Work Order # GPC IV-17

Developing Procedures, Criteria and Evaluation for Establishing School Crossing Guard Locations

August 28, 2012

Prepared by

HNTB

The preparation of this report has been financed in part from the U.S. Department of Transportation (USDOT) through the Federal Highway Administration (FHWA) and/or the Federal Transit Administration (FTA), the State Planning and Research Program (Section 505 of Title 23, U.S. Code) and Miami-Dade County, Florida. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

Work Order # GPC IV-17

Developing Procedures, Criteria and Evaluation for Establishing School Crossing Guard Locations

August 28, 2012

Prepared by

HNTB

The preparation of this report has been financed in part from the U.S. Department of Transportation (USDOT) through the Federal Highway Administration (FHWA) and/or the Federal Transit Administration (FTA), the State Planning and Research Program (Section 505 of Title 23, U.S. Code) and Miami-Dade County, Florida. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

Table of Contents

List of Tables

List of Figures

1. Introduction

The Miami-Dade County Metropolitan Planning Organization (MPO) has a goal to provide a safe transportation system for all users. The U.S. Department of Health and Human Services identifies traffic or street environment as one of the barriers to active transportation to and from school. According to a Florida Department of Transportation's (FDOT) Miami-Dade Pedestrian Safety Project completed in 2008, children and seniors are more likely to be struck during daylight hours than pedestrians of any other ages. Children walking and bicycling to elementary schools are especially vulnerable as they have not developed the skills and experience to respond to different street environments. Variations in street environment include differences in traffic speed and volume, number of lanes, presence of control devices, etc. Adults develop skills to respond to different street environments by changing behavior such as changing walking speed or making themselves seen to vehicular traffic.

The Miami-Dade County Public Schools (M-DCPS), the fourth largest school district in the County, has 345,000 students of which nearly 152,000 are enrolled in K-8 schools. Currently many children do not walk to schools. The MPO and M-DCPS as well as other organizations such as the University of Miami's WalkSafe program are trying to encourage parents to allow children to walk to school. Therefore, the actual and perceived child pedestrian safety issues are critically important to provide a comfort level to parents. Local governments deploy school crossing guards at school crossings with unusual conditions to assist children in safely crossing streets. The assignment of a crossing guard to a specific crossing is by itself recognition of the need for greater than normal safety precautions for school children. As more children walk to school, the needs for crossing guard deployments are growing but local government budgets are shrinking. Local governments now have to make tough decisions like pulling crossing guards from certain intersections and be strategic about school crossing guard deployment. Currently these decisions are being made with little data or analysis and there is an urgent need to identify areas with the highest need for crossing guard deployment.

Therefore, the MPO and other members of the Miami-Dade County Public School Community Traffic Safety Team (CTST) sought to develop procedures and criteria to assist local governments with the evaluation of need for crossing guard locations within their jurisdictions.

1.1. Study Objectives

The study has the following two objectives:

- Determine criteria for the establishment of crossing guard posts based on factors such as traffic volume, number of children crossing, crossing distance, speed limit, and traffic crash history.
- Apply those criteria to appropriate locations around Elementary and K-8 schools in Miami-Dade County and prepare a list of prioritized list of crossing guard locations.

1.2. Scope of this Effort

This effort primarily utilizes street environment factors such as number of vehicles, crosswalk width, number of children walking, crash history, etc. to determine the need. These factors or variables are selected based on availability of reliable data and their suitability to accomplish the defined objectives. The study team recognizes that the need for crossing guards can be based on several factors. Some of them include:

- Education: Crossing guards, directly and indirectly, educate children of traffic laws and safe walking practices. It is reasonable to expect that awareness of traffic laws varies across jurisdictions and therefore, crossing guard deployment can be based on awareness of traffic laws. Similarly, the need for crossing guard deployment can be eliminated or reduced by educating school children and motorists. Local governments can partly use their resources on education instead of deployment of crossing guards.

- Enforcement: Adult crossing guards are used to assist school children in safely crossing a street. They direct children, not traffic unless they are a law enforcement officer and have the authority to direct traffic in the law enforcement sense. Therefore, the need for crossing guard deployment can be reduced by enforcing existing traffic laws thereby reducing the need for additional assistance in the form of crossing guards.
- Engineering: Engineering treatments such as highly visible and audible walking cues, markings and signage can reduce the need for crossing guards. Locations with recent improvements may not need crossing guards as much as some other locations.

While they all are worthy causes and methods, the main purpose of this study is to provide a readily available desktop analytical assessment for an area-wide analysis to local crossing guard program administrators to help them determine needs for crossing guards by school. Deployment of crossing guards is a community decision taken in collaboration with local schools, parents, and elected leaders. No set of guidelines can cover all unique conditions that exist in the County. It is expected that a local administrator will be able to supplement this analysis with their local knowledge, engineering judgment, and assessment of school administrators to make the most suitable decisions.

1.3. Study Coordination

The Miami-Dade County Public School CTST was used as the Study Advisory Committee (SAC) for this project. The Committee includes the following agencies:

- Miami-Dade County Public Works
- Law Enforcement Officers
- Florida Department of Transportation (FDOT)
- Metropolitan Planning Organization (MPO) – Bicycle Pedestrian Program and Citizens Advisory Committee
- Miami-Dade Local Governments
- Miami-Dade County Citizens Independent Transportation Trust
- University of Miami Miller School of Medicine/WalkSafe Program
- M-DCPS (School Board) MPO Liaison
- School District Division of Safety and Emergency Management
- School District Police
- School District Transportation
- School District Operations
- Florida International University (FIU) Engineering Division
- The City of Miami

The study related items were presented at the following CTST meetings:

- September 2011 – Project Scope
- November 2011 – Results of Literature Review and a Preliminary List of Evaluation Criteria
- March 2012 – Preliminary Evaluation List
- June 2012 – Draft Report

2. Literature Review

The purpose of the literature review was to identify procedures and criteria already established in other jurisdictions for locating crossing guards. Many jurisdictions require that a detailed traffic study be completed for any potential location before a crossing guard is assigned. It appears that crossing guard locations in such jurisdictions remain constant and do not witness many changes. A total of five guidance documents were reviewed. A summary is provided below:

2.1. Guidance Provided in the Manual on Uniform Traffic Control Devices

- Purpose: The Manual on Uniform Traffic Control Devices (MUTCD) provides some general guidance on how to determine the need for a guard at a particular location.
- Criteria: The MUTCD 2003 Section 7E.02 states that adult school crossing guards "may be used to provide gaps in traffic at a school crossing where an engineering study has shown that adequate gaps need to be created and where authorized by law." An acceptable gap may be defined as the minimum time between vehicles that 85 percent of all groups of pedestrians waiting to cross a street will accept as adequate to cross the street, according to the Institute of Transportation Engineer's "School Trip Safety Program Guidelines."
- Advantages: One of the major benefits of this methodology is that it brings uniformity across jurisdictions.
- Limitations:
  - As the MUTCD states, this guidance is to be used for a site-specific analysis. Given the limited amount of resources, engineers and safety officials in the County, a site-specific analysis for all the potential locations around elementary schools in the county is not feasible. Therefore, this methodology, while useful, has limited usage for the purpose of this project which focuses on an area-wide analysis.
  - Also, there are several other factors such as street width, number of lanes, traffic volume that should also be considered. They are not included in the MUTCD methodology.

2.2. The Safe Routes to School Online Guide

- Purpose: The guide provides a number of variables that local administrators should consider while determining the need for crossing guard locations.
- Criteria: The guide does not provide a set of measures to determine the need. Instead, it provides the following variables for consideration (Table 1):

Table 1: Crossing Guard Needs Assessment Criteria by the Safe Routes to School Online Guide

Criteria	Description
1. Age of Students	Generally, younger children need more assistance than older children because they have a more difficult time judging the speed and distance of approaching vehicles and may be tempted to cross during an unsafe gap.
2. Street Width and Number of Lanes	Wide streets with multiple lanes of traffic typically require the use of two or more adult school crossing guards.
3. Sight Distance	These conditions are measured from the student's and driver's perspectives and for actual vehicle operating speeds. Sight distance can be affected by temporary obstructions, such as parked vehicles.
4. Safe Gap in Traffic	In addition to the MUTCD guidance, the guide suggests that volume of child pedestrians or pedestrian groups should also be considered when determining the need for adult school crossing guards or other traffic control.
5. Presence of Traffic Control Devices, Signs and Pavement	If they are present, administrators should consider whether they are sufficient. A signalized intersection at a school crossing should always have WALK/DON'T WANT signals and a pedestrian push button.
6. Speed	Vehicles that travel faster require greater stopping distance, and young children have more difficulty than adults judging the speed of fast approaching vehicles.
7. Volume of Traffic and Pedestrians	The number of students currently using pedestrian facilities as well as the projected pedestrian demand based on school demographics should be determined.
8. Attendance Boundary and Walk Zone	Both can impact the number of children walking to school and the routes they take.
9. Distance of Crossing from School and Land Use	A crossing in close proximity to a school within a residential neighborhood may attract more student pedestrians than, for example, a crossing located further from a school surrounded by non-residential land uses.
10. Crash History	The number, type and time of day that each crash occurs at a specific location should be recorded and analyzed.

- Advantages: The guidance is very comprehensive and includes all potential measures from a pedestrian and a vehicular stand point. It also considers volumes of pedestrians, an important factor in deciding locations for crossing guards.
- Limitations: Some variables are not suited for an area-wide analysis.

2.3. Kansas Guidelines for School Crossing Guards

- Purpose: The purpose is to provide guidance to City and County officials, school administrators, traffic engineers and crossing guards based on minimum standards for the safety of children regarding school crossing guards. The recommended practices in this manual are not mandates, but rather are guidelines intended to bring uniformity to training programs, procedures, and criteria for school crossing guards. Local crossing guard administrators are encouraged to add any enhancements they wish to these guidelines, as long as the minimum recommendations are followed.
- Criteria: The evaluation criteria are developed for rural and urban areas. The criteria listed in Table 2 are for urban areas.

Table 2: Crossing Guard Needs Assessment Criteria for the State of Kansas

At Un-signalized Intersections (where the nearest signalized intersection is beyond 600 feet)	
Signal Timing	If 85 percentile approach speed is less than 40 miles per hour, the number of "adequate gaps" in traffic during the period the children are using the crossing, is less than the number of minutes in that same time period (ex: less than 60 adequate gaps within an hour)
Number of Children	If 85 percentile approach speed is less than 40 miles per hour, 40 or more children crossing on an average school day
	If 85 percentile approach speed exceeds 40 miles per hour, 30 or more children on an average school day
At Stop Sign Controlled Intersections	
Traffic Volume	Traffic volumes on an undivided roadway with four or more lanes exceeds 500 vehicles per hour during any period when the school pedestrians are going to or from school
At Traffic Signal Controlled Intersection	
Turning Movement	Turning Movements through the school crosswalk exceed 300 per hour while school pedestrians are going to or from school
Pedestrian Refuge	Crosswalks longer than 80 feet without intermediate pedestrian refuge
Heavy Vehicles	More than 25 percent of the traffic stream is composed of large commercial vehicles

- Advantages: Based on the review, these criteria have the following advantages:
  - The evaluation criteria take in to account presence of traffic control devices.
  - The evaluation criteria address key traffic variables such as number of children, traffic volume, turning movement, and pedestrian refuge.
- Limitations: The following appear to be limitations of these criteria:
  - The concept of traffic gaps appears to be more suitable for a site-specific analysis as opposed to an area-wide analysis. The method also requires availability of signal timing data.
  - Presence of traffic control device dictates other variables thereby limiting their influence.
  - The turning movement counts are expensive to obtain so the analysis will be expensive to conduct for multiple locations.
  - Pedestrian refuge, while a good criteria, may not be sufficient to determine school crossing guard needs. Intersections near schools can observe large numbers of children in a compressed time. Every median is a refuge although the safety of the refuge will depend on roadway design. Therefore, the size of a pedestrian refuge is just as important, if not more, as the presence of a pedestrian refuge.

2.4. City of Madison, Wisconsin Traffic Engineering Department

- Purpose: According to the City, the ITE method does not directly consider speed of traffic, safety record of the crossing over the years, sight distance, etc. that are relevant to the safety of the pedestrians crossing. The City uses a more detailed two-tier method.
- Criteria: The City utilizes the following factors in analyzing school pedestrian crossings (Table 3).

Table 3: Crossing Guard Needs Assessment Criteria for the City of Madison, Wisconsin

Criteria	
Number of elementary (grades K-5) school children crossing	At an intersection having a major through street and a minor street(s) controlled by "STOP" or "YIELD" signs, the number of elementary school children crossing the major street approach during the peak crossing hour shall be used. When the intersection is signalized, the number of elementary school children in the most heavily used crosswalk during the peak crossing hour shall be used. The total number of elementary school children crossing at an intersection shall be considered under Hazard Rating Factor 5 (Other Factors).
Vehicle gap	The criterion for this element shall be the percentage of time during the school crossing period when gaps adequate for a safe crossing are available. The safe crossing time shall be considered as the time necessary for an elementary school child to cross from one refuge point to another (usually from one curb to another) at a walking speed of 3.0 feet per second. At an intersection having a major through street and minor street streets controlled by "STOP" or "YIELD" signs, the gaps in traffic to be considered will be those for the traffic on the major street approaches. At signalized intersections, the gaps to be considered shall be those from turning movements, which conflict with the crosswalk used by the largest group of school children, and the gaps will be computed per hour of "GREEN" time. In this instance, the width of the roadway is equal to one-half of the roadway, since the children are "protected" on the other half by vehicles waiting for the green light on the cross street (except for right turns on red). Where a major street has a median strip at least ten feet in width, which can afford adequate pedestrian refuge, the major approaches shall be considered as separate one-way streets and the gaps used will be those of the heaviest traveled approach. Right turns on red that conflict with a crosswalk used by elementary students will be analyzed. There are both benefits and hazards to pedestrians from right turn on red, but if unusual hazards exist from right turns on red, prohibition of such turns will be posted.
	If 85 percentile approach speed exceeds 40 miles per hour, 30 or more children crossing on an average school day
Speed	The criterion for this element shall be the 85th percentile speed observed on the major approaches. The 85th percentile speed is determined from a speed study made with a radar unit. It is the speed at which only 15 percent of the motorists were observed traveling faster than, or the speed below which 85 percent of the motorists travel.
Sight distance	The criterion for this element shall be the ratio of the sight distance of a vehicle driver observing a three-foot high object in the crosswalk to design stopping distance. The sight distance (wet pavement) is determined based on the American Association of State Highway and Transportation Officials (AASHTO) guidance.
Safety history	The main criterion for this element shall be the number of pedestrian accidents occurring at the study location, involving school children going to or coming from school, during the previous five-year period. For locations where two or more such accidents have occurred, the five-year limit shall not apply. In addition, a history of other accident types that could conflict with pedestrian crossing will be considered, especially if there is a history of accidents at times of the day when elementary school children generally need to cross. However, significant geometric or traffic control changes at the crossing location need to be considered.
Other factors	Certain unique factors may exist at some locations which would tend to increase or decrease the hazard to school-age pedestrians. Such factors may include complex intersection and/or traffic signal design, existence of safer crossings nearby, the age of children crossing, a street which is used extensively by "foreign" traffic, the presence of stopped buses and other obstructions, and the volume of turning traffic not reflected in the gap availability criterion. In addition, the character of the street (i.e., arterial, local, etc.) will be considered and will be a factor in borderline situations. The uniformity of the hazards throughout the school year, and from morning to evening crossing periods, needs to be considered. Situations where few children desire to walk to school when the temperature drops in the fall need special consideration.

- The city has developed a rating system for each of the identified criteria.
- Advantages: Based on the review, the City uses a comprehensive method to assess the needs which goes beyond the ITE's recommended criteria.
- Limitations:
  - The method primarily assesses street conditions which is a supply side factor. Different crossings have different "pedestrian demands" and therefore, attract different volumes. The method does not take demand into consideration.
  - The methodology is more suitable for a site-specific analysis and will be cumbersome if used for an area-wide analysis.

2.5. Pedestrian Crossing Control Manual for British Columbia

- Purpose: The manual provides guidance for the entire state of British Columbia, Canada. According to the manual, adult crossing guards should be assigned to school crossings only after a study has indicated a need. The manual acknowledges that the great demand for crossing guards makes it essential that the same set of procedures be strictly followed if crossing guard assignments are to be held to a minimum, according to need.
- Criteria: The State of British Columbia utilizes the following factors in analyzing school pedestrian crossings (Table 4).

Table 4: Crossing Guard Needs Assessment Criteria for the State of British Columbia, Canada

Criteria	
Traffic volume	300 to 500 vehicles during peak pedestrian periods, whereas minimum school crossing flows may vary from 20 to 60 children per hour
Traffic gap	Considered excessive where they are less frequent than one per minute
Traffic speed	If the posted speed exceeds 38 miles per hour
Turning movement	If the turning movement through the crosswalk exceed 300 vehicles per hour while the children are going to or from school. There are circumstances not normally present at a signalized intersection, such as crosswalks more than 82 feet long with no refuge or an abnormally high proportion of heavy commercial vehicles

- Advantages: The methodology takes in to account a number of other factors beyond the ones listed above.
- Limitations:
  - The method primarily assesses street conditions which is a supply side factor. Different crossings have different "pedestrian demands" and therefore, attract different volumes. The method does not take demand into consideration.
  - The methodology is more suitable for a site-specific analysis and will be cumbersome if used for an area-wide analysis.
  - The methodology is too prescriptive and may not help set priorities for certain jurisdictions. For instance, in some jurisdictions 500 vehicles per hour may not be high enough and in others 300 vehicles may be too high.

2.6. Summary

Criteria used by several other jurisdictions were also evaluated but were found to be similar to the ones listed above. One common theme across all existing guidelines is that they all recognize the value of engineering judgment in making needs related decisions.

Overall, the Safe Routes to School Online Guide appears to have the most comprehensive set of criteria that take in to account supply-side variables such as street condition, as well as demand-side factors such as age and volume of pedestrians. All guidelines appear to lean toward site-specific analysis and therefore, may have limited suitability for this project.

3. Environmental Features and Access to Schools

Literature review found that most jurisdictions require site-specific analysis to establish need for locating crossing guards. This is primarily due to the fact that in any region, street conditions differ significantly. The Institute of Environment located at the University of North Carolina conducted research to identify environmental threats to children attending public schools in North Carolina and they found that about half of the state's 2,225 public schools are located within close proximity to environmental hazards. The study defined hazards broadly by including sources of air and water pollution. However, they also included physical features such as highways, busy arterials, railroads, industrial and manufacturing land uses.

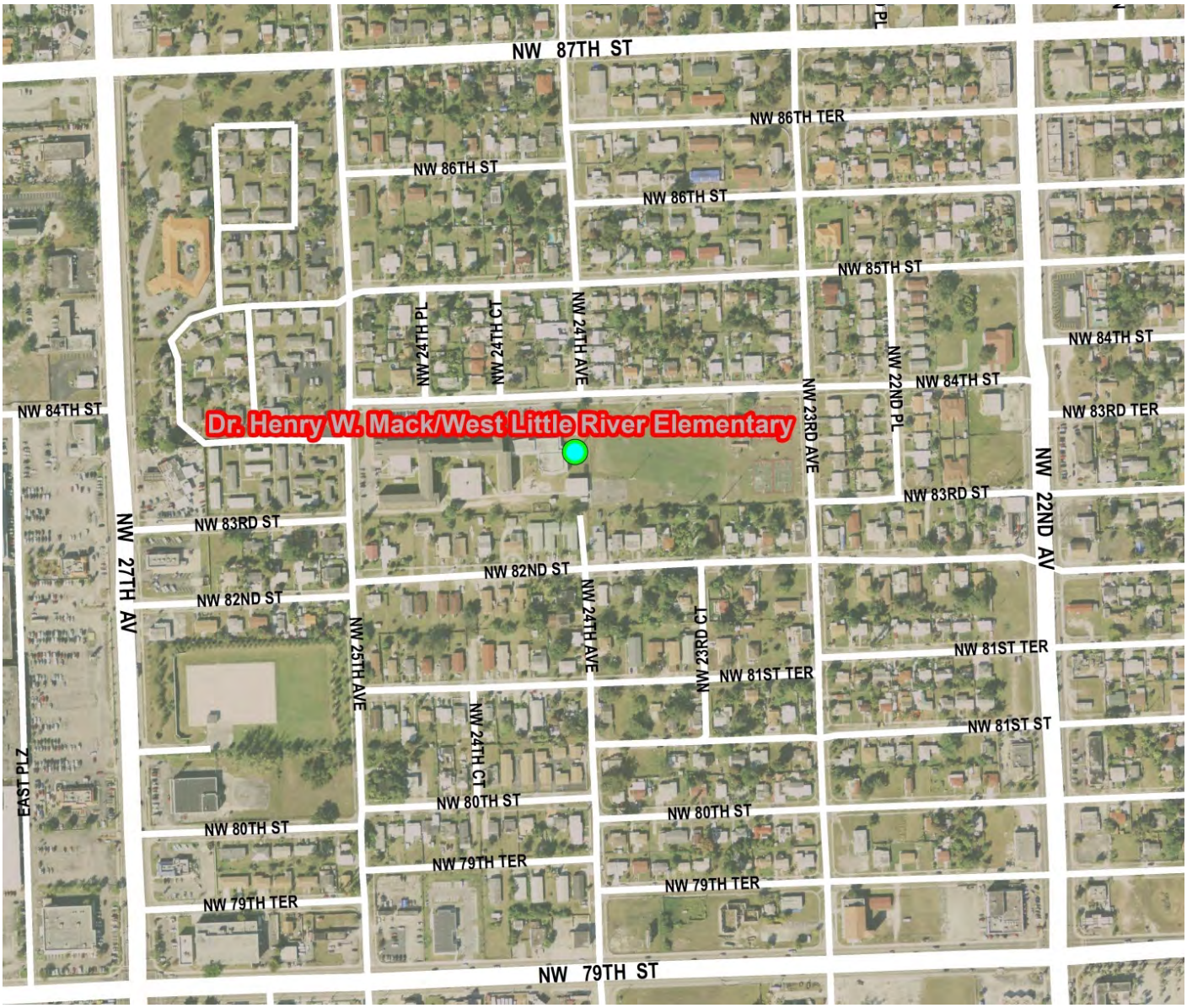
It is reasonable to assume that environmental features such as roadways and canals will influence the number of children walking to school and crossing at intersections. For instance, a busy intersection at arterials may deter some parents from allowing their children to walk to school. Street conditions depend on adjacent land use. Schools surrounded by commercial or industrial land uses may witness higher traffic.

Perception of environmental factors may also be equally important. Parents may be less willing to walk their children to school if they do not perceive street conditions to be safe. Given that environmental features may have an impact on perceived and actual child pedestrian safety at intersections, criteria to determine school crossing guards should be determined to best reflect diverse environmental features and land use situations in the County. A brief assessment of various school conditions was conducted to identify unique issues that should be considered while developing criteria for crossing guard locations. Some of the typical conditions are included below:

3.1. Location 1: Schools located in the middle of a residential neighborhood

Dr. Henry W. Mach / Little River Elementary School is located in the middle of sectionline roadways and is surrounded by residential uses (Figure 1). This is an ideal situation as it allows children in the nearby residential areas to walk to school with minimum exposure to heavy traffic along arterials. This school is located in the eastern more urban part of the County and therefore commercial land uses are located along arterials. These businesses typically attract more traffic than low-density residential uses. It can be expected that there will be child pedestrians who may have to cross arterials such as NW 27th Avenue or NW 79th Street.

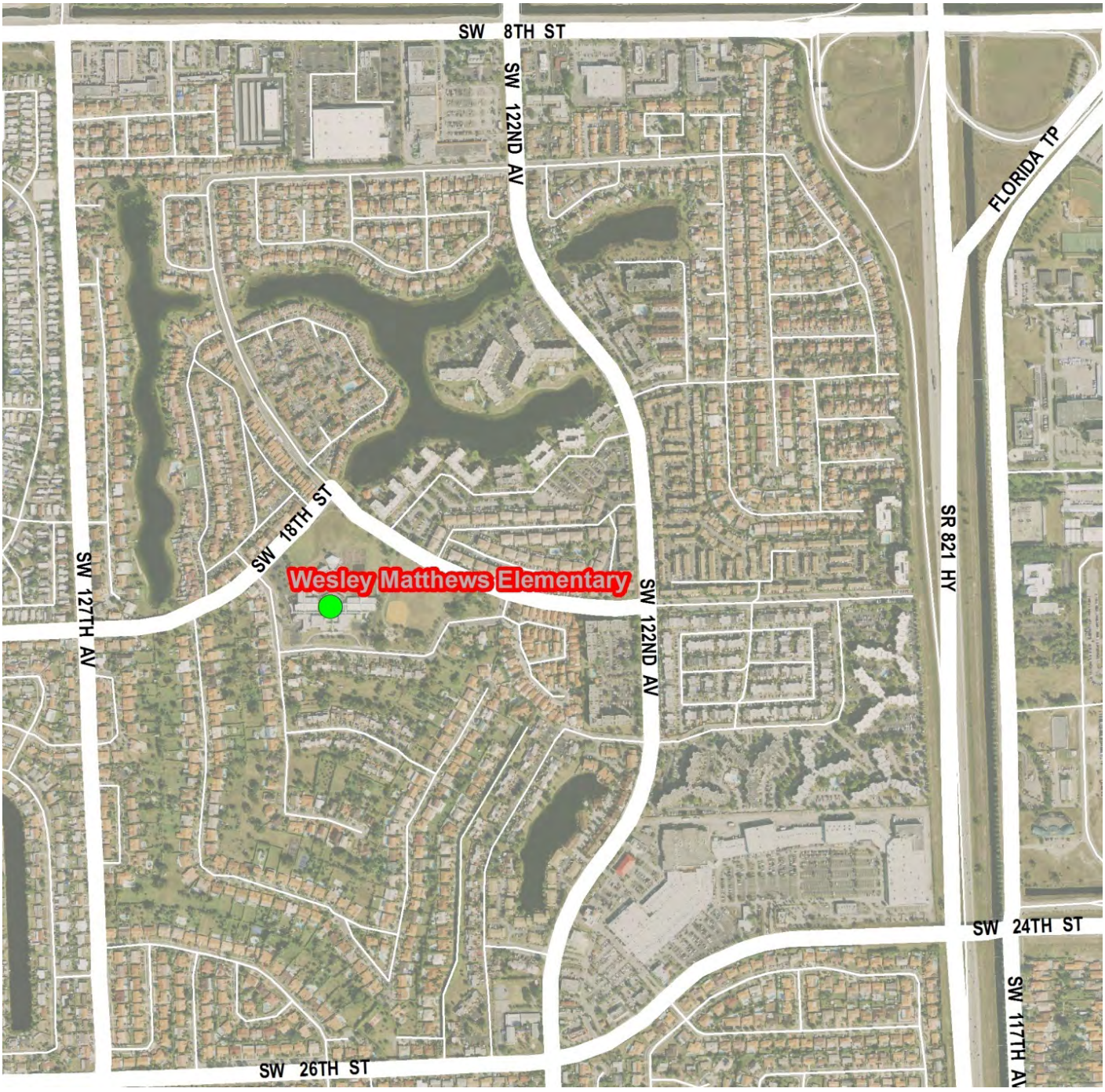
Figure 1: Locational Differences: Schools in the Middle of a Residential Neighborhood



3.2. Location 2: Schools surrounded by canals

Wesley Matthews Elementary is also located in the middle of a residential neighborhood and the situation is similar to the one previously discussed (Figure 2). The difference is that a limited-access highway, the Florida's Turnpike, is on the eastern side of the school. This school is located in the western suburban part of the county. The arterial NW 127th Avenue also has residential land uses and therefore has relatively less traffic around the school area.

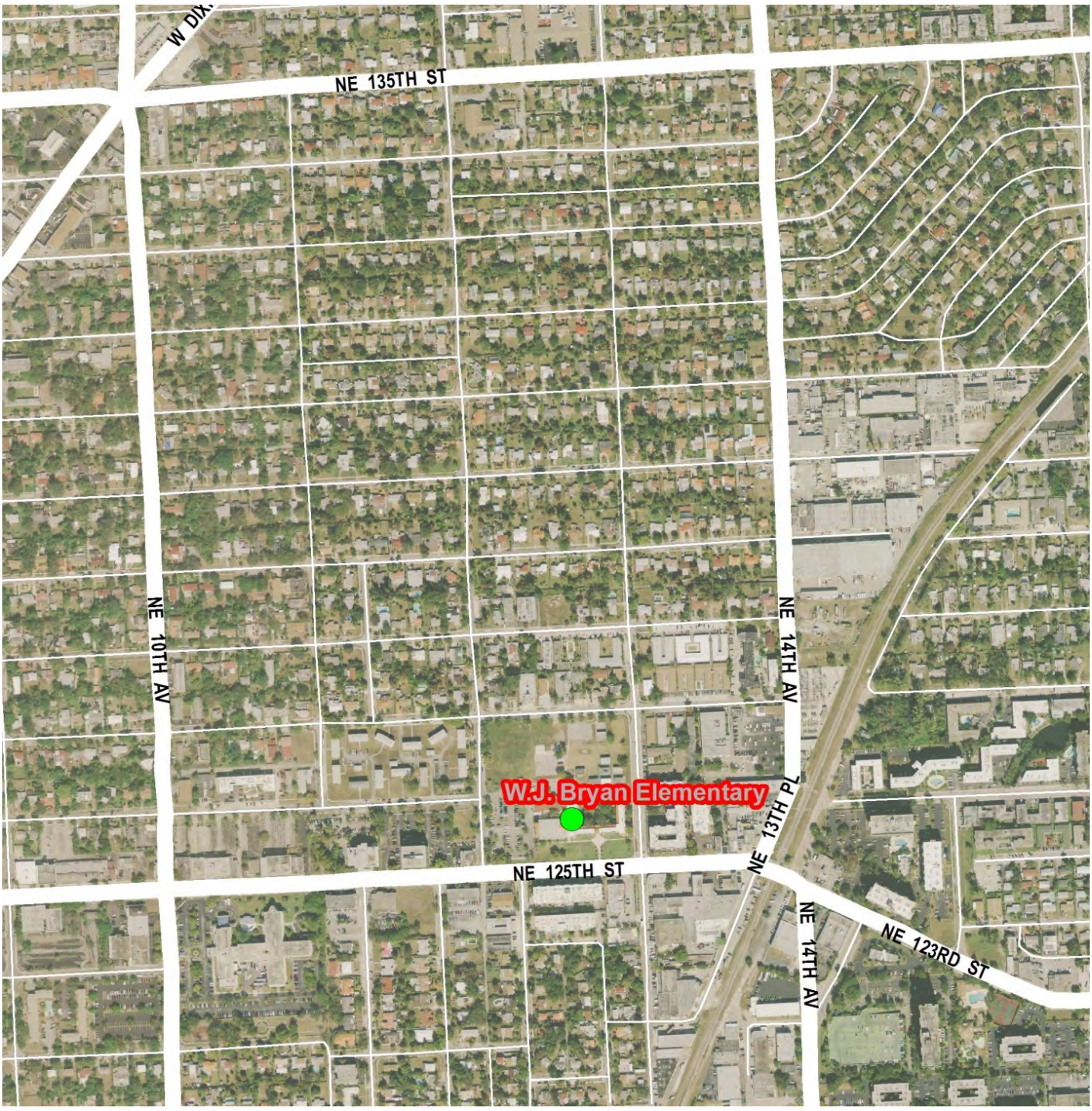
Figure 2: Locational Differences: Schools Surrounded by Canals



3.3. Location 3: School located on arterial streets

W. J Bryan Elementary is located on an arterial street and therefore many students have no option but to cross a major roadway (Figure 3). There may be students living in the back of the school and may have a pedestrian access to the school. This is a common situation as most of the elementary schools are either located on or adjacent to arterial streets. There is a rail line adjacent to the school which can be considered another hazard for child pedestrians.

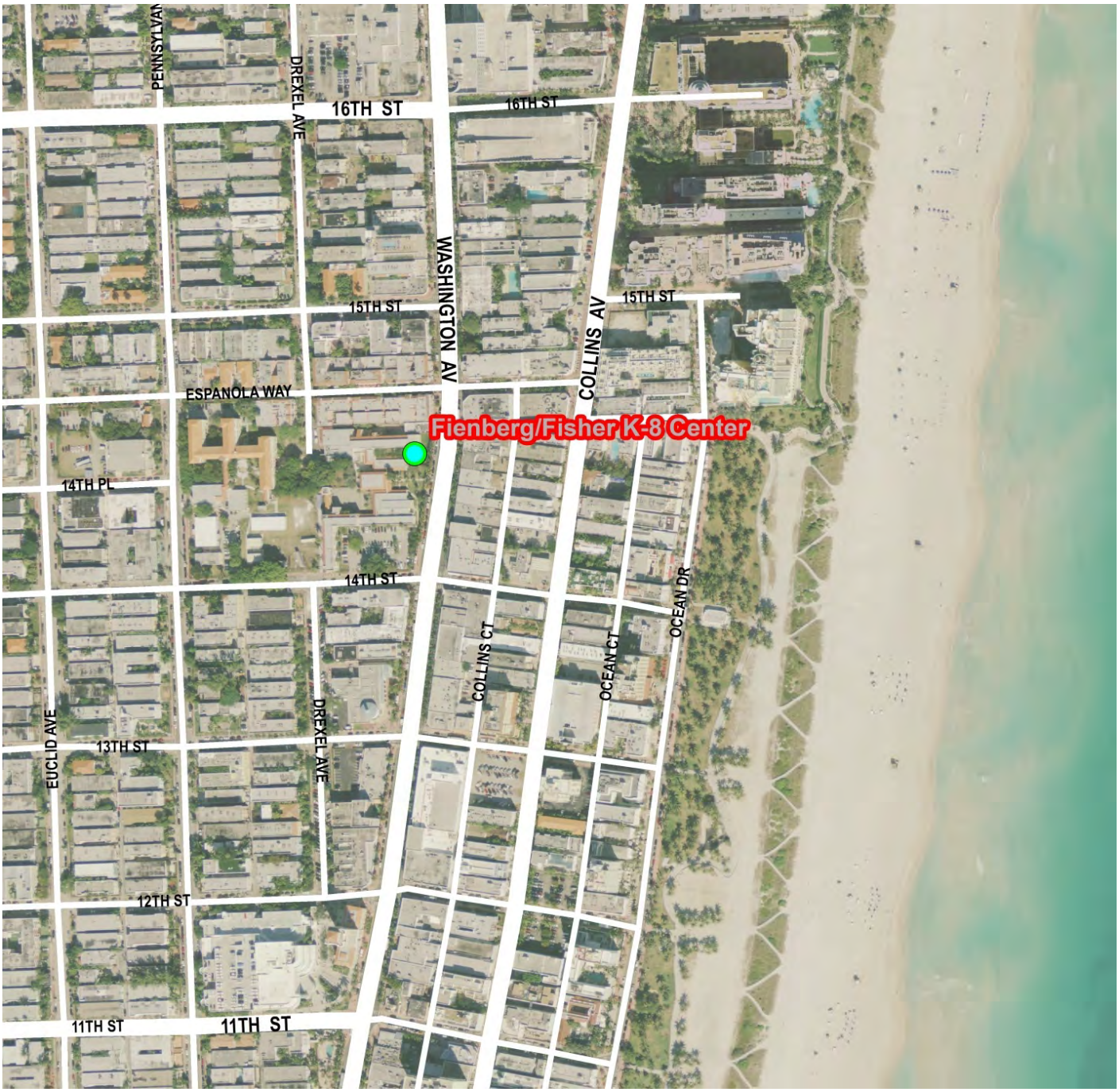
Figure 3: Locational Differences: Schools Located on Arterial Streets



3.4. Location 4: School located adjacent to commercial land uses

Fienberg/Fisher K-8 Center is surrounded by commercial land uses and is located near popular tourist areas (Figure 4). Adjacent residential land uses are of relative higher density but generally are located west of Washington Avenue. As discussed later, in high pedestrian activity areas there are several reported pedestrian crashes that occur around the school. Generally, pedestrian crashes east of the school are of less relevance for this study because they do not involve child pedestrians.

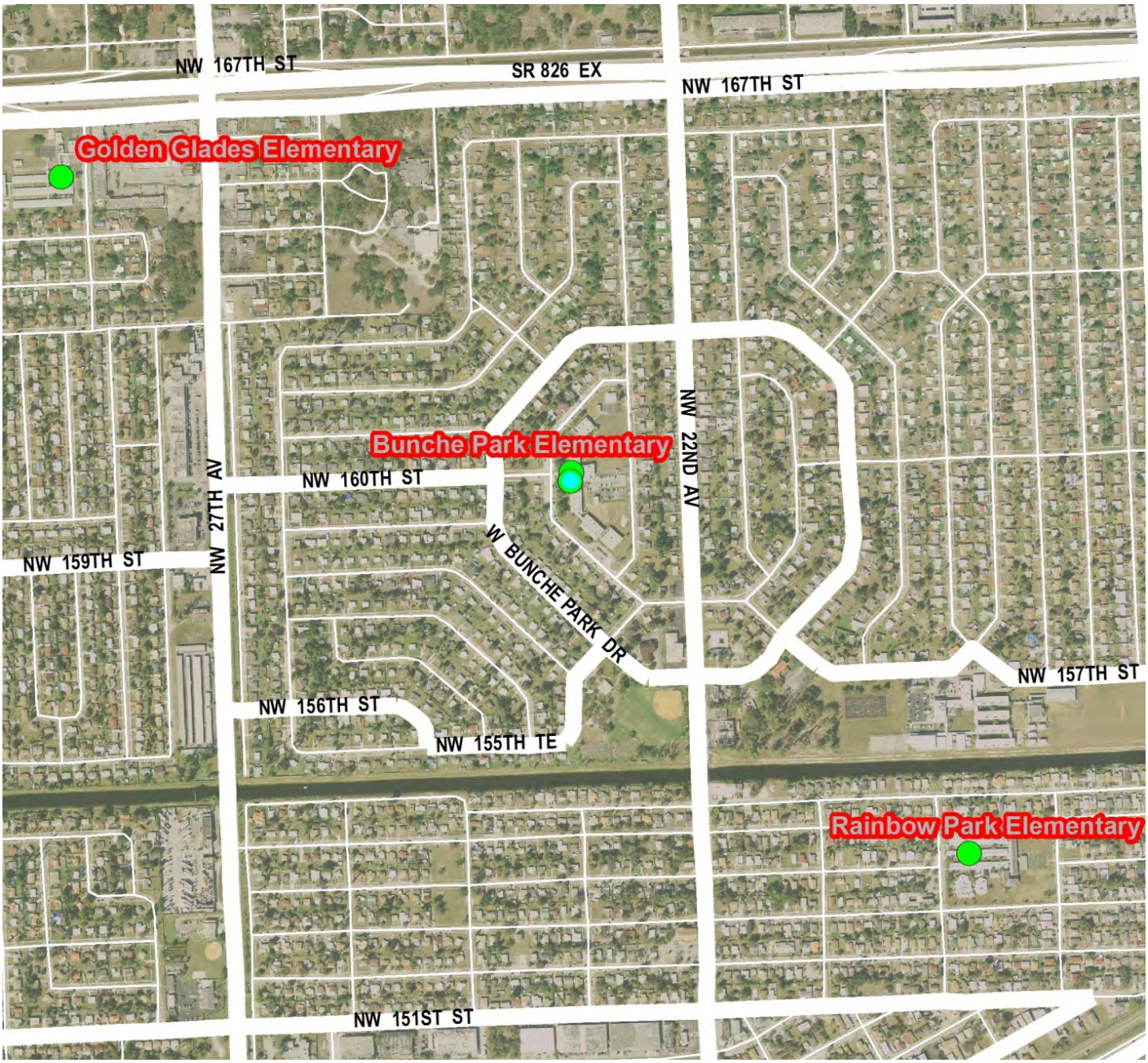
Figure 4: Locational Differences: Schools Adjacent to Commercial Land Uses



3.5. Location 5: Several schools in close proximity

This is an uncommon situation where there are three schools located within a half-mile radius of each other. Golden Glades Elementary is located adjacent to State Road 826, a very busy limited-access freeway and NW 167th Street, another busy one-way road (Figure 5). Of the three schools shown below, Rainbow Park Elementary appears to have the safest location and the most conducive to attract child pedestrians. However, it is located adjacent to a canal and therefore child pedestrians may have to walk longer distances to access the school. This situation complicates determination of crossing guard locations.

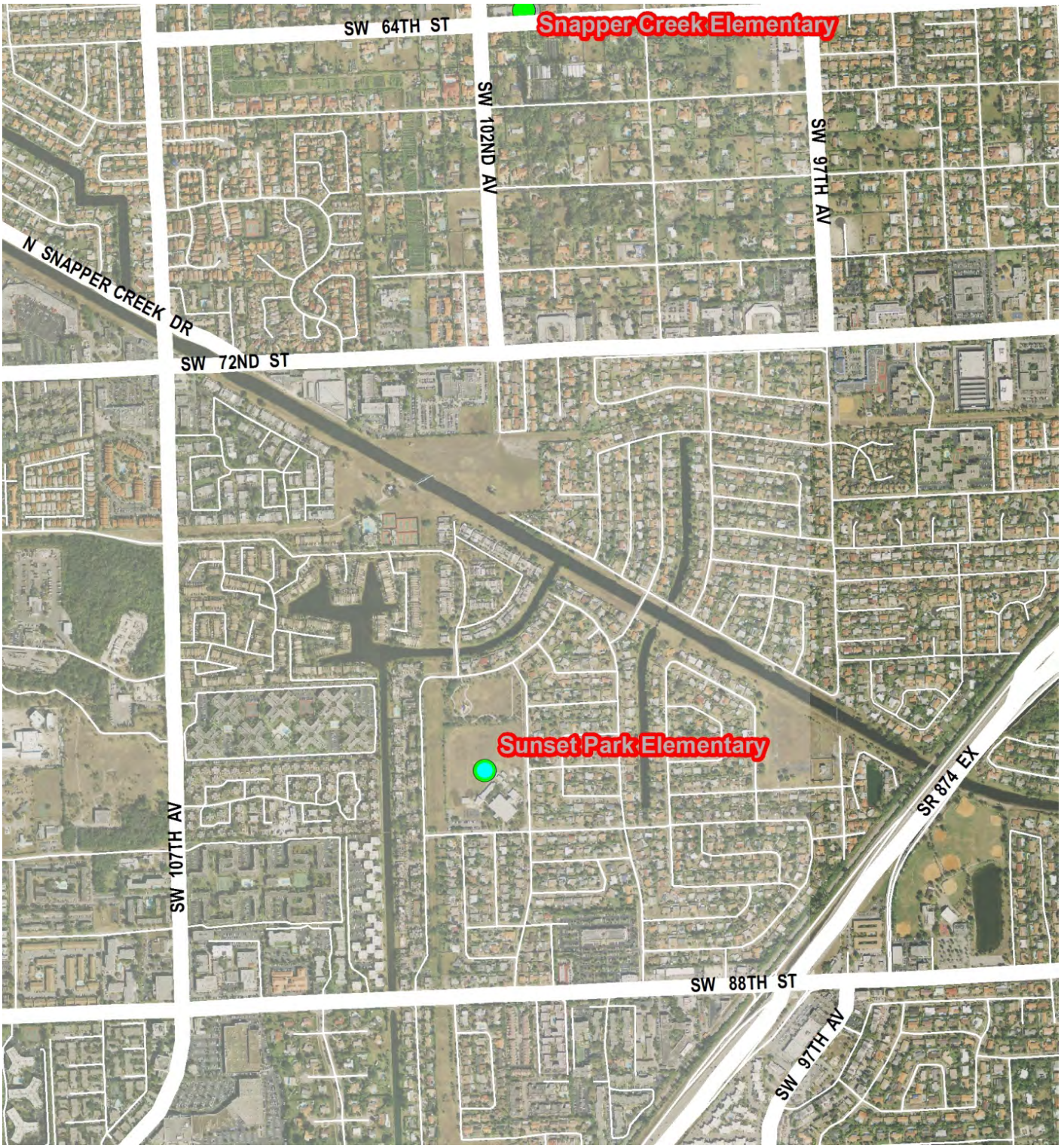
Figure 5: Locational Differences: Several Schools in Close Proximity



3.6. Location 6: School located adjacent to physical barriers (canals)

Sunset Park Elementary is located in the center of a low-density residential neighborhood and has an ideal location to attract child pedestrians (Figure 6). However, walking distances may be longer due to the presence of canals.

Figure 6: Locational Differences: Schools Adjacent to Physical Barriers



3.7. Location 7: Unique Locations

Treasure Island Elementary is located on the 79th Street Causeway and is surrounded by high-density residential and commercial land uses (Figure 7). While students in high-density residential buildings can walk to the school, other child students may have to walk on a very busy arterial.

Figure 7: Locational Differences: Unique Locations

4. Criteria for Establishing School Crossing Guard Locations

4.1. Requirements for Developing Criteria

As discussed previously, there are multiple unique conditions that exist and developing criteria for each unique condition would be cumbersome. However, there is a need for consistency to start development of a uniform set of criteria to determine the need for crossing guards. The Project SAC agreed to develop criteria that met the following requirements:

1. Transparent: Criteria and their application should be transparent and easily understandable. No set of guidelines can cover all the unique conditions that exist. A transparent process will allow safety officials to interpret information based on their local knowledge.
2. Replicable: The process should be replicable to minimize subjectivity at this area-wide analysis level. The study team could have looked at each elementary school location to determine a crossing guard location. However, the assessment may vary from one observer to another and therefore the process and results will not be replicable.
3. Valid: Validity of the process ensures that the focus is on critical "causal" factors. For instance, colors of cars on a roadway are not valid criteria to determine whether crossing guards are needed or not. However, volume of cars may be a valid measure to determine the need of crossing guards. A valid process will ensure that only the criteria that matters to establishing crossing guard needs are considered, rather than intervening, extraneous or confounding variables.
4. Reliability: It refers to the degree to which different raters/observers agree when measuring a given factor. For instance, some may argue crossing guards should be located on streets with aggressive drivers only. However, there are few easily implementable and reliable methods to determine that to the satisfaction of most observers. On the other hand, one can simply assess traffic volume and most observers will agree that it is an important criterion while assessing the need for crossing guards.

Based on the literature review and the feedback of the Project SAC, the following criteria were considered for determining location of crossing guards (Table 5).

Table 5: Criteria Considered for Developing a Crossing Guard Need Scale

Potential Criteria	Measured Factor	Supply- or Demand-side[1]	Threat or Opportunity[2]
• Environmental Conditions	Suitability to Walk	Supply-side	Threat
o Surrounding Land Uses (e.g. Urban, Suburban, Rural)			
• Demand/Users	Usage and Potential Market	Demand-side	Opportunity
o Number of Children Walking to Schools			
o Number of Children Within Walking Distance (0.5 Mile)			
• Adjacent Facility	Degree and Nature of Hazard	Supply-side	Threat
o Functional Classification			
o Divided or Undivided			
o Posted Speed			
o Approach Vehicle Volume (Nearest Intersection)			
• Intersection Conditions	Availability of Assistance	Supply-side	Threat
o Presence of Traffic Control Devices			
o Presence of Pedestrian Signals			
o Frequency of Gaps			
o Length of Gaps			
o Crosswalk Length (or Number of Lanes at Intersection)			
• Historic Safety Data	Surrogate for Usage and Threat	Supply-side	Threat
o Pedestrian Crash History			

Notes:

1. Measures demand to provide crossing guards or supply of transportation facilities or child pedestrians for a given school. A high number of child pedestrians indicate that there is a greater demand which should indicate greater need for crossing guards. Similarly, higher posted speed indicates higher threat to child pedestrians and therefore, a higher need to provide child pedestrians.
2. Local safety officials may have different motives to determine need for crossing guards. Some are more risk averse than others. For instance, some may want to focus all of their all resources on only a few schools that have the greatest threats. On the other hand, some may focus on a few schools that attract or have potential to attract a high number of child pedestrians. This would be considered an opportunity to attract more child pedestrians.

4.2. Evaluation of Preliminary Criteria

A preliminary analysis was conducted to identify confounding criteria or factors unsuitable for an area-wide analysis. The determination was based on the requirements listed previously that every criteria and the resultant process should be transparent, replicable, valid, and reliable. A discussion for each criterion is included below:

1. Surrounding Land Uses: The criterion is relevant but it is closely related with vehicle traffic volume. Also, in order for this criterion to be valid and reliable, a subjective determination will have to be made for each location. An areawide grouping by land use such as urban, suburban, and rural was found to be too general and lacking in specificity for it to be useful for this analysis. Therefore, it was not used for the analysis.

2. Number of Children Walking to School: Clearly, the demand should impact the supply of resources which is, in this case, provision of crossing guards at intersections. Typically, this data is not readily available. However, University of Miami's WalkSafe program conducts an annual survey to determine usage. The criterion was found to be very useful for this analysis and was used.

3. Number of Children within Walking Distance: This is also a demand-side variable which indicates potential usage. Some schools may have fewer children walking to school because of unsuitable conditions for walking. If potential for higher usage is recognized, more resources can be allocated to improve safety. The M-DCPS (school board) has addresses of enrolled students and the data was readily available. The criterion was found to be very useful for this analysis and was used.

4. Functional Classification of Adjacent Facility: Federal Highway Administration's (FHWA) Urban Boundary and Federal Functional Classification Procedure 525-020-311 provides guidance for determining functional classifications for roadways such as local, collectors, and arterials. The principal purpose of roadway classification is to establish the relativity of candidate roads in the overall hierarchy of roadways. There are several sub-types

within each category. For instance, arterials can be either principal arterials or minor arterials. Typically, a local road will have less vehicular volume than a collector which will have less vehicular volume than an arterial. Pedestrians are not allowed on limited-access highways. This variable is relevant but was found to be very highly correlated with approach volume. Therefore, this criterion was not used for the analysis.

5. Adjacent Facility is Divided or Undivided: A divided facility typically will have a median which can potentially be used as pedestrian refuge. However, such determination will require site specific analysis. There are factors that exist that make this criterion less useful. For instance, an undivided facility with a center-turn lane could be better than a divided facility with a three-foot median. Therefore, this criterion was not used for the analysis.

6. Posted Speed on Adjacent Facility: Posted speed determines, among other factors, distance required for a vehicle to completely stop at an intersection with child pedestrians. However, school zones have reduced speed limits immediately before and after the school hours. Also, most of the schools are located on arterials and collectors with posted speed limits between 35 and 45 miles per hour and this criterion does not provide meaningful differentiation. Therefore, this criterion was not used for the analysis.

7. Approach Vehicle Volume at Intersection: Intersection volumes at the nearest intersection can help determine two issues: (1) general vehicular activity in the area; and, (2) indication of nature and type of adjacent land use. The criterion was found to be very useful for this analysis and was used. The MPO's approved Southeast Florida Regional Planning Model (SERPM) 6.5 was used to determine vehicle volumes in the year 2015.

8. Presence of Traffic Control Devices: This criterion was found to be highly correlated with vehicle volume and therefore was not used for the analysis.

9. Presence of Pedestrian Signals: This is a potentially useful variable but requires site-specific analysis as some intersections have pedestrian signals on select legs only. Therefore, this criterion was not used for the analysis.

10. Frequency of Gaps: Frequency of gaps can be altered, if the need is determined based on safety reviews. Also, frequency of gaps, by itself, may not be as useful. The actual benefit of frequent gaps for pedestrians can only be realized if there are pedestrian signals or support infrastructure. Therefore, this criterion was not used for the analysis.

11. Length of Gaps: Length of gaps, when combined with crosswalk length can help determine whether gaps are adequate for child pedestrians. However, similar to frequency of gaps criterion, this can be altered based on safety reviews which would be a more permanent solution than the provision of a crossing guard. Therefore, this criterion was not used for the analysis.

12. Crosswalk Length: Crosswalk length is critical for two reasons: (1) it helps determine exposure of child pedestrians to vehicular traffic; and, (2) it could affect perceived safety of an intersection. Number of through lanes in SERPM 6.5 for the year 2015 were used as a surrogate for this measure.

13. Pedestrian Crash History: Reported crashes involving pedestrians can potentially help determine safety of an intersection however, is not a criteria without limitations. Intersections with fewer or no pedestrian crashes may merely indicate low pedestrian activity instead of high intersection safety. In any case, it can be a useful criterion. The MPO provided a pedestrian crash dataset from 2005 to 2009. Crashes within half mile of a school were analyzed. Their relevancy was determined based on the presence of natural or physical barriers. For instance, in cases where crashes separated from a school walking zone (half-mile radius) by natural or physical barriers were not considered relevant.

4.3. Criteria Weight

At the end of the preliminary analysis, five different criteria were found to be relevant and useful for this analysis. Each criterion was given equal weight in the determination of need for crossing guards. Effectively 40 percent of a final score will indicate demand or opportunities to increase numbers of children walking to schools. The remaining 60 percent will indicate characteristics of transportation system supply or threats to child pedestrians (Table 6).

Table 6: Criteria, Data Sources, and Weights

Potential Criteria	Data Source	Weight	Supply or Demand	Threat or Opportunity[2]
Demand/Users			Demand-side	Opportunity
o Number of Children Walking to Schools	2011 UM WalkSafe Program Survey	20%		
o Number of Children within Walking Distance (0.5 Mile)	2011 M-DCPS (School Board) data	20%		
Adjacent Facility			Supply-side	Threat
o Approach Vehicle Volume (Nearest Intersection)	SERPM 6.5 (2015)	20%		
Intersection Conditions			Supply-side	Threat
o Crosswalk Length (Number of Lanes at Intersection)	SERPM 6.5 (2015)	20%		
Historic Safety Data			Supply-side	Threat
o Pedestrian Crash History	MPO (2005-2009)	20%		

5. Data Analysis

All the datasets were assembled in a geodatabase for evaluation and comparison. The purpose was to develop an ordinal scoring system which will indicate need for school crossing guards.

5.1. Unit of Analysis

The unit analysis was the entire urbanized Miami-Dade County, however, the preliminary analysis indicated that due to the variations in geography, a countywide comparison will yield less reliable results. For instance, a comparison of Redland Elementary, which is located in the County's agricultural Redland area, with Frederick Douglass Elementary, located in the urban area of the County, will require a scale that is sensitive to these diverse conditions. More importantly, funding for crossing guard programs is not at county level but by jurisdictions. The City of Miami can only fund a crossing guard program for schools in their jurisdiction. The same applies to funding in other jurisdictions. Therefore, it was determined that the unit of analysis should be local jurisdictions.

As included in Table 7, 175 of 218 schools, nearly 80 percent are located in only four jurisdictions. The remaining jurisdictions have 6 or fewer schools and therefore, they have much more flexibility and an area-wide analysis is going to be less useful for them. The Project SAC approved developing customized scoring systems for four jurisdictions: (1) Unincorporated Miami-Dade; (2) City of Miami; (3) City of Miami Gardens; and, (4) City of Hialeah.

Table 7: Schools in Miami-Dade County by Jurisdiction

Municipality	Number of Schools By Municipality	Sub-Total
Unincorporated Miami-Dade County	102	
Miami	38	175
Miami Gardens	18	
Hialeah	17	
North Miami	6	
Homestead	4	
Miami Beach	4	
Coral Gables	3	
Doral	3	
North Miami Beach	2	
Palmetto Bay	2	
Opa-Locka	2	
South Miami	2	
Miami Springs	2	
Hialeah Gardens	2	
Miami Lakes	2	
Sweetwater	1	
Cutler Bay	1	
North Bay Village	1	
Key Biscayne	1	
Sunny Isles Beach	1	
Bay Harbor Island	1	
West Miami	1	
Miami Shores	1	
Florida City	1	
Grand Total		218

5.2. Crossing Guard Need Scale and Interpretation of Scoring System

An example of the scoring system is included in Table 8. Data for each criterion has a range and therefore, different categories representing valid statistical break in each data range were developed. Each category was assigned points. For instance, a school with one to four crashes within a half mile radius will receive 2 points on this scale. Similarly, a school with 5,001 to 10,000 vehicles per day on an adjacent roadway will receive 2 points.

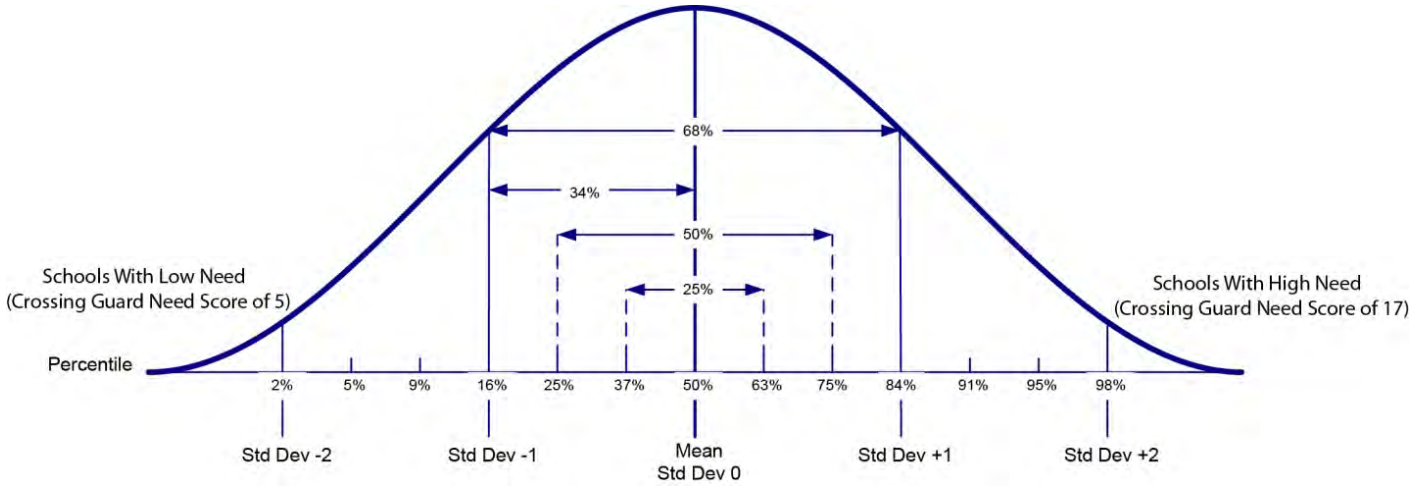
Table 8: Interpretation of Crossing Guard Need Scale

Criteria	Sample Mean /St. Deviation (Interpretation)	Sample Data Range	Points	Interpretation
Pedestrian Crashes (Number)	2.5/3 (An average school in that jurisdiction had 2.5 crashes within a half mile radius between 2005 and 2009.)	0	1	The school had no crashes involving pedestrians between 2004 and 2009 within a half mile radius. The school receives 1 point on the Crossing Guard Need Scale.
		1 to 4	2	The school had one to four crashes involving pedestrians between 2004 and 2009 within a half mile radius. The school receives 2 points on the Crossing Guard Need Scale.
		5 or more	3	The school had five or more crashes involving pedestrians between 2004 and 2009 within a half mile radius. The school receives 3 points on the Crossing Guard Need Scale.
Traffic Volume (Number of Vehicles)	20,000 / 15,000 (An average school in that jurisdiction will have 20,000 vehicles on an adjacent major roadway in 2015)	0 to 5,000	1	The school is projected to have up to daily 5,000 vehicles on an adjacent major roadway. The school receives 1 point on the Crossing Guard Need Scale.
		5,001 to 10,000	2	The school is projected to have daily 5,001 to 10,000 vehicles on an adjacent major roadway. The school receives 2 points on the Crossing Guard Need Scale.
		10,001 to 20,000	3	The school is projected to have daily 10,001 to 20,000 vehicles on an adjacent major roadway. The school receives 3 points on the Crossing Guard Need Scale.
		20,001 to 40,000	4	The school is projected to have daily 20,001 to 40,000 vehicles on an adjacent major roadway. The school receives 4 points on the Crossing Guard Need Scale.
		40,001 or more	5	The school is projected to have daily 40,001 or more vehicles on an adjacent major roadway. The school receives 5 points on the Crossing Guard Need Scale.
Number of Lanes	3.2 / 1.4 (An average school in that jurisdiction has an adjacent roadway with more three lanes)	2	1	The school will have an adjacent major roadway with up to two through lanes. The school receives 1 point on the Crossing Guard Need Scale.
		4	2	The school will have an adjacent major roadway with four through lanes. The school receives 2 points on the Crossing Guard Need Scale.
		More than 4	3	The school will have an adjacent major roadway with more than four through lanes. The school receives 3 points on the Crossing Guard Need Scale.
Number of Students within half mile radius	127 / 87 (An average of 127 students walk to schools in that jurisdiction)	50 or Less	1	The school had fewer than 50 students within a half mile radius. The school receives 1 point on the Crossing Guard Need Scale.
		50 to 200	2	The school had between 50 to 200 students within a half mile radius. The school receives 2 points on the Crossing Guard Need Scale.
		More than 200	3	The school had more than 200 students within a half mile radius. The school receives 3 points on the Crossing Guard Need Scale.
Percentage of Students that Walk to School	21.8 / 25.8 (An average of 22 percent of enrolled students walk to schools in that jurisdiction)	Less than 5 Percent	1	Fewer than five percent of enrolled students walk to school. The school location receives 1 point on the Crossing Guard Need Scale.
		5 to 50 Percent	2	A total of five to 50 percent of enrolled students walk to school. The school receives 2 points on the Crossing Guard Need Scale.
		More than 50 Percent	3	More than 50 percent of enrolled students walk to school. The school receives 3 points on the Crossing Guard Need Scale.

A school location can have a minimum of five points (one point on each of the five criteria) up to a maximum of 17 points. A school with five points indicates that it has relatively low need in its jurisdiction. The school may still have intersections that are unsafe for child pedestrians but, if safety officials have to prioritize allocation of resources, it should receive relatively lower priority compared to other schools with higher scores in that jurisdiction. A school with the score of 17 indicates it has the highest need for crossing guard in that jurisdiction.

A good scoring system will have a point distribution in the form of a bell curve which will result in fewer schools at the tail ends with scores of 5 or 17 (Figure 8). Most of the schools will be in the middle. Such scoring system will confirm that it is not skewed or biased towards safer or less safe schools. This was a key consideration while developing data ranges to assign scores. The results discussed in subsequent sections confirm that data points are normally distributed.

Figure 8: Desired Normal Distribution for Crossing Guard Need Scale



5.3. Crossing Guard Need Scale for Unincorporated Miami-Dade

A Crossing Guard Need Scale was developed for 102 schools in the unincorporated Miami-Dade County. Data ranges and descriptive statistics are included in Table 9. Data ranges are based on statistical breaks in the data and are customized for this jurisdiction. The field “Number of Schools” indicates schools with that data range. For instance, there are 32 schools in the Unincorporated Miami-Dade County that had no crashes within a half-mile radius between 2004 and 2009. These schools received 1 point each.

Table 9: Crossing Guard Need Scale for the Unincorporated Miami-Dade

Criteria	Mean/St. Deviation	Data Range	Points	Number of Schools
Pedestrian Crashes (Number)	2.5 / 3.2	0	1	32
		1 to 4	2	50
		5 or more	3	20
Traffic Volume (Number of Vehicles)	19,900 / 15,364	0 to 5,000	1	16
		5,001 to 10,000	2	14
		10,001 to 20,000	3	33
		20,001 to 40,000	4	28
		40,001 or more	5	11
Number of Lanes	3.2 / 1.4	2	1	55
		4	2	33
		More than 4	3	14
Number of Students within half mile radius	127 / 87	50 or Less	1	20
		50 to 200	2	62
		More than 200	3	20
Percentage of Students that Walk to School	21.8 / 25.8	Less than 5 Percent	1	48
		5 – 50 Percent	2	37
		More than 50 Percent	3	17

School locations in the unincorporated Miami-Dade County were evaluated within ArcMap and the scale included in Table 9 was applied. A summary of results is included in Table 10. The results indicate that there is one school in the unincorporated Miami-Dade with the highest need and one school with the lowest need. The remaining 100 schools fall somewhere in between those two outliers. The Crossing Guard Need Scale scores for each school are included in Table 12 which also includes raw data for each criterion.

Table 10: Distribution of Schools in the Unincorporated Miami-Dade

Score	Number of Schools by Need
5 (Low Need)	1
6	1
7	15
8	9
9	16
10	15
11	11
12	14
13	4
14	7
15	4
16	4
17 (High Need)	1
Total	102

5.4. Crossing Guard Need Scale for the City of Miami

A Crossing Guard Need Scale was developed for 38 schools in the City of Miami. The Crossing Guard Data ranges and descriptive statistics are included in Table 11. Data ranges are based on statistical breaks in the data and are customized for this jurisdiction.

Table 11: Crossing Guard Need Scale for the City of Miami

Criteria	Mean/St. Deviation	Data Range	Points	Number of Schools
Pedestrian Crashes (Number)	9.1 / 9.6	0 to 2	1	10
		3 to 15	2	21
		16 or more	3	7
Traffic Volume (Number of Vehicles)	18,450 / 9,449	0 to 10,000	1	7
		10,001 to 15,000	2	7
		15,001 to 20,000	3	11
		20,001 to 30,000	4	7
		30,001 or more	5	6
Number of Lanes	3.1 / 1.2	2	1	20
		4	2	16
		More than 4	3	2
Number of Students within half mile radius	194 / 113	100 or Less	1	9
		100 to 300	2	22
		More than 300	3	7
Percentage of Students that Walk to School	29.3 / 25.9	Less than 5 Percent	1	8
		5 – 50 Percent	2	22
		More than 50 Percent	3	8

Table 12: Crossing Guard Needs for Schools in the Unincorporated Miami-Dade County

School ID	School Name	School Address	Zipcode	Enrollment	Number of Ped Crashes	Traffic Volume	Number of Lanes	No. Students within Half Mile	No. of Students Walking to School	Crash Score	Traffic Score	Lane Score	Student Score	Walk Score	Need Score
401	Van E. Blanton Elementary	10327 NW 11TH AVE	33150	547	8	41,879	6	295	60	3	5	3	3	3	17
4761	Royal Palm Elementary	4200 SW 112TH CT	33165	532	8	43,356	6	220	25	3	5	3	3	2	16
3301	Miami Park Elementary	2225 NW 103RD ST	33147	445	5	46,020	6	142	58	3	5	3	2	3	16
4071	Olinda Elementary	5536 NW 21ST AVE	33142	359	12	28,971	6	202	96	3	4	3	3	3	16
1561	Earlington Heights Elementary	4750 NW 22ND AVE	33142	478	7	37,078	6	269	96	3	4	3	3	3	16
4401	Kelsey L. Pharr Elementary	2000 NW 46TH ST	33142	413	9	37,078	6	111	58	3	4	3	2	3	15
2581	Madie Ives Elementary	20770 NE 14TH AVE	33179	741	4	60,784	6	111	65	2	5	3	2	3	15
4501	Poinciana Park Elementary	6745 NW 23RD AVE	33147	442	4	32,403	6	205	70	2	4	3	3	3	15
2981	Liberty City Elementary	1855 NW 71ST ST	33147	278	5	34,465	6	185	82	3	4	3	2	3	15
4091	Olympia Heights Elementary	9797 SW 40TH ST	33165	550	8	47,725	6	85	0	3	5	3	2	1	14
4921	Seminole Elementary	121 SW 78TH PL	33144	533	8	69,976	6	116	2	3	5	3	2	1	14
4801	Gertrude Edelman/Sabal Palm Elementary	17101 NE 7TH AVE	33162	763	3	46,732	4	275	5	2	5	2	3	2	14
4461	Pine Villa Elementary	21799 SW 117TH CT	33170	298	9	46,122	4	86	50	3	5	2	2	2	14
1331	Devon Aire K-8 Center	10501 SW 122ND AVE	33186	1531	1	62,899	6	0	55	2	5	3	1	3	14
3041	Lorah Park Elementary	5160 NW 31ST AVE	33142	406	9	23,345	4	193	60	3	4	2	2	3	14
1401	Charles R. Drew Elementary	1775 NW 60TH ST	33142	249	13	26,577	4	146	80	3	4	2	2	3	14
1841	Flagami Elementary	920 SW 76TH AVE	33144	482	6	46,811	2	157	5	3	5	1	2	2	13
1081	Coral Terrace Elementary	6801 SW 24TH ST	33155	539	5	32,155	4	132	10	3	4	2	2	2	13
5381	E.W.F. Stirrup Elementary	330 NW 97TH AVE	33172	856	3	25,591	4	212	15	2	4	2	3	2	13
101	Arcola Lake Elementary	1037 NW 81ST ST	33150	466	12	18,541	4	202	49	3	3	2	3	2	13
2651	Kendale Lakes Elementary	8000 SW 142ND AVE	33183	731	5	29,708	4	172	2	3	4	2	2	1	12
2441	Virginia A. Boone/Highland Oaks Elementary	20500 NE 24TH AVE	33180	643	1	73,102	6	14	4	2	5	3	1	1	12
441	Blue Lakes Elementary	9250 SW 52ND TER	33165	496	2	35,172	4	139	5	2	4	2	2	2	12
3261	Miami Heights Elementary	17661 SW 117TH AVE	33177	1126	2	16,255	4	258	5	2	3	2	3	2	12
2331	Charles R. Hadley Elementary	8400 NW 7TH ST	33126	993	1	28,424	2	437	5	2	4	1	3	2	12
311	Goulds Elementary	23555 SW 112TH AVE	33032	544	1	20,310	4	66	6	2	4	2	2	2	12
3541	Robert Russa Moton Elementary	18050 HOMESTEAD AVE	33157	345	1	23,251	4	139	20	2	4	2	2	2	12
521	Broadmoor Elementary	3401 NW 83RD ST	33147	385	2	23,723	4	105	35	2	4	2	2	2	12
1681	Lillie C. Evans Elementary	1895 NW 75TH ST	33147	399	7	20,829	4	0	40	3	4	2	1	2	12
2801	Lake Stevens Elementary	5101 NW 183RD ST	33055	293	2	13,216	6	53	40	2	3	3	2	2	12
4021	Oak Grove Elementary	15640 NE 8TH AVE	33162	688	3	33,629	4	194	40	2	4	2	2	2	12
5901	Carrie P. Meek/Westview Elementary	2101 NW 127TH ST	33167	384	5	16,766	4	178	50	3	3	2	2	2	12
1811	Dante B. Fascell Elementary	15625 SW 80TH ST	33193	505	0	12,595	4	266	57	1	3	2	3	3	12
771	William A. Chapman Elementary	27190 SW 140TH AVE	33032	392	1	13,448	4	160	60	2	3	2	2	3	12
2891	William Lehman Elementary	10990 SW 113TH PL	33176	730	1	25,333	4	104	0	2	4	2	2	1	11
2181	Joella C. Good Elementary	6350 NW 188TH TER	33015	862	2	27,463	4	85	4	2	4	2	2	1	11
2641	Kendale Elementary	10693 SW 93RD ST	33176	554	0	37,904	4	59	8	1	4	2	2	2	11
3101	Frank C. Martin International K-8 Center	14250 BOGGS DR	33176	1155	2	28,466	4	34	10	2	4	2	1	2	11
4511	Dr. Gilbert L. Porter Elementary	15851 SW 112TH ST	33196	765	0	30,905	4	132	10	1	4	2	2	2	11
4061	Ojus Elementary	18600 W DIXIE HWY	33180	840	11	13,598	2	109	12	3	3	1	2	2	11
251	Ethel Koger Beckham Elementary	4702 SW 143RD CT	33175	691	0	15,943	4	214	19	1	3	2	3	2	11
3181	Melrose Elementary	3050 NW 35TH ST	33142	560	13	8,499	4	184	20	3	2	2	2	2	11
2241	Gratigny Elementary	11905 N MIAMI AVE	33168	690	0	28,995	4	179	30	1	4	2	2	2	11
2821	Lakeview Elementary	1290 NW 115TH ST	33167	464	3	8,365	2	232	54	2	2	1	3	3	11
5141	Hubert O. Sibley Elementary	255 NW 115TH ST	33168	767	0	16,402	2	210	70	1	3	1	3	3	11
1281	Cypress Elementary	5400 SW 112TH CT	33165	329	4	33,619	2	104	0	2	4	1	2	1	10

School ID	School Name	School Address	Zipcode	Enrollment	Number of Ped Crashes	Traffic Volume	Number of Lanes	No. Students within Half Mile	No. of Students Walking to School	Crash Score	Traffic Score	Lane Score	Student Score	Walk Score	Need Score
2341	Joe Hall Elementary	1901 SW 134TH AVE	33175	651	0	23,878	4	173	0	1	4	2	2	1	10
4721	Rockway Elementary	2790 SW 93RD CT	33165	442	2	18,976	4	121	2	2	3	2	2	1	10
831	Claude Pepper Elementary	14550 SW 96TH ST	33186	830	2	10,083	4	175	2	2	3	2	2	1	10
1371	Marjory Stoneman Douglas Elementary	11901 SW 2ND ST	33184	1112	1	19,562	2	91	5	2	3	1	2	2	10
1001	Coral Park Elementary	1225 SW 97TH AVE	33174	1022	2	17,359	2	175	5	2	3	1	2	2	10
1721	Everglades K-8 Center	8375 SW 16TH ST	33155	1191	0	10,391	2	393	6	1	3	1	3	2	10
4391	Irving & Beatrice Peskoe Elementary	29035 SW 144TH AVE	33033	575	0	22,500	4	0	20	1	4	2	1	2	10
861	Colonial Drive Elementary	10755 SW 160TH ST	33157	288	1	16,122	2	67	20	2	3	1	2	2	10
2881	Leewood K-8 Center	10343 SW 124TH ST	33176	728	1	12,195	2	116	20	2	3	1	2	2	10
661	Caribbean Elementary	11990 SW 200TH ST	33177	654	2	11,128	2	165	20	2	3	1	2	2	10
201	Banyan Elementary	3060 SW 85TH AVE	33155	364	4	13,640	2	102	22	2	3	1	2	2	10
2901	Leisure City K-8 Center	14950 SW 288TH ST	33033	1085	0	22,487	4	0	33	1	4	2	1	2	10
4651	Ethel F. Beckford/Richmond Elementary	16929 SW 104TH AVE	33157	264	4	8,686	2	113	70	2	2	1	2	3	10
2911	Linda Lentin K-8 Center	14312 NE 2ND CT	33161	962	4	5,000	2	317	85	2	1	1	3	3	10
4441	Pine Lake Elementary	16700 SW 109TH AVE	33157	461	3	10,626	2	108	0	2	3	1	2	1	9
41	Air Base Elementary	12829 SW 272ND ST	33032	681	1	14,103	4	20	1	2	3	2	1	1	9
5401	Sunset Elementary	5120 SW 72ND ST	33143	1095	1	12,867	2	79	1	2	3	1	2	1	9
2511	Zora Neale Hurston Elementary	13137 SW 26TH ST	33175	837	0	30,492	4	10	2	1	4	2	1	1	9
1761	David Fairchild Elementary	5757 SW 45TH ST	33155	589	1	15,715	2	82	3	2	3	1	2	1	9
1691	Christina M. Eve Elementary	16251 SW 99TH ST	33196	698	2	5,916	2	119	5	2	2	1	2	2	9
4741	Royal Green Elementary	13047 SW 47TH ST	33175	681	0	13,498	2	170	5	1	3	1	2	2	9
5281	South Miami Heights Elementary	12231 SW 190TH TER	33177	618	0	8,579	2	209	5	1	2	1	3	2	9
451	Dr. Bowman Foster Ashe Elementary	6601 SW 152ND AVE	33193	856	1	1,211	2	251	6	2	1	1	3	2	9
1641	Emerson Elementary	8001 SW 36TH ST	33155	390	0	14,087	2	128	10	1	3	1	2	2	9
2701	Kenwood K-8 Center	9300 SW 79TH AVE	33156	1146	0	14,781	2	168	10	1	3	1	2	2	9
361	Biscayne Gardens Elementary	560 NW 151ST ST	33169	625	0	10,499	2	52	14	1	3	1	2	2	9
125	Norma Butler Bossard Elementary	15950 SW 144TH ST	33196	1270	1	5,000	2	208	15	2	1	1	3	2	9
5641	Village Green Elementary	12265 SW 34TH ST	33175	383	0	10,928	2	121	20	1	3	1	2	2	9
5991	Charles David Wyche Jr. Elementary	5241 NW 195TH DR	33055	898	1	5,000	2	233	20	2	1	1	3	2	9
651	Campbell Drive Elementary	15790 SW 307TH ST	33033	652	1	10,149	2	0	30	2	3	1	1	2	9
2021	Gloria Floyd Elementary	12650 SW 109TH AVE	33176	604	1	18,048	2	20	0	2	3	1	1	1	8
3861	North Glade Elementary	5000 NW 177TH ST	33055	359	1	8,335	2	91	0	2	2	1	2	1	8
4491	Henry E.S. Reeves Elementary	2005 NW 111TH ST	33167	801	1	9,231	2	163	1	2	2	1	2	1	8
5121	Snapper Creek Elementary	10151 SW 64TH ST	33173	537	2	14,456	2	32	2	2	3	1	1	1	8
231	Aventura Waterways K-8 Center	21101 NE 26TH AVE	33180	1859	1	2,552	2	52	5	2	1	1	2	2	8
5521	Tropical Elementary	4545 SW 104TH AVE	33165	415	0	9,421	2	64	5	1	2	1	2	2	8
73	Mandarin Lakes K-8 Academy	12225 SW 280TH ST	33032	1369	0	9,163	2	121	5	1	2	1	2	2	8
3111	Wesley Matthews Elementary	12345 SW 18TH TER	33175	504	0	7,967	2	191	10	1	2	1	2	2	8
5861	Dr. Henry W. Mack/West Little River Elementary	2450 NW 84TH ST	33147	348	2	5,000	2	134	45	2	1	1	2	2	8
2761	Martin Luther King Elementary	7124 NW 12TH AVE	33150	201	3	8,219	2	0	0	2	2	1	1	1	7
5061	Dr. Carlos J. Finlay Elementary	851 SW 117TH AVE	33174	495	0	15,195	2	0	0	1	3	1	1	1	7
2261	Greenglade Elementary	3060 SW 127TH AVE	33175	561	0	13,916	2	38	0	1	3	1	1	1	7
671	Calusa Elementary	9580 W CALUSA CLUB DR	33186	793	2	3,158	2	88	1	2	1	1	2	1	7
4281	Palm Springs North Elementary	17615 NW 82ND AVE	33015	965	0	8,117	2	137	1	1	2	1	2	1	7
2521	Oliver Hoover Elementary	9050 HAMMOCKS BLVD	33196	905	1	5,306	2	47	2	2	2	1	1	1	7
5421	Sunset Park Elementary	10235 SW 84TH ST	33173	650	2	5,000	2	73	2	2	1	1	2	1	7
5671	Vineland K-8 Center	8455 SW 119TH ST	33156	807	0	18,253	2	34	4	1	3	1	1	1	7
271	Bent Tree Elementary	4861 SW 140TH AVE	33175	563	0	1,664	2	80	5	1	1	1	2	2	7

School ID	School Name	School Address	Zipcode	Enrollment	Number of Ped Crashes	Traffic Volume	Number of Lanes	No. Students within Half Mile	No. of Students Walking to School	Crash Score	Traffic Score	Lane Score	Student Score	Walk Score	Need Score
2191	Spanish Lake Elementary	7940 NW 194TH St	33015	1689	0	2,000	2	181	5	1	1	1	2	2	7
161	Avocado Elementary	16969 SW 294TH ST	33030	640	0	8,211	2	26	10	1	2	1	1	2	7
2151	Jack D. Gordon Elementary	14600 COUNTRY WALK DR	33186	1195	0	5,000	2	82	10	1	1	1	2	2	7
211	Dr. Manuel C. Barreiro Elementary	5125 SW 162ND AVE	33185	900	0	1,122	2	114	15	1	1	1	2	2	7
4691	Jane S. Roberts Center ECC-3	16350 SW 47TH ST	33185	0	0	1,703	2	83	40	1	1	1	2	2	7
5961	Winston Park K-8 Center	13200 SW 79TH ST	33183	1373	1	5,000	2	0	50	2	1	1	1	2	7
3621	Coconut Palm K-8 Academy	24400 SW 124TH AVE	33032	1323	0	3,585	2	0	6	1	1	1	1	2	6
4581	Redland Elementary	24501 SW 162ND AVE	33031	898	0	374	2	4	0	1	1	1	1	1	5

Table 13: Crossing Guard Needs for Schools in the City of Miami

School ID	School Name	School Address	Zipcode	Enrollment	Number of Ped Crashes	Traffic Volume	Number of Lanes	No. Students within Half Mile	No. of Students Walking to School	Crash Score	Traffic Score	Lane Score	Student Score	Walk Score	Need Score
4841	Santa Clara Elementary	1051 NW 29TH TER	33127	543	18	30,547	4	353	41	3	5	2	3	2	15
5001	Shenandoah Elementary	1023 SW 21ST AVE	33135	1000	9	39,328	4	337	30	2	5	2	3	2	14
4681	Riverside Elementary	1190 SW 2ND ST	33130	909	51	24,524	4	460	50	3	4	2	3	2	14
3021	Jesse J. McCrary Jr. Elementary	514 NW 77TH ST	33150	510	11	27,730	6	192	65	2	4	3	2	3	14
3051	Toussaint L'ouverture Elementary	120 NE 59TH ST	33137	449	20	20,666	4	202	83	3	4	2	2	3	14
5321	Southside Elementary	45 SW 13TH ST	33130	597	17	16,869	4	324	10	3	3	2	3	2	13
801	Citrus Grove Elementary	2121 NW 5TH ST	33125	894	6	27,353	4	364	20	2	4	2	3	2	13
2531	Thena C. Crowder Elementary	757 NW 66TH ST	33150	131	23	32,594	4	59	45	3	5	2	1	2	13
3501	Morningside Elementary	6620 NE 5TH AVE	33138	421	8	27,921	4	146	55	2	4	2	2	3	13
2501	Holmes Elementary	1175 NW 67TH ST	33150	524	3	16,342	4	380	90	2	3	2	3	3	13
1881	Henry M. Flagler Elementary	5222 NW 1ST ST	33126	825	10	35,197	4	265	0	2	5	2	2	1	12
5041	Silver Bluff Elementary	2609 SW 25TH AVE	33133	536	2	34,239	4	196	25	1	5	2	2	2	12
3431	Phyllis Ruth Miller Elementary	840 NE 87TH ST	33138	652	2	43,215	4	237	30	1	5	2	2	2	12
2781	Kinloch Park Elementary	4275 NW 1ST ST	33126	856	15	26,751	4	260	30	2	4	2	2	2	12
81	Lenora B. Smith Elementary	4700 NW 12TH AVE	33127	483	8	22,717	4	185	50	2	4	2	2	2	12
2351	Eneida Massas Hartner Elementary	401 NW 29TH ST	33127	584	5	16,158	4	283	40	2	3	2	2	2	11
121	Auburndale Elementary	3255 SW 6TH ST	33135	881	8	10,318	2	340	60	2	2	1	3	3	11
1441	Paul Laurence Dunbar Elementary	505 NW 20TH ST	33127	350	3	10,578	4	172	65	2	2	2	2	3	11
5931	Phillis Wheatley Elementary	1801 NW 1ST PL	33136	205	14	15,562	2	106	80	2	3	1	2	3	11
4961	Shadowlawn Elementary	149 NW 49TH ST	33127	293	4	15,589	2	202	15	2	3	1	2	2	10
261	Bel-Aire Elementary	10205 SW 194TH ST	33157	486	3	17,672	4	37	1	2	3	2	1	1	9
1801	Fairlawn Elementary	444 SW 60TH AVE	33144	661	3	10,660	2	273	10	2	2	1	2	2	9
5561	Frances S. Tucker Elementary	3500 DOUGLAS RD	33133	388	12	18,083	2	79	15	2	3	1	1	2	9
881	Comstock Elementary	2420 NW 18TH AVE	33142	544	7	11,603	2	192	15	2	2	1	2	2	9
5951	Whispering Pines Elementary	18929 SW 89TH RD	33157	684	1	15,217	2	125	40	1	3	1	2	2	9
1601	Edison Park Elementary	500 NW 67TH ST	33150	362	2	11,960	2	175	60	1	2	1	2	3	9
3191	Ada Merritt K-8 Center	660 SW 3RD ST	33130	714	20	10,467	2	34	1	3	2	1	1	1	8
1361	Frederick Douglass Elementary	314 NW 12TH ST	33136	385	21	9,566	2	143	2	3	1	1	2	1	8
4421	Pinecrest Elementary	10250 SW 57TH AVE	33156	929	0	15,851	2	38	5	1	3	1	1	2	8
2661	Kensington Park Elementary	711 NW 30TH AVE	33125	1236	0	14,088	2	252	5	1	2	1	2	2	8
5981	Dr. Edward L. Whigham Elementary	21545 SW 87TH AVE	33189	658	0	15,025	2	36	15	1	3	1	1	2	8
4171	Orchard Villa Elementary	5720 NW 13TH AVE	33142	410	12	3,301	2	276	0	2	1	1	2	1	7
4221	Palmetto Elementary	12401 SW 74TH AVE	33156	549	2	16,849	2	64	1	1	3	1	1	1	7
111	Maya Angelou Elementary	1850 NW 32ND ST	33142	570	11	4,617	2	256	1	2	1	1	2	1	7
841	Coconut Grove Elementary	3351 MATILDA ST	33133	336	13	4,615	2	107	2	2	1	1	2	1	7
1121	Coral Way K-8 Center	1950 SW 13TH AVE	33145	1559	3	9,813	2	0	10	2	1	1	1	2	7
1241	Cutler Ridge Elementary	20210 CORAL SEA RD	33189	888	0	9,637	2	137	25	1	1	1	2	2	7
2541	Howard Drive Elementary	7750 SW 136TH ST	33156	622	0	7,875	2	85	20	1	1	1	1	2	6

School locations in the City of Miami were evaluated within ArcMap and the scale included in Table 11 was applied. A summary of results is included in Table 14. The results indicate that there is one school in the City of Miami with relatively higher need and there are a number of schools with a Need Score of 10, 11, and 12. The Crossing Guard Need Scale scores for each school are included in Table 13 which also includes raw data for each criterion.

Table 14: Distribution of Schools in the City of Miami

Score	Number of Schools by Need
5 (Low Need)	1
6	6
7	5
8	6
9	1
10	4
11	5
12	5
13	4
14	1
15	1
16	0
17 (High Need)	0
Total	38

5.5. Crossing Guard Need Scale for the City of Miami Gardens

A Crossing Guard Need Scale was developed for 18 schools in the City of Miami Gardens. The Crossing Guard Data ranges and descriptive statistics are included in Table 15. Data ranges are based on statistical breaks in the data and are customized for this jurisdiction.

Table 15: Crossing Guard Need Scale for the City of Miami Gardens

Criteria	Mean/St. Deviation	Data Range	Points	Number of Schools
Pedestrian Crashes (Number)	2.9 / 2.2	0 or 1	1	5
		2 to 4	2	8
		5 or more	3	5
Traffic Volume (Number of Vehicles)	16,180 / 10,837	0 to 5,000	1	2
		5,001 to 10,000	2	5
		10,001 to 15,000	3	4
		15,001 to 30,000	4	4
		30,001 or more	5	3
Number of Lanes	2.7 / 0.9	2	1	12
		4	2	0
		More than 4	3	6
Number of Students within half mile	130 / 66	75 or Less	1	4

Criteria	Mean/St. Deviation	Data Range	Points	Number of Schools
radius		76 to 200	2	11
		More than 200	3	3
Percentage of Students that Walk to School	29.3 / 25.9	10 Percent or less	1	3
		11 – 75 Percent	2	11
		More than 75 Percent	3	4

School locations in the City of Miami Gardens were evaluated within ArcMap and the scale included in Table 15 was applied. A summary of results is included in Table 16. The results indicate there are no schools with relatively low or high needs and most of the schools fall in the middle of the scale. The Crossing Guard Need Scale scores for each school are included in Table 19 which also includes raw data for each criterion.

Table 16: Distribution of Schools in the City of Miami Gardens

Score	Number of Schools by Need
5 (Low Need)	0
6	0
7	2
8	2
9	0
10	5
11	2
12	3
13	1
14	2
15	0
16	0
17 (High Need)	0
Total	18

5.6. Crossing Guard Need Scale for the City of Hialeah

A Crossing Guard Need Scale was developed for 17 schools in the City of Hialeah. The Crossing Guard Data ranges and descriptive statistics are included in Table 17. Data ranges are based on statistical breaks in the data and are customized for this jurisdiction.

Table 17: Crossing Guard Need Scale for the City of Hialeah

Criteria	Mean/St. Deviation	Data Range	Points	Number of Schools
Pedestrian Crashes (Number)	3.9 / 3.2	0 or 1	1	6
		2 to 6	2	7
		7 or more	3	4
Traffic Volume (Number of Vehicles)	23,415 / 9,408	0 to 10,000	1	2
		10,001 to 20,000	2	5
		21,001 to 30,000	3	5
		30,001 to 40,000	4	4
		25,001 or more	5	1
Number of Lanes	3.8 / 1.2	2	1	4
		4	2	11
		More than 4	3	2
Number of Students within half mile radius	299 / 176	150 or Less	1	3
		151 to 400	2	11
		More than 400	3	3
Percentage of Students that Walk to School	16.2 / 21.9	Less than 15 Percent	1	10
		15 – 50 Percent	2	5
		More than 50 Percent	3	2

School locations in the City of Hialeah were evaluated within ArcMap and the scale included in Table 17 was applied. A summary of results is included in Table 18. The results indicate there are no schools with relatively low or high needs. Most of the schools fall in the middle of the scale. The Crossing Guard Need Scale scores for each school are included in Table 20 which also includes raw data for each criterion.

Table 18: Distribution of Schools in the City of Hialeah

Score	Number of Schools by Need
5 (Low Need)	0
6	0
7	3
8	2
9	1
10	5
11	1
12	1
13	3
14	1
15	0
16	0
17 (High Need)	0
Total	17

Table 19: Crossing Guard Needs for Schools in the City of Miami Gardens

School ID	School Name	School Address	Zipcode	Enrollment	Number of Ped Crashes	Traffic Volume	Number of Lanes	No. Students within Half Mile	No. of Students Walking to School	Crash Score	Traffic Score	Lane Score	Student Score	Walk Score	Need Score
4001	Norwood Elementary	19810 NW 14TH CT	33169	497	4	31,704	4	208	45	2	5	2	3	2	14
3781	Barbara Hawkins Elementary	19010 NW 37TH AVE	33056	321	5	32,465	4	90	51	3	5	2	2	2	14
3241	Miami Gardens Elementary	4444 NW 195TH ST	33055	292	2	38,863	4	148	70	2	5	2	2	2	13
641	Bunche Park Elementary	16001 BUNCHE PARK SCHOOL DR	33054	308	4	23,991	4	115	54	2	4	2	2	2	12
2401	Hibiscus Elementary	18701 NW 1ST AVE	33169	614	5	5,535	2	255	75	3	2	1	3	3	12
461	Brentwood Elementary	3101 NW 191ST ST	33056	791	5	10,292	2	190	85	3	3	1	2	3	12
3701	Norland Elementary	19340 NW 8TH CT	33169	598	2	16,510	2	85	20	2	4	1	2	2	11
2161	Golden Glades Elementary	16520 NW 28TH AVE	33054	293	8	13,959	2	20	75	3	3	1	1	3	11
5131	North Dade Center For Modern Languages Elementary	16001 BUNCHE PARK SCHOOL DR	33054	380	4	24,571	4	3	0	2	4	2	1	1	10
3581	Myrtle Grove Elementary	3125 NW 176TH ST	33056	325	5	11,467	2	150	0	3	3	1	2	1	10
5081	Skyway Elementary	4555 NW 206TH TER	33055	456	1	29,948	4	71	20	1	4	2	1	2	10
1161	Crestview Elementary	2201 NW 187TH ST	33056	674	2	8,790	2	218	38	2	2	1	3	2	10
4301	Parkview Elementary	17631 NW 20TH AVE	33056	383	2	8,992	2	133	82	2	2	1	2	3	10
681	Carol City Elementary	4375 NW 173RD DR	33055	580	0	7,142	2	139	40	1	2	1	2	2	8
4341	Parkway Elementary	1320 NW 188TH ST	33169	354	0	11,842	2	71	43	1	3	1	1	2	8
3821	North County Elementary	3250 NW 207TH ST	33056	354	4	5,000	2	96	60	2	1	1	2	2	8
4881	Scott Lake Elementary	1160 NW 175TH ST	33169	534	0	8,161	2	199	10	1	2	1	2	1	7
4541	Rainbow Park Elementary	15355 NW 19TH AVE	33054	412	0	2,000	2	142	54	1	1	1	2	2	7

Table 20: Crossing Guard Needs for Schools in the City of Miami Gardens

School ID	School Name	School Address	Zipcode	Enrollment	Number of Ped Crashes	Traffic Volume	Number of Lanes	No. Students within Half Mile	No. of Students Walking to School	Crash Score	Traffic Score	Lane Score	Student Score	Walk Score	Need Score
5201	South Hialeah Elementary	265 E 5TH ST	33010	1209	7	29,568	4	591	76	3	3	2	3	3	14
1481	John G. Dupuis Elementary	1150 W 59TH PL	33012	724	3	40,456	6	196	0	2	5	3	2	1	13
3901	North Hialeah Elementary	4251 E 5TH AVE	33013	641	11	32,328	4	245	34	3	4	2	2	2	13
3421	M.A. Milam K-8 Center	6020 W 16TH AVE	33012	1165	4	29,971	4	606	55	2	3	2	3	3	13
481	James H. Bright Elementary	2530 W 10TH AVE	33010	726	10	33,858	4	343	0	3	4	2	2	1	12
4261	Palm Springs Elementary	6304 E 1ST AVE	33013	722	1	33,892	4	199	20	1	4	2	2	2	11
2621	J.W. Johnson Elementary	735 W 23RD ST	33010	21	4	21,896	4	343	0	2	3	2	2	1	10
5711	Mae M. Walters Elementary	650 W 33RD ST	33012	781	4	21,896	4	295	1	2	3	2	2	1	10
5051	Ernest R. Graham Elementary	7330 W 32ND AVE	33018	1258	2	30,115	4	0	2	2	4	2	1	1	10
2361	Hialeah Elementary	550 E 8TH ST	33010	813	6	26,206	4	131	15	2	3	2	1	2	10
3141	Meadowlane Elementary	4280 W 8TH AVE	33012	1133	3	19,140	4	233	40	2	2	2	2	2	10
5601	Twin Lakes Elementary	6735 W 5TH PL	33012	599	7	18,422	2	182	1	3	2	1	2	1	9
1521	Amelia Earhart Elementary	5987 E 7TH AVE	33013	501	1	16,101	6	47	0	1	2	3	1	1	8
1921	Flamingo Elementary	701 E 33RD ST	33013	822	1	15,821	4	365	1	1	2	2	2	1	8
4241	Palm Lakes Elementary	7450 W 16TH AVE	33014	867	1	13,671	2	287	5	1	2	1	2	1	7
5021	Ben Sheppard Elementary	5700 W 24TH AVE	33016	1017	1	9,896	2	634	5	1	1	1	3	1	7
3981	North Twin Lakes Elementary	625 W 74TH PL	33014	617	0	4,818	2	380	20	1	1	1	2	2	7

6. Recommendations

The recommendations focus on identification of measures to improve safety for children walking to school.

6.1. Engineering Improvements

- There are roadways in the County that do not have sidewalks and there are intersections that do not have designated crosswalks on all potential legs. The first and foremost engineering improvement should be to provide sidewalks and designated crosswalks providing safest walking connections to schools.

- Safety is not a one-time issue and all engineering improvements related to roadway design, geometry, and markings, signals etc. should be thoroughly monitored throughout the year to ensure safety of all pedestrians. Locations near elementary schools should consider special treatment suitable for children. For example, pedestrian signals should be adjusted to accommodate children who walk at slower speeds.

- Engineering improvements around schools should focus on increasing visibility of children by providing additional signage and marking. Flashing beacons should be considered at unsignalized intersections.

- Intersections can be made safer by ensuring compliance with sight distance requirements. Sight distance is an issue at many intersections and such locations near schools can be targeted for engineering improvements. Many times the solution is simple enforcement by eliminating sidewalk encroachment.

- Vegetation and areas around intersections can be modified to meet the principles of Crime Prevention through Environmental Design (CPTED). As discussed previously,

perception of safety may be just as important as the actual safety.

- School crossing guards are trained staff that witness engineering needs and deficiencies on a daily basis. A formal survey of school crossing guards will ensure that their input is used to identify relevant engineering needs.

- Turn movements restrictions at intersections with high turning volumes should be considered to minimize conflicts between child pedestrians and motorists. Right turns are prohibited on red at many intersections with high pedestrian volumes.

- Maintenance of sidewalks and crosswalks also plays a major role in the safety of child pedestrians. Such improvements should be prioritized or advanced for high volume pedestrian areas or in areas near schools.

- Pedestrian refuge areas reduce the distance for a child pedestrian to make a safe crossing. However, pedestrian refuges are added obstruction in the roadway and may conflict with left turns. Suitability of such improvements should be determined on case-by-case basis.

- Engineering improvements identified and implemented through the Safe Route to School (SRTS) program are critical and should continue receiving high priority.

6.2. Education and Encouragement

- The MPO, the M-DCPS (school board), FDOT, and private organizations like WalkSafe conduct year-round safety programs to educate teachers, parents, and children. Parents should be encouraged to walk with their children to school. This is a great way for families to spend time together and get physical activity at the same time. While this is ideal, it's not always possible. Education programs, wherever applicable, could provide tools to school administrators to form groups of older and younger children to provide an additional level of protection. Parents or adult volunteers could be encouraged to take turns walking groups of children from their neighborhood. This is more formally called a Walking School Bus.

- School administrators and teachers can be trained to conduct safety workshops for students that focus on basic walking skills like stopping at the curb or edge of the street, checking all directions to ensure clear and safe crossing conditions, etc. The provision of school crossing guards should be considered an additional safety measure which does not eliminate the need to teach basic traffic navigation skills to child pedestrians.

- Parents and children can be provided with some guidance on safest pedestrian routes to schools that have a minimal number of street crossings.

- Integration of walk related subjects into traditional classroom subjects should be considered to increase awareness. The school board and UM's WalkSafe program work with teachers to implement this. For example, a mathematics problem may include calculating the average walking speeds or distance. More involved assignments may include a voluntary assignment of walking a given distance every day. In addition to serving an educational objective, such exercises can potentially portray walk as a feasible mode to travel.

- The Child Pedestrian Safety Curriculum was developed by the National Highway Traffic Safety Administration (NHTSA) to teach and encourage practice in safe pedestrian behaviors for students at the elementary level (grades Kindergarten through Fifth). It is organized into five lessons that target the main areas of pedestrian safety: walking near traffic, crossing streets, crossing intersections, parking lot safety, and school bus stop and school bus safety. The students gain knowledge through teacher discussion and demonstration. Following this instruction, students are given ample time to ingrain the behavioral experiences through active learning where they practice the skills they have learned. Finally, teachers are encouraged to provide lesson reviews and extensions in the form of cross-curriculum experiences to further take students toward the "autonomous" stage. These times of curricular

exercises should be incorporated throughout the M-DCPS (school board) system.

- The Mid-America Regional Council (MARC), a regional planning organization for Greater Kansas City, is training people to become "Safety Ambassadors" in an effort to provide consistency in the pedestrian and bicycle safety messages that children are learning. The dual funding was used for two sessions that have trained 38 people. Many police officers, emergency management technicians and experts in health, safety and education are already interacting with people about safe routes to school, and the standard training ensures that they are sharing the same safety messages throughout the region. Established forums like CTST can use its members as "Safety Ambassadors" that spread the child pedestrian safety messages throughout their organizations in the County.

- Variable Message Signs (VMS) installed along major roadways in the County provide a valuable opportunity to educate motorists. Brief messages such as "Watch of Child Pedestrians" or "Yield to Pedestrians" signs can be displayed to educate a significant number of motorists in the County.

- Crossing guard training, according to the FDOT guidance, should continue to receive a high priority.

6.3. Enforcement

- Forums like CTST should continue working with police departments, traffic courts, and city and county attorneys to enforce key laws and impose meaningful penalties for pedestrian related violations.

- Walk mode specific traffic violators should be given options to attend classes of pedestrian safety in lieu of standard defensive driving classes. Certified volunteers may be recruited to undertake this effort.

- A formal mechanism to allow crossing guards to report areas with high violations should be devised. Police resources for locations with a high number of violations should be prioritized. Crossing guards are the eyes at critical locations and their feedback should be incorporated in enforcement decision-making.

- Parents driving to school to drop off their children are often in conflict with others walking their children to school. The town of Independence, Oregon, a rural community, developed a program to increase enforcement around school areas while educating driving parents.

6.4. Funding the Adult School Crossing Guard Program

- Forums like CTST should consider supporting additional dedicated and stable sources of funding for school crossing guard programs. According to the National Center for Safe Routes to School, a variety of sources have been used across the nation. Communities have obtained financial resources through taxes, local school boards, sheriff, police, public works and traffic engineering departments and also through surcharges on parking fines. Public and private organizations as well as Parent-Teacher Associations or Organizations also have contributed funding for guard programs.

- The County or municipalities are authorized under Section 318.21(11), F.S., to impose a surcharge on parking fines for the purpose of funding a school crossing guard program. Florida Senate Bill 1716, introduced in 2012, allows jurisdictions to impose a countywide surcharge on school zone speed violations for the sole purpose of funding school crossing guard programs throughout the county.

- Unfortunately, jurisdictions in Miami-Dade County are not the only ones struggling with funding issues as many cities and jurisdictions across the Country are grappling with funding shortages. Some cities have completely withdrawn funding from crossing guard programs and local school districts are left solely responsible for funding the program. Child safety should be a high priority and accordingly reflected in budgets and local lists of priorities. An increased awareness of the program through parents and teachers will bring attention to this important cause and could result in increased funding.

- Cities like Corpus Christie, Texas, are considering a $1.50 child safety fee for each registered vehicle to raise an estimated $275,000 for their crossing guard program. A similar program could be considered for funding local school crossing guard programs.

- The City of Walnut Creek, California, has committed to using redevelopment funds for their crossing guard program. A similar provision could be considered in the County as well.

- Cities are increasingly looking at contracting out crossing guard services to private companies. The City of Pacentia, California did so in 1997. The City of San Jose recently completed a preliminary business case analysis to identify feasibility of outsourcing their crossing guard program and found that it could save approximately $55,000 or about 4.3% per year. More cities have adopted this approach and a similar approach could be evaluated by many jurisdictions in the County. The ultimate savings would depend on local factors such as availability of qualified personnel, overhead, etc.