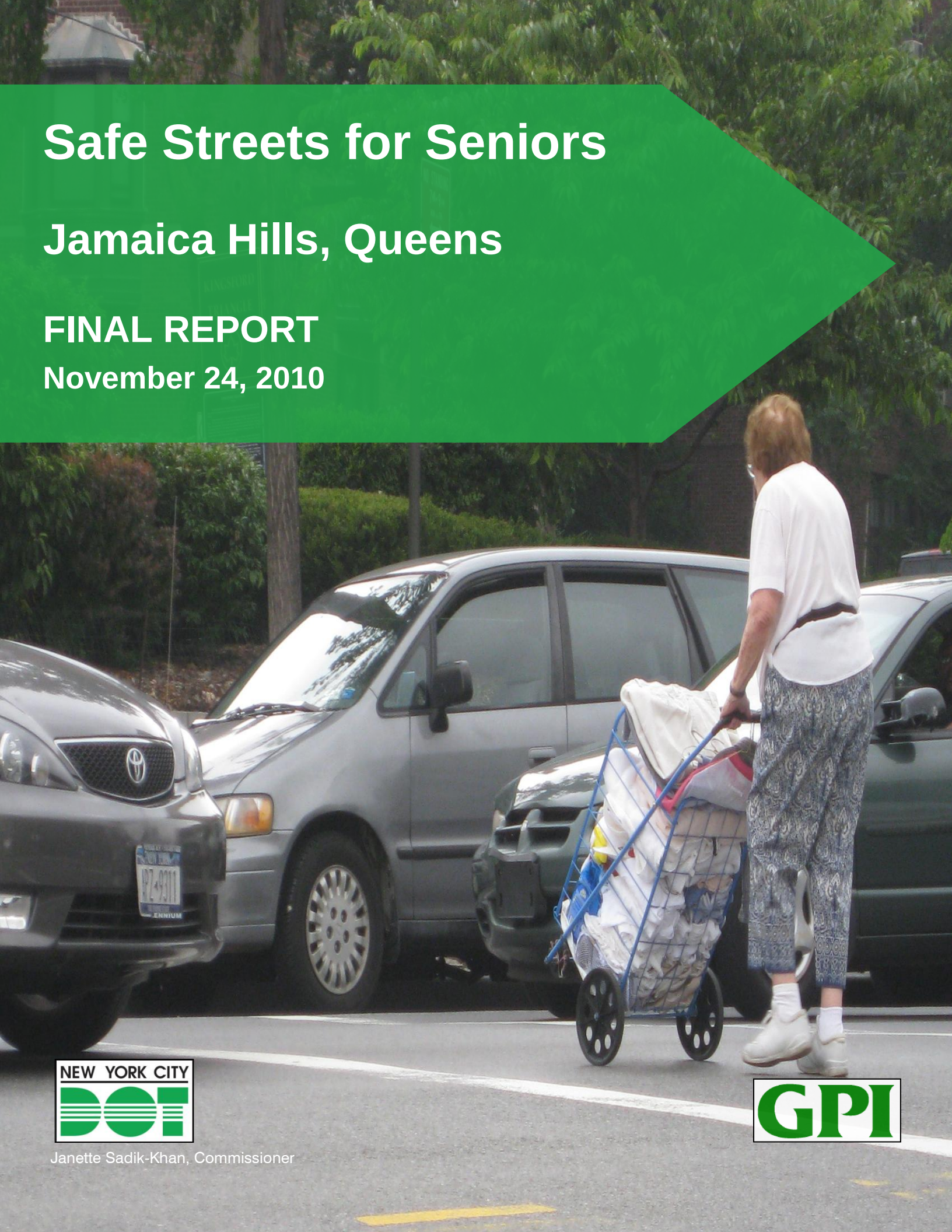
Safe Streets for Seniors

Jamaica Hills, Queens

FINAL REPORT

November 24, 2010



NEW YORK CITY DOT

GPI

Janette Sadik-Khan, Commissioner

Safe Streets for Seniors
Jamaica Hills, Queens
TABLE OF CONTENTS

EXHIBITS

APPENDICES

PROJECT DESCRIPTION

Since 1990 the number of pedestrian fatalities in New York City has decreased by 56%. Moreover, prior to 1950, pedestrians accounted for ¾ of all traffic fatalities and since then, that percentage has decreased to account for about ½ of all traffic fatalities. Despite these statistical improvements, pedestrians continue to be the largest at risk mode – with older adults more likely to suffer serious injuries or fatalities from traffic crashes than other pedestrians. The rate of pedestrian fatalities for every 100,000 persons in the City has decreased by nearly half since 1991 – to 2.0 from 3.8 – while the rate of senior pedestrian fatalities per 100,000 seniors has decreased even more sharply – to 6.6 from 13.1. Nevertheless, while seniors make up only 12% of the population in New York City, they still comprise 39% of pedestrian fatalities. The recognition of the disproportional representation of the senior population among severe pedestrian injuries and fatalities led to the development of the Department's **Safe Streets for Seniors** (SSS) program.

The purpose of this project is to address senior pedestrian safety issues at twenty-five **Senior Pedestrian Focus Areas** (SPFAs) in the five boroughs of New York City and to develop and implement mitigation measures to improve the safety of seniors and other pedestrians within the 25 SPFA areas. DOT identified SPFAs to include the top senior pedestrian crash (severe injury and fatality) areas within each borough. Four of the SPFAs are located in the Bronx, seven in Brooklyn, five in Queens, eight in Manhattan and one in Staten Island. The SPFAs have been selected based on the density of senior pedestrian crashes resulting in fatalities or severe injuries in a five-year period. DOT conducted in-house studies for five pilot SPFAs and is utilizing consultant services to perform a comprehensive study of pedestrian safety conditions at intersections and along corridors within twenty selected SPFAs.

The project evaluates the crash history and existing traffic conditions and controls (e.g., roadway geometry, signal timing) at selected intersections and corridors within each SPFA in order to develop short- and long-term measures to reduce pedestrian crashes specifically for seniors, and improve safety and traffic operations for all users. The consultant makes specific safety recommendations consisting of low-cost as well as capital engineering and design improvements for these twenty areas. In addition, the consultant conducts data analysis as needed, prepares engineering and design schematics and related services, as necessary, for capital improvements.

In this report, the Jamaica Hills SPFA located in Queens has been studied, evaluated and addressed.

Background

BACKGROUND

Land-use in the Jamaica Hills Study Area includes a mixture of commercial and residential buildings. Most of these commercial buildings are one to two stories high with the second floor typically used for residential purposes and the ground floor mainly used by street front stores. Some of the residential buildings are about 6 to 8 stories high. The study area is a very busy section of Queens and can be considered as a multi-modal hub when it comes to daily traffic and transportation activities.

Jamaica Hills has all of the dominant elements typical of an urban setting, including vehicular, bus, subway and pedestrian modes of transportation. Subway and bus services in the study area are provided along Hillside Avenue. Subway stations are located on Hillside Avenue for the F line at its intersections with Midland Parkway, 179th Place and 179th Street. The bus operations include services for the Q1, Q2, Q3, Q17, Q36, Q43, Q75, Q76, Q77, N1, N2, N3, N6, N22, N22A, N24, N26, X32 and the X68 lines.

Significant pedestrian activity is also generated by the Susan B. Anthony School (I.S. 238), Eastwood Elementary (P.S. 095) and Mary Louis Academy schools which are located within the boundary of the project study area.

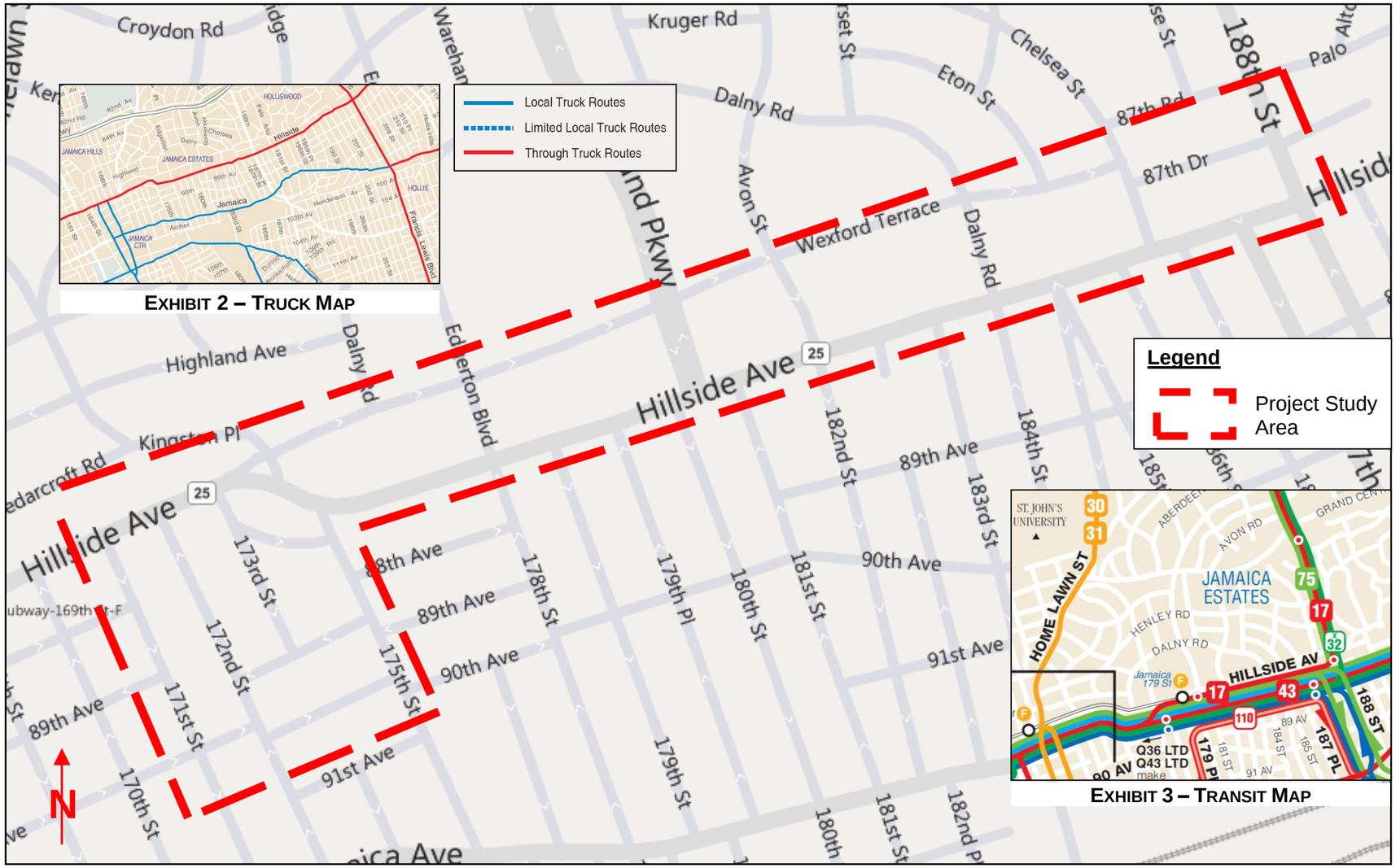
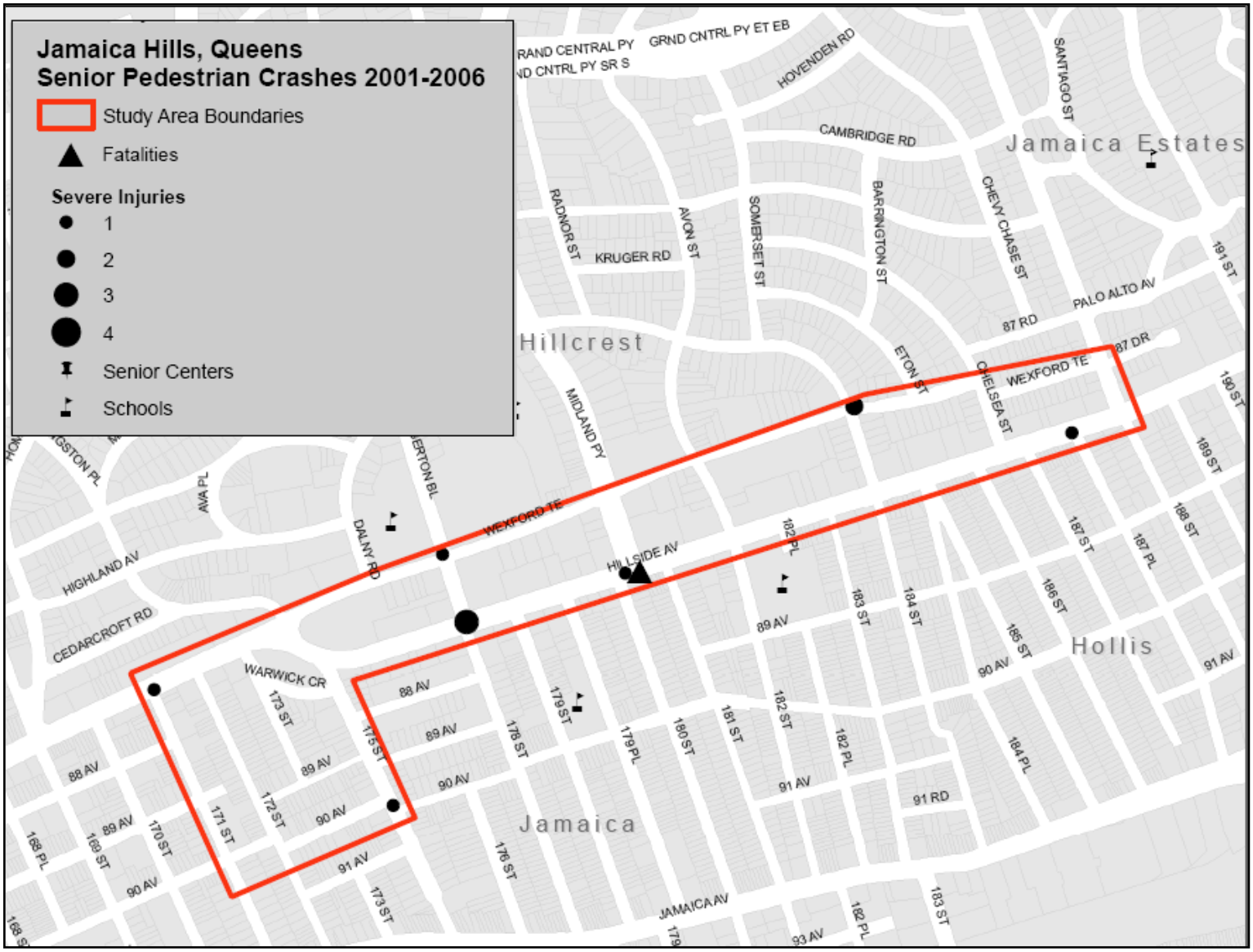


EXHIBIT 2 – TRUCK MAP

EXHIBIT 3 – TRANSIT MAP

EXHIBIT 1 – ROADWAY MAP OF THE STUDY AREA

EXHIBIT 4 – PEDESTRIAN CRASH STATISTICS (2001-2006)



EXISTING CONDITIONS

The Jamaica Hills Senior Pedestrian Focus Study Area was selected for senior pedestrian improvements because it was identified as having a history of senior pedestrian crashes. This area is largely defined by the east-west corridors of Hillside Avenue, a major arterial, and Wexford Terrace, a local residential roadway. Both are located in close proximity to the urban activity center or business district. The study segment of Hillside Avenue is approximately 1.3 miles long and intersects 22 cross streets. Wexford Terrace runs one block north and parallel to Hillside Avenue within the study area. It is approximately 1.1 miles long and intersects many of the same cross streets as Hillside Avenue. In addition to these two corridors, one spot location of 175th Street and 90th Avenue was also studied under this project. Exhibits 1, 2 and 3 provide area-wide truck, bus and subway route information, as well as a roadway map of the study area. Exhibit 4 provides the statistics for senior pedestrian crashes occurring within the study area between 2001 and 2006.

In order to determine, evaluate and recommend measures associated with the safety issues faced by senior pedestrians, numerous site visits and interviews with senior pedestrians were conducted. The issues that were repeatedly observed during field visits and noted during these interviews are listed below:

- Insufficient pedestrian crossing time
- Faded or missing crosswalk striping
- Missing or non-standard ADA pedestrian ramps
- Turning vehicles not yielding to pedestrians with right-of-way at intersections
- Potholes and poor surface conditions at crosswalks
- Poor drainage and ponding

A photo log of the site visit is included in Appendix A, while the field investigation forms are presented in Appendix B.

It was noted during the site visits that these operational and geometric issues, coupled with high traffic volumes and significantly high senior pedestrian activity, has made it difficult for these pedestrians to safely cross various roadways within the study area. A description of these observations and findings are discussed below with appropriate safety recommendations.

In addition to the recommendations proposed in this SPFA report which are aimed at senior pedestrian safety improvements, the NYCDOT is concurrently involved in a similar project which is focused on improving pedestrian safety in the immediate vicinity of 135 “priority” elementary and middle schools located throughout the five boroughs of New York City. Some of these “priority” schools are located within the SPFA projects and thus, the recommendations developed under the school safety projects have also been shown in the ***“Illustrating the Solution”*** section of this report. It is important to note that, in view of the senior

pedestrian requirements at some of the common locations, the recommendations made under the SPFA project may further enhance the recommendations proposed under the school safety project.

Research has indicated that the Jamaica Hills SPFA has one such "priority" school safety project, as listed below:

- I.S. 238, Susan B. Anthony School, Queens

  (School Safety Engineering Project PIN# 84100MBTR144)

A complete copy of the priority school report for this school is readily available at the following NYCDOT website:

http://home2.nyc.gov/html/dot/html/safety/saferoutes.shtml

Copy of the recommendations proposed in this school safety report has been included in Appendix G of this report for reference. These recommendations, coupled with the SPFA recommendations, will present a complete picture of the recommendations within the study area.

RECOMMENDATIONS

Hillside Avenue

Hillside Avenue is a major two-way arterial with two moving lanes in each direction, a parking lane along each curb and left turn bays at major intersections (Photo No. 1). This corridor provides east-west access extending from Nassau County in the east to Brooklyn in the west. Parking is generally permitted on both sides of the arterial within the study area. The curb lanes are reserved for buses and right turning vehicles during weekdays, 7-9 AM westbound and 4-7 PM eastbound on Hillside Avenue. Hillside Avenue is a major through-truck route and also supports significant transit operations including buses and a subway line. Thus it is one of the most heavily traveled corridors in Queens with the greatest traffic activity during the typical AM, midday and PM peak commuting hours.

Due to significant store front activities, closely spaced and populated residential buildings and readily available transit services within walking distance on Hillside Avenue, there is a substantial pedestrian population, including seniors, utilizing this corridor on a daily basis. The high senior population underscores the importance of accommodating safe pedestrian travel within the overall scheme of traffic and transportation operations.

Hillside Avenue (looking east)

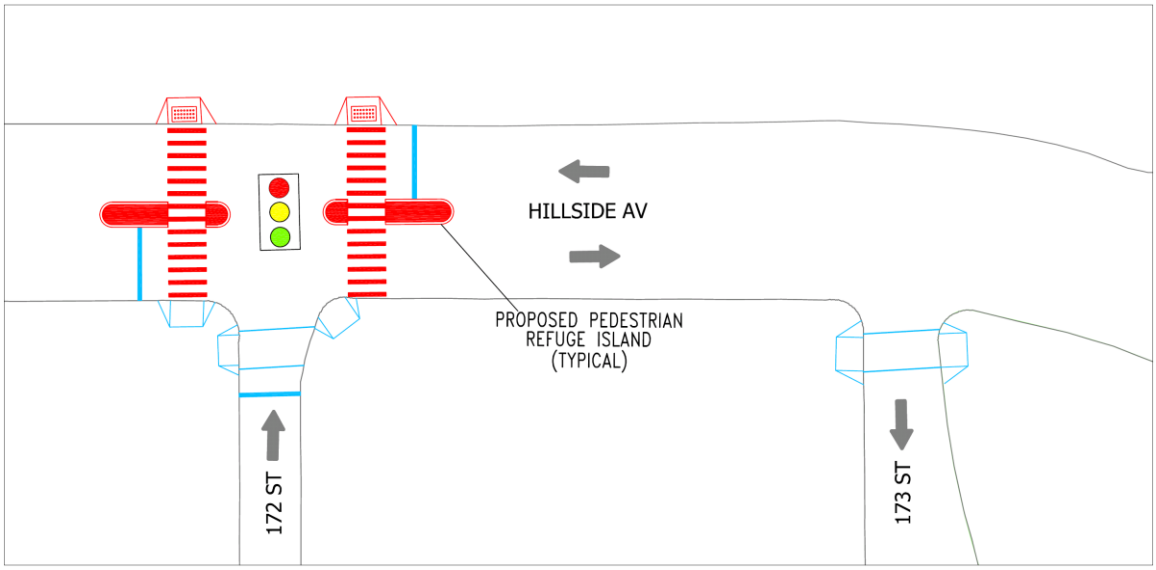
Photo No. 1

The observations made along this corridor have resulted in various corridor-wide, as well as intersection-specific recommendations. These recommendations are shown in the Site 1 illustrations.

Corridor-Wide Recommendations

- Under the existing conditions, there is a yellow hatched median on Hillside Avenue between 188th Street and 171st Street. It is recommended that the striped median be replaced with pedestrian refuge islands at major signalized intersections and specifically at locations where these pedestrian refuge islands will not interfere with the existing left turn bays approaching intersections. The installation of pedestrian islands will provide senior pedestrians with a refuge while crossing Hillside Avenue. These traffic calming islands or raised medians will not only slow down the speed of turning vehicles but will effectively shorten the crossing distance by allowing senior pedestrians to cross the roadway in two traffic signal

cycles (if necessary). Construction details for these pedestrian refuge islands are provided in Appendix F. It is important to note that within the striped crosswalk, the raised median island should be constructed at-grade so that all pedestrians can conveniently utilize the refuge without requiring a step up to or down from the raised median curb.



Pedestrian Refuge Island Details (Typical)

- Install high visibility crosswalks and advanced stop bars at signalized intersections.
- Replace non-standard ramps with new ADA (Americans with Disabilities Act) compliant pedestrian ramps.
- Install oversized street name signs at various intersecting roadways, particularly where these signs are not presently installed or have substandard lettering.

Intersection-Specific Recommendations

Hillside Avenue and 171st Street

- Under the present condition, the intersection of Hillside Avenue and 171st Street is unsignalized with no crosswalk provisions across Hillside Avenue (Photo No. 2). The only crosswalk at this intersection is on the minor approach (171st Street); however, pedestrians were observed crossing Hillside Avenue at this intersection. Consistent with past practice, it is not recommended that crosswalks be installed on Hillside Avenue at this location. It is recommended, however, that positive guidance be provided to the pedestrians so that they are guided to cross Hillside Avenue via adjacent signalized intersections. It is recommended that pedestrian signs be installed, including "No Pedestrian Crossing" (MUTCD: R9-3a) signs, supplemented with the directional "Use Crosswalk - with appropriate arrow" (MUTCD: R9-3b) signs. These signs should be appropriately located facing pedestrians on the intersection corners so that pedestrians are guided to cross Hillside Avenue from the adjacent signalized intersection.

Hillside Avenue & 171st Street (looking east)
Photo No. 2

MUTCD: R9-3a

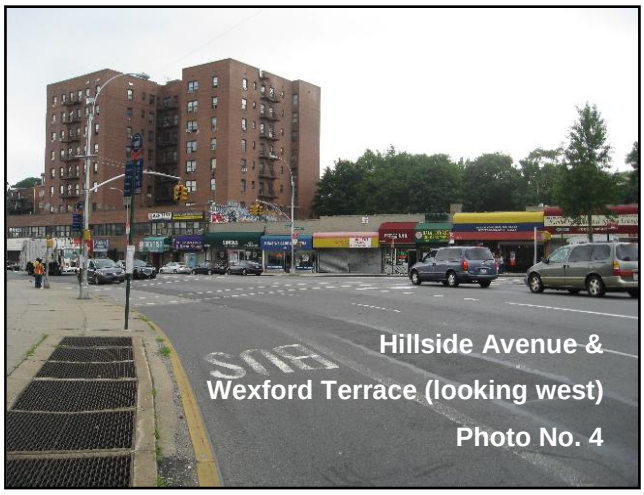
MUTCD: R9-3b

It is also recommended that a high visibility crosswalk be installed on the minor approach of 171st Street.

Hillside Avenue and 172nd Street

- It is recommended that the existing hatched median on Hillside Avenue be replaced by installing median pedestrian refuge islands on the east and west legs of this signalized "T" intersection (Photo No. 3). This measure will reduce the walking distance and the exposure of pedestrians to traffic operations. It is further recommended that high visibility crosswalks be installed across Hillside Avenue along with ADA-compliant pedestrian ramps along the north curb. The intersection box should also be kept clear of parking operations by the installation of "No Standing Any Time" signs.

Hillside Avenue and Wexford Terrace



- Due to the angular intersection geometry and line-of-sight constraints at this "T" intersection, the left turns from Wexford Terrace to Hillside Avenue could potentially lead to pedestrian crashes (Photo No. 4). A photo of one such potential conflict is shown on the cover page of this document. Improvements suggested for this intersection include installing a median pedestrian refuge island on Hillside Avenue within the intersection box, installing high visibility crosswalks on the west and north sides of this intersection, and installing advanced stop bars. These improvements will eliminate the above-noted left turn conflict and would help to improve pedestrian safety at this intersection. Pedestrian count data can be viewed in Appendix D.

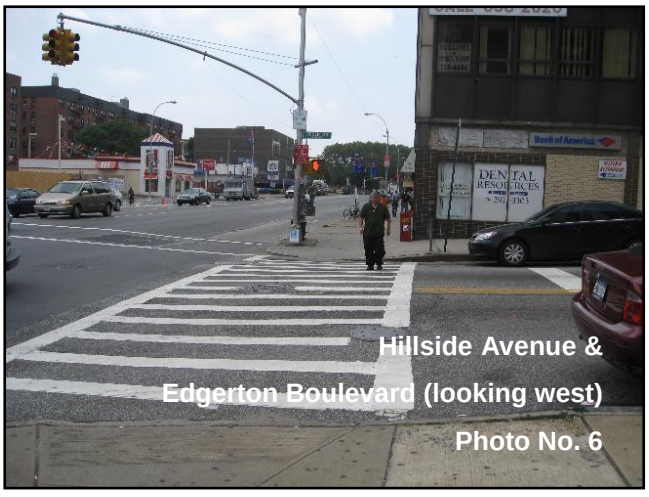
Hillside Avenue and 175th Street

- It is recommended to reduce the pedestrian crosswalk width of the west leg of this intersection by installing a median pedestrian refuge island in place of the existing hatched median on Hillside Avenue (Photo No. 5). The east leg of this intersection currently has an active left turn bay which cannot be closed to accommodate a pedestrian refuge island. It is further recommended that high visibility crosswalks be installed on all three legs of this signalized "T" intersection to improve pedestrian safety.

Hillside Avenue & 175th Street (looking north-west)
Photo No. 5

Hillside Avenue and 178th Street/Edgerton Boulevard

- Install a median pedestrian refuge island on the east leg of Hillside Avenue at this intersection. Relocate the east school crosswalk based upon the new refuge island alignment.
- Install a Leading Pedestrian Interval (LPI) for the north crosswalk at the intersection of Hillside Avenue and 178th Street/Edgerton Boulevard (Photo No. 6). The purpose of an LPI is to give advance, conflict-free crossing time to pedestrians in order to avoid conflicts when they are crossing the path of turning vehicles at a crosswalk. Field observations reveal significant pedestrian activity at this location, involving a considerable number of seniors. Turning movement counts performed on 09/11/08 for the AM and PM peak periods indicate:
  - During the AM peak hour, there are 172 pedestrians crossing Edgerton Boulevard, conflicting with 221 vehicles (23 eastbound left + 198 westbound right).



Hillside Avenue & Edgerton Boulevard (looking west)
Photo No. 6

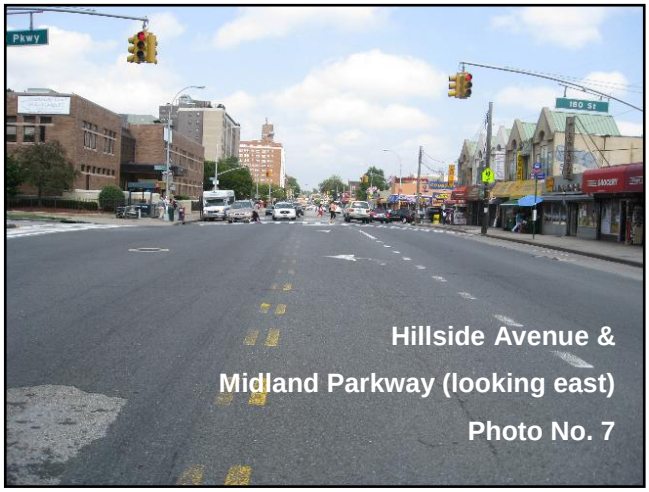
- During the PM peak hour, there are 270 pedestrians crossing Edgerton Boulevard conflicting with 100 vehicles (35 eastbound left + 65 westbound right). .Pedestrian count data can be found in Appendix D.

Hillside Avenue and 179th Street and 179th Place

- In order to improve pedestrian safety, it is recommended that high visibility crosswalks be installed on all three legs of these two signalized "T" intersections. The crosswalks on Hillside Avenue should be provided with ADA-compliant pedestrian ramps, three of which are presently missing from the north curb-side. It is further recommended that median pedestrian refuge islands be installed at both of these intersections in place of the existing hatched medians.

Hillside Avenue and Midland Parkway

- This "T" intersection is sandwiched between the very closely spaced 180th Street and 181st Street intersections. It is located approximately 80 feet east of 180th Street and approximately 170 feet west of 181st Street. In addition, north and southbound Midland Parkway is separated by a median island which is approximately 20' wide. Due to the constrained geometrical configuration at this intersection, the eastbound left turning vehicles from Hillside Avenue to Midland Parkway queue and frequently block the intersection box between 180th Street and 181st Street (Photo Nos. 7 & 8). This results in southbound left turning vehicles from Midland Parkway maneuvering around the vehicles blocking the intersection. As such, these vehicles are frequently in direct conflict with pedestrians utilizing Hillside



Hillside Avenue & Midland Parkway (looking east)
Photo No. 7


Hillside Avenue & Midland parkway (northwest corner looking east)
Photo No. 8

Avenue's east side crosswalk. Even without vehicular blockage of the intersection box, the southbound left turning movement from Midland Parkway is difficult as vehicles have to maneuver over the existing hatched median/left turn bay located within the intersection box. Under the school safety projects, the construction of pedestrian refuge islands has been recommended along Hillside Avenue between Midland Parkway and 182nd Street which will improve pedestrian safety in this area (see Appendix G for details). In addition to these pedestrian refuge islands, it is recommended that a left turn restriction from westbound Hillside Avenue onto 180th Street be implemented.

Hillside Avenue and 187th Place

- Similar to the recommendations proposed for the unsignalized intersection at 171st Street, it is recommended that appropriately placed "No Pedestrian Crossing" (R9-3a) signs be installed, supplemented with the directional "Use Crosswalk - with appropriate arrow" (R9-3b) signs in order to discourage people from crossing Hillside Avenue at 187th Place. A high visibility crosswalk should also be installed on the south leg at 187th Place.

Hillside Avenue and 188th Street

- Install a median pedestrian refuge island on the east leg of Hillside Avenue and high visibility crosswalks on all four legs of this intersection (Photo No. 9).

Hillside Avenue & 188th Street (looking south-east)

Photo No. 9

Wexford Terrace

Wexford Terrace is a local one-way road with one moving lane in the eastbound direction between Kingston Place and 188th Street. Parking is generally permitted on both sides of this roadway. It serves the residential neighborhood that lies between Wexford Terrace and Hillside Avenue.

The observations made along this corridor have resulted in various localized intersection-specific recommendations that are shown in the Site 2 illustrations and are described below.

Intersection-Specific Recommendations

Wexford Terrace and Kingston Place


Wexford Terrace & Kingston Place (looking east)
Photo No. 10

- At the intersection of Wexford Terrace and Kingston Place, the installation of high visibility crosswalks on the north, east and west side approaches is recommended, as well as an advanced stop bar on the southbound approach. The relocation of an existing "Stop Ahead" sign to 50 feet northwest of its present location on Kingston Place is also recommended. In addition, field visits have noted vehicles parked at the southeasterly curb of the Kingston Place and Wexford Terrace intersection (right into the intersection). These vehicles block the driver's view and could result in a serious pedestrian/vehicular conflict between vehicles turning right from Kingston Place to Wexford Terrace and pedestrians crossing at the east crosswalk (Photo No. 10). The installation of "No Standing Any Time" signs is recommended at this corner so that visibility at this skewed intersection can be improved. A new pedestrian ramp should also be installed on the northeast corner.

Wexford Terrace and Dalny Street

- At the intersection of Wexford Terrace and Dalny Street, the installation of high visibility crosswalks on the east and west sides is recommended. It is also recommended that "No Standing Any Time" signs be installed on the southwest corner of Wexford Terrace at this intersection. This measure will help to make the pedestrians crossing Wexford Terrace more visible to approaching vehicles.

Wexford Terrace and Chelsea Street

- The installation of a standard crosswalk and an advanced stop bar on the eastbound approach is recommended at the intersection of Wexford Terrace and Chelsea Street. The installation of a dual direction arrow-intersection warning sign (W1-7) facing eastbound traffic is also recommended.

Wexford Terrace and 188th Street

- At the intersection of Wexford Terrace and 188th Street, the installation of high visibility crosswalks on the east and west approaches is recommended. The relocation of the existing bus stop on the northbound approach is also recommended. It should be moved 5 to 10 feet south to help improve visibility for right turning traffic against the crossing pedestrians. On the eastbound approach to this intersection, the removal of approximately 75 feet of parking spaces on both curb sides is recommended. This will create better vehicular operations by providing two moving lanes at the approach with pavement restriping. On the westbound approach, the old pedestrian ramps should be removed and new ADA compliant pedestrian ramps should be provided and aligned with the crosswalk (Photo No. 11). No crosswalks presently exist on 188th Street and it is not recommended that crosswalks be added; however, it is recommended that positive guidance be provided to pedestrians so that they are guided to cross 188th Street via adjacent signalized intersections. The installation of pedestrian signs is recommended, including "No Pedestrian Crossing" (MUTCD: R9-3a) signs, supplemented with the directional "Use Crosswalk - with appropriate arrow" (MUTCD: R9-3b) signs.

Wexford Street & 188th Street (east crosswalk) Photo No. 11

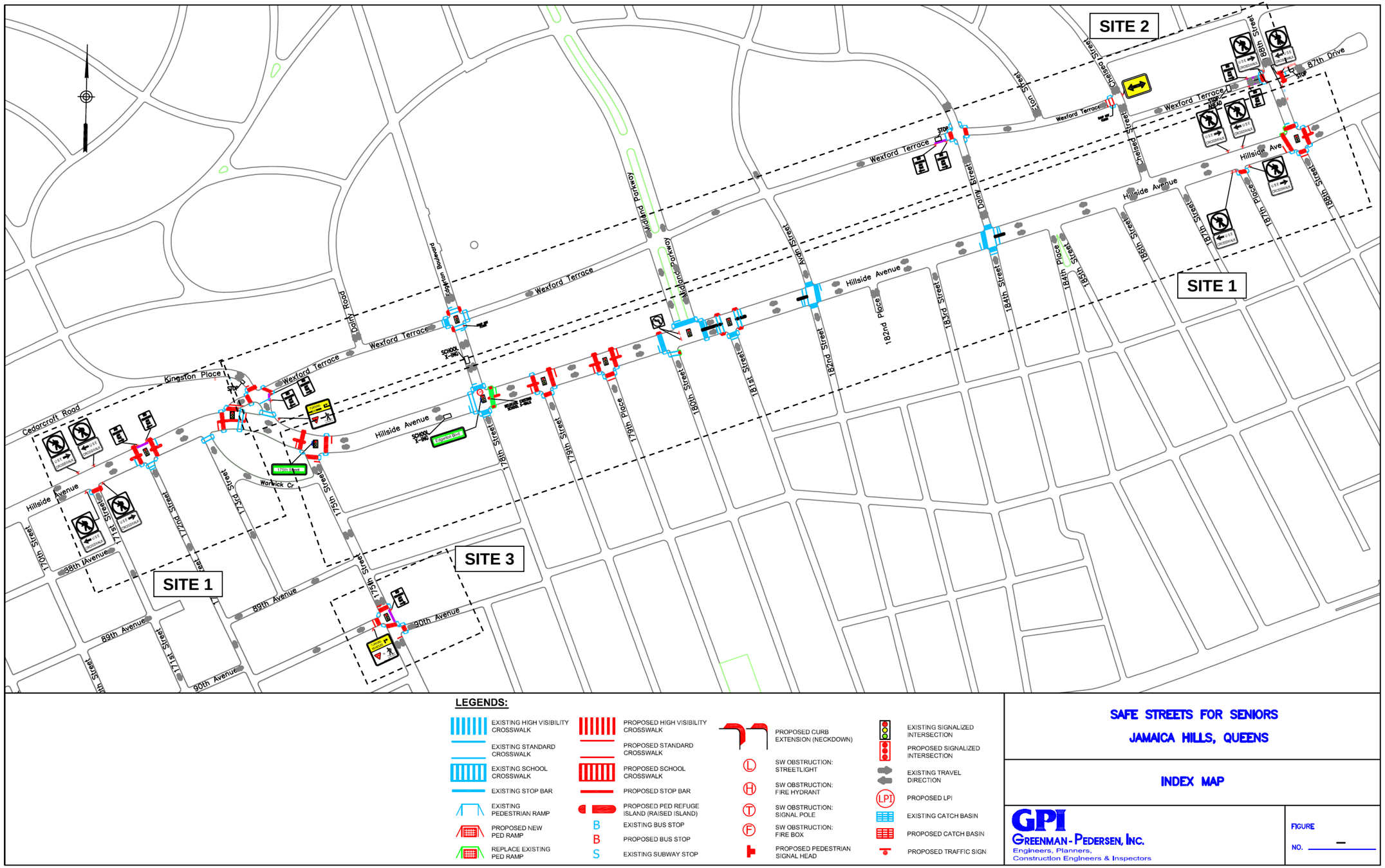
90th Avenue at 175th Street

90th Street & 175th Street (looking north)
Photo No. 12

- This is a staggered 4-leg intersection that is surrounded by a residential neighborhood, including a church and a community center (Photo No.12). At this intersection, the installation of high visibility crosswalks on all four sides and advanced stop bars on the north, south, and west approaches is recommended. It is further recommended that parking be removed from the east side of 175th Street within the intersection box fronting the 90th Avenue approach because it creates a blind spot for drivers and for crossing pedestrians. A "Yield to Pedestrian" sign should also be installed on the 90th Avenue approach. These recommendations are shown in the Site 3 illustrations.

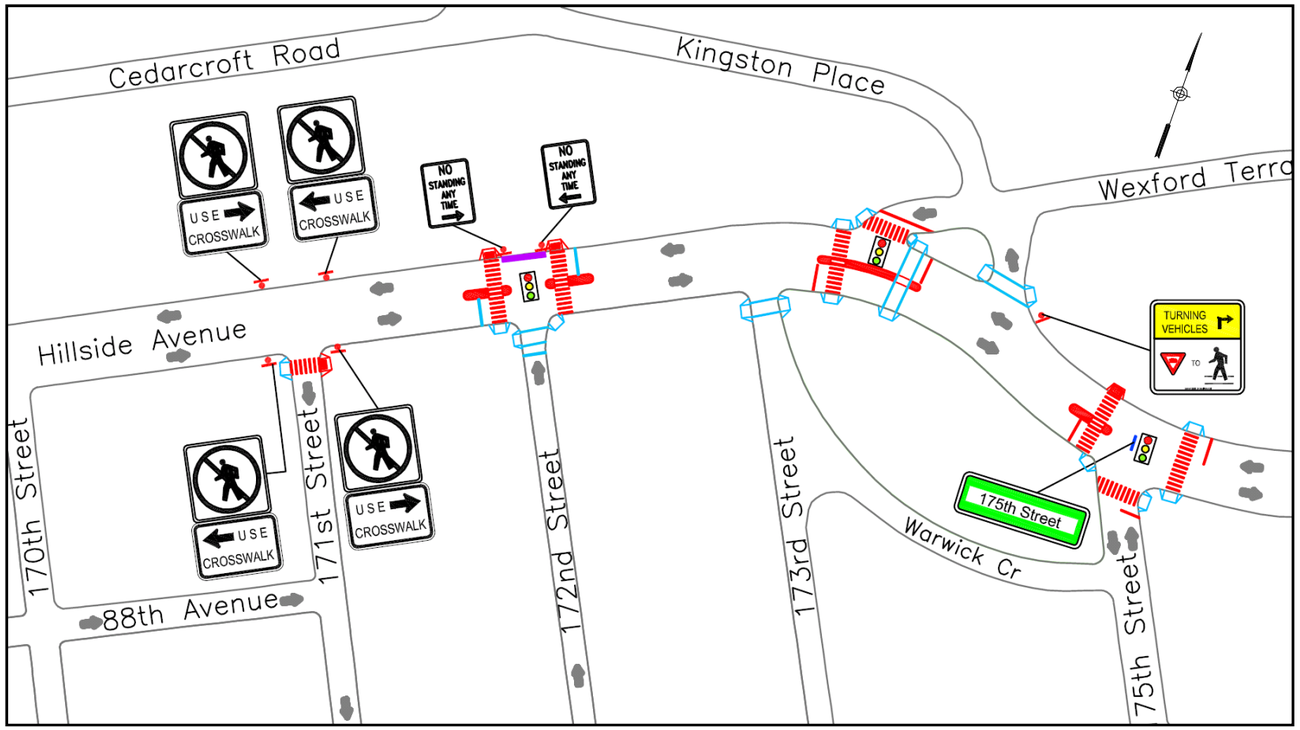
INDEX

Illustrating the Solution



Illustrating the Solution

SITE 1: PLAN 1 HILLSIDE AVENUE (FROM 171ST STREET TO 175TH STREET)



LEGENDS:

- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING SCHOOL CROSSWALK
- EXISTING STOP BAR
- EXISTING PEDESTRIAN RAMP
- PROPOSED NEW PED RAMP
- REPLACE EXISTING PED RAMP
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED SCHOOL CROSSWALK
- PROPOSED STOP BAR
- PROPOSED PED REFUGE ISLAND (RAISED ISLAND)
- B EXISTING BUS STOP
- B PROPOSED BUS STOP
- S EXISTING SUBWAY STOP
- PROPOSED CURB EXTENSION (NECKDOWN)
- L SW OBSTRUCTION: STREETLIGHT
- H SW OBSTRUCTION: FIRE HYDRANT
- T SW OBSTRUCTION: SIGNAL POLE
- F SW OBSTRUCTION: FIRE BOX
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZED INTERSECTION
- EXISTING TRAVEL DIRECTION
- LPI PROPOSED LPI
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN

Pedestrian concerns in this area:

- Non-standard pedestrian ramps
- Turning vehicles not yielding to pedestrians
- Signal timing (insufficient crossing time)

Recommended improvements include:

- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new high visibility crosswalks
- Install new advance stop bars
- Install new pedestrian ramps. Where proposed, align the ramps to the proposed crosswalks
- Install a new "Yield to Pedestrian" sign at the intersection shown in the illustration
- Install new oversized street name sign at the intersection of Hillside Avenue and 175th Street. This sign is to be located on the signal mast arm facing Hillside Avenue traffic in both directions
- Install new pedestrian refuge islands and raised, planted median by replacing the existing striped median island at the intersections shown along Hillside Avenue
- Install new "No Pedestrian Crossing" and "Use Crosswalk" (with appropriate arrow) signs at the intersection of Hillside Avenue and 171st Street
- Remove the parking spaces along the north side of Hillside Avenue at 172nd Street inside the intersection box

Additional Information:

- Parking regulations for the project area have been collected and are shown in Appendix C and E
- Typical geometrical details for the construction of pedestrian refuge island are shown in Appendix F
- This study area was visited on August 7th, 2008

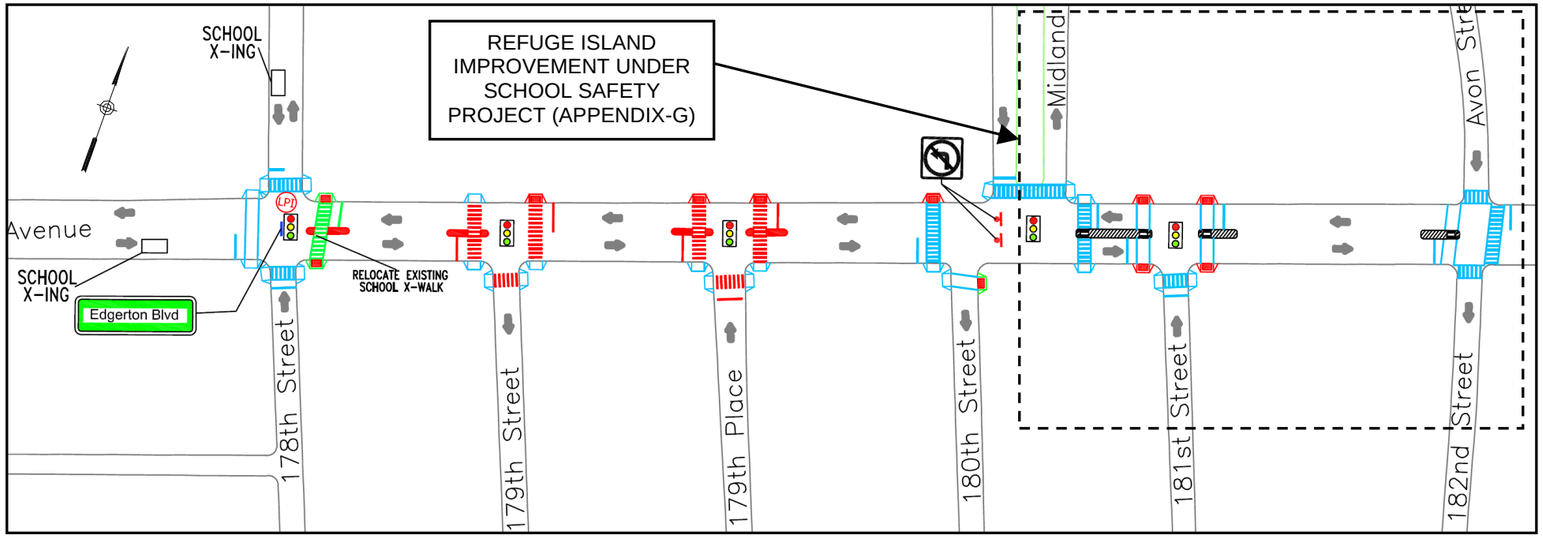
Traffic Analysis:

- Turning Movement Counts at
  - Hillside Avenue and 172nd Street
  - Hillside Avenue and Wexford Terrace
  - Hillside Avenue and 175th Street

  Traffic count data is shown in Appendix D

Illustrating the Solution

SITE 1: PLAN 2 HILLSIDE AVENUE (FROM 178TH STREET TO 181ST STREET)



LEGENDS:

- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING SCHOOL CROSSWALK
- EXISTING STOP BAR
- EXISTING PEDESTRIAN RAMP
- PROPOSED NEW PED RAMP
- REPLACE EXISTING PED RAMP
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED SCHOOL CROSSWALK
- PROPOSED STOP BAR
- PROPOSED PED REFUGE ISLAND (RAISED ISLAND)
- B EXISTING BUS STOP
- B PROPOSED BUS STOP
- S EXISTING SUBWAY STOP
- PROPOSED CURB EXTENSION (NECKDOWN)
- (L) SW OBSTRUCTION: STREETLIGHT
- (H) SW OBSTRUCTION: FIRE HYDRANT
- (T) SW OBSTRUCTION: SIGNAL POLE
- (F) SW OBSTRUCTION: FIRE BOX
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZED INTERSECTION
- EXISTING TRAVEL DIRECTION
- (LPI) PROPOSED LPI
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN

Pedestrian concerns in this area:

- Non-standard pedestrian ramps
- Turning vehicles not yielding to pedestrians
- Signal timing (insufficient crossing time)

Traffic Analysis:

- Turning Movement Counts at
  - Hillside Avenue and 178th Street/Edgerton Blvd
  - Hillside Avenue and 180th Street/Midland Pkwy
  - Hillside Avenue and 181st Street

  Traffic count data is shown in Appendix D

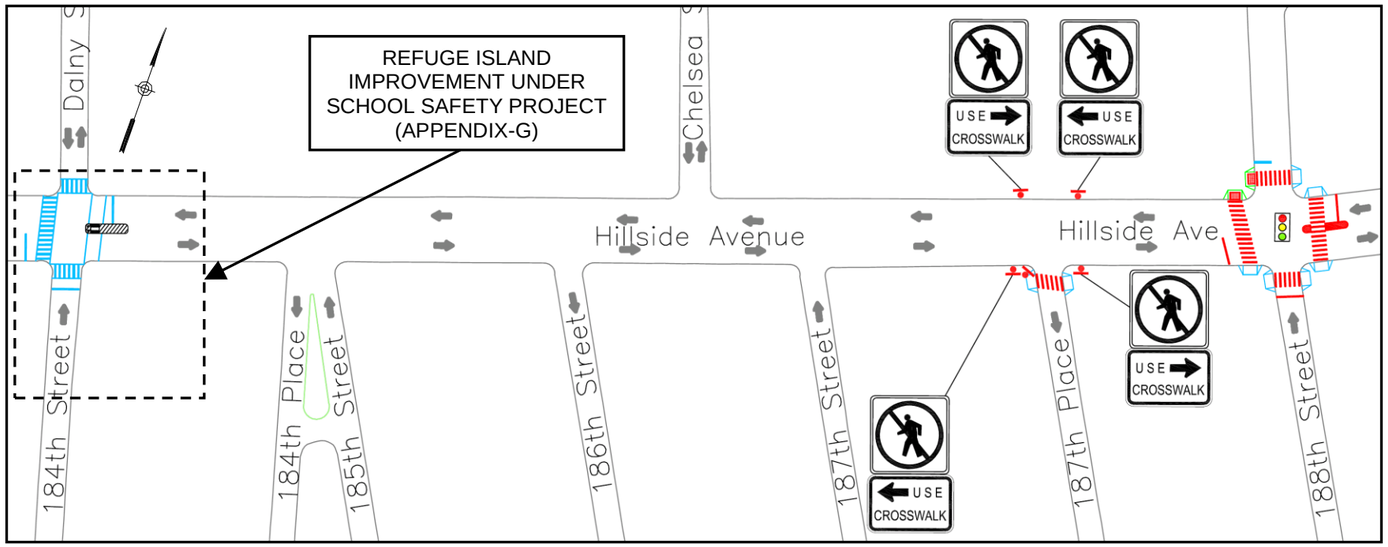
Recommended improvements include:

- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new high visibility crosswalks
- Install new advance stop bars
- Install new pedestrian ramps. Where proposed, align the ramps to the proposed crosswalks
- Install new oversized street name sign at the intersection of Hillside Avenue and Edgerton Boulevard. This sign is to be located on the signal mast arm facing Hillside Avenue traffic in both directions
- Install new pedestrian refuge islands and raised, planted median by replacing the existing striped median island at the intersections shown along Hillside Avenue
- Install new No Left Turn signs at the intersection of Hillside Avenue and 180th Street facing westbound traffic
- Consider installation of a Leading Pedestrian Interval (LPI) at Hillside Avenue and 178th Street/Edgerton Boulevard (for north crosswalk)

Additional Information:

- Parking regulations for the project area have been collected and are shown in Appendix C and E
- Typical geometrical details for the construction of pedestrian refuge island are shown in Appendix F
- School Safety Exhibits are shown in Appendix G
- This study area was visited on August 7th, 2008

SITE 1: PLAN 3 HILLSIDE AVENUE (FROM 187TH PLACE TO 188TH STREET)



Recommended improvements include:

- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new high visibility crosswalks
- Install new advance stop bars
- Install new pedestrian ramps. Where proposed, align the ramps to the proposed crosswalks
- Install new pedestrian refuge islands and raised, planted median by replacing the existing striped median island at the intersections shown along Hillside Avenue
- Install new "No Pedestrian Crossing" and "Use Crosswalk" (with appropriate arrow) signs at the intersection of Hillside Avenue and 187th Place

LEGENDS:

- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING SCHOOL CROSSWALK
- EXISTING STOP BAR
- EXISTING PEDESTRIAN RAMP
- PROPOSED NEW PED RAMP
- REPLACE EXISTING PED RAMP
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED SCHOOL CROSSWALK
- PROPOSED STOP BAR
- PROPOSED PED REFUGE ISLAND (RAISED ISLAND)
- B EXISTING BUS STOP
- B PROPOSED BUS STOP
- S EXISTING SUBWAY STOP
- PROPOSED CURB EXTENSION (NECKDOWN)
- (L) SW OBSTRUCTION: STREETLIGHT
- (H) SW OBSTRUCTION: FIRE HYDRANT
- (T) SW OBSTRUCTION: SIGNAL POLE
- (F) SW OBSTRUCTION: FIRE BOX
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZED INTERSECTION
- EXISTING TRAVEL DIRECTION
- (LPI) PROPOSED LPI
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN

Additional Information:

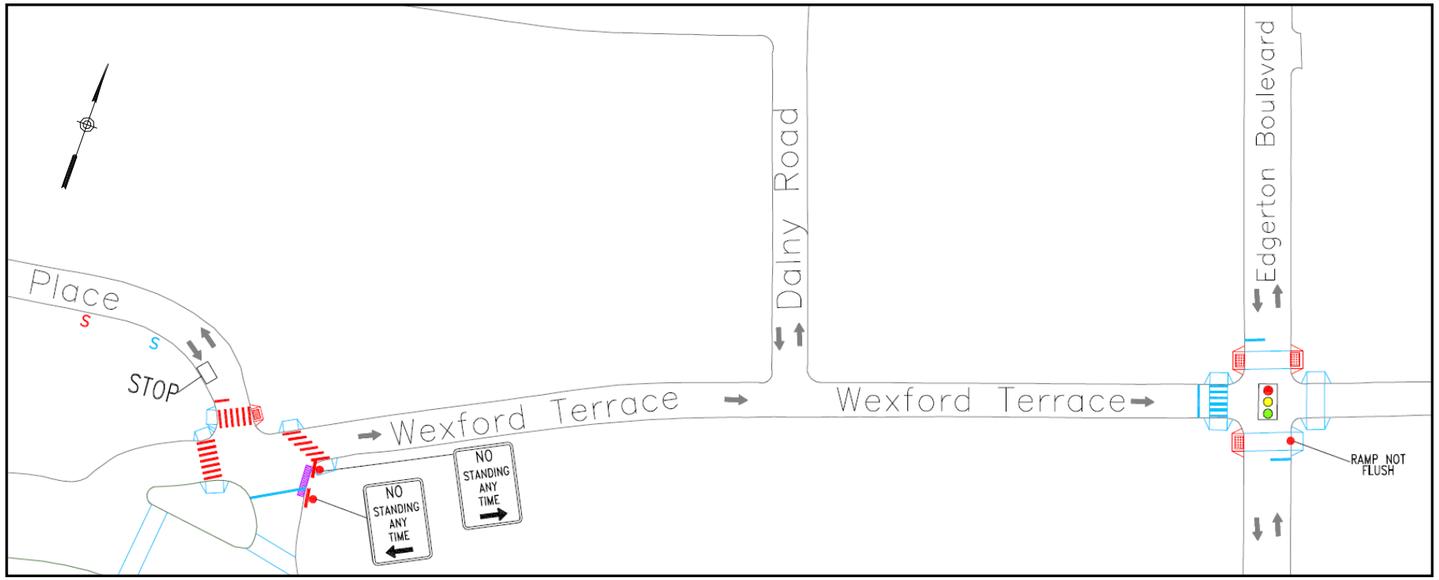
- Parking regulations for the project area have been collected and are shown in Appendix C and E
- Typical geometrical details for the construction of pedestrian refuge island are shown in Appendix F
- School Safety Exhibits are shown in Appendix G
- This study area was visited on August 7th, 2008

Pedestrian concerns in this area:

- Non-standard pedestrian ramps
- Turning vehicles not yielding to pedestrians
- Signal timing (insufficient crossing time)

Illustrating the Solution

SITE 2: PLAN 1 WEXFORD TERRACE (FROM KINGSTON PLACE TO EDGERTON AVENUE)



LEGENDS:

- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING SCHOOL CROSSWALK
- EXISTING STOP BAR
- EXISTING PEDESTRIAN RAMP
- PROPOSED NEW PED RAMP
- REPLACE EXISTING PED RAMP
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED SCHOOL CROSSWALK
- PROPOSED STOP BAR
- PROPOSED PED REFUGE ISLAND (RAISED ISLAND)
- B EXISTING BUS STOP
- B PROPOSED BUS STOP
- S EXISTING SUBWAY STOP
- PROPOSED CURB EXTENSION (NECKDOWN)
- L SW OBSTRUCTION: STREETLIGHT
- H SW OBSTRUCTION: FIRE HYDRANT
- T SW OBSTRUCTION: SIGNAL POLE
- F SW OBSTRUCTION: FIRE BOX
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZED INTERSECTION
- EXISTING TRAVEL DIRECTION
- LPI PROPOSED LPI
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN

Pedestrian concerns in this area:

- Faded or missing crosswalks
- Non-standard pedestrian ramps

Recommended improvements include:

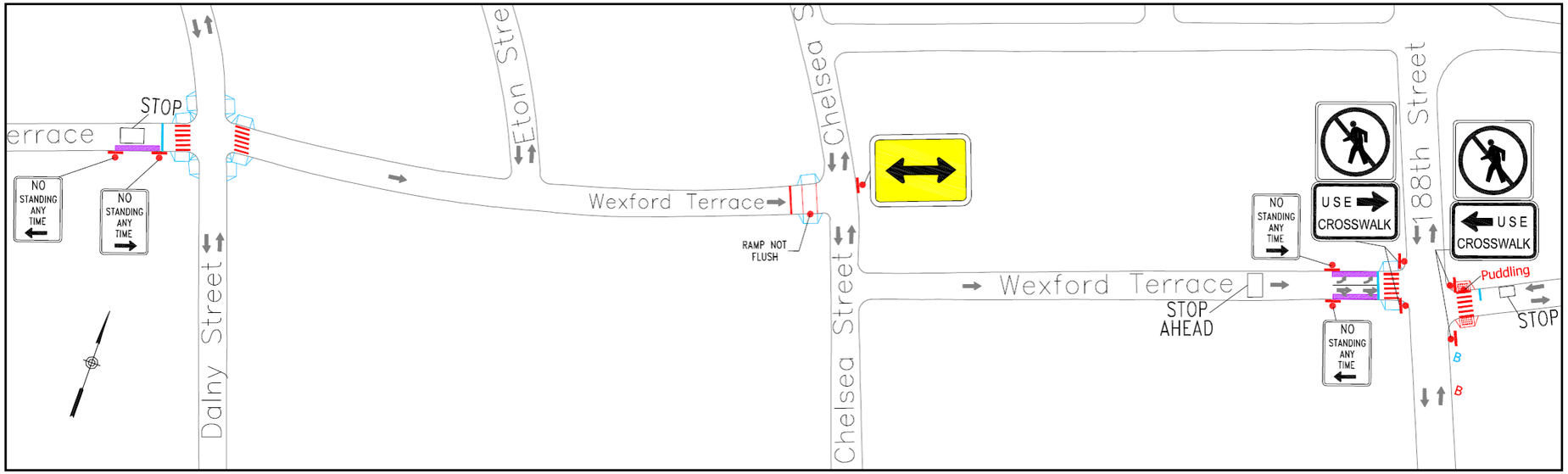
- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new high visibility crosswalks
- Install new advance stop bars
- Install new pedestrian ramps. Where proposed, align the ramps to the proposed crosswalks
- Remove 50 feet of parking from the southeast corner of Wexford Terrace as it intersects Kingston Place (parking spaces are located within the intersection box)
- Move “Stop Ahead” sign on Kingston Place 50 feet in advance of its existing location

Additional Information:

- Parking regulations for the project area have been collected and are shown in Appendix C and E
- This study area was visited on August 7th, 2008

Illustrating the Solution

SITE 2: PLAN 2 WEXFORD TERRACE (FROM DALNY STREET TO 188TH STREET)



LEGENDS:

- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING SCHOOL CROSSWALK
- EXISTING STOP BAR
- EXISTING PEDESTRIAN RAMP
- PROPOSED NEW PED RAMP
- REPLACE EXISTING PED RAMP
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED SCHOOL CROSSWALK
- PROPOSED STOP BAR
- PROPOSED PED REFUGE ISLAND (RAISED ISLAND)
- B EXISTING BUS STOP
- B PROPOSED BUS STOP
- S EXISTING SUBWAY STOP
- PROPOSED CURB EXTENSION (NECKDOWN)
- (L) SW OBSTRUCTION: STREETLIGHT
- (H) SW OBSTRUCTION: FIRE HYDRANT
- (T) SW OBSTRUCTION: SIGNAL POLE
- (F) SW OBSTRUCTION: FIRE BOX
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZED INTERSECTION
- EXISTING TRAVEL DIRECTION
- (LPI) PROPOSED LPI
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN

Pedestrian concerns in this area:

- Faded or missing crosswalks
- Non-standard pedestrian ramps

Additional Information:

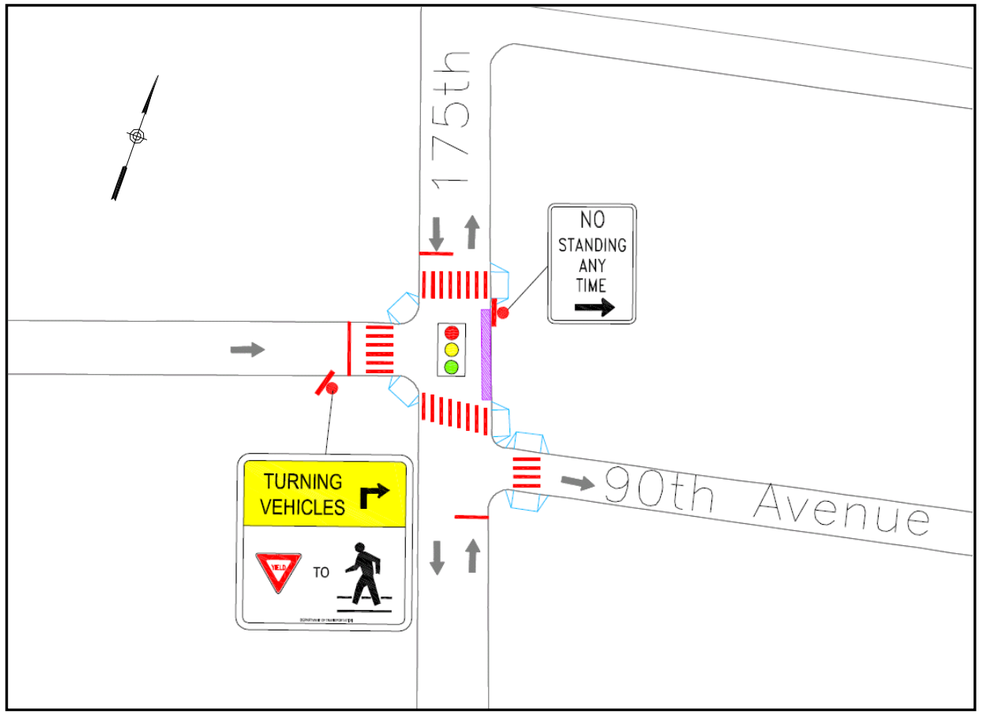
- Parking regulations for the project area have been collected and are shown in Appendix C and E
- This study area was visited on August 7th, 2008

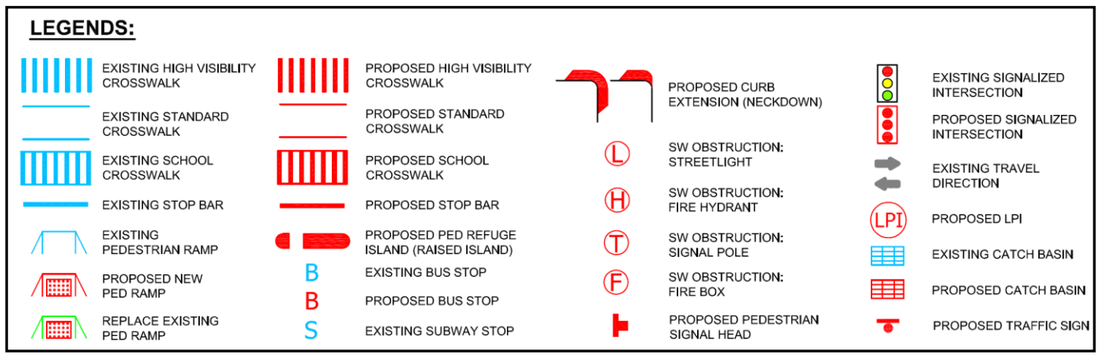
Recommended improvements include:

- Install new high visibility crosswalks
- Install new advance stop bars
- Install new pedestrian ramps. Where proposed, align the ramps to the proposed crosswalks
- Install new “No Pedestrian Crossing” and “Use Crosswalk” (with appropriate arrow) signs at the intersection of Wexford Terrace and 188th Street
- Relocate bus stop 10 feet south of its existing location at the intersection of Wexford Terrace and 188th Street
- Remove 75 feet of parking from both curbsides on Wexford Terrace as it intersects 188th Street. Restripe a left turn and a shared thru/right turn lane on this approach
- Remove 25 feet of parking from south curbside of Wexford Terrace as it intersects Dalny Street
- Install new dual-direction arrow sign facing eastbound traffic on Wexford Terrace at Chelsea Street

Illustrating the Solution

SITE 3: 90TH AVENUE & 175TH STREET





Recommended improvements include:

- Install new high visibility crosswalks
- Install new advance stop bars
- Install new “Yield to Pedestrian” sign as noted in the illustration
- Remove parking from the east curbside of 175th Street as it intersects 90th Avenue (parking that fronts 90th Avenue is located within the intersection box)

Additional Information:

- Parking regulations for the project area have been collected and are shown in Appendix C and E
- This study area was visited on August 7th, 2008

Pedestrian concerns in this area are:

- Turning vehicles not yielding to pedestrians
- Non-standard pedestrian ramps

APPENDIX A:
PHOTO LOG
(SEPARATE COVER)

APPENDIX B:
FIELD INVESTIGATION FORM

APPENDIX B – FIELD INVESTIGATIONS FORM

Jamaica Hills		Issues								Short Term Solutions						Long Term Solutions										
LOCATIONS	Subway/Bus Stop/Bike Rt	Heavy Left Turns	Congestion	P-V Visual Conflict	Faded X-Walk	Apex Curb	SW Obstruction	Broken SW & Curbs	Puddling	New X-Walk	High V / School X-	Restripe X-Walk	Move Stop Bars Back 10'	New Signs	LPI	Resurface	New Ped Ramp	Update Ped Ramp w Safety	Daylighting	Remove Ped Signal	Remove Crosswalk	Relocate Obstruction	Remove Ramp	Pedestrian Refuge Island	Photos
Example:	1 S-NE	2 E->N				3 ALL	4 x	5 NW		6					7 E->N		8 ALL					9 SL			10 4-8
Explanation	1Subway Stop on NE Corner 2.Heavy left turns going Eastbound to Northbound 3.Apex curb on NW, NE, SW, SE corners 4.Sidewalk obstruction on SW & NE corners 5.Broken curb on NW corner 6.New crosswalk is recommended for the east leg of this intersection 7.LPI for Eastbound to Northbound traffic 8.New ped ramp for NW, NE, SW, SE corners 9.Relocate obstruction(street light) on SW & NE corners 10.Intersection photo in photo log, picture # 4, 5, 6, 7, 8.																								
1. Hillside Ave. & 171st St.	B-SW			x	x									UC											35-38
2. Hillside Ave. & 172st St.	B-NE				x									NSA					x					IS (E,W)	32-34
3. Hillside Ave. & 173rd St.																									
4. Hillside Ave. & Wexford Terrace.	B-SW	x		x	x				NW											E	E			IS (E,W)	41-42
5. Hillside Ave. & Kingston Pl.					x									Y2P											39-40
6. Hillside Ave. & 175th St.	B-NE,				x									HS										IS(W)	52-54
7. Hillside Ave. & 178th St.	B-SW		x	x										HS	N									IS(E)	44-51
8. Hillside Ave. & 179th St.	S-All, B-All			x	x																			IS(W)	55-60
9. Hillside Ave. & 179th Pl.	S-NE,SE, B-All				x																			IS (E,W)	61-64
10. Hillside Ave. & 180th St./Midland	S-All, B-SW,SE, NW	x	x	x										NLT										IS(E)	65-75
11. Hillside Ave. & 181st St.	S-NW, B-SE,NW		x		x												ALL							IS (E,W)	76
12. Hillside Ave. & 182nd St./Avon St.																								IS(W)	
13. Hillside Ave. & 182nd Pl.																									
14. Hillside Ave. & 183rd St.																									
15. Hillside Ave. & 184th St./Dalny St.																								IS(E)	
16. Hillside Ave. & 184th Pl./185th St.																									
17. Hillside Ave. & 186th St.																									
18. Hillside Ave. & 187th St.																									

S Subway		ALL	All 4 corners (NW, NE, SW, SE)			HS	High Visibility Street Sign				NSA	No Standing Anytime		FH	Fire Hydrant
B Bus stop		Y2P	Yield to Pedestrians			UC	Use Crosswalk	IS	ISLAND			Long Term Solution		NLT	No Left Turns

Site Visited On: 07/07/2008

APPENDIX B – FIELD INVESTIGATIONS FORM (CONT.)

Jamaica Hills		Issues								Short Term Solutions						Long Term Solutions									Photos
LOCATIONS	Subway/Bus Stop/Bike Rt	Heavy Left Turns	Congestion	P-V Visual Conflict	Faded X-Walk	Apex Curb	SW Obstruction	Broken SW & Curbs	Puddling	New X-Walk	High V / School X-	Restripe X-Walk	Move Stop Bars Back 10'	New Signs	LPI	Resurface	New Ped Ramp	Update Ped Ramp w Safety	Daylighting	Move Meter Behind Stop	Remove Crosswalk	Relocate Obstruction	Remove Ramp	Pedestrian Refuge Island	
Example:	[1]S-NE	[2]E->N				[3]ALL	[4] x	[5]NW		[6]					[7]E->N		[8]ALL					[9] SL			[10]4-8
Explanation	1.Subway Stop on NE Corner 2.Heavy left turns going Eastbound to Northbound 3.Apex curb on NW, NE, SW, SE corners 4.Sidewalk obstruction on SW & NE corners 5.Broken curb on NW corner 6.New crosswalk is recommended for the east leg of this intersection 7.LPI for Eastbound to Northbound traffic 8.New ped ramp for NW, NE, SW, SE corners 9.Relocate obstruction(street light) on SW & NE corners 10.Intersection photo in photo log, picture # 4, 5, 6, 7, 8.																							
19. Hillside Ave. & 187th Pl	B-SE,SW													UC											77-81
20. Hillside Ave. & 188th St	B-NE,NW,SE	x	x	x																				IS(E)	82-87
21. Wexford Ter. & Kingston Pl.					x									NSA, STOP AHEAD					x						22-31
22. Wexford Ter. & Dalny Rd.																									
23. Wexford Ter. & Edgerton Blvd.																									18-21
24. Wexford Ter. & Midland Pkwy.																									
25. Wexford Ter. & Avon St.																									
26. Wexford Ter. & Dalny St.														NSA					x						11-17
27. Wexford Ter. & Eton St.																									
28. Wexford Ter. & Chelsea St.					x									DIRECTION SIGN											9-10
29. Wexford Ter. & 188th St.	B-SE			x	x				NE					UC, NSA					x			B			1-8
30. 88th Ave. & 171st St.																									
31. Warwick Cr. & 175th St.																									
32. 88th Ave. & 175th St.																									
33. 89th Ave. & 171st St.																									
34. 89th Ave. & 172nd St																									
35. 89th Ave. & 173rd St																									
36. 89th Ave. & 175th St																									
37. 90th Ave. & 171st St.																									

S	Subway	ALL	All 4 corners (NW, NE, SW, SE)		HS	High Visibility Street Sign			NSA	No Standing Anytime		FH	Fire Hydrant
B	Bus stop	Y2P	Yield to Pedestrians		UC	Use Crosswalk	IS	ISLAND		Long Term Solution		NLT	No Left Turns

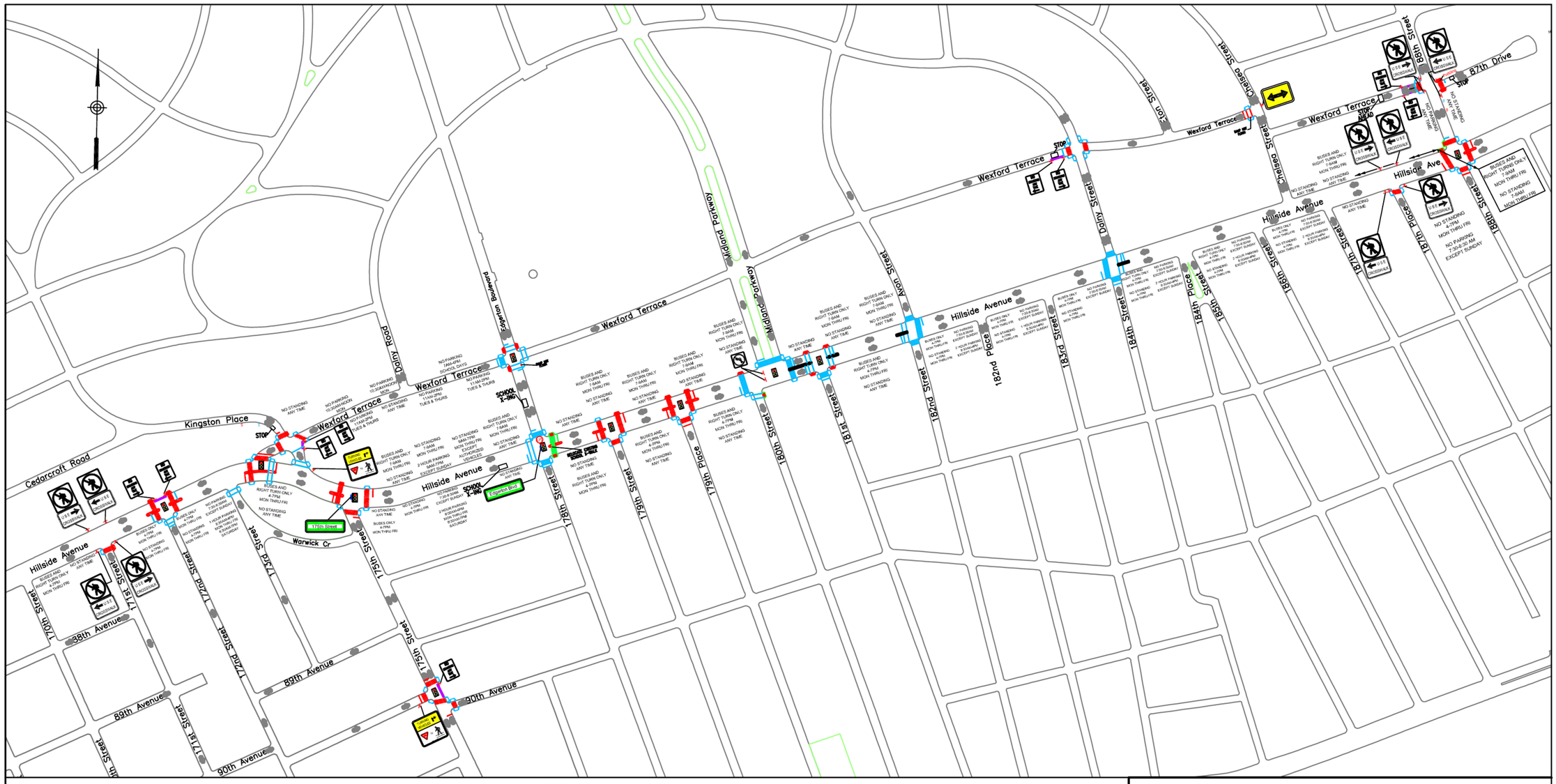
Site Visited On: 07/07/2008

APPENDIX B – FIELD INVESTIGATIONS FORM (CONT.)

Jamaica Hills		Issues								Short Term Solutions						Long Term Solutions									Photos
LOCATIONS	Subway/Bus Stop/Bike Rt	Heavy Left Turns	Congestion	P-V Visual Conflict	Faded X-Walk	Apex Curb	SW Obstruction	Broken SW & Curbs	Puddling	New X-Walk	High V / School X-Walk	Restripe X-Walk	Move Stop Bars Back 10'	New Signs	LPI	Resurface	New Ped Ramp	Update Ped Ramp w Safety	Daylighting	Move Meter Behind Stop	Remove Crosswalk	Relocate Obstruction	Remove Ramp	Pedestrian Refuge Island	
Example:	1 S-NE	2 E->N				3 ALL	4 x	5 NW		6					7 E->N		8 ALL					9 SL			10 4-8
Explanation	1Subway Stop on NE Corner 2.Heavy left turns going Eastbound to Northbound 3.Apex curb on NW, NE, SW, SE corners 4.Sidewalk obstruction on SW & NE corners 5.Broken curb on NW corner 6.New crosswalk is recommended for the east leg of this intersection 7.LPI for Eastbound to Northbound traffic 8.New ped ramp for NW, NE, SW, SE corners 9.Relocate obstruction(street light) on SW & NE corners 10.Intersection photo in photo log, picture # 4, 5, 6, 7, 8.																								
38. 90th Ave. & 172nd St.																									
39. 90th Ave. & 175th St.				x	x									Y2P, NSA					x						88-93
S Subway		ALL	All 4 corners (NW, NE, SW, SE)							HS	High Visibility Street Sign						NSA	No Standing Anytime				FH	Fire Hydrant		
B Bus stop		Y2P	Yield to Pedestrians							UC	Use Crosswalk		IS	ISLAND				Long Term Solution				NLT	No Left Turns		

Site Visited On: 07/07/2008

APPENDIX C:
MAP OF PROPOSED CHANGES



LEGENDS:

- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING SCHOOL CROSSWALK
- EXISTING STOP BAR
- EXISTING PEDESTRIAN RAMP
- PROPOSED NEW PED RAMP
- REPLACE EXISTING PED RAMP
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED SCHOOL CROSSWALK
- PROPOSED STOP BAR
- PROPOSED PED REFUGE ISLAND (RAISED ISLAND)
- B EXISTING BUS STOP
- B PROPOSED BUS STOP
- S EXISTING SUBWAY STOP
- PROPOSED CURB EXTENSION (NECKDOWN)
- (L) SW OBSTRUCTION: STREETLIGHT
- (H) SW OBSTRUCTION: FIRE HYDRANT
- (T) SW OBSTRUCTION: SIGNAL POLE
- (F) SW OBSTRUCTION: FIRE BOX
- PROPOSED PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNALIZED INTERSECTION
- PROPOSED SIGNALIZED INTERSECTION
- EXISTING TRAVEL DIRECTION
- (LPI) PROPOSED LPI
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN

SAFE STREETS FOR SENIORS

JAMAICA HILLS, QUEENS

PROPOSED MEASURES TO IMPROVE SAFETY

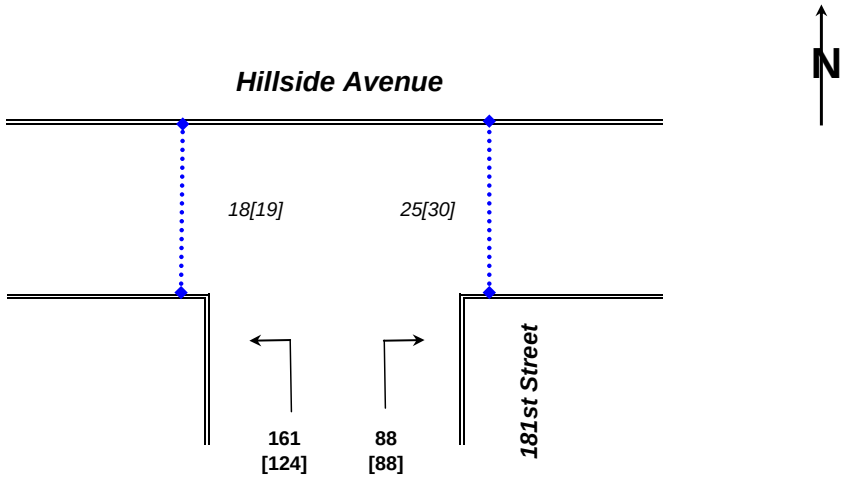
GPI
GREENMAN-PEDERSEN, INC.
Engineers, Planners, Construction Engineers & Inspectors

FIGURE NO. –

APPENDIX D:
TRAFFIC COUNTS

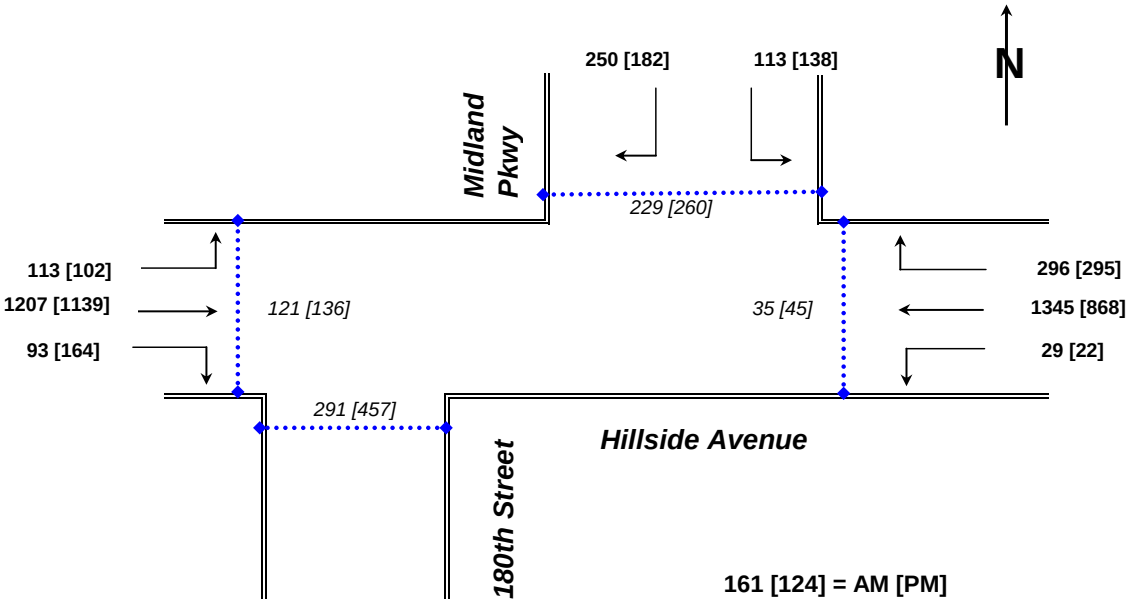
APPENDIX D – TRAFFIC COUNT

One Hour Traffic Count Volumes



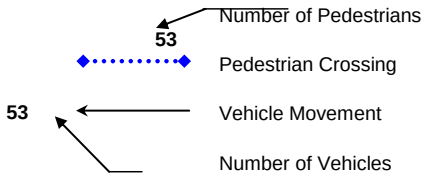
Intersection of Hillside Avenue and 181st Street

Note: Counts Conducted on Wednesday, 09/10/2008.



Intersection of Hillside Avenue and Midland Parkway/180th Street

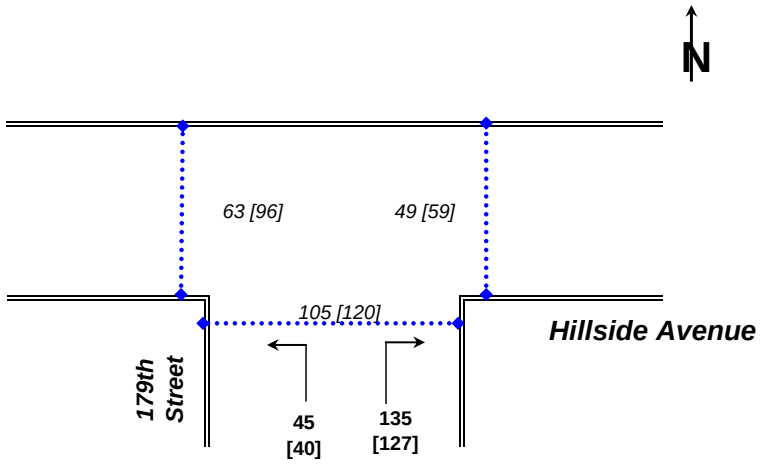
Note: Counts Conducted on Wednesday, 09/10/2008.



APPENDIX D
JAMAICA HILLS, QUEENS
TRAFFIC COUNTS

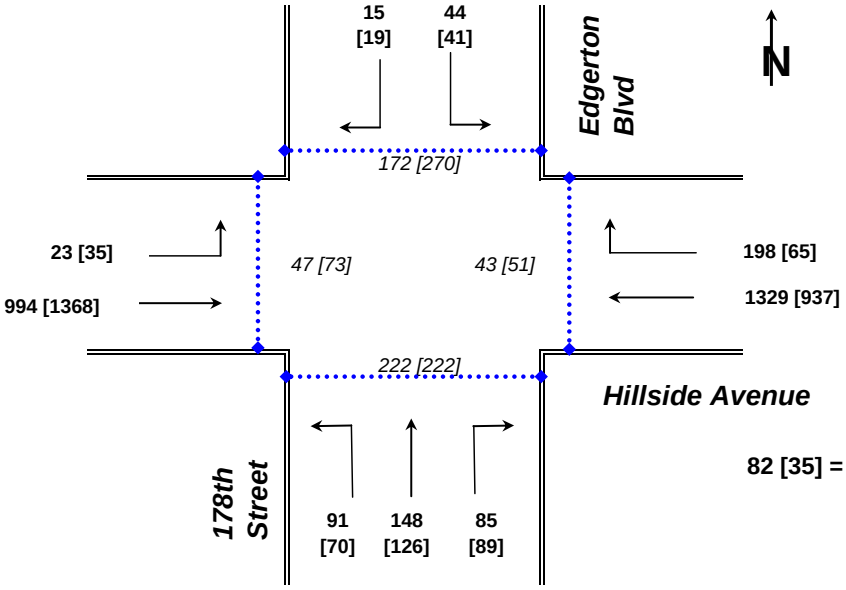
APPENDIX D – TRAFFIC COUNT (CONT.)

One Hour Traffic Count Volumes



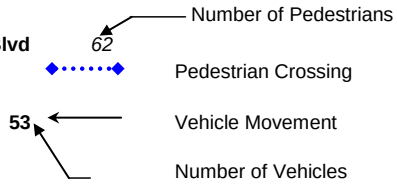
Intersection of Hillside Avenue and 179th Street

Note: Counts Conducted on Thursday, 09/11/2008.



Intersection of Hillside Avenue and 178th Street/Edgerton Blvd

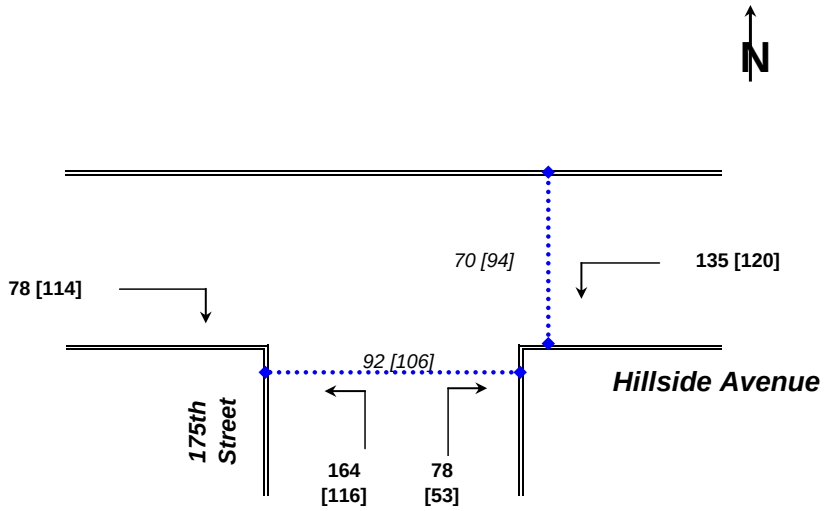
Note: Counts Conducted on Thursday, 09/11/2008.



APPENDIX D
JAMAICA HILLS, QUEENS
TRAFFIC COUNTS

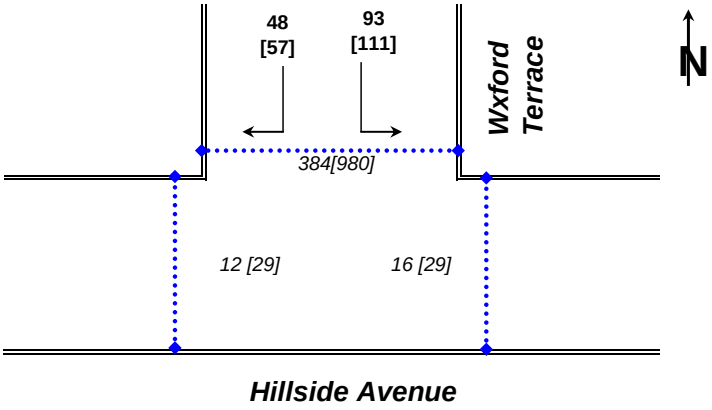
APPENDIX D – TRAFFIC COUNT (CONT.)

One Hour Traffic Count Volumes



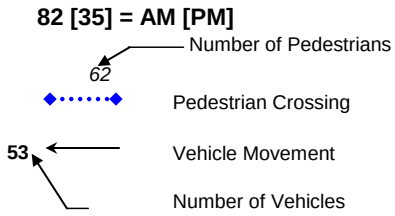
Intersection of Hillside Avenue and 175th Street

Note: Counts Conducted on Wednesday, 09/17/2008.



Intersection of Hillside Avenue and Wexford Terrace

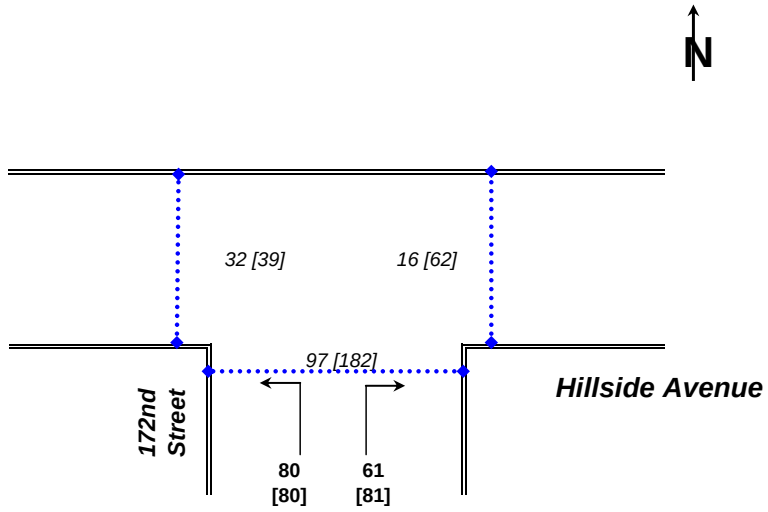
Note: Counts Conducted on Wednesday, 09/17/2008.



APPENDIX D
JAMAICA HILLS, QUEENS
TRAFFIC COUNTS

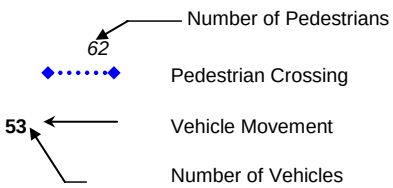
APPENDIX D – TRAFFIC COUNT (CONT.)

One Hour Traffic Count Volumes



Intersection of Hillside Avenue and 172nd Street

Note: Counts Conducted on Thursday, 09/18/2008.



APPENDIX D
JAMAICA HILLS, QUEENS
TRAFFIC COUNTS

APPENDIX E:

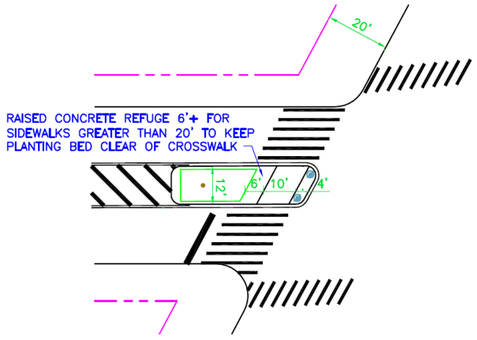
EXISTING PARKING REGULATIONS AT PROPOSED DAYLIGHT INTERSECTION LOCATIONS

EXISTING PARKING REGULATIONS AT PROPOSED DAYLIGHT INTERSECTION LOCATIONS

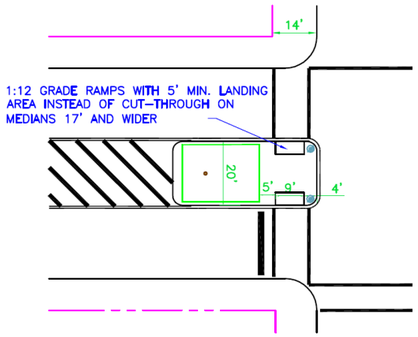
INTERSECTION LOCATION	DIRECTION	PARKING REGULATION
Kingston Place and Wexford Terrace	East	No Parking 10:30 to Noon, Tuesday
!88th Street and Wexford Terrace	West	No Parking 10:30 to Noon, Tuesday No Parking 10:30 to Noon, Monday
Dalny Street and Wexford Terrace	West	No Parking 10:30 to Noon, Tuesday
175th Street and 90th Avenue	East	No Parking 11:30 to 1:00 PM, Tuesday and Friday
	West	No Parking 11:30 to 1:00 PM, Tuesday and Friday

APPENDIX F:
CONSTRUCTION DETAILS

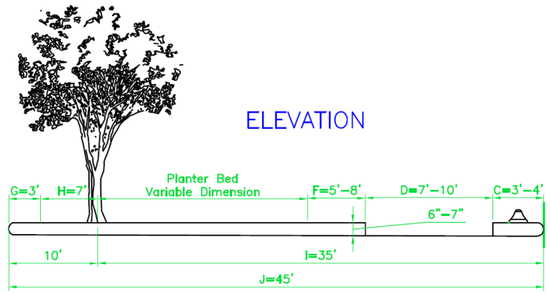
F – CONSTRUCTION DETAIL - MEDIANS



HIGH VISIBILITY CROSSWALK
20' SIDEWALK, 12' WIDE MEDIAN



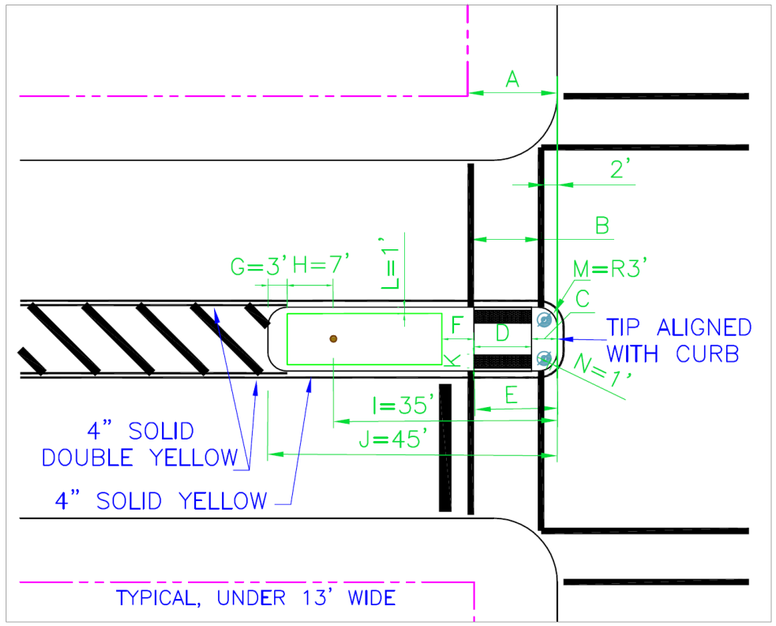
REGULAR CROSSWALK
14' SIDEWALK, 20' WIDE MEDIAN



JAMAICA HILLS SENIOR PEDESTRIAN FOCUS AREA (SPFA) -
PROPOSED MEDIAN IMPROVEMENTS

LOCATION	TYPE	LENGTH *	WIDTH **
EAST LEG OF HILLSIDE AVENUE & 172ND STREET	PEDESTRIAN ISLAND	45'	8'
WEST LEG OF HILLSIDE AVENUE & 172ND STREET	PEDESTRIAN ISLAND	45'	8'
EAST/WEST LEG OF HILLSIDE AVENUE & WEXFORD TR	PEDESTRIAN ISLAND	112'	8'
WEST LEG OF HILLSIDE AVENUE & 175TH STREET	PEDESTRIAN ISLAND	45'	8'
EAST LEG OF HILLSIDE AVE & 178TH ST/EDGERTON BL	PEDESTRIAN ISLAND	45'	8'
WEST LEG OF HILLSIDE AVENUE & 179TH STREET	PEDESTRIAN ISLAND	45'	8'
EAST LEG OF HILLSIDE AVENUE & 179TH PLACE	PEDESTRIAN ISLAND	45'	8'
WEST LEG OF HILLSIDE AVENUE & 179TH PLACE	PEDESTRIAN ISLAND	45'	8'
EAST LEG OF HILLSIDE AVENUE & 188TH STREET	PEDESTRIAN ISLAND	45'	8'

Note: Green refuge islands that are proposed under the school safety project and are located within Jamaica Hill SPFA are presented in Appendix - G.
* The median length may vary based on the final design requirements.
** The median width is based on field observations.



REVISIONS

DATE	BY	DESCRIPTION
3/12/08	TI	
3/17/08	TI	
3/24/08	TI	
4/7/08	TI	Added 17'+ median design.

Green Refuge Island Design Guidelines Applied to Various Sidewalk Widths														
A	Sidewalk Width	10	11	12	13	14	15	16	17	18	19	20	21	22
B	Crosswalk Width	8	9	10	11	12	13	14	15	16	17	18	19	20
C	Island Top	3	3	3	4	4	4	4	4	4	4	4	4	4
D	Cut Through	7	7	8	8	9	10	10	10	10	10	10	10	10
E	Top + Cut Through	10	10	11	12	13	14	14	14	14	14	14	14	14
F	Raised Concrete Refuge	5	5	5	5	5	5	5	5	5	5	6	7	8

Green Refuge Island Design Guidelines

Island Top (C) - The raised portion of the island at the intersection end.
- Ideal length four feet. Three feet is acceptable if needed to achieve the minimum cut-through width.
- Align with the curbs of the sidewalk to either side.
- **Radius** (M): Should be 3' at corners unless adjustments are needed for turning vehicles.
- **Bell Bollards** (N): One bell bollard (optional) when the median width is 7' or less, and two bell bollards for medians 8' and wider. No bollards should be added to the Raised Concrete Refuge or the Island Bottoms. Bell bollards should be placed 1 foot from the Island Top curb. When only one bell bollard is used, any necessary signage should be located to the side of the bollard, behind its center line.

Cut-Through (D) - The at-grade section of the Island, slightly crowned for drainage, crossing area.
- Ideal width ten feet for sidewalks 15' wide or greater. (See table.)
- Minimum width seven feet if sidewalks/crosswalks are narrow.
- Cut-Throughs should begin one-foot towards the intersection from the projection of the property line. However, with wider crosswalks, the Raised Concrete Refuge will extend further into the Cut-Through than one foot.
- Medians that are 17 feet or wider should have 1:12 grade pedestrian ramps on either side with a landing area between them at the same level as the Raised Concrete Refuge and the Island Top. The landing area should be a minimum of five feet. The pedestrian ramps should be the same width as a Cut-Through would be, using the sidewalk width formula, and should not have side flares.
- All Cut-Throughs should slope to the road for drainage.

Raised Concrete Refuge (F) - The raised portion of the island between the Cut-Through and the Planting Bed.
- Minimum length five feet, parallel to the Cut-Through, one foot into the Cut-Through from the projection of the property line.
- Planting beds should not extend into the crosswalk zone, therefore the Raised Concrete Refuge will be greater than 5', extending further into the Cut-Through than one foot, for sidewalks 20' wide or greater (see table).

Island Bottom (G) - The raised concrete portion of the island below the planting bed.
- Must extend 3 feet from the Back of Bed in order to maintain the structural integrity of the concrete refuge island and accommodate a standardized Planting Bed with right angles.

Planting Beds - The landscaped portion of the refuge island.
- **Tree Location** (I): At least 35' from the intersection.
- **Back of Bed** (H): Planting Beds must extend 7' back from the tree in order to provide adequate area for root growth.
- **Concrete Sides** (L): Planting Beds should have 1' of concrete protection along the sides and 6"-12' of cobble stone within the edges of the planter bed.

Typical Refuge Island (J) -
- The total length of the refuge island should be minimum of 45 feet if it is to have a tree: 35' Tree Location (I) +7' Back of Bed (H)+3' Island Bottom (G).
- The minimum width of a green refuge island is 6 feet, to adequately accommodate landscaping.
- Islands should be marked with a 4" edgeline (yellow on two way streets) that surrounds the entire island, including through the crosswalk.

Detectable Warning (K) - Transition areas on either side of the Cut-Through that warn pedestrians that they are stepping off of the refuge island into the roadbed.
- Per NYS DOT standard sheet M608-13, Detectable Warning areas should be set back from the roadbed 6 inches (the width of the curb).
- Per NYS DOT standard sheet M608-13, Detectable Warning areas should be the width of the Cut-Through, 2 feet deep, with at least a 2-foot landing area between the two Detectable Warning areas.
- On 6 foot medians, the depth of the Detectable Warning areas should be reduced to 1 foot each in order to maintain the necessary landing area.

CITY OF NEW YORK DEPARTMENT OF TRANSPORTATION
BUREAU OF TRAFFIC OPERATIONS
28–11 Queens Plaza North L.I.C., N.Y. 11101

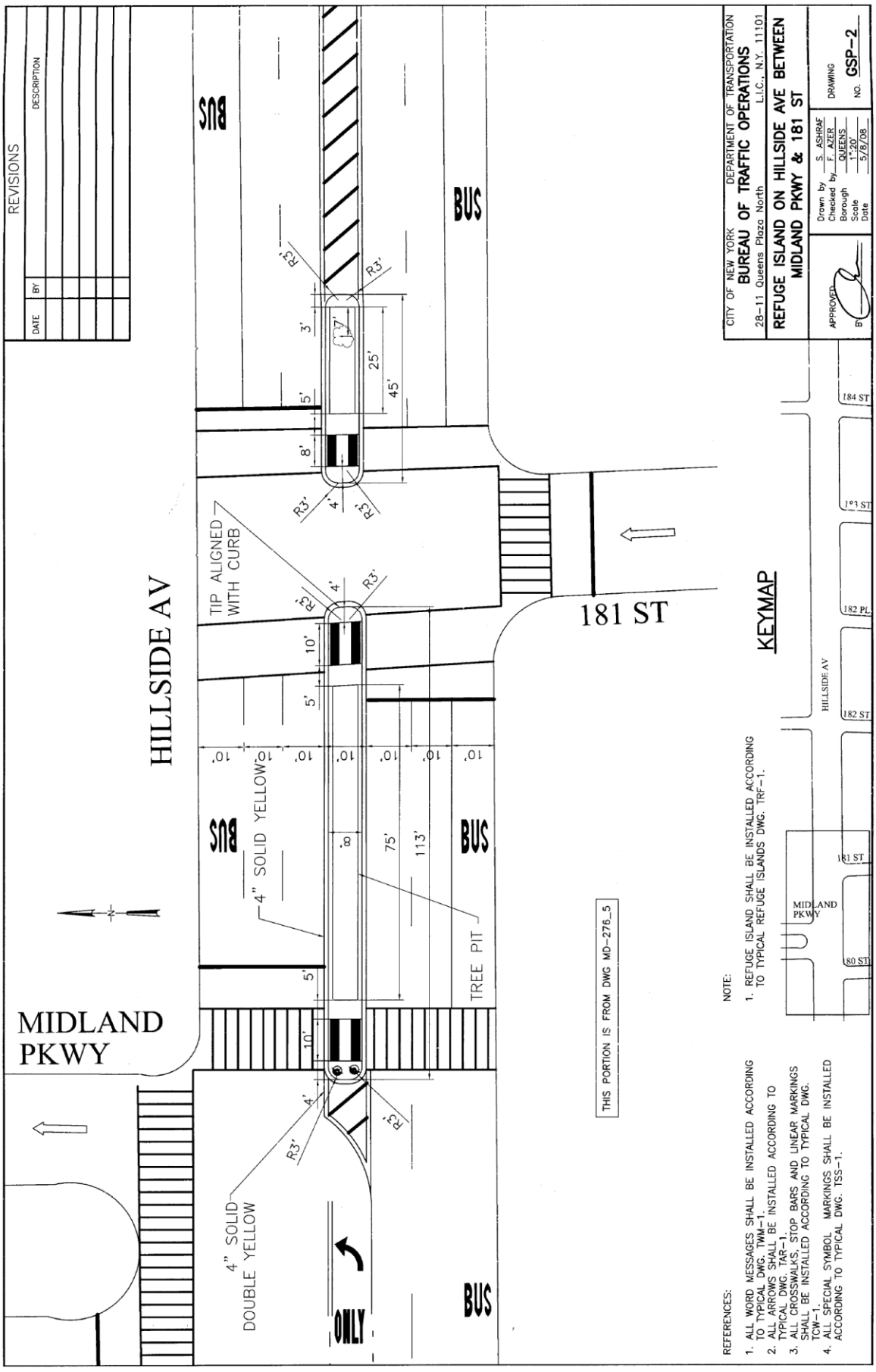
TYPICAL GREEN REFUGE ISLANDS

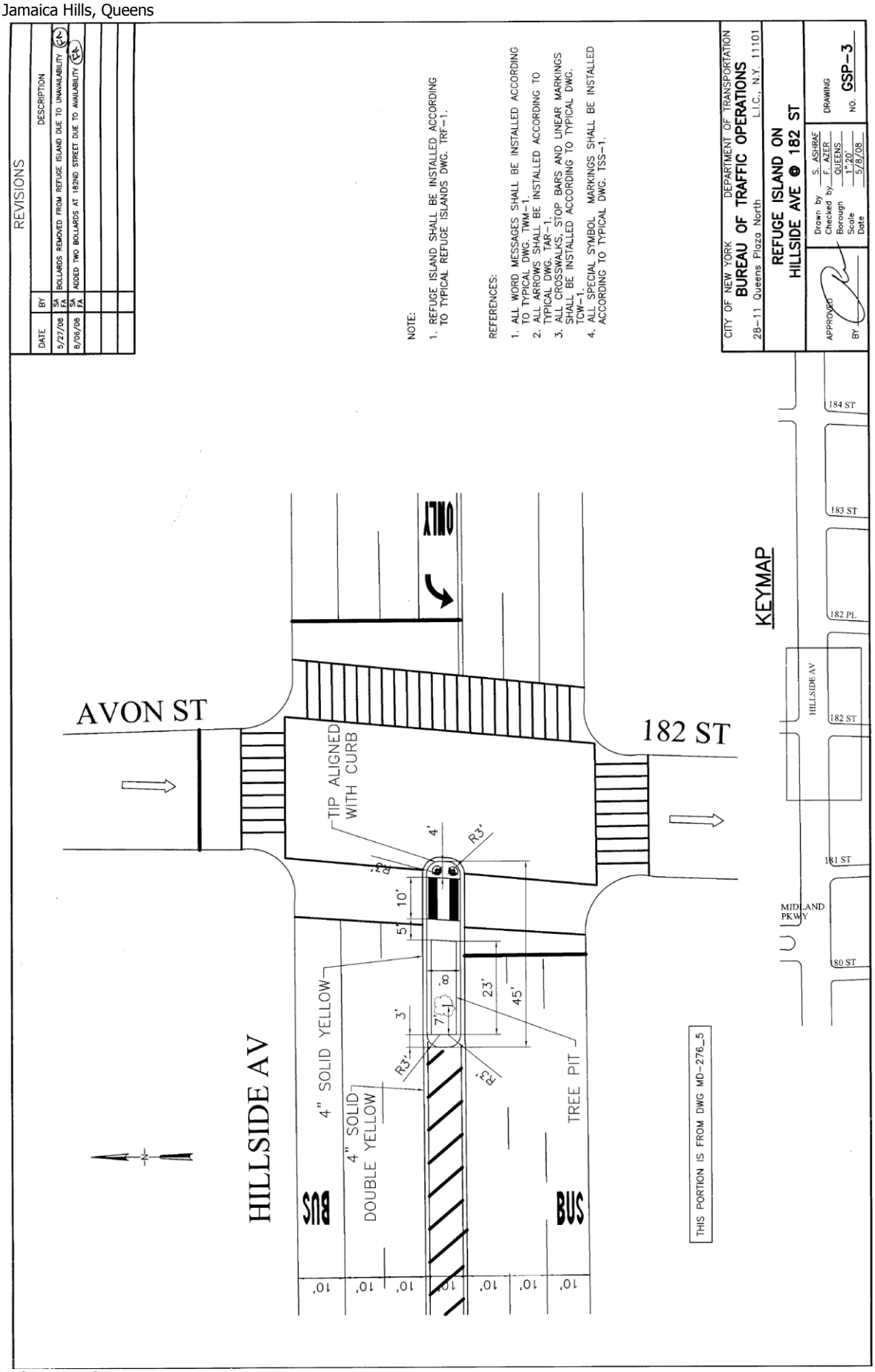
APPROVED
BY _____
F. AZER, P.E.

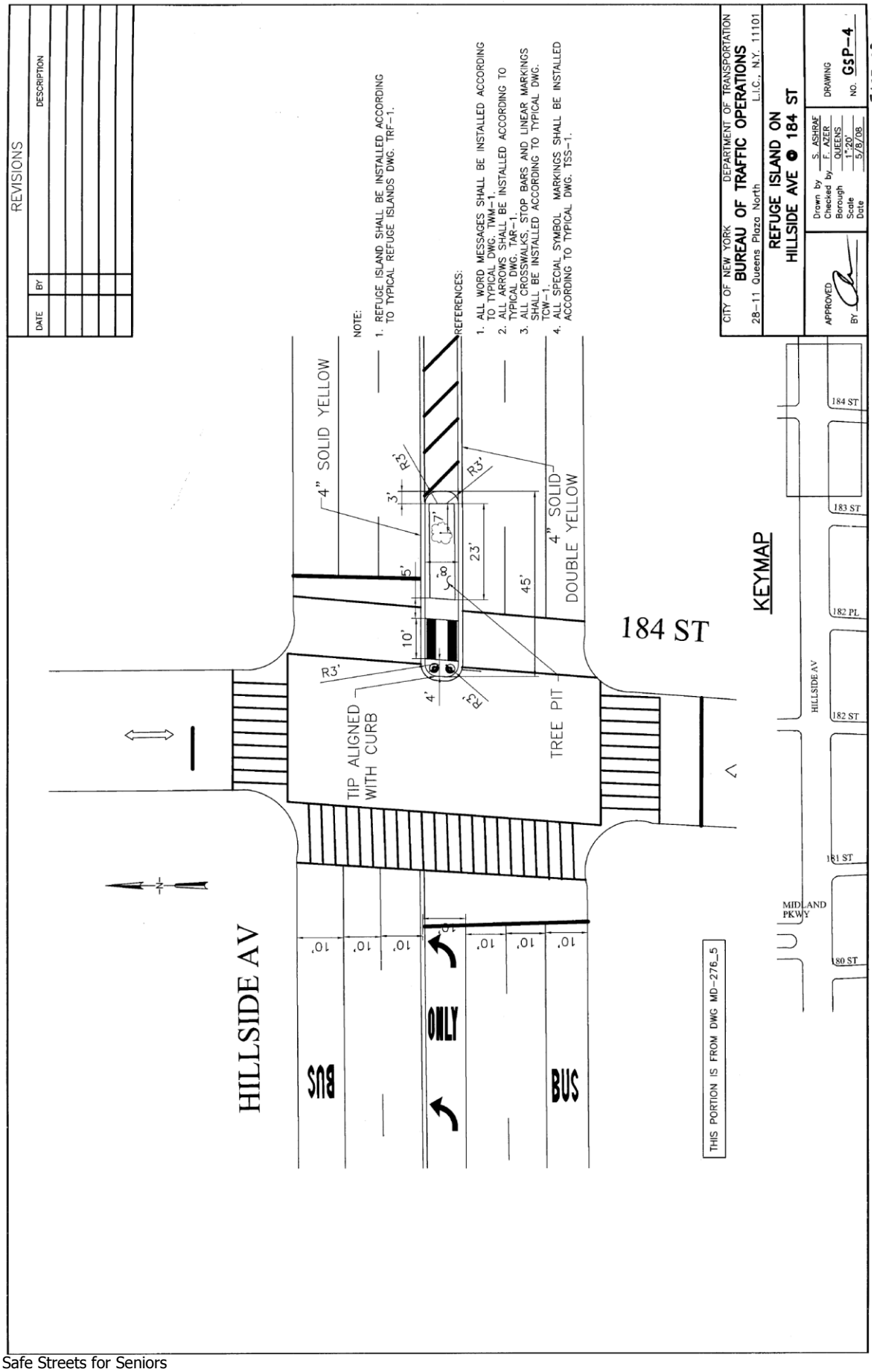
Drawn by KMW
Checked by T. ISHEE
Borough ALL
Scale N.T.S.
Date 3/11/2008

DRAWING NO. **TRF-1**

APPENDIX G:
SCHOOL SAFETY EXHIBITS


REVISIONS
DATE
BY
DESCRIPTION
CITY OF NEW YORK
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRAFFIC OPERATIONS
28-11 Queens Plaza North
L.I.C., N.Y. 11101
REFUGE ISLAND ON HILLSIDE AVE BETWEEN MIDLAND PKWY & 181 ST
APPROVED
BY
Drawn by S. ASHRAF
Checked by F. AZER
Borough QUEENS
Scale 1"=20'
Date 5/9/08
DRAWING NO. GSP-2
HILLSIDE AV
MIDLAND PKWY
181 ST
BUS
TIP ALIGNED WITH CURB
4" SOLID YELLOW
TREE PIT
4" SOLID DOUBLE YELLOW
ONLY
THIS PORTION IS FROM DWG MD-276_5
KEYMAP
184 ST
183 ST
182 PL
182 ST
181 ST
80 ST
NOTE:
1. REFUGE ISLAND SHALL BE INSTALLED ACCORDING TO TYPICAL REFUGE ISLANDS DWG. TRF-1.
REFERENCES:
1. ALL WORD MESSAGES SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TWM-1.
2. ALL ARROWS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TAR-1.
3. ALL CROSSWALKS, STOP BARS AND LINEAR MARKINGS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TCW-1.
4. ALL SPECIAL SYMBOL MARKINGS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TSS-1.


REVISIONS
DATE
BY
DESCRIPTION
5/27/08 SA FA BOLLARDS REMOVED FROM REFUGE ISLAND DUE TO UNAVAILABILITY (2)
8/06/08 SA FA ADDED TWO BOLLARDS AT 182ND STREET DUE TO AVAILABILITY (2)
NOTE:
1. REFUGE ISLAND SHALL BE INSTALLED ACCORDING TO TYPICAL REFUGE ISLANDS DWG. TRF-1.
REFERENCES:
1. ALL WORD MESSAGES SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TWM-1.
2. ALL ARROWS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TAR-1.
3. ALL CROSSWALKS, STOP BARS AND LINEAR MARKINGS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TCW-1.
4. ALL SPECIAL SYMBOL MARKINGS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TSS-1.
CITY OF NEW YORK DEPARTMENT OF TRANSPORTATION
BUREAU OF TRAFFIC OPERATIONS
28-11 Queens Plaza North L.I.C., N.Y. 11101
REFUGE ISLAND ON HILLSIDE AVE @ 182 ST
APPROVED BY
Drawn by S. ASHRAF
Checked by F. AZER
Borough QUEENS
Scale 1"=20'
Date 5/8/08
DRAWING NO. GSP-3
KEYMAP
184 ST
183 ST
182 PL
182 ST
181 ST
180 ST
HILLSIDE AV
MIDLAND PKWY
AVON ST
182 ST
ONLY
TIP ALIGNED WITH CURB
HILLSIDE AV
4" SOLID YELLOW
4" SOLID DOUBLE YELLOW
TREE PIT
BUS
BUS
THIS PORTION IS FROM DWG MD-276_5
4'
R3'
R2'
10'
5'
8'
7'
3'
23'
45'
10'


REVISIONS
DATE
BY
DESCRIPTION
CITY OF NEW YORK DEPARTMENT OF TRANSPORTATION
BUREAU OF TRAFFIC OPERATIONS
28-11 Queens Plaza North L.I.C., N.Y. 11101
REFUGE ISLAND ON
HILLSIDE AVE @ 184 ST
APPROVED
BY
Drawn by S. ASHRAF
Checked by F. AZER
Borough QUEENS
Scale 1"=20'
Date 5/8/08
DRAWING NO. GSP-4
NOTE:
1. REFUGE ISLAND SHALL BE INSTALLED ACCORDING TO TYPICAL REFUGE ISLANDS DWG. TRF-1.
REFERENCES:
1. ALL WORD MESSAGES SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TWM-1.
2. ALL ARROWS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TAR-1.
3. ALL CROSSWALKS, STOP BARS AND LINEAR MARKINGS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TCW-1.
4. ALL SPECIAL SYMBOL MARKINGS SHALL BE INSTALLED ACCORDING TO TYPICAL DWG. TSS-1.
4" SOLID YELLOW
4" SOLID DOUBLE YELLOW
184 ST
HILLSIDE AV
TIP ALIGNED WITH CURB
TREE PIT
BUS
ONLY
BUS
R3'
3'
5'
10'
4'
23'
45'
KEYMAP
184 ST
183 ST
182 PL
182 ST
181 ST
180 ST
HILLSIDE AV
MIDLAND PKWY
THIS PORTION IS FROM DWG MD-276_5