix B shows the unit by which each recommendation is measured and provides a more in-depth analysis of the cost. FDOT's *2010 Basis of Estimates* manual was used to develop the constructability matrix. The estimated engineering costs for the above recommendations are $9,954.92. The costs shown in the constructability matrix includes construction and labor fees. Grading costs are not included. As mentioned before, these improvements are based on field observations and should be verified by a contractor prior to construction.

Table 2
Constructability Matrix
Sweetwater Elementary School Implementation Report

Priority No.	Project Name	Description	Potential Constraints	Estimated Cost
1a	Victoria Gardens Boulevard and Appleview Way (proposed crossing guard location)	Proposed crosswalk striping (24" special emphasis) with thermoplastic paint	Right-of-way should be verified prior to construction; relocate crossing location to this intersection **OR** refurbish the existing crosswalk north of this location	$1,117.08
		Proposed crosswalk striping (12" special emphasis)		$258.00
		Proposed construction of sidewalks (5 feet wide) with pedestrian landings (5 feet wide) that connect to sidewalks on either side of Victoria Gardens Boulevard		$2,801.20
		Re-apply Stop line marking on Appleview Way (24")		$77.04
		Removal of existing crosswalk sign post		$36.26
		Removal of existing crosswalk sign panel		$109.74
		Removal of existing crosswalk markings		$326.40
		Removal of Stop line on Appleview Way		$32.64
		Installation of Stop line on Appleview Way		$77.04
		Installation of new signage (4 School Crossing Assemblies, S1-1 and W16-7P, 8 total) on either sides of the proposed crosswalks		$1,867.76
OR	**Subtotal**			**$6,703.16**
1b	Existing Crossing Guard Location	Removal of existing crosswalk marking	Choose 1a **OR** 1b	$326.40
		Restripe crosswalk marking (24" special emphasis) with thermoplastic paint		$513.60
		Restripe crosswalk marking (12" special emphasis)		$130.72
		STOP paddle for crossing guard		$40.00
	Subtotal			**$1,010.72**
2	Entrance to Teachers Parking Lot	Two signs prohibiting non-bus/staff vehicles from entering the north entrance driveway	None	**$466.94**
3	Clyde Morris Boulevard and Victoria Gardens Boulevard	Periodic monitoring by law enforcement	Police enforcement may not be available to monitor this intersection during the arrival and dismissal times	**N/A**
4	Pedestrian and Bicycling Bridge, West of Boggs Ford Road	Pedestrian and bicycle handrail that is used where drop-offs are between 10-30 inches.	Sidewalk should be used to anchor railing	**$609.20**
5	Southwest Quadrant of Taylor Road and Boggs Ford Road	Removal of sidewalk section that connects to the flume drainage feature	Right-of-way should be verified prior to construction; sidewalk ends at a flume drainage feature; cost does not include grading.	$56.45
		Installation of sidewalk section approaching the landing		$228.62
		Removal of existing Stop line		$32.64
		Install crosswalk striping (24" special emphasis) with thermoplastic paint		$385.20
		Install crosswalk striping (12" special emphasis)		$206.40
		Install Stop line marking on Boggs Ford Road (24")		$77.04
	Subtotal			**$929.90**
6	Southeast quadrant of Taylor Road and Boggs Ford Road	Installation of detectable warning on sidewalk ramp	None	**$235.00**
7	Taylor Road and Boggs Ford Road	Replace damaged pull box cover (city should contact utility owner)	N/A	**N/A**
Total				**$9,954.92**

Cost taken from the FDOT's Basis of Estimates
Area 6 (Volusia County) and 6 Month Moving Statewide Averages were used, where applicable
Abbreviations:

LF - Foot
SY - Square Yard
EA - Each
AS - Assembly
SF - Square Foot

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 Appleview 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 Appleview 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.

Illustration 9: Existing crossing guard location north of Appleview Way

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 Appleview 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.

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 Appleveiw 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

Crosswalk/Crossing Guard Proposed Improvements

Figure 2

Page 22

N

VOLUSIA TPO
TRANSPORTATION PLANNING ORGANIZATION
VISION - PLAN - IMPLEMENT

Lassiter Transportation Group, Inc.
Engineering and Planning

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.

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

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.

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.

Project No. 2: Two Signs Prohibiting Non-Bus/Staff from Entering the North Entrance Driveway

Submitting Agency: City of Port Orange or Volusia County
Project Location: Entrance to Teacher's Parking Lot/Bus Loop
School Served: Sweetwater Elementary School
Project Description: Installation of Regulatory Signs on Victoria Gardens Boulevard
LAP Coordinator: Volusia County
Maintaining Agency: Volusia County School District

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: Motorists are pulling into the teacher's parking lot/bus loop driveway and dropping off/picking up students at the entrance to this driveway. This driveway is restricted to bus and staff use. Blockage of the entrance to this driveway by vehicles dropping off or picking up students is unsafe.

Project Description: This project will include the installation of two regulatory signs at in the northwest quadrant of Victoria Gardens Boulevard and the north entrance to Sweetwater Elementary School. Signs will be placed such that they are facing the eastern and northern directions. Please see Figure 2 for more information.

Existing Conditions: This driveway is restricted to bus and staff traffic.

Estimated Cost: The estimated cost for this project is $466.94.

Project No. 3: Periodic Law Enforcement on Clyde Morris Boulevard and Victoria Gardens Boulevard

Submitting Agency: City of Port Orange or Volusia County
Project Location: Victoria Gardens Boulevard Clyde Morris Boulevard
School Served: Sweetwater Elementary School
Project Description: Periodic Law Enforcement on Victoria Gardens Boulevard and the Intersection of Clyde Morris Boulevard and Victoria Gardens Boulevard
LAP Coordinator: Volusia County
Maintaining Agency: Port Orange Police Department, City of Port Orange, and Volusia County School District

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: It was observed that drivers disregard the reduced speed zone on Victoria Gardens Boulevard. Also, three restrictive left-turn signs are being disregarded at the intersection of Clyde Morris Boulevard and Victoria Gardens Boulevard (Illustration 11).

Illustration 11: Three restrictive left turn signs at Clyde Morris Boulevard and Victoria Gardens Boulevard

Project Description: This project includes periodic law enforcement on Victoria Gardens Boulevard and the intersection of Clyde Morris Boulevard and Victoria Gardens Boulevard. Higher fines should be effective during school arrival and dismissal times.

Existing Conditions: Motorists driving over the restrictive speed limit and motorists disregarding the regulatory signs have caused Victoria Gardens Boulevard and the intersection of Clyde Morris Boulevard and Victoria Gardens Boulevard to require periodic law enforcement.

Estimated Cost: No costs are associated with periodic law enforcement during the arrival/dismissal times of school.

Project No. 4: Pedestrian Bicycling Bridge on Taylor Road

Submitting Agency: City of Port Orange or Volusia County
Project Location: Pedestrian and Bicycling Bridge, Approximately 275 Feet East of Boggs Ford Road and Taylor Road
School Served: Sweetwater Elementary School
Project Description: Installation of Aluminum Guiderail
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: A gap in the drop-off protection between the retaining wall guiderail and the bridge guiderail on the west side of the pedestrian and bicycling bridge does not provide a barrier between the creek and the sidewalk on Taylor Road, east of Boggs Ford Road. See Illustration 12.

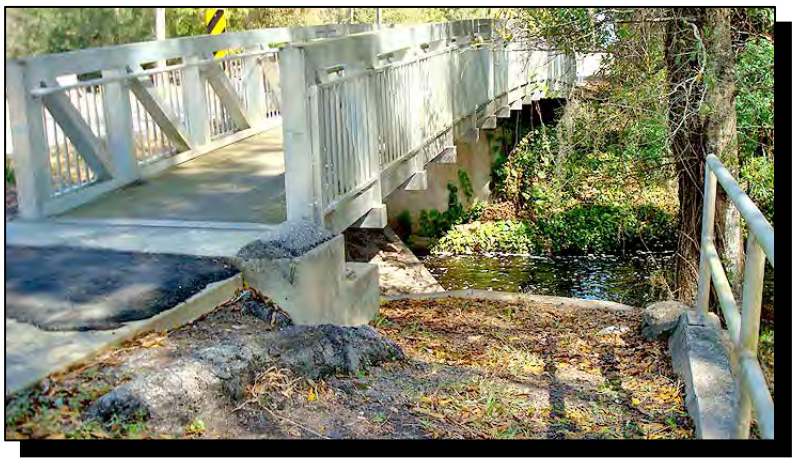

Illustration 12: Eastbound approach to bridge on Taylor Road, east of Boggs Ford Road

Project Description: This project will include the installation of 20-feet of guiderail (the same criteria used for the length of the existing guiderail located on the east side of the bridge. It should connect to the existing pedestrian bridge guiderail and anchored to the existing concrete sidewalk. The guiderail should be installed in accordance with Standard Index No. 870.

Existing Conditions: Only the east side of the bride has a pedestrian guiderail to aid walkers and bicyclists from potential unsafe walking conditions.

Estimated Cost: The estimated cost for this project is $609.20.

Project No. 5: Sidewalk Safety on Taylor Road and Boggs Ford Road

Submitting Agency: City of Port Orange or Volusia County
Project Location: Southwest Quadrant of Taylor Road and Boggs Ford Road
School Served: Sweetwater Elementary School
Project Description: Unsafe Sidewalk and Crossing
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.

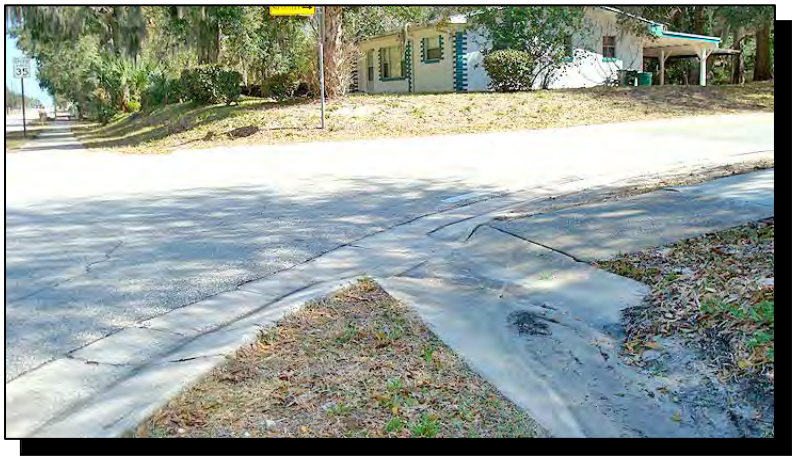

Illustration 13: Sidewalk ends at flume drainage feature at Taylor Road and Boggs Ford Road

Safety Issue: The sidewalk ends at a flume drainage feature (Illustration 13). This does not allow disabled pedestrians or students who choose to walk or bicycle to school to safely transition from the sidewalk to the pavement.

Project Description: This project will include the removal of multiple concrete sidewalk sections connecting the sidewalk to the flume feature, installation of a concrete pedestrian approach and landing that is ADA compliant and connects the sidewalk to the curb, and crosswalk markings. The sidewalk approach and landing should be constructed in accordance with Standard Index Nos. 304 and 310. Special emphasis crosswalk should be installed per Index No. 17346. Right-of-way information for this project is located in Appendix D.

Existing Conditions: The sidewalk which ends at a flume drainage feature does not allow for safe accessibility to the crosswalk. This intersection does not meet ADA standards.

Estimated Cost: The estimated cost for this project is $929.90. It is noted that the cost does not include grading.

Project No. 6: Detectable Warning Strips on Taylor Road

Submitting Agency: City of Port Orange or Volusia County
Project Location: Southeast Quadrant of Taylor Road and Boggs Ford Road
School Served: Sweetwater Elementary School
Project Description: Installation of Detectable Warning Strips
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: No detectable warnings exist at the end of the sidewalk in the southeast quadrant of Taylor Road and Boggs Ford Road (Illustration 14). Disabled pedestrians may not know that the sidewalk has ended and they are about to access the pavement.

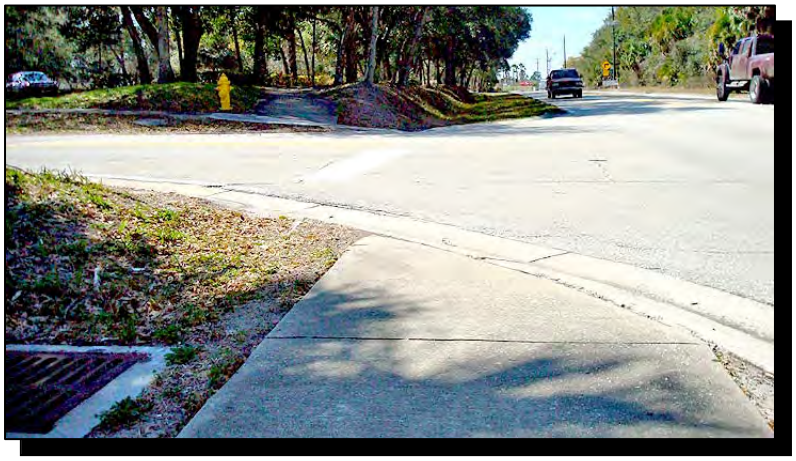

Illustration 14: No detectable warning strip in the southeast quadrant of Taylor Road and Boggs Ford Road

Project Description: This project will include the installation of a detectable warning strip.

Existing Conditions: The sidewalk does not have detectable warnings. To be ADA compliant, detectable warning strips must be attached to sidewalk to show a change in conditions (i.e., end of sidewalk) that may affect safety.

Estimated Cost: The estimated cost for this project is $235.00.

Project No. 7: New Pull Box Cover on Boggs Ford Road

Submitting Agency: City of Port Orange or Volusia County
Project Location: Taylor Road and Boggs Ford Road
School Served: Sweetwater Elementary School
Project Description: Pull Box Cover
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.

Illustration 15: Damaged pull box cover in the southwest quadrant at Taylor Road and Boggs Ford Road

Safety Issue: A damaged pull box cover is close to the edge of the sidewalk at the project location (Illustration 15).

Project Description: The city should contact the utility owner to replace the cover of the pull box.

Existing Conditions: The pull box is cracked and broken.

Estimated Cost: No cost is associated with this project since the utility owner is ultimately responsible for the maintenance of the pull box.

WORKS CITED

"2010 Basis of Estimates Manual." < http://www.dot.state.fl.us/Specificationsoffice/Estimates/Basisof Estimates/BOEManual/BOEOnline.shtm>.

"An Investigation into Application and Bonding Strengths of Thermoplastic Pavement Markers in Concrete and Asphaltic Roadway Surfaces." < http://www.dot.state.fl.us/research-center/Completed_Proj/Summary_SMO/FDOT_BC052_rpt.pdf>.

"Curb Ramps." ADA Accessibility Guidelines for Buildings and Facilities (ADAAG). < http://www. access-board.gov/adaag/html/adaag.htm>.

"KidsWalk-to-School." U.S. Department of Health and Human ServicesCenters for Disease Control and Prevention. < http://www.cdc.gov/nccdphp/dnpa/kidswalk/pdf/kidswalk.pdf>.

"Manual on Uniform Traffic Control Devices." < http://mutcd.fhwa.dot.gov/htm/2009/part7/part7_toc.htm>.

"Pedestrian and Bicycle Information Center." < http://www.walkinginfo.org/problems/problems-sidewalks.cfm>.

"Right-of-Way Procedures Manual." < http://www.dot.state.fl.us/rightofway/ProceduresManual.shtm>.

"Safe Routes to School Guideline." < http://www.saferoutesinfo.org/guide/pdf/SRTS-Guide_full.pdf>.

Section 108 Loan Guarantee Program (Community Development Block Grant). < http://www.hud.gov /offices/cpd/communitydevelopment/programs/108/>.

"The Real Estate Acquistion Handbook. Florida Department of Transportation. <http://www.dot. state.fl.us/rightofway/documents/AcquisitionHandbookEnglish.pdf>.

"Safe Routes to School Guideline." < http://www.saferoutesinfo.org/guide/pdf/SRTS-Guide_full.pdf>.

"Volusia County Property Appraiser." < http://webserver.vcgov.org/index.html>.

APPENDICES

APPENDIX A: FHWA GUIDELINES FOR NEW SIDEWALK INSTALLATION

Table 4 - 2. Guidelines for New Sidewalk Installation

Roadway Classification and Land Use	Sidewalk Requirements	Future Phasing
Highway (rural)	Min. of 1.525 m (60 m) shoulders required.	Secure/preserve ROW for future sidewalks.
Highway (rural/suburban — less than 1 d.u./acre)	One side preferred. Min. of 1.525 m (60 m) shoulders required.	Secure/preserve ROW for future sidewalks.
Suburban Highway (1 to 4 d.u./acre)	Both sides preferred. One side required.	Second side required if density becomes greater than 4 d.u./acre.
Major Arterial (residential)	Both sides required.	
Collector and Minor Arterial (residential)	Both sides required.	1.525 m (60 in)
Local Street (Residential — less than 1 d.u./acre)	One side preferred. Min. of 1.525 m (60 m) shoulders required.	Secure/preserve ROW for future sidewalks.
Local Street (Residential — 1 to 4 d.u./acre)	Both sides preferred. One side required.	Second side required if density becomes greater than 4 d.u./acre.
Local Street (Residential — more than 4 d.u./acre)	Both sides required.	
All Streets (commercial areas)	Both sides required.	
All Streets (industrial areas)	Both sides preferred. One side required.	

Final Draft: *Priorities and Guidelines for Providing Places for Pedestrians to Walk Along Streets and Highways.* FHWA (1999).

APPENDIX B: DETAILED CONSTRUCTABILITY MATRIX

Table 2
Constructability Matrix
Sweetwater Elementary School Implementation Report

Priority No.	Project Name	Description	Potential Constraints	Plan Quantity	Unit Measure	Unit Price	Estimated Cost
1a	Victoria Gardens Boulevard and Appleview Way (proposed crossing guard location)	Proposed crosswalk striping (24" special emphasis) with thermoplastic paint	Right-of-way should be verified prior to construction; relocate crossing location to this intersection **OR** refurbish the existing crosswalk north of this location	174.00	LF	$6.42	$1,117.08
		Proposed crosswalk striping (12" special emphasis)		150.00	LF	$1.72	$258.00
		Proposed construction of sidewalks (5 feet wide) with pedestrian landings (5 feet wide) that connect to sidewalks on either side of Victoria Gardens Boulevard		40.00	SY	$70.03	$2,801.20
		Re-apply Stop line marking on Appleview Way (24")		12.00	LF	$6.42	$77.04
		Removal of existing crosswalk sign post		2	EA	$18.13	$36.26
		Removal of existing crosswalk sign panel		2	EA	$54.87	$109.74
		Removal of existing crosswalk markings		240.00	SF	$1.36	$326.40
		Removal of Stop line on Appleview Way		24.00	SF	$1.36	$32.64
		Installation of Stop line on Appleview Way		12.00	LF	$6.42	$77.04
		Installation of new signage (4 School Crossing Assemblies, S1-1 and W16-7P, 8 total) on either sides of the proposed crosswalks		8.00	EA	$233.47	$1,867.76
OR	**Subtotal**						**$6,703.16**
1b	Existing Crossing Guard Location	Removal of existing crosswalk marking	Choose 1a **OR** 1b	240.00	SF	$1.36	$326.40
		Restripe crosswalk marking (24" special emphasis) with thermoplastic paint		80.00	LF	$6.42	$513.60
		Restripe crosswalk marking (12" special emphasis)		76.00	LF	$1.72	$130.72
		STOP paddle for crossing guard		1.00	EA	$40.00	$40.00
	Subtotal						**$1,010.72**
2	Entrance to Teachers Parking Lot	Two signs prohibiting non-bus/staff vehicles from entering the north entrance driveway	None	2.00	AS	$233.47	**$466.94**
3	Clyde Morris Boulevard and Victoria Gardens Boulevard	Periodic monitoring by law enforcement	Police enforcement may not be available to monitor this intersection during the arrival and dismissal times	N/A	N/A	N/A	**N/A**
4	Pedestrian and Bicycling Bridge, West of Boggs Ford Road	Pedestrian and bicycle handrail that is used where drop-offs are between 10-30 inches.	Sidewalk should be used to anchor railing	20.00	LF	$30.46	**$609.20**
5	Southwest Quadrant of Taylor Road and Boggs Ford Road	Removal of sidewalk section that connects to the flume drainage feature	Right-of-way should be verified prior to construction; sidewalk ends at a flume drainage feature; cost does not include grading.	3.34	SY	$16.90	$56.45
		Installation of sidewalk section approaching the landing		3.34	SY	$68.45	$228.62
		Removal of existing Stop line		24.00	SF	$1.36	$32.64
		Install crosswalk striping (24" special emphasis) with thermoplastic paint		60.00	LF	$6.42	$385.20
		Install crosswalk striping (12" special emphasis)		120.00	LF	$1.72	$206.40
		Install Stop line marking on Boggs Ford Road (24")		12.00	LF	$6.42	$77.04
	Subtotal						**$929.90**
6	Southeast quadrant of Taylor Road and Boggs Ford Road	Installation of detectable warning on sidewalk ramp	None	1.00	EA	$235.00	**$235.00**
7	Taylor Road and Boggs Ford Road	Replace damaged pull box cover (city should contact utility owner)	N/A	N/A	N/A	N/A	**N/A**
Total							**$9,954.92**

Cost taken from the FDOT's Basis of Estimates
Area 6 (Volusia County) and 6 Month Moving Statewide Averages were used, where applicable
Abbreviations:

LF - Foot
SY - Square Yard
EA - Each
AS - Assembly
SF - Square Foot

APPENDIX C: RIGHT-OF-WAY AT VICTORIA GARDENS BOULEVARD AND APPLEVIEW WAY

Volusia County Appraiser's Office

The Volusia County Property Appraiser makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The values shown in the Total Values section at the end of the Property Record Card are "Working Tax Roll" values, as our valuations proceed during the year. These Working Values are subject to change until the Notice of Proposed Taxes (TRIM) are mailed in mid-August. For Official Tax Roll Values, see the History of Values section within the property record card below.

Last Updated: 06-01-2010 Today's Date: 6-21-2010	**Volusia County Property Appraiser's Office** Property Record Card (PRC) Morgan B. Gilreath Jr., M.A., A.S.A., C.F.A. Property Appraiser		Volusia County FLORIDA
Full Parcel ID Short Parcel ID	17-16-33-23-00-0002 6317-23-00-0002	Mill Group	402 Port Orange
Alternate Key	5490254	Millage Rate	22.28310
Parcel Status	Active Parcel	PC Code	07
Date Created	09 NOV 1994		
Owner Name	VICTORIA GARDENS HOMEOWNERS		GO TO ADD'L OWNERS
Owner Name/Address 1	ASSOCIATION INC		ESTIMATE TAXES
Owner Address 2	1475 E TAYLOR ROAD BLDG A		
Owner Address 3	DELAND FL		
Owner Zip Code	32724		
Location Address	PLAINVIEW DR PORT ORANGE		

LEGAL DESCRIPTION

COMMON AREA PARCELS A C D & E UNATIN SUB PHASE III MB 44 PG

165

SALES HISTORY

#	BOOK	PAGE	DATE	INSTRUMENT	QUALIFICATION	IMPROVED?	SALE PRICE
NONE							

HISTORY OF VALUES

GO TO ADD'L HISTORY

YEAR	LAND	BLDG (S)	MISC	JUST	ASD	SCH ASD	NS ASD	EXEMPT	TXBL	SCH TXBL	ADD'L EX	NS TXBL
2009	6	0	0	1	1	1	1	0	1	1	0	1
2008	6	0	0	1	1	1	1	0	1	1	0	1

LAND DATA

TYPE OF LAND USE	FRONTAGE	DEPTH	# OF UNITS	UNIT TYPE	RATE	DPH	LOC	SHP	PHY	JUST VAL
COMMON AREA	No Data	No Data	5.55	ACREAGE	1.08	100	100	100	100	6

NEIGHBORHOOD CODE	5746	UNATIN PHS III & IV

TOTAL LAND CLASSIFIED	0
TOTAL LAND JUST	6

BUILDING CHARACTERISTICS

MISCELLANEOUS IMPROVEMENTS

TYPE	NUMBER UNITS	UNIT TYPE	LIFE	YEAR IN	GRADE	LENGTH	WIDTH	DEPR. VALUE

PLANNING AND BUILDING

PERMIT NUMBER	PERMIT AMOUNT	DATE ISSUED	DATE COMPLETED	DESCRIPTION	OCCUPANCY NBR	OCCUPANCY BLDG
NONE						

TOTAL VALUES

The values shown in the Total Values section at the end of the Property Record Card are "Working Tax Roll" values, as our valuations proceed during the year. These Working Values are subject to change until the Notice of Proposed Taxes (TRIM) are mailed in mid-August. For Official Tax Roll Values, see the History of Values section above.

The Volusia County Property Appraiser makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation.

Land Value	6		New Construction Value	0
Building Value	0		City Econ Dev/Historic Taxable	0
Miscellaneous	0			
Total Just Value	1		Previous Total Just Value	1
School Assessed Value	1		Previous School Assessed	1
Non-School Assessed Value	1		Previous Non-School Assessed	1
Exemption Value	0		Previous Exemption Value	0
Additional Exemption Value	0		Previous Add'l Exempt Value	0
School Taxable Value	1		Previous Taxable	0
Non-School Taxable Value	1		Previous Non-School Taxable	1

MapIT | PALMS | Map Kiosk | SdufhdHQrwhv

MapIT: Your basic parcel record search including sales.

APPENDIX D: RIGHT-OF-WAY AT TAYLOR ROAD AND BOGGS FORD ROAD

The Volusia County Property Appraiser makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The values shown in the Total Values section at the end of the Property Record Card are "Working Tax Roll" values, as our valuations proceed during the year. These Working Values are subject to change until the Notice of Proposed Taxes (TRIM) are mailed in mid-August. For Official Tax Roll Values, see the History of Values section within the property record card below.

Last Updated: 06-01-2010 Today's Date: 6-19-2010	**Volusia County Property Appraiser's Office** Property Record Card (PRC) Morgan B. Gilreath Jr., M.A., A.S.A., C.F.A. Property Appraiser		Volusia County FLORIDA
Full Parcel ID Short Parcel ID	17-16-33-03-00-0010 6317-03-00-0010	Mill Group	402 Port Orange
Alternate Key	3647114	Millage Rate	22.28310
Parcel Status	Active Parcel	PC Code	10
Date Created	31 DEC 1981		
Owner Name	PORT ORANGE CHRISTIAN CHURCH		GO TO ADD'L OWNERS
Owner Name/Address 1			ESTIMATE TAXES
Owner Address 2	904 TAYLOR RD		
Owner Address 3	PORT ORANGE FL		
Owner Zip Code	32127		
Location Address	TAYLOR RD PORT ORANGE		

LEGAL DESCRIPTION	GO TO ADD'L LEGAL
W 315.78 FT OF E 650 FT OF LOT 1 A PLAT 2 CRAIG FARMS EXC	
PART IN RD PER OR 2417 PG 0497 & COPY OF D/C PER OR 4765 PGS	

SALES HISTORY — GO TO ADD'L SALES

#	BOOK	PAGE	DATE	INSTRUMENT	QUALIFICATION	IMPROVED?	SALE PRICE
1	4765	4955	9/2001	Warranty Deed	Multi parcel sale	No	100
2	4317	2144	6/1998	Warranty Deed	Multi parcel sale	No	100,000
3	2971	0332	4/1987	Warranty Deed	Multi parcel sale	No	21,000

HISTORY OF VALUES — GO TO ADD'L HISTORY

YEAR	LAND	BLDG (S)	MISC	JUST	ASD	SCH ASD	NS ASD	EXEMPT	TXBL	SCH TXBL	ADD'L EX	NS TXBL

2009	37,467	0	0	37,467	37,467	37,467	37,467	37,467	0	0	0	0
2008	40,873	0	0	40,873	40,873	40,873	40,873	40,873	0	0	0	0

LAND DATA

TYPE OF LAND USE	FRONTAGE	DEPTH	# OF UNITS	UNIT TYPE	RATE	DPH	LOC	SHP	PHY	JUST VAL
VACANT COMMERCIAL	No Data	No Data	10644.00	SQUARE FEET	8.50	100	40	80	100	28,952

NEIGHBORHOOD CODE	C5540	DUNLAWTON BLVD-NOVA RD TO I-9

TOTAL LAND CLASSIFIED	0
TOTAL LAND JUST	28,952

BUILDING CHARACTERISTICS

MISCELLANEOUS IMPROVEMENTS

TYPE	NUMBER UNITS	UNIT TYPE	LIFE	YEAR IN	GRADE	LENGTH	WIDTH	DEPR. VALUE

PLANNING AND BUILDING

PERMIT NUMBER	PERMIT AMOUNT	DATE ISSUED	DATE COMPLETED	DESCRIPTION	OCCUPANCY NBR	OCCUPANCY BLDG
NONE						

TOTAL VALUES

The values shown in the Total Values section at the end of the Property Record Card are "Working Tax Roll" values, as our valuations proceed during the year. These Working Values are subject to change until the Notice of Proposed Taxes (TRIM) are mailed in mid-August. For Official Tax Roll Values, see the History of Values section above.

The Volusia County Property Appraiser makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation.

Land Value	28,952		New Construction Value	0
Building Value	0		City Econ Dev/Historic Taxable	0
Miscellaneous	0			
Total Just Value	28,952		Previous Total Just Value	37,467
School Assessed Value	28,952		Previous School Assessed	37,467
Non-School Assessed Value	28,952		Previous Non-School Assessed	37,467
Exemption Value	28,952		Previous Exemption Value	37,467
Additional Exemption Value	0		Previous Add'l Exempt Value	0
School Taxable Value	0		Previous Taxable	0

APPENDIX E: FUNDING SOURCES

GRANT NAME	DEADLINE	FUNDING RANGE	MATCH REQUIRED	PROJECT TYPE	CONTACT
Community Development Block Grant	Annually by August	Based on community needs	None	Funding for property acquisition, improvements to neighborhood parks and facilities, new and resurfaced streets, sidewalk installation.	Donna King dking@co.volusia.fl.us Donna King @ 386-943-7039 EXT 2970
Urban & Community Forestry Grant	Early March	$250,000 - $300,000 Annually	50%	Tree ordinance development or revision, tree inventories, management plans, master plans, in-house training, staffing, student interns, and equipment purchases.	Charlie Marus marcusc@doacs.state.fl.us 850-921-0300
Florida Greenways & Trails Acquisition Program (Florida Rails to Trails	None - However, not accepting projects due to projects on hold	$225,000	None	Acquisition of land for greenways and trails	Cindy Radford 850-245-2052 cynthia.radford@dep.state.fl.us
Florida Communities Trust Program	May	3.15 Million Annually - not accepting applications this year	None	Acquisition of land for community-based parks, open spaces, and greenways	Ken Reecy 850-922-2207 ken.reecy@dca.state.fl.us
Volusia County Sidewalk Funding		$250,000 Annually	None	Sidewalk Construction	Gerald Brinton or Jon Cheney gbrinton@co.volusia.fl.us 386-736-5967
Recreational Trials Program	March 31	$200,000	50:50 80:20 60:40	Projects that construct, renovate or maintain recreational trials, trailheads, and trailside facilities and the purchase of trial construction	Jai Subramanya jai.subramanya@dep.state.fl.us 850-245-2052
Safe Routes to School (SAFETEA-LU)	Early March	1.4 Million Annually for 9 counties	None - Requires partnering with local agency who owns road	Eligible applicants are Community Traffic Safety Teams, Schools Boards (for public schools), and private schools. **Partnership with government agency who owns road is required.** Non-infrastructure projects such as Education, Encouragement, Enforcement, and Evaluation. Infrastructure projects such as bicycle or pedestrian facilities, traffic calming, and traffic control devices. Policy development, planning, and implementation of strategies such as improvement to streets and sidewalks, education and encouragement of children and parents and increased enforcement of traffic laws.	Infrastructure: Tony Nosse antony.nosse@dot.state.fl.us 386-943-5334 Non-infrastructure: Joan Carter Pedestrian/Bicycle Coordinator joan.carter@dot.state.fl.us 386-943-5335
XU Funding	Early May (May 3)	Varies	-9.035% local match for feasibility study -25% of total project construction cost -Percentages valid for next 2 years	Bicycle and Pedestrian facilities, safety and educational activities for pedestrians and bicyclists	Robert Keeth, Senior Planner, Volusia County MPO rkeeth@volusiacountympo.com 386-226-3422 EXT 30
Transportation Enhancement Funding - State	Contact Local MPO for Application Dates	Varies	Varies	Bicycle and Pedestrian facilities	Fred Noble or Mariano Berrios fred.noble@dot.state.fl.us 850-414-5269

GRANT NAME	DEADLINE	FUNDING RANGE	MATCH REQUIRED	PROJECT TYPE	CONTACT
Transportation Enhancement Funding - Local	Early May (May 3)	Varies	None	Includes bicycle and pedestrian infrastructure and safety programs, scenic and historic highway programs, landscaping and scenic beautification, historic preservation, and environmental mitigation	Robert Keeth, Senior Planner, Volusia County MPO rkeeth@volusiacountympo.com 386-226-3422 EXT 30
Volusia ECHO Grants-In-Aid Program	Determined annually - must contact	$12,500 - $600,000	1:1 =>MPO cannot apply (only city and/or county)	Environmental/ecological, cultural, historical, or outdoor recreation purposes that **MUST** be open for public use.	volusiaforever-echo.com 866-345-0345
ESRI Conservation Program	January	Donations of software and equipment	None	Grant packages of computers, printers, software, and training	Charles Convis 909-793-2853 EXT 2488 grant@esri.com
American Greenways Kodak Awards Program	Mid-June	$500-$2,500	None	All greenway needs including planning, design, tools for construction, signage, etc.	Emily Hankin 703-525-6300 ehankin@conservationfund.org
National Trails Endowment - American Hiking Society	Mid-December	$500-$5,000	None	All types of trails. All applicants must be Alliance members ($50 annual fee). See website for more information.	Heather Sable 301-565-6704 EXT 208 hsable@AmericanHiking.org
The Trust for Public Land Conservation Services Program	N/A	Interim Funding Source	N/A	Uses public funds for acquisition of public land to build trails, sidewalks, etc. Ensures completion of the transaction. **All expenditures by TPL must be reimbursed. This is not a grant.**	Kevin Mooney 850-222-7911 EXT 21 kevin.mooney@tpl.org

APPENDIX F: SAFETY PROGRAMS

Safety Programs

Based on the findings of the SRTS program many parents living within the walk zone do not allow their students to walk or bicycle to school due to safety issues and traffic related danger. The National Highway Traffic Safety Administration (NHTSA) says that one-fourth of the students between the ages of five to nine who were killed in traffic accidents in 1998 were pedestrians. They went on to say that this age group has not developed the skills and experience to navigate traffic safely nor judge speed and distance.

Many safety programs have been implemented to promote safety for students who walk to school. These programs include community involvement that primarily comes from parents, school officials, and city officials. The following are a few of the major programs that foster safety awareness in students and parents.

- International Walk to School Day – An event that occurs around the world in October where students, parents, teachers, and community leaders walk to school together to promote being active and making the streets more friendly for walking and bicycling.

- Walk to School Programs – An event that encourages safe walking and bicycling to school at the neighborhood, school, county, or state level. It relies on neighborhoods, schools, transportation, public works, health, safety, and environmental partners to accomplish specific goals.

- SAFE KIDS Walk This Way – A year-round pedestrian safety program conducted by the National SAFE KIDS Campaign that participates in the International Walk to School Day. They work with parents, educators, and community leaders to teach pedestrian safety to students, enforce speed limits and other traffic regulations, and improve school environments through research, engineering, and traffic calming.

- KidsWalk-to-School – A small groups of students who are accompanied to and from school by one or more adults.

- Walking School Bus – A group of students who walk to school with one or more adults. The group picks up students, like a school bus, at a set place and time along the route to school and then proceeds to school as a group.

- SRTS – A program established by the Department of Transportation that normalizes walking and bicycling to school. Its main goal is to create an environment where walking and bicycling to school is safer and more accessible for students. This program requires the involvement of the school, community, and local government leaders.

These programs have the same goal: to provide safety for students and to be proactive in promoting a healthier lifestyle for students while walking to school. One or more of these programs should be incorporated as part of each school's yearly schedule. It would enable students to become more aware of their surroundings, learn proper safety procedures, and encourage community cohesiveness since the programs promote parents' and community leaders' involvement.

SRTS

The SRTS was adopted in August 2005 by the federal transportation act, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). It provided $612 million in Federal-aid highway funds to the State DOTs for five Federal Fiscal years to make walking and biking a more chosen option for students in grades K-8. The FDOT had received $29.1 million for use on SRTS projects through the Federal Fiscal year 2009.

The SRTS uses education, engineering, and enforcement strategies to make long term changes to the walking and biking conditions within the walk zone. Educating the parents and community members to yield to pedestrians will make a safer environment for students. Engineering safe and practical areas for pedestrians and bicyclists to walk and ride will encourage parents to allow their child to walk or bicycle to school. Enforcing laws that will change unsafe driving behaviors will also make the walk zone more accessible to students. The use of the SRTS strategy has allowed many schools to increase the number of walkers and bicyclists.