

New York City Department of Transportation

Office of School Safety Engineering

NEW YORK CITY



School Safety Engineering Project

FINAL REPORT: P. S. 314 (Luis Munoz Marin Elementary School), Brooklyn



Prepared by
The RBA Group/Urbitrans Associates



JUNE 8, 2006

School Safety Engineering Project
P.S. 314, Luis Munoz Marin School, Brooklyn

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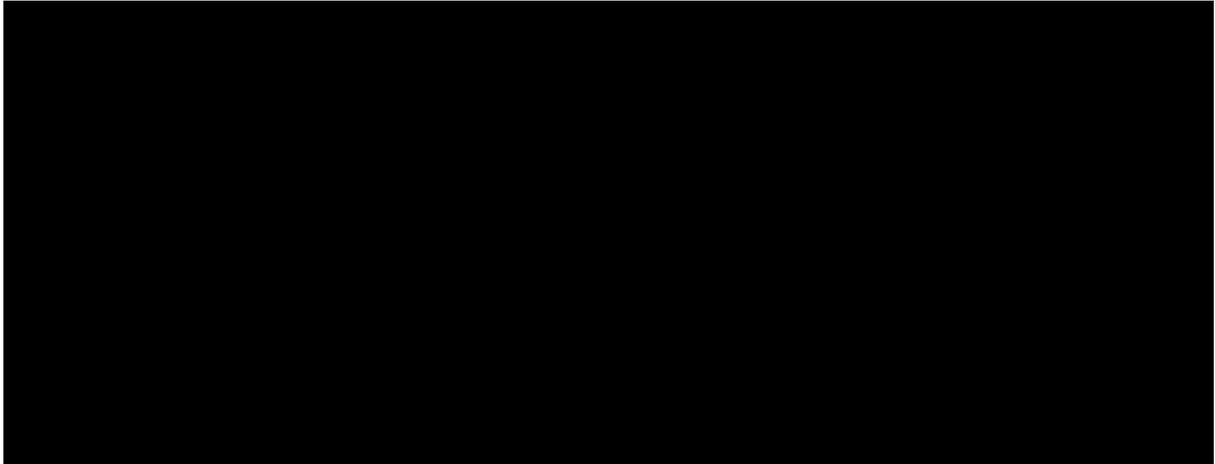
1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The Department of Transportation has developed school safety maps for 1,471 schools throughout the City. Schools currently in the program are primarily elementary and intermediate schools with an enrollment of at least 250 students. The safety plans include the designation of official school crosswalks, identified by prominent warning signs and roadway markings. DOT also designates curbside locations for school bus loading and unloading and other parking controls to improve conditions for students. In addition, nearly 350 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). P.S. 314 (Luis Munoz Marin School) in Brooklyn is one of the 135 priority schools.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



2.2 NEIGHBORHOOD DESCRIPTION

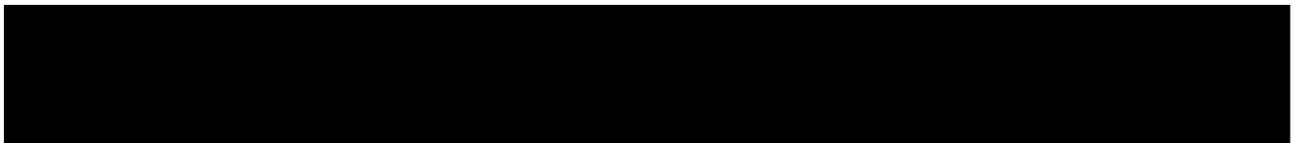
Located at 330 59th Street in Brooklyn, P.S. 314 occupies the city block bounded by Third and Fourth Avenues, and 59th and 60th Streets (Exhibit 1- Aerial Photograph). The Gowanus Expressway runs overhead along Third Avenue; a westbound exit ramp from the Expressway (at Third Avenue and 62nd Street) feeds traffic onto 60th Street between Third and 4th Avenues. The N and R lines run under Fourth Avenue with a station at 59th Street. Land use is residential on 59th and 60th Streets, with mixed use commercial on Fourth Avenue and mostly industrial on Third Avenue.

2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant staff and the principal of P.S. 314 met at the school on the morning of May 10, 2004. According to the principal of the school, the identifiable problems that student pedestrians encounter on a regular basis include the following:

- Inadequate time for a school pedestrian to cross Third Avenue at 60th Street
- Lack of advance signage indicating presence of the school to vehicles exiting the Gowanus Expressway at Third Avenue and 62nd Street
- Students crossing Third Avenue at 59th Street without a crosswalk
- Southbound vehicles on Fourth Avenue have difficulty making the right turn onto 60th Street without crossing the centerline striping
- Lack of curbside access for school bus and parent drop-off on 60th Street.

(See the Appendix for a summary of school concerns)





2.6 PRIMARY MODE OF TRANSPORT TO AND FROM SCHOOL

According to the principal, approximately 86% of the students walk to P.S. 314; eight percent of the students are driven to school by a parent or guardian, two percent use the school buses and four percent arrive via public transportation. During the arrival time, parents were observed walking children to school. During the AM drop-off period, parents were observed double parking on 60th Street and Third Avenue, as well as parking at hydrants or along the curbside designated for Board of Education vehicles (Figure 2). Double-parked vehicles forced vehicles traveling westbound to cross the double yellow line into the lane of oncoming traffic (Figure 3).

TABLE 1: MODE OF TRAVEL (As estimated by school officials)	
Description	Percentage
Walk	86%
Driven by parent or guardian	8%
School Bus	2%
Public Transportation	4%
TOTAL	100%



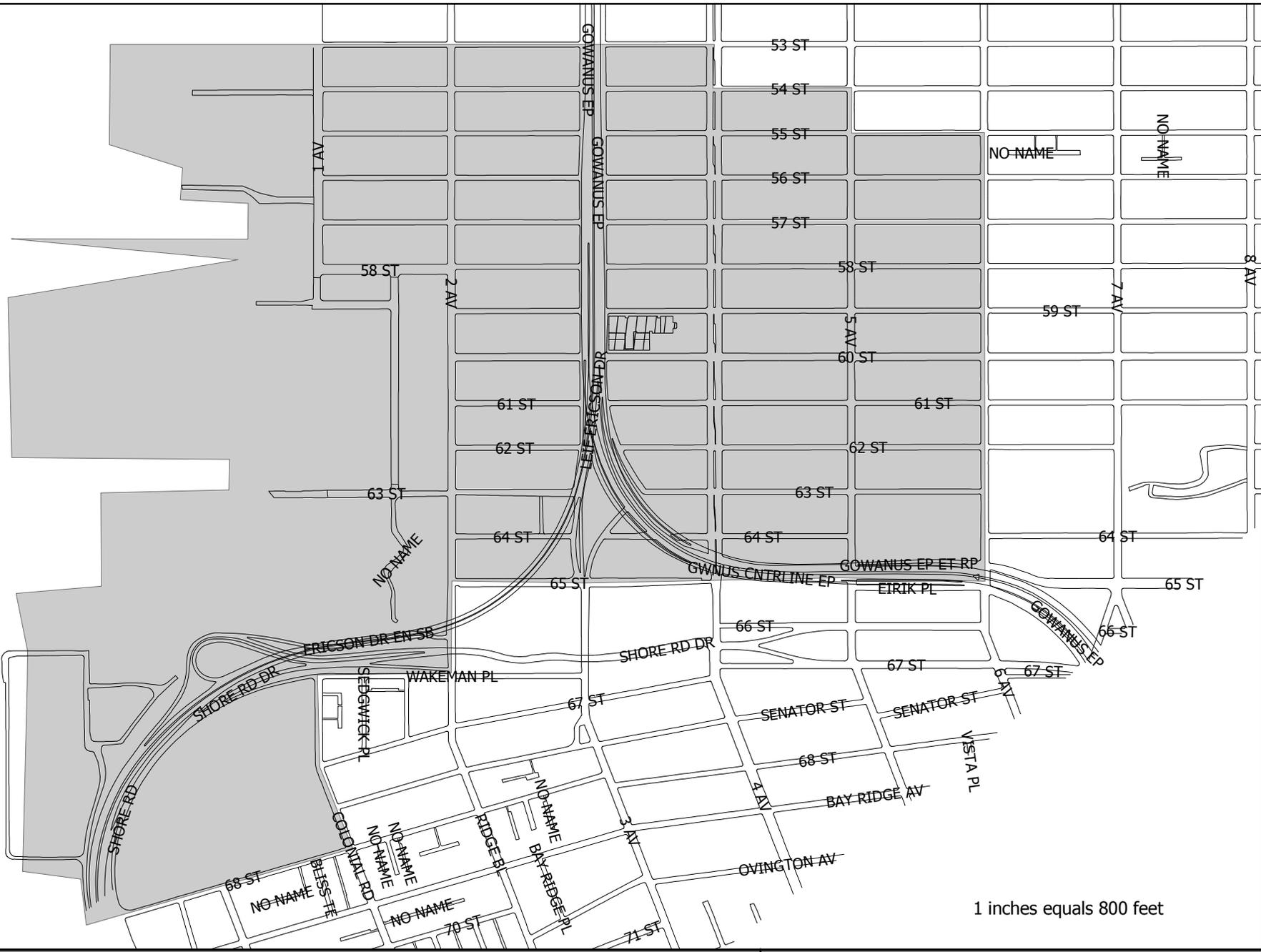
Figure 2 – 60th Street, looking east at double-parked vehicles



Figure 3 – Vehicles crossing the double yellow line due to double-parked vehicles on 60th Street



EXHIBIT 1
LUIS MUNOZ MARIN SCHOOL
P.S. 314, BROOKLYN
AERIAL PHOTOGRAPH

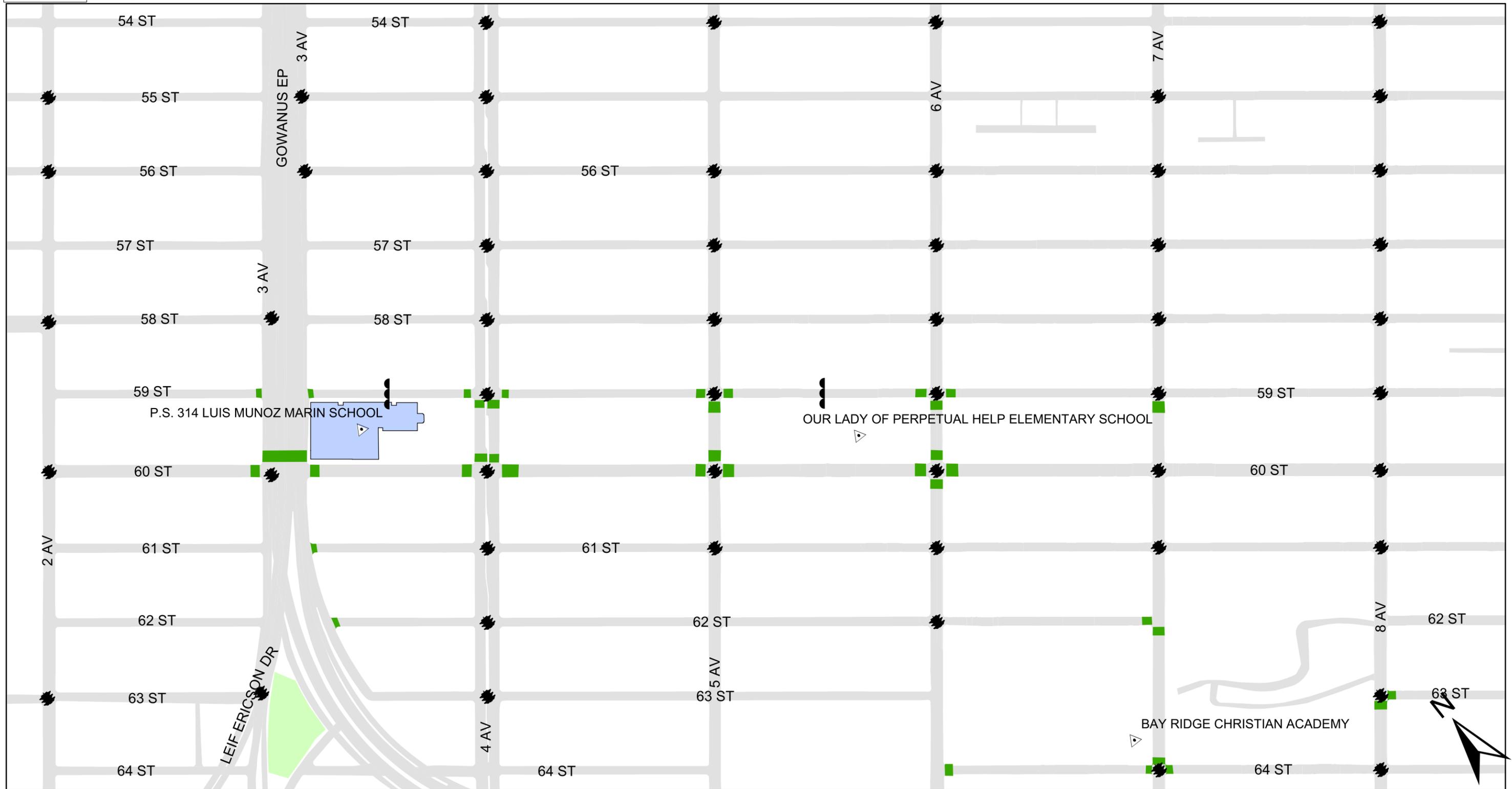


 CATCHMENT AREA

EXHIBIT 2
LUIS MUNOZ MARIN SCHOOL
P.S. 314, BROOKLYN
CATCHMENT AREA



School Traffic Safety Map



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

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

LEGEND:

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

**PS 314 Brooklyn
LUIS MUNOZ MARIN SCHOOL**

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

EXHIBIT 3

Map created on 11/16/2006

COMM. BOARD: 307
PRECINCT: 72

1.5.1

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

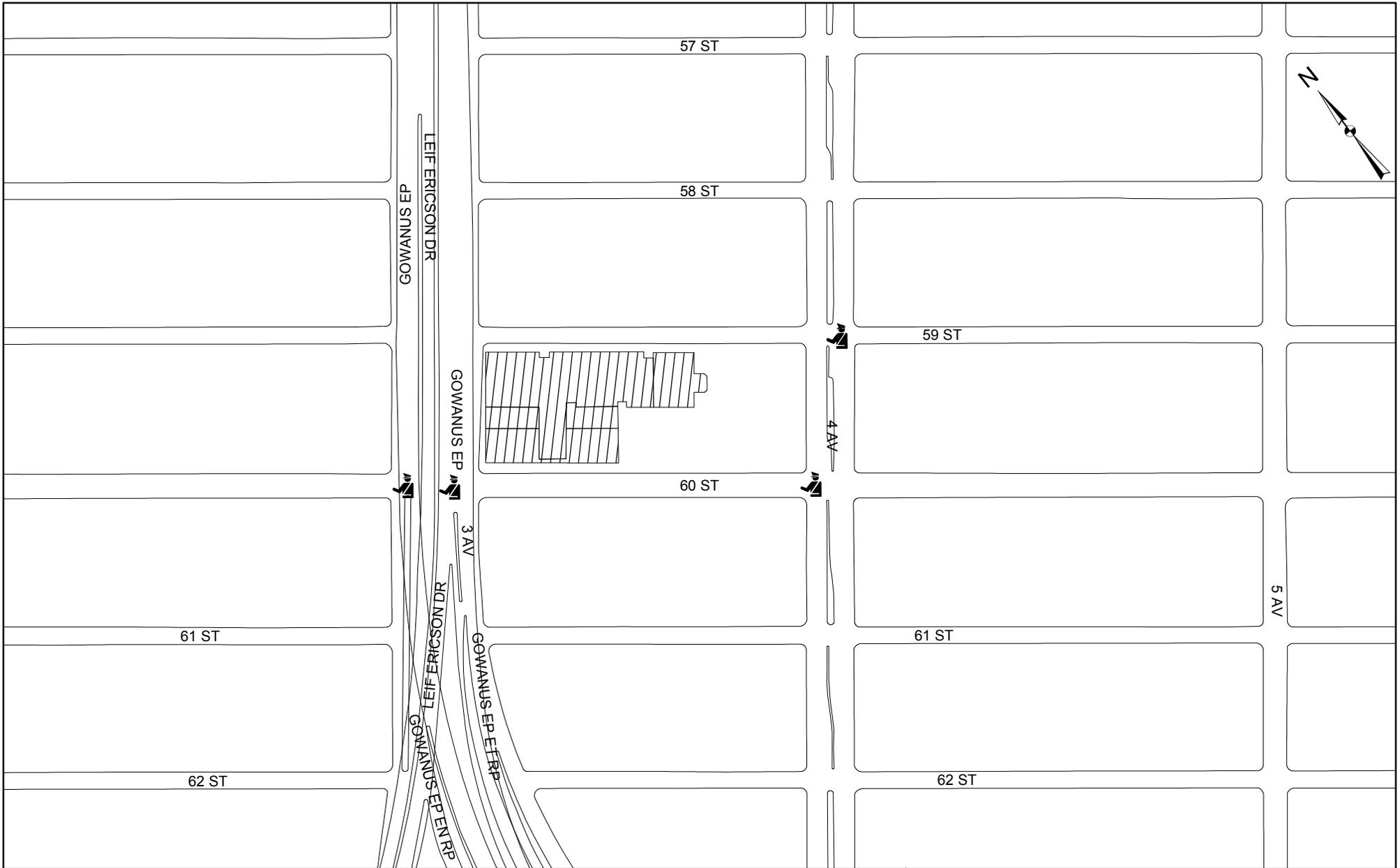
According to the New York City Department of Education website, there are a total of 75 Metro cards issued at P.S. 314. On Third Avenue and on 60th Street there are bus stops for the B9 and B37 bus route and on 4th Avenue there are two subway lines (N & R).

2.8 CROSSING GUARD LOCATIONS

According to the principal, there are four crossing guards assigned to P.S. 314. Two crossing guards are stationed at Third Avenue at 60th Street (Figure 4), one guard is stationed at Fourth Avenue at 60th Street, and one guard is stationed at Fourth Avenue at 59th Street. The locations of the crossing guards are shown in Exhibit 4.



Figure 4 – Crossing guard at the intersection of Third Avenue at 60th Street



Crossing guard assigned to P.S. 314

EXHIBIT 4

**LUIS MUNOZ MARIN SCHOOL
P.S. 314, BROOKLYN**

CROSSING GUARDS

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to the principal, approximately two percent of the students ride a school bus to P.S.314. Two school buses serve the school, including one bus with a hydraulic lift for students of special needs. School buses stop directly in the front of P.S. 314, on 60th Street while double-parked, since curbside bus parking is not provided (Figure 5)

Many vehicles (passenger and commercial) exiting the Gowanus at 62nd Street travel eastbound on 60th Street to access the local street network. Westbound vehicles traveling around the parked school buses do so into oncoming eastbound traffic that includes large vehicles. Although there is a sign reminding motorists that the law prohibits passing a school bus with flashing red lights, vehicles were observed doing so.

3.2 PARENT DROP-OFF OPERATIONS

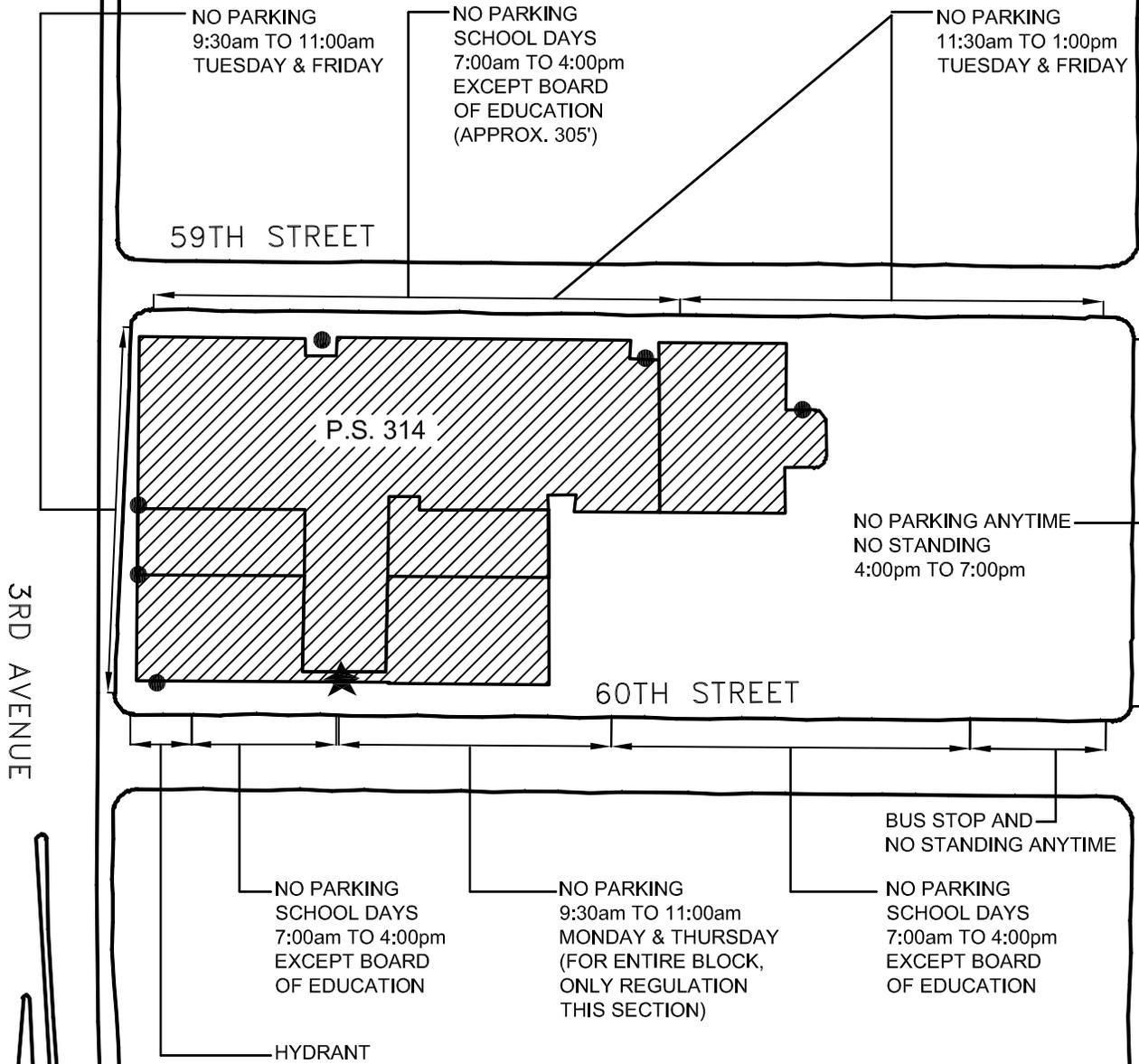
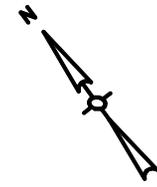
School representatives indicated that ten percent of P.S. 314 students are driven to school, with a much higher percentage being driven during inclement weather. During the morning arrival period it was not uncommon that on 60th Street vehicles were double-parked in front of the school while allowing students to exit vehicles (Figure 5). Parents were also observed stopping on the eastbound side of 60th Street and walking their children midblock across 60th Street. Vehicles were also observed stopping on Third Avenue to allow students to exit the vehicle. The block face in front of the school allows curbside parking; therefore there are no existing curbside areas for a vehicle to unload a student.



Figure 5: Student exiting vehicle on 60th Street while double-parked

3.3 PARKING REGULATIONS

Parking regulations are shown in Exhibit 5. “No Standing Anytime” zones are not provided in front of the school entrances. Teacher parking is provided on 59th Street and



NO PARKING
9:30am TO 11:00am
TUESDAY & FRIDAY

NO PARKING
SCHOOL DAYS
7:00am TO 4:00pm
EXCEPT BOARD
OF EDUCATION
(APPROX. 305')

NO PARKING
11:30am TO 1:00pm
TUESDAY & FRIDAY

59TH STREET

P.S. 314

NO PARKING ANYTIME
NO STANDING
4:00pm TO 7:00pm

60TH STREET

3RD AVENUE

4TH AVENUE

LEGEND

- ★ MAIN ENTRANCE
- ENTRANCE

NO PARKING
SCHOOL DAYS
7:00am TO 4:00pm
EXCEPT BOARD
OF EDUCATION

NO PARKING
9:30am TO 11:00am
MONDAY & THURSDAY
(FOR ENTIRE BLOCK,
ONLY REGULATION
THIS SECTION)

BUS STOP AND
NO STANDING ANYTIME

NO PARKING
SCHOOL DAYS
7:00am TO 4:00pm
EXCEPT BOARD
OF EDUCATION

HYDRANT

NOT TO SCALE

EXHIBIT 5

P.S. 314, BROOKLYN

EXISTING PARKING REGULATIONS

60th Street. Street cleaning regulations are present on 59th and 60th Streets near the school entrances.

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 3, indicates existing signs, signals, and pavement markings. It is noted that a citywide signage program is currently underway to upgrade school signage to current MUTCD standards of fluorescent yellow-green accompanied by downward pointing arrows. The new signs which have been installed under this program are shown as “existing”.



Figure 6: 60th Street, looking west



Figure 7: Fourth Avenue, looking south from 59th Street



Figure 8: Looking north from the west side of Third Avenue at 60th Street



Figure 9: Looking east at median across Fourth Avenue, north side, from 60th Street



Figure 10: Looking east at the south crosswalk at the intersection of Fourth Avenue at 59th Street

There is an existing speed reducer (hump) on 59th Street between Third and Fourth Avenues, at the 59th Street entrance to P.S. 314. The pavement text “BUMP” is in good condition and clearly marked. The pavement markings on the speed reducer itself are also in good condition and it is properly signed (Figure 11).



Figure 11: Looking west on 59th Street at Speed Reducer (Hump) at P.S. 314



Figure 12: Roadway markings on 60th Street, west of Fourth Avenue



Figure 13: Looking north on Fourth Avenue to 59th 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. 314 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 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*
Third Avenue/61 st Street (west side)	7	1	0	1
Third Avenue/61 st Street (east side)	0	0	0	0
Fourth Avenue/61 st Street	22	4	0	0
Third Avenue/60 th Street (west side)	44	2	0	0
Third Avenue/60 th Street (east side)	120	3	1	0
Fourth Avenue/60 th Street	44	6	0	1
Fifth Avenue/60 th Street	22	6	1	1
Third Avenue/59 th Street (east side)	11	0	0	0
Third Avenue/59 th Street (west side)	1	0	0	0
Fourth Avenue/59 th Street	27	1	0	0
Third Avenue/58 th Street (east side)	20	7	0	1
Third Avenue/58 th Street (west side)	10	1	0	0
Fourth Avenue/58 th Street	27	3	0	0
TOTAL	355	34	2	4

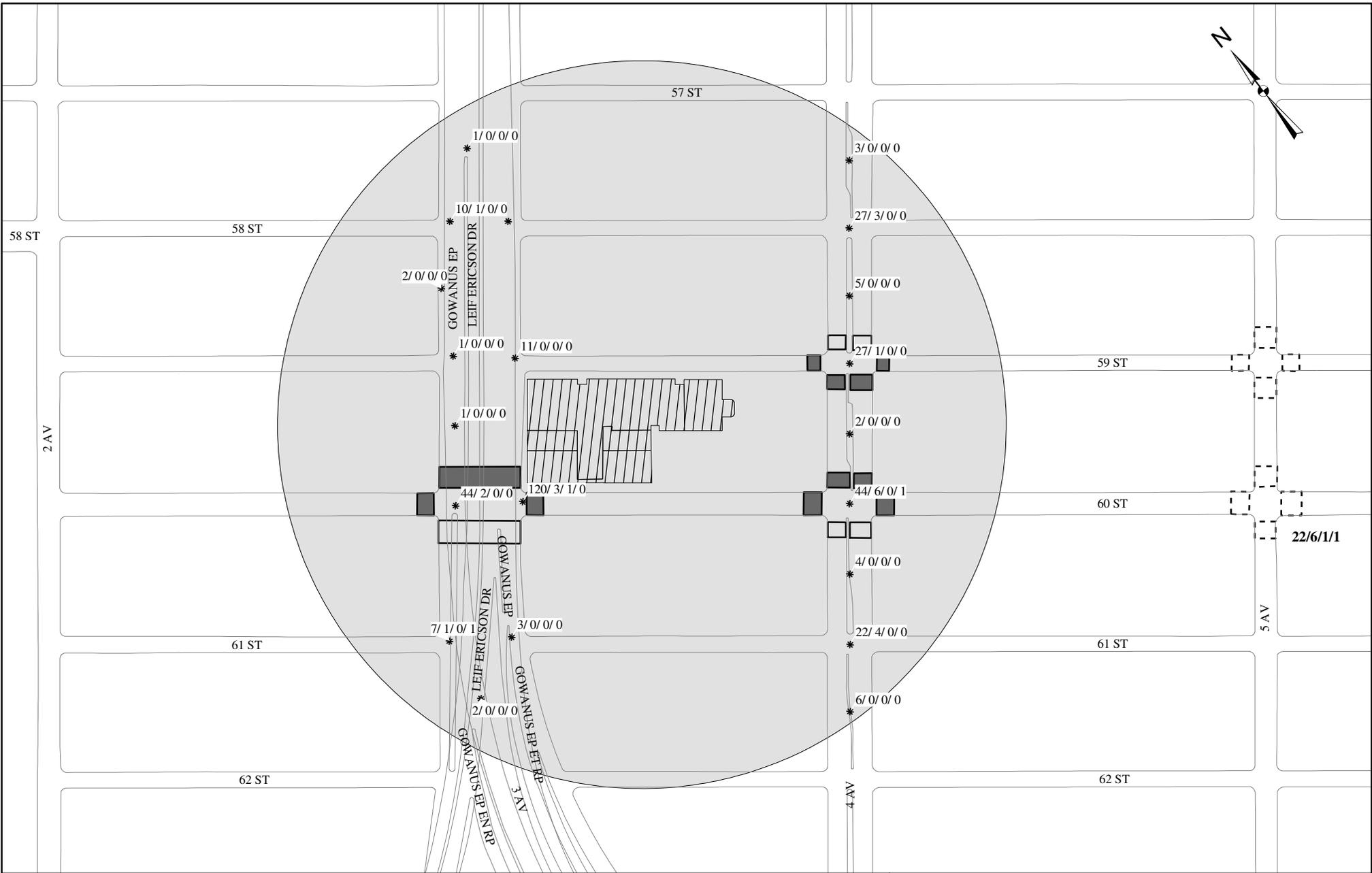
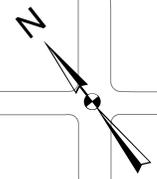
* School-Related Accidents are defined as accidents involving school-age pedestrians (age 4 – 14), occurring weekdays during the school year.

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

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Third Avenue/61 st Street **	16	4	0	0
Fourth Avenue/61 st Street	26	6	0	1
Third Avenue/60 th Street **	184	10	0	0
Fourth Avenue/60 th Street	80	10	0	1
Fifth Avenue/60 th Street	38	4	0	0
Third Avenue/59 th Street **	16	1	0	0
Fourth Avenue/59 th Street	30	5	0	0
Third Avenue/58 th Street **	41	10	0	0
Fourth Avenue/58 th Street	38	3	0	0
TOTAL	469	53	0	2

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

** NYPD accidents are summarized for both east side and west side of the intersection



ACCIDENT LOCATION *

SCHOOL CROSSWALK ASSIGNED TO P.S. 314

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL

CROSSWALK

X/X/X/X

1 inch equals 250 feet

TOTAL ACCIDENTS	PED ACCIDENTS	PED FATAL	SCHOOL_PED ACCIDENTS
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EXHIBIT 6
LUIS MUNOZ MARIN SCHOOL
P.S. 314, BROOKLYN
ACCIDENT SUMMARY
THREE YEAR PERIOD
(1998-2000)

3.6 TRAFFIC OPERATIONS AND ISSUES

The following outlines the traffic accidents and operations issues at intersections in the vicinity of the school.

3.6.1 Third Avenue at 60th Street

Third Avenue is two-way (north-south) collector street approximately 145 feet wide with multiple lanes in each direction. 60th Street is a 44-foot wide two-way roadway with one moving lane in each direction and parking along both sides of the street. This intersection is controlled by a three-phase signal with a northbound and southbound “lagging” left turn phase. At the time of the first site visit, students did not have sufficient time to cross 3rd Avenue at a rate of 3 feet per second. However, on December 23, 2004, a seven second Leading Pedestrian Interval (LPI) was implemented for pedestrians crossing Third Avenue at 60th Street. See Section 3.7 for further discussion.

Pedestrian counts were performed at Third Avenue on Wednesday October 27, 2004 between 7:30 A.M and 8:30 A.M and are summarized below. The intersection has two crossing guards stationed at the northwest and northeast corners. From Table 4 it can be seen that a significant number of pedestrians also cross Third Avenue on the south crosswalk of the intersection which is not a designated school crosswalk.

TABLE 4: ONE HOUR PEDESTRIAN VOLUMES				
INTERSECTION	3RD AVENUE (NORTH CROSSWALK)	60TH STREET (EAST CROSSWALK)	3RD AVENUE (SOUTH CROSSWALK)	60TH STREET (WEST CROSSWALK)
Third Ave. and 60th St.	200	142	142	136

The west side of this intersection has been the site of 44 accidents between 1998 and 2000 (Exhibit 6 and Table 2). Two of the reported accidents during this period involved pedestrian injuries, though none were school age pedestrians.

The east side of this intersection has been the site of 120 accidents between 1998 and 2000 (Exhibit 6 and Table 2). One of the accidents was fatal, with three accidents involving pedestrians. The pedestrians were ages 22, 48, and 75. All three pedestrians were crossing against the traffic signal at the time of these accidents. The two non-fatal accidents occurred at 8:00am and the fatality occurred at 6:00am. Many of the reported accidents were right angle accidents, left turns (against other vehicles), rear-end collisions, and right turn accidents (against other vehicles).

3.6.2 Fourth Avenue at 60th Street

Fourth Avenue is an 87-foot wide two-way (north-south) roadway with three moving lanes in each direction and parking along both sides of the street. The intersection with 60th Street is controlled by a three-phase signal including a “lagging” left turn phase. A seven second Leading Pedestrian Interval (LPI) was implemented on December 23,

2004 for pedestrians crossing Fourth Avenue at 60th Street. See Section 3.7 for further discussion.

Exhibit 7 shows one-hour turning movement counts conducted on March 30, 2005 during dismissal time (between 2:30 pm and 3:30 pm). There were 116 (57+59) vehicles turning into the north crosswalk conflicting with 270 pedestrians in that hour.

This intersection has been the site of 44 accidents between 1998 and 2000 (Exhibit 6 and Table 2), none of which were fatal. Six of the reported accidents involved pedestrians, with one pedestrian being a seven-year-old school age pedestrian who was struck at 6PM. This student pedestrian was reported as emerging from between parked vehicles at the time of the accident. The student was not crossing at the crosswalk at the time of the accident.

The other accidents involved non-school age pedestrians. Of these accidents, two pedestrians were crossing against the traffic signal, two were unreported, and one was crossing with the traffic signal. The pedestrian crossing with the traffic signal, at 2:00pm, was 68 years old.

3.6.3 Fourth Avenue at 59th Street

59th Street is a 30-foot wide one-way (westbound) roadway with one moving lane and parking along both sides of the street. The intersection of Fourth Avenue and 59th Street is controlled by a two-phase signal. As noted in Table 5, pedestrians are required to cross Fourth Avenue in two phases when crossing at a rate of three feet per second; however, the existing median should be widened in order to provide a safer refuge.

Exhibit 7 shows a one-hour turning movement count performed between 2:30 pm and 3:30 pm, March 30, 2005, during school dismissal time.

This intersection has been the site of 27 accidents between 1998 and 2000 (Exhibit 6 and Table 2), none of which were fatal. One of the reported accidents involved pedestrian injuries, but school age pedestrians were not involved.

3.6.4 Third Avenue at 59th Street

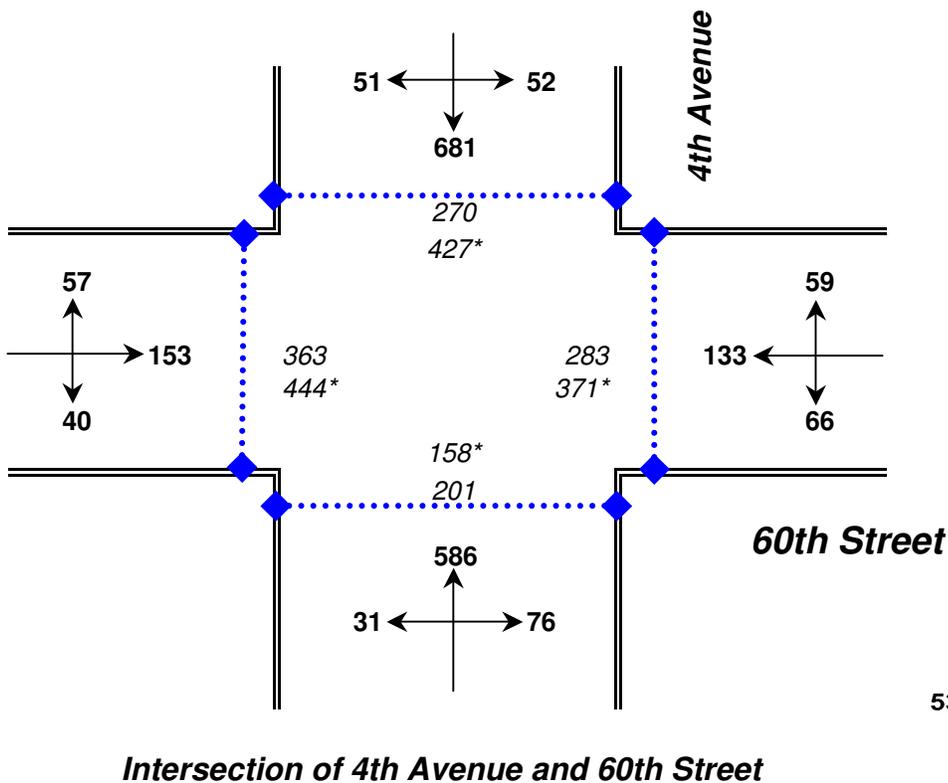
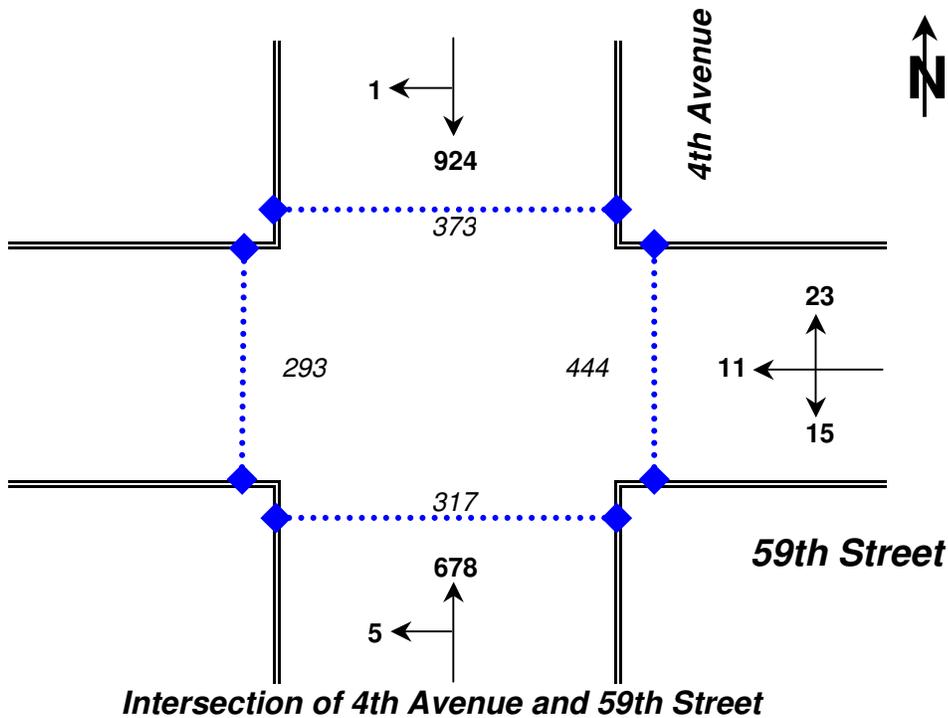
A barrier prevents westbound through traffic on 59th Street from crossing Third Avenue. This intersection is not signalized. Pedestrians were observed walking around the barrier and crossing Third Avenue at this location.

There was one accident on the west side of this intersection between 1998 and 2000 (Exhibit 6 and Table 2). The accident was not fatal and did not involve a pedestrian.

The east side of this intersection has been the site of eleven accidents between 1998 and 2000 (Exhibit 6 and Table 2). The accidents were not fatal and none involved pedestrians.

One Hour Traffic Count Volumes

(2:30 PM - 3:30 PM March 30, 2005)



Number of Pedestrians
 Pedestrian Crossing
 Vehicle Movement
 Number of Vehicles

XX*- 7:30AM - 8:30AM pedestrian

EXHIBIT 7
P.S. 314, BROOKLYN LUIS MUNOZ MARIN SCHOOL
TURNING MOVEMENT COUNTS

3.6.5 Fifth Avenue and 60th Street

At the intersection of Fifth Avenue and 60th Street, a 33-year-old pedestrian was killed on January 20th, 2000 at 8:00am. This pedestrian was crossing with the traffic signal. It was reported that it was snowing at the time of the accident and that the road conditions were wet.

3.6.6 Third Avenue and 61st Street

A nine-year-old pedestrian was struck at this intersection on January 22nd, 1999 at 8 AM. It was reported that it was raining at the time of the accident; however, the road conditions noted in the accident data do not verify this. The intersection of Third Avenue at 61st Street does not have crosswalks or school crosswalks. Pedestrians are supposed to cross at 60th Street, where there are crosswalks and school crossing guards.

3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at signalized intersections in the vicinity of P.S. 314 in September 2005 and is tabulated below:

TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS				
Intersection Name	Crosswalk Width (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd¹ (Seconds)	Timing Adjustment? (Yes/No)
Third Ave. @ 60th St.				
Third Avenue	73 / 73	36 ² / 36 ²	27 / 27	NO
60 th Street	45	53	18	NO
Fourth Ave. @ 60th St.				
Fourth Avenue	43 / 43	27 / 27	18 / 18	NO
60 th Street	45	65 ³	18	NO
Fourth Ave. @ 59th St.				
Fourth Avenue	43 / 43	33 / 33	18 / 18	NO ⁴
59 th Street	30	75	13	NO

Notes:

1. A rate of 3 feet per second plus 3 seconds reaction time was utilized as the rate that a child pedestrian travels.
2. The total crossing time of 36 seconds includes a 6 second Leading Pedestrian Interval (LPI) which was installed on December 23, 2004 by the NYCDOT.
3. The total crossing time of 65 seconds includes a 7 second Leading Pedestrian Interval (LPI) which was installed on December 23, 2004 by the NYCDOT.
4. Pedestrians are required to cross Third Avenue and Fourth Avenue in two signal cycles

The total width of Third Avenue is approximately 186 feet. However the current timing requires a pedestrian to cross the avenue in two pedestrian cycles, waiting at the center median between cycles. As indicated in the table above there is adequate time for a child pedestrian to cross 73 feet to the median in one phase. A similar situation exists for Fourth Avenue.

3.8 PHYSICAL CONDITIONS (ROADWAY AND SIDEWALK)

Sidewalks on 60th Street and 59th Street are approximately 15 feet wide in the vicinity of P.S. 314. The sidewalk on Fourth Avenue is approximately 18 feet wide and the sidewalk on Third Avenue is approximately 12 feet wide in the vicinity of P.S. 314. These sidewalks were found to be in good condition.

Most of the pedestrian ramps at the observed study intersections are in good to fair condition and do not need to be upgraded. Exceptions are ramps at:

- Fourth Avenue and 60th Street – northwest corner: signal pole conflicts with pedestrian ramp (Figure 14)
- Third Avenue and 60th Street – southwest corner: existing ramp is a non-standard apex ramp.



Figure 14 – The existing northwest corner of Fourth Avenue at 60th Street with non-standard pedestrian ramp

4. POTENTIAL MEASURES TO IMPROVE SCHOOL PEDESTRIAN SAFETY

This section describes potential countermeasures to improve school pedestrian safety. These countermeasures are divided into “short-term” and “long-term”. Short-term measures are those that potentially can be performed in-house; long-term measures are proposed capital improvements.

4.1 SHORT-TERM OPTIONS

- *Install graphic “Yield to Pedestrian Sign”*

A “Yield to Pedestrian Sign” should be installed at the following approaches (these crosswalks are assigned to this school and have substantial vehicle-student pedestrian volumes):

- Third Avenue southbound approach at 59th Street
- Third Avenue northbound approach at 60th Street
- Fourth Avenue eastbound approach at 60th Street

- *No-Standing Zone*

“NO STANDING, 7:00 AM TO 4:00 PM, SCHOOL DAYS” regulations should be placed on the north side of 60th Street between Third and Fourth Avenues. Teacher parking will be relocated to the east side of Third Avenue. This will provide clear frontage for school buses to drop-off and pick-up students in front of the school.

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

It is recommended to install a pedestrian information sign adjacent to each of the crosswalks at the intersection of 60th Street and Third Avenue. The sign provides instruction to pedestrians on how to read the “Walk/Don’t Walk” signs at this long crossing.

- *Install enlarged signal lenses*

An enlarged 12” red signal lenses will be installed at the Third Avenue intersection with 60th Street. Replacing existing 8-inch signal lenses with 12-inch signal lenses will improve motorists visibility.

- *Install new school crosswalks, signs and roadway markings*

Install new school crosswalk and associated signage at the following locations:

- 59th Street at Third Avenue (east and west legs)
- 61st Street at Third Avenue (east leg)

The new crosswalks and signage will alert drivers that students cross the street at these locations en route to school, thus making the route safer for students.

▪ Proposed Leading Pedestrian Interval (LPI) at the following intersections

The Leading Pedestrian Interval (LPI) is a signal timing strategy that is designed to minimize turning vehicle/pedestrian conflicts. The LPI provides an exclusive "Walk" period (approximately six to ten seconds) at the start of the signal phase, long enough for pedestrians to establish their presence in the crosswalk.

Modification of pedestrian signal timing to include an LPI should be considered at the following intersections:

- Third Avenue at 60th Street
- Fourth Avenue at 60th Street

(LPIs have been implemented at both intersections on 12/23/2004)

▪ Administer student pedestrian safety education program

It is recommended that the NYCDOT, Safety Education Program work with the school to educate the students not to cross at mid-block locations.

▪ Place advance stop bars before school crosswalk at the following locations:

- 60th Street and Third Avenue (westbound approach) – 47 feet in advance of intersection
- 60th Street and Fourth Avenue (eastbound approach) – 20 feet in advance of intersection (see Exhibit 8 for detail).

In addition, "STOP HERE ON RED" signs should be installed on both locations.

▪ Install "right turn only" pavement markings at the following locations:

- Third Avenue and 59th Street (westbound approach)
- Third Avenue and 61st Street (westbound approach)

▪ Red Light Camera Installation at Third Avenue and 60th Street

The intersection of Third Avenue and 60th Street is being considered as a candidate location for red light camera installation. Current legislation limits the number of red light cameras that can be installed in the City of New York. Therefore legislation is required to add additional red light cameras in the City of New York.

▪ Closure of 59th Street during school dismissal

The NYPD Precinct 72 and the NYCDOT have sanctioned the closing of 59th Street from Third Avenue to Fourth Avenue on school days for afternoon dismissal.

Install pedestrian barriers at the following locations:

It was noted during the field observations that students from P.S. 314 tend to cross Third Avenue at locations between 59th and 62nd Streets, where there are no pedestrian crosswalks or traffic signals. This tendency was also confirmed by the school principal during the meeting with the school. Therefore, it is proposed that pedestrian fences be installed at the following locations:

- Third Avenue, between 58th and 60th Streets - fences should be installed on both service road medians. Jersey barrier should be installed at 59th Street.
- Third Avenue, between 60th Street and 62nd Street – the pedestrian fence should be installed on the center median.



Figure 16 – Existing barrier along Third Avenue at 59th Street

▪ Install a school sign with flashing beacons at Gowanus Expressway off-ramp

Install a school sign accompanied with an “AHEAD” sign and two flashing beacons at the end of Gowanus Expressway northbound off-ramp to alert drivers to the presence of school pedestrians. The proposed sign should be installed on an existing street light pole (see Exhibit 8 for detail).

4.2 LONG-TERM OPTIONS

▪ Install/replace pedestrian ramps

Consideration should be given for installation and/or replacement of pedestrian ramps per NYCDOT standards at the following locations:

- Fourth Avenue and 60th Street – northwest corner (will require relocation of the signal pole)
- Third Avenue and 60th Street – southwest corner (will require relocation of the signal pole)

▪ Extend and widen Fourth Avenue medians

Current signal timing requires child pedestrians crossing Fourth Avenue at three feet per second to wait at the medians between pedestrian cycles. The existing median needs to be widened to provide safer refuge for pedestrians.

Consideration should be given to extending the Fourth Avenue medians through the full crosswalk area, and providing at-grade ADA compliant cut-throughs (extending the full width of the crosswalk).

The medians should also be widened to provide a safer pedestrian refuge.

The additional width of the medians could be achieved by widening Fourth Avenue between 59th Street and 60th Street by 1' along each curb line. This widening will reduce the sidewalks from approximately 17' to 16' feet on either side of Fourth Avenue.



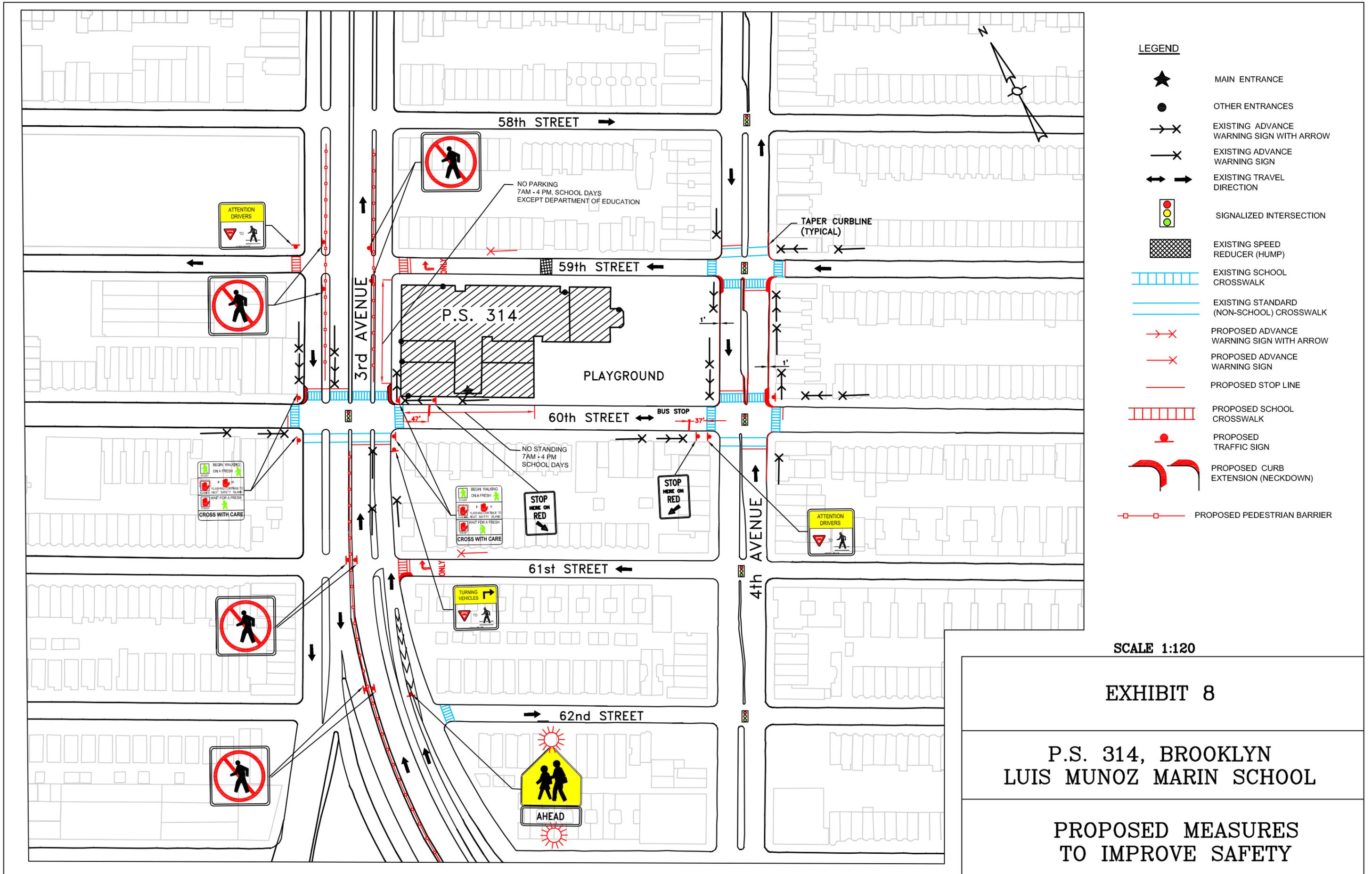
Figure 17 – Existing median on Fourth Avenue and 60th Street (north side)

- Install curb extensions at the following intersections:
 - Northeast corner of Fourth Avenue and 60th Street (on Fourth Avenue)
 - Southeast and southwest corners of Fourth Avenue and 59th Street (on Fourth Avenue).
 - Northeast and northwest corners of 60th Street and Third Avenue (on Third Avenue)
 - Southeast corner of 61st Street and Third Avenue on Third Avenue)

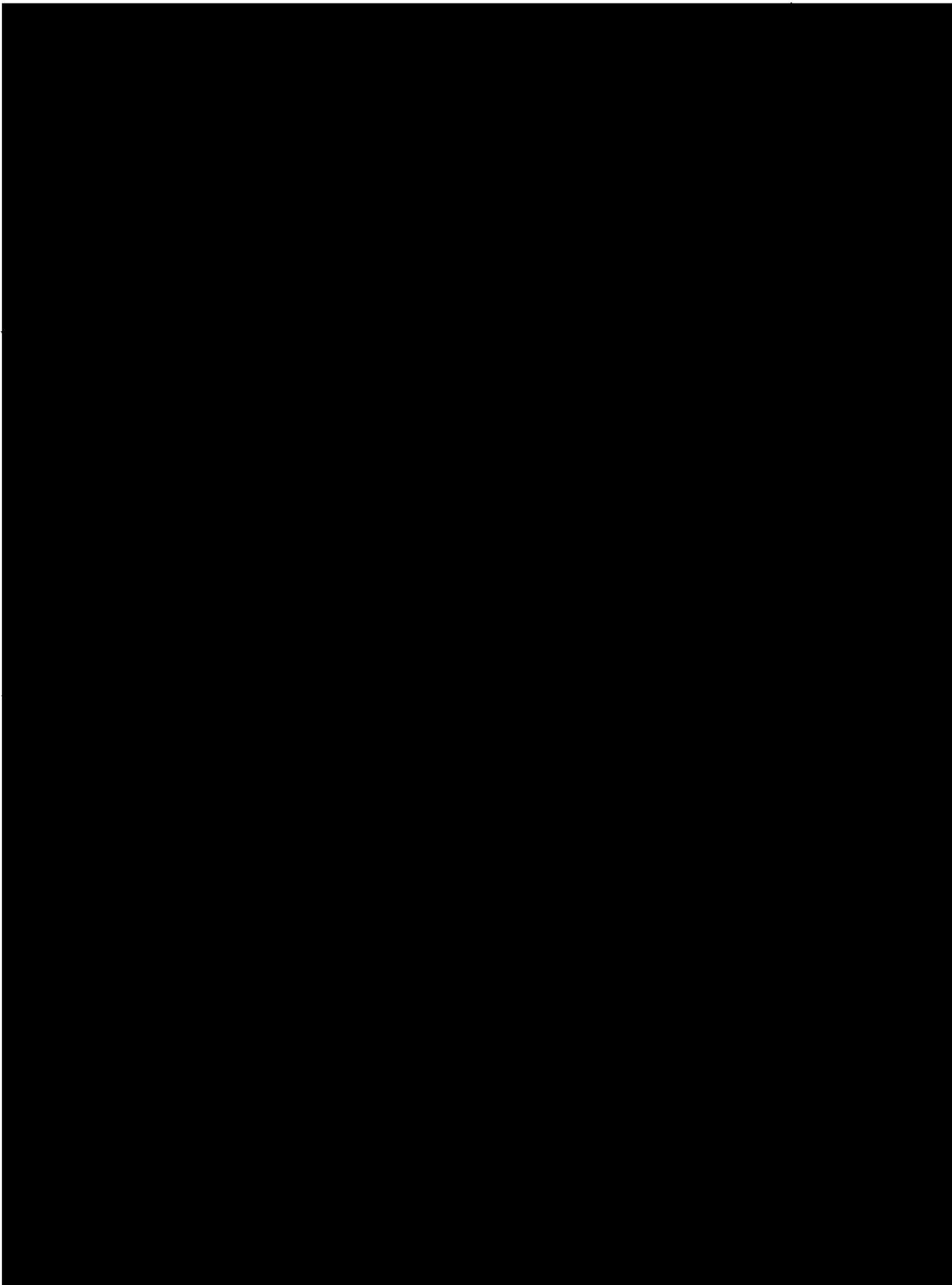
Curb extensions should be installed at the corners as shown in Exhibit 8.

The purpose of curb extensions is to reduce the speeds of approaching and turning vehicles at these heavily utilized school crosswalks, as well as providing increased pedestrian storage space and to shorten the crossing distance.

These curb extensions will not eliminate or reduce the width of any moving lanes. Curb extensions are not proposed where they would hinder a vehicle's ability to turn. Final details pertaining to curb extensions will be developed during Final Design/Contract Document preparation.



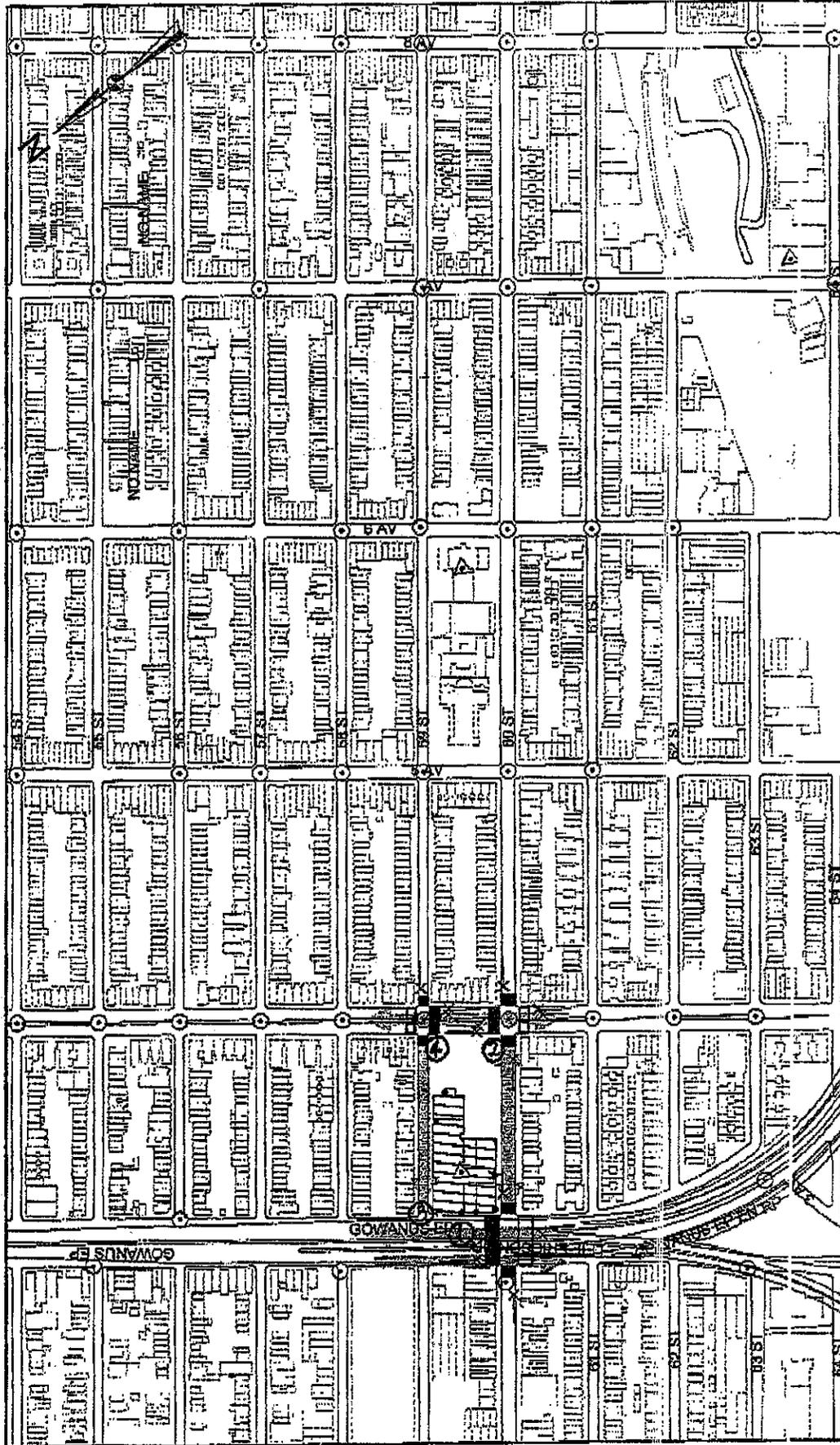
APPENDIX



BUREAU OF TRAFFIC

**TRAFFIC SAFETY PLAN
OFFICIAL ROUTES TO SCHOOL**

**NEW YORK CITY
DEPT. OF TRANSPORTATION**



**LUMUNOZ MARIN SCHOOL
P.S. 314**

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

DATE: 12/14/90
DRAWING NO. 041500
DESIGNER: J. J. J. J.
CHECKER: J. J. J. J.
REVISIONS: 7
PRECINCT: 72

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

The TRAFFIC SAFETY PLAN shown on this map was established to provide the maximum degree of safety for children going to and from school. It is required that all drivers follow the prescribed routes and use the designated crosswalks.

4TH AVENUE AND 60TH STREET

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BROOKLYN BOROUGH
 Title3 : P.S 314

Site:
 Date: 03/30/05

Combined

**Peds not included in table data*

Begin Time	Total	4th Avenue			60th Street			4th avenue			60th Street		
		SB-R	SB-T	SB-L	WB-L	WB-T	WB-R	NB-L	NB-T	NB-R	EB-L	EB-T	EB-R
14:33:00	17	0	4	0	2	3	2	0	0	0	1	5	0
14:35:00	160	4	52	4	4	7	2	3	64	3	3	8	6
14:40:00	132	1	53	7	6	14	2	4	45	1	3	11	5
14:45:00	167	3	67	5	4	7	3	12	56	0	1	5	4
14:50:00	181	5	42	3	9	22	9	4	51	3	2	24	7
14:55:00	147	9	57	2	6	7	3	11	39	2	3	6	2
15:00:00	170	6	43	7	2	12	10	3	49	3	11	14	10
15:05:00	167	5	73	3	7	9	4	3	54	0	0	6	3
15:10:00	170	3	50	4	4	14	4	3	52	2	5	23	6
15:15:00	161	2	64	8	2	4	7	6	46	5	2	10	5
15:20:00	164	3	59	2	3	17	9	11	32	4	5	13	6
15:25:00	194	4	79	2	3	9	9	13	57	4	2	9	3
15:30:00	135	6	38	5	7	8	2	3	41	4	2	19	0
1,985		51	681	52	59	133	66	76	586	31	40	153	57

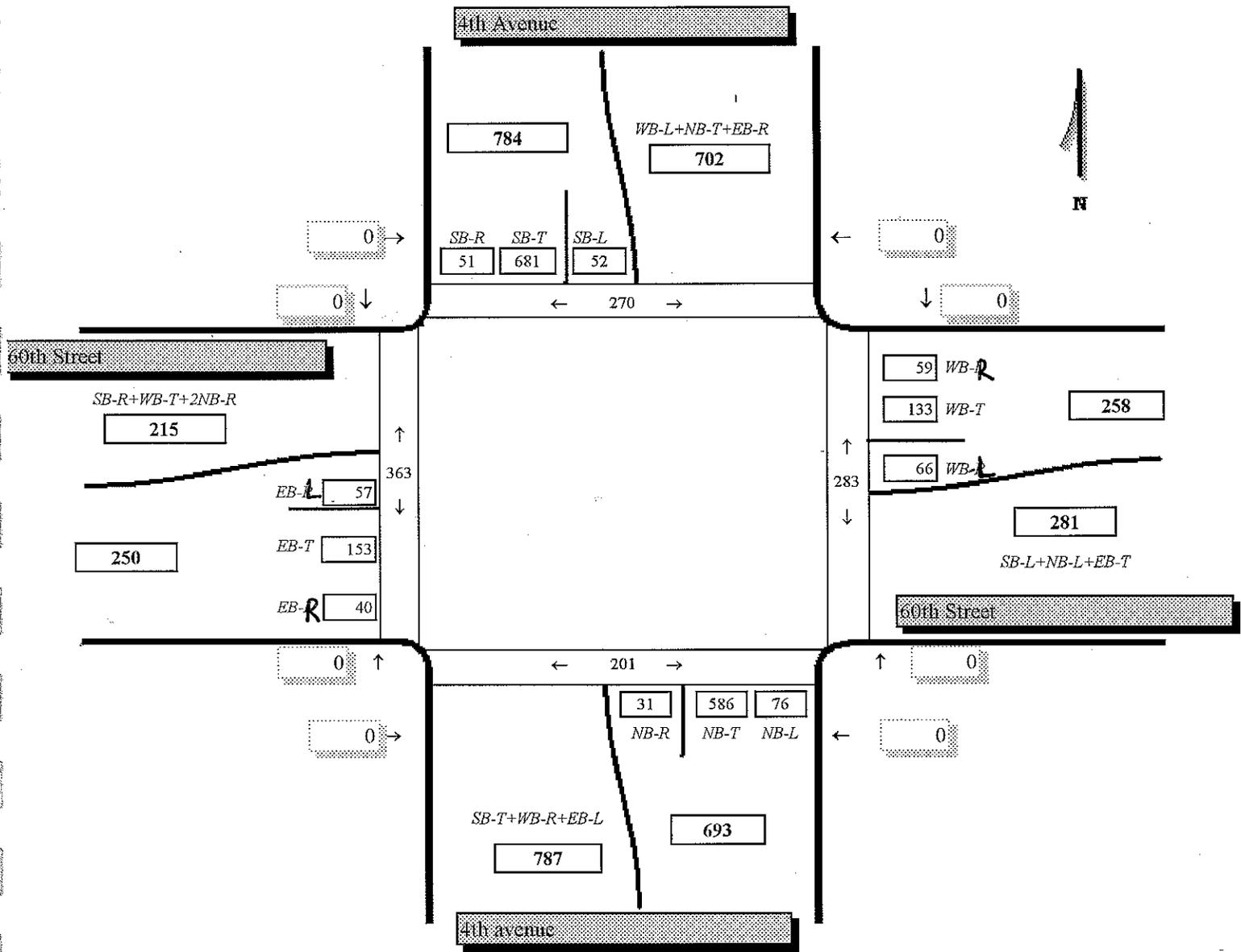
Peak Volume Periods <small>(1 hour Res: 15 min)</small>					
Period		Peak Period		Volume	
AM	05:00:00 To 10:00:00	NA	To NA	0	
Noon	10:00:00 To 15:00:00	14:30:00	To 15:30:00	824	
PM	15:00:00 To 20:00:00	14:30:00	To 15:30:00	1,850	

4TH AVENUE AND 60TH STREET

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BROOKLYN BOROUGH
 Title3 : P.S 314

Site: 03/30/05
 Date:

Combined
 *Peds not included in table data



4TH AVENUE AND 59TH STREET

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BROOKLYN
 Title3 : P.S. 314

Site:
 Date: 03/30/05

Combined
 *Peds not included in table data

Begin Time	Total	4th Avenue			59th Street			4th Avenue			59th Street		
		SB-R	SB-T	SB-L	WB-L	WB-T	WB-R	NB-L	NB-T	NB-R	EB-L	EB-T	EB-R
14:31:00	99	0	64	0	1	1	4	0	29	0	0	0	0
14:35:00	144	0	80	0	3	0	1	0	60	0	0	0	0
14:40:00	123	0	59	0	2	0	0	0	62	0	0	0	0
14:45:00	139	0	83	0	0	0	0	0	56	0	0	0	0
14:50:00	119	0	56	0	1	0	0	0	62	0	0	0	0
14:55:00	135	0	78	0	0	0	0	0	57	0	0	0	0
15:00:00	127	0	64	0	0	0	0	0	62	0	0	0	1
15:05:00	123	0	68	0	0	0	0	0	55	0	0	0	0
15:10:00	174	0	97	0	3	0	0	0	74	0	0	0	0
15:15:00	139	0	84	0	5	1	1	0	48	0	0	0	0
15:20:00	148	0	93	0	1	4	4	1	45	0	0	0	0
15:25:00	137	1	73	0	6	4	3	0	45	5	0	0	0
15:30:00	52	0	25	0	1	1	2	0	23	0	0	0	0
1,659		1	924	0	23	11	15	1	678	5	0	0	1

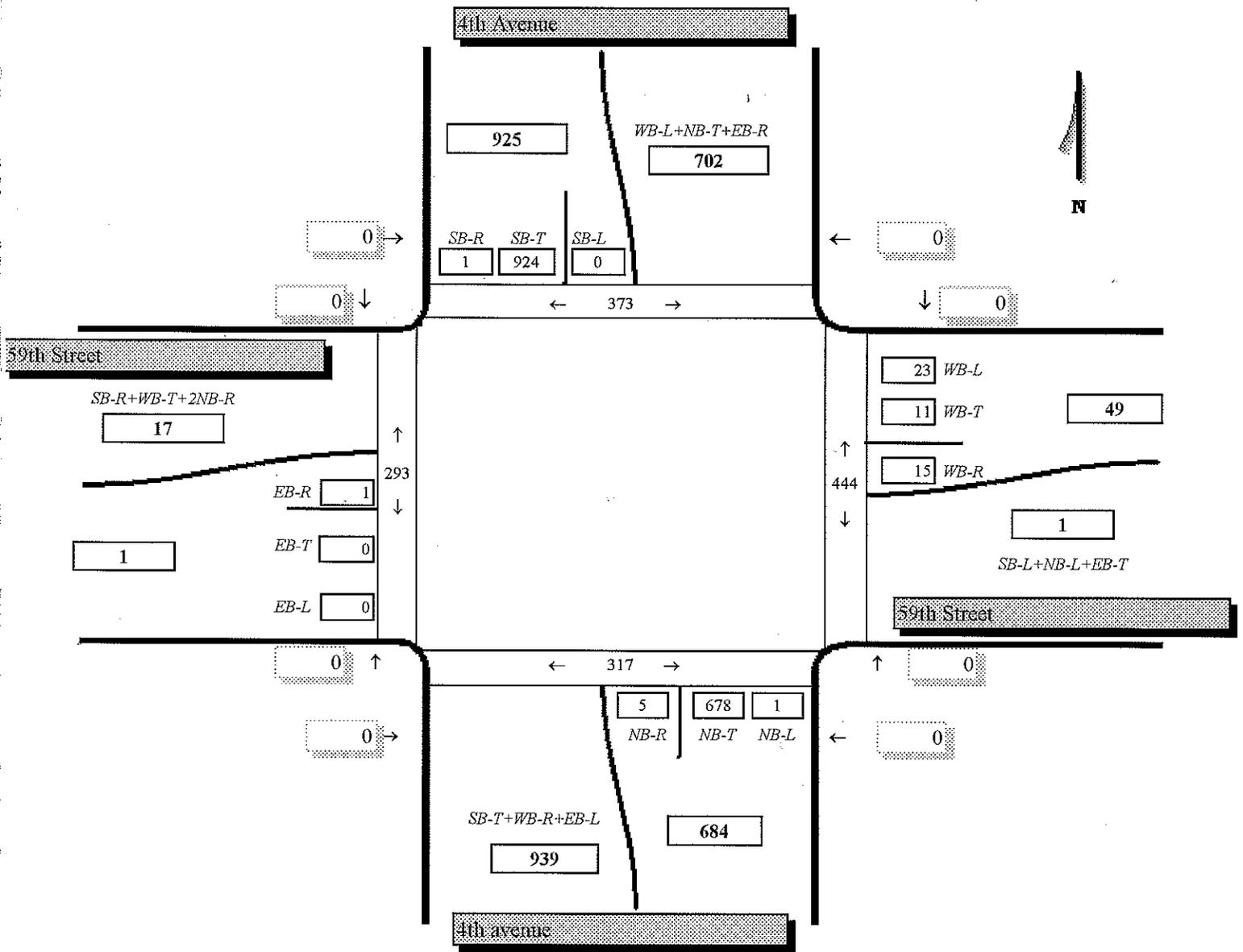
Peak Volume Periods <small>(1 hour Res 15 min)</small>					
Period		Peak Period		Volume	
AM	05:00:00 To 10:00:00	NA	To NA	0	
Noon	10:00:00 To 15:00:00	14:30:00	To 15:30:00	759	
PM	15:00:00 To 20:00:00	14:30:00	To 15:30:00	1,607	

4TH AVENUE AND 59TH STREET

Title1 : SCHOOL SAFETY ENGINEERING
 Title2 : BROOKLYN
 Title3 : P.S. 314

Site:
 Date: 03/30/05

Combined
 *Peds not included in table data



Analyst: TTHE RBA GROUP
 Agency:
 Date: 4/1/2005
 Period: PM PEAK
 Project ID: No LPI
 E/W St: 60TH STREET

Inter.:
 Area Type: All other areas
 Jurisd:
 Year : 2005
 N/S St: 6TH AVENUE

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	0	1	3	0	1	3	0
LGConfig	L	T	R	L	TR		L	TR		L	TR	
Volume	57	153	40	66	133	59	31	586	76	52	681	51
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		P			NB Left	P		
Thru		P			Thru	P		
Right		P			Right	P		
Peds		X			Peds	X		
WB Left		P			SB Left	P		
Thru		P			Thru	P		
Right		P			Right	P		
Peds		X			Peds	X		
NB Right					EB Right			
SB Right					WB Right			
Green	32.0	8.0			65.0			
Yellow	3.0	3.0			3.0			
All Red	2.0	2.0			2.0			

Cycle Length: 120.0 sec

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/C	Delay	LOS	Delay	LOS
Eastbound								
L	444	1805	0.14	0.38	30.2	C		
T	507	1900	0.34	0.27	37.2	D	35.0+	D
R	431	1615	0.10	0.27	33.6	C		
Westbound								
L	286	1073	0.26	0.27	36.8	D		
TR	483	1812	0.44	0.27	39.5	D	38.8	D
Northbound								
L	311	574	0.11	0.54	14.1	B		
TR	2761	5098	0.27	0.54	15.0	B	14.9	B
Southbound								
L	345	636	0.17	0.54	14.9	B		
TR	2780	5133	0.29	0.54	15.2	B	15.2	B

Analyst: TTHE RBA GROUP
 Agency:
 Date: 4/1/2005
 Period: PM PEAK
 Project ID: With 5 second LPI
 E/W St: 60TH STREET

Inter.:
 Area Type: All other areas
 Jurisd:
 Year : 2005
 N/S St: 6TH AVENUE

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	0	1	3	0	1	3	0
LGConfig	L	T	R	L	TR		L	TR		L	TR	
Volume	57	153	40	66	133	59	31	586	76	52	681	51
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		P	P		NB Left	P		
Thru		P			Thru	P		
Right		P			Right	P		
Peds		X	X		Peds	X		
WB Left		P			SB Left	P		
Thru		P			Thru	P		
Right		P			Right	P		
Peds		X	X		Peds	X		
NB Right					EB Right			
SB Right					WB Right			
Green		5.0	32.0	8.0		60.0		
Yellow		0.0	3.0	3.0		3.0		
All Red		0.0	2.0	2.0		2.0		

Cycle Length: 120.0 sec

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios		Lane Group		Approach	
			v/c	g/c	Delay	LOS	Delay	LOS
Eastbound								
L	279	1133	0.23	0.38	32.4	C		
T	497	1863	0.34	0.27	37.4	D	36.1	D
R	212	796	0.21	0.27	36.4	D		
Westbound								
L	163	611	0.45	0.27	45.3	D		
TR	430	1612	0.50	0.27	41.3	D	42.3	D
Northbound								
L	195	390	0.17	0.50	18.4	B		
TR	2257	4514	0.33	0.50	18.3	B	18.3	B
Southbound								
L	220	440	0.26	0.50	20.2	C		
TR	2289	4577	0.36	0.50	18.7	B	18.8	B