

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



School Safety Engineering Project

FINAL REPORT: P.S. 17 (Henry Thoreau School), Queens



Prepared by
The RBA Group/Urbitran Associates



MARCH 22, 2006

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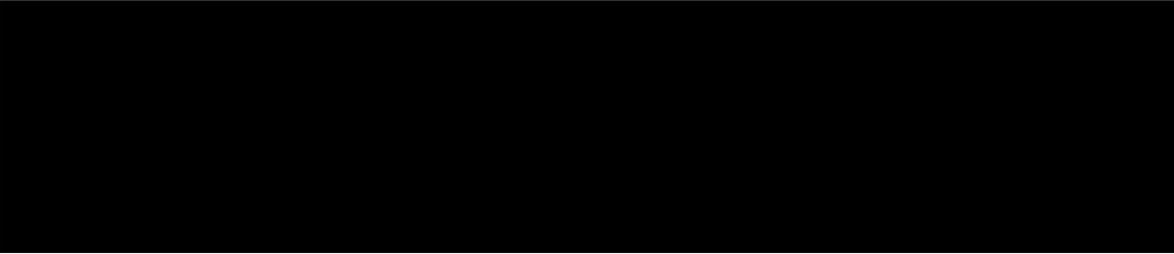
1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The Department of Transportation has developed school safety maps for 1,471 schools throughout the City. Schools currently in the program are primarily elementary and intermediate schools with an enrollment of at least 250 students. The safety plans include the designation of official school crosswalks, identified by prominent warning signs and roadway markings. DOT also designates curbside locations for school bus loading and unloading and other parking controls to improve conditions for students. In addition, nearly 350 speed reducers (humps) have been installed in the immediate vicinity of schools.

Under this consultant study, the School Safety Engineering Project, crash data in the vicinity of all program schools was reviewed. As a result, schools were ranked in terms of pedestrian safety, and 135 “priority” schools were identified Citywide. At each of these priority schools safety improvements are being recommended (e.g., new school crosswalks, new traffic signals and signal timing modifications, new speed reducers). In addition, 32 of these schools will receive further investigation to design physical improvements (e.g., raised center medians, widened sidewalks, “neckdowns” or “bulbouts” at intersections). P.S. 17 in Queens is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS

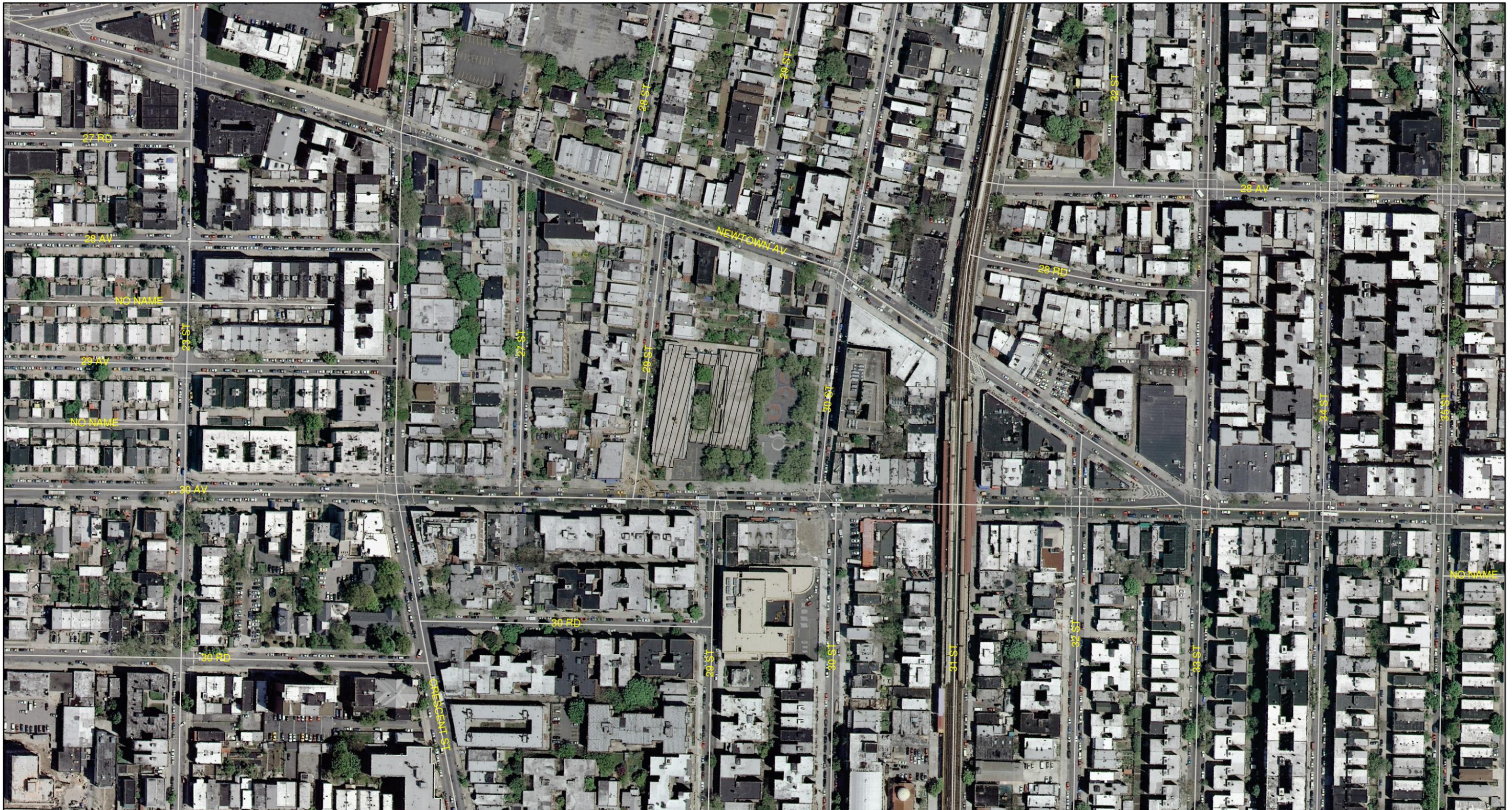


*Figure 1:30th Avenue;
Vicinity of P.S. 17, Astoria,
Queens*

2.2 NEIGHBORHOOD DESCRIPTION

The land use surrounding P.S. 17 is residential with mixed-use commercial. Thirtieth Avenue is an active commercial street, with restaurants, bakeries, grocery stores, a senior complex, Athens Park, and a branch of Mount Sinai Hospital all situated within two blocks of P.S. 17. The school's main entrance is on 29th Street.

The school's catchment area is roughly defined by the Triborough Bridge to the north, Broadway to the south, 35th Street to the east, and 21st Street to the west, although the western boundary does extend further to include Astoria Gardens, a large public housing project (see Exhibit 2 for Catchment Area). The elevated N/W train runs along 31st Street with a stop on 30th Avenue, 1 block southeast of the school.



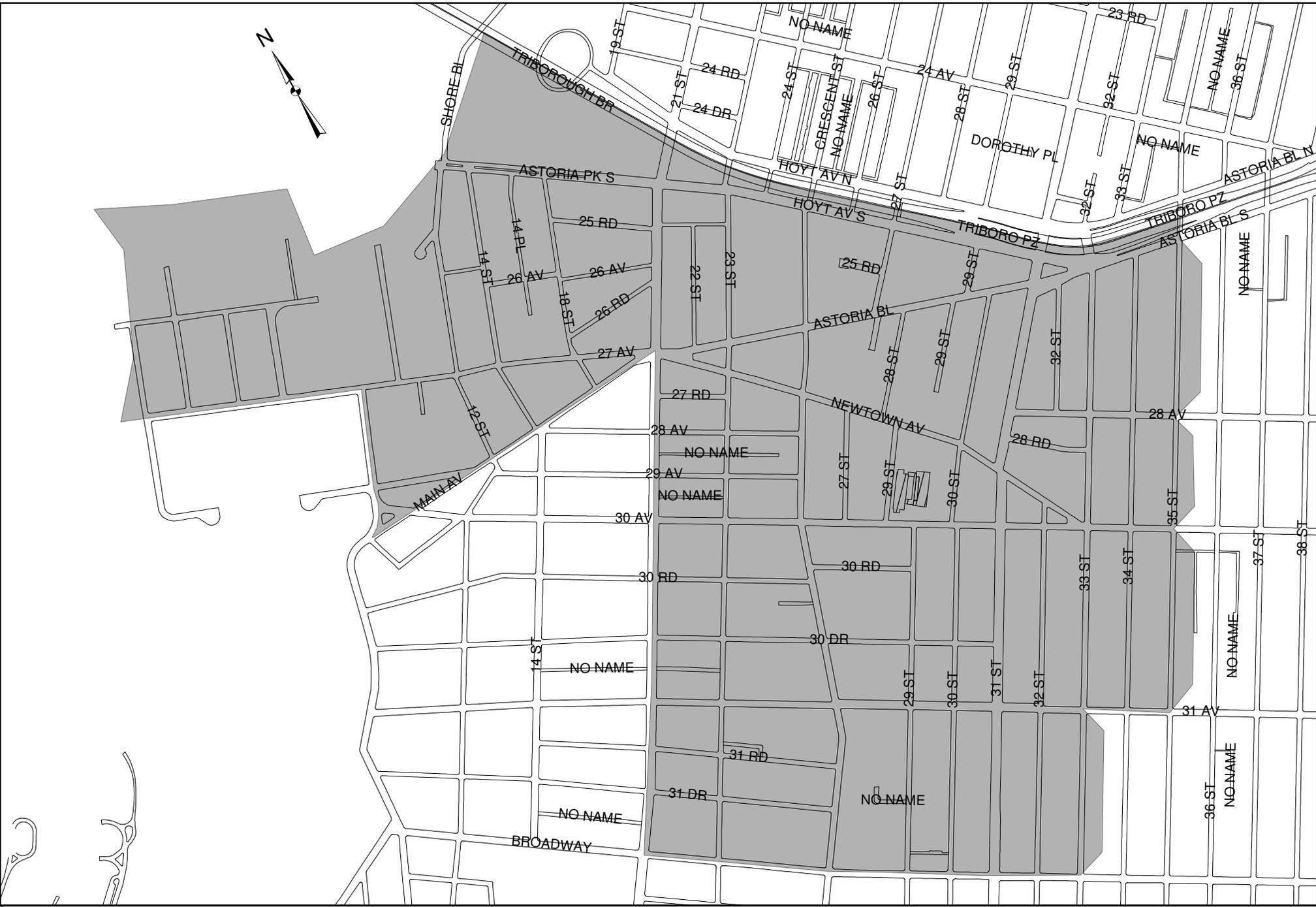
1 inch equals 200 feet

EXHIBIT 1
HENRY THOREAU SCHOOL
P.S. 17, QUEENS
AERIAL PHOTOGRAPH

2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant team met with representatives of P.S. 17 on the morning of January 29, 2004. Representatives from the schools included the supervising school aide, the school nurse, the NYPD school safety agent, the parent coordinator, the school counselor, and the interim acting assistant principal. A follow-up meeting with consultant staff and the principal only was held on February 5, 2004. The school representatives identified the following concerns regarding student pedestrian safety:

- In the afternoon, children cross 30th Avenue to the candy store, then cross back to the city bus stop in front of the Mount Sinai senior center (north side of 30th Avenue at 29th Street).
- Severe vehicle congestion at the school entrances during dismissal.
- Pedestrian congestion on the sidewalk of 30th Avenue.
- Students from other schools (including P.S. 234) add to the congestion and the vehicular and pedestrian traffic on surrounding streets.
- Mount Sinai Hospital ambulances need to negotiate traffic, complicating traffic and increasing congestion.
- Vehicles run traffic signals (on 30th Avenue).
- A recently-installed all-way stop sign at the intersection of 29th Street and Newtown Avenue is not observed by all motorists: many cars roll through the stop sign. School representatives indicated that they would like a signal.



1 inch equals 750 feet

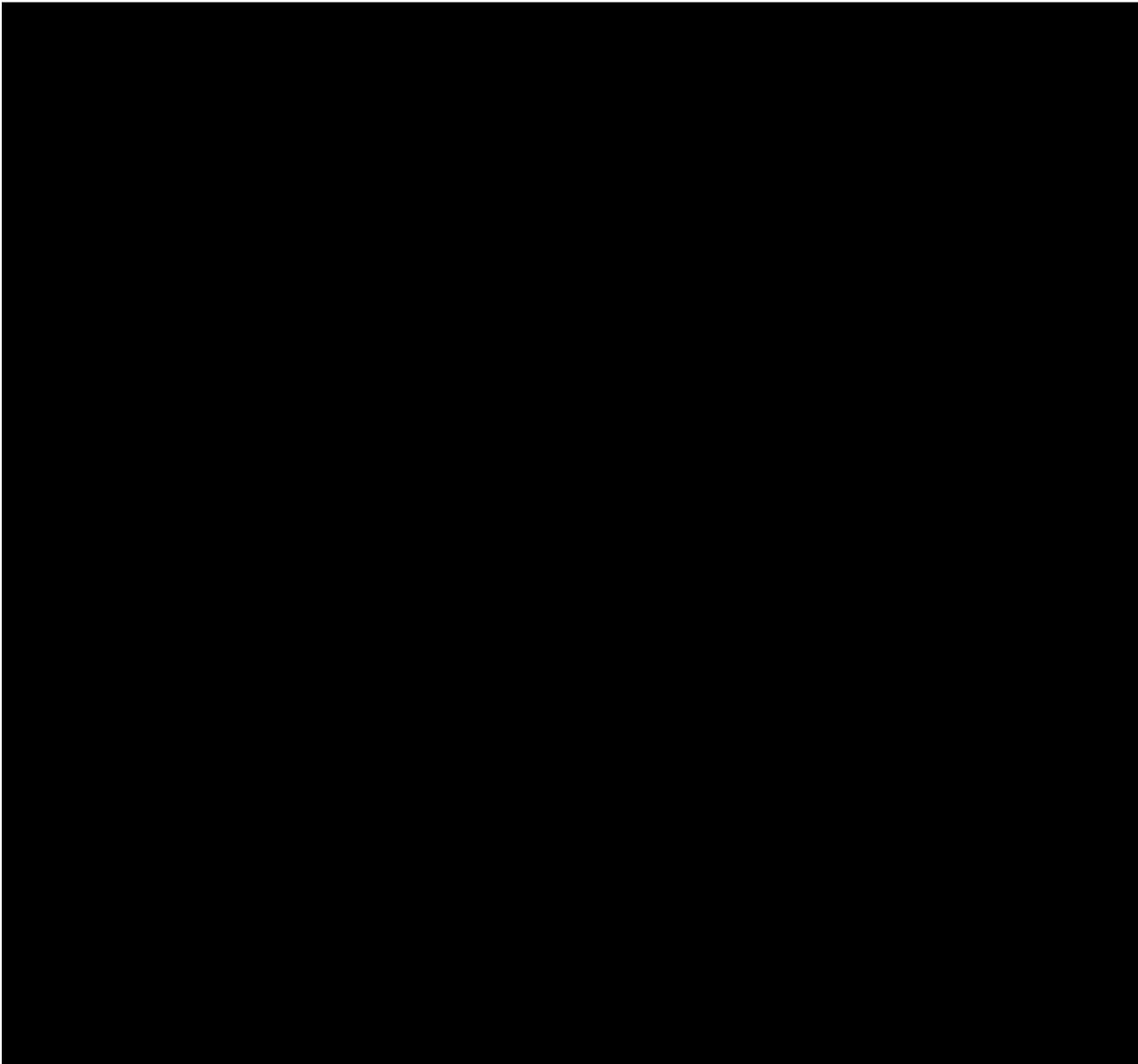
 **CATCHMENT AREA**

EXHIBIT 2

HENRY THOREAU SCHOOL

P.S. 17, QUEENS

CATCHMENT AREA



2.6 PRIMARY MODE OF TRANSPORT TO AND FROM SCHOOL

Table 1 indicates the approximate breakdown in mode of transportation used by students en route to and from school. Most students walk or are driven in a private vehicle to school.

TABLE 1: MODE OF TRAVEL (P.S. 17) (AS ESTIMATED BY SCHOOL OFFICIALS)	
DESCRIPTION	PERCENTAGE
Walk	32%
Driven by car	31%
School bus	24%
MTA bus or other city bus	13%
TOTAL	100%

2.7 OTHER PEDESTRIAN TRAFFIC GENERATORS

School officials indicated that students often visit the candy store across 30th Avenue after school. Other destinations include a karate school on 30th Avenue, and the Boys' and Girls' Club on 21st Street.

Other schools in the vicinity are P.S. 234/I.S. 235 located across 29th Street, St. Dimitrious School on 30th Drive at 30th Street, Mount Carmel School on Crescent Street at Newtown Avenue, and Ideal Islamic School on 31st Street near 28th Avenue.

2.8 CROSSING GUARD LOCATIONS

According to school representatives, there is one crossing guard assigned to P.S. 17 at the intersection of 30th Avenue and 29th Street (see Exhibit 4). P.S. 234, which is located across 30th Avenue from P.S. 17, confirmed that this is the only crossing guard assigned for these two schools.



School Traffic Safety Map



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

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

LEGEND:

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

**PS 17 Queens
HENRY DAVID THOREAU SCHOOL**

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

Map created on 11/17/2006

COMM. BOARD: 401
PRECINCT: 114



1 inch equals 250 feet



Crossing guard assigned to P.S. 17

EXHIBIT 4
HENRY THOREAU SCHOOL
P.S. 17, QUEENS

CROSSING GUARDS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

In order to be eligible for school busing, students in grades K-2 must live more than ½ mile from the school, and students in grades 3-5 must live more than one mile from the school.

School representatives indicated that 192 students travel to and from school via yellow school buses, and another 105 use private contractor buses. All yellow school buses drop off and pick students up on 29th Street, near the school's main entrance. For students arriving via MTA buses, the bus stop is located in front of the senior center on 30th Avenue at 29th Street, across the street from the school.



Figure 3: Bus stop across from P.S. 17 on 30th Avenue

According to observations taken at the school, students exiting school buses on 29th Street must navigate parked cars in front of the school in order to reach the school entrance. Regulations permit teacher parking in front of the school's main entrance.



Figure 4: Parked vehicles block the 29th Street entrance to P.S. 17

3.2 PARENT DROP-OFF OPERATIONS

According to the survey provided by the school representatives, approximately 31% of students at P.S. 17 are driven to and from school by parents or guardians. Field observations indicated that both 29th Street and 30th Avenue are utilized to drop-off students. 29th Street is only wide enough to accommodate one moving-lane of traffic; therefore, vehicles double-parked at arrival and dismissal cause delays. On 30th Avenue, children are dropped-off directly in front of the school's entrance. Several cars queue up and then make U-turns on 30th Avenue, which causes further congestion.

3.3 PARKING REGULATIONS

Exhibit 5 shows the existing parking regulations on the roadways surrounding P.S. 17.

“NO PARKING 7:00 AM – 4 PM SCHOOL DAYS EXCEPT BOARD OF EDUCATION” signs are posted on 29th Street between 30th Avenue and Newtown Avenue. Teacher parking is permitted on the east curbside of 29th Street.

Street cleaning regulations, which prohibit parking on alternating sides of the roadway, are in place near the school.



Figure 5: Parking regulations on 29th Street in front of P.S. 17

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Map, Exhibit 3, shows existing signs, signals, and pavement markings as of June 2004. It is noted that a citywide signage program is currently underway to upgrade school signage to current MUTCD standards of fluorescent yellow-green accompanied by downward pointing arrows. Signs scheduled to be installed under this program are shown as “existing” on Exhibit 8.

3.5 ACCIDENT SUMMARY

Exhibit 6 and Table 2 show a summary of accidents, as obtained from New York State Department of Motor Vehicles (DMV) in the vicinity of P.S. 17 for the three-year period from January 1, 1998 through December 1, 2000. The DMV data provides some detail relating to the cause of accidents. 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. Accidents are discussed in Section 3.6, Traffic Operations and Issues.



LEGEND

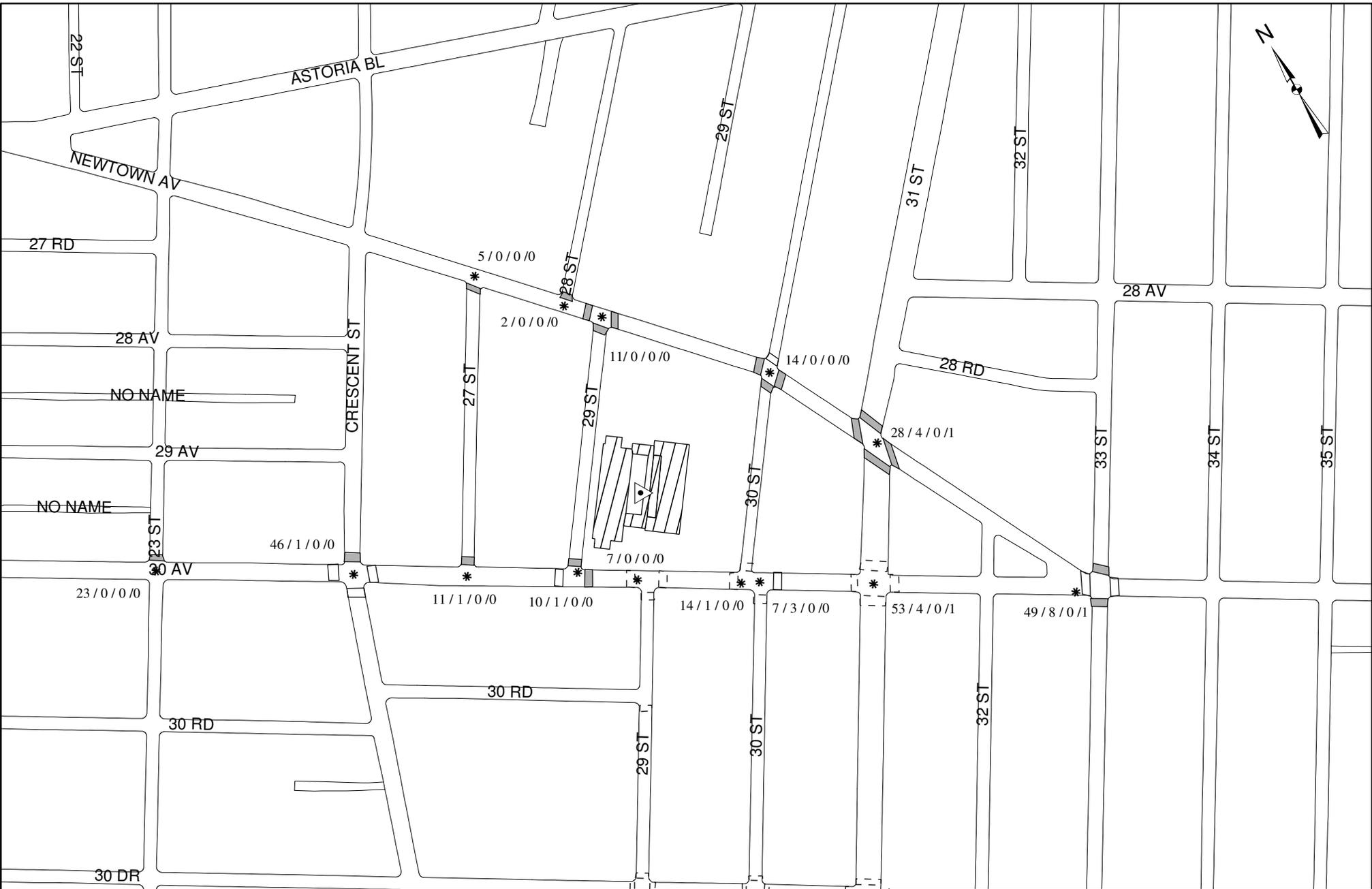
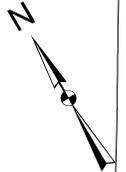
- ★ MAIN ENTRANCE
- ENTRANCE

EXHIBIT 5

**P.S. 17
 Henry Thoreau School
 QUEENS**

EXISTING PARKING REGULATIONS

SCALE: 1" : 150'



ACCIDENT LOCATION

SCHOOL CROSSWALK ASSIGNED TO P.S. 17

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL

CROSSWALK

X/X/X/X

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

*



1 inch equals 300 feet

EXHIBIT 6

**HENRY THOREAU SCHOOL
P.S. 17, QUEENS**

**ACCIDENT SUMMARY
THREE YEAR PERIOD
(1998-2000)**

TABLE 2: DMV THREE YEAR ACCIDENT SUMMARY (1998-2000)

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
30 th Avenue and 23 rd Street	23	0	0	0
30 th Avenue and Crescent Street	46	1	0	0
30 th Avenue and 27 th Street	11	1	0	0
30 th Avenue and 29 th Street (N) **	10	1	0	0
30 th Avenue and 29 th Street (S) **	7	0	0	0
30 th Avenue and 30 th Street (N) **	14	1	0	0
30 th Avenue and 30 th Street (S) **	7	3	0	0
30 th Avenue and 31 st Street	53	4	0	1
30 th Avenue and 33 rd Street/Newtown Avenue	49	8	0	1
Newtown Avenue and 27 th Street	5	0	0	0
Newtown Avenue and 28 th Street	2	0	0	0
Newtown Avenue and 29 th Street	11	0	0	0
Newtown Avenue and 30 th Street	14	0	0	0
Newtown Avenue and 31 st Street	28	4	0	1
Total	280	23	0	3

TABLE 3: NYPD FOUR YEAR ACCIDENT SUMMARY (2001-2004)

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
30 th Avenue and 23 rd Street	24	1	0	0
30 th Avenue and Crescent Street	101	8	0	0
30 th Avenue and 27 th Street	18	3	0	1
30 th Avenue and 29 th Street ***	32	6	0	1
30 th Avenue and 30 th Street ***	46	5	0	1
30 th Avenue and 31 st Street	108	14	0	0
30 th Avenue and 33 rd Street/Newtown Avenue	55	3	0	0
Newtown Avenue and 27 th Street	2	0	0	0
Newtown Avenue and 28 th Street	1	0	0	0
Newtown Avenue and 29 th Street	14	0	0	0
Newtown Avenue and 30 th Street	25	0	0	0
Newtown Avenue and 31 st Street	53	5	0	0
Total	479	45	0	3

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

** This is an offset intersection comprised of two T-junctions. See Figures 9 & 10.

***The NYPD Data from 2001-2004 combines the two T-junctions into one intersection.

3.6 TRAFFIC OPERATIONS AND ISSUES

The following sections outline the traffic accidents and operations issues at the intersections in the vicinity of P.S. 17.

3.6.1 30th Avenue and 23rd Street

The intersection of 30th Avenue and 23rd Street is controlled by an all-way stop. 30th Avenue is a two-way collector with one travel-lane in each direction and a parking lane on both sides. 23rd Street is a one-way northbound street with one travel lane and parking along both curbs. A school crosswalk is located on the north leg, across 23rd Street.



Figure 6: Intersection of 23rd Street and 30th Avenue

From 1998-2000, the accident data indicates that there were 23 accidents at this intersection, none of which involved a pedestrian. The NYPD accident data (Table 3) shows one pedestrian accident between 2001-2004. The accident was not school-related.

3.6.2 30th Avenue and Crescent Street

North of 30th Avenue, Crescent Street is a two-lane, two-way street with parking available on each side. South of 30th Avenue, Crescent Street is one-way southbound, with two travel lanes. The intersection is signalized with a school crosswalk designated on the north leg. Field observations indicated that vehicles traveling southbound on Crescent Street accelerated in advance to “make the light” at 30th Avenue, at times crossing over into the northbound travel lane in anticipation of the street becoming one-way (see Figure 7).



Figure 7: Vehicle crossing over centerline while traveling southbound on Crescent Street

Forty-six accidents occurred at this intersection from 1998-2000. One accident involved a pedestrian, although it was not school-related. The pedestrian was crossing without a signal while the vehicle was turning left onto Crescent Street. The NYPD accident data from 2001-2004 shows 8 pedestrian accidents at this intersection. None of these were school-related.

3.6.3 30th Avenue and 27th Street

27th Street is a one-way southbound street with parking along each side. It dead-ends into 30th Avenue at an unsignalized intersection. There is a school crosswalk on the north leg.



Figure 8: Intersection of 30th Avenue and 27th Street

Accident data from 1998-2000 revealed that 11 accidents occurred at this intersection, one involving a pedestrian. This accident was not school-related. The accident was due to driver inattention while traveling south as the pedestrian was crossing outside the crosswalk.

NYPD accident data from 2001-2004 included three pedestrian accidents, one being school-related.

3.6.4 30th Avenue and 29th Street

29th Street is a one-way northbound roadway with parking along each side. At 30th Avenue, there is an offset intersection comprised of two t-junctions. From the south, 29th Street dead-ends directly in front of the entrance to P.S. 17. It continues northbound again offset approximately 138' to the west and runs adjacent to the school (see Figure 9).

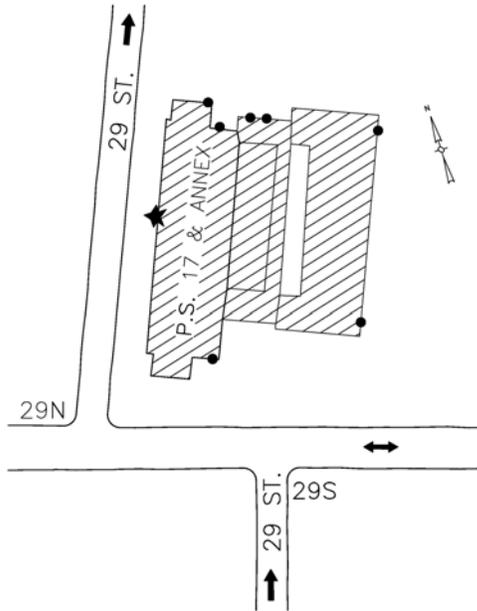


Figure 9: Intersection of 29th Street and 30th Avenue

Intersection 29N is signalized with school crosswalks on the north and east legs. Intersection 29S is also signalized with school crosswalks on all three legs. The accident data from 1998-2000 identifies this as two separate intersections, with a total of 17 accidents. (see Exhibit 6) One of these accidents involved a pedestrian; it was not school-related. The pedestrian was crossing against the signal while the vehicle was traveling westbound on 30th Avenue.

The NYPD accident data from 2001-2004 shows one school-related accident at this intersection. No additional information is available regarding this accident.

To determine the operating speeds on Newtown Avenue and East 29th Street speed data was collected on January 5, 2006. The speed study results are shown in Table 4.

TABLE 4: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
Newtown Avenue btw. 29 th Street and 30 th Street	24	27
29 th Street btw. Newtown Avenue and 30 Avenue	26	29

3.6.5 30th Avenue and 30th Street

30th Street is a one-way southbound street with one travel lane and parking on each side. Similar to 29th Street, the intersection of 30th Street with 30th Avenue is an offset intersection comprised of two t-junctions (see Figure 10). School crosswalks are designated on the north, south, and west legs of the signalized intersection.

The accident data from 1998-2000 identifies this as two separate intersections, with a total of 21 accidents (see Exhibit 6). Four of these accidents involved a pedestrian; none of them were school-related. Two of these accidents were due to driver inattention while reversing the vehicle. In the other accidents, the pedestrian was crossing outside the crosswalk.

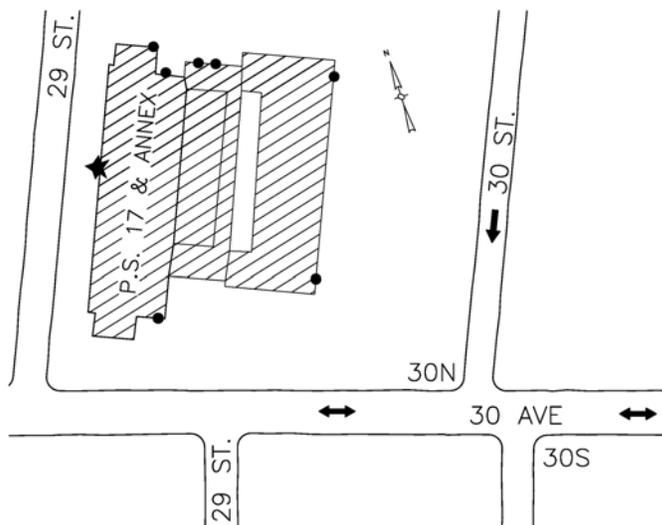


Figure 10: Intersection of 30th Street and 30th Avenue

The NYPD accident data from 2001-2004 shows one school-related accident at this intersection. No additional information is available regarding this accident.

At the northwest corner of 30N, the pedestrian ramp is missing (see Figure 11). A traffic signal pole is located on the corner where the pedestrian ramp should be installed.



Figure 11: Intersection of 30th Street and 30th Avenue without pedestrian ramp

3.6.6 30th Avenue and 31st Street

The intersection of 30th Avenue with 31st Street, a two-way street with parking on each side, is signalized with school crosswalks on all legs. The 1998-2000 accident data indicates four pedestrian accidents occurred at this intersection; one of them was school-related. The pedestrian was crossing against the signal while the vehicle was traveling south. In two of the other accidents, the pedestrian was crossing with the signal and was struck due to driver inattention. The other accident resulted from a pedestrian crossing against the signal while the driver was traveling north.



Figure 12: Station for N & W elevated subway line at the intersection of 30th Avenue and 31st Street

The NYPD accident data indicates that there were 108 accidents at this intersection from 2001-2004. Fourteen of these accidents involved pedestrians, though none of them were school-related. This is a heavily traveled intersection with the elevated subway station

for trains N and W located at this intersection. Subway columns reduce visibility for both vehicles and pedestrians.

3.6.7 30th Avenue, 33rd Street, and Newtown Avenue

This five-leg signalized intersection has school crosswalks on the north and south legs crossing 33rd Street, a one-way northbound street with two travel lanes and parking on both sides. Newtown Avenue is a one-way northwest roadway between 33rd Street and 31st Street, with metered parking on both sides of the street. West of 31st Street, Newtown Avenue is two-way, with one travel lane in each direction and metered parking on both sides of the street.

Accident data from 1998-2000 revealed that 8 pedestrian accidents occurred at this intersection, one of which was school related. This accident, along with 4 of the other accidents at this intersection, was due to driver inattention while the pedestrian was crossing with the signal. The NYPD accident data indicates 3 pedestrian accidents from 2001-2004; none of these were school-related.



Figure 13: Looking west on Newtown Avenue, at the intersection with 33rd Street and 30th Avenue

3.6.8 Newtown Avenue and 27th Street

At 27th Street, Newtown Avenue is a two-way collector street with parking on each side. The intersection is unsignalized and has a school crosswalk on the south leg. Accident data from 1998-2000 indicates that there were 5 accidents at this intersection, none of which involved a pedestrian. The NYPD data from 2001-2004 shows two accidents at this intersection, none that were school-related or involved a pedestrian.

3.6.9 Newtown Avenue and 28th Street

28th Street is a one-way northbound roadway with parking available on each side. The intersection with Newtown Avenue is unsignalized with a school crosswalk on the north leg. From 1998-2000, two accidents occurred at this intersection, neither of which

involved a pedestrian. From 2001-2004, NYPD data shows only one accident at this location, which did not involve a pedestrian.

3.6.10 Newtown Avenue and 29th Street

This is a T-intersection, with 29th Street ending at Newtown Avenue. School crosswalks are designated on all 3 legs of the intersection. A total of 11 accidents occurred at this intersection between 1998-2000. Formerly, traffic on Newtown Avenue was uncontrolled. A two-way STOP sign was installed on Newtown Avenue in September 2003, making this an all-way STOP-controlled intersection (see Figure 14). According to school representatives and field observations, the majority of vehicles traveling on Newtown Avenue do not comply with the STOP control.



Figure 14: Stop at intersection of Newtown Avenue at 29th Street

The NYPD data from 2001-2004 indicate 14 accidents that occurred at this intersection. No pedestrians were involved. Traffic counts were taken at this intersection to analyze pedestrian and vehicle use (see Exhibit 7).

3.6.11 Newtown Avenue and 30th Street

30th Street is a one-way southbound roadway with parking on both sides. The intersection of Newtown Avenue and 30th Street is controlled by a two-phase signal. School crosswalks are assigned to all legs of the intersection except the north. Accident data from 1998-2000 shows 14 accidents, none of which involved a pedestrian. The NYPD data indicates that there were 25 accidents at this intersection between 2001-2004, but none involved pedestrians.



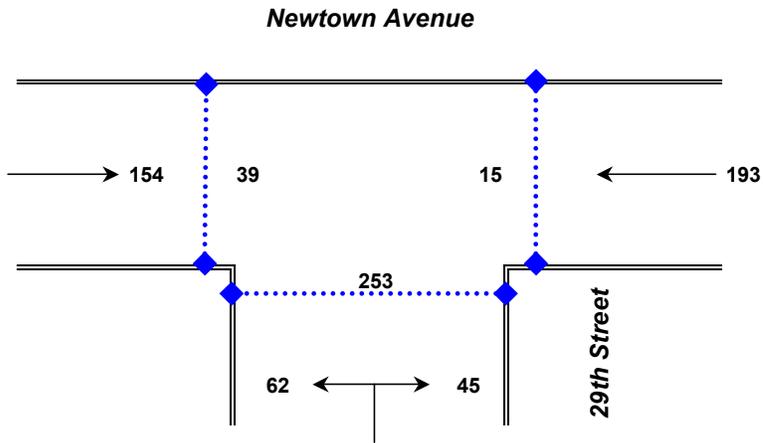
Figure 15: Intersection of Newtown Avenue and 30th Street

3.6.12 Newtown Avenue and 31st Street

The intersection of Newtown Avenue and 31st Street is signalized with school crosswalks on all 4 legs. 31st Street is a two-way arterial with parking permitted on both sides. West of 31st street, Newtown Avenue is two-way; east of 31st Street, Newtown Avenue is one-way northwest. The southbound traveling vehicles on 31st Street turning right onto Newtown Avenue do not stop on red, although no right turn on red is allowed. According to the field observations and review of the signal plan, this occurs because no red signal is located within the 60 degree cone of vision from the stop line for vehicles waiting to turn right.

Accident data from 1998-2000 indicates 4 accidents involving pedestrians, one of which was school-related. The pedestrian was crossing with the signal; no other information is available. The other 3 accidents all occurred while the driver was traveling north. The NYPD data from 2001-2004 shows 53 accidents, 5 of which involved a pedestrian. None of these were school-related.

One Hour Traffic Count Volumes
 (2:00pm - 3:00pm February 5, 2004)



Intersection of Newtown Avenue and 29th Street

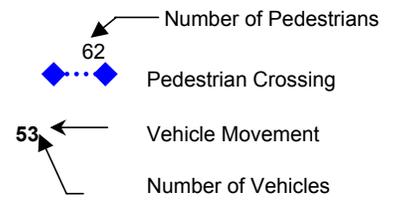


EXHIBIT 7
P.S. 17
TRAFFIC COUNTS

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 17. With a child pedestrian walking rate of 3ft/sec, the crossing time was found to be adequate in all directions and approaches. (see Table 5)

TABLE 5: PEDESTRIAN CROSSING TIME				
AT SIGNALIZED INTERSECTIONS IN THE VICINITY OF P.S. 17				
Intersection Name	Crosswalk Width (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)	Timing Adjustment? (Yes/No)
30th Avenue @ Crescent St.				
30 th Avenue	43	20	15	NO
Crescent St.	38	30	16	NO
30th Avenue @ 29th Street (West)				
30 th Avenue	38	20	13	NO
29 th Street	28	30	10	NO
30th Avenue @ 29th Street (East)				
30 th Avenue	38	20	13	NO
29 th Street (North)	28	30	10	NO
29 th Street (South)	28	30	10	NO
30th Avenue @ 30th Street				
30 th Avenue	37	20	13	NO
30 th Street	25	30	9	NO
30th Avenue @ 31st Street				
30 th Avenue.	39	20	13	NO
31 st Street	60	30	20	NO
30th Avenue @ 33 Street				
30 th Avenue	41	20	14	NO
33 rd Street	25	30	12	NO
Newtown Avenue @ 30th Street				
Newtown Avenue.	37	20	13	NO
30 th Street	32	30	11	NO
Newtown Avenue @ 31st Street				
Newtown Avenue	63	30	21	NO
31 st Street	72	50	24	NO
Newtown Avenue @ Crescent Street				
Newtown Avenue	37	31	13	NO
Crescent Street	38	19	16	NO

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

3.8 PHYSICAL CONDITIONS (ROADWAY AND SIDEWALK)

In general, roadways and sidewalks are in fair to good condition in the vicinity of the project. During a field visit on September 17, 2005, it was observed that several roadways in the area were recently repaved. As shown in the Figures 14 & 15, many crosswalks have not been re-stripped since the roadway was repaved. Other crosswalks in the area are in poor condition (see Figure 16).



Figure 16: Intersection of Newtown Avenue and Crescent Street

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

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

4.1 SHORT-TERM OPTIONS

- Administer student pedestrian safety education program

It is recommended that the NYCDOT, Safety City Program work with the school to educate the students on pedestrian safety including crossing the street with the WALK phase, and the meaning of WALK - FLASHING DON'T WALK - DON'T WALK pedestrian signal sequence. It is also recommended that the school dedicate a staff member to act as valet or greeter to expedite the time required for students to disembark from or enter vehicles.

- Install new school crosswalks

Existing school crosswalks are located on the north and south legs of the intersection of 33rd Street and 30th Avenue. Students traveling west from 33rd Street currently do not have designated school crosswalks until 31st Street. Therefore, new school crosswalks should be installed at the following locations:

- North and south legs of 30th Avenue at 32nd Street
- North leg of 30th Avenue at Newtown Avenue (see Exhibit 8 for detail).

- Upgrade No Parking to No Standing parking regulation on 29th Street

During arrival and dismissal, cars double-parked along the curb on 30th Avenue in front of P.S. 17 cause congestion. Additionally, yellow buses that drop off and pick up students on 29th Street currently have no designated area and must stop in the only travel lane. Therefore, the following parking regulations are recommended:

- “NO STANDING 7AM-4PM SCHOOL DAYS” signs be installed in front of school’s main entrance on 29th Street for a length of 60 feet. The lost teachers parking would be compensated by adding 60 feet of teachers parking further north on 29th Street.
- “No Parking, School Days 7am-4pm, Except Board of Education” signs should be upgraded to “No Standing, School Days 7am-4pm, Except Board of Education” (see Exhibit 8)

- Install a peg-a-track double yellow through the intersection of Crescent Street and 30th Avenue

As noted in section 3.6.2 southbound vehicles tend to crossover to the northbound lane in anticipation of street becoming one-way. Therefore, it is recommended that a peg-a-track double yellow be installed through the intersection and painted channelization at the south leg to serve as a blockbuster (see Exhibit 8). Existing parking on the east curb of the south leg would continue to be allowed.

- Upgrade traffic signal at 31st Street and Newtown Avenue intersection

As noted in Section 3.6.12 southbound vehicles on 31st Street turning right onto Newtown Avenue currently have a free right turn on red. To prohibit this free right turn it is recommended that a post-mounted traffic signal be installed at the southwest corner of this intersection (which falls within the 60 degree cone of vision). The right turn would be allowed only on green signal indication.

- Install Advance Stop Bars

Stop bars installed 10-feet in advance of the school crosswalk reduce the incidence of motorists stopping in the crosswalk. This allows pedestrians to proceed in a crosswalk before motor vehicles turn, reducing pedestrian vehicle conflicts. The stop bars should be installed at the following intersection:

- 29th Street and Newtown Avenue

- Install pedestrian ramps at required locations

Currently, several corners are either missing pedestrian ramps or are obstructed by signs or utility poles. All obstructions should be relocated and standard pedestrian ramps should be installed at the following locations:

- Northeast corner of 30th Street and 30th Avenue
- Northwest and northeast corner of Newtown Avenue and 30th Avenue.

The light pole at the northeast corner of 30th Street and 30th Avenue will have to be relocated to make space for a standard pedestrian ramp.

4.2 LONG-TERM RECOMMENDATIONS

- Consider curb extensions at the following intersections:
 - 30th Avenue and 33rd Street
 - 29th Street and 30th Avenue
 - Newtown Avenue and 29th Street

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

The purpose of the curb extensions is to shorten the crossing distance for pedestrians, and to reduce speeds of vehicles approaching and turning at school crosswalks.

These curb extensions will not eliminate or reduce the width of any moving lanes. Curb extensions are not proposed where they would hinder the ability of vehicles to turn. Final details pertaining to curb extensions will be developed during the Final Design/Contract Document preparation.

- Realign the intersection of Newtown Avenue and 30th Avenue

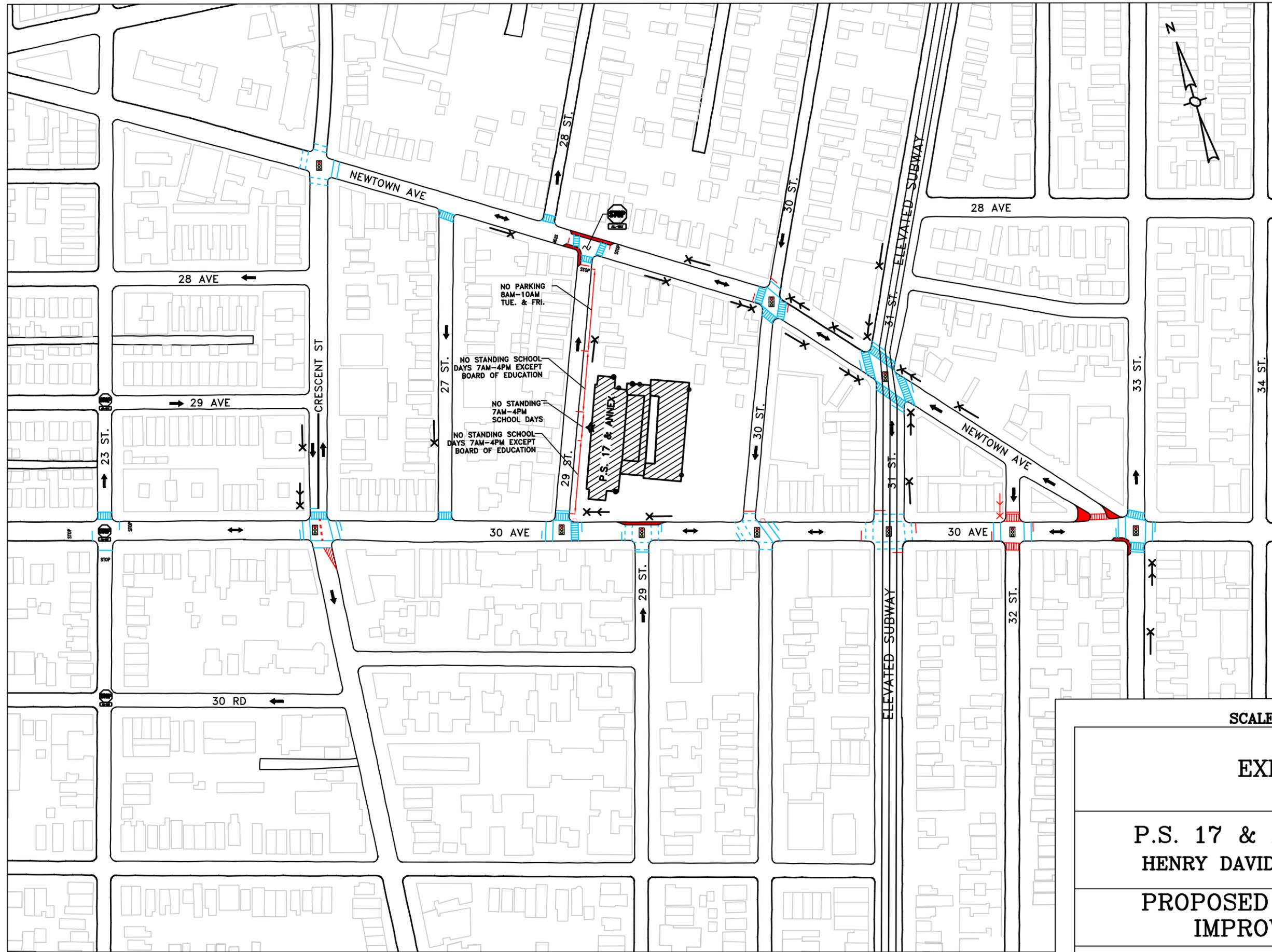
Figure 13 shows the existing condition of this intersection: flexible temporary bollards and a striped gore delineate the gore area (see the appendix). It is recommended that this area be normalized by the installation of a permanent curb and sidewalk at this location, which would realign the intersection and reduce the crossing distance for pedestrians (see Exhibit 8).

- *Install pedestrian ramps at required locations*

Currently, several corners are either missing pedestrian ramps or are obstructed by signs or utility poles. All obstructions should be relocated and standard pedestrian ramps should be installed at the following locations:

- Northeast corner of 30th Street and 30th Avenue
- Northwest and northeast corner of Newtown Avenue and 30th Avenue.

The light pole at the corner of 30th Street and 30th Avenue will have to be relocated to make space for a standard pedestrian ramp.



LEGEND

-  MAIN ENTRANCE
-  OTHER ENTRANCES
-  EXISTING ADVANCE WARNING SIGN WITH ARROW
-  EXISTING ADVANCE WARNING SIGN
-  EXISTING TRAVEL DIRECTION
-  SIGNALIZED INTERSECTION
-  EXISTING ALL-WAY STOP INTERSECTION
-  EXISTING SCHOOL CROSSWALK
-  EXISTING STANDARD (NON-SCHOOL) CROSSWALK
-  PROPOSED PEDESTRIAN RAMP
-  PROPOSED ADVANCE WARNING SIGN WITH ARROW
-  PROPOSED ADVANCE WARNING SIGN
-  PROPOSED STOP LINE
-  PROPOSED STANDARD CROSSWALK
-  PROPOSED SCHOOL CROSSWALK
-  PROPOSED TRAFFIC SIGN
-  PROPOSED CURB EXTENSION (NECKDOWN)
-  PROPOSED BOLLARD

SCALE: 1" : 200'

EXHIBIT 8

**P.S. 17 & ANNEX, QUEENS
HENRY DAVID THOREAU SCHOOL
PROPOSED MEASURES TO
IMPROVE SAFETY**

APPENDIX

SPOT SPEED STUDY

Date: **January 6, 2006** Time: **12:30 pm - 13:15 pm**
 Location: **Newton Avenue between 29th Street and 30th Street**
 Surveyor: **The RBA Group**

School: **P.S. 17**
 Direction: **East-West**
 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	2	1.8%	1.8%	36	648
19	1	0.9%	2.7%	19	361
20	4	3.6%	6.3%	80	1600
21	8	7.2%	13.5%	168	3528
22	13	11.7%	25.2%	286	6292
23	16	14.4%	39.6%	368	8464
24	21	18.9%	58.6%	504	12096
25	7	6.3%	64.9%	175	4375
26	14	12.6%	77.5%	364	9464
27	12	10.8%	88.3%	324	8748
28	4	3.6%	91.9%	112	3136
29	3	2.7%	94.6%	87	2523
30	4	3.6%	98.2%	120	3600
31	1	0.9%	99.1%	31	961
32	0	0.0%	99.1%	0	0
33	0	0.0%	99.1%	0	0
34	1	0.9%	100.0%	34	1156
35	0	0.0%	100.0%	0	0
36	0	0.0%	100.0%	0	0
37	0	0.0%	100.0%	0	0
38	0	0.0%	100.0%	0	0
39	0	0.0%	100.0%	0	0
40	0	0.0%	100.0%	0	0
41	0	0.0%	100.0%	0	0
42	0	0.0%	100.0%	0	0
43	0	0.0%	100.0%	0	0
44	0	0.0%	100.0%	0	0
45	0	0.0%	100.0%	0	0
46	0	0.0%	100.0%	0	0
47	0	0.0%	100.0%	0	0
48	0	0.0%	100.0%	0	0
49	0	0.0%	100.0%	0	0
50	0	0.0%	100.0%	0	0
51	0	0.0%	100.0%	0	0
52	0	0.0%	100.0%	0	0
53	0	0.0%	100.0%	0	0
54	0	0.0%	100.0%	0	0
55	0	0.0%	100.0%	0	0
56	0	0.0%	100.0%	0	0
	111	100.0%		2708	66952

Mean Speed = 24.4 mph Median Speed = 24.4 mph
 Standard Deviation = 2.8 mph 15th Percentile Speed = 21.5 mph
 Margin of Error (95% Confidence) = ± 0.5 mph 85th Percentile Speed = 27.3 mph

SPOT SPEED STUDY

Date: **January 6, 2006**

Time: **12:30 pm - 13:15 pm**

School: **P.S. 17**

Location: **Newton Avenue between 29th Street and 30th Street**

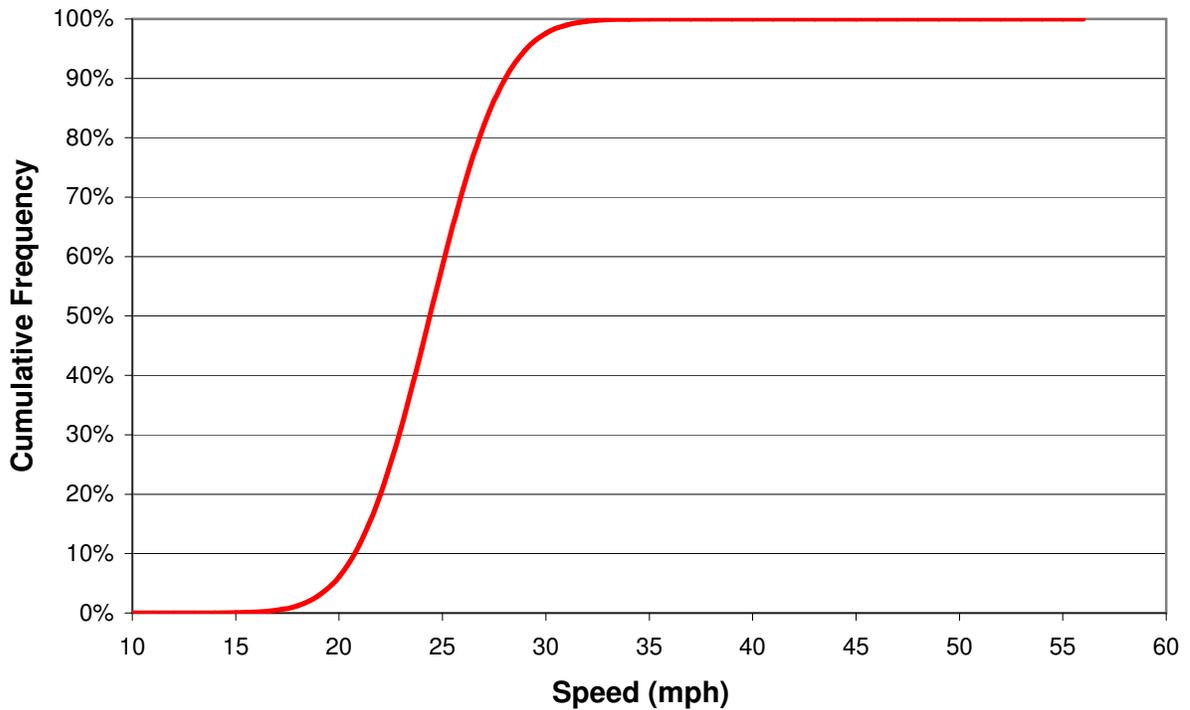
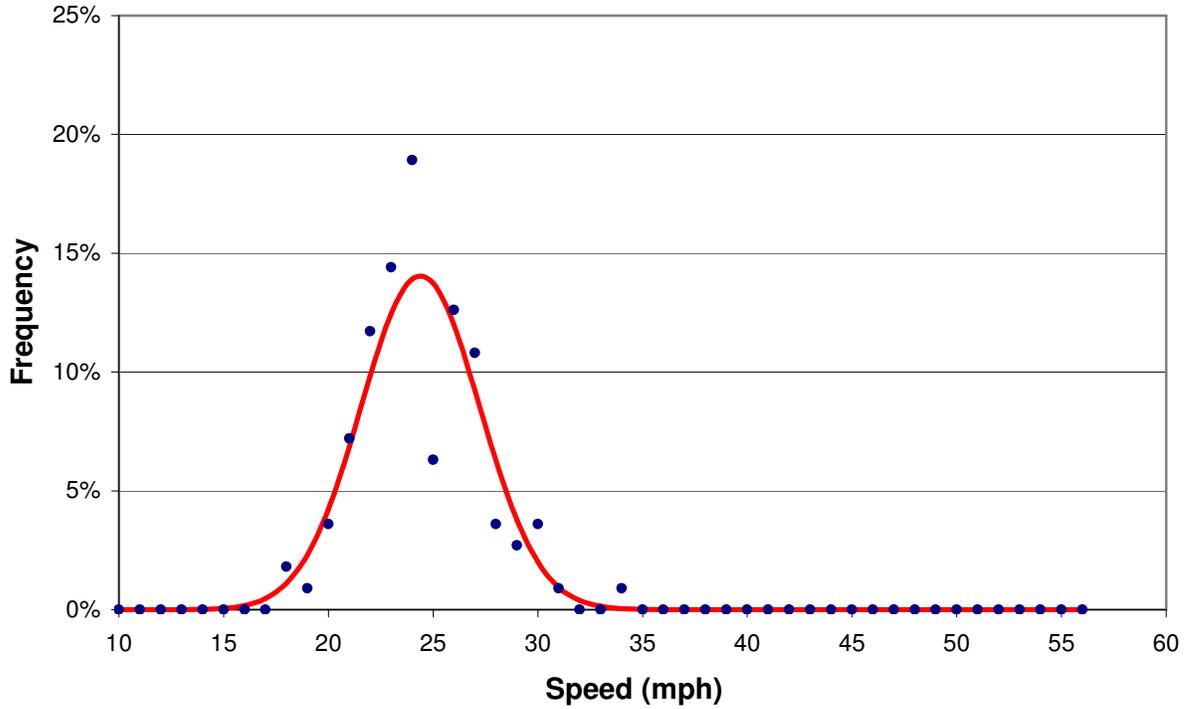
Direction: **East-West**

Surveyor: **The RBA Group**

Comments:

Mean Speed = 24.4 mph
Standard Deviation = 2.8 mph
Margin of Error (95% Confidence) = ± 0.5 mph

Median Speed = 24.4 mph
15th Percentile Speed = 21.5 mph
85th Percentile Speed = 27.3 mph



SPOT SPEED STUDY

Date: **January 6, 2006** Time: **13:15 pm - 14:15 pm**
 Location: **29th Street between Newton Avenue and 30th Street**
 Surveyor: **The RBA Group**

School: **P.S. 17**
 Direction: **North**
 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	2	3.2%	3.2%	40	800
21	1	1.6%	4.8%	21	441
22	3	4.8%	9.7%	66	1452
23	6	9.7%	19.4%	138	3174
24	13	21.0%	40.3%	312	7488
25	4	6.5%	46.8%	100	2500
26	8	12.9%	59.7%	208	5408
27	14	22.6%	82.3%	378	10206
28	4	6.5%	88.7%	112	3136
29	3	4.8%	93.5%	87	2523
30	2	3.2%	96.8%	60	1800
31	0	0.0%	96.8%	0	0
32	0	0.0%	96.8%	0	0
33	1	1.6%	98.4%	33	1089
34	0	0.0%	98.4%	0	0
35	0	0.0%	98.4%	0	0
36	0	0.0%	98.4%	0	0
37	0	0.0%	98.4%	0	0
38	1	1.6%	100.0%	38	1444
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
	62	100.0%		1593	41461

Mean Speed = 25.7 mph Median Speed = 25.7 mph
 Standard Deviation = 3.0 mph 15th Percentile Speed = 22.6 mph
 Margin of Error (95% Confidence) = ± 0.7 mph 85th Percentile Speed = 28.8 mph

SPOT SPEED STUDY

Date: **January 6, 2006**

Time: **13:15 pm - 14:15 pm**

School: **P.S. 17**

Location: **29th Street between Newton Avenue and 30th Street**

Direction: **North**

Surveyor: **The RBA Group**

Comments:

Mean Speed = 25.7 mph
Standard Deviation = 3.0 mph
Margin of Error (95% Confidence) = ± 0.7 mph

Median Speed = 25.7 mph
15th Percentile Speed = 22.6 mph
85th Percentile Speed = 28.8 mph

