

NEW YORK CITY DEPARTMENT OF TRANSPORTATION
Office of School Safety Engineering



School Safety Engineering Project

FINAL REPORT: P.S. 106, The Edward E. Hale School, Brooklyn



Prepared by
The RBA Group/Urbitran Associates



OCTOBER 27, 2006

School Safety Engineering Project
P.S. 106, The William H. Prescott School, Brooklyn

TABLE OF CONTENTS

1. INTRODUCTION.....	4
1.1 PROJECT DESCRIPTION.....	4
2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS	5
[REDACTED]	
2.2 NEIGHBORHOOD DESCRIPTION	5
2.3 MEETING WITH SCHOOL REPRESENTATIVES.....	8
[REDACTED]	
2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL.....	9
2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS	9
2.8 CROSSING GUARD LOCATIONS.....	11
3. TRAFFIC OPERATIONS	13
3.1 SCHOOL BUS OPERATIONS	13
3.2 PARENT DROP-OFF OPERATIONS	14
3.3 PARKING REGULATIONS	14
3.4 EXISTING SCHOOL SIGNS AND MARKINGS	16
3.5 ACCIDENT SUMMARY	17
3.6 TRAFFIC OPERATIONS AND ISSUES	19
3.7 SIGNAL TIMING: PEDESTRIAN PHASE.....	25
3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS).....	25
4. PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY	26
4.1 SHORT-TERM MEASURES	26
4.2 LONG-TERM MEASURES.....	27

EXHIBITS

EXHIBIT 1 - AERIAL PHOTOGRAPH.....	6
EXHIBIT 2 – TRAFFIC SAFETY MAP.....	7
EXHIBIT 3 – CATCHMENT AREA.....	10
EXHIBIT 4 – CROSSING GUARDS.....	12
EXHIBIT 5 – PARKING REGULATIONS	15
EXHIBIT 6 – ACCIDENT SUMMARY.....	18
EXHIBIT 7 – TRAFFIC COUNTS.....	22
EXHIBIT 8 – PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY	28

TABLES

TABLE 1: MODES OF TRAVEL	9
TABLE 2: DMV THREE-YEAR ACCIDENT SUMMARY (1998-2000).....	17
TABLE 3: NYPD FOUR-YEAR ACCIDENT SUMMARY (2001-2004).....	17
TABLE 4: SPOT SPEED STUDY (WILSON AVENUE)	20
TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS	25

APPENDIX

SPOT SPEED STUDY – WILSON AVE.	A-2
TRAFFIC COUNT (WILSON AVE. AND CORNELIA STREET).....	A-4
TRAFFIC COUNT (CORNELIA STREET AND KNICKERBOCKER AVE.).....	A-6

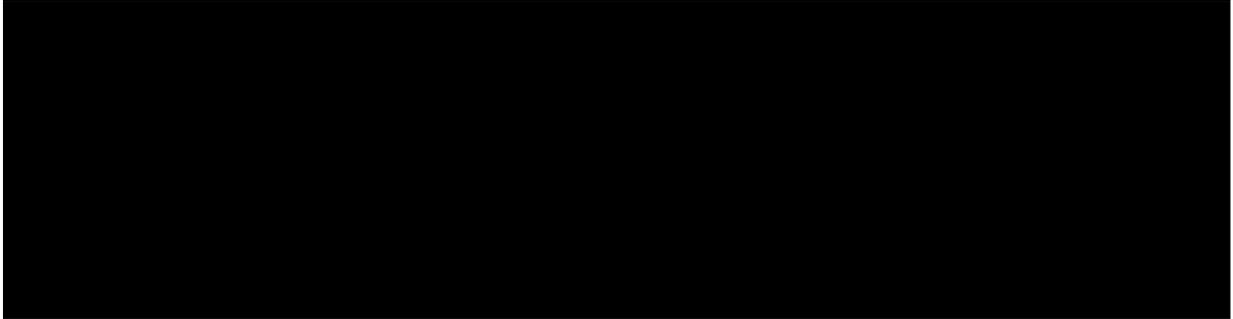
1. INTRODUCTION

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 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). P.S. 106 in Brooklyn is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

Located at 1314 Putnam Avenue in Brooklyn, P.S. 106 occupies the north side of Wilson Avenue between Putnam Avenue and Cornelia Street (see Figures 1 and 2). The surrounding land use is mostly residential with three to four story residential buildings. Many of the residential buildings have retail space on the first floor (see Exhibit 1 for Aerial Photograph).



Figure 1: Looking north on Putnam Avenue at Wilson Avenue (P.S. 106 is on the right)

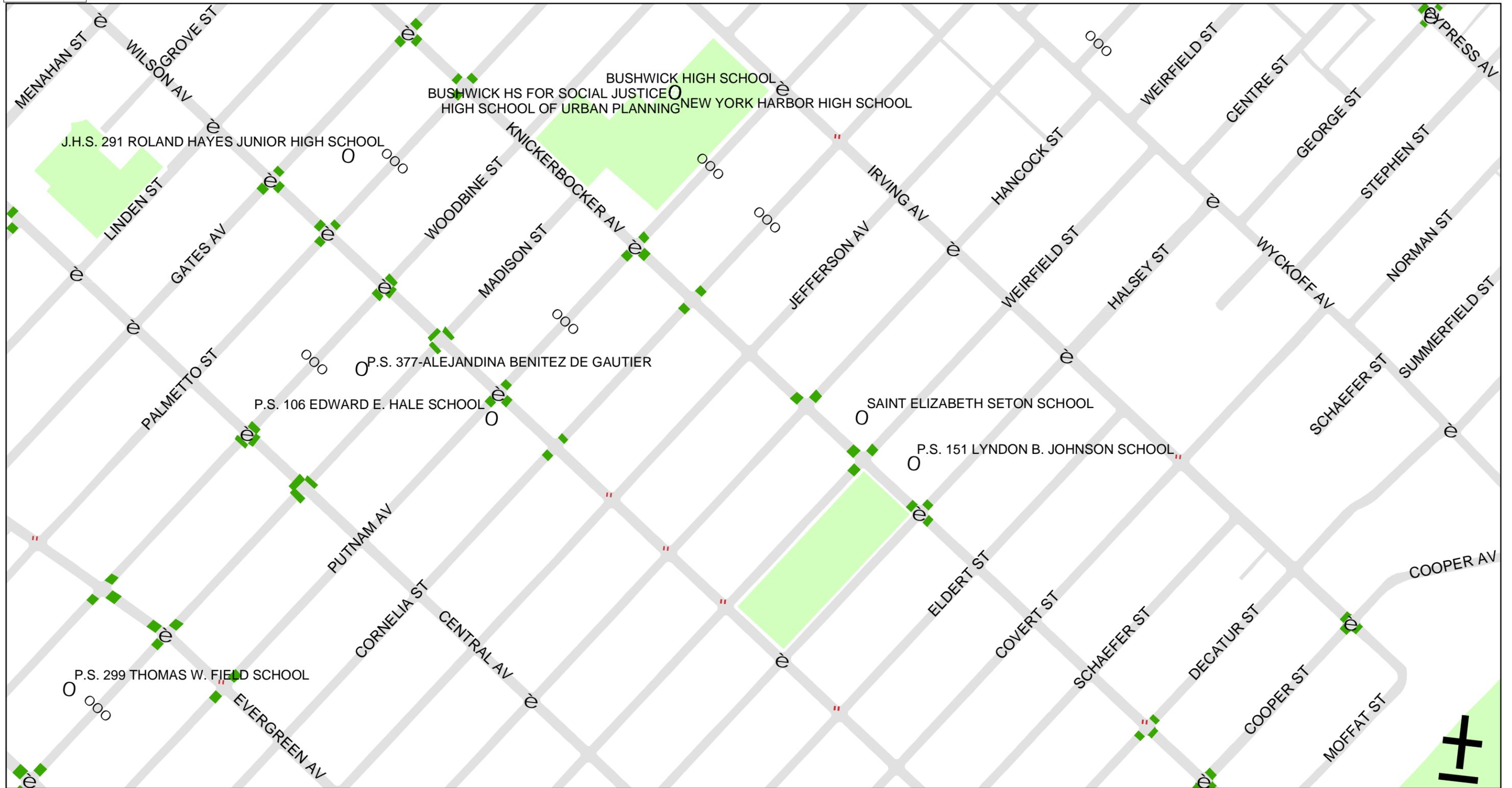


1 inch equals 200 feet

EXHIBIT 1
EDWARD E. HALE SCHOOL
P.S. 106, BROOKLYN
AERIAL PHOTOGRAPH



School Traffic Safety Map



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

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

LEGEND:

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

PS 106 Brooklyn
EDWARD E. HALE SCHOOL

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

Map created on 10/12/2006

COMM. BOARD: 304
PRECINCT: 83

1.5.0



Figure 2: Looking north along Cornelia Street at Wilson Avenue

2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant staff, the New York City DOT staff and representatives from P.S. 106 met at the school on the afternoon of May 7, 2004. Representatives from the school included the parent coordinator and the school principal.

According to representatives of the school, the major problems presented for student pedestrians include the following:

- Students have difficulty crossing Wilson Avenue at the intersection with Cornelia Street
- Congestion created by double-parked vehicles, U-turning traffic, and deliveries to the adjacent commercial businesses
- Poor sight distance due to parked vehicles near the intersections and crosswalks.
- Speeding along Wilson Avenue

2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

According to the principal, approximately 94% of students walk to school, 3% are transported by school bus, 2% of the students are driven to school and 1% arrive by public transportation. See Table 1 for school's estimate of the modes of travel.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	
Description	Percentage
Walk	94%
Driven by parent or guardian	2%
School bus	3%
MTA bus or subway	1%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

P.S. 299 with approximately 600 students is located on Woodbine Street between Evergreen Avenue and Bushwick Avenue. J.H.S. 291 with over 1000 students is located on Palmetto Street between Wilson Avenue and Knickerbocker Avenue. Both P.S. 299 and J.H.S 291 are priority 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 106 Brooklyn
EDWARD E. HALE SCHOOL

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

Map created on 11/16/2006

EXHIBIT 3

COMM. BOARD: 304
PRECINCT: 83

2.8 CROSSING GUARD LOCATIONS

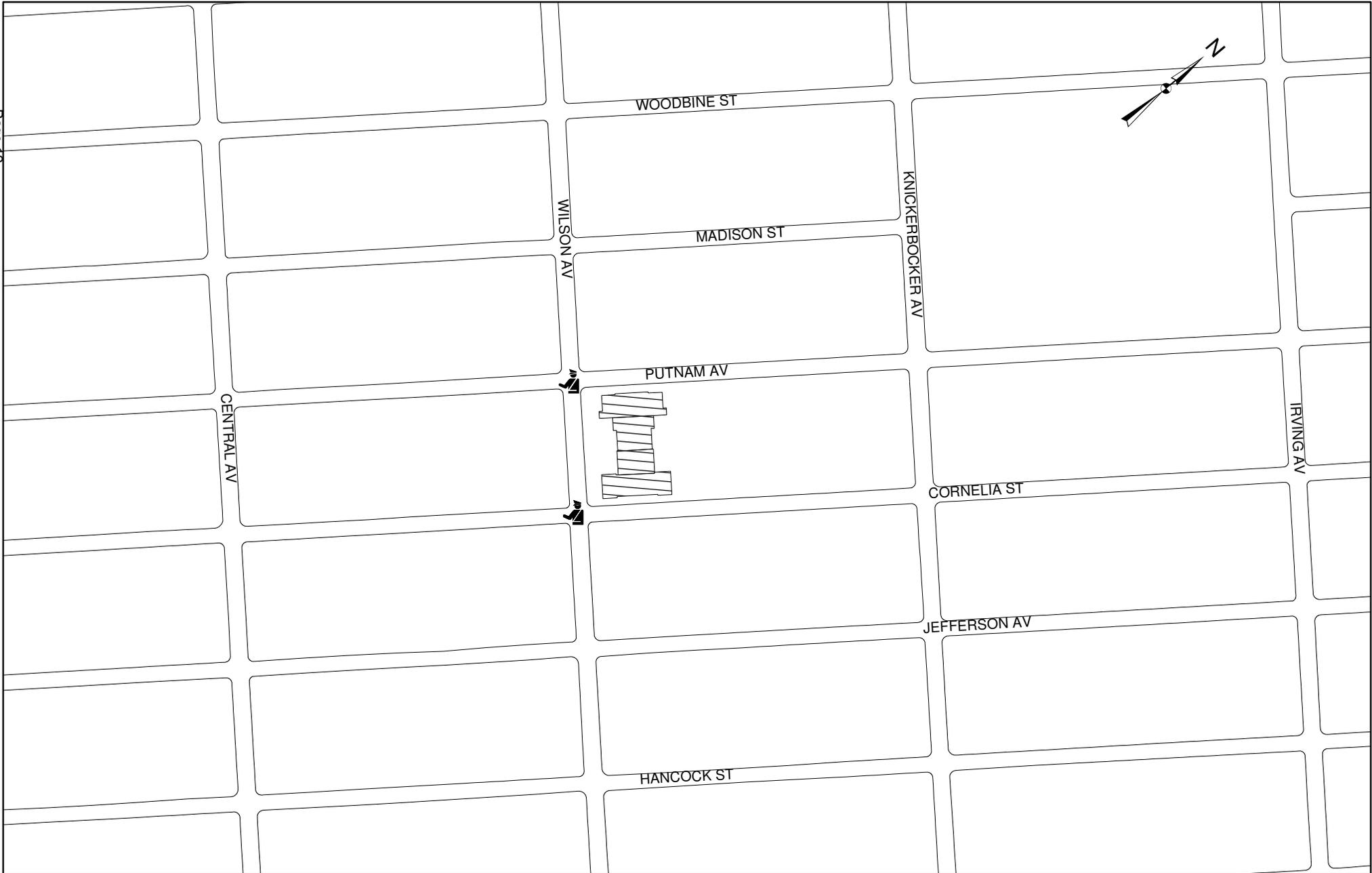
According to school officials there are two crossing guards assigned to P.S. 106. Crossing guards are stationed at:

- Wilson Avenue and Putnam Avenue
- Wilson Avenue and Cornelia Street (see Figure 3).

See Exhibit 4 for a map of the crossing guard locations.



Figure 3 – Crossing Guard at Wilson Avenue and Cornelia Street.



1 inch equals 250 feet



Crossing guard assigned to P.S. 106

EXHIBIT 4

**EDWARD E. HALE SCHOOL
P.S. 106, BROOKLYN**

CROSSING GUARDS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school representatives, five school buses transport P.S. 106 students to and from school. Buses pick up and drop off on Putnam Avenue in front of the school's main entrance. Buses mostly double-park to load and unload students. During the school bus operations school traffic safety officers stop traffic on Putnam Avenue.



Figure 4: Vehicles parked in front of the entrance on Putnam Avenue prevent school buses from stopping along the curb (on left).

3.2 PARENT DROP-OFF OPERATIONS

School representatives indicated that parents, livery cabs, or mini-vans transport approximately 15 students per day. There is no defined drop-off/pick-up area for this. Vehicles typically double park along Putnam Avenue, Wilson Avenue or Cornelia Street to drop off or pick up students (see Figure 5).



Figure 5: Students on Cornelia Street (view northbound from Wilson Avenue)

3.3 PARKING REGULATIONS

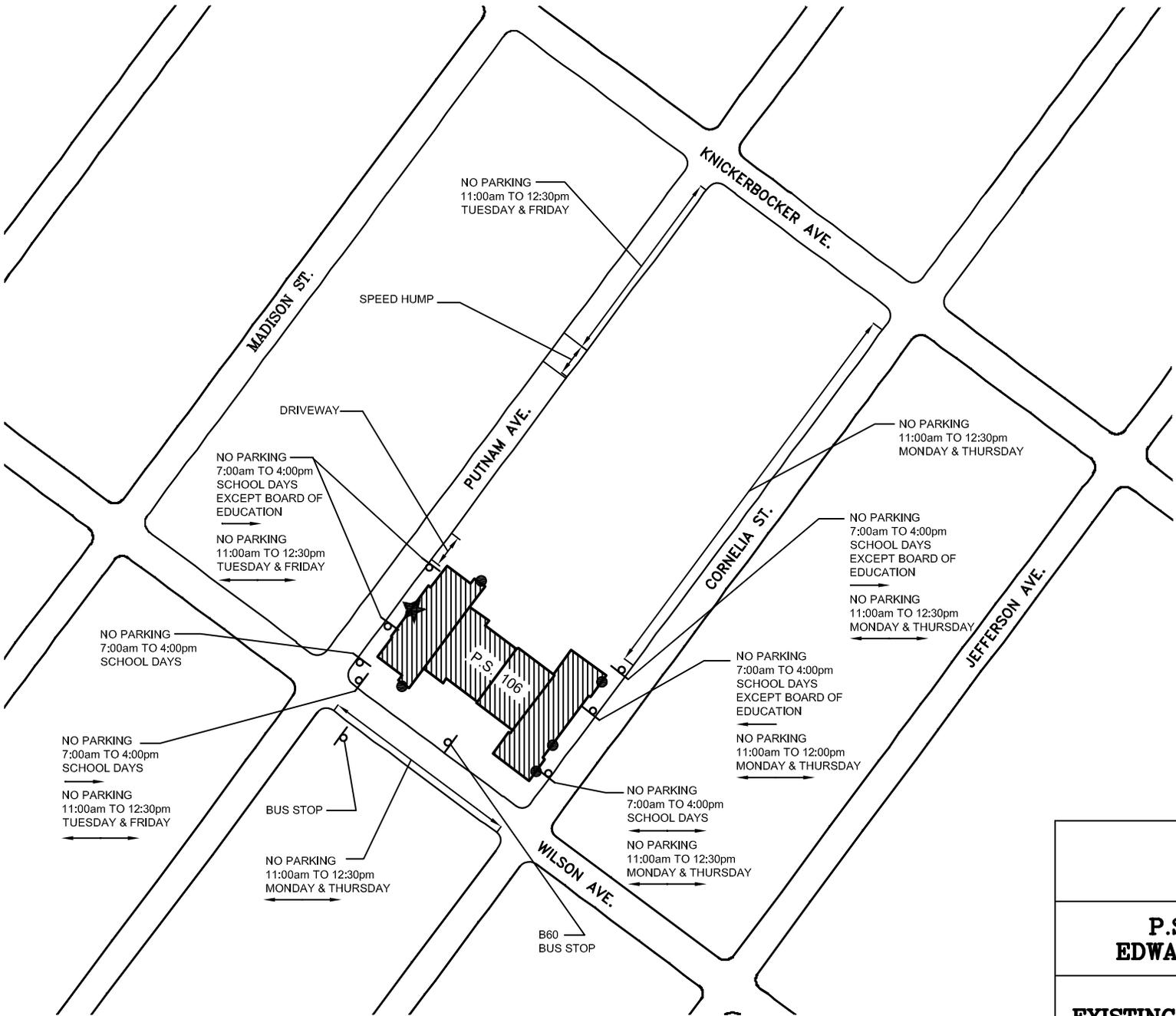
“NO PARKING, 7 AM - 4 PM, SCHOOL DAYS” parking regulation are posted on Putnam Avenue, Wilson Avenue and Cornelia Street in front of school entrances.

A “NO PARKING, 7 AM - 4 PM, SCHOOL DAYS, EXCEPT BOARD OF EDUCATION” parking regulation is posted on Putnam Avenue and Cornelia Street.

Exhibit 5 displays parking regulations in the vicinity of P.S. 106.



Figure 6: Parking regulations on Cornelia Street



LEGEND

-  MAIN ENTRANCE
-  ENTRANCE
-  STREET SIGN

EXHIBIT 5
P.S. 106, BROOKLYN EDWARD E. HALE SCHOOL
EXISTING PARKING REGULATIONS

SCALE: 1" : 150'

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 2, shows existing signals and school crosswalk pavement markings in the vicinity of the school. It is noted that a citywide signage program is currently underway to upgrade school signage to current Federal Manual of Uniform Traffic Control (MUTCD) standards of fluorescent yellow-green signs accompanied by downward pointing arrows. Signs scheduled to be installed under this program are shown as "existing" on Exhibit 8.

3.5 ACCIDENT SUMMARY

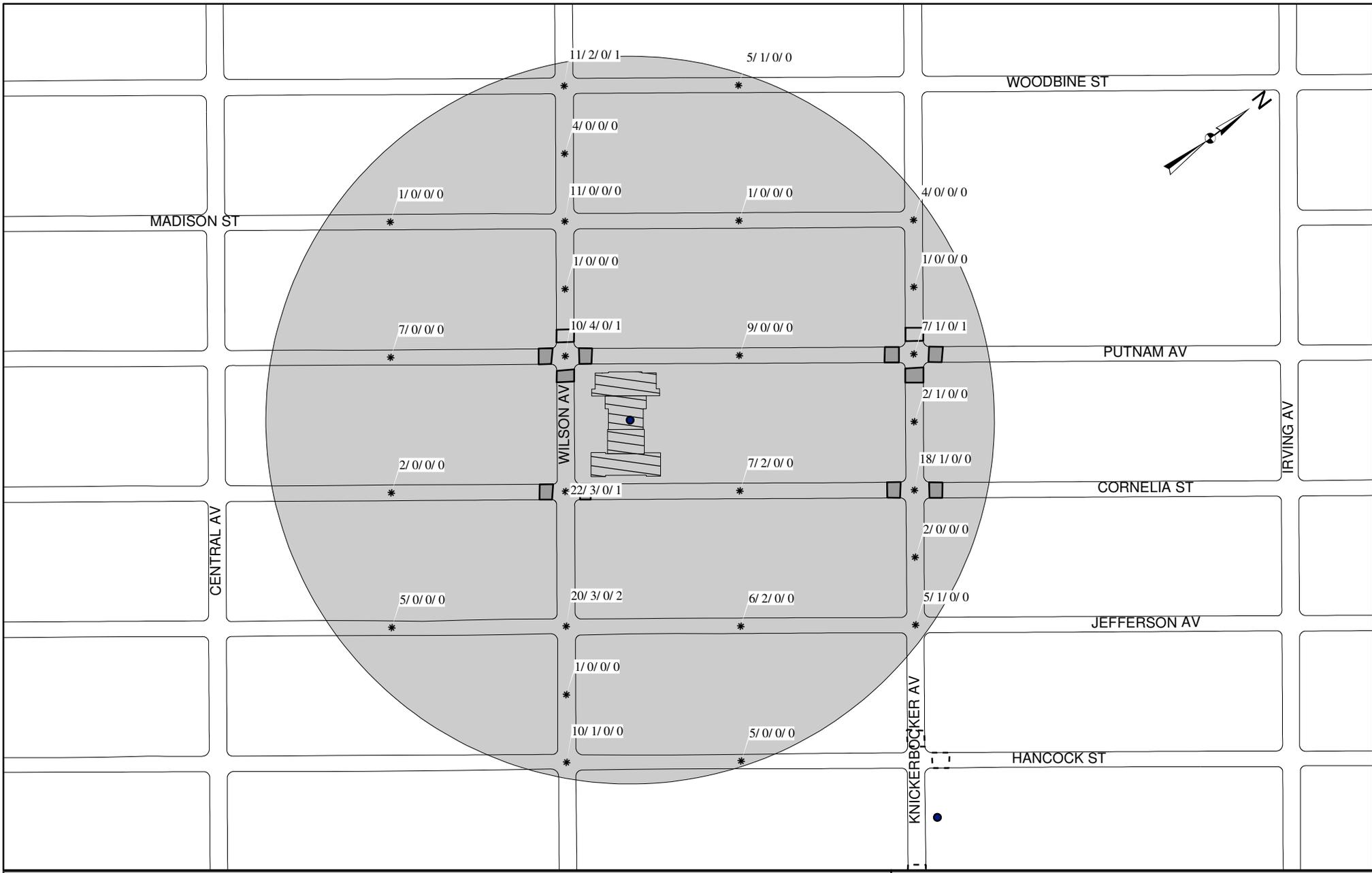
Exhibit 6 and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV), in the vicinity of P.S. 106 for the three-year period from January 1, 1998 through December 31, 2000. The DMV data provides some detail relating to the circumstances and cause of the 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.

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

TABLE 2: DMV THREE-YEAR ACCIDENT SUMMARY (1998-2000)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Wilson Avenue and Putnam Avenue	10	4	0	1
Wilson Avenue and Cornelia Street	22	3	0	1
Wilson Avenue and Jefferson Avenue	20	3	0	2
Wilson Street and Woodbine Street	11	2	0	1
Knickerbocker Ave. and Cornelia Street	18	1	0	0
Knickerbocker Ave. and Putnam Ave.	7	1	0	1
TOTAL	88	14	0	6

TABLE 3: NYPD FOUR-YEAR ACCIDENT SUMMARY (2001-2004)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Wilson Avenue and Putnam Avenue	16	3	0	0
Wilson Avenue and Cornelia Street	40	4	0	0
Wilson Avenue and Jefferson Avenue	33	8	0	3
Wilson Street and Woodbine Street	30	1	0	0
Cornelia Street and Knickerbocker Ave	20	5	0	0
Putnam Ave. and Knickerbocker Ave.	22	4	0	0
TOTAL	161	25	0	3

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



ACCIDENT LOCATION

SCHOOL CROSSWALK ASSIGNED TO P.S. 106

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 250 feet

EXHIBIT 6

**P.S. 106, BROOKLYN
EDWARD E. HALE SCHOOL**

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

3.6 TRAFFIC OPERATIONS AND ISSUES

The following outlines the traffic accident and operational issues in the vicinity of P.S. 106:

3.6.1 Wilson Avenue and Putnam Avenue

Wilson Avenue is a 34-foot wide, two-way (east-west) street with one moving lane in each direction and parking on both sides. Putnam Avenue is a 30-foot wide, one-way (southbound) street, with one travel lane and parking along both sides. This is a signalized intersection located adjacent to the main entrance of P.S. 106 (see Figure 7). The MTA B60 bus line runs both eastbound and westbound on Wilson Avenue. There are school crosswalks on the north, south and east legs of the intersection.

According to school officials, this intersection poses the greatest concern to students of P.S. 106. Many school children cross both Wilson Avenue and Putnam Avenue during their school commute. School buses load and unload students on Putnam Avenue in front of the school's main entrance (just north of the intersection). There is an existing speed hump on Putnam Avenue, 380 feet north of the intersection. A crossing guard is assigned to this intersection.

There were ten accidents during the 1998-2000 study period. Four accidents involved pedestrians, one of which was school-related. One of the accidents was attributed to driver inattention, and one to the pedestrian playing in the roadway. Another of the accidents occurred while the driver was backing his vehicle northbound and struck a pedestrian who was outside of the crosswalk. There is no information on the fourth accident except that the driver was going west.



Figure 7: View northbound across Wilson Avenue at Putnam Avenue

The school officials believed that vehicles were speeding on Wilson Avenue. A spot speed study was conducted on Wilson Avenue between Putnam Avenue and Cornelia Street on September 7, 2005.

The spot speed study showed that the 85th percentile speed to be 30 mph, which does not exceed the statutory speed limit of 30 mph.

The speed study results are shown in Table 4 and in the Appendix.

TABLE 4: SPOT SPEED STUDY (WILSON AVENUE)		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
Wilson Avenue between Putnam Avenue and Cornelia Street	26	30

3.6.2 Putnam Avenue and Knickerbocker Avenue

Knickerbocker Avenue is a 34-foot wide one-way (westbound) street with one travel lane and parking on both sides (see Figure 8). The intersection of Putnam Avenue and Knickerbocker Avenue is controlled by a two-phase signal. There are school crosswalks on the north, south and east legs of the intersection.



Figure 8: Knickerbocker Avenue and Putnam Avenue view southbound (Crosswalks have been re-striped since this photo was taken).

There were seven accidents at this intersection during the 1998-2000 study period. One accident involved a pedestrian. The pedestrian accident was school related. According to the accident data the pedestrian was struck while crossing with the traffic signal.

3.6.3 Cornelia Street and Wilson Avenue

Cornelia Street is a 30-foot wide one-way (northbound) street with one travel lane and parking on both sides. The intersection of Cornelia Street and Wilson Avenue is stop-controlled by a stop sign on Cornelia Street (see Figure 9). According to school officials, this stop-controlled intersection, poses the second largest concern to P.S. 106 students. Many school children cross both Wilson Avenue and Cornelia Street at this location.

Since there are no traffic controls or marked crosswalks on Wilson Avenue at this intersection or at Jefferson Avenue to the east, motorists tend to speed on Wilson Avenue and do not yield to student pedestrians. This issue was cited by P.S. 106 officials as a main concern and was confirmed during field observations.

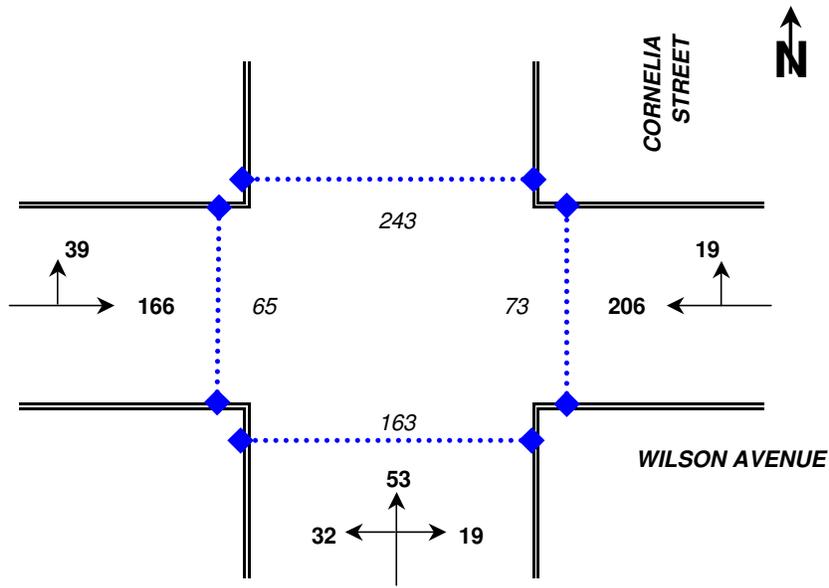


Figure 9: Wilson Avenue at Cornelia Street (looking westbound)

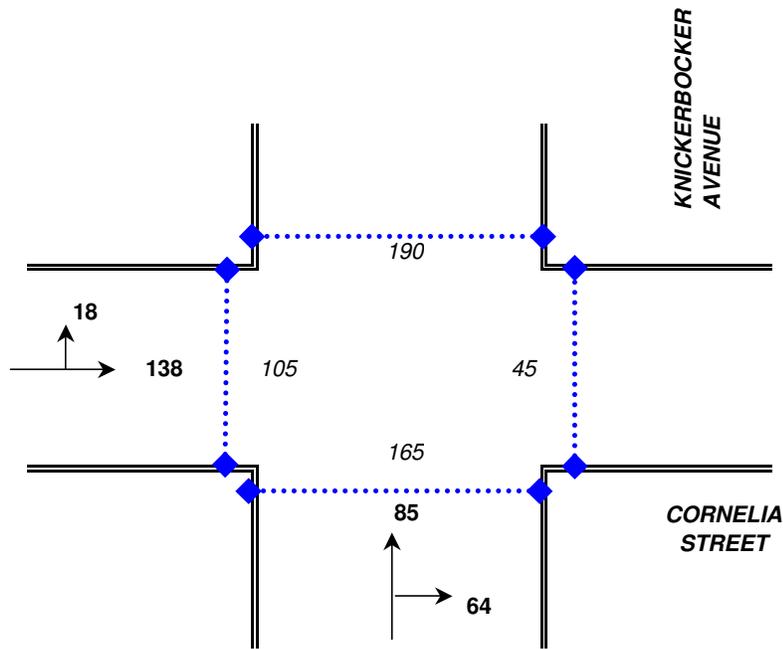
There were 22 accidents at this intersection during the 1998-2000 study period. Three accidents involved pedestrians, one of which was school-related. Each of the three pedestrian accidents occurred while the pedestrian was attempting to cross Wilson Avenue without a pedestrian crosswalk.

A traffic count was performed on Wednesday, June 1, 2005 from 7:30 am to 8:30 am (see Exhibit 7) to determine if traffic signal warrants are met. The traffic count showed that a total of 138 (65+73) pedestrians crossed Wilson Avenue between 7:30 am and 8:30 am. The traffic count showed that signal warrants are not met at this location.

One Hour Traffic Count Volumes



Intersection of Wilson Avenue and Cornelia Street
(7:30 AM - 8:30 AM - JUNE 1, 2005)



Intersection of Cornelia Street and Knickerbocker Avenue
(7:30 AM - 8:30 AM - MAY 26, 2005)



- Number of Pedestrians
- 62 Pedestrian Crossing
- 53 Vehicle Movement
- Number of Vehicles

EXHIBIT 7
P.S 106 , BROOKLYN EDWARD E. HALE SCHOOL
TRAFFIC COUNTS

3.6.4 Cornelia Street and Knickerbocker Avenue

Cornelia Street is stop controlled at the intersection with Knickerbocker Avenue (see Figure 10). There are school crosswalks on the north and south legs of the intersection.



Figure 10: Cornelia Street at Knickerbocker Avenue (northbound)

There were 18 accidents at this intersection during the 1998-2000 study period. One accident involved a pedestrian. The accident involving a pedestrian occurred while the pedestrian was crossing outside of a striped crosswalk and a vehicle was heading north.

To better understand the level of vehicle and pedestrian conflicts at this intersection, a traffic count was conducted on Thursday May 26, 2005. The count showed that approximately 355 pedestrians used this intersection to cross Knickerbocker Avenue during the study hour. During the same hour, there were a total of 85 through vehicles on Knickerbocker Avenue (see Exhibit 7).

3.6.5 Wilson Avenue and Jefferson Avenue

Jefferson Avenue is a 30-foot wide, one-way (northbound) street with one travel lane and parking on both sides (see Figure 11). Jefferson Avenue is stop controlled, while traffic on Wilson Avenue is uncontrolled. There are no school crosswalks at this intersection. There are pedestrian crosswalks on the north and south legs of the intersection.

There were 20 accidents at this intersection during the 1998-2000 study period. Three accidents involved pedestrians, two of which were school-related. One accident was attributed to driver error due to failure to yield. The other two accidents occurred outside of the crosswalk area. There is no further information on these two accidents.



Figure 11: Looking east along Wilson Avenue at the intersection of Wilson Avenue and Jefferson Avenue.

3.6.6 Wilson Avenue and Woodbine Street

Woodbine Street is a 30-foot wide, one-way (southbound) street with one travel lane and parking on both sides. This is a signalized intersection. There are crosswalks on the north, south and east legs of the intersection.

There were 11 accidents at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, one of which was school-related. According to the accident data, a northbound vehicle making a right turn struck an 11-year old child who was crossing outside of the crosswalk. The second accident involved a driver making a left turn.

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 106, and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches (see Table 5).

TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS				
Intersection Name	Crosswalk Length (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)	Timing Adjustment? (Yes/No)
Putnam Av. @ Wilson Av				
crossing Putnam Av	30	35	13	NO
crossing Wilson Av.	34	25	15	NO
Putnam Av. @ Knickerbocker Av.				
crossing Putnam Av	30	35	13	NO
crossing Knickerbocker Av	34	25	15	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 (ROADWAYS AND SIDEWALKS)

The roadways and sidewalks were observed to be in good condition. There is minor ponding present at catch basins along Wilson Avenue that could be remedied with typical repaving.

4. PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes potential countermeasures. 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 are capital improvements.

4.1 SHORT-TERM MEASURES

- No-Standing Zone on Putnam Avenue in front of P.S. 106

“NO PARKING 7:00 AM - 4:00 PM, SCHOOL DAYS” parking regulations on Putnam Avenue should be upgraded to “NO STANDING 7:00 AM - 4:00 PM, SCHOOL DAYS” for a length of 30 feet. This will improve visibility of students arriving and leaving the school. The teachers parking should be relocated further north on Putnam Avenue.

- Administer student pedestrian safety education program

It is recommended that the NYCDOT Safety Education Program work with the school to educate the students on pedestrian safety, including crossing the street with the WALK phase, and the meaning of the WALK - FLASHING DON'T WALK - DON'T WALK pedestrian signal sequence. It is also recommended that the students be educated not to cross at mid-block locations.

- 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.

- New school crosswalks are recommended at the following intersections:

- Cornelia Street and Wilson Avenue – east leg
- Wilson Avenue and Jefferson Avenue – north and south legs

School officials identified these three intersections as P.S. 106 student crossings. Therefore, to ensure walking route continuity school crosswalks are recommended at these two intersections.

4.2 LONG-TERM MEASURES

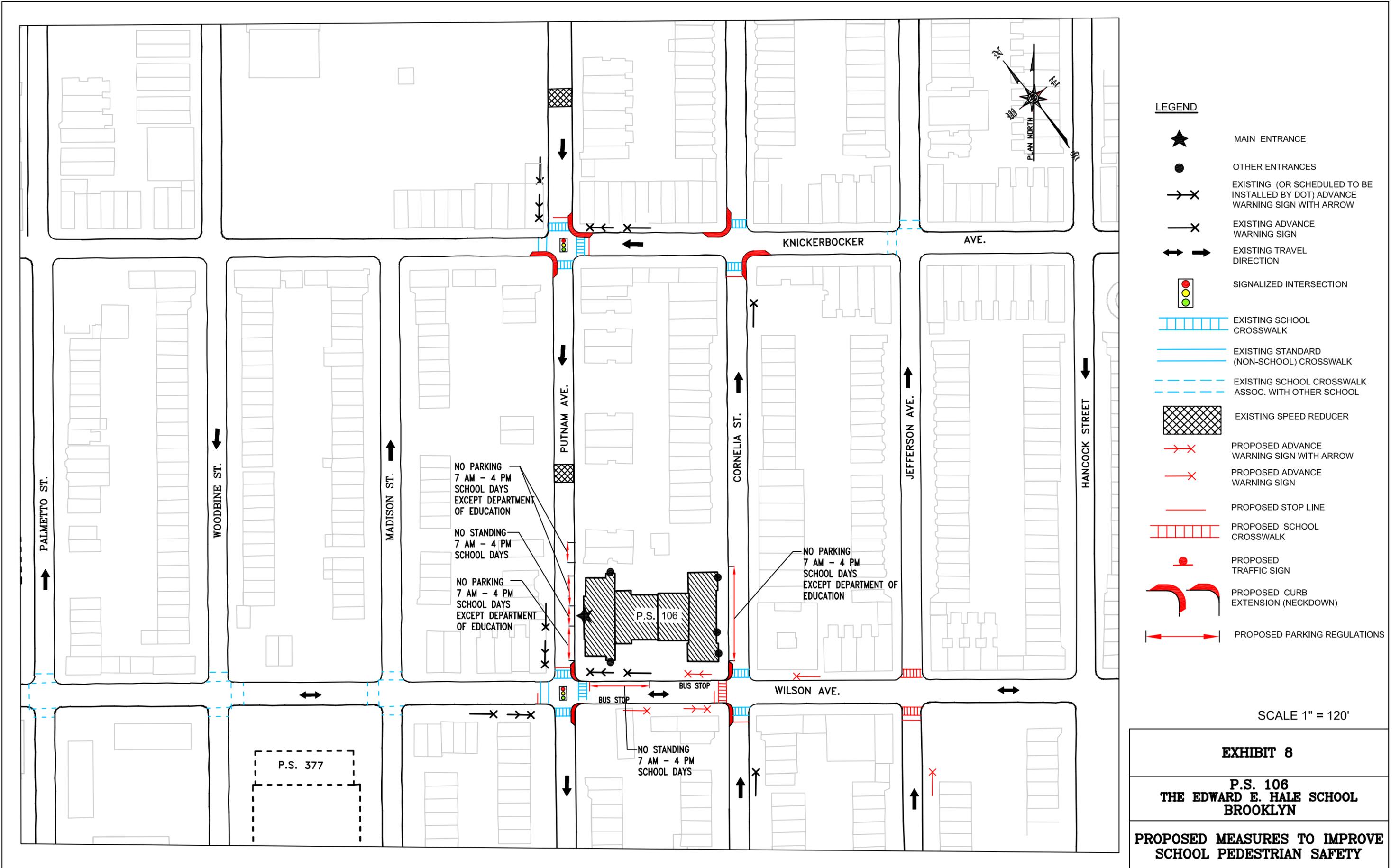
- Consider curb extensions at the following intersections:

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

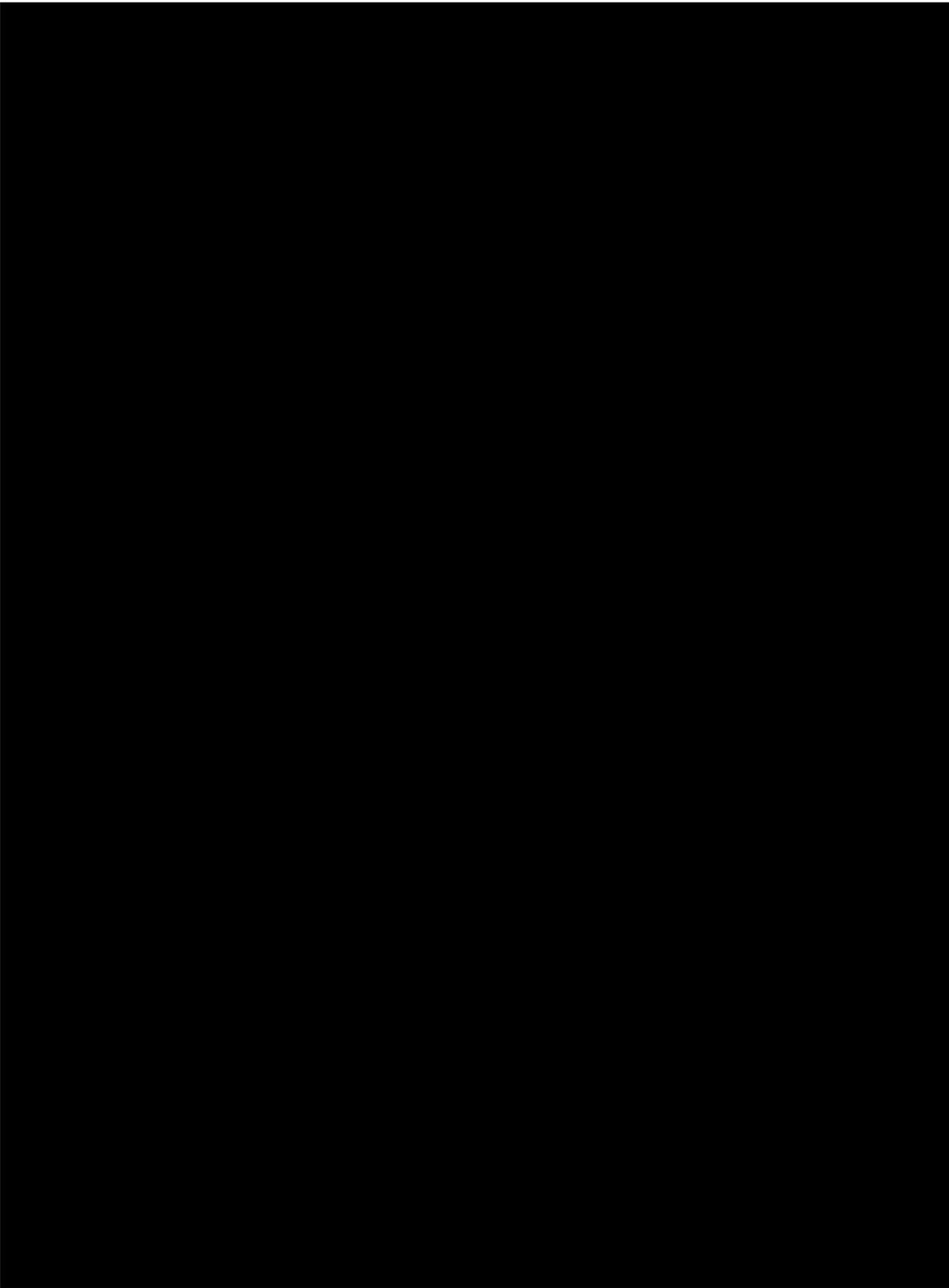
- Wilson Avenue and Cornelia Street
- Wilson Avenue and Putnam Avenue
- Knickerbocker Avenue and Cornelia Avenue
- Knickerbocker Avenue and Putnam Avenue

Curb extensions should be considered 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 these heavily utilized school crosswalks (or intersections). These curb extensions would not eliminate or reduce the width of any moving lanes.



APPENDIX



SPOT SPEED STUDY

Date: **September 7, 2005** Time: **10:30 am - 11:30 am**
 Location: **Wilson Avenue between Cornelia Street and Putnam Avenue**
 Surveyor: **Eyad Yousef**

School: **PS 106**
 Direction:
 Comments: **Clear and dry**

Speed S (mph)	No. of Vehicles in		% Cumulative Vehicles	nS	nS ²
	Group	% of Vehicles in Group			
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	2.2%	2.2%	36	648
19	0	0.0%	2.2%	0	0
20	5	5.6%	7.8%	100	2000
21	4	4.4%	12.2%	84	1764
22	9	10.0%	22.2%	198	4356
23	9	10.0%	32.2%	207	4761
24	10	11.1%	43.3%	240	5760
25	4	4.4%	47.8%	100	2500
26	18	20.0%	67.8%	468	12168
27	3	3.3%	71.1%	81	2187
28	4	4.4%	75.6%	112	3136
29	1	1.1%	76.7%	29	841
30	3	3.3%	80.0%	90	2700
31	9	10.0%	90.0%	279	8649
32	1	1.1%	91.1%	32	1024
33	2	2.2%	93.3%	66	2178
34	3	3.3%	96.7%	102	3468
35	3	3.3%	100.0%	105	3675
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
	90	100.0%		2329	61815

Mean Speed = 25.9 mph
 Standard Deviation = 4.2 mph
 Margin of Error (95% Confidence) = ± 0.9 mph

Median Speed = 25.9 mph
 15th Percentile Speed = 21.6 mph
 85th Percentile Speed = 30.2 mph

SPOT SPEED STUDY

Date: **September 7, 2005**

Time: **10:30 am - 11:30 am**

School: **PS 106**

Location: **Wilson Avenue between Cornelia Street and Putnam Avenue**

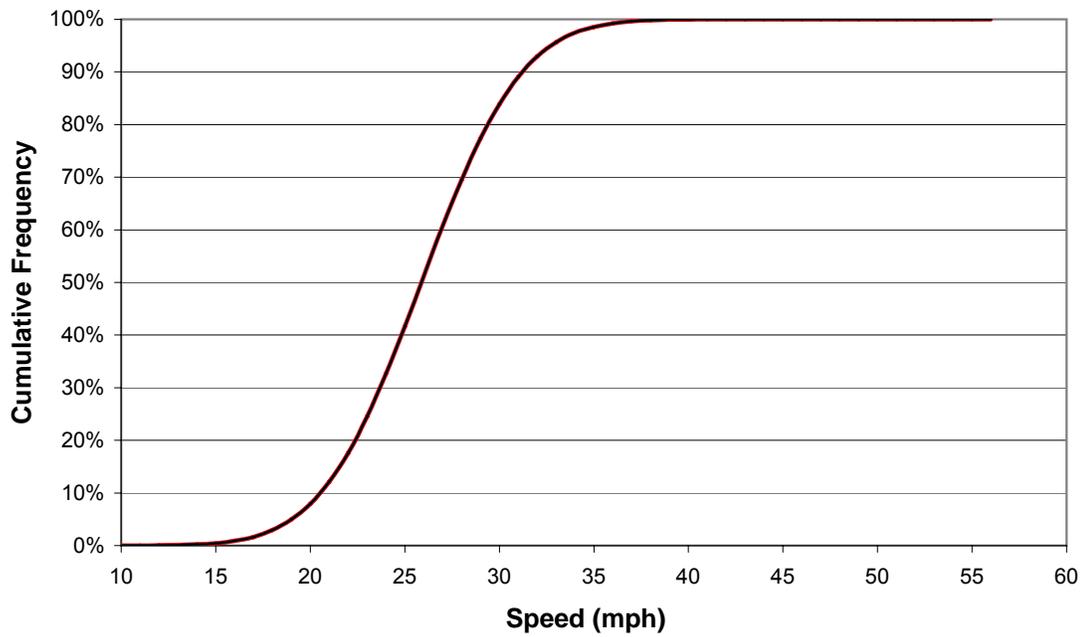
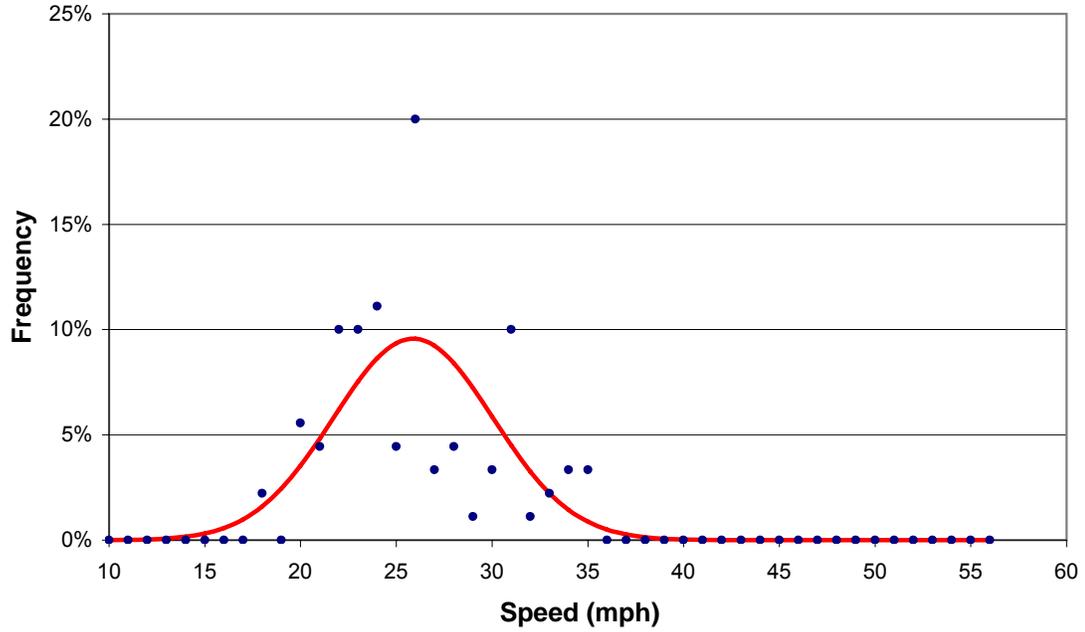
Direction:

Surveyor: **Eyad Yousef**

Comments: **Clear and dry**

Mean Speed = 25.9 mph
Standard Deviation = 4.2 mph
Margin of Error (95% Confidence) = ± 0.9 mph

Median Speed = 25.9 mph
15th Percentile Speed = 21.6 mph
85th Percentile Speed = 30.2 mph



P.S. 106
 June 1, 2005
 7:30 am - 8:30 am

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BOROUGH OF BROOKLYN
 Title3 : NYC-DOT

Site:
 Date: 06/01/05

Combined
 *Peds not included in table data

Begin Time	Total	CORNELIA STREET			WILSON AVENUE		CORNELIA STREET			WILSON AVENUE			
		WB-R	WB-T		WB-R	WB-T	NB-R	NB-T	NB-L	EB-T	EB-L		
07:30:00	106	0	0	0	3	46	0	3	6	6	0	32	10
07:45:00	143	0	0	0	1	47	0	5	24	8	0	52	6
08:00:00	159	0	0	0	4	60	0	6	14	14	0	51	10
08:15:00	126	0	0	0	11	53	0	5	9	4	0	31	13
	534	0	0	0	19	206	0	19	53	32	0	166	39

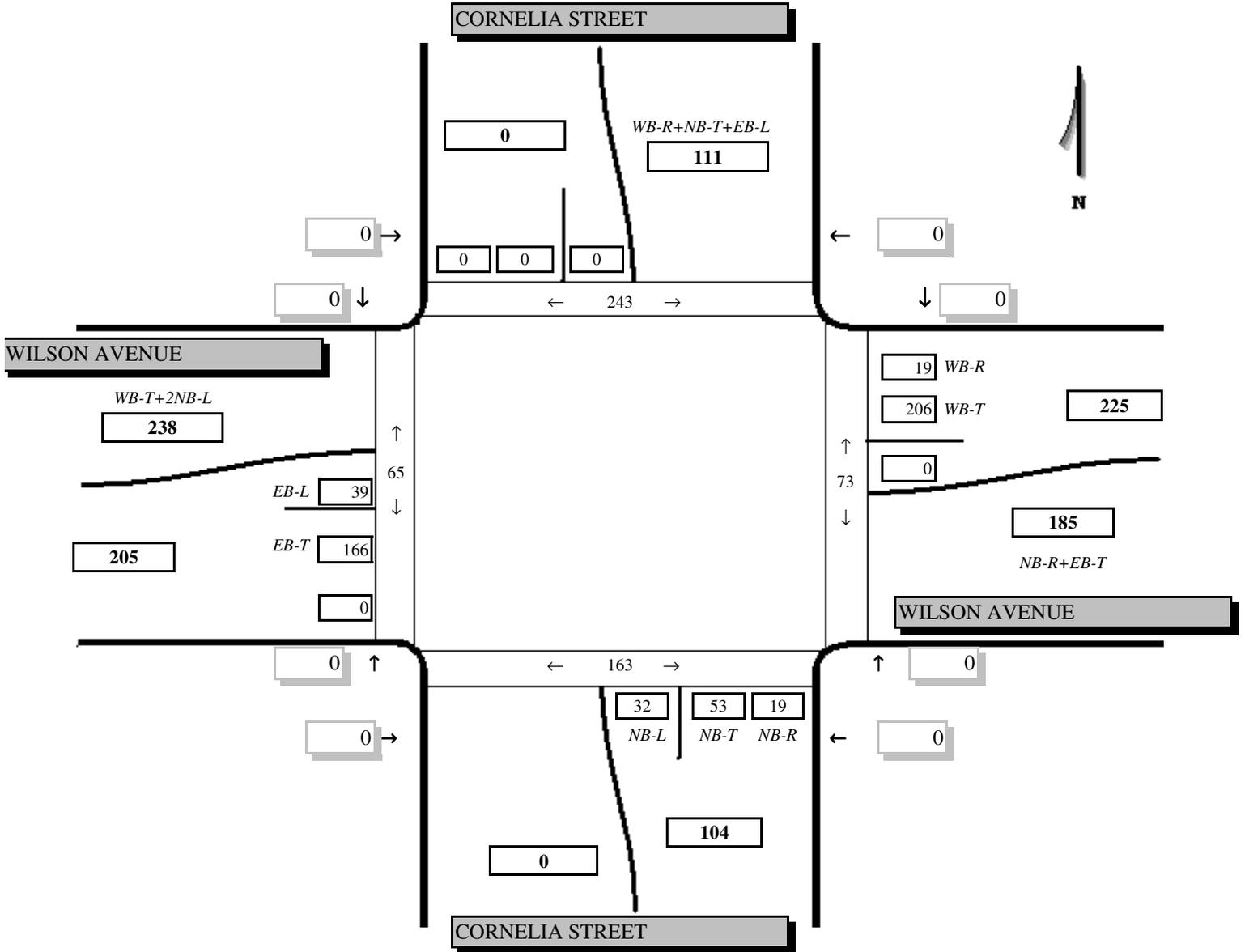
Peak Volume Periods (1 hour Res:15 min.)					
Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	07:30:00	To 08:30:00	534
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	NA	To NA	0

P.S. 106
 June 1, 2005
 7:30 am - 8:30 am

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BOROUGH OF BROOKLYN
 Title3 : NYC-DOT

Site:
 Date: 06/01/05

Combined
 *Peds not included in table data



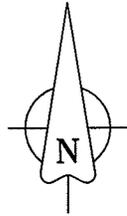
SCHOOL SAFETY ENGINEERING

INTERSECTION: Knickerbocker Av & Cornelia St

TIME : 7:30-8:30 am

DATE : 5/26/05

PS 106



STREET NAME:

Cornelia St

