

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



School Safety Engineering Project

FINAL REPORT: P.S. 1 (Alfred E. Smith School), Manhattan



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



OCTOBER 4, 2006

**School Safety Engineering Project
P.S. 1 (Alfred E. Smith School), Manhattan**

TABLE OF CONTENTS

1. INTRODUCTION	4
1.1 PROJECT DESCRIPTION	4
2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS.....	5
2.2 NEIGHBORHOOD DESCRIPTION	
2.3 MEETING WITH SCHOOL REPRESENTATIVES.....	
2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL.....	
2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS	
2.8 CROSSING GUARD LOCATIONS.....	
3. TRAFFIC OPERATIONS	13
3.1 SCHOOL BUS OPERATIONS	13
3.2 PARENT DROP-OFF OPERATIONS	13
3.3 PARKING REGULATIONS	13
3.4 EXISTING SCHOOL SIGNS AND MARKINGS	15
3.5 ACCIDENT SUMMARY	16
3.6 TRAFFIC OPERATIONS AND ISSUES	18
3.7 SIGNAL TIMING: PEDESTRIAN PHASE.....	23
3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS).....	23
4. PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY.....	24
4.1 SHORT-TERM MEASURES	24
4.2 LONG-TERM MEASURES	25

EXHIBITS

EXHIBIT 1 – AERIAL PHOTOGRAPH	7
EXHIBIT 2 – CATCHMENT AREA	8
EXHIBIT 3 – TRAFFIC SAFETY PLAN	11
EXHIBIT 4 – CROSSING GUARDS.....	12
EXHIBIT 5 – EXISTING PARKING REGULATIONS	14
EXHIBIT 6 – ACCIDENT SUMMARY	17
EXHIBIT 7 – TRAFFIC COUNTS	20
EXHIBIT 8 – PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY.....	26

TABLES

TABLE 1: MODES OF TRAVEL	9
TABLE 2: DMV THREE-YEAR ACCIDENT SUMMARY (1998-2000)	16
TABLE 3: NYPD FOUR-YEAR ACCIDENT SUMMARY (2001-2004).....	16
TABLE 4: SPOT SPEED STUDIES	22
TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS	23

APPENDIX



SPOT SPEED STUDY – CATHERINE STREET.....	A4
SPOT SPEED STUDY – OLIVER STREET	A6
SPOT SPEED STUDY – MADISON STREET	A8
TRAFFIC COUNT – CATHERINE STREET / HENRY STREET	A10
TRAFFIC COUNT – HENRY STREET / OLIVER STREET	A12

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. 1 in Manhattan is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

Located at 8 Henry Street, P.S. 1 occupies the city block bounded by Henry Street, Oliver Street, Madison Street and Catherine Street (see Figure 1). The school is in the midst of the dense Chinatown commercial and residential area, and is bordered by the Lower East Side, and the civic center of lower Manhattan. The surrounding area is generally a mixed residential and commercial neighborhood (see Exhibit 1 for Aerial Photograph).



Figure 1: Henry Street in front of P.S.1's main entrance

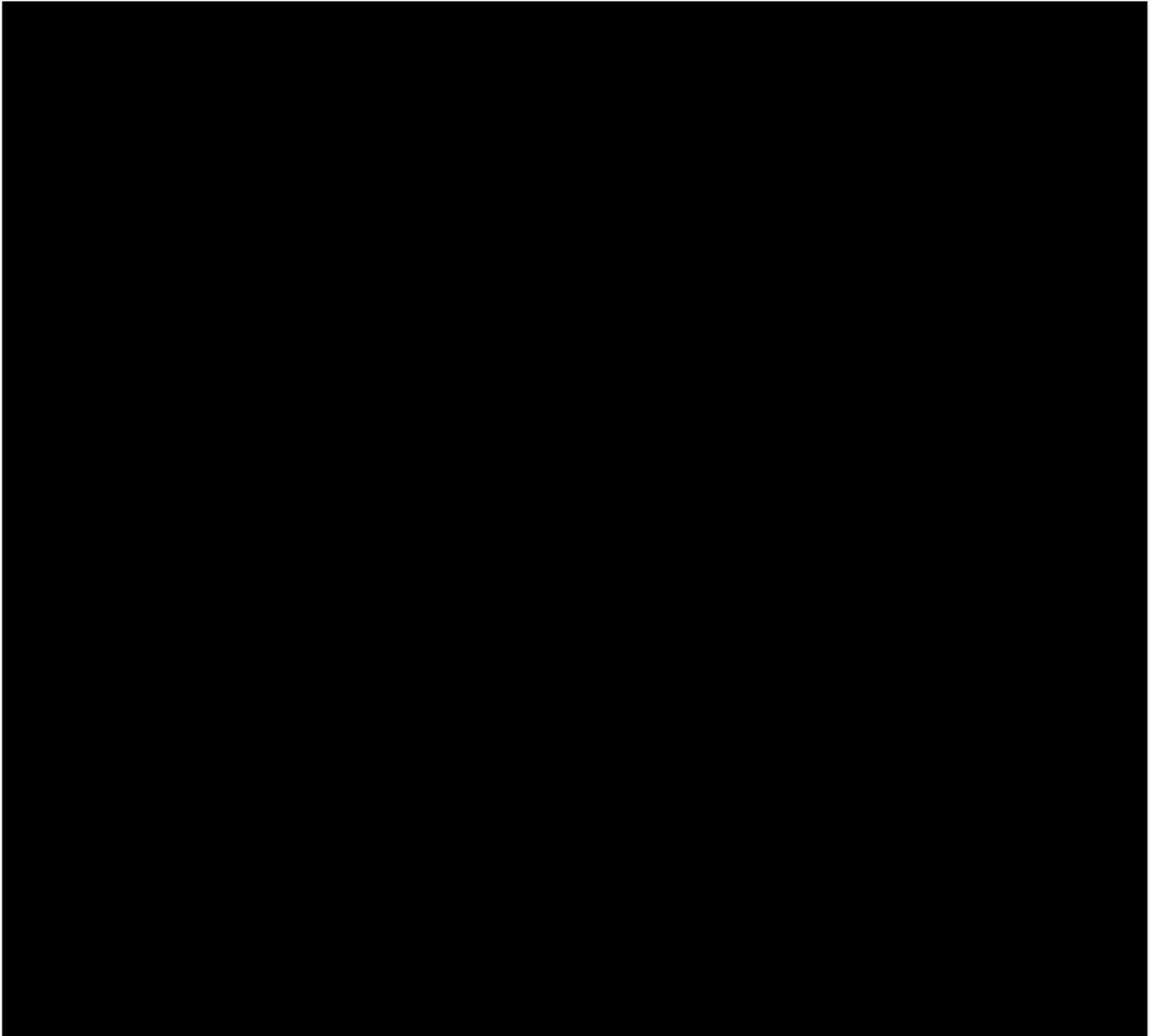
2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant team and representatives from P.S. 1 met at the school on the afternoon of June 1, 2004 (see the Appendix for a list of attendees).

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

- Vehicles speeding on Catherine, Oliver and Madison Streets;
- Children crossing at mid-block locations on Catherine, Oliver and Henry Streets;
- Poor lighting around the exterior of school especially on Henry Street and Oliver Street

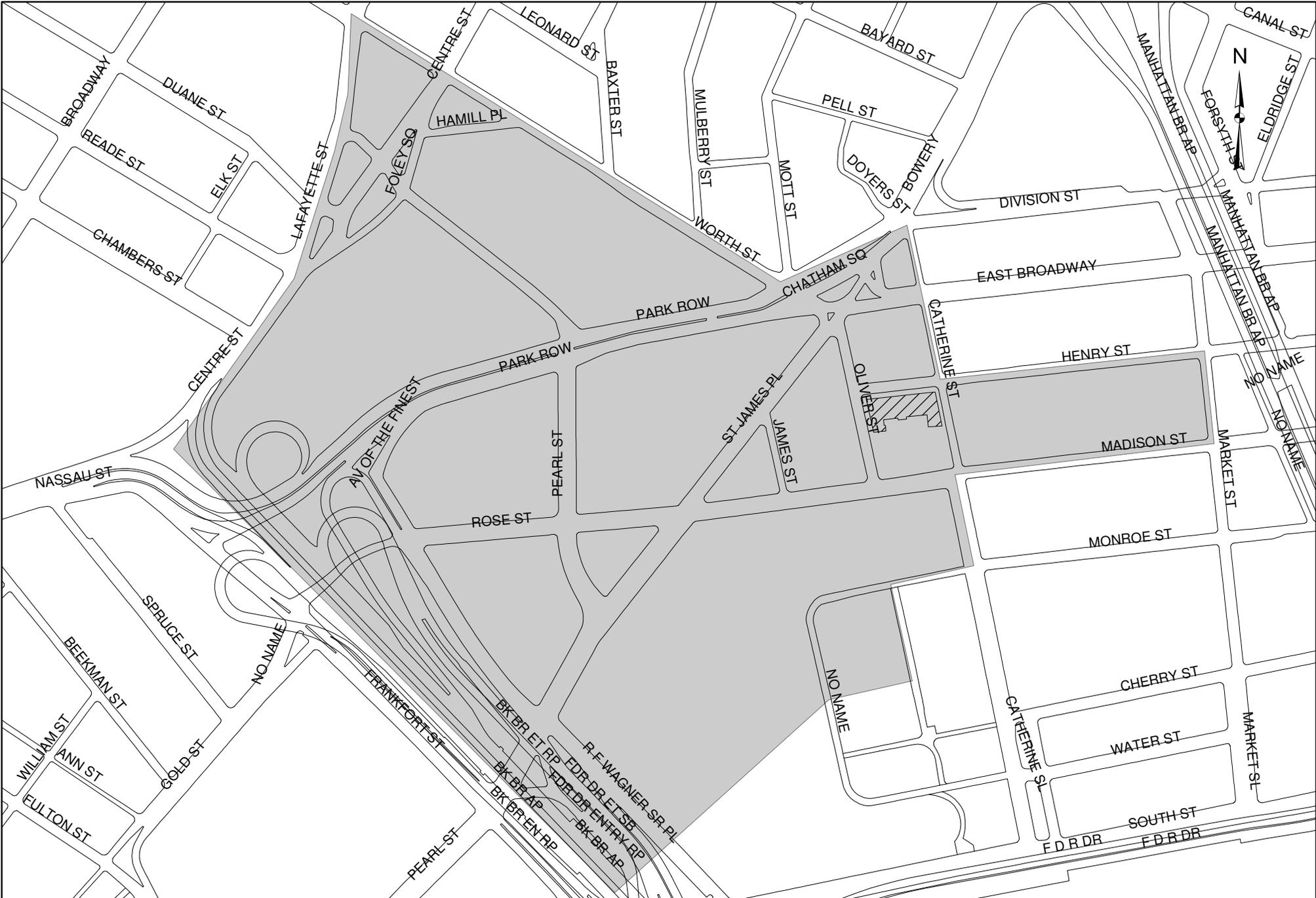
(See the Appendix for a summary of school concerns, and the school's survey response).





1 inch equals 150 feet

EXHIBIT 1
P.S. 1, MANHATTAN
ALFRED E. SMITH SCHOOL
AERIAL PHOTOGRAPH



1 inch equals 350 feet


CATCHMENT AREA

EXHIBIT 2
P.S. 1, MANHATTAN
ALFRED E. SMITH SCHOOL

CATCHMENT AREA

2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

According to school officials, approximately 85% of students walk to P.S. 1, 11% arrive via public transportation, 3% are driven by a parent or guardian, and the remaining 1% of students ride on school buses. The Catchment Area as defined by the Department of Education is shown in Exhibit 2. See 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	85%
Driven by a parent or guardian	3%
School bus	1%
MTA bus or subway	11%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

The streets surrounding the school are utilized by large numbers of pedestrians. Numerous private and public schools are located within four city blocks from P.S. 1. P.S. 124 is located on Division Street, and P.S. 126 is located on Catherine Street just south of Madison Street. P.S. 124 is a priority school. Many pedestrians walk along these streets to subway stops and bus stops for the M15, M103, M51 and M9 bus lines.

2.8 CROSSING GUARD LOCATIONS

Crossing guards assigned to P.S. 1 are stationed at the following intersections (see Figure 3):

- Henry Street and Catherine Street
- Madison Street and Catherine Street
- Madison Street and Oliver Street

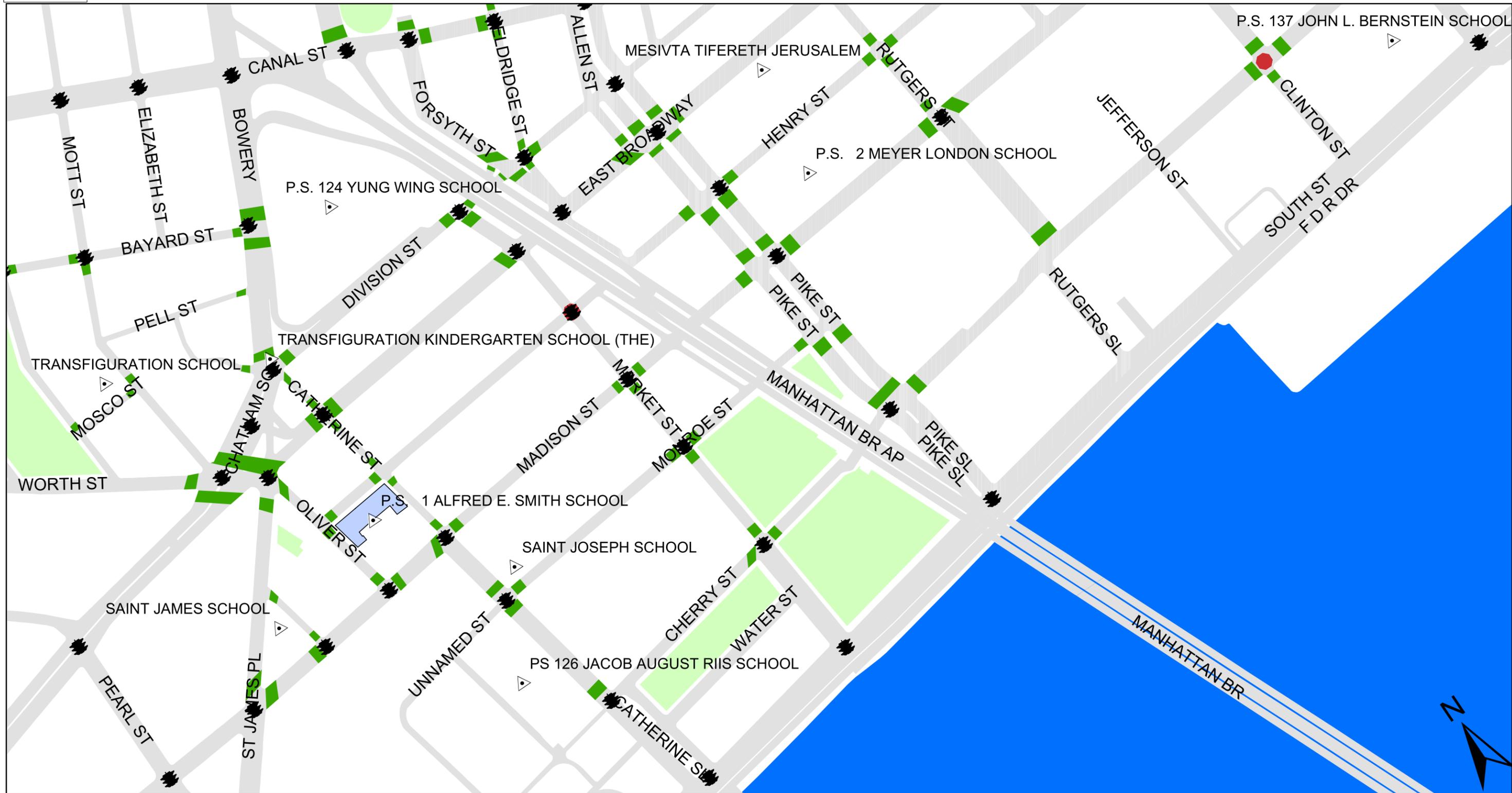
In addition, crossing guards assigned to other schools in the area were observed on Madison Street. See Exhibit 4 for crossing guard locations.



Figure 3: P.S. 1 crossing guard assisting students during dismissal time



School Traffic Safety Map



0 260 520 1,040 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 1 Manhattan
ALFRED E. SMITH SCHOOL

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

Map created on 11/16/2006

EXHIBIT 3

COMM. BOARD: 103
PRECINCT: 5

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school officials, three school buses transport P.S. 1 students to and from school. Buses double park on Henry Street or Catherine Street while loading and unloading students. Because Catherine Street is a narrow street (20 feet wide), school buses occasionally park on the sidewalk so as not to block moving traffic. However, this blocks the sidewalk, making it difficult for pedestrians to pass (see Figure 4).



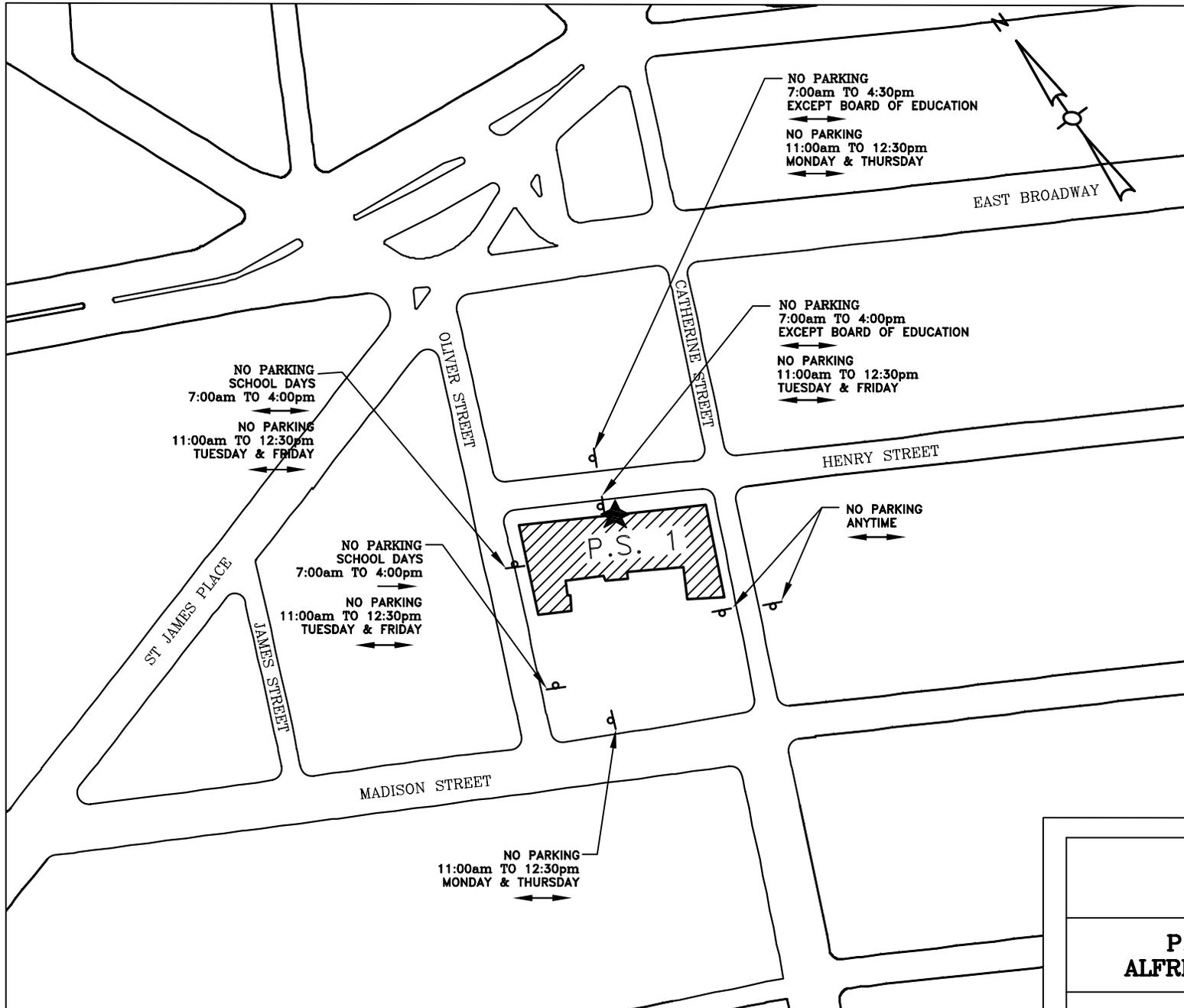
Figure 4: School bus parked on the sidewalk on Catherine Street (looking north)

3.2 PARENT DROP-OFF OPERATIONS

School officials have indicated that approximately 3% of P.S. 1 students are driven to and from school by parents or guardians. Field observations taken on June 1, 2004 indicated that parents primarily use Henry Street as the student drop-off point.

3.3 PARKING REGULATIONS

Parking regulations on both sides of Henry Street are posted as “NO PARKING, 7 AM - 4 PM, SCHOOL DAYS, EXCEPT BOARD OF EDUCATION” in the front of the school’s main entrance. “NO PARKING, 7 AM - 4 PM, SCHOOL DAYS” is posted on Oliver Street. “NO PARKING ANYTIME” is posted on Catherine Street. Parking is prohibited on alternating sides of the roadways between 11:00 am and 12:30 pm. Exhibit 5 shows parking regulations on Henry Street, Oliver Street, and Catherine Street.



- LEGEND**
- ★ MAIN ENTRANCE
 - STREET SIGN

EXHIBIT 5

**P.S. 1, MANHATTAN
ALFRED E. SMITH SCHOOL**

EXISTING PARKING REGULATIONS

SCALE: 1" : 100'

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, shows existing school crosswalks. 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 with downward pointing arrows. Signs scheduled to be installed under this program are shown as “existing” on Exhibit 8.



Figure 5: Typical school crosswalks at the intersection of Madison Avenue and Oliver Street

3.5 ACCIDENT SUMMARY

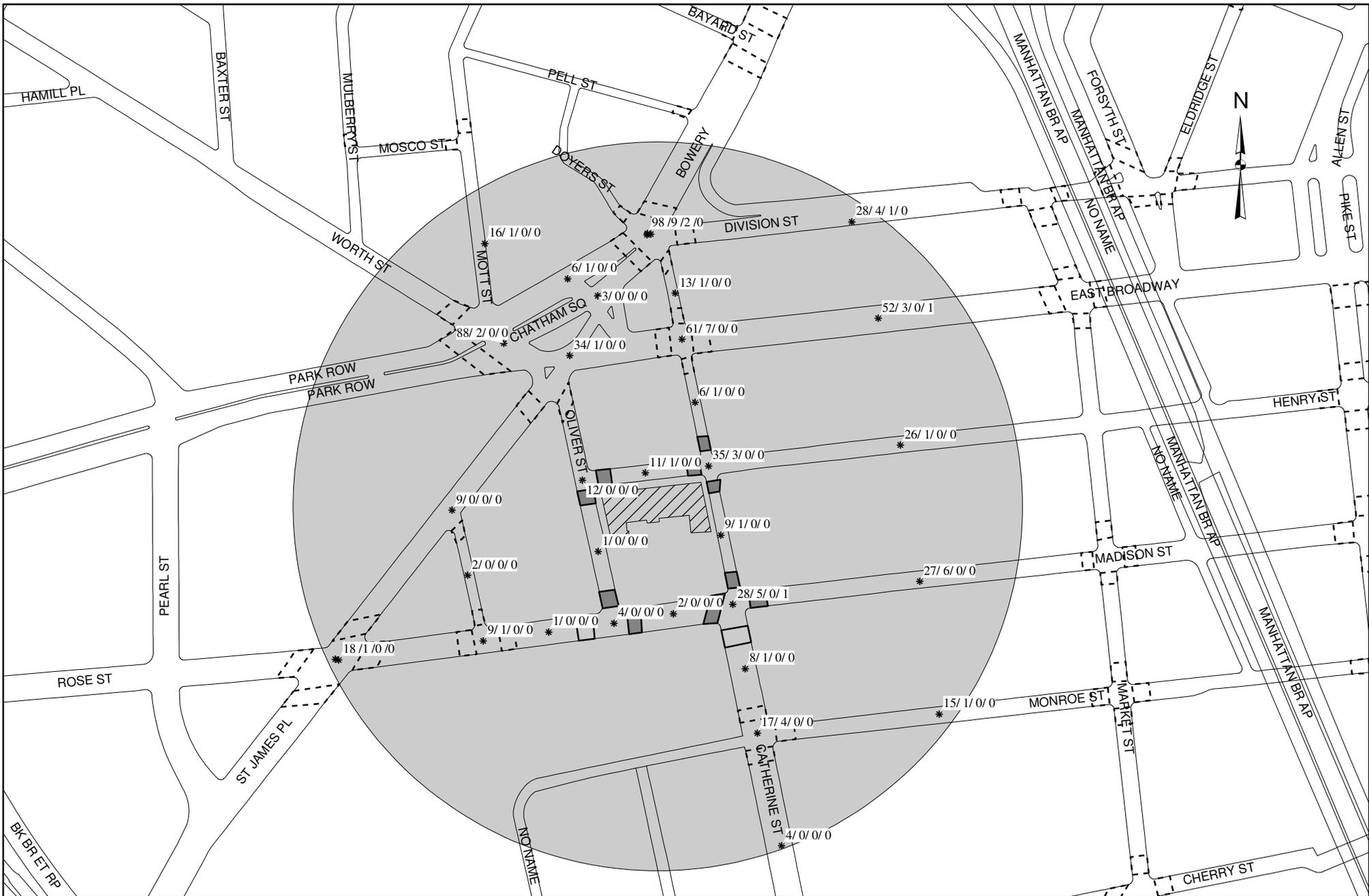
Exhibit 6 and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV), in the vicinity of P.S. 1 for the three-year period from January 1, 1998 through December 31, 2000. The DMV data provides some detail relating to the circumstances and cause of the accident. Table 3 is a summary of more recent accident data obtained from the NYC Police Department (NYPD). Though current through 2004, the NYPD data does not provide the same level of detail as the DMV data.

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

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED* ACCIDENTS
Henry Street and Catherine Street	35	3	0	0
Henry Street and Oliver Street	12	0	0	0
Madison Avenue and Catherine St.	28	5	0	1
Madison Avenue and Oliver Street	4	0	0	0
Division St., Bowery, Doyers St. and Catherine St.	98	9	2	0
TOTAL	177	17	2	1

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED* ACCIDENTS
Henry Street & Catherine Street	79	10	0	0
Henry Street & Oliver Street	10	0	0	0
Madison Avenue & Catherine Street	44	7	0	1
Madison Avenue & Oliver Street	8	0	0	0
Division St., Bowery, Doyers St. and Catherine St.	108	13	0	0
TOTAL	249	30	0	1

* 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. 1

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL

CROSSWALK

X/X/X/X

TOTAL ACCIDENTS	PED ACCIDENTS	PED FATAL	SCHOOL PED ACCIDENTS
X	X	X	X



1 inch equals 250 feet

EXHIBIT 6

**P.S. 1, MANHATTAN
ALFRED E. SMITH 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. 1.

3.6.1 Henry Street and Catherine Street

This intersection is stop controlled for eastbound and westbound traffic along Henry Street (see Figure 6). Henry Street is a 32-foot wide, two-way roadway with one travel lane in each direction and parking allowed on both sides of the street. Catherine Street is a 20-foot wide, one-way (southbound) roadway with one travel lane and parking permitted only on the eastern side of the street. There are school crosswalks on the north, south, and west legs.

Thirty-five accidents occurred at this intersection during the 1998-2000 study period. Three accidents involved pedestrians, none of which were school related. According to the accident data, two pedestrians were struck while crossing outside of the marked crosswalks. The third accident was attributed to a driver's failure to yield while making a left turn.

A one-hour traffic count was performed at this intersection on Tuesday, September 20, 2005 to determine the feasibility of converting Henry Street to a one-way (eastbound) roadway. In one hour 585 pedestrians crossed the western leg of this intersection and only 45 vehicles proceeded westbound on Henry Street between Catherine Street and Oliver Street (see Exhibit 7). Therefore, converting this block of Henry Street to a one-way (eastbound) street is recommended.



Figure 6: Henry Street and Catherine Street intersection (looking east)

3.6.2 Catherine Street and Madison Street

This is a signalized intersection. Madison Street is a two-way street, 34 feet wide east of Catherine Street and 51 feet wide west of Catherine Street. Catherine Street is one-way southbound and is 20 feet wide north of Madison Street and 50 feet wide south of

Madison Street (see Figures 7 and 8). Parking is permitted on both sides of each street. There are school crosswalks on the north, west and east legs of this intersection.

Twenty-eight accidents occurred at this intersection during the 1998-2000 study period, including five pedestrian accidents. One pedestrian accident was reported as a school-related accident. Two accidents, including the school related accident, were attributed to pedestrian error although no further data was provided. Three other accidents involved drivers' failure to yield when making left turns.

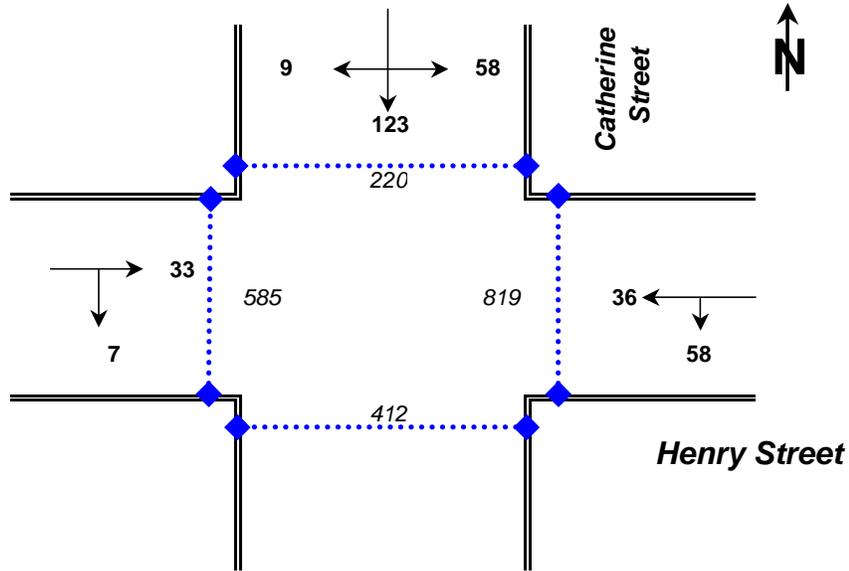


Figure 7: Madison Street and Catherine Street (looking south)

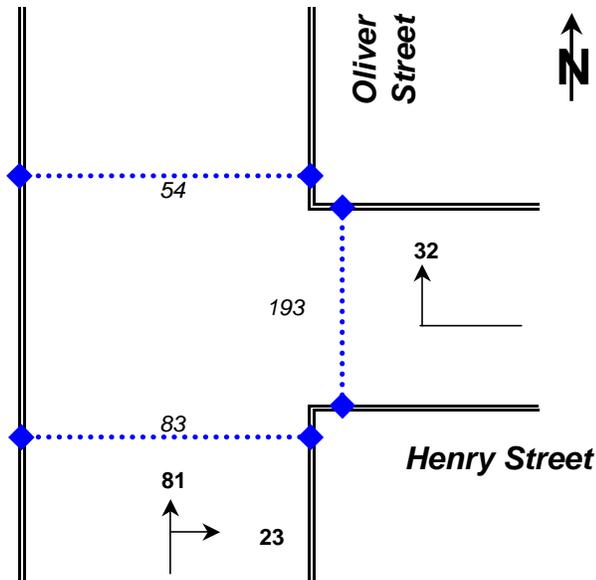


Figure 8: Madison Street and Catherine Street (looking east)

One Hour Traffic Count Volumes



Intersection of Catherine Street and Henry Street - (2:30 PM - 3:30 PM, September 20, 2005)



Intersection of Oliver Street and Henry Street - (2:30 PM - 3:30 PM, Septemebr 20, 2005)

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

EXHIBIT 7
P.S. 1
TRAFFIC COUNTS

3.6.3 Oliver Street and Madison Street

This is a signalized T-intersection (See Figure 9). Madison Street is a 47-foot wide, two-way roadway with one travel lane in each direction and parking allowed on both sides. Oliver Street is a 30-foot wide, one-way northbound roadway with one travel lane and parking allowed on both sides. School crosswalks are in place on the north and east legs of this intersection.

Four accidents occurred during the 1998-2000 study period. No pedestrians were struck during this time.



Figure 9: Madison Street and Oliver Street (looking south on Oliver Street)

3.6.4 Oliver Street and Henry Street

Oliver Street and Henry Street is an unsignalized, stop-controlled T-intersection (see Figure 10). The westbound traffic on Henry Street is stop controlled at this intersection. School crosswalks are on the east and south legs.

Twelve accidents occurred at this location between 1998 and 2000. No pedestrians were involved.

A one-hour traffic count was performed at this intersection on Tuesday, September 20, 2005 to assess the impacts of converting Henry Street into a one-way (eastbound) roadway. In one hour, 193 pedestrians crossed the eastern leg of this intersection and only 32 vehicles entered this intersection from the westbound approach (see Exhibit 7). Therefore, converting this block of Henry Street to a one-way (eastbound) street will not have a significant effect on traffic circulation in the area.



Figure 10: Oliver Street and Henry Street (on Henry Street looking west)

3.6.5 Vehicle speeds on Oliver Street, Catherine Street and Madison Street

Officials of P.S. 1 noted during the June 1, 2004 meeting that vehicles tend to drive at high speeds along Oliver Street, Catherine Street and Madison Street in the vicinity of the school. To determine the operating speeds along these three streets, spot speed surveys were conducted on Catherine Street between Madison Street and Henry Street, on Oliver Street between Madison Street and Henry Street, and on Madison Street between Catherine Street and Oliver Street on September 19, 2005.

The speed study results are shown in Table 5 and in the Appendix. The 85th percentile speed on Catherine Street was 21 mph, 23 mph on Oliver Street, and 26 mph on Madison Street. Therefore, because the 85th percentile speed is lower than the legal speed limit of 30 mph no speed reducing measures are recommended for these streets at this time.

TABLE 4: SPOT SPEED STUDIES		
LOCATION	MEDIAN SPEED (MPH)	85TH PERCENTILE SPEED (MPH)
Catherine Street between Madison Street and Henry Street	19	21
Oliver Street between Madison Street and Henry Street	20	23
Madison street between Catherine Street and Oliver Street	23	26

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of P.S. 1, 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 Length (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)	Timing Adjustment? (Yes/No)
Madison St and Catherine St				
crossing Madison Street	57*	25	22	NO
crossing Catherine Street	51**	55	20	NO
Madison St and Oliver St				
crossing Madison Street	47	25	19	NO
crossing Oliver Street	30	55	13	NO

Note – A rate of 3 ft/sec plus 3 seconds reaction time was utilized as the child pedestrian walking rate

** The west crosswalk across Madison Street*

*** The south crosswalk across Catherine Street*

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 (see Figure 11).



Figure 11: Sidewalk on Henry Street in front of the main school entrance (looking east)

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

“NO STANDING 7AM-4 PM, SCHOOL DAYS” parking regulations should be installed in front of the school’s main entrance on Henry Street to provide sufficient clear frontage for school buses to drop-off and pick-up students. The displaced teacher parking should be relocated to Oliver Street. (This is a typical requirement for all NYC schools in order to provide for emergency access to and from the school.)

In addition, the existing “NO PARKING, SCHOOL DAYS, 7 AM – 4 PM” on Oliver Street should be upgraded to “NO STANDING, SCHOOL DAYS, 7 AM – 4 PM”.

- 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 issues, including crossing the street with the WALK phase and the meaning of the WALK - FLASHING DON’T WALK - DON’T WALK pedestrian signal sequence.

- Place advanced stop bars 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.

- Improve street lighting conditions around P.S. 1

School officials indicated that lighting conditions around the school building are not satisfactory, specifically on Henry Street and Oliver Street. Therefore, it is recommended that NYCDOT Division of Street Lighting assess lighting conditions around P.S. 1 and make improvements, as appropriate.

Note: As a result of a field survey conducted around PS 1, the NYCDOT Division of Street Lighting will install two new street lights at the following locations to improve lighting in this area:

- Southeast corner of Henry Street and Oliver Street.
- North side of Madison Street between Oliver Street and Catherine Street.

4.2 LONG-TERM MEASURES

- Consider curb extensions at the following intersections:

Consideration should be given to installing a curb extension 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.

- Madison Street and Oliver Street (along south curb and northwest corner)
- Madison Street and Catherine Street (northwest and southwest corners)
- Henry Street and Catherine Street (northwest corner and only in conjunction with the proposed one-way travel direction on Henry Street)

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

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

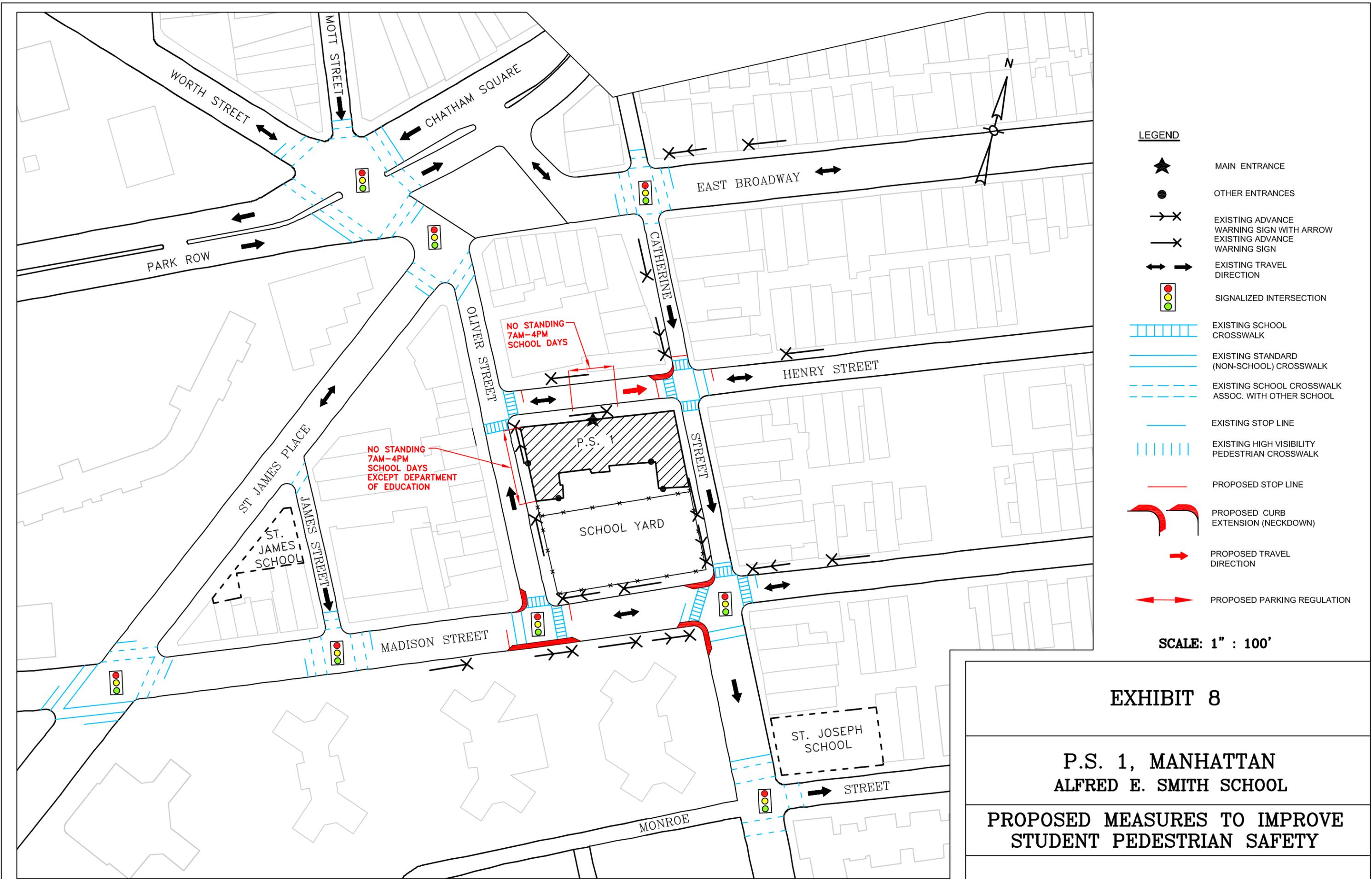
- Consider converting Henry Street between Catherine Street and Oliver Street to a one-way street (in the eastbound direction):

DOT is evaluating alternatives for the reconstruction of Chatham Square. This reconstruction may impact traffic operations in the vicinity of P.S. 1. Pending final design of the reconstruction, it is recommended that DOT consider converting Henry Street to a one-way street in the east-bound direction between Oliver Street and Catherine Street and possibly extending the one-way conversion to Market Street or Peck Slip, subject to further analysis by DOT of potential traffic impacts.

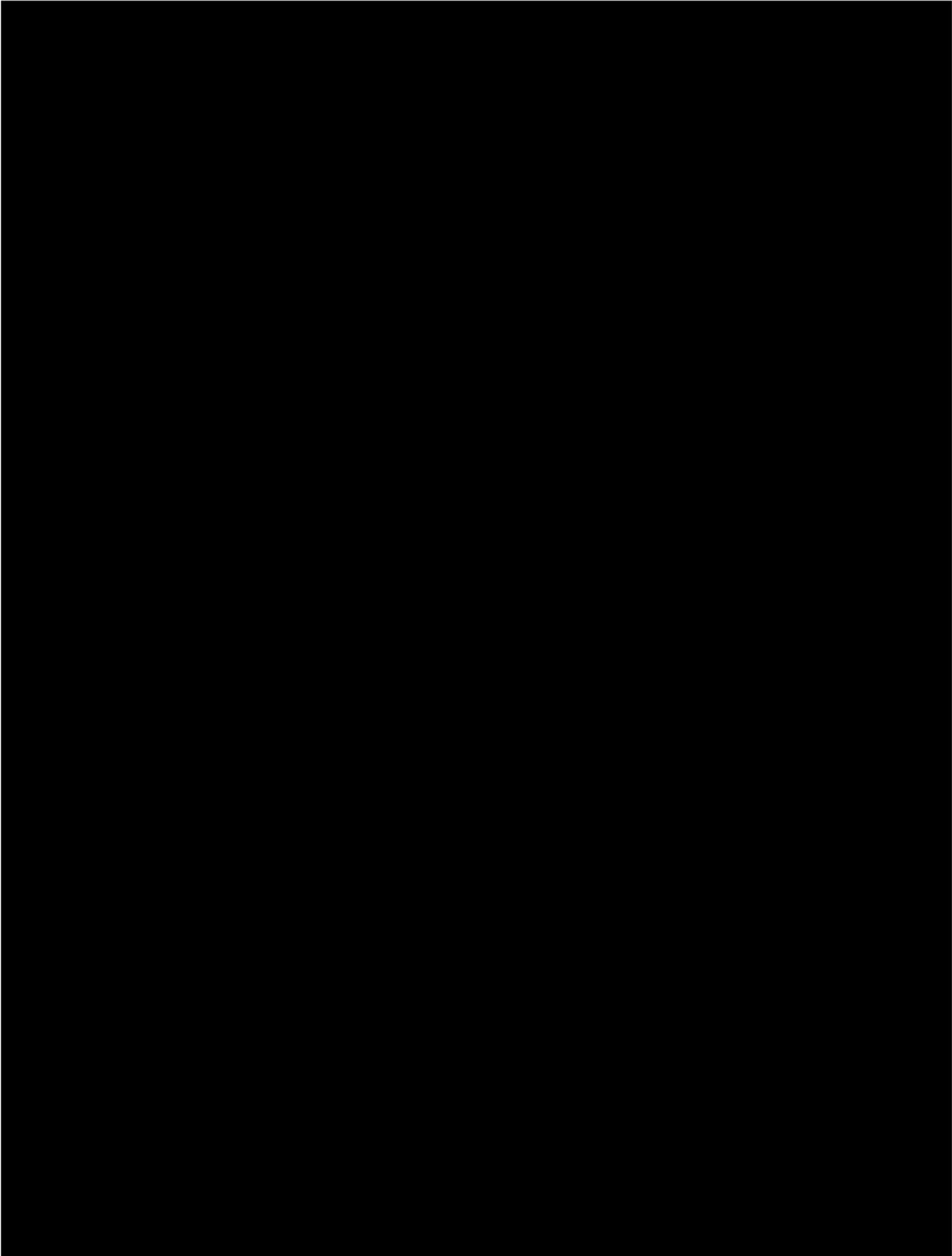
The advantages of converting Henry Street from two-way to one-way (eastbound) operation are as follows:

- Eliminates the southbound right turn from Catherine Street and the westbound through movement from Henry Street; therefore reduces vehicle-pedestrian conflict at the west school crosswalk across Henry Street
- Prevents commercial traffic from using Henry Street as a cut through to get to Chatham Square
- Provides school buses with more curbside space on the school block

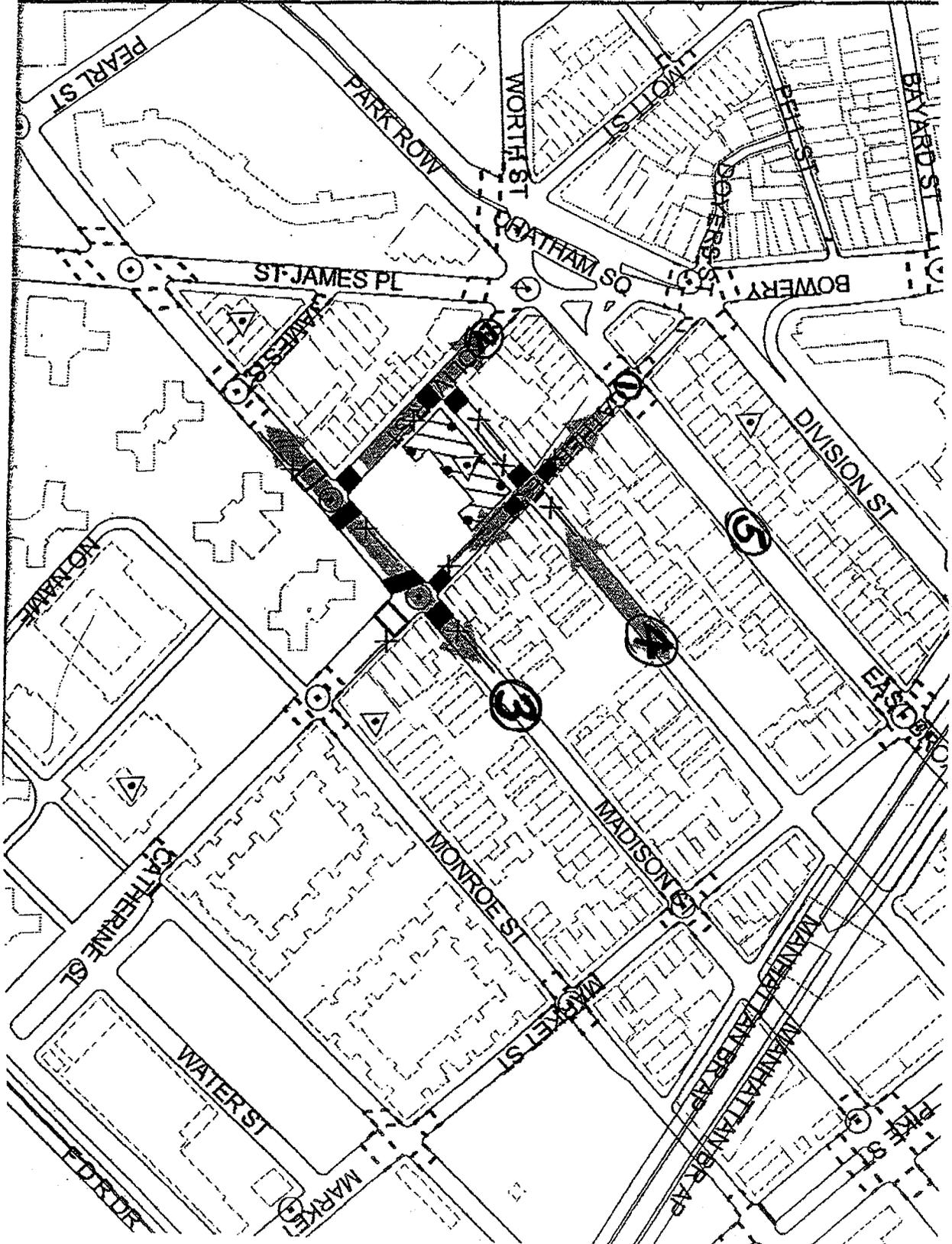
Converting Henry Street to a one-way operation will eliminate southbound right turns at Catherine Street and westbound through movements on Henry Street. To determine the impacts of this change, traffic counts were conducted at the intersections of Catherine Street and Henry Street, and at Oliver Street and Henry Street (see Exhibit 7). A total of 45 (36 through + 9 right turn) vehicles per hour will be diverted due to the conversion of Henry Street to a one-way street.



APPENDIX



- ① Catherine St
- ② Oliver St.
- ③ Madison St
- ④ Henry St.
- ⑤ E. Broadway



SPOT SPEED STUDY

Date: **September 19, 2005** Time: **9:15 AM To 10:15 AM**
 Location: **Catherine Street between, Henry Street and Madison Street**
 Surveyor: **Eyad Yousef**

School: **P.S.1**
 Direction: **SB**
 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	6	6.0%	6.0%	90	1350
16	12	12.0%	18.0%	192	3072
17	17	17.0%	35.0%	289	4913
18	6	6.0%	41.0%	108	1944
19	14	14.0%	55.0%	266	5054
20	19	19.0%	74.0%	380	7600
21	8	8.0%	82.0%	168	3528
22	14	14.0%	96.0%	308	6776
23	4	4.0%	100.0%	92	2116
24	0	0.0%	100.0%	0	0
25	0	0.0%	100.0%	0	0
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
	100	100.0%		1893	36353

Mean Speed = 18.9 mph Median Speed = 18.9 mph
 Standard Deviation = 2.3 mph 15th Percentile Speed = 16.6 mph
 Margin of Error (95% Confidence) = ± 0.4 mph 85th Percentile Speed = 21.3 mph

SPOT SPEED STUDY

Date: **September 19, 2005**

Time: **9:15 AM To 10:15 AM**

School: **P.S.1**

Location: **Catherine Street between, Henry Street and Madison Street**

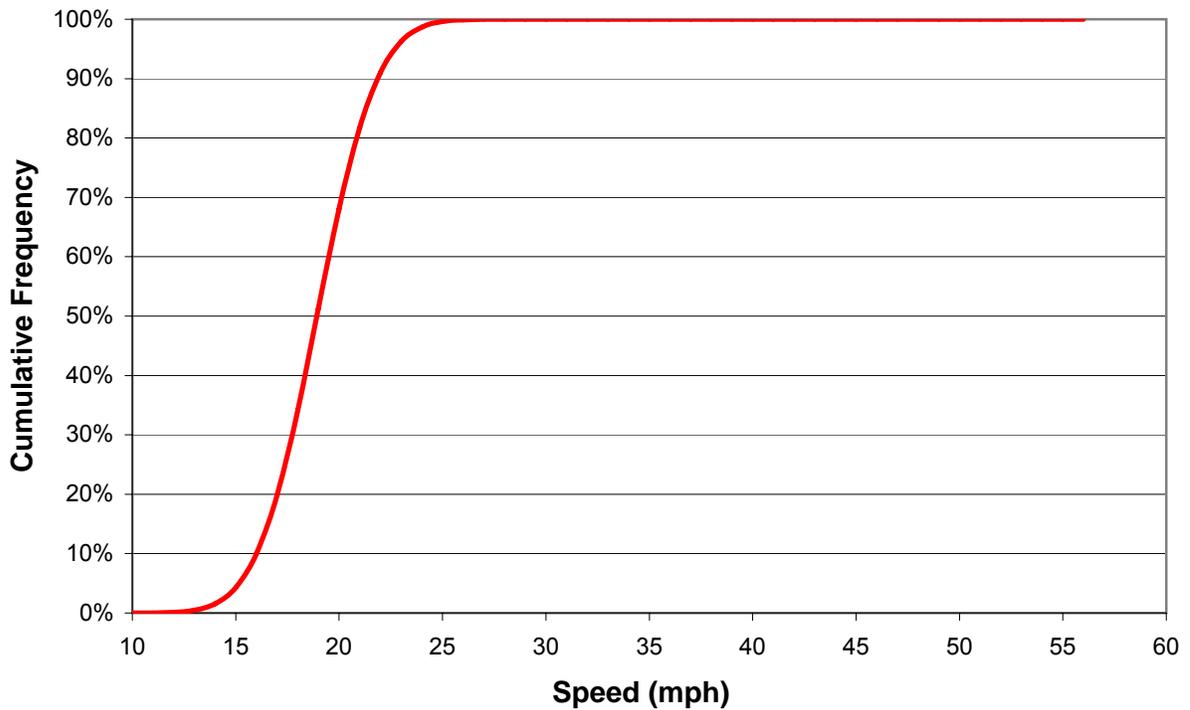
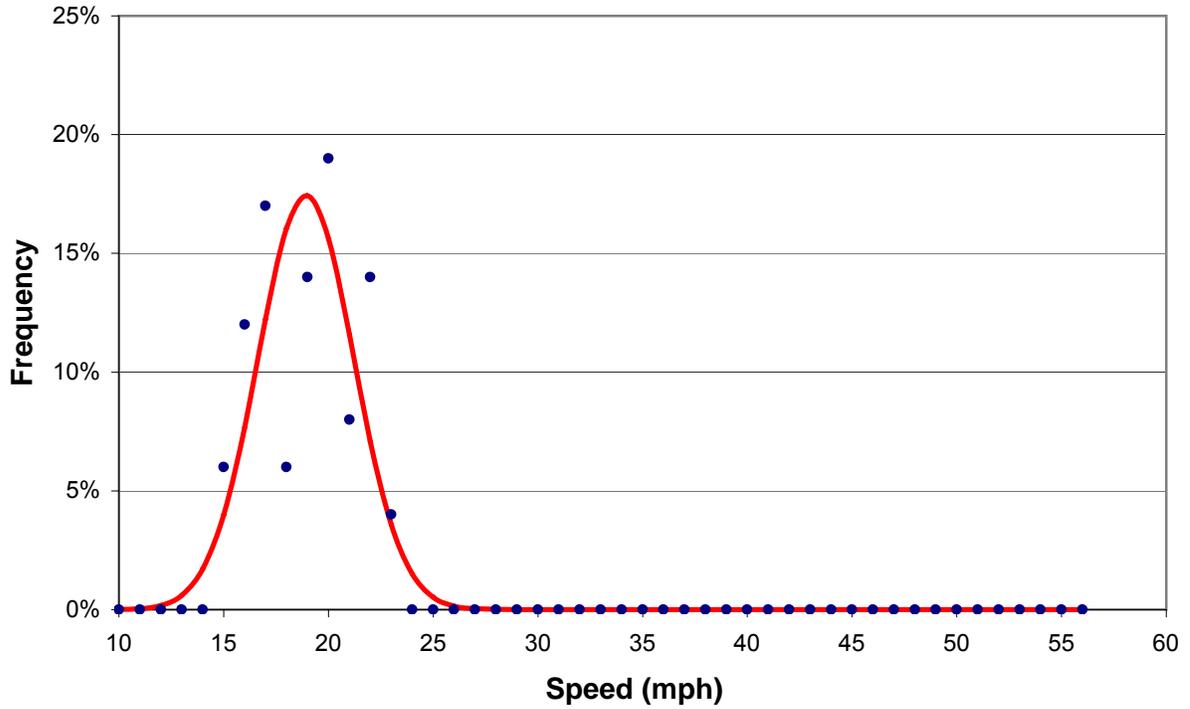
Direction: **SB**

Surveyor: **Eyad Yousef**

Comments: **Sunny and Dry**

Mean Speed = 18.9 mph
Standard Deviation = 2.3 mph
Margin of Error (95% Confidence) = ± 0.4 mph

Median Speed = 18.9 mph
15th Percentile Speed = 16.6 mph
85th Percentile Speed = 21.3 mph



SPOT SPEED STUDY

Date: **September 19, 2005** Time: **10:15 AM To 11:15 AM**
 Location: **Oliver Street between Henry Street and Madison Street**
 Surveyor: **Eyad Yousef**

School: **P.S.1**
 Direction: **NB**
 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	2	3.6%	3.6%	32	512
17	4	7.3%	10.9%	68	1156
18	4	7.3%	18.2%	72	1296
19	3	5.5%	23.6%	57	1083
20	13	23.6%	47.3%	260	5200
21	12	21.8%	69.1%	252	5292
22	6	10.9%	80.0%	132	2904
23	5	9.1%	89.1%	115	2645
24	3	5.5%	94.5%	72	1728
25	3	5.5%	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
	55	100.0%		1135	23691

Mean Speed = 20.6 mph Median Speed = 20.6 mph
 Standard Deviation = 2.2 mph 15th Percentile Speed = 18.3 mph
 Margin of Error (95% Confidence) = ± 0.6 mph 85th Percentile Speed = 22.9 mph

SPOT SPEED STUDY

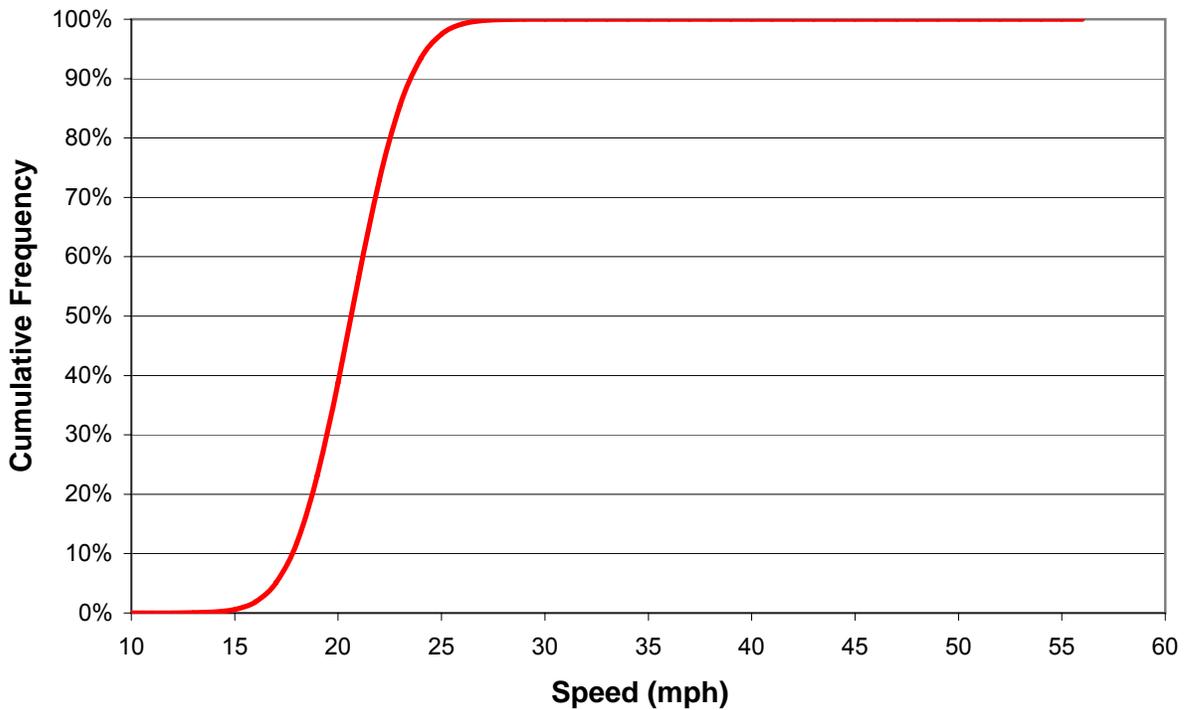
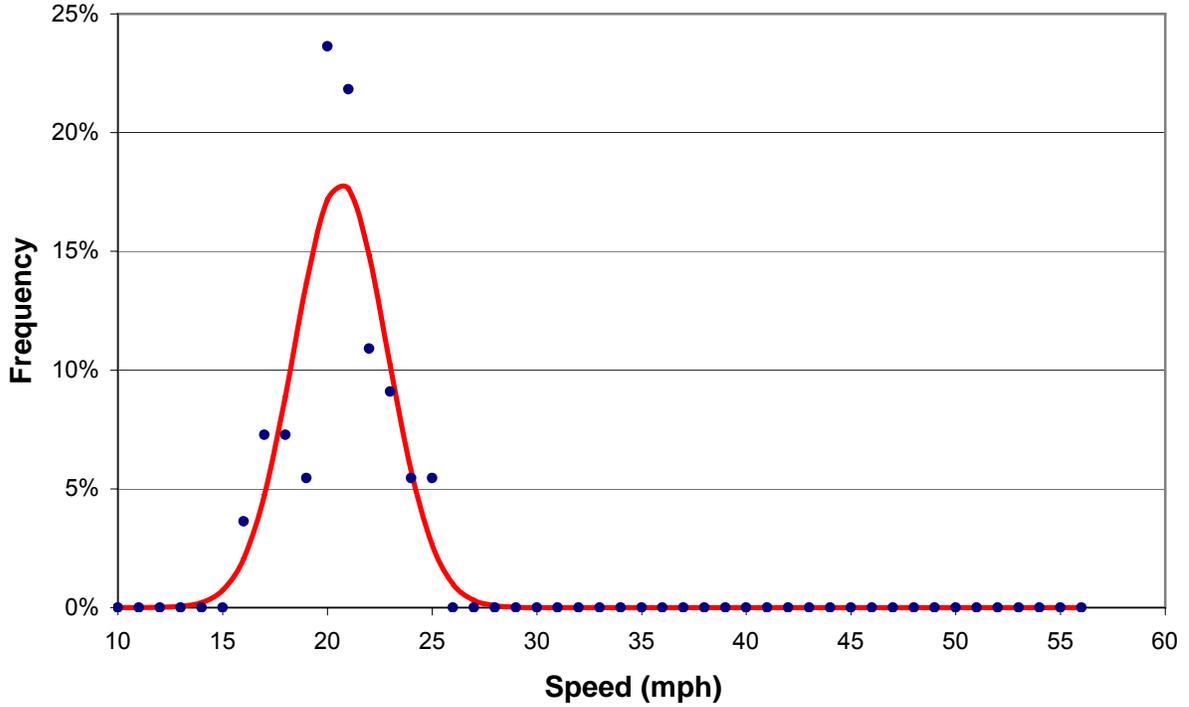
Date: **September 19, 2005**
Location: **Oliver Street between Henry Street and Madison Street**
Surveyor: **Eyad Yousef**

Time: **10:15 AM To 11:15 AM**

School: **P.S.1**
Direction: **NB**
Comments: **Sunny and Dry**

Mean Speed = 20.6 mph
Standard Deviation = 2.2 mph
Margin of Error (95% Confidence) = ± 0.6 mph

Median Speed = 20.6 mph
15th Percentile Speed = 18.3 mph
85th Percentile Speed = 22.9 mph



SPOT SPEED STUDY

Date: **September 19, 2005** Time: **9:15 AM To 10:15 AM**
 Location: **Catherine Street between, Henry Street and Madison Street**
 Surveyor: **Eyad Yousef**

School: **P.S.1**
 Direction: **SB**
 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	6	6.0%	6.0%	90	1350
16	12	12.0%	18.0%	192	3072
17	17	17.0%	35.0%	289	4913
18	6	6.0%	41.0%	108	1944
19	14	14.0%	55.0%	266	5054
20	19	19.0%	74.0%	380	7600
21	8	8.0%	82.0%	168	3528
22	14	14.0%	96.0%	308	6776
23	4	4.0%	100.0%	92	2116
24	0	0.0%	100.0%	0	0
25	0	0.0%	100.0%	0	0
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
	100	100.0%		1893	36353

Mean Speed = 18.9 mph Median Speed = 18.9 mph
 Standard Deviation = 2.3 mph 15th Percentile Speed = 16.6 mph
 Margin of Error (95% Confidence) = ± 0.4 mph 85th Percentile Speed = 21.3 mph

SPOT SPEED STUDY

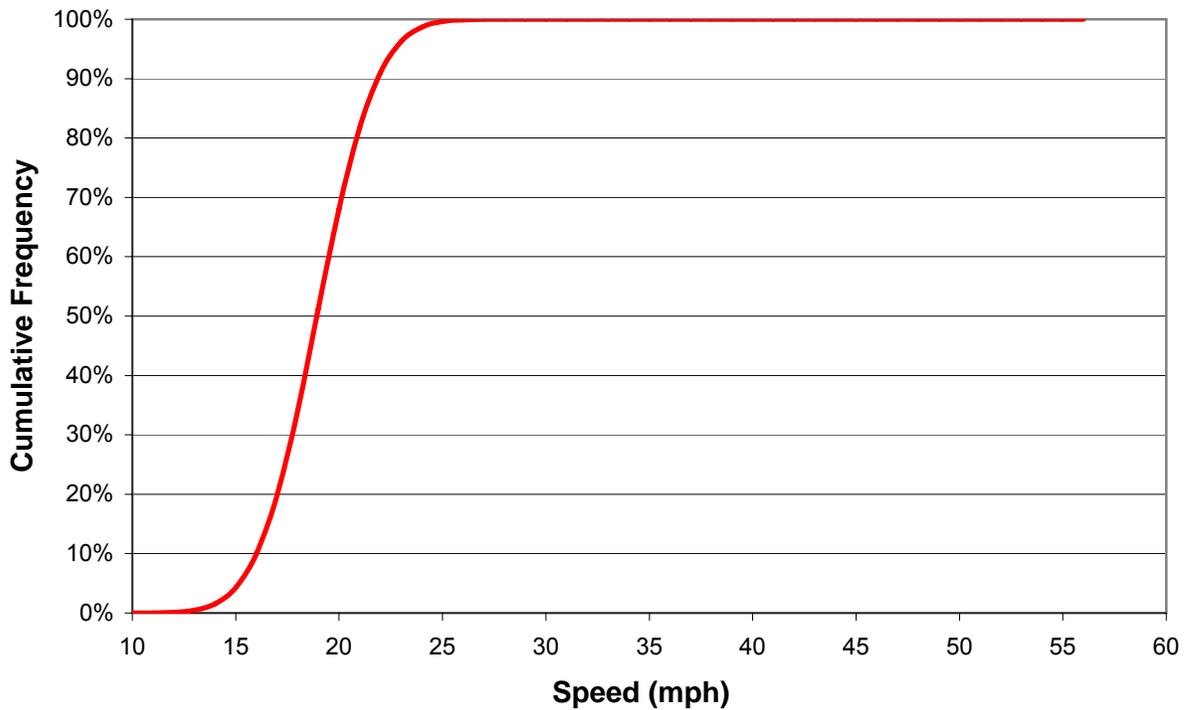
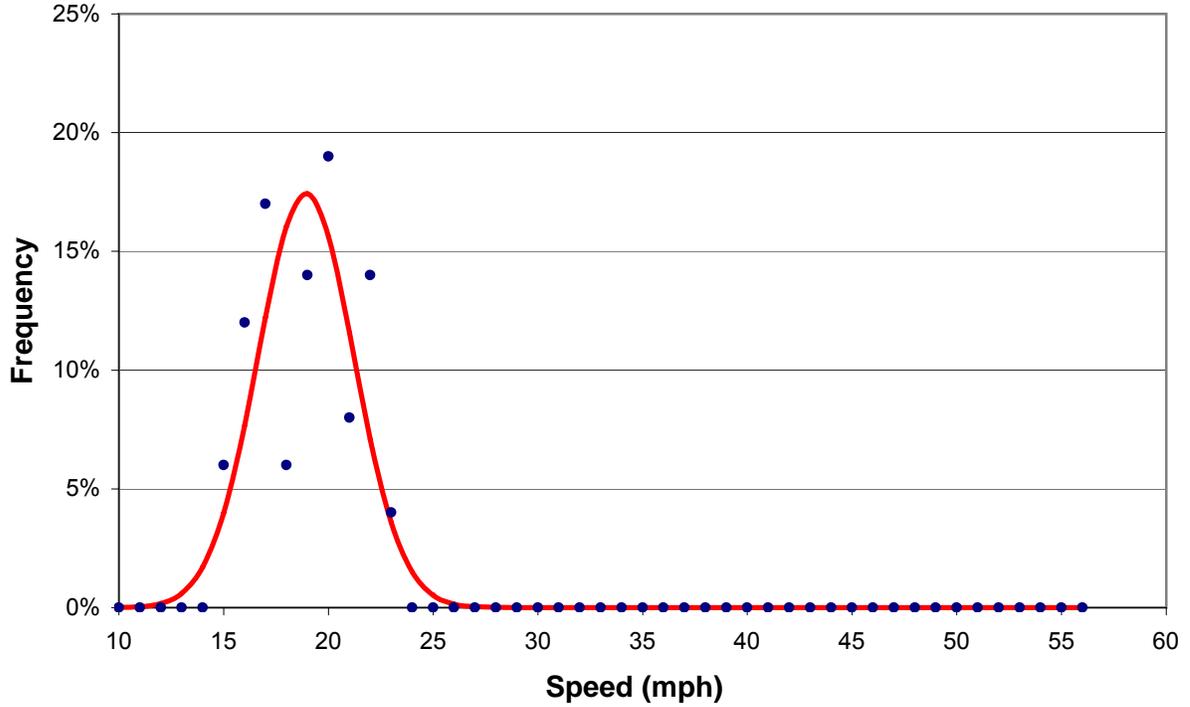
Date: **September 19, 2005**
Location: **Catherine Street between, Henry Street and Madison Street**
Surveyor: **Eyad Yousef**

Time: **9:15 AM To 10:15 AM**

School: **P.S.1**
Direction: **SB**
Comments: **Sunny and Dry**

Mean Speed = 18.9 mph
Standard Deviation = 2.3 mph
Margin of Error (95% Confidence) = ± 0.4 mph

Median Speed = 18.9 mph
15th Percentile Speed = 16.6 mph
85th Percentile Speed = 21.3 mph



P.S. 1
 September 20, 2005
 2:30 pm - 3:30 pm

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

Site: _____
 Date: 09/20/05

Combined

Begin Time	Total	CATHERINE STREET			HENRY STREET <i>able</i>			CATHERINE STREET			HENRY STREET		
		S-R	S-T	S-L	W-T	W-L				E-R	E-T		
14:30:00	81	0	39	7	0	6	12	0	0	0	0	17	0
14:45:00	68	2	30	7	0	10	12	0	0	0	2	5	0
15:00:00	89	3	22	19	0	10	29	0	0	0	1	5	0
15:15:00	86	4	32	25	0	10	5	0	0	0	4	6	0
	324	9	123	58	0	36	58	0	0	0	7	33	0

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	14:15:00	To 15:15:00	149
PM	15:00:00	To 20:00:00	14:30:00	To 15:30:00	324

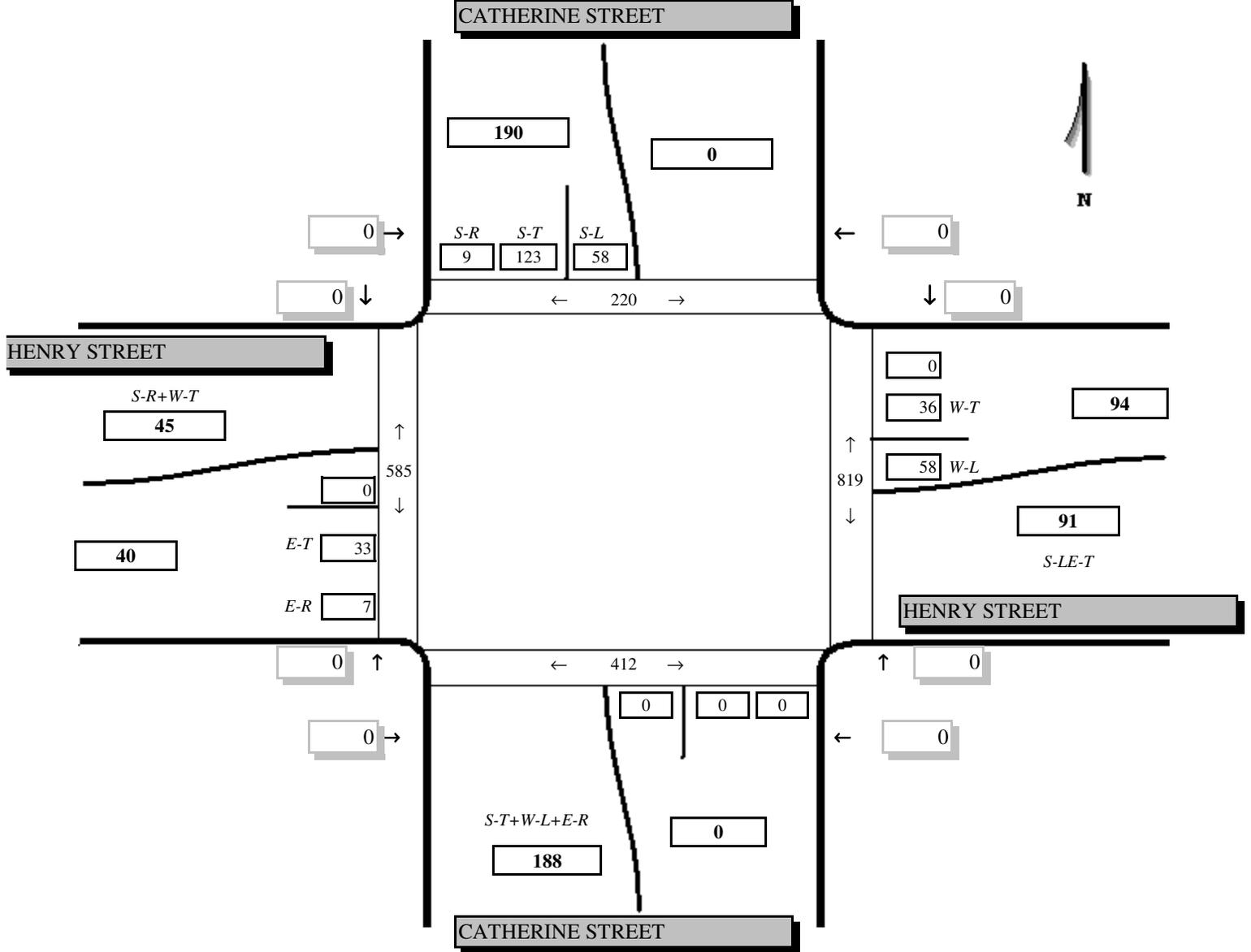
P.S. 1
 September 20, 2005
 2:30 pm - 3:30 pm

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

Site: _____
 Date: 09/20/05

Combined

**Peds not included in table data*



P.S. 1

INTERSECTION: HENRY ST. @ OLIVER ST

TIME : 2:30 PM - 3:30 PM

DATE : 9-20-05

