

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



School Safety Engineering Project

FINAL REPORT: P.S. 153, Adam Clayton Powell School Manhattan



**Prepared by
The RBA Group/Urbitran Associates**



SEPTEMBER 15, 2006



School Safety Engineering Project
P.S. 153, Adam Clayton Powell School, Manhattan

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1. INTRODUCTION

1.1 PROJECT DESCRIPTION

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

Under this consultant study, the School Safety Engineering Project, 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. 153 (Adam Clayton Powell School) is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



Figure 1: Looking south on Amsterdam Avenue, Washington Heights, Manhattan

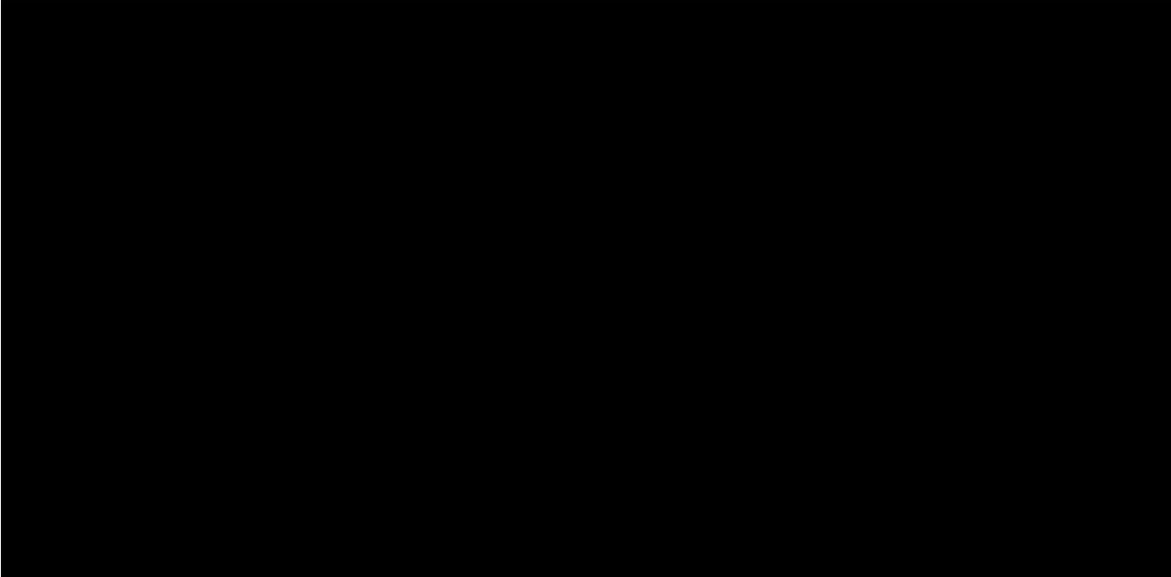
2.2 NEIGHBORHOOD DESCRIPTION

Amsterdam Avenue is a commercial roadway, with storefronts and multi-story apartment buildings on both sides of the street. West 146th Street and West 147th Street are residential roadways with multi-level apartment buildings along both sides of the street (See Exhibit 1 for Aerial photograph). The school is one block from West 145th Street, a major roadway in Washington Heights that leads to the 145th Street Bridge.

2.3 MEETING WITH SCHOOL REPRESENTATIVES

The school principal of P.S. 153 and the consultant team met at the school on the afternoon of June 14, 2004 (see the Appendix for a list of attendees). According to the principal, the identifiable problems that student pedestrians encounter on a regular basis include the following:

- Lack of existing curb space for school buses to load and unload students on Amsterdam Avenue and West 147th Street;
- Pedestrian difficulties crossing Amsterdam Avenue;
- Insufficient sidewalk space during dismissal time on West 146th Street.



2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

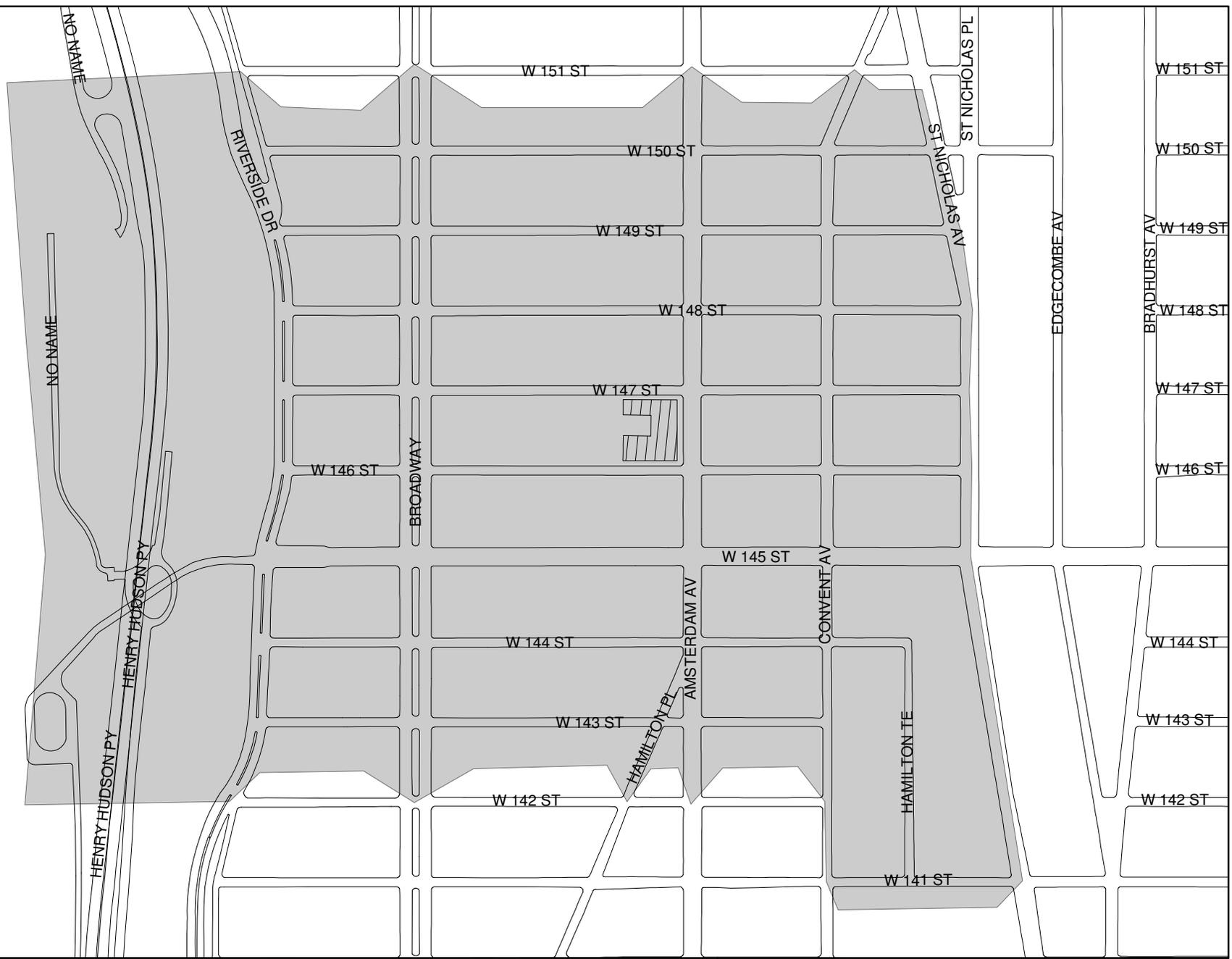
According to the principal, approximately 66% of the students walk to P.S. 153, 15% arrive via MTA buses or subway service, 17% are driven by parents or guardians, and the remaining 2% of students ride school buses. See Exhibit 2 for the Catchment Area and Table 1 for the school's estimate of the modes of travel.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BY SCHOOL OFFICIALS)	
Description	Percentage
Walk	66%
Driven by a parent or guardian	17%
School bus	2%
MTA bus or subway	15%
TOTAL	100%



1 inch equals 200 feet

EXHIBIT 1
P.S. 153, MANHATTAN
ADAM CLAYTON POWELL SCHOOL
AERIAL PHOTOGRAPH



1 inch equals 450 feet

 CATCHMENT AREA

EXHIBIT 2
P.S. 153, MANHATTAN
ADAM CLAYTON POWELL SCHOOL

CATCHMENT AREA

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are a variety of food and candy stores located on Amsterdam Avenue and Broadway in the vicinity of the school. They are popular with school children. In addition, bus stops for the NYCTA Bx19, M4 and M5 lines, and entrances for the number 1 subway line are located at the intersection of Broadway and West 145th Street.

2.8 CROSSING GUARD LOCATIONS

According to field observations, there are three crossing guards assigned to P.S. 153. They are stationed at the following locations:

- Amsterdam Avenue at West 145th Street
- Amsterdam Avenue at West 146th Street
- Amsterdam Avenue at West 147th Street

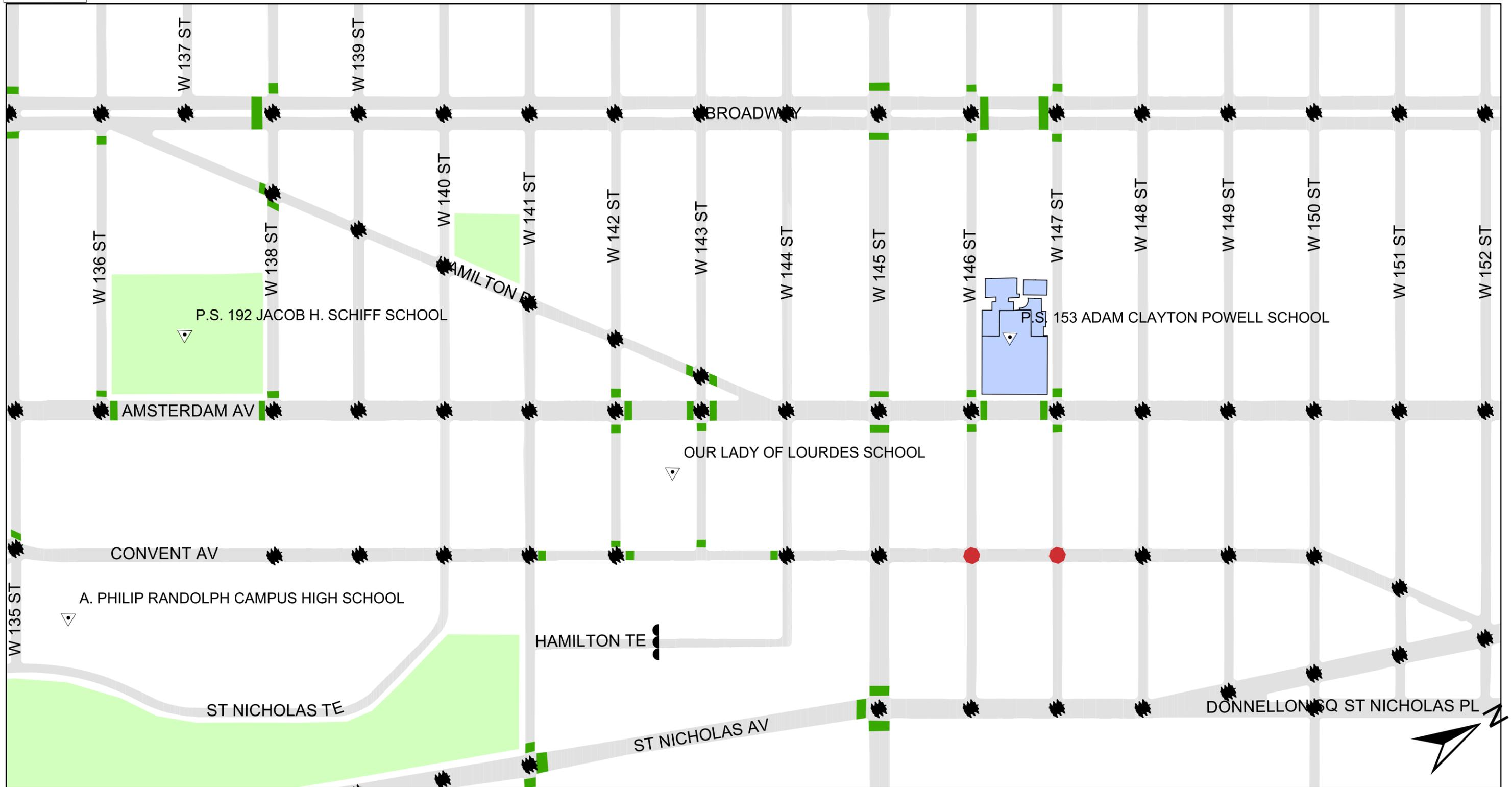
See Exhibit 4 for a map of crossing guard locations.



Figure 2- Crossing guard at Amsterdam Avenue and West 145th Street



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	

**PS 153 Manhattan
ADAM CLAYTON POWELL SCHOOL**

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

Map created on 11/16/2006

EXHIBIT 3

COMM. BOARD: 109
PRECINCT: 30

1.5.1



1 inch equals 250 feet



CROSSING GUARD ASSIGNED TO P.S. 153

EXHIBIT 4

**P.S. 153, MANHATTAN
ADAM CLAYTON POWELL SCHOOL**

CROSSING GUARDS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to the school principal, five school buses are assigned to P.S. 153. School buses pick up and drop off students on Amsterdam Avenue or West 147th Street. All bused students enter the school through the entrances on West 146th or West 147th Street, depending on their grades.



Figure 3: School buses on Amsterdam Avenue in front of P.S. 153

3.2 PARENT DROP-OFF OPERATIONS

The school principal indicated that approximately 17% of P.S. 153 students are driven to and from school by parents or guardians. Field observations taken on June 14, 2004 indicated that parents park or double-park on all roadways surrounding the school. However, West 146th Street was the most congested roadway. Parents were observed double-parking their vehicles to walk their child into the school or wait for the school to open.

During dismissal, congestion also occurs as parents double-park to enter the school and sign out their children.

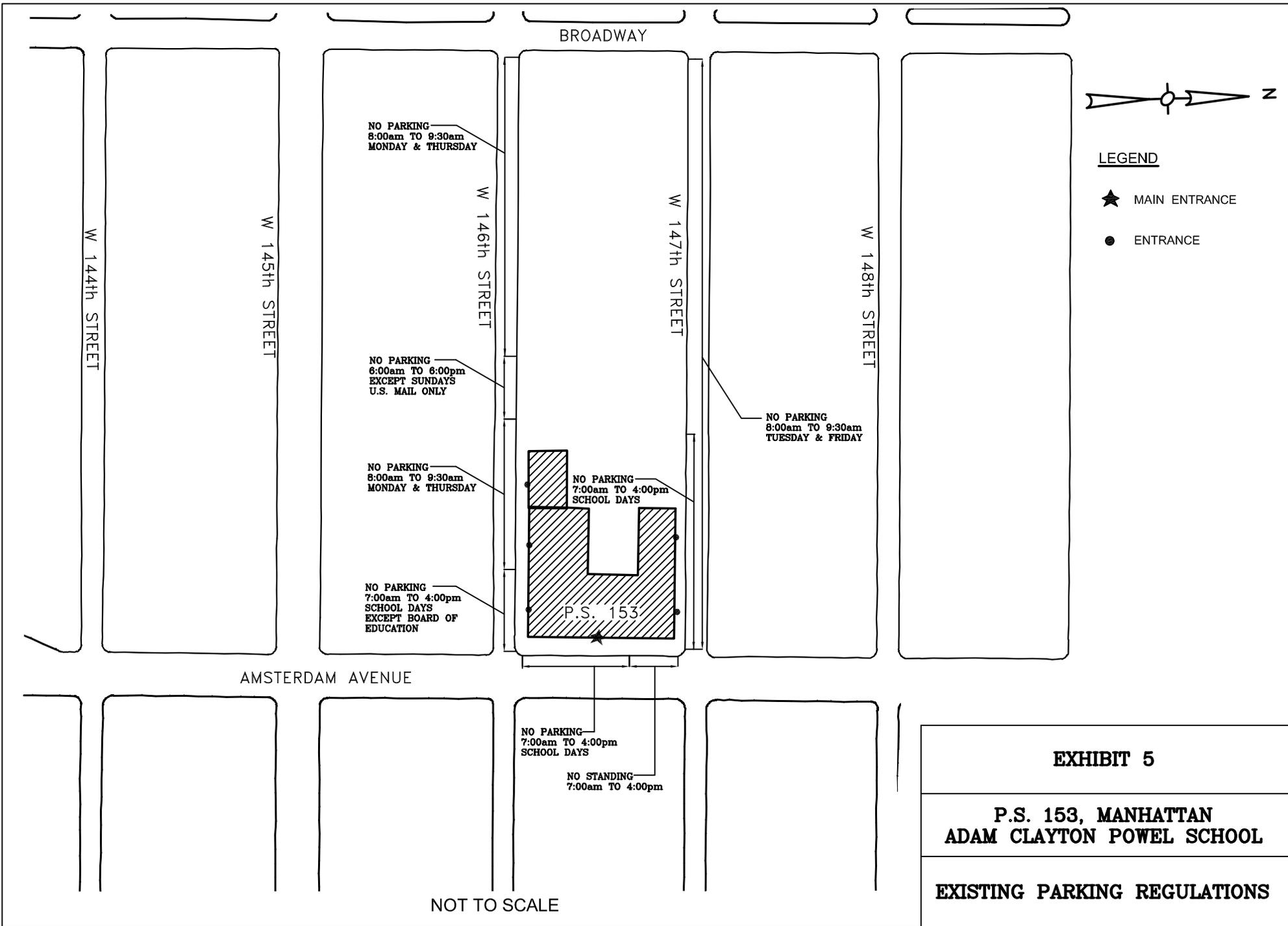
P.S. 153 has parent volunteers to assist during arrival and dismissal times.

3.3 PARKING REGULATIONS

“NO PARKING, SCHOOL DAYS, 7 AM - 4 PM, EXCEPT BOARD OF EDUCATION” parking regulations are posted on West 146th Street. “NO PARKING, SCHOOL DAYS, 7 AM - 4 PM” parking regulations are posted on West 147th Street.

Amsterdam Avenue between West 146th street and West 147th Street is posted as “NO STANDING, 7 AM - 4 PM” for approximately 60 feet to the north of the block and “NO PARKING, SCHOOL DAYS, 7 AM - 4 PM” for the remainder of the block.

Alternate side parking regulations are in effect between 8:00 am and 9:30 am. Exhibit 5 shows the parking regulations on the roadways surrounding the school.



3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, shows existing crosswalk pavement markings. 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.



Figure 4: Advance warning signs on West 145th Street, west of Broadway (looking east)

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. 153 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 do not provide the same level of detail as the DMV data.

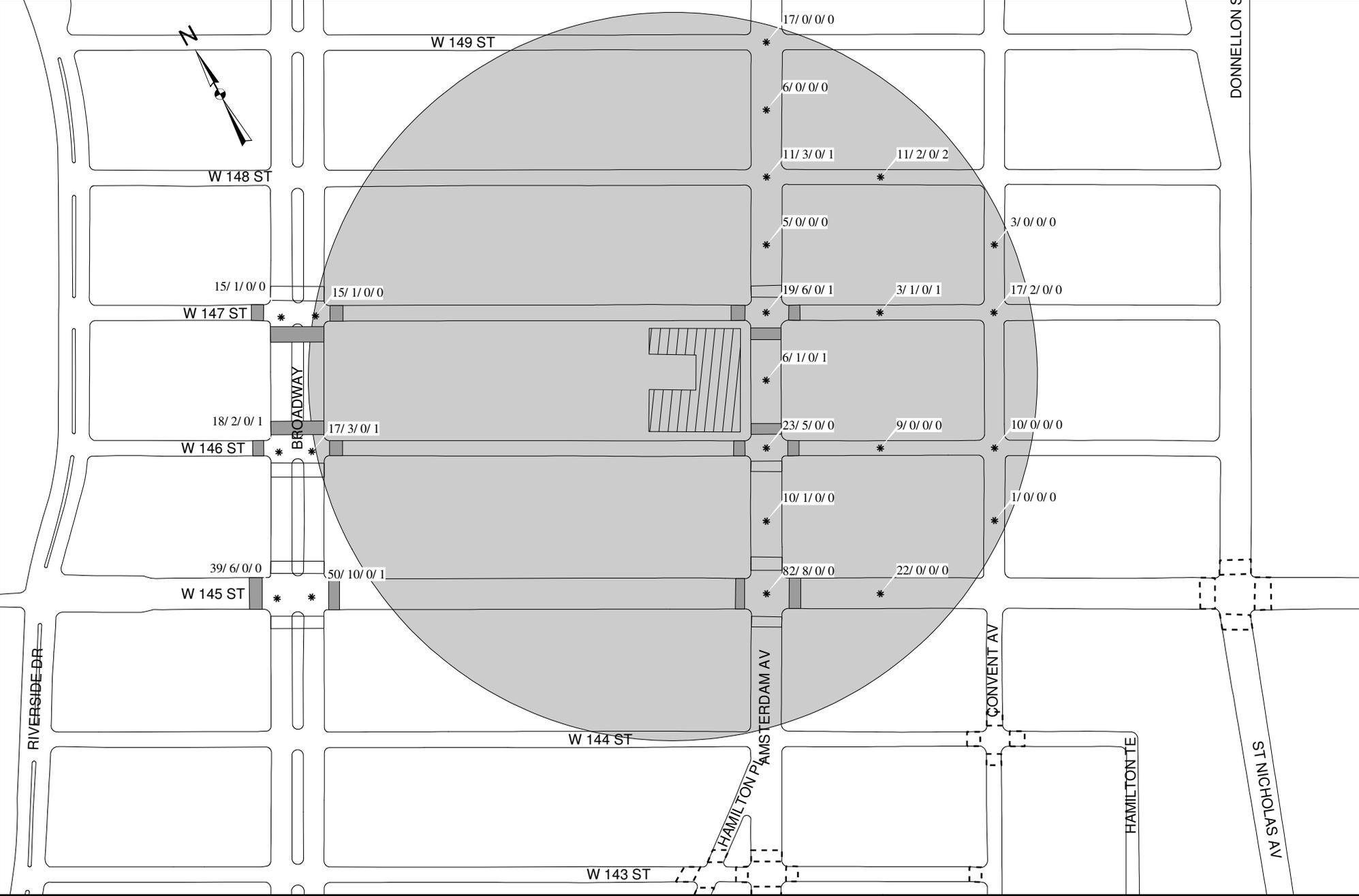
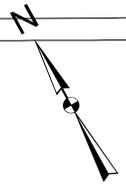
This report targets intersections closest to the school where the highest concentration of student pedestrians occurs. Intersections farther from the school and locations for which detailed data were not available at the time of this study will be addressed with the ongoing work of DOT’s School Safety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

TABLE 2: DMV THREE-YEAR ACCIDENT SUMMARY (1998-2000)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED* ACCIDENTS
Broadway and West 147 th Street	30**	2	0	0
Broadway and West 146 th Street	35**	5	0	2
Broadway and West 145 th Street	89**	16	0	1
Amsterdam Ave. and West 145 th St.	82	8	0	0
Amsterdam Ave. and West 146 th St.	23	5	0	0
Amsterdam Ave. and West 147 th St.	19	6	0	1
Amsterdam Ave. and West 148 th St.	11	3	0	1
TOTAL	289	45	0	5

TABLE 3: NYPD FOUR-YEAR ACCIDENT SUMMARY (2001-2004)				
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED* ACCIDENTS
Broadway and West 147 th Street	45	4	0	0
Broadway and West 146 th Street	50	6	0	0
Broadway and West 145 th Street	131	14	0	1
Amsterdam Ave. and West 145 th	101	19	0	0
Amsterdam Ave. and West 146 th	36	11	0	2
Amsterdam Ave. and West 147 th	43	9	0	1
Amsterdam Ave. and West 148 th	39	3	0	0
TOTAL	445	66	0	4

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

** *Accident totals have been combined for the both northbound and southbound Broadway*



ACCIDENT LOCATION

SCHOOL CROSSWALK ASSIGNED TO P.S.153

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
P.S. 153, MANHATTAN
ADAM CLAYTON POWELL SCHOOL

ACCIDENT SUMMARY
THREE YEAR PERIOD
(1998-2000)

3.6 TRAFFIC OPERATIONS AND ISSUES

The following describes traffic accidents and operational issues at intersections in the vicinity of P.S. 153.

3.6.1 Broadway and West 147th Street

Broadway is a 100-foot wide, two-way divided roadway with three moving lanes in each direction and parking along the outer curb of the roadway. A 20-foot wide median separates the northbound and southbound traffic (Figure 5). West 147th Street is a 30-foot wide, one-way westbound roadway with one moving lane and parking on both sides. The intersection is controlled by a two-phase signal. School crosswalks are in place on the west, south and east legs. The north median does not have standard pedestrian ramps due to utility conflicts (Figure 5).



Figure 5: Broadway at West 147th Street, looking east

Review of existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Broadway from curb-to-curb in one cycle at a walking rate of three feet per second plus three seconds reaction time. A pedestrian is expected to wait at the center median between signal cycles. It is common practice to utilize the median as a refuge for pedestrians to wait between signal cycles (see Table 5).

Thirty accidents occurred at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, none of which were school related. One pedestrian was crossing with the signal and struck by a westbound right turning vehicle. The other pedestrian was struck while crossing against the signal.

3.6.2 Broadway and West 146th Street

West 146th Street is a 30-foot wide, one-way eastbound roadway with one moving lane and parking on both sides. The intersection is controlled by a two-phase signal. School crosswalks are in place on the north, west, and east legs. The north and south medians do not have standard pedestrian ramps due to utility conflicts (Figure 6).

Review of existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Broadway from curb-to-curb in one cycle at a walking rate of three feet per second plus three seconds reaction time. A pedestrian is expected to wait at the center median between signal cycles. It is common practice to utilize the median as a refuge for pedestrians to wait between signal cycles (see Table 5).

Thirty-five accidents occurred at this intersection during the 1998-2000 study period. Five accidents involved pedestrians two of which were school related. A six-year-old student was struck while emerging from parked vehicles. A 12-year-old student was struck due to the driver's failure to yield. The third pedestrian was struck when crossing against the signal. Two other accidents were attributed to drivers' unsafe speeds.



Figure 6: Broadway at West 146th Street, looking west from the north leg center median (substandard pedestrian ramp)

3.6.3 Broadway and West 145th Street

West 145th Street is a 60-foot wide, two-way roadway with two moving lanes in each direction and parking on both sides. The intersection is controlled by a two-phase signal. School crosswalks are in place on the west and east legs. The northeast, northwest corner and the north raised median do not have standard pedestrian ramps.

Review of existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Broadway from curb-to-curb in one cycle at a walking rate of three feet per second plus three seconds reaction time. A pedestrian is

expected to wait at the center median between signal cycles. It is common practice to utilize the median as a refuge for pedestrians to wait between signal cycles (see Table 5).



Figure 7: Broadway at West 145th Street, looking east from southwest corner

Eighty-nine accidents occurred at this intersection during the 1998-2000 study period. Sixteen accidents involved pedestrians, one of which was school related. Four pedestrians, including a 10-year-old student, were struck while crossing against the signal. Eleven pedestrian accidents occurred due to drivers' failure to yield when making turns. There were no details for the last accident.

3.6.4. Amsterdam Avenue and West 147th Street

Amsterdam Avenue is a 60-foot wide, two-way roadway with two moving lanes in each direction and parking on both sides. The intersection of West 147th Street and Amsterdam Avenue is controlled by a two-phase signal. School crosswalks are in place on the south, east and west legs.

Nineteen accidents occurred at this location during the 1998-2000 study period. Six accidents involved pedestrians, one of which was school related. According to the accident data, a nine-year-old student was struck while emerging from parked vehicles. Three accidents occurred due to drivers' failure to yield. Two other pedestrians were struck while crossing against the signal.

A seven-year-old child was struck while emerging from parked vehicles mid-block on West 147th Street between Amsterdam Avenue and Convent Avenue during school hours.

The school principal noted that students have difficulties crossing Amsterdam Avenue. Traffic and pedestrian counts were conducted at this intersection to determine if a Lead Pedestrian Interval (LPI) was warranted. It was determined that the existing volumes do not warrant an LPI at this time (Exhibit 7).



Figure 7: Amsterdam Avenue at West 147th Street (south crosswalk)

3.6.5 Amsterdam Avenue and West 146th Street

The intersection of West 146th Street and Amsterdam Avenue is controlled by a two-phased signal. School crosswalks are in place on the north, east and west legs of the intersection.

Twenty-three accidents occurred at this location during the 1998-2000 study period. Five accidents involved pedestrians, none of which was school related. Three pedestrians were struck while crossing Amsterdam Avenue against the signal. Two pedestrians crossing with the signal were struck by turning vehicles.

An 11-year-old student was struck mid-block on Amsterdam Avenue between West 146th Street and West 147th Street during school hours.

The school principal noted that students have difficulties crossing Amsterdam Avenue. Traffic and pedestrian counts were conducted at this intersection to determine if a Lead Pedestrian Interval (LPI) was warranted. It was determined that the existing volumes do not warrant an LPI at this time (Exhibit 7).

3.6.6 Amsterdam Avenue and West 145th Street

The intersection of West 145th Street and Amsterdam Avenue is controlled by a two-phased signal. School crosswalks are in place on the east and west legs.

Eighty-two accidents occurred at this intersection during the 1998-2000 study period, including eight non-school related pedestrian accidents. Four pedestrians were struck due to drivers' failure to yield or unsafe speed. Two pedestrians were struck while crossing against the signal. There were no details for the last two accidents.



Figure 8: Amsterdam Avenue at West 145th Street, looking east

3.6.6 Amsterdam Avenue and West 148th Street

West 148th Street is a 30-foot wide, one-way eastbound roadway with one moving lane and parking on both sides. The intersection of West 148th Street and Amsterdam Avenue is controlled by a two-phase signal. All four corners have pedestrian ramps, but none of them are school crosswalks.

Eleven accidents occurred at this location during the 1998-2000 study period. Three accidents involved pedestrians, one of which was school related. Two pedestrians, including a ten-year-old student, were struck when crossing against the signal. The third accident was attributed to driver's inattention.

Two school children were struck while emerging from parked vehicles mid-block West on 148th Street between Amsterdam Avenue and Convent Avenue during school hours.

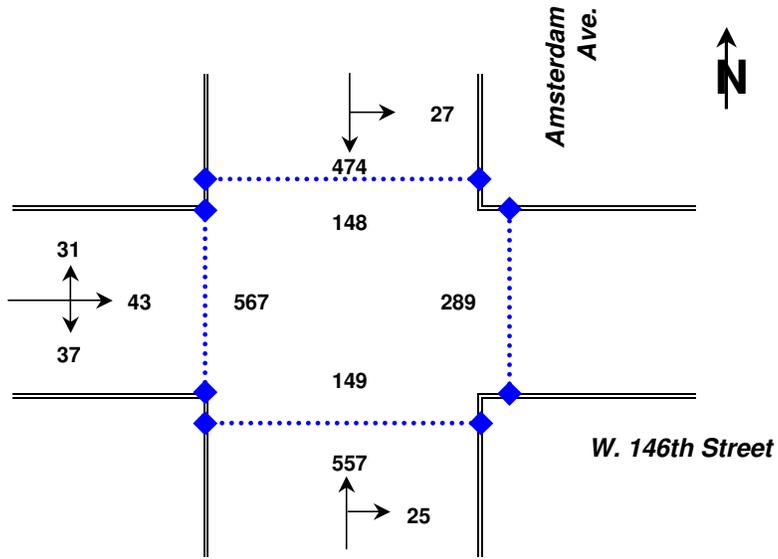
3.6.7 Speeds on West 146th Street and West 147th Street between Broadway and Amsterdam Avenue

Spot speed studies were conducted on October 31, 2005 on both West 146th Street and West 147th Street between Amsterdam Avenue and Broadway. The objective of the study was to determine if vehicles were speeding on these roadway sections, which are adjacent to the school.

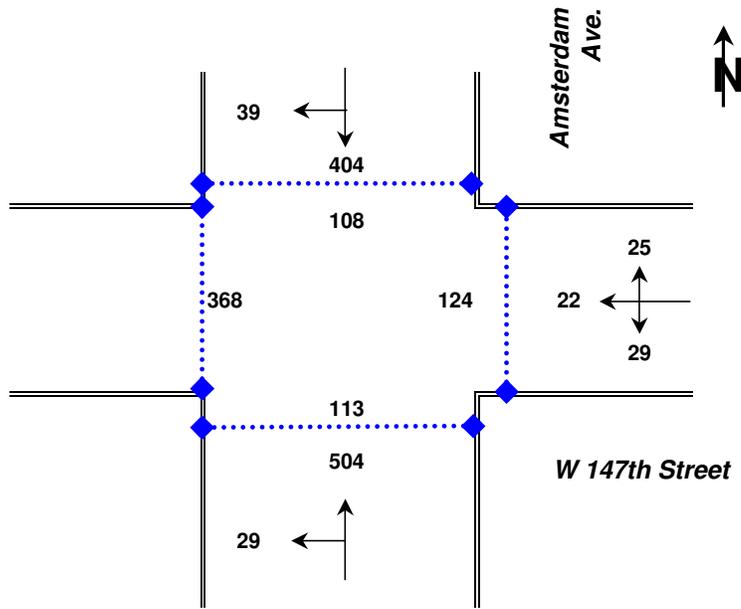
The 85th percentile speed is 25 mph on both West 146th Street and West 147th Street, which is below the legal speed limit of 30 mph. See Table 4 for a summary of the results and the Appendix for further detail.

TABLE 4: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
West 146 th Street between Amsterdam Avenue and Broadway	21	25
West 147 th Street between Amsterdam Avenue and Broadway	21	25

One Hour Traffic Count Volumes
(2:30 PM - 3:30 AM October 31, 2005)



Intersection of Amsterdam Avenue and West 146th Street



Intersection of Amsterdam Avenue and West 147th Street

62 ← Number of Pedestrians
 ◆.....◆ Pedestrian Crossing
 53 ← Vehicle Movement
 ← Number of Vehicles

EXHIBIT 7
P.S. 153, MANHATTAN ADAM CLAYTON POWEL SCHOOL
TRAFFIC COUNTS

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 153, and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches.

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)
Broadway and West 145th Street				
Crossing Broadway	40/40*	23	17/17	NO
Crossing West 145 th Street	60	65	23	NO
Broadway and West 146th Street				
Crossing Broadway	40/40*	22	17/17	NO
Crossing West 146 th Street	30	65	13	NO
Broadway and West 147th Street				
Crossing Broadway	40/40*	21	17/17	NO
Crossing West 147 th Street	30	58	13	NO
Amsterdam Ave and W. 145th St.				
Crossing Amsterdam Ave.	60	59	20	NO
Crossing West 145 th Street	60	24	20	NO
Amsterdam Ave and W. 146th St.				
Crossing Amsterdam Ave.	60	59	23	NO
Crossing West 146 th Street	30	23	13	NO
Amsterdam Ave and W. 147th St.				
Crossing Amsterdam Ave.	60	59	23	NO
Crossing West 147 th Street	30	20	13	NO

Note – A rate of three feet per second plus three seconds reaction time was utilized as the child pedestrian walking rate

** A pedestrian needs two signal cycles to cross Broadway at a rate of three feet per second while stopping at the protected pedestrian median.*

3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS)

The roadways and sidewalks in the vicinity of the school were generally observed to be in good condition. Several pedestrian ramps are misaligned or in poor condition. The locations where pedestrian ramps need to be replaced are shown on Exhibit 8 and discussed in Section 4.2.

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 Amsterdam Avenue

“NO STANDING 7 AM – 4 PM, SCHOOL DAYS” parking regulations should be considered for the full length of Amsterdam Avenue between West 146th Street and West 147th Street. This will allow for additional clear frontage for school buses and parents to drop-off and pick-up students.

- Upgrade No Parking Zone to No Standing

The existing “NO PARKING 7 AM - 4 PM, SCHOOL DAYS” regulations posted on 147th Street should be upgraded to “NO STANDING 7 AM - 4 PM, SCHOOL DAYS”.

- Install pedestrian information sign that explains the signal phases

The safety of pedestrians at the wide intersections of Broadway at West 147th Street, West 146th Street, and West 145th Street is a major concern. Installation of a pedestrian information sign adjacent to each school crosswalk that explains the signal phases is recommended. During a consultant field visit, it was noted that students and others attempted to cross Broadway in one pedestrian signal phase. The pedestrian should be informed to wait at the refuge island between signal cycles.

- Administer student pedestrian safety education program

It is recommended that the NYCDOT- Safety Education Program work with the school to educate the students not to cross mid-block, not to cross against signals, and to cross Broadway in two cycles.

- Utilization of buses equipped with left hand side exit doors

Currently, school buses unload P.S. 153 students through right hand side doors. The school entrance is on the left side of the buses that drop off and pick up students on West 146th Street and West 147th Street. The Department of Education bus fleet includes buses with left hand side doors. Therefore, it is recommended that buses with left hand side doors be used to transport students to and from P.S. 153.

This measure in conjunction with “NO STANDING 7 AM - 4 PM” in front of the school’s entrance on West 146th Street and West 147th Street, would allow students to load and unload from the bus, at the curbside, directly in front of the school.

- Place advance stop bar ten feet before 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.

4.2 LONG-TERM MEASURES

- Consider curb extensions at the following intersections:

- Amsterdam Avenue and West 146th Street
- Amsterdam Avenue and West 147th Street
- Broadway and West 146th Street
- Broadway and West 147th Street

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

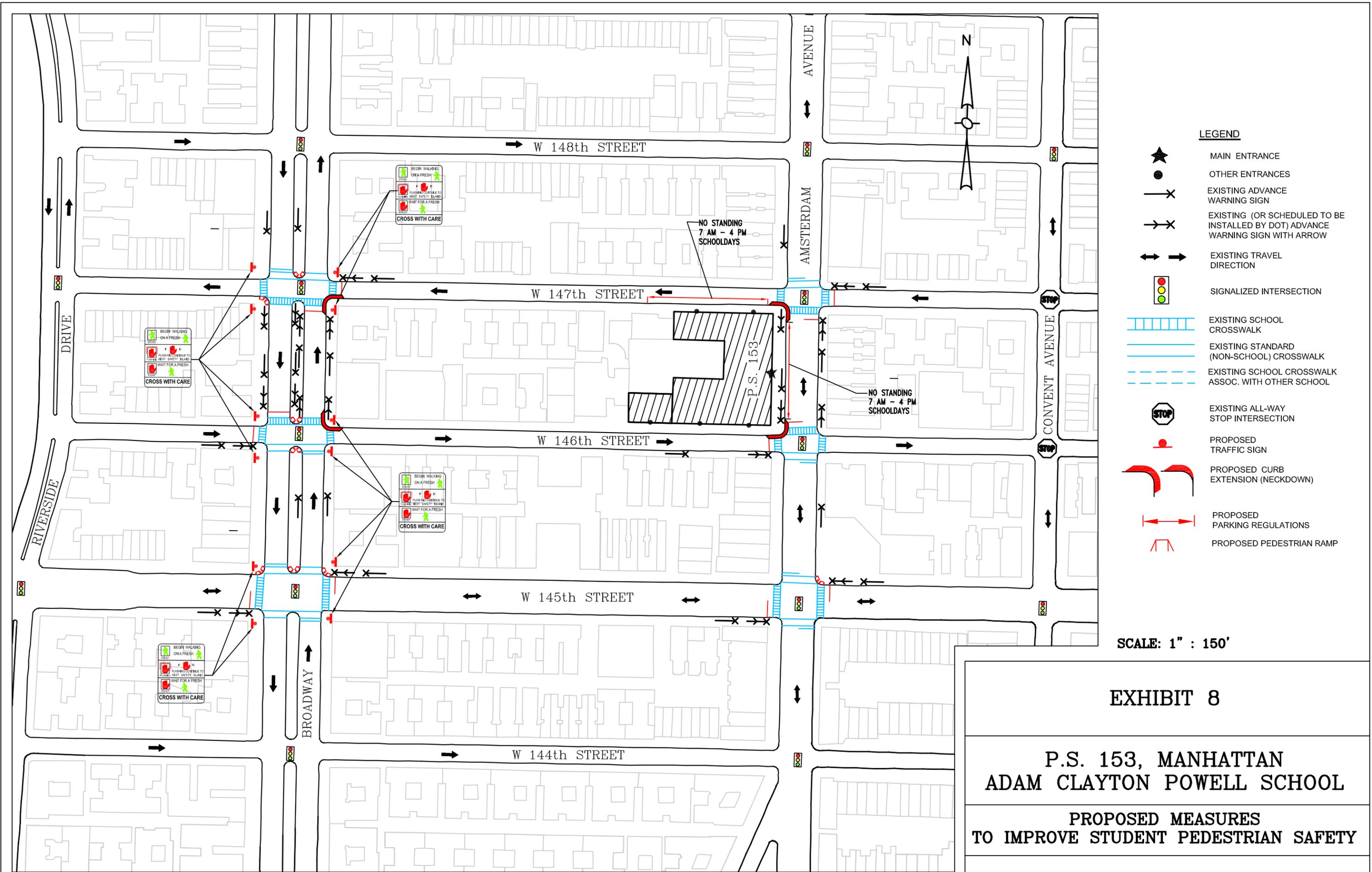
The purpose of the curb extensions is to shorten the crossing distance for pedestrians, and to reduce speeds of vehicles approaching and turning at these heavily utilized school crosswalks.

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.

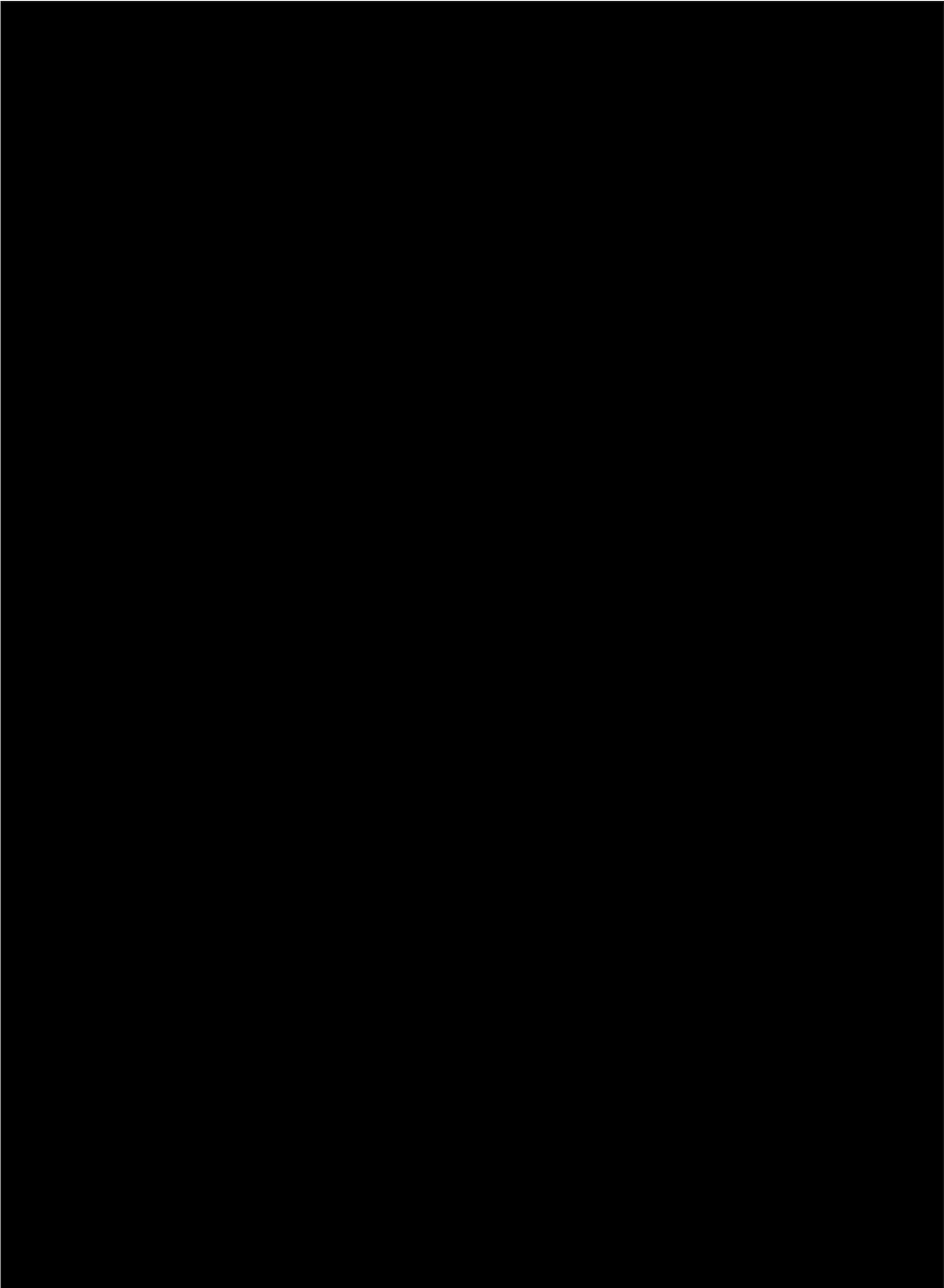
- Install/replace complex pedestrian ramps

Due to existing utility pole conflicts, the following pedestrian ramps are considered complex. Consideration should be given to the installation of pedestrian ramps per NYCDOT standards at these locations.

- Broadway and West 145th Street – north median, northeast and northwest corners
- Broadway and West 146th Street – north and south medians
- Broadway and West 147th Street – southwest corner and north median
- Amsterdam Avenue and West 145th Street – northeast corner



APPENDIX



SPOT SPEED STUDY

Date: **October 31, 2005** Time: **12:30 PM To 1:30 PM**
 Location: **West 146th Street, btw. Amsterdam Avenue and Broadway**
 Surveyor: **Eyad Yousef**

School: **P.S. 153**
 Direction: **EB**
 Comments: **Sunny and Dry**

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	3	7.1%	7.1%	45	675
16	3	7.1%	14.3%	48	768
17	3	7.1%	21.4%	51	867
18	2	4.8%	26.2%	36	648
19	2	4.8%	31.0%	38	722
20	1	2.4%	33.3%	20	400
21	13	31.0%	64.3%	273	5733
22	2	4.8%	69.0%	44	968
23	9	21.4%	90.5%	207	4761
24	0	0.0%	90.5%	0	0
25	2	4.8%	95.2%	50	1250
26	0	0.0%	95.2%	0	0
27	0	0.0%	95.2%	0	0
28	0	0.0%	95.2%	0	0
29	0	0.0%	95.2%	0	0
30	0	0.0%	95.2%	0	0
31	0	0.0%	95.2%	0	0
32	1	2.4%	97.6%	32	1024
33	0	0.0%	97.6%	0	0
34	0	0.0%	97.6%	0	0
35	0	0.0%	97.6%	0	0
36	1	2.4%	100.0%	36	1296
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
	42	100.0%		880	19112

Mean Speed = 21.0 mph Median Speed = 21.0 mph
 Standard Deviation = 4.1 mph 15th Percentile Speed = 16.8 mph
 Margin of Error (95% Confidence) = ± 1.2 mph 85th Percentile Speed = 25.2 mph

SPOT SPEED STUDY

Date: **October 31, 2005**

Time: **12:30 PM To 1:30 PM**

School: **P.S. 153**

Location: **West 146th Street, btw. Amsterdam Avenue and Broadway**

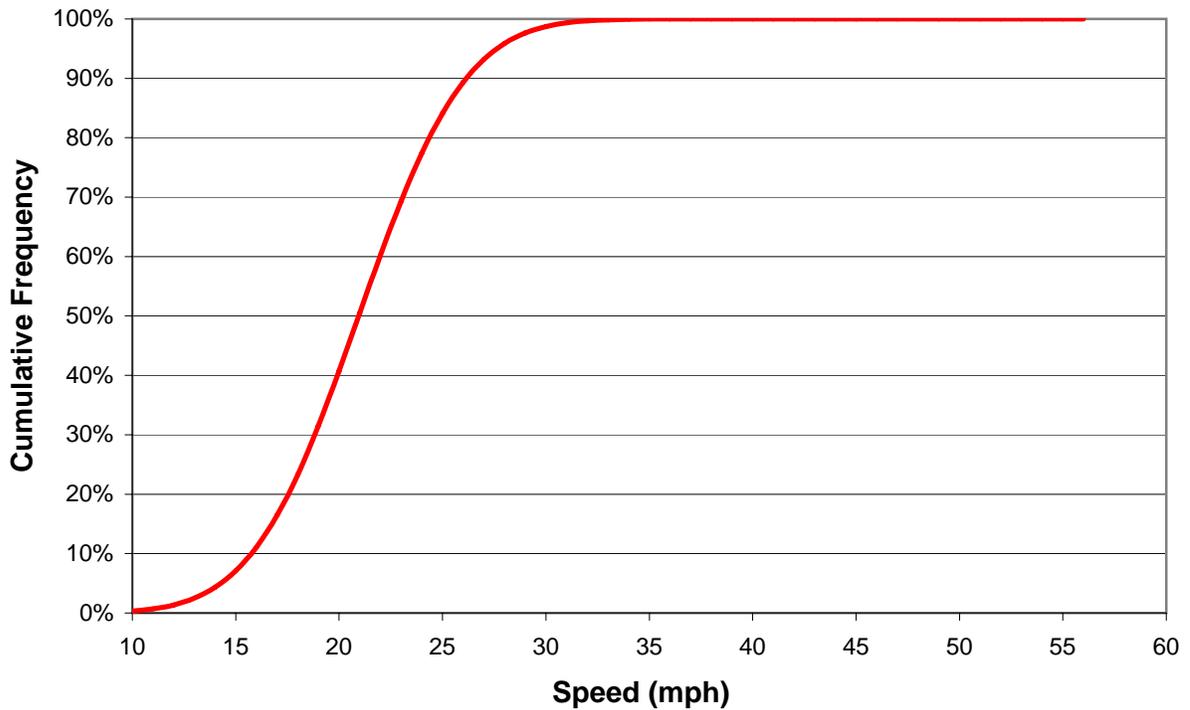
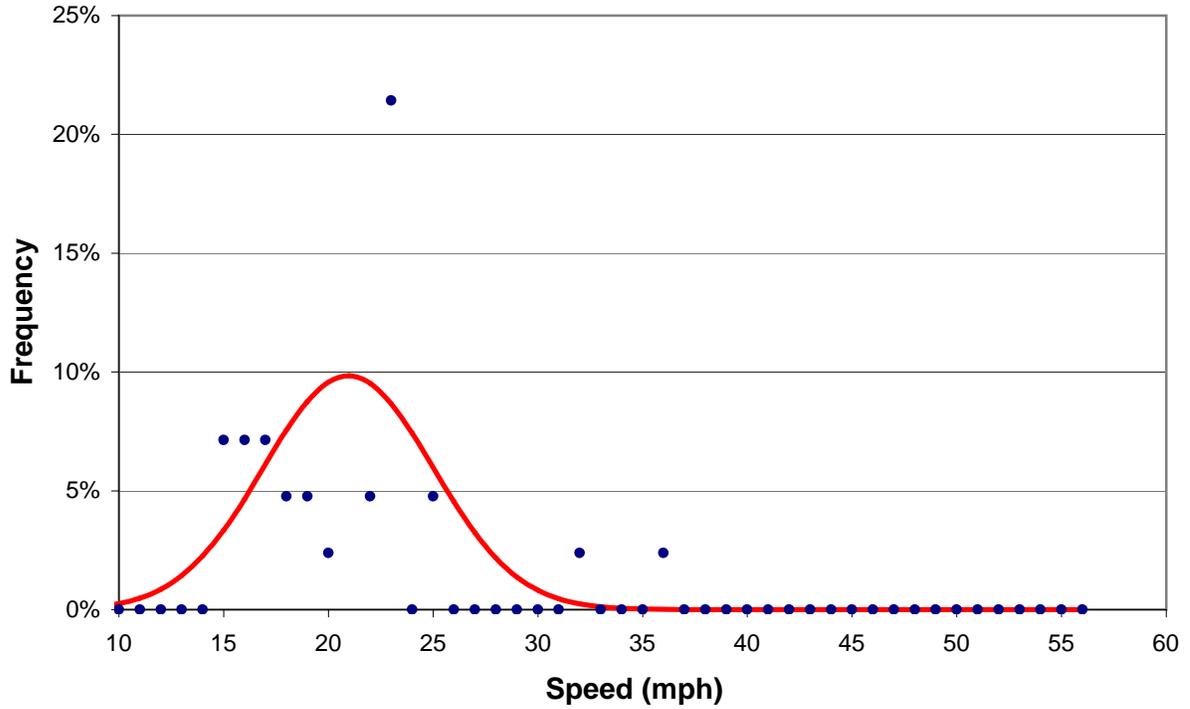
Direction: **EB**

Surveyor: **Eyad Yousef**

Comments: **Sunny and Dry**

Mean Speed = 21.0 mph
Standard Deviation = 4.1 mph
Margin of Error (95% Confidence) = ± 1.2 mph

Median Speed = 21.0 mph
15th Percentile Speed = 16.8 mph
85th Percentile Speed = 25.2 mph



SPOT SPEED STUDY

Date: **October 31, 2005** Time: **2:00 PM To 3:00 PM**
 Location: **West 147th Street, btw. Amsterdam Avenue and Broadway**
 Surveyor: **Eyad Yousef**

School: **P.S. 153**
 Direction: **WB**
 Comments: **Sunny and Dry**

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	3	6.3%	6.3%	45	675
16	4	8.3%	14.6%	64	1024
17	4	8.3%	22.9%	68	1156
18	2	4.2%	27.1%	36	648
19	3	6.3%	33.3%	57	1083
20	4	8.3%	41.7%	80	1600
21	7	14.6%	56.3%	147	3087
22	12	25.0%	81.3%	264	5808
23	3	6.3%	87.5%	69	1587
24	2	4.2%	91.7%	48	1152
25	0	0.0%	91.7%	0	0
26	1	2.1%	93.8%	26	676
27	0	0.0%	93.8%	0	0
28	0	0.0%	93.8%	0	0
29	0	0.0%	93.8%	0	0
30	2	4.2%	97.9%	60	1800
31	1	2.1%	100.0%	31	961
32	0	0.0%	100.0%	0	0
33	0	0.0%	100.0%	0	0
34	0	0.0%	100.0%	0	0
35	0	0.0%	100.0%	0	0
36	0	0.0%	100.0%	0	0
37	0	0.0%	100.0%	0	0
38	0	0.0%	100.0%	0	0
39	0	0.0%	100.0%	0	0
40	0	0.0%	100.0%	0	0
41	0	0.0%	100.0%	0	0
42	0	0.0%	100.0%	0	0
43	0	0.0%	100.0%	0	0
44	0	0.0%	100.0%	0	0
45	0	0.0%	100.0%	0	0
46	0	0.0%	100.0%	0	0
47	0	0.0%	100.0%	0	0
48	0	0.0%	100.0%	0	0
49	0	0.0%	100.0%	0	0
50	0	0.0%	100.0%	0	0
51	0	0.0%	100.0%	0	0
52	0	0.0%	100.0%	0	0
53	0	0.0%	100.0%	0	0
54	0	0.0%	100.0%	0	0
55	0	0.0%	100.0%	0	0
56	0	0.0%	100.0%	0	0
	48	100.0%		995	21257

Mean Speed = 20.7 mph Median Speed = 20.7 mph
 Standard Deviation = 3.7 mph 15th Percentile Speed = 16.9 mph
 Margin of Error (95% Confidence) = ± 1.0 mph 85th Percentile Speed = 24.5 mph

SPOT SPEED STUDY

Date: **October 31, 2005**

Time: **2:00 PM To 3:00 PM**

School: **P.S. 153**

Location: **West 147th Street, btw. Amsterdam Avenue and Broadway**

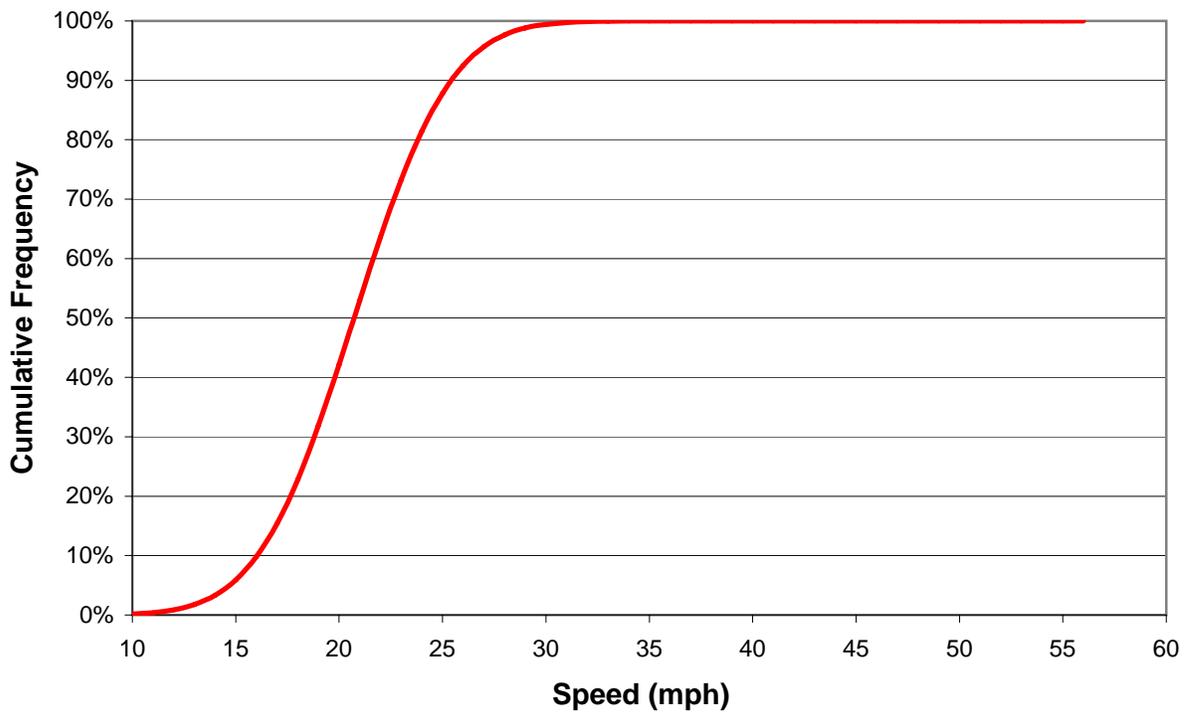
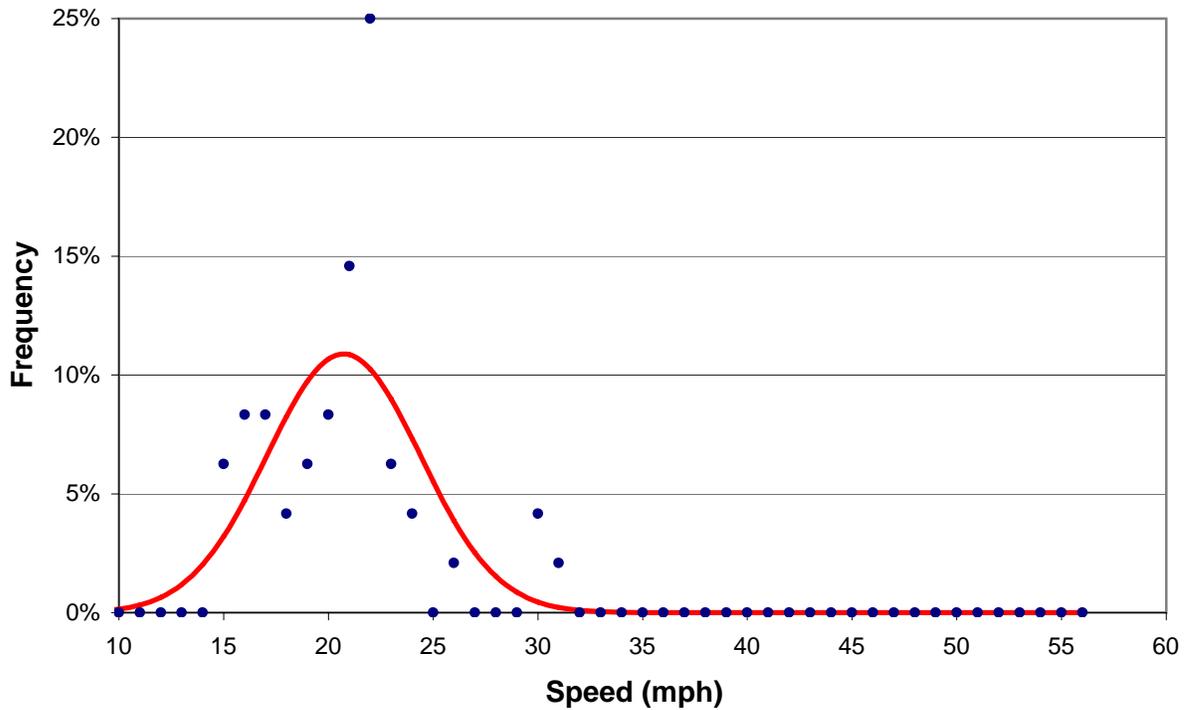
Direction: **WB**

Surveyor: **Eyad Yousef**

Comments: **Sunny and Dry**

Mean Speed = 20.7 mph
 Standard Deviation = 3.7 mph
 Margin of Error (95% Confidence) = ± 1.0 mph

Median Speed = 20.7 mph
 15th Percentile Speed = 16.9 mph
 85th Percentile Speed = 24.5 mph



PS 153
 October 31, 2005
 2:30 pm - 3:30 pm

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BOROUGH OF MANHATTAN
 Title3 : NYCDOT

Site:
 Date: 11/01/05

Combined
**Peds not included in table data*

Begin		AMSTERDAM AVE			W 146 STREET			AMSTERDAM AVE			AMSTERDAM AVE		
Time	Total	S-T	S-L				N-R	N-T		E-R	E-T	E-L	
02:30:00	269	0	107	3	0	0	0	2	142	0	6	3	6
02:45:00	297	0	98	14	0	0	0	10	143	0	13	11	8
03:00:00	330	0	141	7	0	0	0	9	134	0	11	16	12
03:15:00	298	0	128	3	0	0	0	4	138	0	7	13	5
1,194		0	474	27	0	0	0	25	557	0	37	43	31

Peak Volume Periods						<i>(1 hour Res:15 min.)</i>	
Period			Peak Period			Volume	
AM	05:00:00	To 10:00:00	NA	To NA			0
Noon	10:00:00	To 15:00:00	NA	To NA			0
PM	15:00:00	To 20:00:00	NA	To NA			0

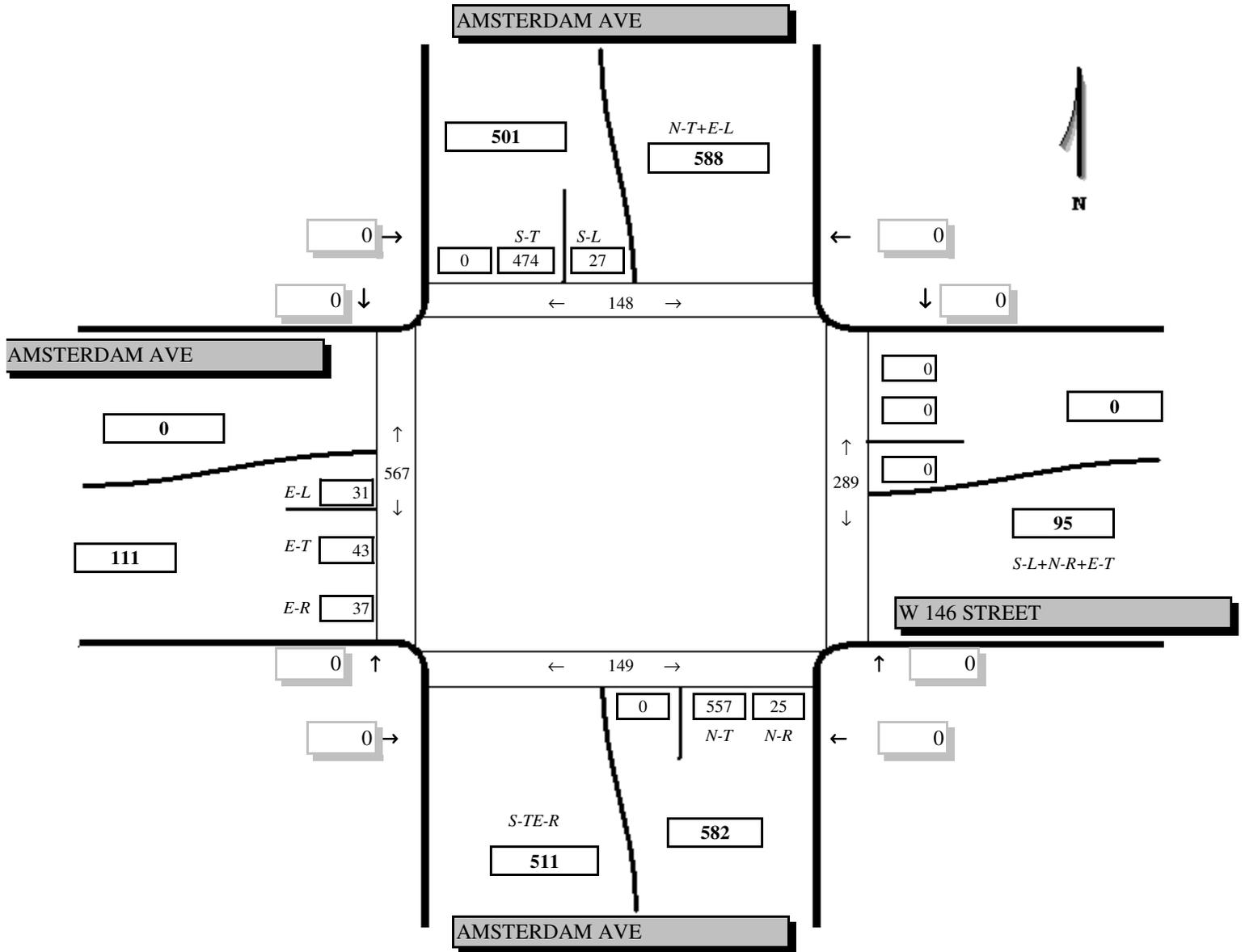
PS 153

October 31, 2005
2:30 pm - 3:30 pm

Title1 : SCHOOL SAFETY ENGINEERING
Title2 : BOROUGH OF MANHATTAN
Title3 : NYCDOT

Site:
Date: 11/01/05

Combined
*Peds not included in table data



PS 153
 October 31, 2005
 2:30 pm - 3:30 pm

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

Site:
 Date: 11/01/05

Combined
 *Peds not included in table data

