

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



School Safety Engineering Project

FINAL REPORT: J.H.S. 198 (Benjamin N. Cardozo), Queens



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



November 17, 2006

**School Safety Engineering Project
Final Report: J.H.S. 198, Queens**

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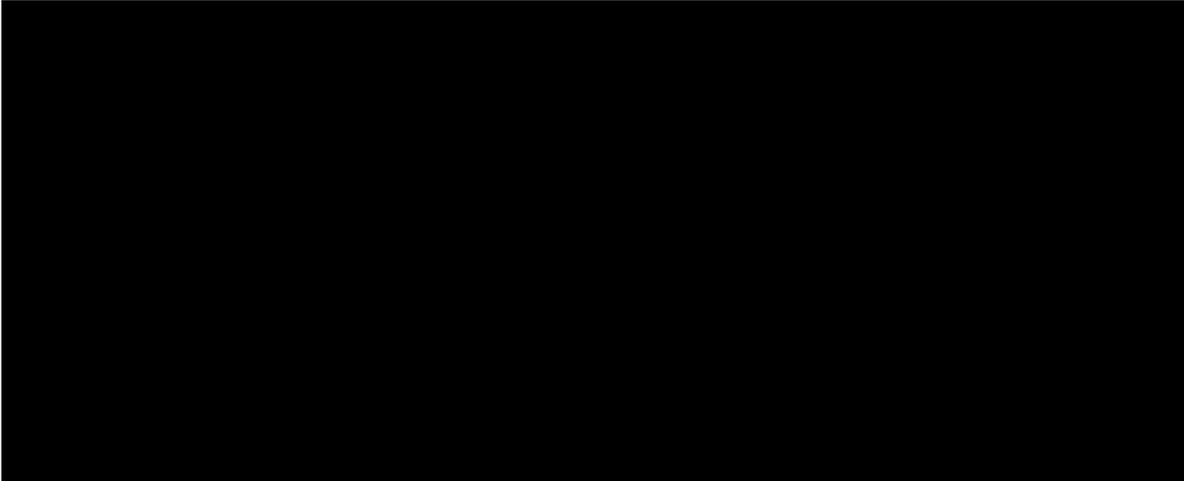
1. INTRODUCTION

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). J.H.S. 198 (Benjamin N. Cardozo 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. J.H.S. 198 is bounded by Beach Channel Drive to the north, Arverne Boulevard to the south, Beach 56th Street to the east, and Beach 57th Street to the west. The neighborhood surrounding the school consists primarily of multi-family high-rise apartment buildings.

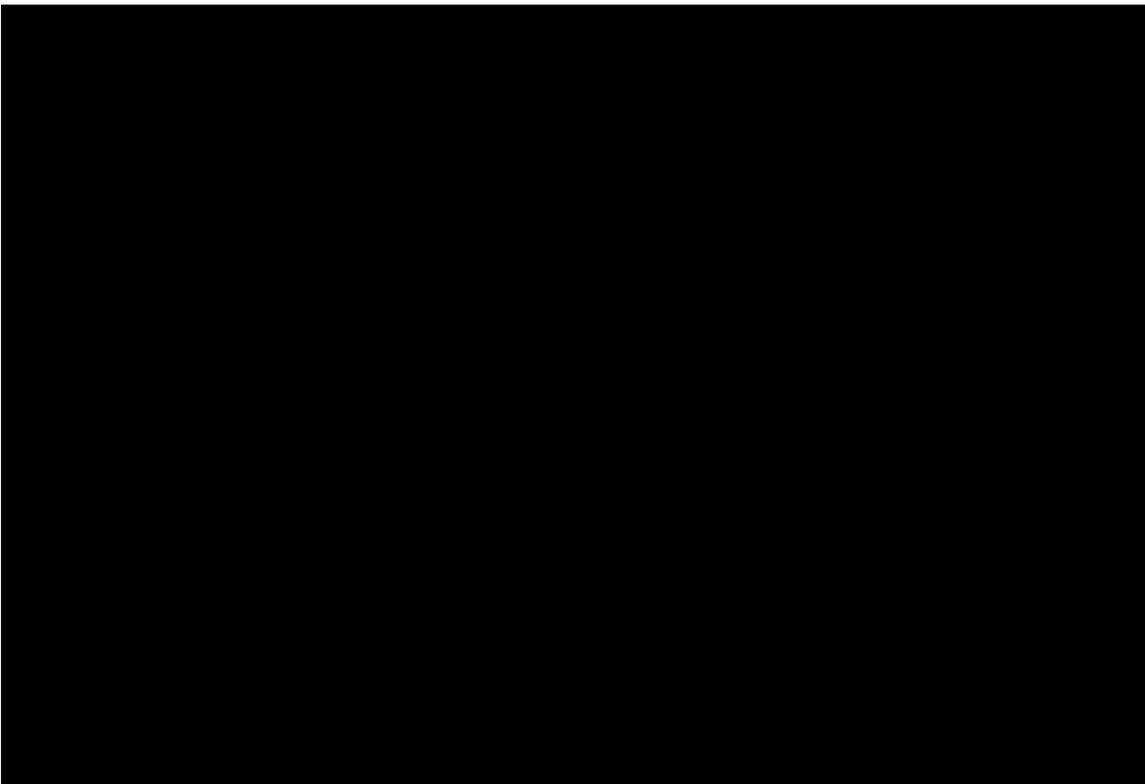
2.3 MEETING WITH SCHOOL REPRESENTATIVES

Members of the consultant team met with the principal of J.H.S. 198 at the school on the morning of May 14, 2004. According to the principal, students at J.H.S. 198 face the following problems:

- Vehicles travel at excessive speeds on streets surrounding the school.
- Vehicles are double parking on streets surrounding the school. Parked vehicles (including school buses) block crosswalks.
- Drivers frequently disregard stop signs and other traffic control devices, and do not yield to pedestrians in crosswalks.
- Traffic signals are needed at unsignalized intersections on Rockaway Beach Boulevard and Beach Channel Drive in the vicinity of the school.
- Pedestrian crossing times at signalized intersections in the vicinity of the school are insufficient to allow pedestrians to cross, particularly on Rockaway Beach Boulevard.
- School crossing guards are needed at the following locations:
 - Beach Channel Drive and Beach 57th Street intersection

- Arverne Boulevard and Beach 57th Street intersection
- Mid-block on Beach 56th Place between Rockaway Beach Boulevard and Arverne Boulevard
- On-street parking for faculty and staff is insufficient around the school.





2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

The school’s “catchment area” as defined by the Department of Education is shown in Exhibit 2 at the end of this section. The catchment area is roughly bounded by Jamaica Bay to the north, the Atlantic Ocean beachfront to the south, Beach 73rd Street to the west, and Beach 44th Street and Beach 42nd Street to the east.

Table 1 presents the modes of travel for students at J.H.S. 198 as identified by school officials.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	STUDENTS (Percentage)
Walk	46%
Driven by Car	0%
Public School Bus	6%
MTA Bus/ Subway	48%
Bicycle	0%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are no significant student pedestrian traffic generators in the vicinity of J.H.S. 198.

2.8 CROSSING GUARD LOCATIONS

School crossing guards are assigned to the following intersections in the vicinity of J.H.S. 198:

- Beach Channel Drive and Beach 56th Street
- Beach Channel Drive and Beach 59th Street

The crossing guard locations are shown in Exhibit 4.



EXHIBIT 1
J.H.S. 198 QUEENS
BENJAMIN N. CARDOZO SCHOOL
AERIAL PHOTOGRAPH



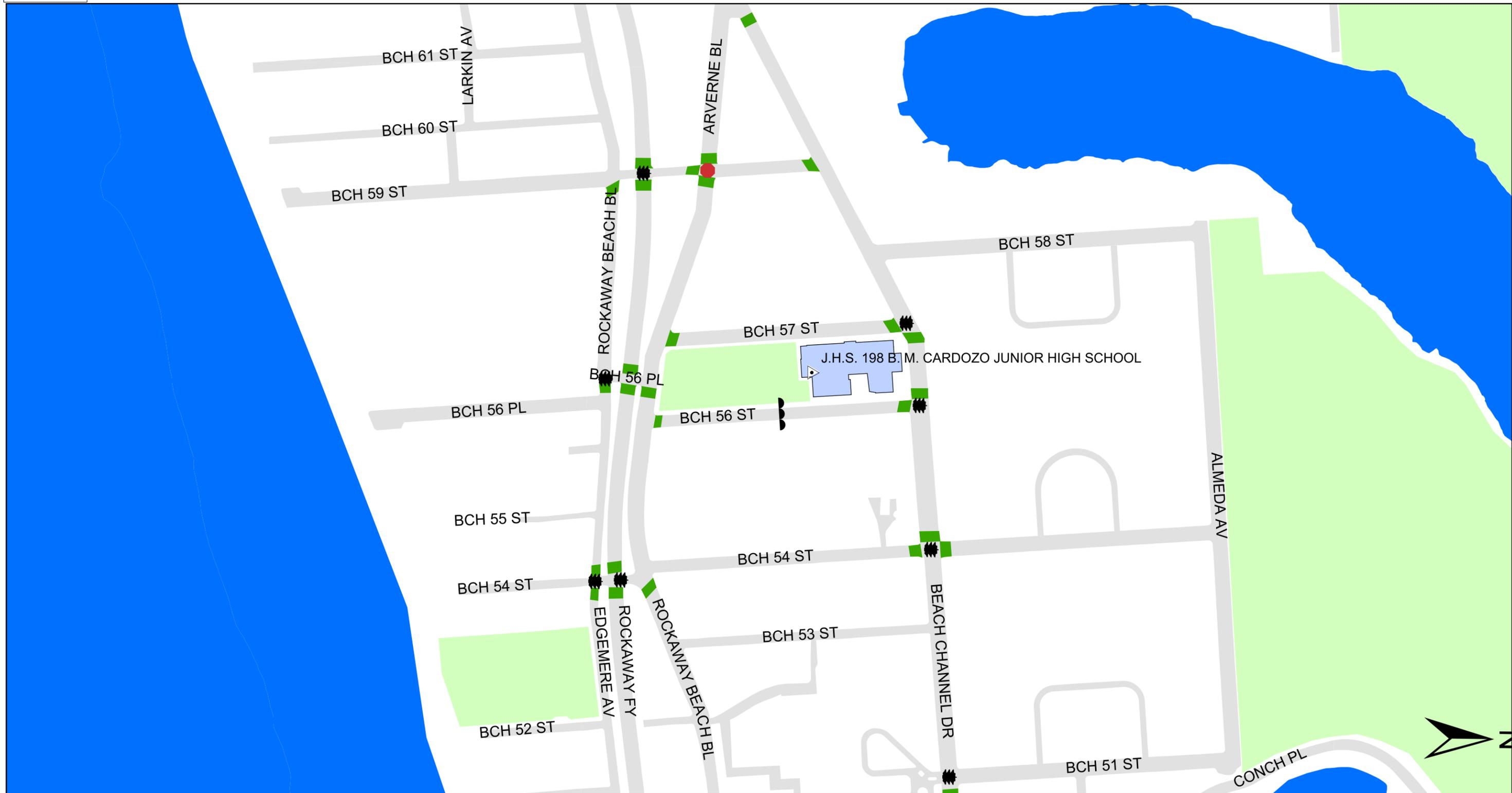
EXHIBIT 2
J.H.S. 198 QUEENS
BENJAMIN N. CARDOZO SCHOOL
CATCHMENT AREA

LEGEND:
 CATCHMENT AREA, (DEPARTMENT OF EDUCATION DESIGNATED AREA FROM WITHIN WHICH STUDENTS ARE ENTITLED TO ATTEND J.H.S. 198)

025500 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
- SCHOOL CROSSWALK
- TRAFFIC SIGNAL
- ALL - WAY STOP
- SPEED REDUCER

**MS 198 Queens
BENJAMIN N. CARDOZO SCHOOL**

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

Map created on 11/17/2006

EXHIBIT 3

COMM. BOARD: 414
PRECINCT: 101

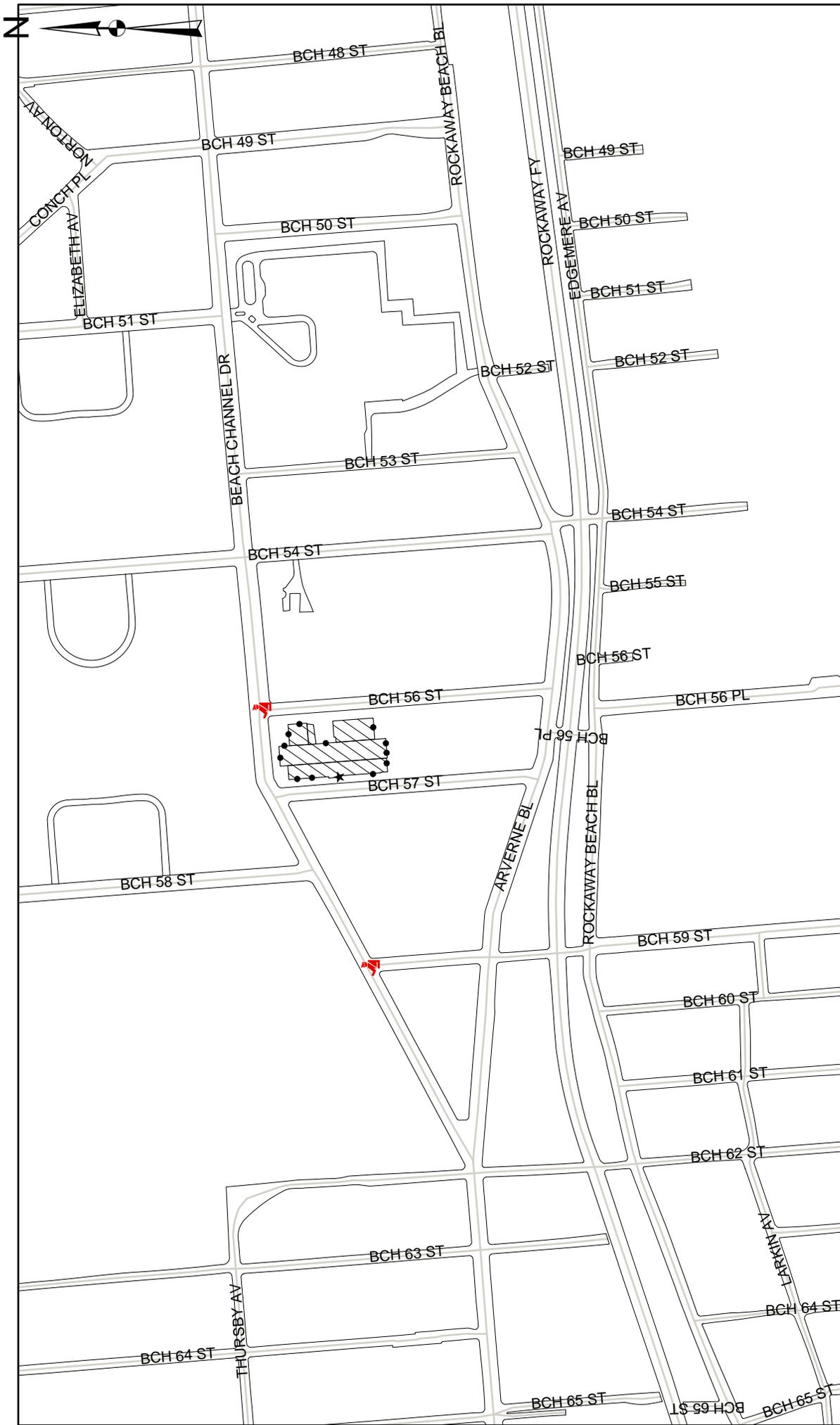


EXHIBIT 4
J.H.S. 198 QUEENS
BENJAMIN N. CARDOZO SCHOOL
CROSSING GUARD LOCATIONS

LEGEND:

CROSSING GUARD LOCATION 

0 250 500 1,000 Feet 

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school officials, approximately six percent of the students (approximately 24 students) currently ride a yellow school bus to and from school. Approximately 48 percent of the students (approximately 192 students) ride an MTA bus or subway to and from school.

In the vicinity of the school, the Q22 bus and the QM-17 Express Bus to Manhattan operate along Beach Channel Drive. The nearest subway stop is the Beach 60th Street stop on the Far Rockaway-Mott Avenue branch of the “A” subway line. This stop is located near Beach 60th Street and the Rockaway Freeway.

3.2 PARENT DROP-OFF OPERATIONS

Parent drop off operations are not a problem at J.H.S 198. According to the school officials no students are dropped off at the school. Almost all students walk or ride a bus to school.

3.3 PARKING REGULATIONS

Parking regulations around the school block are shown in Exhibit 5. Beach Channel Drive and Rockaway Beach Boulevard are both designated snow routes, which prohibits standing or parking a vehicle during times of a declared snow emergency.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

Exhibit 3 shows the existing signals, signs, school crosswalks, and speed reducers in the vicinity of J.H.S. 198. 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 7.

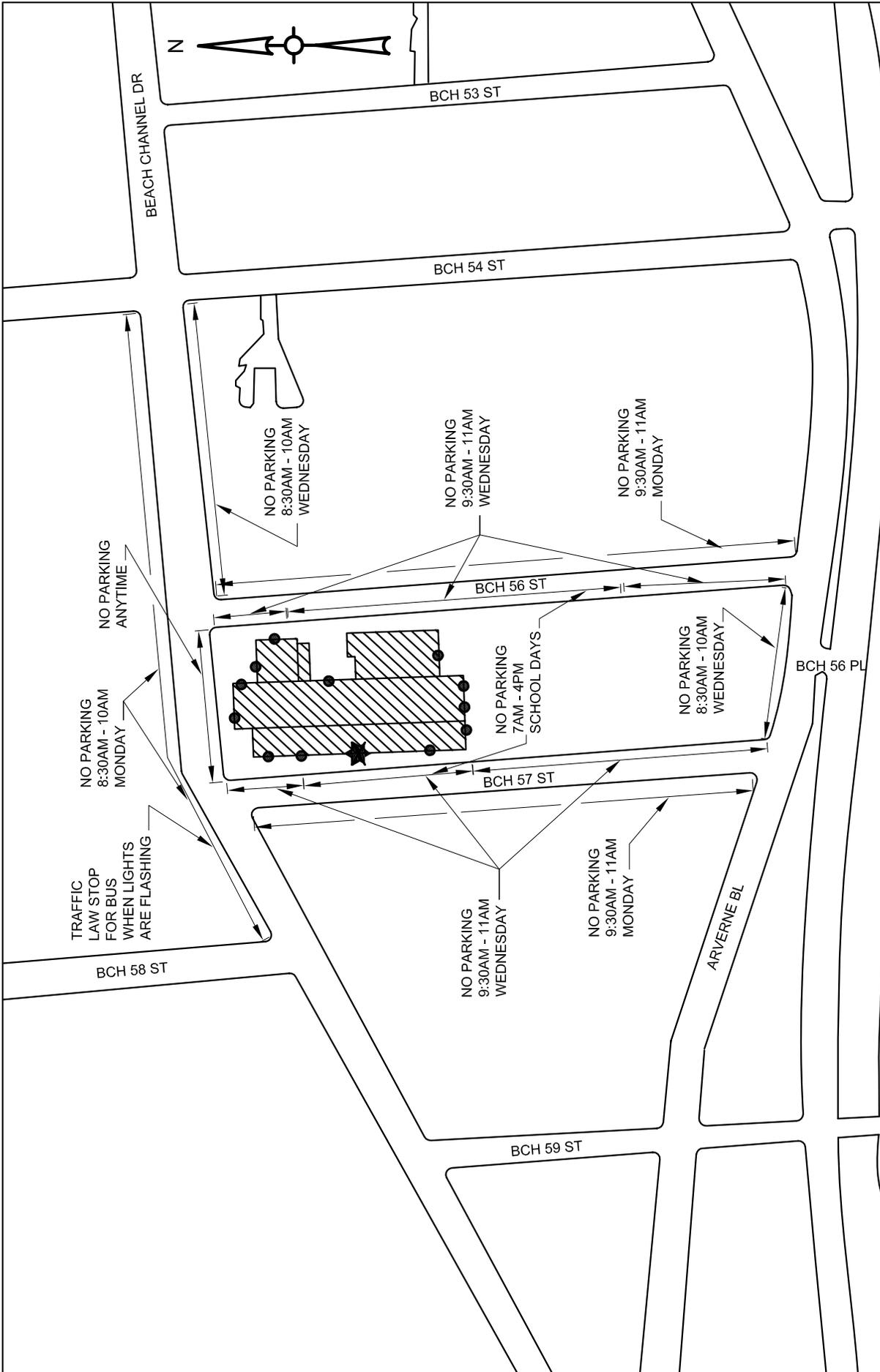


EXHIBIT 5
J.H.S. 198 QUEENS
BENJAMIN N. CARDOZO SCHOOL
EXISTING PARKING REGULATIONS

LEGEND:

- ★ MAIN ENTRANCE
- ENTRANCE

0 200 400 FEET

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 J.H.S. 198 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.

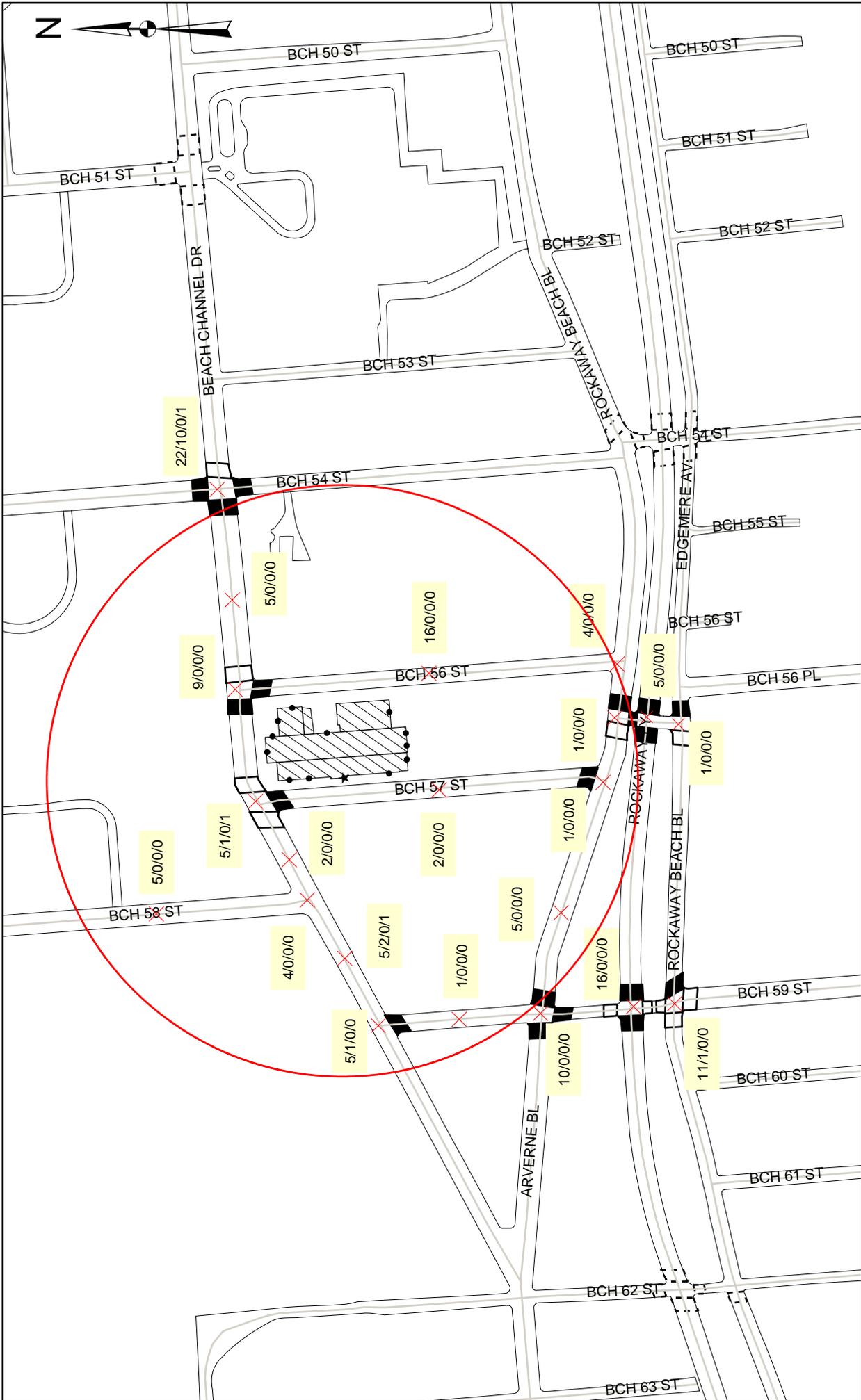
This report targets intersections closest to the school where the highest concentration of student pedestrians occurs. Intersections farther from the school and locations for which detailed data was not available at the time of this study will be addressed with the ongoing work of DOT's School Safety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

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Beach Channel Drive and Beach 59 th Street	5	1	0	0
Beach Channel Drive and Beach 58 th Street	4	0	0	0
Beach Channel Drive and Beach 57 th Street	5	1	0	1
Beach Channel Drive and Beach 56 th Street	9	0	0	0
Beach Channel Drive and Beach 54 th Street	22	10	0	1
Arverne Boulevard and Beach 59 th Street	10	0	0	0
Arverne Boulevard and Beach 57 th Street	1	0	0	0
Arverne Boulevard and Beach 56 th Place	1	0	0	0
Arverne Boulevard and Beach 56 th Street	4	0	0	0
Rockaway Freeway and Beach 59 th Street	16	0	0	0
Rockaway Freeway and Beach 56 th Place	5	0	0	0
Rockaway Beach Boulevard and 59 th Street	11	1	0	0
Rockaway Beach Boulevard and Beach 56 th Place	1	0	0	0
TOTAL	94	13	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*
Beach Channel Drive and Beach 59 th Street	18	3	0	0
Beach Channel Drive and Beach 58 th Street	2	0	0	0
Beach Channel Drive and Beach 57 th Street	4	0	0	0
Beach Channel Drive and Beach 56 th Street	10	2	0	1
Beach Channel Drive and Beach 54 th Street	23	11	0	2
Arverne Boulevard and Beach 59 th Street	12	2	0	0
Arverne Boulevard and Beach 57 th Street	4	0	0	0
Arverne Boulevard and Beach 56 th Place				
Arverne Boulevard and Beach 56 th Street	6	0	0	0
Rockaway Freeway and Beach 59 th Street	0	0	0	0
Rockaway Freeway and Beach 56 th Place	0	0	0	0
Rockaway Beach Boulevard and 59 th Street	8	2	0	1
Rockaway Beach Boulevard and Beach 56 th Place	0	0	0	0
TOTAL	87	20	0	4

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



LEGEND:

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

TOTAL ACCD	PED ACCD	PED FATAL	SCHOOL_PED ACCD
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0 250 500 1,000 Feet

EXHIBIT 6

J.H.S. 198 QUEENS

BENJAMIN N. CARDOZO SCHOOL

ACCIDENT SUMMARY (1998-2000)

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 J.H.S. 198.

3.6.1 Beach Channel Drive and Beach 59th Street

This is a four-leg unsignalized intersection with a school crosswalk located across the south leg of Beach Channel Drive. A private driveway, providing access to a marina, is aligned opposite Beach 59th Street on the north side of Beach Channel Drive. In the vicinity of J.H.S. 198, Beach Channel Drive is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 59th Street is a one-way southbound roadway with one relatively wide travel lane and on-street parking permitted on both sides of the roadway (see Figure 2).

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

School officials reported a speeding problem on Beach Channel Drive. Therefore, spot speed surveys were conducted on Beach Channel Drive between Beach 57th Street and Beach 58th Street in order to verify the existence of a speeding problem and to determine its extent. The spot speed surveys showed an 85th percentile speed of 33 mph for eastbound vehicles, and an 85th percentile speed of 34 mph for westbound vehicles. These speeds would suggest the need for a speed reduction measures for both directions on this section of roadway. However, because this roadway is a local bus route (Q-22) and a designated snow route, this precludes the use of a speed reducers (humps) and neckdowns in the roadway.

However, it should be noted that NYCDOT recently installed two 5-foot wide bike lanes and a channelized center median on Beach Channel Drive. The newly installed pavement markings reduced the effective width of the travel lanes to 11-foot wide in both directions. The reduced lane width is expected to calm traffic and reduce the effects of speeding on Beach Channel Drive.



Figure 2: Looking south on Beach 59th Street from the unsignalized intersection with Beach Channel Drive.

3.6.2 Beach Channel Drive and Beach 58th Street

This is a three-leg unsignalized intersection with no crosswalks. In the vicinity of J.H.S. 198, Beach Channel Drive is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 58th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 58th Street is stop-controlled on the southbound approach to Beach Channel Drive.

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

3.6.3 Beach Channel Drive and Beach 57th Street

This is a three-leg signalized intersection with a school crosswalk located across the south leg of Beach 57th Street and pedestrian crosswalks located across the east and west legs of Beach Channel Drive. In the vicinity of J.H.S. 198, Beach Channel Drive is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 57th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway (see Figure 3).

There was a total of five accidents reported at this intersection between 1998 and 2000, including one pedestrian accident that was also school-related, but did not involve a fatality (Table 2). The school-related accident occurred at approximately 8:00 am on May 27, 1999 when a ten-year-old pedestrian sustained a non-incapacitating injury while

crossing the intersection with the traffic signal. At the time of the accident, the roadway surface and weather conditions were reported as dry and clear, respectively.



Figure 3: Looking south on the east side of Beach 57th Street from the signalized intersection with Beach Channel Drive.

School officials reported a speeding problem on Beach 57th Street in the vicinity of the school. Therefore, spot speed surveys were conducted on Beach 57th Street between Arverne Boulevard and Beach Channel Drive in order to verify the existence of a speeding problem and to determine its extent.

In the analysis of vehicle speeds, the 85th percentile speed is considered to be the representative speed for a specified street segment. By definition, this is the speed at which 85 percent of the surveyed vehicles are traveling below and 15 percent of the surveyed vehicles are traveling above. An 85th percentile speed exceeding a 30 mph threshold indicates a potential speeding problem that may require appropriate traffic calming measures.

The results of the spot speed surveys indicated that northbound vehicles on Beach 57th Street between Arverne Boulevard and Beach Channel Drive were traveling at an 85th percentile speed of 30 mph. Southbound vehicles on the same section of Beach 57th Street were traveling at an 85th percentile speed of 35 mph. Because the 85th percentile speed for southbound vehicles exceeds the 30 mph threshold, speed reduction measures are recommended for Beach 57th Street as described in Section 4.1.

The detailed results of the spot speed surveys on Beach 57th Street between Arverne Boulevard and Beach Channel Drive are shown in the Appendix at the end of this document.

3.6.4 Beach Channel Drive and Beach 56th Street

This is a three-leg signalized intersection with school crosswalks located across the west leg of Beach Channel Drive and the south leg of Beach 56th Street, and a pedestrian crosswalk located across the east leg of Beach Channel Drive. In the vicinity of J.H.S. 198, Beach Channel Drive is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 56th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway (see Figures 4 and 5).

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



Figure 4: Looking south on Beach 56th Street from across the signalized intersection with Beach Channel Drive.



Figure 5: Looking west on Beach Channel Drive to the signalized intersection with Beach 56th Street (Note: NYCDOT recently installed bike lanes and channelized center median on Beach Channel Drive)

School officials reported a speeding problem on Beach 56th Street. Therefore, spot speed surveys were conducted on 56th Street between Arverne Boulevard and Beach Channel Drive in order to verify the existence of a speeding problem and to determine its extent.

In the analysis of vehicle speeds, the 85th percentile speed is considered to be the representative speed for a specified street segment. By definition, this is the speed at which 85 percent of the surveyed vehicles are traveling below and 15 percent of the surveyed vehicles are traveling above. An 85th percentile speed exceeding a 30 mph threshold indicates a potential speeding problem that may require appropriate traffic calming measures.

The results of the spot speed surveys indicated that northbound vehicles on Beach 56th Street between Arverne Boulevard and Beach Channel Drive were traveling at an 85th percentile speed of 25 mph. Southbound vehicles on this same section of Beach 56th Street were traveling at an 85th percentile speed of 27 mph. Because these 85th percentile speeds do not exceed the 30 mph threshold, no speed reduction measures are recommended along Beach 56th Street in the vicinity of the school.

The detailed results of the spot speed surveys on 56th Street between Arverne Boulevard and Beach Channel Drive are shown in the Appendix at the end of this document.

3.6.5 Beach Channel Drive and Beach 54th Street

This is a four-leg signalized intersection with school crosswalks located across the west leg of Beach Channel Drive, and the north and south legs of Beach 54th Street. There is a pedestrian crosswalk located across the east leg of Beach Channel Drive. In the vicinity

of J.H.S. 198, Beach Channel Drive is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway (see Figure 6). North of the intersection with Beach Channel Drive, Beach 54th Street is a one-way southbound roadway with one travel lane and on-street parking permitted on both sides of the roadway. South of the intersection, Beach 54th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway. Between Beach Channel Drive and Rockaway Beach Boulevard, parallel parking is permitted along the east side of Beach 54th Street and head-in (90 degree) parking is permitted on the west side of Beach 54th Street.

There was a total of 22 accidents reported at this intersection between 1998 and 2000, including ten pedestrian accidents, one of which was school-related (Table 2). The school-related accident occurred at approximately 2:00 pm on March 8, 1999 when a seven-year-old pedestrian sustained a “possible injury” while crossing against the signal at the intersection. At this time of the accident, the roadway surface and weather conditions were reported as dry and clear, respectively. There were no pedestrian fatalities reported at this intersection between 1998 and 2000.



Figure 6: Looking west on Beach Channel Drive to the signalized intersection with Beach 54th Street.

3.6.6 Arverne Boulevard and Beach 59th Street

This is a four-leg all-way stop-controlled intersection with school crosswalks located across the east and west legs of Arverne Boulevard, and the south leg of Beach 59th Street. In the vicinity of J.H.S. 198, Arverne Boulevard is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach

59th Street is a one-way southbound roadway with one travel lane and on-street parking permitted on both sides of the roadway. The intersection is stop controlled on the eastbound, westbound, and southbound approaches (see Figure 7).

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



Figure 7: Looking east on Arverne Boulevard to the all-way stop-controlled intersection with Beach 59th Street.

3.6.7 Arverne Boulevard and Beach 57th Street

This is a three-leg unsignalized intersection with a school crosswalk located across the north leg of Beach 57th Street. In the vicinity of J.H.S. 198, Arverne Boulevard is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 59th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway (see Figure 8). Beach 57th Street is stop-controlled at its intersection with Arverne Boulevard.

There was one accident reported at this intersection between 1998 and 2000, and it did not involve a pedestrian (Table 2).



Figure 8: Looking south on Beach 57th Street to the unsignalized intersection with Arverne Boulevard.

3.6.8 Arverne Boulevard and Beach 56th Place

This is a three-leg signalized intersection with a school crosswalk located across the east leg of Arverne Boulevard and pedestrian crosswalks located across the west leg of Arverne Boulevard and the south leg of 56th Place. In the vicinity of J.H.S. 198, Arverne Boulevard is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 56th Place is a one-way northbound roadway with one travel lane on each side of the roadway and no on-street parking (see Figures 9 and 10).

There was one accident reported at this intersection between 1998 and 2000, and it did not involve a pedestrian (Table 2).



Figure 9: Looking south on Beach 56th Place at the signalized intersection with Arverne Boulevard.



Figure 10: Looking south on the east side of Beach 56th Place at the signalized intersection with Arverne Boulevard (note school crosswalk configuration across the Rockaway Freeway, on far side of the median).

School officials reported a speeding problem on Arverne Boulevard. Therefore, spot speed surveys were conducted on Arverne Boulevard between Beach 54th Street and Beach 56th Street in order to verify the existence of a speeding problem and to determine its extent.

In the analysis of vehicle speeds, the 85th percentile speed is considered to be the representative speed for a specified street segment. By definition, this is the speed at which 85 percent of the surveyed vehicles are traveling below and 15 percent of the surveyed vehicles are traveling above. An 85th percentile speed exceeding a 30 mph threshold indicates a potential speeding problem that may require appropriate traffic calming measures.

The results of the spot speed surveys indicated that eastbound vehicles on Arverne Boulevard between Beach 54th Street and Beach 56th Street were traveling at an 85th percentile speed of 38 mph. Westbound vehicles on the same section of Arverne Boulevard were found to be traveling at an 85th percentile speed of 40 mph. Because the 85th percentile speeds in both directions exceed the 30 mph threshold, speed reduction measures are recommended for Arverne Boulevard as described in Section 4.1.

The detailed results of the spot speed surveys on Arverne Boulevard between Beach 54th Street and Beach 56th Street are shown in the Appendix at the end of this document.

3.6.9 Arverne Boulevard and Beach 56th Street

This is a three-leg unsignalized intersection with a school crosswalk located across the north leg of Beach 56th Street. In the vicinity of J.H.S. 198, Arverne Boulevard is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. Beach 56th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway (see Figure 11). Beach 56th Street is stop-controlled on its approach to Arverne Boulevard.

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



Figure 11: Looking west on Arverne Boulevard to the unsignalized intersection with Beach 56th Street.

3.6.10 Rockaway Freeway and Beach 59th Street

This is a four-leg signalized intersection with school crosswalks located across the east and west legs of Rockaway Freeway and pedestrian crosswalks located across the north and south legs of Beach 59th Street. In the vicinity of J.H.S. 198, Rockaway Freeway is a two-way east-west roadway with one travel lane on each side of the roadway and no on-street parking. There is a raised concrete median divider along Rockaway Freeway separating eastbound and westbound traffic. An elevated track for the “A” subway line (Far Rockaway-Mott Avenue branch) is located over Rockaway Freeway. At the intersection with Rockaway Freeway, Beach 59th Street is a one-way southbound roadway with one travel lane and on-street parking permitted along both sides of the roadway. There is an exclusive westbound left-turn lane on Rockaway Freeway for traffic turning onto southbound Beach 59th Street (see Figures 12 and 13).

There was a total of 16 accidents reported at this intersection between 1998 and 2000, but none of these accidents involved pedestrians (Table 2).



Figure 12: Looking east along westbound Rockaway Freeway at the signalized intersection with Beach 59th Street.



Figure 13: Looking east along eastbound Rockaway Freeway at the signalized intersection with Beach 59th Street.

3.6.11 Rockaway Freeway and Beach 56th Place

This is a four-leg unsignalized intersection with school crosswalks located across the east and west legs of Rockaway Freeway and pedestrian crosswalks located across the north and south legs of Beach 56th Place. In the vicinity of J.H.S. 198, Rockaway Freeway is a two-way east-west roadway with one travel lane on each side of the roadway and no on-street parking. There is a raised concrete median divider along Rockaway Freeway separating eastbound and westbound traffic. An elevated track for the “A” subway line (Far Rockaway-Mott Avenue branch) is located over Rockaway Freeway. North of the intersection with Rockaway Freeway, Beach 56th Place is a one-way northbound street with one travel lane on each side of the roadway and no on-street parking. There is an exclusive westbound left-turn lane on Rockaway Freeway for traffic turning to travel southbound on Beach 56th Place.

There was one accident reported at this intersection between 1998 and 2000, and it was not a pedestrian accident.

3.6.12 Rockaway Beach Boulevard and Beach 59th Street

This is a four-leg signalized intersection with a school crosswalk located across the east leg of Rockaway Beach Boulevard, and pedestrian crosswalks located across the west leg of Rockaway Beach Boulevard and the north and south legs of Beach 59th Street. In the vicinity of J.H.S. 198, Rockaway Beach Boulevard is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. North of the intersection with Rockaway Beach Boulevard, Beach 59th Street is a one-way southbound roadway with one travel lane and on-street parking on both sides of the roadway. South of this intersection, Beach 59th Street is a two-way north-south roadway with one travel lane and one on-street parking lane on each side of the roadway.

There was a total of 11 accidents reported at this intersection between 1998 and 2000, including one pedestrian accident that was not school-related. There were no pedestrian fatalities reported at this intersection between 1998 and 2000.

3.6.13 Rockaway Beach Boulevard and Beach 56th Place

This is a three-leg signalized intersection with a school crosswalk located across the east leg of the intersection and a pedestrian crosswalk located across the west leg. Rockaway Beach Boulevard is a two-way east-west roadway with one travel lane and one on-street parking lane on each side of the roadway. North of the intersection with Rockaway Beach Boulevard, Beach 56th Place (north leg) is a two-way north-south roadway with one travel lane on each side of the roadway and no on-street parking. South of this intersection, Beach 56th Place (south leg) is offset slightly to the east of the north leg and has one travel lane and one on-street parking lane on each side of the roadway (see Figure 14).

There was one accident reported at this intersection between 1998 and 2000, but it did not involve a pedestrian.



Figure 14: Looking north from the west side of Beach 56th Place (south leg) toward the signalized intersection of Rockaway Beach Boulevard and Beach 56th Place (north leg).

3.7 SIGNAL TIMING

Pedestrian crossing times were field-verified for crosswalks at signalized intersections in the vicinity of J.H.S. 198, and were found to be adequate in most directions and on most approaches based upon a child pedestrian walking at the rate of three feet per second. The exceptions are the crossing of Beach Channel Drive at Beach 56th Street, and the crossing of the Rockaway Freeway at Beach 56th Place. A comparison of 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)⁽¹⁾	TIMING ADJUSTMENT REQUIRED?
Beach Channel Drive and Beach 57th Street				
crossing Beach Channel Drive	55	23	22	NO
crossing Beach 57 th Street	50	35	20	NO
Beach Channel Drive and Beach 56th Street				
crossing Beach Channel Drive	65	27	25	NO
crossing Beach 56 th Street	39	33	16	NO
Beach Channel Drive and Beach 54th Street				
crossing Beach Channel Drive	60	34	23	NO
crossing Beach 54 th St (north leg)	50	42	20	NO
crossing Beach 54 th St. (south leg)	40	42	17	NO
Arverne Boulevard and Beach 56th Place				
crossing Arverne Boulevard	55	23	22	NO
crossing Beach 56 th Place	45	33	18	NO
Rockaway Freeway and Beach 59th Street				
crossing Rockaway Freeway	50	21	20	NO
crossing Beach 59 th Street	29	26	13	NO
Rockaway Freeway and Beach 56th Place				
crossing Rockaway Freeway	50	22	20	NO
crossing Beach 56 th Place	31	37	14	NO
Rockaway Beach Boulevard and Beach 59th Street				
crossing Rockaway Beach Blvd.	40	21	17	NO
crossing Beach 59 th Street	29	26	13	NO
Rockaway Beach Boulevard and Beach 56th Place				
crossing Rockaway Beach Blvd. (east leg)	47	24	19	NO
crossing Rockaway Beach Blvd. (west leg)	40	24	17	NO
crossing Beach 56 th Place	31	28	14	NO

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

As shown in Table 4, four extra seconds of green time would be needed to accommodate student pedestrians crossing Beach Channel Drive at the signalized intersection with Beach 56th Street.

In addition, although the time required to cross the entire width of Rockaway Freeway at the signalized intersection with Beach 56th Place is 20 seconds, the time to reach the concrete median is only 12 seconds. Because the concrete median is approximately 3.5 feet wide, it provides a pedestrian refuge for the crosswalks. One more second of green time would have to be added to the Beach 56th Place signal phase in order to

accommodate children crossing the entire distance. Although it is common practice to utilize wide concrete medians as a pedestrian refuge for multi-stage crossings, this location is marginal due to the median width (approximately 3.5 feet) and the sight obstruction caused by the elevated subway support columns on the median. Therefore, one extra second should be added to the Beach 56th Place green time.

3.8 PHYSICAL CONDITIONS

3.8.1 Roadways and Sidewalks

The roadways and sidewalks in the vicinity of J.H.S. 198 were observed to be in fair condition. Sidewalks on the school block-faces were observed to be in fair condition and vary in width from approximately 10 to 15 feet wide. However, sidewalk was found to be missing along both sides of Rockaway Beach Boulevard between Beach 56th Place and Beach 52nd Street.

3.8.2 Pedestrian Ramps

Pedestrian ramps in the vicinity of the school were observed to be standard and in fair condition with the exception of the following locations:

Beach Channel Drive and Beach 59th Street

- The pedestrian ramp on the southwest corner, for the school crosswalk located across the south leg of the intersection, is too narrow and has a lip at the curb which prevents a smooth transition from the roadway pavement to the sidewalk.

Beach Channel Drive and Beach 57th Street

- Pedestrian ramps are missing on both the north and the south sides of Beach Channel Drive for the crosswalks located across the west and east legs of the intersection.

Beach Channel Drive and Beach 56th Street

- The pedestrian ramps on the south side of Beach Channel Drive are too narrow for the crosswalks located across the west and east legs of the intersection.
- Pedestrian ramps are missing on the north side of Beach Channel Drive for the school crosswalk located across the west leg and for the pedestrian crosswalk located across the east leg of the intersection.
- The northwest corner of the intersection where there is a traffic signal pole in the path for the school crosswalk located across the west leg
- The northeast corner of the intersection where there is a utility pole in the path for the pedestrian crosswalk located across the east leg

- The southwest corner of the intersection where there is a utility pole in the path for the school crosswalk located across the west leg.
- The southeast corner of the intersection where there is a traffic signal pole in the path for the school crosswalk located across the east leg.

Beach Channel Drive and 54th Street

- The northwest corner of the intersection where there is a utility pole and a traffic signal pole in the path for the pedestrian crosswalk located across the west leg.

Arverne Boulevard and Beach 59th Street

- All pedestrian ramps at the intersection of Arverne Boulevard and Beach 59th Street are too narrow.

Arverne Boulevard and Beach 56th Place

- The north side of Arverne Boulevard where pedestrian ramps are missing for the pedestrian crosswalk located across the west leg, and the school crosswalk located across the east leg.

Rockaway Freeway and Beach 59th Place

- The south side of westbound Rockaway Freeway, and the north and south sides of eastbound Rockaway Freeway at Beach 59th Place, where the pedestrian ramps are missing for the school crosswalks on both the west and east legs of Rockaway Freeway.

Rockaway Freeway and Beach 56th Place

- The south side of westbound Rockaway Freeway, and the north and south sides of eastbound Rockaway Freeway at Beach 56th Place, where the pedestrian ramps are missing for the school crosswalks on both the west and east legs of Rockaway Freeway.

Rockaway Beach Boulevard and Beach 59th Street

- The south side of Rockaway Beach Boulevard at Beach 59th Street where pedestrian ramps are missing for the school crosswalk located across the east leg and the pedestrian crosswalk located across the west leg of Rockaway Beach Boulevard.

Rockaway Beach Boulevard and Beach 56th Place

- The north and south sides of Rockaway Beach Boulevard at Beach 56th Place, where pedestrian ramps are missing for the pedestrian crosswalk located across the west leg of Rockaway Beach Boulevard.

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes the proposed measures to improve school pedestrian safety around J.H.S. 198. 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 J.H.S. 198 is discussed as follows, and is shown in more detail in Exhibit 7.

4.1 SHORT-TERM MEASURES

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

Signs should be installed reading “NO STANDING 7AM - 4PM SCHOOL DAYS” 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.)

➤ *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 graphic “YIELD TO PEDESTRIAN” sign*

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

- Eastbound approach of Beach Channel Drive at Beach 59th Street.

➤ *Speeding on Beach 57th Street*

School officials reported a speeding problem on Beach 57th Street. Therefore, spot speed surveys were conducted on Beach 57th Street between Beach Channel Drive and Arverne Boulevard in order to verify the existence of a speeding problem and to determine its extent.

The spot speed surveys showed an 85th percentile speed of 35 mph for southbound vehicles on Beach 57th Street between Beach Channel Drive and Arverne Boulevard. This 85th percentile speed exceeds the 30 mph threshold and suggests the need for speed reduction measures on this section of roadway.

Therefore, the following actions are recommended:

- Install a speed reducer (hump) on Beach 57th Street between Beach Channel Drive and Arverne Boulevard. A speed reducer installed at the middle of the street should effectively control speeding on this block. The speed reducers should be marked and signed per NYCDOT standards.

➤ *Speeding on Arverne Boulevard*

School officials reported a speeding problem on Arverne Boulevard. Therefore, spot speed surveys were conducted on Arverne Boulevard between Beach 54th Street and Beach 56th Street in order to verify the existence of a speeding problem and to determine its extent.

The spot speed surveys showed an 85th percentile speed of 38 mph for eastbound vehicles and an 85th percentile speed of 40 mph for westbound vehicles on Arverne Boulevard between Beach 54th Street and Beach 56th Street. These 85th percentile speeds exceed the 30 mph threshold and suggest the need for speed reduction measures on this section of roadway. As the road is 55 feet wide, speed reducers are not feasible

Therefore, the following actions are recommended:

- Install a channelized center median on Arverne Boulevard between Beach Channel Drive and Beach 54th Street. The proposed pavement markings will reduce the effective width of the travel lanes to 11ft wide in both directions. The reduced lane width is expected to calm traffic and reduce the effects of speeding on Arverne Boulevard.

➤ *Additional traffic/parking enforcement in the vicinity of the school*

School officials reported both school buses and cars double parked, cars parked illegally and blocking crosswalks, drivers not yielding at crosswalks, and drivers disregarding stop signs and other traffic control devices.

To address the concerns of school officials regarding the above issues, the following action is recommended:

- School representatives should request the assistance of traffic agents and/or police officers to periodically patrol the streets in the vicinity of the school, particularly during arrival and dismissal times, and summon any drivers or vehicles violating traffic and parking regulations around the school block.

➤ *Request the NYPD assign crossing guards*

The school principal reported the need for additional crossing guards at three locations in the vicinity of J.H.S. 198. Therefore it is recommended to request that the NYPD assign crossing guards to the following intersections:

- Beach Channel Drive and Beach 57th Street intersection.
- Arverne Boulevard and Beach 57th Street intersection.
- Mid-block on Beach 56th Place between Rockaway Beach Boulevard and Arverne Boulevard.

➤ Convert existing pedestrian crosswalk to school crosswalk

There is an existing pedestrian crosswalk located across the east leg of Beach Channel Drive at the signalized intersection with Beach 57th Street. This crosswalk is located on a corner adjacent to the school building, and on the same side of the street as the main entrance of the school. As such, it would be appropriate for this crosswalk to be designated as a school crosswalk.

Therefore, the following action is recommended:

- Designate the existing pedestrian crosswalk located across the east leg of the Beach Channel Drive and Beach 57th Street intersection as a school crosswalk. The appropriate advanced warning signs and marking should also be installed.

4.2 LONG-TERM MEASURES

➤ Construct pedestrian ramps

Pedestrian ramps are missing at various intersections in the vicinity of J.H.S. 198. Therefore, the following actions are recommended:

- Construct pedestrian ramps on both the north and the south sides of Beach Channel Drive at the intersection with Beach 57th Street for the crosswalks located across the east and west legs of Beach Channel Drive (four ramps).
- Construct pedestrian ramps on the north side of Beach Channel Drive at the intersection with Beach 56th Street for the school crosswalk located across the west leg and the pedestrian crosswalk located across the east leg of Beach Channel Drive (two ramps).
- Construct pedestrian ramps on the north side of Arverne Boulevard at the intersection with Beach 56th Place, for the pedestrian crosswalk located across the west leg and the school crosswalk located across the east leg of Arverne Boulevard (two ramps).
- Construct pedestrian ramps on the south side of eastbound Rockaway Freeway at the intersection with Beach 59th Street, for the school crosswalks on both the west and east legs of Rockaway Freeway (two ramps).
- Construct pedestrian “cut-through” areas on the raised concrete median aligned along the center of the Rockaway Freeway, for each of the crosswalks

located across the east and west legs of Rockaway Freeway at the intersection with Beach 59th Street (two cut-throughs).

- Construct pedestrian ramps on the south side of eastbound Rockaway Freeway at the intersection with Beach 56th Place, for the school crosswalks on both the west and east legs of Rockaway Freeway (two ramps).
- Construct pedestrian “cut-through” areas on the raised concrete median aligned along the center of the Rockaway Freeway, for each of the crosswalks located across the east and west legs of Rockaway Freeway at the intersection with Beach 56th Place (two cut-throughs).
- Construct pedestrian ramps on the south side of Rockaway Beach Boulevard at the intersection with Beach 59th Street, for the pedestrian crosswalk located across the west leg and the school crosswalk located across the east leg of Rockaway Beach Boulevard (two ramps).
- Construct pedestrian ramps on the north and south sides of Rockaway Beach Boulevard at the intersection with Beach 56th Place, for the pedestrian crosswalk located across the west leg of Rockaway Beach Boulevard (two ramps).

➤ Reconstruct pedestrian ramps

Several pedestrian ramps do not conform to current standards. Therefore, the following actions are recommended:

- Reconstruct the pedestrian ramp on the west side of Beach 59th Street at the intersection with Beach Channel Drive, for the school crosswalk located across the south leg of Beach 59th Street to current standards.
- Reconstruct the pedestrian ramps on the south side of Beach Channel Drive at the intersection with Beach 56th Street, for the school crosswalk located across the west leg of the intersection and the pedestrian crosswalk located across the east leg of the intersection to current standards.
- Reconstruct the pedestrian ramps on the south side of Arverne Boulevard at the intersection with Beach 59th Street to current standards (one ramp).

➤ Relocate traffic signal pole

There are several locations where traffic signal poles obstruct the path of crosswalks. Therefore, the following actions are recommended:

- Relocate the traffic signal pole located on the north side of Beach Channel Drive at the intersection with Beach 56th Street from the path for the pedestrian crosswalk located across the west leg of Beach Channel Drive.

- Relocate the traffic signal pole located on the south side of Beach Channel Drive at the intersection with Beach 56th Street from the path for the school crosswalk located across the east leg of Beach Channel Drive.
- Relocate the traffic signal pole located on the north side of Beach Channel Drive at the intersection with Beach 54th Street from the path for the pedestrian crosswalk located across the west leg of Beach Channel Drive.

➤ Relocate utility pole

There are several locations where utility poles obstruct the path of crosswalks. Therefore, the following actions are recommended:

- Relocate the utility pole located on the north side of Beach Channel Drive at the intersection with Beach 56th Street from the path for the pedestrian crosswalk located across the east leg of Beach Channel Drive.
- Relocate the utility pole located on the south side of Beach Channel Drive at the intersection with Beach 56th Street from the path for the school crosswalk located across the west leg of Beach Channel Drive.
- Relocate the utility pole located on the north side of Beach Channel Drive at the intersection with Beach 54th Street from the path for the pedestrian crosswalk located across the west leg of Beach Channel Drive.

➤ Consider installing curb extensions at the following locations

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

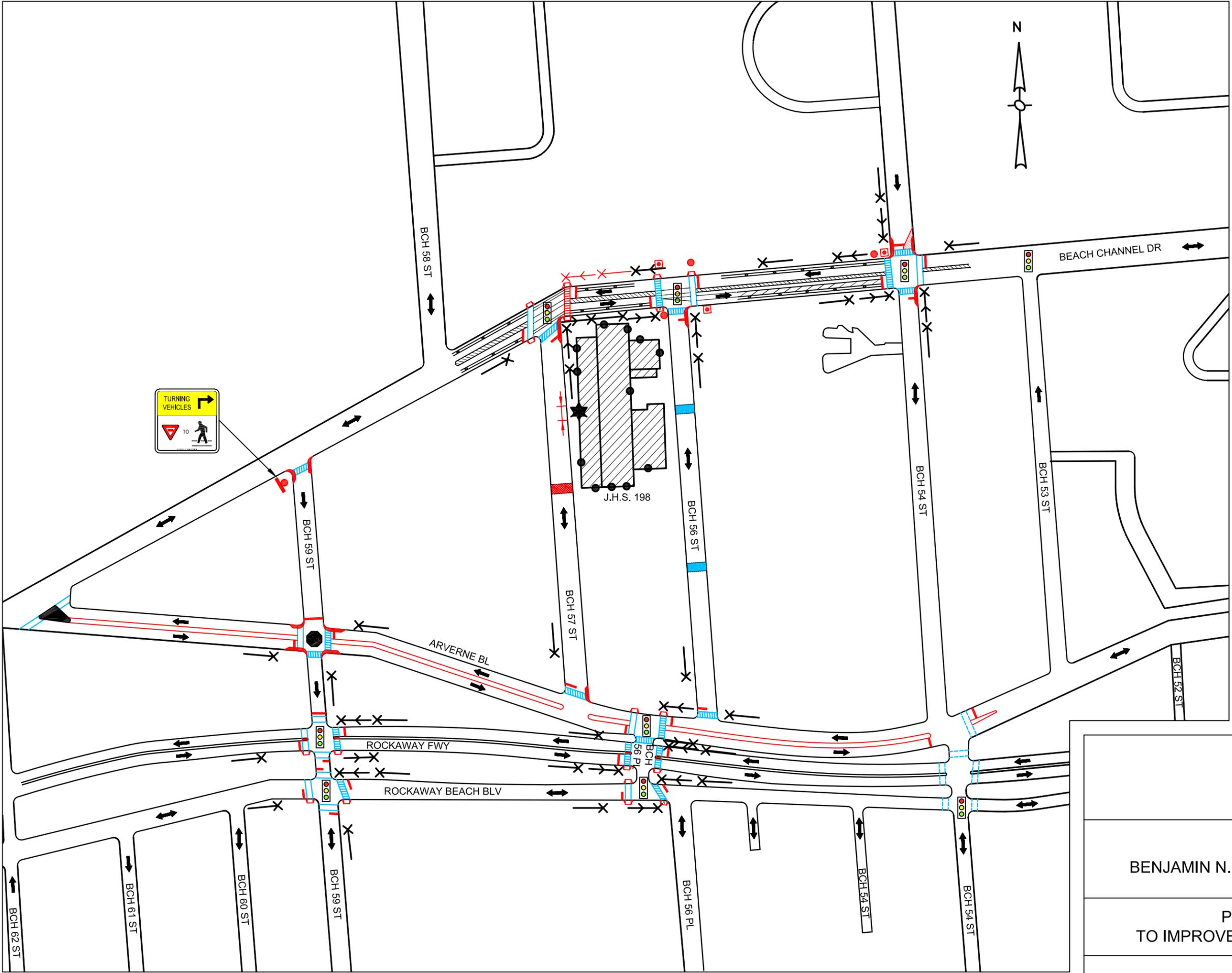
- On the east and west sides of Beach 59th Street at the unsignalized intersection with Beach Channel Drive, for the school crosswalk located across the south leg of the intersection.
- East side of Beach 57th Street at the signalized intersection with Beach Channel Drive, for the school crosswalk located across the south leg of the intersection.
- East side of Beach 56th Street at the signalized intersection with Beach Channel Drive, for the school crosswalk located across the south leg of the intersection.

- East and west sides of Beach 54th Street at the signalized intersection with Beach Channel Drive, for the school crosswalk located across the north leg of the intersection.
- East side of Beach 54th Street at the signalized intersection with Beach Channel Drive, for the school crosswalk located across the south leg of the intersection.
- East and west sides of Beach 59th Street at the unsignalized intersection with Beach Channel Drive, for the school crosswalk located across the south leg of the intersection.
- All four corners of the unsignalized intersection of Beach 59th Street and Arverne Boulevard.
- East side of Beach 57th Street at the unsignalized intersection with Arverne Boulevard, for the school crosswalk located across the north leg of the intersection.

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

➤ *Install curb extension to provide blockbuster treatment at the intersection of Beach Channel Drive and Beach 54th Street*

At this intersection Beach 54th Street operates one-way southbound as it approaches Beach Channel Drive from the north. However, Beach 54th Street operates two-way as it approaches Beach Channel Drive from the south. In order to reduce the head-on conflict at this intersection, consideration should be given to installing a blockbuster style curb extension; provided that the Final Design confirms that construction of the recommended curb extension would be feasible and not interfere with traffic operations. Final details pertaining to the geometry of the curb extension will be developed during the Final Design/Contract Document preparation.



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



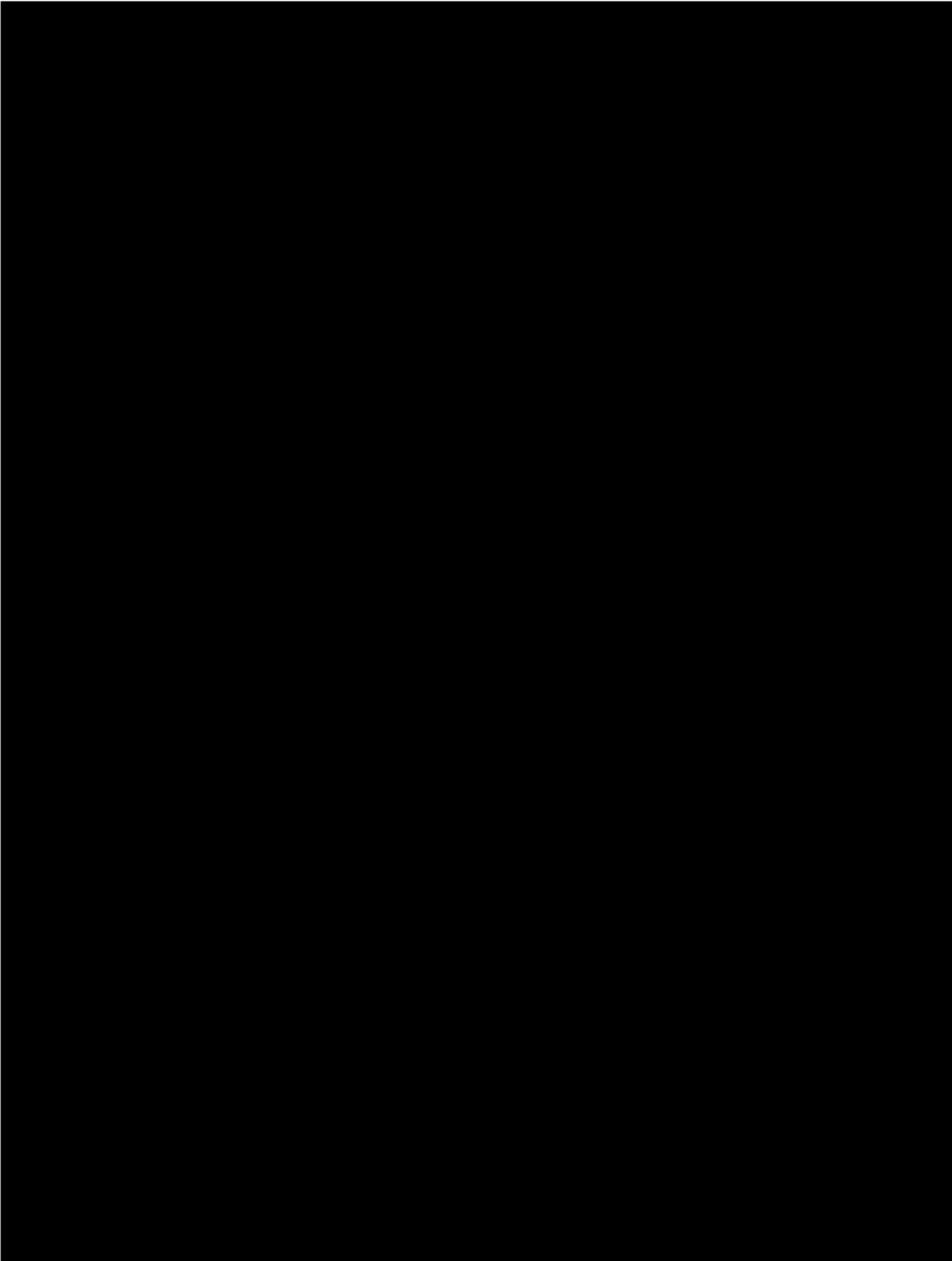
1" = 200'

EXHIBIT 7

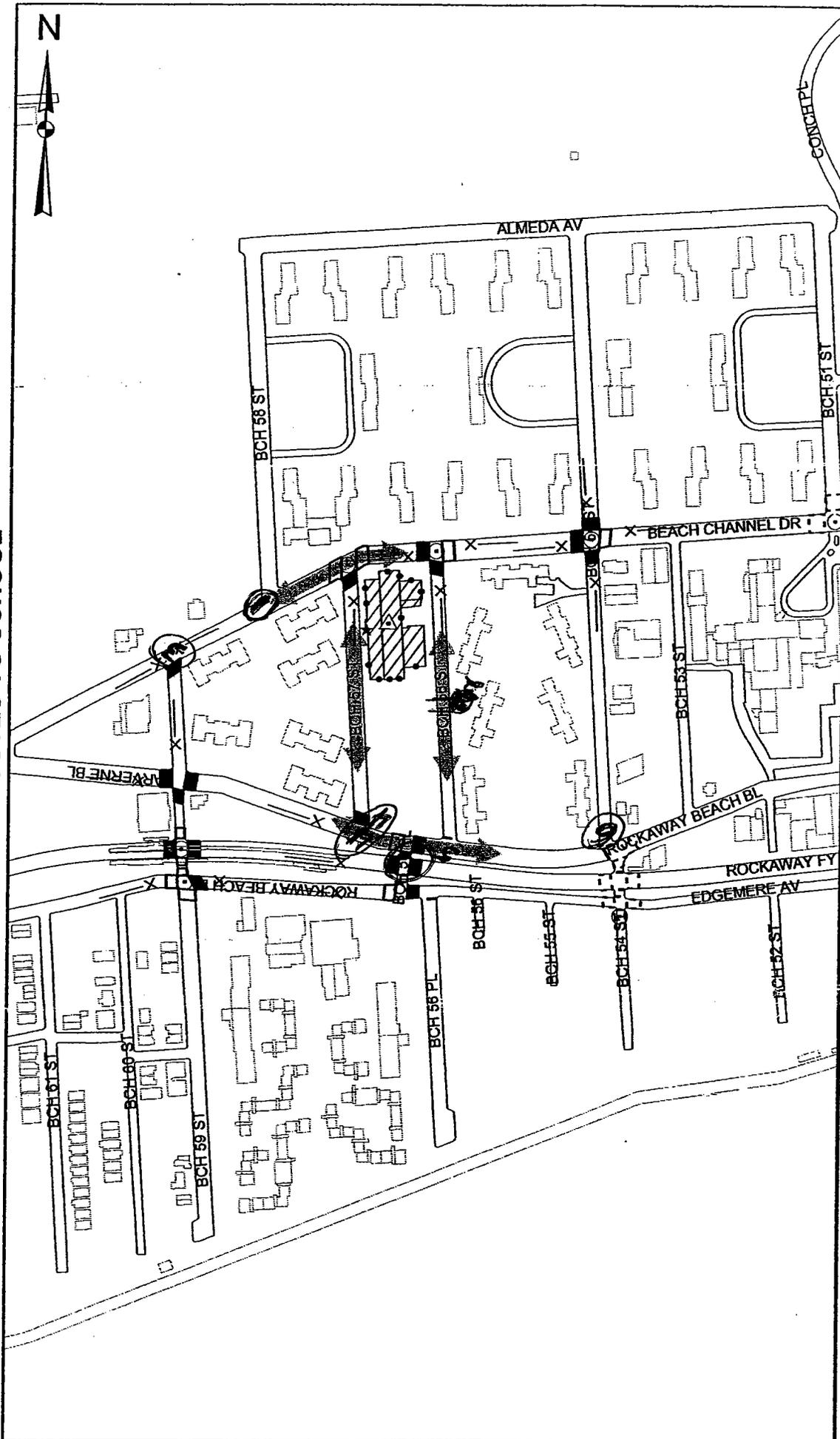
J.H.S. 198 QUEENS
BENJAMIN N. CARDOZO JUNIOR HIGH SCHOOL

POTENTIAL MEASURES
TO IMPROVE STUDENT PEDESTRIAN SAFETY

APPENDIX



TRAFFIC SAFETY PLAN OFFICIAL ROUTES TO SCHOOL



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:

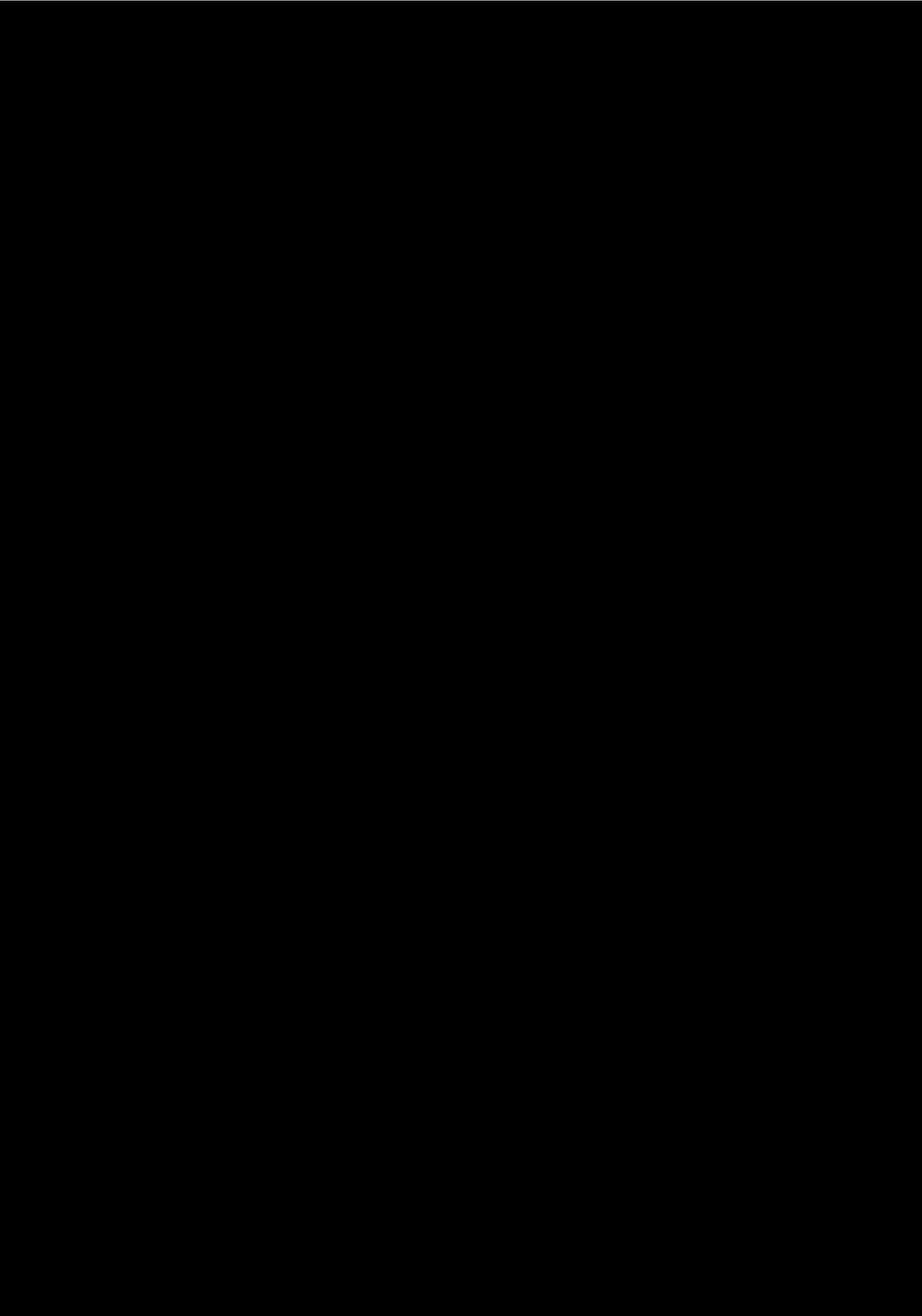
- TRAFFIC FLOW
- ROUTE TO SCHOOL
- ADV. WARNING SIGN
- SCHOOL LOCATION
- MAIN SCHOOL ENTRANCE
- OTHER SCHOOL ENTRANCES
- SCHOOL X-WALK
- PED. X-WALK
- STOP LINE
- X-WALKS ASSOCIATED WITH OTHER SCHOOLS
- SPEED HUMP
- TRAFFIC SIGNAL
- ALL - WAY STOP
- 2 - WAY STOP

**B. M. CARDOSO JHS
J.H.S. 198**

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

ORIG. DATE: 10/31/888
GIS CONV: 04/2002
REVISIONS:

COMM. BOARD: 14
BOROUGH: QUEENS
PRECINCT: 101



SPOT SPEED STUDY

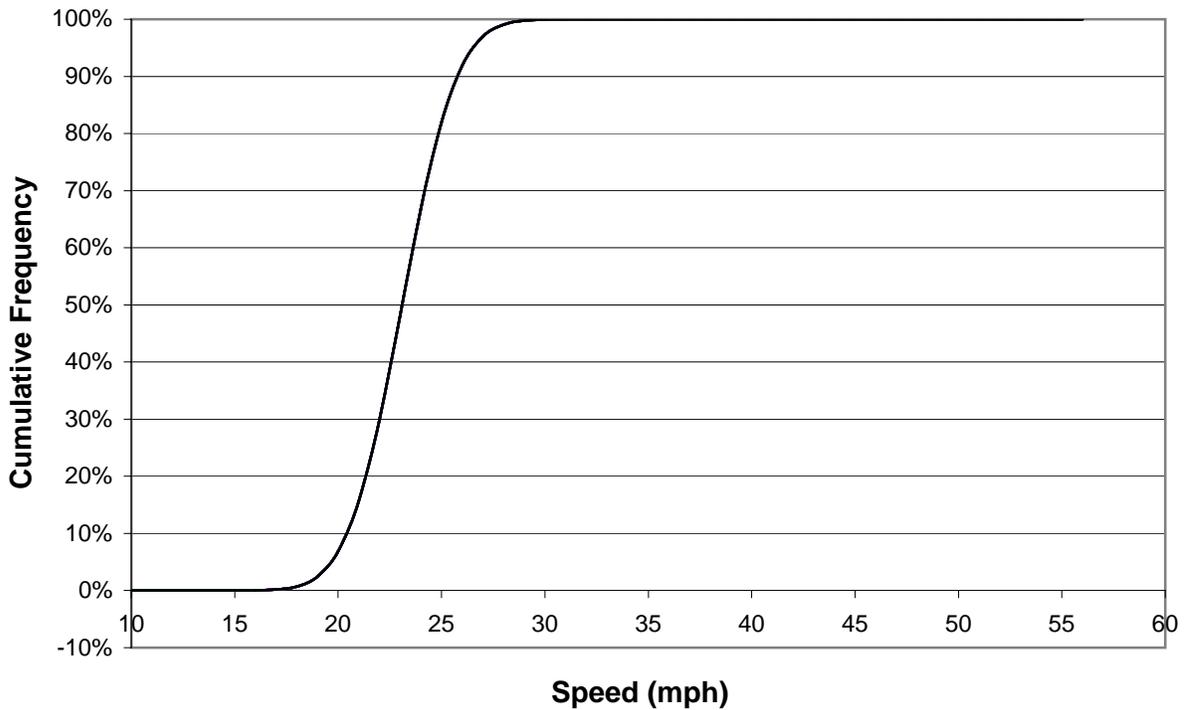
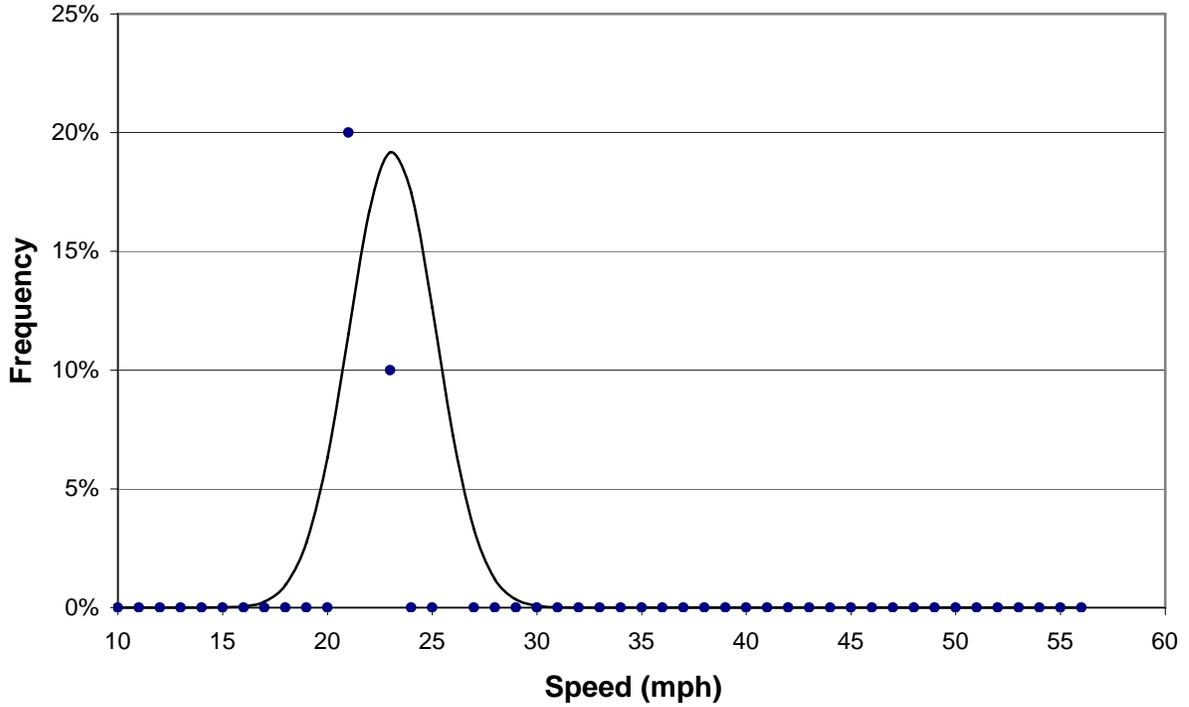
Date: 10/31/05
Location: Beach 56 St between Rockaway Boulevard and Beach Channel Drive
Surveyor: Richard Calvache

Time: 10:00 PM

School: J.H.S 198
Direction: NB
Comments:

Mean Speed = 23.1 mph
Standard Deviation = 2.1 mph
Margin of Error (95% Confidence) = ± 1.3 mph

Median Speed = 23.1 mph
15th Percentile Speed = 20.9 mph
85th Percentile Speed = 25.3 mph



SPOT SPEED STUDY

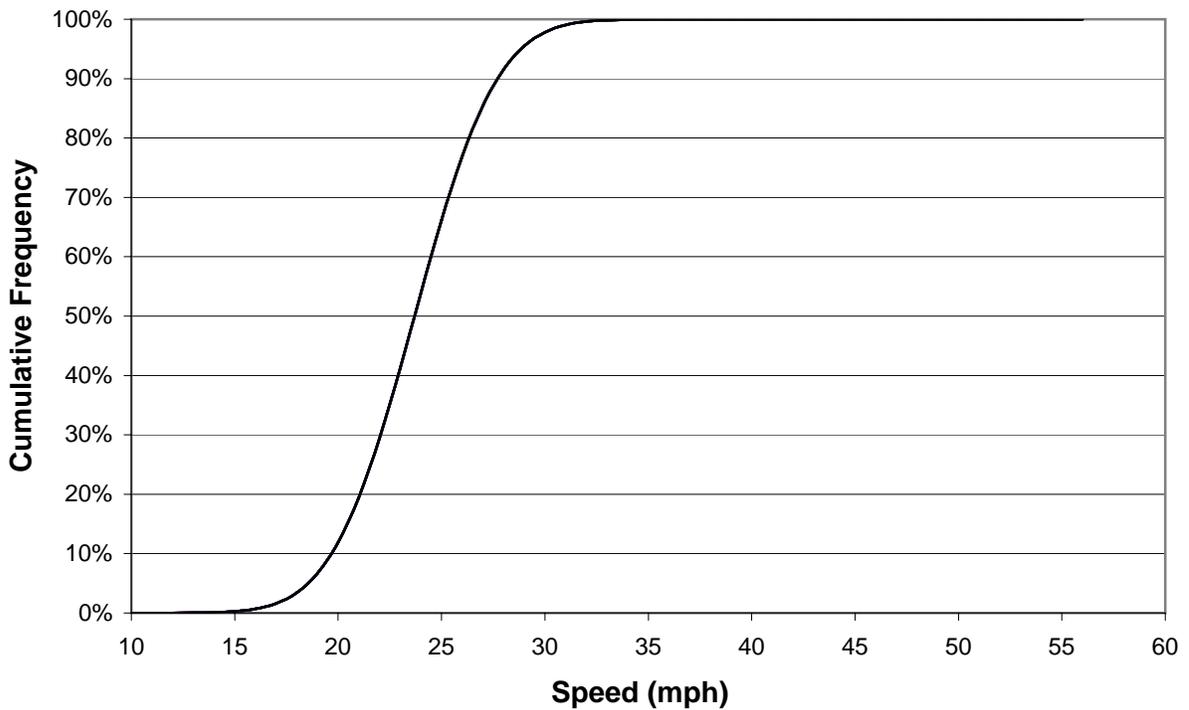
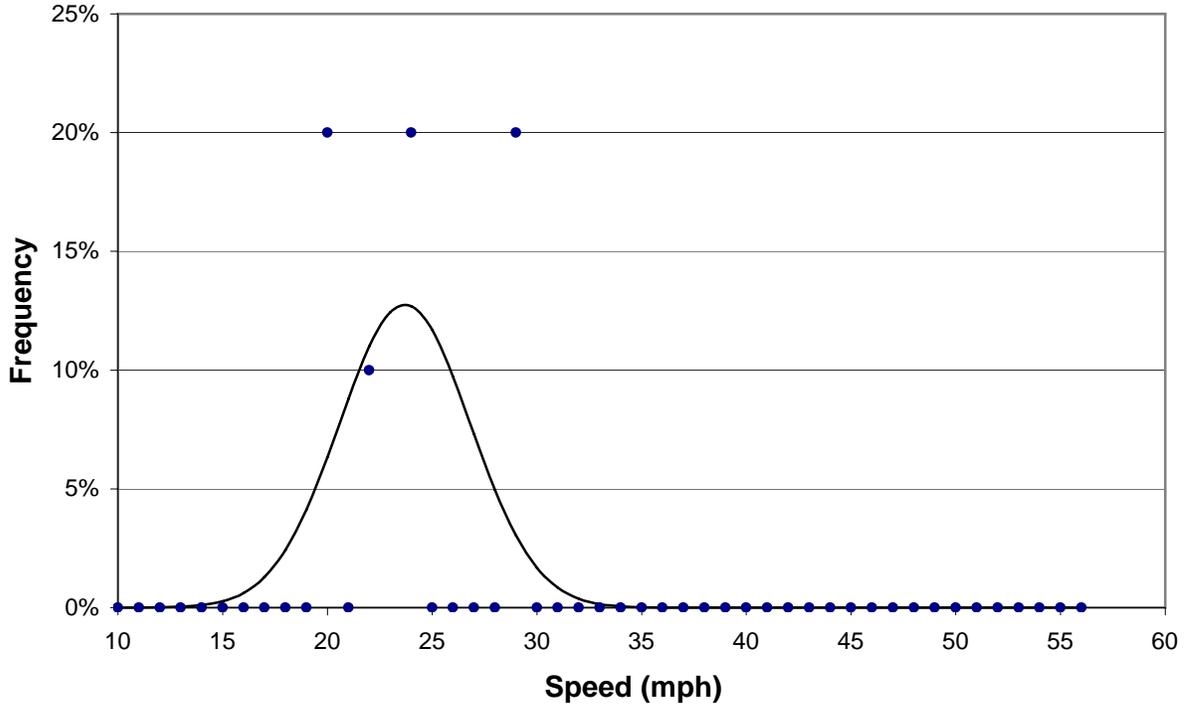
Date: 10/31/05
Location: Beach 56 St between Rockaway Boulevard and Beach Channel Drive
Surveyor: Richard Calvache

Time: 10:00 PM

School: J.H.S 198
Direction: SB
Comments:

Mean Speed = 23.7 mph
Standard Deviation = 3.1 mph
Margin of Error (95% Confidence) = ± 1.9 mph

Median Speed = 23.7 mph
15th Percentile Speed = 20.5 mph
85th Percentile Speed = 26.9 mph



SPOT SPEED STUDY

Date: 10/31/05
 Location: Beach 57 St between Rockaway Boulevard and Beach Channel Drive
 Surveyor: Richard Calvache

Time: 11:00 PM

School: J.H.S 198
 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	0	0.0%	0.0%	0	0
23	0	0.0%	0.0%	0	0
24	0	0.0%	0.0%	0	0
25	0	0.0%	0.0%	0	0
26	0	0.0%	0.0%	0	0
27	0	0.0%	0.0%	0	0
28	0	0.0%	0.0%	0	0
29	1	50.0%	50.0%	29	841
30	1	50.0%	100.0%	30	900
31	0	0.0%	100.0%	0	0
32	0	0.0%	100.0%	0	0
33	0	0.0%	100.0%	0	0
34	0	0.0%	100.0%	0	0
35	0	0.0%	100.0%	0	0
36	0	0.0%	100.0%	0	0
37	0	0.0%	100.0%	0	0
38	0	0.0%	100.0%	0	0
39	0	0.0%	100.0%	0	0
40	0	0.0%	100.0%	0	0
41	0	0.0%	100.0%	0	0
42	0	0.0%	100.0%	0	0
43	0	0.0%	100.0%	0	0
44	0	0.0%	100.0%	0	0
45	0	0.0%	100.0%	0	0
46	0	0.0%	100.0%	0	0
47	0	0.0%	100.0%	0	0
48	0	0.0%	100.0%	0	0
49	0	0.0%	100.0%	0	0
50	0	0.0%	100.0%	0	0
51	0	0.0%	100.0%	0	0
52	0	0.0%	100.0%	0	0
53	0	0.0%	100.0%	0	0
54	0	0.0%	100.0%	0	0
55	0	0.0%	100.0%	0	0
56	0	0.0%	100.0%	0	0
	2	100.0%		59	1741

Mean Speed = 29.5 mph
 Standard Deviation = 0.7 mph
 Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 29.5 mph
 15th Percentile Speed = 28.8 mph
 85th Percentile Speed = 30.2 mph

SPOT SPEED STUDY

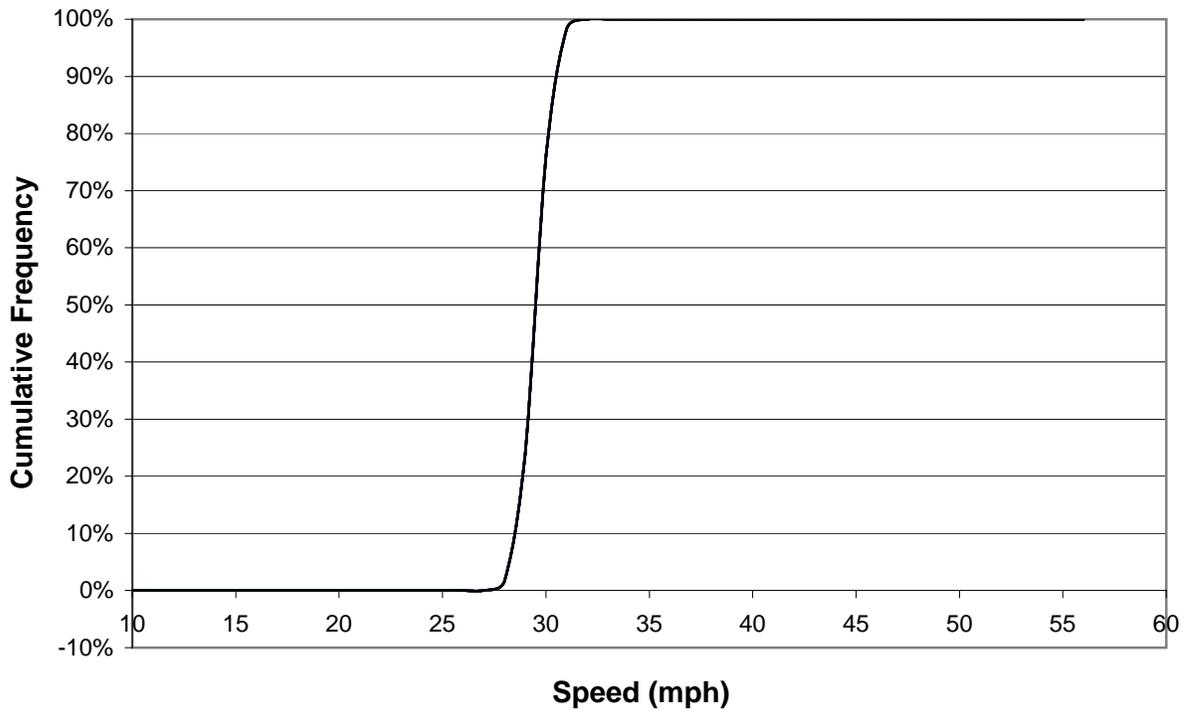
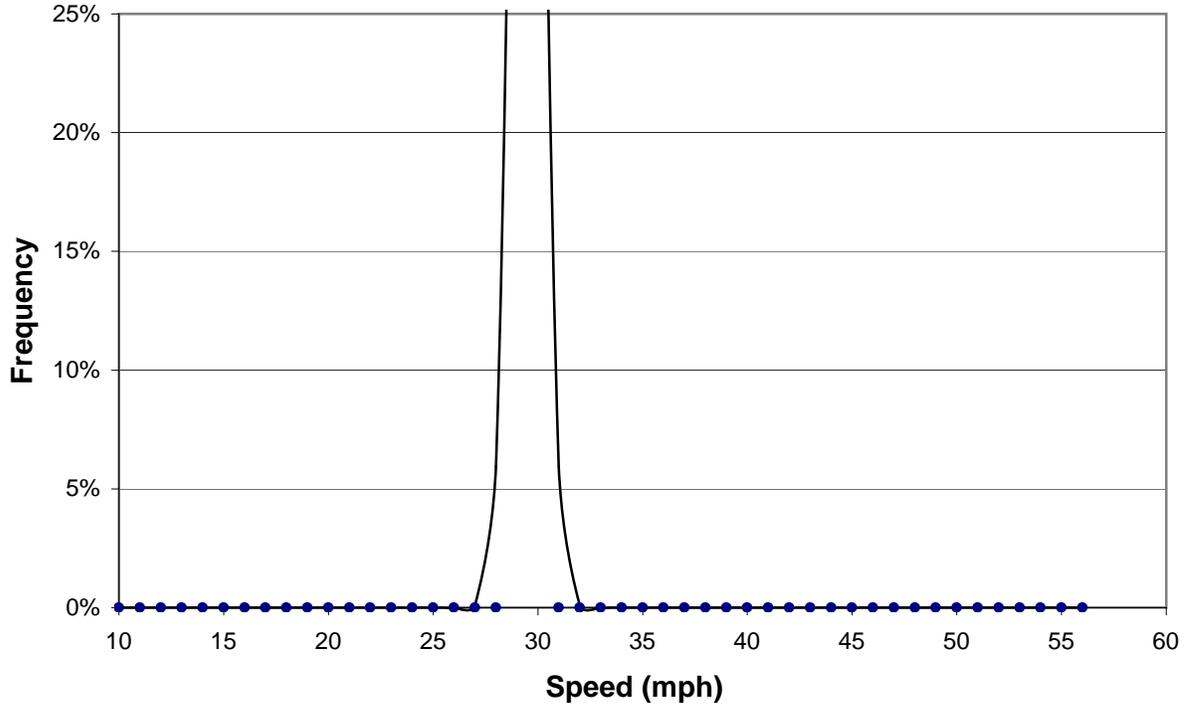
Date: 10/31/05
Location: Beach 57 St between Rockaway Boulevard and Beach Channel Drive
Surveyor: Richard Calvache

Time: 11:00 PM

School: J.H.S 198
Direction: NB
Comments:

Mean Speed = 29.5 mph
Standard Deviation = 0.7 mph
Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 29.5 mph
15th Percentile Speed = 28.8 mph
85th Percentile Speed = 30.2 mph



SPOT SPEED STUDY

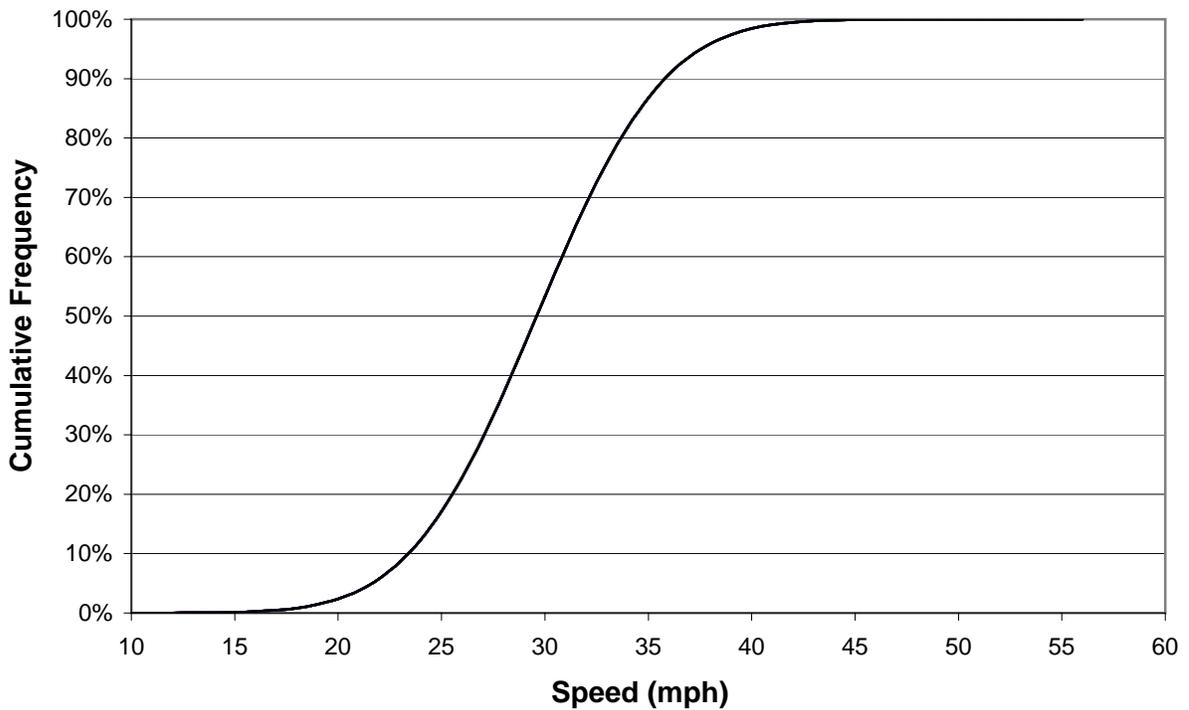
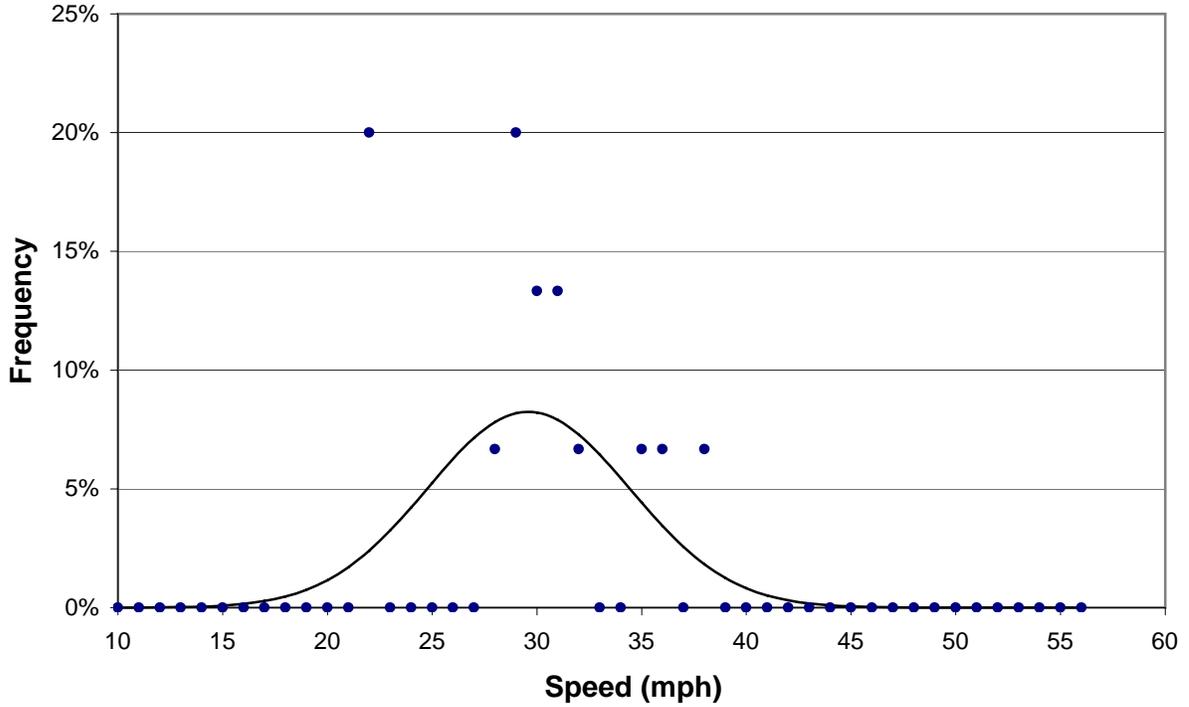
Date: **10/31/05** Time: **11:00 PM**
 Location: **Beach 57 St between Rockaway Boulevard and Beach Channel Drive**
 Surveyor: **Richard Calvache**

School: **J.H.S 198**
 Direction: **SB**
 Comments:

Mean Speed = 29.6 mph
Median Speed = 29.6 mph

Standard Deviation = 4.8 mph
15th Percentile Speed = 24.6 mph

Margin of Error (95% Confidence) = ± 2.4 mph
85th Percentile Speed = 34.6 mph

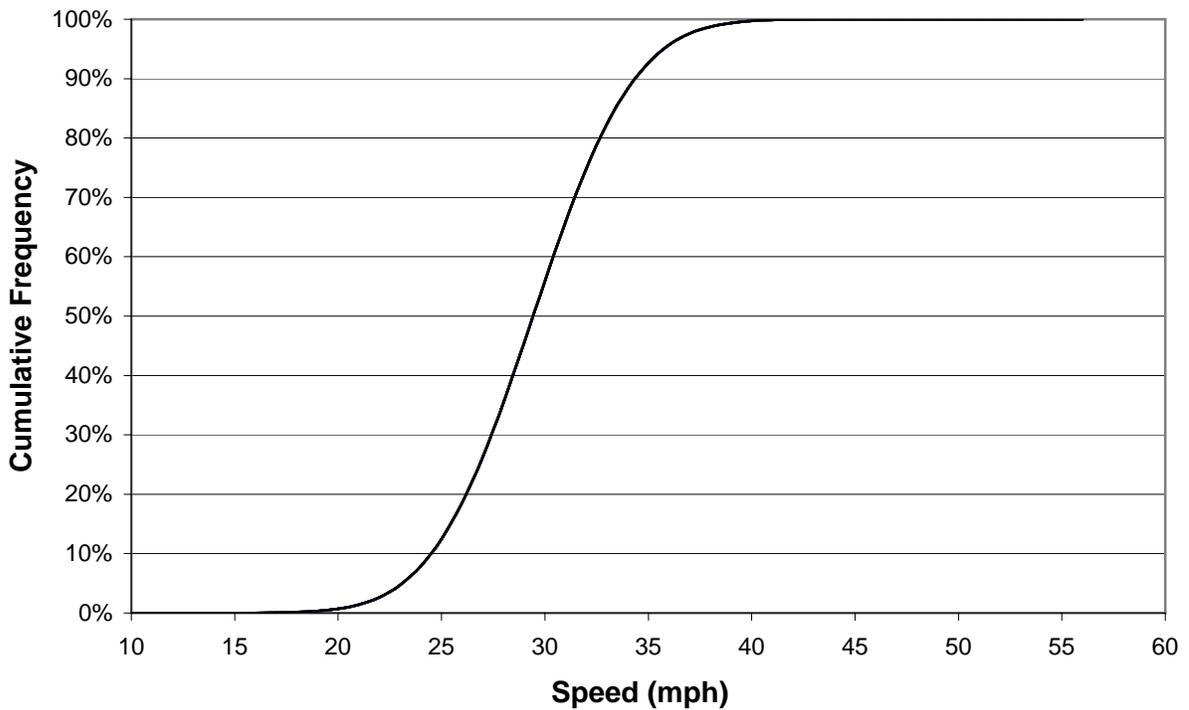
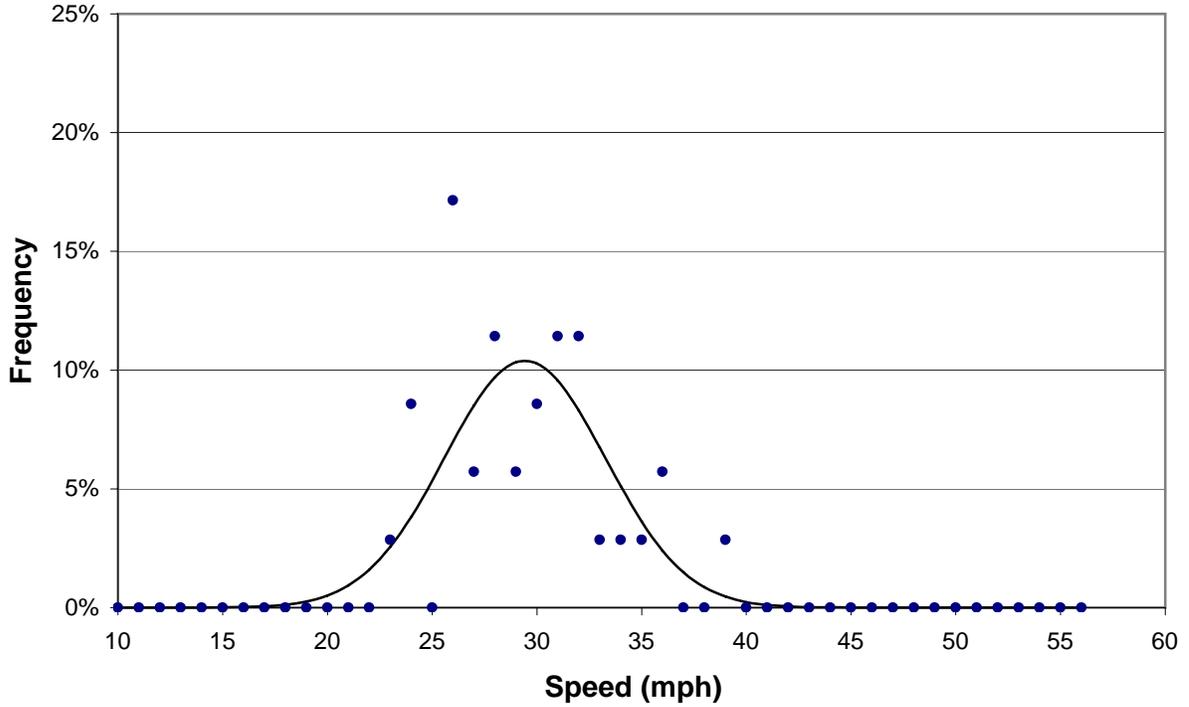


SPOT SPEED STUDY

Date: **10/31/05** Time: **1:10 PM**
 Location: **Beach Channel Drive between Beach 57 St and Beach 58 St**
 Surveyor: **Richard Calvache**

School: **J.H.S 198**
 Direction: **EB**
 Comments:

Mean Speed = 29.4 mph Median Speed = 29.4 mph
 Standard Deviation = 3.8 mph 15th Percentile Speed = 25.5 mph
 Margin of Error (95% Confidence) = ± 1.3 mph 85th Percentile Speed = 33.4 mph

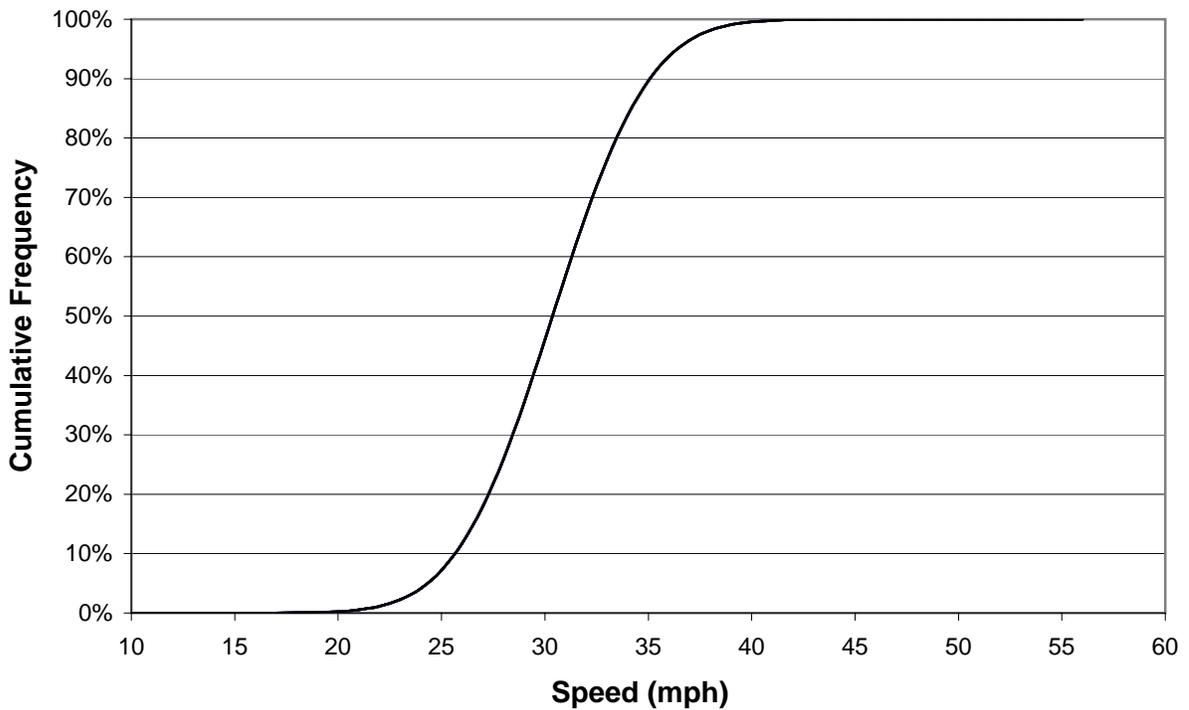
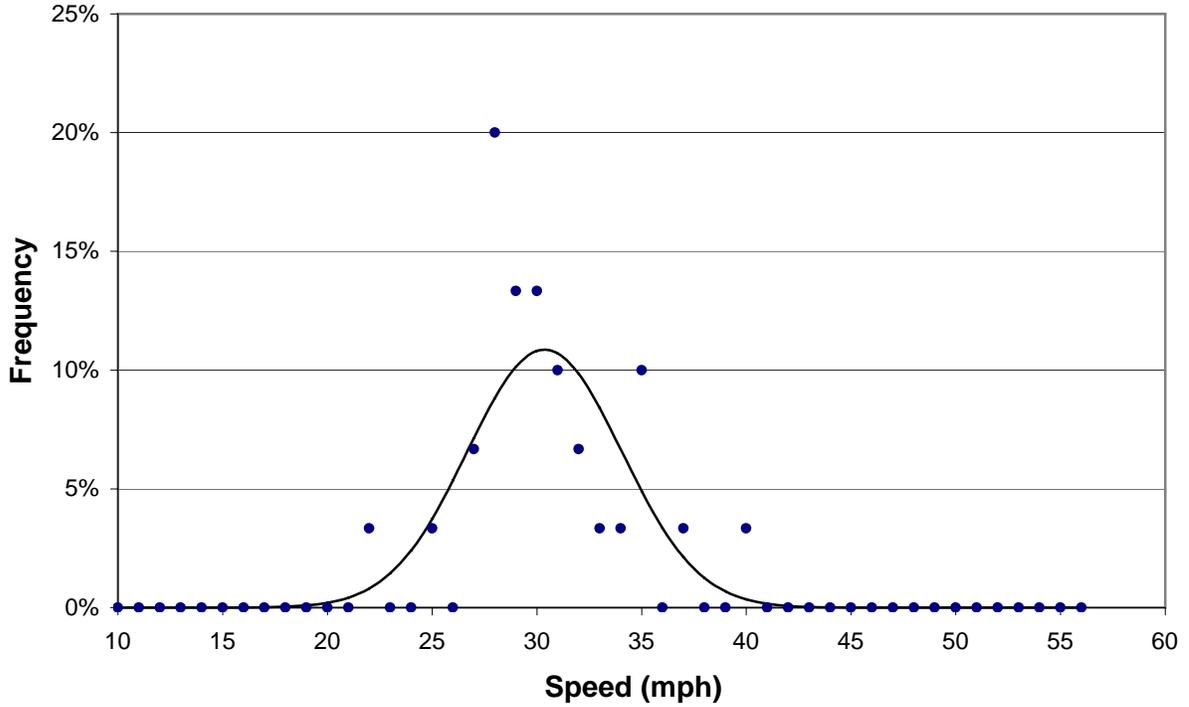


SPOT SPEED STUDY

Date: **10/31/05** Time: **1:10 PM**
 Location: **Beach Channel Drive between Beach 57 St and Beach 58 St**
 Surveyor: **Richard Calvache**

School: **J.H.S 198**
 Direction: **WB**
 Comments:

Mean Speed = 30.4 mph Median Speed = 30.4 mph
 Standard Deviation = 3.7 mph 15th Percentile Speed = 26.6 mph
 Margin of Error (95% Confidence) = ± 1.3 mph 85th Percentile Speed = 34.2 mph



SPOT SPEED STUDY

Date: 10/31/05
 Location: Rockaway Boulevard between Beach 54 St and Beach 56 St
 Surveyor: Richard Calvache

Time: 11:00 PM

School: J.H.S 198
 Direction: EB
 Comments:

Speed S (mph)	No. of Vehicles in Group n	% of Vehicles in Group	% Cumulative Vehicles	nS	nS ²
8	0	0.0%	0.0%	0	0
9	0	0.0%	0.0%	0	0
10	0	0.0%	0.0%	0	0
11	0	0.0%	0.0%	0	0
12	0	0.0%	0.0%	0	0
13	0	0.0%	0.0%	0	0
14	0	0.0%	0.0%	0	0
15	0	0.0%	0.0%	0	0
16	0	0.0%	0.0%	0	0
17	0	0.0%	0.0%	0	0
18	0	0.0%	0.0%	0	0
19	0	0.0%	0.0%	0	0
20	0	0.0%	0.0%	0	0
21	0	0.0%	0.0%	0	0
22	0	0.0%	0.0%	0	0
23	0	0.0%	0.0%	0	0
24	0	0.0%	0.0%	0	0
25	0	0.0%	0.0%	0	0
26	1	2.0%	2.0%	26	676
27	0	0.0%	2.0%	0	0
28	2	4.1%	6.1%	56	1568
29	1	2.0%	8.2%	29	841
30	5	10.2%	18.4%	150	4500
31	2	4.1%	22.4%	62	1922
32	4	8.2%	30.6%	128	4096
33	3	6.1%	36.7%	99	3267
34	7	14.3%	51.0%	238	8092
35	8	16.3%	67.3%	280	9800
36	7	14.3%	81.6%	252	9072
37	1	2.0%	83.7%	37	1369
38	4	8.2%	91.8%	152	5776
39	2	4.1%	95.9%	78	3042
40	1	2.0%	98.0%	40	1600
41	1	2.0%	100.0%	41	1681
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
	49	100.0%		1668	57302

Mean Speed = 34.0 mph
 Standard Deviation = 3.3 mph
 Margin of Error (95% Confidence) = ± 0.9 mph

Median Speed = 34.0 mph
 15th Percentile Speed = 30.6 mph
 85th Percentile Speed = 37.5 mph

SPOT SPEED STUDY

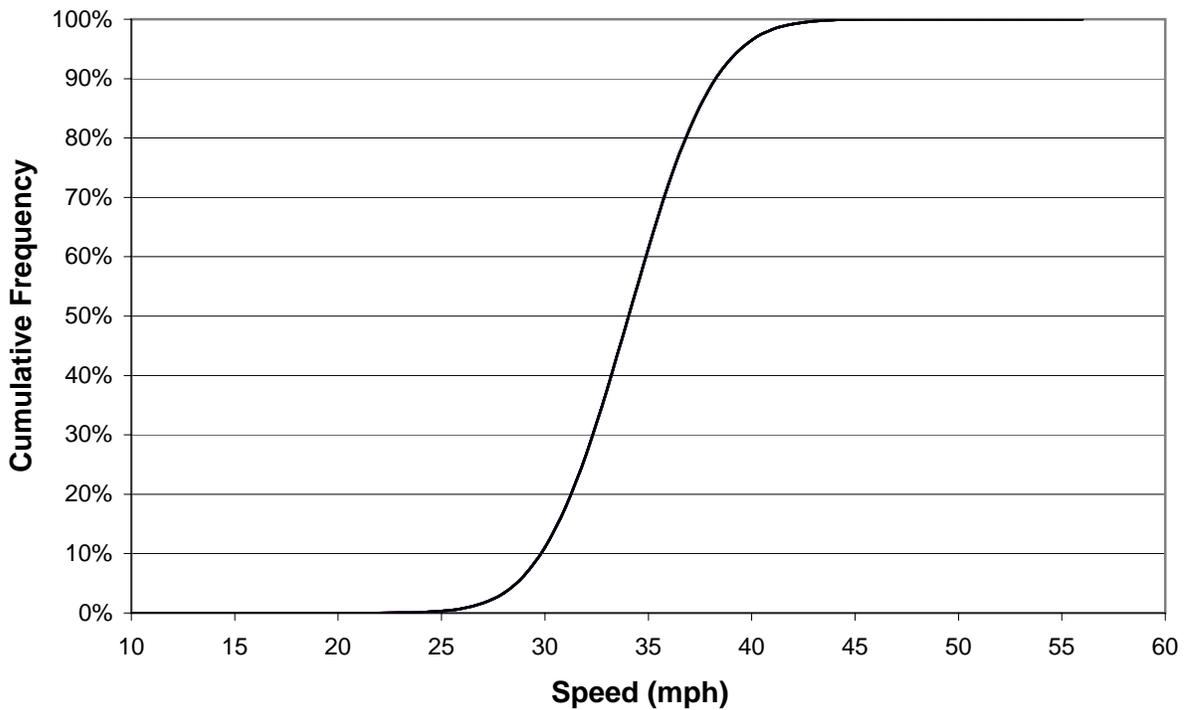
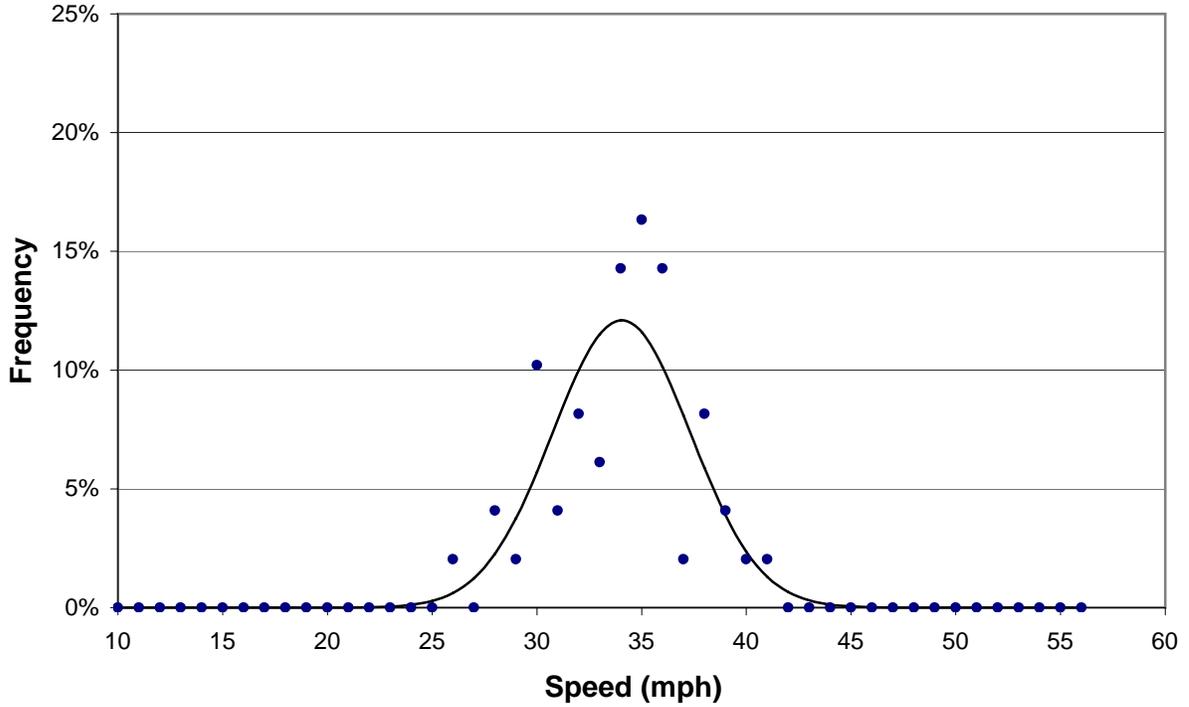
Date: 10/31/05
Location: Rockaway Boulevard between Beach 54 St and Beach 56 St
Surveyor: Richard Calvache

Time: 11:00 PM

School: J.H.S 198
Direction: EB
Comments:

Mean Speed = 34.0 mph
Standard Deviation = 3.3 mph
Margin of Error (95% Confidence) = ± 0.9 mph

Median Speed = 34.0 mph
15th Percentile Speed = 30.6 mph
85th Percentile Speed = 37.5 mph



SPOT SPEED STUDY

Date: 10/31/05
 Location: Rockaway Boulevard between Beach 54 St and Beach 56 St
 Surveyor: Richard Calvache

Time: 11:00 PM

School: J.H.S 198
 Direction: WB
 Comments:

Speed S (mph)	No. of Vehicles in Group n	% of Vehicles in Group	% Cumulative Vehicles	nS	nS ²
8	0	0.0%	0.0%	0	0
9	0	0.0%	0.0%	0	0
10	0	0.0%	0.0%	0	0
11	0	0.0%	0.0%	0	0
12	0	0.0%	0.0%	0	0
13	0	0.0%	0.0%	0	0
14	0	0.0%	0.0%	0	0
15	0	0.0%	0.0%	0	0
16	0	0.0%	0.0%	0	0
17	0	0.0%	0.0%	0	0
18	0	0.0%	0.0%	0	0
19	0	0.0%	0.0%	0	0
20	0	0.0%	0.0%	0	0
21	0	0.0%	0.0%	0	0
22	0	0.0%	0.0%	0	0
23	0	0.0%	0.0%	0	0
24	0	0.0%	0.0%	0	0
25	0	0.0%	0.0%	0	0
26	1	1.3%	1.3%	26	676
27	0	0.0%	1.3%	0	0
28	2	2.6%	3.8%	56	1568
29	4	5.1%	9.0%	116	3364
30	4	5.1%	14.1%	120	3600
31	4	5.1%	19.2%	124	3844
32	9	11.5%	30.8%	288	9216
33	4	5.1%	35.9%	132	4356
34	4	5.1%	41.0%	136	4624
35	4	5.1%	46.2%	140	4900
36	6	7.7%	53.8%	216	7776
37	13	16.7%	70.5%	481	17797
38	6	7.7%	78.2%	228	8664
39	4	5.1%	83.3%	156	6084
40	4	5.1%	88.5%	160	6400
41	4	5.1%	93.6%	164	6724
42	2	2.6%	96.2%	84	3528
43	2	2.6%	98.7%	86	3698
44	0	0.0%	98.7%	0	0
45	0	0.0%	98.7%	0	0
46	1	1.3%	100.0%	46	2116
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
	78	100.0%		2759	98935

Mean Speed = 35.4 mph
 Standard Deviation = 4.2 mph
 Margin of Error (95% Confidence) = ± 0.9 mph

Median Speed = 35.4 mph
 15th Percentile Speed = 31.0 mph
 85th Percentile Speed = 39.7 mph

SPOT SPEED STUDY

Date: 10/31/05
Location: Rockaway Boulevard between Beach 54 St and Beach 56 St
Surveyor: Richard Calvache

Time: 11:00 PM

School: J.H.S 198
Direction: WB
Comments:

Mean Speed = 35.4 mph
Standard Deviation = 4.2 mph
Margin of Error (95% Confidence) = ± 0.9 mph

Median Speed = 35.4 mph
15th Percentile Speed = 31.0 mph
85th Percentile Speed = 39.7 mph

