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

# School Safety Engineering Project

# FINAL REPORT: P. S. 194 (Countee Cullen School), Manhattan

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

**OCTOBER 13, 2006**

# School Safety Engineering Project
# P. S. 194 (Countee Cullen School), Manhattan

## TABLE OF CONTENTS



## EXHIBITS

## TABLES



## APPENDIX

[redacted]

# 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. 194 (Countee Culleen School) is one of the 135 priority schools.

## 2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS

[redacted]


*Figure 1: Looking west on West 144th Street, Manhattan*

### 2.2 NEIGHBORHOOD DESCRIPTION

P.S. 194 is located mid-block on West 144th street between Adam Clayton Powell Boulevard and Frederick Douglass Boulevard. West 144th Street is primarily a residential street. Located in the vicinity of P.S. 194 are Renaissance Park, the Drew Hamilton Apartments, a fire station, Drew Hamilton Community Center and many commercial establishments. The 145th Street Bridge (connecting Manhattan with the Bronx) is also located a few blocks from P.S. 194 (see Exhibit 1 for Aerial Photograph).

### 2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant team, the New York City Department of Education, the 32nd Precinct of the New York City Police Department and representatives from P.S. 194 met at the school on the afternoon of April 21, 2004. Representatives from P.S. 194 included the principal, the vice principal, a school aide, teachers and a parent coordinator.

According to school representatives, the identifiable problems that student pedestrians encounter on a regular basis include the following:

- Congestion at the rear entrance to the schoolyard on West 143rd Street due to fire station trucks and emergency vehicles
- Students crossing mid-block on West 143rd Street

- Not enough time for pedestrians to cross Adam Clayton Powell Boulevard
- Speeding on West 144th Street

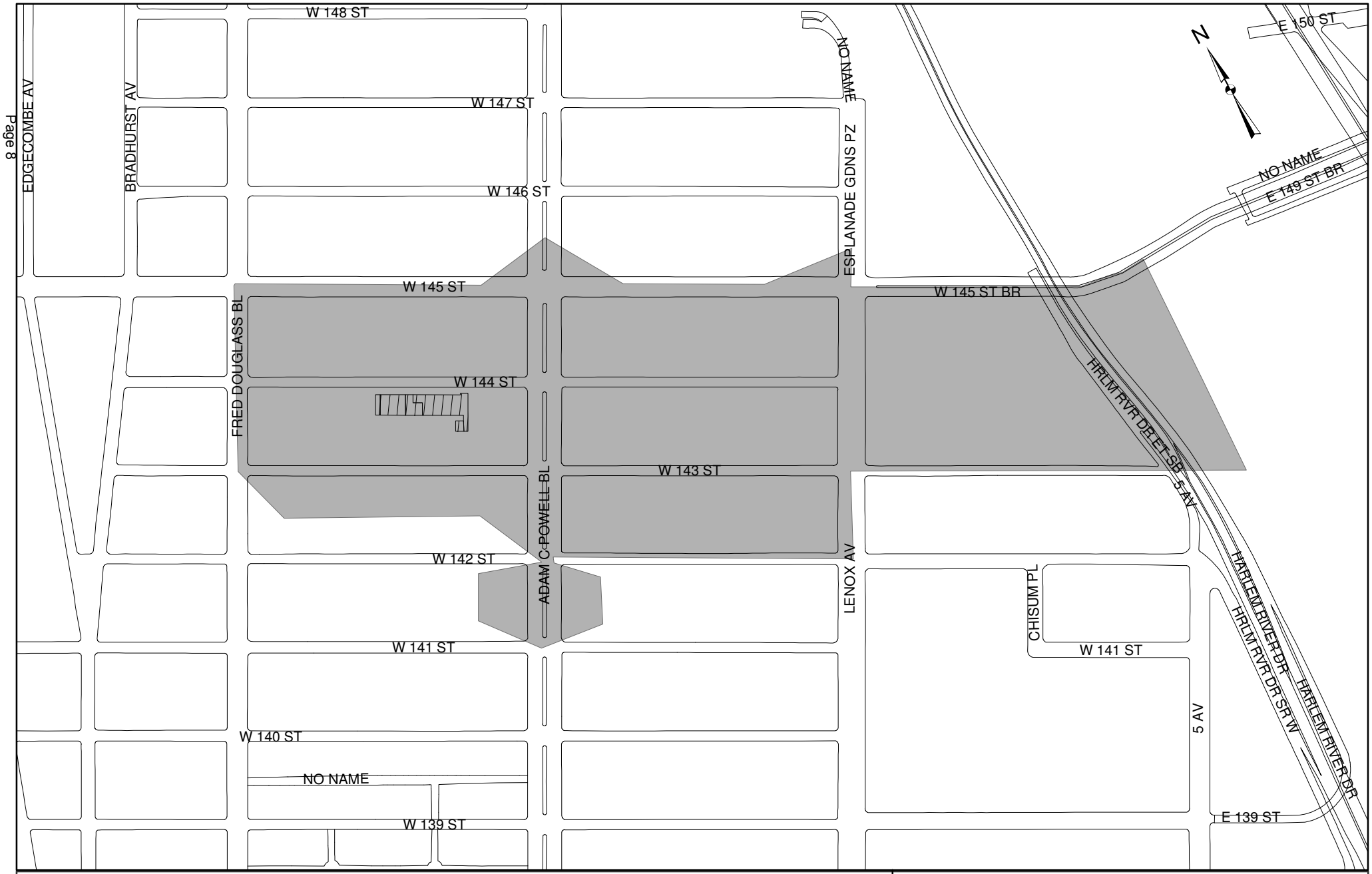
(See the Appendix for the school's survey response.)


1 inch equals 200 feet

**EXHIBIT 1**

**COUNTEE CULLEN SCHOOL**
**P.S. 194, MANHATTAN**

**AERIAL PHOTOGRAPH**






1 inch equals 375 feet

**CATCHMENT AREA**

**EXHIBIT 2**

**P.S. 194, MANHATTAN**

**COUNTEE CULLEN SCHOOL**

**CATCHMENT AREA**

## 2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

According to school officials, approximately 95% of the students walk to P.S. 194, 2% arrive via public transportation, 1% are driven by a parent or guardian, and the remaining 2% of students arrive by school buses. See Table 1 for the school's estimate of modes of travel and Exhibit 2 for the school catchment area.

**TABLE 1: MODES OF TRAVEL**
**(AS ESTIMATED BY SCHOOL OFFICIALS)**

| Description | Percentage |
|---|---|
| Walk | 95% |
| Driven by a parent or guardian | 1% |
| School bus | 2% |
| MTA bus or subway | 2% |
| **TOTAL** | 100% |

## 2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

Various stores on Adam Clayton Powell Boulevard and the playground at the rear of the school are popular with schoolchildren. Many students play in the playground during daylight hours, as the playground remains open after school.

St. Charles Borromeo School is located on West 142nd Street between Adam Clayton Powell Boulevard and Frederick Douglass Boulevard. P.S. 123 is on West 140th Street between Frederick Douglass Boulevard and Edgecombe Avenue. These two schools are both priority schools.

## 2.8 CROSSING GUARD LOCATIONS

Crossing guards assigned to P.S. 194 are stationed at the following intersections (see Figures 2 and 3):

- Adam Clayton Powell Boulevard at West 145th Street (two crossing guards)
- Adam Clayton Powell Boulevard at West 144th Street
- Adam Clayton Powell Boulevard at West 143rd Street
- Frederick Douglass Boulevard at West 143rd Street
- Frederick Douglass Boulevard at West 144th Street

See Exhibit 4 for crossing guard locations.

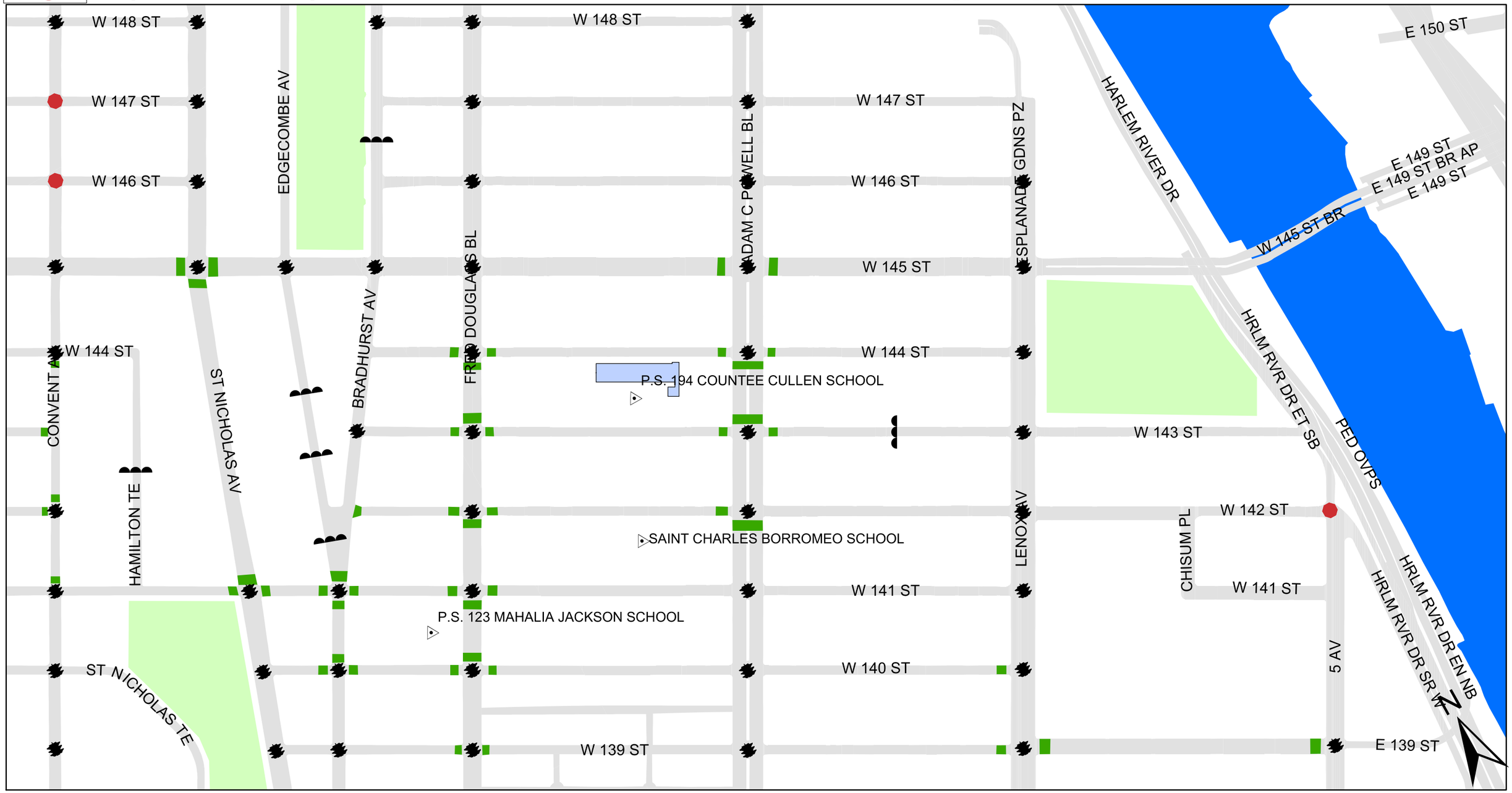

*Figure 2: a crossing guard accompanying a P.S. 194 student at West 145th Street and Adam Clayton Powell Boulevard*

*Figure 3: A crossing guard at Adam Clayton Powell Boulevard*

New York City
Department of Transportation

# School Traffic Safety Map

Traffic Operations Division




0 285 570 1,140 Feet

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

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

**LEGEND:**

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

## PS 194 Manhattan
## COUNTEE CULLEN SCHOOL

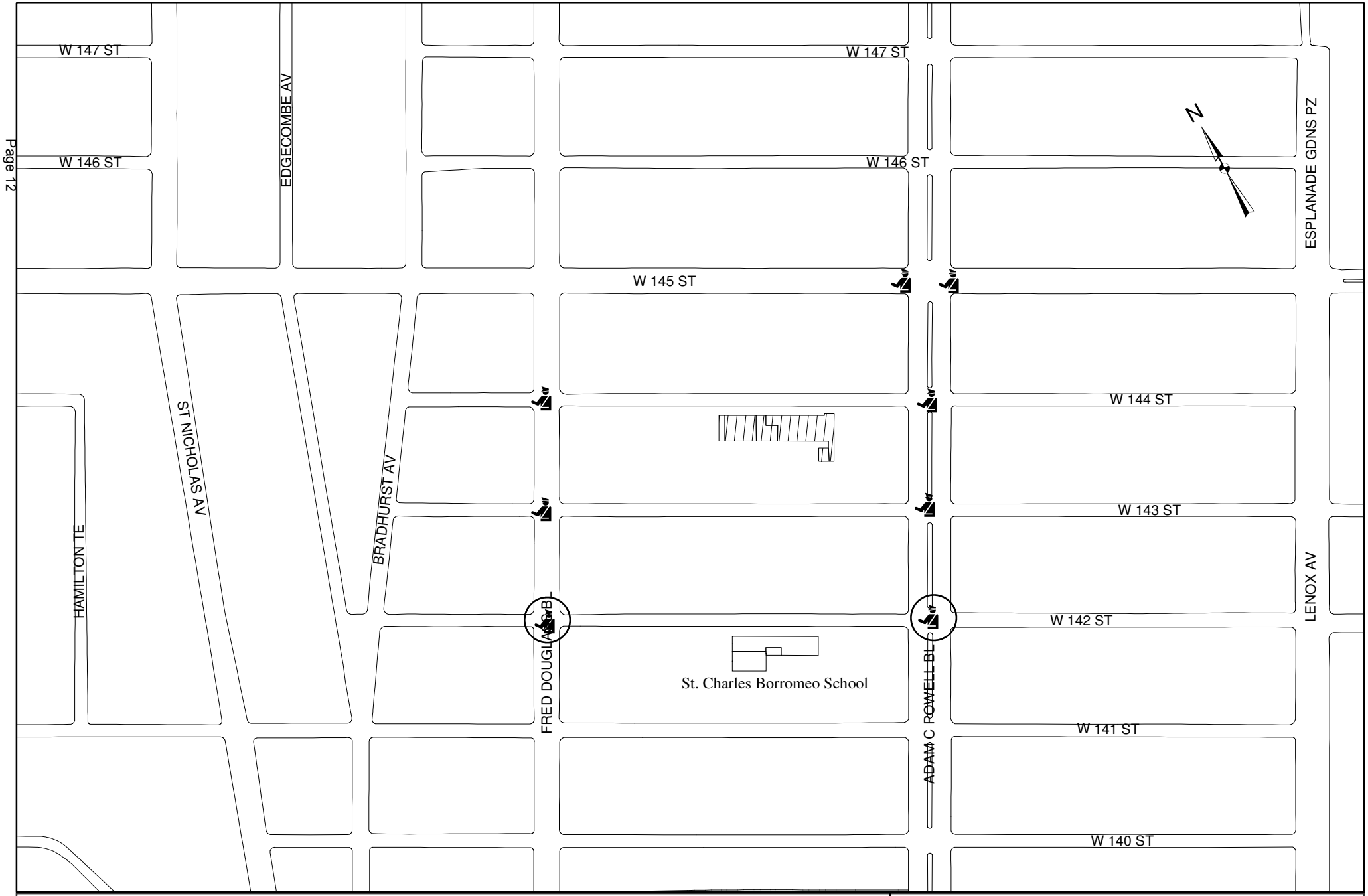
Prepared by the NEW YORK CITY DEPARTMENT OF TRANSPORTATION, Iris Weinshall, COMMISSIONER.

Map created on 11/16/2006

**EXHIBIT 3**

COMM. BOARD: 110
PRECINCT: 32

1.5.1




1 inch equals 300 feet

**Crossing guard assigned to P.S. 194**

**Crossing guard assigned to St. Charles Borromeo School**

**EXHIBIT 4**

**P.S. 194, MANHATTAN**
**COUNTEE CULLEN SCHOOL**

**CROSSING GUARDS**

# 3. TRAFFIC OPERATIONS

## 3.1 SCHOOL BUS OPERATIONS

According to school officials, ten students are transported to school by a school bus. Bused students are dropped off in front of the school on West 144th Street, temporarily blocking the moving traffic (see Figure 4).

*Figure 4: School bus unloading students between parked vehicles on West 144th Street, Manhattan*

At dismissal time, school buses pick up schoolchildren on West 144th Street in front of the school's main entrance. Students line up prior to bus arrival in order to minimize delays on West 144th Street.

## 3.2 PARENT DROP-OFF OPERATIONS

School officials indicated that approximately 1% of P.S. 194 students are driven to and from school by parents or guardians. During the arrival and dismissal time, parents were observed:

- Stopping in the one travel lane on West 144th Street in order to drop off students at arrival time
- Parking vehicles in no parking zones, driveways and in the no parking area of the fire house at dismissal time

There was no observed double parking or congestion on West 143rd Street created by waiting vehicles.

*Figure 5: Parents waiting for students at the rear of P.S. 194, Manhattan*

### 3.3 PARKING REGULATIONS

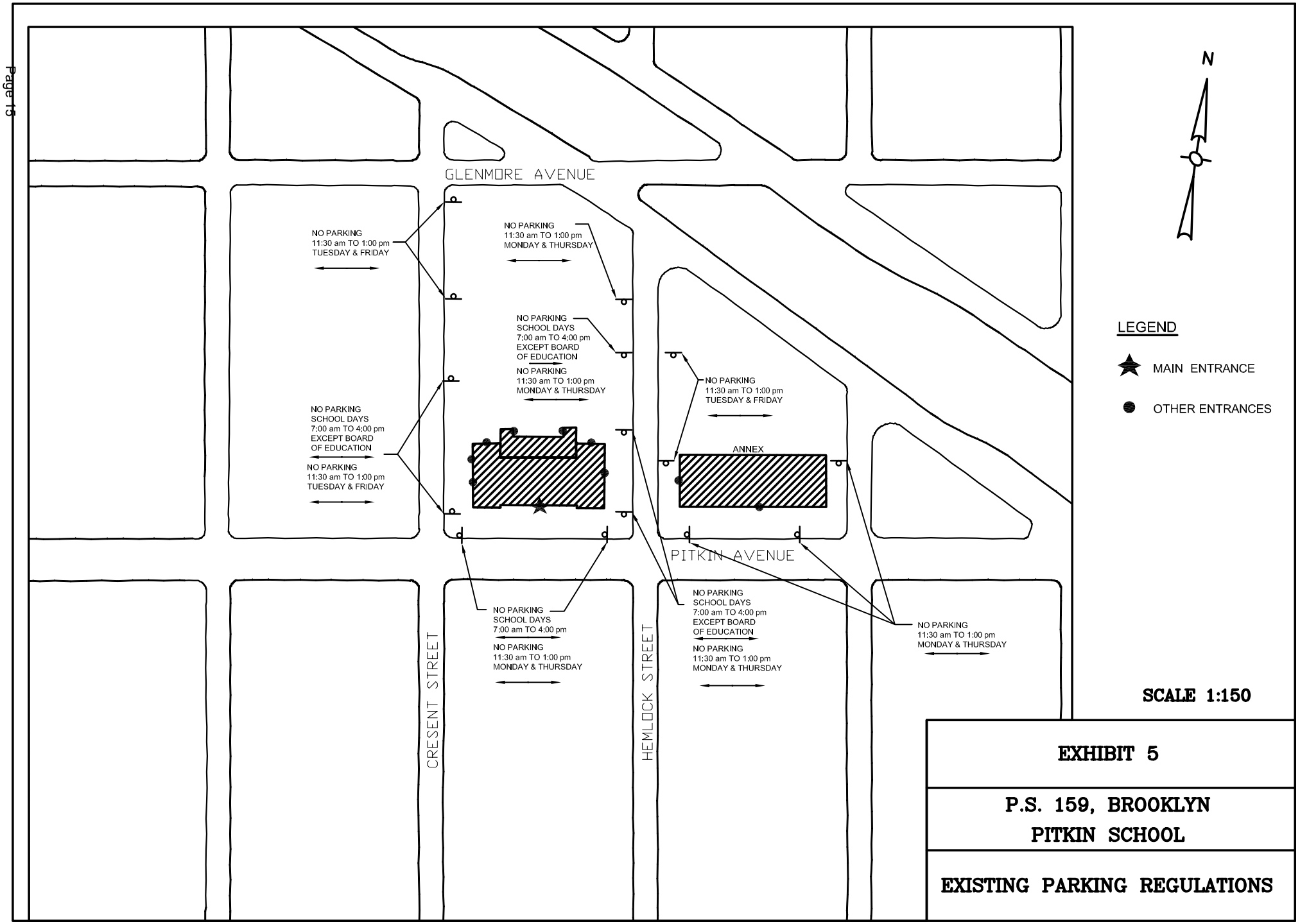
"NO PARKING SCHOOL DAYS 7 AM – 4 PM, EXCEPT BOARD OF EDUCATION" parking regulations are posted on the south side of West 144th Street in front of P.S. 194.

"NO PARKING SCHOOL DAYS 7 AM – 4 PM, EXCEPT BOARD OF EDUCATION" parking regulations are posted on the north side of West 143rd Street in front of the school yard.

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 with downward pointing arrows. Signs scheduled to be installed under this program are shown as "existing" on Exhibit 8.




SCALE 1:150

**EXHIBIT 5**

**P.S. 159, BROOKLYN**
**PITKIN SCHOOL**

**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 P.S. 194 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.

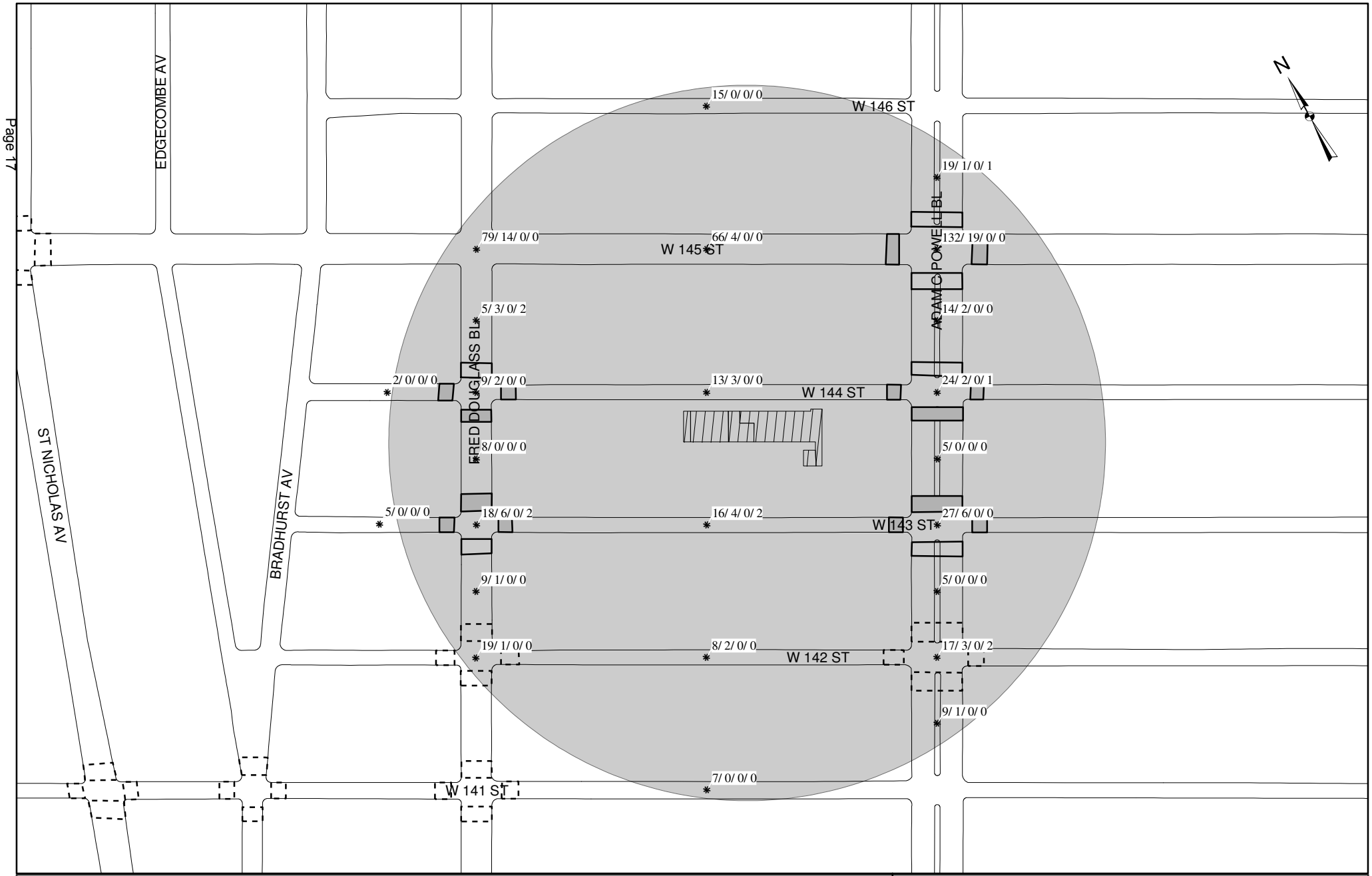
**TABLE 2: DMV THREE-YEAR ACCIDENT SUMMARY (1998-2000)**

| INTERSECTION | TOTAL ACCIDENTS | PEDESTRIAN ACCIDENTS | PEDESTRIAN FATALITIES | SCHOOL-RELATED* ACCIDENTS |
|---|---|---|---|---|
| A.C. Powell Blvd. and West 143rd St. | 27 | 6 | 0 | 0 |
| A.C. Powell Blvd. and West 144th St. | 24 | 2 | 0 | 1 |
| A.C. Powell Blvd. and West 145th St. | 132 | 19 | 0 | 0 |
| F. Douglass Blvd. and West 143rd St. | 18 | 6 | 0 | 2 |
| F. Douglass Blvd. and West 144th St. | 9 | 2 | 0 | 0 |
| A.C. Powell Blvd. and West 142nd St. | 17 | 3 | 0 | 2 |
| **TOTAL** | **227** | **38** | **0** | **5** |

**TABLE 3: NYPD FOUR-YEAR ACCIDENT SUMMARY (2001-2004)**

| INTERSECTION | TOTAL ACCIDENTS | PEDESTRIAN ACCIDENTS | PEDESTRIAN FATALITIES | SCHOOL-RELATED* ACCIDENTS |
|---|---|---|---|---|
| A.C. Powell Blvd. and West 143rd St. | 56 | 11 | 0 | 4 |
| A.C. Powell Blvd. and West 144th St. | 22 | 2 | 0 | 1 |
| A.C. Powell Blvd. and West 145th St. | 217 | 17 | 0 | 0 |
| F. Douglass Blvd. and West 143rd St. | 45 | 6 | 0 | 2 |
| F. Douglass Blvd. and West 144th St. | 34 | 8 | 0 | 0 |
| A.C. Powell Blvd. and West 142nd St. | 43 | 8 | 0 | 1 |
| **TOTAL** | **417** | **52** | **0** | **8** |

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




**ACCIDENT LOCATION** *

**SCHOOL CROSSWALK ASSIGNED TO P.S. 194**

**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 |
|---|---|---|---|---|---|---|

**EXHIBIT 6**

**P.S. 194, MANHATTAN**

**COUNTEE CULLEN 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. 194.

### *3.6.1 Adam Clayton Powell Boulevard and West 143rd Street*

Adam Clayton Powell Boulevard is a 100-foot wide, two-way street with three travel lanes in each direction and parking on both sides. A 10-foot wide raised concrete median separates the northbound and the southbound traffic. West 143rd Street is a 30-foot wide, one-way westbound street 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 east, west, and north legs (see Figure 6). A school crossing guard is assigned at this intersection.

*Figure 6: Ccrosswalk, west side of West 143rd Street and Adam Clayton Powell Boulevard*

Review of the existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Adam Clayton Powell Boulevard in one cycle at a walking rate of three feet per second plus a three second reaction time. A school age pedestrian needs two signal cycles to cross at three feet per second, stopping at the raised median to wait between signal cycles. However, the raised medians do not extend through the crosswalks (Figure 7).

Traffic counts were conducted at this intersection on November 3, 2005 between 2:30 pm and 3:30 pm to determine the vehicular-pedestrian conflicts. As shown in Exhibit 7, there were 51 vehicles turning right into the north leg school crosswalk and 33 vehicles turning right into the west leg school crosswalk during the study hour. The moderate turning vehicle volumes do not satisfy the DOT guidelines for installation of a Leading Pedestrian Interval (LPI).


*Figure 7: West 143rd Street and Adam Clayton Powell Boulevard, looking east*

Twenty-seven accidents occurred at this intersection during the 1998-2000 study period. Six accidents involved pedestrians, none of which were school-related. Four accidents occurred as a result of pedestrians crossing against the signal. One pedestrian was struck while emerging from a parked vehicle. Another pedestrian was struck when getting out of a vehicle. The last two accidents were due to drivers' error.

### *3.6.2 Adam Clayton Powell Boulevard and West 144th Street*

West 144th 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 east, west, and south legs. A school crossing guard is assigned at this intersection.

Review of the existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Adam Clayton Powell Boulevard in one cycle at a walking rate of three feet per second plus a three second reaction time. A school age pedestrian needs two signal cycles to cross at three feet per second, stopping at the raised median to wait between signal cycles. However, the raised medians do not extend through the crosswalks.

Traffic counts were conducted at this intersection on November 3, 2005 between 2:30 pm and 3:30 pm to determine the vehicular-pedestrian conflicts. As shown in Exhibit 7A, there were 59 vehicles turning right into the south leg school crosswalks and 65 vehicles turning right into the east leg school crosswalk during the study hour. The moderate turning vehicle volumes do no satisfy the DOT guidelines for installation of a Leading Pedestrian Interval (LPI).

Twenty-four accidents occurred at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, one of which was school-related. A six-year-old pedestrian was struck by an eastbound vehicle while crossing against the signal. The second pedestrian accident was attributed to driver error. No further information is available.

### *3.6.3 Adam Clayton Powell Boulevard and West 145th Street*

West 145th Street is a 60-foot wide, two-way roadway with one moving lane in each direction and parking on both sides. The intersection is controlled by a two-phase signal. School crosswalks are in place on the east and west legs. Two school crossing guards are assigned to this intersection.

Review of the existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Adam Clayton Powell Boulevard in one cycle at a walking rate of three feet per second plus a three second reaction time. A school age pedestrian needs two signal cycles to cross at three feet per second, stopping at the raised median to wait between signal cycles. However, the raised medians do not extend through the crosswalks.

This intersection had 132 accidents during the 1998-2000 study period. Nineteen accidents involved pedestrians, none of which were school-related. Twelve pedestrians were struck while crossing with the signal in a marked crosswalk. These accidents occurred as a result of driver error, primarily failure to yield to crossing pedestrians. Five accidents occurred as a result of pedestrians crossing against the signal or emerging from parked vehicles. Another pedestrian was struck while getting out of a vehicle. There were no details for the last accident.

### *3.6.4 Frederick Douglass Boulevard and West 143rd Street*

Frederick Douglass Boulevard is a 60-foot wide, two-way roadway with two moving lanes in each direction and parking on both sides. West 143rd Street is a 30-foot wide, one-way westbound roadway with one travel lane and parking on both sides. The intersection of West 143rd Street and Frederick Douglass Boulevard is controlled by a two-phase signal. School crosswalks are in place on the north, east and west legs of the intersection. A school crossing guard is assigned to this intersection.

Eighteen accidents occurred at this location during the 1998-2000 study period. Six accidents involved pedestrians two of which were school-related. Two pedestrians, including a six-old student, were struck while crossing against the signal. Another three pedestrian accidents occurred as a result of the drivers' failure to yield to pedestrians while making turns. The last accident was due to driver error, but no further information was reported.

### *3.6.5 Frederick Douglass Boulevard and West 144th Street*

West 144th Street is a 30-foot wide, one-way roadway with one travel lane and parking on both sides of the roadway. East of Frederick Douglass Boulevard, West 144th Street is a one-way eastbound roadway and West of Frederick Douglass Boulevard, West 144th Street is a one-way westbound roadway. Therefore, there is no traffic approaching this intersection from the east or west legs. West 144th Street and Frederick Douglass Boulevard is controlled by a two-phase signal. School crosswalks are in place on the south, east and west legs of the intersection.

Nine accidents occurred at this location during the 1998-2000 study period. Two accidents involved pedestrians, none of which were school-related. One accident

involved an inexperienced driver who struck a pedestrian while making a right turn. There were no details for the second accident.

*3.6.6 Adam Clayton Powell Boulevard and West 142nd Street*

Adam Clayton Powell Boulevard and West 142nd Street is a signalized intersection. West 142nd Street is a 30-foot wide, one-way eastbound roadway with one travel lane and parking on both sides of the street (Figure 7). School crosswalks are in place on the west and south legs of the intersection. A school crossing guard is assigned to this intersection.


*Figure 8: Looking east on West 142nd Street, at West 142nd Street and Adam C. Powell Boulevard*

Review of the existing signal timing indicates that the pedestrian phase does not provide adequate time for pedestrians to cross Adam Clayton Powell Boulevard in one cycle at a walking rate of three feet per second plus a three second reaction time. A school age pedestrian needs two signal cycles to cross at three feet per second, stopping at the raised median to wait between signal cycles. However, the raised medians do not extend through the crosswalks (Figure 8).

This signalized intersection had seventeen accidents during the 1998-2000 study period. Three accidents involved pedestrians, two of which were school-related. A seven-year old child was struck while crossing outside of the crosswalk. An 11-year old child was struck while crossing against the signal. The details of the third pedestrian accident were not reported.


*Figure 9: The raised median does not extend through the school crosswalk*

### *3.6.7 West 143rd Street and West 144th Street between Frederick Douglass Boulevard and Adam Clayton Powell Boulevard*

*Figure 10: Fire truck traveling wrong way on West 143rd Street, Manhattan*

The spot speed studies were conducted on West 143rd Street and on West 144th Street between Frederick Douglass Boulevard and Adam Clayton Powell Boulevard on October 31, 2005. The 85th percentile speed was found to be 26 mph on West 143rd Street and 24 mph on West 144th Street, which are below the statutory speed limit of 30 mph. See Table in 4 for a summary of the results and the Appendix for further detail.

There were sixteen accidents on West 143rd Street between Frederick Douglass Boulevard and Adam Clayton Powell Boulevard. Four accidents involved pedestrians, two of which were school-related. A six-year-old pedestrian was struck while emerging

from between parked vehicles. Three other accidents, including the school-related accident, were due to pedestrians crossing or playing at mid-block locations.

There were thirteen accidents on West 144th Street between Frederick Douglass Boulevard and Adam Clayton Powell Boulevard. Three accidents involved pedestrians, none of which were school-related. One pedestrian was struck while emerging from between parked vehicles. Two other pedestrians were struck while crossing at mid-block locations.

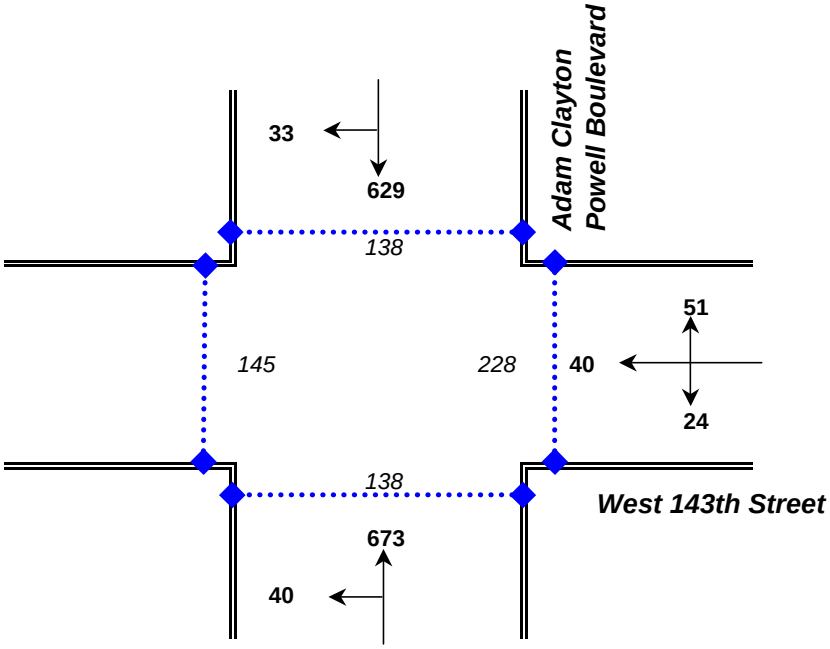
During a recent field visit, schoolchildren were observed playing in the street on West 143rd Street. Fire trucks also use West 143rd Street as a two-way roadway, which increases safety concerns for student pedestrians. (see Figure 10).

The school officials indicated that vehicles were speeding on West 144th Street in the vicinity of school. They also noted that fire station trucks and emergency vehicles created traffic congestion at the rear entrance to the schoolyard on West 143rd Street.

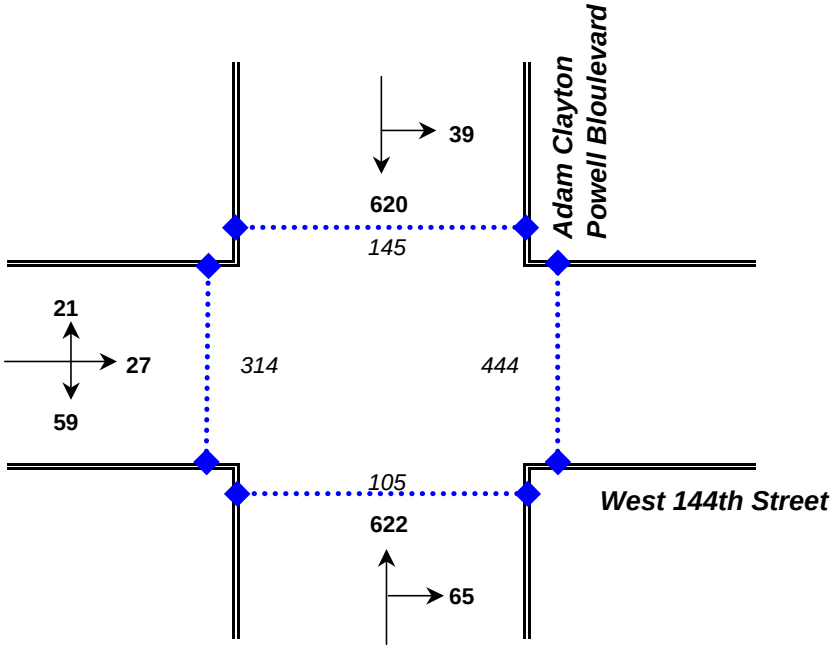
**TABLE 4: SPOT SPEED STUDIES**

| LOCATION | MEDIAN SPEED (MPH) | 85TH PERCENTILE SPEED (MPH) |
|---|---|---|
| West 143rd Street between Frederick Douglass Boulevard and Adam Clayton Powell Boulevard | 23 | 26 |
| West 144th Street between Frederick Douglass Boulevard and Adam Clayton Powell Boulevard | 22 | 24 |

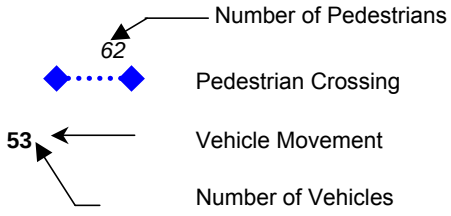
## One Hour Traffic Count Volumes




*Intersection of Adam Clayton Powell Boulevard and West 143rd Street - (2:30 PM - 3:30 PM, November 3, 2005)*




*Intersection of Adam Clayton Powell Boulevard and West 144th Street - (2:30 PM - 3:30 PM, November 3, 2005)*




| EXHIBIT 7 |
|---|
| P.S. 194 |
| TRAFFIC COUNTS |

### 3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 194, and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches.

**TABLE 6: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS**

| Intersection Name | Crosswalk Length (Feet) | Ped. Phase Actual (Seconds) | Ped. Phase Req'd (Seconds)* | Timing Adjustment? (Yes/No) |
|---|---|---|---|---|
| Adam Clayton Powell Boulevard and West 143rd Street | | | | |
| Adam Clayton Powell Boulevard | 50/50** | 30/30 | 20/20** | NO |
| West 143rd Street | 30 | 50 | 13 | NO |
| Adam Clayton Powell Boulevard and West 144th Street | | | | |
| Adam Clayton Powell Boulevard | 50/50** | 30/30 | 20/20** | NO |
| West 144th Street | 30 | 50 | 13 | NO |
| Adam Clayton Powell Boulevard and West 145th Street | | | | |
| Adam Clayton Powell Boulevard | 50/50** | 38/38 | 20/20** | NO |
| West 145th Street | 60 | 42 | 23 | NO |
| Fredrick Douglas Boulevard and West 143rd Street | | | | |
| Frederick Douglass Boulevard | 60 | 25 | 23 | NO |
| West 143rd Street | 30 | 58 | 13 | NO |
| Fredrick Douglas Boulevard and West 144th Street | | | | |
| Frederick Douglass Boulevard | 60 | 25 | 23 | NO |
| West 144th Street | 30 | 58 | 13 | NO |

*Notes:*

* *A rate of 3 feet per second plus 3 seconds reaction time was utilized as the child pedestrian walking rate*

** *A pedestrian needs two signal cycles to cross Adam C. Powell Boulevard at a rate of three feet per second while stopping at the raised center medians between the northbound and southbound roadways. The actual pedestrian phase in one signal cycle is 31 seconds.*

### 3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS)

The roadways and sidewalks in the vicinity of the school were observed to be generally in good condition.

## 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 West 144th Street*

  "NO STANDING 7 AM - 4 PM, SCHOOL DAYS" parking regulations should be posted in front of the school's main entrance on West 144th Street for a length of 60 feet. This will allow school buses and parents a place to load and unload students at the curb, and also improve visibility of those students arriving and leaving the school. Teacher parking will be extended further west on West 144th Street to make up for lost teacher parking.

- *Install pedestrian information sign that explains the signal phases*

  The safety of pedestrians at the wide intersections of Adam Clayton Powell Boulevard and at Frederick Douglass Boulevard 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 other pedestrians attempted to cross Adam Clayton Powell Boulevard in one pedestrian signal phase. The information signs instruct pedestrians to wait at the raised median between signal cycles.

  Frederick Douglass Boulevard does not have a median however; the crossing is long (60 feet) on a busy roadway. Therefore, the information signs on Frederick Douglass Boulevard instruct pedestrians not to begin crossing the block when the pedestrian head shows a flashing "Don't Walk" hand. Pedestrians will benefit from informational signage.

- *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, the meaning of WALK - FLASHING DON'T WALK - DON'T WALK pedestrian signal sequence and instructing students not to cross at mid-block locations. 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.

- *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.

- *Dismiss schoolchildren onto West 144th Street*

  School officials noted that due to the fire station located on West 143rd Street large numbers of trucks and emergency vehicles use this street. Occasionally, emergency vehicles travel at excessive speeds and against the traffic. To minimize student-vehicle conflicts, it is recommended that students be directed to exit the school at the West 144th Street entrance.

- *Install enlarged signal lens*

  Enlarged 12" red signal lenses should be installed at the following intersection:

  - Adam Clayton Powell Boulevard at West 144th Street
  - Adam Clayton Powell Boulevard at West 143rd Street

  Replacing existing 8-inch signal lenses with 12-inch signal lenses will improve visibility.

### 4.2 LONG-TERM MEASURES

- *Consider curb extensions at the following intersections:*

  Consideration should be given to installing curb extensions at the following location, 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.

  - Adam Clayton Powell Boulevard and West 143rd Street
  - Adam Clayton Powell Boulevard and West 144th Street
  - Frederick Douglass Boulevard and West 143rd Street
  - Frederick Douglass Boulevard and West 144th Street

  Curb extensions should be considered 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.

- *Extend raised concrete medians through the school crosswalks*

  Since pedestrians must cross Adam Clayton Powell Boulevard in more than one signal phase, all raised medians should be extended through the adjacent crosswalk at the following intersections provided that the Final Design confirms

that construction of the recommended median extensions would be feasible and not interfere with traffic operations:

- Adam Clayton Powell Boulevard and West 143rd Street
- Adam Clayton Powell Boulevard and West 144th Street
- Adam Clayton Powell Boulevard and West 145th Street
- Adam Clayton Powell Boulevard and West 142nd Street - north leg

By extending the raised median, a refuge location can be provided for the student pedestrians as they wait for the next cycle to cross the street. In addition, an ADA at- grade cut through should be provided at this location. Median extensions were not proposed at the locations where a standard unit vehicle would not be able to complete a left turn movement. Final details pertaining to the number, location and geometry of median extensions will be developed during the Final Design/Contract Document preparation.

## 4.3 ADDITIONAL MEASURES FOR PRIORITY SCHOOLS IN THE VICINITY OF P.S. 194

(All references in Section 4.3 refer to the St. Charles Borromeo Priority School Report)

- *Install graphic "Yield to Pedestrians" Sign*

  A "Yield to Pedestrian Sign" should be installed at the following locations:

  - Adam Clayton Powell Boulevard and West 143rd Street - (on the median of Adam Clayton Powell Boulevard, northbound and southbound approach)
  - Adam Clayton Powell Boulevard and West 145th Street - (on the median of Adam Clayton Powell Boulevard, northbound and southbound approach)

  The installation of the signs is intended to remind the drivers that pedestrians have right of way within the crosswalk.

- *Install enlarged signal lens*

  Enlarged 12" red signal lenses should be installed at the following intersections:

  - Adam Clayton Powell Boulevard at West 142nd Street
  - Adam Clayton Powell Boulevard at West 143rd Street

  Replacing existing 8-inch signal lenses with 12-inch signal lenses will improve visibility.

- *New school crosswalks at West 141st Street and Adam Clayton Powell Boulevard*

  During the field visit, it was observed that St. Charles Borromeo students used the west leg of the intersection to cross West 141st Street. It is recommended the existing pedestrian crosswalk at the west leg be installed as a school crosswalk. Additionally, the east leg should be installed as a school crosswalk, in order to encourage students to continue north on the east side of the street and use the school crosswalk at West 142nd Street to cross Adam Clayton Powell Boulevard.

- *Adjust signal timing at the following intersections:*

  - Frederick Douglass Boulevard and West 141st Street
  - Frederick Douglass Boulevard and West 142nd Street

  22 seconds are available for pedestrians crossing Frederick Douglass Boulevard, which is not sufficient for student pedestrians to cross this street at a speed of three feet per second plus three seconds of reaction time. Therefore, it is recommended that an additional five seconds be added to the "Walk" phase for pedestrians crossing Frederick Douglass Boulevard at both intersections.

- *Consider curb extensions at the following intersections*

  Consideration should be given to installing curb extensions at the following location, 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.

- Adam Clayton Powell Boulevard and West 142nd Street
- Frederick Douglass Boulevard and West 142nd Street

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

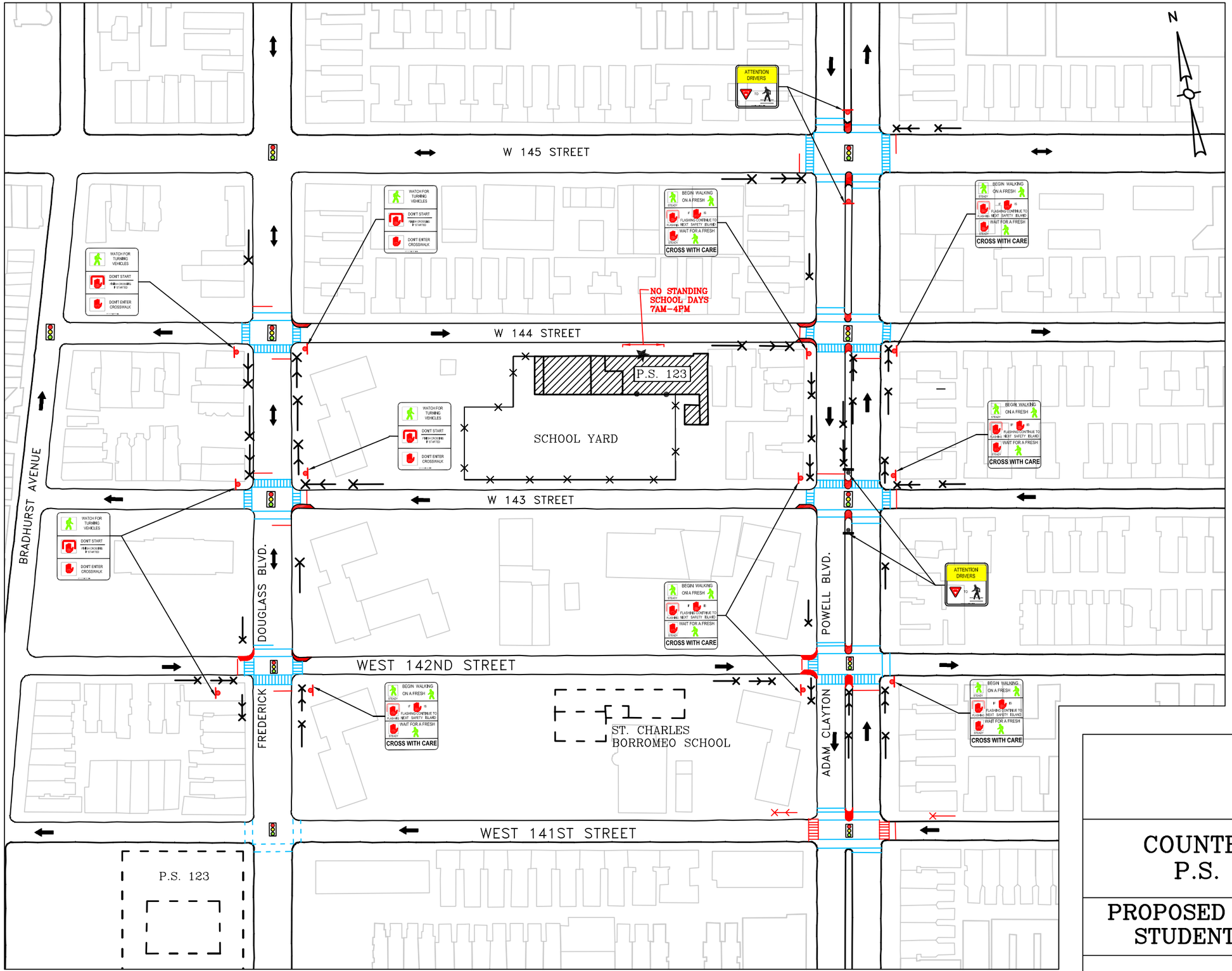
The purpose of the curb extensions is to shorten the crossing distance for pedestrians, and to reduce speeds of vehicles approaching and turning at these heavily utilized school crosswalks (or intersections). These curb extensions would not eliminate or reduce the width of any moving lanes.

- *Extend concrete raised medians on Adam Clayton Powell Boulevard through adjacent school crosswalk*

  Since pedestrians must cross Adam Clayton Powell Boulevard in more than one signal phase, all raised medians should be extended through the adjacent crosswalk at the following intersections provided that the Final Design confirms that construction of the recommended median extensions would be feasible and not interfere with traffic operations:

  - Adam Clayton Powell Boulevard and West 141st Street - north leg
  - Adam Clayton Powell Boulevard and West 142nd Street - south leg

  By extending the raised median, a refuge location can be provided for the student pedestrians as they wait for the next cycle to cross the street. In addition, an ADA at- grade cut through should be provided at this location. Median extensions were not proposed at the locations where a standard unit vehicle would not be able to complete a left turn movement. Final details pertaining to the number, location and geometry of median extensions will be developed during the Final Design/Contract Document preparation.




LEGEND

- MAIN ENTRANCE
- OTHER ENTRANCES
- EXISTING ADVANCE WARNING SIGN WITH ARROW
- EXISTING ADVANCE WARNING SIGN
- EXISTING TRAVEL DIRECTION
- EXISTING SIGNALIZED INTERSECTION
- EXISTING SCHOOL CROSSWALK
- EXISTING STANDARD (NON-SCHOOL) CROSSWALK
- EXISTING SCHOOL CROSSWALK ASSOC. WITH OTHER SCHOOL
- PROPOSED STOP LINE
- PROPOSED TRAFFIC SIGN
- PROPOSED CURB EXTENSION (NECKDOWN)
- PROPOSED MEDIAN EXTENSION
- PROPOSED PARKING REGULATIONS
- PROPOSED SCHOOL CROSSWALK

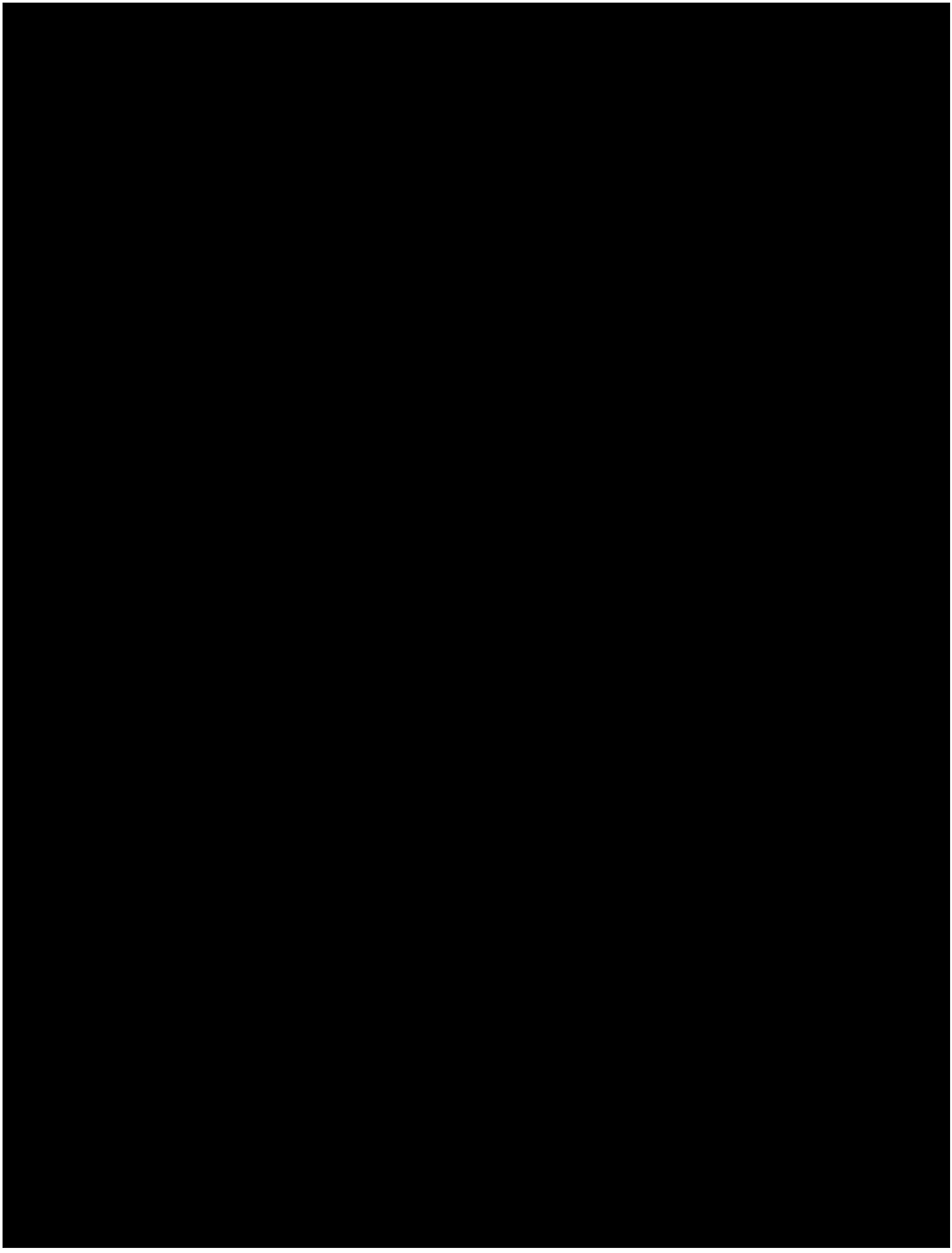
**SCALE: 1" : 200'**

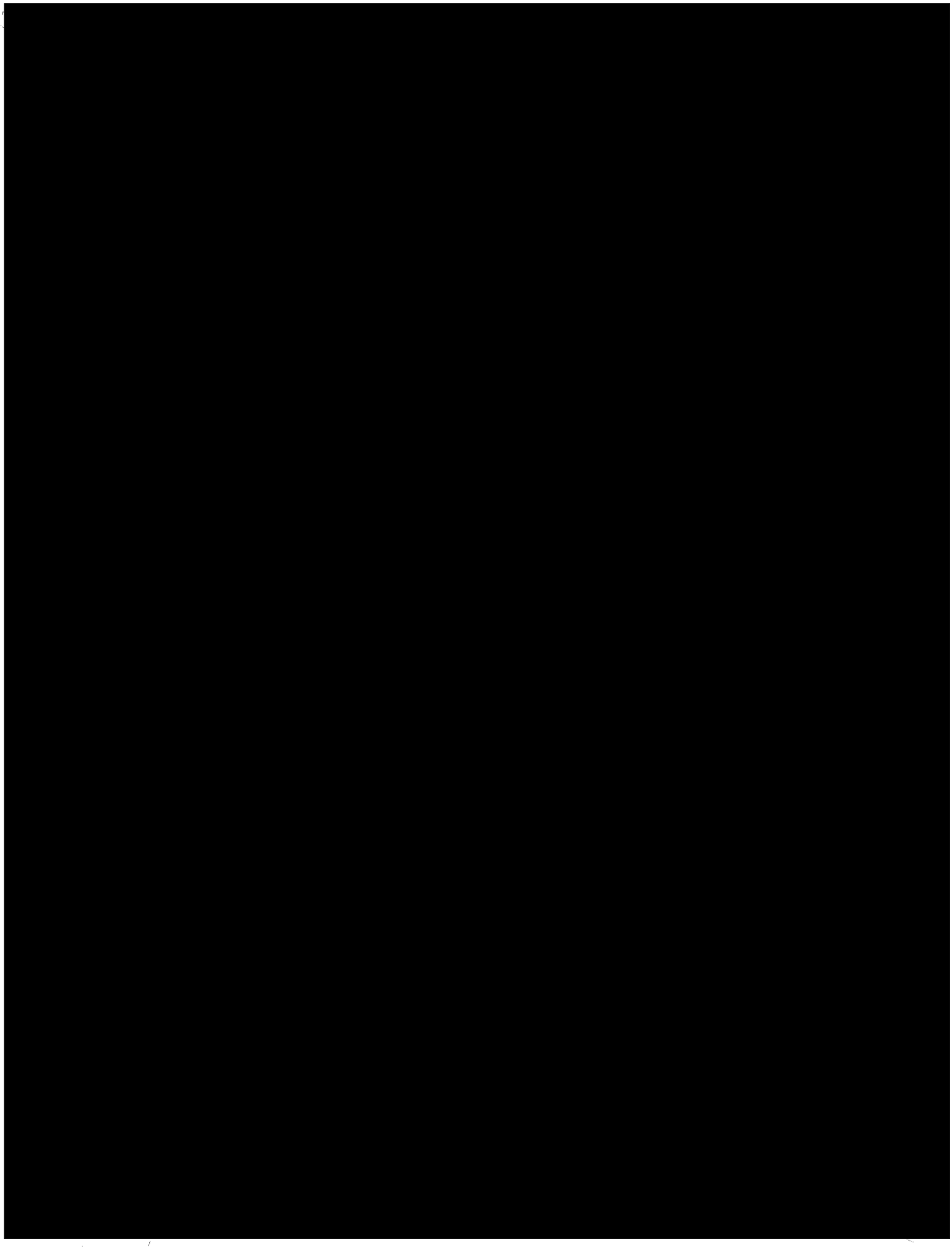
# EXHIBIT 8

## COUNTEE CULLEN SCHOOL
## P.S. 194, MANHATTAN

## PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

# APPENDIX





# SPOT SPEED STUDY

Date: **October 31, 2005** Time: **11:30 AM To 12:30 AM** School: **P.S. 194**
Location: **West 143rd Street, btw. F. Douglas Blvd. And A.C. Powel Blvd.** Direction: **WB**
Surveyor: **Eyad Yousef** 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 | 0 | 0.0% | 0.0% | 0 | 0 |
| 16 | 0 | 0.0% | 0.0% | 0 | 0 |
| 17 | 0 | 0.0% | 0.0% | 0 | 0 |
| 18 | 3 | 4.6% | 4.6% | 54 | 972 |
| 19 | 3 | 4.6% | 9.2% | 57 | 1083 |
| 20 | 3 | 4.6% | 13.8% | 60 | 1200 |
| 21 | 6 | 9.2% | 23.1% | 126 | 2646 |
| 22 | 6 | 9.2% | 32.3% | 132 | 2904 |
| 23 | 17 | 26.2% | 58.5% | 391 | 8993 |
| 24 | 14 | 21.5% | 80.0% | 336 | 8064 |
| 25 | 4 | 6.2% | 86.2% | 100 | 2500 |
| 26 | 2 | 3.1% | 89.2% | 52 | 1352 |
| 27 | 3 | 4.6% | 93.8% | 81 | 2187 |
| 28 | 0 | 0.0% | 93.8% | 0 | 0 |
| 29 | 0 | 0.0% | 93.8% | 0 | 0 |
| 30 | 2 | 3.1% | 96.9% | 60 | 1800 |
| 31 | 2 | 3.1% | 100.0% | 62 | 1922 |
| 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 |
| | 65 | 100.0% | | 1511 | 35623 |

Mean Speed = 23.2 mph
Standard Deviation = 2.8 mph
Margin of Error (95% Confidence) = ± 0.7 mph

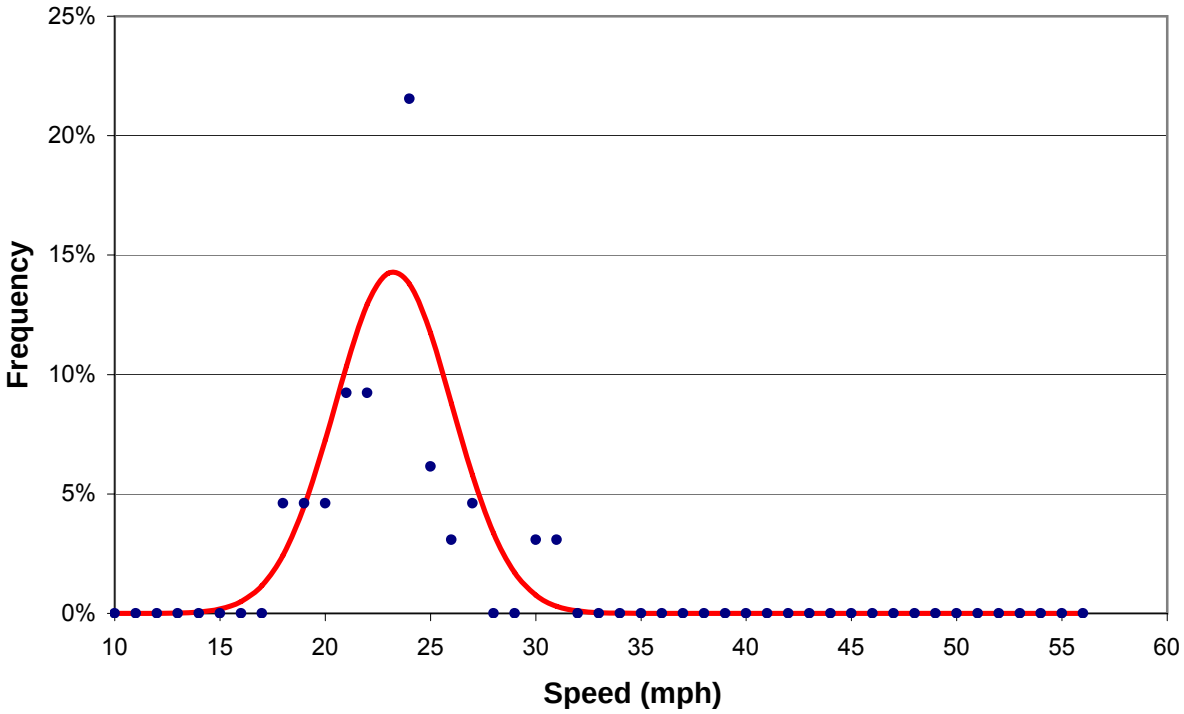
Median Speed = 23.2 mph
15th Percentile Speed = 20.4 mph
85th Percentile Speed = 26.1 mph

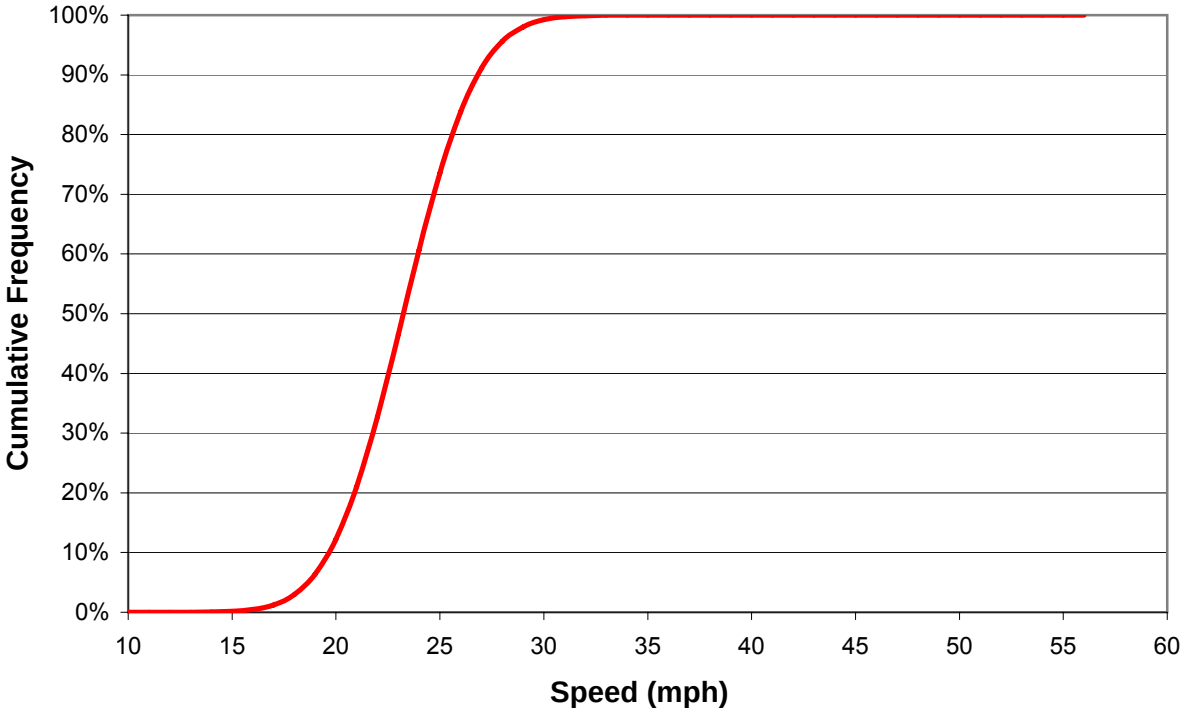
## SPOT SPEED STUDY

Date: **October 31, 2005** Time: **11:30 AM To 12:30 AM** School: **P.S. 194**
Location: **West 143rd Street, btw. F. Douglas Blvd. And A.C. Powel Blvd.** Direction: **WB**
Surveyor: **Eyad Yousef** Comments: **Sunny and Dry**

Mean Speed = 23.2 mph
Standard Deviation = 2.8 mph
Margin of Error (95% Confidence) = ± 0.7 mph

Median Speed = 23.2 mph
15th Percentile Speed = 20.4 mph
85th Percentile Speed = 26.1 mph



# SPOT SPEED STUDY

Date: **October 31, 2005** Time: **10:30 AM To 11:30 AM** School: **P.S. 194**
Location: **West 144th Street, btw. F. Douglas Blvd. And A.C. Powel Blvd.** Direction: **EB**
Surveyor: **Eyad Yousef** 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 | 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 | 2 | 3.3% | 3.3% | 38 | 722 |
| 20 | 6 | 9.8% | 13.1% | 120 | 2400 |
| 21 | 17 | 27.9% | 41.0% | 357 | 7497 |
| 22 | 9 | 14.8% | 55.7% | 198 | 4356 |
| 23 | 15 | 24.6% | 80.3% | 345 | 7935 |
| 24 | 9 | 14.8% | 95.1% | 216 | 5184 |
| 25 | 3 | 4.9% | 100.0% | 75 | 1875 |
| 26 | 0 | 0.0% | 100.0% | 0 | 0 |
| 27 | 0 | 0.0% | 100.0% | 0 | 0 |
| 28 | 0 | 0.0% | 100.0% | 0 | 0 |
| 29 | 0 | 0.0% | 100.0% | 0 | 0 |
| 30 | 0 | 0.0% | 100.0% | 0 | 0 |
| 31 | 0 | 0.0% | 100.0% | 0 | 0 |
| 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 |
| | 61 | 100.0% | | 1349 | 29969 |

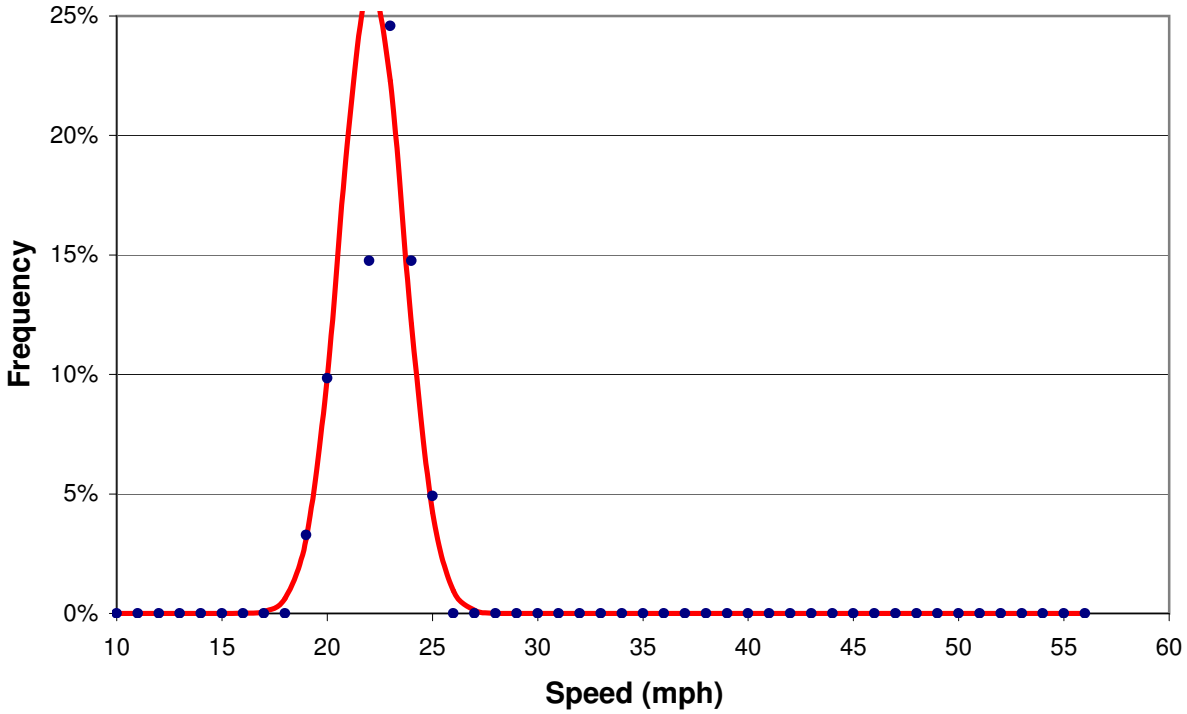
Mean Speed = 22.1 mph
Standard Deviation = 1.5 mph
Margin of Error (95% Confidence) = ± 0.4 mph

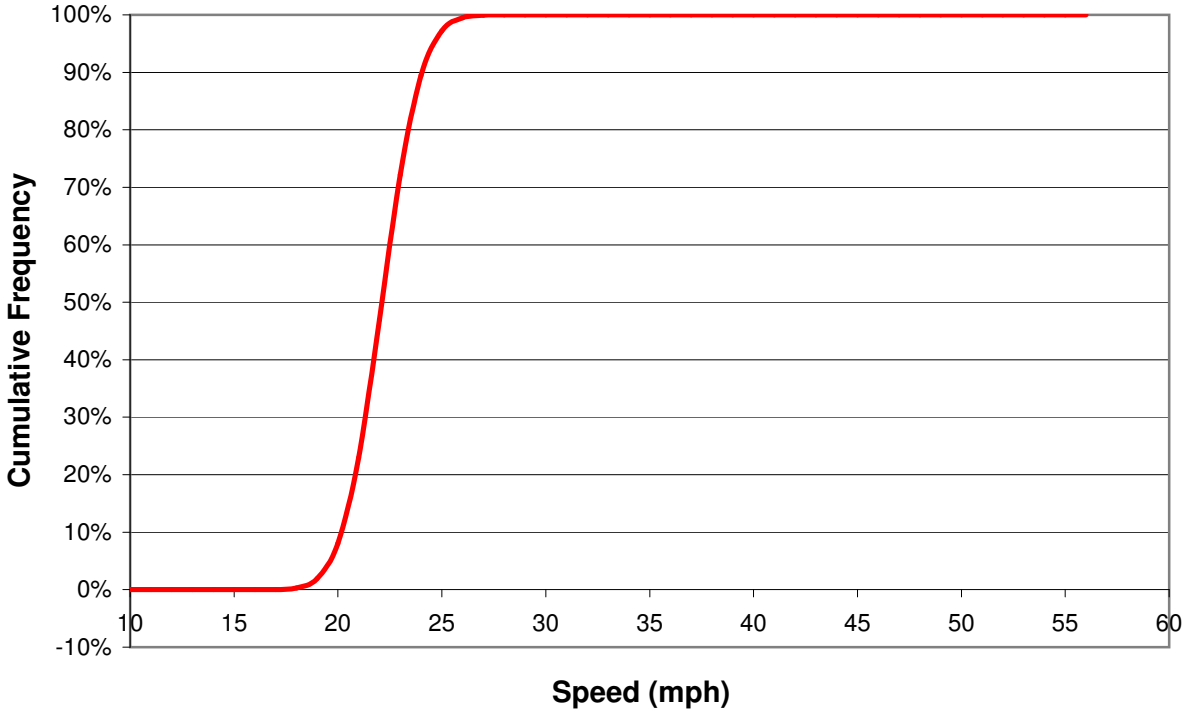
Median Speed = 22.1 mph
15th Percentile Speed = 20.6 mph
85th Percentile Speed = 23.7 mph

## SPOT SPEED STUDY

Date: **October 31, 2005** Time: **10:30 AM To 11:30 AM** School: **P.S. 194**
Location: **West 144th Street, btw. F. Douglas Blvd. And A.C. Powel Blvd.** Direction: **EB**
Surveyor: **Eyad Yousef** Comments: **Sunny and Dry**

| | | | |
|---|---|---|---|
| Mean Speed = | 22.1 mph | Median Speed = | 22.1 mph |
| Standard Deviation = | 1.5 mph | 15th Percentile Speed = | 20.6 mph |
| Margin of Error (95% Confidence) = | ± 0.4 mph | 85th Percentile Speed = | 23.7 mph |



# P.S. 194

November 3, 2005
2:30 pm - 3:30 pm

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

Site:
Date: 11/03/05

Combined
**Peds not included in table data*

| Begin | | A. C. POWEL BLVD | | | W. 143 STREET | | | A. C. POWEL BLVD | | | W. 143 STREET | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | **Total** | **S-R** | **S-T** | **S-L** | **W-R** | **W-T** | **W-L** | **N-R** | **N-T** | **N-R** | **E-R** | **E-T** | **E-L** |
| 14:30:00 | 311 | 7 | 125 | 0 | 15 | 9 | 6 | 0 | 134 | 15 | 0 | 0 | 0 |
| 14:45:00 | 362 | 16 | 148 | 0 | 17 | 13 | 6 | 0 | 147 | 15 | 0 | 0 | 0 |
| 15:00:00 | 411 | 7 | 186 | 0 | 8 | 8 | 9 | 0 | 190 | 3 | 0 | 0 | 0 |
| 15:15:00 | 406 | 3 | 170 | 0 | 11 | 10 | 3 | 0 | 202 | 7 | 0 | 0 | 0 |
| | **1,490** | 33 | 629 | 0 | 51 | 40 | 24 | 0 | 673 | 40 | 0 | 0 | 0 |

Peak Volume Periods *(1 hour Res:15 min.)*

| | Period | | | Peak Period | | | Volume |
|---|---|---|---|---|---|---|---|
| **AM** | 05:00:00 | To | 10:00:00 | NA | To | NA | 0 |
| **Noon** | 10:00:00 | To | 15:00:00 | 14:15:00 | To | 15:15:00 | 673 |
| **PM** | 15:00:00 | To | 20:00:00 | 14:30:00 | To | 15:30:00 | 1,490 |

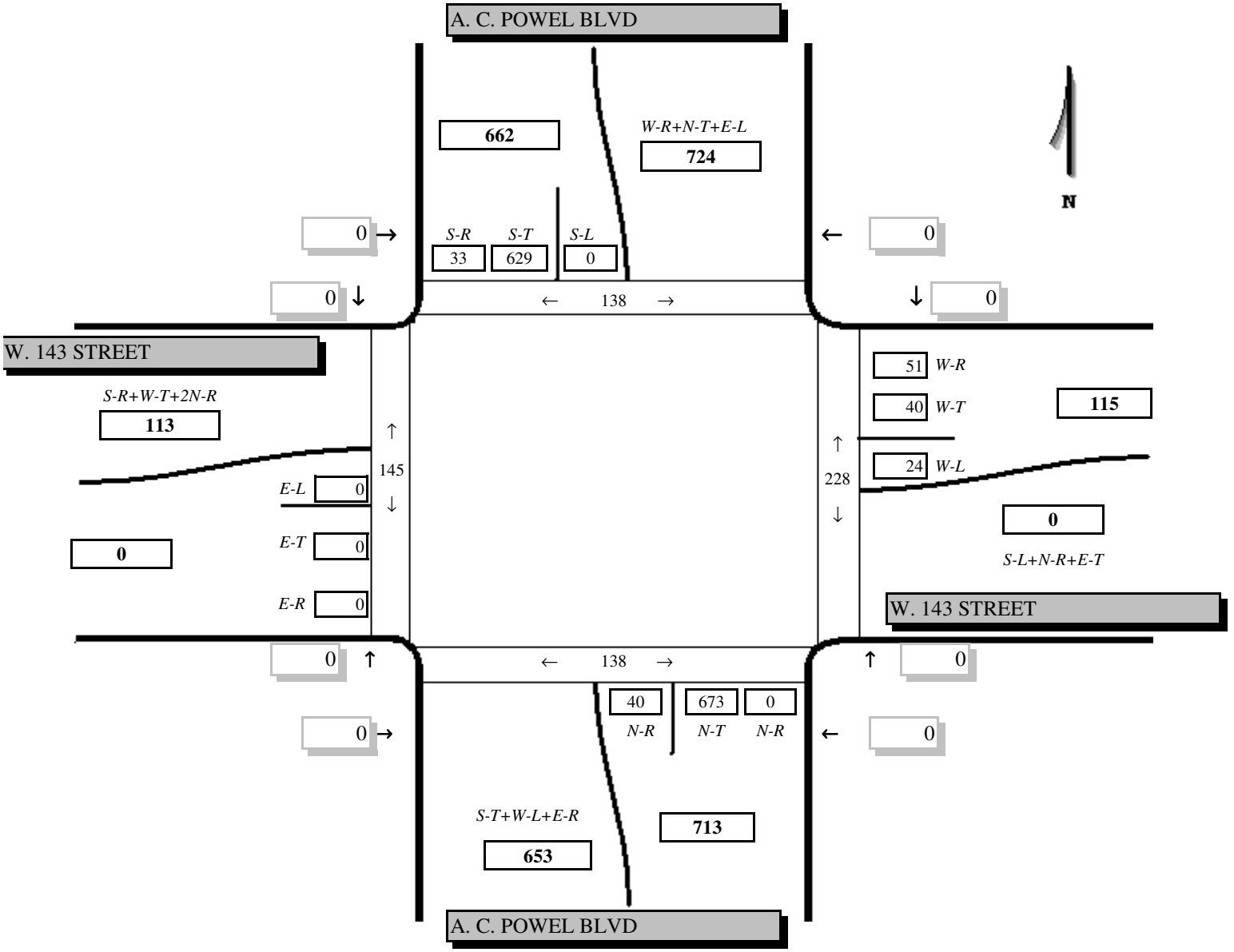
# P.S. 194

November 3, 2005
2:30 pm - 3:30 pm

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

Site:
Date: 11/03/05

Combined
**Peds not included in table data*



# P.S. 194

November 3, 2005
2:30 pm - 3:30 pm

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

Site:
Date: 11/03/05

Combined
**Peds not included in table data*

| Begin | | ADAM CLAYTON BLVD. | | | W. 144 STREET | | | ADAM CLAYTON BLVD. | | | W. 144 STREET | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | **Total** | | **S-T** | **S-L** | | | | **N-R** | **N-T** | | **E-R** | **E-T** | **E-L** |
| 15:30:00 | 282 | 0 | 120 | 13 | 0 | 0 | 0 | 20 | 115 | 0 | 5 | 6 | 3 |
| 15:45:00 | 373 | 0 | 176 | 6 | 0 | 0 | 0 | 15 | 152 | 0 | 14 | 4 | 6 |
| 16:00:00 | 392 | 0 | 166 | 12 | 0 | 0 | 0 | 13 | 172 | 0 | 13 | 8 | 8 |
| 16:15:00 | 406 | 0 | 158 | 8 | 0 | 0 | 0 | 17 | 183 | 0 | 27 | 9 | 4 |
| | **1,453** | 0 | 620 | 39 | 0 | 0 | 0 | 65 | 622 | 0 | 59 | 27 | 21 |

Peak Volume Periods *(1 hour Res:15 min.)*

| | 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 | 15:30:00 | To | 16:30:00 | 1,453 |

# P.S. 194

November 3, 2005
2:30 pm - 3:30 pm

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

Site:
Date: 11/03/05

Combined
**Peds not included in table data*