

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



School Safety Engineering Project

FINAL REPORT: I.S. 391 (Mahalia Jackson Middle School), Brooklyn



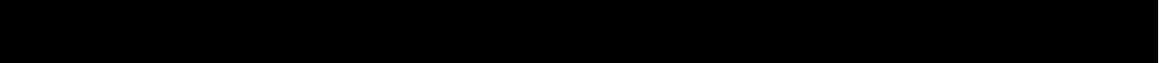
Prepared by
The RBA Group/Urbitrans Associates



NOVEMBER 17, 2006

School Safety Engineering Project
Draft Report: I.S. 391 (Mahalia Jackson Middle School), Brooklyn

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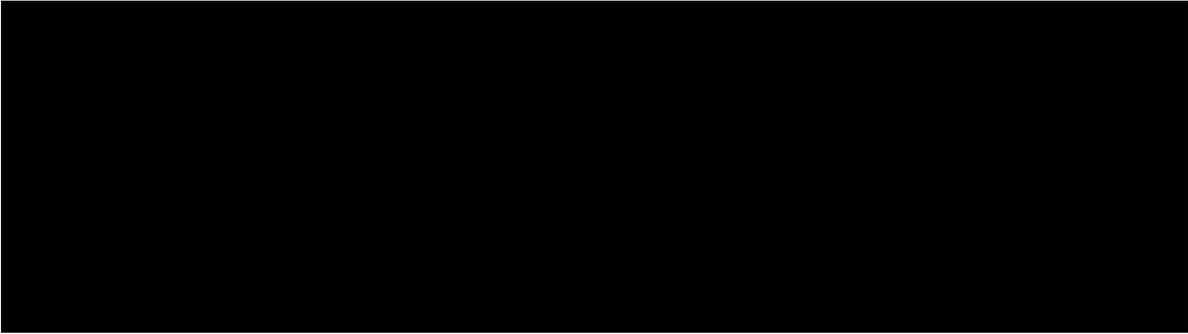
1. INTRODUCTION

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 600 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). I.S. 391 (Mahalia Jackson Middle School) in Brooklyn is one of 135 such “priority” schools.

2. BACKGROUND – EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

Located at 790 East New York Avenue in Brooklyn, Mahalia Jackson Middle School is situated along Troy Avenue, between East New York Avenue and Maple Street (Aerial Photograph, Exhibit 1). There are ball fields and a rowing track directly across Maple Street, however the fields are used by The Boys and Girls High School located approximately 20 blocks north at Fulton Street. The fields take up the entire city block bounded by Maple Street (north), Troy Avenue (west), Rutland Road (south), and Schenectady Avenue (east). The surrounding land use is residential on Maple Street, with mixed use commercial on East New York Avenue, Troy Avenue, and Schenectady Ave. The B12 and B17 bus routes operate on East New York Avenue and Troy Avenue north of East New York Avenue.



Figure 1: East New York Avenue in front of I.S. 391 School

2.3 MEETING WITH SCHOOL REPRESENTATIVES

Representatives from the Brooklyn Borough Commissioner's Office, the consultant staff, and I.S. 391 met at the school on April 28, 2004.

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

- Vehicles speeding on Troy Avenue
- Vehicles speeding on Maple Street
- Students crossing at the mid-block of East New York Avenue to get to the bus stop
- The need for school crossing guards at the following intersections:
 - East New York Avenue and Troy Avenue
 - East New York Avenue and Schenectady Avenue
- School officials believed that pedestrian crossing times at the intersections of East New York Avenue with Troy Avenue, and East New York Avenue with Schenectady Avenue were inadequate.

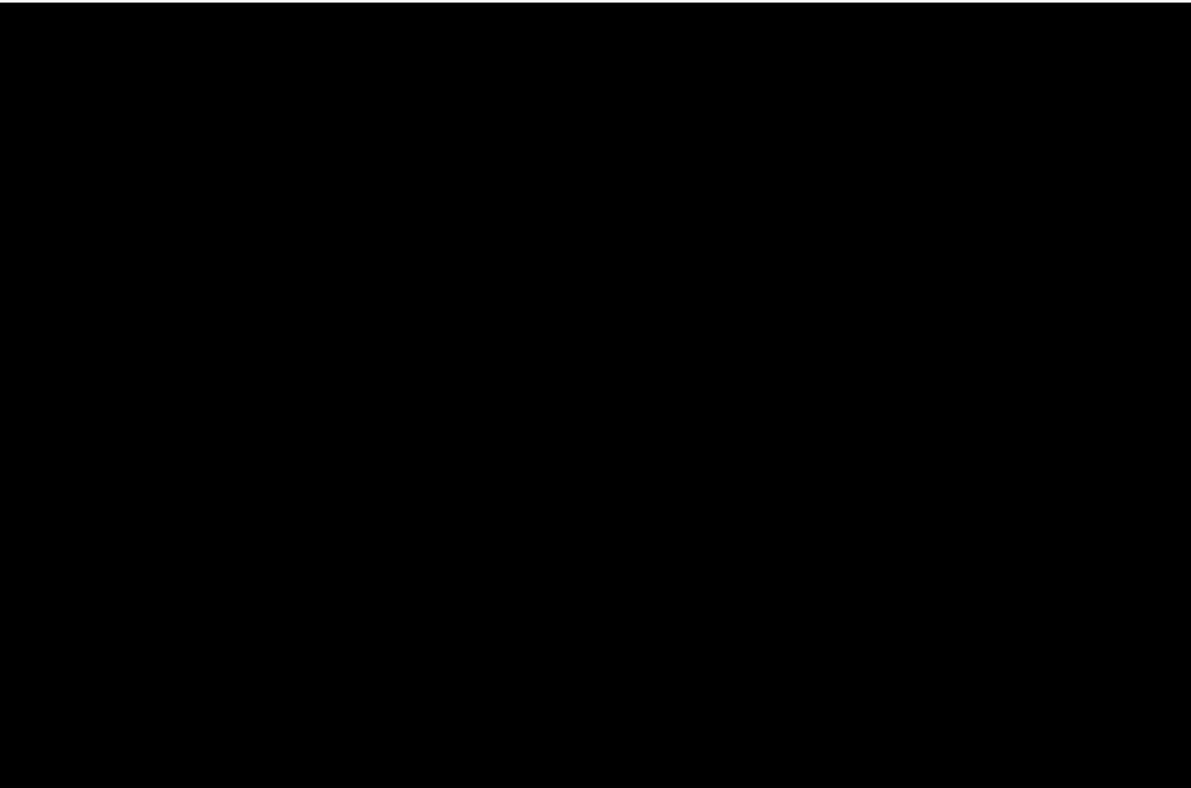




Figure 2: School's main entrance on East New York Avenue

2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

According to the principal, approximately 50% of students arrive at I.S. 391 via public transportation, 40% walk to school, 8% arrive by school bus, and 2% of the students are driven to school. See Table 1 for school's estimate of modes of travel and Exhibit 2 for the Catchment Area.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	
Description	Percentage
Walk	40%
Driven by car, livery cab or mini-bus	2%
School bus	8%
MTA bus or subway	50%
TOTAL	100%



1 inch equals 175 feet

EXHIBIT 1
MAHALIA JACKSON
I.S. 391, BROOKLYN
AERIAL PHOTOGRAPH



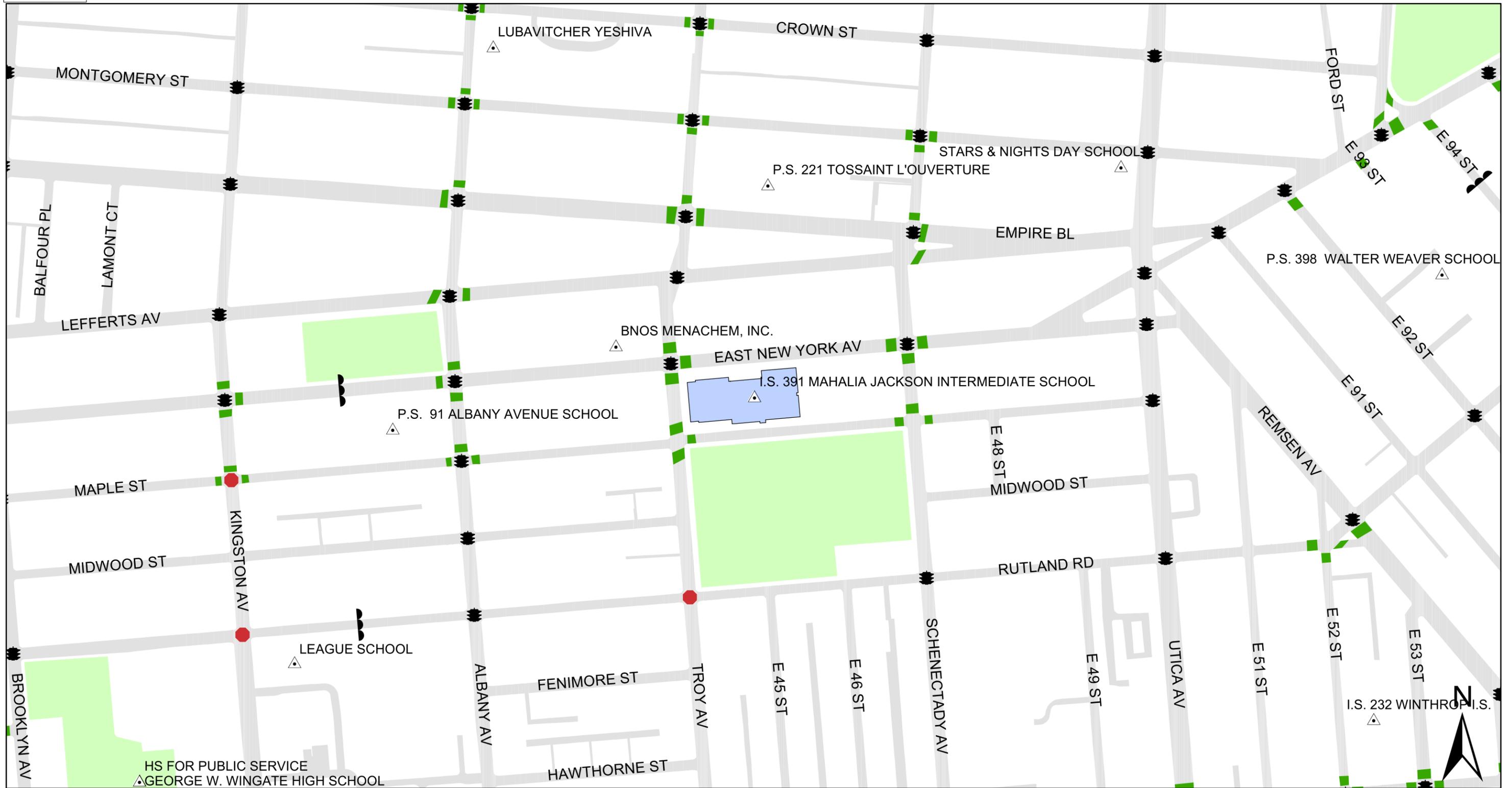
1 inch equals 600 feet


CATCHMENT AREA

EXHIBIT 2
MAHALIA JACKSON
I.S. 391, 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		TRAFFIC SIGNAL	
SCHOOL CROSSWALK		ALL - WAY STOP	
		SPEED REDUCER	

IS 391 Brooklyn
MAHALIA JACKSON INTERMEDIATE SCHOOL

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

Map created on 11/16/2006

EXHIBIT 3

1.5.1

COMM. BOARD: 309
 PRECINCT: 71

2.7 OTHER STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are two public schools in the vicinity of I.S. 391: P.S. 221 with approximately 700 students is located on Empire Boulevard between Schenectady Avenue and Troy Avenue, and P.S. 91 with approximately 850 students is located on Albany Avenue taking up the entire block from East New York Avenue to Maple Street (P.S. 91 is also a priority school). In addition, a small private school, Bnos Menachem, is located on East New York Avenue between Troy Avenue and Albany Avenue.

The principal indicated that after school, the students walk to a deli across Schenectady Avenue and to a White Castle restaurant across East New York Avenue and Schenectady Avenue.

There are also bus stops for the B12 and B17 bus routes along East New York Avenue and Troy Avenue north of East New York Avenue.

2.8 CROSSING GUARD LOCATIONS

According to field observations and as confirmed by the school principal, currently there are no crossing guards assigned to I.S. 391. However, previously there was a crossing guard assigned to the intersection of Troy Avenue and East New York Avenue.



Figure 3: Looking northeast at school crosswalk at East New York Avenue and Troy Avenue

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to the school principal, approximately eight percent of the students are transported by school buses to I.S. 391. Seven buses serve the school, including four yellow buses, two mini-buses and one wheelchair bus with a hydraulic lift. School buses line up at the Maple Street entrance to pick up and drop off students.

3.2 PARENT DROP-OFF OPERATIONS

School officials have indicated that approximately two percent of I.S. 391 students are driven to and from school by parents or guardians. During arrival and dismissal times, vehicles typically park and double-park in front of the school's main entrance on East New York Avenue to pick up or drop off students.

3.3 PARKING REGULATIONS

“NO PARKING 7:00 AM – 4:00 PM SCHOOL DAYS EXCEPT BOARD OF EDUCATION” parking regulations are posted in front of the school on East New York Avenue. Teacher parking is provided on East New York Avenue.

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

Parking regulations are shown in Exhibit 4.



Figure 4: East New York Avenue, looking east

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, shows existing signals and 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 6.



Figure 5: Maple Street and Troy Avenue (looking north)

3.5 ACCIDENT SUMMARY

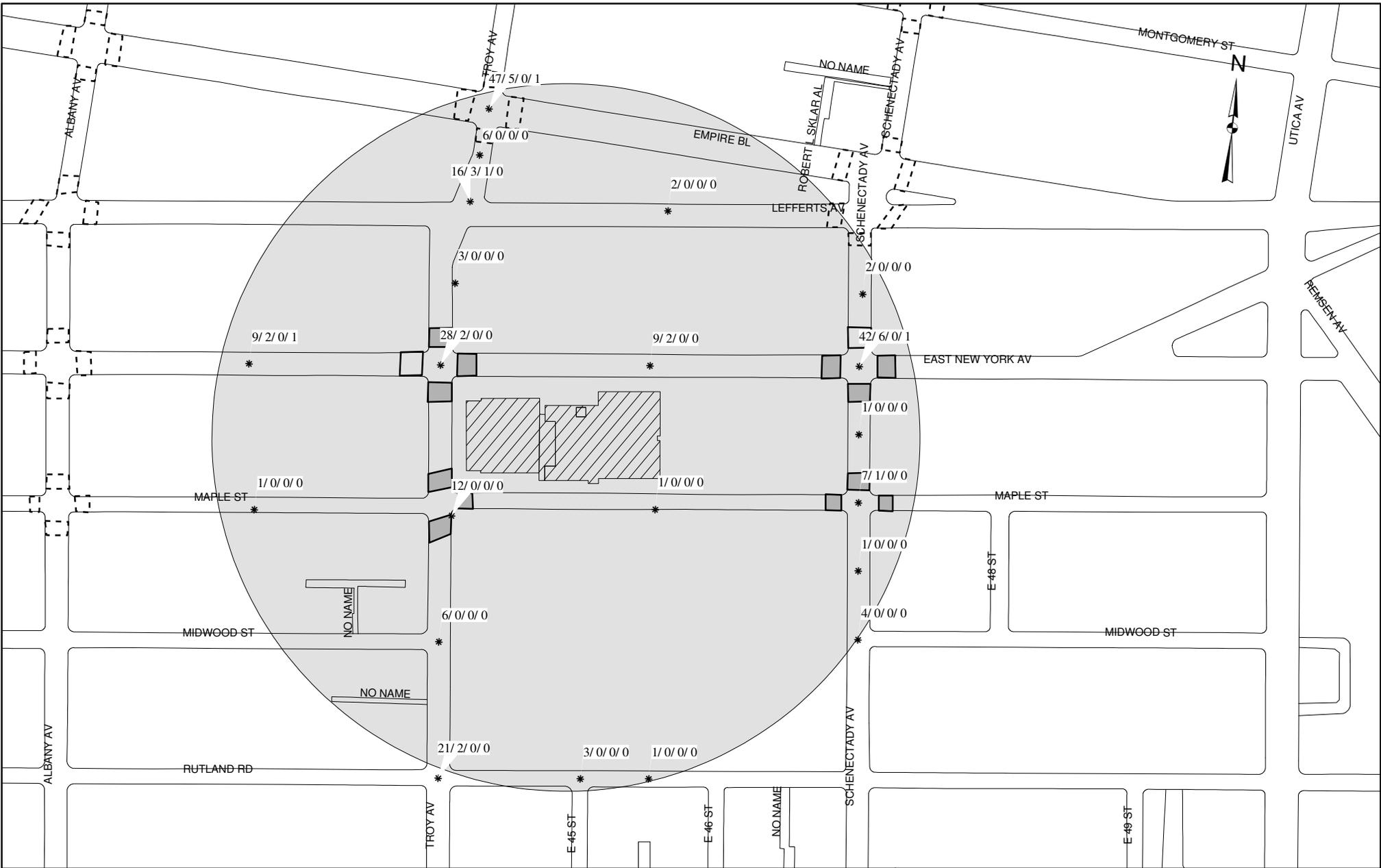
Exhibit 5 and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV), in the vicinity of I.S. 391 for the three-year period from January 1, 1998 through December 31, 2000. The DMV data provides some detail relating to the circumstances and cause of 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
East New York Avenue and Troy Avenue	28	2	0	0
East New York Avenue and Schenectady Ave.	42	6	0	1
East New York Avenue and Albany Avenue	30	5	1	1
Maple Street and Troy Avenue	12	0	0	0
Maple Street and Schenectady Avenue	7	1	0	0
Lefferts Avenue and Troy Avenue	16	3	1	0
Empire Boulevard and Troy Avenue	47	5	0	1
TOTAL	182	22	2	3

TABLE 3: NYPD THREE-YEAR ACCIDENT SUMMARY (2001-2004)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED* ACCIDENTS
East New York Avenue and Troy Avenue	39	3	0	2
East New York Avenue and Schenectady Ave.	37	3	0	1
East New York Avenue and Albany Avenue	47	10	0	0
Maple Street and Troy Avenue	19	0	0	0
Maple Street and Schenectady Avenue	22	2	0	0
Lefferts Avenue and Troy Avenue	24	4	0	0
Empire Boulevard and Troy Avenue	69	8	0	3
TOTAL	257	30	0	6

* 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 I.S. 391

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL

CROSSWALK

X/X/X/X

TOTAL ACCIDENTS	PED ACCIDENTS	PED FATAL	SCHOOL_PED ACCIDENTS
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1 inch equals 250 feet

EXHIBIT 5

**I.S. 391, BROOKLYN
MAHALIA JACKSON**

**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 I.S. 391.

3.6.1 – East New York Avenue and Troy Avenue

East New York Avenue is a 45-foot wide, two-way street (east-west) with one travel lane in each direction and parking on both sides. Troy Avenue is a 45-foot wide, one-way (northbound) street with two travel lanes and parking on both sides. This is a signalized intersection. There are school crosswalks on the north, south and east legs of the intersection. There is a bus shelter on the north sidewalk for the westbound B12 and B17 bus lines along East New York Avenue. The northwest corner of the intersection has a substandard pedestrian ramp due to a utility pole location.

There were 28 accidents at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, though none were school related. Both pedestrian accidents were attributed to driver error due to failure to yield to pedestrians.

In addition, nine accidents occurred on East New York Avenue between Albany Avenue and Troy Avenue. Two accidents involved pedestrians, one of which was school related.

It should also be noted that NYCDOT has recently installed channelized buffers on both sides of the street on Troy Avenue. The painted buffers reduce the effective width of the roadway and are intended to help slow speeds on this street. The buffers can be seen in the Figure 6A below.

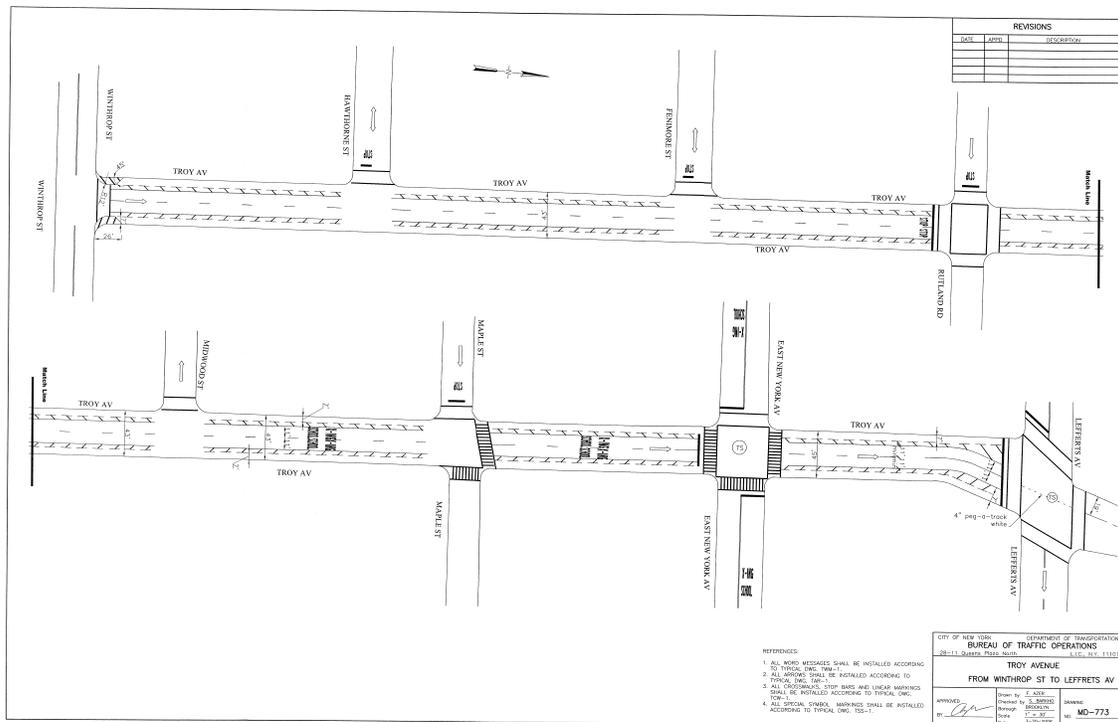


Figure 6A: Bureau of Traffic Pavement Marking Plan for Troy Avenue (MD-773)



Figure 6B: East New York Avenue and Troy Avenue (looking at the northwest corner)

3.6.2 – East New York Avenue and Schenectady Avenue

Schenectady Avenue is a 42-foot wide, one-way (southbound) street with two travel lanes and parking on both sides. This is a signalized intersection. There are school crosswalks on the east, west and south legs of the intersection. The pedestrian ramp at northeast corner of the intersection is not aligned with the crosswalk. There is a bus stop for the B12 and B17 lines on East New York Avenue west of the intersection.

There were 42 accidents at this intersection during the 1998-2000 study period. Six of the accidents involved pedestrians, of which one accident was school-related. Three accidents included school age children, however only one accident is classified as a school-related accident because the other two accidents two occurred outside of school hours or days.

The one school-related accident involved a 4-year-old student who was crossing Schenectady Avenue when struck by a vehicle, which was backing up. A 12-year old child was crossing Schenectady Avenue against the signal when struck by a southbound vehicle, and an 11-year old was crossing East New York Avenue with the signal when struck by a vehicle making a right turn from Schenectady Avenue onto East New York Avenue. The other three pedestrian accidents were attributed to pedestrian error due to crossing against the signal or outside of marked crosswalks.



Figure 7: Intersection of East New York Avenue and Schenectady Avenue facing north

3.6.3 – Maple Street and Troy Avenue

Maple Street is a 30-foot wide, one-way (eastbound) street with one travel lane and parking on both sides. This is a stop-controlled intersection with a stop sign on Maple Street. Troy Avenue is not controlled at this intersection and therefore the school crosswalks at the north and south legs of the intersection are uncontrolled. There are school crosswalks on the north, south and east legs of the intersection.

There were 12 accidents at this intersection during the 1998-2000 study period. There were no pedestrians involved in these accidents.

School officials noted that vehicles were speeding on Troy Avenue. Spot speed surveys were conducted on June 9, 2005 on Troy Avenue between East New York Avenue and Maple Street between 10:00 am-11:00 am. The objective of the survey was to determine if there is a speeding problem on Troy Avenue and on Maple Street in the vicinity of the school as reported by school officials.

The results of the speed study are shown Table 4 and in the Appendix. The 85th percentile speed on Troy Avenue was 35 mph, which exceeds the city’s legal speed limit of 30 mph. A speed reducer is not feasible because of the short block length, however alternative measures are recommended in Section 4.

TABLE 4: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
Troy Avenue btw. East New York Avenue and Maple Street	29	35

3.6.4 – Maple Street and Schenectady Avenue

Maple Street is controlled by a stop sign at the intersection with Schenectady Avenue. Schenectady Avenue is uncontrolled at this intersection. Therefore, the school crosswalk on the north leg of the intersection is uncontrolled. There are school crosswalks on the east, west and north legs of the intersection.

There were seven accidents in the 1998-2000 study period. One accident involved a pedestrian. This was a left-turn accident that resulted from the driver's inattention.

3.6.5 – Lefferts Avenue and Troy Avenue

Lefferts Avenue is a 45-foot wide, two-way (east-west) roadway with one travel lane in each direction and parking on both sides. This is a signalized intersection. There are no school crosswalks on any legs of the intersection.

There were 16 accidents at this intersection during the 1998-2000 study period. Three accidents involved pedestrians, there was one fatality. According to the accident data a 55-year old pedestrian was struck while crossing with the signal. This accident was attributed to driver error due to failure to yield to pedestrian. Another pedestrian was struck while crossing with the signal. The third pedestrian was struck while crossing against the signal.

3.6.6 – Empire Boulevard and Troy Avenue

Empire Boulevard is a 60-foot wide, two-way (east-west) street with two travel lanes in each direction and parking on both sides. This is a signalized intersection. There are school crosswalks on the east, west and north legs of the intersection. P.S. 221 is located on the northeast side of the intersection. Empire Boulevard is a bus route for the B12 line.

There were 47 accidents at this intersection during the 1998-2000 study period. Five accident involved pedestrians, one of which was a school related accident. According to the accident data two accidents occurred as a result of vehicles failing to yield to pedestrians. The other three pedestrians were struck while crossing against the signal.

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of I.S. 391, and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches (see Table 4).

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)
East New York Avenue and Troy Avenue				
Crossing East New York Ave.	44	25	18	NO
Crossing Troy Ave.	44	25	18	NO
East New York Avenue and Schenectady Avenue				
Crossing East New York Ave.	44	55	18	NO
Crossing Schenectady Ave.	44	55	18	NO
East New York Avenue and Albany Avenue				
Crossing E. New York Ave.	44	50	18	NO
Crossing Albany Ave.	44	30	18	NO
East New York Avenue and Utica Avenue				
Crossing East New York Ave.	50	60	17	NO
Crossing Utica Ave.	65	55	25	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)

Generally, the roadways and sidewalks were observed to be in good condition.

4. POTENTIAL 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

- 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.

- Install new school crosswalks on Glenwood Road

To ensure a continuous walking route, it is also recommended that school crosswalks be installed at the following locations:

- Lefferts Avenue and Troy Avenue – East leg
- Westminster Road and Glenwood Road

- 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.

- No Standing Zones on Maple Street and East New York Avenue

“NO PARKING 7AM – 4 PM, SCHOOL DAYS” parking regulations on Maple Street should be upgraded to “NO STANDING 7 AM – 4 PM, SCHOOL DAYS” and extended for the school length (approximately 360 feet) to provide sufficiently clear frontage for school buses and parents to drop off and pick up students. Additionally, “NO STANDING 7AM – 4 PM, SCHOOL DAYS” parking regulations should be extended for a length of 30 feet in front of the school’s main entrance on East New York Avenue.

- Submit request to the Police Department for Crossing Guards

It is recommended that a crossing guard be requested for the intersection of East New York Avenue and Troy Avenue and for the intersection of East New York Avenue and Schenectady Avenue.

- *Install Speed Reducer on Maple Street*

School officials noted that vehicles were speeding on Maple Street. Spot speed surveys were conducted on June 9, 2005 on Maple Street between Schenectady Avenue and Troy Avenue between 11:00 am-12:00 am. The objective of the survey was to determine if there is a speeding problem on Troy Avenue and on Maple Street in the vicinity of the school as reported by school officials.

The results of the speed study are shown Table 6 and in the Appendix. The 85th percentile speed on Maple Street was 32 mph, which exceeds the city’s legal speed limit of 30 mph.

To mitigate speeding, it is recommended that speed reducers (humps) should be considered on Maple Street in the vicinity of I.S. 391. The actual number and location of speed reducers will be determined by NYCDOT prior to installation.

TABLE 6: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
Maple Street btw. Schenectady Avenue and Troy Avenue	26	32

- *Install bike lanes on East New York Avenue and Maple Street*

As part of the Department of Transportation’s ongoing effort to provide safer routes for bicyclists throughout the city, bike lanes are planned to be installed along Maple Street and East New York Avenue within the vicinity of I.S. 391. In addition to providing a designated space for bicyclists, the bike lanes will narrow the effective width of the moving lanes and is expected to help calm traffic on these streets.

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.

- East New York Avenue and Troy Avenue
- East New York Avenue and Schenectady Avenue
- Maple Street and Troy Avenue
- Maple Street and Schenectady Avenue

Curb extensions should be considered at the corners as shown in Exhibit 6.

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.

- Install/replace pedestrian ramps

Consideration should be given to replacement of pedestrian ramps per NYCDOT standards at the following locations:

- East New York Avenue and Schenectady Avenue, northeast corner
- East New York Avenue and Troy Avenue, northwest corner (requires signal relocation)

4.3 ADDITIONAL RECOMMENDATIONS FOR PRIORITY SCHOOLS IN THE VICINITY

4.3.1 RECOMMENDATIONS FOR P.S. 91:

- 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

- 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 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.

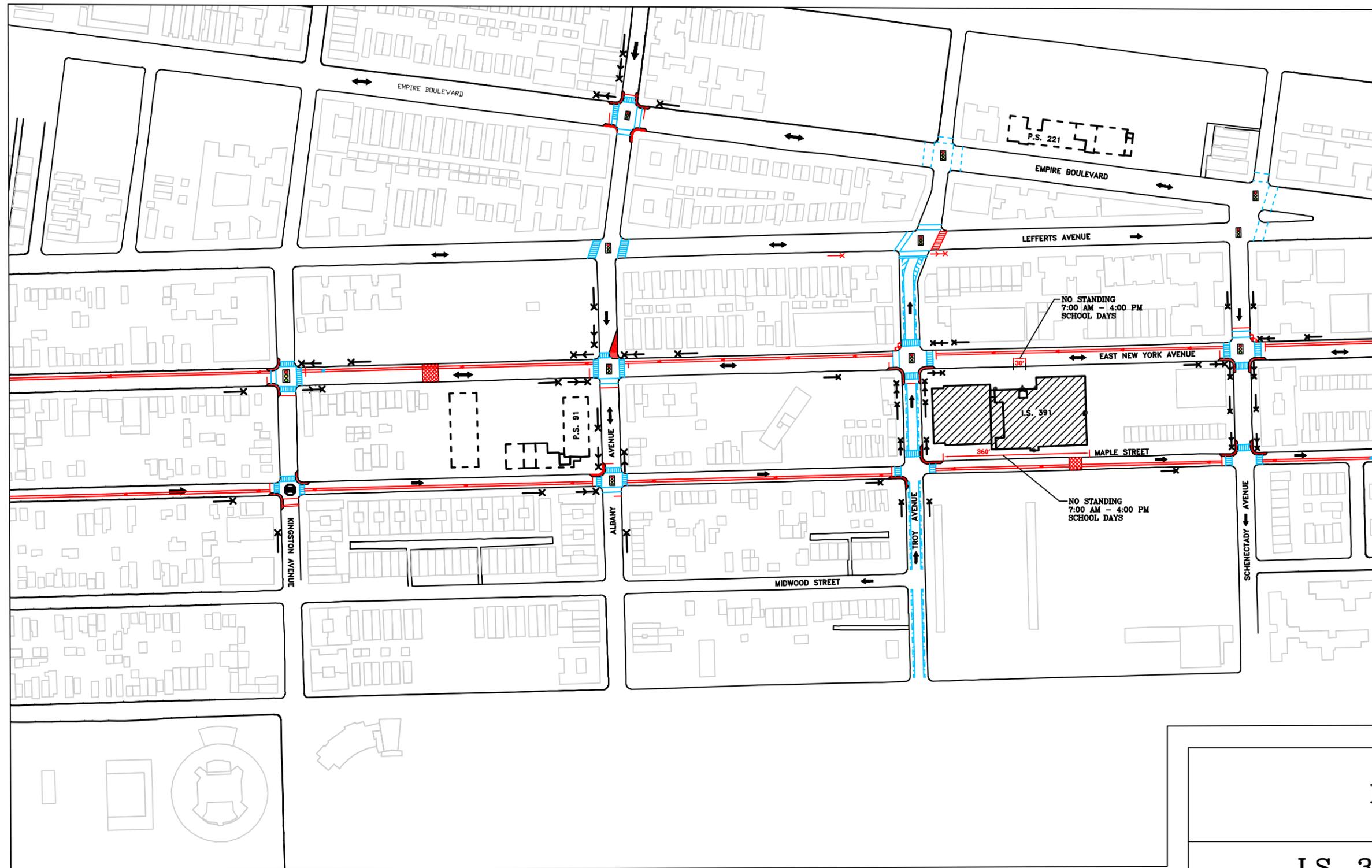
▪ Consider curb extensions (neckdowns) at the following intersections:

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.

- 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 6.

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.



- LEGEND**
- ★ MAIN ENTRANCE
 - OTHER ENTRANCES
 - X EXISTING ADVANCE WARNING SIGN WITH ARROW
 - X EXISTING ADVANCE WARNING SIGN
 - ↔ EXISTING TRAVEL DIRECTION
 - 🚦 EXISTING SIGNALIZED INTERSECTION
 - ▬▬▬ EXISTING SCHOOL CROSSWALK
 - ▬▬▬ EXISTING STANDARD (NON-SCHOOL) CROSSWALK
 - ▬▬▬ EXISTING STANDARD BUFFER
 - X PROPOSED ADVANCE WARNING SIGN WITH ARROW
 - X PROPOSED ADVANCE WARNING SIGN
 - PROPOSED STOP LINE
 - 👉 PROPOSED CURB EXTENSION (NECKDOWN)
 - ▨ PROPOSED SPEED REDUCER (HUMP)
 - ↗ PROPOSED PEDESTRIAN RAMP
 - ⏸ PROPOSED PARKING REGULATIONS
 - 🚲 PROPOSED BIKE LANE

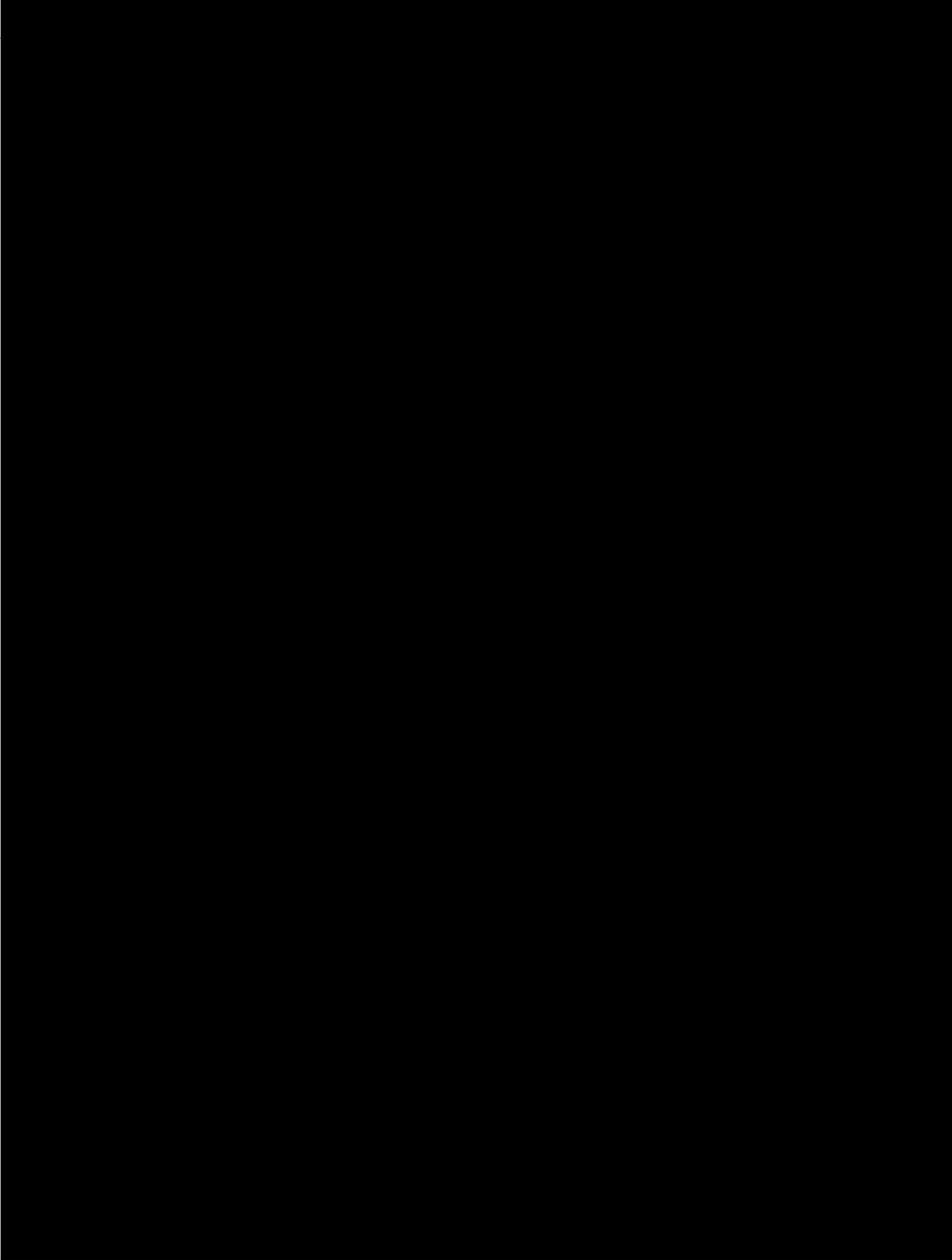
SCALE 1" = 200'

EXHIBIT 6

**I.S. 391, BROOKLYN
MAHALIA JACKSON MIDDLE SCHOOL**

**PROPOSED MEASURES
TO IMPROVE SAFETY**

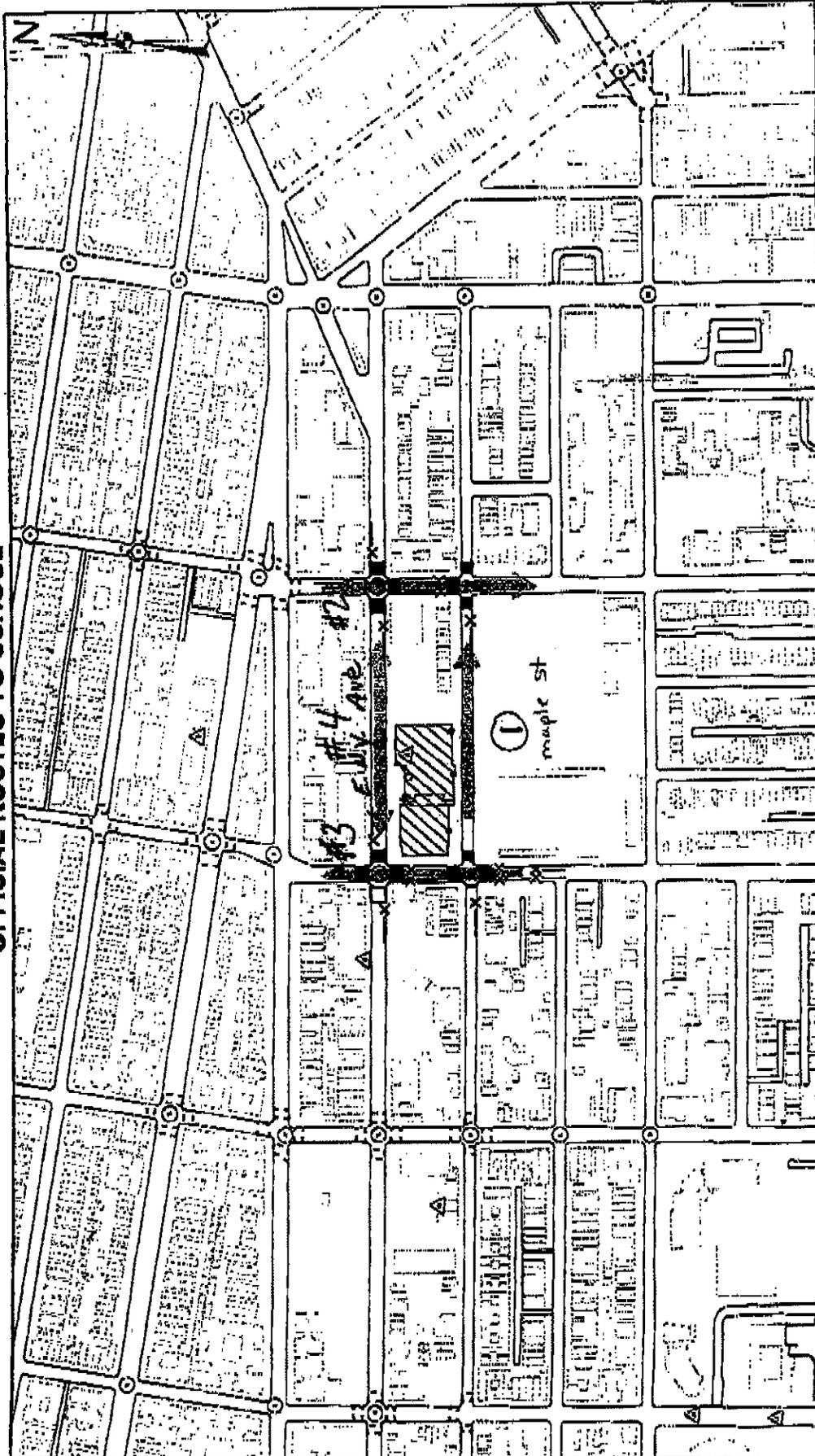
APPENDIX



NEW YORK CITY
DEPT. OF TRANSPORTATION

TRAFFIC SAFETY PLAN
OFFICIAL ROUTES TO SCHOOL

BUREAU OF TRAFFIC



MAHALIA JACKSON
I.S. 391

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

CHRG. DATE: _____
DIS. DATE: _____
SIS. NO.: _____
SIS. NO.: _____
SIS. NO.: _____

CCAM. BOARD: _____
BOARDING: _____
PRESBYT.: _____

LEGEND:

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

The TRAFFIC SAFETY PLAN shown on this map was submitted to provide the minimum degree of safety for children going to and from school. It is required that all children know the prescribed routes and use the designated crossings.

INTERSECTION: TROY AVENUE AND MAPLE STREET

TIME : 7:30 - 8:30 AM

DATE : 6/1/05

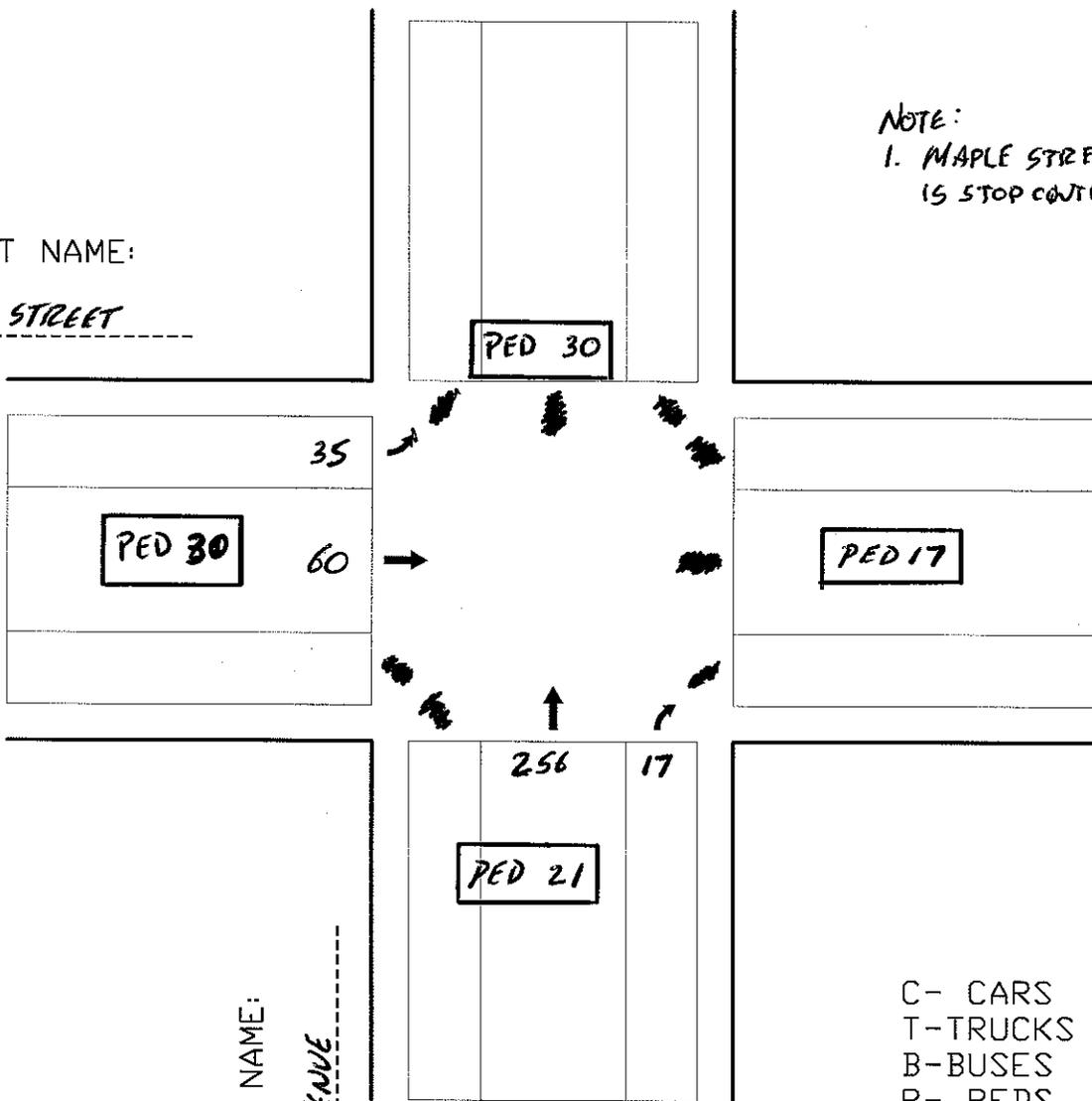


STREET NAME:

MAPLE STREET

NOTE:

- 1. MAPLE STREET IS STOP CONTROLLED



STREET NAME:

TROY AVENUE

- C- CARS
- T-TRUCKS
- B-BUSES
- P- PEDS

INTERSECTION: SCHENECTADY AVENUE AND MAPLE STREET

TIME : 7:30-8:30 AM

DATE : 6/2/05

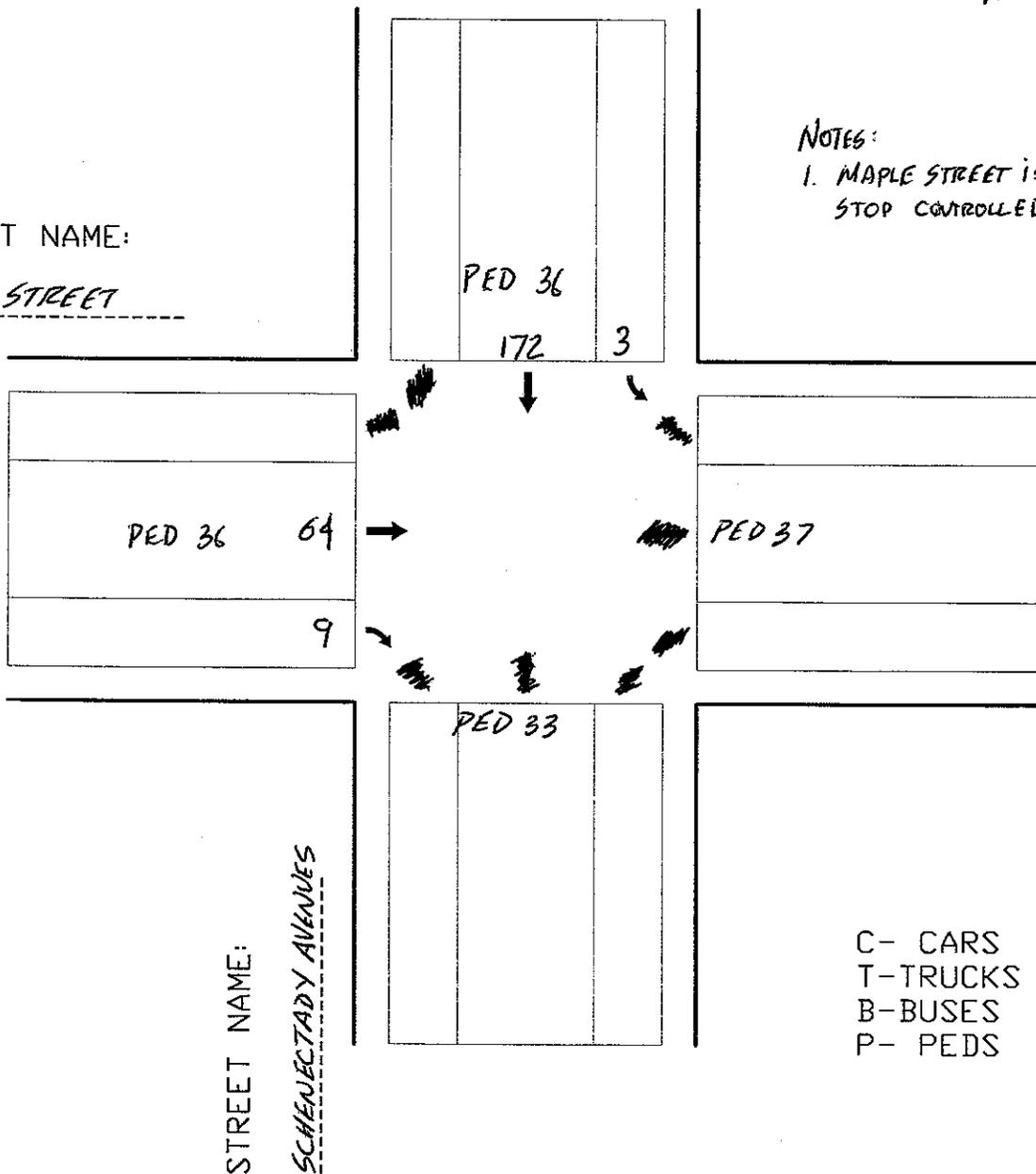


STREET NAME:

MAPLE STREET

NOTES:

- 1. MAPLE STREET IS STOP CONTROLLED



- C- CARS
- T-TRUCKS
- B-BUSES
- P- PEDS

SPOT SPEED STUDY

Date: **June 9, 2005**
 Location: **Troy Avenue Between New York Avenue and Maple Street**
 Surveyor: **Eyad Jousef**

Time: **10:00 - 11:00 AM**

School: **P.S. 391**
 Direction: **Northbound**
 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	3.5%	3.5%	40	800
21	2	3.5%	7.0%	42	882
22	4	7.0%	14.0%	88	1936
23	3	5.3%	19.3%	69	1587
24	3	5.3%	24.6%	72	1728
25	4	7.0%	31.6%	100	2500
26	2	3.5%	35.1%	52	1352
27	3	5.3%	40.4%	81	2187
28	4	7.0%	47.4%	112	3136
29	3	5.3%	52.6%	87	2523
30	4	7.0%	59.6%	120	3600
31	4	7.0%	66.7%	124	3844
32	4	7.0%	73.7%	128	4096
33	3	5.3%	78.9%	99	3267
34	1	1.8%	80.7%	34	1156
35	2	3.5%	84.2%	70	2450
36	1	1.8%	86.0%	36	1296
37	2	3.5%	89.5%	74	2738
38	1	1.8%	91.2%	38	1444
39	2	3.5%	94.7%	78	3042
40	1	1.8%	96.5%	40	1600
41	2	3.5%	100.0%	82	3362
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
	57	100.0%		1666	50526

Mean Speed = 29.2 mph
 Standard Deviation = 5.7 mph
 Margin of Error (95% Confidence) = ± 1.5 mph

Median Speed = 29.2 mph
 15th Percentile Speed = 23.3 mph
 85th Percentile Speed = 35.2 mph

SPOT SPEED STUDY

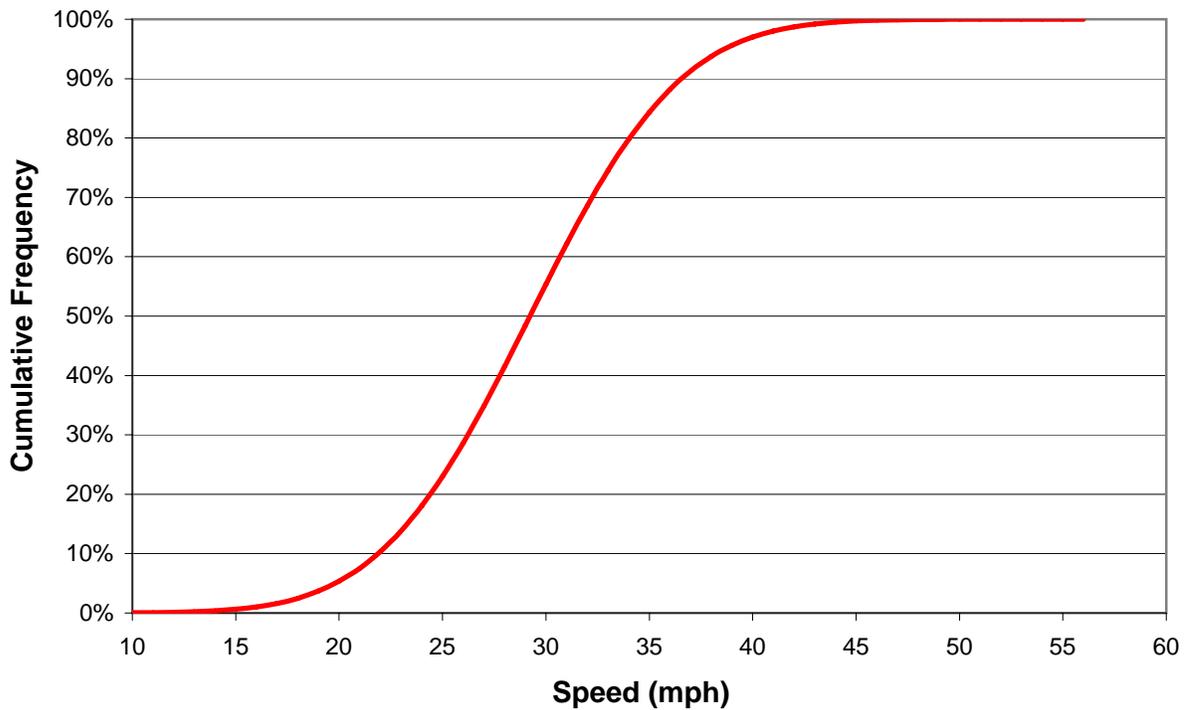
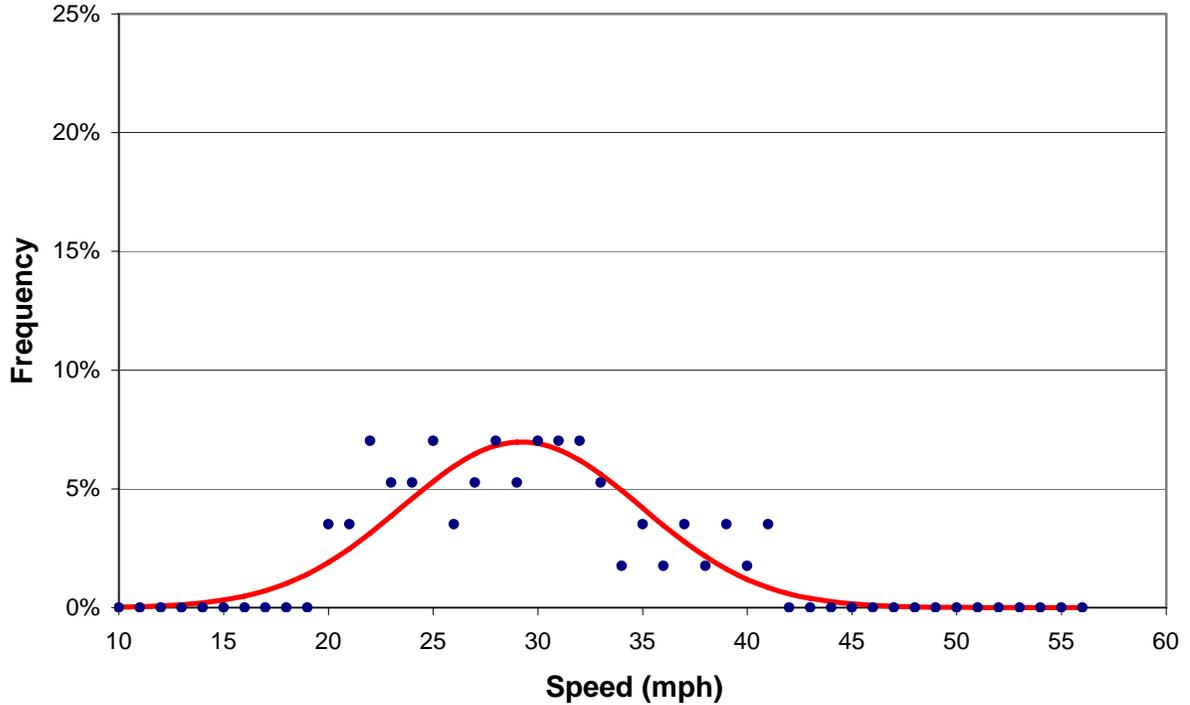
Date: **June 9, 2005**
Location: **Troy Avenue Between New York Avenue and Maple Street**
Surveyor: **Eyad Jousef**

Time: **10:00 - 11:00 AM**

School: **P.S. 391**
Direction: **Northbound**
Comments:

Mean Speed = 29.2 mph
Standard Deviation = 5.7 mph
Margin of Error (95% Confidence) = ± 1.5 mph

Median Speed = 29.2 mph
15th Percentile Speed = 23.3 mph
85th Percentile Speed = 35.2 mph



SPOT SPEED STUDY

Date: **June 9, 2005**
 Location: **Maple Street Between Schenectady Avenue and Troy Avenue**
 Surveyor: **Eayd Jousef**

Time: **11:00 AM - 12:00 PM**

School: **P.S. 391**
 Direction: **Eastbound**
 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	6	15.8%	15.8%	120	2400
21	6	15.8%	31.6%	126	2646
22	3	7.9%	39.5%	66	1452
23	4	10.5%	50.0%	92	2116
24	3	7.9%	57.9%	72	1728
25	3	7.9%	65.8%	75	1875
26	1	2.6%	68.4%	26	676
27	2	5.3%	73.7%	54	1458
28	1	2.6%	76.3%	28	784
29	1	2.6%	78.9%	29	841
30	0	0.0%	78.9%	0	0
31	1	2.6%	81.6%	31	961
32	1	2.6%	84.2%	32	1024
33	1	2.6%	86.8%	33	1089
34	1	2.6%	89.5%	34	1156
35	1	2.6%	92.1%	35	1225
36	0	0.0%	92.1%	0	0
37	1	2.6%	94.7%	37	1369
38	0	0.0%	94.7%	0	0
39	1	2.6%	97.4%	39	1521
40	0	0.0%	97.4%	0	0
41	1	2.6%	100.0%	41	1681
42	0	0.0%	100.0%	0	0
43	0	0.0%	100.0%	0	0
44	0	0.0%	100.0%	0	0
45	0	0.0%	100.0%	0	0
46	0	0.0%	100.0%	0	0
47	0	0.0%	100.0%	0	0
48	0	0.0%	100.0%	0	0
49	0	0.0%	100.0%	0	0
50	0	0.0%	100.0%	0	0
51	0	0.0%	100.0%	0	0
52	0	0.0%	100.0%	0	0
53	0	0.0%	100.0%	0	0
54	0	0.0%	100.0%	0	0
55	0	0.0%	100.0%	0	0
56	0	0.0%	100.0%	0	0
	38	100.0%		970	26002

Mean Speed = 25.5 mph
 Standard Deviation = 5.8 mph
 Margin of Error (95% Confidence) = ± 1.8 mph

Median Speed = 25.5 mph
 15th Percentile Speed = 19.5 mph
 85th Percentile Speed = 31.5 mph

SPOT SPEED STUDY

Date: **June 9, 2005** Time: **11:00 AM - 12:00 PM**
Location: **Maple Street Between Schenectady Avenue and Troy Avenue**
Surveyor: **Eayd Jousef**

School: **P.S. 391**
Direction: **Eastbound**
Comments:

Mean Speed = 25.5 mph
Standard Deviation = 5.8 mph
Margin of Error (95% Confidence) = ± 1.8 mph

Median Speed = 25.5 mph
15th Percentile Speed = 19.5 mph
85th Percentile Speed = 31.5 mph

