

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

NEW YORK CITY



School Safety Engineering Project

FINAL REPORT: P.S. 91, Brooklyn



Prepared by
The RBA Group/Urbitrans Associates



FEBRUARY 15, 2006

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	5
[REDACTED]	
2.6 PRIMARY MODE OF TRANSPORT TO AND FROM SCHOOL	10
2.7 OTHER STUDENT PEDESTRIAN TRAFFIC GENERATORS	10
2.8 CROSSING GUARD LOCATION	11
3. TRAFFIC OPERATIONS.....	13
3.1 SCHOOL BUS OPERATIONS	13
3.2 PARENT DROP-OFF OPERATIONS	13
3.3 PARKING REGULATIONS	13
3.4 EXISTING SCHOOL SIGNS AND MARKINGS	14
3.5 ACCIDENT SUMMARY	16
3.6 TRAFFIC OPERATIONS AND ISSUES	18
3.7 SIGNAL TIMING: PEDESTRIAN PHASE	26
3.8 PHYSICAL CONDITIONS (ROADWAY AND SIDEWALK)	26
4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY	27
4.1 SHORT-TERM OPTIONS	27
4.2 LONG-TERM RECOMMENDATIONS.....	28

EXHIBITS

EXHIBIT 1 – AERIAL PHOTOGRAPH.....	7
EXHIBIT 2 – CATCHMENT AREA	8
EXHIBIT 3 – EXISTING TRAFFIC SAFETY MAP.....	9
EXHIBIT 4 - CROSSING GUARDS.....	12
EXHIBIT 5 - PARKING REGULATIONS	15
EXHIBIT 6 - ACCIDENT SUMMARY	17
EXHIBIT 7- TURNING MOVEMENT COUNTS	20
EXHIBIT 8 – PROPOSED MEASURES TO IMPROVE SAFETY.....	30

TABLES

TABLE 1: MODE OF TRAVEL.....	10
TABLE 2: DMV ACCIDENT SUMMARY (1998-2000).....	16
TABLE 3: NYPD ACCIDENT SUMMARY (2001-2004).....	16
TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS	26
TABLE 5: SPOT SPEED STUDIES	28

APPENDIX



TMC - ALBANY AVENUE AND EAST NEW YORK AVENUE	A4
TMC – MAPLE STREET AND KINGSTON AVENUE	A6
HCS LEVEL OF SERVICE ANALYSIS – ALBANY AVENUE AND EAST NEW YORK AVENUE.....	A9
SPOT SPEED SUDY – EAST NEW YORK AVENUE.....	A10

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. 91 in Brooklyn is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS

2.2 NEIGHBORHOOD DESCRIPTION

Located at 532 Albany Avenue in Brooklyn, P.S. 91 is situated along Albany Avenue, taking up the entire block from East New York Avenue to Maple Street (Exhibit 1, Aerial Photograph). The school's main entrance is located on Albany Avenue. The surrounding land use is residential on Maple Street and Kingston Street, with mixed use commercial on Albany Avenue and East New York Avenue (Figure 1). A Mets Park is located on the north side of East New York Avenue, occupying the whole block to Lefferts Avenue. The B12 bus route operates on Albany Avenue.



Figure 1: Looking north on Albany Avenue from Maple Street, P.S. 91 is at left

2.3 MEETING WITH SCHOOL REPRESENTATIVES

Representatives from New York City DOT, Borough Commissioner's Office, NYPD 71st Precinct, the consultant team, and from P. S. 91 met at the school on April 1, 2004. Representatives of P.S. 91 included the principal, assistant principal, teachers, the building manager and parents.

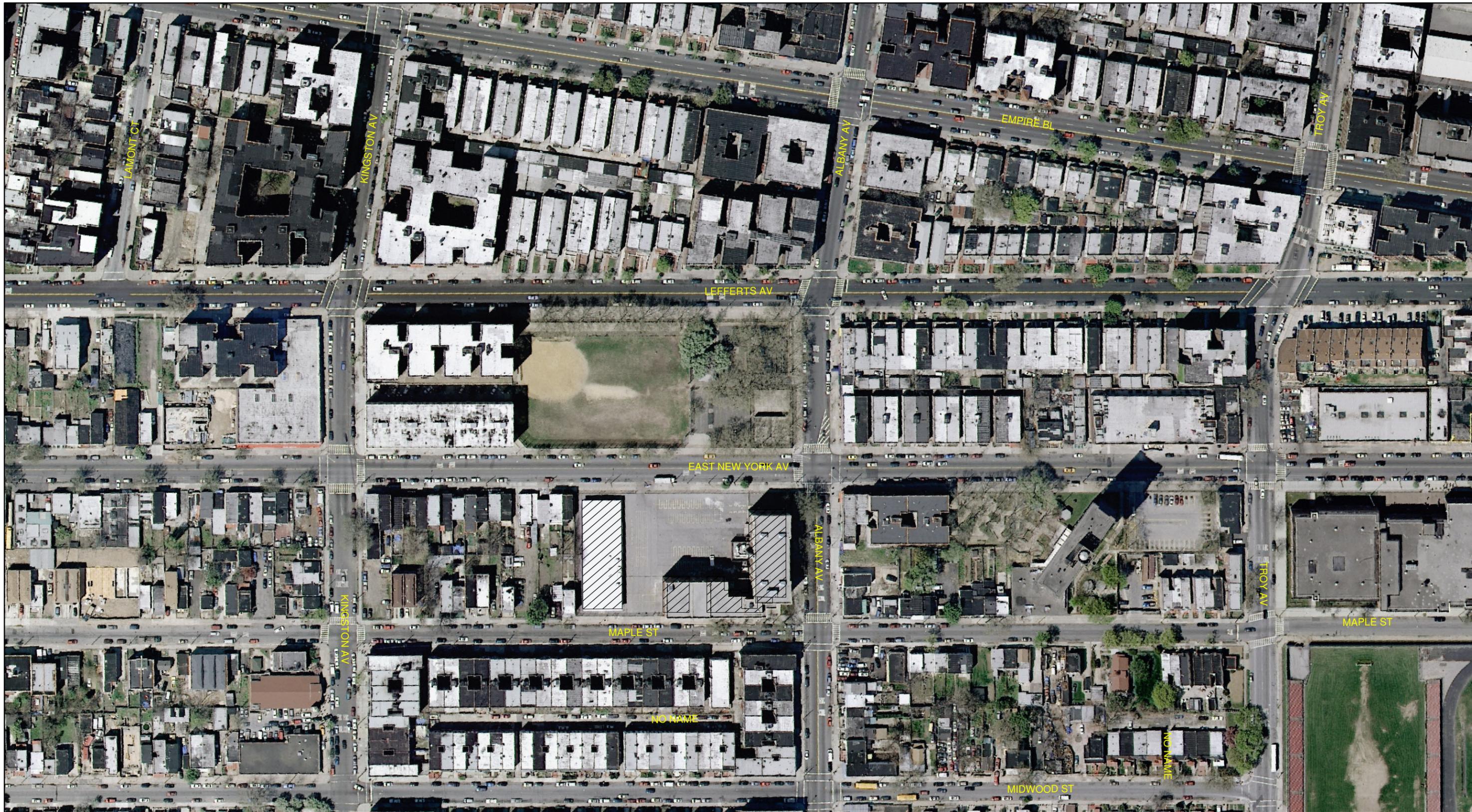
According to representatives of the school, the major concerns regarding student pedestrian safety include the following:

- Vehicle congestion on Albany Avenue in front of P.S. 91

- Vehicles speeding on Albany Avenue
- Drivers do not yield at the intersection of Albany Avenue and East New York Avenue
- Students crossing mid-block on Albany Avenue and East New York Avenue

See the Appendix for the school's survey response.



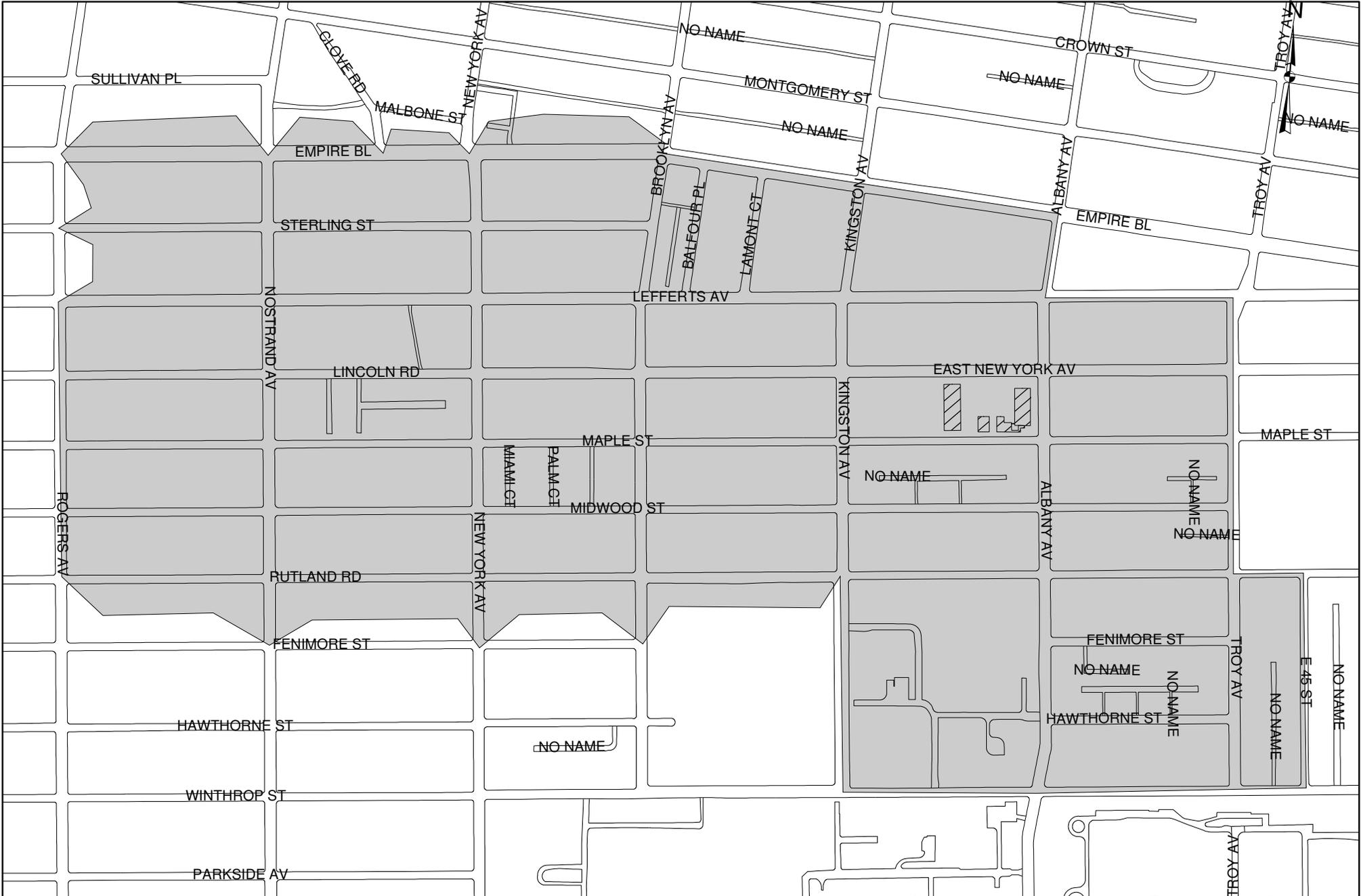


1 inch equals 150 feet

EXHIBIT 1

**ALBANY AVE SCHOOL
P.S. 91, BROOKLYN**

AERIAL PHOTOGRAPH



CATCHMENT AREA

1 inch equals 500 feet

EXHIBIT 2
ALBANY AVE SCHOOL
P.S. 91, BROOKLYN
CATCHMENT AREA



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 91 Brooklyn
ALBANY AVENUE SCHOOL

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

Map created on 11/16/2006

EXHIBIT 3

COMM. BOARD: 309
 PRECINCT: 71

2.6 PRIMARY MODE OF TRANSPORT TO AND FROM SCHOOL

According to the school officials, approximately 70% of the students walk to school, 18% arrive via public transportation, 5% are driven by parents or guardians, 5% arrive by school bus, and another 2% of the students ride bicycle to school.

TABLE 1: MODE OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	
DESCRIPTION	PERCENTAGE
Walk	70%
Driven by car, livery cab or mini-bus	5%
School bus	5%
MTA bus or subway	18%
Bicycle	2%
TOTAL	100%

2.7 OTHER STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are two other public schools in the vicinity of PS. 91: I.S. 391 and P.S. 221. In addition, three small private schools are in the area. School Bnos Menachem is located on East New York Avenue between Troy Avenue and Albany Avenue. League School and George W. Wingate high school are located on Kingston Avenue between Rutland Road and Fenimore Street.

Grocery stores at the southwest corner of Albany Avenue and Maple Street and at Albany Avenue and East New York Avenue are popular with the students of P.S. 91. At dismissal time, schoolchildren from P.S. 91 and from surrounding neighborhood schools gather near the Albany Avenue entrance to P.S. 91.

Some students participating in after-school programs are dismissed to the Brooklyn Public Library branch on New York Avenue at Maple Street.

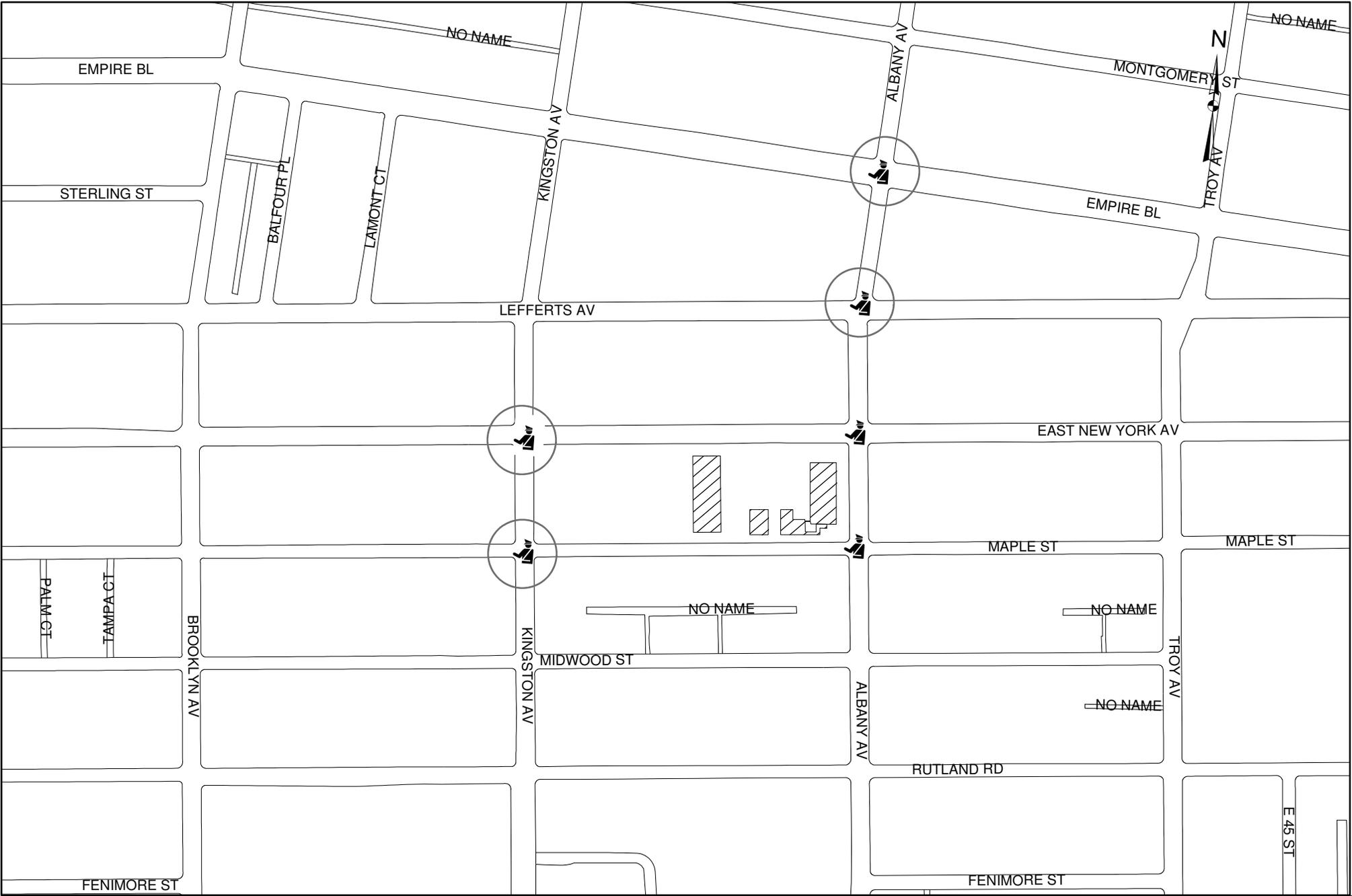
There are also bus stops for the B12 bus routes along Albany Avenue.

2.8 CROSSING GUARD LOCATION

Two crossing guards, one at Albany Avenue and East New York Avenue and one at Albany Avenue and Maple Street, are assigned to P.S. 91. Four more crossing guards assigned to other schools are on duty adjacent to P.S. 91. They are at Kingston Avenue and East New York Avenue, Kingston Avenue and Maple Street, Albany Avenue and Lefferts Avenue, and Albany Avenue and Empire Boulevard, respectively. See Exhibit 4 for a map of the crossing guard locations.



Figure 3 - Crossing guard at Albany Avenue and East New York Avenue during dismissal time.



Crossing guard assigned to P.S. 91

Crossing guard assigned to another school

1 inch equals 300 feet

EXHIBIT 4
ALBANY AVE SCHOOL
P.S. 91, BROOKLYN
CROSSING GUARDS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school representatives, about five percent of the students ride a school bus to P.S. 91. Six school buses serve the school, including three big yellow buses and three mini-buses used to transport handicapped students. School buses drop off and pick up school children on East New York Avenue in front of the schoolyard gate.



Figure 4: School bus on East New York Avenue

3.2 PARENT DROP-OFF OPERATIONS

According to school officials, approximately five percent of P.S. 91 students are driven to and from school by parents or guardians. During arrival and dismissal time, vehicles typically park or double-park on East New York Avenue to pick-up or drop-off students. Vehicles also park in the no parking zones on Maple Street, Albany Avenue, and East New York Avenue, as well as at the bus stop on Albany Avenue.

3.3 PARKING REGULATIONS

Parking regulations are shown in Exhibit 5. On East New York Avenue, “No Parking 7:00 AM – 4:00 PM School Days except Board of Education” parking signs are posted in front of the school.

“No Parking 7:00 AM – 4:00 PM School Days “ signs are posted on Maple Street and Albany Avenue respectively.

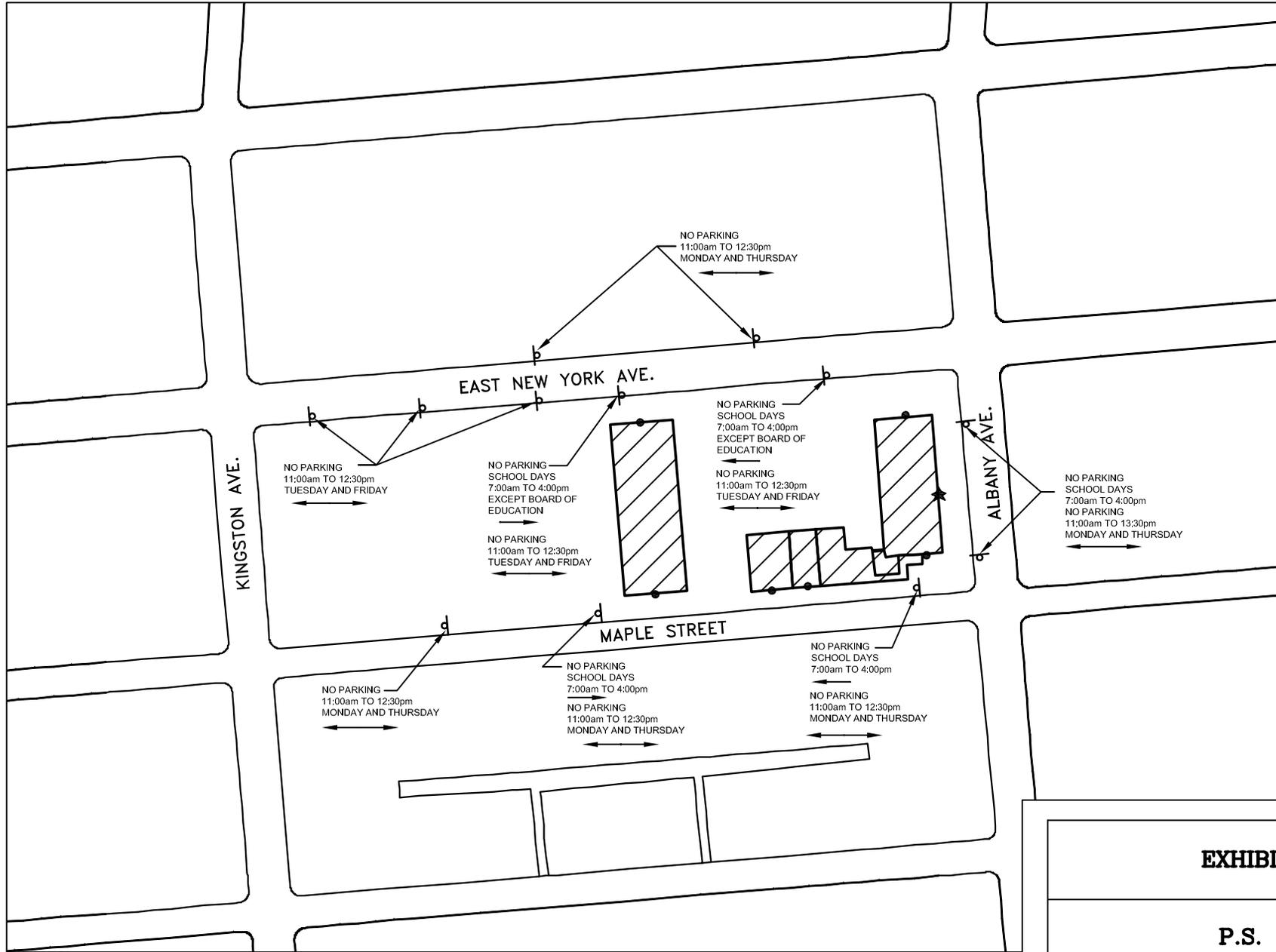
Street cleaning regulations, which prohibit parking on alternating sides of the roadway, are in place near the school entrance on East New York Avenue, Albany Avenue, and Maple Street.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, indicates existing signs, signals and pavement markings as of April 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".



*Figure 5: Looking east on East
New York Avenue*



LEGEND

- ★ MAIN ENTRANCE
- OTHER ENTRANCES

EXHIBIT 5

P.S. 91

EXISTING PARKING REGULATIONS

SCALE: 1" : 150'

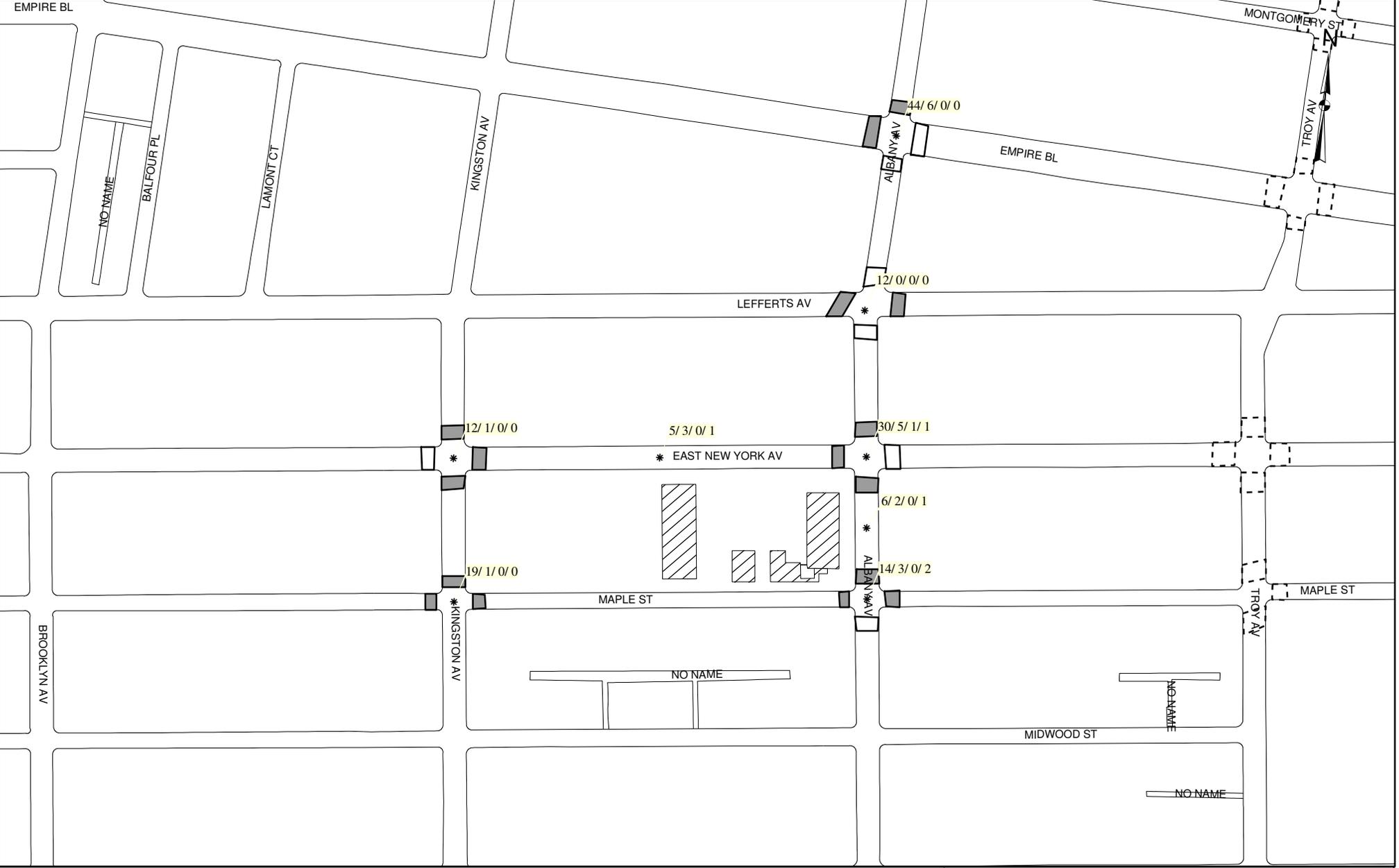
3.5 ACCIDENT SUMMARY

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. 91 for the three-year period from January 1, 1998 through December 1, 2000. The DMV data provides some detail relating to the cause of the accident. Table 3 is a summary of more recent accident data obtained from the NYC Police Department (NYPD). Though current through 2004, the NYPD data does not provide the same level of detail as the DMV data. Accidents are 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
Albany Avenue at Empire Boulevard	44	6	0	0
Albany Avenue at Lefferts Avenue	12	0	0	0
Albany Ave. at East New York Ave.	30	5	1	1
Albany Avenue at Maple Street	14	3	0	2
Kingston Ave. at E. New York Ave.	12	1	0	0
Kingston Avenue at Maple Street	19	1	0	0
Mid-block E. New York Ave. between Kingston Ave. and Albany	5	3	0	1
Mid-block Albany Ave. between East New York Ave and Maple St.	6	2	0	1
TOTAL	142	21	1	5

TABLE 3: NYPD FOUR YEAR ACCIDENT SUMMARY (2001-2004)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED* ACCIDENTS
Albany Avenue at Empire Boulevard	75	9	0	0
Albany Avenue at Lefferts Avenue	31	5	0	1
Albany Ave. at East New York Ave.	47	10	0	0
Albany Avenue at Maple Street	19	2	0	1
Kingston Ave. at E. New York Ave.	15	3	0	1
Kingston Avenue at Maple Street	10	2	0	0
TOTAL	197	31	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. 91 ———
 SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL - - - -
 CROSSWALK □

1 inch equals 250 feet

X/X/X/X

TOTAL ACCIDENTS	PED ACCIDENTS	PED FATAL	SCHOOL_PED ACCIDENTS
X	X	X	X

EXHIBIT 6
ALBANY AVE SCHOOL
P.S. 91, BROOKLYN
ACCIDENT SUMMARY
THREE YEAR PERIOD
(1998-2000)

3.6 TRAFFIC OPERATIONS AND ISSUES

The following outlines the traffic accident and operational issues at the intersections in the vicinity of P.S. 91.

3.6.1- East New York Avenue and Albany Avenue

Albany Avenue is 45 feet wide with one-way southbound traffic north of East New York Avenue. South of East New York Avenue, Albany Avenue is a two-way roadway, with one lane in both directions and parking permitted along each curb line. East New York Avenue is a two-way roadway, with one lane in both directions and parking permitted along each curb line. The intersection is controlled by a two-phase signal and has a crossing guard assigned to P.S. 91.

This intersection had 30 accidents between 1998 and 2000. There was a fatality of a 13-year old I.S. 391 student at this intersection on Wednesday February 24, 1999. The child was crossing Albany Avenue against the signal at approximately 3:00 pm when struck by a vehicle traveling south on Albany Avenue.

Four other pedestrian accidents occurred including two that involved school age children (11 and 13 years old). Details of these two accidents involving school age pedestrians (one occurring outside of school hours) were not reported. A pedestrian was crossing against the signal when struck. Another pedestrian was struck by a vehicle failing to yield.



Figure 6: Looking north on Albany Avenue at East New York Avenue

A one-hour turning movement count was performed on Tuesday, September 21, 2004 from 7:30 am to 8:30 am (Exhibit 7). The results show that 425 southbound through vehicles on Albany Avenue came into this intersection, which becomes two-way. In addition, 246 vehicles turned into the west crosswalk conflicting with 77 pedestrians, and 56 vehicles turned into the south crosswalk conflicting with 129 pedestrians in that hour.

LPI was considered at this intersection for the south crosswalk and west crosswalk during arrival and dismissal periods to mitigate conflicts between vehicle and student pedestrians. However, according to one-hour turning movement count and HCS level of service analysis (Appendix for detail), the moderate turning vehicle volumes and pedestrian volumes do not meet requirements for an LPI.

3.6.2- Maple Street and Albany Avenue

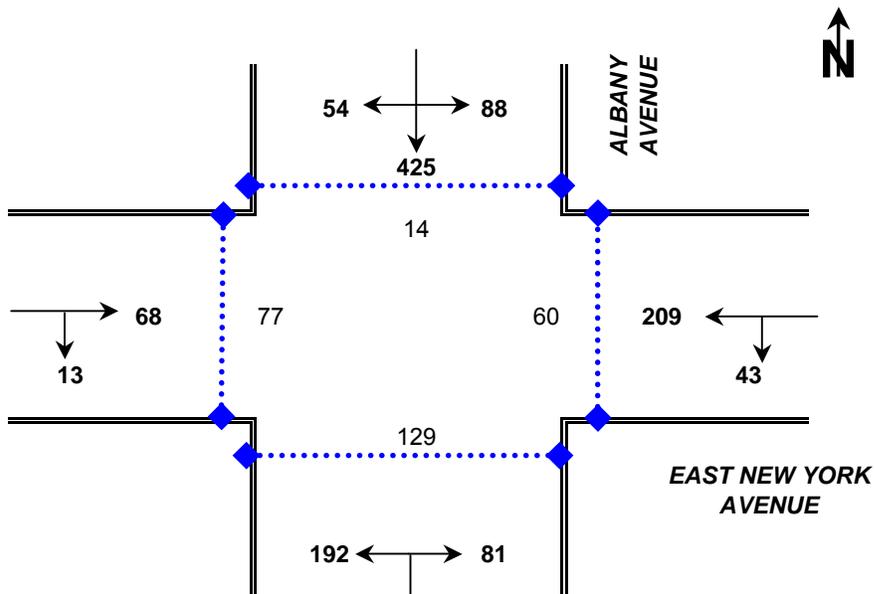
Maple Street is a one-way eastbound road, with one moving lane and parking permitted along both curb lines. This signalized intersection had fourteen accidents between 1998 and 2000. Three accidents included pedestrians and two of them involved school age pedestrians. Two school children (10 and 11 years old) were crossing against the signal when struck. A third pedestrian was crossing with the signal when struck by a vehicle making a left turn from Maple Street onto Albany Avenue.

All corners have pedestrian ramps, but the signal pole at the northeast corner and southwest corner are within the pedestrian crosswalks. A school crossing guard was assigned at this intersection.

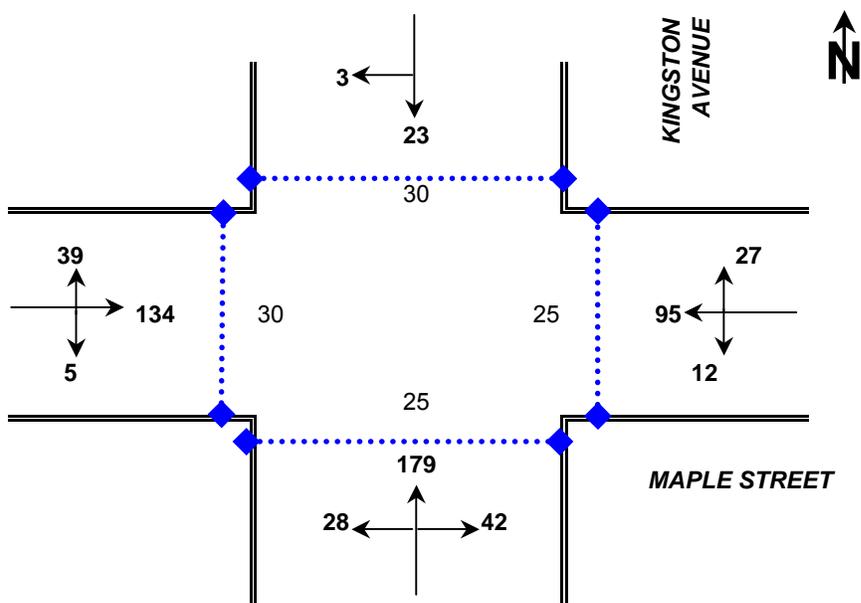


Figure 7: Albany Avenue and Maple Street, looking north

One Hour Traffic Count Volumes



Intersection of Albany Avenue and East New York Avenue
(7:30 AM - 8:30 AM, SEPTEMBER 21, 2004)



Intersection of Maple Street and Kingston Avenue
(7:30 AM - 8:30 AM MAY 19, 2005)

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

EXHIBIT 7
P.S 91 , BROOKLYN
TRAFFIC COUNTS

3.6.3- Kingston Avenue and East New York Avenue

Kingston Avenue is a one-way northbound roadway with parking permitted along both curb lines. A school crossing guard was assigned to this intersection. The southwest corner at this intersection has only one apex ramp and the utility pole at the northwest corner is not positioned correctly, and is within the corner quadrant. School officials felt that vehicles are speeding at this intersection.

This signalized intersection had twelve accidents between 1998 and 2000. One accident included a pedestrian, but none involved school age children. A 33-year-old pedestrian with a three-year old child was crossing outside of the crosswalk area when struck.



Figure 8 - Kingston Avenue and East New York Avenue, looking north

3.6.4- Kingston Avenue and Maple Street

This all-way stop controlled intersection had nineteen accidents between 1998 and 2000 with one pedestrian involved. A seventeen-year-old pedestrian was crossing outside of the crosswalk when struck by a northbound vehicle. A school crossing guard is assigned to this intersection.

The pedestrian ramps on the north side of the intersection are non-standard with apex ramps and the ramps at the southeast corner are not positioned correctly due to conflicts with a utility pole and fire alarm post.



*Figure 9- Maple Street and
Kingston Avenue, looking north*



*Figure 10 – Pedestrian ramp
conflicts with fire alarm*

3.6.5- Albany Avenue and Empire Boulevard

Empire Boulevard is a two-way, four-lane roadway with parking along both curbs. Forty-four accidents occurred between 1998 and 2000. Six accidents included pedestrians, one of which involved a school age child (occurring outside of school hours). Five pedestrians including a ten-year-old child were crossing when struck by vehicles making a left-turn or right-turn. The details for the sixth accident were not reported.



Figure 11- Albany Avenue and Empire Blvd., looking north

3.6.6- Albany Avenue and Lefferts Avenue

Lefferts Avenue is two-way roadway with one travel lane in each direction and parking along both curbs. Albany Avenue is one-way southbound with parking along both curbs at Lefferts Avenue. A school crossing guard was assigned at this intersection.

This signalized intersection had twelve accidents between 1998 and 2000. No pedestrians were struck and there were no fatalities.



Figure 12 – Albany Avenue and Lefferts Avenue, looking north

3.6.7- Albany Avenue between East New York Avenue and Maple Street

School representatives who stated that students frequently cross mid-block on Albany Avenue identified the segment as an area of concern. They also felt vehicles were speeding on this segment and that there is congestion along Albany Avenue in front of the school's main entrance.

As previously stated, Albany Avenue is a one-way southbound roadway, north of East New York Avenue, and a two-way roadway south of East New York Avenue. According to school representatives, vehicles routinely travel north on Albany Avenue into the one-way southbound oncoming traffic. Vehicles were observed performing U-turns on this roadway segment.

It was also observed that this block is a destination for students being dismissed from schools surrounding P.S. 91, due to the location of the B12 bus stop in front of the school. During dismissal, school officials stand outside P.S. 91 in order to disperse pedestrians. Students were observed running between parked vehicles, crossings mid-block, and disregarding traffic signals.



Figure 13 – Albany Avenue in front of P.S. 91, during dismissal time

Six accidents occurred along this segment between 1998 and 2000. Two accidents included pedestrians, one of which involved a ten-year-old school age pedestrian. Both pedestrians were crossing mid-block at the time of the accident.

3.6.8- East New York Avenue between Albany Avenue and Kingston Avenue

All school bus drop-off and pick-up is on East New York Avenue, within this roadway segment. The main gate to the schoolyard is also on East New York Avenue.

Students were observed crossings mid-block, running between parked buses and vehicles, and disregarding commands from the crossing guard located nearby. School officials felt that vehicles are speeding along this segment of East New York Avenue.

Five accidents occurred along this segment between 1998 and 2000. Three accidents included pedestrians and one involved a school child. All three pedestrians were crossing mid-block at the time of the accident.



Figure 14 – School buses on East New York Avenue

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 91 on April 1, 2004, and found to be adequate in all directions and approaches (Table 5).

TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS				
Intersection Name	Crosswalk Width (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)	Timing Adjustment? (Yes/No)
Albany Ave. at Empire Blvd.				
Crossing Albany Avenue	40	38	14	NO
Crossing Empire Boulevard	60	42	20	NO
Albany Ave. at Lefferts Avenue				
Crossing Albany Avenue	45	31	15	NO
Crossing Lefferts Avenue	45	49	15	NO
Albany Ave. at E. New York Ave.				
Crossing Albany Avenue	45	36	15	NO
Crossing East New York Avenue	45	44	15	NO
Albany Ave. at Maple St.				
Crossing Albany Avenue	45	31	15	NO
Crossing Maple Street	30	49	10	NO
Kingston Ave. at E. New York Ave.				
Crossing Kingston Avenue	45	31	15	NO
Crossing East New York Avenue	45	49	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 (ROADWAY AND SIDEWALK)

The roadways and sidewalks were generally observed to be in good condition in the vicinity of P.S. 91 with the exception of the following:

- On north side of Maple Street, west of Kingston Avenue, there is a section of sidewalk that was observed to be cracked.
- On Maple Street, in the vicinity of the schoolyard, there is sidewalk and curb damage at the schoolyard fence.

Pedestrian ramps that are missing or not positioned correctly have been noted in Section 3.6.

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 students not to cross mid-block and not to cross against signals.

- Repair roadway and sidewalk deficiencies in the vicinity of P.S. 91

Pavement repairs should be performed at the following location:

- Sidewalk on Maple Street, between Kingston Avenue and Albany Avenue

- No-Standing Zone on Albany Avenue

School officials observed the traffic is heavy in front of school's main entrance along Albany Avenue. "No Standing, 7:00 AM to 4:00 PM School Days" parking regulation should be considered on Albany Avenue in front of P.S. 91 to prohibit any vehicles from parking or standing in front of the school or within the MTA bus stop during the arrival or dismissal periods.

- No-Standing Zone on East New York Avenue

"No Standing School Days, 7:00 AM to 4:00 PM" parking regulations should be considered in front of the main schoolyard gate on the south side of East New York Avenue for a length of 60 feet to provide sufficient clear frontage for school buses to drop-off and pick-up students. Displaced teacher parking could be relocated to the north side of East New York Avenue facing the park.

- Install Advanced Stop Bars

Stop bars installed in advance of the school crosswalk reduces the incidence of motorists stopping in the crosswalk. This allows pedestrians to proceed in a crosswalk before motor vehicles turn, reducing pedestrian vehicle conflicts. Therefore, it is recommended that stop lines be installed in advance of pedestrian crosswalks at signalized intersections.

- Install Speed Reducer (Hump) on East New York Avenue

School officials believed that vehicles were speeding on the East New York Avenue in the vicinity of the school. A spot speed survey was performed on July 12, 2005 on East New York Avenue between Albany Avenue and Kingston Avenue between 9:00 am and 9:45 am.

The speed study results are shown in Table 5 and in the Appendix. The 85th percentile speed was 37 mph. Therefore, because the 85th percentile speeds exceed the city legal speed limit of 30 mph, a speed reducer should be considered

on East New York Avenue between Albany Avenue and Kingston Avenue in the vicinity of P.S. 91.

TABLE 5: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
East New York Avenue btw. Albany Avenue and Kingston Avenue	32	37
Albany Avenue btw. East New York Avenue and Maple Street	27	32

- Install or replace pedestrian ramps at all crosswalks where required

New standard pedestrian ramps should be installed at all locations where currently only one ramp exists, or where a utility pole is located within the corner quadrant.

4.2 LONG-TERM RECOMMENDATIONS

- Install a curb extension “neckdown” at the Albany Avenue and East New York Avenue

The painted gore area at the intersection of Albany Avenue and East New York Avenue should be formalized with a raised sidewalk extension. The new formalized sidewalk will provide traffic calming where the speed study conducted on February 9, 2006 indicated the 85th percentile was exceeding the speed limit on Albany Avenue (see Table 5). In addition, the raised sidewalk extension will shorten the crossing distance for pedestrians and slow down turning vehicles.

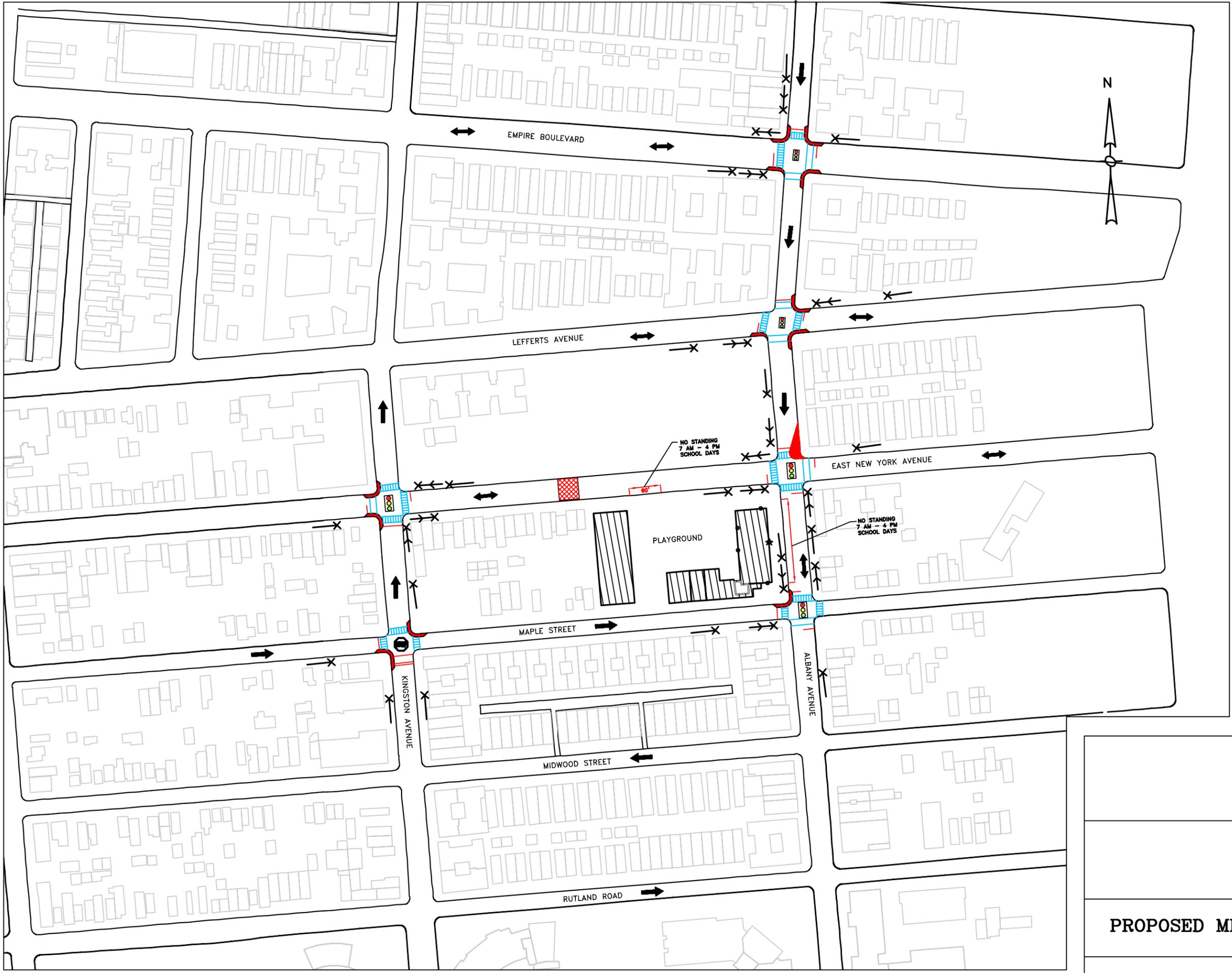
The new curb extension “neckdown” should be consistent with AASHTO guidelines. The extension will not eliminate or reduce the width of any moving lanes or hinder the ability of vehicles to turn. Final details pertaining to curb extensions will be developed during the Final Design/Contract Document preparation.

- Consider curb extensions (neckdowns) at the following intersections:
 - Albany Avenue and Maple Street
 - Albany Avenue and Lefferts Avenue
 - Albany Avenue and Empire Boulevard
 - Kingston Avenue and East New York Avenue
 - Kingston Avenue and Maple Street

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 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.



- LEGEND**
- MAIN ENTRANCE
 - OTHER ENTRANCES
 - EXISTING ADVANCE WARNING SIGN WITH ARROW
 - EXISTING ADVANCE WARNING SIGN
 - EXISTING TRAVEL DIRECTION
 - SIGNALIZED INTERSECTION
 - ALL-WAY STOP INTERSECTION
 - EXISTING SCHOOL CROSSWALK
 - EXISTING STANDARD (NON-SCHOOL) CROSSWALK
 - EXISTING SCHOOL CROSSWALK ASSOC. WITH OTHER SCHOOL
 - PROPOSED ADVANCE WARNING SIGN WITH ARROW
 - PROPOSED ADVANCE WARNING SIGN
 - PROPOSED STOP LINE
 - PROPOSED REGULAR CROSSWALK
 - PROPOSED CURB EXTENSION (NECKDOWN)
 - PROPOSED SPEED REDUCER (HUMP)

SCALE: 1" : 150'

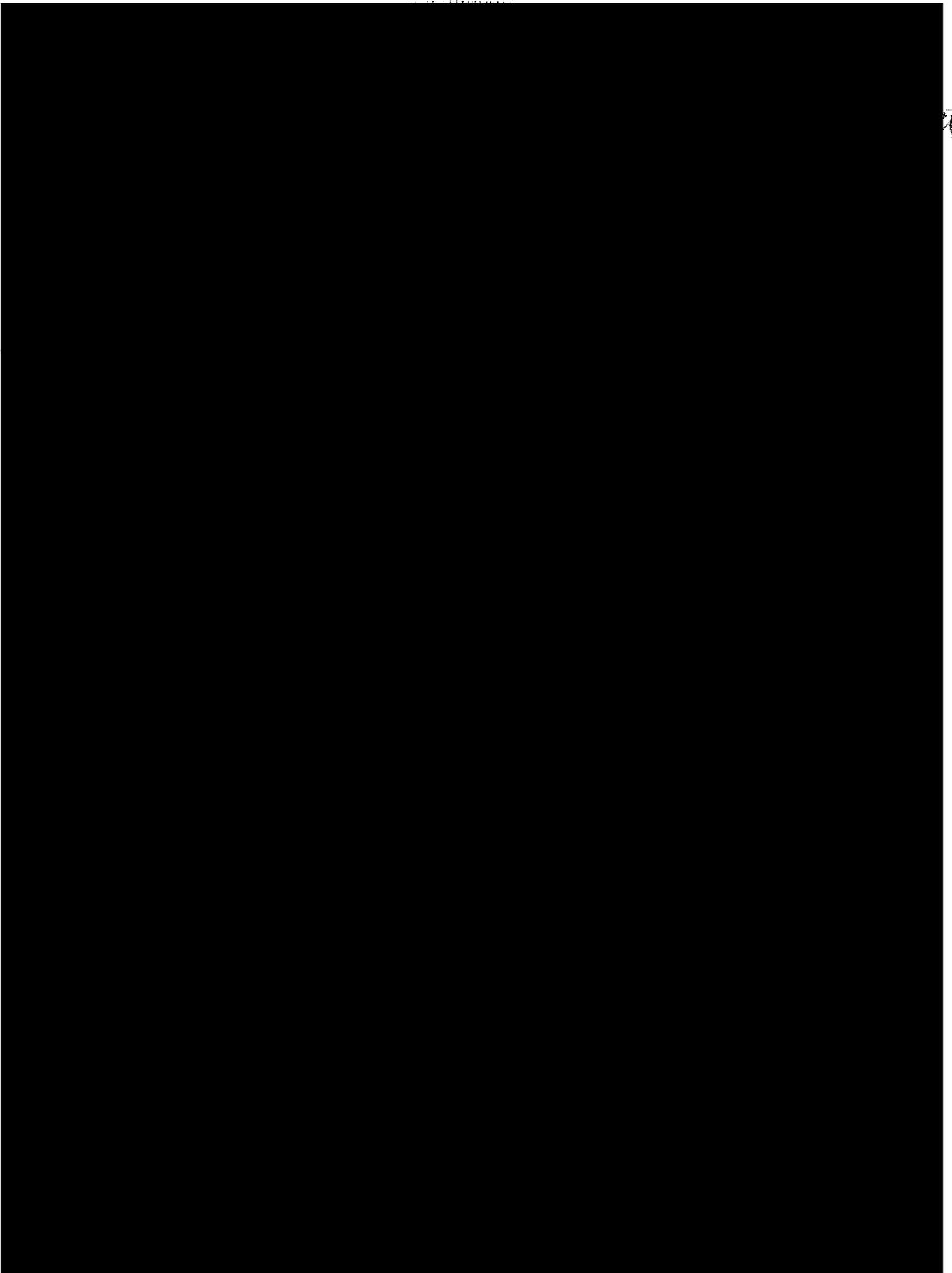
EXHIBIT 8

P.S. 91

PROPOSED MEASURES TO IMPROVE SAFETY

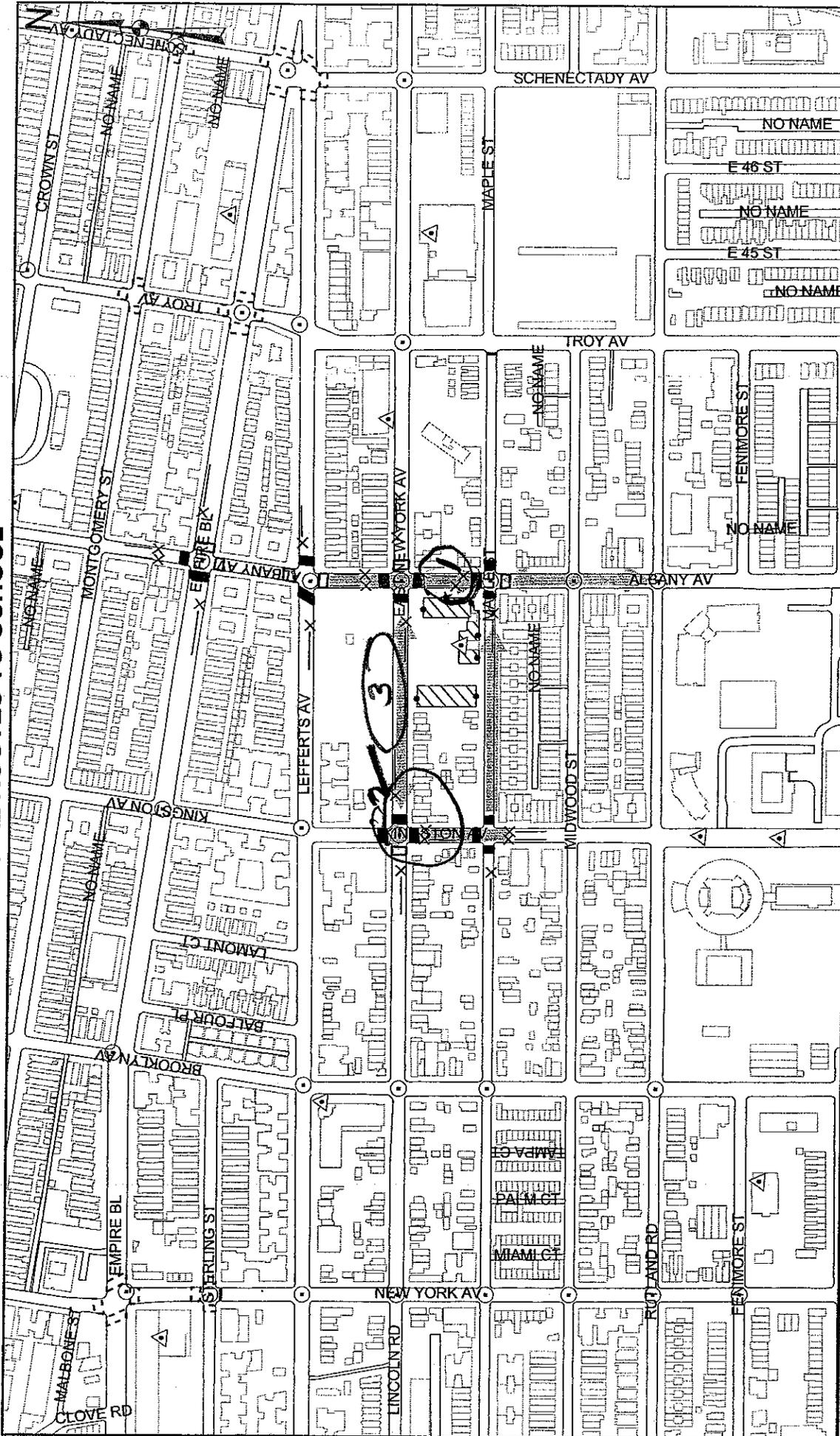
APPENDIX





7

**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

**ALBANY AVE SCHOOL
P.S. 91**

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

ORIG. DATE: 8/12/1953
GIS CONVERT: 04/7/2002
DRAWING NO. QC-286
REVISIONS: MS-3820

COMM. BOARD: 8
BOROUGH: BROOKLYN
PRECINCT: 71

P.S. 91
 May 19, 2005
 7:30 am - 8:30 am

Title1 : SCHOOL SAFETY PROJECT
 Title2 : BOROUGH OF BROOKLYN
 Title3 : P.S. 91

Site:
 Date: 09/21/04

Combined
**Peds not included in table data*

Begin Time	Total	ALBANY AVENUE			EAST NEW YORK AVE			ALBANY AVENUE			EAST NEW YORK AVE		
		SB-R	SB-T	SB-L	WB-R	WB-T	WB-L	NB-R	NB-T	NB-L	EB-R	EB-T	EB-L
07:30:00	249	6	94	18	0	46	10	24	0	36	2	13	0
07:45:00	295	10	97	23	0	62	6	17	0	58	4	18	0
08:00:00	318	18	118	23	0	52	13	18	1	50	3	22	0
08:15:00	313	20	116	24	0	49	14	22	1	48	4	15	0
	1,175	54	425	88	0	209	43	81	2	192	13	68	0

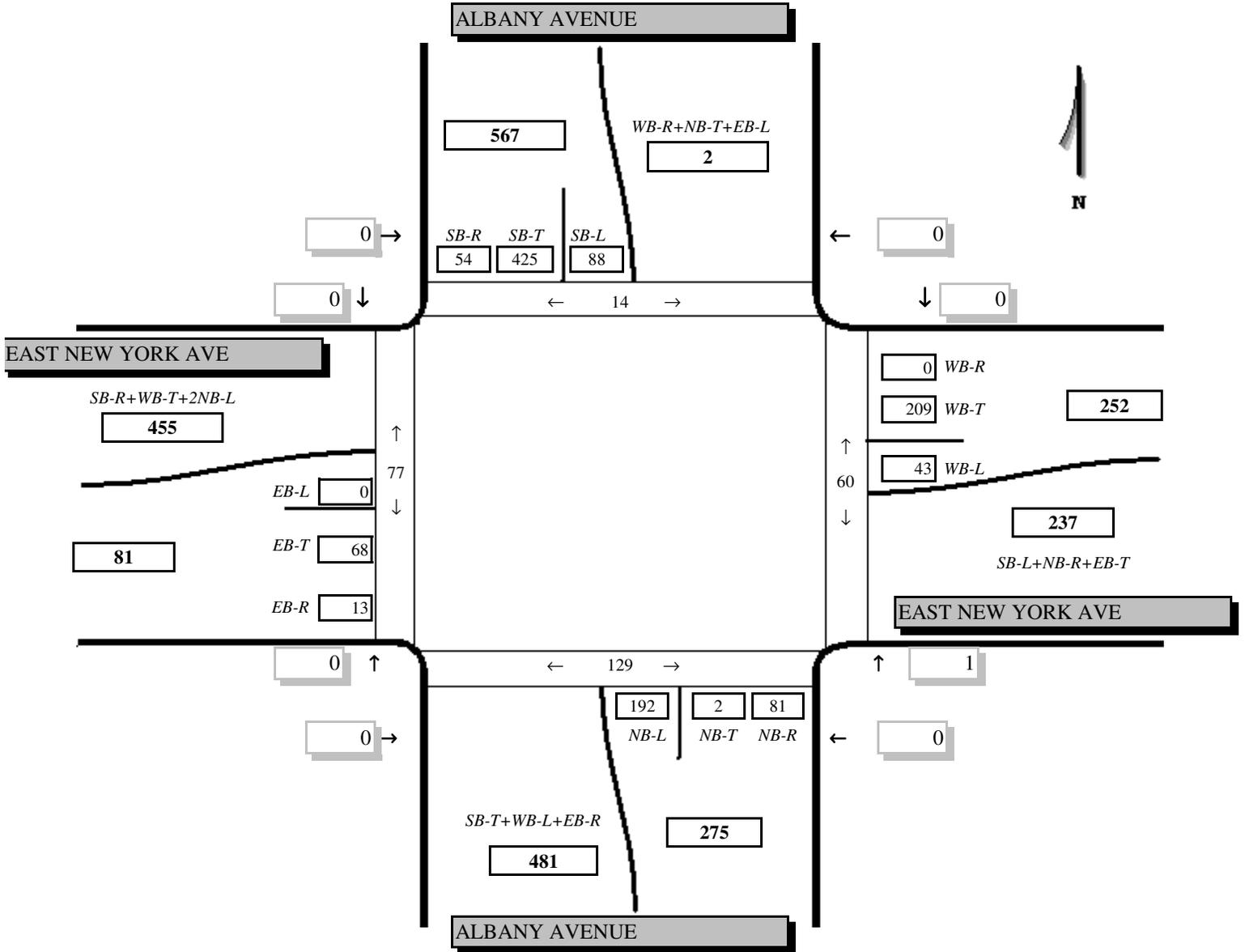
Peak Volume Periods (1 hour Res:15 min.)					
Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	07:30:00	To 08:30:00	926
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	NA	To NA	0

P.S. 91
 May 19, 2005
 7:30 am - 8:30 am

Title1 : SCHOOL SAFETY PROJECT
 Title2 : BOROUGH OF BROOKLYN
 Title3 : P.S. 91

Site:
 Date: 09/21/04

Combined
 *Peds not included in table data



P.S. 91
 May 19, 2005
 7:30 am - 8:30 am

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

Site:
 Date: 05/19/05

Combined
 *Peds not included in table data

Begin Time	Total	KINGSTON			MAPLE			KINGSTON			MAPLE		
		S-R	S-T	S-L	W-R	W-T	W-L	N-R	N-T	N-L	E-R	E-T	E-L
07:30:00	131	0	0	0	11	21	0	7	40	12	0	26	14
07:45:00	173	3	15	0	11	32	7	9	46	8	5	29	8
08:00:00	179	0	8	0	5	41	5	9	51	7	0	46	7
08:15:00	104	0	0	0	0	1	0	17	42	1	0	33	10
587		3	23	0	27	95	12	42	179	28	5	134	39

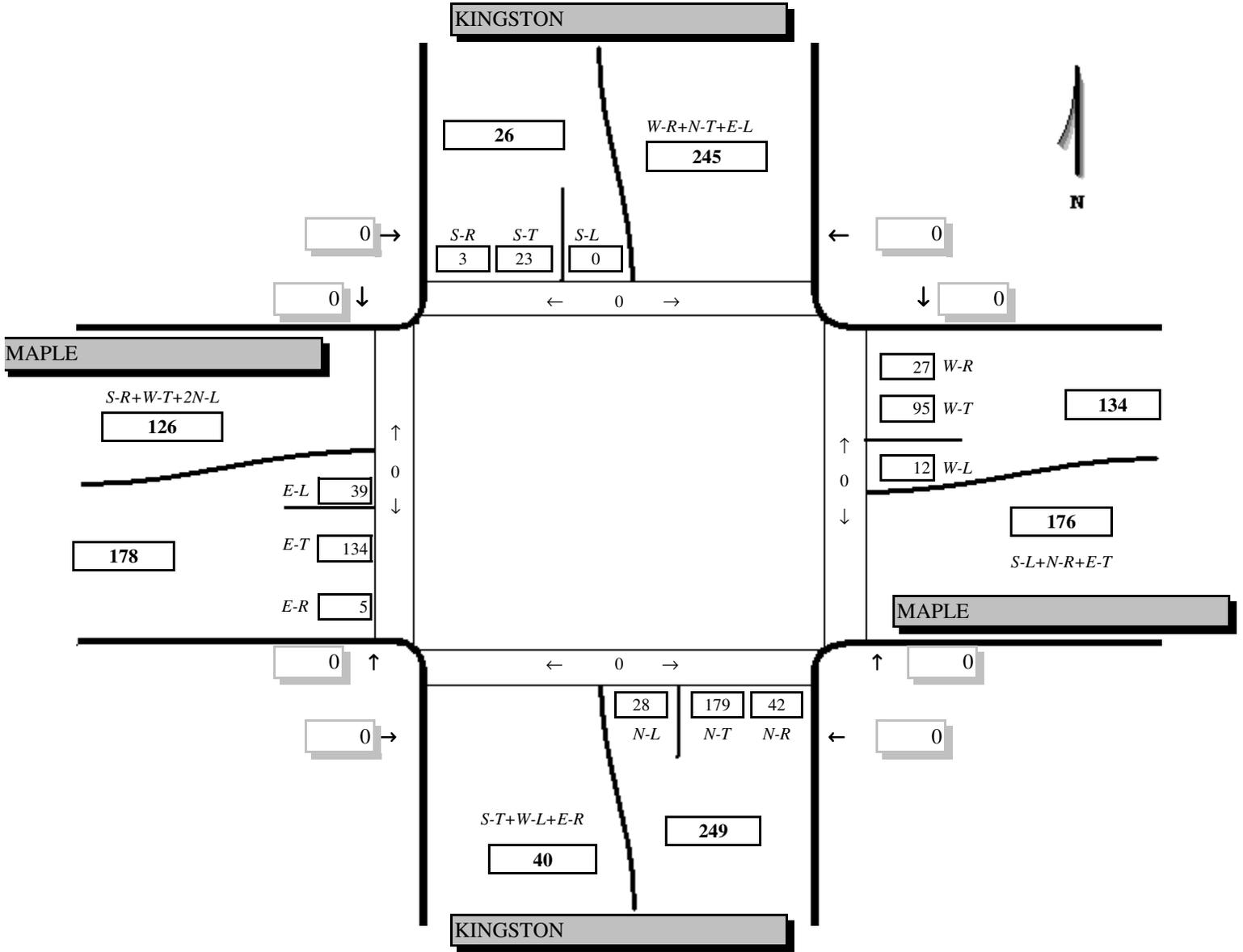
Peak Volume Periods (1 hour Res:15 min.)					
Period			Peak Period		Volume
AM	05:00:00	To 10:00:00	07:30:00	To 08:30:00	587
Noon	10:00:00	To 15:00:00	NA	To NA	0
PM	15:00:00	To 20:00:00	NA	To NA	0

P.S. 91
 May 19, 2005
 7:30 am - 8:30 am

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

Site:
 Date: 05/19/05

Combined
 *Peds not included in table data





Pedestrian Count Form

Job Number _____

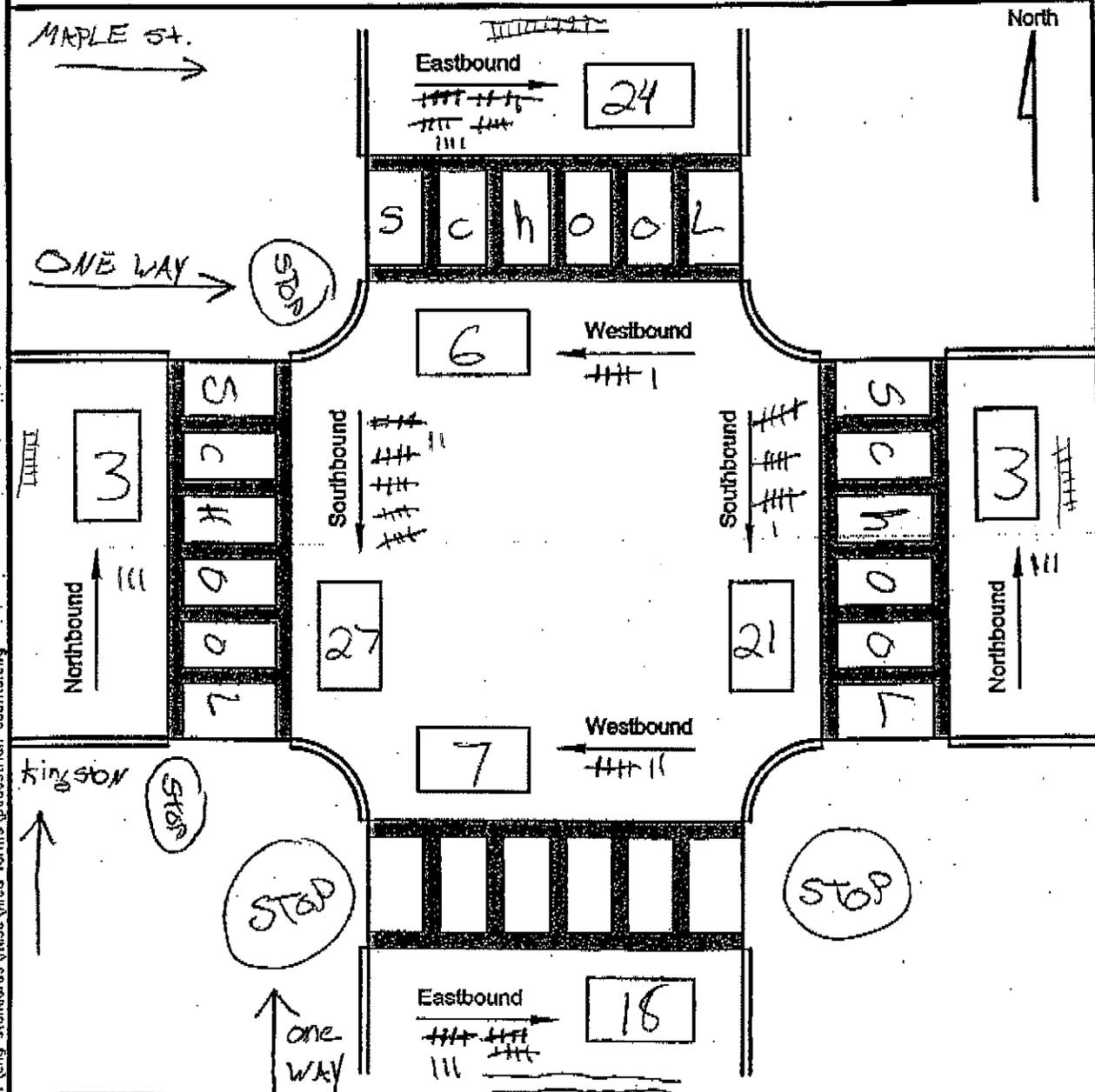
Prepared By E.Y.

Task Number _____

Date 5-19-05

Location MAPLE St. & Kingston

Time Period 7:45-8:45



i:\eng_standards\misc\filed_forms\pedestrian_counts.dwg

Analyst: The RBA Group Inter.:
 Agency: Area Type: All other areas
 Date: 7/13/2005 Jurisd:
 Period: AM Peak Year : 2004- NO LPI
 Project ID: School Safety Engineering Project
 E/W St: East New York Avenue N/S St: Albany Avenue

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	0	0	0	0	1	0
LGConfig	TR			LT			LR			LTR		
Volume	68	13		43	209		192		81	88	425	54
Lane Width	12.0			12.0			12.0			12.0		
RTOR Vol	0						0			0		

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	P		
Thru	P				Thru			
Right	P				Right	P		
Peds	X				Peds	X		
WB Left	P				SB Left	P		
Thru	P				Thru	P		
Right					Right	P		
Peds	X				Peds	X		
NB Right					EB Right			
SB Right					WB Right			
Green	36.0				44.0			
Yellow	3.0				3.0			
All Red	2.0				2.0			

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS

Eastbound

TR 711 1778 0.13 0.40 17.4 B 17.4 B

Westbound

LT 682 1706 0.41 0.40 21.2 C 21.2 C

Northbound

LR 342 700 0.89 0.49 47.6 D 47.6 D

Southbound

LTR 879 1797 0.72 0.49 23.1 C 23.1 C

Intersection Delay = 28.0 (sec/veh) Intersection LOS = C

SPOT SPEED STUDY

Date: **July 12, 2005** Time: **9:00 am - 9:45 am**
 Location: **East New York Avenue between Albany Avenue and Kingston Avenue**
 Surveyor:

School: **P.S. 91**
 Direction:
 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	1	0.9%	0.9%	20	400
21	1	0.9%	1.9%	21	441
22	4	3.7%	5.6%	88	1936
23	0	0.0%	5.6%	0	0
24	3	2.8%	8.3%	72	1728
25	5	4.6%	13.0%	125	3125
26	3	2.8%	15.7%	78	2028
27	4	3.7%	19.4%	108	2916
28	6	5.6%	25.0%	168	4704
29	4	3.7%	28.7%	116	3364
30	23	21.3%	50.0%	690	20700
31	7	6.5%	56.5%	217	6727
32	4	3.7%	60.2%	128	4096
33	8	7.4%	67.6%	264	8712
34	8	7.4%	75.0%	272	9248
35	9	8.3%	83.3%	315	11025
36	3	2.8%	86.1%	108	3888
37	2	1.9%	88.0%	74	2738
38	3	2.8%	90.7%	114	4332
39	3	2.8%	93.5%	117	4563
40	2	1.9%	95.4%	80	3200
41	1	0.9%	96.3%	41	1681
42	0	0.0%	96.3%	0	0
43	2	1.9%	98.1%	86	3698
44	0	0.0%	98.1%	0	0
45	1	0.9%	99.1%	45	2025
46	0	0.0%	99.1%	0	0
47	0	0.0%	99.1%	0	0
48	0	0.0%	99.1%	0	0
49	0	0.0%	99.1%	0	0
50	1	0.9%	100.0%	50	2500
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
	108	100.0%		3397	109775

Mean Speed = 31.5 mph Median Speed = 31.5 mph
 Standard Deviation = 5.2 mph 15th Percentile Speed = 26.0 mph
 Margin of Error (95% Confidence) = ± 1.0 mph 85th Percentile Speed = 36.9 mph

SPOT SPEED STUDY

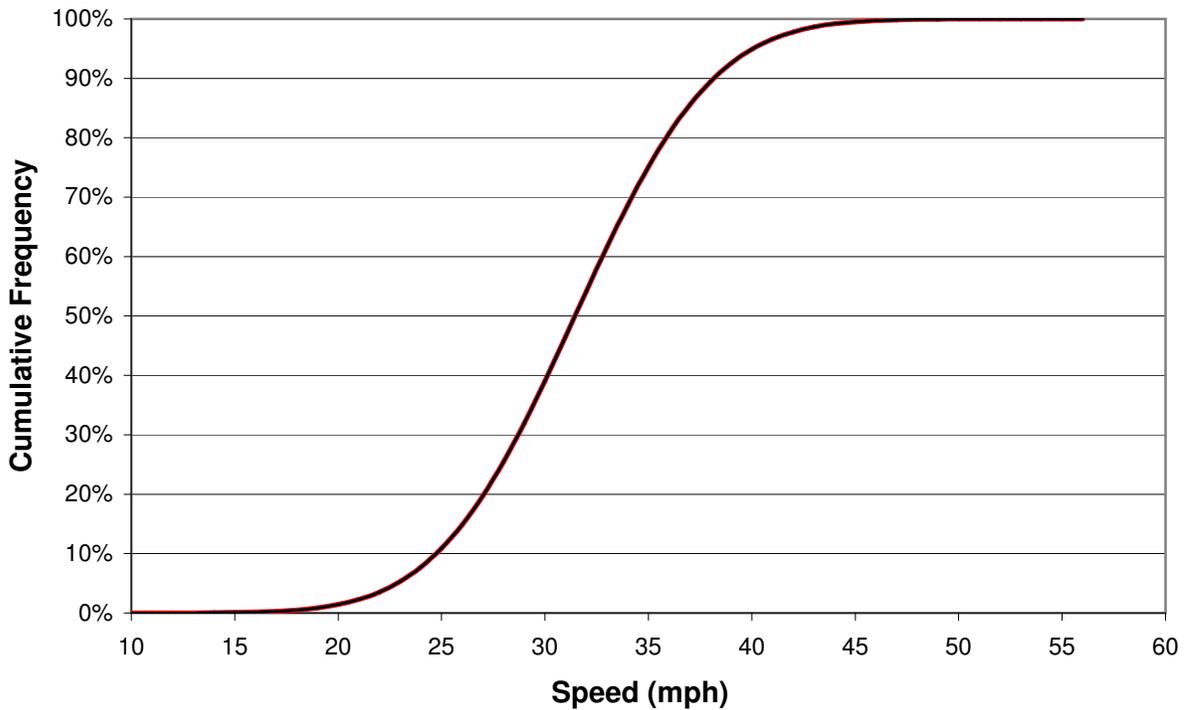
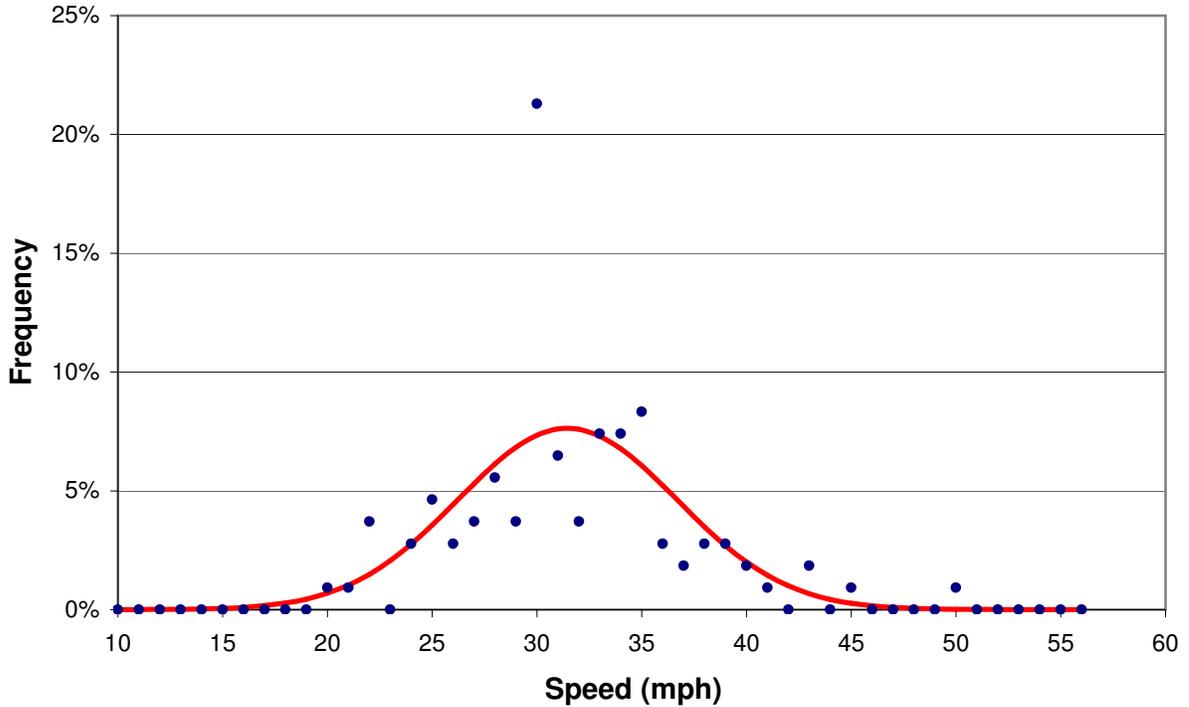
Date: **July 12, 2005**
Location: **East New York Avenue between Albany Avenue and Kingston Avenue**
Surveyor:

Time: **9:00 am - 9:45 am**

School: **P.S. 91**
Direction:
Comments:

Mean Speed = 31.5 mph
Standard Deviation = 5.2 mph
Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 31.5 mph
15th Percentile Speed = 26.0 mph
85th Percentile Speed = 36.9 mph



SPEED DATA AND ANALYSIS SHEET

School: P.S. 91
Location: EAST NEW YORK AVE
Between: KINGSTON AVE. & ARBANY AVE.
Borough: BROOKLYN

Date: 7-12-05
Time: 9:00 - 9:45
Weather: CLEAR
Pavement: DRY

SPEED (Mph)		TOTAL
15		
16		
17		
18		
19		
20		1
21		1
22		4
23		
24		3
25	###	5
26		3
27		4
28	###	6
29		4
30	### ## # # #	23
31	###	7
32		4
33	###	8
34	###	8
35	###	9
36		3
37		2
38		3
39		3
40		2
41		1
42		
43		2
44		
45		1
46		
47		
48		
49		
50		1
51		
52		
53		
54		