

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



School Safety Engineering Project

FINAL REPORT: St. Angela Merici, Bronx



**Prepared by
The RBA Group and URBITRAN Associates Inc.**



July 28, 2006

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Final Report: Saint Angela Merici School, Bronx**

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1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The Department of Transportation (DOT) 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). Saint Angela Merici School in the Bronx is one of the 135 “priority” schools identified by the New York City Department of Transportation, Office of School Safety Engineering.

2. BACKGROUND—EXISTING CONDITIONS AND ANALYSIS

2.2 NEIGHBORHOOD DESCRIPTION

Exhibit 1 shows an aerial view of the neighborhood surrounding the Saint Angela Merici School, which is generally residential in character. Saint Angela Merici is situated on the south side of East 163rd Street and the east side of Grant Avenue. East 162nd Street is to the south and Morris Avenue is to the east. East 161st Street is two blocks to the south and is a major connector road in the Bronx. There are two other schools in the neighborhood. One is P.S. 35 (Franz Siegel) located at 261 East 163rd Street, on the north side and across from Saint Angela Merici. The other school is J.H.S. 166 (Roberto Clemente) located at 250 East 164 Street, just one block north of Saint Angela Merici, between Grant Avenue and Morris Avenue. These two schools are both on the same block, which is just north of Saint Angela Merici School, and are bounded by Morris Avenue, Grant Avenue, and East 164th Street. A new courthouse is under construction on the south side of East 162nd Street and west of Grant Avenue. The construction has caused Grant Avenue to be permanently terminated between East 161st Street and East 162nd Street. Grant Avenue will now run from East 162nd Street north. East 162nd Street is also permanently terminated between Grant Avenue and Sherman Avenue. Not all exhibits in this report depict this new street configuration.

2.3 MEETING WITH SCHOOL REPRESENTATIVES

Consultant staff, the Borough Commissioner, the Borough Engineer, and the Principal met at the school on the morning of Thursday, May 4, 2006. According to the school principal, some of the problems faced by students and staff are as follows:

- The ongoing construction of the new court house is affecting travel around the school.
- Congestion on Morris Avenue, especially between 163rd Street and 161st Street. It can take almost 15 minutes to go from 163rd Street to 161st Street during congested period.
- The west sidewalk along Morris Avenue between East 162nd and East 161st Street is closed due to the construction of the new court house and some students walk in the street instead of using the east sidewalk.
- At present, East 162nd Street is mainly used by construction crews and police officers to access the construction site. Police officers and officials tend to park illegally in this area (on sidewalks and at street corners). This illegal parking endangers the school children. The principal has requested the police department not to park illegally.

- The Principal has raised concerns of using the East 162nd Street (main school yard faces East 162nd Street) as a main entrance, because of the potential danger from felons appearing in court.
- Due to congestion, speeding around the school is not an issue.
- When there is an afternoon baseball game at Yankee Stadium, police officers assigned along East 161st Street help keep traffic moving. This has a positive effect on the school and it's surrounding as it prevents congestion on East 161st Street.
- The Borough Commissioner mentioned that due to the new court house construction, there is a plan to assign twelve safety officers on East 161st Street from 7:00 am to 7:00 pm, seven days a week. The Borough Commissioner will check the possibility of extending their locations so that Saint Angela Merici and other neighboring schools may also benefit.

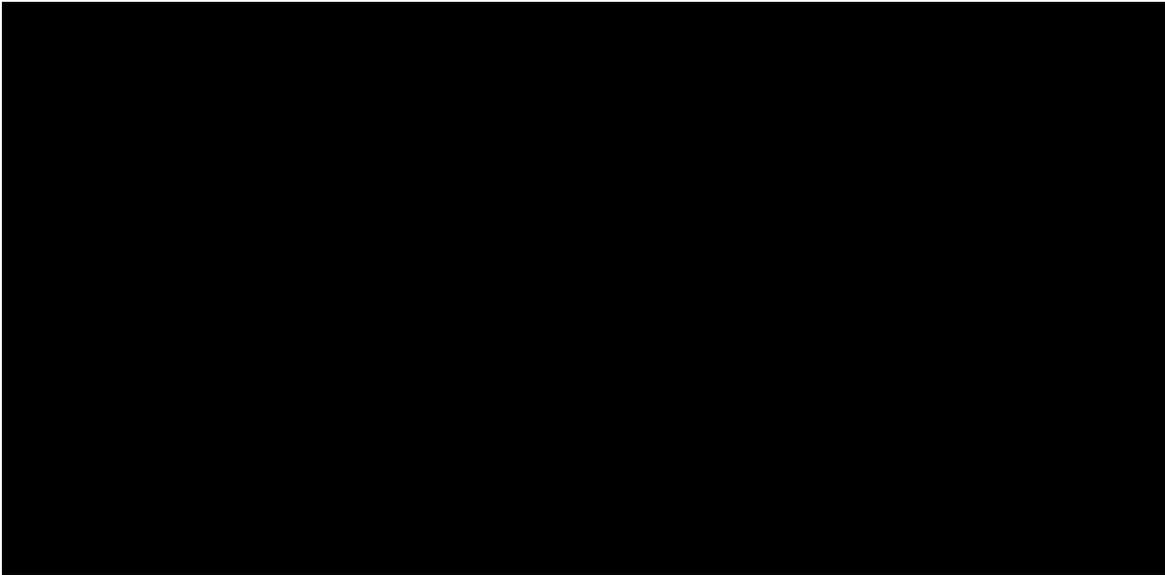




Figure 1: Looking south across East 163rd Street at Saint Angela Merici School’s main entrance

2.6 PRIMARY MODES OF TRANSPORT TO AND FROM SCHOOL

The school’s catchment area is typically defined by the Department of Education and normally shown in an exhibit at the end of this section. Since Saint Angela Merici is a private parochial school, the actual “catchment area” is dependent upon other factors determined by the school administrators.

Table 1 presents the modes of travel for Saint Angela Merici School as estimated by school representatives.

TABLE 1: MODES OF TRAVEL (AS ESTIMATED BT SCHOOL OFFICIALS)	STUDENTS (Percentage)
Walk	80%
Driven by car	10%
School bus	0%
MTA Bus/Subway	10%
Bicycle	0%
TOTAL	100%

2.7 ADDITIONAL STUDENT PEDESTRIAN TRAFFIC GENERATORS

There are several stores in the neighborhood that serve students such as a delicatessen and a pizzeria, both across the street on each corner of East 163rd Street on the east side of Morris Avenue (see Figures 2 and 3). The two schools on the block immediately north of Saint Angela Merici School (J.H.S. 166 - Roberto Clemente and P.S. 35 - Franz Siegel) also generate student pedestrian traffic as well as vehicular traffic.

2.8 CROSSING GUARD LOCATION

There is no crossing guard assigned to St. Angela Merici School. The crossing guard on E.163rd Street and Morris Avenue is assigned to the nearby public school P.S. 35.



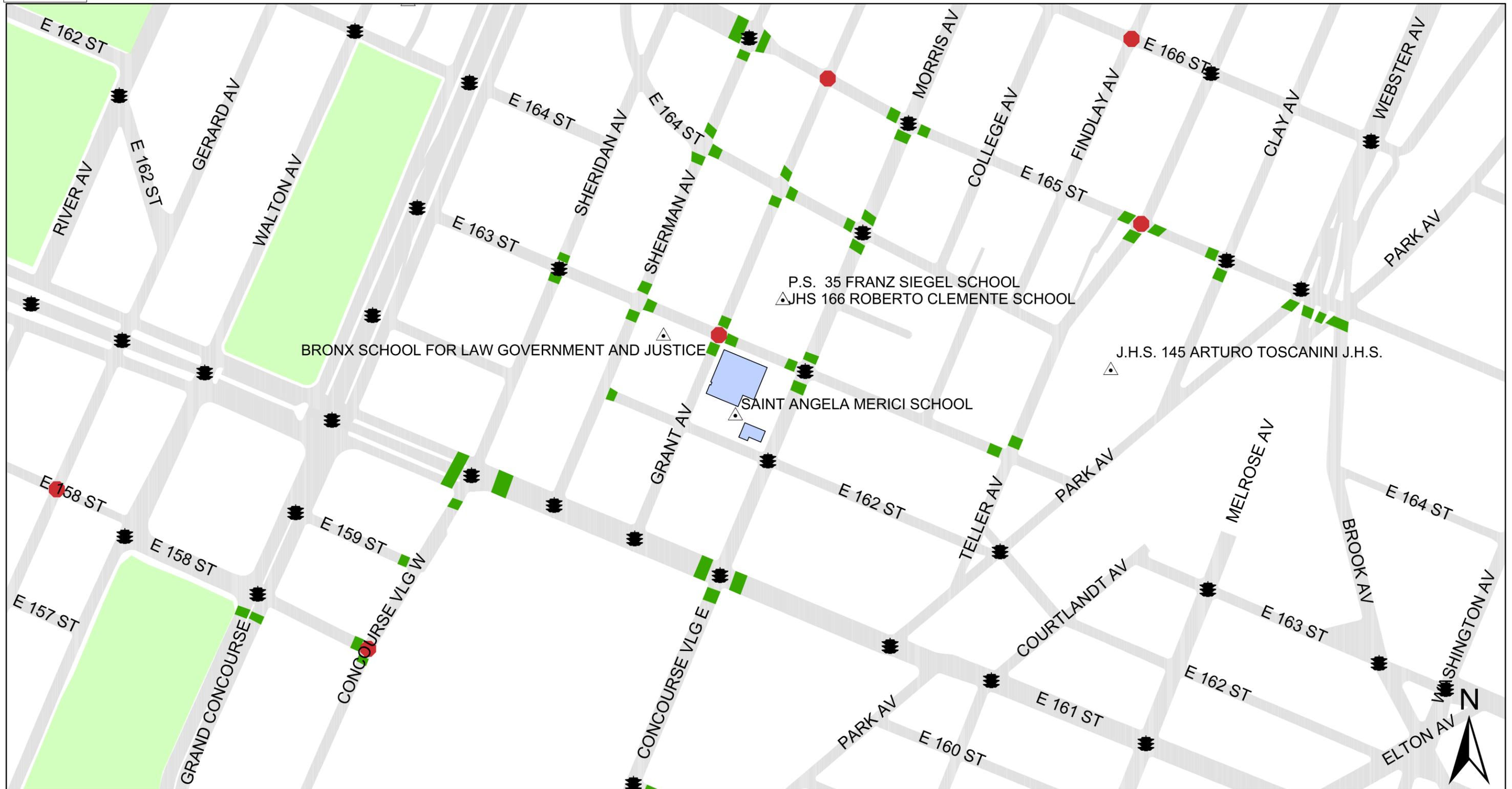
Figure 2: Looking north at a crossing guard and pizzeria, on west side of Morris Avenue at East 163rd Street



Figure 3: Stores at Morris Avenue and East 163rd Street include a delicatessen



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	
SCHOOL CROSSWALK	
TRAFFIC SIGNAL	
ALL - WAY STOP	
SPEED REDUCER	

Bronx
ST ANGELA MERICI SCHOOL

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

Map created on 11/16/2006

EXHIBIT 2

COMM. BOARD: 204
 PRECINCT: 44

1.5.1 9

3. TRAFFIC OPERATIONS

3.1 SCHOOL BUS OPERATIONS

According to school representatives, there are no yellow school buses serving the school. Approximately 25 students ride an MTA bus to school.

3.2 PARENT DROP-OFF OPERATIONS

Most of the students are generally being dropped-off and picked-up on Morris Avenue. Parents face difficulty finding parking on Morris Avenue. The consultant staff observed congestion and double-parking during the morning arrival. Double parking was also observed on Morris Avenue and on East 163rd Street during afternoon dismissal.

3.3 PARKING REGULATIONS

Parking regulations around the school block are shown in Exhibit 3 at this section. Typical regulation signs are shown in Figures 4 and 5.



Figure 4: Parking regulations on west side of Morris Avenue

3.4 EXISTING SCHOOL SIGNS AND MARKINGS

Exhibit 2 shows the existing school signals and pavement markings around Saint Angela Merici School. It should be noted that a citywide signage program is currently underway to upgrade school signage to the current Federal Manual on Uniform Traffic Control Devices (MUTCD) standards of fluorescent yellow-green signs accompanied by downward pointing arrows. (Signs scheduled to be installed under this program are shown as “existing” in Exhibit 5.)



Figure 5: Parking regulations on the east side of Grant Avenue (school is on the right)

3.5 ACCIDENT SUMMARY

Exhibit 4 and Table 2 show a summary of accidents, as obtained from the New York State Department of Motor Vehicles (DMV), in the vicinity of St. Angela Merici School 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.

INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Grant Avenue & East 163 rd St	7	0	0	0
Morris Avenue & East 163 rd St	7	3	0	0
Grant Ave & East 162 nd St	18	0	0	0
Morris Ave & East 162 nd St	9	1	0	1
Morris Ave & East 161 st St	75	13	0	2
Grant Ave & East 164 th St	10	1	0	0
Morris Ave & East 164 th St	14	3	0	0
TOTAL	140	21	0	3

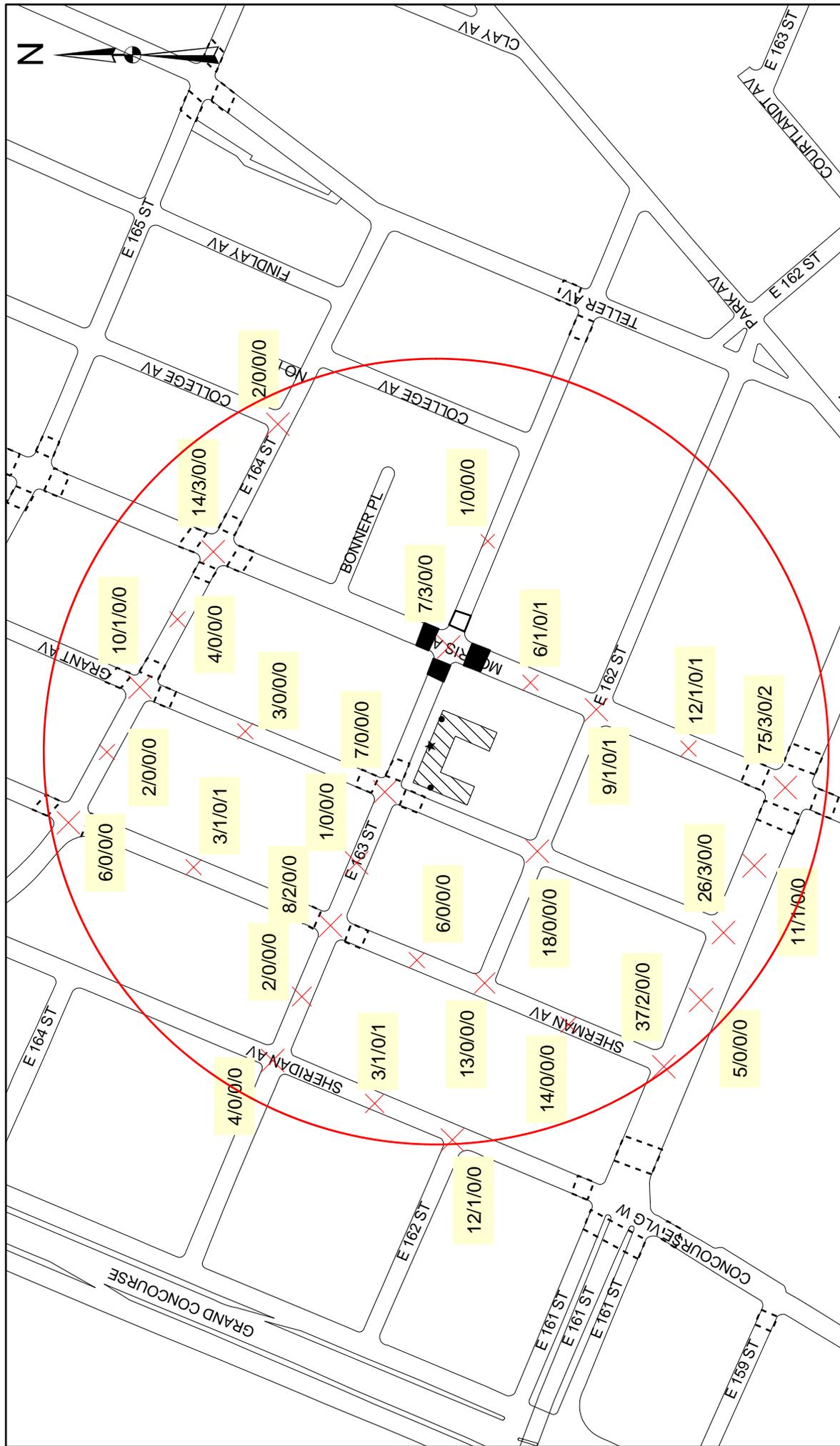
INTERSECTION	TOTAL ACCIDENTS	PEDESTRIAN ACCIDENTS	PEDESTRIAN FATALITIES	SCHOOL-RELATED ACCIDENTS*
Grant Avenue & East 163 rd St	7	1	0	0
Morris Avenue & East 163 rd St	21	9	0	3
Grant Ave & East 162 nd St	1	0	0	0
Morris Ave & East 162 nd St	32	4	0	0
Morris Ave & East 161 st St	135	21	0	3
Grant Ave & East 164 th St	17	2	0	2
Morris Ave & East 164 th St	21	9	0	3
TOTAL	234	46	0	11

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

EXHIBIT 4

ST. ANGELA MERICI SCHOOL BRONX

ACCIDENT SUMMARY (1998-2000)



LEGEND:

- ACCIDENT LOCATION
- SCHOOL LOCATION
- SCHOOL CROSSWALK
- SCHOOL CROSSWALK ASSIGNED TO ANOTHER SCHOOL
- BORDER OF 700 FEET
- X/XX/X

TOTAL ACCD	PED ACCD	PED FATAL	SCHOOL_PED ACCD
/	/	/	/
X	X	X	X

3.6 TRAFFIC OPERATIONS AND ISSUES

The specific roadway-related physical conditions for each location within the school's vicinity directly affect the safety and efficiency of operations for both pedestrian and vehicular traffic. These specific conditions are required information when analyzing a location, and are the starting point for any revisions that may be considered to improve safety and/or efficiency.

The following sub-sections outline the physical conditions and issues concerning traffic operations and accidents at the intersections in the vicinity of Saint Angela Merici School.

3.6.1 Morris Avenue and East 163rd Street

This is a signalized intersection with school crosswalks located across the north, west, and south legs, and a standard pedestrian crosswalk located across the east leg of the intersection.

Morris Avenue is two-way north-south roadway with one travel lane and a parking lane on each side of the roadway. Commercial stores abut the street in the vicinity of the school and various court buildings are located to the south and west of the school block. In front of the school, East 163rd Street is a one-way eastbound street with one travel lane and parking lanes on both sides of the road. East of Morris Avenue, however, East 163rd Street operates as one-way westbound. All traffic on East 163rd Street, whether eastbound or westbound, must turn north or south onto Morris Avenue, as it is one-way from both directions into Morris Avenue (see Figures 6 and 7).

This intersection has been the site of seven accidents between 1998 and 2000; two of these were pedestrian accidents, none of which were school-related. There were six mid-block accidents reported on Morris Avenue between East 162nd and East 163rd Streets during the same three-year period; one of these was a pedestrian accident, which was also school-related. The school-related accident occurred on December 18, 2000 at 3:00 pm and involved an 11-year-old pedestrian whose action was reported as crossing with no signal or crosswalk. The accident location was reported as mid-block. The accident occurred on a straight and level surface under daylight condition. The weather was clear and the road was dry. The type of injury was reported as “non-incapacitating injury.”

There were no pedestrian fatalities during this time period.



Figure 6: Intersection of East 163rd Street and Morris Avenue, looking southwest toward Saint Angela Merici School



Figure 7: Looking west on East 163rd Street toward Morris Avenue

3.6.2 Grant Avenue and East 163rd Street

This is an unsignalized all-way STOP controlled intersection, with three school crosswalks, located across the north, south, and east legs of the intersection. None of these crosswalks are assigned to Saint Angela Merici School (see Figure 8).

East 163rd Street is a one-way eastbound street, with one travel lane and parking lanes on each side of the roadway. Grant Avenue is a one-way northbound street, with one travel lane and parking lanes on both sides of the roadway. The uses along the street are generally residential in character (see Figure 9).

This intersection has been the site of seven accidents between 1998 and 2000, none of which were pedestrian accidents. There were no pedestrian fatalities during this period.



Figure 8: Looking south on Grant Avenue toward East 163rd Street (Saint Angela Merici School is on far left)



Figure 9: Looking north at reduced speed limit signs on Grand Avenue at the intersection with East 163rd Street

3.6.3 Morris Avenue and East 162nd Street

This is a signalized intersection, with two school crosswalks, which are located across the north and east legs of the intersection. Neither of these crosswalks is assigned to Saint Angela Merici School.

Morris Avenue is a two-way street with one travel lane in each direction and parking lanes on each side of the roadway. Uses are generally commercial in character (see Figure 10). East 162nd Street, east of Morris Avenue is a one-way eastbound street with one traffic lane and parking lanes on both sides of the roadway. East 162nd Street is currently two-way west of Morris Avenue with no parking any time on both sides due to the current construction of the courthouse.

This intersection has been the site of nine accidents between 1998 and 2000; one of which was a school-related pedestrian accident. The accident occurred on March 27, 1998 at 2:00 pm and involved an eight-year-old pedestrian whose action was reported as crossing with no signal or crosswalk. The accident location was not reported. The accident occurred during daylight condition while the weather was clear and the road was dry. The injury was reported as “possible injury.”

There were 12 mid-block accidents reported on Morris Avenue between East 161st and East 162nd Streets during the same three-year period. One of these accidents was a school-related accident which occurred on June 1, 2000 at 6:00 pm and involved a ten-year-old pedestrian whose action was reported as crossing with no signal or crosswalk.

The accident location was reported as mid-block. The accident occurred on a straight and level surface under daylight condition. The weather was clear and the road surface was dry. The reported type of injury was “incapacitating injury.”

There were no pedestrian fatalities during this time period.



Figure 10: Looking south on Morris Avenue toward East 162nd Street intersection

3.6.4 Grant Avenue and East 162nd Street

This is an unsignalized intersection, with one school crosswalk located across the north leg of the intersection, which is not assigned to this school.

East 162nd Street is currently a two-way street between Grant Avenue and Morris Avenue, with one travel lane in each direction and with parking now suspended on both sides due to the courthouse construction on the south side of the street. East 162nd Street has been permanently terminated between Grant Avenue and Sherman Avenue.

Grant Avenue is a one-way northbound street, with one travel lane and parking lanes on both sides of the roadway. Grant Avenue has also been terminated between East 161st Street and East 162nd Street due to the new courthouse building and now forms an “L” type of intersection with East 162nd Street (see Figure 11).

18 accidents occurred at this location between 1998 and 2000. There were no pedestrian accidents during the same three-year period.



*Figure 11: Looking south on Grant Avenue toward the East 162nd Street intersection
(Construction has closed Grant Avenue)*

3.6.5 Morris Avenue and East 161st Street

This is a four-leg signalized intersection with school crosswalks located across all four legs of the intersection. None of these crosswalks are assigned to Saint Angela Merici School.

Morris Avenue is a two-way street with one travel lane in each direction and parking lanes on each side of the roadway. However, due to the courthouse construction, parking is not permitted along the west curbside of Morris between East 161st and East 162nd Streets. East 161st Street is a two-way east-west street with two travel lanes and a parking lane on both sides of the roadway. Due to the courthouse construction, parking is not permitted along the north side of East 161st Street between Morris Avenue and Sherman Avenue.

This intersection has been the site of 75 accidents between 1998 and 2000; 13 of these were pedestrian accidents, two of which were school-related. The first school-related accident occurred on June 4, 1998 at 3:00 pm and involved a 12-year-old pedestrian whose action was reported as “other action in roadway.” The accident occurred on a straight and level surface under daylight condition. The weather was clear and the road surface was dry. The reported type of injury was “non-incapacitating injury.” The second school-related accident occurred on February 16, 2000 at 4:00 pm and involved two pedestrians including a six-year-old pedestrian and their actions were reported as “crossing against signal.” The accident occurred on a straight and level surface under daylight condition. The weather was clear and roadway surface was dry. The type of injury was reported as “possible injury.”

There were no pedestrian fatalities during this time period.

3.6.6 Morris Avenue and East 164th Street

This is a four-leg signalized intersection with school crosswalks located across the north, west, and south legs, and a standard pedestrian crosswalk located across the east leg of the intersection. None of these school crosswalks are assigned to Saint Angela Merici School.

Morris Avenue is two-way north-south roadway with one travel lane and a parking lane on each side of the roadway. East 164th Street is a two-way east-west roadway with one travel lane and a parking lane on each side of the road.

This intersection has been the site of 14 accidents between 1998 and 2000; three of these were pedestrian accidents, none of which were school-related. There were no pedestrian fatalities during this time period.

3.6.7 Grant Avenue and East 164th Street

This is an unsignalized intersection, with three school crosswalks located across the stop-controlled north and south legs of Grant Avenue and across the east leg of East 164th Street. None of these crosswalks are assigned to Saint Angela Merici School.

East 164th Street is a two-way east-west street, with one travel lane and a parking lane on each side of the roadway. Grant Avenue is a one-way northbound street, with one travel lane and parking lanes on both sides of the roadway.

This intersection has been the site of ten accidents between 1998 and 2000; one of these was pedestrian accident which was not school-related. There were no pedestrian fatalities during this time period.

3.7 SIGNAL TIMING

Pedestrian crossing times were field-verified for crosswalks at signalized intersections in the vicinity of Saint Angela Merici, and were found to be adequate based upon a child pedestrian walking at a rate of 3 feet per second. Signal timings are shown in Table 4.

TABLE 4: PEDESTRIAN CROSSING TIMES AT SIGNALIZED INTERSECTIONS				
INTERSECTION	CROSSWALK LENGTH (FEET)	PEDESTRIAN TIME ACTUAL (SECONDS)	PEDESTRIAN TIME REQUIRED (SECONDS)	TIMING ADJUSTMENT REQUIRED?
East 163 rd Street & Morris Avenue				
crossing Morris Avenue	42	18	17	No
crossing East 163 rd Street	30	30	13	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

3.8.1 Roadways and Sidewalks

The roadways and sidewalks in the vicinity of Saint Angela Merici School are generally in fair condition. However, there is a major courthouse construction project on the south side of East 162nd Street and west of Morris Avenue, extending past Grant Avenue. The

construction has caused Grant Avenue to be closed south of East 162nd Street and East 162nd Street to be closed west of Grant Avenue. Additionally, this has caused some sidewalk closures including the sidewalks along East 162nd Street between Grant Avenue and Morris Avenue, and along the west side of Morris Avenue between East 161st Street and East 162nd Street (see Figures 11 and 12).



Figure 12: Looking west on East 162nd Street toward Morris Avenue intersection (Sidewalk closures and No Parking between Morris Avenue and Grant Avenue)

3.8.2 Pedestrian Ramps

Overall, pedestrian ramps in the area of the school seem to be standard. One exception is the northeast corner of Morris Avenue & East 162nd Street. A signal pole and a trash basket are centered in the northerly crosswalk on the east side of Morris Avenue (see Figure 13).



Figure 13: Looking north at easterly crosswalk across Morris Avenue at East 162nd Street

4. PROPOSED MEASURES TO IMPROVE SCHOOL PEDESTRIAN SAFETY

This section describes the proposed measures to improve student pedestrian safety around Saint Angela Merici School. The proposed 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 involve capital improvements. Each of the short- and long-term measures recommended for the Saint Angela Merici School is discussed as follows, and is shown in more detail in Exhibit 5 at the end of this section.

4.1 SHORT-TERM MEASURES

➤ Install “NO STANDING 7AM – 4PM SCHOOL DAYS” Sign

Install “NO STANDING 7AM - 4PM SHOOOL DAYS” signs for thirty feet (30’) in front of the school at the main entrance of the school. (This is a typical requirement for all NYC schools in order to provide for emergency access to and from the schools.)

Double parking and congestion were observed along Morris Avenue between 162nd Street and 163rd Street. This area could be used for student drop-off and pick-up if parking were not allowed during school hours.

It is therefore recommended to:

- Consider instituting a parking regulation restricting parking from “7:00 am to 4:00 pm – School Days” along the west side of Morris Avenue, between East 163rd Street and East 162nd Street.
- Install “NO STANDING 7AM - 4PM SHOOOL DAYS” along the west side of Morris Avenue, between East 163rd Street and East 162nd Street.

➤ Install graphic “YIELD TO PEDESTRIAN” sign

Install “yield to pedestrian” signs at intersection approaches with substantial vehicle–student pedestrian volumes at intersections assigned to this school. A “yield to pedestrian” sign is recommended on the following approach:

- Eastbound approach of Morris Avenue at its intersection with East 163rd Street

➤ Place advanced stop bars before school crosswalk

The MUTCD and New York City DOT standard for placement of a stop bar is four feet (4’) in advance of a marked crosswalk. At signalized intersections and mid-block crossings, the vehicle stop line can be moved farther back from the pedestrian crosswalk.

For school crosswalks with significant potential for vehicular/pedestrian conflicts, it is recommended that the advance stop bar be placed ten feet (10’) in advance of the crosswalk to maximize the safety benefit for school-aged pedestrians. (This would improve visibility of pedestrians to motorists, and allow pedestrians to proceed in a crosswalk before motor vehicles turn.)

Ten feet (10’) advanced stop bars before school crosswalks are recommended on the following approaches of signalized intersections surrounding Saint Angela Merici School:

- Eastbound, westbound, northbound, and southbound approaches of Morris Avenue and East 161st Street intersection.
- Northbound, southbound and eastbound approaches of Morris Avenue and East 163rd Street intersection.
- Northbound, southbound, and eastbound approaches of Morris Avenue and East 164th Street intersection.

➤ Administer student pedestrian safety education program

There were seven school-related accidents within a 700-foot radius around the Saint Angela Merici School. Five of those seven school-related accidents occurred at mid-block locations. In addition, one of the school-related accidents at the intersection of Morris Avenue and East 161st Street occurred while crossing the street against the signal. It is therefore recommended that:

- The NYCDOT Safety Education Program work with the school to educate the students not to cross mid-block and not to cross against signals.

➤ Meeting with representatives of local police precinct

At present, East 162nd Street is mainly used by construction crews and police officers to access the construction site. Police officers and officials tend to park illegally in this area (on sidewalks and at street corners). The principal has requested the police department not to park illegally. It is therefore recommended that:

- NYC DOT should consider arranging a meeting with representatives of the local police precinct and school officials in order to discuss this problem and identify corrective actions.

➤ Safety officer at the intersection of Morris Avenue and East 161st Street

This intersection experienced thirty-four (34) pedestrian accidents between 1998 and 2004 including three school-related accidents. During the meeting with school officials, the Borough Commissioner mentioned that due to the new courthouse construction, there is a plan to assign twelve safety officers to East 161st Street from 7:00 am to 7:00 pm, seven days a week during construction. It is recommended that a safety officer be assigned to the intersection of Morris Avenue and 161st Street after court house construction is completed.

➤ Reduced speed zone

NYCDOT has installed a reduced speed zone (20 mph) on Grant Avenue from East 163rd Street to East 164th Street. Its effectiveness is being evaluated by DOT.

➤ *Install a traffic signal at the intersection of East 163rd Street and Grant Avenue*

A Warrant analysis was completed at the intersection of East 163rd Street and Grant Avenue and Warrant 6, Coordinated Signal System was satisfied. The installation of the traffic signal will provide a progressive movement in order to maintain proper platooning of vehicles on East 163rd Street between Sheridan and Morris Avenues.

- Install a traffic signal at the intersection of East 163rd Street and Grant Avenue and upgrade the associated signs and markings.

4.2 LONG-TERM MEASURES

➤ *Curb extension to provide blockbuster treatment at the intersection of Morris Avenue and East 163rd Street*

At this intersection two one-way streets meet head-on (East 163rd Street is a one-way eastbound street west of Morris Avenue and a one-way westbound street east of Morris Avenue). It is therefore recommended to:

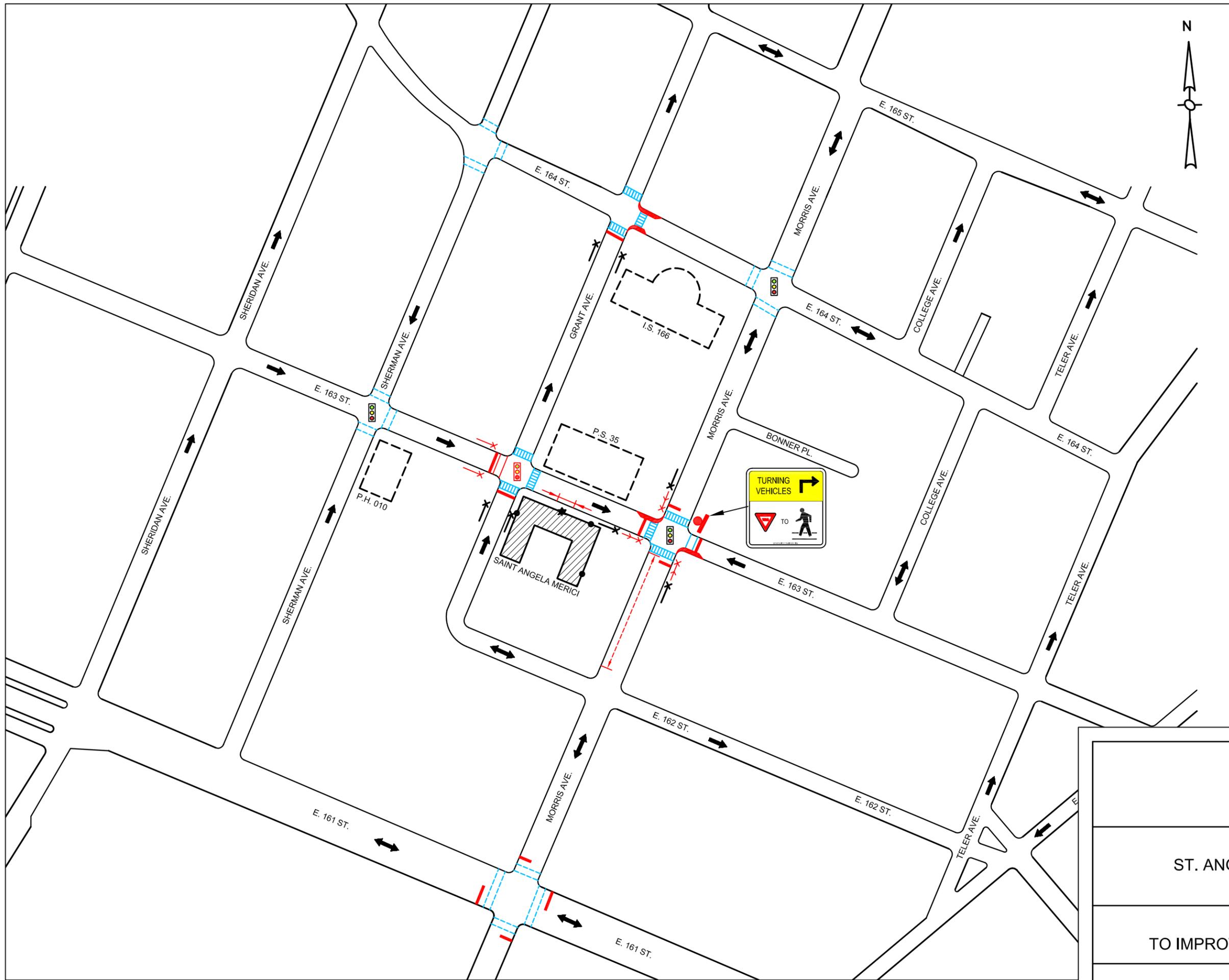
- Provide curb extensions at the southeast and northwest corners of East 163rd Street.

➤ *Curb extension at the intersection of Grant Avenue and East 164th Street*

This intersection experienced two school-related accidents between 2001 and 2004. There is an uncontrolled school crosswalk located across the east leg of East 164th Street. It is therefore recommended to:

- Provide curb extensions at the northeast and southeast corners of East 164th Street at its intersection with Grant Avenue.

Curb extensions (neckdowns) should be installed at the corners as shown in Exhibit 5. The purpose of the curb extensions is to provide additional reservoir space for pedestrian, to shorten the crossing distance for pedestrians, and to reduce the speed of vehicles approaching and turning on school crosswalks. The curb extension will not eliminate or reduce the width of any travel lanes. Curb extensions are not proposed where they would hinder the ability of a vehicle to turn.



LEGEND

-  MAIN ENTRANCE
-  OTHER ENTRANCES
-  EXISTING TRAVEL DIRECTION
-  EXISTING ADVANCE WARNING SIGN OR SCHEDULED TO BE INSTALLED
-  EXISTING SIGNALIZED LOCATION
-  EXISTING ALL WAY STOP LOCATION
-  EXISTING SCHOOL CROSSWALK
-  EXISTING SCHOOL CROSSWALK ASSOCIATED WITH ANOTHER SCHOOL
-  PROPOSED SCHOOL CROSSWALK WARNING ASSEMBLY OR SCHEDULED TO BE INSTALLED
-  PROPOSED TRAFFIC SIGN
-  PROPOSED STOP LINE IN ADVANCE OF SCHOOL CROSSWALK
-  PROPOSED "NO STANDING 7:00AM - 4:00PM SCHOOL DAYS"
-  PROPOSED "NO PARKING 7:00AM - 4:00PM SCHOOL DAYS"
-  PROPOSED CURB EXTENSION (NECKDOWN)
-  PROPOSED SIGNALIZED LOCATION

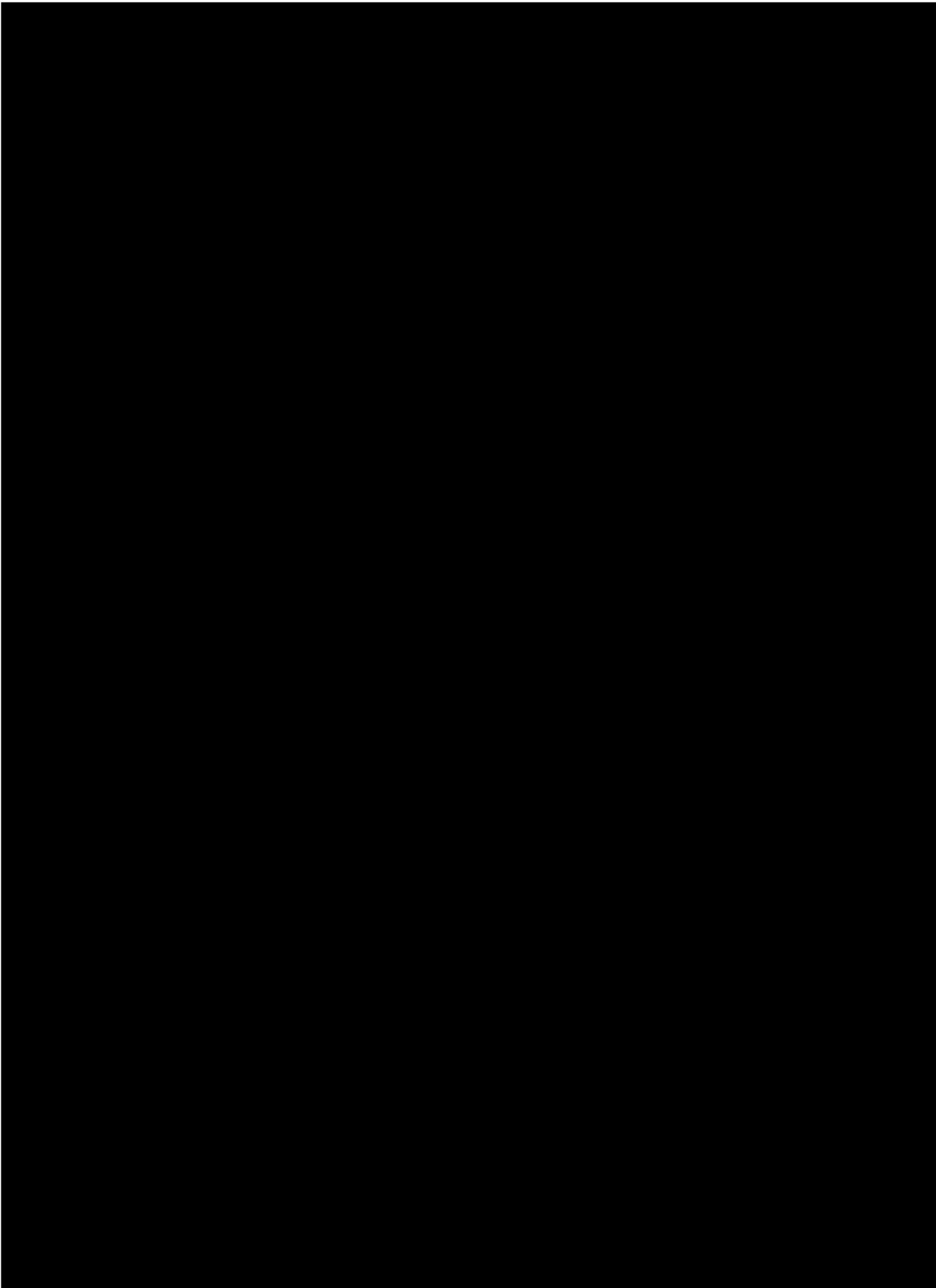
1" = 200'

EXHIBIT 5

ST. ANGELA MERICI SCHOOL BRONX

PROPOSED MEASURES TO IMPROVE SCHOOL PEDESTRIAN SAFETY

APPENDIX

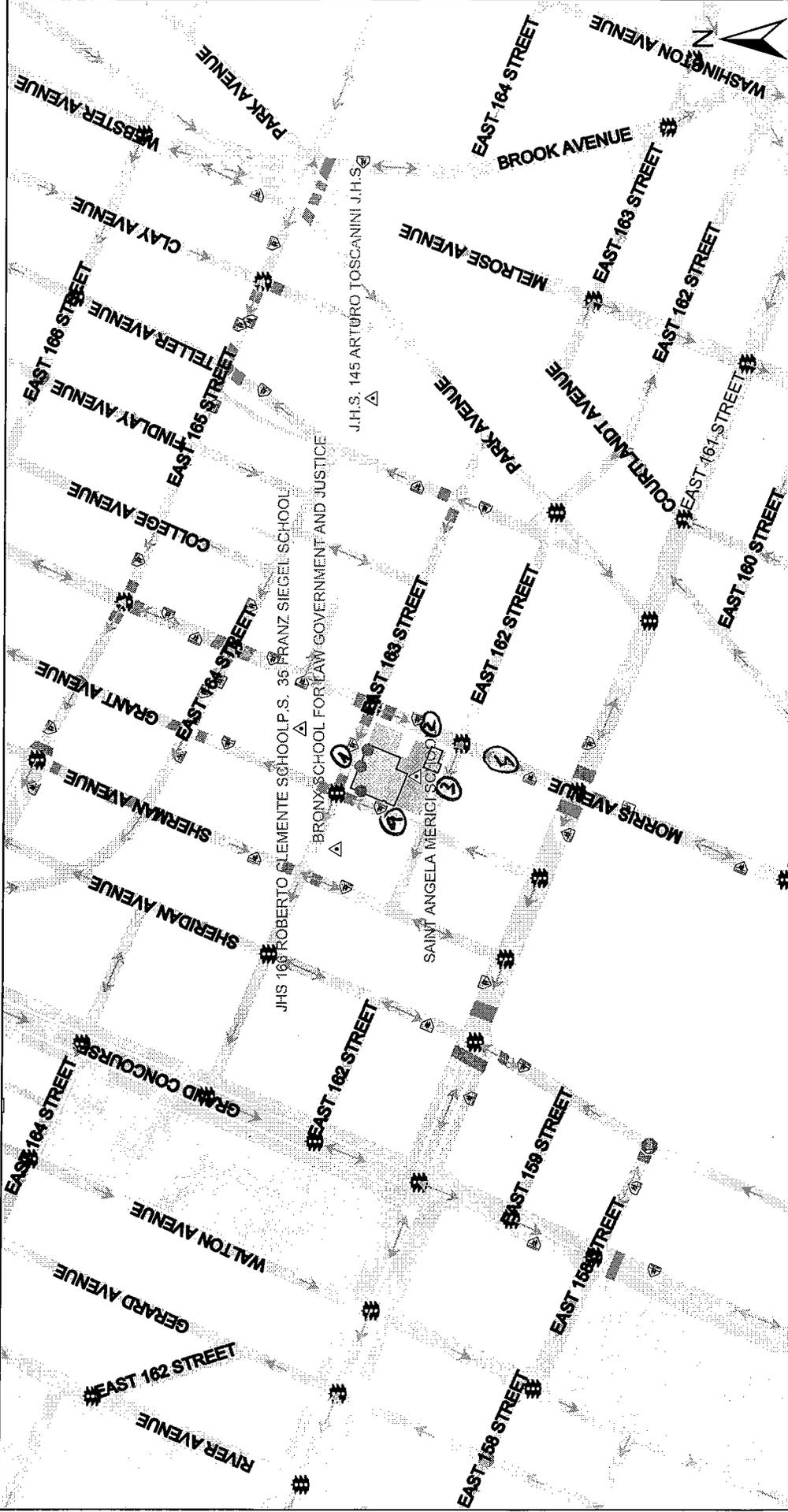




New York City
Department of Transportation

School Traffic Safety Map

Traffic Operations Division



1,980 Feet

990

495

0

LEGEND:

- TRAFFIC FLOW
- SCHOOL LOCATION
- SCHOOL ENTRANCE
- SCHOOL CROSSWALK
- TRAFFIC SIGNAL
- ALL-WAY STOP
- SPEED REDUCER
- ADVANCE WARNING SIGN

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 advance warning signs, speed reducers, school crosswalks and some traffic control devices. (While virtually all intersections in NYC benefit from traffic control devices - such as stop signs, yield signs, traffic signals, and all way stop signs - this map only shows 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.

Bronx
ST ANGELA MERICI SCHOOL
Prepared by the NEW YORK CITY DEPARTMENT OF TRANSPORTATION, ITS WEINSHALL, COMMISSIONER.
Map created on 3/30/15
COMM. BOARD: 204
PRECINCT: 44
1.2.13



