

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



School Safety Engineering Project

FINAL REPORT: Blessed Sacrament, Queens



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



October 18, 2006

**School Safety Engineering Project
Final Report: Blessed Sacrament, 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 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). Blessed Sacrament 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. Blessed Sacrament is bounded by 34th Avenue to the north, 35th Avenue to the south, 94th Street to the east, and 93rd Street to the west. The neighborhood surrounding the school consists primarily of multi-family apartment buildings, but commercial land uses are also found in the vicinity of the school along the following corridors:

- Northern Boulevard (approximately two blocks north of the school).
- 37th Avenue and Elmhurst Avenue (approximately one block south of the school).
- Roosevelt Avenue (approximately two blocks south of the school).
- Junction Boulevard (approximately one block east of the school).

2.3 MEETING WITH SCHOOL REPRESENTATIVES

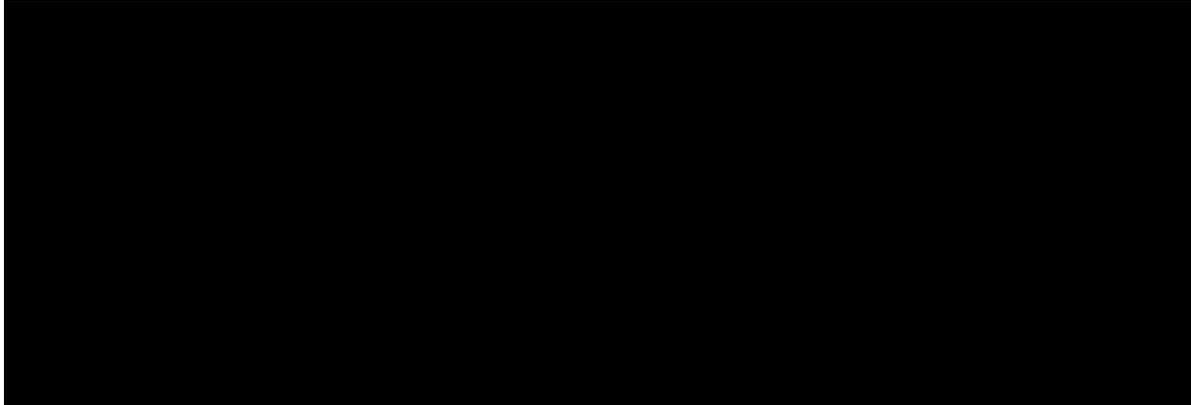
Members of the consultant team were unable to arrange a meeting with school officials to discuss traffic and pedestrian safety issues at and around the school. The school also did not provide a response to the survey questionnaire distributed by the New York City Department of Transportation (NYCDOT) in late 2003, which is typically used to identify additional safety issues and concerns. However, school officials were subsequently contacted by phone and identified the following problem:

- Congestion on 35th Avenue and 93rd Street due to parents dropping off students.
- Congestion on 93rd Street, near the intersection with 35th Avenue, due to school bus operations.

In addition, the following problems were observed around the school during a site visit:

- Double parking was observed in front of the school, which causes some vehicular congestion on 94th Street at arrival and dismissal times.
- Vehicular and pedestrian traffic generated by P.S. 149, located on 34th Avenue between 93rd and 94 streets, overlaps with vehicular and pedestrian traffic generated by Blessed Sacrament.

A phone call to the school on August 28th, 2006 confirmed that the main problem is congestion on 35th Avenue and 94th at arrival and dismissal times.



2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

The school’s catchment area is typically defined by the Department of Education (DOE) and is typically shown in an Exhibit at the end of this section. However, because Blessed Sacrament is a private parochial school, the actual “catchment area” is dependent upon other factors determined by the school administrators, and therefore, is not shown.

The modes of travel for Blessed Sacrament were obtained via a phone call to school officials on August 28, 2006.

TABLE 1: MODES OF TRAVEL	STUDENTS (Percentage)
Walk	60%
Driven by Car	5%
Private School Bus	35%
MTA Bus	0%
MTA Subway	0%
Bicycle	0%
TOTAL	

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

Commercial land uses located on Northern Boulevard, Roosevelt Avenue, 37th Avenue and Junction Boulevard generate both pedestrian and vehicular traffic in the vicinity of the school. Each of these commercial corridors is located within two blocks of the school. P.S. 149 (The Christa McAuliffe School) is located one block north of Blessed Sacrament, at 93-11 34th Avenue, between 93rd and 94th Streets (refer to Exhibit 2 for school location). P.S. 149 is also one of the 135 “priority” schools identified by the New York City Department of Transportation, Office of School Safety Engineering.

2.8 CROSSING GUARD LOCATION

One crossing guard was observed at the signalized intersection of 35th Avenue and 94th Street (see Figure 1). The location of the school crossing guard is also shown in Exhibit 3.



Figure 1: A school crossing guard shown on the northwest corner of the signalized 35th Avenue and 94th Street intersection.

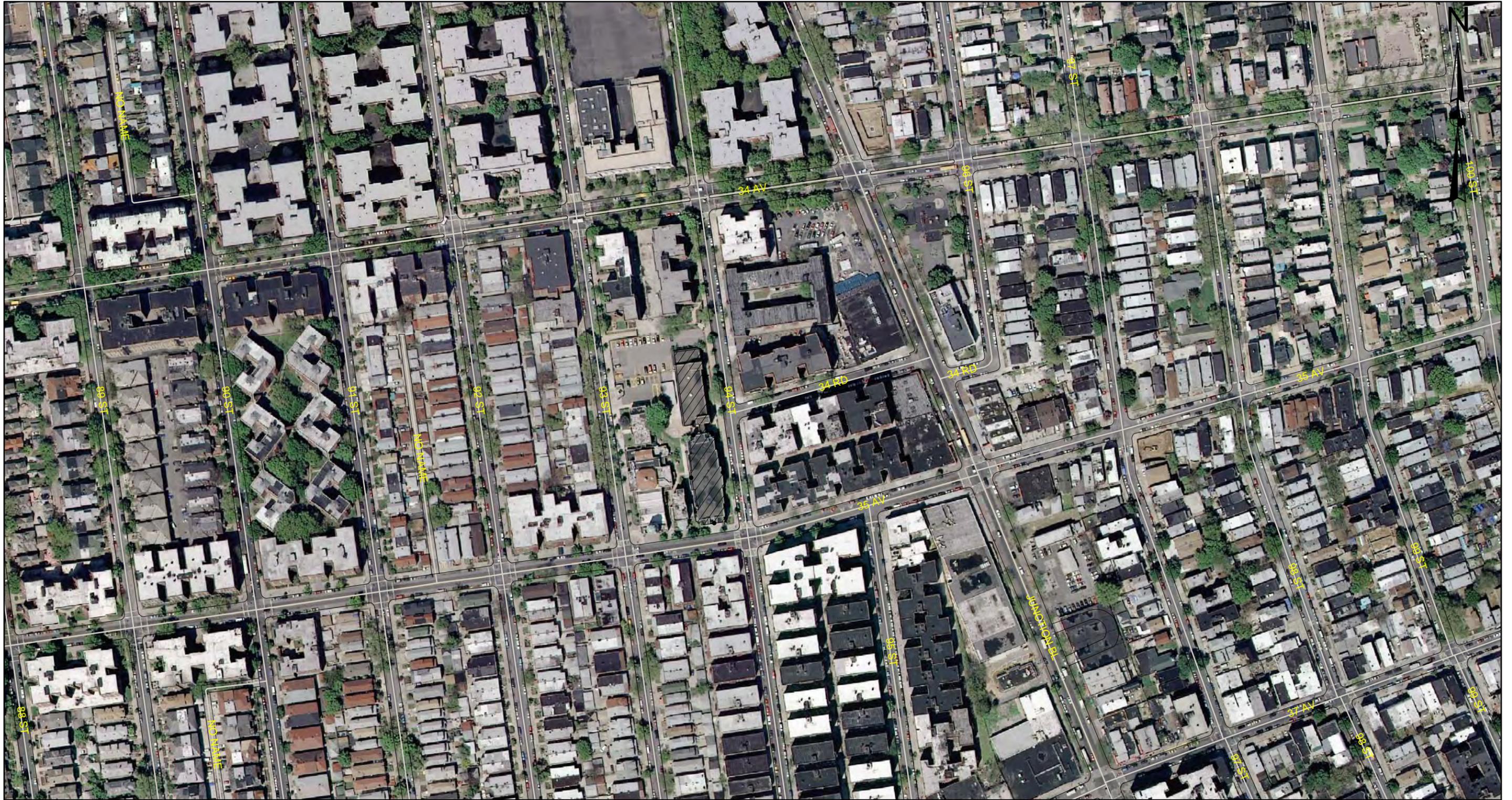


EXHIBIT 1
BLESSED SACRAMENT SCHOOL QUEENS
AERIAL PHOTOGRAPH



School Traffic Safety Map



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

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

LEGEND:

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

Queens
BLESSED SACRAMENT SCHOOL

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

Map created on 11/17/2006

1.5.1

COMM. BOARD: 403
 PRECINCT: 115

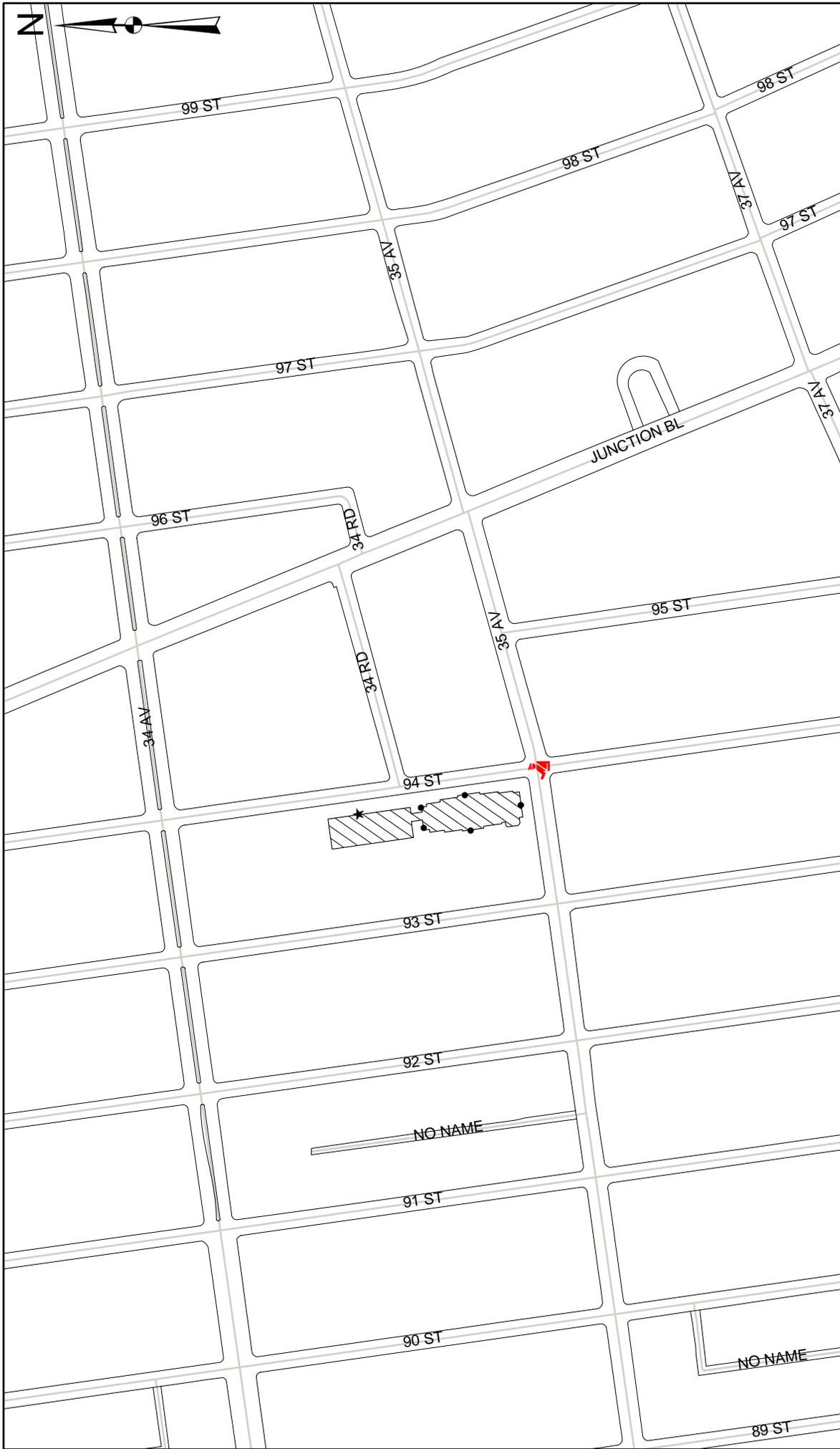


EXHIBIT 3

BLESSED SACRAMENT SCHOOL QUEENS

CROSSING GUARD LOCATION

LEGEND:

CROSSING GUARD LOCATION



3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to a phone call to school officials on August 28, 2006, there are approximately 160 students who ride the school's private yellow buses to and from school. The buses drop off students on 94th Street adjacent to the school, and are a source of local traffic congestion near the signalized intersection of 94th Street and 35th Avenue.

Local bus transportation is provided nearby on Northern Boulevard (Q66) and Junction Boulevard (Q72). The nearest subway stops are located on Roosevelt Avenue at 90th Street-Elmhurst Avenue and Junction Boulevard. Both stops are served by the No. 7 subway line.

3.2 PARENT DROP-OFF OPERATIONS

According to school officials, approximately 23 students are currently being dropped off. Double parking associated with these drop offs was observed in front of the school, causing some local traffic congestion on 94th Street during arrival and dismissal times.

3.3 PARKING REGULATIONS

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

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

Exhibit 2 shows the existing signals, school crosswalks, and speed reducers in the vicinity of Blessed Sacrament. 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.

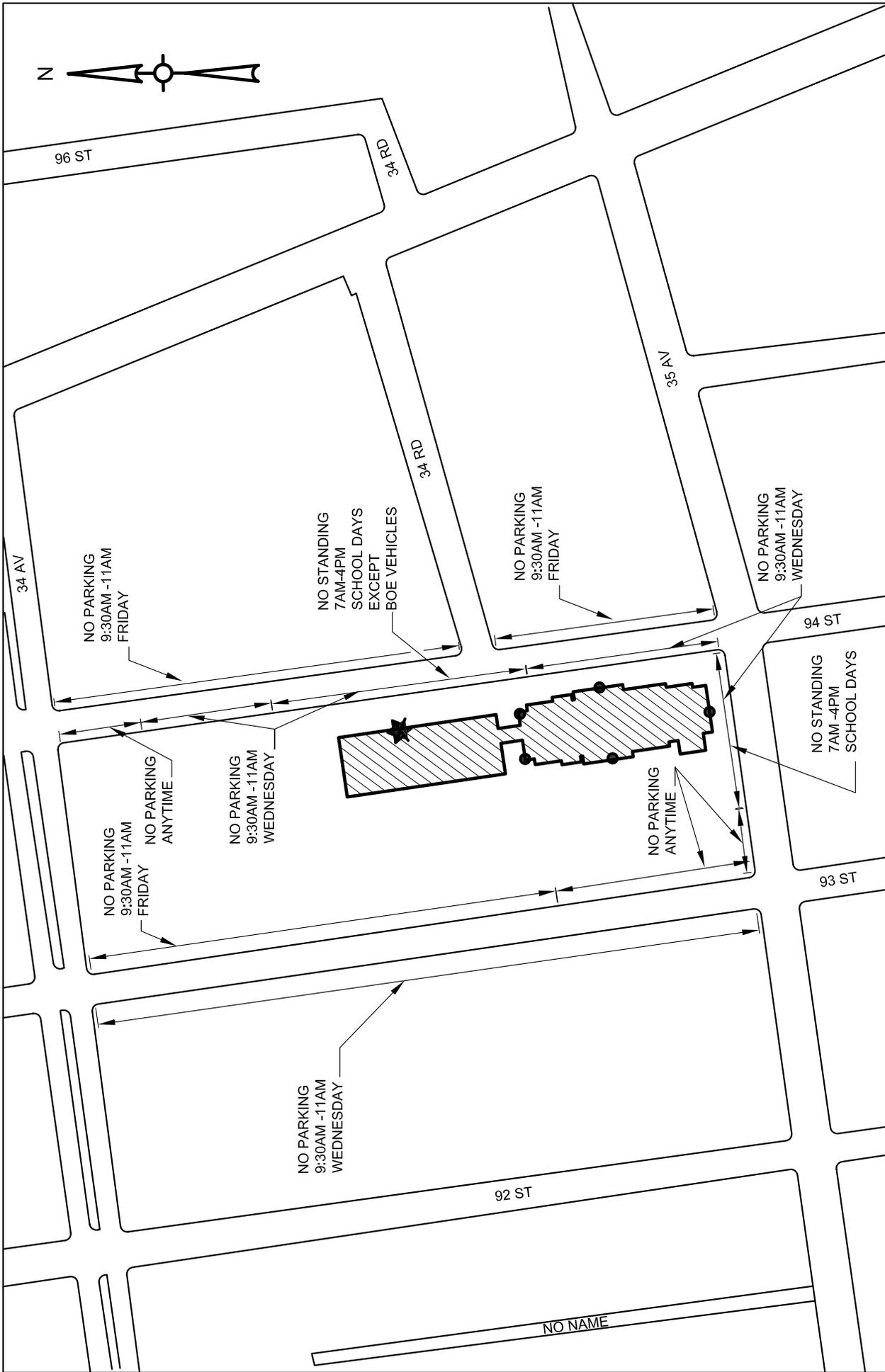


EXHIBIT 4

BLESSED SACRAMENT SCHOOL 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 Blessed Sacrament School for the three-year period from January 1, 1998 through December 31, 2000. The DMV data provides some detail relating to the circumstances and probable cause(s) of an 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.

TABLE 2: ACCIDENT SUMMARY OF NYS DMV DATA (1998-2000)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
35 th Avenue and 93 rd Street	9	0	0	0
35 th Avenue and 94 th Street	15	1	0	0
35 th Avenue and 95 th Street	11	0	0	0
35 th Avenue and Junction Boulevard	45	6	0	0
37 th Avenue/Elmhurst Avenue and 94 th Street	7	1	0	0
94 th Street and 34 th Road	5	0	0	0
34 th Avenue and 94 th Street	9	2	0	0
34 th Avenue and 93 rd Street	27	4	0	2
TOTAL	128	14	0	2

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

TABLE 3: ACCIDENT SUMMARY OF NYPD DATA (2001-2004)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
35 th Avenue and 93 rd Street	6	1	0	0
35 th Avenue and 94 th Street	9	1	0	0
35 th Avenue and 95 th Street	16	2	0	0
35 th Avenue and Junction Boulevard	41	7	0	0
37 th Avenue/Elmhurst Avenue and 94 th Street	21	3	0	0
94 th Street and 34 th Road	5	0	0	0
34 th Avenue and 94 th Street	20	5	0	0
34 th Avenue and 93 rd Street	23	2	0	0
TOTAL	143	21	0	0

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

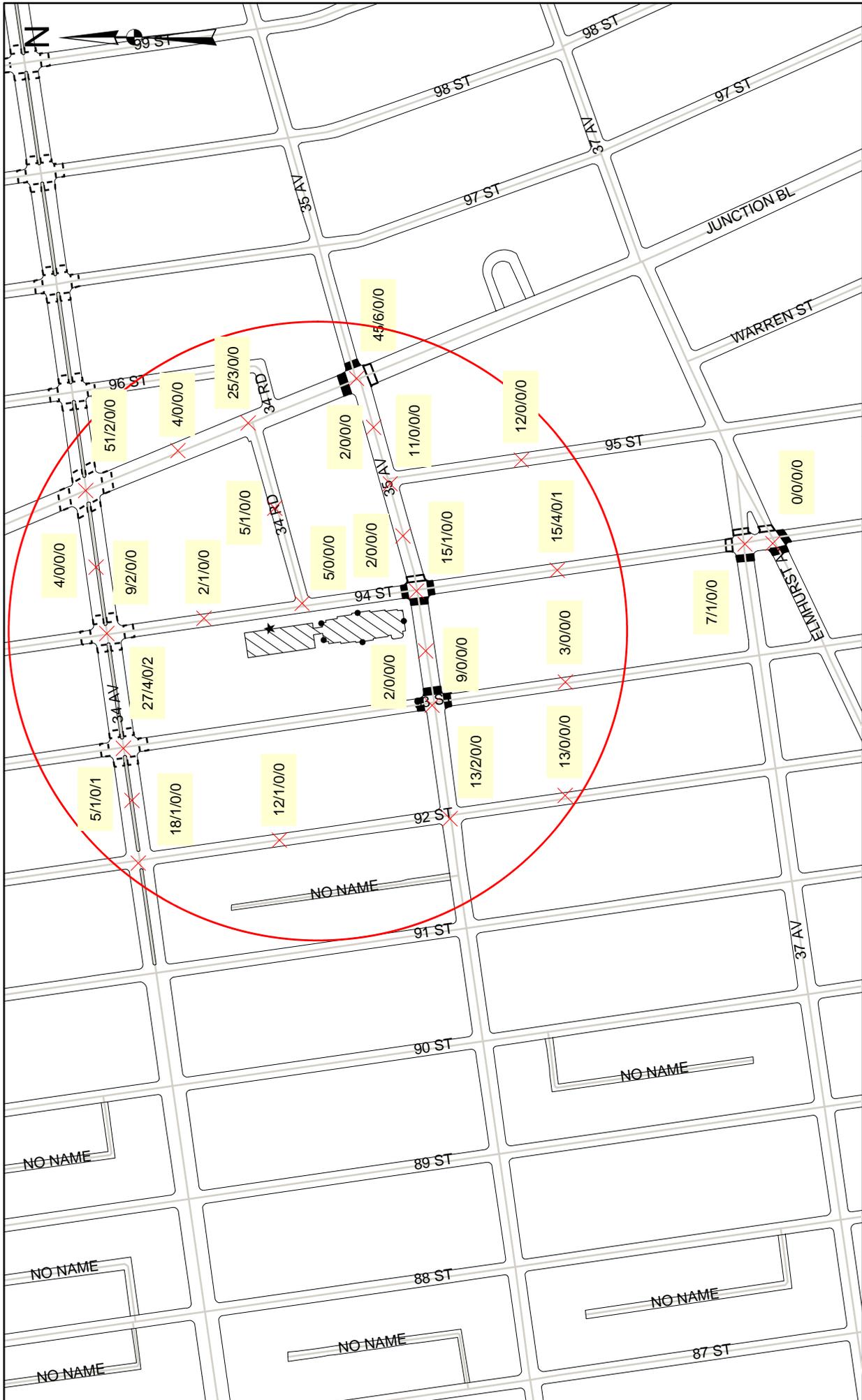


EXHIBIT 5
BLESSED SACRAMENT SCHOOL QUEENS
ACCIDENT SUMMARY (1998-2000)

LEGEND:

- ACCIDENT LOCATION
- SCHOOL CROSSWALK
- SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL
- BORDER OF 700 FEET
- X/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 Blessed Sacrament.

3.6.1 35th Avenue and 93rd Street

This is a four-leg signalized intersection with school crosswalks located across the east leg of 35th Avenue and the north and south legs of 93rd Street, and a pedestrian crosswalk located across the west leg of 35th Avenue. In the vicinity of Blessed Sacrament, 35th Avenue is a two-way east-west street with one travel lane and one on-street parking lane on each side of the roadway (see Figure 2). 93rd Street is a one-way northbound street with one travel lane and on-street parking permitted on both sides of the roadway (see Figure 3).

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

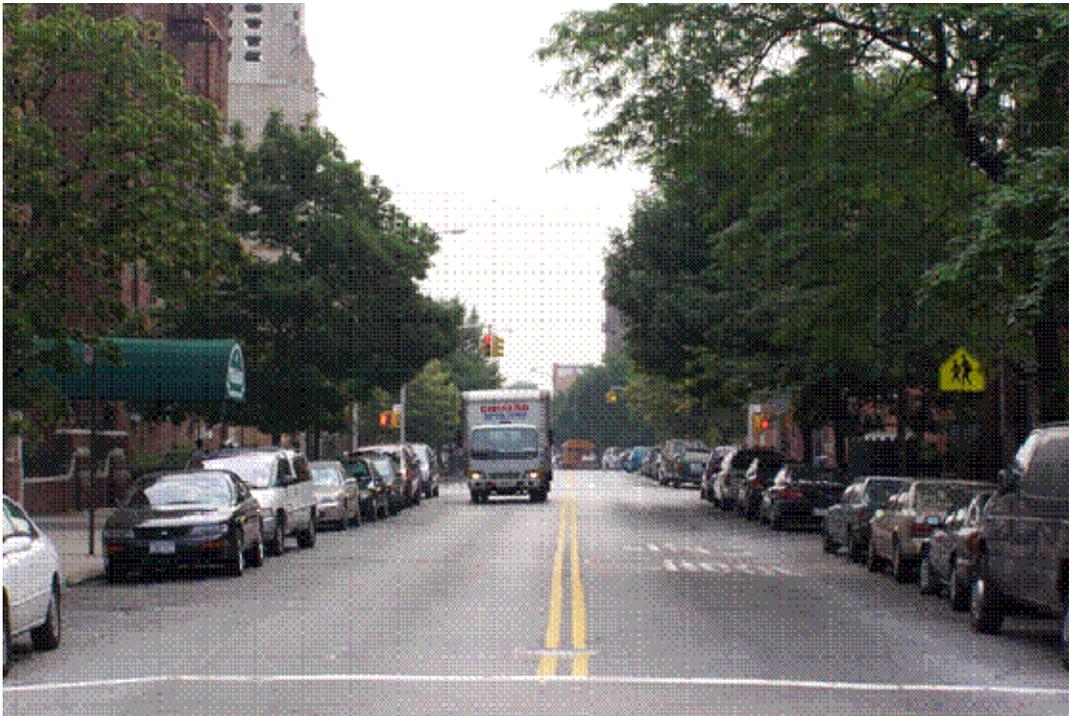


Figure 2: Looking east on 35th Avenue toward the signalized intersection with 93rd Street.



Figure 3: Looking north on 93rd Street at the signalized intersection with 35th Avenue.

3.6.2 35th Avenue and 94th Street

This is a four-leg signalized intersection with school crosswalks located across the west leg of 35th Avenue and the north and south legs of 94th Street, and a pedestrian crosswalk located across the east leg of 35th Avenue. In the vicinity of Blessed Sacrament, 35th Avenue is a two-way east-west street with one travel lane and one on-street parking lane on each side of the roadway. 94th Street is a one-way southbound street with one travel lane and on-street parking permitted on both sides of the roadway (see Figures 4 and 5).

There was a total of 15 accidents reported at this intersection between 1998 and 2000, including one pedestrian accident that was not school-related (Table 2). There were no pedestrian fatalities reported at this intersection between 1998 and 2000.

There was one school-related accident that occurred south of this intersection, mid-block on 94th Street between 35th Avenue and 37th Avenue. This accident occurred at approximately 5:00 pm on April 30, 1998, when a six-year-old pedestrian sustained an incapacitating injury while crossing 94th Street mid-block. At the time of the accident, the roadway surface was dry and the weather was clear. The accident occurred during daylight conditions.



Figure 4: Looking north on 94th Street at the signalized intersection with 35th Avenue (Blessed Sacrament school is shown at left).



Figure 5: Looking west on 35th Avenue at the signalized intersection with 94th Street (Blessed Sacrament school is shown at right).

3.6.3 35th Avenue and 95th Street

This is a three-leg unsignalized intersection with no crosswalks across any legs. In the vicinity of Blessed Sacrament, 35th Avenue is a two-way east-west street with one travel lane and one on-street parking lane on each side of the roadway. 95th Street is a one-way northbound street with one travel lane and on-street parking permitted on both sides of the roadway. 95th Street is stop-controlled at its intersection with 35th Avenue.

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

3.6.4 35th Avenue and Junction Boulevard

This is a four-leg signalized intersection with school crosswalks located across all legs. In the vicinity of Blessed Sacrament, 35th Avenue is a two-way east-west street with one travel lane and one on-street parking lane on each side of the roadway. 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 (see Figure 6).

There was a total of 45 accidents reported at this intersection between 1998 and 2000, including six pedestrian accidents, none of which were school-related (Table 2). There were no pedestrian fatalities reported at this intersection between 1998 and 2000.



Figure 6: Looking north on Junction Boulevard to the signalized intersection with 35th Avenue.

3.6.5 37th Avenue/Elmhurst Avenue and 94th Street

This is a five-leg intersection with school crosswalks located across the west legs of 37th Avenue and Elmhurst Avenue, and across the south leg of 94th Street. Pedestrian crosswalks are located across the east legs of 37th Avenue and Elmhurst Avenue, and across the north leg of 94th Street.

37th Avenue is a two-way east-west street with one travel lane and one on-street parking lane on each side of the roadway (see Figure 7). 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 8). Elmhurst Avenue is a one-way eastbound street with one travel lane and on-street parking permitted on both sides of the roadway. Elmhurst Avenue is located south of 37th Avenue, and intersects with both 94th Street and 37th Avenue at a northeast-southwest alignment (see Figures 9 and 10). The eastbound and westbound approaches of 37th Avenue, and the southbound approach of 94th Street, are controlled by a traffic signal. The eastbound approach of Elmhurst Avenue is stop-controlled at its intersection with 94th Street

There was a total of seven accidents reported at this intersection between 1998 and 2000, including one pedestrian accident that was not school-related (Table 2). There were no pedestrian fatalities reported at this intersection between 1998 and 2000.



Figure 7: Looking east on 37th Avenue at the signalized intersection with 94th Street.



Figure 8: Looking north on 94th Street at the intersection with 37th Avenue and Elmhurst Avenue.



Figure 9: Looking west to Elmhurst Avenue (to the left) and 37th Avenue (to the right) at the intersection with 94th Street.



Figure 10: Looking southwest toward the intersection of Elmhurst Avenue and 37th Avenue.

3.6.7 94th Street and 34th Road

This is a three-leg unsignalized intersection with no crosswalks located across any legs. 94th Street is a one-way southbound street with one travel lane and on-street parking permitted on both sides of the roadway. 34th Road is a one-way eastbound street with one travel lane and on-street parking permitted on both sides of the roadway.

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

3.6.8 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 on-street parking permitted on both sides of the roadway.

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). The first school-related accident occurred at approximately 8:00 am on October 21, 1998, when a six-year-old pedestrian sustained an incapacitating injury 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.

The second school-related accident occurred at approximately 3:00 pm on March 14, 2000, when a nine-year-old pedestrian sustained a non-incapacitating injury 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.

There was also one school-related accident that occurred mid-block on 34th Avenue, between 93rd Street and 92nd Street. This accident occurred at approximately 3:00 pm on June 25, 1998, when an eight-year-old pedestrian sustained a non-incapacitating injury 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.

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.

3.6.9 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.

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 reported at this intersection between 1998 and 2000.

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.

Speeding was also observed 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.

3.7 SIGNAL TIMING

Pedestrian crossing times were field-verified for crosswalks at signalized intersections in the vicinity of Blessed Sacrament, and were found to be adequate in all directions and on all approaches based upon a child pedestrian walking at the rate of three feet per second. The actual and required pedestrian crossing times 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?
35th Avenue and 93rd Street				
crossing 35 th Avenue	40	43	17	NO
crossing 93 rd Street	30	73	13	NO
35th Avenue and 94th Street				
crossing 35 th Avenue	40	38	17	NO
crossing 94 th Street	30	78	13	NO
35th Avenue and Junction Boulevard				
crossing 35 th Avenue (east leg)	30	43	13	NO
crossing 35 th Avenue (west leg)	40	43	17	NO
crossing Junction Blvd.	44	43	18	NO
37th Avenue and Elmhurst Avenue/94th Street				
crossing 37 th Avenue	40	31	17	NO
crossing Elmhurst Avenue	40	31	17	NO
crossing 94 th Street	30	55	13	NO

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

3.8 PHYSICAL CONDITIONS

3.8.1 Roadways and Sidewalks

The roadways and sidewalks in the vicinity of Blessed Sacrament, were observed to be in fair condition. On the school’s block faces, sidewalks are in fair condition and vary in width between approximately 10 and 15 feet. Crosswalk pavement markings were observed to be worn at intersections in the vicinity of Blessed Sacrament.

3.8.2 Pedestrian Ramps

Pedestrian ramps in the vicinity of the school were observed to be standard and in fair condition.

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes the proposed measures to improve school pedestrian safety around Blessed Sacrament. 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 Blessed Sacrament is discussed as follows, and is shown in more detail in Exhibit 6. See Section 4.3 for additional recommendations for this area from the report on P.S.149, a nearby priority school.

4.1 SHORT-TERM MEASURES

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

Install “NO STANDING 7AM-4PM SCHOOL DAYS” signs 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.)

➤ 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.

4.2 LONG-TERM MEASURES

➤ 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.

4.3 ADDITIONAL RECOMMENDATIONS FROM PRIORITY SCHOOLS IN THE VICINITY OF BLESSED SACRAMENT

4.3.1 RECOMMENDATIONS FOR P.S. 149 (CHRISTA MCAULIFFE 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.

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.

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.

➤ Consider refuge islands at the following intersections

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. 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.



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)

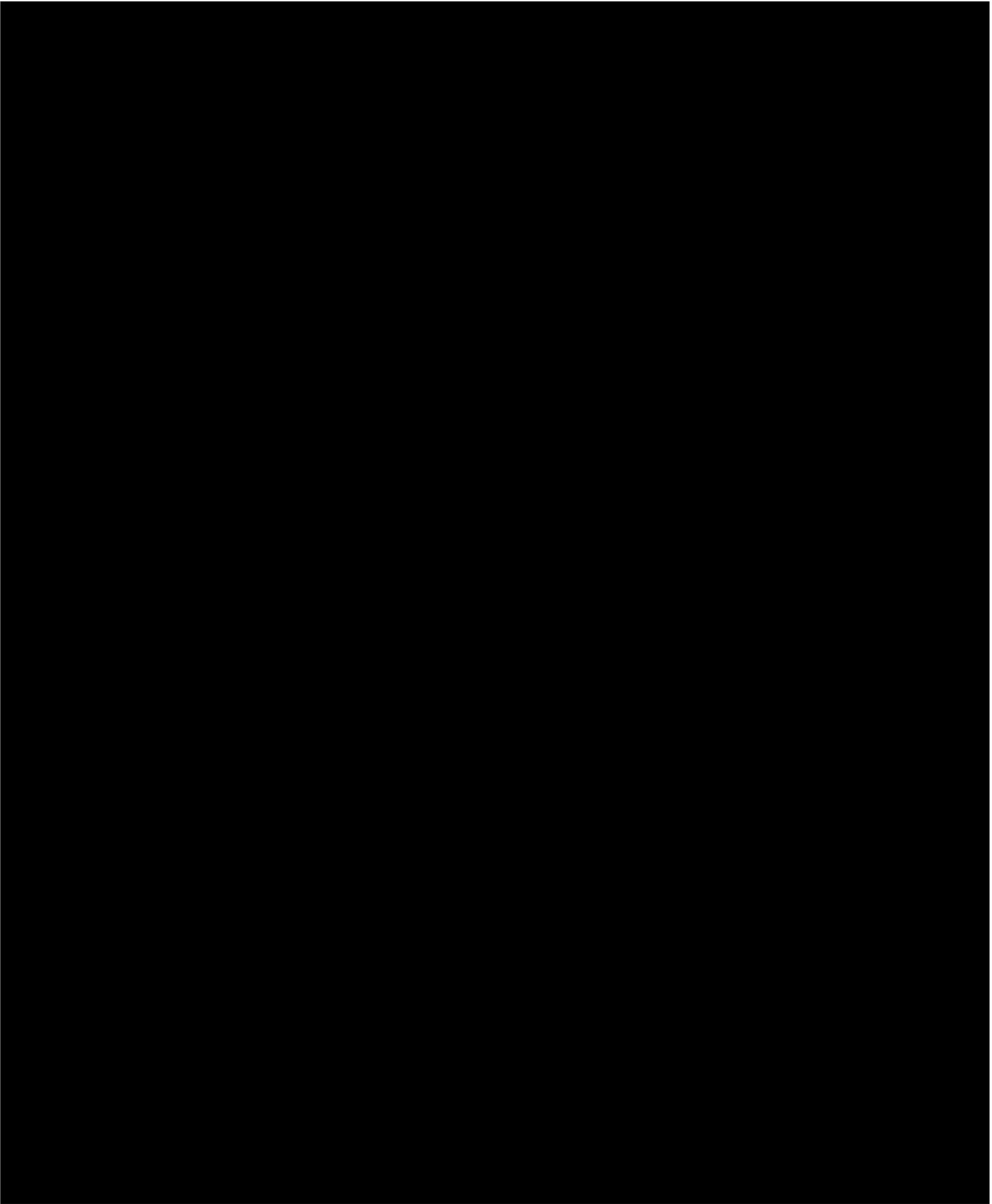
1" = 300'

EXHIBIT 6

BLESSED SACRAMENT SCHOOL
QUEENS

POTENTIAL MEASURES
TO IMPROVE STUDENT PEDESTRIAN SAFETY

APPENDIX



SPOT SPEED STUDY

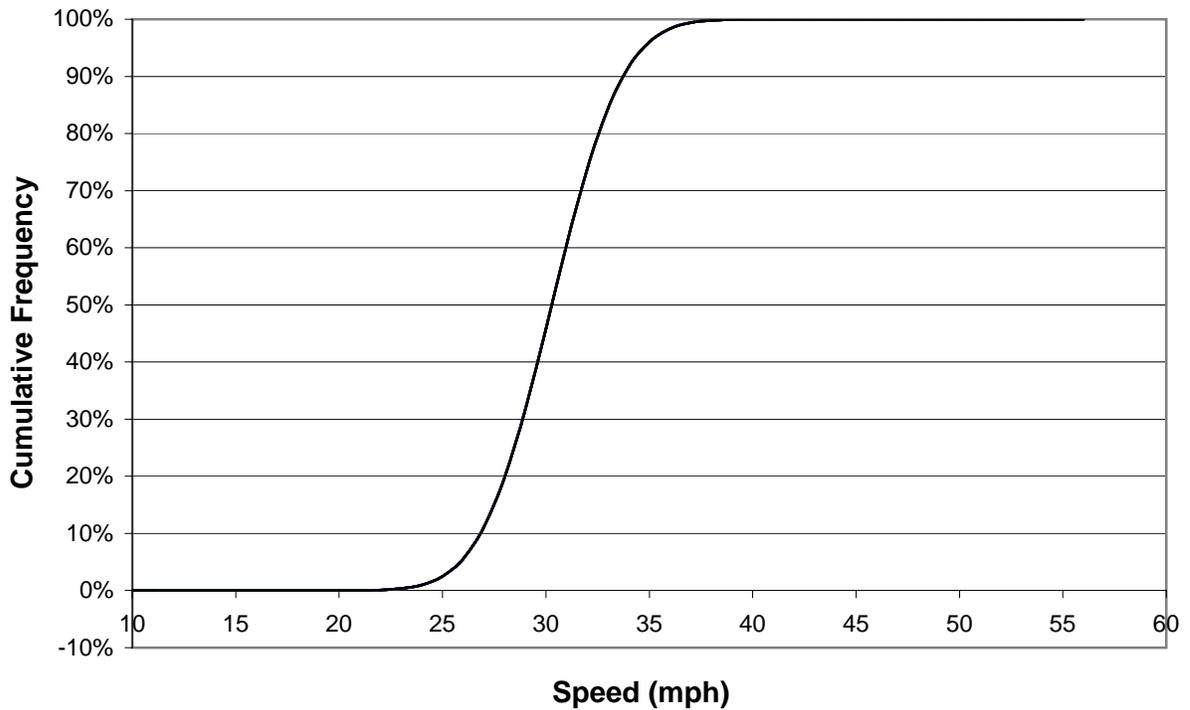
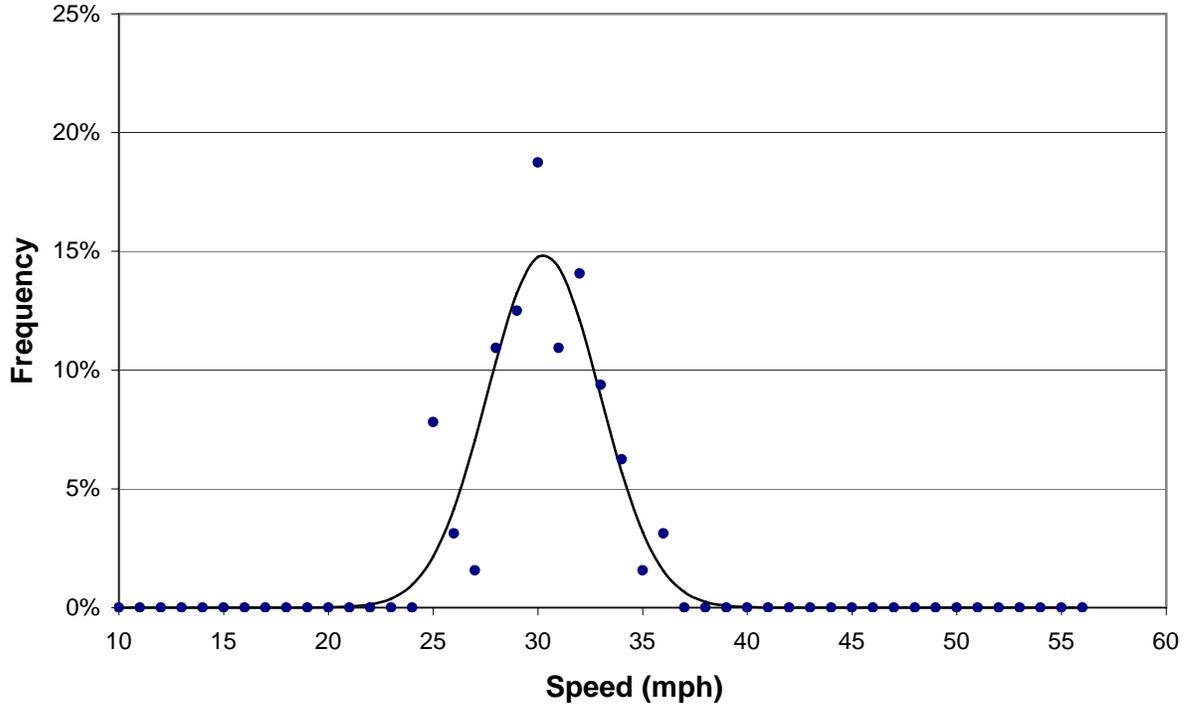
Date: **10/27/05**
Location: **34 Ave between 94 Ave and 93 Ave**
Surveyor: **Richard Calvache**

Time: **12:10 PM**

School: **P.S. 149/ Blessed Sacrament**
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

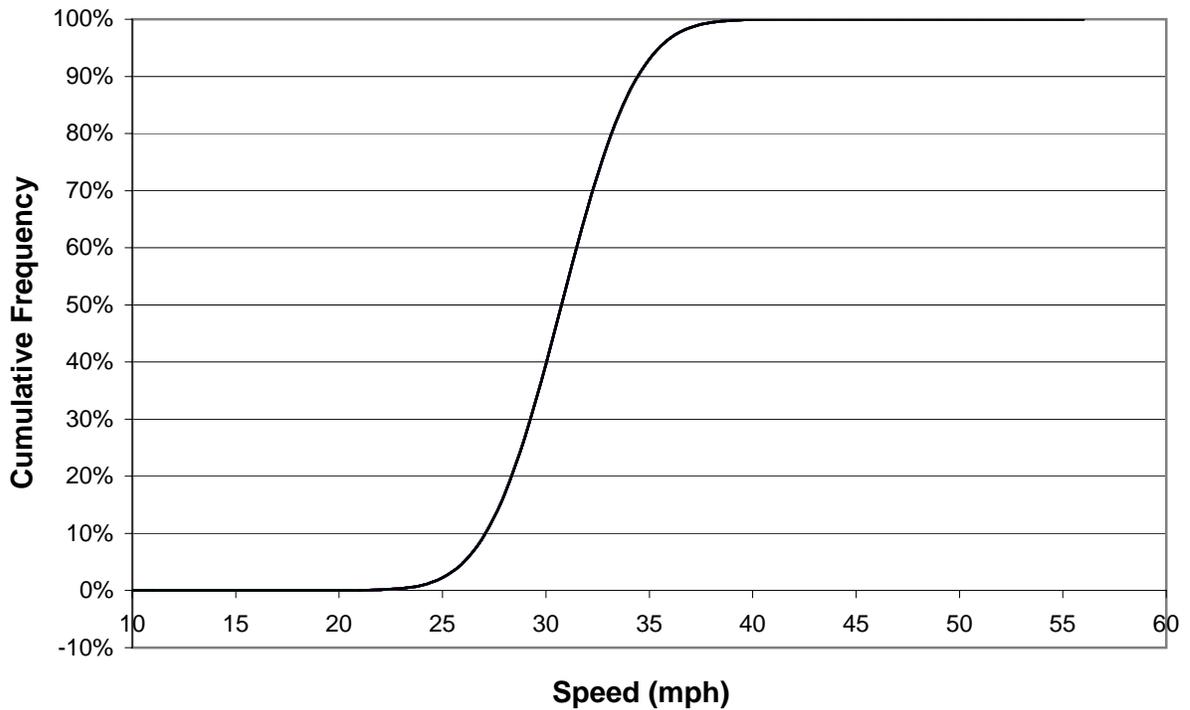
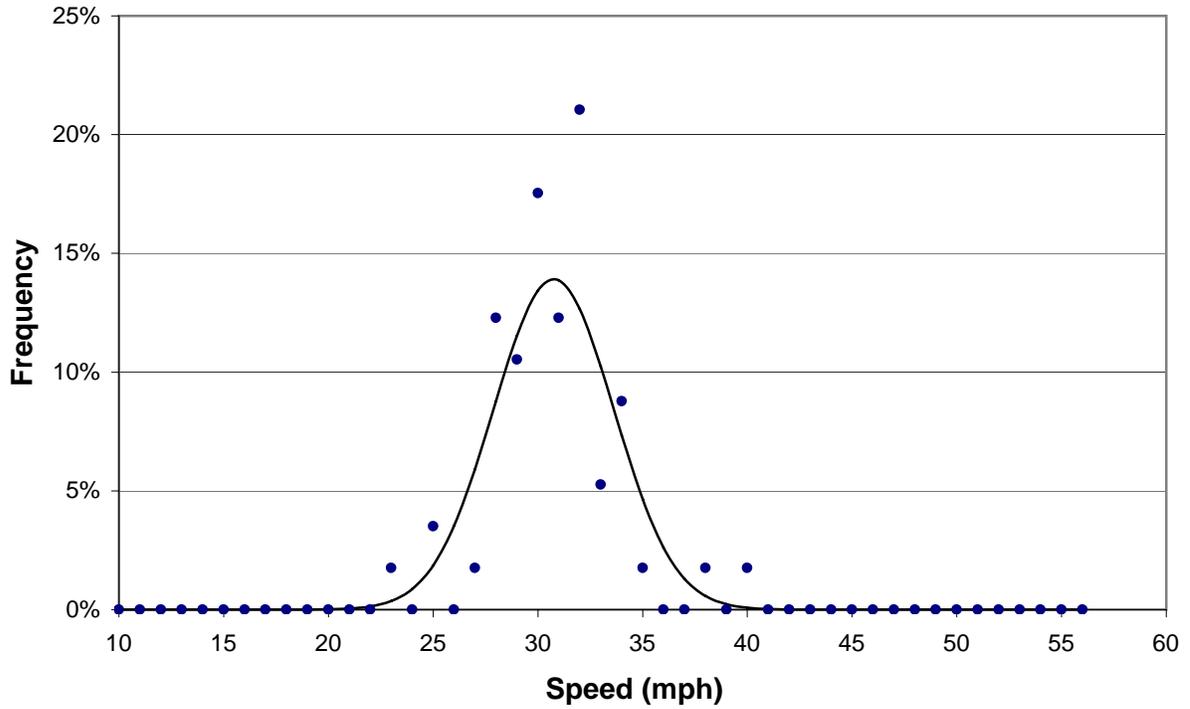
Date: **10/27/05**
Location: **34 Ave between 94 Ave and 93 Ave**
Surveyor: **Richard Calvache**

Time: **12:10 PM**

School: **P.S. 149/Blessed Sacrament**
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/Blessed Sacrament
 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

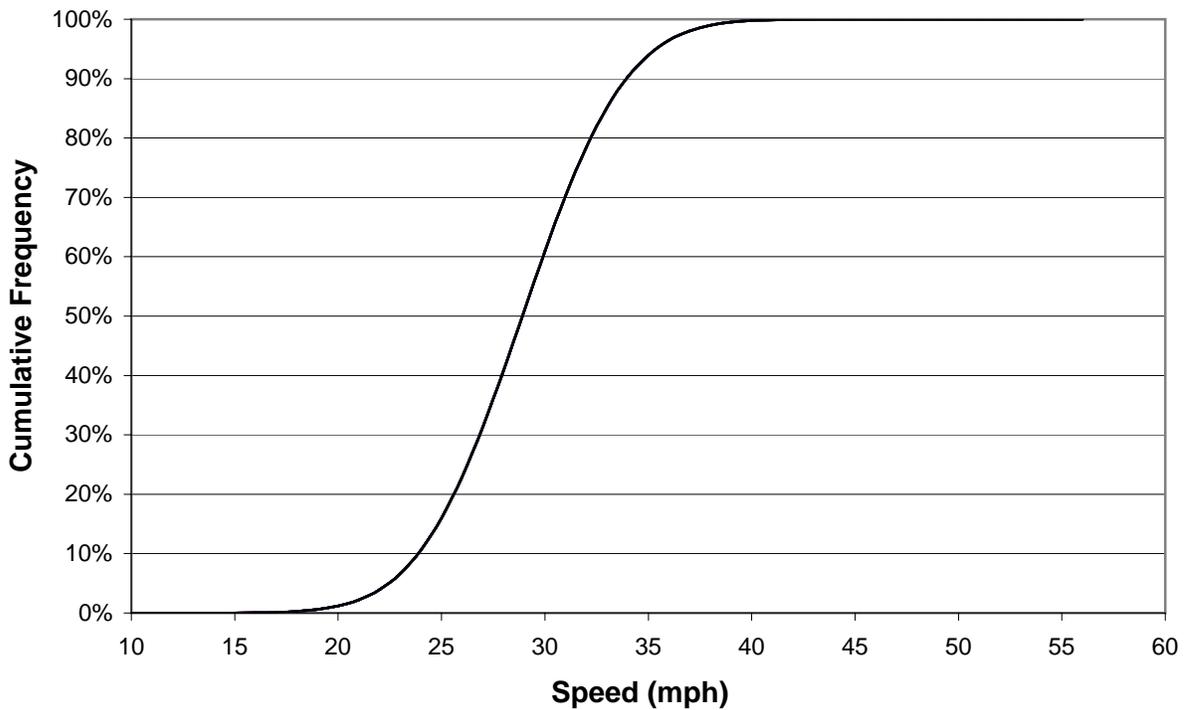
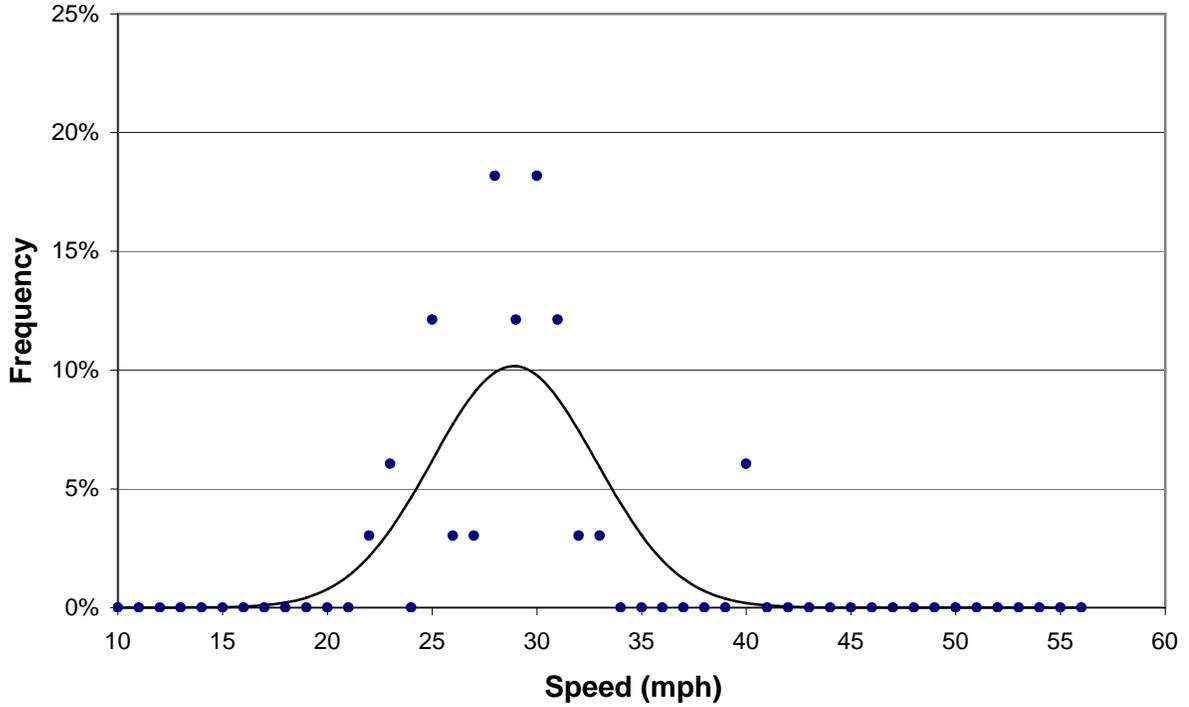
Date: **10/27/05** Time: **12:10 PM**
 Location: **93 St between Northern Blvd and 34 Ave**
 Surveyor: **Richard Calvache**

School: **P.S. 149/Blessed Sacrament**
 Direction: **NB**
 Comments:

Mean Speed = 28.9 mph
Median Speed = 28.9 mph

Standard Deviation = 3.9 mph
15th Percentile Speed = 24.8 mph

Margin of Error (95% Confidence) = ± 1.3 mph
85th Percentile Speed = 33.0 mph



SPOT SPEED STUDY

Date: **10/27/05** Time: **1:20 PM**
Location: **94 St between Northern Blvd and 34 Ave**
Surveyor: **Richard Calvache**

School: **P.S. 149/Blessed Sacrament**
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

