

Bicycle and Pedestrian School Safety Review Study

Assessment & Implementation Report David C. Hinson, Sr Middle School *Daytona Beach, FL*



August 9, 2011

Acknowledgements

Lassiter Transportation Group, Inc. would like to thank the following people for their help and contribution in developing this Bicycle and Pedestrian School Safety Review Study for David C. Hinson Sr. Middle School. The information and advice they have given, as well as the connections they shared was invaluable.

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EXECUTIVE SUMMARY

Lassiter Transportation Group, Inc. (LTG) was contracted by the Volusia County Transportation Planning Organization (TPO) to prepare an Assessment Report for the Bicycle and Pedestrian School Safety Review Study for 17 Volusia County schools. The Assessment Report for the Bicycle and Pedestrian School Safety Review Study will aid the Volusia County TPO in making recommendations for projects that will improve conditions within the walk zones for these schools, and potentially make walking and biking to school a more attractive mode of transportation for students. The subject of this Assessment Report is David C. Hinson Sr. Middle School (Hinson Middle School). Evaluation of the walk zone for Hinson Middle School has resulted in recommendations for sidewalk improvements as follows:

Purpose

The purpose of this study is to improve the environment for students to walk or bicycle to school. The goal for the assessment phase of the Bicycle and Pedestrian School Safety Review Study is to provide the Volusia County TPO with a comprehensive study that will delineate each of the listed school's concerns, document the observed pedestrian and bicycle circulation routes adjacent to the school sites, and then make recommendations for improvements. The assessment examines the walk zone surrounding the school to evaluate safety issues that may affect students walking or bicycling to school.

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). This has caused the percentage of overweight students from ages six to eleven years to double over the past 30 years. 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
- Improved childhood health
- Improved sense of self-image and autonomy
- Reduced childhood obesity
- Conducive 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

The Safe Routes to School (SRTS) program and the CDC went on to say that not only does a safe walking and bicycling environment benefit students, but it also benefits the community in the following ways:

- Decline in the congestion on the roads
- Decreased opportunities for traffic accidents
- Improved air quality
- Improved community security
- Reduced fuel consumption
- Enhanced community accessibility
- Increased community involvement
- Improved partnerships among schools, parents, community groups, and the local government leaders

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INTRODUCTION

LTG has been retained to conduct an Assessment Report for Hinson Middle School as part of a Bicycle and Pedestrian School Safety Review Study for the Volusia TPO. Hinson Middle School is located at 1850 N. Clyde Morris Boulevard, in the City of Daytona Beach. A school location map, that also illustrates the walk zone of the school, is presented as Figure 1.

Background on Hinson Middle School

Hinson Middle School is the community middle school for southeast Volusia County. Six elementary schools feed into the school. The Principal of Hinson Middle School is Ms. Lesly Sileo.

The following information on Hinson Middle School has been provided by Principal Sileo:

- **Student Population:** 1,052 Students
- **Number of Walkers:** Approximately 30 students (less than 3 percent)
- **Number of Volusia County Buses in Use:** 25
- **Location and Description of Access Points:** There are two access points into the schools, one on Clyde Morris Boulevard and one on Strickland Range Road. Main access to the school is provided via Clyde Morris Boulevard. This access point serves the parent loop, staff and visitor parking. The Strickland Range road access point serves the bus loop and additional staff parking. The walkers access the school from Clyde Morris Boulevard adjacent to the parent loop. Figure 2 depicts the location of these access points.



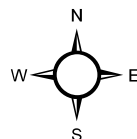
Illustration 1: Parent Loop access on Clyde Morris Boulevard



Illustration 2: Bus loop access on Strickland Range Road



David C. Hinson Sr. Middle School
 Bicycle and Pedestrian School Safety Review Study
 Daytona Beach, Florida



Aerial Detail of School Access

Figure: 2



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EXISTING CONDITIONS

Hinson Middle School is located at 1850 N. Clyde Morris Boulevard in the City of Daytona Beach. Access to the school is provided via Clyde Morris Boulevard, a north/south arterial and Strickland Range Road.

School Walk Zone

As depicted in Figure 1, the Hinson Middle School walk zone is primarily bounded by LPGA Boulevard to the south, to a line approximately a half mile north of and parallel to Strickland Range Road, Williamson Boulevard to the west and the eastern boundaries of the Grand Preserve Subdivision to the east. There are no other schools located within the school's walk zone.

Clyde Morris Boulevard a north/south arterial and Strickland Range Road, an east-west collector, are the only major roadways that traverse through the school's walk zone. The school and its walk zone consist of primarily undeveloped land. A small area of medical development is located in the north east corner of the LPGA Boulevard/Clyde Morris Boulevard intersection. The residential areas within the walk zone are situated immediately across Clyde Morris Boulevard from the school and on the eastern end of Strickland Range Road.

There are no Votran routes on Clyde Morris Boulevard in front of the school. According to Principal Sileo, a Votran route that students can use is school is desirable to accommodate students who stay after school for activities and need transportation home.

According to Principal Sileo, walking to school was originally discouraged because of the heavy volume and speed of traffic on Clyde Morris Boulevard as well as construction on Clyde Morris Boulevard. Currently, the school has approximately less than three percent of the enrollment walking or riding bicycles/skateboards/scooters to school. As development in the area occurs and more residential units are constructed within the walk zone, this percentage may rise.

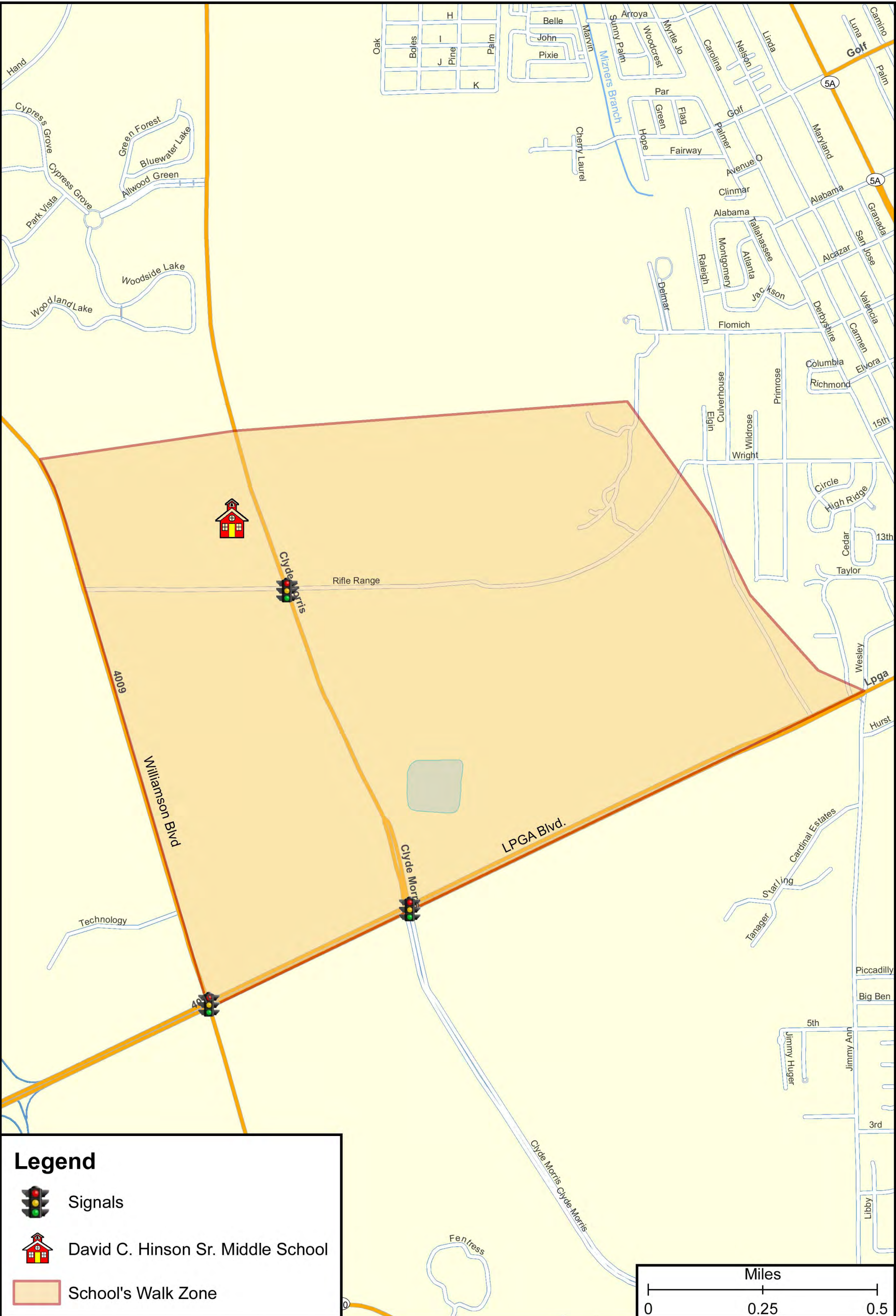
Figure 3 shows the approximate locations of the traffic signal locations identified within the walk zone.

Crash Data

Pedestrian and bicycle crash data for Hinson Middle School's walk zone was obtained from Volusia County. The data was generated based on the following guidelines:

- Data was collected during the timeframes of 8:15 a.m.- 9:15 a.m. and 3:15 p.m.- 4:15 p.m. on Mondays, Tuesdays, Thursdays, and Fridays
- Data was collected during the timeframes of 8:15 a.m.- 9:15 a.m. and 2:15 p.m.- 3:15 p.m. on Wednesdays
- Data was collected within the walk zone of the school
- Crashes occurring within the last three years

Analysis of the crash data showed that there were no pedestrian or bicycle-related incidents meeting the guidelines above.



Legend

- Signals
- David C. Hinson Sr. Middle School
- School's Walk Zone

David C. Hinson Sr. Middle School
Bicycle and Pedestrian School Safety Review Study
Daytona Beach, FL

Existing Conditions

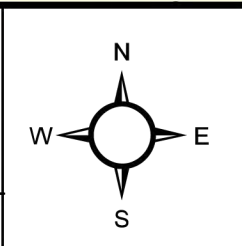


Figure: 3

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MEETINGS

A meeting was held at Hinson Middle School on Wednesday, April 6, 2011. In attendance were members of LTG Staff, Volusia TPO Staff, New Smyrna Beach Middle School Principal Lesly Sileo, Assistant Principal Ronnie Dickens, and City of Daytona Beach Senior Planner Tom Weitnauer. This meeting, along with questionnaires which were produced by LTG and completed by Principal Sileo, assisted in identifying matters of concern within the school walk zone (see completed questionnaires as well as initial letters sent to establish this meeting in Appendix A).

Meeting Summary

Most prevalent among the concerns discussed in the meeting, as expressed by Principal Sileo, is the volume and speed of traffic on Clyde Morris Boulevard. The residential development currently located within the walk zone is located east of Clyde Morris Boulevard, requiring the students to cross this roadway to get to school. There is a light that operates during the morning and afternoon school arrival and dismissal periods that provides a signal control crossing of Clyde Morris Boulevard at Strickland Range road. Other concerns pointed out by Principal Sileo are as follows:



Illustration 3: Volume and speed of traffic on Clyde Morris Boulevard main concern of safety for students who walk and bike to and from school

- Concerned that students sometimes do not use the signal controlled crossing of Clyde Morris Boulevard at Strickland Range Road.
- Conflict at the Clyde Morris Boulevard and Strickland Range Road between students and turning vehicles.
- The speed on Clyde Morris Boulevard under the reduced school speed limit is still too fast at 35 miles per hour.
- The lack of sidewalk on Williamson Boulevard.
- The lack of a Votran stop adjacent to the school.

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FINDINGS AND RECOMMENDATIONS

The amount of walkers to Hinson Middle, estimated by the Principal is approximately 30 students or less than three percent of the student population. The school's walk zone is primarily undeveloped and has a limited roadway network. However, good and, seemingly, well-maintained sidewalk coverage is already in place on the two major roadways, Clyde Morris Boulevard and Strickland Range Road. The residential developments located currently located within the school's walk zone lie east of Clyde Morris Boulevard, requiring students to cross this arterial. There is a signal that operates during the morning arrival and afternoon dismissal periods at Clyde Morris Boulevard and Strickland Range Road to provide signal control crossing of Clyde Morris Boulevard.

This section of the report includes data collected during the on-site and off-site investigative observations of Hinson Middle School and its walk zone. Areas of interest identified in the meeting with Principal Sileo and completed questionnaires were investigated, along with a thorough field review of conditions within the walk zone.

LTG evaluated the safety of sidewalk features based on conditions that are deemed hazardous in the *2009 Florida Statutes*, the *Americans with Disabilities Act (ADA) of 1990 Guidelines*, the *Manual on Uniform Traffic Control Devices (MUTCD)*, the *Florida Department of Transportation (FDOT)*, and the *Federal Highway Administration (FHWA)*. The relevant excerpts are included in Appendices B and C.

For a walkway that is parallel to the road, the *2009 Florida Statutes*, Chapter 1006.23 considers the following conditions to be hazardous:

- If there is not an area at least four feet wide adjacent to the road, having a surface upon which students may walk without being required to walk on the road surface
- If the road along which students must walk is uncurbed, has a posted speed limit of 55 miles per hour or greater, and the walk area is not set off the road by at least three feet.

For walkways that are perpendicular to the road, the *2009 Florida Statutes*, Chapter 1006.23 considers the following conditions to be hazardous:

- If the traffic volume on the road exceeds the rate of 360 vehicles per hour, per direction (including all lanes), during the time students walk to and from school and if the crossing site is uncontrolled (an "uncontrolled crossing site" is an intersection or other designated crossing site where no crossing guard, traffic enforcement officer, or STOP sign or other traffic control signal is present during the times students walk to and from school)
- If the total traffic volume on the road exceeds 4,000 vehicles per hour through an intersection or other crossing site controlled by a STOP sign or other traffic control signal, unless crossing guards or other traffic enforcement officers are also present during the times students walk to and from school

On-Site Investigation - A.M. Observations

LTG visited Hinson Middle School on Thursday, April 14, 2011, during student arrival period and on Tuesday, April 19, 2011 during the student dismissal period. Both periods were observed for an interval of 30 minutes before and after the bell for a comprehensive view of all queuing, entering, and exiting patterns at different entry/exit points around the school as well as student walking and cycling practices at the crosswalk and along the adjacent roadways. The following general information was gathered:

Observation: LTG began the investigation by observing the parent loop. During the a.m. observation parents were observed to use the parent loop correctly. No conflicts were observed.

Recommendations: Continue to operate in the same condition.

Observation: The school had one bike rack area with approximately 7 bicycles. On the days of a.m. and p.m. observations, no students riding bicycles, skateboards or scooters were observed wearing helmets.

Recommendations: This school may be a good candidate for the receipt of free bicycle helmets through programs headed by the Department of Health or the Sheriff's Office.



Illustration 4: Bicycle Rack Area



Illustration 5: Cars stacking at the light to make a U-turn

Observation: There was no conflict observed at the entrance and exit to the parent loop. Vehicles wishing to head north on Clyde Morris Boulevard turned right out of the access drive and made a U-turn at the signal at Clyde Morris Boulevard and Strickland Range Road.

Recommendations: Continue to operate in the same condition.

On-Site Investigations - P.M. Observations

Observation: The parent loop is designed to allow for two lanes of vehicle stacking. This works for a pick-up situation only.

However, if a parent needs to park and go into the school the stacked vehicles block the one-way access to the parking area. As a result, parents who needed to park their vehicles, accessed the parking area by driving in the exit only access drive.



Illustration 6: Vehicles stack up in both lanes of the parent loop prior to the afternoon dismissal

Recommendation: Since both lanes are needed to accommodate the stacking, It is recommended that the exit only access to the parking area be converted to both entrance and exit to avoid conflicts of parents accessing the parking area through the exit, since the entrance is blocked with vehicles stacked for student pick-up.



**Illustration 7:
Vehicles entering the exit only
drive to access the parking area**



**Illustration 8:
Convert right-out only to a shared
right/left-out and convert existing
left out to inbound to allow access
to the parking area**

Off-Site Investigation

Observation: Students were observed utilizing the sidewalk along Clyde Morris Boulevard and crossing at the signal control crosswalk at Strickland Range Road.

Recommendation: Continue to emphasize the importance and safety implications of using the crosswalk at Strickland Range Road in order to cross Clyde Morris Boulevard.



Illustration 9: Students walking on sidewalk to access the signal crossing at Strickland Range Road in the afternoon.

Observation: There is no crosswalk on Clyde Morris Boulevard at the parent loop driveway. Currently, there are no residential units within the walk zone located north on Clyde Morris Boulevard that would utilize a crosswalk here. However, as development occurs in the area, the need would arise for a crosswalk in this location to serve walkers and bicyclists to the school.

Recommendation: Install a crosswalk on the west side of Clyde Morris Boulevard at the parent loop.

Observation: The sidewalk on Strickland Range Road between the Bus Loop Drive and Clyde Morris Boulevard is overgrown with grass and weeds.

Recommendation: Maintenance is needed on this portion of the sidewalk.



Illustration 10: Missing Crosswalk on Clyde Morris Boulevard at parent loop driveway

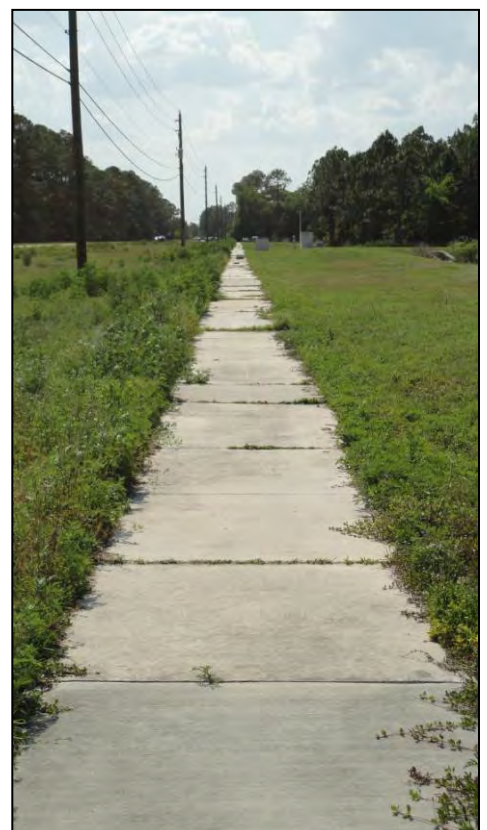


Illustration 11: Unmaintained sidewalk on Strickland Range Road, west of Clyde Morris Boulevard

Parallel and Perpendicular Sidewalk Inventory

An inventory of sidewalk coverage within the walk zone was taken. The focus of this inventory was the east/west and north/south urban collectors within the walk-zone. This was to verify whether there are routes of continuous sidewalk coverage that can be taken to and from the school and whether or not any of these routes are considered hazardous based on the parallel criteria listed above. There are no streets within the walk zone with a posted speed limit of 55 miles per hour or greater. The parallel sidewalk coverage on these urban collector roads is summarized in Tables 2 and 3.

The perpendicular sidewalk conditions are summarized in Table 4. Peak-hour, directional volumes were estimated using the Volusia County Traffic Counts for collector and arterial roadways within the school walk zone by applying a peak-hour factor of 0.0977 and a directional factor of 0.55. Crossing conditions are deemed to be hazardous if they meet the criteria listed above for walkways perpendicular to the roadway.

**Table 1
East/West Parallel Collector Sidewalk Inventory
Hinson Middle School Assessment Study**

East/West Roadway	Segment	Sidewalk Details				Hazardous Condition?
		Sidewalk Coverage	Side of Road			
			North	South	Exceptions/Comments	
Strickland Range Road	Williamson Boulevard to Bus Loop Drive				Not a likely walk route as this area is undeveloped and does not lead to residential areas within the walk zone	No
	Bus Loop Drive to Clyde Morris Boulevard	✓	✓		Sidewalk needs to be maintained of overgrown weeds and grass.	No
	Clyde Morris Boulevard to Grand Preserve Subdivision	✓	✓			No

**Table 2
North/South Parallel Collector Sidewalk Inventory
Hinson Middle School Assessment Study**

North/ South Roadway	Segment	Sidewalk Details				Hazardous Condition?
		Sidewalk Coverage	Side of Road			
			East	West	Exceptions/Comments	
Clyde Morris Boulevard	LPGA Boulevard to Strickland Range Road	✓	✓	✓	Eastside sidewalk adjacent to developed properties only.	No
	Strickland Range Road to Hand Avenue	✓	✓	✓	Eastside sidewalk adjacent to developed properties only.	No

**Table 3
Perpendicular Sidewalk Evaluation
Hinson Middle School Assessment Study**

Roadway	Perpendicular Street	Daily Traffic Volume	Peak-Hour Directional Traffic Volume	Exceed Volume Threshold	Traffic Signal or Stop Sign	Hazardous Condition
Clyde Morris Boulevard	Strickland Range Road	11,970	643	No	Yes	No

Based on the criteria for hazardous conditions identified above, there are no roadways with hazardous conditions identified in the walk zone.

It should be noted that while there is no sidewalk on Strickland Range Road from Williamson Boulevard to the Bus Loop Drive, this is not a likely walk route as there are no residential areas in the walk zone that would use this route. Since Hinson Middle School is in a predominantly undeveloped area, as development occurs, additional sidewalks will be constructed to serve the new developments.

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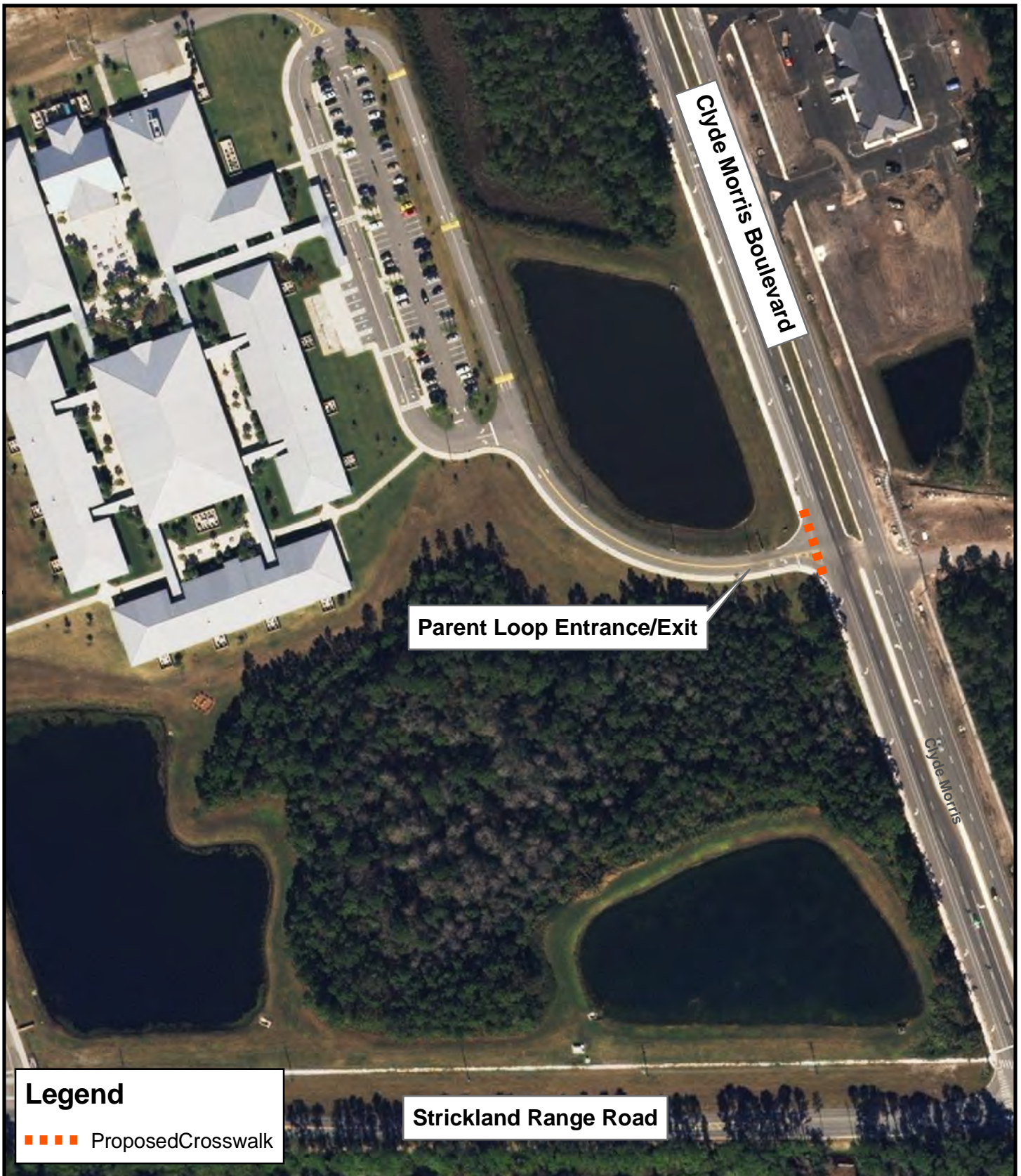
SUMMARY

The number of walkers and bike riders to Hinson Middle School, estimated at less than three percent, is low. This is due to the location of the middle school being in a predominately undeveloped area. There are only two residential subdivisions and one apartment complex located within the walk zone. As more properties are developed within the walk zone, the percentage of walkers and bikers should increase. Consistent with the City of Daytona Beach development requirements, sidewalk construction will occur as part of construction of a new project, thereby providing sidewalk connectivity as the area develops.

Table 4 summarizes the recommendation that has been made within this report. This recommendation and is also illustrated on Figure 4. It should be noted that Volusia County has identified \$1,000,000 for the purpose of constructing sidewalks at not-yet determined locations in its 2010/2011-2014/2015 Transportation Improvement Program. Therefore, it is recommended that the City of Daytona Beach and the County collaborate to implement the recommendations of highest priority.

Table 5
Summary of Recommended Improvements
Hinson Middle School Assessment Study

Location	Observations	Recommendations
Off-Campus		
Westside of Clyde Morris Boulevard at the Parent Driveway	Missing Crosswalk on Clyde Morris Boulevard at parent loop driveway.	Install a special emphasis crosswalk at this location.



<p>David C. Hinson Sr. Middle School Bicycle and Pedestrian School Safety Review Study Daytona Beach, Florida</p>		
<p>Recommended Improvements</p>	<p>Figure: 4</p>	

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EXECUTIVE SUMMARY – IMPLEMENTATION REPORT

Lassiter Transportation Group, Inc. (LTG) was retained by the Volusia Transportation Planning Organization (VTPO) 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 Hinson Middle School. Recommendations for sidewalk improvements within this report have an associated total cost of \$1,125.45.

Assessment of Existing Conditions

Conditions within the walk zone of Hinson Middle School have been presented and assessed within the Assessment Report contained in the previous sections. Recommendations were also made within those sections to improve observed conditions. These recommendations are evaluated within the following sections, based on these factors:

- 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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BEST PRACTICES

This section of the report will address the best practices which 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 Florida Department of Transportation (FDOT) and the Volusia County School District.

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 which is located 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 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 persons with disabilities in the first phases of programming, planning, designing, operating, and constructing pedestrian facilities
- Agencies should ensure that accessibility 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 B 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. If the roadway is retrofitted in the future, then existing sidewalks must be brought into compliance with current 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, noncompliant 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 difficult. When sidewalks are obstructed or do not have curb ramps, it is difficult 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 balance.

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
- 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

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 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 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.

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.
- 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 12) also play an important role in safety. Flashing beacons alert drivers that they are entering a school zone and indicate 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.



Best Practices

Illustration 12: Flashing beacon traffic signal control

- 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. 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.

Students who choose to ride their bicycles to school do not always wear helmets.

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

School districts generally 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

- As defined in F.S. 1006.23, the School District staff collaborates with the Sheriff's crossing guards, City and County Public Works and FDOT to evaluate a school's walk zone and its hazardous walking conditions as defined.
- In effort to avoid the inter-mingling of elementary, middle, and high school traffic, school arrival and dismissal, Volusia County School District has a three-tiered bell schedule. Further, each school separates bus traffic from parent pick-up drop-off traffic.
- It is necessary to review 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. Volusia County School District is a member of city and county development review teams and reviews new site plans and subdivisions to ensure adequate area is designated for school bus stops and sidewalks. City and County land development regulations require sidewalks.

- All new schools should be planned with good sidewalk connectivity/network to all neighborhoods and developments within its walk zone.
- As required by F.S. 1006.23, Volusia County School District provides bus service to students who do not have access to safe routes to school.
- There are certain programs which promote walking and bicycling to school. The Volusia County School District currently participates in such programs (e.g. Walking School Bus, SAFE KIDS Walk This Way, and International Walk to School Day). Bicycle and pedestrian safety is part of the existing elementary physical education curriculum.
- A No Backpack policy should 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, helmet usage should be closely monitored for compliance, and PTA meetings to ensure parent support and compliance with these policies should be promoted.
- 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

Refer to Figure 4 of the Assessment Section for the recommendations. It highlights the locations of existing conditions as well as the proposed improvements. The following sections will provide more details on the recommendations shown in Figure 4.

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CONSTRUCTABILITY MATRIX

The Matrix in Table 5 shows the estimated cost of sidewalk-related projects that are recommended for improvement. FDOT's *2010 Basis of Estimates* manual was used to develop the Constructability Matrix. The estimated construction costs for these recommendations are \$1,125.45. The costs shown in the Constructability Matrix includes material and labor fees. As mentioned before, these improvements are based on field observations and should be verified by a contractor prior to construction.

Table 5
Constructability Matrix
Hinson Middle School Implementation Report

PRIORITY #	PROJECT NAME	DESCRIPTION		PAY ITEM NUMBER	PAY ITEM DESCRIPTION	PLAN QTY	UNIT MEASURE	UNIT PRICE	ESTIMATED COST
		LOCATION	RECOMMENDATION						
1	Pavement Marking	West side of Clyde Morris Boulevard at the Parent Loop driveway	Special Emphasis Crosswalk Should be Installed	711-11-125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	225.00	LF	\$3.53	\$794.25
				711-11-123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	180.00	LF	\$1.84	\$331.20
Total:									\$1,125.45

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RECOMMENDED PRIORITY PROJECTS

This section of the report provides additional information about each project in ranking order.

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. The safety issues which produce the following crosswalk recommendation may force students to cross the parent loop drive after they enter the school property. Provision of well connected sidewalks and crosswalks dictates exactly where students should walk.

Project No. 1: **Crosswalk on Clyde Morris Boulevard at the Parent Loop Driveway**

Submitting Agency: City of Daytona Beach

Project Location: West side of Clyde Morris Boulevard at the parent loop driveway

School Served: Hinson Middle School

Project Description: **Special emphasis pavement markings**

LAP Coordinator: City of Daytona Beach

Maintaining Agency: FDOT

Project Description: This project includes installing special emphasis crosswalk on the west side of Clyde Morris Boulevard at the parent loop driveway.

Estimated Cost: The estimated cost for this project is \$1,125.45.

WORKS CITED

"2010 Basis of Estimates Manual." < <http://www.dot.state.fl.us/Specificationsoffice/Estimates/BasisofEstimates/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>>.

"Florida School Crossing Guard Training Guidelines." Florida Department of Transportation Safety Offices. <http://www.dot.state.fl.us/safety/ped_bike/brochures/pdf/SCG%20Training%20Guidelines2009.pdf>.

"KidsWalk-to-School." U.S. Department of Health and Human Services Centers 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/hm/2009/part7/part7_toc.htm>.

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

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APPENDICES

Appendix A

Letter to Principal and
Principal Questionnaire



Via Email (lmsileo@volusia.k12.fl.us)

Ref: 3706.15

March 4, 2011

Principal Lesly Sileo
Hinson Middle School
1860 N. Clyde Morris Boulevard
Daytona Beach, FL 32117

Re: Volusia County Transportation Planning Organization (VCTPO) Bike and Pedestrian Safety Review

Dear Mrs. Sileo:

The VCTPO has been awarded a Florida Department of Transportation (FDOT) safety grant to study bicycle and pedestrian safety as it relates to schools, such as Hinson Middle, in the VCTPO planning area. Lassiter Transportation Group, Inc. has been retained to conduct these studies on the VCTPO's behalf.

We would like input from you to identify any bicycle and pedestrian safety-related issues or concerns that the school may be experiencing. Enclosed with this letter is a questionnaire form detailing the information that we are requesting. We would like to arrange a meeting with you, at your convenience, to discuss these items and will contact you in the near future to this end.

If you should have any questions or comments regarding this letter, please feel free to contact me at (386) 257-2571.

Sincerely,

LASSITER TRANSPORTATION GROUP, INC.

R. Sans Lassiter, PE
President

- c: Stephan C. Harris, Bicycle & Pedestrian Coordinator, VCTPO
Saralee Morrissey, AICP, Director of Site Acquisitions & Intergovernmental Coordinator, Volusia County Schools
Jon Cheney, PE, Volusia County Traffic Engineering
Lt. Bobby Lambert, Volusia County Sheriff's Office
Rich Walton Planning Director, City of Daytona Beach
Joan Carter, M.A., Bicycle & Pedestrian Coordinator, FDOT D-5



PRINCIPAL
QUESTIONNAIRE

TO: Principal Lesly Sileo
Hinson Middle School
1860 N. Clyde Morris Boulevard
Daytona Beach, FL 32117

FROM: Stephan Harris
Volusia County Transportation Planning Organization (VCTPO)
2570 W. International Speedway Blvd, Suite 120
Daytona Beach, FL 32114-8145

**RE: MEETING DATE (TBD)
SCHOOL WALK ZONE SAFETY ANALYSIS**

The Volusia County Transportation Planning Organization (VCTPO) is conducting assessments aimed at improving the safety conditions for students who bicycle or walk to and from school. Hinson Middle School has been chosen as one of the schools to be studied during this study phase. The following questionnaire will aid us in this effort. Your participation is key to the success of this analysis and is greatly appreciated.

You will be meeting with our traffic engineering consultants who will be conducting this study, Lassiter Transportation Group. Each staff member responsible for conducting the on-site analysis has gone through the appropriate back-ground check. Should you have any questions, please do not hesitate to contact them directly. Mr. Sans Lassiter or Ms. Crystal Mercedes PH: (386) 257-2571 or by E-mail: rlassiter@lassitertransportation.com or cmercedes@lassitertransportation.com.

1. Number of students currently enrolled: _____

Comments: _____

2. Number of students (or approximate percentage) who walk/bicycle to/from school: _____

Comments: _____

3. Are you aware of any facility (sidewalk, crosswalk, etc.) maintenance issues? If yes, please explain.

4. Are you aware of any parents who stop and/or park along the walk zone route to drop-off/pick-up their students to avoid the regular school pick-up lines? If yes, does this cause a safety issue with the students who walk/bicycle?

5. Are you aware of any safety hazards or issues along the school's walk zone?

6. Please list all known crash incidents within the walk zone. Did any of the crashes cause an issue for walkers/bikers? If yes, please explain.

7. What is your biggest concern relative to the conditions faced by the students who walk/bicycle to/from school?

8. What changes/improvements would you like to see relative to the conditions faced by the students who walk/bicycle to/from school?

COMMENTS:

Appendix B

2009 Florida Statute Excerpts

The 2009 Florida Statutes

[Title XLVIII](#)

K-20 EDUCATION CODE

[Chapter 1006](#)

SUPPORT FOR LEARNING

[View Entire Chapter](#)

(1) DEFINITION.--As used in this section, "student" means any public elementary school student whose grade level does not exceed grade 6.

(2) TRANSPORTATION; CORRECTION OF HAZARDS.--

(a) It is intended that district school boards and other governmental entities work cooperatively to identify conditions that are hazardous along student walking routes to school and that district school boards provide transportation to students who would be subjected to such conditions. It is further intended that state or local governmental entities having jurisdiction correct such hazardous conditions within a reasonable period of time.

(b) Upon a determination pursuant to this section that a condition is hazardous to students, the district school board shall request a determination from the state or local governmental entity having jurisdiction regarding whether the hazard will be corrected and, if so, regarding a projected completion date. State funds shall be allocated for the transportation of students subjected to such hazards, provided that such funding shall cease upon correction of the hazard or upon the projected completion date, whichever occurs first.

(3) IDENTIFICATION OF HAZARDOUS CONDITIONS.--When a request for review is made to the district school superintendent or the district school superintendent's designee concerning a condition perceived to be hazardous to students in that district who live within the 2-mile limit and who walk to school, such condition shall be inspected by a representative of the school district and a representative of the state or local governmental entity that has jurisdiction over the perceived hazardous location. The district school superintendent or his or her designee and the state or local governmental entity or its representative shall then make a final determination that is mutually agreed upon regarding whether the hazardous condition meets the state criteria pursuant to this section. The district school superintendent or his or her designee shall report this final determination to the department.

(4) STATE CRITERIA FOR DETERMINING HAZARDOUS WALKING CONDITIONS.--

(a) *Walkways parallel to the road.*--

1. It shall be considered a hazardous walking condition with respect to any road along which students must walk in order to walk to and from school if there is not an area at least 4 feet wide adjacent to the road, having a surface upon which students may walk without being required to walk on the road surface. In addition, whenever the road along which students must walk is uncurbed and has a posted speed limit of 55 miles per hour, the area as described above for students to walk upon shall be set off the road by no less than 3 feet from the edge of the road.

2. The provisions of subparagraph 1. do not apply when the road along which students must walk:

a. Is in a residential area which has little or no transient traffic;

- b. Is a road on which the volume of traffic is less than 180 vehicles per hour, per direction, during the time students walk to and from school; or
- c. Is located in a residential area and has a posted speed limit of 30 miles per hour or less.

(b) *Walkways perpendicular to the road.*--It shall be considered a hazardous walking condition with respect to any road across which students must walk in order to walk to and from school:

1. If the traffic volume on the road exceeds the rate of 360 vehicles per hour, per direction (including all lanes), during the time students walk to and from school and if the crossing site is uncontrolled. For purposes of this subsection, an "uncontrolled crossing site" is an intersection or other designated crossing site where no crossing guard, traffic enforcement officer, or stop sign or other traffic control signal is present during the times students walk to and from school.
2. If the total traffic volume on the road exceeds 4,000 vehicles per hour through an intersection or other crossing site controlled by a stop sign or other traffic control signal, unless crossing guards or other traffic enforcement officers are also present during the times students walk to and from school.

Traffic volume shall be determined by the most current traffic engineering study conducted by a state or local governmental agency.

History.--s. 297, ch. 2002-387.

Title XXIII

Chapter 316

[View Entire Chapter](#)

MOTOR VEHICLES STATE UNIFORM TRAFFIC CONTROL

316.75 School crossing guards.--The Department of Transportation shall adopt uniform guidelines for the training of school crossing guards. Each local governmental entity administering a school crossing guard program shall provide a training program for school crossing guards according to the uniform guidelines. Successful completion of the training program shall be required of each school guard except:

- (1) A person who received equivalent training during employment as a law enforcement officer.
- (2) A person who receives less than \$5,000 in annual compensation in a county with a population of less than 75,000.
- (3) A student who serves in a school patrol.

School crossing guard training programs may be made available to nonpublic schools upon contract.

History.--s. 2, ch. 92-194; s. 42, ch. 97-190.

Note.--Former s. 234.302.

Title XXIII**Chapter 316****[View Entire Chapter](#)****MOTOR VEHICLES STATE UNIFORM TRAFFIC CONTROL****316.2065 Bicycle regulations.--**

(1) Every person propelling a vehicle by human power has all of the rights and all of the duties applicable to the driver of any other vehicle under this chapter, except as to special regulations in this chapter, and except as to provisions of this chapter which by their nature can have no application.

(2) A person operating a bicycle may not ride other than upon or astride a permanent and regular seat attached thereto.

(3)(a) A bicycle may not be used to carry more persons at one time than the number for which it is designed or equipped, except that an adult rider may carry a child securely attached to his or her person in a backpack or sling.

(b) Except as provided in paragraph (a), a bicycle rider must carry any passenger who is a child under 4 years of age, or who weighs 40 pounds or less, in a seat or carrier that is designed to carry a child of that age or size and that secures and protects the child from the moving parts of the bicycle.

(c) A bicycle rider may not allow a passenger to remain in a child seat or carrier on a bicycle when the rider is not in immediate control of the bicycle.

(d) A bicycle rider or passenger who is under 16 years of age must wear a bicycle helmet that is properly fitted and is fastened securely upon the passenger's head by a strap, and that meets the standards of the American National Standards Institute (ANSI Z 90.4 Bicycle Helmet Standards), the standards of the Snell Memorial Foundation (1984 Standard for Protective Headgear for Use in Bicycling), or any other nationally recognized standards for bicycle helmets adopted by the department. As used in this subsection, the term "passenger" includes a child who is riding in a trailer or semitrailer attached to a bicycle.

(e) Law enforcement officers and school crossing guards may issue a bicycle safety brochure and a verbal warning to a bicycle rider or passenger who violates this subsection. A bicycle rider or passenger who violates this subsection may be issued a citation by a law enforcement officer and assessed a fine for a pedestrian violation, as provided in s. 318.18. The court shall dismiss the charge against a bicycle rider or passenger for a first violation of paragraph (d) upon proof of purchase of a bicycle helmet that complies with this subsection.

(4) No person riding upon any bicycle, coaster, roller skates, sled, or toy vehicle may attach the same or himself or herself to any vehicle upon a roadway. This subsection does not prohibit attaching a bicycle trailer or bicycle semitrailer to a bicycle if that trailer or semitrailer is commercially available and has been designed for such attachment.

(5)(a) Any person operating a bicycle upon a roadway at less than the normal speed of traffic at the time and place and under the conditions then existing shall ride as close as practicable to the right-hand curb or edge of the roadway except under any of the following situations:

1. When overtaking and passing another bicycle or vehicle proceeding in the same direction.
2. When preparing for a left turn at an intersection or into a private road or driveway.

3. When reasonably necessary to avoid any condition, including, but not limited to, a fixed or moving object, parked or moving vehicle, bicycle, pedestrian, animal, surface hazard, or substandard-width lane, that makes it unsafe to continue along the right-hand curb or edge. For the purposes of this subsection, a "substandard-width lane" is a lane that is too narrow for a bicycle and another vehicle to travel safely side by side within the lane.

(b) Any person operating a bicycle upon a one-way highway with two or more marked traffic lanes may ride as near the left-hand curb or edge of such roadway as practicable.

(6) Persons riding bicycles upon a roadway may not ride more than two abreast except on paths or parts of roadways set aside for the exclusive use of bicycles. Persons riding two abreast may not impede traffic when traveling at less than the normal speed of traffic at the time and place and under the conditions then existing and shall ride within a single lane.

(7) Any person operating a bicycle shall keep at least one hand upon the handlebars.

(8) Every bicycle in use between sunset and sunrise shall be equipped with a lamp on the front exhibiting a white light visible from a distance of at least 500 feet to the front and a lamp and reflector on the rear each exhibiting a red light visible from a distance of 600 feet to the rear. A bicycle or its rider may be equipped with lights or reflectors in addition to those required by this section.

(9) No parent of any minor child and no guardian of any minor ward may authorize or knowingly permit any such minor child or ward to violate any of the provisions of this section.

(10) A person propelling a vehicle by human power upon and along a sidewalk, or across a roadway upon and along a crosswalk, has all the rights and duties applicable to a pedestrian under the same circumstances.

(11) A person propelling a bicycle upon and along a sidewalk, or across a roadway upon and along a crosswalk, shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing such pedestrian.

(12) No person upon roller skates, or riding in or by means of any coaster, toy vehicle, or similar device, may go upon any roadway except while crossing a street on a crosswalk; and, when so crossing, such person shall be granted all rights and shall be subject to all of the duties applicable to pedestrians.

(13) This section shall not apply upon any street while set aside as a play street authorized herein or as designated by state, county, or municipal authority.

(14) Every bicycle shall be equipped with a brake or brakes which will enable its rider to stop the bicycle within 25 feet from a speed of 10 miles per hour on dry, level, clean pavement.

(15) A person engaged in the business of selling bicycles at retail shall not sell any bicycle unless the bicycle has an identifying number permanently stamped or cast on its frame.

(16)(a) A person may not knowingly rent or lease any bicycle to be ridden by a child who is under the age of 16 years unless:

1. The child possesses a bicycle helmet; or

2. The lessor provides a bicycle helmet for the child to wear.

(b) A violation of this subsection is a nonmoving violation, punishable as provided in s. 318.18.

(17) The court may waive, reduce, or suspend payment of any fine imposed under subsection (3) or subsection (16) and may impose any other conditions on the waiver, reduction, or suspension. If the court finds that a person does not have sufficient funds to pay the fine, the court may require the performance of a specified number of hours of community service or attendance at a safety seminar.

(18) Notwithstanding s. 318.21, all proceeds collected pursuant to s. 318.18 for violations under paragraphs (3)(e) and (16)(b) shall be deposited into the State Transportation Trust Fund.

(19) The failure of a person to wear a bicycle helmet or the failure of a parent or guardian to prevent a child from riding a bicycle without a bicycle helmet may not be considered evidence of negligence or contributory negligence.

(20) Except as otherwise provided in this section, a violation of this section is a noncriminal traffic infraction, punishable as a pedestrian violation as provided in chapter 318. A law enforcement officer may issue traffic citations for a violation of subsection (3) or subsection (16) only if the violation occurs on a bicycle path or road, as defined in s. 334.03. However, they may not issue citations to persons on private property, except any part thereof which is open to the use of the public for purposes of vehicular traffic.

History.--s. 1, ch. 71-135; s. 1, ch. 76-31; s. 2, ch. 76-286; s. 1, ch. 78-353; s. 8, ch. 83-68; s. 5, ch. 85-309; s. 1, ch. 86-23; s. 7, ch. 87-161; s. 21, ch. 94-306; s. 899, ch. 95-148; s. 1, ch. 96-185; s. 2, ch. 97-300; s. 161, ch. 99-248.

Note.--Former s. 316.111.

Appendix C

Americans with Disabilities Accessibility
Guidelines Excerpts

4.7 Curb Ramps.

4.7.1 Location. Curb ramps complying with 4.7 shall be provided wherever an accessible route crosses a curb.

4.7.2 Slope. Slopes of curb ramps shall comply with [4.8.2](#). The slope shall be measured as shown in [Fig. 11](#). Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed 1:20.

4.7.3 Width. The minimum width of a curb ramp shall be 36 in (915 mm), exclusive of flared sides.

4.7.4 Surface. Surfaces of curb ramps shall comply with [4.5](#).

4.7.5 Sides of Curb Ramps. If a curb ramp is located where pedestrians must walk across the ramp, or where it is not protected by handrails or guardrails, it shall have flared sides; the maximum slope of the flare shall be 1:10 (see [Fig. 12\(a\)](#)). Curb ramps with returned curbs may be used where pedestrians would not normally walk across the ramp (see [Fig. 12\(b\)](#)).

4.7.6 Built-up Curb Ramps. Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes (see [Fig. 13](#)).

4.7.7 Detectable Warnings. A curb ramp shall have a detectable warning complying with [4.29.2](#). The detectable warning shall extend the full width and depth of the curb ramp.

4.7.8 Obstructions. Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.

4.7.9 Location at Marked Crossings. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides (see [Fig. 15](#)).

4.7.10 Diagonal Curb Ramps. If diagonal (or corner type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have 48 in (1220 mm) minimum clear space as shown in [Fig. 15\(c\)](#) and [\(d\)](#). If diagonal curb ramps are provided at marked crossings, the 48 in (1220 mm) clear space shall be within the markings (see [Fig. 15\(c\)](#) and [\(d\)](#)). If diagonal curb ramps have flared sides, they shall also have at least a 24 in (610 mm) long segment of straight curb located on each side of the curb ramp and within the marked crossing (see [Fig. 15\(c\)](#)).

4.7.11 Islands. Any raised islands in crossings shall be cut through level with the street or have curb ramps at both sides and a level area at least 48 in (1220 mm) long between the curb ramps in the part of the island intersected by the crossings (see [Fig. 15\(a\)](#) and [\(b\)](#)).

4.8 Ramps.

4.8.1* General. Any part of an accessible route with a slope greater than 1:20 shall be considered a ramp and shall comply with 4.8. [Appendix Note](#)

4.8.2* Slope and Rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 in (760 mm) (see [Fig. 16](#)). Curb ramps and ramps to be constructed on existing sites or in existing buildings or facilities may have slopes and rises as allowed in [4.1.6\(3\)\(a\)](#) if space limitations prohibit the use of a 1:12 slope or less. [Appendix Note](#)

4.8.3 Clear Width. The minimum clear width of a ramp shall be 36 in (915 mm).

4.8.4* Landings. Ramps shall have level landings at bottom and top of each ramp and each ramp run. Landings shall have the following features:

(1) The landing shall be at least as wide as the ramp run leading to it.

(2) The landing length shall be a minimum of 60 in (1525 mm) clear.

(3) If ramps change direction at landings, the minimum landing size shall be 60 in by 60 in (1525 mm by 1525 mm).

(4) If a doorway is located at a landing, then the area in front of the doorway shall comply with [4.13.6](#). [Appendix Note](#)

4.8.5* Handrails. If a ramp run has a rise greater than 6 in (150 mm) or a horizontal projection greater than 72 in (1830 mm), then it shall have handrails on both sides. Handrails are not required on curb ramps or adjacent to seating in assembly areas. Handrails shall comply with [4.26](#) and shall have the following features:

(1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback or dogleg ramps shall always be continuous.

(2) If handrails are not continuous, they shall extend at least 12 in (305 mm) beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface (see [Fig. 17](#)).

(3) The clear space between the handrail and the wall shall be 1 - 1/2 in (38 mm).

(4) Gripping surfaces shall be continuous.

(5) Top of handrail gripping surfaces shall be mounted between 34 in and 38 in (865 mm and 965 mm) above ramp surfaces.

(6) Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.

(7) Handrails shall not rotate within their fittings. [Appendix Note](#)

4.8.6 Cross Slope and Surfaces. The cross slope of ramp surfaces shall be no greater than 1:50. Ramp surfaces shall comply with [4.5](#).