

**New York City Department of Transportation**

**Office of School Safety Engineering**



**School Safety Engineering Project**

**FINAL REPORT: Holy Cross, Brooklyn**



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



**SEPTEMBER 29, 2006**



**School Safety Engineering Project  
Holy Cross, Brooklyn**

**TABLE OF CONTENTS**

**1. INTRODUCTION ..... 4**  
1.1 PROJECT DESCRIPTION ..... 4  
**2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS..... 5**  
**2.1 NEIGHBORHOOD DESCRIPTION ..... 5**  
2.2 NEIGHBORHOOD DESCRIPTION ..... 5  
2.3 MEETING WITH SCHOOL REPRESENTATIVES..... 5  
**2.4 TRAFFIC OPERATIONS AND ANALYSIS..... 5**  
2.5 TRAFFIC OPERATIONS AND ANALYSIS..... 5  
2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL ..... 6  
2.7 OTHER STUDENT PEDESTRIAN TRAFFIC GENERATORS..... 9  
2.8 CROSSING GUARD LOCATIONS..... 9  
**3. TRAFFIC OPERATIONS..... 11**  
3.1 SCHOOL BUS OPERATIONS ..... 11  
3.2 PARENT DROP-OFF OPERATIONS ..... 11  
3.3 PARKING REGULATIONS ..... 12  
3.4 EXISTING SCHOOL SIGNS AND MARKINGS ..... 12  
3.5 ACCIDENT SUMMARY ..... 14  
3.6 TRAFFIC OPERATIONS AND ISSUES..... 16  
3.7 SIGNAL TIMING: PEDESTRIAN PHASE..... 21  
3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS) ..... 21  
**4. PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY..... 23**  
4.1 SHORT-TERM MEASURES ..... 23  
4.2 LONG-TERM MEASURES ..... 24  
4.3 ADDITIONAL RECOMMENDATIONS FOR PRIORITY SCHOOL IN THE VICINITY HOLY CROSS..... 25

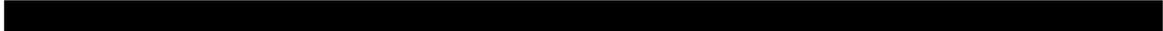
**EXHIBITS**

EXHIBIT 1 - AERIAL PHOTOGRAPH ..... 7  
EXHIBIT 2 - TRAFFIC SAFETY PLAN ..... 8  
EXHIBIT 3 - CROSSING GUARDS ..... 10  
EXHIBIT 4 - EXISTING PARKING REGULATIONS ..... 13  
EXHIBIT 5 - ACCIDENT SUMMARY ..... 15  
EXHIBIT 6A - TRAFFIC COUNTS ..... 19  
EXHIBIT 6B - TRAFFIC COUNTS ..... 20  
EXHIBIT 7 - PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY ..... 26

## TABLES

TABLE 1: MODES OF TRAVEL .....	6
TABLE 2: DMV THREE-YEAR ACCIDENT SUMMARY (1998-2000) .....	14
TABLE 3: NYPD FOUR-YEAR ACCIDENT SUMMARY (2001-2004).....	14
TABLE 4: SPOT SPEED STUDY – ROGERS AVENUE .....	16
TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS .....	21
TABLE 6: SPOT SPEED STUDY – ERASMUS STREET .....	24

## APPENDIX

	
SPOT SPEED STUDY – ROGERS AVENUE.....	A-2
SPOT SPEED STUDY – ERASMUS STREET.....	A-4

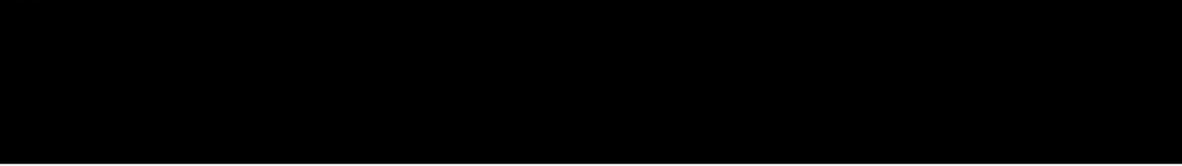
## **1. INTRODUCTION**

### **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). Holy Cross School in Brooklyn is one of the 135 priority schools.

## 2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS



### 2.2 NEIGHBORHOOD DESCRIPTION

Holy Cross School is located at 2520 Church Avenue in Brooklyn, between Johnson Place and Veronica Place. Church Avenue and Bedford Avenue within the immediate area of Holy Cross School have a mixture of commercial establishments and three to four story residential buildings (see Aerial Photograph, Exhibit 1).

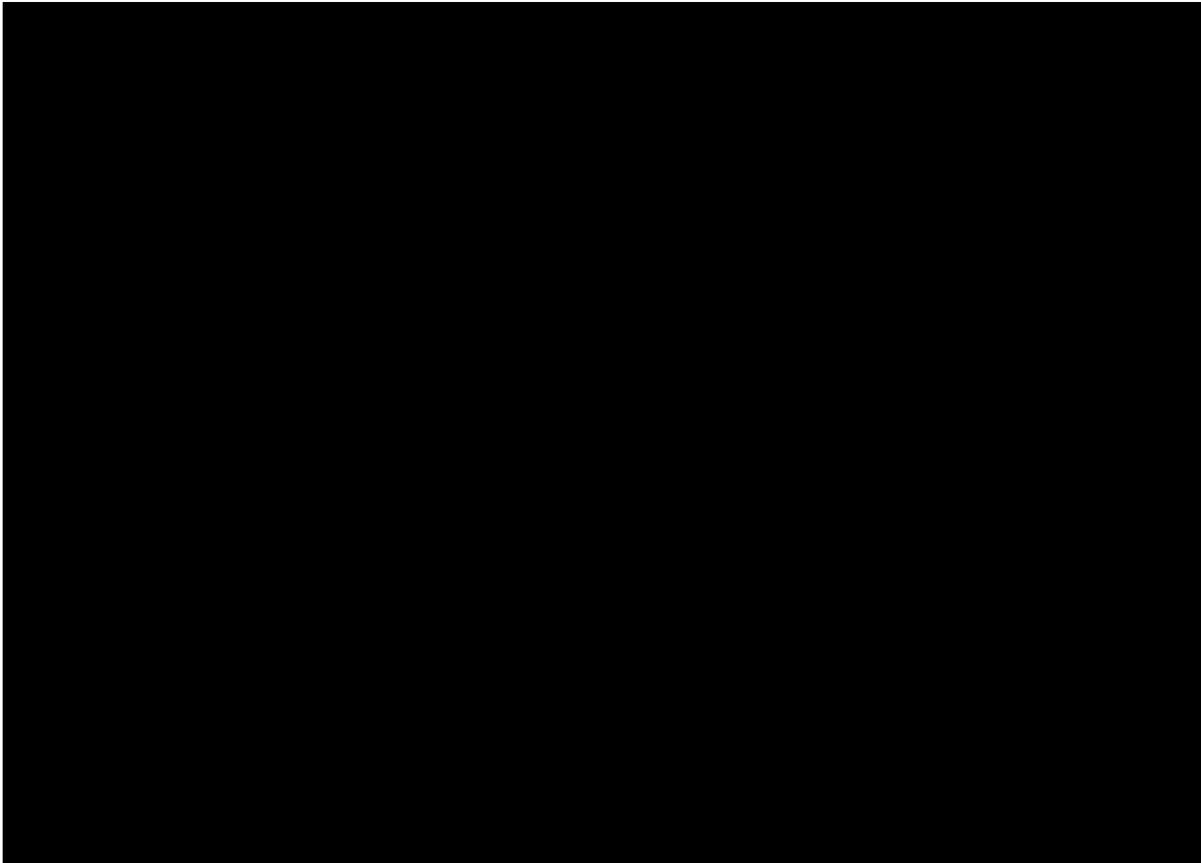


*Figure 1: Church Avenue, looking west toward Holy Cross School*

### 2.3 MEETING WITH SCHOOL REPRESENTATIVES

The consultant team and the school principal met at the school on the morning of June 1, 2004. According to the principal, the identifiable problems that student pedestrians encounter on a regular basis include the following:

- Safety issues with students crossing the intersection of Church Avenue and Rogers Avenue
- Buses and commercial activity on Church Avenue, including taxi and van pick up and drop off activities and U-turning traffic
- Speeds on Rogers Avenue
- Speeds on Erasmus Street
- School buses associated with other schools park on Church Avenue, occupying space needed for Holy Cross School.



## 2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

According to the principal, approximately 10% of students walk to school, 46% arrive by public transportation, and 44% of students are driven to school by parents or guardians. See Table 1 for the school’s estimate of the modes of travel.

<b>TABLE 1: MODES OF TRAVEL</b> (AS ESTIMATED BY SCHOOL OFFICIALS)	
Description	Percentage
Walk	10%
Driven by parent or guardian	44%
School bus	0%
MTA bus or subway	46%
<b>TOTAL</b>	<b>100%</b>

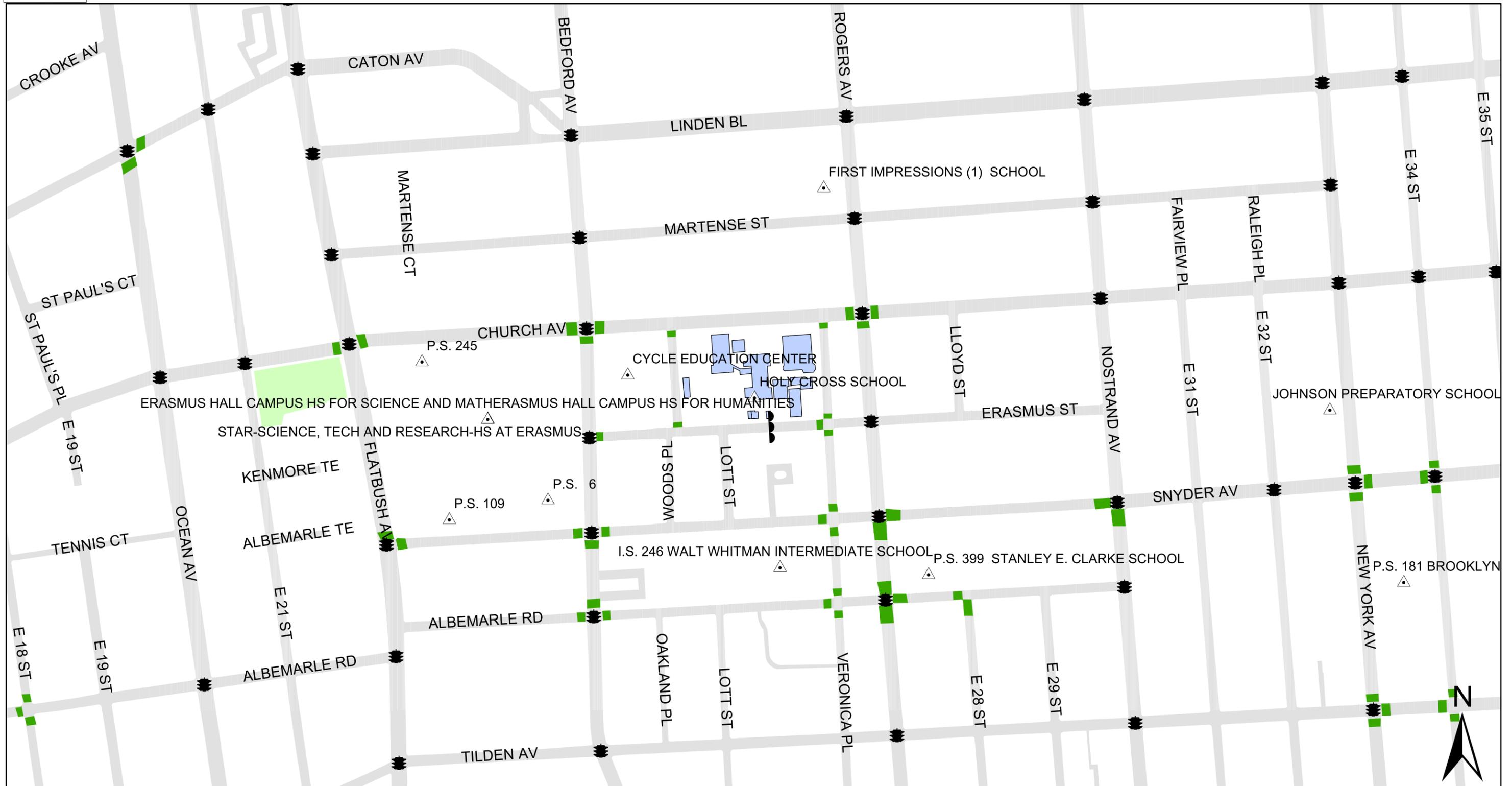


1 inch equals 146 feet

EXHIBIT 1

HOLY CROSS  
BROOKLYN

AERIAL PHOTOGRAPH



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

**Brooklyn**  
**HOLY CROSS SCHOOL**

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

Map created on 11/16/2006

**EXHIBIT 2**

1.5.1

COMM. BOARD:	317
PRECINCT:	67

## 2.7 OTHER STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are several other schools in the immediate neighborhood surrounding Holy Cross, including P.S. 6 on Bedford Avenue with 773 students, Erasmus High School on Flatbush Avenue with an enrollment of over 2,000 students, Explore Charter School, and P.S. 245 on Snyder Avenue with 161 students. P.S. 6 is also a priority school. In addition, a Boys and Girls Club on Bedford Avenue between Erasmus Street and Snyder Avenue has weekend and after school programs.

## 2.8 CROSSING GUARD LOCATIONS

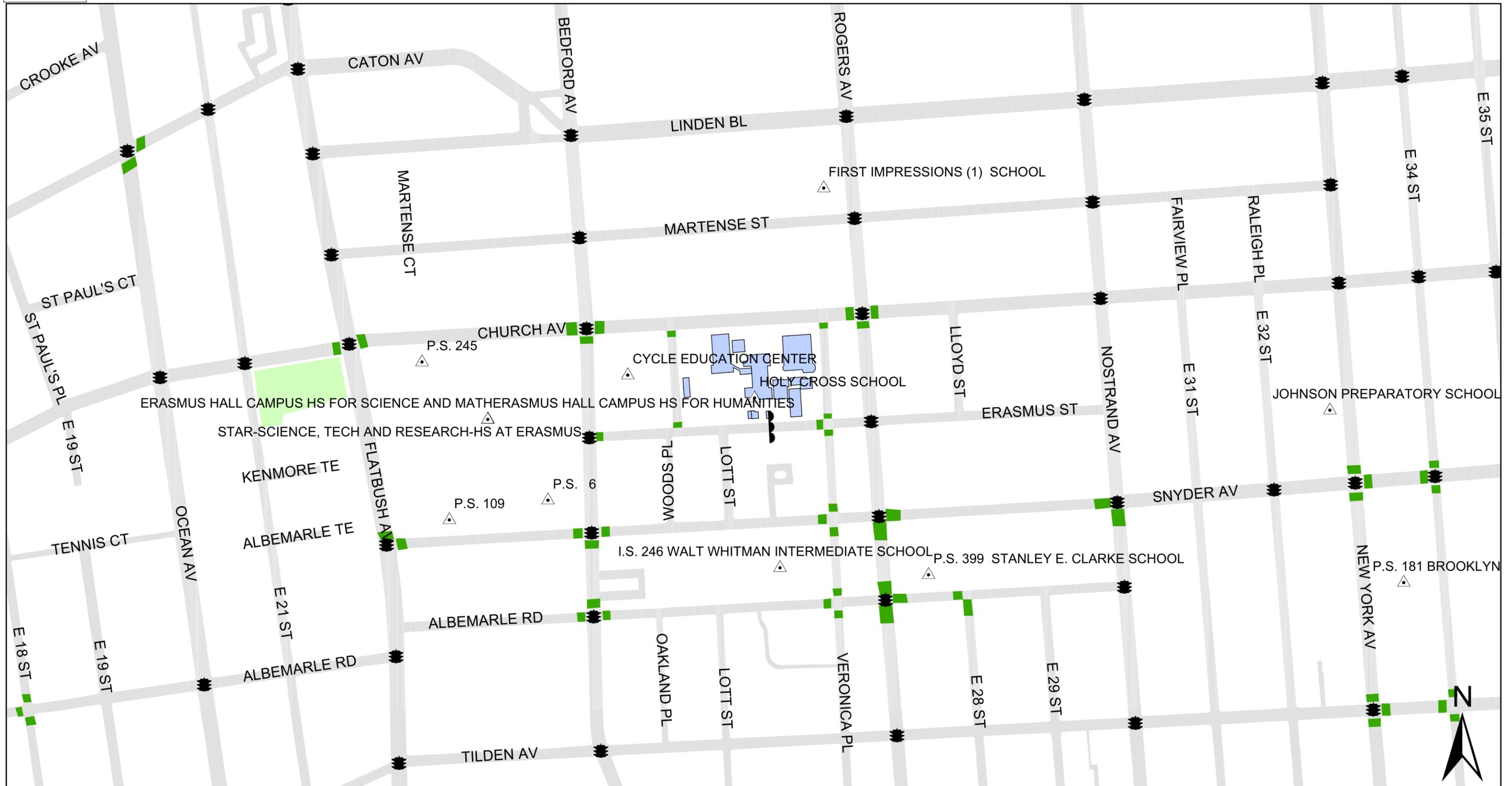
According to field observations, there are two crossing guards assigned to Holy Cross School. Both crossing guards were stationed at the intersection of Church Avenue and Rogers Avenue (Figure 3). See Exhibit 3 for a map of the crossing guard location.



*Figure 3: Crossing Guards on Church Avenue at Rogers Avenue*



# 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 

**Brooklyn**  
**HOLY CROSS SCHOOL**

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

Map created on 11/16/2006

**EXHIBIT 3**

1.5.1

COMM. BOARD:	317
PRECINCT:	67

### 3. TRAFFIC OPERATIONS

#### 3.1 SCHOOL BUS OPERATIONS

According to school officials none of the Holy Cross students use school buses to travel to and from school. However, several school buses affiliated with surrounding schools were observed to stage on Church Avenue during dismissal time, just west of Holy Cross School.



*Figure 4: School buses staging on Church Avenue*

#### 3.2 PARENT DROP-OFF OPERATIONS

According to the school principal, approximately 44% of students from Holy Cross School are driven to and from school by a parent or guardian. Parents pick up and drop off students on Erasmus Street and Church Avenue, or in the parking lot at the rear of the school. School teachers also use the lot for parking.



*Figure 5: Parent dropping off a child on Church Avenue*

### 3.3 PARKING REGULATIONS

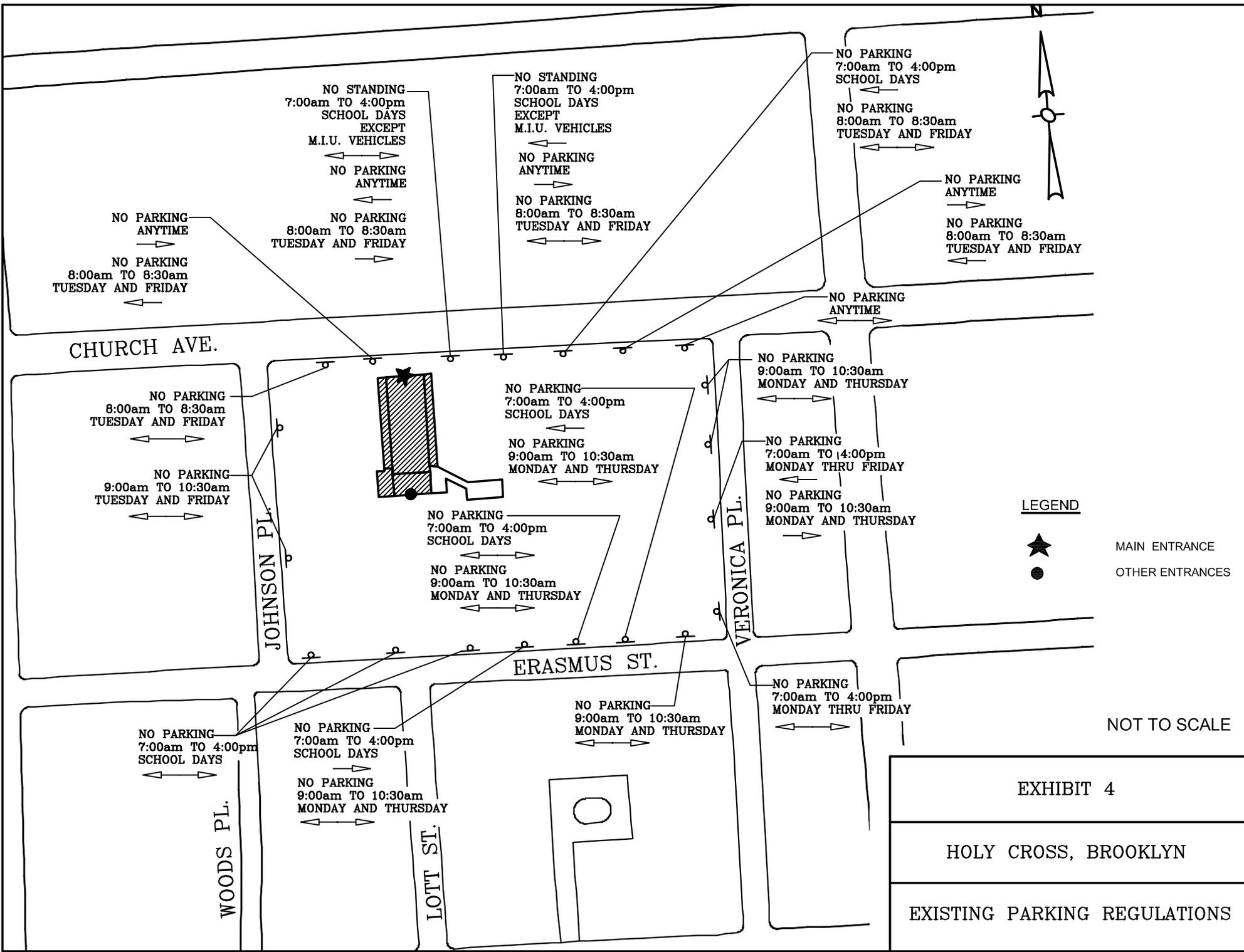
“NO STANDING 7 AM - 4 PM, SCHOOL DAYS, EXCEPT M.I.U. VEHICLES” parking regulations are posted on the south side of Church Avenue in front of the school. “NO PARKING 7 AM - 4 PM, SCHOOL DAYS” parking regulations are posted on the north side of Erasmus Street. Exhibit 4 shows the parking regulations on the roadways surrounding the school.



*Figure 6: Parking regulations on Church Avenue in front of the school*

### 3.4 EXISTING SCHOOL SIGNS AND MARKINGS

The Traffic Safety Plan, Exhibit 2, 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 sign and downward pointing arrows. Signs scheduled to be installed under this program are shown as “existing” on Exhibit 7.



LEGEND



MAIN ENTRANCE  
OTHER ENTRANCES

NOT TO SCALE

EXHIBIT 4

HOLY CROSS, BROOKLYN

EXISTING PARKING REGULATIONS

### 3.5 ACCIDENT SUMMARY

Exhibit 5 and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV), in the vicinity of Holy Cross School for the three-year period from January 1, 1998 through December 31, 2000. The DMV data provide some detail relating to the circumstances and cause of the accidents. Table 3 is a summary of more recent accident data obtained from the NYC Police Department (NYPD). Though current through 2004, the NYPD data do not provide the same level of detail as the DMV data.

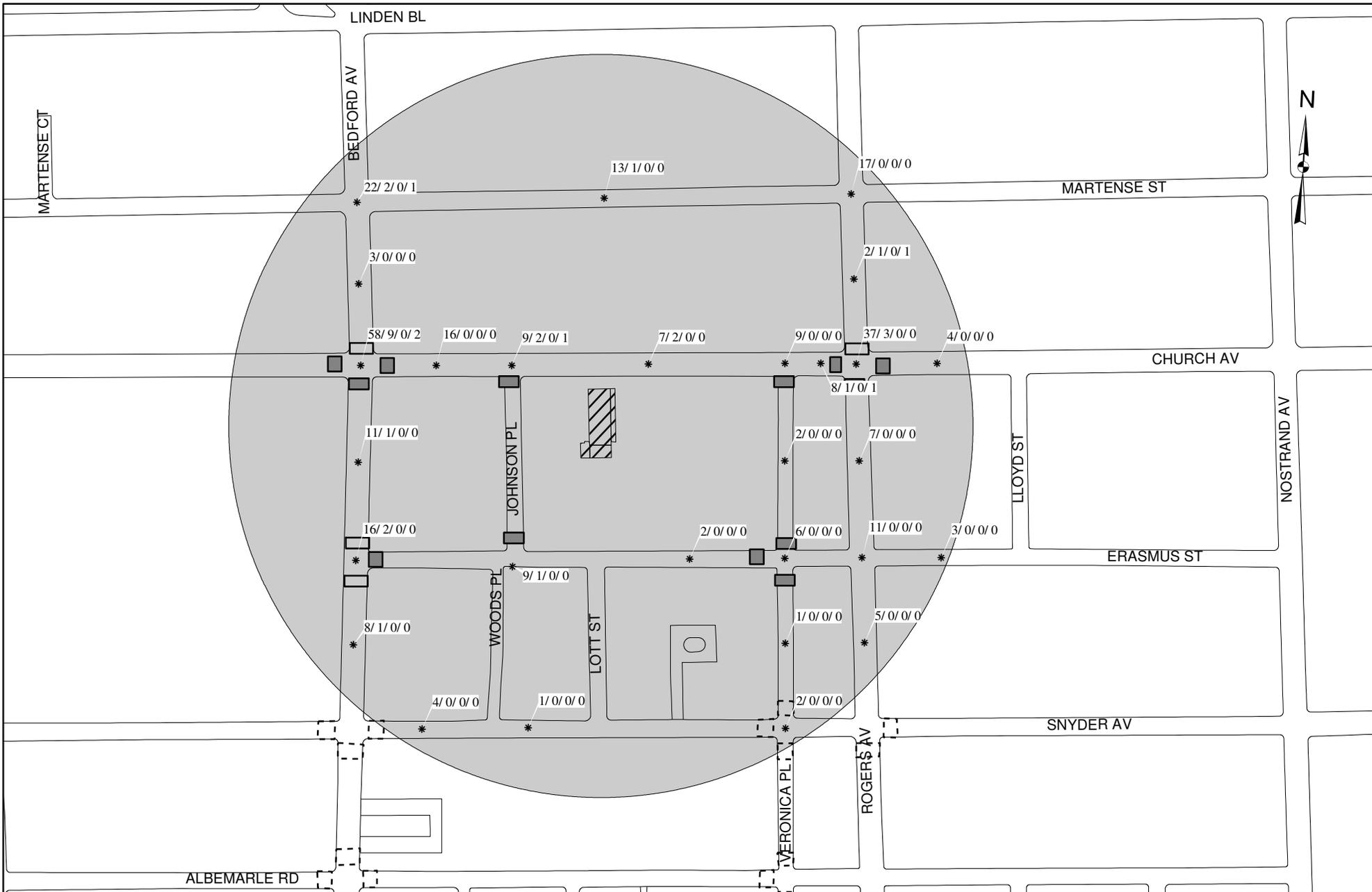
This report targets intersections closest to the school where the highest concentration of student pedestrians occurs. Intersections farther from the school and locations for which detailed data were not available at the time of this study will be addressed with the ongoing work of DOT's School Safety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

<b>INTERSECTION</b>	<b>TOTAL ACCIDENTS</b>	<b>PEDESTRIAN ACCIDENTS</b>	<b>PEDESTRIAN FATALITIES</b>	<b>SCHOOL-RELATED ACCIDENTS*</b>
Church Avenue and Rogers Avenue	37	3	0	0
Church Avenue and Veronica Place	9	0	0	0
Church Avenue and Johnson Place	9	2	0	1
Church Avenue and Bedford Avenue	58	9	0	2
Erasmus Street and Bedford Avenue	16	2	0	0
Erasmus Street and Johnson Place	9	1	0	0
Erasmus Street and Veronica Place	6	0	0	0
Martense Street and Bedford Avenue	22	2	0	1
<b>TOTAL</b>	<b>166</b>	<b>19</b>	<b>0</b>	<b>4</b>

<b>INTERSECTION</b>	<b>TOTAL ACCIDENTS</b>	<b>PEDESTRIAN ACCIDENTS</b>	<b>PEDESTRIAN FATALITIES</b>	<b>SCHOOL-RELATED ACCIDENTS*</b>
Church Avenue and Rogers Avenue**	71	8	1	n/a
Church Avenue and Veronica Place	13	3	0	0
Church Avenue and Johnson Place	10	1	0	0
Church Avenue and Bedford Avenue**	67	9	0	n/a
Erasmus Street and Bedford Avenue**	17	2	0	n/a
Erasmus Street and Johnson Place	2	1	0	0
Erasmus Street and Veronica Place	10	0	0	0
Martense Street and Bedford Avenue**	30	5	0	n/a
<b>TOTAL</b>	<b>220</b>	<b>29</b>	<b>1</b>	<b>n/a</b>

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

\*\*NYPD accident data does not always provide pedestrian age or accident time



ACCIDENT LOCATION \*

SCHOOL CROSSWALK ASSIGNED TO HOLY CROSS [Solid Gray Box]

SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL [Dashed Box]

CROSSWALK [Open Box]

X/X/X/X

TOTAL ACCIDENTS / PED ACCIDENTS / PED FATAL / SCHOOL\_PED ACCIDENTS

1 inch equals 250 feet

**EXHIBIT 5**  
**HOLY CROSS**  
**BROOKLYN**  
**ACCIDENT SUMMARY**  
**THREE YEAR PERIOD**  
**(1998-2000)**

### 3.6 TRAFFIC OPERATIONS AND ISSUES

The following outlines traffic accident and operational issues in the vicinity of Holy Cross School.

#### 3.6.1 Church Avenue and Rogers Avenue

This is a four-way signalized intersection. Church Avenue is a 44-foot wide, two-way roadway with one travel lane in each direction and parking on both sides. Rogers Avenue is a 44-foot wide, one-way northbound roadway with two travel lanes and parking on both sides. School crosswalks are in place on the east, west and south legs. Two crossing guards are stationed at this intersection.

This signalized intersection had 37 accidents during the 1998-2000 study period. Three accidents involved pedestrians, none of which were school-related. A left turning driver struck a pedestrian who was crossing with the signal. The second accident was attributed to driver inattention. There was no detailed information for the third accident.

A 14-year-old child with a four-year-old child was struck while crossing mid-block on Church Avenue between Rogers Avenue and Veronica Place.

A one-hour traffic count was performed between 2:30 pm and 3:30 pm on April 13, 2005 to better understand the pedestrian and vehicle conflicts at this intersection (Exhibit 6A). Results indicate that turning vehicular volumes and crossing pedestrian volumes are moderate in all directions.

According to school officials, vehicles speed on Rogers Avenue in the vicinity of Holy Cross School. A spot speed study was conducted on April 13, 2005 on Rogers Avenue between Church Avenue and Snyder Avenue. The study indicates the 85th percentile is 29 mph, which is below the legal speed limit of 30 mph. See Table 4 for a summary of the results and the Appendix for further detail.

<b>TABLE 4: SPOT SPEED STUDY – ROGERS AVENUE</b>		
<b>(Thursday, April 13, 2005)</b>		
<b>LOCATION</b>	<b>MEDIAN SPEED (MPH)</b>	<b>85TH PERCENTILE SPEED (MPH)</b>
Rogers Avenue between Church Avenue and Snyder Avenue	25	29

#### 3.6.2 Church Avenue and Veronica Place

Church Avenue and Veronica Place is an un-signalized T-intersection. Veronica Place runs one-way southbound from Church Avenue. There is a school crosswalk in place on the south leg of the intersection.

This intersection had nine accidents during the 1998-2000 study period, none of which involved pedestrians.

### 3.6.3 Church Avenue and Johnson Place

This is an un-signalized T-intersection with a stop control for the northbound vehicles on Johnson Place. Johnson Place is a 30-foot wide, two-way roadway with one travel lane and parking on both sides. There is a school crosswalk in place on the south leg of the intersection.

Nine accidents occurred at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, one of which was school-related. An eight-year-old student was struck while crossing Church Avenue. This location did not have a school crosswalk and was uncontrolled. The other accident was attributed to a driver backing up his vehicle unsafely.

### 3.6.4 Church Avenue and Bedford Avenue

Bedford Avenue is 45-foot wide, two-way roadway with one travel lane in each direction and parking on both sides. School crosswalks are in place on the south, east and west legs. This intersection is controlled by a two-phase signal.

A one-hour traffic count was performed between 7:30 am and 8:30 am on April 13, 2005 to better understand the pedestrian and vehicle conflicts at this intersection (Exhibit 6B). Results indicate that turning vehicular volumes and crossing pedestrian volumes are moderate in all directions. The heaviest pedestrian crossing volumes were at the western leg of this intersection; over 530 pedestrians crossed Church Avenue during this hour.

A total of 58 accidents occurred at this intersection during the 1998-2000 study period. Nine accidents involved pedestrians, two of which were school-related. Two school children were struck while crossing Bedford Avenue outside of a crosswalk. A pedestrian was struck when crossing against the signal. The four other pedestrian accidents involved drivers who failed to yield to the pedestrian. There were no details for the last two accidents.

### 3.6.5 Erasmus Street and Bedford Avenue

Erasmus Street and Bedford Avenue is a signalized T-intersection. Erasmus Street, a 32-foot wide one-way (eastbound) with one travel lane and parking on both sides. There is a school crosswalk on the east leg.

Sixteen accidents occurred at this location during the 1998-2000 study period. Two accidents involved pedestrians, neither of which was school-related. One accident involved a driver backing up and hitting a pedestrian who was working in the street. The other accident involved a driver failing to yield to the pedestrian.

### 3.6.6 Erasmus Street and Johnson Place

Erasmus Street and Johnson Place is an un-signalized T-intersection with a stop control on Johnson Place for the southbound traffic onto Erasmus Street. There is a school crosswalk in place on the north leg of this intersection.

Nine accidents occurred at this intersection during the 1998-2000 study period. One accident involved a pedestrian, which was not school-related. The accident involved a driver who was making an improper turn.

### 3.6.7 Erasmus Street and Veronica Place

Erasmus Street and Veronica Place is an un-signalized intersection with a stop control on Veronica Place for southbound traffic onto Erasmus Street. There are school crosswalks on the north, south and west legs. Erasmus Street is uncontrolled at this intersection; therefore the school crosswalk on the west leg is uncontrolled.

A one-hour traffic count was performed on November 9, 2005 from 2:30 pm to 3:30 pm (Exhibit 6A). The results indicated that during the study hour a total of 81 pedestrians crossed Erasmus Street, which is uncontrolled, while conflicting with 102 vehicles traveling on Erasmus Street. Based on MUTCD Section 4C.05 Signal Warrant 4 (Pedestrian Volume) the need for a traffic control signal at an intersection shall be considered if an engineering study finds that the pedestrian volume crossing the major street at an intersection during an average day is 190 or more during any one hour. Existing conditions do not meet the criteria for signalizing the intersection at this time.

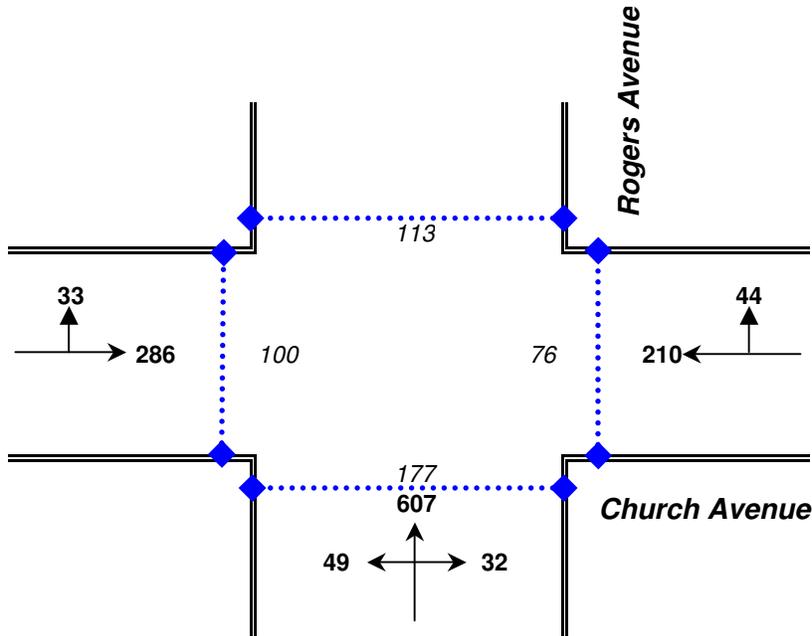
The intersection had six accidents during the 1998-2000 study period, none of which involved pedestrians.

### 3.6.8 Bedford Avenue and Martense Street

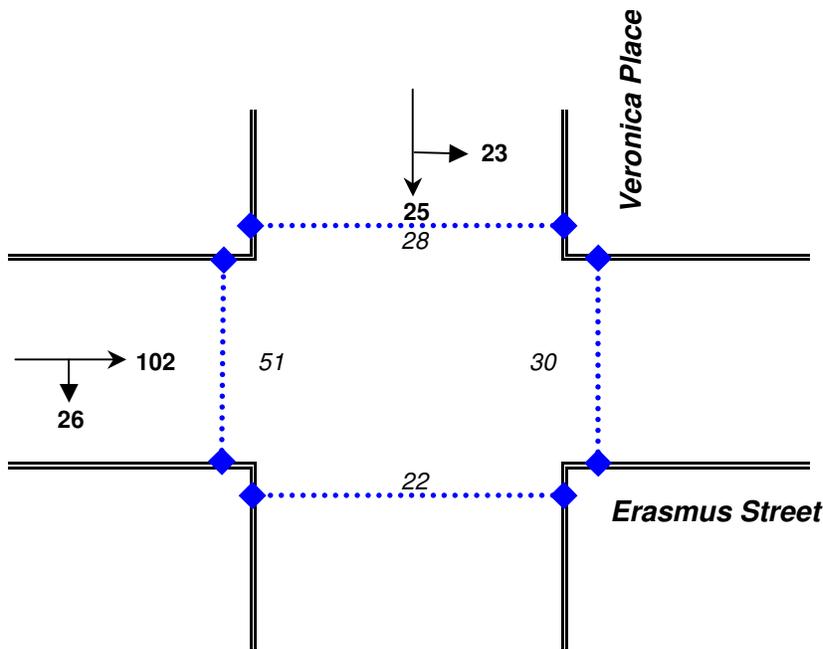
Bedford Avenue and Martense Street is a signalized intersection. Martense Street is a 32-foot wide, two-way street with one travel lane in each direction and parking on both sides. Pedestrian crosswalks are in place on all four approaches, none of which are school crosswalks.

There were twenty-two accidents at this intersection during the 1998-2000 study period. Two accidents involved pedestrians, one of which was school-related. A driver traveling against the signal struck an eight-year-old student. The other accident was due to driver's inattention.

**One Hour Traffic Count Volumes**



**Intersection of Rogers Avenue and Church Avenue**  
 April 13, 2005  
 2:30 pm - 3:30 pm



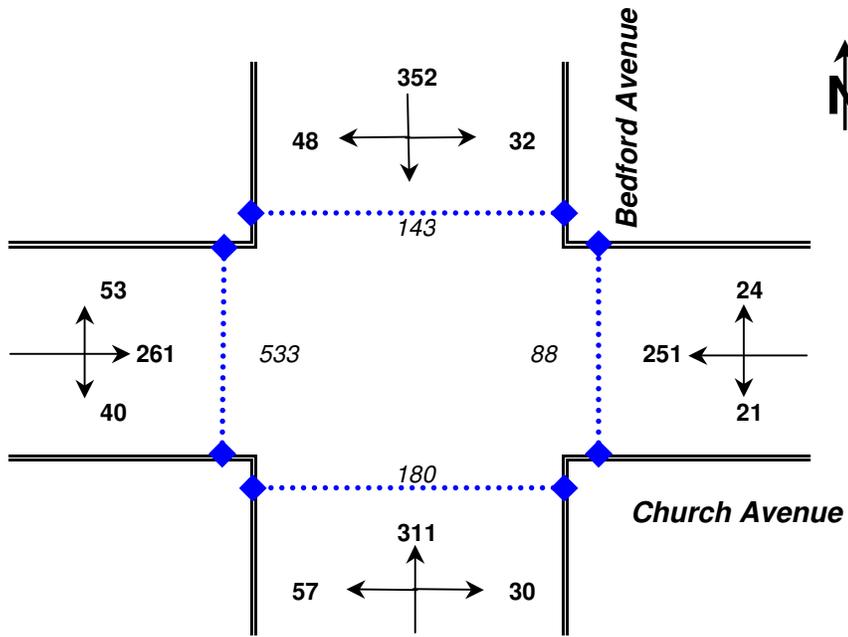
**Intersection of Erasmus Street and Veronica Place**  
 November 9, 2005  
 2:30 pm - 3:30 pm

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

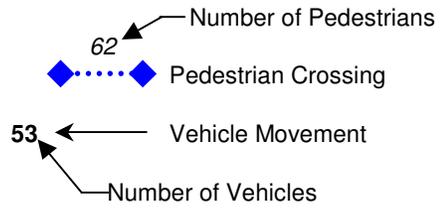
EXHIBIT 6A
HOLY CROSS BROOKLYN
TRAFFIC COUNTS

### One Hour Traffic Count Volumes

(7:30 AM - 8:30 AM April 13, 2005)



**Church Avenue and Bedford Avenue**



<b>EXHIBIT 6B</b>
<b>HOLY CROSS BROOKLYN</b>
<b>TRAFFIC COUNTS</b>

### 3.7 SIGNAL TIMING: PEDESTRIAN PHASE

Pedestrian crossing time was field verified at all signalized intersections in the vicinity of Holy Cross School and found to be adequate for a child pedestrian walking rate of three feet per second in all directions and approaches (see Table 5 for details).

<b>TABLE 5: PEDESTRIAN CROSSING TIME AT SIGNALIZED INTERSECTIONS</b>				
Intersection Name	Crosswalk Width (Feet)	Ped. Phase Actual (Seconds)	Ped. Phase Req'd (Seconds)	Timing Adjustment? (Yes/No)
<b>Church Avenue and Rogers Avenue</b>				
Church Avenue	34	30	15	NO
Rogers Avenue	34	80	15	NO
<b>Bedford Ave. and Erasmus St</b>				
Crossing Bedford Avenue	40	70	16	NO
Crossing Erasmus St	35	40	15	NO
<b>Bedford Ave. and Church St</b>				
Crossing Bedford Avenue	40	50	16	NO
Crossing Church St	50	60	20	NO

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

### 3.8 PHYSICAL CONDITIONS (ROADWAYS AND SIDEWALKS)

The roadways and sidewalks were observed to be in fair condition. Two exceptions to this are the sidewalks on Church Avenue in front of and immediately east of the school (Figure 7); and Erasmus Street on the north side, east of Woods Place (Figure 8). Each of these areas had broken and heaved sidewalk sections.



*Figure 7: Church Avenue Sidewalk*



*Figure 8: Erasmus Street sidewalk*

## 4. PROPOSED MEASURES TO IMPROVE STUDENT PEDESTRIAN SAFETY

### 4.1 SHORT-TERM MEASURES

- No-Standing Zones

Existing “NO PARKING 7 AM - 4 PM, SCHOOL DAYS” parking regulations on Church Avenue and Erasmus Street should be upgraded to “NO STANDING 7 AM - 4 PM, SCHOOL DAYS”.

This will allow parents a place to load and unload students at the curb, and will also improve visibility of those students arriving and leaving the school.

- Administer student pedestrian safety education program

It is recommended that the NYCDOT Safety Education Program work with the school to educate students on pedestrian safety, including crossing the street with the WALK phase, and the meaning of WALK - FLASHING DON'T WALK - DON'T WALK pedestrian signal sequence. It is also recommended that the students be educated not to cross at mid-block locations.

- 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.

- Install new school crosswalks at the following locations:

- Bedford Avenue and Martense Street - south and east legs
- Erasmus Street and Woods Place - south leg
- Erasmus Street and Lott Street - south leg
- Erasmus Street and Rogers Avenue - north, east and west legs

Providing school crosswalks at these locations will facilitate students walking to Holy Cross.

- Submit Request to Police Department for Crossing Guard

As noted in section 3.6.2, Erasmus Street and Veronica Place is not signalized and has an uncontrolled school crossing. One-hour traffic counts indicated the existing traffic and pedestrian volumes do not meet the criteria for signalizing the intersection or installing an all-way stop control. It is recommended that a crossing guard be requested at this intersection, to assist students at this location.

- Install a speed reducer (hump) on Erasmus Street

The school principal indicated that vehicles were speeding on Erasmus Street in the vicinity of Holy Cross School. A spot speed study was conducted on Erasmus Street between Bedford Avenue and Veronica Place on April 13, 2005.

The spot speed study confirmed that the 85<sup>th</sup> percentile speed was 31 mph, which exceeds the statutory speed limit of 30 mph. To reduce speeding in the vicinity of Holy Cross, a speed reducer (hump) is to be installed on Erasmus Street between Johnson Place and Veronica Place. The actual number and location of speed reducers (humps) will be determined by NYCDOT. The school warning pavement markings may need to be reinstalled after the installation of the speed reducer. See Table 6 for a summary of the results and the Appendix for further details.

TABLE 6: SPOT SPEED STUDY – ERASMUS STREET		
LOCATION	MEDIAN SPEED (MPH)	85 <sup>TH</sup> PERCENTILE SPEED (MPH)
Erasmus Street between Bedford Avenue and Veronica Place	25	31

- Reconstruct the sidewalks at the following locations:

- Church Avenue in front of and east of Holy Cross
- Erasmus Street on the north side, east of Woods Place

It is recommended to resurface and re-grade pavement at these two locations to correct the broken and heaved sidewalks.

#### 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.

- Rogers Avenue and Church Avenue - northwest, southwest and southeast corners
- Erasmus Street and Veronica Place – northwest and southwest corners
- Bedford Avenue and Church Avenue – southeast corner

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.

### **4.3 ADDITIONAL RECOMMENDATIONS FOR PRIORITY SCHOOL IN THE VICINITY OF HOLY CROSS**

#### ***4.3.1 MEASURES FOR P.S. 6***

The following actions are recommended as part of proposed measures to improve student pedestrian safety around P.S. 6, a nearby Priority School.

- *Install school crosswalk at following intersections:*
  - Snyder Avenue and Woods Place (north leg)
  - Snyder Avenue and Lott Street (north leg)
  - Bedford Avenue and Erasmus Street (south leg)

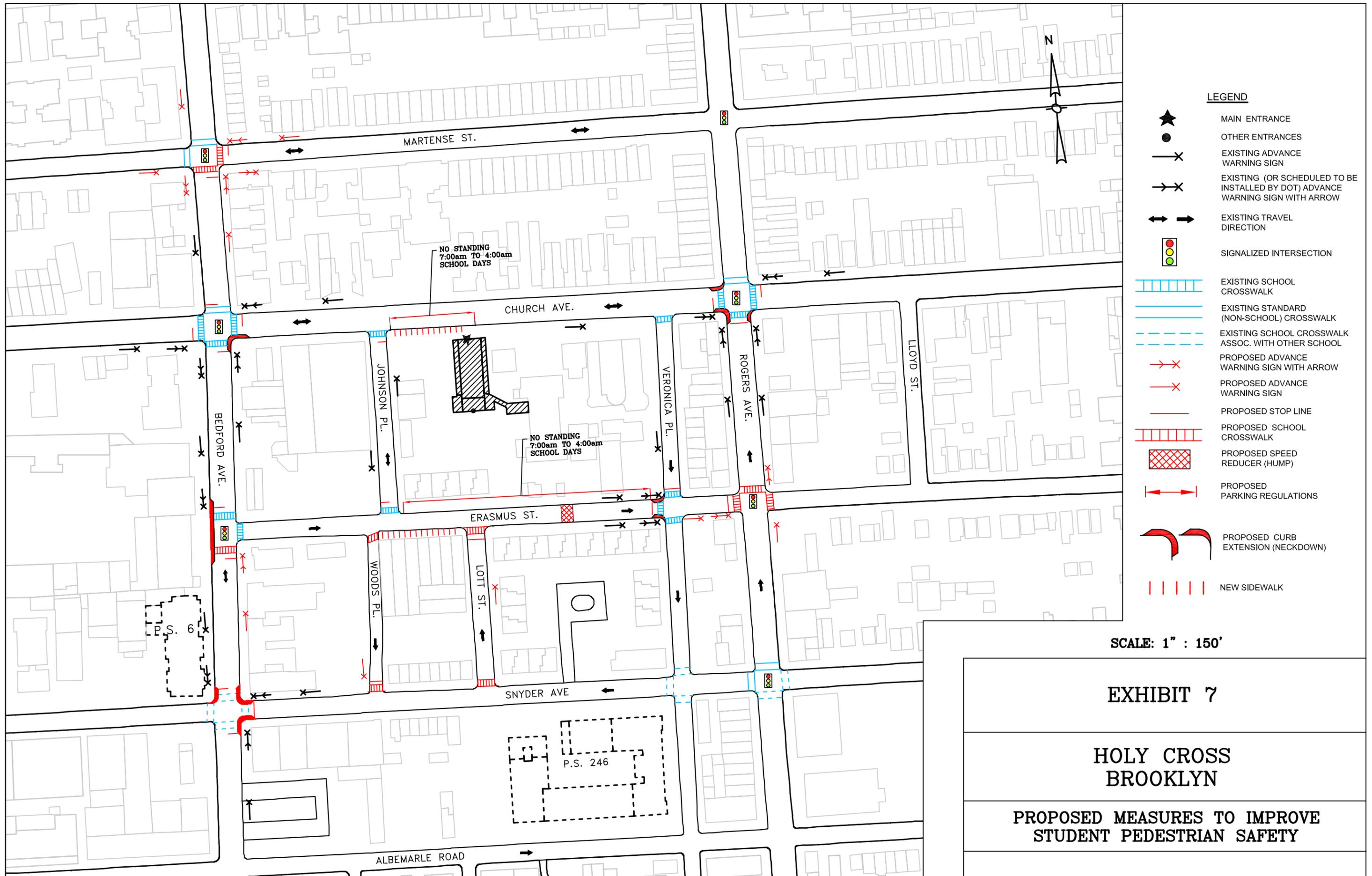
According to feedback from school officials, some students utilize these intersections en route to P.S. 6. Therefore, it is recommended that school crosswalks be installed to ensure continuous walking routes.

- *Install curb extensions at the following locations:*
  - Bedford Avenue and Snyder Avenue (northwest, northeast, southeast)
  - Bedford Avenue and Erasmus Street (west)

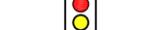
These two intersections are located directly across from the school.

The purpose of the curb extensions is to shorten the crossing distance for pedestrians, increase pedestrian storage space, and to reduce the speeds of vehicles approaching and turning at school crosswalks.

These curb extensions will not eliminate or reduce the width of any moving lanes. Curb extensions are not proposed where they would hinder the ability of vehicles to turn. Final details pertaining to curb extensions will be developed during the Final Design/Contract Document preparation. New standard pedestrian ramps would be installed with new curb extensions.



**LEGEND**

-  MAIN ENTRANCE
-  OTHER ENTRANCES
-  EXISTING ADVANCE WARNING SIGN
-  EXISTING (OR SCHEDULED TO BE INSTALLED BY DOT) ADVANCE WARNING SIGN WITH ARROW
-  EXISTING TRAVEL DIRECTION
-  SIGNALIZED INTERSECTION
-  EXISTING SCHOOL CROSSWALK
-  EXISTING STANDARD (NON-SCHOOL) CROSSWALK
-  EXISTING SCHOOL CROSSWALK ASSOC. WITH OTHER SCHOOL
-  PROPOSED ADVANCE WARNING SIGN WITH ARROW
-  PROPOSED ADVANCE WARNING SIGN
-  PROPOSED STOP LINE
-  PROPOSED SCHOOL CROSSWALK
-  PROPOSED SPEED REDUCER (HUMP)
-  PROPOSED PARKING REGULATIONS
-  PROPOSED CURB EXTENSION (NECKDOWN)
-  NEW SIDEWALK

SCALE: 1" : 150'

**EXHIBIT 7**

**HOLY CROSS  
BROOKLYN**

**PROPOSED MEASURES TO IMPROVE  
STUDENT PEDESTRIAN SAFETY**

# APPENDIX



## SPOT SPEED STUDY

Date: **April 13, 2005**  
 Location: **Rogers Avenue between Church Avenue and Snyder Avenue**  
 Surveyor: **EY**

Time: **1:30 - 2:30**  
 School: **Holy Cross**  
 Direction: **Northbound**  
 Comments: **Dry**

Speed S (mph)	No. of Vehicles in Group n	% of Vehicles in Group	% Cumulative Vehicles	nS	nS <sup>2</sup>
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	0	0.0%	0.0%	0	0
20	11	11.0%	11.0%	220	4400
21	11	11.0%	22.0%	231	4851
22	14	14.0%	36.0%	308	6776
23	15	15.0%	51.0%	345	7935
24	11	11.0%	62.0%	264	6336
25	1	1.0%	63.0%	25	625
26	6	6.0%	69.0%	156	4056
27	7	7.0%	76.0%	189	5103
28	3	3.0%	79.0%	84	2352
29	3	3.0%	82.0%	87	2523
30	3	3.0%	85.0%	90	2700
31	3	3.0%	88.0%	93	2883
32	5	5.0%	93.0%	160	5120
33	4	4.0%	97.0%	132	4356
34	1	1.0%	98.0%	34	1156
35	1	1.0%	99.0%	35	1225
36	0	0.0%	99.0%	0	0
37	1	1.0%	100.0%	37	1369
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%		2490	63766

Mean Speed = 24.9 mph	Median Speed = 24.9 mph
Standard Deviation = 4.2 mph	15th Percentile Speed = 20.5 mph
Margin of Error (95% Confidence) = ± 0.8 mph	85th Percentile Speed = 29.3 mph

# SPOT SPEED STUDY

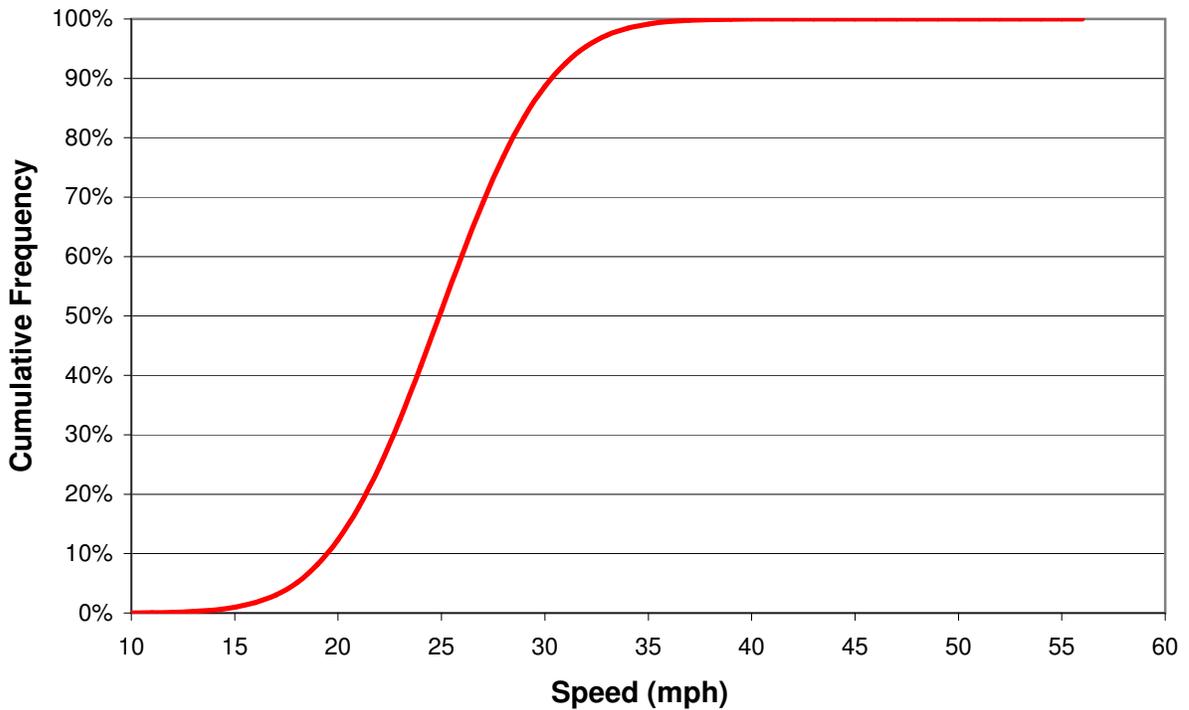
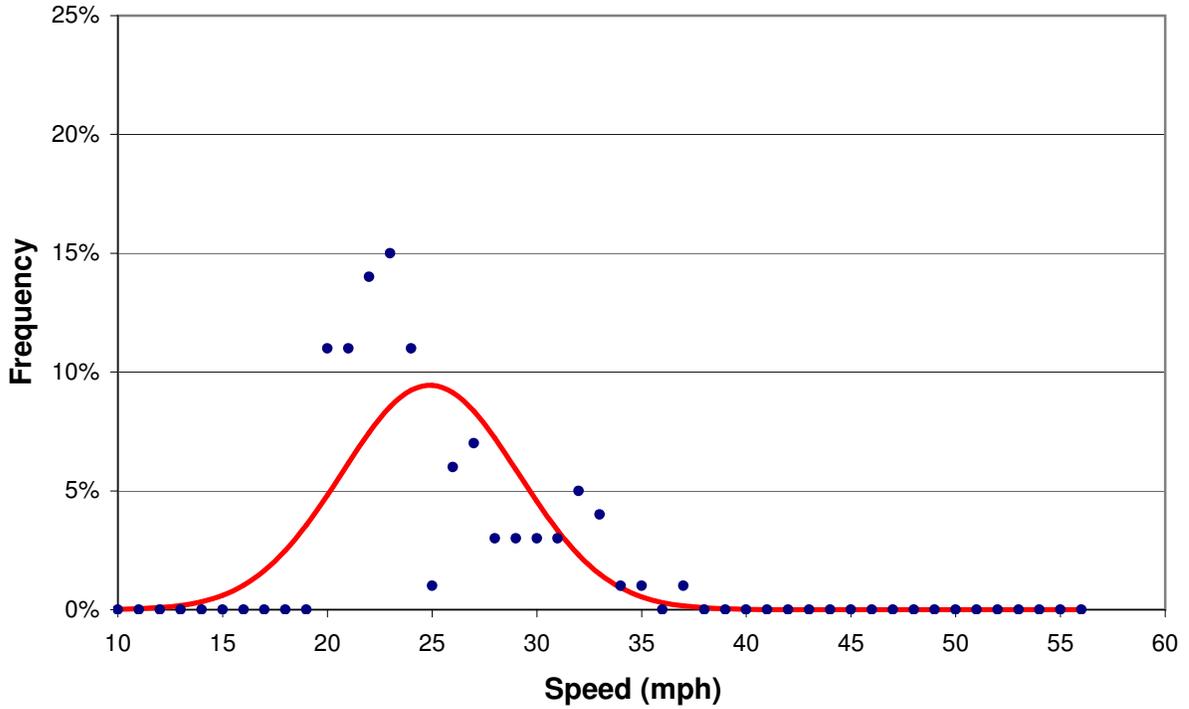
Date: **April 13, 2005**  
Location: **Rogers Avenue between Church Avenue and Snyder Avenue**  
Surveyor: **EY**

Time: **1:30 - 2:30**

School: **Holy Cross**  
Direction: **Northbound**  
Comments: **Dry**

Mean Speed = 24.9 mph  
Standard Deviation = 4.2 mph  
Margin of Error (95% Confidence) =  $\pm 0.8$  mph

Median Speed = 24.9 mph  
15th Percentile Speed = 20.5 mph  
85th Percentile Speed = 29.3 mph



## SPOT SPEED STUDY

Date: **April 13, 2005**  
 Location: **Erasmus Street between Bedford Avenue and Veronica Place**  
 Surveyor: **EY**

Time: **12:30 - 1:30**  
 School: **Holy Cross**  
 Direction: **Eastbound**  
 Comments: **Dry**

Speed S (mph)	No. of Vehicles in Group n	% of Vehicles in Group	% Cumulative Vehicles	nS	nS <sup>2</sup>
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	0	0.0%	0.0%	0	0
20	4	16.0%	16.0%	80	1600
21	4	16.0%	32.0%	84	1764
22	2	8.0%	40.0%	44	968
23	3	12.0%	52.0%	69	1587
24	1	4.0%	56.0%	24	576
25	1	4.0%	60.0%	25	625
26	1	4.0%	64.0%	26	676
27	1	4.0%	68.0%	27	729
28	0	0.0%	68.0%	0	0
29	2	8.0%	76.0%	58	1682
30	1	4.0%	80.0%	30	900
31	1	4.0%	84.0%	31	961
32	1	4.0%	88.0%	32	1024
33	1	4.0%	92.0%	33	1089
34	0	0.0%	92.0%	0	0
35	1	4.0%	96.0%	35	1225
36	0	0.0%	96.0%	0	0
37	0	0.0%	96.0%	0	0
38	1	4.0%	100.0%	38	1444
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
	25	100.0%		636	16850

Mean Speed = 25.4 mph  
 Standard Deviation = 5.3 mph  
 Margin of Error (95% Confidence) = ± 2.1 mph

Median Speed = 25.4 mph  
 15th Percentile Speed = 20.0 mph  
 85th Percentile Speed = 30.9 mph

# SPOT SPEED STUDY

Date: **April 13, 2005**  
Location: **Erasmus Street between Bedford Avenue and Veronica Place**  
Surveyor: **EY**

Time: **12:30 - 1:30**

School: **Holy Cross**  
Direction: **Eastbound**  
Comments: **Dry**

Mean Speed = 25.4 mph  
Standard Deviation = 5.3 mph  
Margin of Error (95% Confidence) =  $\pm 2.1$  mph

Median Speed = 25.4 mph  
15th Percentile Speed = 20.0 mph  
85th Percentile Speed = 30.9 mph

