

**New York City Department of Transportation
Office of School Safety Engineering**



School Safety Engineering Project

FINAL REPORT: Saint Elizabeth, Queens



**Prepared by
The RBA Group and URBITRAN Associates Inc.**



May 4, 2006

**School Safety Engineering Project
Final Report: St. Elizabeth School, Queens**

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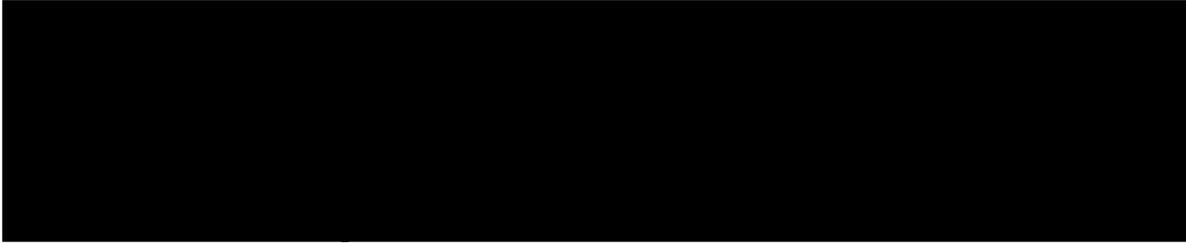
1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The Department of Transportation (DOT) has developed school safety maps for 1,471 schools throughout the City. Schools currently in the program are primarily elementary and intermediate schools with an enrollment of at least 250 students. The safety plans include the designation of official school crosswalks, identified by prominent warning signs and roadway markings. DOT also designates curbside locations for school bus loading and unloading and other parking controls to improve conditions for students. In addition, nearly 350 speed reducers (humps) have been installed in the immediate vicinity of schools.

Under this consultant study, the School Safety Engineering Project, crash data in the vicinity of all program schools was reviewed. As a result, schools were ranked in terms of pedestrian safety, and 135 “priority” schools were identified Citywide. At each of these priority schools, safety improvements are being recommended (e.g., new school crosswalks, new traffic signals and signal timing modifications, new speed reducers). In addition, 32 of these schools will receive further investigation to design physical improvements (e.g., raised center medians, widened sidewalks, “neckdowns” or “bulbouts” at intersections). St. Elizabeth School in Queens is one of the 135 “priority” schools identified by the New York City Department of Transportation, Office of School Safety Engineering.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

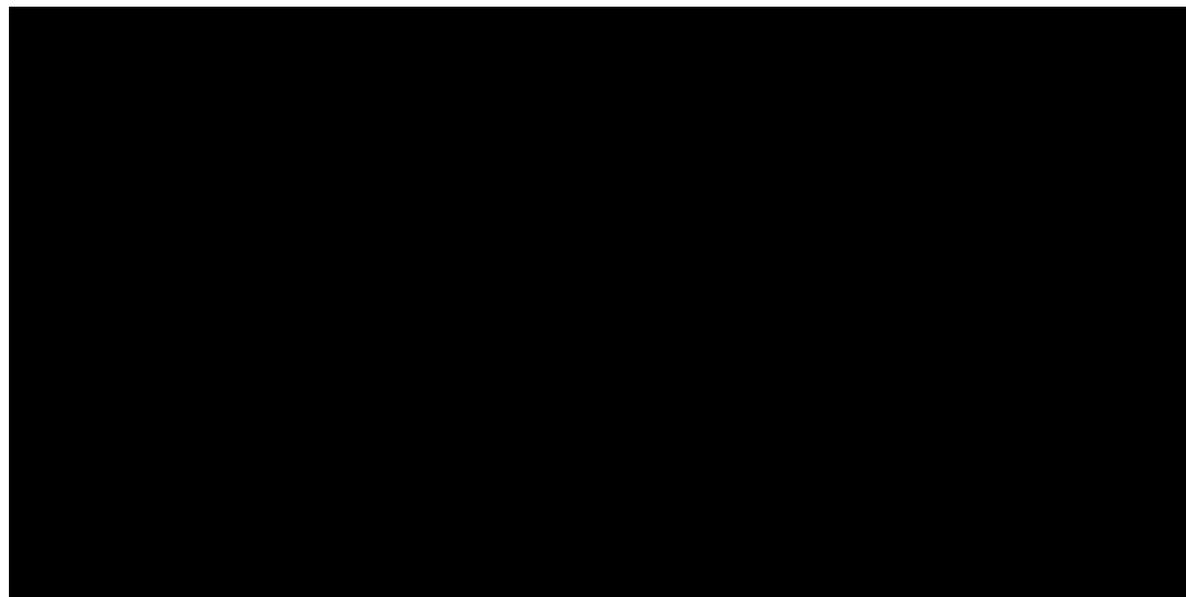
Exhibit 1, at the end of this section, shows an aerial view of the neighborhood surrounding St. Elizabeth School, which is generally a combination of residential and commercial uses in character. St. Elizabeth School has two separate buildings situated on the both the southeast and southwest corners of 85th Street & Atlantic Avenue with 95th Avenue to the south. Rockaway Boulevard is two blocks to the south.

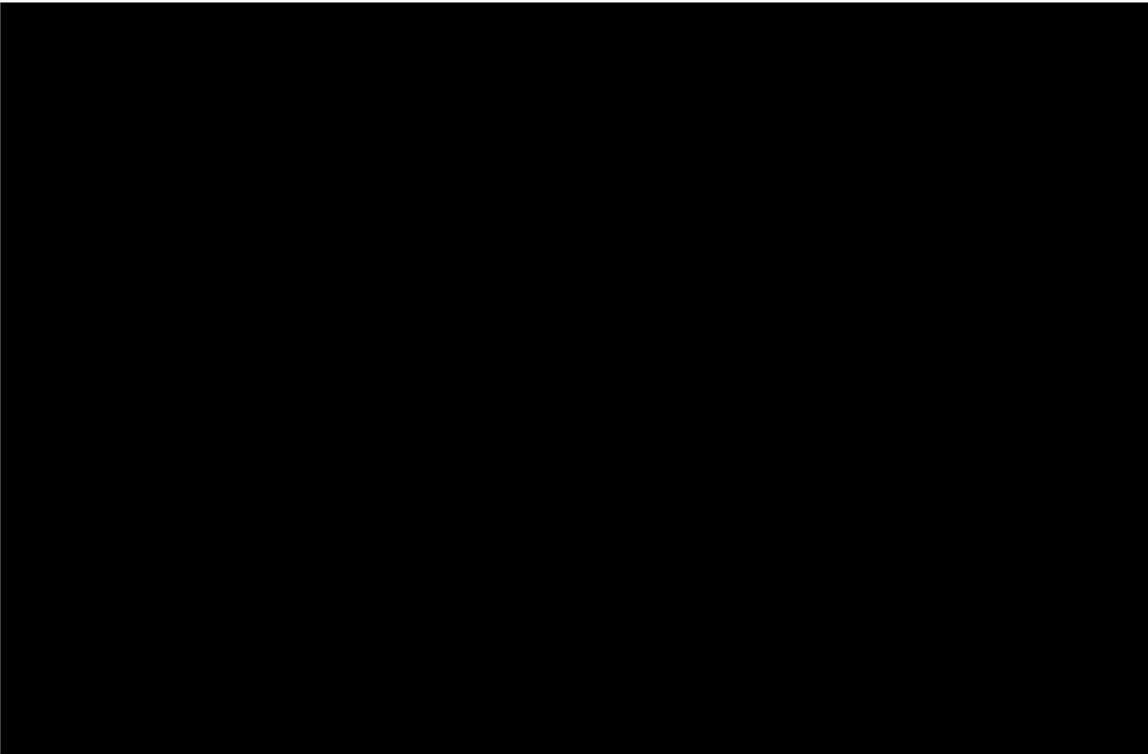
2.3 MEETING WITH SCHOOL REPRESENTATIVES

Consultant staff met with the principal, the assistant principal, the assistant pastor, parents from St. Elizabeth School, and school crossing guards at the school on the morning of Tuesday, May 25, 2004. According to the school officials, the problems faced by St. Elizabeth School students are as follows:

- There are no street markings, school crosswalks, or text messages on Atlantic Avenue at 84th and 85th Streets.
- There is not enough green time for pedestrians to cross Atlantic Avenue.
- Atlantic Avenue median is high and difficult for young kids to cross (not enough width in the median ramp),

(See Appendix for a summary of school concerns, and the school's survey response.)





2.6 PRIMARY MODE OF TRANSPORT TO AND FROM SCHOOL

A school’s catchment area is typically defined by the Department of Education and normally shown in an Exhibit at the end of this section. Since St. Elizabeth is a private parochial school, the actual “catchment area” is dependent upon other factors, determined by the school administrators.

Table 1 presents the mode of travel for St. Elizabeth School as estimated by school representatives.

TABLE 1: MODE OF TRAVEL	STUDENTS (Percentage)
Walk	50%
Driven by car	40%
School bus	0%
MTA Bus/Subway	10%
Bicycle	0%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

There were no additional student pedestrian traffic generators observed in the vicinity of St. Elizabeth school.

2.8 CROSSING GUARD LOCATIONS

According to the school principal, there are three crossing guards assigned to the area. They are assigned to the following intersections:

- 84th Street & Atlantic Avenue

- 84th Street & 95th Avenue
- 85th Street & 95th Avenue

The crossing guard locations are shown in Exhibit 3 at the end of this section.



Figure 2: Looking southeast across intersection of Atlantic Avenue & 84th Street at crossing guard location

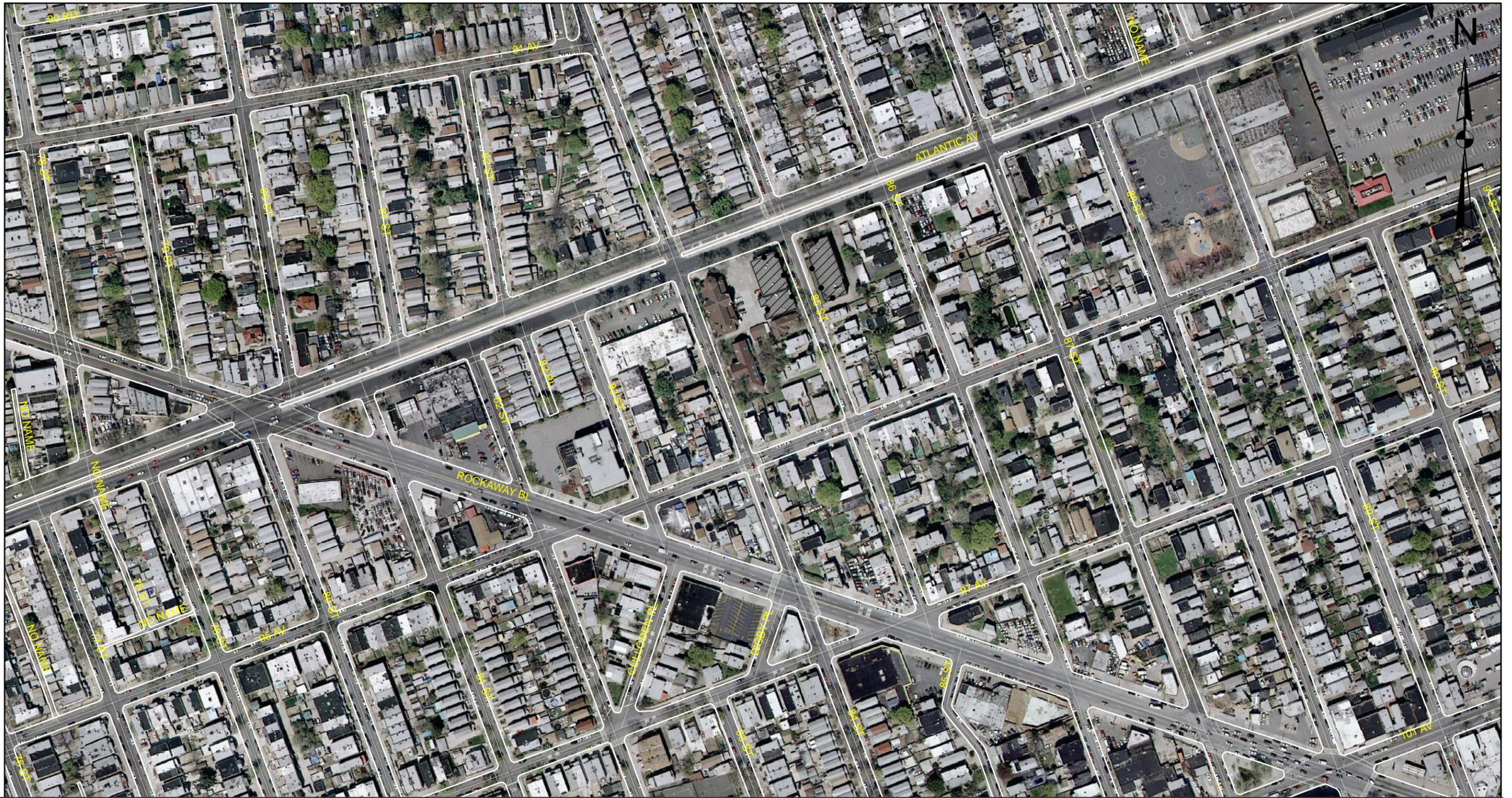
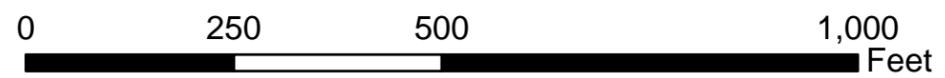


EXHIBIT 1

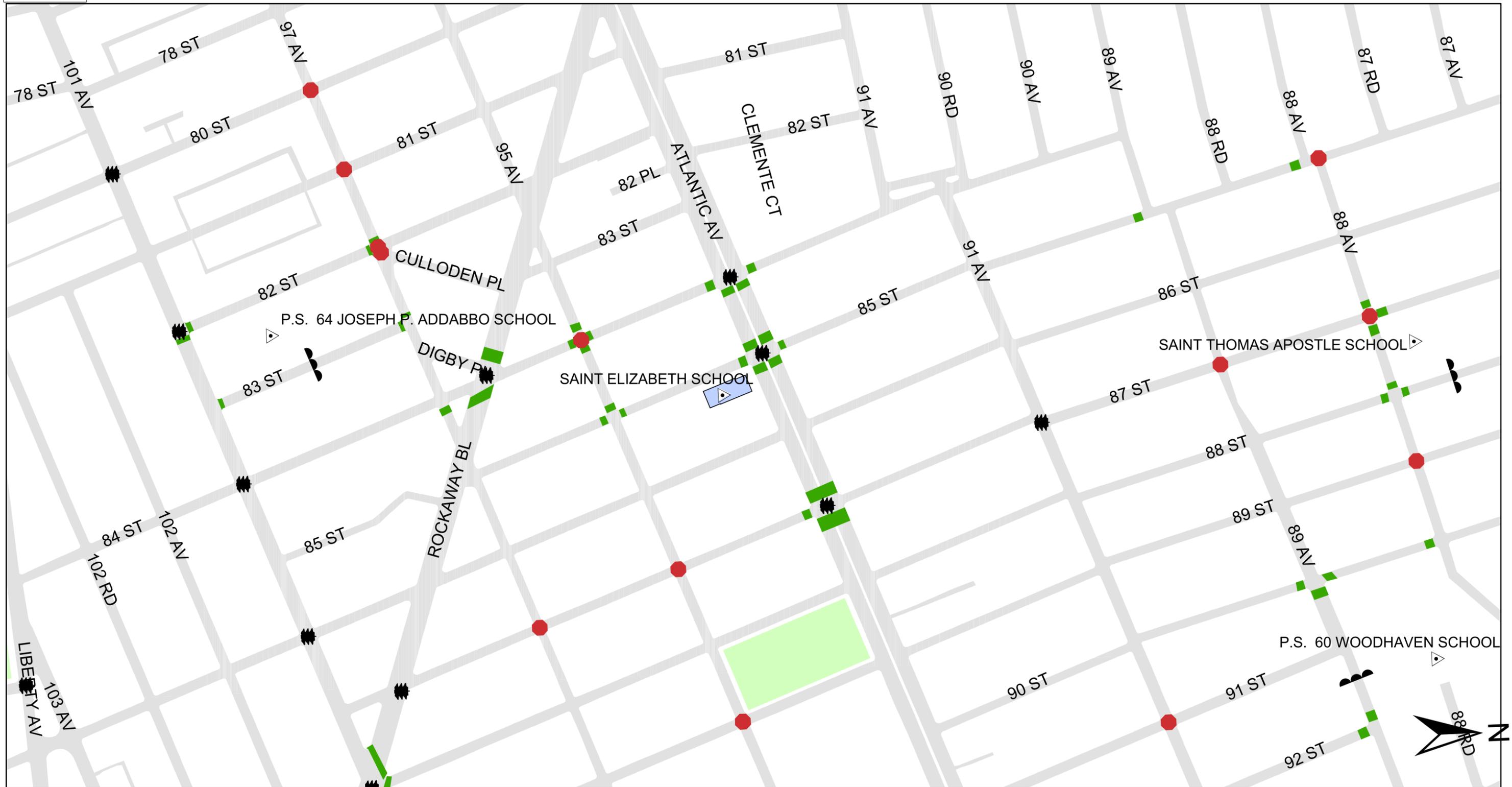
ST. ELIZABETH QUEENS

AERIAL PHOTOGRAPH





School Traffic Safety Map



The School Traffic Safety Map was established to help provide the maximum degree of safety for children going to and from school - by indicating the location of speed reducers, school crosswalks and some traffic control devices. (While virtually all intersections in NYC benefit from traffic control devices - such as stop signs, traffic signals, yield signs, and all way stop signs - this map shows only traffic signals and all way stop signs.) The school crosswalks that are shown are ladder striped and make the crosswalk more visible to drivers and help make the intersection safer. These crosswalks are where school children are recommended to cross.

Note: Every attempt has been made to provide complete and accurate information that is updated regularly. The City's streets are constantly changing and it is not always possible to present information without error.

LEGEND:

SCHOOL LOCATION 	TRAFFIC SIGNAL 
SCHOOL CROSSWALK 	ALL - WAY STOP 
	SPEED REDUCER 

Queens
SAINT ELIZABETH SCHOOL

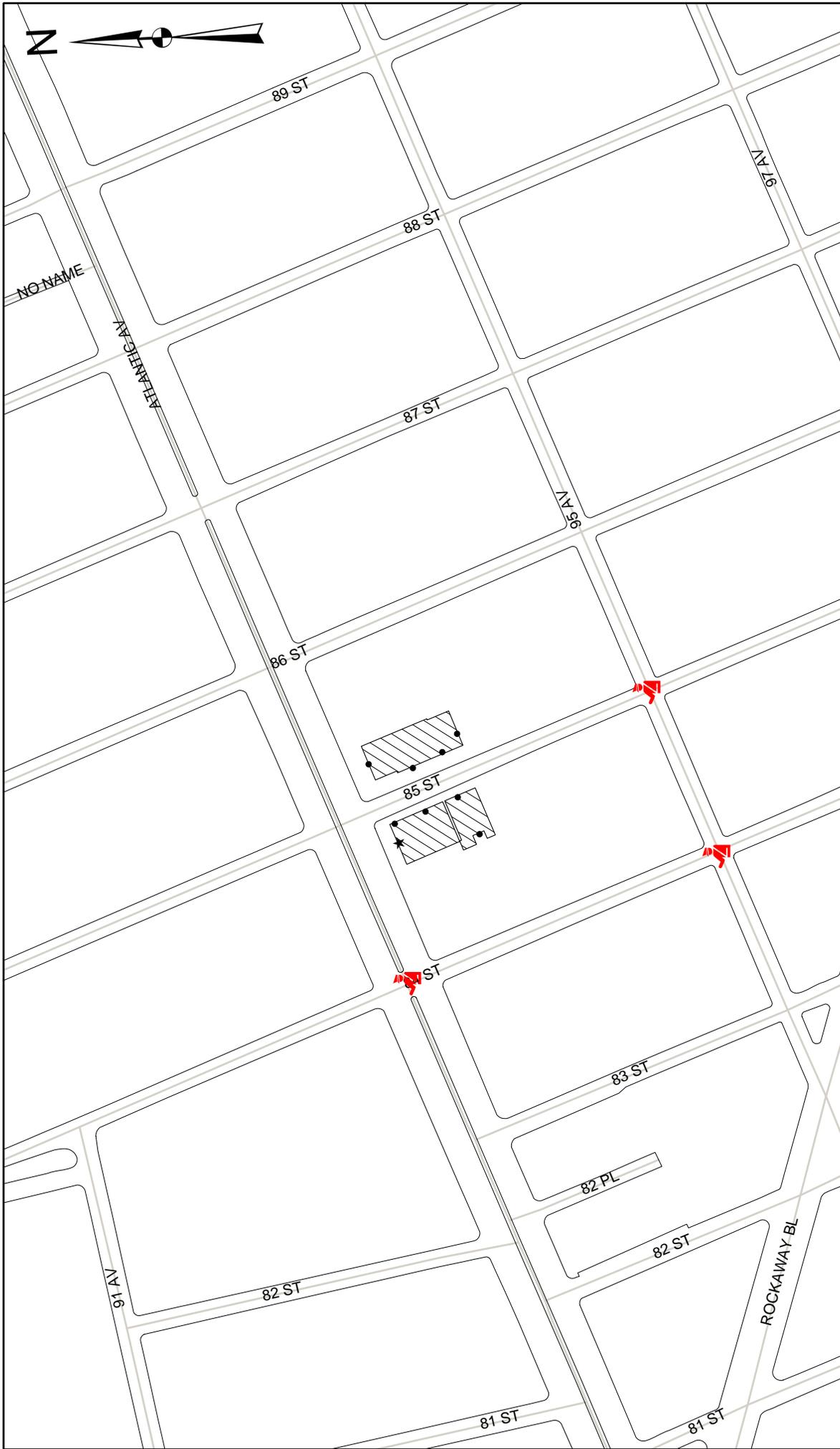
Prepared by the NEW YORK CITY DEPARTMENT OF TRANSPORTATION, Iris Weinsall, COMMISSIONER.

Map created on 11/17/2006

EXHIBIT 2

COMM. BOARD: 409
 PRECINCT: 102

1.5.1 6



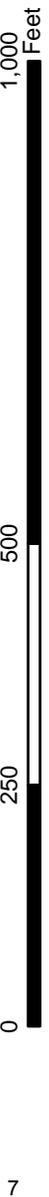
LEGEND:

CROSSING GUARD LOCATION



EXHIBIT 3

ST. ELIZABETH SCHOOL QUEENS



CROSSING GUARD LOCATIONS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school representatives, there are no yellow school buses serving the school, while approximately 25 students ride an MTA bus to school.

3.2 PARENT DROP-OFF OPERATIONS

Parents generally drop-off students on 85th Street, on Atlantic Avenue and on 95th Avenue. There was some congestion and double-parking during the morning arrival. In addition, during the field visit, some parents who used 95th Avenue (a one-way westbound street) were observed backing up on 85th Street (a one-way southbound street) to drop-off students rather than going around the block.

3.3 PARKING REGULATIONS

Parking regulations around the school block are shown in Exhibit 4, at the end of this section. Atlantic Avenue is a “Snow Route” which prohibits standing on the street during an emergency condition. In addition, Atlantic Avenue is also a designated through truck route.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

Exhibit 2, at the end of Section 2, shows existing traffic signals, and the school signs and markings assigned to St. Elizabeth School. It should be noted that a citywide signage program is currently underway to upgrade school signage to current Federal Manual on Uniform Traffic Control Devices (MUTCD) standards of fluorescent yellow-green accompanied by downward pointing arrows. Signs scheduled to be installed under this program are shown as “existing” in Exhibit 7.

3.5 ACCIDENT SUMMARY

The number and severity of accidents at various locations are typical indicators used to help determine the existence and severity of any potentially safety-related situations. Such situations are then examined for possible solutions and/or remedies.

Exhibit 5, at the end of this section, and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV) in the vicinity of St. Elizabeth School, for a three-year period from January 1, 1998 through December 1, 2000. The DMV data provides some detail relating to the cause of an accident. Table 3 provides a summary of more recent accident data obtained from the New York City Police Department (NYPD). Though current through 2004, the NYPD data does not provide the same level of detail as the DMV data. Further discussions of accidents are included in Section 3.6, Traffic Operations and Issues.

TABLE 2: ACCIDENT SUMMARY OF NYS DMV DATA (1998-2000)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Atlantic Avenue and 84 th Street	49	0	0	0
Atlantic Avenue and 85 th Street	9	0	0	0
95 th Avenue and 84 th Street	18	0	0	0
95 th Avenue and 85 th Street	2	0	0	0
Rockaway Boulevard & 84 th Street / Digby Place	7	0	0	0
97 th Avenue & 84 th Street	21	0	0	0
TOTAL	106	0	0	0

TABLE 3: ACCIDENT SUMMARY OF NYPD DATA (2001-2004)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Atlantic Avenue and 84 th Street	70	4	0	0
Atlantic Avenue and 85 th Street	8	0	0	0
95 th Avenue and 84 th Street	5	0	0	0
95 th Avenue and 85 th Street	3	0	0	0
Rockaway Boulevard & 84 th Street / Digby Place	23	1	0	0
97 th Avenue. & 84 th Street	13	0	0	0
TOTAL	122	5	0	0

* School-related accidents are defined as accidents involving school-age pedestrians (age 4 – 14), occurring on weekdays during the school year.

3.6 TRAFFIC OPERATIONS AND ISSUES

The specific roadway-related physical conditions for each location within the school’s vicinity directly affect the safety and efficiency of operations for both pedestrian and vehicular traffic. These specific conditions are required information when analyzing a location, and are the starting point for any revisions that may be considered to improve safety and/or efficiency.

The following sub-sections outline the physical conditions and issues concerning traffic operations and accidents at the intersections in the vicinity of St. Elizabeth School.

3.6.1 Atlantic Avenue & 84th Street

This is a signalized intersection with school crosswalks located across the north and south legs of 84th Street, the east leg of Atlantic Avenue and a pedestrian crosswalk located across the west leg of Atlantic Avenue.

The NYC DOT has widened the raised concrete median along the center of the roadway of Atlantic Avenue and reduced the number of travel lanes to improve traffic safety along Atlantic Avenue for vehicular and pedestrian traffic. Atlantic Avenue a two-way street,

now has two travel lanes in each direction separated by an approximately eighteen (18) foot wide (at the intersection) raised concrete median, with parking on each side of the roadway. There is a dedicated left turn lane for each direction of travel on Atlantic Avenue provided by way of turn bays created in the median. Away from the intersection, the raised concrete median is approximately twenty-five feet wide. South of Atlantic Avenue, 84th Street is a two-way street with one travel lane and a parking lane on each side of the roadway. North of Atlantic Avenue, 84th Street is a one-way northbound street with one travel lane and parking on both sides of the roadway (see Figure 3).

This intersection has been the site of forty-nine (49) accidents between 1998 and 2000, none of which were pedestrian accidents (Table 2). The NYPD accident data (Table 3) shows seventy (70) accidents between 2001 and 2004 including four (4) pedestrian accidents, none of which were school-related. There were no pedestrian fatalities during the same four-year period.



Figure 3: Looking east on Atlantic Avenue at intersection of 84th Street

The school officials reported a speeding problem on Atlantic Avenue. Therefore, a speed survey was conducted on Atlantic Avenue between 84th Street and 85th Street in order to verify the existence of a speeding problem and to determine its extent.

The 85th percentile speed for eastbound vehicles on Atlantic Avenue between 84th Street and 85th Street were found to be 41 mph. The 85th percentile speed for the westbound vehicles on Atlantic Avenue between 84th Street and 85th Street were found to be 38 mph.

The 85th percentile speed is considered to be the representative speed for the street segment. Speeds above the 30 mph threshold would indicate a speeding problem and may require appropriate traffic calming measures.

The detailed results of the spot speed survey on Atlantic Avenue between 84th Street and 85th Street are shown in the Appendix at the end of the document.

The school officials reported insufficient green time to cross Atlantic Avenue; therefore, a traffic movement count was performed at Atlantic Avenue & 84th Street intersection from 7:30 to 9:00 am on Wednesday, June 22, 2005 to better determine if the traffic conditions at this intersection would permit the extending of the green time to cross Atlantic Avenue by two seconds. This would enable a child pedestrian to cross the entire roadway in one phase of the signal (see Table 10). The results of the traffic movement count are shown in Table 4 for vehicular volumes and in Table 5 for pedestrian volumes. The traffic movement count is also shown in Exhibit 6A at the end of this section.

TABLE 4: VEHICLE VOLUMES (7:30-8:30 AM)									
INTERSECTION	Atlantic Avenue EASTBOUND			Atlantic Avenue WESTBOUND			84 th Street NORTHBOUND		
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right
Atlantic Avenue & 84 th Street	89	523	15	87	854	11	14	131	46
TOTAL	627			952			191		

TABLE 5: PEDESTRIAN VOLUMES (7:30-8:30 AM)				
INTERSECTION	Crossing Atlantic Avenue WEST-LEG CROSSWALK	Crossing Atlantic Avenue EAST-LEG CROSSWALK	Crossing 84 th Avenue SOUTH-LEG CROSSWALK	Crossing 84 th Avenue NORTH-LEG CROSSWALK
Atlantic Avenue & 84 th Street	52 (41 / 11) *	82 (69 / 13) *	53 (30 / 23) *	30 (27 / 3) *

* Numbers in parenthesis indicate (adults / students).

3.6.2 Atlantic Avenue & 85th Street

This is a signalized intersection, with school crosswalks located across the north and south legs of 85th Street, the west leg of Atlantic Avenue and a pedestrian crosswalk located across the east leg of Atlantic Avenue.

Atlantic Avenue is a two-way street with two travel lanes in each direction separated by an approximately twenty-five foot wide raised concrete median which continues across the intersection, with parking on each side of the roadway. There are no left turns from westbound Atlantic Avenue into southbound 85th Street since the raised concrete median prevents vehicular traffic from crossing Atlantic Avenue. North of Atlantic Avenue, 85th Street is a one-way northbound street with one travel lane and parking on both sides of the roadway. South of Atlantic Avenue, 85th Street is a one-way southbound street with one travel lane and parking on both sides of the roadway. Pedestrian traffic is accommodated by the traffic signal control and at-grade openings through the raised concrete median. 85th Street is closed with barricades in the area of the school from 8:00 to 9:00 am and from 11:30 am to 1:30 pm on school days. Atlantic Avenue is commercial in nature with residential uses. 85th Avenue is generally residential in character (see Figure 4).

This intersection has been the site of nine (9) accidents between 1998 and 2000, none of which were pedestrian accidents (Table 2). The NYPD accident data (Table 3) shows eight (8) accidents between 2001 and 2004, none of which were pedestrian accidents.



Figure 4: Looking south across Atlantic Avenue at 85th Street intersection

3.6.3 95th Avenue & 84th Street

This is an unsignalized all-way stop-controlled intersection, with school crosswalks located across all four legs of the intersection.

95th Avenue is a one-way westbound street with one travel lane and parking on both sides of the roadway. 84th Street is a two-way street, with one travel lane and a parking lane on each side of the roadway. 95th Avenue is generally residential in character with commercial uses. 84th Avenue is generally residential in character (see Figure 5).

This intersection has been the site of eighteen (18) accidents between 1998 and 2000; none of which were pedestrian accidents (Table 2). The NYPD accident data (Table 3) shows five (5) accidents between 2001 and 2004, none of which were pedestrian accidents.



Figure 5: Looking north on 84th Street toward 95th Avenue intersection

3.6.4 95th Avenue & 85th Street

This is an unsignalized two-way stop-controlled intersection, with school crosswalks located across the north and south legs of 85th Street and the west leg of 95th Avenue.

85th Street is a one-way southbound street north of 95th Avenue and a one-way northbound street south of 95th Avenue, with one travel lane and parking on both sides of the roadway. 95th Avenue is a one-way westbound street, with one travel lane and parking on both sides of the roadway. There are stop signs for northbound and southbound 85th Street. 95th Avenue is generally residential in character with commercial uses, while 85th Avenue is generally residential in character (see Figure 6).

This intersection has been the site of two (2) accidents between 1998 and 2000; neither of which were pedestrian accidents (Table 2). The NYPD accident data (Table 3) shows three (3) accidents between 2001 and 2004, none of which were pedestrian accidents.



Figure 6: Looking west on 95th Avenue at 85th Street intersection

There is an unprotected school crosswalk on the west leg of 95th Avenue at this intersection. To better determine the type of control that would be appropriate at 95th Avenue and 85th Street, a traffic count was conducted at this intersection from 7:30 to 9:00 am on Friday, October 21, 2005 including both vehicle and pedestrian volumes. The results of the peak hour (7:30 to 8:30 am) count are shown in Tables 6 and 7 and in Exhibit 6B at the end of this section.

In addition, a traffic signal warrant analysis was performed to determine the need for a traffic signal control at this intersection. The results of the preliminary assessment based on traffic signal warrant 4 (Pedestrian Volumes) and warrant 5 (School Crossing) of the Federal MUTCD are presented in Tables 8 and 9, respectively.

TABLE 6: VEHICLE VOLUMES (7:30-8:30 AM)			
INTERSECTION	95 th Avenue WESTBOUND	85 th Street NORTHBOUND	85 th Street SOUTHBOUND
95 th Avenue & 85 th Street	Straight	Left	Right
	174	26	40
TOTAL	174	26	40

TABLE 7: PEDESTRIAN VOLUMES (7:45-8:45 AM)				
INTERSECTION	Crossing 95 th Avenue WEST-LEG CROSSWALK	Crossing 95 th Avenue EAST-LEG CROSSWALK	Crossing 85 th Street SOUTH-LEG CROSSWALK	Crossing 85 th Street NORTH-LEG CROSSWALK
95 th Avenue & 85 th Street	52 (41 / 11) *	82 (69 / 13) *	53 (30 / 23) *	30 (27 / 3) *
* Numbers in parenthesis indicate (adults / students).				

TABLE 8: TRAFFIC SIGNAL WARRANT 4 ANALYSIS (PEDESTRIAN VOLUME)						
Intersection	Total Hourly (7:30-8:30 AM) Pedestrian Volumes			Criteria		Traffic Signal Warranted
	Crossing Street			Gap	Crossing Major Street	
	Major	Minor	Total	Fewer than 60 gaps / hour*	Greater than 190 Pedestrians / hour	
95 th Avenue & 85 th Street	134	83	217	No	No	No
* The available gap is based on the time needed for a pedestrian to walk across the street. The analysis assumed 11 seconds.						

TABLE 9: TRAFFIC SIGNAL WARRANT 5 ANALYSIS (SCHOOL CROSSING)						
Intersection	Total Hourly (7:30-8:30) Student Volumes			Criteria		Traffic Signal Warranted
	Crossing Street			Gap	Crossing Major Street	
	Major	Minor	Total	Fewer than 60 gaps / hour*	Greater than 20 Students / hour	
95 th Avenue & 85 th Street	24	26	50	No	Yes	No
* The available gap is based on the time needed for a pedestrian to walk across the street. The analysis assumed 11 seconds.						

3.6.5 Rockaway Boulevard & 84th Street / Digby Place

This is a signalized intersection, with school crosswalks located across the east and west legs of Rockaway Boulevard, and pedestrian crosswalks located across the north and south legs of 84th Street and the south leg of Digby Place.

Rockaway Boulevard is a two-way street with two travel lanes and a parking lane on each side of the roadway. 84th Street is a two-way street, with one travel lane and a parking lane on each side of the roadway. Digby Place only runs the short distance between Rockaway Boulevard and 97th Avenue, intersecting with the south side of Rockaway Boulevard just west of 84th Street, forming a T-intersection. Digby Place is a one-way southbound street with one travel lane and parking on both sides of the roadway. Rockaway Boulevard is generally commercial in character, while 84th Street is generally residential in character (see Figure 7).

This intersection has been the site of seven (7) accidents between 1998 and 2000; none of which were pedestrian accidents (Table 2). The NYPD accident data (Table 3) shows twenty-three (23) accidents between 2001 and 2004 including one (1) pedestrian accident, which was neither school-related nor a fatal accident.



Figure 7: Looking north on Rockaway Boulevard toward intersections of 84th Street and Digby Place

3.6.6 97th Avenue & 84th Street

This is an unsignalized intersection, with a school crosswalk located across the east leg of 97th Avenue.

97th Avenue is a one-way eastbound street with one traffic lane and parking on both sides of the roadway. 84th Street is a two-way street, with one travel lane and a parking lane on each side of the roadway.

This intersection has been the site of twenty-one (21) accidents between 1998 and 2000, none of which were pedestrian accidents (Table 2). The NYPD accident data (Table 3) shows thirteen (13) accidents between 2001 and 2004, none of which were pedestrian accidents.

3.7 SIGNAL TIMING

Pedestrian crossing times were field-verified for crosswalks at signalized intersections in the vicinity of St. Elizabeth, and were found to be adequate based upon a child pedestrian walking at the rate of 3 feet per second. Signal timings are shown in Table 10.

TABLE 10: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS				
INTERSECTION	CROSSWALK LENGTH (FEET)	PEDESTRIAN TIME ACTUAL (SECONDS)	PEDESTRIAN TIME REQUIRED (SECONDS)⁽¹⁾	TIMING ADJUSTMENT REQUIRED?
Atlantic Avenue & 84th Street				
crossing Atlantic Avenue (EB)	40	32	17	NO
crossing Atlantic Avenue (WB)	36	32	15	NO
crossing Atlantic Avenue	85	32	32	NO ⁽²⁾
crossing 84 th Street	25	75	12	NO
Atlantic Avenue & 85th Street				
crossing Atlantic Avenue (EB)	30	39	13	NO
crossing Atlantic Avenue (WB)	30	39	13	NO
crossing Atlantic Avenue	85	39	32	NO ⁽²⁾
crossing 85 th Street	26	81	12	NO
Rockaway Blvd. & 84th Street				
crossing Rockaway Blvd.	60	32	23	NO
crossing 84 th Street	30	58	13	NO
crossing Digby Place	30	58	13	NO

1. A rate of 3 ft/sec plus 3 seconds reaction time was utilized as the child pedestrian walking rate.
2. Although the time required to cross the entire width of Atlantic Avenue is 32 seconds, the time to reach the concrete median is only 16 and 17 seconds. Since the concrete median is nine feet wide, it provides a pedestrian refuge for the crosswalks. It is common practice to utilize relatively wide concrete medians as a pedestrian refuge for multi-roadway crossings.

3.8 PHYSICAL CONDITIONS

3.8.1 Roadways and Sidewalks

The roadways in the vicinity of St. Elizabeth School are in good conditions. The sidewalks in the vicinity of St. Elizabeth School are generally five to fifteen feet wide and in fair condition.

3.8.2 Pedestrian Ramps

Overall, pedestrian ramps in the area of the school appeared to be standard

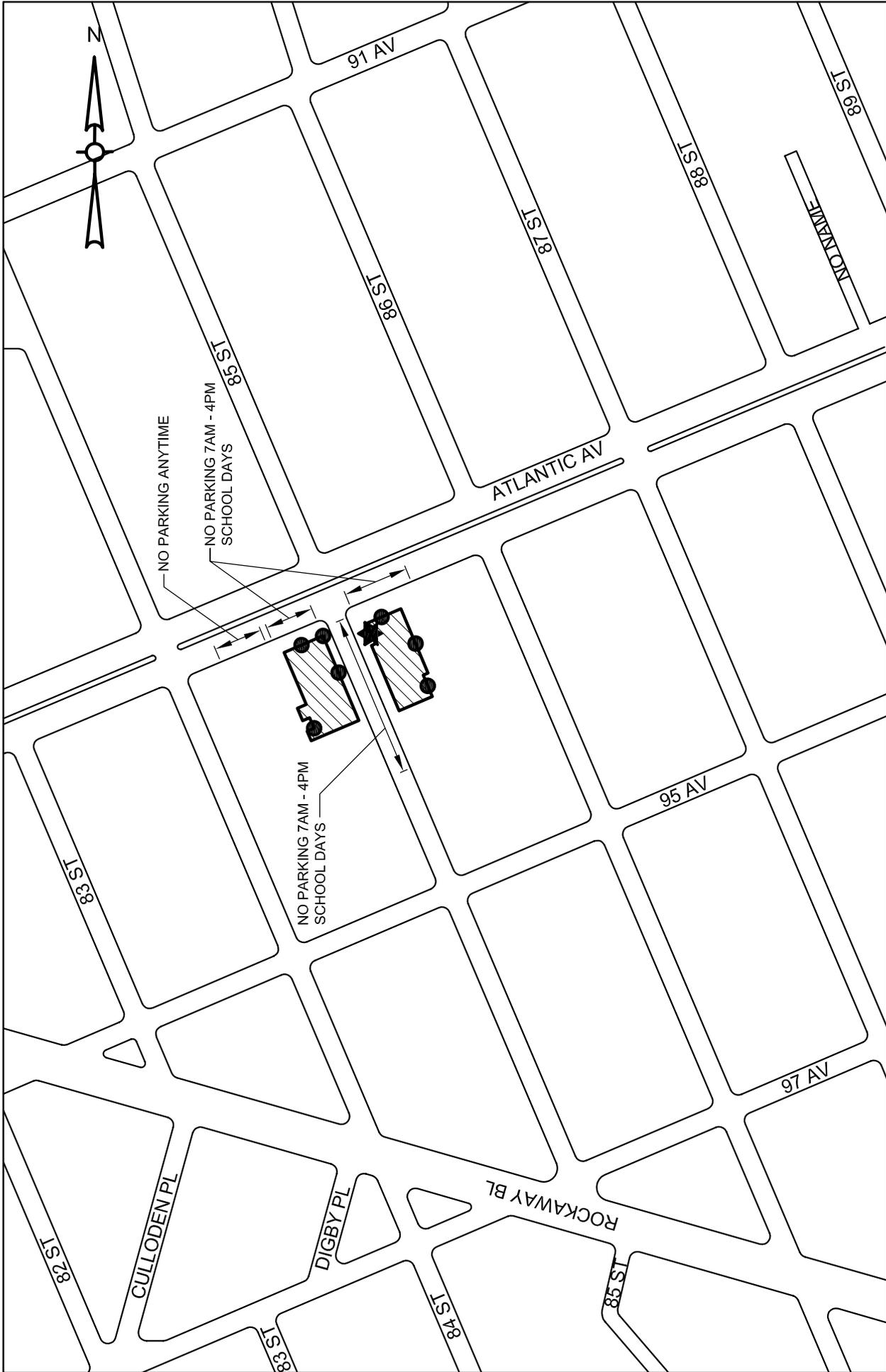
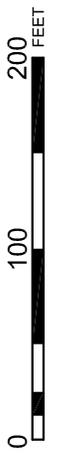


EXHIBIT 4
 ST. ELIZABETH SCHOOL
 QUEENS

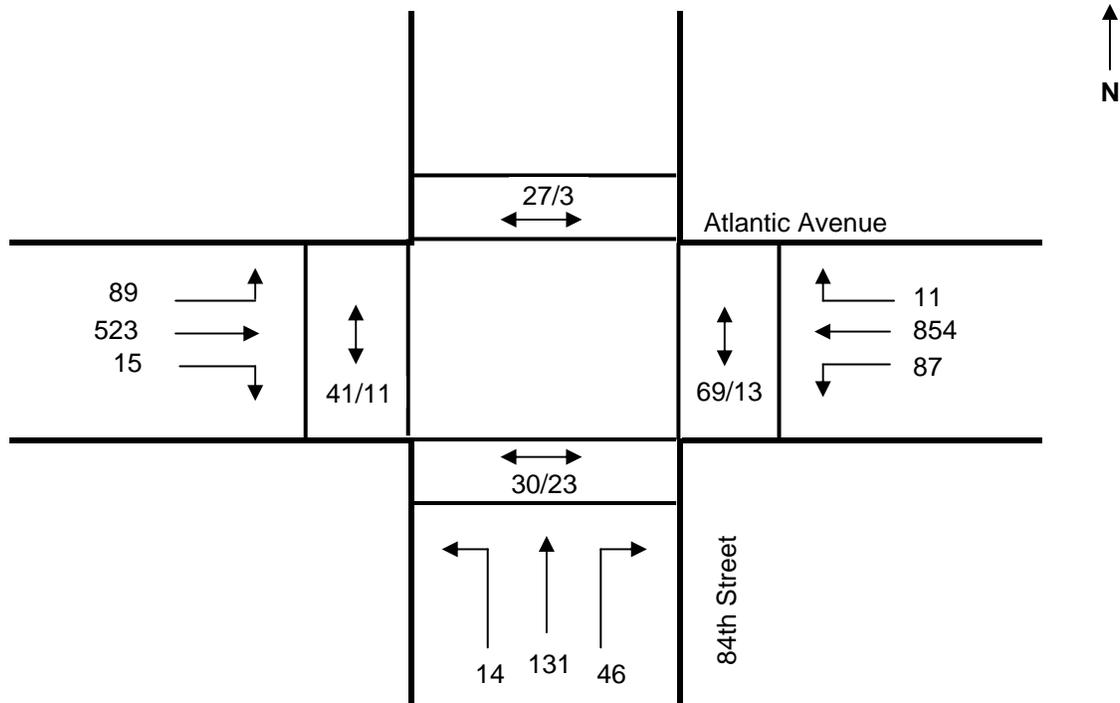
EXISTING PARKING REGULATIONS

LEGEND:

- ★ MAIN ENTRANCE
- ENTRANCE



One Hour Traffic Volumes
Thursday, October 20th, 2005 7:30 am - 8:30 am

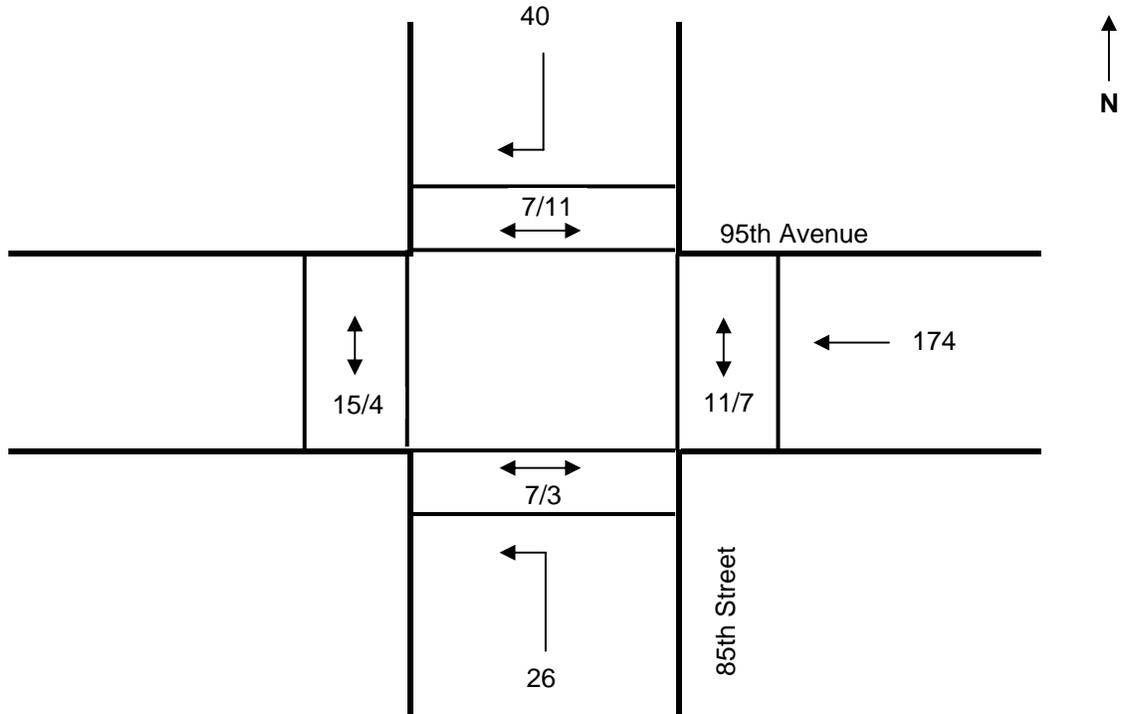


Intersection of Atlantic Avenue and 84th Street

<u>Legend</u>	
XX / XX	(Adult / Child)
←→	Pedestrian Counts
—↑	Vehicle Movement

EXHIBIT 6A
St. Elizabeth School QUEENS
TRAFFIC AND PEDESTRIAN COUNTS

One Hour Traffic Volumes
Friday, October 21, 2005 7:30 am - 8:30 am



Intersection of 95th Avenue and 85th Street

<u>Legend</u>	
XX / XX	(Adult / Child)
←→	Pedestrian Counts
—↑	Vehicle Movement

EXHIBIT 6B
St. Elizabeth School, QUEENS
TRAFFIC AND PEDESTRIAN COUNTS

4. PROPOSED MEASURES TO IMPROVE SCHOOL PEDESTRIAN SAFETY

This section describes the proposed measures to improve student pedestrian safety around Saint Elizabeth School. The proposed recommendations are divided into short-term and long-term measures. Short-term measures are those that potentially can be performed in-house. Long-term measures involve capital improvements. Each of the short- and long-term measures recommended for Saint Elizabeth School is discussed as follows, and is shown in more detail in Exhibit 6 at the end of this section.

4.1 SHORT-TERM MEASURES

➤ *Install “No Standing 7AM - 4PM School Days” signs*

There are existing parking regulation signs “No Parking 7AM - 4PM School Days” along the east side of 85th Street in front of school building and at the main entrance of the school. These existing signs need to be replaced with “No Standing 7AM - 4PM School Days”. (This is a typical requirement for all NYC schools in order to provide for emergency access to and from the school.). This treatment should also improve traffic operations and reduce congestion on 85th Street.

➤ *Install graphic “Yield to Pedestrian” sign*

“YIELD TO PEDESTRIAN” signs should be installed at approaches with substantial vehicle–student pedestrian volumes at intersections assigned to this school. “YIELD TO PEDESTRIAN” signs are recommended on the following approaches of signalized intersections around St. Elizabeth School:

- Westbound approach of 84th Street at Rockaway Boulevard
- Eastbound approach of 84th Street at Rockaway Boulevard

These signs are suggested to improve driver awareness and the visibility and safety of student-pedestrians.

➤ *Place advanced stop bar before school crosswalk*

The MUTCD and New York City DOT standard for placement of a stop bar is four feet (4’) in advance of a marked crosswalk. At signalized intersections and mid-block crossings, the vehicle stop line can be moved farther back from the pedestrian crosswalk.

For school crosswalks with significant potential for vehicular / pedestrian conflicts, it is recommended that the advance stop bar be placed ten feet (10’) in advance of the crosswalk to maximize the safety benefit for school-aged pedestrians. (This would improve visibility of pedestrians to motorists, and allow pedestrians to proceed in a crosswalk before motor vehicles turn.)

Ten feet (10’) advanced stop bars before school crosswalks are recommended on the following approaches of signalized intersections surrounding St. Elizabeth School:

- Northbound and westbound approaches of Atlantic Avenue and 84th Street intersection.
- Eastbound and westbound approaches of Atlantic Avenue and 85th Street intersection
- Eastbound and westbound approaches of Rockaway Boulevard at its intersection with 84th Street/Digby Place.

➤ Speeding on Atlantic Avenue

The school officials reported speeding as a problem on Atlantic Avenue. A speed survey was therefore conducted on Atlantic Avenue between 84th Street and 85th Street in order to verify the existence of a speeding problem and to determine its extent. The spot speed survey showed an 85th percentile speed of 41 mph in the eastbound direction and an 85th percentile speed of 38 mph in the westbound direction. This would indicate the need for speed reducers (humps) for this section of roadway. This roadway is a local bus route however, which precludes the use of speed reducers in the roadway. Further, Atlantic Avenue is a designated through truck route. A curb extension (neckdown) would also not be conducive to the character of the roadway at this location. This location would also not be a candidate for school zone reduced speed limits since it is not a minor local roadway. A technique often used to slow traffic on a roadway is the use of an automatic “speed board” which informs an approaching driver of the actual speed of the vehicle, and also shows a reminder of what the actual speed limit is for the roadway.

It is therefore recommended:

- Install one speed board in each direction on Atlantic Avenue in advance of the school crosswalks. The speed board alerts drivers to their current speed, raises awareness that they are traveling at excessive speeds, and reminds them of the roadway speed limit.

➤ Unprotected School Crosswalk

There is an uncontrolled school crosswalk on the west leg of 95th Avenue at the 85th Street intersection. To better determine the type of control that would be appropriate at 95th Avenue & 85th Street, a traffic count was conducted at the intersection from 7:30 to 9:00 am on Friday, October 21, 2005 including both vehicle and pedestrian volumes. A traffic signal warrant was then performed to determine if traffic signal is appropriate for this location. The results of the peak hour (7:30 to 8:30) count are shown in Tables 6 and 7 and in Exhibit 6B at the end of section 3.

The results of the analysis determined a traffic signal is unwarranted. An all-way stop was also found to be not warranted. There is a school crossing guard currently assigned to this location. Since a traffic signal was found to be unwarranted, and an all-way stop was also found to be unwarranted, the crossing guard should remain assigned to this intersection, as St. Elizabeth School is an elementary school with classes from Pre-K through Grade 8.

It is therefore recommended:

- Retain the assignment of a school crossing guard for this location.
- Assign police officer or traffic agent to the intersection of 95th Avenue and 85th Street during the school arrival period

During the school visit, some parents were observed backing onto 85th Street (a one-way southbound street) from 95th Avenue (a one-way westbound street) to drop-off students rather than going around the block.

It is therefore recommended that:

- Consideration be given to assigning a police officer or traffic agent to this location during the morning arrival period to prevent this illegal and unsafe "back-up" maneuver.

4.2 LONG-TERM MEASURES

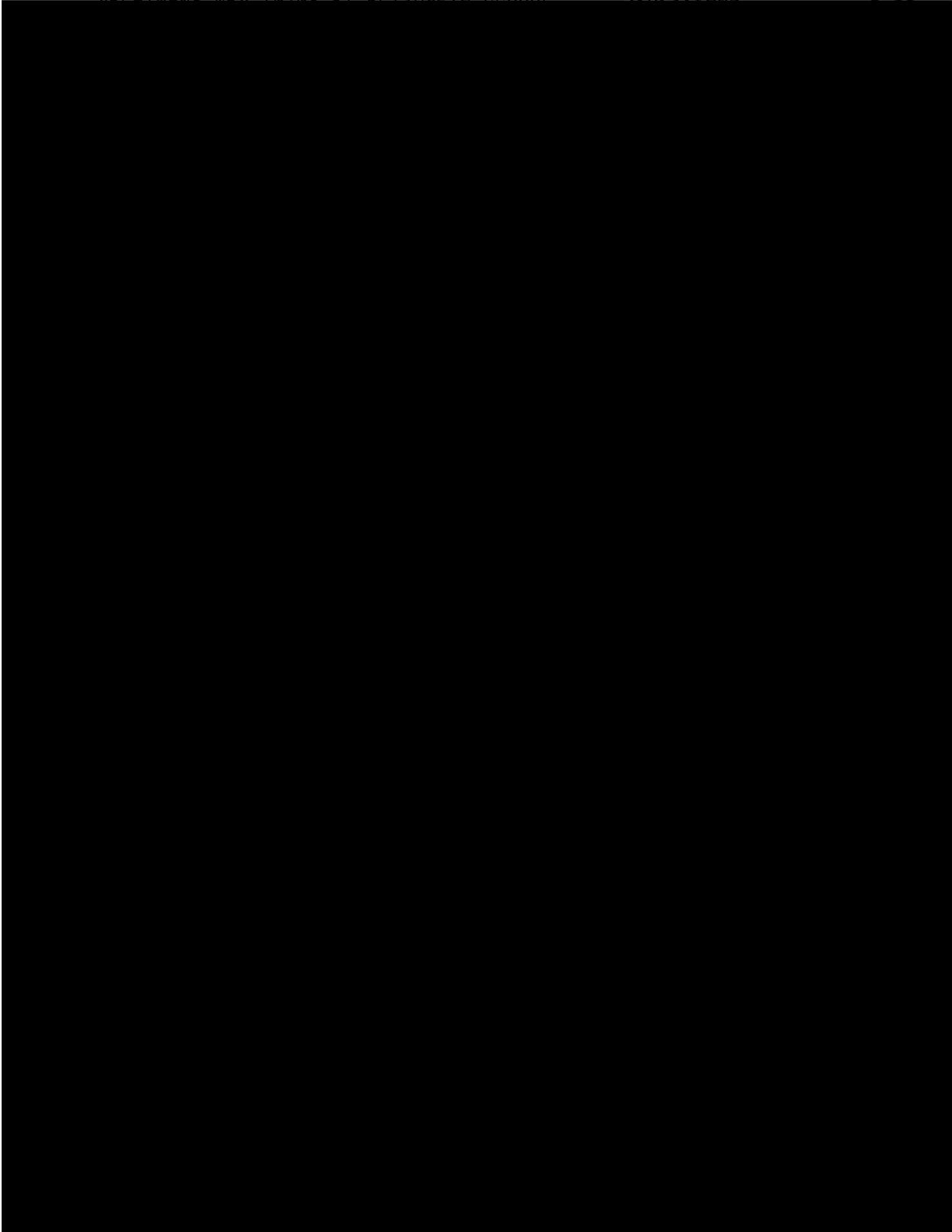
- Consider refuge islands at the intersection of Atlantic Avenue and 84th Street as shown in Exhibit 6:

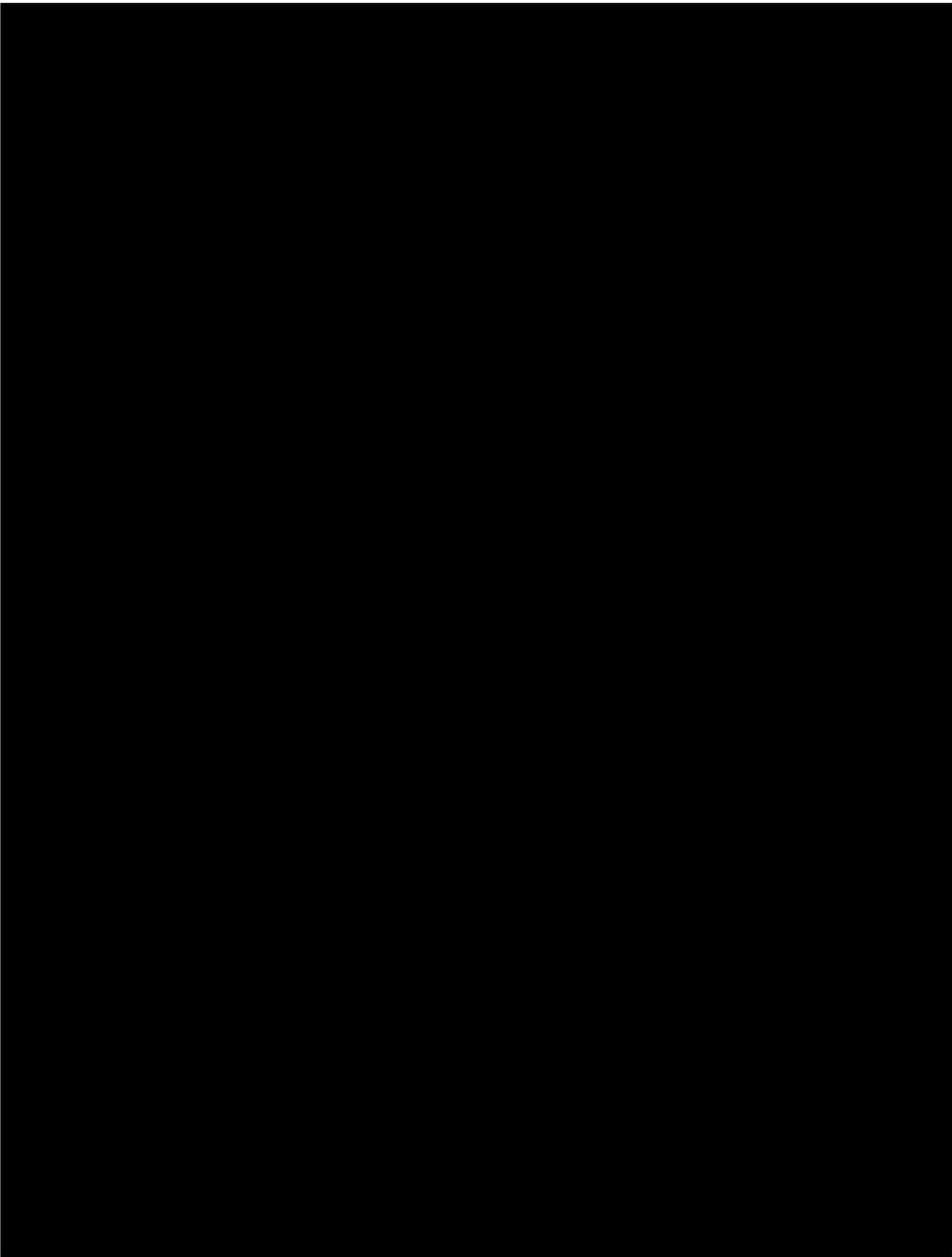
Atlantic Avenue raised median is high and difficult for children to cross (the existing median opening, which does not provide enough cut in the median for crossing, is non-standard and it is not ADA compliant). It is therefore recommended to:

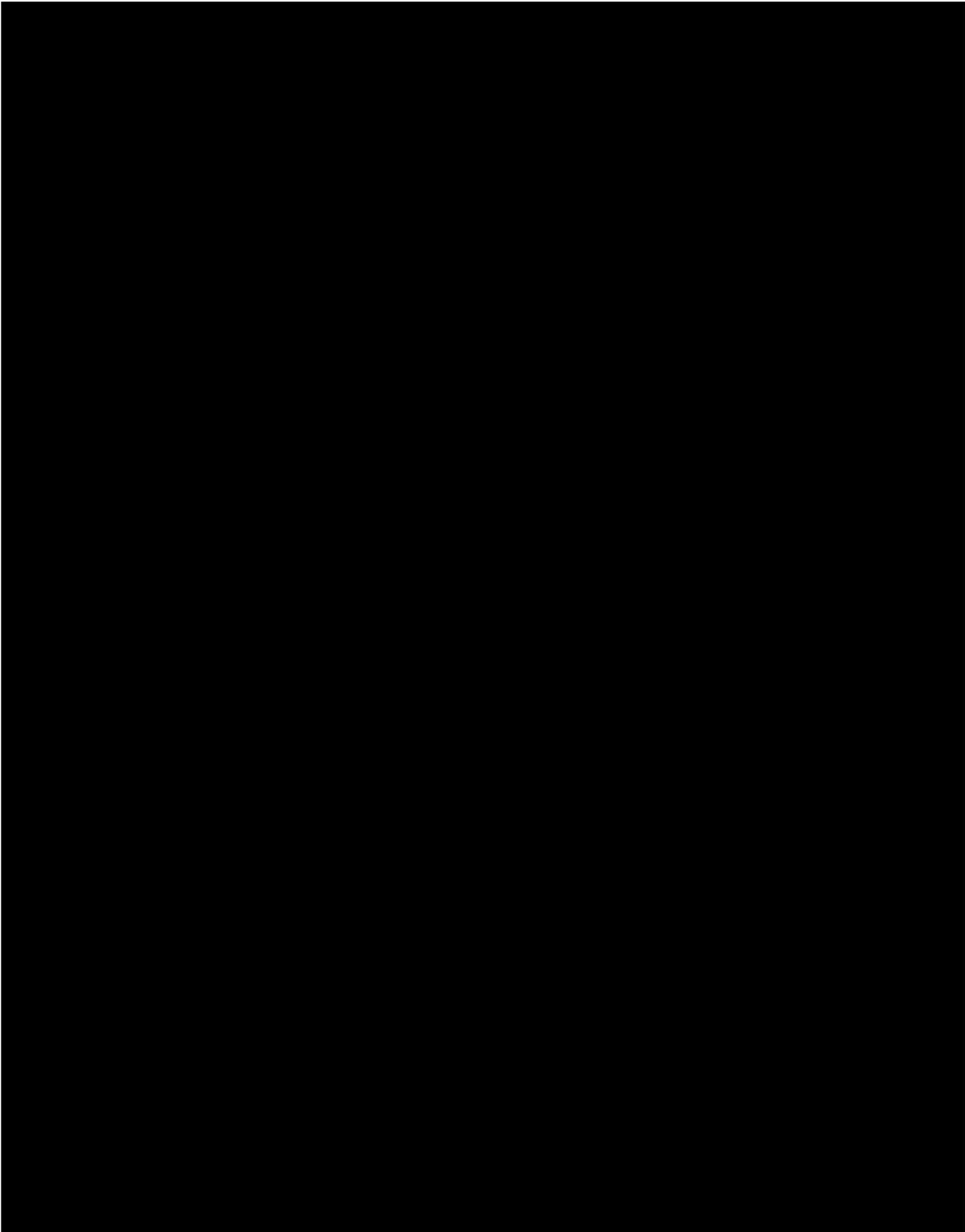
- Modify and extend the existing concrete median through the pedestrian and school crosswalks located across the west and east legs of Atlantic Avenue, respectively, and provide at least 5-foot at grade cut through section.

The refuge islands with extended medians will provide a refuge for pedestrians who do not complete the crossing during the flashing "Don't Walk" indication. The proposed extended median should extend beyond the crosswalk, and should have at least 5-feet at grade cut through section. These medians are not proposed where they would hinder the ability of vehicles to turn. Final details pertaining to proposed extended medians will be developed during Final Design.

APPENDIX







SPOT SPEED STUDY

Date: **October 21, 2005** Time: **10:15 Am**
 Location: **Atlantic Avenue between 84th Street & 85th Street**
 Surveyor: **Richard Calvache & Hugo Salinas**

School: **St. Elizabeth**
 Direction: **Eastbound**
 Comments:

Speed S (mph)	No. of Vehicles in Group n	% of Vehicles in Group	% Cumulative Vehicles	nS	nS ²
8	0	0.0%	0.0%	0	0
9	0	0.0%	0.0%	0	0
10	0	0.0%	0.0%	0	0
11	0	0.0%	0.0%	0	0
12	0	0.0%	0.0%	0	0
13	0	0.0%	0.0%	0	0
14	0	0.0%	0.0%	0	0
15	0	0.0%	0.0%	0	0
16	0	0.0%	0.0%	0	0
17	0	0.0%	0.0%	0	0
18	0	0.0%	0.0%	0	0
19	0	0.0%	0.0%	0	0
20	0	0.0%	0.0%	0	0
21	0	0.0%	0.0%	0	0
22	0	0.0%	0.0%	0	0
23	1	1.0%	1.0%	23	529
24	0	0.0%	1.0%	0	0
25	1	1.0%	2.0%	25	625
26	0	0.0%	2.0%	0	0
27	1	1.0%	3.0%	27	729
28	5	5.0%	8.0%	140	3920
29	3	3.0%	11.0%	87	2523
30	5	5.0%	16.0%	150	4500
31	2	2.0%	18.0%	62	1922
32	8	8.0%	26.0%	256	8192
33	7	7.0%	33.0%	231	7623
34	10	10.0%	43.0%	340	11560
35	9	9.0%	52.0%	315	11025
36	7	7.0%	59.0%	252	9072
37	7	7.0%	66.0%	259	9583
38	3	3.0%	69.0%	114	4332
39	4	4.0%	73.0%	156	6084
40	8	8.0%	81.0%	320	12800
41	5	5.0%	86.0%	205	8405
42	1	1.0%	87.0%	42	1764
43	9	9.0%	96.0%	387	16641
44	0	0.0%	96.0%	0	0
45	1	1.0%	97.0%	45	2025
46	1	1.0%	98.0%	46	2116
47	0	0.0%	98.0%	0	0
48	0	0.0%	98.0%	0	0
49	1	1.0%	99.0%	49	2401
50	1	1.0%	100.0%	50	2500
51	0	0.0%	100.0%	0	0
52	0	0.0%	100.0%	0	0
53	0	0.0%	100.0%	0	0
54	0	0.0%	100.0%	0	0
55	0	0.0%	100.0%	0	0
56	0	0.0%	100.0%	0	0
	100	100.0%		3581	130871

Mean Speed = 35.8 mph
 Standard Deviation = 5.2 mph
 Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 35.8 mph
 15th Percentile Speed = 30.5 mph
 85th Percentile Speed = 41.2 mph

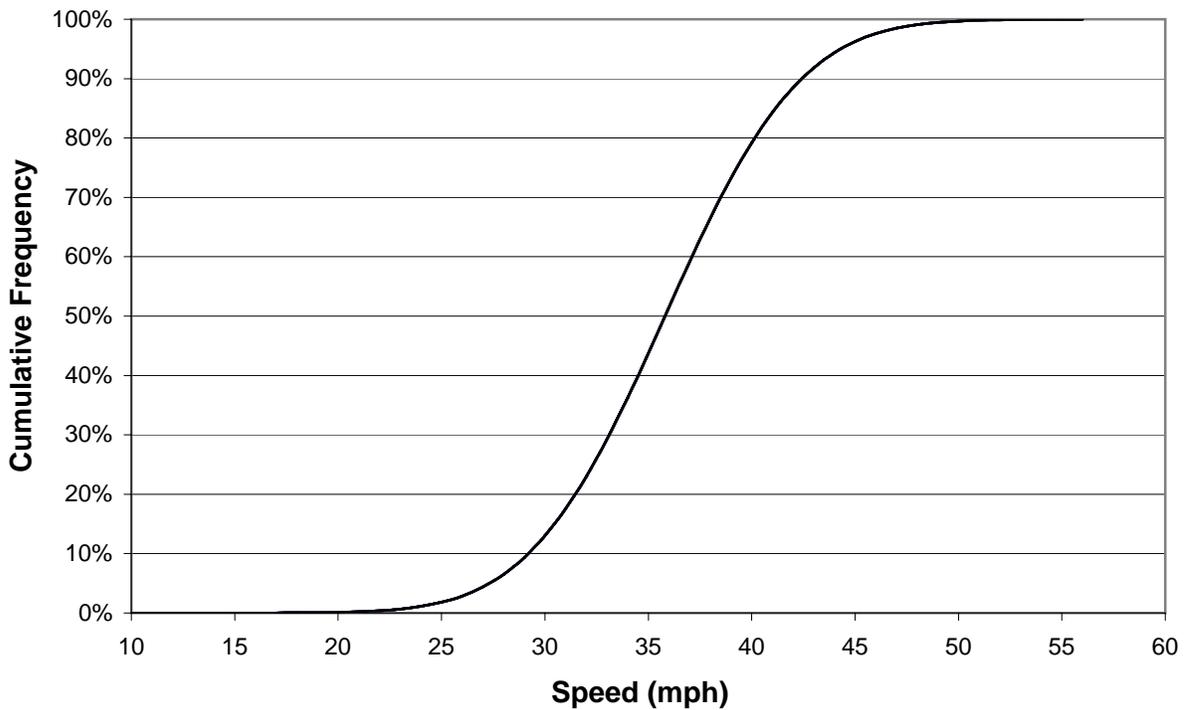
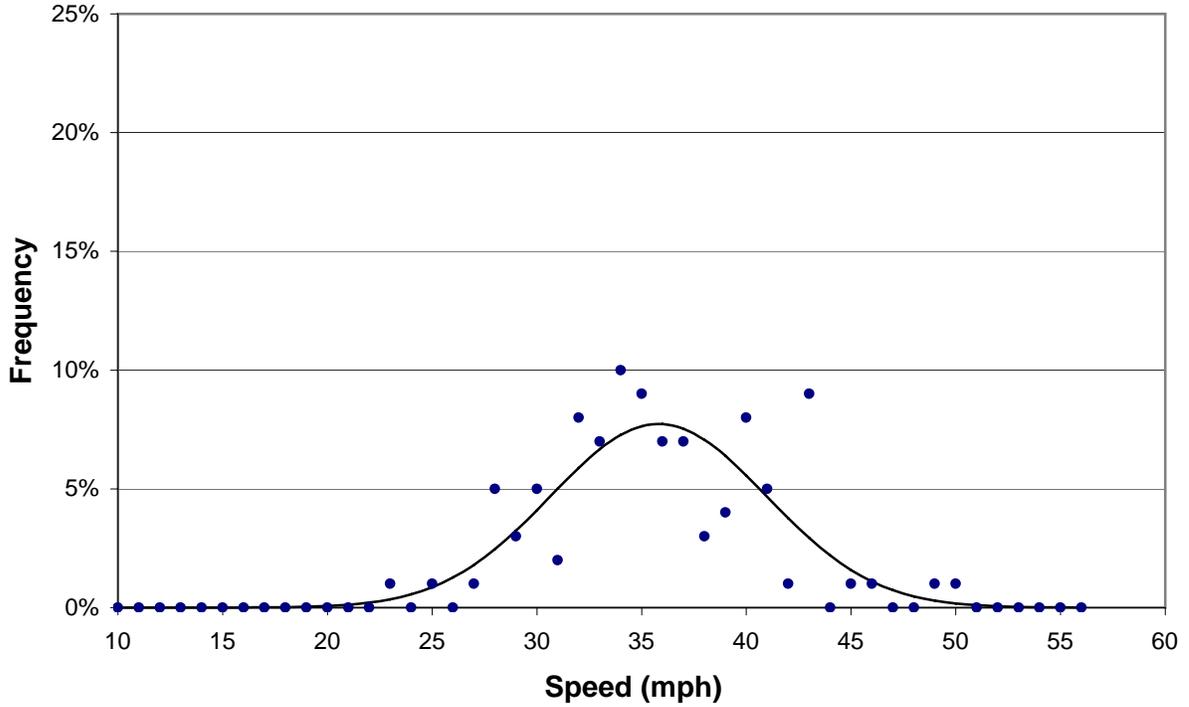
SPOT SPEED STUDY

Date: **October 21, 2005** Time: **10:15 Am**
Location: **Atlantic Avenue between 84th Street & 85th Street**
Surveyor: **Richard Calvache & Hugo Salinas**

School: **St. Elizabeth**
Direction: **Eastbound**
Comments:

Mean Speed = 35.8 mph
Standard Deviation = 5.2 mph
Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 35.8 mph
15th Percentile Speed = 30.5 mph
85th Percentile Speed = 41.2 mph



SPOT SPEED STUDY

Date: **October 20, 2005** Time: **9:30 AM**
 Location: **Atlantic Avenue between 84th Street & 85th Street**
 Surveyor: **Richard Calvache & Hugo Salinas**

School: **St. Elizabeth**
 Direction: **Westbound**
 Comments:

Speed S (mph)	No. of Vehicles in Group n	% of Vehicles in Group	% Cumulative Vehicles	nS	nS ²
8	0	0.0%	0.0%	0	0
9	0	0.0%	0.0%	0	0
10	0	0.0%	0.0%	0	0
11	0	0.0%	0.0%	0	0
12	0	0.0%	0.0%	0	0
13	0	0.0%	0.0%	0	0
14	0	0.0%	0.0%	0	0
15	0	0.0%	0.0%	0	0
16	0	0.0%	0.0%	0	0
17	0	0.0%	0.0%	0	0
18	0	0.0%	0.0%	0	0
19	0	0.0%	0.0%	0	0
20	0	0.0%	0.0%	0	0
21	0	0.0%	0.0%	0	0
22	0	0.0%	0.0%	0	0
23	0	0.0%	0.0%	0	0
24	0	0.0%	0.0%	0	0
25	0	0.0%	0.0%	0	0
26	2	2.0%	2.0%	52	1352
27	1	1.0%	3.0%	27	729
28	7	7.0%	10.0%	196	5488
29	8	8.0%	18.0%	232	6728
30	6	6.0%	24.0%	180	5400
31	10	10.0%	34.0%	310	9610
32	16	16.0%	50.0%	512	16384
33	12	12.0%	62.0%	396	13068
34	3	3.0%	65.0%	102	3468
35	11	11.0%	76.0%	385	13475
36	6	6.0%	82.0%	216	7776
37	5	5.0%	87.0%	185	6845
38	5	5.0%	92.0%	190	7220
39	3	3.0%	95.0%	117	4563
40	1	1.0%	96.0%	40	1600
41	1	1.0%	97.0%	41	1681
42	1	1.0%	98.0%	42	1764
43	0	0.0%	98.0%	0	0
44	0	0.0%	98.0%	0	0
45	0	0.0%	98.0%	0	0
46	0	0.0%	98.0%	0	0
47	0	0.0%	98.0%	0	0
48	0	0.0%	98.0%	0	0
49	0	0.0%	98.0%	0	0
50	0	0.0%	98.0%	0	0
51	1	1.0%	99.0%	51	2601
52	1	1.0%	100.0%	52	2704
53	0	0.0%	100.0%	0	0
54	0	0.0%	100.0%	0	0
55	0	0.0%	100.0%	0	0
56	0	0.0%	100.0%	0	0
	100	100.0%		3326	112456

Mean Speed = 33.3 mph Median Speed = 33.3 mph
 Standard Deviation = 4.3 mph 15th Percentile Speed = 28.8 mph
 Margin of Error (95% Confidence) = ± 0.8 mph 85th Percentile Speed = 37.7 mph

SPOT SPEED STUDY

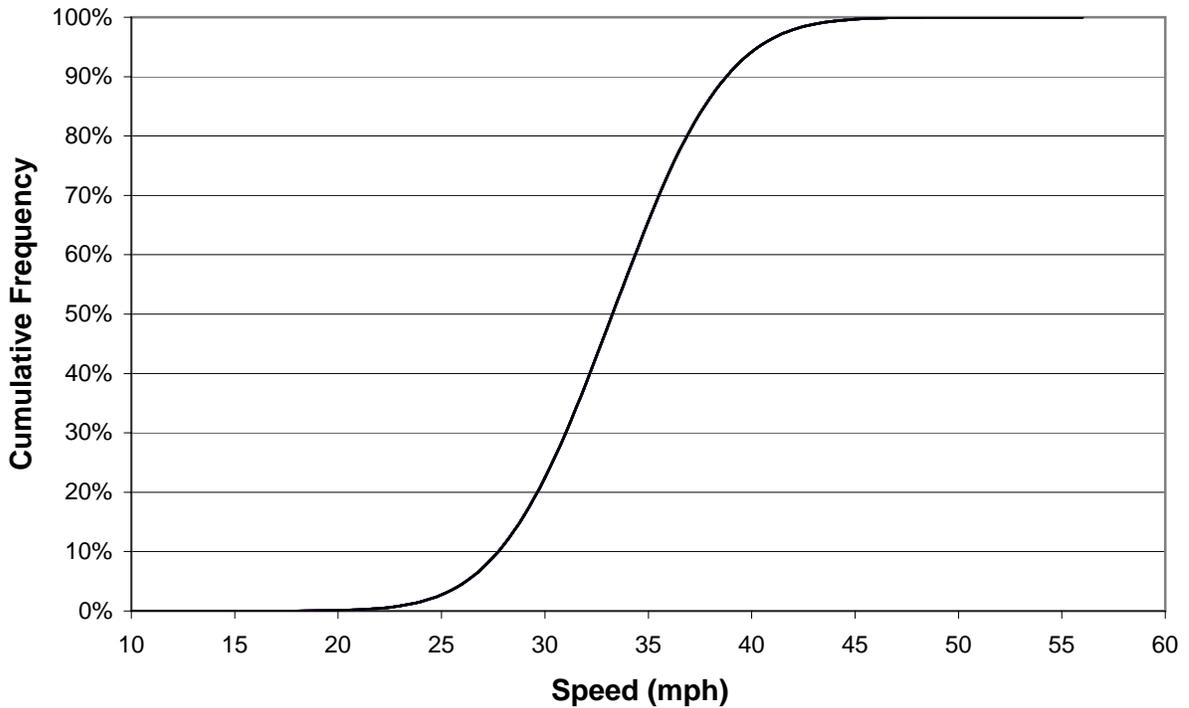
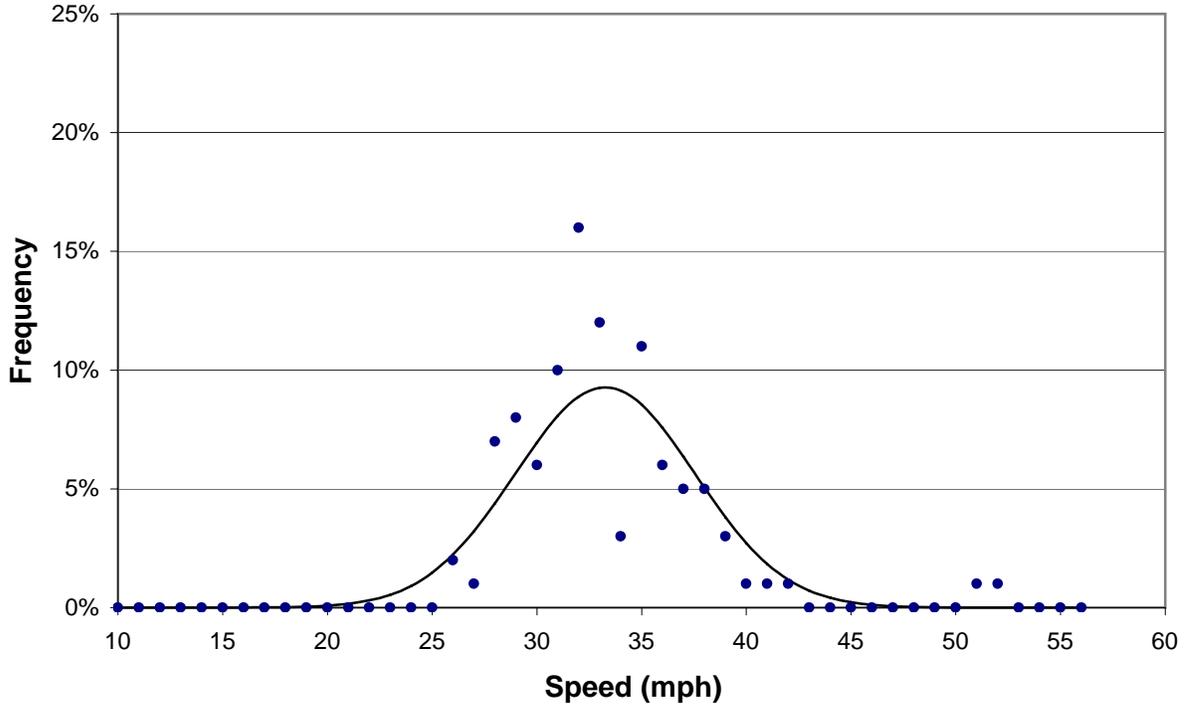
Date: **October 20, 2005**
Location: **Atlantic Avenue between 84th Street & 85th Street**
Surveyor: **Richard Calvache & Hugo Salinas**

Time: **9:30 AM**

School: **St. Elizabeth**
Direction: **Westbound**
Comments:

Mean Speed = 33.3 mph
Standard Deviation = 4.3 mph
Margin of Error (95% Confidence) = ± 0.8 mph

Median Speed = 33.3 mph
15th Percentile Speed = 28.8 mph
85th Percentile Speed = 37.7 mph



GAP STUDY FIELD SHEET

St. Elizabeth

Date: October 20, 2005

Location: 85 St/95 Ave

Gap Information:

Crossing Distance	<u>29</u>	ft
Reaction Time	<u>3</u>	sec
Walking Speed	<u>3</u>	sec/ft
Minimum Acceptable Gap	<u>13</u>	sec

Gap Survey:

Time:	From: <u>7:45 am</u>	To: <u>8:15 am</u>	
Gap (sec)	Tally		
10		DISCARDED GAPS LESS THAN 13 SEC	
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			
43			
44			
45			
		Total:	28