Safe Streets for Seniors

Yorkville, Manhattan

FINAL REPORT

February, 2014

NEW YORK CITY DOT

Polly Trottenberg, Commissioner

RBA

Safe Streets for Seniors

YORKVILLE

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1 Project Description

1. 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 SPFAs. 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.

2. BACKGROUND

Land-use in the Yorkville Study Area is a mix of commercial and residential buildings.

There are four Senior Centers located near the Study Area:

- Washington Lexington Senior Center at 3rd Avenue between East 98th Street and East 99th Street
- Search & Care Inc. at 2nd Avenue between East 95th Street and East 96th Street
- Stanley M. Isaacs Senior Center located at East 93rd Street between York Avenue and 1st Avenue
- Lenox Hill Senior Center at East 70th Street between 1st Avenue and 2nd Avenue.

There are three nursing homes in the area (not shown on Exhibit 1 – Area Map):

- Dewitt Nursing Home at East 79th Street between 2nd Avenue and 3rd Avenue
- Castle Senior Living 80th Street Residence at East 80th Street between York Avenue and 1st Avenue
- Mary Manning Walsh Nursing Home Co. Inc. at York Avenue between 71st Street and 72nd Street.

There are two medical centers in the Study Area, Lenox Hill Hospital at East 77th Street at Park Avenue and Grace Square Hospital at E 76th Street between York Avenue and 1st Avenue.

There are twenty-five schools in the study area and the list of school names and addresses are listed in Exhibit 5.

Bicycle Facilities

The 2010 NYC Bike Map shows "existing" and "planned/proposed" bicycle facilities throughout the city. In the vicinity of Yorkville Study Area, East 90th Street, East 91st Street and First Avenue are existing bike routes. In addition, East 72nd Street, East 79th Street and East 78th Street between East End and York Avenue, Second Avenue and Fifth Avenue are planned / proposed striped on street bike routes (Exhibit 2).

Truck Routes

First Avenue, Second Avenue, Third Avenue, Lexington Avenue, East 79th Street and East 86th Street are local truck route in the vicinity of the study area (Exhibit 3).

Bus Lines and Subway

Fourteen bus lines operate in the study area including:

- M31: Operates along York Avenue
- M15: Operates along First Avenue and Second Avenue
- M98, M101, M102, M103: Operates along Third Avenue and Lexington Avenue
- M1, M2, M3 and M4: Operates along Madison Avenue and Fifth Avenue
- M30, M72: Operates along East 72nd Street and part of East 71st Street
- M79: Operates along East 79th Street
- M86: Operates along East 86th Street

EXHIBIT 1 – AREA MAP

The M15 bus line is part of the Select Bus Service, a MTA Regional Bus Operations for Bus Rapid Transit Service (see Appendix F). The Lexington Avenue Line runs through the study area. A subway station for the 6 is on East 77th Street and for the 4, 5 and 6 is on East 86th Street (Exhibit 4).

2 Background

Exhibit 2 – Bike Map

Exhibit 3 – Truck Map

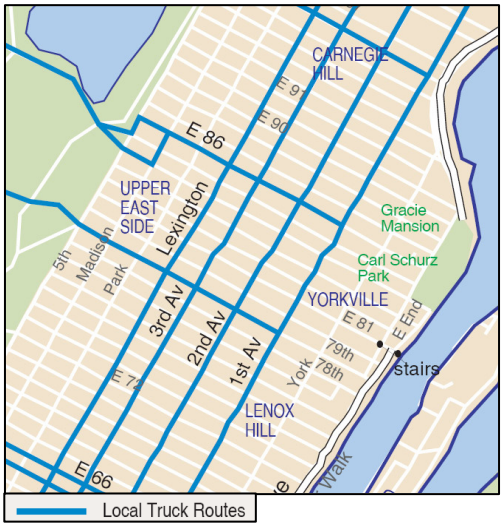


Exhibit 4 – Transit Map

2 Background

EXHIBIT 5 – LIST OF THE SCHOOLS IN THE STUDY AREA

School Name	Address
Richard R. Green High School	East 88th Street between York Avenue and 1st Avenue
St. Josephs School of Yorkville	East 87th Street between York Avenue and 1st Avenue
The McCarton School	East 82nd Street at 1st Avenue
St. Stephen School	East 82nd Street at 1st Avenue
The Caedmon School	East 80th Street between York Avenue and 1st Avenue
Eleanor Roosevelt High School	East 76th Street between York Avenue and 1st Avenue
The International Preschools	East 74th Street at 1st Avenue
Our Lady of Good Counsel School	East 91st Street between 1st Avenue and 2nd Avenue
P.S. 290	East 82nd Street between 1st Avenue and 2nd Avenue
Metaphysics & Parapsychology	East 74th Street between 2nd Avenue and 3rd Avenue
Robert F. Wagner High School	East 76th Street between 2nd Avenue and 3rd Avenue
PTA JHS 167	East 76th Street between 2nd Avenue and 3rd Avenue
All Souls School	Lexington Avenue between East 79th Street and East 80th Street
Allen Stevenson School	East 78th Street at Lexington Avenue
St. Jean Baptiste High School	East 75th Street between 3rd Avenue and Lexington Avenue
The Buckley School	East 73rd Street between Lexington Avenue and Park Avenue
The Dalton School	East 89th Street between Lexington Avenue and Park Avenue
Church of Advent Hope	East 87th Street between Lexington Avenue and Park Avenue
Ramaz School – Lower School	East 85th Street between Lexington Avenue and Park Avenue
Brick Church School	East 92nd Street between Park Avenue and Madison Avenue
Regis High School	East 84th Street between Park Avenue and Madison Avenue
Loyola School	Park Avenue between East 83rd Street and East 84th Street
P.S. 6	East 81st Street at Madison Avenue
Ramaz School – Upper School	East 78th Street between Park Avenue and Madison Avenue
The Hewitt School	East 75th Street between Park Avenue and Madison Avenue

3 Existing Conditions

3. EXISTING CONDITIONS

3.1 About the Study Area

The Yorkville Study Area consists of seven major north-south corridors: York Avenue, First Avenue, Second Avenue, Third Avenue, Lexington Avenue, Park Avenue and Madison Avenue and three major east-west corridors: East 72nd Street, East 79th Street and East 86th Street (Photo No. 1).

Photo No. 1: East 86th Street & Lexington Avenue

New York City Transit is installing a Bus Rapid Transit (BRT) System in New York to improve urban mobility. The First Avenue/Second Avenue Select Bus Service (SBS) are two of five corridors where the BRT is being implemented across NYC. Along these corridors, the BRT will extend from 125th Street to South Ferry. However, from 125th Street to Houston Street the BRT will have an exclusive bus lane with bus bulb outs at the stations. The SBS will improve service with increased hours of operation by utilizing a simpler service pattern including transit signal priority between Houston Street and South Ferry.

There were several accidents in the study area including 34 senior pedestrian accidents, four of which resulted with fatalities from 2001 to 2006. Most of these accidents occurred during the day at signalized intersections where pedestrians were crossing with the signal. The combination of heavy traffic and pedestrian volumes, operational factors and geometric factors make these corridors difficult for a senior pedestrian to safely cross.

3.2 Field Observations and Pedestrians Concerns

There were numerous issues that were repeatedly observed during the field visits and/or conveyed by senior pedestrians during interviews. Those issues are listed here:

- Insufficient crossing time
- Vehicles failure to yield
- Missing or inadequate pedestrian ramps

4 Traffic Operations

4. TRAFFIC OPERATIONS

4.1 Crash Summary

Crash data was obtained from the New York City Department of Transportation (NYCDOT) in the Yorkville study area from 2001 through 2006. This data provides some detail relating the circumstances and cause of each crash. Table 1 and Exhibit 6 show a summary of crashes.

Table 1: DMV Six Year Crash Summary (2001-2006)

INTERSECTION		SENIOR PEDESTRIAN CRASHES	SENIOR PEDESTRIAN FATALITIES
East 72nd Street	First Avenue	1	0
	Second Avenue	1	0
	Lexington Avenue	1	0
	Park Avenue	1	0
	Madison Avenue	2	0
East 76th Street	York Avenue	1	0
East 77th Street	Park Avenue	1	0
East 78th Street	First Avenue	2	0
	Third Avenue	2	0
East 79th Street	Third Avenue	1	0
	Madison Avenue	1	0
East 80th Street	York Avenue	1	1
	Second Avenue	1	0
East 81st Street	York Avenue	1	0
	First Avenue	1	0
East 82nd Street	York Avenue	2	1
East 84th Street	Lexington Avenue	1	0
	Madison Avenue	1	0
East 85th Street	Lexington Avenue	1	0
East 86th Street	First Avenue	1	1
	Third Avenue	1	0
	Lexington Avenue	1	0
East 87th Street	Third Avenue	1	0
	Lexington Avenue	2	0
East 88th Street	York Avenue	1	0
	Second Avenue	1	0
East 89th Street	Madison Avenue	2	1
East 90th Street	York Avenue	1	0
TOTAL		**34**	**4**

EXHIBIT 6 – PEDESTRIAN CRASH STATISTICS (2001-2006)

4 Traffic Operations

4.2 Traffic Volumes

The level of vehicle and pedestrian conflicts at the intersections utilized by senior pedestrians, in the Yorkville study area, was assessed using traffic volume data collected at key locations in June of 2009 and March of 2010 (Table 2).

The results of the ATR, TMC and pedestrian counts are included in Appendices A, B, C and the Technical Supplement.

Table 2: Traffic Volume Data

Locations	ATR[1]	TMC[2]	PED COUNTS
York Avenue & E 72nd Street		x	
York Avenue between E 72nd Street & E 73rd Street	x		
York Avenue & E 73rd Street		x	
York Avenue between E 76th Street & E 77th Street	x		
York Avenue & E 80th Street		x	
York Avenue & E 81st Street		x	
York Avenue & E 82nd Street		x	
York Avenue between E 82nd Street & E 83rd Street	x		
York Avenue & E 85th Street		x	
York Avenue between E 88th Street & E 89th Street	x		
York Avenue between E 90th Street & E 91st Street	x		
York Avenue & East 91st Street		x	
Third Avenue between E 71st Street & E 72nd Street	x		
Lexington Avenue between E 72nd Street & E 73rd Street	x		
E 72nd Street between York Avenue & First Avenue	x		
E 72nd Street & First Avenue		x	x
E 72nd Street & Second Avenue		x	x
E 72nd Street & Third Avenue		x	x
E 72nd Street & Lexington Avenue		x	x

Notes:
1. Twenty-four hour Automatic Traffic Recorder (ATR)
2. Turning Movement Counts (TMC's)

4 Traffic Operations

Locations	ATR[1]	TMC[2]	PED COUNTS
E 72nd Street between Lexington Avenue & Park Avenue	x		
E 72nd Street & Park Avenue		x	
E 72nd Street & Madison Avenue		x	
E 72nd Street & Fifth Avenue		x	
First Avenue between E 78th Street & E 79th Street	x		
Lexington Avenue between E 79th Street & E 80th Street	x		
E 79th Street & York Avenue		x	
E 79th Street between York Avenue & First Avenue	x		
E 79th Street & First Avenue		x	x
E 79th Street & Second Avenue		x	x
E 79th Street & Third Avenue		x	x
E 79th Street & Lexington Avenue		x	x
E 79th Street & Park Avenue		x	
E 79th Street & Madison Avenue		x	
E 79th Street between Madison Avenue & Fifth Avenue	x		
E 79th Street & Fifth Avenue		x	
Third Avenue between E 85th Street & E 86th Street	x		
Lexington Avenue between E 86th Street & E 87th Street	x		
E 86th Street & York Avenue		x	
E 86th Street between York Avenue & First Avenue	x		
E 86th Street & Third Avenue		x	x
E 86th Street & Lexington Avenue		x	x
E 86th Street & Park Avenue		x	
E 86th Street between Park Avenue & Madison Avenue	x		
E 86th Street & Madison Avenue		x	
E 86th Street & Fifth Avenue		x	

Notes:
1. Twenty-four hour Automatic Traffic Recorder (ATR)
2. Turning Movement Counts (TMC's)

4 Traffic Operations

4.3 Existing Level of Service

The common practices used to evaluate both un-signalized and signalized intersections are level-of-service (LOS), delay, and volume-to-capacity ratio (v/c). The intersections and corridors to be evaluated were selected based on the pedestrian crash locations and what was observed during the field visit. At some signalized intersections, delay and v/c were analyzed. The baseline conditions at a specific intersection are measured in the amount of time (delay) that a vehicle has to wait at that intersection. This is measured in seconds per vehicle (sec/veh) during the busiest one hour (peak hour) in both the morning (AM) and evening (PM), and referred to as total delay. Total delay is adjusted for additional accrued time due to traffic controls and queuing conditions. A volume-to-capacity ratio indicates the amount of congestion that occurs at a particular location. An intersection with a v/c that is greater than or equal to 1 proves that the traffic conditions are above or at capacity; whereas an intersection with a v/c less than 1 indicates that traffic operations are below capacity.

For un-signalized intersections, the level of service is determined by the time spent while the vehicle is not moving (stopped delay). The two approaches can be used to measure the average stopped delay, either by minor movements of the intersection as a whole or by lane grouping.

The results of existing level of service analysis for the studied corridors in the study area during both AM and PM peak hours are indicated in Table 3. The detailed results of the analysis are included in Appendix D and the Technical Supplement.

Table 3: Existing (2010) Intersection Level of Service and Delays (sec)

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
East 72nd Street & York Avenue	34.7	C	27.5	C
East 72nd Street & First Avenue	34.7	C	27.5	C
East 72nd Street & Second Avenue	19.6	B	18.8	B
East 72nd Street & Third Avenue	48.6	D	31.8	C
East 72nd Street & Lexington Avenue	41.4	D	18.2	B
East 72nd Street & Park Avenue (northbound)	39.0	D	18.5	B
East 72nd Street & Park Avenue (southbound)	20.9	C	17.4	B
East 72nd Street & Madison Avenue	44.9	D	21.8	C
East 72nd Street & Fifth Avenue	44.9	D	21.8	C
East 86th Street & York Avenue	27.5	C	23.2	C

4 Traffic Operations

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
East 86th Street & First Avenue	41.7	D	21.2	C
East 86th Street & Second Avenue	28.3	C	20.4	C
East 86th Street & Third Avenue	28.3	C	20.4	C
East 86th Street & Lexington Avenue	57.1	E	35.5	D
East 86th Street & Park Avenue (northbound)	17.2	B	15.6	B
East 86th Street & Park Avenue (southbound)	24.3	C	14.0	B
East 86th Street & Madison Avenue	35.6	D	21.5	C
East 86th Street & Fifth Avenue	23.0	C	23.1	C

4.4 Signal Timing: Pedestrian Interval

According to MUTCD 2009 (Manual on Uniform Traffic Control Devices) Section 4E.06, a minimum of seven (7) seconds is allocated for a walk interval, in addition to a pedestrian clearance time based on a walking speed of 3.5 feet per second. All signalized intersections in the study area were modified to provide a clearance interval of 3 feet per second to accommodate slower walking speeds.

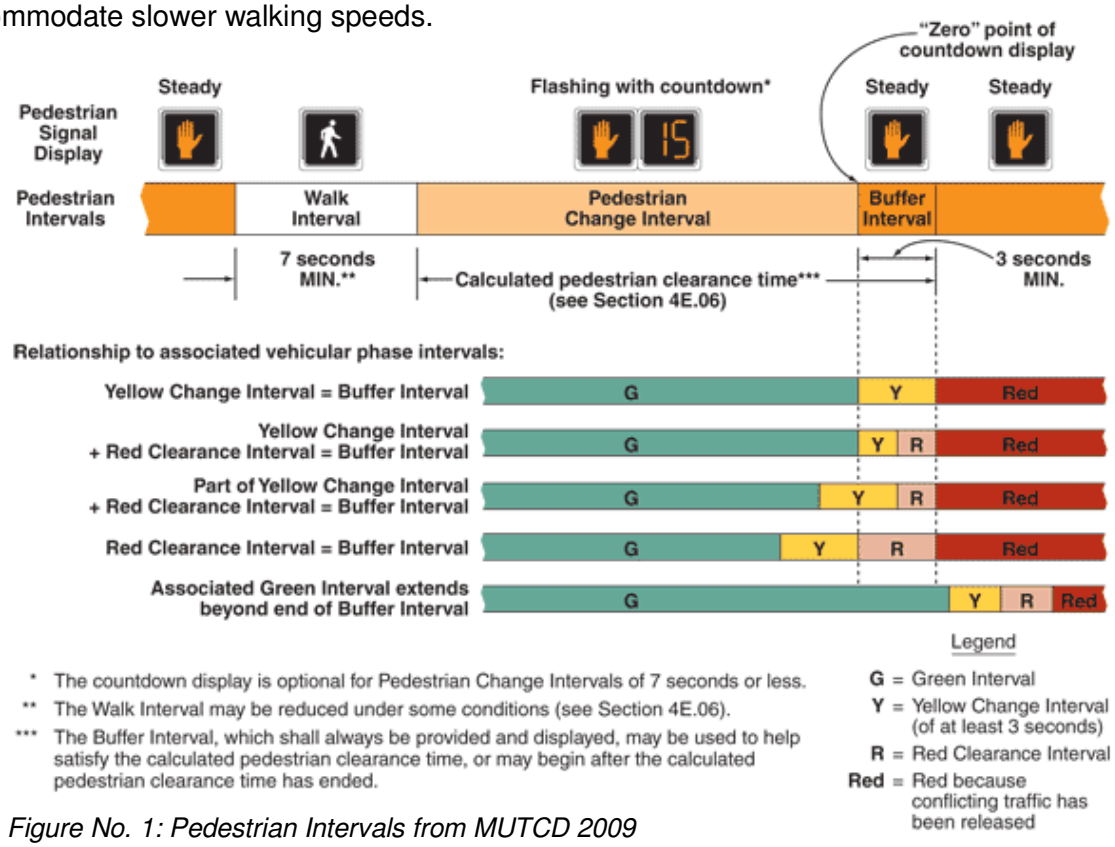


Figure No. 1: Pedestrian Intervals from MUTCD 2009

5 Illustrating The Solution

5. ILLUSTRATING THE SOLUTION

5.1 Executive Summary and General Recommendations

Section	Locations	Extended/Raised Median	Curb Extension	Left-turn Bay	Ban Left-turn
5.2	York Avenue & 79th Street		x		
5.2	York Avenue & 82nd Street		x		
5.3	First Avenue & 86th Street	x		x	
5.3	Lexington Avenue & 86th Street				x
5.4	Third Avenue & 83rd Street		x		

It should be noted that turning movement counts, traffic volumes and pedestrian counts were gathered along East 72nd Street and East 86th Street (Appendices A, B & C) from York Avenue to Fifth Avenue to determine the feasibility of reducing both corridors to one moving lane in each direction. Preliminary analysis of the traffic data showed that the reduction may be viable for both East 72nd Street and East 86th Street from York Avenue to Third Avenue and Park Avenue to Fifth Avenue without significantly impacting the vehicular level of service (Appendix D & Technical Supplement). The conceptual reconfiguration will have one shared travel lane in each direction with parking on both sides and a median to be used for left-turn bays as appropriate at the intersections. Further detailed study and analysis is required to validate these initial studies and observations.

5 Illustrating The Solution

General Recommendations

- *Place stop bars ten feet in advance of all crosswalks*

  The NYCDOT standard for placement of a stop bar is ten feet in advance of any marked pedestrian crosswalk, including school and high-visibility crosswalks. This helps to maximize pedestrian visibility and to minimize the potential for pedestrian/vehicle conflicts. Therefore, it is recommended that stop bars be placed ten feet in advance of all crosswalks.

- *Provide additional crossing time where feasible*

  Number of senior residents interviewed, indicated that there was not enough time to cross a lot of the streets. All the signals, where possible, will be retimed to allow more crossing time for pedestrians.

- *Green projects where feasible*

  All medians, pedestrian plazas and curb extensions will be part of the Greenstreets project where feasible. The Greenstreets project is a citywide program to convert paved vacant traffic islands and medians into green spaces filled with shade trees, flowering trees, shrubs and groundcover.

5 Illustrating The Solution

5.2 York Avenue

Photo No. 2: York Ave. & E 81st St. (looking north)

York Avenue is a 60-foot wide street with two travel lanes in each direction and parking on both sides. During the field visit, it was observed that York Avenue is congested near the entrances to the FDR at: East 73rd Street, East 80th Street and East 91st Street. There was a high concentration of senior pedestrian crashes along York Avenue between East 80th Street and East 82nd Street, including two fatalities. These consecutive intersections were evaluated to determine an underlying cause for the high concentration of crashes. It was found that a significant volume of turning vehicles entering onto the FDR failing to yield to pedestrians. In addition, multiple bus stops as well as high volume of taxis and private vehicles making U-turns make these intersections intimidating for seniors.

Automatic Traffic Recorder (ATR) and Turning Movement Counts (TMC) were collected in March of 2010 along York Avenue from East 72nd Street to East 91st Street (Appendices A & B). The analysis and field observation indicated that a lane reduction may be feasible for only northbound traffic (Technical Supplement). Along with the elimination of a moving lane, new pedestrian refuge islands are recommended. Further study is required to fully evaluate these initial studies and observations.

Neckdowns are recommended for the following intersections to shorten the crossing distance and slow turning traffic:

- Southeast corner of York Avenue & 79th Street
- Southeast corner of York Avenue & 82nd Street

Vehicle turning was reviewed and the proposed neckdowns allow for vehicles to safely complete all legal turns (Appendix E).

Most of the pedestrian ramps along York Avenue are in good condition with the exception of the northwest corner of East 82nd Street and the northeast corner of East 86th Street. New NYCDOT standard pedestrian ramp and ADA safety surface is recommended.

Photo No. 3: York Ave. & E 82nd St. (northwest corner)

5 Illustrating The Solution

5.3 East 86th Street

East 86th Street is a 59-foot wide street with two moving lanes in each direction and parking on both sides (Photo No. 4). It is a designated truck route. The conflict between turning vehicles and pedestrians make many intersections along East 86th Street intimidating for seniors.

Photo No. 4: E 86th St. & Lexington Ave. (looking west)

All of the pedestrian ramps along East 86th Street are in good condition with the exception of the northwest corner of York Avenue. This ramp should be replaced with new NYCDOT standard pedestrian ramps and ADA safety surfaces.

There is a number of conflicting priorities for East 86th Street. It is a collector roadway that crosses Central Park making it a crucial East-West connector; however, heavy pedestrian volumes from residential and commercial activities make this street a vital pedestrian route. To determine the appropriate pedestrian amenities that could be installed without causing a decrease in vehicle level of service, a traffic study program was initiated.


Photo No. 5: E 86th St. & First Ave. (looking east)

A new concrete refuge island is recommended for the east leg of 86th Street and First Avenue. Vehicle turning was reviewed and the proposed concrete refuge island allows for vehicles to safely complete all legal turns (Appendix E). The new median will slow turning traffic, discourage pedestrians from crossing mid-block and provide a refuge area.

On the west leg of 86th Street and First Avenue, a left-turn bay is recommended to help improve the flow of traffic along 86th Street. The left-turn bay will reduce the "shock wave" effect caused by a speed differential. Shock waves occur when left-turning vehicles are forced to decelerate in the through lanes, causing through traffic to decelerate. The flow of traffic at the intersection will be improved by the 100-feet left-turn bay.

5 Illustrating The Solution

At the intersection of 86th Street and Lexington Avenue, a left-turn ban is recommended. The left-turn ban will reduce the conflict between pedestrians and left-turning vehicles and allow more crossing time for the pedestrians.

5.4 Third Avenue

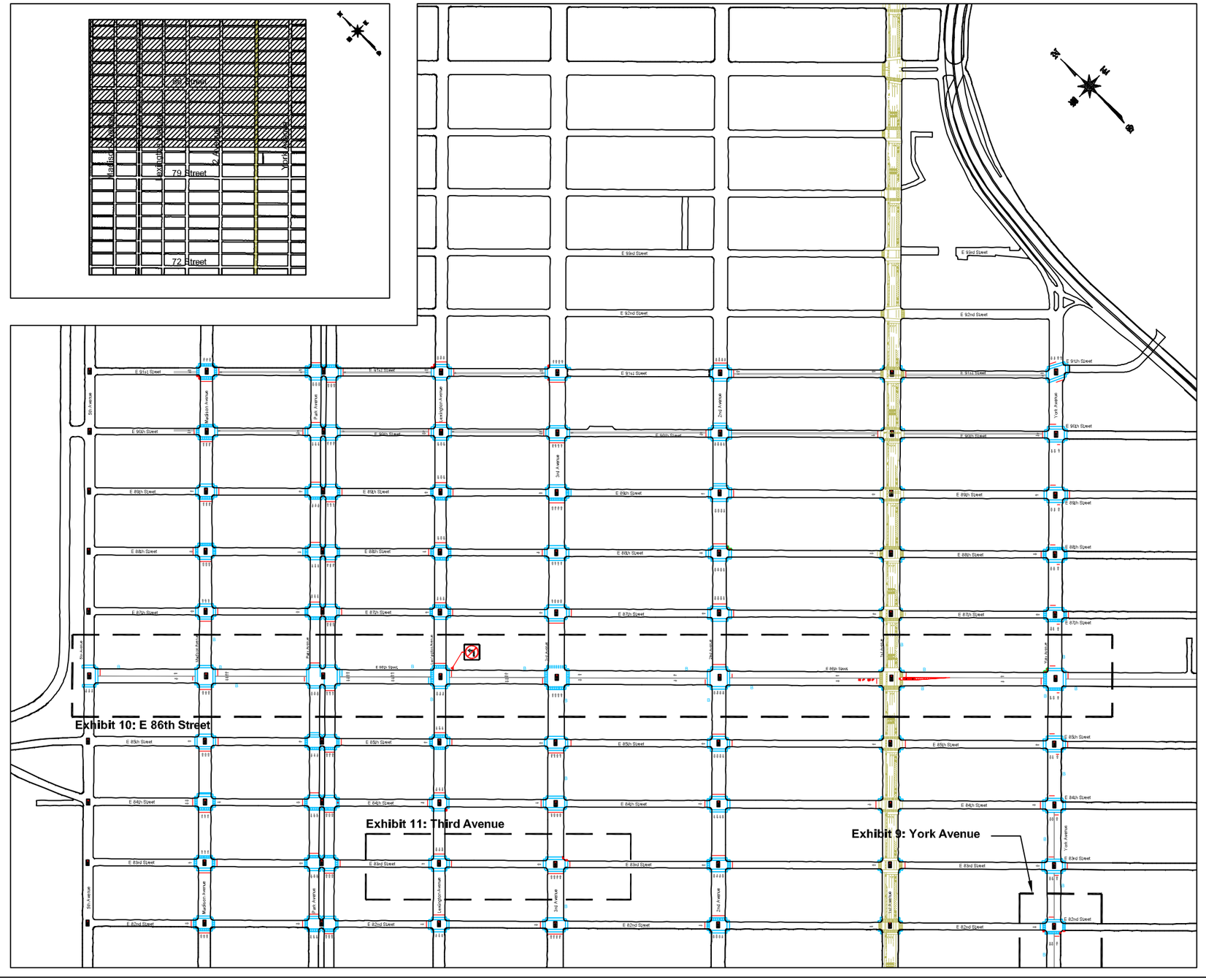
Third Avenue is a 70-foot wide northbound street with four moving lanes and parking on both sides.

The southeast corner of East 73rd Street is missing a pedestrian ramp along Third Avenue and a NYCDOT standard pedestrian ramp configuration with ADA safety surface is recommended.

Photo No. 6: E 86th St. & First Ave. (looking east)

At the northeast corner of 83rd Street, a single neckdown along Third Avenue is recommended to shorten the crossing distance for seniors and to slow turning traffic. Vehicle turning was reviewed and the proposed neckdowns allow for vehicles to safely complete all legal turns (Appendix E).

Exhibit 7 - RECOMMENDATION INDEX 1



LEGEND:

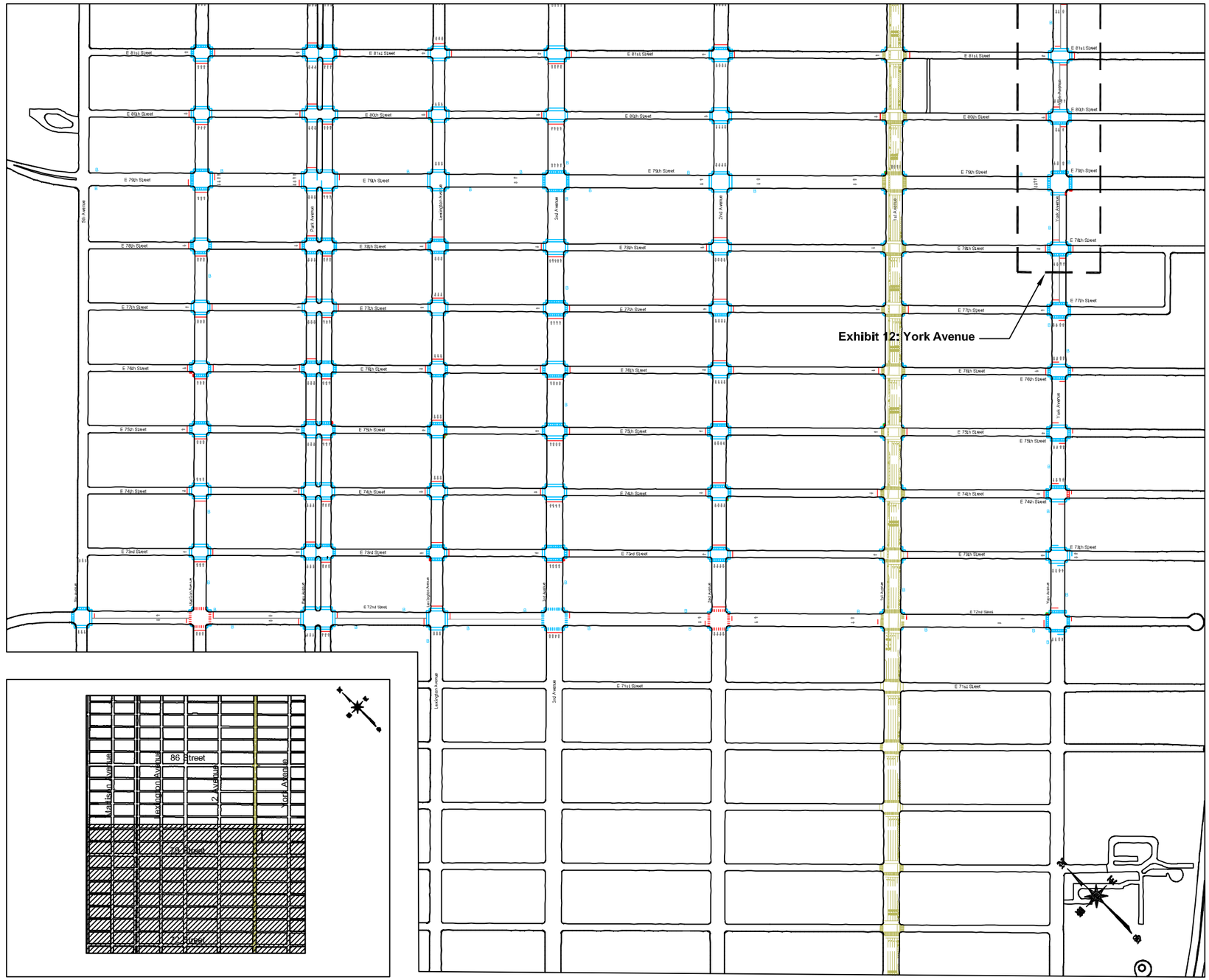
- EXISTING TRAVEL DIRECTION
- EXISTING SIGNALIZED INTERSECTION
- EXISTING SCHOOL CROSSWALK
- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING PEDESTRIAN RAMP
- EXISTING CATCH BASIN
- EXISTING TRAFFIC SIGN
- S — SUBWAY STOP
- B — BUS STOP
- PROPOSED STOP BAR
- PROPOSED SCHOOL CROSSWALK
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED NEW PEDESTRIAN RAMP
- REPLACE EXISTING PEDESTRIAN RAMP
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN
- PROPOSED CURB EXTENSION (NECKDOWN)
- PROPOSED SIGNALIZED INTERSECTION
- PROPOSED CONCRETE REFUGE ISLAND
- BOLLARDS
- PLANNED DOT PROJECTS

NOTE: NOT ALL ITEMS ARE USED AND NOT ALL ITEMS ARE SHOWN.

YORKVILLE, MANHATTAN

RECOMMENDATION INDEX 1

Exhibit 8 - RECOMMENDATION INDEX 2



LEGEND:

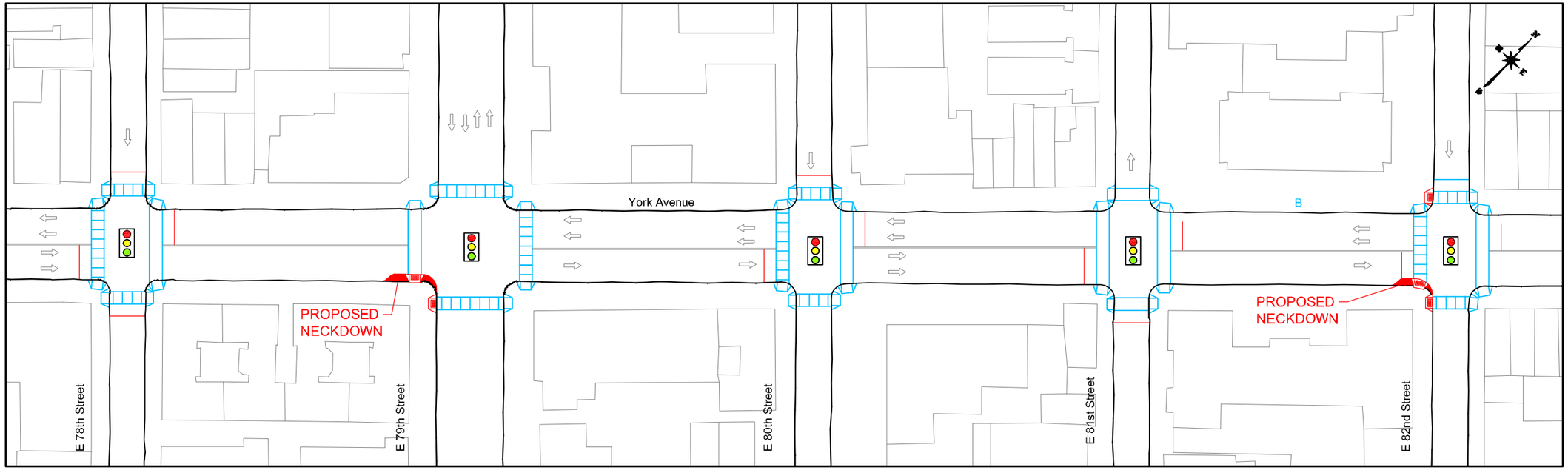
- EXISTING TRAVEL DIRECTION
- EXISTING SIGNALIZED INTERSECTION
- EXISTING SCHOOL CROSSWALK
- EXISTING HIGH VISIBILITY CROSSWALK
- EXISTING STANDARD CROSSWALK
- EXISTING PEDESTRIAN RAMP
- EXISTING CATCH BASIN
- EXISTING TRAFFIC SIGN
- S SUBWAY STOP
- B BUS STOP
- PROPOSED STOP BAR
- PROPOSED SCHOOL CROSSWALK
- PROPOSED HIGH VISIBILITY CROSSWALK
- PROPOSED STANDARD CROSSWALK
- PROPOSED NEW PEDESTRIAN RAMP
- REPLACE EXISTING PEDESTRIAN RAMP
- PROPOSED CATCH BASIN
- PROPOSED TRAFFIC SIGN
- PROPOSED CURB EXTENSION (NECKDOWN)
- PROPOSED SIGNALIZED INTERSECTION
- PROPOSED CONCRETE REFUGE ISLAND
- BOLLARDS
- PLANNED DOT PROJECTS

NOTE: NOT ALL ITEMS ARE USED AND NOT ALL ITEMS ARE SHOWN.

YORKVILLE, MANHATTAN

RECOMMENDATION INDEX 2

Exhibit 9 - York Avenue (From 78th Street to 82nd Street)



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 CONCRETE REFUGE ISLAND
B EXISTING BUS STOP
S EXISTING SUBWAY STOP
PROPOSED CURB EXTENSION (NECKDOWN)
SW OBSTRUCTION: STREETLIGHT
SW OBSTRUCTION: SIGNAL POLE
PROPOSED BIKE LANE
PROPOSED SHARED BIKE LANE
BOLLARDS
EXISTING SIGNALIZED INTERSECTION
PROPOSED SIGNALIZED INTERSECTION
EXISTING TRAVEL DIRECTION
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
EXISTING TRAFFIC SIGN
PROPOSED TRAFFIC SIGN
PLANNED DOT PROJECTS

*NOTE: NOT ALL ITEMS ARE USED AND NOT ALL ITEMS ARE SHOWN.

Recommended improvements include:

- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new advanced stop bars
- Install a neckdown
  -southeast corner of York Avenue & E 79th Street
  -southeast corner of York Avenue & E 79th Street

Pedestrian concerns in this area:

- Turning vehicles not yielding to pedestrians
- Signal timing (insufficient crossing time)
- Missing or inadequate pedestrian ramps

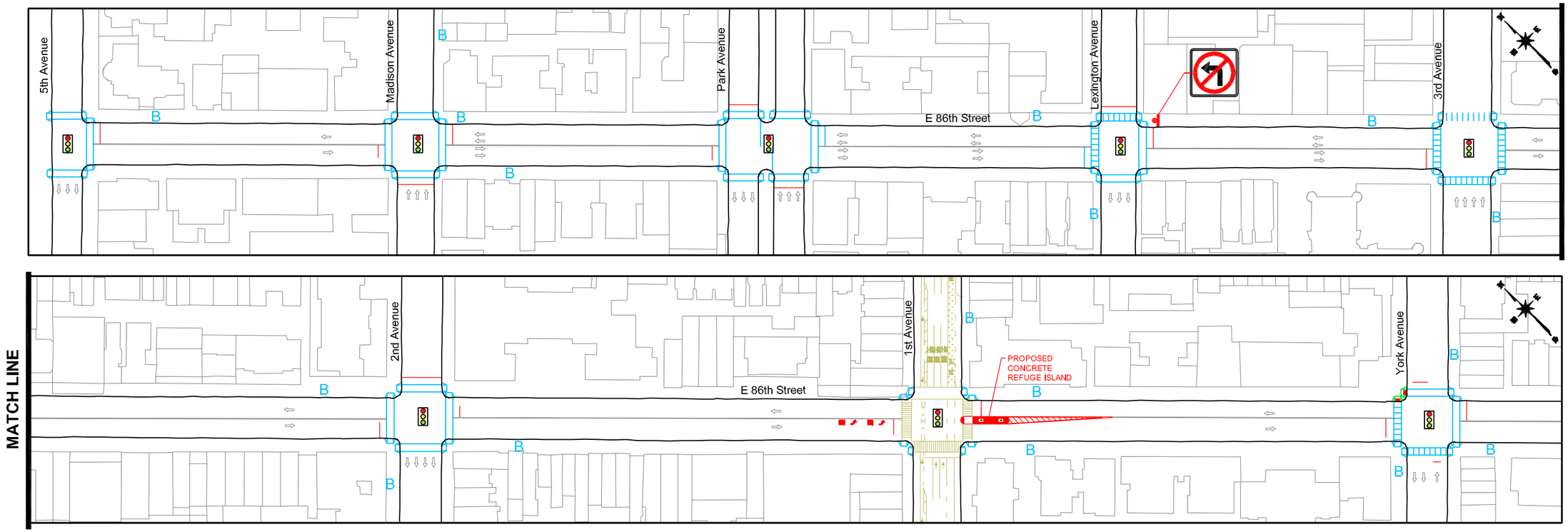
Traffic Analysis:

- Turning Movement Counts (TMC)
- Automatic Traffic Recorder Counts (ATR)

Additional Information:

- This study area was visited on December 22nd, 2009 and April 6th, 2011
- Autoturn for York Avenue & East 79th Street, and York Avenue & East 82nd Street are shown in Appendix E

Exhibit 10 - East 86th Street (From York Avenue to Fifth Avenue)



EXISTING HIGH VISIBILITY CROSSWALK
EXISTING STANDARD CROSSWALK
EXISTING SCHOOL CROSSWALK
EXISTING STOP BAR
EXISTING PEDESTRIAN RAMP
PROPOSED NEW PED RAMP
REPLACE EXISTING PED RAMP
*NOTE: NOT ALL ITEMS ARE USED AND NOT ALL ITEMS ARE SHOWN.

PROPOSED HIGH VISIBILITY CROSSWALK
PROPOSED STANDARD CROSSWALK
PROPOSED SCHOOL CROSSWALK
PROPOSED STOP BAR
PROPOSED CONCRETE REFUGE ISLAND
B EXISTING BUS STOP
S EXISTING SUBWAY STOP

PROPOSED CURB EXTENSION (NECKDOWN)
SW OBSTRUCTION: STREETLIGHT
SW OBSTRUCTION: SIGNAL POLE
PROPOSED BIKE LANE
PROPOSED SHARED BIKE LANE
BOLLARDS

EXISTING SIGNALIZED INTERSECTION
PROPOSED SIGNALIZED INTERSECTION
EXISTING TRAVEL DIRECTION
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
EXISTING TRAFFIC SIGN
PROPOSED TRAFFIC SIGN
PLANNED DOT PROJECTS

Recommended improvements include:

- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new advanced stop bars
- Install "No Left-Turn" sign for westbound traffic along E 86th Street at Lexington Avenue
- Stripe left-turn bay for eastbound traffic along E 86th Street at First Avenue
- Install a concrete refuge island along east leg of First Avenue

Pedestrian concerns in this area:

- Turning vehicles not yielding to pedestrians
- Signal timing (insufficient crossing time)
- Missing or inadequate pedestrian ramps

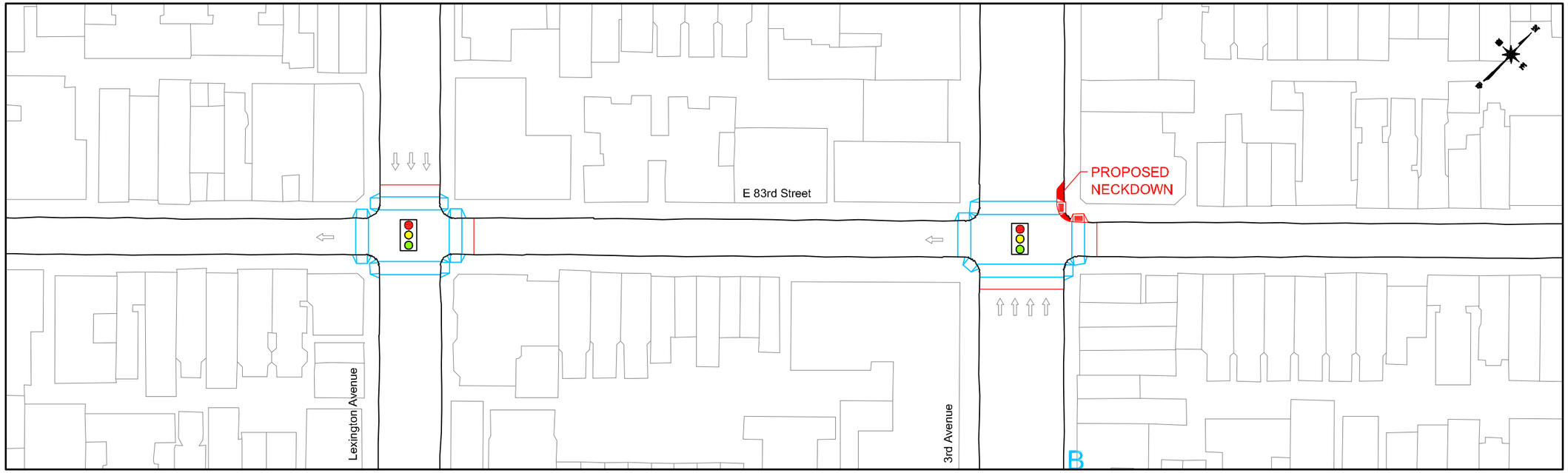
Traffic Analysis:

- Automatic Traffic Recorder Counts (ATR)
- Turning Movement Counts (TMC)
- Pedestrian Counts

Additional Information:

- This study area was visited on December 22nd, 2009 and April 6th, 2011

Exhibit 11 - Third Avenue



EXISTING HIGH VISIBILITY CROSSWALK
EXISTING STANDARD CROSSWALK
EXISTING SCHOOL CROSSWALK
EXISTING STOP BAR
EXISTING PEDESTRIAN RAMP
PROPOSED NEW PED RAMP
REPLACE EXISTING PED RAMP
*NOTE: NOT ALL ITEMS ARE USED AND NOT ALL ITEMS ARE SHOWN.

PROPOSED HIGH VISIBILITY CROSSWALK
PROPOSED STANDARD CROSSWALK
PROPOSED SCHOOL CROSSWALK
PROPOSED STOP BAR
PROPOSED CONCRETE REFUGE ISLAND
B EXISTING BUS STOP
S EXISTING SUBWAY STOP

PROPOSED CURB EXTENSION (NECKDOWN)
SW OBSTRUCTION: STREETLIGHT
SW OBSTRUCTION: SIGNAL POLE
PROPOSED BIKE LANE
PROPOSED SHARED BIKE LANE
BOLLARDS

EXISTING SIGNALIZED INTERSECTION
PROPOSED SIGNALIZED INTERSECTION
EXISTING TRAVEL DIRECTION
EXISTING CATCH BASIN
PROPOSED CATCH BASIN
EXISTING TRAFFIC SIGN
PROPOSED TRAFFIC SIGN
PLANNED DOT PROJECTS

Recommended improvements include:

- Time all signals for seniors and where feasible, the crossing time will be extended
- Install new advanced stop bars
- Install a neckdown at the northeast corner of Third Avenue & E 83rd Street

Pedestrian concerns in this area:

- Turning vehicles not yielding to pedestrians
- Signal timing (insufficient crossing time)
- Missing or inadequate pedestrian ramps

Traffic Analysis:

- Turning Movement Counts (TMC)
- Automatic Traffic Recorder Counts (ATR)

Additional Information:

- This study area was visited on December 22nd, 2009 and April 6th, 2011
- Autoturn for Third Avenue & East 78th Street, Madison Avenue & East 76th Street, Madison Avenue & East 79th Street, and Madison Avenue & East 84th Street are shown in Appendix E