

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



School Safety Engineering Project

FINAL REPORT: P.S. 108 (The Vincent G. Fowler School), Queens



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



September 27, 2006

**School Safety Engineering Project
Final Report: P.S. 108, Queens**

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SPEED SURVEY DATAA4-A11

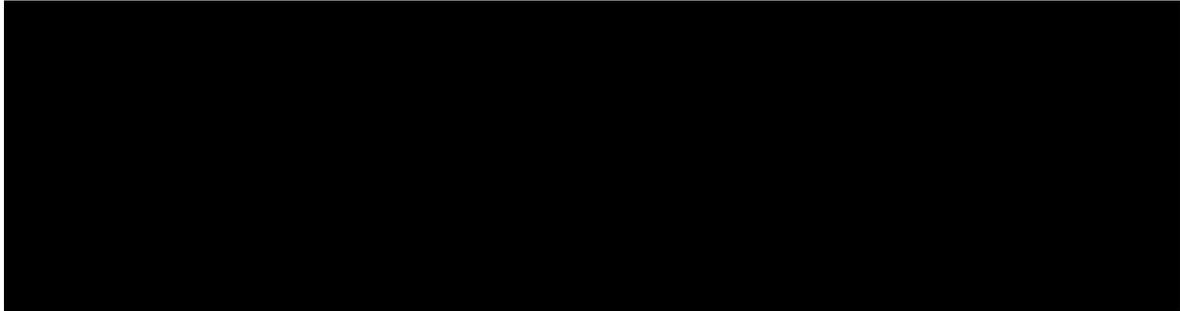
1. INTRODUCTION

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). P.S. 108 (The Captain Vincent G. Fowler School) in the South Ozone Park section of 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



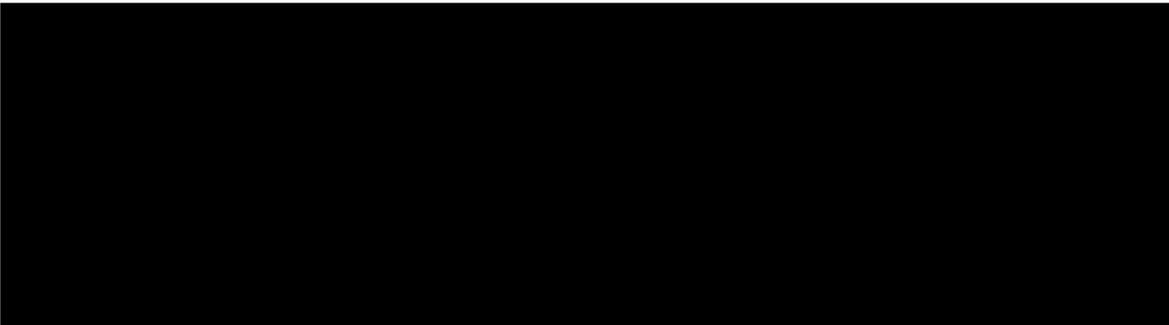
2.2 NEIGHBORHOOD DESCRIPTION

Exhibit 1 shows an aerial view of the neighborhood surrounding the school. P.S. 108 is bounded by 109th Avenue to the north, Rockaway Boulevard to the south, 109th Street to the east, and 108th Street to the west. The neighborhood in the vicinity of the school primarily consists of residential uses, but also includes some commercial uses, particularly along Rockaway Boulevard to the south of the school. Aqueduct Race Track is located on the south side of Rockaway Boulevard, opposite P.S. 108.

2.3 MEETING WITH SCHOOL REPRESENTATIVES

Members of the consultant team met with the school principal and parent coordinator at P.S. 108 on the morning of May 20, 2004 to discuss traffic and pedestrian safety issues at and around the school. According to these school representatives, the primary problems facing student pedestrians at P.S. 108 are:

- Vehicles speeding along the streets abutting the school, particularly 109th Avenue.
- Motorists not complying with posted traffic signs, speeds, and parking regulations. Police enforcement is needed in the vicinity of the school to encourage motorist compliance.
- Pedestrian ramps are needed on the corners of several intersections in the vicinity of P.S. 108.





2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

The school’s “catchment area” as defined by the Department of Education is shown in Exhibit 2 at the end of this section. The catchment area is roughly bounded by 103rd Avenue to the north, Conduit Avenue to the south, 115th Street to the east, and Cross Bay Boulevard to the west.

Table 1 presents the modes of travel for P.S. 108 students, as identified by the school’s principal

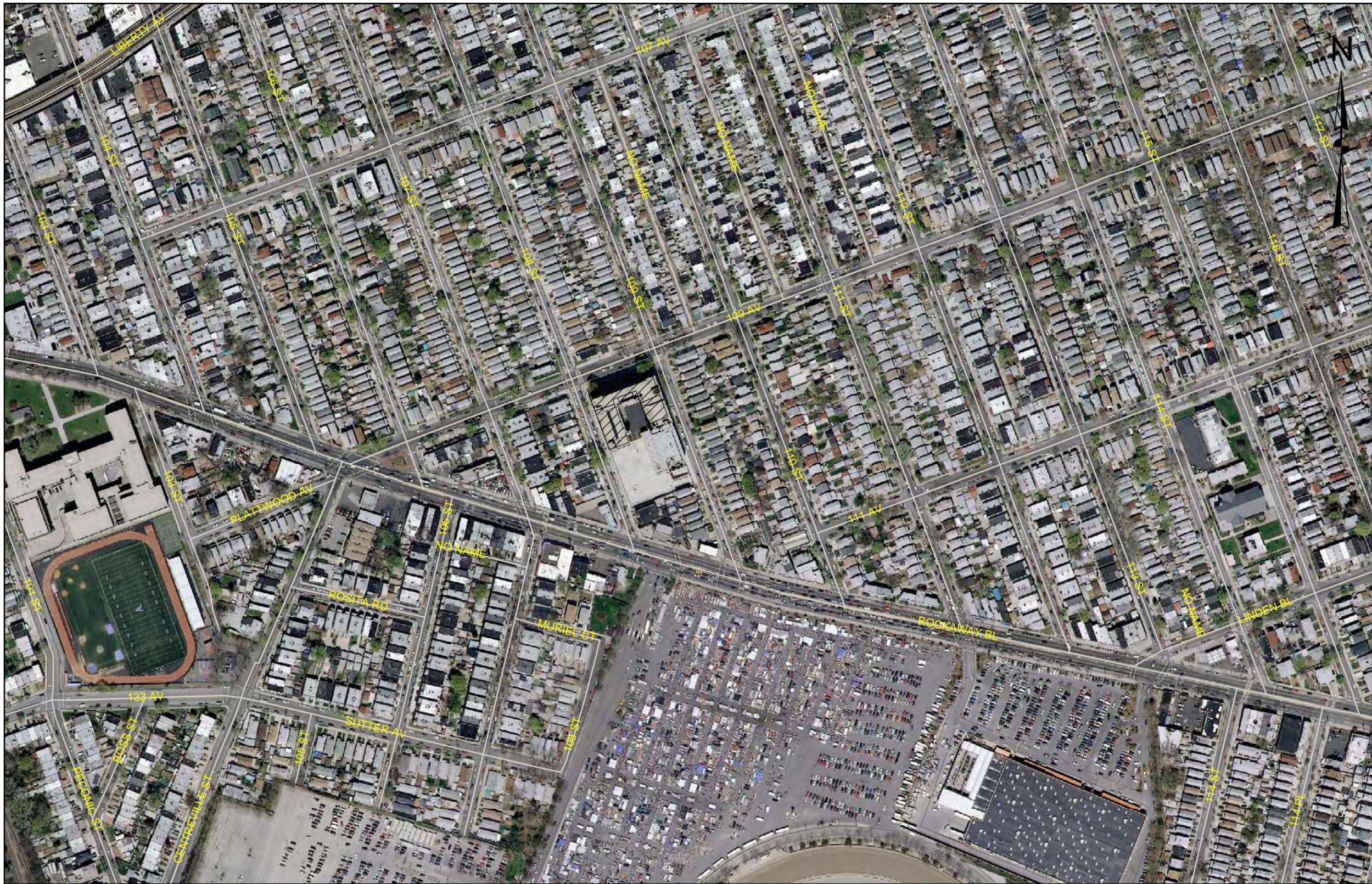
TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	STUDENTS (Percentage)
Walk	75%
Driven by Car	9%
School Bus	8%
MTA Bus/Subway	8%
Bicycle	0%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are several commercial properties in the vicinity of P.S. 108 that attract student pedestrians. These include small grocery stores located on the northeast and southeast corners of the 107th Street and Rockaway Boulevard intersection, and a small restaurant located on the southeast corner of 106th Street and 109th Avenue intersection.

2.8 CROSSING GUARD LOCATION

Crossing guards are not assigned to any intersection in the vicinity of P.S. 108.



0 250 500 1,000 Feet

EXHIBIT 1
P.S. 108 QUEENS
AERIAL PHOTOGRAPH

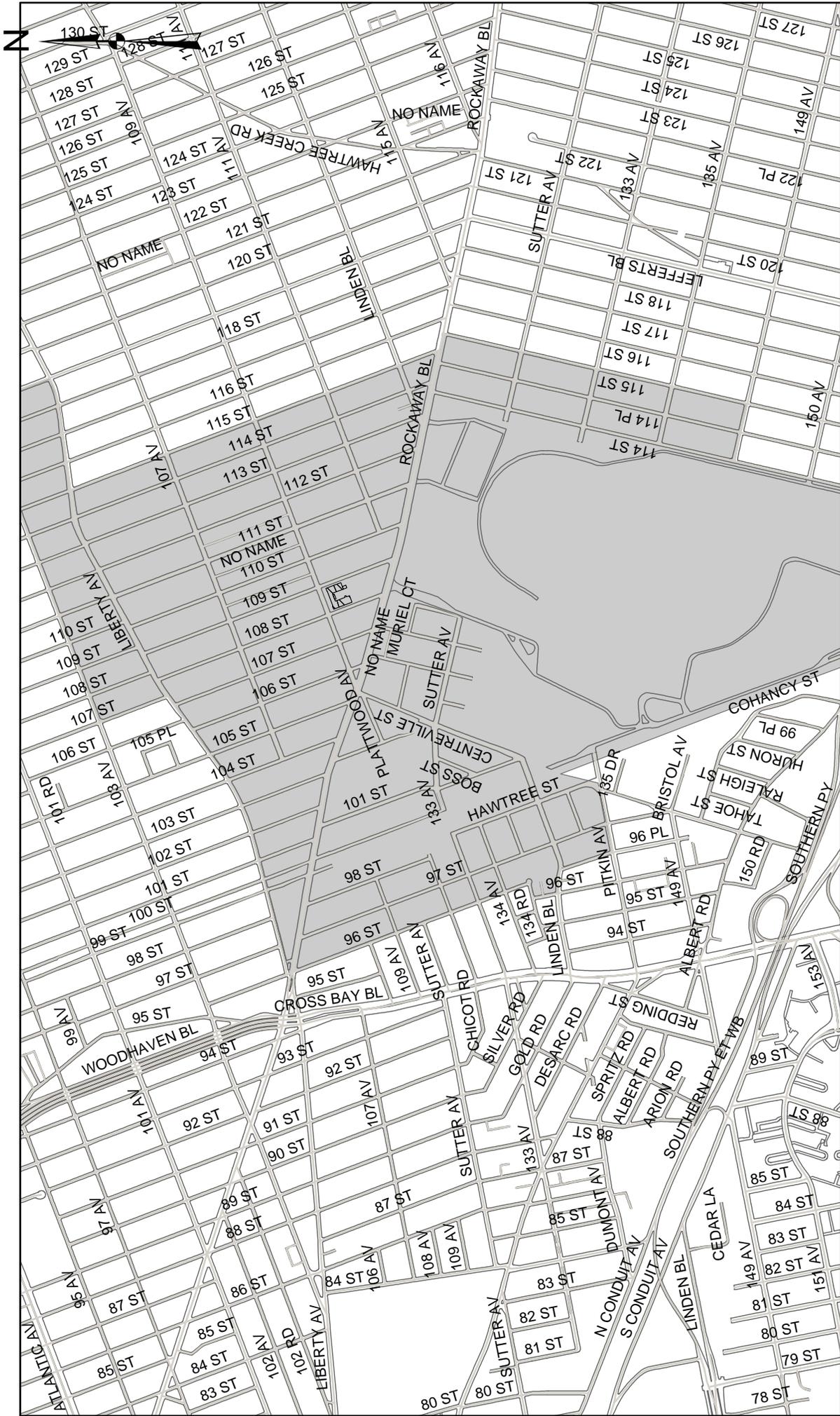
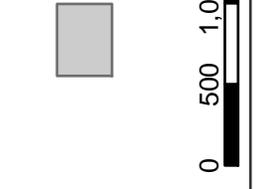


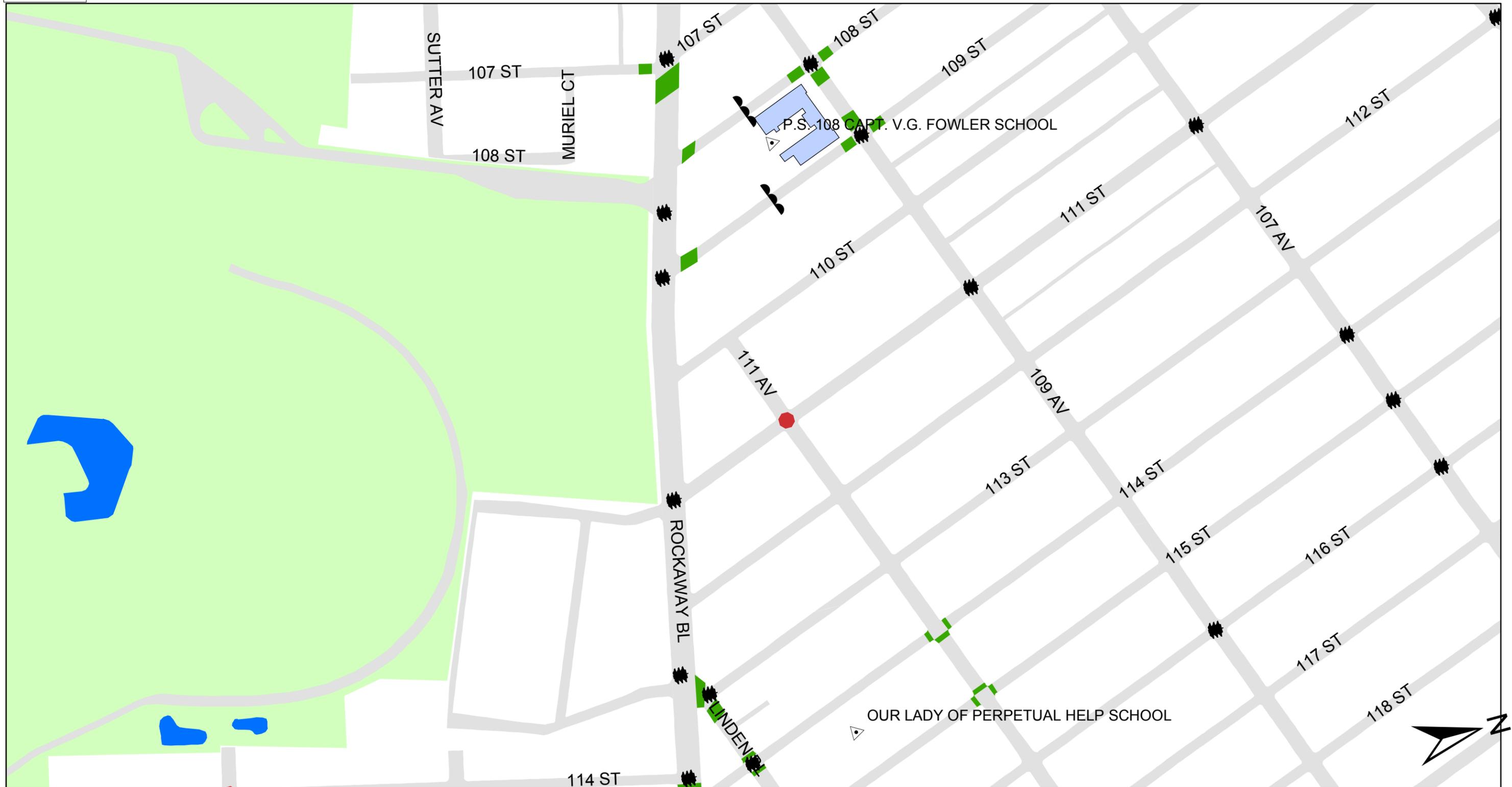
EXHIBIT 2
P.S. 108 QUEENS
CATCHMENT AREA



LEGEND:
 CATCHMENT AREA, (DEPARTMENT OF EDUCATION DESIGNATED AREA FROM WITHIN WHICH STUDENTS ARE ENTITLED TO ATTEND P.S. 108)



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 advance warning signs, 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 only shows 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 108 Queens
CAPT. VINCENT G. FOWLER

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

Map created on 9/15/2006

EXHIBIT 3

COMM. BOARD: 410
 PRECINCT: 106

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

Information concerning school bus operations for P.S. 108 was obtained from the principal of P.S. 108 on May 20, 2004. The school principal estimated that two school buses, four to five mini-vans, and two special education buses are used.

According to information posted on the Department of Education website, P.S. 108 currently provides school bus transportation for approximately 102 students (two routes with a total of 19 stops), as well as door-to-door transportation for 67 special education students on a total of seven routes. The website also indicates that the school issues 46 half-fare Metro Cards and 64 full-fare Metro Cards. In the vicinity of the school, the Q41 bus provides service along 109th Avenue, and the Q7 bus provides service along Rockaway Boulevard. The nearest subway stops are located on Liberty Avenue at the intersection with Rockaway Boulevard, and at the 104th Street and 111th Street intersection. Both stops provide access to the “A” subway line.

3.2 PARENT DROP-OFF OPERATIONS

According to the principal, approximately nine percent of the students at P.S. 108 are currently being dropped off. During the field visit, parents were observed dropping off students on 108th Street, 109th Street, and 109th Avenue around the school perimeter (see Figures 1 and 2). Congestion and double parking occur frequently during both arrival and dismissal times.



Figure 1: Looking north from the east side of 109th Street toward the intersection with 109th Avenue, during dismissal time (note double parking and resultant congestion)



Figure 2: Looking north from the west side of 109th Street toward the intersection with 109th Avenue during dismissal time (note double parking and resultant congestion)

3.3 PARKING REGULATIONS

Parking regulations around the school block are shown in Exhibit 4.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

Exhibit 3 shows the existing school signals and pavement markings around P.S. 108. 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 signs accompanied by downward pointing arrows. Signs scheduled to be installed under this program are shown as “existing” in Exhibit 6.

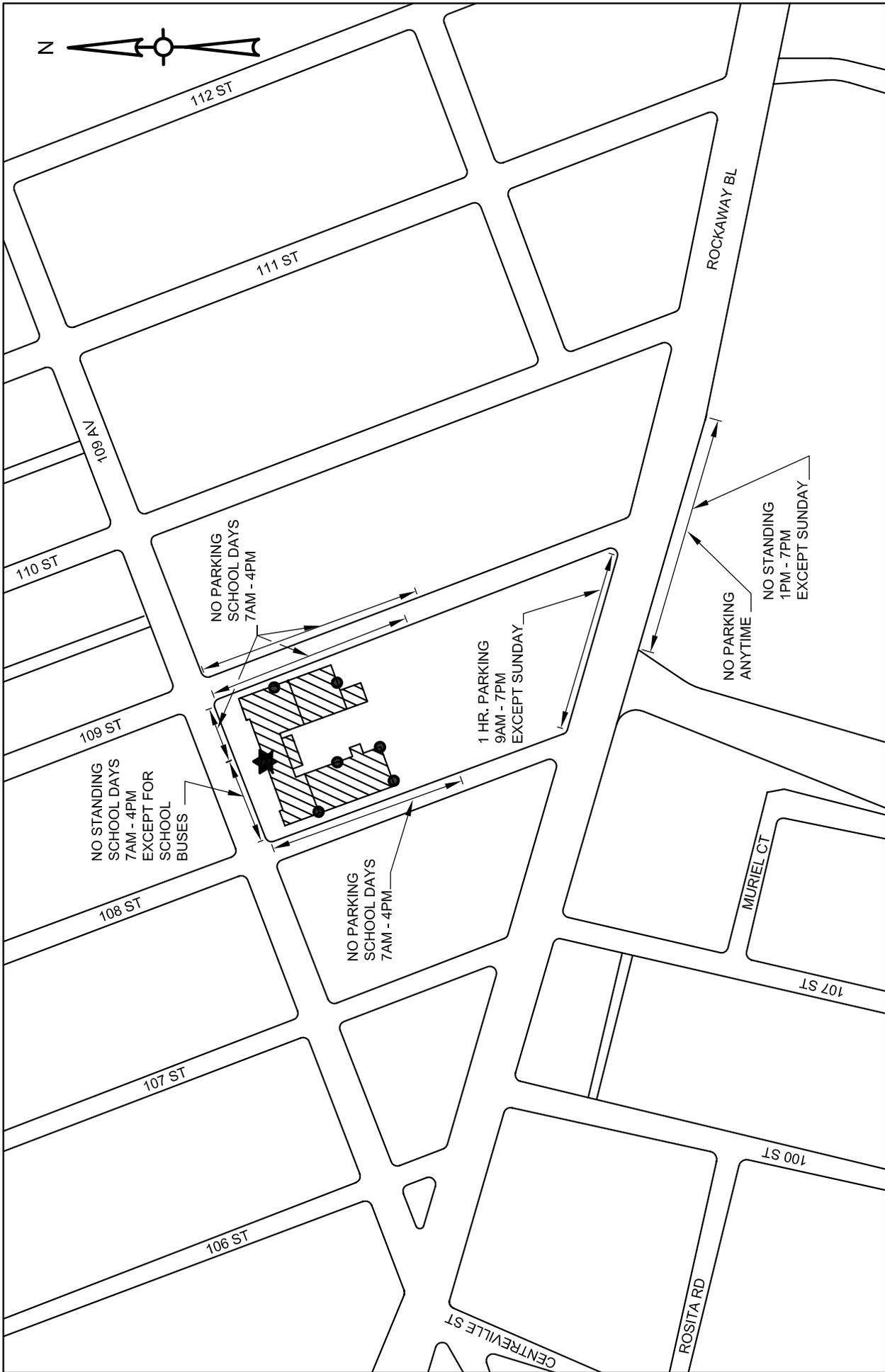


EXHIBIT 4
P.S. 108 QUEENS

EXISTING PARKING REGULATIONS

LEGEND:

- ★ MAIN ENTRANCE
- ENTRANCE



3.5 ACCIDENT SUMMARY

Exhibit 5 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 108 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 concentration of student pedestrians occurs. Intersections farther from the school and locations for which detailed data was not available at the time of this study will be addressed with the ongoing work of DOT's School Safety Engineering Program. DMV accident data is discussed in Section 3.6, Traffic Operations and Issues.

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS *
Rockaway Boulevard and 106 th Street	12	1	0	1
Rockaway Boulevard and 107 th Street	20	2	0	1
Rockaway Boulevard and 108 th Street	24	1	0	0
Rockaway Boulevard and 109 th Street	12	0	0	0
Rockaway Boulevard and Linden Boulevard	47	4	0	0
109 th Avenue and 107 th Street	17	1	0	1
109 th Avenue and 108 th Street	9	0	0	0
109 th Avenue and 109 th Street	11	0	0	0
TOTAL	152	9	0	3

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Rockaway Boulevard and 106 th Street	17	1	0	0
Rockaway Boulevard and 107 th Street	25	0	0	0
Rockaway Boulevard and 108 th Street	34	6	0	0
Rockaway Boulevard and 109 th Street	17	0	0	0
Rockaway Boulevard and Linden Boulevard	50	0	0	0
109 th Avenue and 107 th Street	23	1	0	0
109 th Avenue and 108 th Street	14	1	0	1
109 th Avenue and 109 th Street	8	0	0	0
TOTAL	188	8	0	1

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

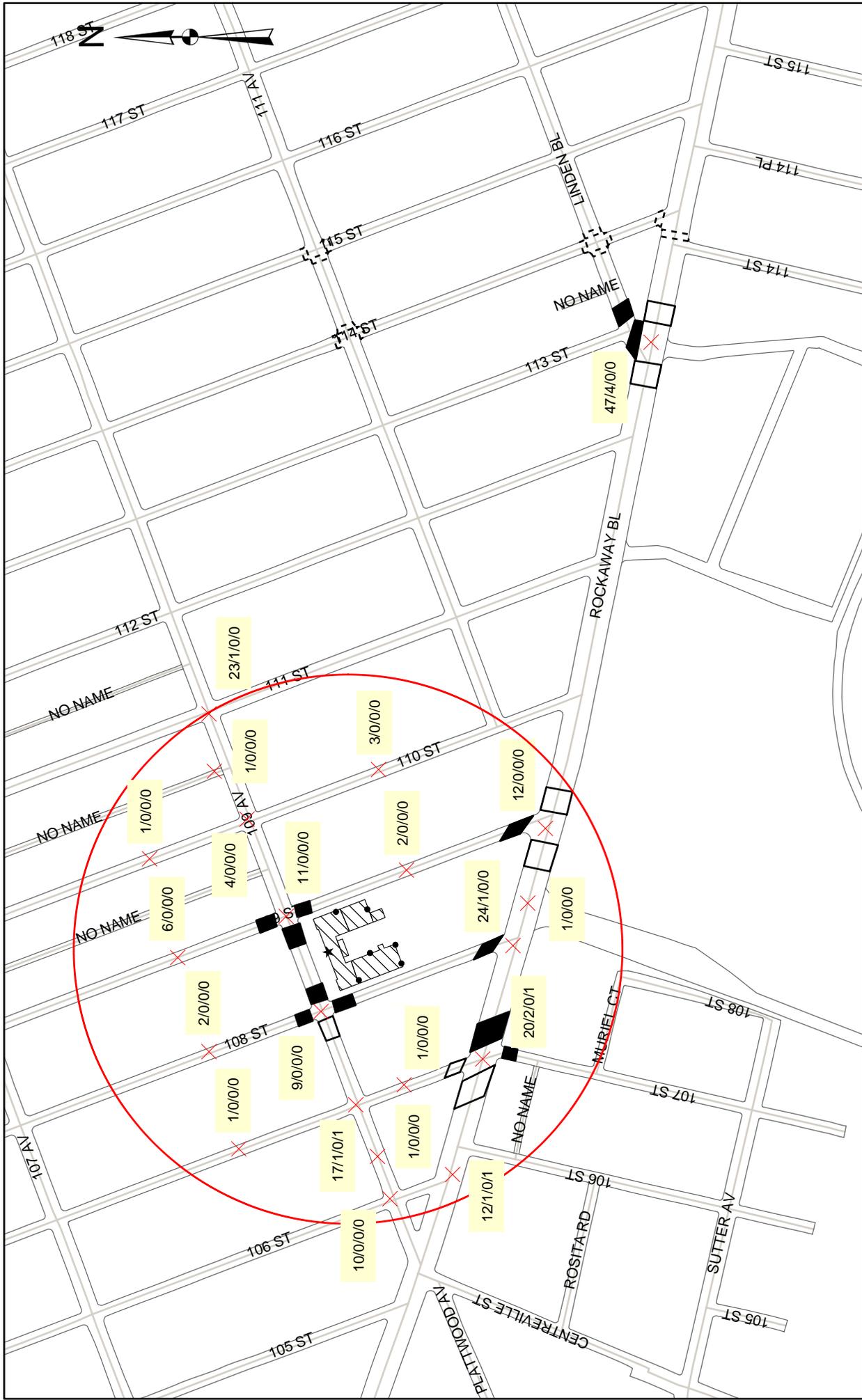


EXHIBIT 5

P.S. 108 QUEENS

ACCIDENT SUMMARY (1998-2000)

1,000 Feet

500

250

0

LEGEND:
 ACCIDENT LOCATION
 SCHOOL CROSSWALK
 SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL
 PEDESTRIAN CROSSWALK
 BORDER OF 700 FEET
 X//X//X

TOTAL ACCD / PED ACCD / PED FATAL / SCHOOL_PED ACCD

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 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 P.S. 108.

3.6.1 Rockaway Boulevard and 106th Street

This is a three-leg unsignalized "T"-intersection with a pedestrian crosswalk located across the north leg. Throughout the study area, Rockaway Boulevard is a two-way east-west roadway with two travel lanes in each direction, on-street parking permitted on each side of the roadway, and center left-turn lanes (or pockets) at major intersections and driveways. The Q7 bus line provides service along Rockaway Boulevard in the vicinity of P.S. 108. 106th Street is a one-way northbound roadway with one travel lane and on-street parking permitted on both sides of the roadway.

There were a total of 12 accidents reported at this intersection between 1998 and 2000 (Table 2), including one pedestrian accident that was also school-related. The school-related accident occurred at approximately 7:00 am on March 13, 2000, when a nine-year-old pedestrian sustained a "possible injury" at the intersection. The pedestrian's actions were unreported. The roadway surface and weather conditions were reported as dry and clear, respectively. No pedestrian fatalities were reported at this intersection between 1998 and 2000.

3.6.2 Rockaway Boulevard and 107th Street

This is a four-leg signalized intersection with school crosswalks located across the east leg of Rockaway Boulevard and the south leg of 107th Street. Pedestrian crosswalks are located across the west leg of Rockaway Boulevard and the north leg of 107th Street. North of Rockaway Boulevard, 107th Street is one-way southbound street with one travel lane and on-street parking along both sides of the roadway. South of Rockaway Boulevard, 107th Street is a two-way street with one travel lane and one on-street parking lane in each direction.

There were a total of 20 accidents reported at this intersection between 1998 and 2000 (Table 2), including two pedestrians accidents, one of which was school-related. The school-related accident occurred at approximately 8:00 am on January 5, 1999 when a five-year old pedestrian sustained an incapacitating injury after being struck by a vehicle while crossing with the traffic signal. The roadway surface and weather conditions were reported as dry and clear, respectively. No pedestrian fatalities were reported at this intersection between 1998 and 2000.

3.6.3 Rockaway Boulevard and 108th Street

This is an unsignalized “T”-intersection with a school crosswalk located across the north leg of 108th Street. 108th Street is a one-way northbound street with one travel lane and on-street parking permitted along both sides of the roadway. On the south side of Rockaway Boulevard, east of 108th Street, there is a signalized two-way access driveway to/from the Aqueduct Race Track. At the intersection of the driveway and Rockaway Boulevard, pedestrian crosswalks are located across the south leg of the driveway and the east leg of Rockaway Boulevard.

There were a total of 24 accidents reported at this intersection between 1998 and 2000 (Table 2), including one pedestrian accident that was not school-related.

3.6.4 Rockaway Boulevard and 109th Street

This is a signalized “T”-intersection with a school crosswalk located across the north leg of 109th Street, and pedestrian crosswalks located across the east and west legs of Rockaway Boulevard. 109th Street is a one-way southbound street with one travel lane and on-street parking permitted on both sides of the roadway.

There were a total of 12 accidents reported at this intersection between 1998 and 2000 (Table 2), but none of these accidents involved pedestrians.

3.6.5 Rockaway Boulevard and Linden Boulevard/113th Street

This is a five-leg signalized intersection with both 113th Street and Linden Boulevard intersecting at an angle on the north side of Rockaway Boulevard, and an access driveway to Aqueduct Race Track intersecting opposite these roadways on the south side of Rockaway Boulevard. Two school crosswalks are located across the Linden Boulevard approach—one on either side of the intersection with 113th Street. Pedestrian crosswalks are located across the east and west legs of Rockaway Boulevard, as well as across the Aqueduct Race Track access driveway (south leg of the intersection). 113th Street is a one-way northbound street with one travel lane and on-street parking permitted on both sides of the roadway. Linden Boulevard is a two-way street with one travel lane and one on-street parking lane in each direction. The Aqueduct Race Track access driveway, opposite the intersection of 113th Street/Linden Boulevard, is a two-way roadway with one entrance lane and one exit lane.

There were a total of 47 accidents reported at this intersection between 1998 and 2000 (Table 2), including four pedestrian accidents, none of which were school-related. No pedestrian fatalities were reported at this intersection between 1998 and 2000.

3.6.6 109th Avenue and 107th Street

This is a four-leg signalized intersection with no school or pedestrian crosswalks. 109th Avenue is a two-way east-west street with one travel lane and one on-street parking lane in each direction. 107th Street is one-way southbound street with one travel lane and on-street parking permitted along each side of the roadway.

There were a total of 17 accidents reported at this intersection between 1998 and 2000 (Table 2), including one pedestrian accident that was also school-related. This school-related accident occurred at approximately 3:00 pm on September 21, 2000, when a five-year-old pedestrian was reported to have sustained a “possible injury” after being struck by a vehicle while crossing at the intersection where there was “no signal or crosswalk” and “no traffic control.” *(It is not known exactly what description was intended by these coded entries because there is a traffic signal present at this intersection. This entry may be understood to mean that the incident took place at a location in close proximity to the signalized intersection where there was no signal control to directly facilitate a crossing.)* The roadway surface and weather conditions were reported as dry and clear, respectively.

3.6.7 109th Avenue and 108th Street

This is a four-leg signalized intersection with school crosswalks located across the east leg of 109th Avenue, and the north and south legs of 108th Street. A pedestrian crosswalk is located across the west leg of 109th Avenue. 109th Avenue is a two-way east-west street with one travel lane and one on-street parking lane in each direction of travel. 108th Street is a one-way northbound street with one travel lane and on-street parking permitted along both sides of the roadway.

There were a total of nine accidents reported at this intersection between 1998 and 2000 (Table 2), but none of these accidents involved pedestrians.

The school principal reported a speeding problem along 109th Avenue between 107th Street and 109th Street. Therefore, a spot speed survey was conducted on 109th Avenue, between 108th Street and 109th Street, in order to verify the existence of a speeding problem and to determine its extent.

Spot speed surveys are used to identify the 85th percentile speed, which is considered to be the representative speed for a specified street segment. By definition, 85 percent of the surveyed vehicles are traveling below this speed and 15 percent of the surveyed vehicles are traveling above this speed. 85th percentile speeds above 30 mph indicate a potential speeding problem that may require appropriate traffic calming measures. The results of the spot speed survey revealed that eastbound vehicles on 109th Avenue were found to be traveling with an 85th percentile speed of 35 mph, and westbound vehicles on 109th Avenue were found to be traveling with an 85th percentile speed of 36 mph.

The detailed results of the spot speed survey on 109th Avenue between 108th and 109th Streets are shown in the Appendix at the end of the document.

In addition, spot speed surveys were conducted along 108th Street and 109th Street, between Rockaway Boulevard and 109th Avenue, to verify the existence of a speeding problem in the immediate vicinity of the school and to determine its extent.

The 85th percentile speed for northbound vehicles on 108th Street between Rockaway Boulevard and 109th Avenue was found to be 29 mph. The 85th percentile speed for

southbound vehicles on 109th Street between 109th Avenue and Rockaway Boulevard was found to be 31 mph.

The detailed results of the spot speed surveys on 108th and 109th Streets between Rockaway Boulevard and 109th Avenue are shown in the Appendix at the end of the document.

3.6.8 109th Avenue and 109th Street

This is a four-leg signalized intersection with school crosswalks located across the west leg of 109th Avenue, and the north and south legs of 109th Street. There is also a pedestrian crosswalk located across the east leg of 109th Avenue. 109th Avenue is a two-way east-west roadway with one travel lane and one on-street parking lane in each direction of travel. 109th Street is a one-way southbound street with one travel lane and on-street parking permitted on both sides of the roadway. It should also be noted that 109th Street is closed and used as a playground area for P.S. 108 students between 8:00 and 9:00 am and again between 2:00 and 3:00 pm on school days.

An existing speed reducer is located on 109th Street near the school. However, as described previously, the spot speed results indicated that the 85th percentile speed for southbound vehicles on 109th Street was 31 mph, slightly above the threshold value of 30 mph.

There were a total of 11 accidents reported at this intersection between 1998 and 2000 (Table 2), but none of these involved pedestrians.

3.7 SIGNAL TIMING

Pedestrian crossing times were field-verified for crosswalks at signalized intersections in the vicinity of P.S. 108, and were found to be adequate based upon a child pedestrian walking at a rate of three feet per second. The existing crosswalk widths, existing signal timings, and required child pedestrian crossing times for each intersection are shown in Table 4.

TABLE 4: PEDESTRIAN CROSSING TIMES AT SIGNALIZED INTERSECTIONS				
INTERSECTION	CROSSWALK LENGTH (FEET)	PEDESTRIAN TIME ACTUAL (SECONDS)	PEDESTRIAN TIME REQUIRED (SECONDS)	TIMING ADJUSTMENT REQUIRED?
107th Street and 109th Avenue				
crossing 107 th Street	30	35	13	NO
crossing 109 th Avenue	44	23	18	NO
108th Street and 109th Avenue				
crossing 108 th Street	30	35	13	NO
crossing 109 th Avenue	44	23	18	NO
109th Street and 109th Avenue				
crossing 109 th Street	30	35	13	NO
crossing 109 th Avenue	44	23	18	NO
107th Street and Rockaway Boulevard				
crossing 107 th Street	30	78	13	NO
crossing Rockaway Boulevard	72	38	27	NO
109th Street and Rockaway Boulevard				
crossing 109 th Street	30	78	13	NO
crossing Rockaway Boulevard	72	38	27	NO
Linden Boulevard and Rockaway Boulevard				
crossing Linden Boulevard (north leg)	45	75	18	NO
crossing Linden Boulevard (south leg)	45	75	18	NO
crossing Rockaway Boulevard	72	35	27	NO

Note: A child pedestrian walking rate of 3 feet/second, plus 3 seconds reaction time, was used to calculate the required pedestrian crossing times.

3.8 PHYSICAL CONDITIONS

3.8.1 Roadways and Sidewalks

Field observations indicated that the roadways and sidewalks in the vicinity of P.S. 108 were in fair to good condition. Sidewalks abutting the school are approximately 15 feet wide on 108th Street and 109th Street (along the sides of P.S. 108) and are approximately 18 feet wide on 109th Avenue (in front of the main entrance to P.S. 108). However, sidewalks along other roadways in the vicinity of P.S. 108 are approximately nine to ten feet wide.

3.8.2 Pedestrian Ramps

In general, pedestrian ramps in the vicinity of the school were observed to be standard. However, pedestrian ramps were found to be missing at the following locations:

- The northeast and northwest corners of the 108th Street and 109th Avenue intersection (see Figure 3).

- The northwest corner of the Rockaway Boulevard and 108th Street intersection, for the school crosswalk located across the north leg of the intersection.
- The northeast and southeast corners of the 113th Street-Linden Boulevard and Rockaway Boulevard intersection (see Figure 4)



Figure 3: Looking north towards the missing pedestrian ramps on the northeast corner of the 108th Street and 109th Avenue intersection



Figure 4: Looking south towards the missing pedestrian ramp on the northeast corner of the 113th Street-Linden Boulevard and Rockaway Boulevard intersection

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes proposed measures to improve school pedestrian safety around P.S. 108. The proposed recommendations are divided into short-term and long-term measures. Short-term measures are those that potentially can be performed in-house by DOT. Long-term measures involve capital improvements. Each of the short- and long-term measures recommended for the P.S. 108 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 “NO STANDING 7AM-4PM SCHOOL DAYS EXCEPT FOR SCHOOL BUSES” signs along the south side of 109th Avenue west of the school’s main entrance, and “NO PARKING 7AM-4PM SCHOOL DAYS” signs east of the school’s main entrance on 109th Avenue. “NO STANDING 7AM-4PM SCHOOL DAYS” signs should be installed for a distance of 30 feet in front of the main entrance to the school. (This is a typical requirement for all NYC schools in order to provide for emergency access to and from the school). Signs indicating “NO STANDING 7AM-4PM SCHOOL DAYS EXCEPT FOR SCHOOL BUSES” should be installed along the remaining length of this block face.

➤ *Install graphic “YIELD TO PEDESTRIAN” signs*

“YIELD TO PEDESTRIAN” signs should be installed on intersection approaches with substantial potential for vehicle/student pedestrian conflicts. “yield to PEDESTRIAN” signs are recommended on the following approaches to intersections in the vicinity of P.S. 108:

- Westbound approach of Rockaway Boulevard at 110th Street

➤ *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.

➤ *Speeding on 108th Street and 109th Street*

School representatives reported speeding as a problem on 108th Street and 109th Street between 109th Avenue and Rockaway Boulevard. Spot speed surveys were conducted on both streets in order to verify the existence of a speeding problem and to determine its extent. Although the spot speed survey indicated that

vehicles on 109th Street were traveling at an 85th percentile speed of 31 mph, it is not feasible to install another speed hump on 109th Street between 109th Avenue and Rockaway Boulevard due to the number of curb cuts (driveways) on the block.

The spot speed surveys on 108th Street between Rockaway Boulevard and 109th Avenue showed an 85th percentile speed of 29 mph. Therefore it is recommended to:

- Install one speed reducer on 108th Street between 109 Avenue and Rockaway Boulevard.

Note: A speed reducer was installed by NYCDOT in August 2006.

➤ Request that NYPD assign a school crossing guard

There were two pedestrian accidents, including one school-related accident, reported at the intersection of 107th Street and Rockaway Boulevard. An alternate measure to provide protection for these school crosswalks would be to assign a crossing guard to the intersection during the school's morning arrival and afternoon departure times to accommodate student pedestrian crossings of the intersection. Therefore, it is recommended that:

- A crossing guard be requested for the intersection of 109th Street and Rockaway Boulevard during the morning arrival and afternoon departure times for P.S. 108.

➤ Install new pedestrian crosswalks and new school crosswalks

There are several intersections that currently have no school or pedestrian crosswalks, but are located in close proximity to the school and/or were observed accommodating significant volumes of pedestrian crossings. Therefore, it is recommended to:

- Designate school crosswalks across the north and south legs of 107th Street at its intersection with 109th Avenue.
- Designate pedestrian crosswalks across the east and west legs of 109th Avenue at its intersection with 107th Street.
- Designate a school crosswalk across the east leg of Rockaway Boulevard at its intersection with 108th Street.
- Designate a school crosswalk across the westerly access driveway (opposite 108th Street) serving the Aqueduct Race Track at its intersection with Rockaway Boulevard (i.e. the south leg of the intersection).

- Designate a school crosswalk across the north leg of 110th Street at its intersection with Rockaway Boulevard.
- Designate school crosswalks across the north and south legs of 111th Street at its intersection with Rockaway Boulevard.
- Designate pedestrian crosswalks across the east and west legs of 111th Street at its intersection with Rockaway Boulevard.
- Install all appropriate advance warning devices in conjunction with the crosswalk installations described above.

➤ *Request additional traffic and parking enforcement around P.S. 108*

School representatives should request the assistance of NYPD traffic agents and/or police officers to periodically issue summons to motorists violating traffic and parking regulations around the school during arrival and dismissal times. This would provide for enhanced safety for students of P.S. 108.

4.2 LONG-TERM MEASURES

➤ *Consider installing curb extensions (neckdowns)*

School representatives reported speeding as a problem on 109th Avenue in front of P.S. 108. In order to verify the existence of a speeding problem and to determine its extent, a speed survey was conducted on 109th Avenue between 108th and 109th streets in both directions of travel. The spot speed survey showed 85th percentile speeds of 35 and 36 mph in the eastbound and westbound directions, respectively. Since 109th Avenue is a local bus route (Q41), a speed reducer (hump) would not be feasible in this section of roadway.

Consideration should be given to installing curb extensions at the following locations, provided that the Final Design confirms that construction of the recommended curb extensions would be feasible and 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.

- On the east and west corners of 109th Street at its intersection with Rockaway Boulevard.
- On the east and west corners of 108th Street at its intersection with Rockaway Boulevard.
- On the northeast and southeast corners of 108th Street at its intersection with 109th Avenue.

- On the northwest corner of 109th Street, and on at the southeast corner of 109th Avenue, at the 109th Street and 109th Avenue intersection.

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. These curb extensions would not eliminate or reduce the width of any moving lanes.

➤ Construct pedestrian ramps

There were several locations where pedestrian ramps were missing or needed some modification. Therefore, it is recommended to:

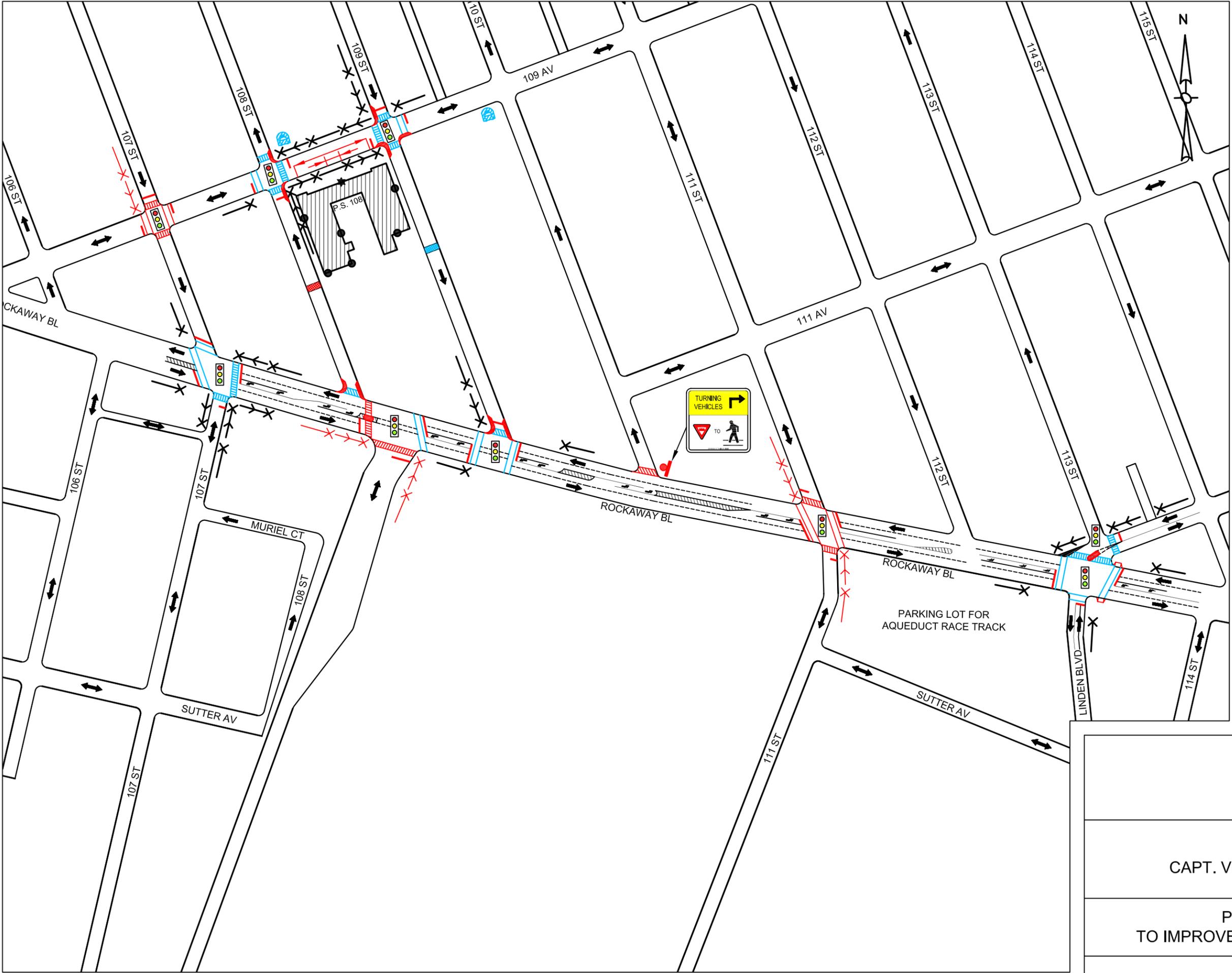
- Construct pedestrian ramps on the northeast and southeast corners of 113th Street/Linden Boulevard and Rockaway Boulevard.

➤ Consider concrete refuge islands

There are striped medians on Linden Boulevard north of its intersection with Rockaway Boulevard, and also along Rockaway Boulevard east of its intersection with 108th Street. At the former intersection, a school crosswalk exists across the north leg (Linden Boulevard). At the latter intersection, a school crosswalk is proposed across Rockaway Boulevard. It is recommended that pedestrian refuge islands be installed at these intersections, as follows:

- Provide a concrete refuge island on Linden Boulevard, north of its intersection with Rockaway Boulevard.
- Provide a concrete refuge island on Rockaway Boulevard, east of the intersection with 108th Street, for the proposed school crosswalk.

The refuge islands will provide a refuge for pedestrians who do not complete the crossing during the flashing “DON’T WALK” indication. The proposed refuge islands should be the same width as the existing striped median, should extend through the crosswalk, and should have at least a five-foot 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 refuge islands, curb extensions and striped medians will be developed during Final Design.



- LEGEND**
-  MAIN ENTRANCE
 -  OTHER ENTRANCES
 -  EXISTING TRAVEL DIRECTION
 -  EXISTING ADVANCE WARNING SIGN OR SCHEDULED TO BE INSTALLED
 -  EXISTING SCHOOL CROSSWALK WARNING ASSEMBLY OR SCHEDULED TO BE INSTALLED
 -  EXISTING SIGNALIZED LOCATION
 -  EXISTING CURB EXTENSION (NECKDOWN)
 -  EXISTING BUS STOP
 -  EXISTING SCHOOL CROSSWALK
 -  EXISTING PEDESTRIAN CROSSWALK
 -  EXISTING SPEED REDUCER
 -  PROPOSED ADVANCE WARNING SIGN
 -  PROPOSED SCHOOL CROSSWALK WARNING ASSEMBLY
 -  PROPOSED SCHOOL CROSSWALK
 -  PROPOSED PEDESTRIAN CROSSWALK
 -  PROPOSED TRAFFIC SIGN
 -  PROPOSED PEDESTRIAN RAMP
 -  PROPOSED STOP LINE IN ADVANCE OF SCHOOL CROSSWALK
 -  PROPOSED "NO STANDING 7:00AM - 4:00PM SCHOOL DAYS"
 -  PROPOSED "NO STANDING 7:00AM - 4:00PM SCHOOL DAYS EXCEPT FOR BUSES"
 -  PROPOSED CONCRETE REFUGE ISLAND
 -  PROPOSED CURB EXTENSION (NECKDOWN)
 -  PROPOSED SPEED REDUCER

1" = 200'

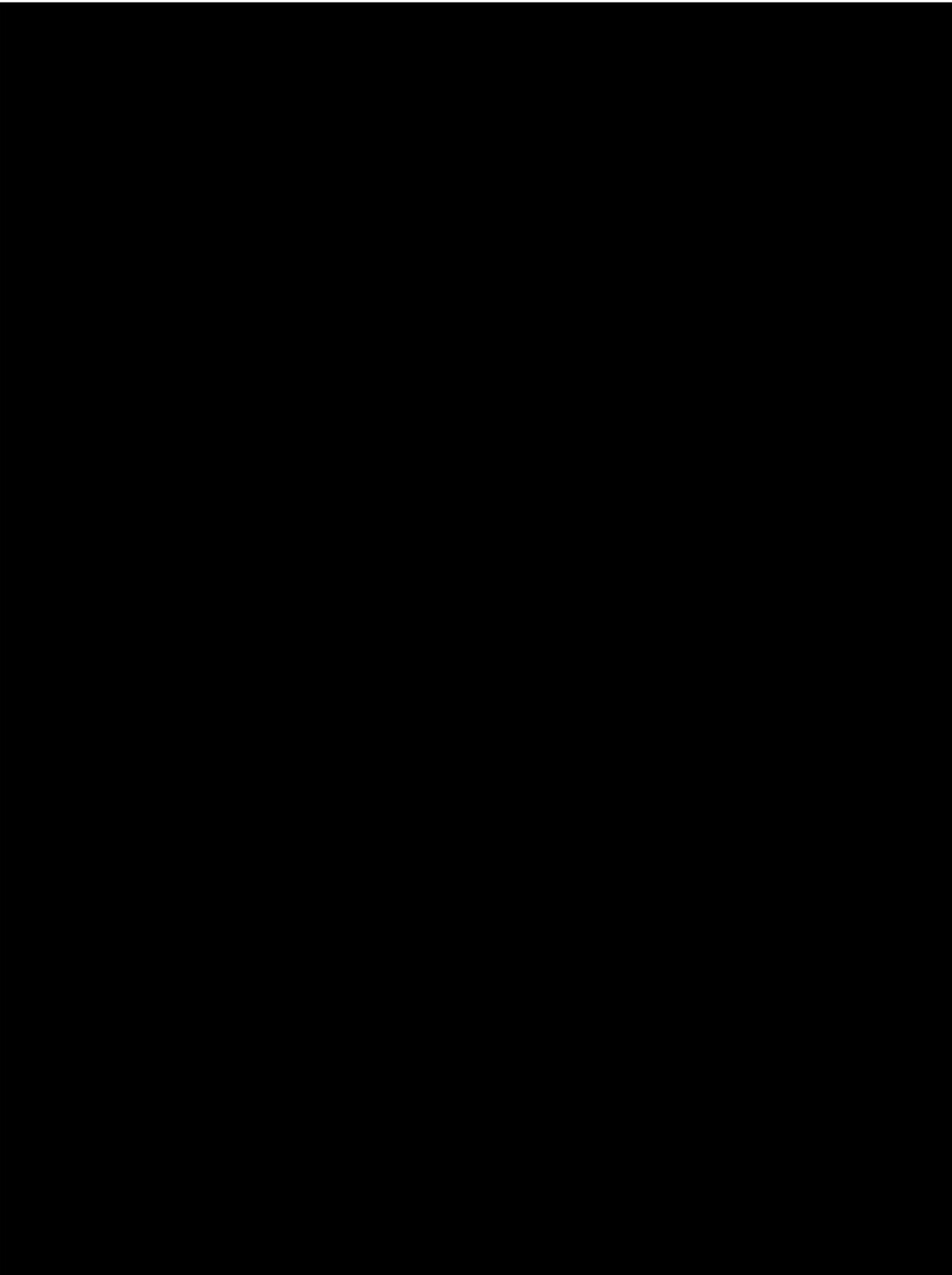
EXHIBIT 6

P.S. 108 QUEENS
CAPT. VINCENT G. FOWLER SCHOOL

POTENTIAL MEASURES
TO IMPROVE STUDENT PEDESTRIAN SAFETY

APPENDIX

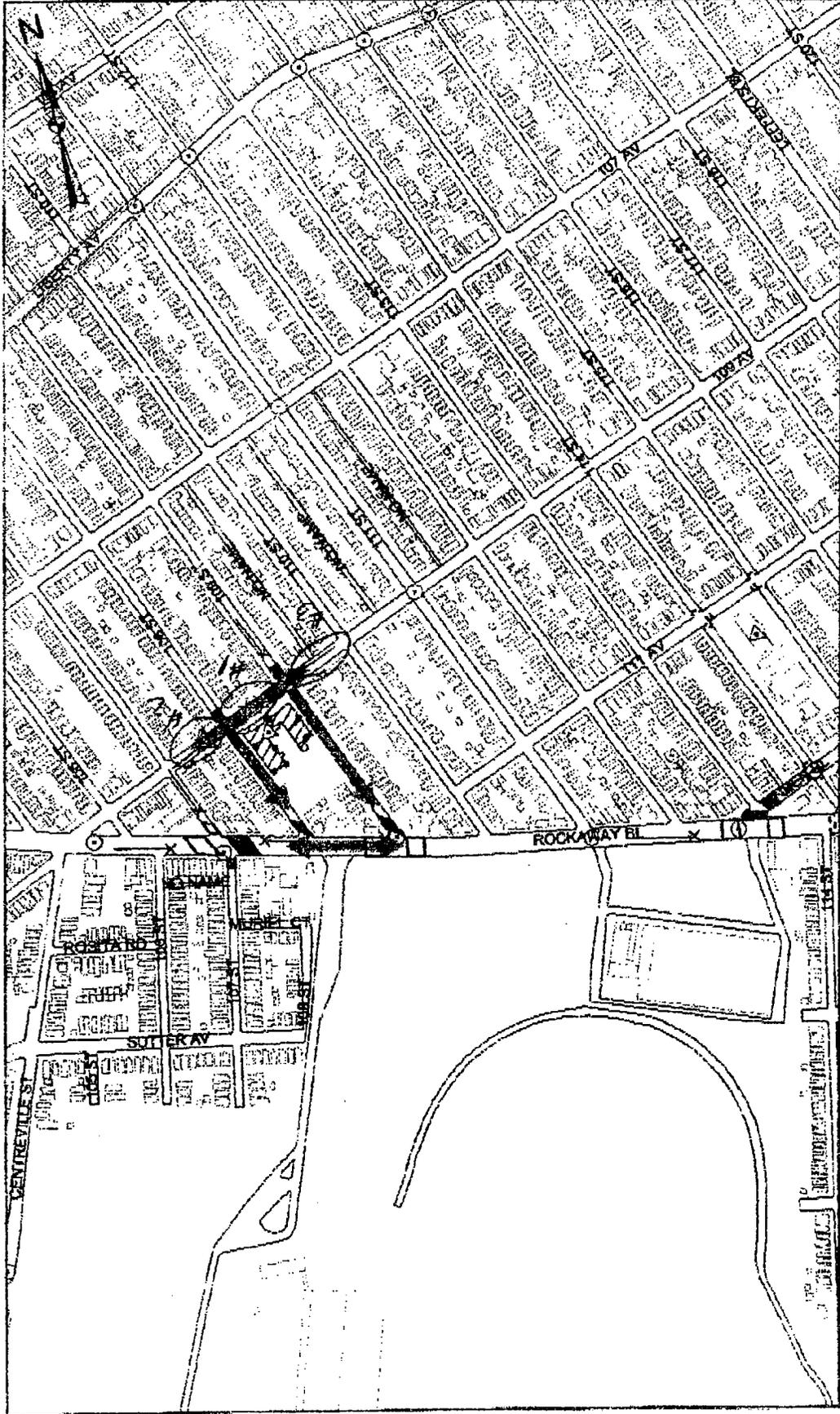
ALL



NEW YORK CITY
DEPT. OF TRANSPORTATION

**TRAFFIC SAFETY PLAN
OFFICIAL ROUTES TO SCHOOL**

BUREAU OF TRAFFIC



LEGEND:

- TRAFFIC FLOW
- ROUTE TO SCHOOL
- ADV. WARNING SIGN
- SCHOOL LOCATION
- MAIN SCHOOL ENTRANCE
- OTHER SCHOOL ENTRANCES

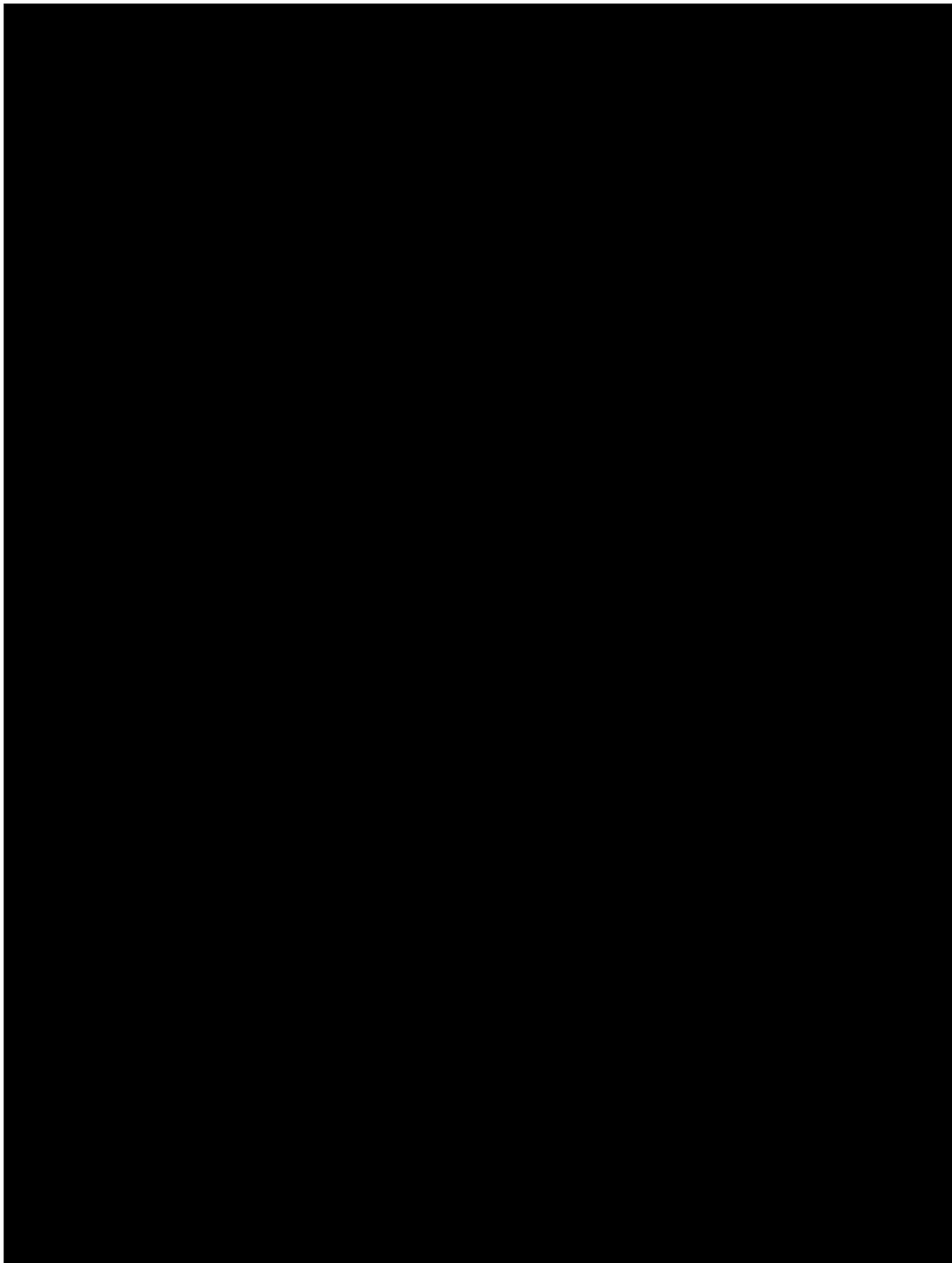
- SCHOOL X-WALK
- PEO. X-WALK
- STOP LINE
- X-WALKS ASSOCIATED WITH OTHER SCHOOLS
- SPEED HUMP

- TRAFFIC SIGNAL
- ALL-WAY STOP
- 2-WAY STOP

P.S. 108

Prepared by the NEW YORK CITY DEPARTMENT OF TRANSPORTATION,
IN CONSULTATION WITH THE COMMISSIONER OF EDUCATION, in cooperation with SCHOOL and
POLICE OFFICIALS.

DRAWING NO. _____ COMM. BOARD
DATE: 3/27/72 QC-341 BOROUGH:
SIB COMMENT: 06/20/82 MS-5110 PRECINCT:
REV. NO. _____



SPOT SPEED STUDY

Date: **October 17, 2005** Time: **9:45 am - 10:45 am**
 Location: **108 Street between Rockaway Boulevard & 109 Avenue**
 Surveyor: **R. Calvache/H. Salinas**

School: **P.S. 108**
 Direction: **Northbound**
 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	1	2.9%	2.9%	18	324
19	0	0.0%	2.9%	0	0
20	7	20.6%	23.5%	140	2800
21	0	0.0%	23.5%	0	0
22	9	26.5%	50.0%	198	4356
23	3	8.8%	58.8%	69	1587
24	1	2.9%	61.8%	24	576
25	0	0.0%	61.8%	0	0
26	2	5.9%	67.6%	52	1352
27	0	0.0%	67.6%	0	0
28	0	0.0%	67.6%	0	0
29	3	8.8%	76.5%	87	2523
30	5	14.7%	91.2%	150	4500
31	2	5.9%	97.1%	62	1922
32	0	0.0%	97.1%	0	0
33	0	0.0%	97.1%	0	0
34	1	2.9%	100.0%	34	1156
35	0	0.0%	100.0%	0	0
36	0	0.0%	100.0%	0	0
37	0	0.0%	100.0%	0	0
38	0	0.0%	100.0%	0	0
39	0	0.0%	100.0%	0	0
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
	34	100.0%		834	21096

Mean Speed = 24.5 mph
 Standard Deviation = 4.4 mph
 Margin of Error (95% Confidence) = ± 1.5 mph

Median Speed = 24.5 mph
 15th Percentile Speed = 20.0 mph
 85th Percentile Speed = 29.1 mph

SPOT SPEED STUDY

Date: **October 17, 2005** Time: **11:10 am - 12:10 pm**
 Location: **109 Avenue between 108 Street & 109 Street**
 Surveyor: **R. Calvache/H. Salinas**

School: **P.S. 108**
 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	1.6%	1.6%	23	529
24	1	1.6%	3.2%	24	576
25	2	3.2%	6.3%	50	1250
26	3	4.8%	11.1%	78	2028
27	3	4.8%	15.9%	81	2187
28	6	9.5%	25.4%	168	4704
29	11	17.5%	42.9%	319	9251
30	10	15.9%	58.7%	300	9000
31	5	7.9%	66.7%	155	4805
32	8	12.7%	79.4%	256	8192
33	5	7.9%	87.3%	165	5445
34	1	1.6%	88.9%	34	1156
35	1	1.6%	90.5%	35	1225
36	1	1.6%	92.1%	36	1296
37	1	1.6%	93.7%	37	1369
38	0	0.0%	93.7%	0	0
39	1	1.6%	95.2%	39	1521
40	0	0.0%	95.2%	0	0
41	1	1.6%	96.8%	41	1681
42	0	0.0%	96.8%	0	0
43	0	0.0%	96.8%	0	0
44	1	1.6%	98.4%	44	1936
45	1	1.6%	100.0%	45	2025
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
	63	100.0%		1930	60176

Mean Speed = 30.6 mph Median Speed = 30.6 mph
 Standard Deviation = 4.1 mph 15th Percentile Speed = 26.4 mph
 Margin of Error (95% Confidence) = ± 1.0 mph 85th Percentile Speed = 34.9 mph

SPOT SPEED STUDY

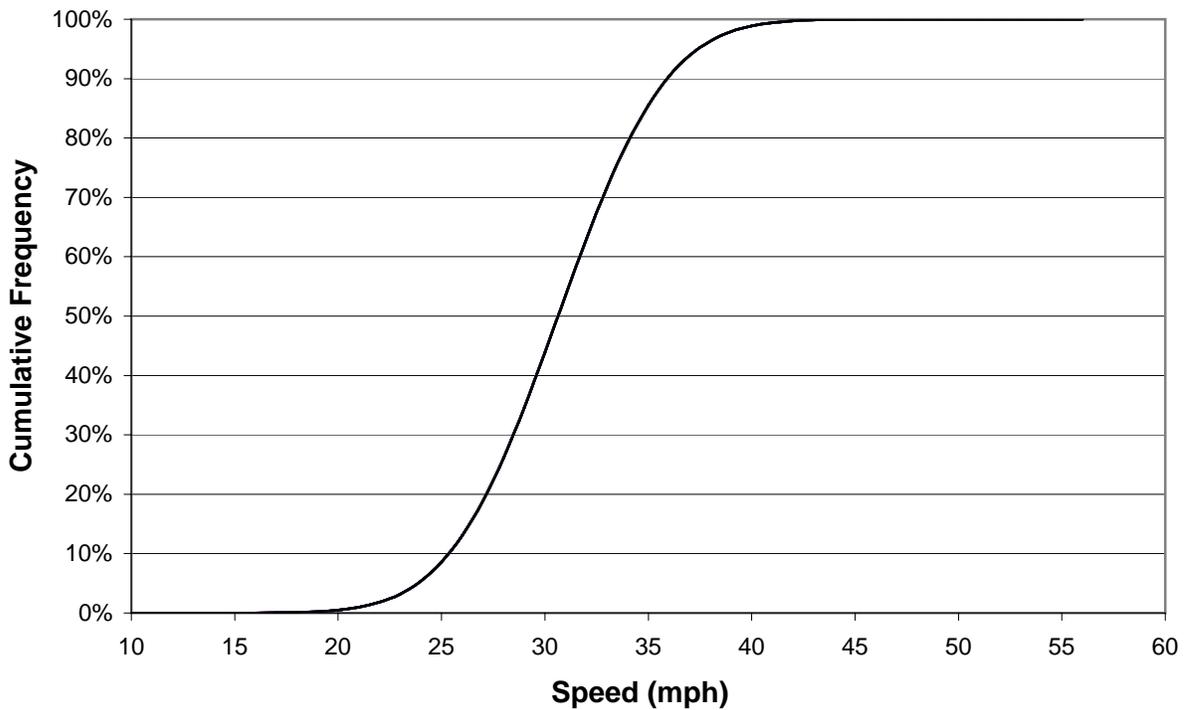
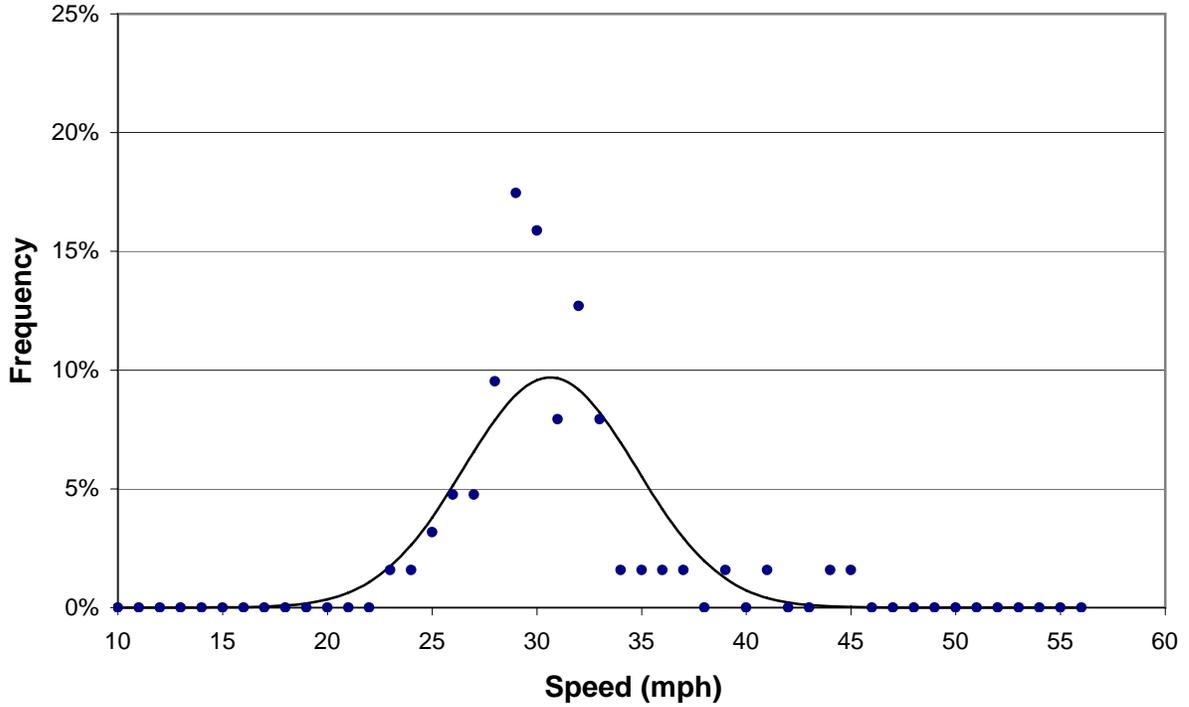
Date: **October 17, 2005**
Location: **109 Avenue between 108 Street & 109 Street**
Surveyor: **R. Calvache/H. Salinas**

Time: **11:10 am - 12:10 pm**

School: **P.S. 108**
Direction: **Eastbound**
Comments:

Mean Speed = 30.6 mph
Standard Deviation = 4.1 mph
Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 30.6 mph
15th Percentile Speed = 26.4 mph
85th Percentile Speed = 34.9 mph



SPOT SPEED STUDY

Date: **October 17, 2005** Time: **11:10 am - 12:10 pm**
 Location: **109 Avenue between 108 Street & 109 Street**
 Surveyor: **R. Calvache/H. Salinas**

School: **P.S. 108**
 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	1	2.1%	2.1%	24	576
25	1	2.1%	4.2%	25	625
26	3	6.3%	10.4%	78	2028
27	4	8.3%	18.8%	108	2916
28	2	4.2%	22.9%	56	1568
29	3	6.3%	29.2%	87	2523
30	9	18.8%	47.9%	270	8100
31	3	6.3%	54.2%	93	2883
32	5	10.4%	64.6%	160	5120
33	3	6.3%	70.8%	99	3267
34	1	2.1%	72.9%	34	1156
35	2	4.2%	77.1%	70	2450
36	4	8.3%	85.4%	144	5184
37	2	4.2%	89.6%	74	2738
38	2	4.2%	93.8%	76	2888
39	1	2.1%	95.8%	39	1521
40	0	0.0%	95.8%	0	0
41	1	2.1%	97.9%	41	1681
42	0	0.0%	97.9%	0	0
43	1	2.1%	100.0%	43	1849
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
	48	100.0%		1521	49073

Mean Speed = 31.7 mph Median Speed = 31.7 mph
 Standard Deviation = 4.3 mph 15th Percentile Speed = 27.2 mph
 Margin of Error (95% Confidence) = ± 1.2 mph 85th Percentile Speed = 36.2 mph

SPOT SPEED STUDY

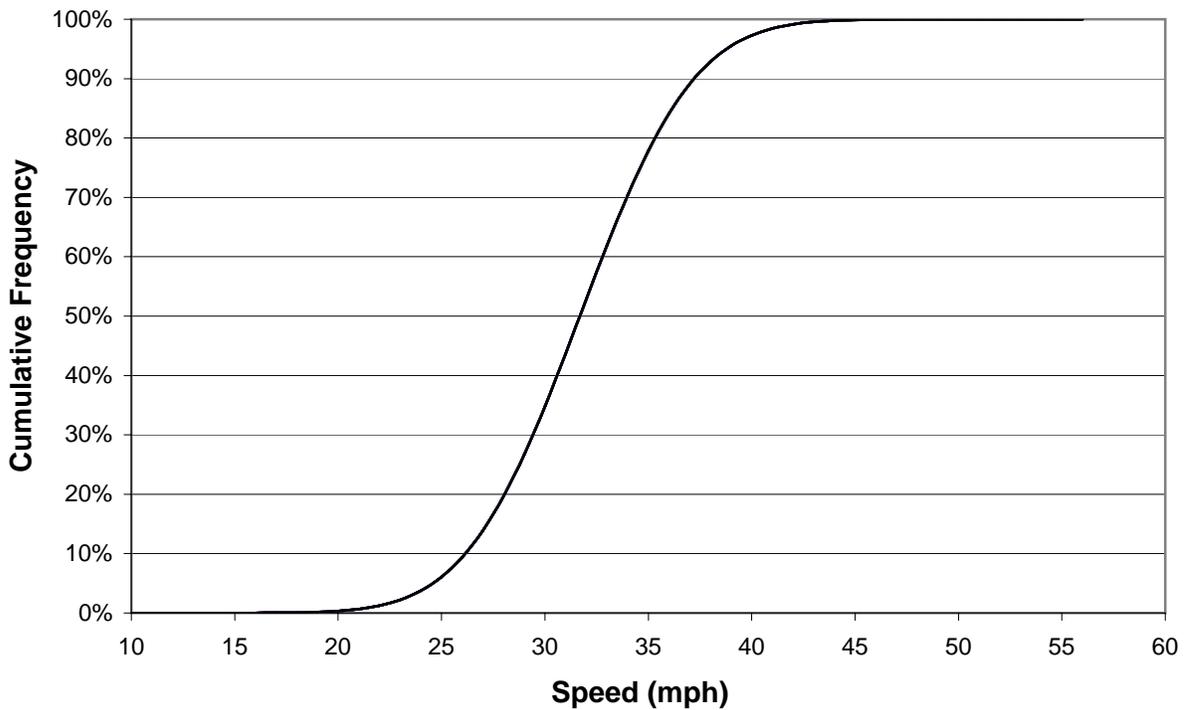
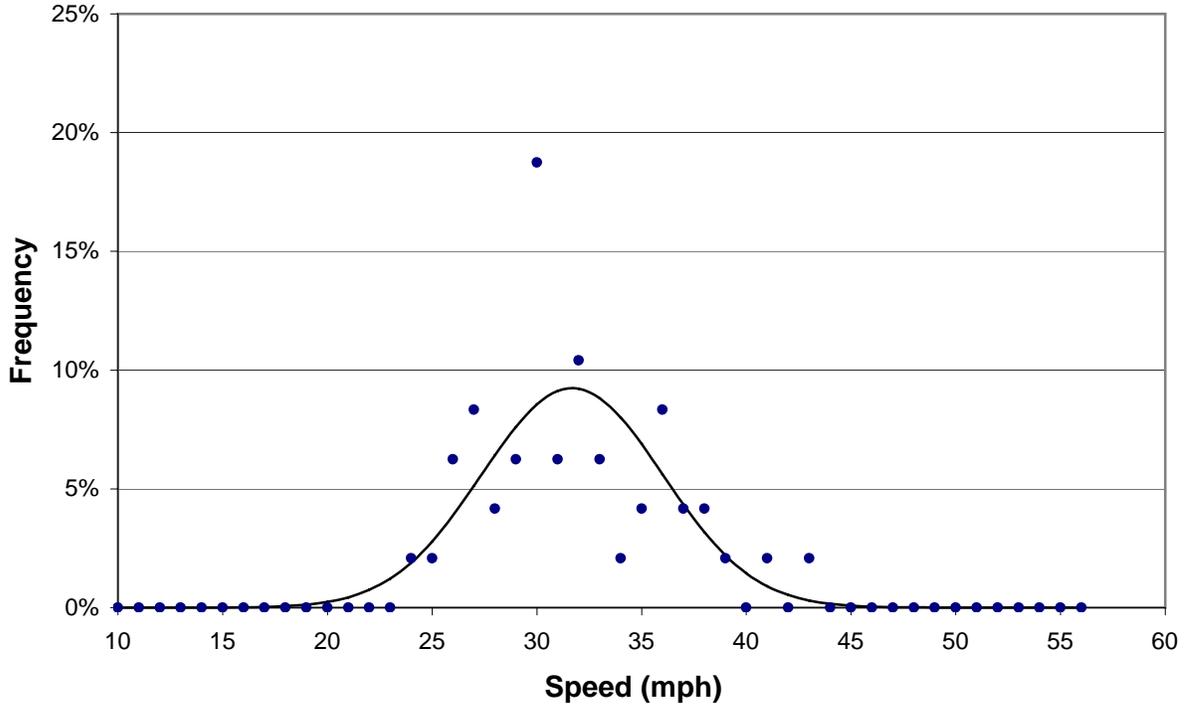
Date: **October 17, 2005**
 Location: **109 Avenue between 108 Street & 109 Street**
 Surveyor: **R. Calvache/H. Salinas**

Time: **11:10 am - 12:10 pm**

School: **P.S. 108**
 Direction: **Westbound**
 Comments:

Mean Speed = 31.7 mph
 Standard Deviation = 4.3 mph
 Margin of Error (95% Confidence) = ± 1.2 mph

Median Speed = 31.7 mph
 15th Percentile Speed = 27.2 mph
 85th Percentile Speed = 36.2 mph



SPOT SPEED STUDY

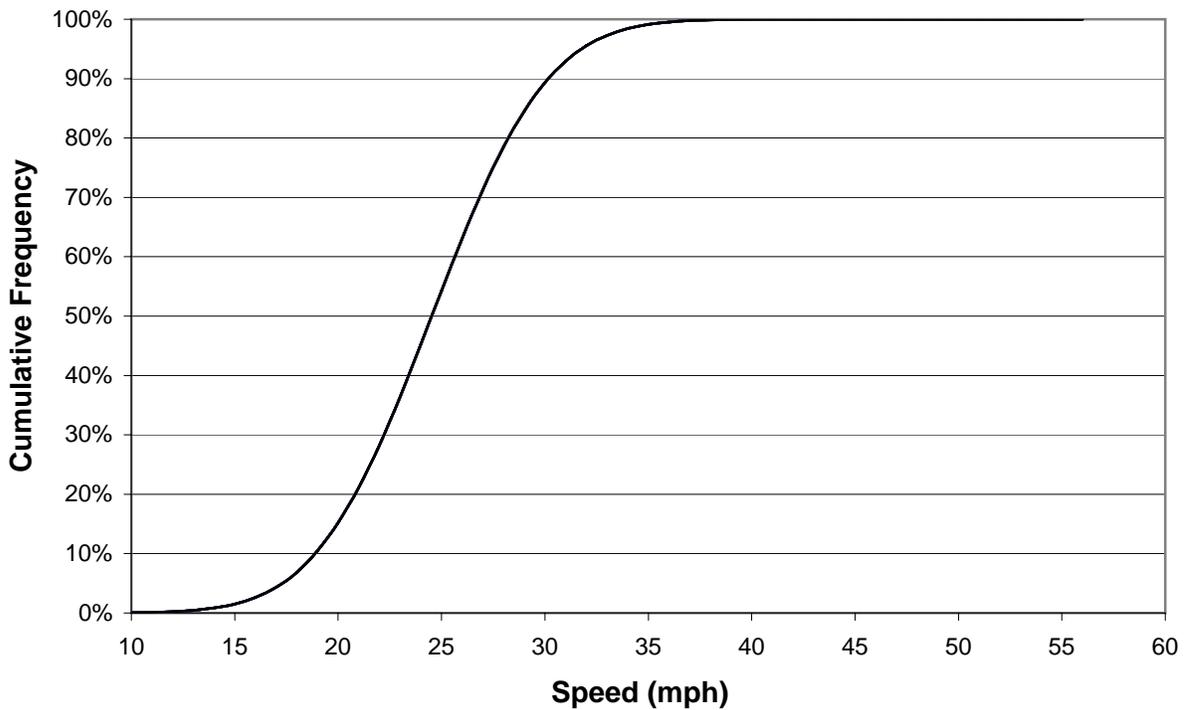
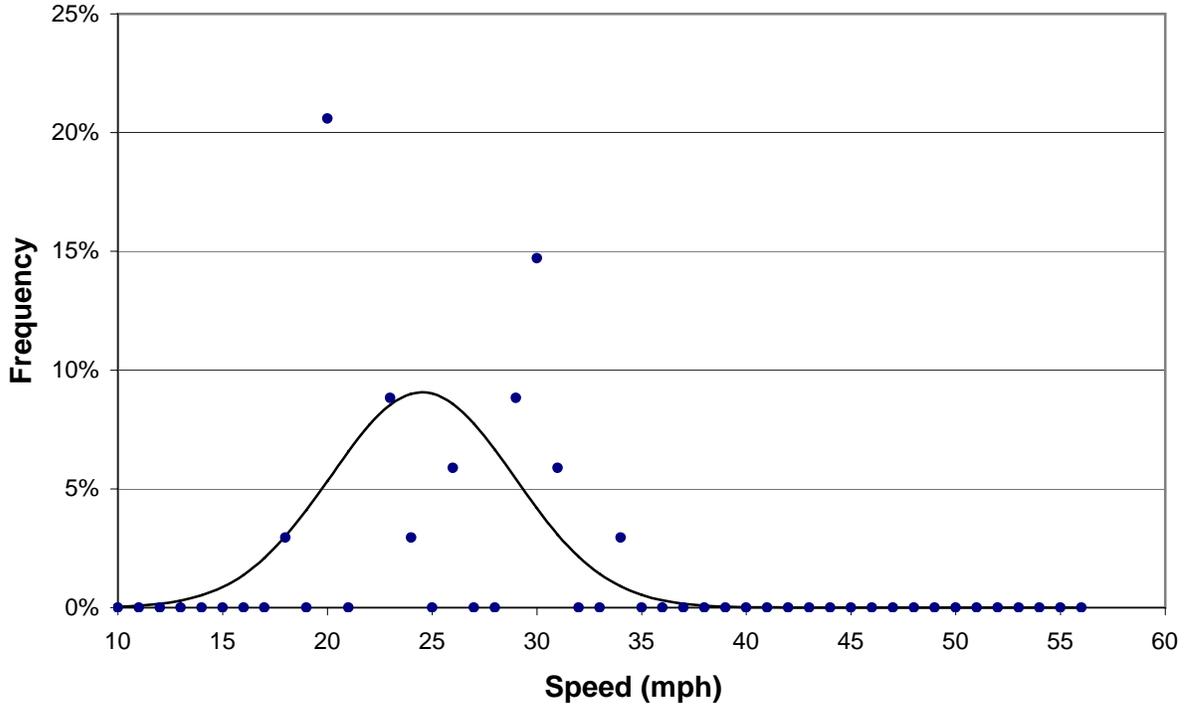
Date: **October 17, 2005**
Location: **108 Street between Rockaway Boulevard & 109 Avenue**
Surveyor: **R. Calvache/H. Salinas**

Time: **9:45 am - 10:45 am**

School: **P.S. 108**
Direction: **Northbound**
Comments:

Mean Speed = 24.5 mph
Standard Deviation = 4.4 mph
Margin of Error (95% Confidence) = ± 1.5 mph

Median Speed = 24.5 mph
15th Percentile Speed = 20.0 mph
85th Percentile Speed = 29.1 mph



SPOT SPEED STUDY

Date: **October 17, 2005** Time: **12:20 pm - 1:20 pm**
 Location: **108 Street between Rockaway Boulevard & 109 Avenue**
 Surveyor: **R. Calvache/H. Salinas**

School: **P.S. 108**
 Direction: **Southbound**
 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	3	8.3%	8.3%	60	1200
21	0	0.0%	8.3%	0	0
22	0	0.0%	8.3%	0	0
23	0	0.0%	8.3%	0	0
24	2	5.6%	13.9%	48	1152
25	7	19.4%	33.3%	175	4375
26	6	16.7%	50.0%	156	4056
27	4	11.1%	61.1%	108	2916
28	1	2.8%	63.9%	28	784
29	2	5.6%	69.4%	58	1682
30	3	8.3%	77.8%	90	2700
31	5	13.9%	91.7%	155	4805
32	2	5.6%	97.2%	64	2048
33	1	2.8%	100.0%	33	1089
34	0	0.0%	100.0%	0	0
35	0	0.0%	100.0%	0	0
36	0	0.0%	100.0%	0	0
37	0	0.0%	100.0%	0	0
38	0	0.0%	100.0%	0	0
39	0	0.0%	100.0%	0	0
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
	36	100.0%		975	26807

Mean Speed = 27.1 mph Median Speed = 27.1 mph
 Standard Deviation = 3.4 mph 15th Percentile Speed = 23.6 mph
 Margin of Error (95% Confidence) = ± 1.1 mph 85th Percentile Speed = 30.6 mph

SPOT SPEED STUDY

Date: **October 17, 2005**

Time: **12:20 pm - 1:20 pm**

School: **P.S. 108**

Location: **108 Street between Rockaway Boulevard & 109 Avenue**

Direction: **Southbound**

Surveyor: **R. Calvache/H. Salinas**

Comments:

Mean Speed = 27.1 mph
Standard Deviation = 3.4 mph
Margin of Error (95% Confidence) = ± 1.1 mph

Median Speed = 27.1 mph
15th Percentile Speed = 23.6 mph
85th Percentile Speed = 30.6 mph

