

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



School Safety Engineering Project

FINAL REPORT: I.S. 195, Roberto Clemente School, Manhattan



Prepared by
The RBA Group/Urbitrans Associates



NOVEMBER 17, 2006

**School Safety Engineering Project
I.S. 195, Roberto Clemente School, Manhattan**

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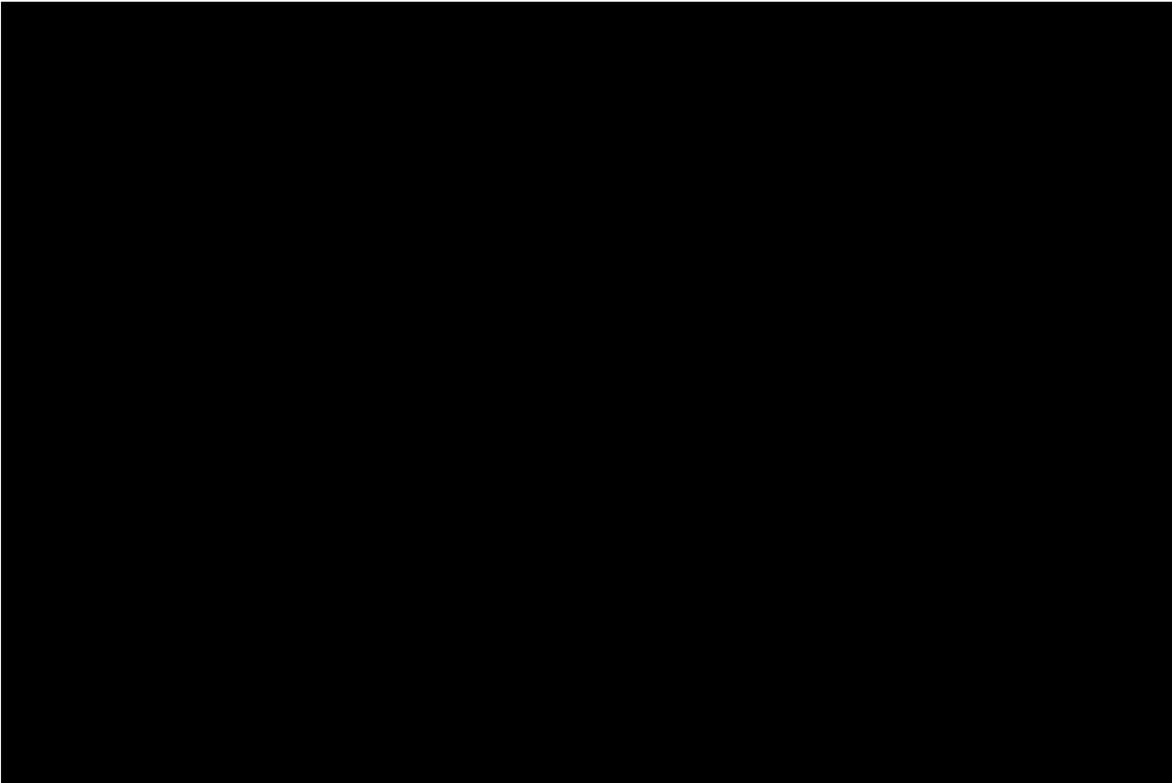
1. INTRODUCTION

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 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. 195 (Roberto Clemente School) in Manhattan is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

I.S. 195 (Roberto Clemente School) is located at 625 West 133rd Street (Figure 1) on the border of a residential/commercial area of Manhattan. Broadway and Amsterdam Avenue are both mixed-use roadways, lined by commercial storefronts such as delis, shops, pharmacies, and 3-4 story apartment buildings. West 133rd, West 134th, and West 135th Streets are all residential streets (See Exhibit 1 for Aerial Photograph).

When I.S. 195 was constructed, it was incorporated into a large high-rise apartment complex called The Riverside Park Community. Figure 1 shows the apartment complex in the background, which is attached to the school.

There are many bus routes in the vicinity of I.S. 195. The M4 runs along Broadway adjacent to the school and has a bus stop at the intersection of West 135th Street and Broadway. The M5 and M11 both run east/west along West 135th Street adjacent to the school and also have bus stops at the intersection of West 135th Street and Broadway. The M100 and M101 run along Amsterdam Avenue, one block east of the school.

2.3 MEETING WITH SCHOOL REPRESENTATIVES

Representatives from I.S. 195 and the consultant staff met at the school on the afternoon of May 24th, 2004. According to the representatives at the school, the major problems encountered by student pedestrians include the following:

- Vehicles speeding along West 133rd Street

- Loss of parking along the south side of West 133rd Street due to the MTA bus depot
- Drivers do not yield to pedestrians at the intersection of West 133rd Street and Broadway



2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

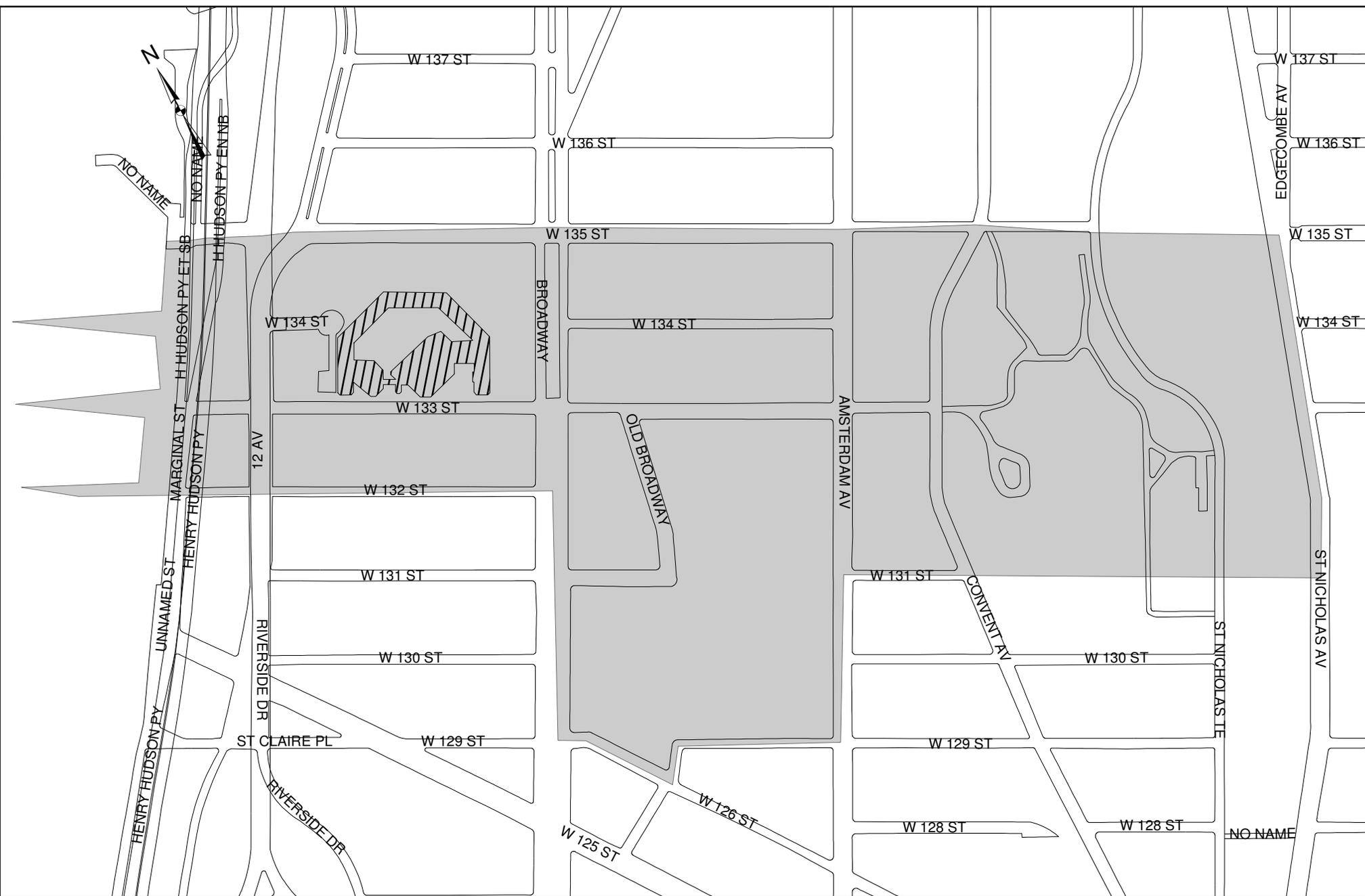
According to school officials, approximately 50% of students walk to I.S. 195, 10% are transported by school buses, and 40% by public transportation. See Table 1 for the school's estimate of the modes of travel. See Exhibit 2 for the catchments area of the school

TABLE 1: MODES OF TRAVEL	
(AS ESTIMATED BY SCHOOL OFFICIALS)	
DESCRIPTION	PERCENTAGE
Walk	50%
Driven by parent of guardian	0%
School bus	10%
MTA bus	40%
MTA subway	0%
TOTAL	100%



1 inch equals 200 feet

EXHIBIT 1
I.S. 195, MANHATTAN
ROBERTO CLEMENTE SCHOOL
AERIAL PHOTOGRAPH



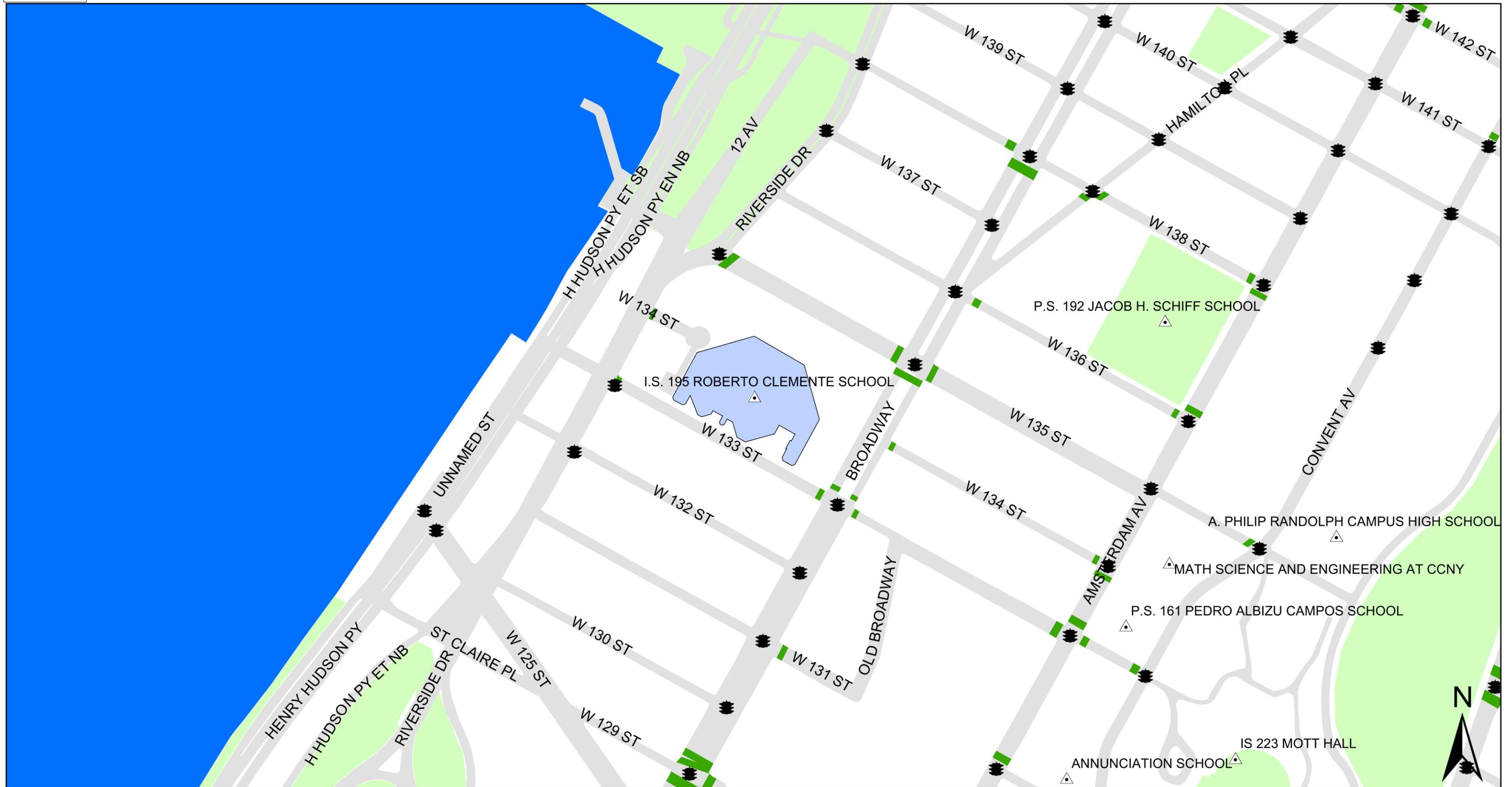
1 inch equals 400 feet

 **CATCHMENT AREA**

EXHIBIT 2
I.S. 195, MANHATTAN
ROBERTO CLEMENTE SCHOOL
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 195 Manhattan
ROBERTO CLEMENTE 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: 109
PRECINCT: 30

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

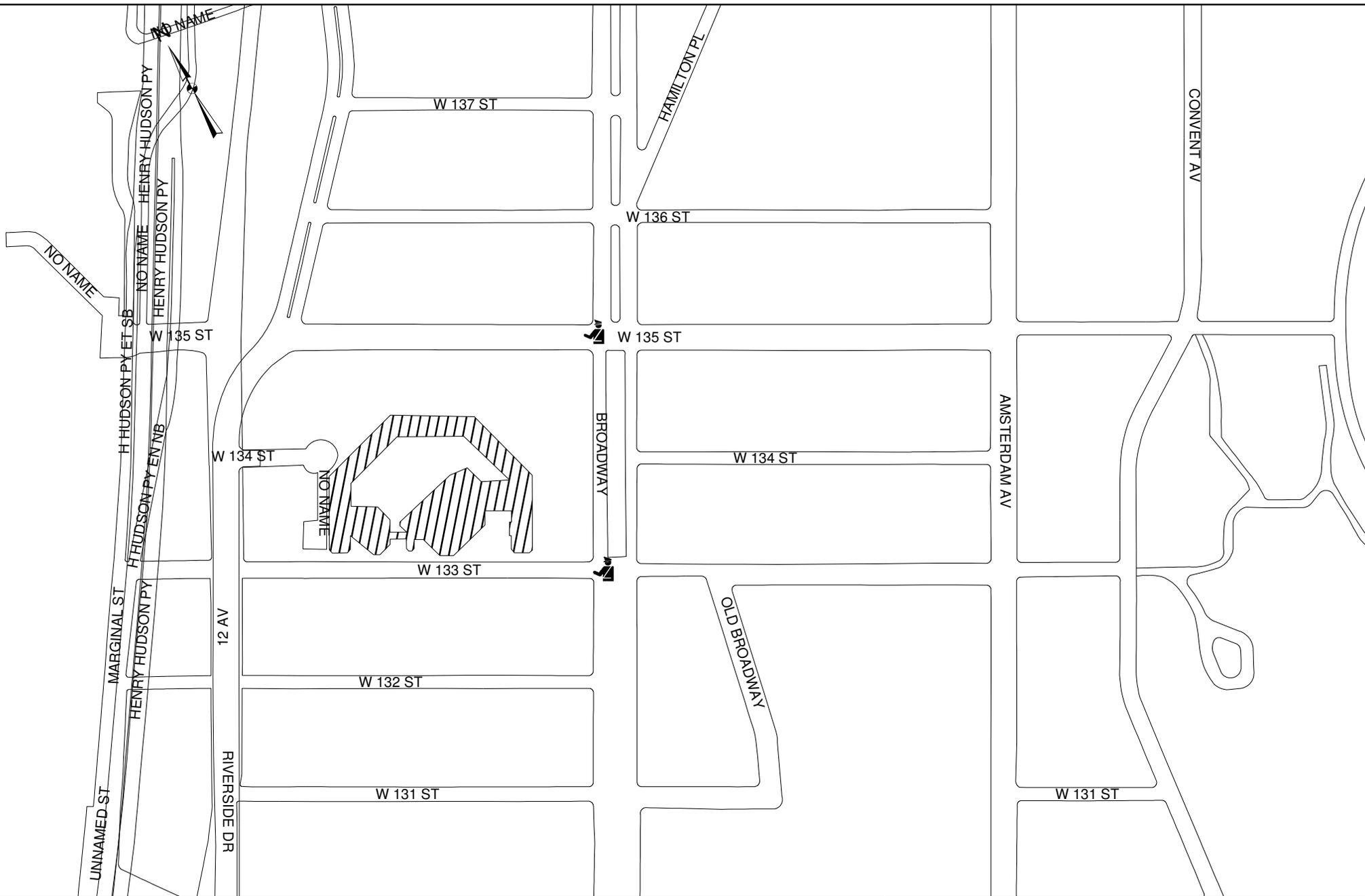
The high-rise apartment complex adds significant pedestrian traffic to this area along with P.S. 161, which is at the intersection of West 133rd Street, and Amsterdam Avenue and PS. 192, which is on Amsterdam Avenue between West 136th Street and West 137th Street.

2.8 CROSSING GUARD LOCATIONS

There are two crossing guards assigned to I.S. 195. The crossing guards are assigned to the following intersections:

- West 133rd Street and Broadway
- West 135th Street and Broadway

See Exhibit 4 for a map of the assigned crossing guards in the vicinity of I.S. 195.



1 inch equals 300 feet



CROSSING GUARD ASSIGNED TO I.S. 195

EXHIBIT 4
I.S. 195, MANHATTAN
ROBERTO CLEMENTE SCHOOL
CROSSING GUARD

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school representatives, five school buses transport students to and from school. All school buses pick-up and drop-off students on West 133rd Street between 12th Avenue and Broadway. It was observed that school buses must double-park along West 133rd Street in order to pick up students at dismissal time.

3.2 PARENT DROP-OFF OPERATIONS

School officials have indicated that less than 1% of I.S. 195 students are driven to and from school by parents or guardians. Students that are driven to school are dropped off mid-block on Broadway between West 133rd Street and West 135th Street.

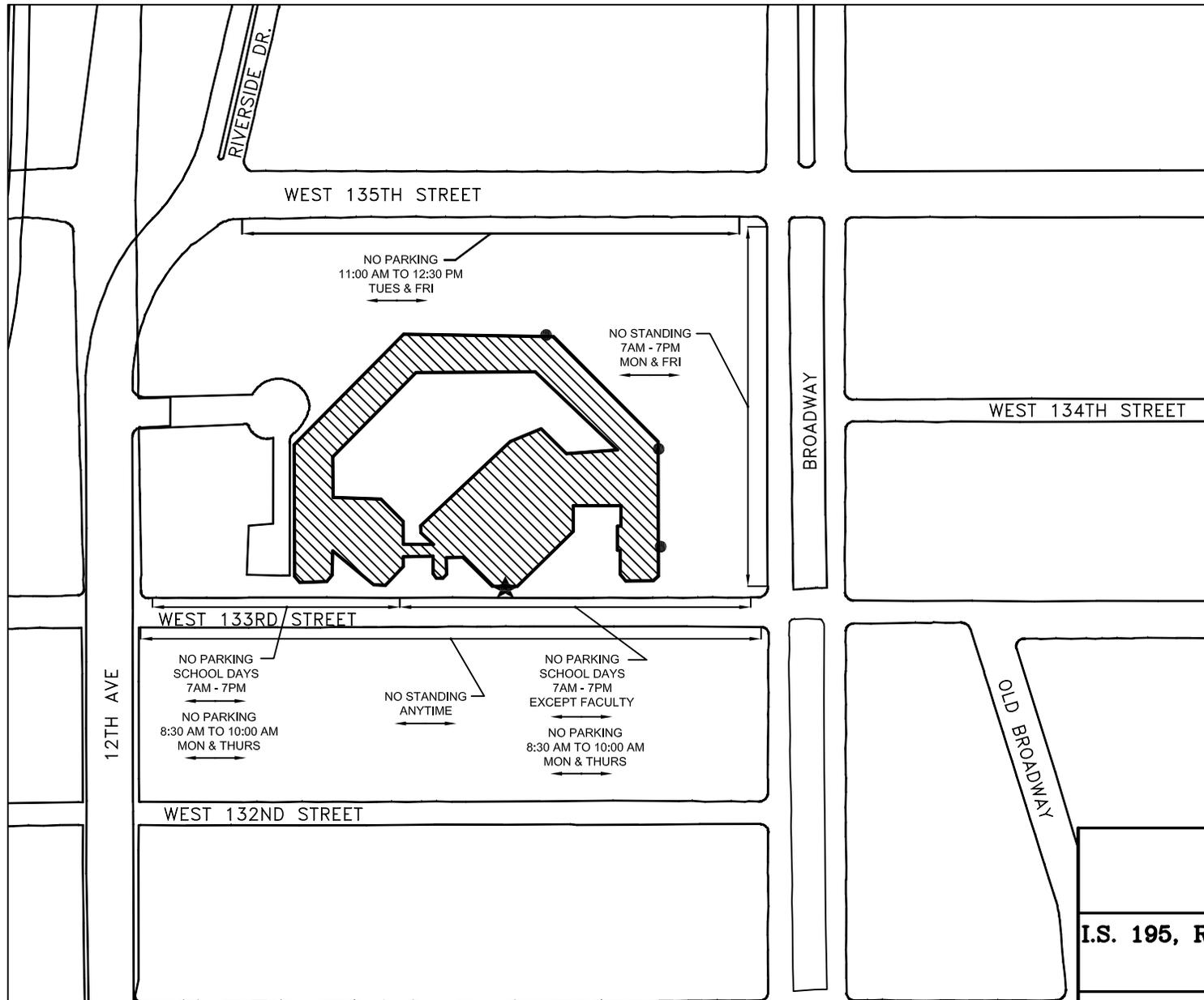
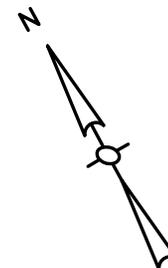
3.3 PARKING REGULATIONS

A “NO PARKING, 7:00 AM – 4:00 PM, SCHOOL DAYS, EXCEPT FACULTY” parking regulation is posted on the north side of West 133rd Street for approximately two-thirds of the block in front of the school. A “NO PARKING, 7:00 AM – 4:00 PM, SCHOOL DAYS” parking regulation is posted on the north side of West 133rd Street east of 12th Avenue for approximately one-third of the block.

Exhibit 5 displays existing parking regulations on West 133rd Street, West 135th Street, and Broadway.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, shows existing signals and school crosswalk pavement markings in the vicinity of the school. It is noted that a citywide signage program is currently underway to upgrade school signage to current Federal Manual of Uniform Traffic Control Devices (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 7.



- LEGEND**
- ★ MAIN ENTRANCE
 - OTHER ENTRANCES

SCALE 1" = 200'

EXHIBIT 5

**I.S. 195, ROBERTO CLEMENTE SCHOOL
MANHATTAN**

EXISTING PARKING REGULATIONS

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 I.S. 195 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.

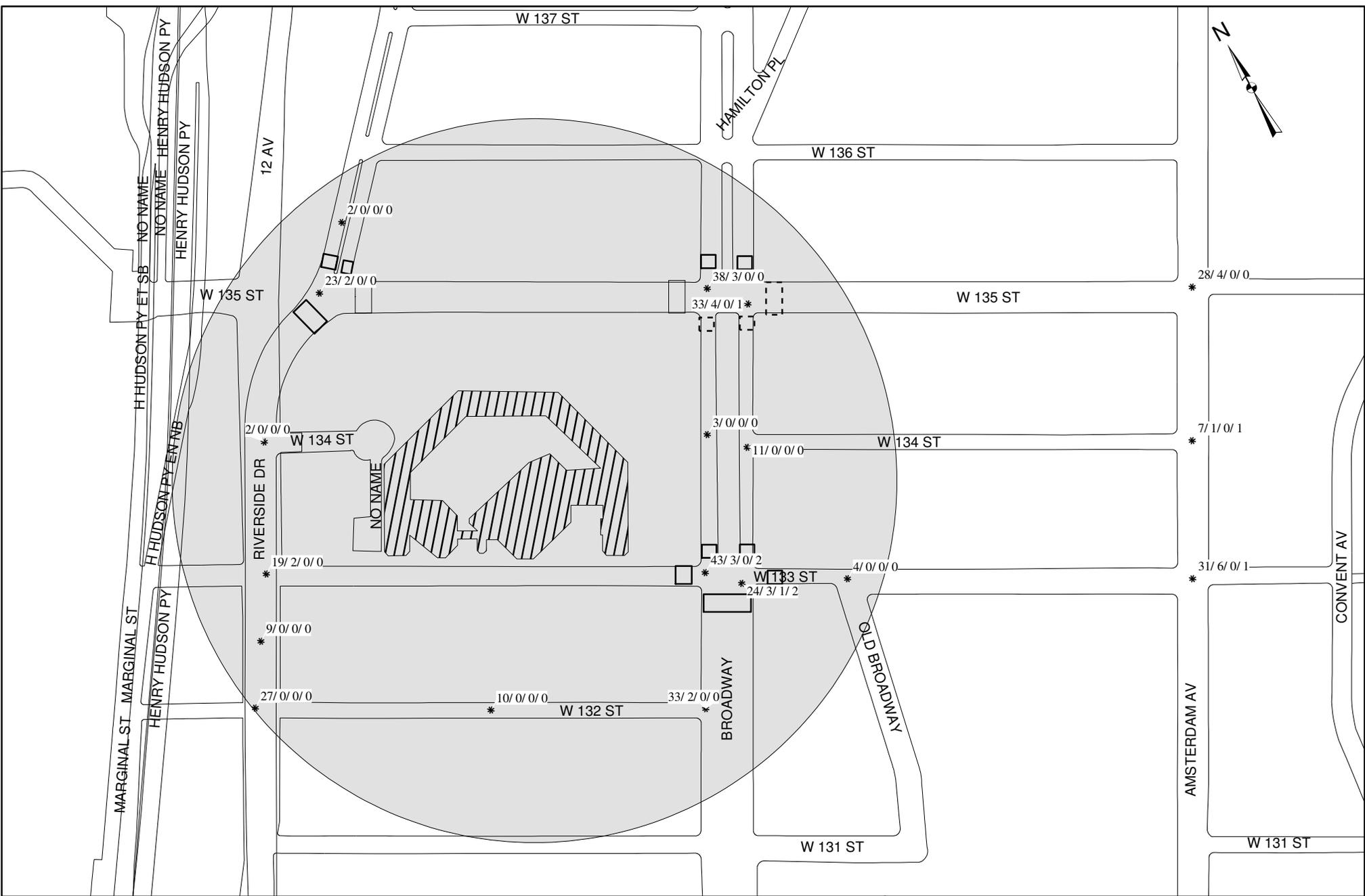
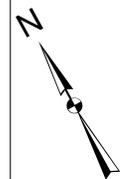
This report targets intersections closest to the school where the highest concentration of student pedestrians occurs. Intersections farther from the school and locations for which detailed data was not available at the time of this study will be addressed with the ongoing work of DOT's School Safety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

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
West 135 th Street and Riverside Drive	23	2	0	0
West 135 th Street and Broadway**	71	7	0	1
West 133 rd Street and Broadway **	67	6	1	4
West 135 th Street and Amsterdam Avenue	28	4	0	0
West 134 th Street and Amsterdam Avenue	7	1	0	1
West 133 rd Street and Amsterdam Avenue	31	6	0	1
TOTAL	227	26	1	7

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
West 135 th Street at Riverside Drive	30	N/A	N/A	N/A
West 135 th Street at Broadway **	83	1	0	0
West 133 rd Street at Broadway**	85	7	0	1
West 135 th Street at Amsterdam Avenue	56	5	0	1
West 134 th Street at Amsterdam Avenue	35	11	0	1
West 133 rd Street at Amsterdam Avenue	62	9	0	1
TOTAL	351	33	0	4

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

** *Includes accidents for both northbound and southbound Broadway*



ACCIDENT LOCATION *

SCHOOL CROSSWALK ASSIGNED TO I.S. 195

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL

CROSSWALK

X/X/X/X

TOTAL ACCIDENTS	PED ACCIDENTS	PED FATAL	SCHOOL_PED ACCIDENTS
2/0/0/0			
23/2/0/0			
2/0/0/0			
19/2/0/0			
9/0/0/0			
27/0/0/0			
10/0/0/0			
33/2/0/0			
38/3/0/0			
33/4/0/1			
3/0/0/0			
11/0/0/0			
43/3/0/2			
24/3/1/2			
4/0/0/0			
28/4/0/0			
7/1/0/1			
31/6/0/1			

1 inch equals 250 feet

EXHIBIT 6
I.S. 195, MANHATTAN
ROBERTO CLEMENTE SCHOOL

ACCIDENT SUMMARY
THREE YEAR PERIOD
(1998-2000)

3.6 TRAFFIC OPERATIONS AND ISSUES

The following sub-sections outline the physical conditions and issues concerning traffic operations and accidents at the intersections in the vicinity of I.S. 195.

3.6.1 West 135th Street and Riverside Drive

Riverside Drive is a 60-foot wide, two-way street with two moving lanes in both the northbound and southbound directions. North of the intersection with West 135th Street, there is parking on both sides and a narrow landscaped median. West 135th Street has two travel lanes in each direction and parking on both sides. Currently this T-intersection does not have school crosswalks and it is controlled by a traffic signal. There are standard pedestrian ramps at each quadrant and all are in good condition (Figure 2).



Figure 2 – Intersection of Riverside Drive and West 135th Street, looking north

There were 23 accidents at this intersection in the 1998-2000 study period. Two accidents involved pedestrians but none were school-related. According to the accident data one pedestrian was struck by a southbound left turning vehicle, while crossing against the signal. The second pedestrian was struck by an oversized vehicle backing up unsafely.

3.6.2 West 135th Street and Broadway

In the vicinity of I.S. 195, Broadway is divided by an elevated subway structure. In the southbound direction there are three travel lanes and parking on the right side of the street. In the northbound direction, there are two travel lanes with parking on the right side of the street. The median on the northern side of the intersection is approximately 24 feet wide while the median on the southern side is approximately 43 feet wide. This intersection is controlled by a traffic signal and has school crosswalks on the south and east legs. The two western quadrants have two pedestrian ramps each but they are in poor condition while the two eastern quadrants are in good condition.

There were 71 accidents at this intersection in the 1998-2000 study period. Seven accidents involved pedestrians, of which one was school-related. On Friday, March 25, 2000, a 9-year-old student was crossing Broadway when struck by a vehicle. The vehicle was traveling north and the student was crossing against the signal. Three pedestrians were struck while crossing with the signal. No detailed information is available on the other three accidents.

The median on the north side of this intersection has been reconstructed recently with new curbs, sidewalk, benches, and concrete barriers to create a refuge for pedestrians (Figure 3). The median on the south side of the intersection is very old and the curbs and sidewalks are in poor condition (Figure 4). There are also no formal pedestrian ramps on this median.



Figure 3 – Raised median at the intersection of Broadway and West 135th Street (north side), recently constructed



Figure 4 – Raised median at the intersection of Broadway and West 135th Street (south side), in poor condition

This intersection is close to where the majority of students exit the school at dismissal. Many students congregate at the southwest corner after dismissal and then cross Broadway at this location.

3.6.3 West 133rd Street and Broadway

West 133rd Street west of Broadway is a 38-foot wide, two-way street with one travel lane in each direction and parking on the northern side of the roadway. West 133rd Street is a 30-foot wide, street between Broadway and Old Broadway, and it widens to 48-feet east of Old Broadway. Pedestrians crossing Broadway cross beneath the structure for the elevated subway (Figure 5). The elevated train structure obstructs pedestrian view of oncoming traffic on Broadway. The structure abuts the edge of the travel lane, making it difficult for pedestrians to see oncoming traffic.

This intersection is controlled by a traffic signal and has no school crosswalks. The western quadrants are in good condition, however the northeastern and southeastern quadrants are in poor condition.



Figure 5 – Intersection of West 133rd Street and Broadway with the elevated subway structure (view looking east)

There were 67 accidents at this location in the 1998-2000 study period. Six of these accidents involved pedestrians; and four pedestrian accidents were school-related. There was one fatality at this intersection. The victim was an intoxicated 48-year old pedestrian who was struck by a northbound vehicle while crossing with the signal.

Of the four accidents involving students, two were crossing Broadway with the signal and the other two were crossing Broadway against the signal. According to the DMV's records, driver's inattention or errors were cited as the cause for three of the accidents involving students. All students were struck by vehicles traveling either northbound or southbound on Broadway.

A spot speed study was conducted on West 133rd Street between Broadway and 12th Avenue on Tuesday, November 15, 2005. The results indicated that the 85th percentile speed was 28 mph, which does not exceed the statutory speed limit of 30 mph. See the following table for a summary of the results and the appendix for further discussion.

TABLE 4: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
West 133 rd Street between Broadway and 12 th Avenue	23	28

(It should also be noted that NYCDOT recently conducted an investigation of West 133rd Street and found that due to the grade of the roadway, speed reducers would not be feasible at this location.)

3.6.4 West 135th Street and Amsterdam Avenue

Amsterdam Avenue is a 60-foot wide, two-way (north-south) street with two travel lanes in each direction and parking on both sides of the roadway. The intersection is controlled with a traffic signal and has no school crosswalks. All corner quadrants at this intersection have standard pedestrian ramps and are in good condition.

There were twenty-eight accidents at this signalized intersection between 1998 and 2000. Four accidents involved pedestrians. There were no school-related accidents. According to the accident data two pedestrians were struck while crossing with the signal, and two pedestrians were struck while crossing against the signal.

3.6.5 West 134th Street and Amsterdam Avenue

West 134th Street is a one-way (eastbound) roadway with one travel lane and parking on both sides. This T-intersection is controlled with a traffic signal and has school crosswalks on both the south and west legs. Pedestrian ramps are properly designed and aligned at this intersection.

There were seven accidents at this signalized intersection between 1998 and 2000. The one pedestrian involved in an accident was a student. An 8-year-old pedestrian was struck by a southbound vehicle while crossing against the signal.

3.6.6 West 133rd Street and Amsterdam Avenue

West 133rd Street is a two-way (east-west) street with one lane in each direction and parking on both sides. The intersection is controlled by a two-phase traffic signal. There are school crosswalks on the north, east and west legs of the intersection. All four corners have standard pedestrian ramps, which are in good condition.

There were 31 accidents at this intersection in the 1998-2000 study period. Six accidents involved pedestrians; one was school-related. On Friday, June 10, 1998, a 13-year-old student was crossing Amsterdam Avenue against the signal when struck by a vehicle, which was traveling north. No further information was available.

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field-verified at all signalized intersections in the vicinity of I.S. 195, and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches (See Table 5 for details).

TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS				
Intersection Name	Crosswalk Length (Feet)¹	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)²	Timing Adjustment? (Yes/No)
West 135th Street at Riverside Drive				
West 135 th Street	64	55	24	NO
Riverside Drive	64	25	24	NO
West 135th Street at Broadway				
West 135 th Street	60	53	23	NO
Broadway	39/39 ³	27/27 ⁴	16/16	NO
West 133rd Street at Broadway				
West 133 rd Street	38	45	16	NO
Broadway	30/30 ³	35/35 ⁴	13/13	NO
West 135th Street at Amsterdam Avenue				
West 135 th Street	60	53	23	NO
Amsterdam Avenue	60	28	23	NO
West 134th Street at Amsterdam Avenue				
West 134 th Street	30	58	13	NO
Amsterdam Avenue	60	23	23	NO
West 133rd Street at Amsterdam Avenue				
West 133 rd Street	50	54	20	NO
Amsterdam Avenue	61	26	23	NO

Note:

- 1 Many of the streets studied in the vicinity of I.S. 195 have varying widths on either side of the intersection. In these cases, the longer of the two crosswalk distances was used for the pedestrian crossing time calculations.
- 2 A rate of 3 ft/sec plus 3 seconds reaction time was utilized as the child pedestrian walking rate
- 3 Northbound and southbound travel lanes on Broadway are split by the elevated subway tracks in this area. At both intersections studied there is a refuge for pedestrians varying from 24 feet to 43 feet in between the travel lanes.
- 4 A pedestrian needs two signal cycles to cross Broadway at a rate of three feet per second while stopping at the medians separating the two directions of traffic. The actual pedestrian phase in one signal cycle is 27 seconds at West 135th Street and 35 seconds at West 133rd Street.

3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS)

Generally, the roadways and sidewalks in the vicinity of I.S. 195 were observed to be in good condition.

Some of the intersections studied in the vicinity of I.S. 195 have pedestrian ramps that are in poor condition and it is recommended that new pedestrian ramps be constructed at various intersections in the vicinity of I.S. 195. These locations are discussed in Section 3.6 and shown on Exhibit 7.

4. POTENTIAL MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

This section describes potential countermeasures. These 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 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 school dedicate a staff member to act as valet or greeter to expedite the time required for students to disembark from or enter vehicles.

- Install No Standing Zone

The parking restriction “NO STANDING, 7:00 AM – 4:00 PM, SCHOOL DAYS” should be posted for a length of 120 feet in front of school’s main entrance on West 133rd Street for buses to load and unload students.

“NO PARKING, 7:00 AM – 4:00 PM, SCHOOL DAYS, EXCEPT DEPARTMENT OF EDUCATION” parking regulations should be provided for the rest of the north side of West 133rd Street in front of the school (see Exhibit 7).

- Review bus management / staging procedures

One hundred twenty feet of curbside space has been proposed for school bus operations. This may require that some buses must stage at other locations until sufficient curbside space becomes available. School officials should review the bus operations at the school and consider the following:

- Restrict drop-off/pick-up of students from school buses except at the designated curbside fronting the school
- Define a staging area for buses to queue until they can safely pull into the curbside directly fronting the school for drop-off/pick-up operations.

It is important that students not enter/exit buses while the buses are in the staging area. By reducing the number of students entering or exiting the buses at one time, it may be easier to manage the students’ actions at arrival and dismissal times.

- Install pedestrian information sign that explains the signal phases

The safety of pedestrians at the wide intersections of Broadway and Amsterdam Avenue at West 133rd Street and West 135th Street is a major concern. Installation of a pedestrian information sign adjacent to each school crosswalk that explains the signal phases is recommended. Both Broadway and Amsterdam Avenue are

wide, high volume roadways. Pedestrians will benefit from informational signage even though they are provided with sufficient time to cross at these intersections.

- Install new school crosswalks at the following locations:

According to the school principal, some students walk to I.S. 195 from along West 133rd Street and Broadway. Therefore, it is recommended that school crosswalks be installed at the following intersections:

- West 133rd Street and Broadway – west, east and north leg
- West 133rd Street and Old Broadway – south leg
- West 133rd Street and 12th Avenue – east leg
- West 134th Street and Riverside Drive – east leg
- West 135th Street and Riverside Drive – east leg
- West 135 Street and Broadway- west leg

- 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.

- Submit a request to the Police Department for crossing guards

It is recommended that a request be submitted to the Police Department for a second crossing guard at the intersection of West 133rd Street and Broadway. There is currently one crossing guard at this intersection but with the reduced visibility due to the overpass, another crossing guard would be beneficial.

4.2 LONG-TERM MEASURES

- Construct new raised median at the intersection of West 135th and Broadway

The raised median on the south side of the intersection is very old and in poor condition. There are no pedestrian ramps and there is asphalt pavement instead of a concrete sidewalk. The median on the north side has recently been reconstructed.

Consideration should be given to installing a new median on the south side, provided that the Final Design confirms that construction of the recommended median would be feasible and would not interfere with traffic operations. This is the intersection where the majority of students exit and enter the school and cross Broadway. A new raised median would greatly increase the safety of the students. Final details pertaining to geometry of the median will be developed during the Final Design/Contract Document preparation.

- Install curb extensions at:

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.

- West 133rd Street and Old Broadway – southwest and southeast corners

Curb extensions should be installed at the corners as shown in Exhibit 7.

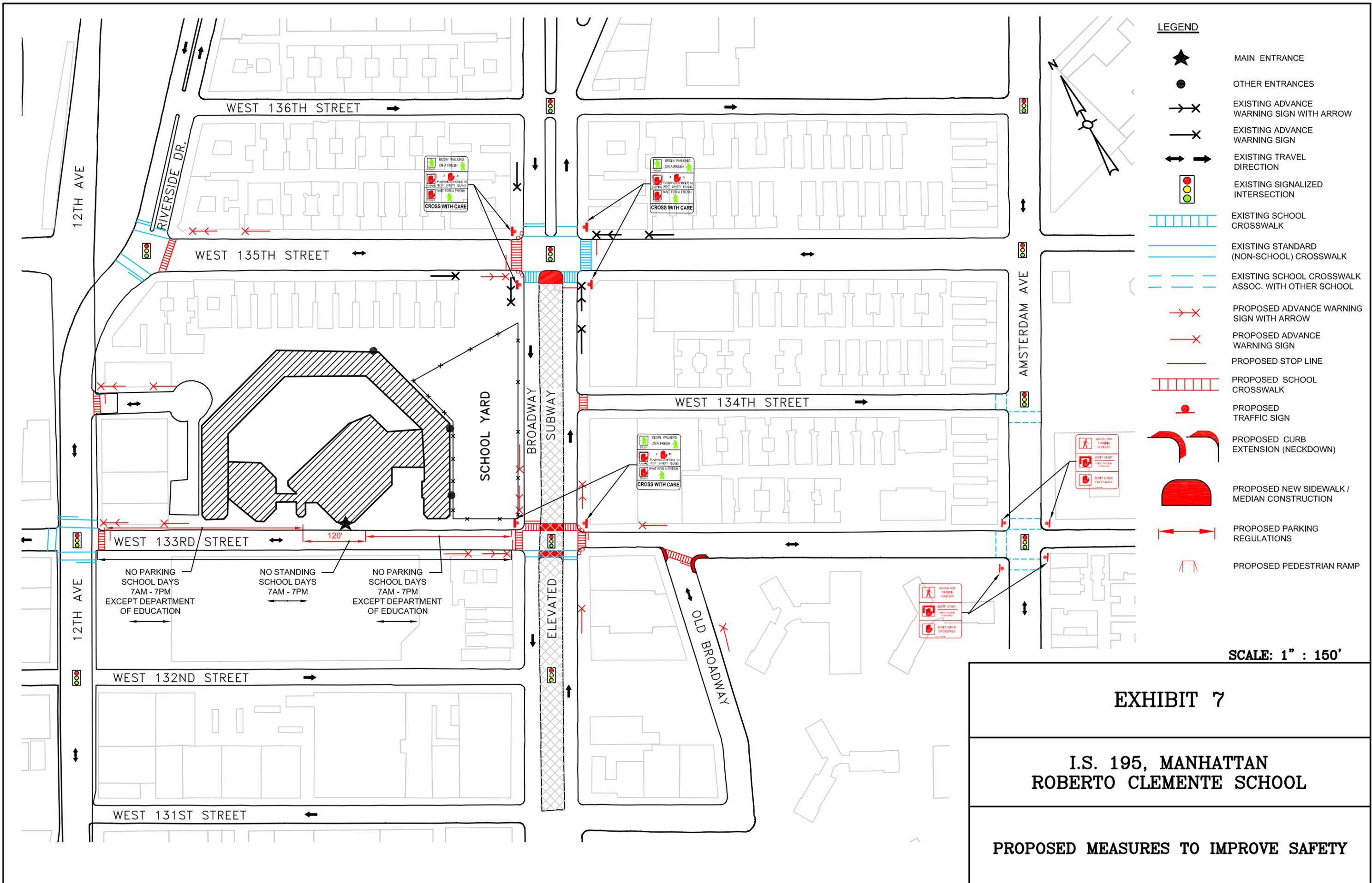
The purpose of the curb extensions is to shorten the crossing distance for pedestrians, and to reduce speeds of vehicles approaching and turning at these heavily utilized school crosswalks (or intersections). These curb extensions would not eliminate or reduce the width of any moving lanes.

- Construct raised sidewalk at West 133rd Street and Broadway

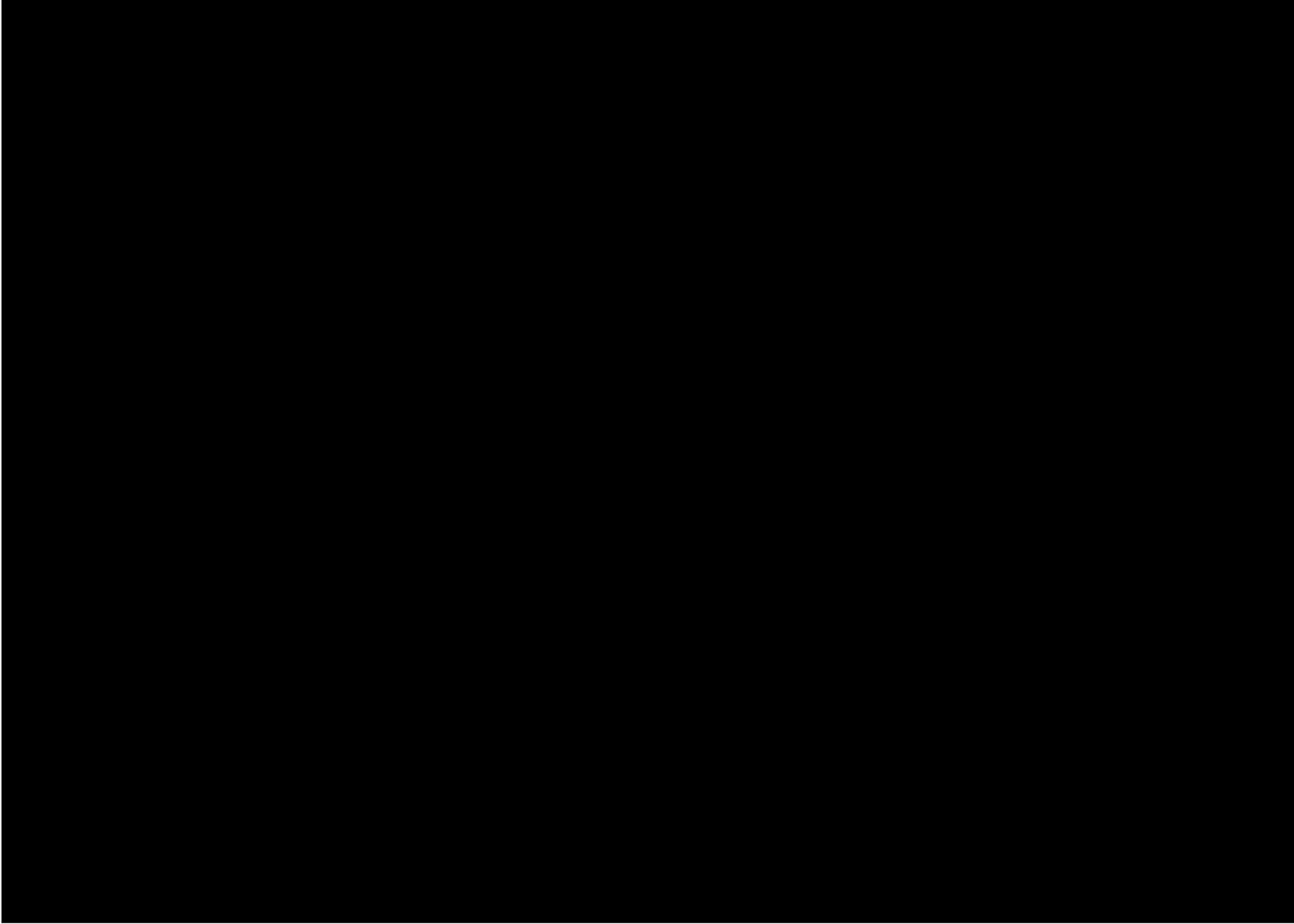
Vehicles and pedestrians on West 133rd Street cross Broadway beneath the elevated structure (see Figure 5). Currently there are only painted crosswalks for pedestrians on both sides. Therefore, it is recommended that sidewalks be constructed beneath the overpass on both the north and south sides of West 133rd Street.

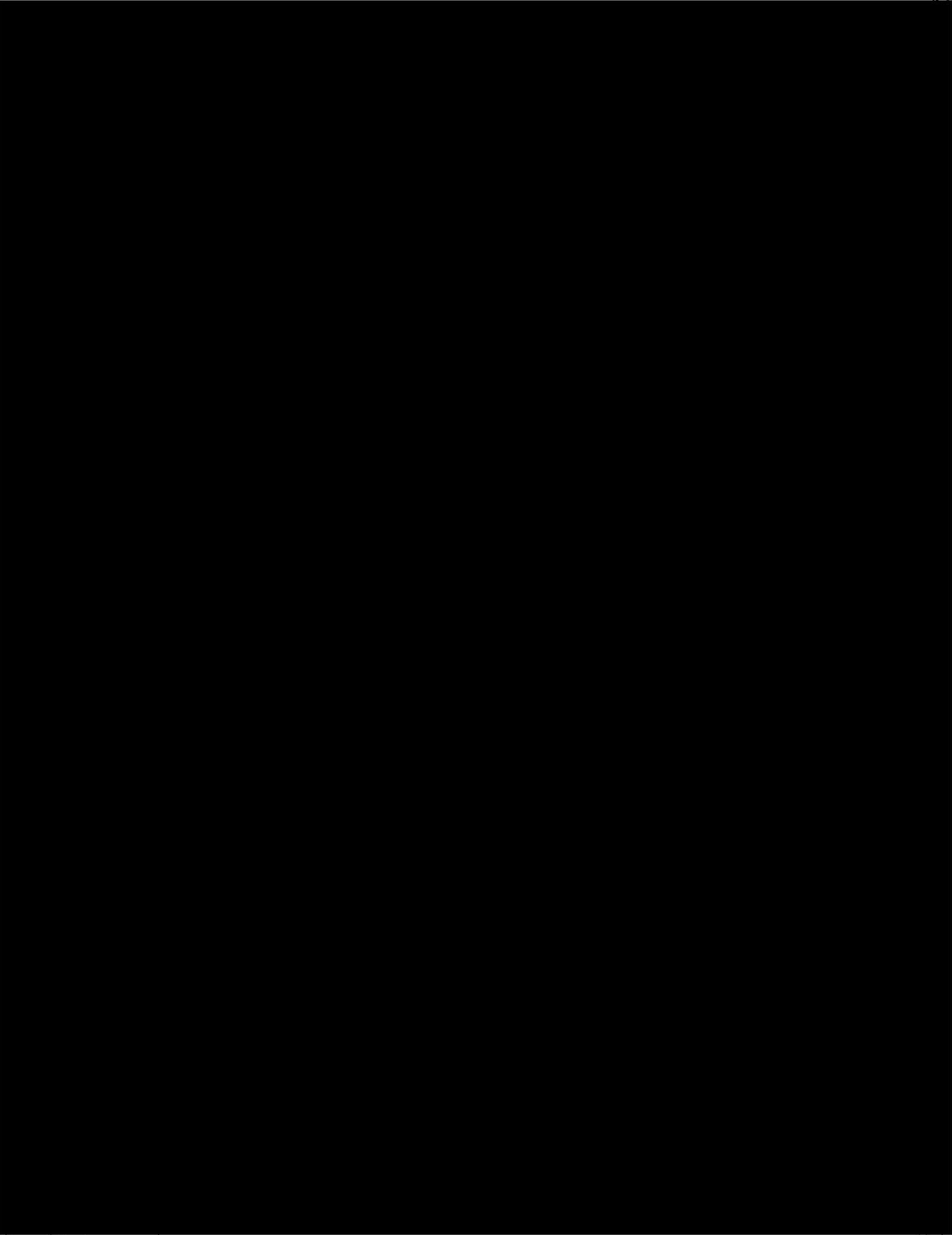
- Install pedestrian ramps at required locations

Install pedestrian ramps at the intersections discussed in Section 3.8 in which deficiencies currently exist. See Exhibit 7 for locations.



APPENDIX





12

SPOT SPEED STUDY

Date: **November 15, 2005** Time: **4:00 pm - 5:00 pm**
 Location: **W. 133rd Street between Broadway and 12th Avenue**
 Surveyor: **Eyad Yousef**

School: **I.S. 195**
 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	3	4.8%	4.8%	51	867
18	1	1.6%	6.5%	18	324
19	3	4.8%	11.3%	57	1083
20	9	14.5%	25.8%	180	3600
21	9	14.5%	40.3%	189	3969
22	3	4.8%	45.2%	66	1452
23	13	21.0%	66.1%	299	6877
24	7	11.3%	77.4%	168	4032
25	3	4.8%	82.3%	75	1875
26	0	0.0%	82.3%	0	0
27	0	0.0%	82.3%	0	0
28	2	3.2%	85.5%	56	1568
29	0	0.0%	85.5%	0	0
30	2	3.2%	88.7%	60	1800
31	1	1.6%	90.3%	31	961
32	0	0.0%	90.3%	0	0
33	6	9.7%	100.0%	198	6534
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
	62	100.0%		1448	34942

Mean Speed = 23.4 mph
 Standard Deviation = 4.3 mph
 Margin of Error (95% Confidence) = ± 1.1 mph

Median Speed = 23.4 mph
 15th Percentile Speed = 18.9 mph
 85th Percentile Speed = 27.8 mph

SPOT SPEED STUDY

Date: **November 15, 2005**

Time: **4:00 pm - 5:00 pm**

School: **I.S. 195**

Location: **W. 133rd Street between Broadway and 12th Avenue**

Direction: **Eastbound**

Surveyor: **Eyad Yousef**

Comments:

Mean Speed = 23.4 mph
Standard Deviation = 4.3 mph
Margin of Error (95% Confidence) = ± 1.1 mph

Median Speed = 23.4 mph
15th Percentile Speed = 18.9 mph
85th Percentile Speed = 27.8 mph

