

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



School Safety Engineering Project

FINAL REPORT: P.S. 149 (Christa McAuliffe School), Queens



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



October 18, 2006

**School Safety Engineering Project
Final Report: P.S. 149, 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 600 speed reducers (humps) have been installed in the immediate vicinity of schools.

Under this consultant study, the School Safety Engineering Project, accident data in the vicinity of all program schools were 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. 149 (Christa McAuliffe 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 shows an aerial view of the neighborhood surrounding the school. P.S. 149 is bounded by Northern Boulevard to the north, 34th Avenue to the south, 94th Street on the east, and 93rd Street to the west. The neighborhood in the vicinity of the school consists primarily of high-density residential buildings. Commercial uses are located one block to the north along Northern Boulevard, and one block to the east along Junction Boulevard. Both of these roadways carry high traffic volumes.

2.3 MEETING WITH SCHOOL REPRESENTATIVES

Consultant team members were unable to arrange a meeting with school representatives. Therefore, the recommendations in this report were based upon the school's survey response, information from the current Department of Education web site, and field observations made during visits to the school and the surrounding area. According to the school's survey response, student pedestrians at P.S. 149 face the following problems:

- Vehicles traveling at excessive speeds along 34th Avenue, 93rd Street, and 94th Street.
- Children crossing at mid-block locations along 34th Avenue, 93rd Street, and Junction Boulevard.

(See the Appendix of this report for the school's survey response.)

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.

The catchment area is slightly irregular in shape, and is roughly bounded by Northern Boulevard to the north, 37th Avenue to the south, Junction Boulevard and 95th Street to the east, and 87th Street to the west.

Table 1 presents the modes of travel for P.S. 149, as estimated by school officials.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	STUDENTS (Percentage)
Walk	90%
Driven by car	5%
School bus	5%
MTA Bus / Subway	0%
Bicycle	0%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

There is a playground located on the southeast corner of the Junction Boulevard and 34th Avenue intersection that attracts P.S. 149 students. There are also some commercial uses, including a deli, on the south side of Northern Boulevard that attract P.S. 149 students. P.S. 228 (located one-half block to the north of P.S. 149 on 93rd Street), Blessed Sacrament School (located one-half block to the south on 94th Street), and I.S. 227 (Louis Armstrong School, located approximately one block to the north at the Junction Boulevard and 32nd Street intersection) also generate pedestrian activity and vehicular traffic in the vicinity of P.S. 149.

2.8 CROSSING GUARD LOCATION

According to the school officials, a crossing guard is assigned to the intersection of 34th Avenue and 94th Street to assist P.S. 149 students in crossing this intersection. The location of the crossing guard is shown in Exhibit 4 at the end of this section.

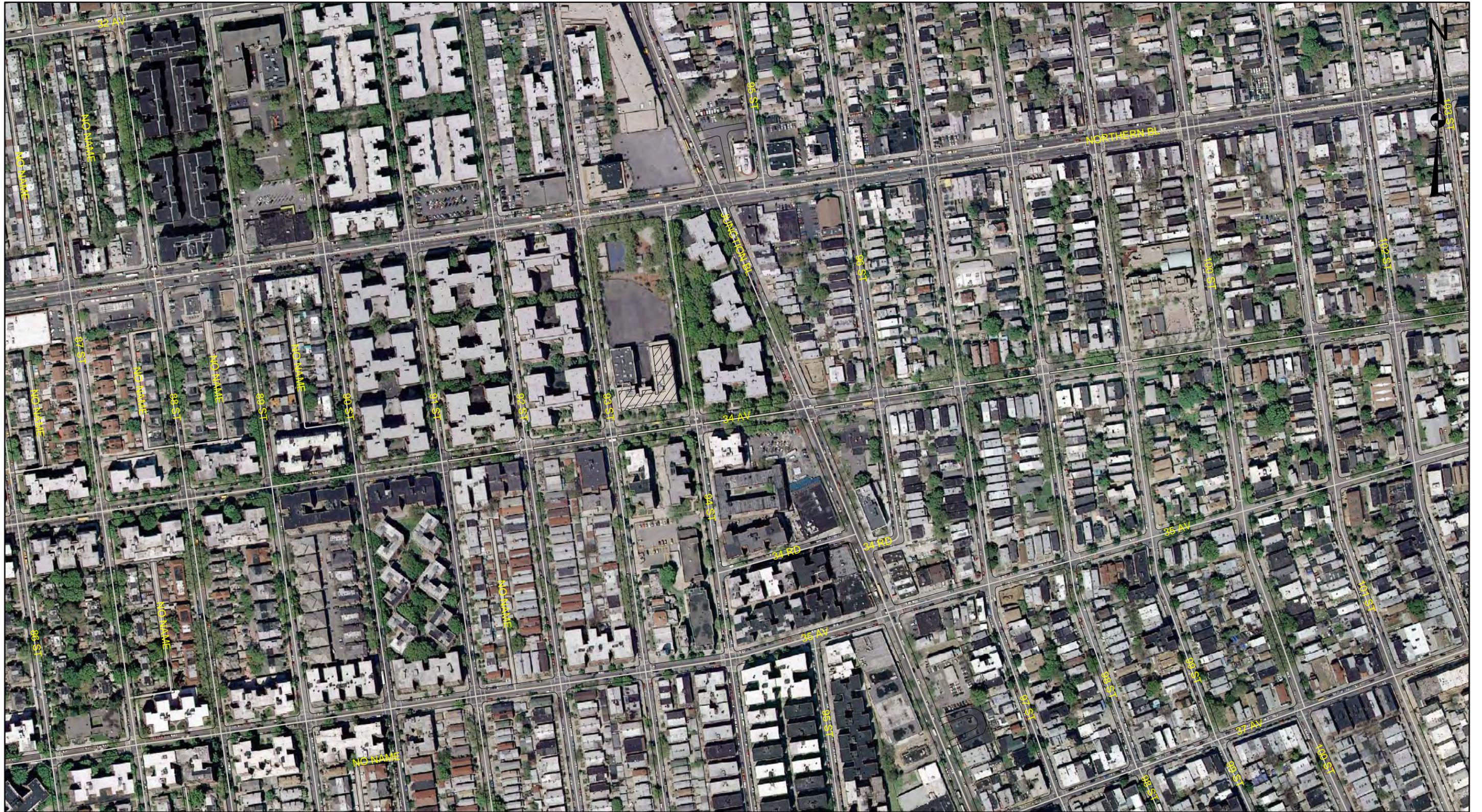


EXHIBIT 1
P.S. 149 QUEENS
CHRISTA MCAULIFFE SCHOOL
AERIAL PHOTOGRAPH



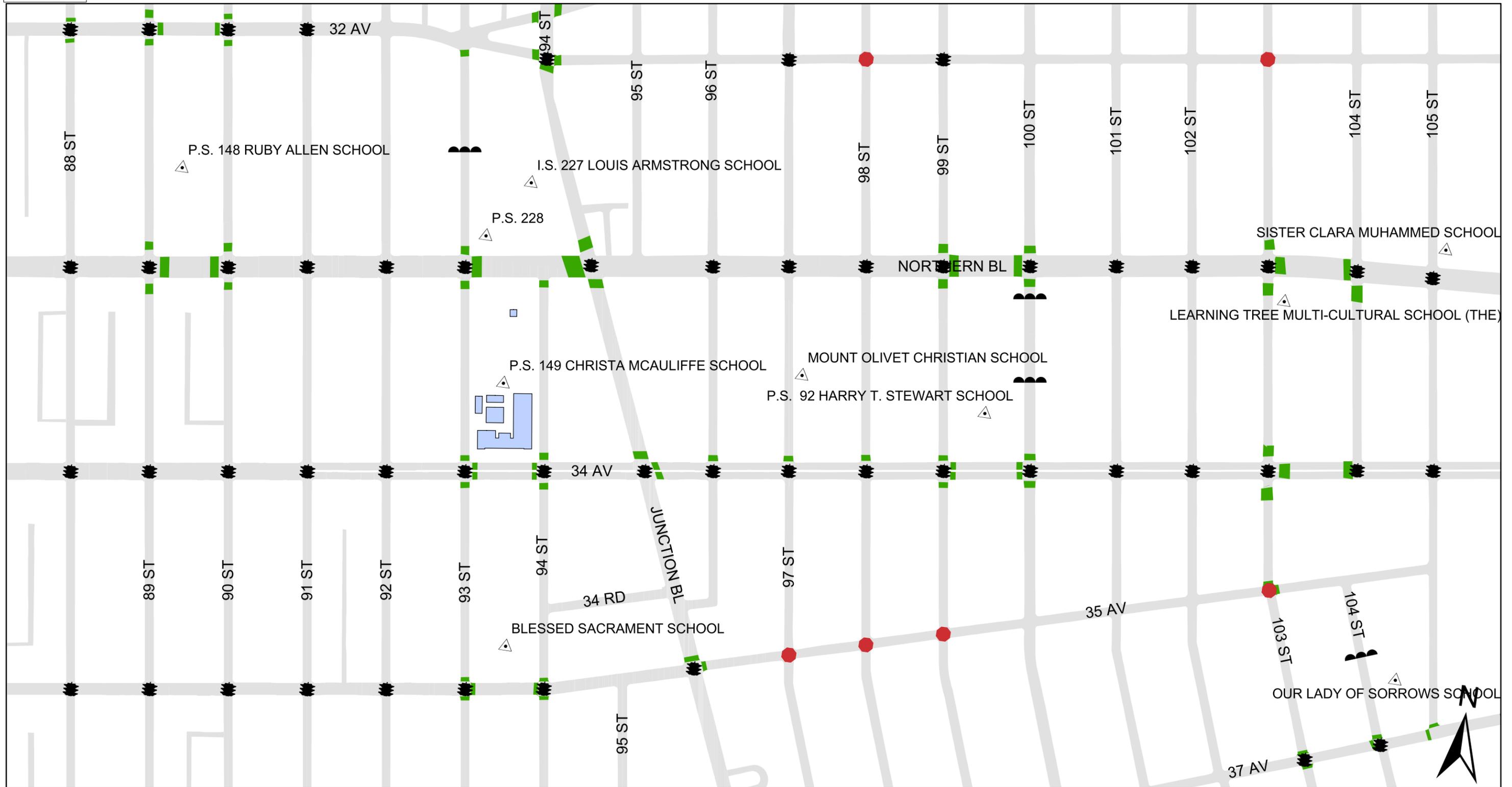
EXHIBIT 2
P.S. 149 QUEENS
CHRISTA MCAULIFFE SCHOOL
CATCHMENT AREA

LEGEND:
 CATCHMENT AREA, (DEPARTMENT OF EDUCATION DESIGNATED AREA FROM WITHIN WHICH STUDENTS ARE ENTITLED TO ATTEND P.S. 149)

0 250 500 1,000 Feet



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

**PS 149 Queens
CHRISTA MCAULIFFE SCHOOL**

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

Map created on 11/17/2006

EXHIBIT 3

COMM. BOARD: 403
PRECINCT: 115

1.5.1 8

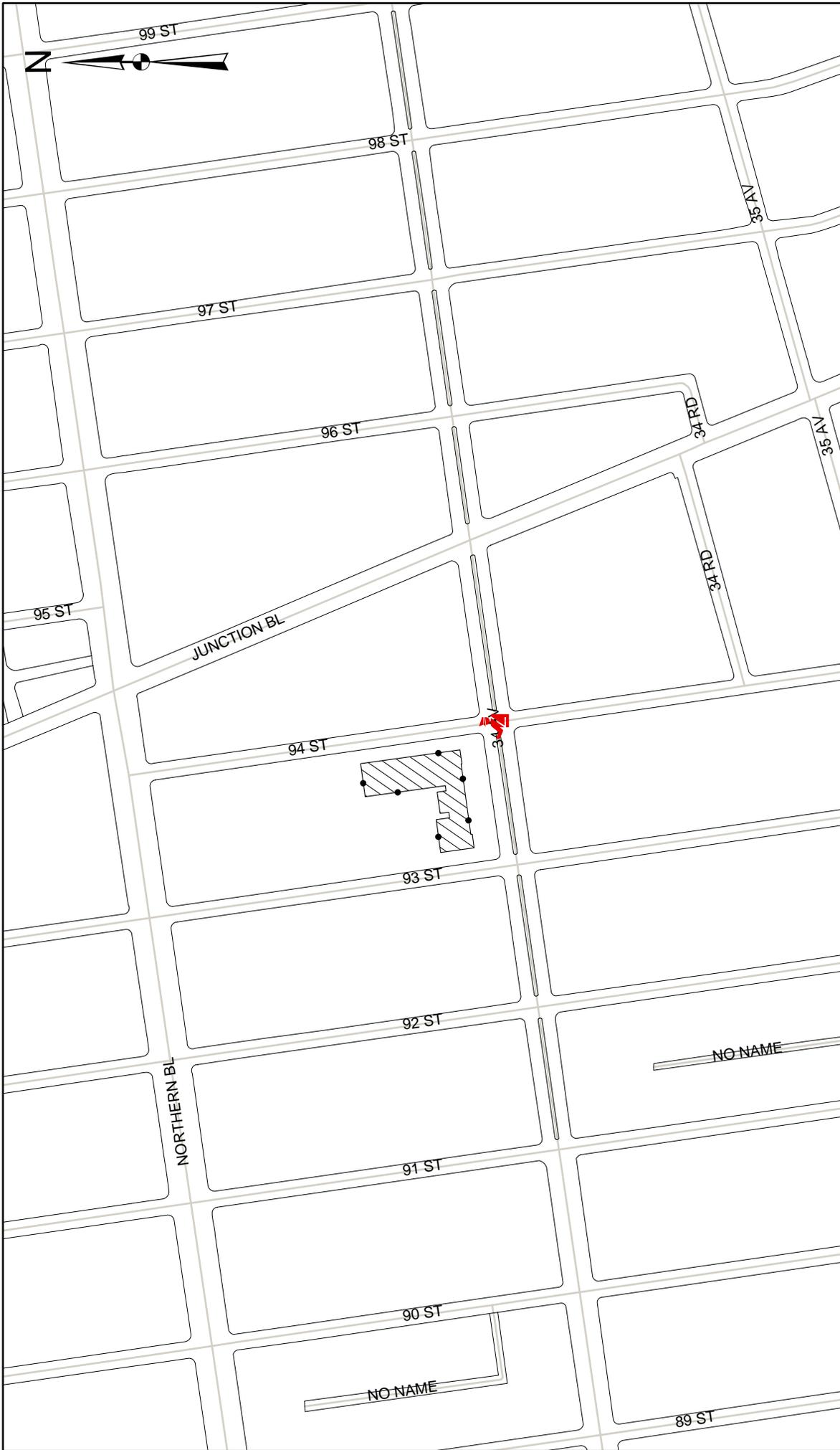


EXHIBIT 4
P.S. 149 QUEENS
CHRISTA MCAULIFFE SCHOOL
CROSSING GUARD LOCATION



LEGEND:
 CROSSING GUARD LOCATION

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to representatives of P.S. 149, few students ride an MTA bus to school, but approximately 50 students ride a yellow school bus to school. The current Department of Education web site has no information regarding bus usage for this school. However, it was observed during visits to the school by the consultant team that numerous school buses of various sizes do serve the student population. Students board the school buses in front of P.S. 149 on the north side of 34th Avenue. As shown in Figures 1, 2 and 3, a certain amount of congestion is associated with school bus operations and pedestrian activity during the student dismissal period.

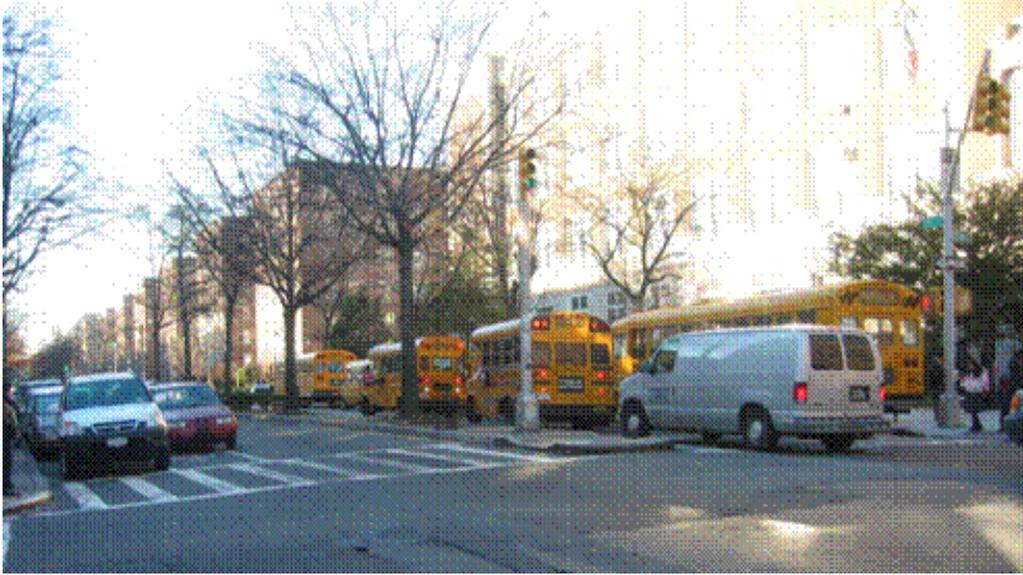


Figure 1: Looking northwest across the 34th Avenue and 94th Street intersection (note congestion due to the presence of buses in front of P.S. 149)



Figure 2: Looking northwest across the 34th Avenue and 94th Street intersection (note congestion due to the presence of buses and student pedestrian activity in front of P.S. 149)



Figure 3: Looking south across the westerly crosswalk at the intersection of 34th Avenue and 94th Street (note vehicles blocking school crosswalk)

3.2 PARENT DROP-OFF OPERATIONS

According to school representatives, approximately five percent of the students at P.S. 149 are currently being dropped off.

3.3 PARKING REGULATIONS

Parking regulations around the school block are shown in Exhibit 5. It should be noted that Northern Boulevard and Junction Boulevard are designated “through” and “local” truck routes, respectively. In addition, both of these roadways are designated snow routes. A snow route designation prohibits vehicles from standing during times of declared emergencies.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

Exhibit 3 shows the existing signals and pavement markings assigned to P.S 149. It should be noted that a citywide signage program is currently underway to upgrade school signage to the current edition of the Federal Manual of 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 8.

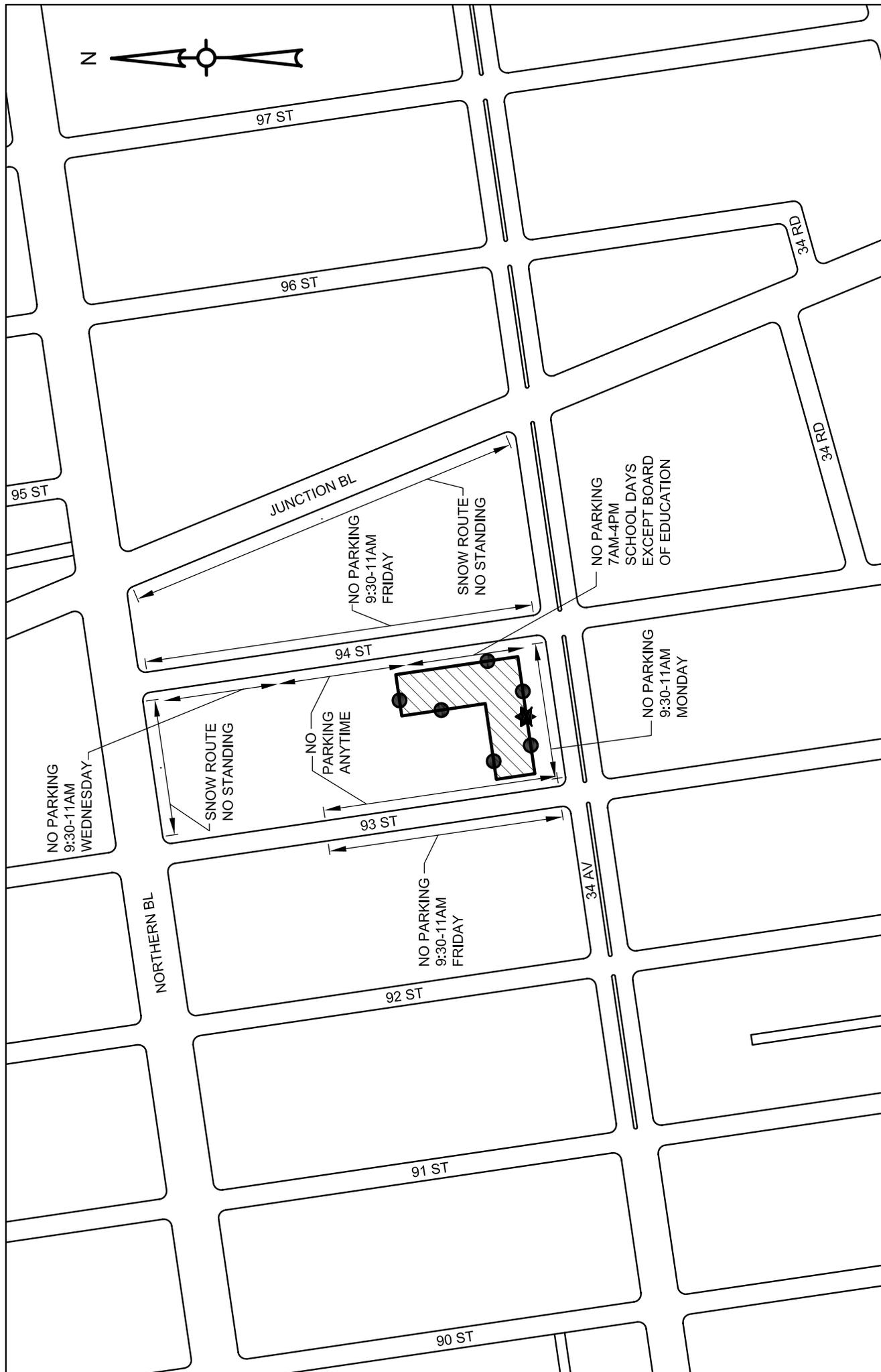
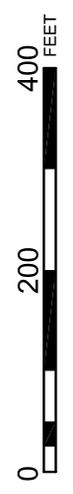


EXHIBIT 5

P.S. 149 QUEENS
CHRISTA MCAULIFFE SCHOOL
EXISTING PARKING REGULATIONS

LEGEND:

- ★ MAIN ENTRANCE
- ENTRANCE



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 149 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*
34 th Avenue and 91 st Street	11	2	1	1
34 th Avenue and 93 rd Street	27	4	0	2
34 th Avenue and 94 th Street	9	2	0	0
34 th Avenue and Junction Boulevard	51	2	0	0
Northern Boulevard and 93 rd Street	31	2	0	0
Northern Boulevard and 94 th Street	31	3	0	1
Northern Boulevard and Junction Boulevard	110	7	0	1
TOTAL	270	22	1	5

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
34 th Avenue and 91 st Street	32	3	0	0
34 th Avenue and 93 rd Street	23	2	0	0
34 th Avenue and 94 th Street	20	5	0	0
34 th Avenue and Junction Boulevard	89	5	0	0
Northern Boulevard and 93 rd Street	45	1	0	0
Northern Boulevard and 94 th Street	45	5	0	0
Northern Boulevard and Junction Boulevard	132	10	0	1
TOTAL	386	31	0	1

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

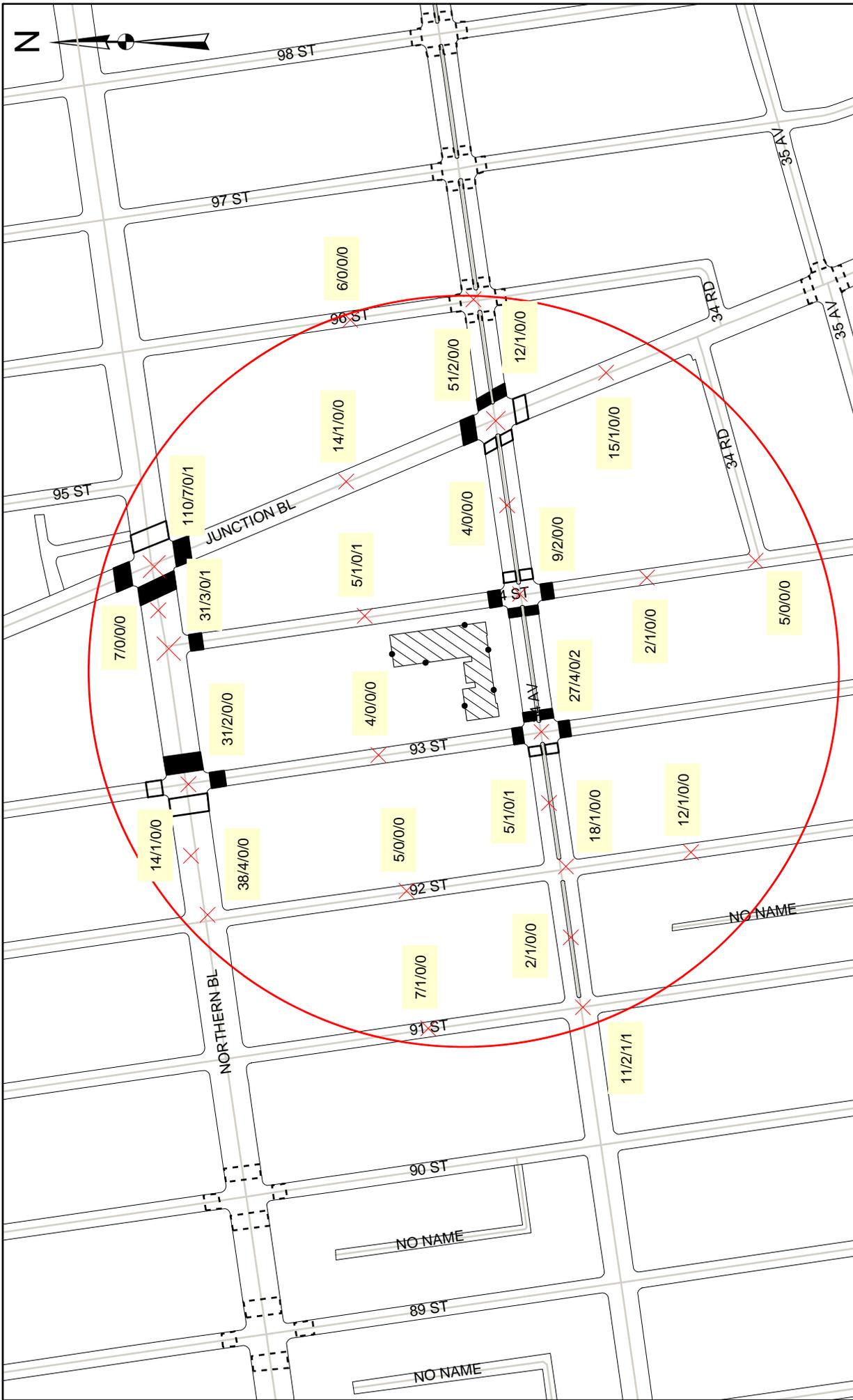


EXHIBIT 6
P.S. 149 QUEENS
CHRISTA MCAULIFFE SCHOOL
ACCIDENT SUMMARY (1998-2000)

LEGEND:

- ACCIDENT LOCATION
- SCHOOL CROSSWALK
- SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL
- BORDER OF 700 FEET

X / X / X / X PED ACCD / PED ACCD / SCHOOL_PED ACCD / PED FATAL / SCHOOL_PED ACCD

0 250 500 1,000 Feet

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. 149. Details on specific intersections or roadway segments are given in the following Sections.

3.6.1 34th Avenue and 91st Street

This is a four-leg signalized intersection with pedestrian crosswalks located across all four legs. 34th Avenue is a two-way east-west street with one travel lane, one on-street parking lane, and one bicycle lane on each side of the roadway. A raised concrete median approximately six feet wide is located along the center of 34th Avenue, separating eastbound and westbound traffic. 91st Street is a one-way northbound street with one travel lane and on-street parking permitted on both sides of the roadway.

There was a total of 11 accidents reported at this intersection between 1998 and 2000, including two pedestrian accidents, one of which was school-related and the other which involved a pedestrian fatality (Table 2). In the school-related accident, a five-year-old pedestrian sustained a "possible injury" at approximately 8:00 am on November 5, 1999 after being struck while crossing with the signal at this intersection. At the time of the accident, the roadway surface was dry and the weather was clear, and the accident occurred during daylight conditions. No information was available concerning the fatal pedestrian accident.

3.6.2 34th Avenue and 93rd Street

This is a four-leg signalized intersection with school crosswalks located across the north and south legs of 93rd Street and the east leg of 34th Avenue, and a pedestrian crosswalk located across the west leg of 34th Avenue. 34th Avenue is a two-way east-west street with one travel lane, one on-street parking lane, and one bicycle lane on each side of the roadway. A raised concrete median approximately six feet wide is located along the center of 34th Avenue, separating eastbound and westbound traffic. 93rd Street is a one-way northbound street with one travel lane and parking permitted on the west side except between 9:30-11:00 AM Friday (see Figures 4 and 5).

There was a total of 27 accidents reported at this intersection between 1998 and 2000, including four pedestrian accidents, two of which were school-related (Table 2). In the first school-related accident, a six-year-old pedestrian sustained an "incapacitating injury" at approximately 8:00 am on October 21, 1998 while crossing with the signal at this intersection. At the time of the accident, the roadway surface was dry and the weather was cloudy. The accident occurred during daylight conditions.

In the second school-related accident, a nine-year-old pedestrian sustained a “non-incapacitating injury” at approximately 3:00 pm on March 14, 2000 while emerging from behind a parked vehicle at the intersection. At the time of the accident, the roadway surface was dry and the weather was clear. There were no pedestrian fatalities reported at this intersection between 1998 and 2000.

It should also be noted that one school-related accident was reported mid-block on 34th Avenue between 92nd Street and 93rd Street. This particular accident occurred at approximately 3:00 pm on June 25, 1998, when an eight-year-old pedestrian sustained a non-incapacitating injury after being struck while emerging from behind a parked vehicle. At the time of the accident, the roadway surface was dry and the weather was clear. The accident occurred during daylight conditions.

School officials reported a problem with vehicles speeding along 93rd Street. Therefore, a spot speed survey was conducted on 93rd Street, between 34th Avenue and Northern Boulevard, 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 on 93rd Street indicated that northbound vehicles were traveling at an 85th percentile speed of 33 mph, which exceeds the 30 mph threshold. A summary of the spot speed survey on 93rd Street is provided in the Appendix at the end of this document.



Figure 4: Looking east on 34th Avenue at the intersection with 93rd Street during the afternoon dismissal period



Figure 5: Looking west on 34th Avenue at the intersection with 93rd Street

3.6.3 34th Avenue and 94th Street

This is a four-leg signalized intersection with school crosswalks located across the north and south legs of 94th Street and the west leg of 34th Avenue, and a pedestrian crosswalk located across the east leg of 34th Avenue. 34th Avenue is a two-way east-west street with one travel lane, one on-street parking lane, and one bicycle lane on each side of the roadway. A raised concrete median approximately six feet wide is located along the center of 34th Avenue, separating eastbound and westbound traffic. 94th Street is a one-way southbound street with one travel lane and on-street parking permitted on both sides of the roadway (see Figure 6).

There was a total of nine accidents reported at this intersection between 1998 and 2000, including two pedestrian accidents, neither of which was school-related (Table 2). There were no pedestrian fatalities at this intersection between 1998 and 2000.



Figure 6: Looking west on 34th Avenue at the intersection with 94th Street during the afternoon dismissal period

School officials reported a problem with vehicles speeding along 34th Avenue. Therefore, a spot speed survey was conducted on 34th Avenue, between 93rd Street and 94th 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 on 34th Avenue indicated that eastbound vehicles were traveling at an 85th percentile speed of 33 mph, and westbound vehicles were traveling at an 85th percentile speed of 34 mph, both of which exceed the 30 mph threshold. A summary of the spot speed survey on 93rd Street is provided in the Appendix at the end of this document.

These findings suggest the need for speed reduction measures along 34th Avenue. However, there are traffic signals on each end of the block between 93rd Street and 94th Street. A NYCDOT design criterion for placement of a speed reducer is a minimum distance of 200 feet from the nearest traffic signal or stop sign. This criterion cannot be met on 34th Avenue because traffic signals are spaced only 200 feet apart. Furthermore, curb extensions (neckdowns) would not be conducive to the character of the roadway at this location, due to the high level of school bus activity on 34th Avenue in front of the school.

School officials also reported a problem with vehicles speeding along 94th Street. Therefore, a spot speed survey was conducted on 94th Street, between Northern Boulevard and 34th Avenue, in order to verify the existence of a speeding problem and to determine its extent. The results of the spot speed survey on 94th Street indicated that southbound vehicles were traveling at an 85th percentile speed of 32 mph, which exceeds the 30 mph threshold.

3.6.4 34th Avenue and Junction Boulevard

This is a four-leg signalized intersection with school crosswalks located across the north leg of Junction Boulevard and the east leg of 34th Avenue. Pedestrian crosswalks are located across the south leg of Junction Boulevard and the west leg of 34th Avenue. Junction Boulevard is a two-way north-south street with one travel lane and one on-street parking lane on each side of the roadway. 34th Avenue is a two-way east-west street with one travel lane, one on-street parking lane, and one bicycle lane on each side of the roadway. A raised concrete median approximately six feet wide is located along the center of 34th Avenue, separating eastbound and westbound traffic (see Figures 7 and 8).

There was a total of 51 accidents reported at this intersection between 1998 and 2000, including two pedestrian accidents, neither of which was school-related (Table 2). There were no pedestrian fatalities at this intersection between 1998 and 2000.



Figure 7: Looking east on 34th Avenue at the intersection with Junction Boulevard



Figure 8: Looking south on Junction Boulevard at the intersection with 34th Avenue

3.6.5 Northern Boulevard and 93rd Street

This is a four-leg signalized intersection with school crosswalks located across the north and south legs of 93rd Street, and the east leg of Northern Boulevard. A pedestrian crosswalk is located across the west leg of Northern Boulevard. Northern Boulevard, also known as State Highway Route 25A, is a major east-west arterial roadway through Queens. Northern Boulevard extends approximately 23 miles between Queens Boulevard (near the Queensborough Bridge, where it connects directly with Jackson Avenue) and Nassau County at the city line. Northern Boulevard is also a designated “through” truck route. In the vicinity of P.S. 149, Northern Boulevard has two travel lanes and one on-street parking lane in each direction, plus an approximate 12 foot wide median striped along the center of the roadway separating eastbound and westbound traffic. 93rd Street is a one-way northbound street with one travel lane and on-street parking permitted on both sides of the roadway. There is an exclusive eastbound left-turn lane in the median of Northern Boulevard at its intersection with 93rd Street (see Figures 9 and 10).

There was a total of 31 accidents reported at this intersection between 1998 and 2000, including two pedestrian accidents, neither of which was school-related (Table 2). There were no pedestrian fatalities at this intersection between 1998 and 2000.



Figure 9: Looking south along 93rd Street at the intersection with Northern Boulevard (P.S. 149 can be seen to the left)



Figure 10: Looking north along 93rd Street at the intersection with Northern Boulevard

3.6.6 Northern Boulevard and 94th Street

This is an unsignalized “T”-intersection with a school crosswalk located across the south leg of 93rd Street. Northern Boulevard has two travel lanes and one on-street parking lane in each direction, plus an approximate 12 foot wide median striped along the center of the roadway separating eastbound and westbound traffic. 93rd Street is a one-way southbound street with one travel lane and on-street parking permitted on both sides of the roadway (see Figure 11).

There was a total of 31 accidents reported at this intersection between 1998 and 2000, including three pedestrian accidents, one of which was school-related (Table 2). This particular accident involved an 11-year-old pedestrian who sustained a “possible injury” at approximately 8:00 am on May 10, 1999 while attempting to cross the intersection where there was “no signal or crosswalk” (this suggests that the pedestrian may have been crossing Northern Boulevard). At the time of this accident, the roadway surface was dry and the weather was clear. The accident occurred during daylight conditions. There were no pedestrian fatalities at this intersection between 1998 and 2000.



Figure 11: Looking south along 94th Street at the intersection with Northern Boulevard

3.6.7 Northern Boulevard and Junction Boulevard

This is a four-leg signalized intersection with school crosswalks located across the north and south legs of Junction Boulevard and the west leg of Northern Boulevard. A pedestrian crosswalk is located across the east leg of Northern Boulevard. Northern Boulevard and Junction Boulevard are designated “through” and “local” truck routes, respectively, and both roadways are also designated as snow emergency routes.

In the vicinity of P.S. 149, Northern Boulevard has two travel lanes and one on-street parking lane in each direction, plus an approximate 12 foot wide median striped along the center of the roadway separating eastbound and westbound traffic. Junction Boulevard is a two-way north-south street with one travel lane and one on-street parking lane on each side of the roadway. There are exclusive eastbound and westbound left-turn lanes on Northern Boulevard at the intersection with Junction Boulevard (see Figures 12 and 13).

There was a total of 110 accidents reported at this intersection between 1998 and 2000, including seven pedestrian accidents, one of which was school-related (Table 2). In this particular accident, two 11-year-old pedestrians sustained incapacitating injuries at approximately 9:00 am on December 7, 1998 while attempting to cross the intersection. The pedestrians’ actions were reported as “crossing, no signal, marked crosswalk.” At the time of the accident, the roadway surface was dry and the weather was clear. The accident was reported to have occurred during daylight conditions. There were no pedestrian fatalities reported at this intersection.

To assess vehicle and pedestrian volumes on Northern Boulevard and Junction Boulevard in the vicinity of P.S. 149, vehicle turning movement and pedestrian crossing counts were conducted at the intersection of Northern Boulevard and Junction Boulevard between 7:30 and 9:00 am on Wednesday, November 17, 2005. The results of these counts during the weekday morning peak hour (7:30 to 8:30 am) are shown in Tables 4 and 5 and in Exhibit 7 at the end of this section.

TABLE 4: VEHICLE TURNING MOVEMENT VOLUMES (7:30 TO 8:30 AM)												
INTERSECTION	Northern Boulevard EASTBOUND			Northern Boulevard WESTBOUND			Junction Boulevard NORTHBOUND			Junction Boulevard SOUTHBOUND		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Northern Boulevard and Junction Boulevard	27	709	52	77	1,301	69	35	131	45	43	144	55
TOTAL	788			1,447			211			242		

TABLE 5: PEDESTRIAN CROSSING VOLUMES (7:30 TO 8:30 AM)				
INTERSECTION	Crossing Northern Boulevard WEST-LEG CROSSWALK	Crossing Northern Boulevard EAST-LEG CROSSWALK	Crossing Junction Boulevard SOUTH-LEG CROSSWALK	Crossing Junction Boulevard NORTH-LEG CROSSWALK
Northern Boulevard and Junction Boulevard	168 (44 / 124) *	94 (65 / 29) *	70 (25 / 45) *	142 (41 / 101) *

* Numbers in parentheses indicate (adults / students).



Figure 12: Looking west on Northern Boulevard at the intersection with Junction Boulevard



Figure 13: Looking south along Junction Boulevard at the intersection with Northern Boulevard

3.7 SIGNAL TIMING

Pedestrian crossing times were field-verified for crosswalks at signalized intersections in the vicinity of P.S. 149, and were found to be adequate in all directions and approaches based upon a child pedestrian walking at the rate of three feet per second. The signal timings are shown in Table 6.

TABLE 6: PEDESTRIAN CROSSING TIMES AT SIGNALIZED INTERSECTIONS				
INTERSECTION	CROSSWALK LENGTH (FEET)	PEDESTRIAN TIME ACTUAL (SECONDS)	PEDESTRIAN TIME REQUIRED (SECONDS)	TIMING ADJUSTMENT REQUIRED?
34th Avenue and 93rd Street				
crossing 34 th Avenue (EB)	24	31	11	No
crossing 34 th Avenue (WB)	24	31	11	No
crossing 34 th Avenue	56	31	22	No
crossing 93 rd Street	31	55	14	No
34th Avenue and 94th Street				
crossing 34 th Avenue (EB)	24	31	11	No
crossing 34 th Avenue (WB)	24	31	11	No
crossing 34 th Avenue	56	31	22	No
crossing 94 th Street	30	55	13	No
34th Avenue and Junction Boulevard				
crossing 34 th Avenue (EB)	24	31	11	No
crossing 34 th Avenue (WB)	24	31	11	No
crossing 34 th Avenue	56	31	22	No
crossing Junction Boulevard	46	55	19	No
Northern Boulevard and 93rd Street				
crossing Northern Boulevard	74	31 (am) 33 (pm)	28	No
crossing 93 rd Street	31	74 (am) 69 (pm)	14	No
Northern Boulevard and Junction Boulevard				
crossing Northern Boulevard	74	29	28	No
crossing Junction Boulevard	46	74	19	No

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

3.8 PHYSICAL CONDITIONS

3.8.1 Roadways and Sidewalks

Roadways in the vicinity of P.S. 149 are in fair condition. Sidewalks on the school's block faces are between 10 and 15 feet wide, and are in fair condition.

3.8.2 Pedestrian Ramps

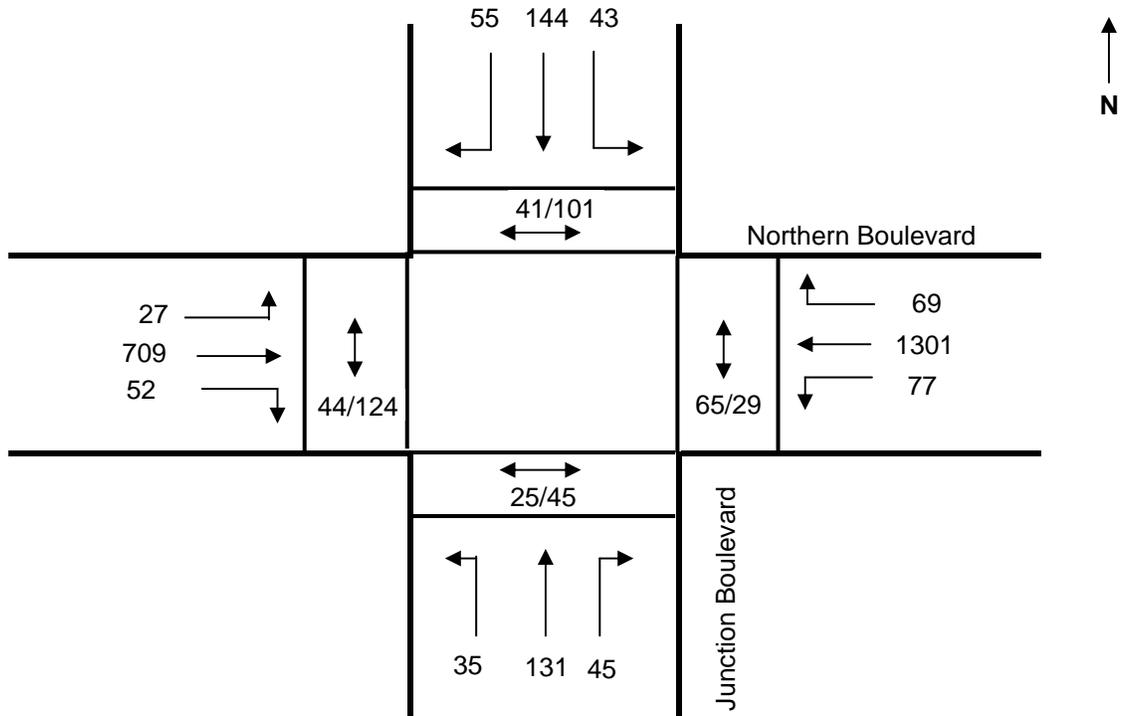
Most pedestrian ramps in the vicinity of P.S. 149 were found to be standard. However, pedestrian ramps were found to be non-standard at the following locations:

- The pedestrian ramps located in the center median, for the crosswalks located across the east and west legs of the 34th Avenue and 93rd Street intersection, have a lip at the curb and do not provide smooth transitions between the pavement and the sidewalk.
- The pedestrian ramp located on the northwest corner of the 34th Avenue and 93rd Street intersection, for the crosswalk located across the west leg of the intersection, has a small lip at the curb and does not provide a smooth transition between the pavement and the sidewalk.
- A traffic signal pole is situated on the southwest corner of the 34th Avenue and 93rd Street intersection and obstructs the path of the pedestrian crosswalk located across the west leg of the intersection.
- The pedestrian ramps located in the center median, for the crosswalks located across the east and west legs of the 34th Avenue and 94th Street intersection, have a lip at the curb and do not provide smooth transitions between the pavement and the sidewalk.
- The pedestrian ramp located on the southwest corner of the 34th Avenue and 94th Street intersection, for the school crosswalk located across the west leg of the intersection, has a small lip at the curb and does not provide a smooth transition between the pavement and the sidewalk.
- A traffic signal pole is situated on the southwest corner of the 34th Avenue and 94th Street intersection and obstructs the path of the school crosswalk located across the west leg of the intersection.
- The pedestrian ramps located in the center median, for the crosswalks located across the east and west legs of the 34th Avenue and Junction Boulevard intersection, have a lip at the curb and do not provide smooth transitions between the pavement and the sidewalk.
- The pedestrian ramp located on the southwest corner of the 34th Avenue and Junction Boulevard intersection, for the crosswalk located across the west leg of

the intersection, where a portion of the curb at the ramp is higher than both the pedestrian ramp and the roadway pavement, and forms a lip at the curb.

- A pedestrian ramp is missing on the northeast corner of the 34th Avenue and Junction Boulevard intersection, for the school crosswalk located across the north leg of Junction Boulevard.
- A traffic signal pole is situated on the southwest corner of the 34th Avenue and Junction Boulevard intersection and obstructs the path of the pedestrian crosswalk located across the west leg of the intersection.

One Hour Traffic Volumes
Friday, June 17th, 2005 7:30am - 8:30am



Intersection of Northern Boulevard and Junction Boulevard

Table of Content:

XX / XX	Adult / Child
←→	Pedestrian Counts
—↑	Vehicle Movement

EXHIBIT 7
P.S. 149 QUEENS CHRISTA MCAULIFFE SCHOOL
TRAFFIC AND PEDESTRIAN COUNTS

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes the proposed measures to improve school pedestrian safety around P.S. 149. 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 P.S. 149 is discussed as follows, and is shown in more detail in Exhibit 8 at the end of this section. See Section 4.3 for additional recommendations for this area from the report on Blessed Sacrament School, a nearby priority school.

4.1 SHORT-TERM MEASURES

➤ *Install “NO STANDING 7AM - 4PM SCHOOL DAYS” signs*

A parking regulation should be instituted and signs installed reading “NO STANDING 7AM - 4PM SCHOOL DAYS” for 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.)

➤ *Install graphic “YIELD TO PEDESTRIAN” sign*

“YIELD TO PEDESTRIAN” signs should be installed at intersection approaches with substantial vehicle–student pedestrian volumes. A “YIELD TO PEDESTRIAN” sign is recommended on the following approach:

- Eastbound approach to the Northern Boulevard and 94th Street intersection.

➤ *Place advance stop bars before 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 93rd Street*

School officials reported a speeding problem on 93rd Street. Therefore, a speed survey was conducted on 93rd Street between 34th Avenue and Northern Boulevard in order to verify the existence of a speeding problem and to determine its extent (see Section 3.6.2).

The spot speed survey showed an 85th percentile speed of 33 mph for vehicles traveling northbound on 93rd Street, between 34th Avenue and Northern Boulevard. This finding suggests the need for speed reduction measures for this section of roadway.

Therefore, it is recommended to:

- Install a speed reducer (hump) on 93rd Street, mid-block between 34th Avenue and Northern Boulevard. A speed reducer should help reduce speeding along 93rd Street. The speed reducer should be marked and signed per NYCDOT standards.

➤ Speeding on 94th Street

School officials also reported a speeding problem on 94th Street. Therefore, a speed survey was conducted on 94th Street, between Northern Boulevard and 34th Avenue, in order to verify the existence of a speeding problem and to determine its extent (see Section 3.6.3).

The spot speed survey showed an 85th percentile speed of 32 mph for vehicles traveling northbound on 94th Street between Northern Boulevard and 34th Avenue. This finding suggests the need for speed reduction measures for this section of roadway.

Therefore, it is recommended to:

- Install a speed reducer (hump) on 94th Street, mid-block between 34th Avenue and Northern Boulevard. A speed reducer should help reduce speeding along 94th Street. The speed reducer should be marked and signed per NYCDOT standards.

4.2 LONG-TERM MEASURES

➤ Consider refuge islands at the following intersections, as shown in Exhibit 8:

The landscaped median along the center of 34th Avenue separates eastbound and westbound traffic, but does not extend through the crosswalks. Therefore, it is recommended to:

- Provide a pedestrian refuge area by extending the medians on 34th Avenue through the school and pedestrian crosswalks on the east and west legs of the intersections with 93rd Street, 94th Street, and Junction Boulevard, as shown in Exhibit 8.

There is a canalized center median along Northern Boulevard, separating eastbound and westbound traffic. A school crosswalk is located across the east leg of the Northern Boulevard and 93rd Street intersection. Therefore, it is recommended to:

- Provide a raised concrete pedestrian refuge island on the east leg of the Northern Boulevard and 93rd Street intersection, as shown in Exhibit 8.

The refuge islands and extended medians will provide a refuge area for pedestrians who do not completely cross the roadway during the flashing “DON’T WALK” indication. The medians should be at least five feet wide, should extend beyond 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 the proposed refuge islands and curb extensions will be developed during Final Design.

➤ *Install new or reconstruct existing pedestrian ramps*

There are several locations where pedestrian ramps are of non-standard design or are missing entirely (see Section 3.8.2). Final details will be developed during the Final Design/Contract Document preparation. Therefore, the following improvements are recommended:

- Reconstruct or modify the existing pedestrian ramp located on the northwest corner of the 34th Avenue and 93rd Street intersection. It has a small lip at the curb and does not provide a smooth transition between the pavement and the sidewalk.
- Reconstruct or modify the existing pedestrian ramp located on the southwest corner of the 34th Avenue and 94th Street intersection. It has a small lip at the curb and does not provide a smooth transition between the pavement and the sidewalk.
- Reconstruct or modify the existing pedestrian ramp located on the southwest corner of the 34th Avenue and Junction Boulevard intersection. A portion of the curb at the ramp is higher than both the pedestrian ramp and the roadway pavement, and forms a lip at the curb.
- Install a new pedestrian ramp on the northeast corner of the 34th Avenue and Junction Boulevard intersection.

➤ *Remove obstructions in crosswalk paths*

There are several locations where traffic signal poles are situated in such a way that they obstruct the path of adjacent crosswalks (see Section 3.8.2). Therefore, it is recommended to:

- Relocate the traffic signal pole situated on the southwest corner of the 34th Avenue and 93rd Street intersection, which obstructs the path of the pedestrian crosswalk located across the west leg of the intersection.

- Relocate the traffic signal pole situated on the southwest corner of the 34th Avenue and 94th Street intersection, which obstructs the path of the school crosswalk located across the west leg of the intersection.
- Relocate the traffic signal pole situated on the southwest corner of the 34th Avenue and Junction Boulevard intersection, which obstructs the path of the pedestrian crosswalk located across the west leg of the intersection.

4.3 ADDITIONAL RECOMMENDATIONS FROM PRIORITY SCHOOLS IN THE VICINITY OF P.S. 149

4.3.1 RECOMMENDATIONS FOR BLESSED SACRAMENT SCHOOL:

➤ *Install graphic “YIELD TO PEDESTRIAN” signs*

“YIELD TO PEDESTRIAN” signs should be installed at intersection approaches with substantial vehicle–student pedestrian volumes. A “YIELD TO PEDESTRIAN” sign is recommended at the following location in the vicinity of Blessed Sacrament:

- Southbound approach of 94th Street at the intersection with 37th Avenue.

➤ *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 school crosswalk*

A school crosswalk should be installed across the south leg of 95th Street at the stop-controlled intersection with 35th Avenue. This measure is recommended to provide continuity with other school crosswalks located along the south side of 35th Avenue from 93rd Street to Junction Boulevard. All of the associated advance warning signs should be installed in conjunction with the new school crosswalk.

➤ *Provide crossing guard with STOP paddle*

It is recommended that the school crossing guard be provided with a “STOP” paddle in order to improve the visibility of the guard and student-pedestrians at the intersection of 35th Avenue and 94th Street.

➤ Consider installing curb extensions

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 northwest and southwest corners of the 35th Avenue and 93rd Street intersection.
- On the northwest and southwest corners of the 35th Avenue and 94th Street intersection.
- On the east and west sides of 95th Street, south of the intersection with 35th Avenue.
- On the northeast corner of the 37th Avenue and 94th Street intersection, and on the south side of 37th Avenue, west of 94th Street.
- On the southeast and southwest corners of the Elmhurst Avenue and 94th Street intersection, and on the north side of Elmhurst Avenue, west of 94th Street.

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.



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 BIKE LANE
-  EXISTING STRIPED MEDIAN
-  EXISTING ALL WAY STOP LOCATION
-  EXISTING SCHOOL CROSSWALK
-  EXISTING PEDESTRIAN CROSSWALK
-  EXISTING SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL
-  PROPOSED ADVANCE WARNING SIGN
-  PROPOSED SCHOOL CROSSWALK
-  PROPOSED TRAFFIC SIGN
-  PROPOSED PEDESTRIAN RAMP
-  PEDESTRIAN RAMP TO BE RECONSTRUCTED
-  PROPOSED STOP LINE IN ADVANCE OF SCHOOL CROSSWALK
-  PROPOSED "NO STANDING 7:00AM - 4:00PM SCHOOL DAYS"
-  PROPOSED SPEED REDUCER
-  PROPOSED REFUGE ISLAND
-  TRAFFIC SIGNAL POLE TO BE RELOCATED
-  PROPOSED CURB EXTENSION (NECKDOWN)

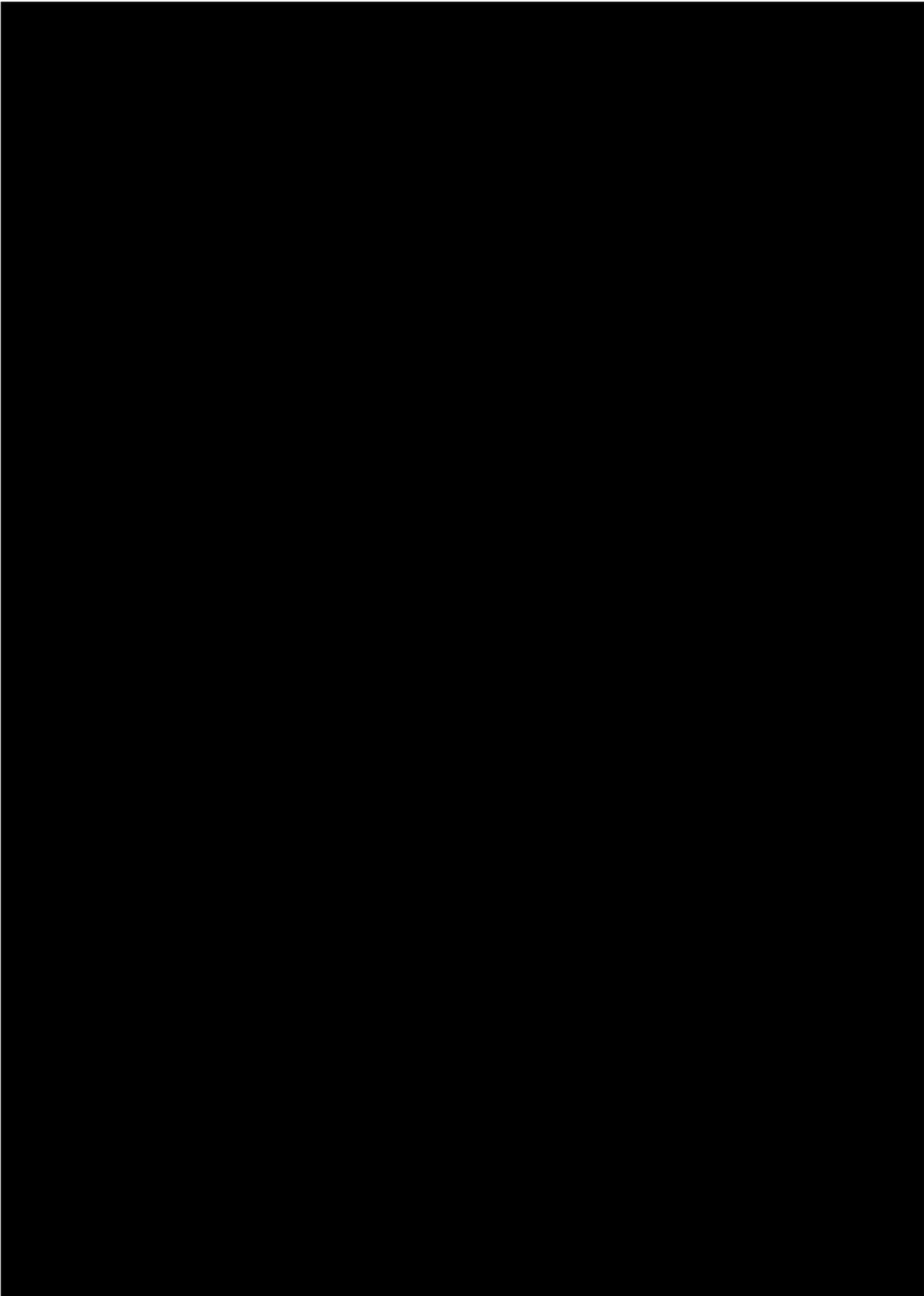
1" = 300'

EXHIBIT 8

P.S. 149 QUEENS
CHRISTA MCAULIFFE SCHOOL

POTENTIAL MEASURES
TO IMPROVE STUDENT PEDESTRIAN SAFETY

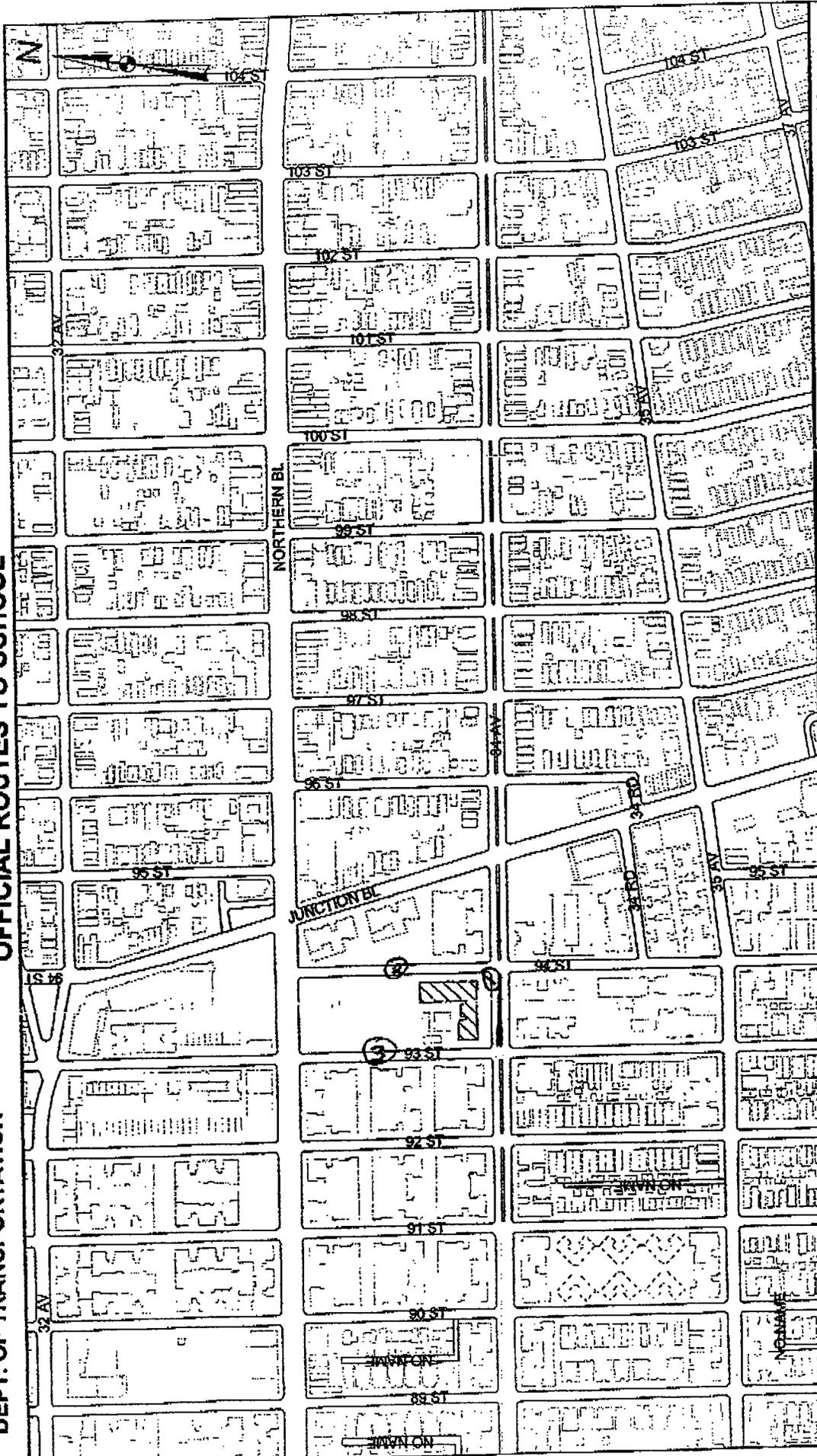
APPENDIX



**NEW YORK CITY
DEPT. OF TRANSPORTATION**

**TRAFFIC SAFETY PLAN
OFFICIAL ROUTES TO SCHOOL**

BUREAU OF TRAFFIC



The TRAFFIC SAFETY PLAN shown on this map was established to provide the maximum degree of safety for children going to and from school. It is required that all children follow the prescribed routes and use the designated crosswalks.

- LEGEND:**
- TRAFFIC FLOW
 - ROUTE TO SCHOOL
 - ADV. WARNING SIGN
 - SCHOOL LOCATION
 - MAIN SCHOOL ENTRANCE
 - OTHER SCHOOL ENTRANCES
 - SCHOOL X-WALK
 - PEDESTRIAN X-WALK
 - STOP LINE
 - X-WALKS ASSOCIATED WITH OTHER SCHOOLS
 - SPEED HUMP
 - TRAFFIC SIGNAL
 - ALL-WAY STOP
 - 2-WAY STOP

**CHRISTA MCAULIFFE SCHOOL
P.S. 149**

Prepared by the NEW YORK CITY DEPARTMENT OF TRANSPORTATION,
Lisa Walther, COMMISSIONER, in cooperation with SCHOOL and
POLICE OFFICIALS.

ORIG. DATE: 03/1984
GIS CONVRT: 04/2002
DRAWING NO. OC-1017
MS-3523
COMM. BOARD: 3
BOROUGH: QUEENS
PRECINCT: 110

SPOT SPEED STUDY

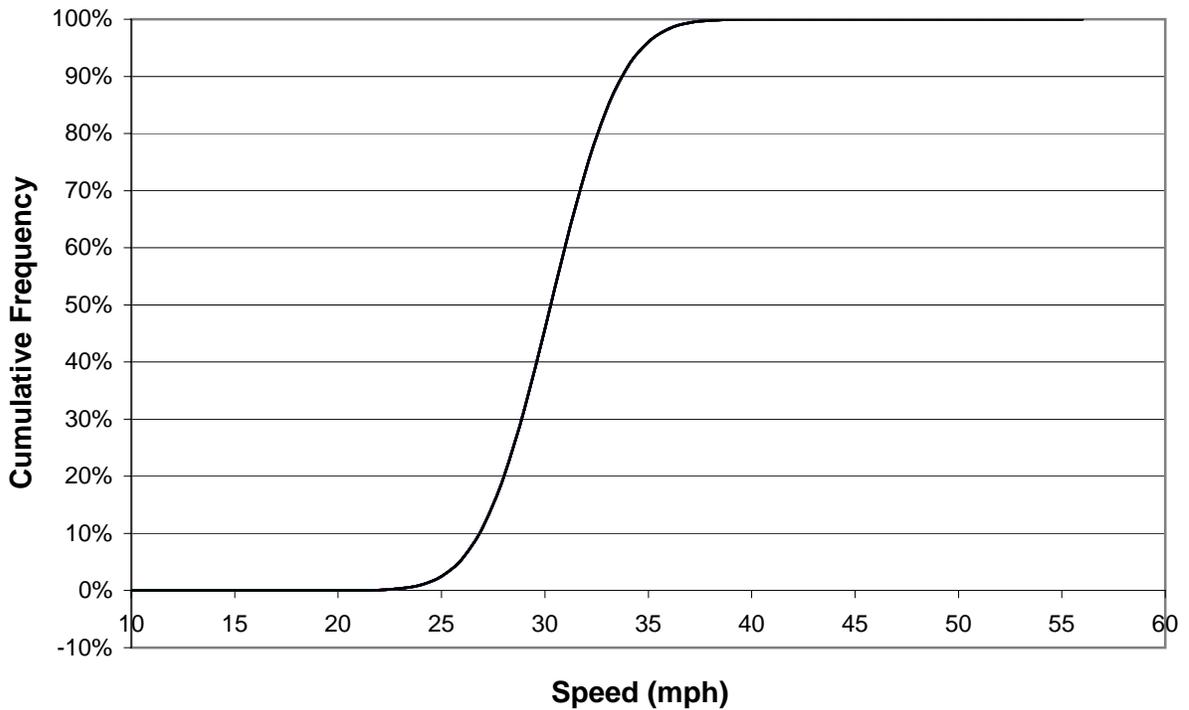
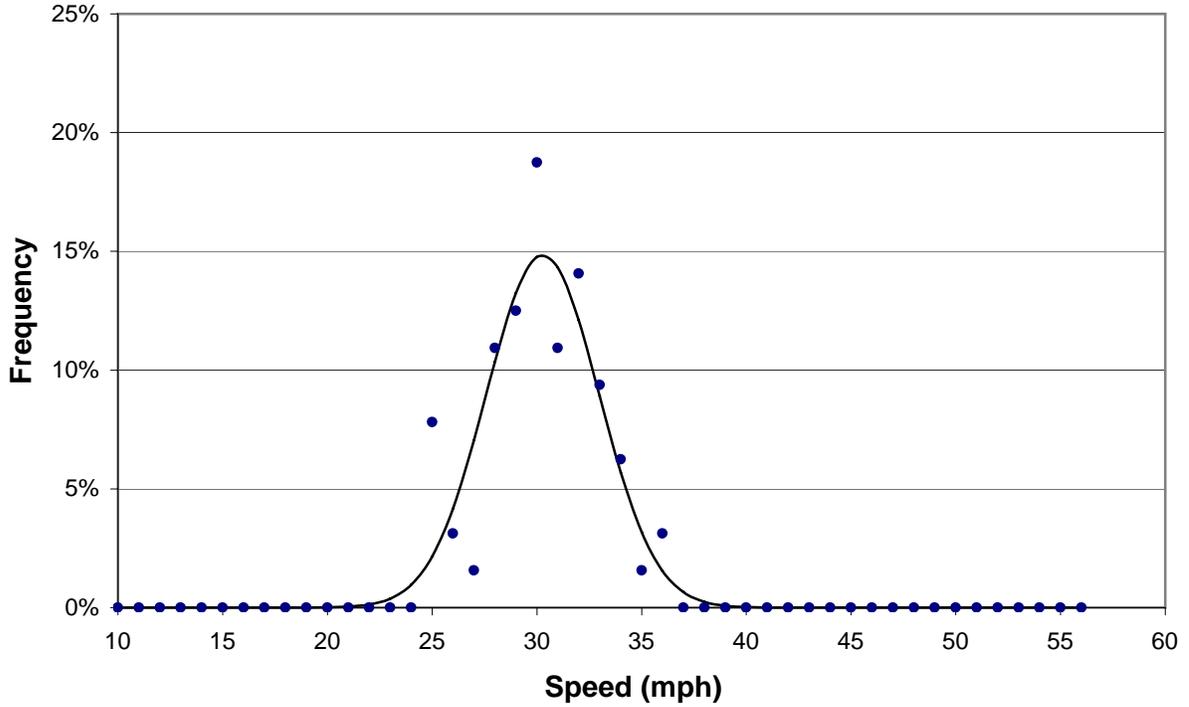
Date: 10/27/05
Location: 34 Ave between 94 Ave and 93 Ave
Surveyor: Richard Calvache

Time: 12:10 PM

School: P.S. 149
Direction: EB
Comments:

Mean Speed = 30.3 mph
Standard Deviation = 2.7 mph
Margin of Error (95% Confidence) = ± 0.7 mph

Median Speed = 30.3 mph
15th Percentile Speed = 27.5 mph
85th Percentile Speed = 33.1 mph



SPOT SPEED STUDY

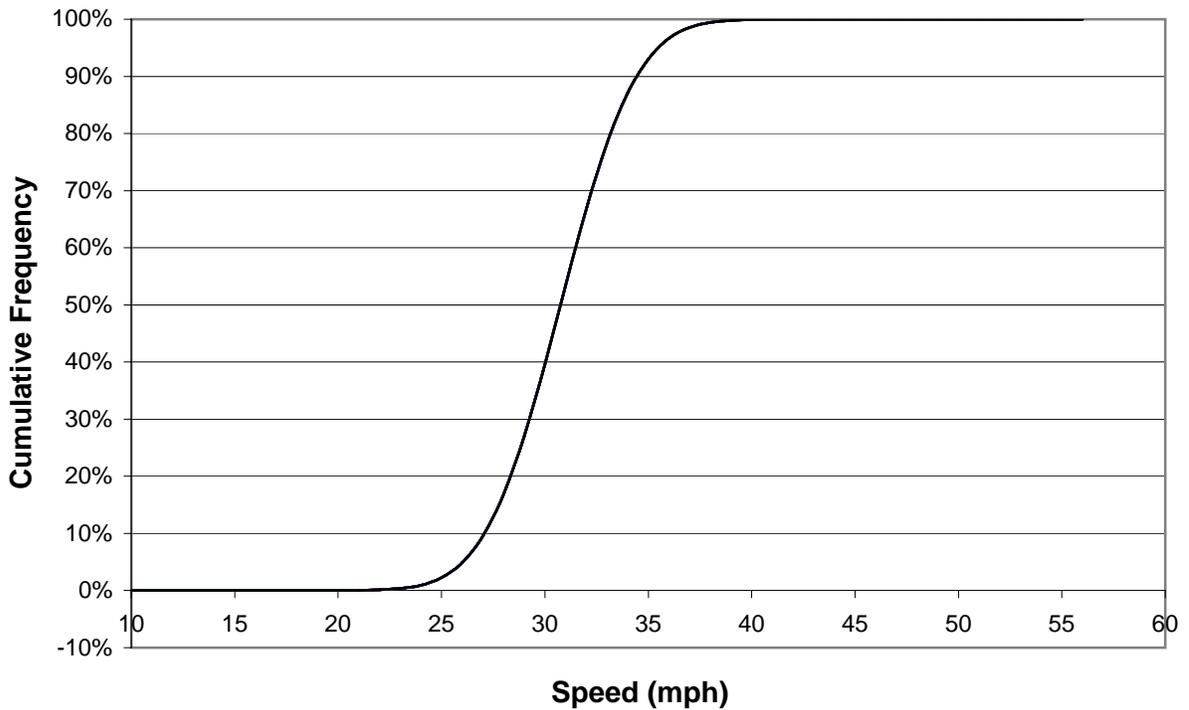
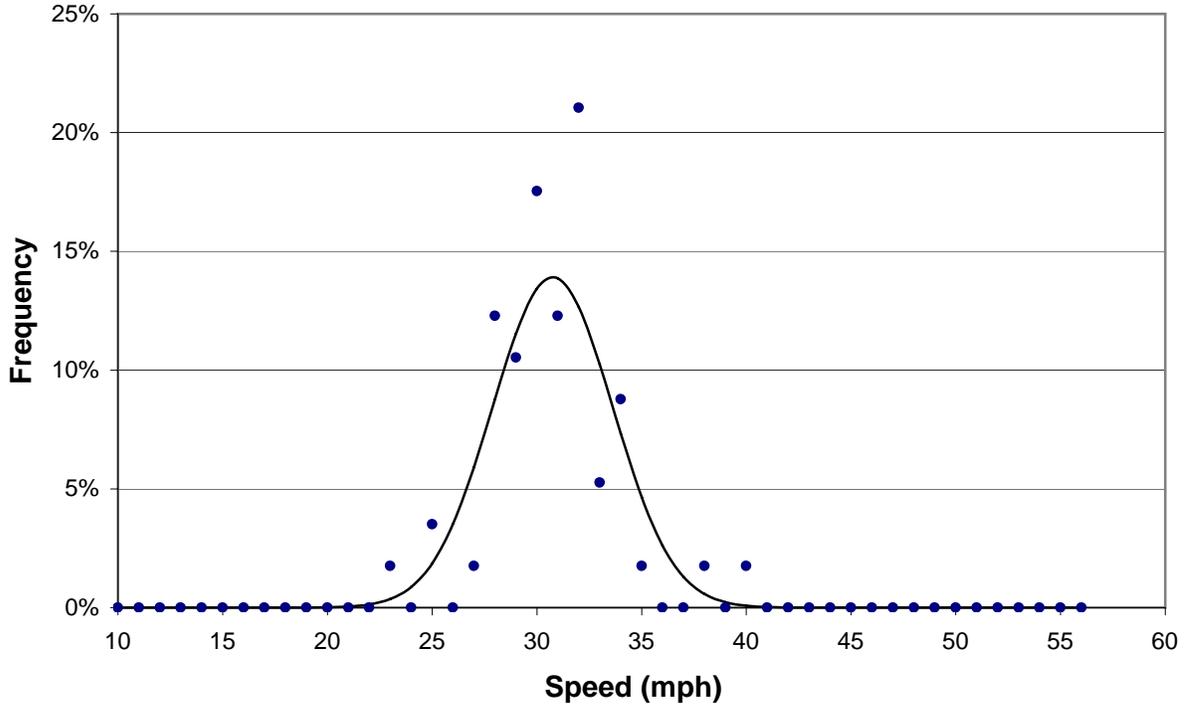
Date: 10/27/05
Location: 34 Ave between 94 Ave and 93 Ave
Surveyor: Richard Calvache

Time: 12:10 PM

School: P.S. 149
Direction: WB
Comments:

Mean Speed = 30.8 mph
Standard Deviation = 2.9 mph
Margin of Error (95% Confidence) = ± 0.7 mph

Median Speed = 30.8 mph
15th Percentile Speed = 27.8 mph
85th Percentile Speed = 33.7 mph



SPOT SPEED STUDY

Date: 10/27/05
 Location: 93 St between Northern Blvd and 34 Ave
 Surveyor: Richard Calvache

Time: 12:10 PM

School: P.S. 149
 Direction: NB
 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	1	3.0%	3.0%	22	484
23	2	6.1%	9.1%	46	1058
24	0	0.0%	9.1%	0	0
25	4	12.1%	21.2%	100	2500
26	1	3.0%	24.2%	26	676
27	1	3.0%	27.3%	27	729
28	6	18.2%	45.5%	168	4704
29	4	12.1%	57.6%	116	3364
30	6	18.2%	75.8%	180	5400
31	4	12.1%	87.9%	124	3844
32	1	3.0%	90.9%	32	1024
33	1	3.0%	93.9%	33	1089
34	0	0.0%	93.9%	0	0
35	0	0.0%	93.9%	0	0
36	0	0.0%	93.9%	0	0
37	0	0.0%	93.9%	0	0
38	0	0.0%	93.9%	0	0
39	0	0.0%	93.9%	0	0
40	2	6.1%	100.0%	80	3200
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
	33	100.0%		954	28072

Mean Speed = 28.9 mph
 Standard Deviation = 3.9 mph
 Margin of Error (95% Confidence) = ± 1.3 mph

Median Speed = 28.9 mph
 15th Percentile Speed = 24.8 mph
 85th Percentile Speed = 33.0 mph

SPOT SPEED STUDY

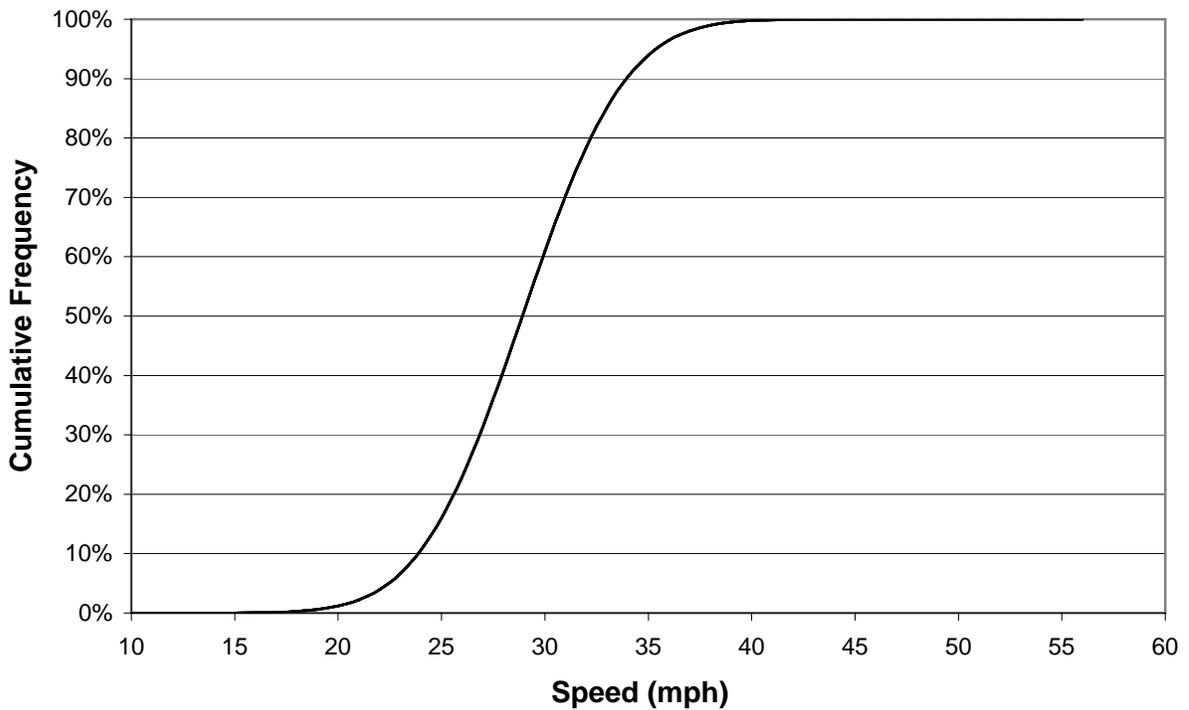
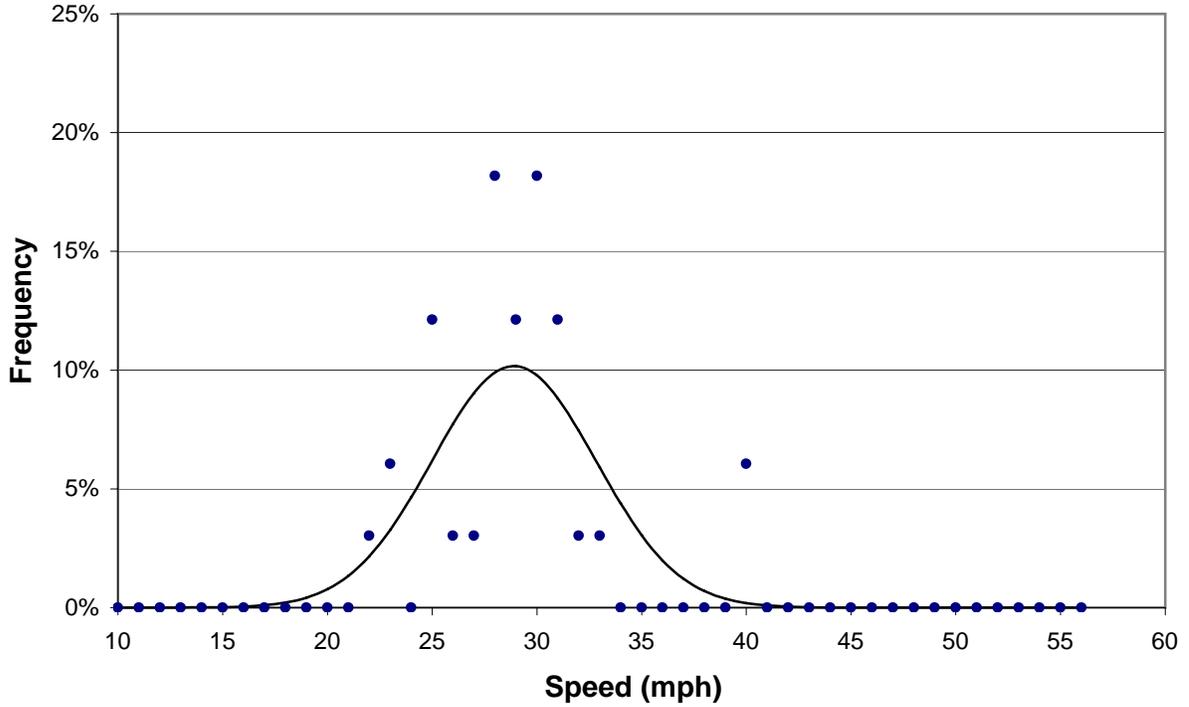
Date: **10/27/05**
 Location: **93 St between Northern Blvd and 34 Ave**
 Surveyor: **Richard Calvache**

Time: **12:10 PM**

School: **P.S. 149**
 Direction: **NB**
 Comments:

Mean Speed = 28.9 mph
 Standard Deviation = 3.9 mph
 Margin of Error (95% Confidence) = ± 1.3 mph

Median Speed = 28.9 mph
 15th Percentile Speed = 24.8 mph
 85th Percentile Speed = 33.0 mph



SPOT SPEED STUDY

Date: 10/27/05
Location: 94 St between Northern Blvd and 34 Ave
Surveyor: Richard Calvache

Time: 1:20 PM

School: P.S. 149
Direction: SB
Comments:

Mean Speed = 28.5 mph
Standard Deviation = 2.9 mph
Margin of Error (95% Confidence) = ± 1.2 mph

Median Speed = 28.5 mph
15th Percentile Speed = 25.5 mph
85th Percentile Speed = 31.5 mph

