

NEW YORK CITY DEPARTMENT OF TRANSPORTATION

Office of School Safety Engineering

NEW YORK CITY



School Safety Engineering Project

FINAL REPORT: P.S. 159, The Pitkin School, Brooklyn



**Prepared by
The RBA Group/Urbitran Associates**



NOVEMBER 10, 2006



**School Safety Engineering Project
P.S. 159, The Pitkin School, Brooklyn**

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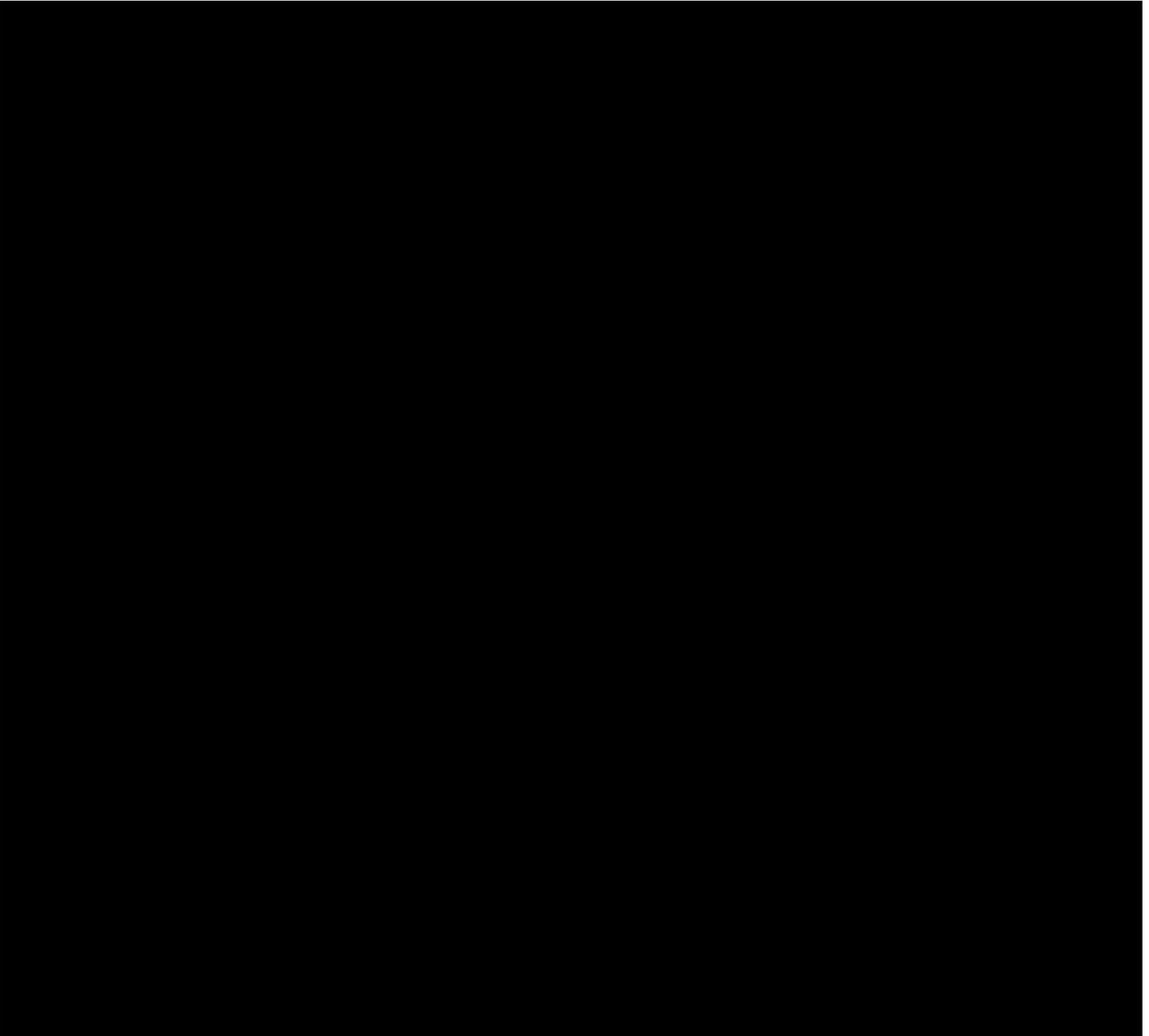
1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The Department of Transportation 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 600 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). P.S. 159 in Brooklyn is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

Located at 2781 Pitkin Avenue in Brooklyn, P.S. 159 occupies most of a city block between Crescent Street and Hemlock Street. The school's main entrance is on Pitkin Avenue, which is a two-way street. Hemlock runs one-way southbound to the east of the school and Crescent Street runs one-way northbound to the west of the school. Conduit Boulevard is a major roadway located one block northeast of the school. (See Exhibit 1 for Aerial Photograph and Exhibit 2 for the Catchment Area).

Pitkin Avenue has many storefront properties with residential units on the upper floors. There are also several four-story apartment buildings. Hemlock Street and Crescent Street are primarily residential. North of the Conduit, Liberty Avenue is primarily commercial, and with residential units on upper floors.

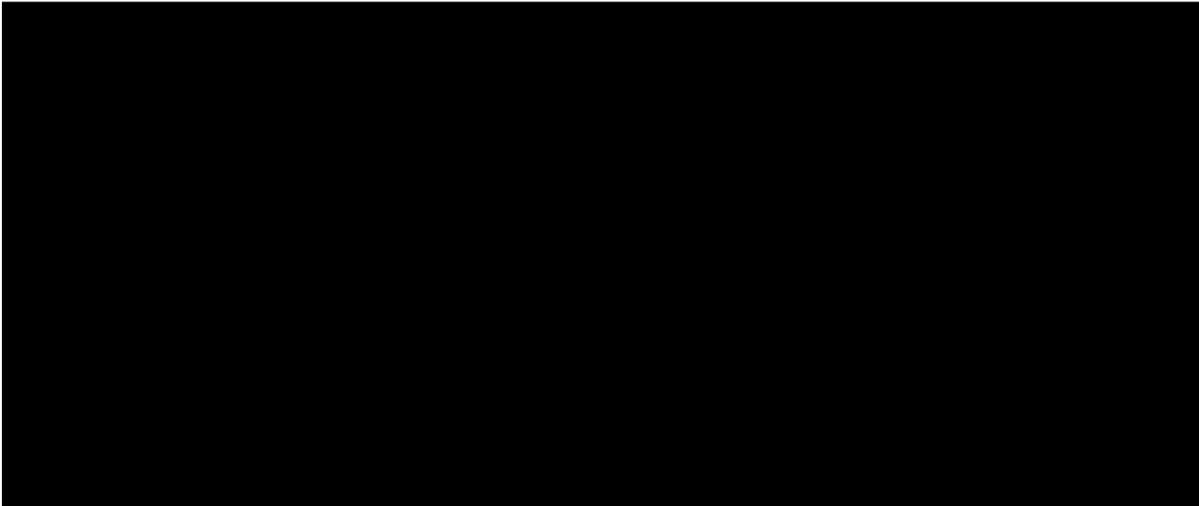


Figure 2: Pitkin Avenue in front of P.S. 159, looking west

2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant team and the school representatives from P.S. 159 met at the school on May 20, 2004. According to the school principal, the identifiable problems that student pedestrians encounter on a regular basis include the following:

- Vehicles speeding on Pitkin Avenue
- Students have difficulty crossing Pitkin Avenue
- Mid-block crossings on Hemlock Street





1 inch equals 225 feet

EXHIBIT 1
PITKIN SCHOOL
P.S. 159, BROOKLYN
AERIAL PHOTOGRAPH



1 inch equals 600 feet

 CATCHMENT AREA

EXHIBIT 2
P.S. 159, BROOKLYN
PITKIN SCHOOL
CATCHMENT AREA

2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

According to school representatives, approximately 76% of students walk to school, 10% arrive by school bus, 7% utilize MTA bus or subway service and the remaining 7% of students are driven to school. Table 1 shown below indicates the school’s estimate of the modes of travel.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	
Description	Percentage
Walk	76%
Driven by car, livery cab or mini-bus	7%
School bus	10%
MTA bus or subway	7%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

Bus stops for the Q7 and Q8 lines are located on Pitkin Avenue, one block to the east and one block to the west of the School.



Figure 3 – Bus stop on Pitkin Avenue

2.8 CROSSING GUARD LOCATIONS

According to school representatives and as confirmed by field observations, there are currently two crossing guards assigned to this school. The two crossing guards are stationed at the following locations:

- Pitkin Avenue and Hemlock Street
- Pitkin Avenue and Crescent Street

Exhibit 4 shows the crossing guard locations.



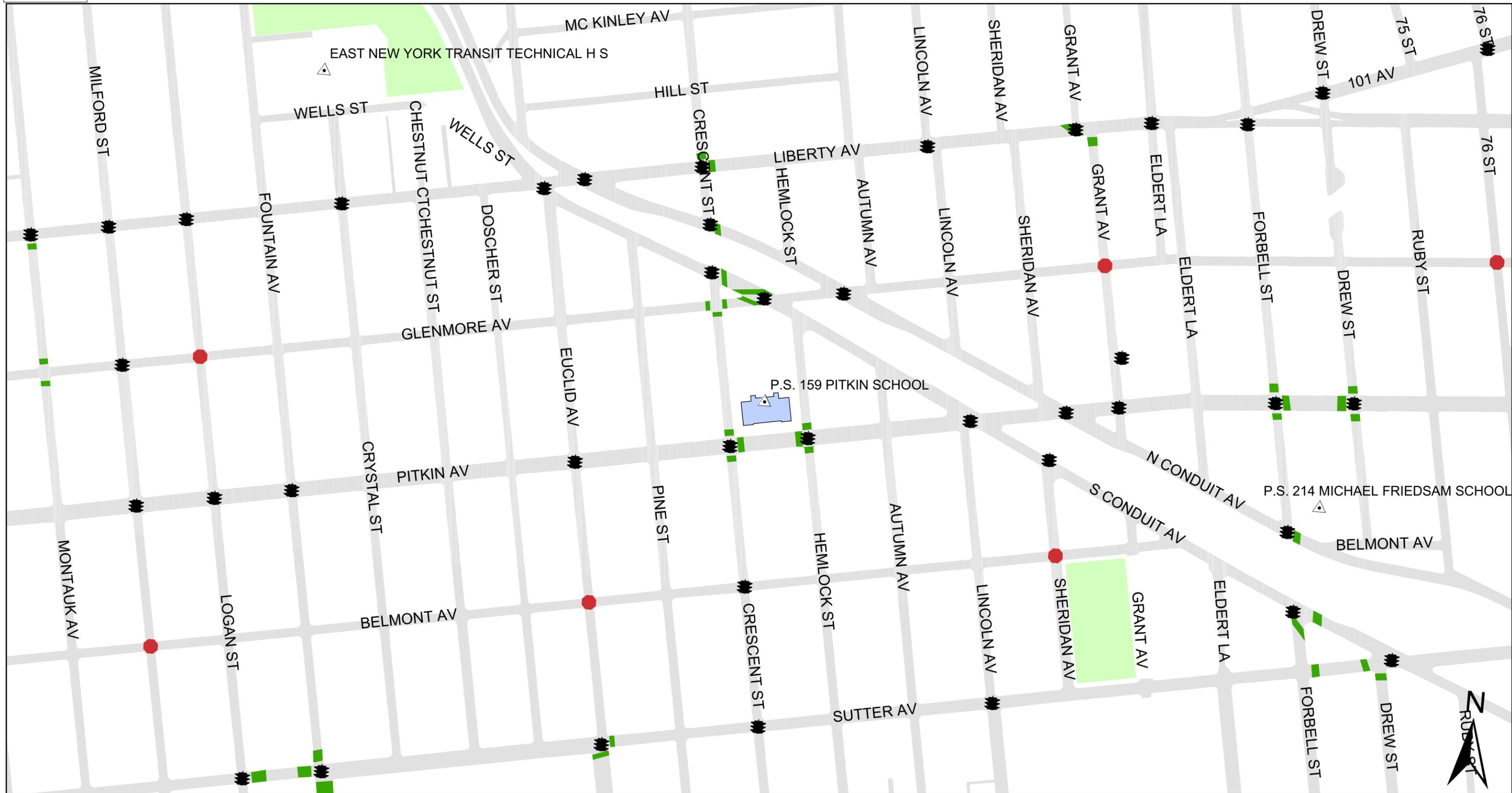
Figure 4 – Crossing guard at Pitkin Avenue and Hemlock Street



Figure 5: Crossing guard at Pitkin Avenue and Crescent Street



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

PS 159 Brooklyn PITKIN SCHOOL

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

Map created on 11/16/2006

1.5.1

EXHIBIT 3

COMM. BOARD: 305
PRECINCT: 75



1 inch equals 250 feet



CROSSING GUARD LOCATIONS ASSIGNED TO P.S. 159

EXHIBIT 4
P.S. 159, BROOKLYN
PITKIN SCHOOL
CROSSING GUARDS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school representatives, school buses transport approximately 100 students from P.S. 159 to and from school. There are two minibuses carrying special education students and two standard buses carrying 65 to 70 students daily. All buses load and unload students on Pitkin Avenue, near the school's entrance. School buses park or double-park, depending on the traffic conditions (Figures).

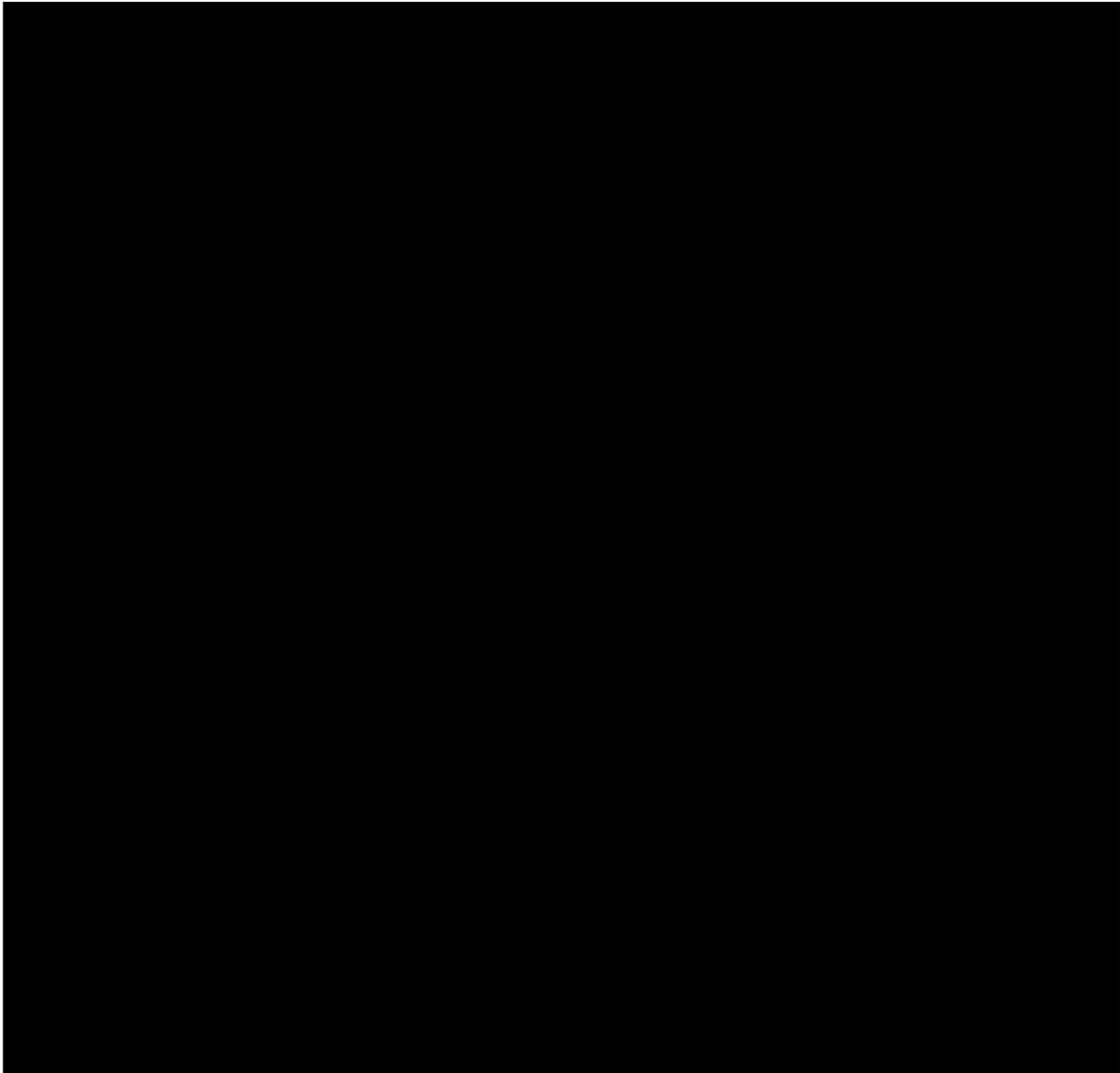


Figure 6: School buses double-parked on Pitkin Avenue during dismissal time

3.2 PARENT DROP-OFF OPERATIONS

The school representatives have indicated that approximately 75 students from P.S. 159 are driven to and from school by a parent or guardian. Field observations taken on May 20, 2004 indicated that during arrival and dismissal times, vehicles typically park and double-park in front of the school's main entrance on Pitkin Avenue to pick up or drop off students (see Figures 7 and 8). Parents were also observed dropping off and picking up students on Hemlock Street and on the south side of Pitkin Avenue. All kindergarten students are dismissed only when a parent or guardian comes and signs them out.

In the annex building, all students are dismissed when a parent or guardian comes and signs them out. Vehicles also double-park along Pitkin Avenue during arrival and dismissal at the annex.



3.3 PARKING REGULATIONS

“NO PARKING 7 AM – 4 PM SCHOOL DAYS, EXCEPT BOARD OF EDUCATION” parking regulation signs are posted on Hemlock Street and Crescent Street.

“NO PARKING 7 AM – 4 PM SCHOOL DAYS ” parking regulation signs are posted on Pitkin Avenue.

Alternate side of street parking regulations are in effect 11:30 am – 1:00 pm on the roadways surrounding the school. See Exhibit 5 for the parking regulations.



Figure 9: Parking restrictions on Hemlock Avenue

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, shows existing signals and crosswalk pavement markings. It is noted that a citywide signage program is currently underway to upgrade school signage to current Federal Manual of Uniform Traffic Control (MUTCD) standards of fluorescent yellow-green signs accompanied by downward pointing arrows. Signs scheduled to be installed under this program are shown as "existing" on Exhibit 8.



LEGEND

- ★ MAIN ENTRANCE
- OTHER ENTRANCES

SCALE 1:150

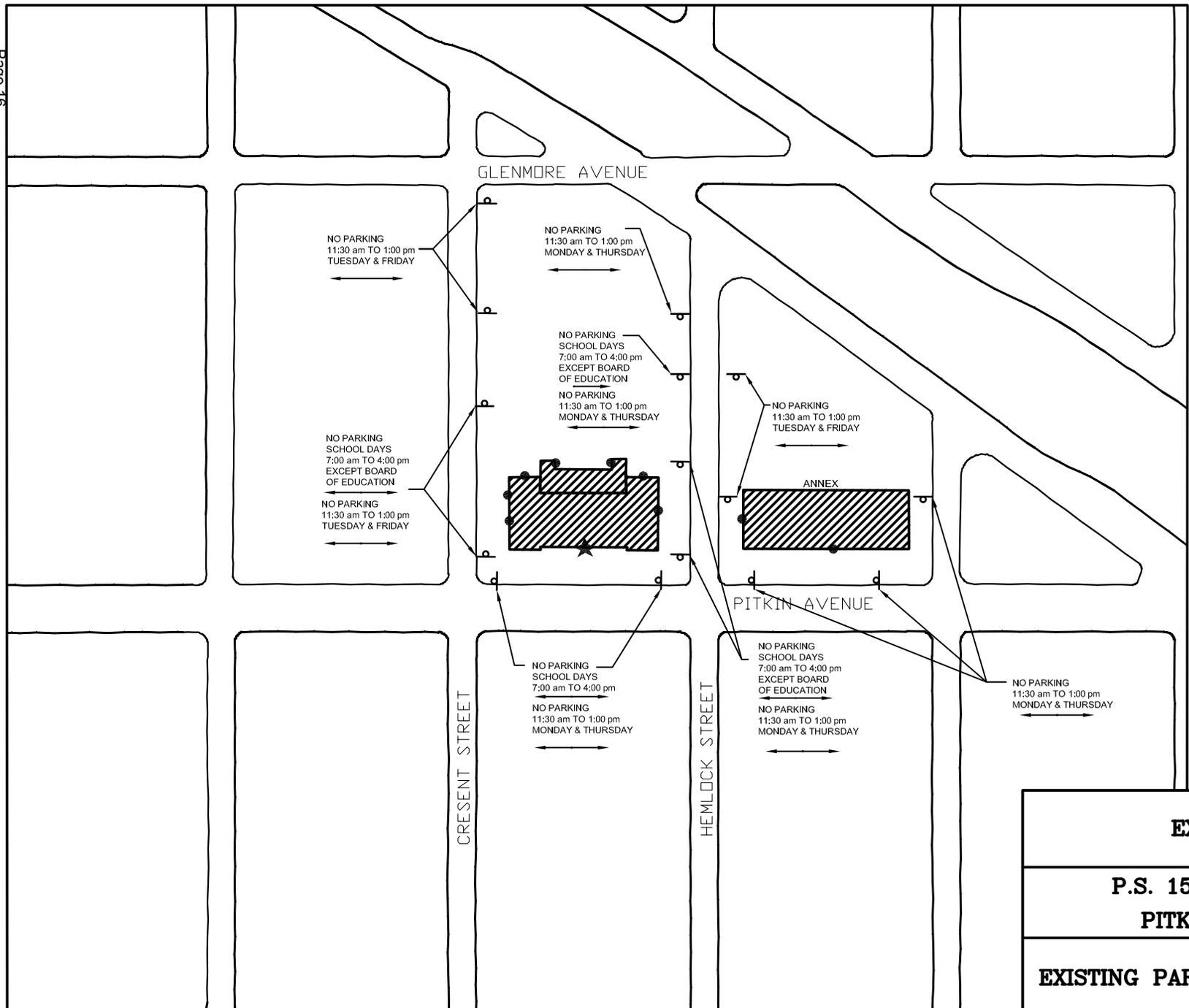


EXHIBIT 5

**P.S. 159, BROOKLYN
PITKIN SCHOOL**

EXISTING PARKING REGULATIONS

3.5 ACCIDENT SUMMARY

Exhibit 6 and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV), in the vicinity of P.S. 159 for the three-year period from January 1, 1998 through December 31, 2000. The DMV data provides some detail relating to the circumstances and cause of the accident. Table 3 is a summary of more recent accident data obtained from the NYC Police Department (NYPD). Though current through 2004, the NYPD data does not provide the same level of detail as the DMV data.

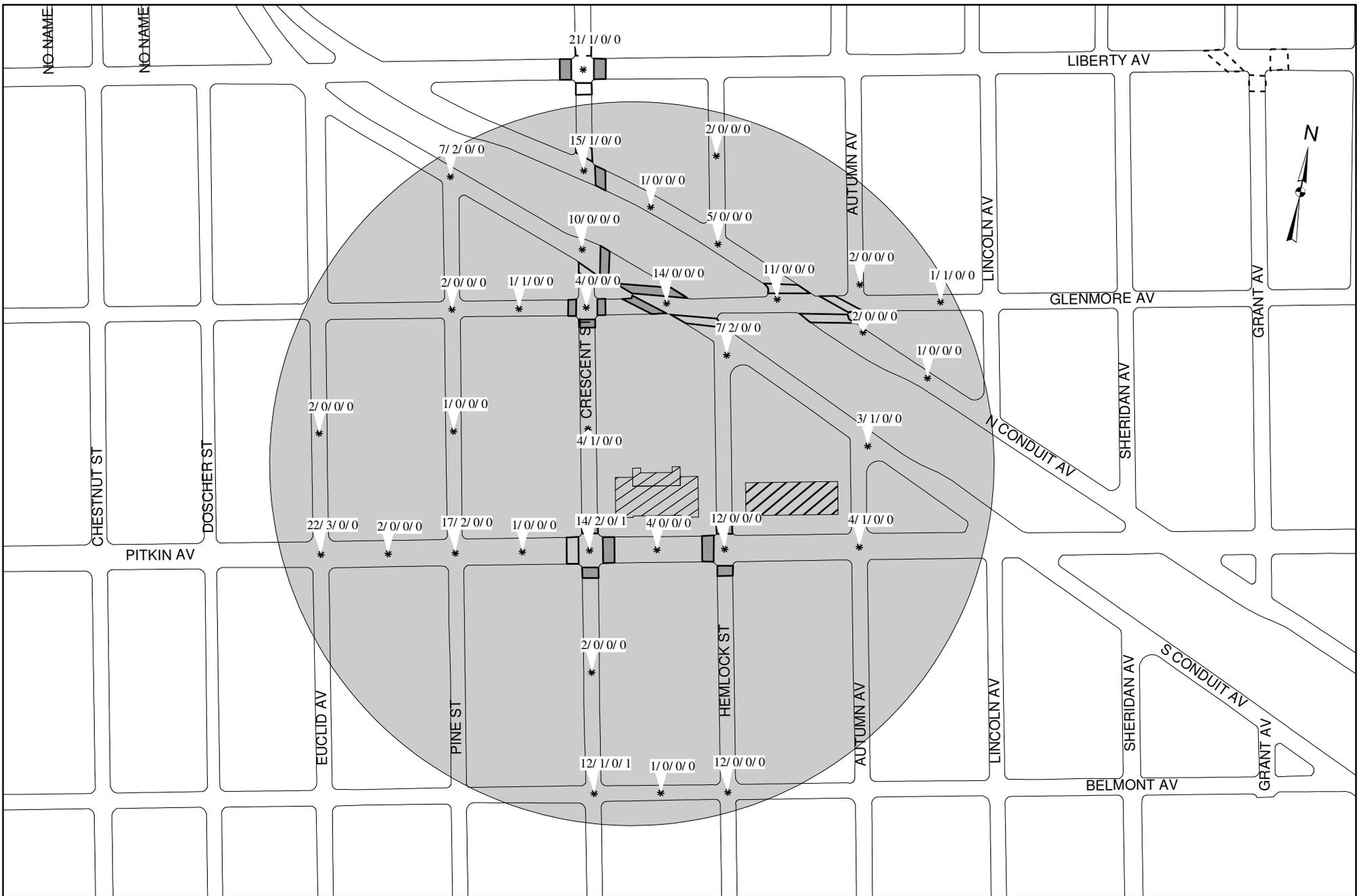
This report targets intersections closest to the school where the highest concentrations of student pedestrians occur. Intersections that are farther from the school and locations for which detailed data was not available at the time of this study will be addressed with DOT's School Safety Engineering Program's ongoing work. DMV accident data is discussed in Section 3.6, Traffic Operations and Issues.

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Pitkin Ave. and Hemlock Street	12	0	0	0
Pitkin Ave. and Crescent Street	14	2	0	1
Glenmore Ave. and Crescent Street	4	0	0	0
Glenmore Ave. and S. Conduit Ave.	14	0	0	0
Crescent St. and S. Conduit Ave.	10	0	0	0
Crescent St. and N. Conduit Ave.	15	1	0	0
Crescent St. and Liberty Ave.	21	1	0	0
Belmont Ave. and Crescent Street	12	1	0	1
TOTAL	102	5	0	2

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Pitkin Ave. and Hemlock Street	16	0	0	0
Pitkin Ave. and Crescent Street	15	2	0	0
Glenmore Ave. and Crescent Street	4	1	0	0
Glenmore Ave. and S. Conduit Ave.	NA	NA	NA	NA
Crescent St. and S. Conduit Ave.	NA	NA	NA	NA
Crescent St. and N. Conduit Ave.	NA	NA	NA	NA
Crescent St. and Liberty Ave.	34	4	0	1
Belmont Ave. and Crescent Street	8	0	0	0
TOTAL	77	7	0	1

NA – NYPD accident data was not available for this location during study period

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



ACCIDENT LOCATION *

SCHOOL CROSSWALK ASSIGNED TO P.S. 159

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL

CROSSWALK

X/X/X/X

*



TOTAL ACCIDENTS	PED ACCIDENTS	PED FATAL	SCHOOL PED ACCIDENTS
X	X	X	X

1 inch equals 250 feet

EXHIBIT 6
P.S. 159, BROOKLYN
PITKIN SCHOOL
ACCIDENT SUMMARY
THREE YEAR PERIOD
(1998-2000)

3.6 TRAFFIC OPERATIONS AND ISSUES

The following outlines the traffic accident and operational issues in the vicinity of P.S. 159:

3.6.1 Pitkin Avenue and Hemlock Street

Pitkin Avenue is a 50-foot wide, two-way street with one travel lane in each direction and parking on both sides of the street. Hemlock Street is a 30-foot wide, one-way southbound street with one travel lane and parking on both sides. Pitkin Avenue and Hemlock Street is a signalized intersection with school crosswalks in place on the north, south and west legs.

There were twelve accidents at this intersection during the 1998-2000 study period, none of which were pedestrian accidents.



Figure 10: Pitkin Avenue and Hemlock Street, looking eastbound from school entrance

School officials indicated that vehicles were speeding on Pitkin Avenue in the Vicinity of the school. A spot speed study was conducted on Pitkin Avenue between Hemlock Street and Crescent Street Tuesday August 9, 2005. The spot speed study confirmed that the 85th percentile speed on Pitkin Avenue was 32 mph, which exceeds the statutory speed limit of 30 mph. See Table 4 and the Appendix for additional details on the speed study.

TABLE 4: SPOT SPEED STUDY		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
Pitkin Avenue between Hemlock Street and Crescent Street	26	32

Installation of a speed reducer (hump) was considered on Pitkin Avenue between Hemlock Street and Crescent Street. However, Pitkin Avenue is a bus route, and therefore does not meet the DOT criteria for a speed reducer (hump). Alternative measures to improve student pedestrian safety are discussed in Section 4.

3.6.2 Pitkin Avenue and Crescent Street

Pitkin Avenue and Crescent Street is a signalized intersection. Crescent Street is a 30-foot wide, one-way northbound street with one travel lane and parking on both sides. There are school crosswalks in place on the north, south and east legs.

There were fourteen accidents at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, one of which was school-related. A driver starting from a parked position struck a 12-year-old child. The other driver struck a pedestrian while making a left turn. The second accident was due to the driver's failure to yield to a pedestrian.

Crescent Street was under major construction at the time of the school visit. New curbing was being installed and the roadway was being reconstructed. The construction is completed according to the field visit on September 8, 2006.



Figure 11: Pitkin Avenue and Hemlock Street, looking westbound from school

3.6.3 Glenmore Avenue and Crescent Street

Glenmore Avenue and Crescent Street is an un-signalized intersection with a stop control on Crescent Street for northbound traffic. Glenmore Avenue is a 30-foot wide, one-way eastbound street with one travel lane and parking on both sides of the street. Crescent Street is running northbound south of Glenmore Avenue and running southbound north of Glenmore Avenue. There are school crosswalks on the south, east and west legs, therefore, the east and west school crosswalks are uncontrolled.

This intersection is located very close to South Conduit Avenue, which runs southeast. The block lengths to the adjacent intersections are less than 100 feet to the north and to the east.

Traffic counts were performed on Wednesday September 6, 2006 between 2:30 pm and 3:30 pm to better understand the pedestrian and vehicle conflicts at this intersection (Exhibit 7). The results indicate that during the study hour, 64 pedestrians crossed the west and east legs, which are currently uncontrolled school crosswalks. Based on MUTCD Section 4C.05 Signal Warrant 4 (Pedestrian Volume) the need for a traffic control signal at an intersection shall be considered if an engineering study finds that the pedestrian volume crossing the major street at an intersection during an average day is 190 or more during any one hour. Existing conditions do not meet the criteria for signalizing the intersection at this time.

There were four accidents at this intersection during the 1998-2000 study period, none of which were pedestrian accidents.

3.6.4 Glenmore Avenue and South Conduit Avenue

Glenmore Avenue and South Conduit Avenue is a signalized intersection with school crosswalks on the north and west legs. South Conduit Avenue is 34-foot wide and runs southeast with three travel lanes. Parking is not allowed on South Conduit Avenue.

According to school officials and as confirmed by field observations, a significant number of P.S. 159 students use this intersection en route to school.

A total of fourteen accidents occurred at this intersection during the 1998-2000 study period, none of which involved pedestrians.

3.6.5 Crescent Street and South Conduit Avenue

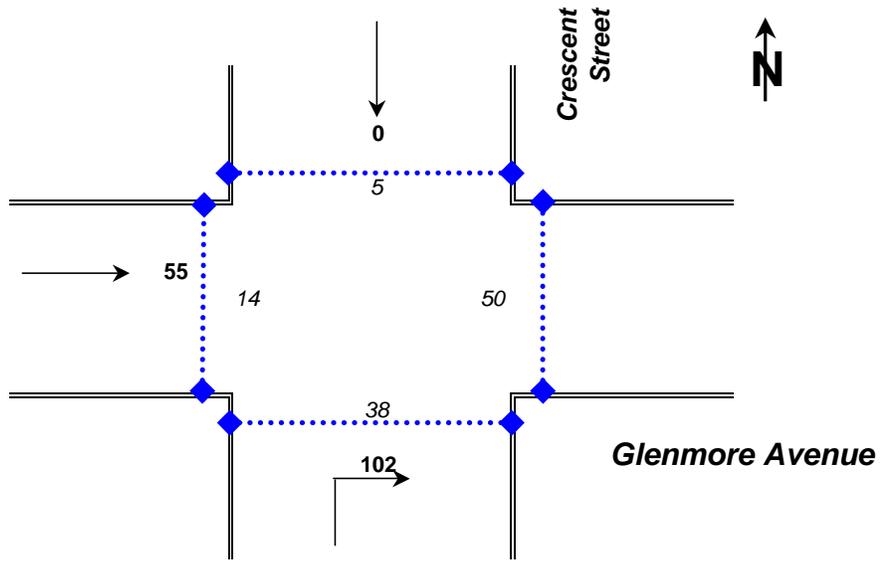
Crescent Street and South Conduit Avenue is a signalized T-intersection with a school crosswalk on the east leg. Crescent Street is running southbound South of Conduit Avenue.

A total of ten accidents occurred at this intersection during the 1998-2000 study period, none of which involved pedestrians.



Figure 12: Crescent Street and South Conduit Avenue, looking north

One Hour Traffic Count Volumes



Intersection of Glenmore Avenue and Crescent Street - (2:30 PM - 3:30 PM September 6, 2006)

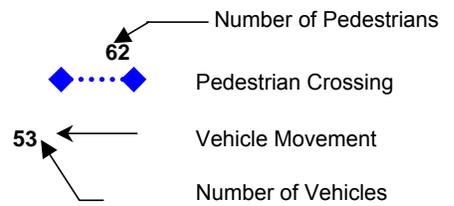


EXHIBIT 7
P.S. 159, BROOKLYN PITKIN SCHOOL
TRAFFIC COUNTS

3.6.6 Crescent Street and North Conduit Avenue

Crescent Street and North Conduit Avenue is a signalized T-intersection with a school crosswalk on the east leg. North Conduit Avenue is 34-foot wide and runs northwest with three travel lanes. Parking is not allowed on North Conduit Avenue. Crescent Street is running northbound north of conduit Avenue. There are various retail commercial and business properties along North Conduit Avenue.

Fifteen accidents occurred at this intersection during the 1998-2000 study period. One accident involved a pedestrian, which was not school-related. A pedestrian was struck while crossing North Conduit Avenue outside of the crosswalk.



Figure 13: Crescent Avenue and North Conduit Avenue, looking north

3.6.7 Crescent Street and Liberty Avenue

Crescent Street and Liberty Avenue is a signalized intersection. Liberty Avenue is a 40-foot wide, two-way street with one travel lane in each direction and parking on both sides. There are school crosswalks on the east and west legs.

There were 21 accidents at this intersection during the 1998-2000 study period. One accident involved a pedestrian, which was not school-related. There were no further details for this accident.

3.6.8 Belmont Avenue and Crescent Street

Belmont Avenue and Crescent Street is a signalized intersection. Belmont Avenue is a 30-foot wide, one-way eastbound street with one travel lane and parking on both sides. There are school crosswalks on the east and south legs. There are no pedestrian crosswalks at this intersection.

There were twelve accidents at this intersection during the 1998-2000 study period, one of which was school-related pedestrian accident. An eight-year-old student was struck while crossing against the signal.

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 159 and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches.

TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS				
Intersection Name	Crosswalk Length (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)	Timing Adjustment? (Yes/No)
Pitkin Avenue and Hemlock Street				
Crossing Pitkin Ave.	50	25	20	NO
Crossing Hemlock Street	20	35	10	NO
Pitkin Avenue and Crescent Street				
Crossing Pitkin Ave.	50	30	20	NO
Crossing Crescent Street	30	30	13	NO
Glenmore Ave. and S. Conduit Avenue				
Crossing Glenmore Ave.	30	84	13	NO
Crossing South Conduit Ave.	47	36	19	NO
Crescent Ave. and South Conduit Avenue				
Crossing Crescent Ave.	40	84	13	NO
Crossing South Conduit Ave.	60	36	23	NO
Crescent Avenue and North Conduit Avenue				
Crossing Crescent Ave.	30	84	13	NO
Crossing North Conduit Ave.	40	36	17	NO
Crescent Street and Liberty Avenue				
Crossing Crescent Ave.	30	60	13	NO
Crossing Liberty Ave.	20	30	10	NO

Note – A rate of 3 ft/sec plus 3 seconds reaction time was utilized as the child pedestrian walking rate

3.8 PHYSICAL CONDITIONS (ROADWAY AND SIDEWALK)

The roadways and sidewalks in the vicinity of the school were observed to be fair condition. At the time of the school visit, Crescent Street was under major reconstruction, with new curbs and pavement in the process of being installed. The construction is completed according to the field visit on September 8, 2006.

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes potential countermeasures. These countermeasures are divided into short-term and long-term measures. Short-term measures are those that potentially can be performed in-house; long-term measures are proposed capital improvements.

4.1 SHORT-TERM MEASURES

- Administer student pedestrian safety education program

It is recommended that the NYCDOT Safety Education Program work with the school to educate the students on pedestrian safety, including crossing the street with the WALK phase, and the meaning of WALK - FLASHING DON'T WALK - DON'T WALK pedestrian signal sequence. It is also recommended that the students be educated not to cross mid-block.

- Upgrade No Parking Zone to No Standing Zone

Existing “NO PARKING 7:00 AM - 4:00 PM, SCHOOL DAYS” parking regulations on Pitkin Avenue should be upgraded to “NO STANDING 7:00 AM - 4:00 PM, SCHOOL DAYS”. This will allow school buses and parents a place to load and unload students at the curb, and will also improve visibility of those students arriving and leaving the school.

- No Standing Zone

“NO STANDING 7:00 AM - 4:00 PM, SCHOOL DAYS” parking regulations should be considered on Pitkin Avenue in front of P.S. 159 annex for a length of 30 feet. This will allow parents a place to load and unload students at the curb, and will also improve visibility of those students arriving and leaving the school.

- Place stop bars ten feet in advance of school crosswalks

The MUTCD and New York City DOT standard for placement of a stop bar is four feet in advance of a marked crosswalk. At signalized (or stop controlled) crosswalks, the vehicle stop line can be placed farther back from the crosswalk in order to maximize visibility of pedestrians and to minimize the potential for pedestrian/vehicle conflicts. Therefore, it is recommended that stop bars be placed ten feet in advance of all school crosswalks.

- Install new school crosswalks at the following location:

- Belmont Avenue and Crescent Street – north, south and east legs
- Glenmore Avenue and North Conduit Avenue – north leg

Providing a new school crosswalk at these two locations will complete a network of contiguous school crosswalks in the immediate school vicinity. In addition, a school-related accident occurred at Belmont Avenue and Crescent Street during the 1998-2000 study period. Therefore, it is recommended that school crosswalks be installed at these two intersections.

4.2 LONG-TERM MEASURES

▪ Channelization of traffic and median islands on Pitkin Avenue

School officials indicated that vehicles were speeding on Pitkin Avenue in front of the school. A spot speed study conducted on August 9, 2005 confirmed that the 85th percentile speed exceeds the statutory speed limit of 30 mph (see Table 4 and Appendix).

It is recommended that the wide pavement area be narrowed visually by channeling the traffic with a center median approximately 6' wide. This has been shown as an effective measure to reduce vehicle speeds.

In conjunction with the median striping, consideration should be given to installing a median islands at the following locations, provided that the Final Design confirms that construction of the recommended islands would be feasible and would not interfere with traffic operations. Final details pertaining to the number, location and geometry of curb extensions will be developed during the Final Design/Contract Document preparation.

- Pitkin Avenue and Crescent Street
- Pitkin Avenue and Hemlock Street

The purpose of the median islands is to shorten the crossing distance for pedestrians, and to reduce speeds of vehicles approaching and turning at these heavily utilized school crosswalks (or intersections). These curb extensions would not eliminate or reduce the width of any moving lanes.

▪ Consider curb extensions at the following intersections:

Consideration should be given to installing a median islands at the following locations, provided that the Final Design confirms that construction of the recommended islands would be feasible and would not interfere with traffic operations. Final details pertaining to the number, location and geometry of curb extensions will be developed during the Final Design/Contract Document preparation.

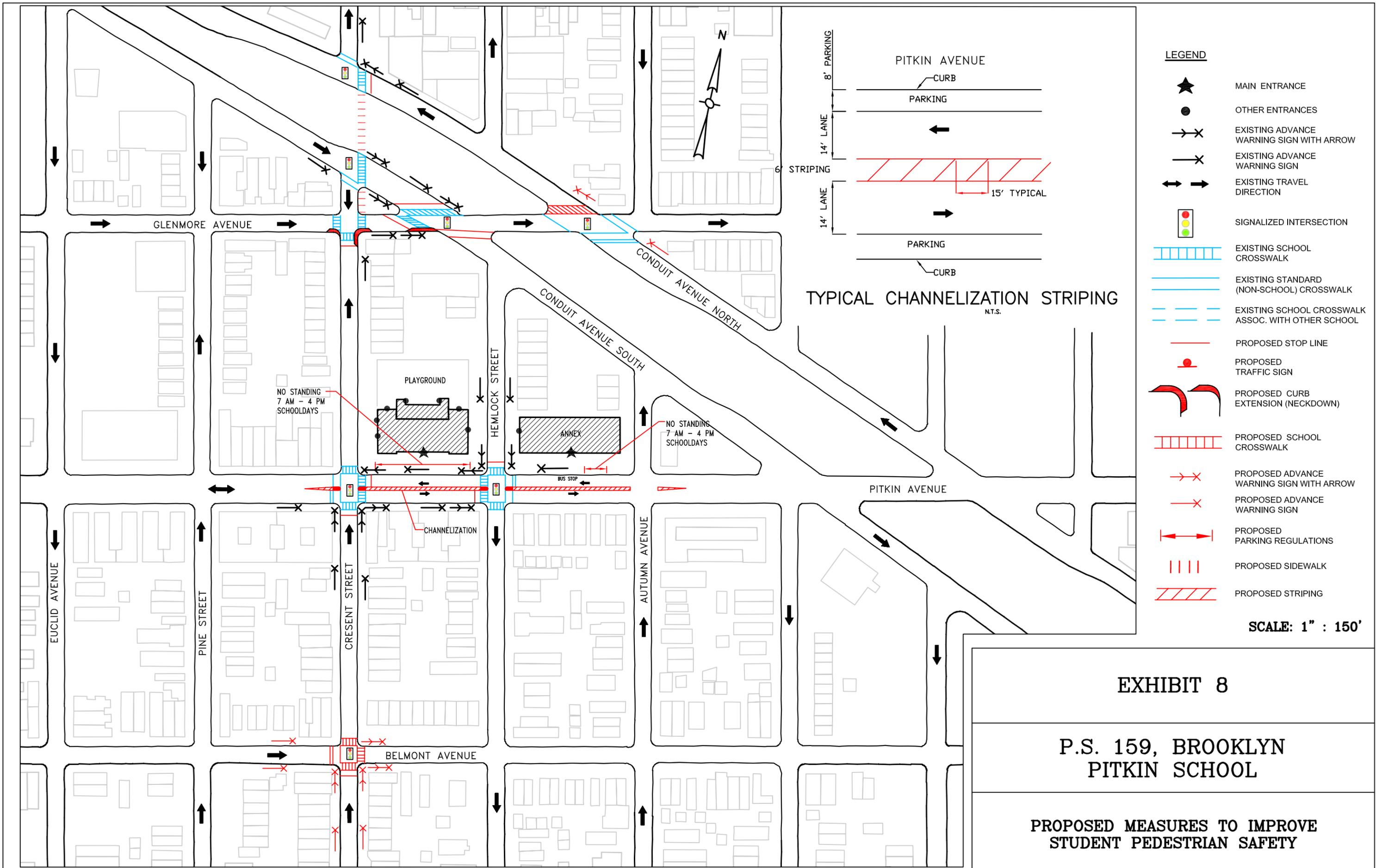
- Glenmore Avenue and South Conduit Avenue
- Glenmore Avenue and Crescent Street

Curb extensions should be considered at the corners as shown in Exhibit 8.

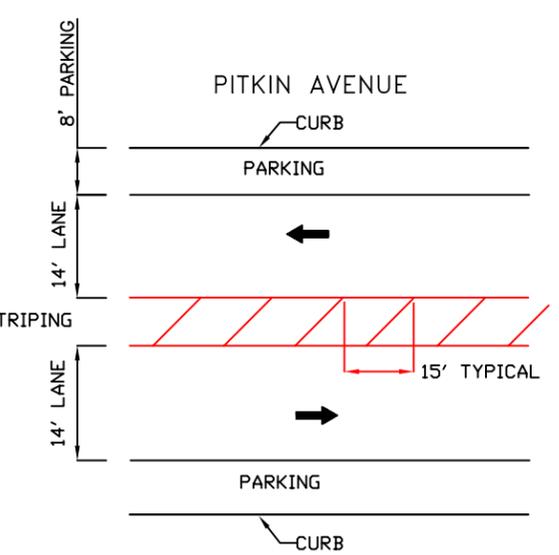
The purpose of the curb extensions is to shorten the crossing distance for pedestrians, and to reduce speeds of vehicles approaching and turning at these heavily utilized school crosswalks (or intersections). These curb extensions would not eliminate or reduce the width of any moving lanes.

- *Reconstruct new sidewalks across Conduit Avenue along the Crescent Street alignment*

New sidewalk curbs, standard pedestrian ramps and concrete sidewalks should be considered to be reconstructed to replace the existing broken asphalt sidewalk that spans between South Conduit Avenue and North Conduit Avenue along the Crescent Street alignment.



- LEGEND**
- ★ MAIN ENTRANCE
 - OTHER ENTRANCES
 - X EXISTING ADVANCE WARNING SIGN WITH ARROW
 - X EXISTING ADVANCE WARNING SIGN
 - ↔ EXISTING TRAVEL DIRECTION
 - 🚦 SIGNALIZED INTERSECTION
 - ▬ EXISTING SCHOOL CROSSWALK
 - ▬ EXISTING STANDARD (NON-SCHOOL) CROSSWALK
 - ▬ EXISTING SCHOOL CROSSWALK ASSOC. WITH OTHER SCHOOL
 - PROPOSED STOP LINE
 - PROPOSED TRAFFIC SIGN
 - ⤵ PROPOSED CURB EXTENSION (NECKDOWN)
 - ▬ PROPOSED SCHOOL CROSSWALK
 - X PROPOSED ADVANCE WARNING SIGN WITH ARROW
 - X PROPOSED ADVANCE WARNING SIGN
 - ⏏ PROPOSED PARKING REGULATIONS
 - ▬ PROPOSED SIDEWALK
 - ▨ PROPOSED STRIPING



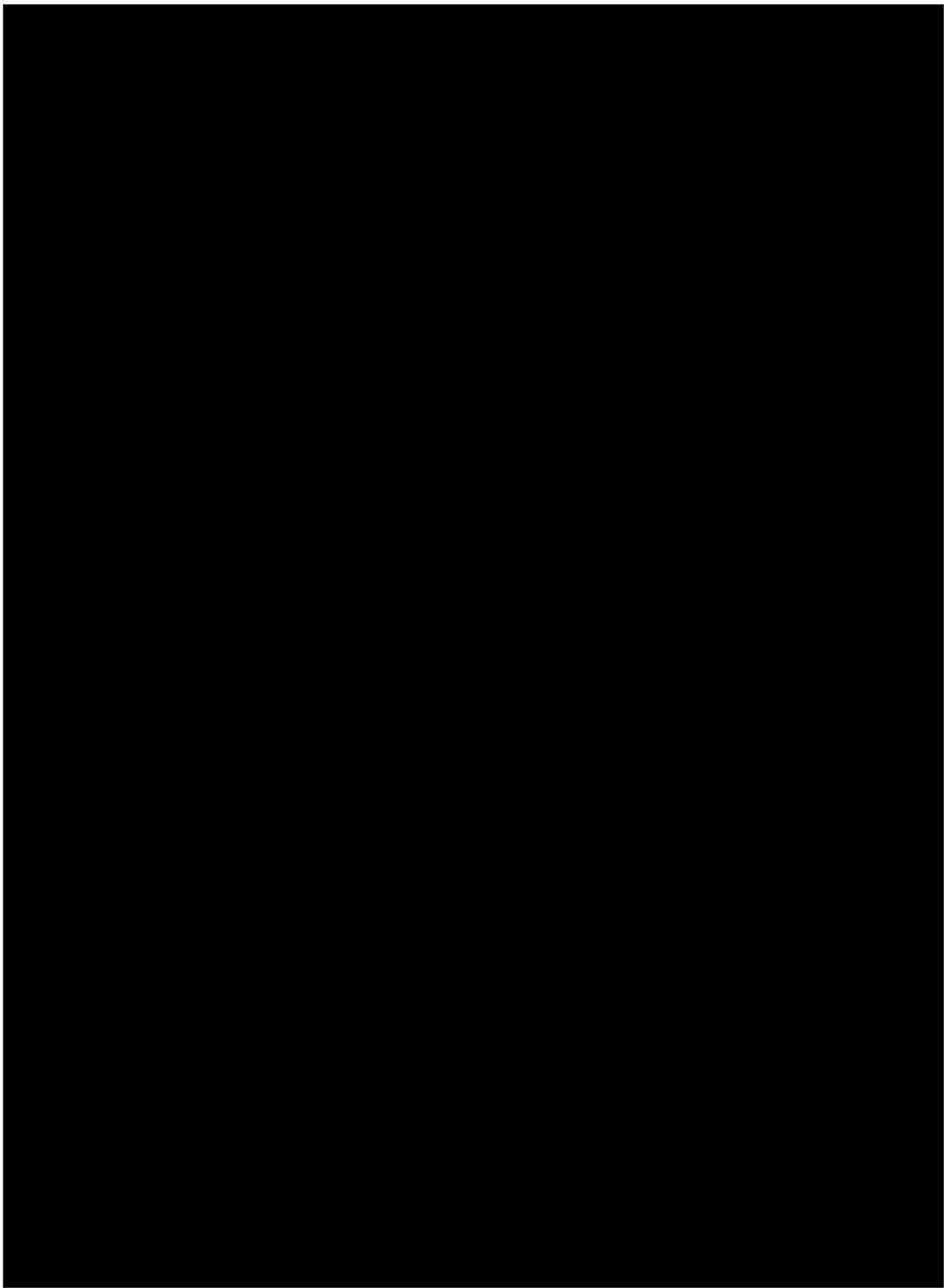
SCALE: 1" : 150'

EXHIBIT 8

**P.S. 159, BROOKLYN
PITKIN SCHOOL**

**PROPOSED MEASURES TO IMPROVE
STUDENT PEDESTRIAN SAFETY**

APPENDIX



SPOT SPEED STUDY

Date: **August 9, 2005**
 Location: **Pitkin Ave between Hemlock St & Crescent St**
 Surveyor: **Eyad Yousef**

Time: **8:00 am - 9:00 am**

School: **PS 159**
 Direction:
 Comments: **Clear and dry**

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	2	2.0%	2.0%	30	450
16	4	4.0%	6.0%	64	1024
17	2	2.0%	8.0%	34	578
18	2	2.0%	10.0%	36	648
19	2	2.0%	12.0%	38	722
20	3	3.0%	15.0%	60	1200
21	4	4.0%	19.0%	84	1764
22	4	4.0%	23.0%	88	1936
23	7	7.0%	30.0%	161	3703
24	4	4.0%	34.0%	96	2304
25	9	9.0%	43.0%	225	5625
26	9	9.0%	52.0%	234	6084
27	2	2.0%	54.0%	54	1458
28	9	9.0%	63.0%	252	7056
29	9	9.0%	72.0%	261	7569
30	10	10.0%	82.0%	300	9000
31	4	4.0%	86.0%	124	3844
32	4	4.0%	90.0%	128	4096
33	4	4.0%	94.0%	132	4356
34	2	2.0%	96.0%	68	2312
35	0	0.0%	96.0%	0	0
36	2	2.0%	98.0%	72	2592
37	0	0.0%	98.0%	0	0
38	0	0.0%	98.0%	0	0
39	2	2.0%	100.0%	78	3042
40	0	0.0%	100.0%	0	0
41	0	0.0%	100.0%	0	0
42	0	0.0%	100.0%	0	0
43	0	0.0%	100.0%	0	0
44	0	0.0%	100.0%	0	0
45	0	0.0%	100.0%	0	0
46	0	0.0%	100.0%	0	0
47	0	0.0%	100.0%	0	0
48	0	0.0%	100.0%	0	0
49	0	0.0%	100.0%	0	0
50	0	0.0%	100.0%	0	0
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%		2619	71363

Mean Speed = 26.2 mph
 Standard Deviation = 5.3 mph
 Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 26.2 mph
 15th Percentile Speed = 20.7 mph
 85th Percentile Speed = 31.7 mph

SPOT SPEED STUDY

Date: **August 9, 2005**

Time: **8:00 am - 9:00 am**

School: **PS 159**

Location: **Pitkin Ave between Hemlock St & Crescent St**

Direction:

Surveyor: **Eyad Yousef**

Comments: **Clear and dry**

Mean Speed = 26.2 mph
Standard Deviation = 5.3 mph
Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 26.2 mph
15th Percentile Speed = 20.7 mph
85th Percentile Speed = 31.7 mph

