

W 95 St

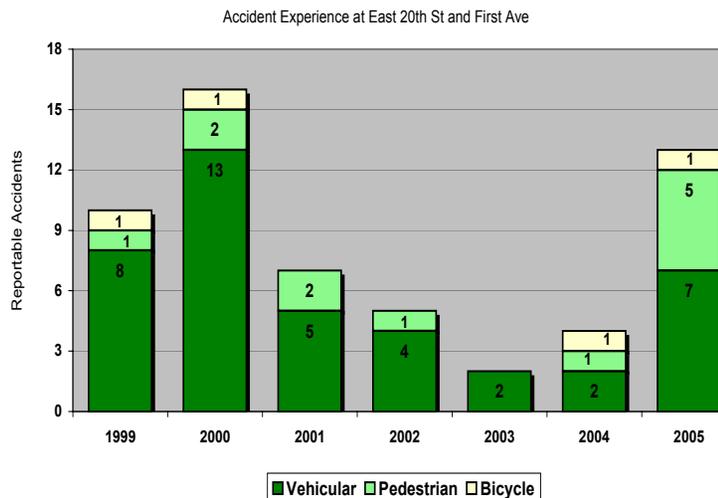
MANHATTAN



# EAST 20<sup>TH</sup> STREET/ FIRST AVENUE

## Description

The intersection at East 20th Street and First Avenue was identified as problematic for pedestrians based on community concerns regarding the high number of accidents at this location as well as a pedestrian fatality that occurred in 2006. Because there are educational facilities on both the northern and southern block faces of East 20th Street between First and Second Avenues, providing safe crossing at this intersection was a high priority for the Department. At this intersection, vehicles could enter onto the service road paralleling First Avenue along its east side. They could also enter the intersection mid-block from First Avenue between East 20th and East 21st Streets. Crossing this intersection from the northeast to northwest corners of East 20th Street was dangerous for pedestrians since the “Walk” sign corresponded with a heavy stream of traffic turning onto First Avenue coming both east and west from East 20th Street. Because of this, pedestrians were often likely to cross when the “Don’t Walk” sign was illuminated but after the northbound First Avenue traffic had passed.



From 2000 to 2005, the reportable accident experience at this location fluctuated. There was a high of 16 reportable accidents in 2000, of which two involved pedestrians and one involved a bicyclist. Reportable accidents decreased to two in 2003 from seven in 2001, but increased to 13 in 2005, of which five involved pedestrians and one involved a bicyclist. While pedestrian accidents also fluctuated between 1999 and 2005, the large increase in 2005 drew attention to this location. After an evaluation of the intersection was completed in 2006, safety improvements were designed and completed in the same year.



This Green Street was constructed where the service road along the eastern side First Avenue formally existed. By closing off the service area to vehicles, pedestrians have more space to walk and encounter less vehicle conflicts as they walk along First Avenue.



At 20th Street, this sign warns vehicles to pay attention to pedestrians crossing at this intersection.

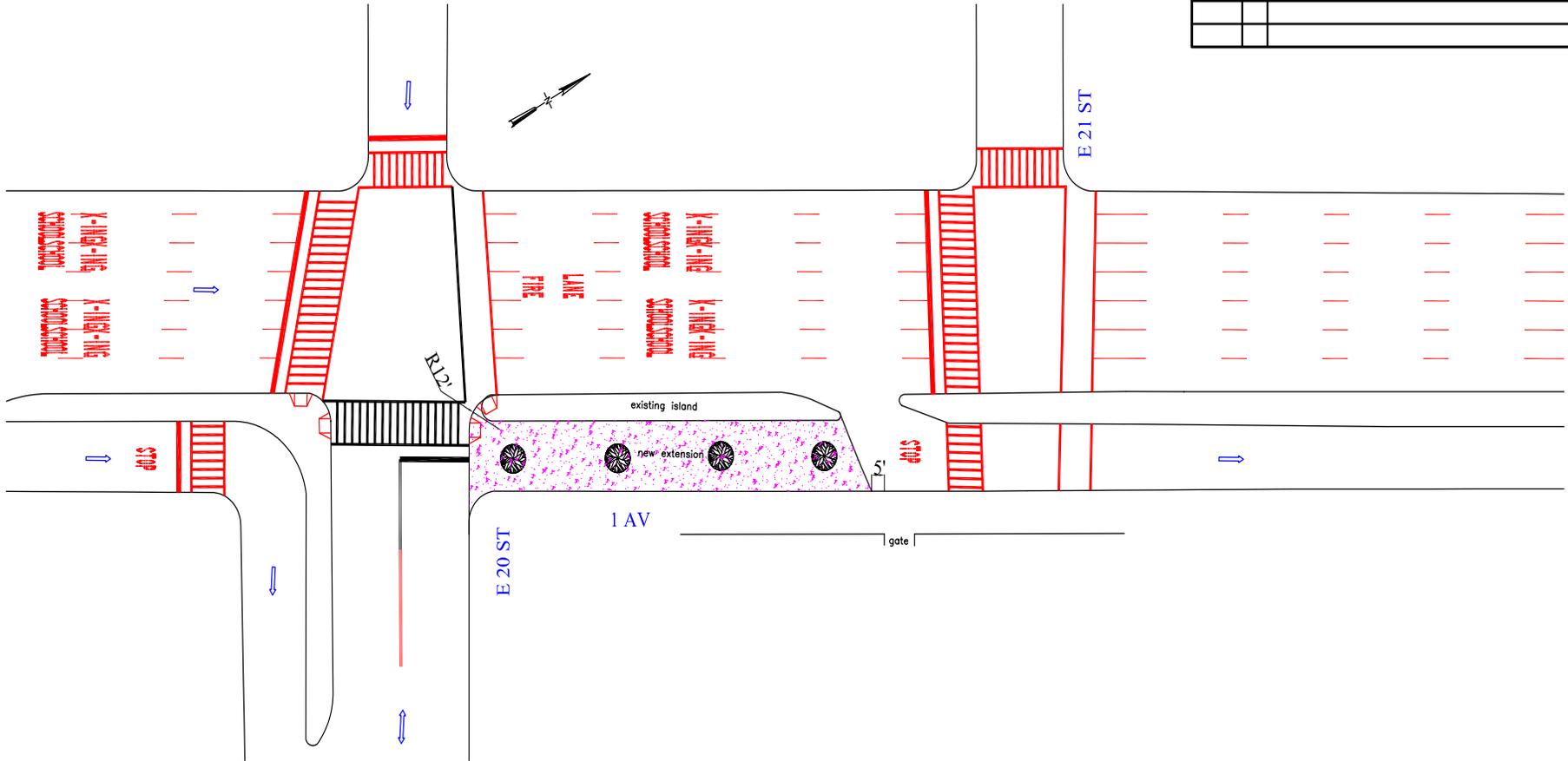
## Improvements Implemented in November 2006

- The entrance to the service road on the east side of First Avenue was closed, normalizing the intersection and eliminating a portion of the service road. This reduced the distance required to cross First Avenue on the north side and allowed the Department to realign the crosswalk and shorten the crossing distance of East 20th Street on the east side. Vehicles are still able to access the service road at the existing opening in the median south of East 21st Street. As part of this closure and in conjunction with the Department of Parks and Recreation, a Greenstreet was installed between East 20th and East 21st Streets, providing an amenity to the community.
- The traffic signals at East 20th Street and First Avenue were also modified to provide additional crossing time for pedestrians. The existing Leading Pedestrian Interval (LPI) across First Avenue (which allows pedestrians to begin crossing First Avenue prior to the vehicles on East 20th Street receiving a green indication) was increased to 18 seconds from 11 seconds. While the realignment of the east crosswalk resulted in the removal of the right arrow signals for northbound First Avenue, an eight second LPI was installed to supply the additional crossing time for pedestrians. Americans with Disability Act (ADA) compliant wheelchair ramps were also installed at this intersection during reconstruction.



The LPI on East 20th Street gives pedestrians more time to cross the street without vehicle conflict.

REVISIONS		
DATE	BY	DESCRIPTION



CITY OF NEW YORK		DEPARTMENT OF TRANSPORTATION	
<b>BUREAU OF TRAFFIC OPERATIONS</b>			
28-11 Queens Plaza North		L.I.C., N.Y. 11101	
<b>1 AV at E 20 ST</b>			
APPROVED	Drawn by <u>DR</u>	DRAWING	
BY <u>SB</u>	Checked by <u>JA</u>	NO. <u>MB-</u>	
	Borough <u>MANHATTAN</u>		
	Scale <u>1"=40'</u>		
	Date <u>5/16/2006</u>		



# PARK AVENUE/ EAST 33<sup>RD</sup> STREET

## Description

The intersection of Park Avenue and East 33<sup>rd</sup> Street had consistently been ranked number one in the number of pedestrian crashes in the City, holding this position from 1996 through 1998, and again in 2001 and 2003. This trend is directly attributed to the unusual configuration of the intersection and its location at the terminus or “mouth” of the Park Avenue Tunnel, which runs under Park Avenue between East 33<sup>rd</sup> and East 40<sup>th</sup> Streets. The tunnel serves two-way traffic with one lane in each direction. There is a posted height clearance of 8’–11” and trucks are prohibited in the tunnel. At the north leg of the intersection, the Park Avenue Tunnel emerges, severely limiting visibility for southbound Park Avenue traffic exiting the tunnel. Additionally, the merging of southbound Park Avenue surface traffic and southbound tunnel traffic exiting at East 33<sup>rd</sup> Street created unsafe pedestrian and vehicular conditions. Overall, pedestrians crossing on the north leg of the intersection were at the most risk due to the limited visibility.

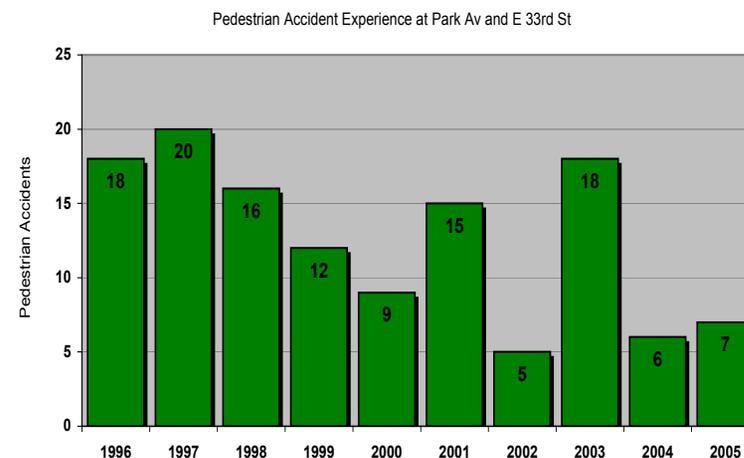
Based upon these known factors, DOT has been actively working at this location to improve overall safety, especially for pedestrians. A central component of this initiative was the prohibition of pedestrians from using the north leg to cross Park Avenue directly at the mouth of the tunnel. This was accomplished through the use of signs and an iron fence at the northeast and northwest corners. Nevertheless, non-compliance of these regulations remains high.

In terms of the accident history at this location, this intersection has consistently ranked first in the City with the highest number of pedestrian accidents (18 in 1996, 20 in 1997, 16 in 1998 and 15 in 2001.) Pedestrian accidents peaked in 1997 with 20 and continued to decline with 16 accidents in

1998 and 12 accidents in 1999, the year the Department implemented its improvements. In 2000, the first full year for which post-implementation information is available, accidents declined to nine, which is 55% less than the accident experience in 1997. The Department believes the decline since 1999 can be attributed to the improvements and changes to pedestrian movements through this intersection. However, in 2001, pedestrian accidents increased substantially to 15, a 67% increase. Given the decline in accidents at this location between 1997 and 2000 and the unusual increase that took place in 2001, the Department took a closer look at the contributing factors for accidents that took place at this intersection. A detailed analysis of each of the 15 accidents indicated that most of these accidents were attributed to pedestrians crossing against the signal and occurred in the southbound direction where vehicles exit the tunnel.

**After this analysis took place, pedestrian accidents in 2002 declined to only five, a 67% decrease. Although pedestrian accidents increased to 18 in 2003, they continued to decrease in 2004 and 2005. Despite the increases in 2001 and 2003, the post implementation data shows that the average number of accidents per year decreased by 39%, to 10 from 16.5.**

Based upon the additional information, the Department believes the accident experience in 2001 and 2003 were anomalies. Overall, pedestrian accidents have declined significantly at this location since the safety improvements were implemented in October 1999 and have made this intersection significantly safer for pedestrians and motorists alike.



## Improvements Implemented in October 1999

As part of the 1999 Mayor's Holiday Traffic Program, the Department implemented several measures to separate Park Avenue Tunnel traffic from pedestrians. This was accomplished by the installation of barriers extending from the mouth of the tunnel at the north leg of the intersection to near the south leg. Now pedestrians are physically able to cross Park Avenue only at the south leg (in conformance with the existing regulation). Furthermore, westbound traffic on East 33<sup>rd</sup> Street is no longer allowed to continue across Park Avenue, but is required to turn right (northbound) at Park Avenue. Green right arrow signals have been installed for westbound East 33<sup>rd</sup> Street. The improvements resulted in an overall reduction in conflicts between pedestrians and turning vehicles at all crosswalks in the intersection. Directional signs were installed throughout the area to direct truckers to appropriate truck routes (e.g., East 31<sup>st</sup> Street) and avoid unnecessary travel on East 33<sup>rd</sup> Street or Park Avenue. Specifically, the following improvements were implemented:

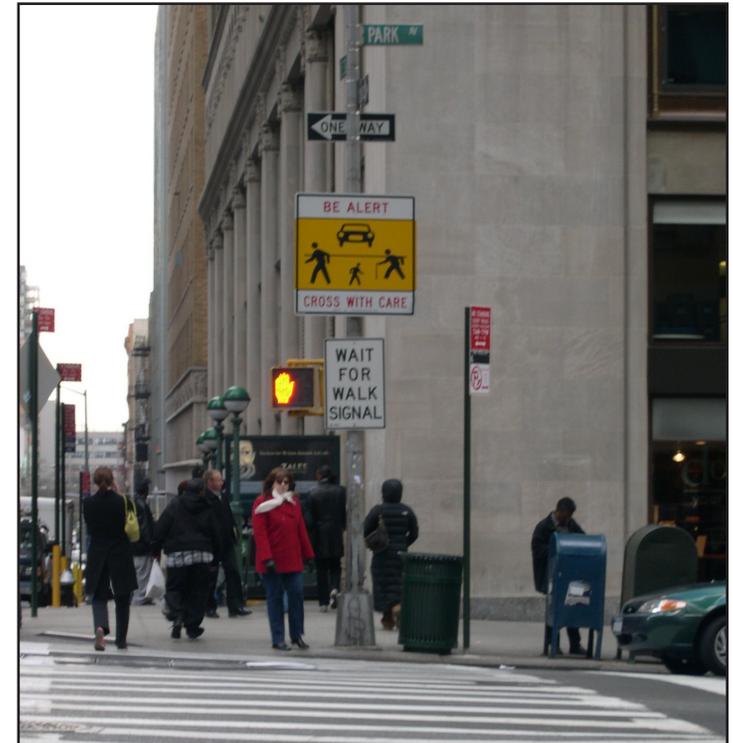


Pedestrian signage, iron pedestrian fences and other roadway improvements discourage pedestrians from crossing at this location and provide for safer vehicular movements

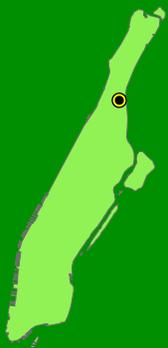
- A Jersey barrier separating the southbound tunnel exit from southbound Park Avenue surface traffic.
- Flexible delineators along the centerline of Park Avenue between the mouth of the tunnel and the south leg crosswalk.
- Signs prohibiting through traffic on westbound East 33<sup>rd</sup> Street and requiring all traffic to turn right to proceed northbound on Park Avenue surface road or into the tunnel (except trucks, which are prohibited in the tunnel).
- Signs to direct motorists primarily to East 31<sup>st</sup> Street to access East 33<sup>rd</sup> Street west of Park Avenue and points west.
- Signal face with right green arrow for traffic on westbound East 33<sup>rd</sup> Street approach to Park Avenue.
- Daylighting of the south curb of East 33<sup>rd</sup> Street at the approach to Park Avenue to facilitate turning movements for trucks.

- Remove alternate side “No Standing” regulations on East 33rd Street between Lexington and Park Avenues since the additional capacity created by making the curb lane a travel lane is no longer needed (East 33<sup>rd</sup> Street experiences reduced volume as a result of the improvements).
- Provide continuous “WALK” signal for pedestrians crossing west leg of intersection across East 33<sup>rd</sup> Street, including the signal phase when Park Avenue traffic is stopped since no conflicts can occur from westbound traffic.

Maintenance of all special items is continuing. In June 2000, several damaged sections of the iron fencing were repaired and re-installed. In March 2003, 18 linear feet of fencing was repaired and re-installed. Pavement markings were refurbished in June 2003. In February 2005, two fence sections at the northeast corner of Park Avenue and East 33<sup>rd</sup> Street and one section on the center median were repaired.



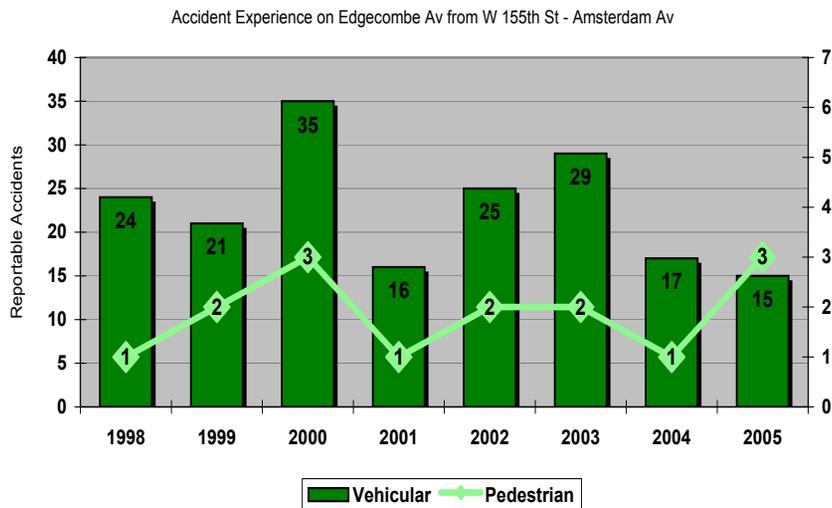
Oversized signage advised pedestrians to cross with care and wait for the walk signal



# EDGECOMBE AVENUE

## Description

Along the section of Edgecombe Avenue between West 155<sup>th</sup> Street and Amsterdam Avenue there are three schools (IS 90/PS 79, IS 164, and PS 8), a new police precinct (33<sup>rd</sup> Precinct) and a playground. The community raised concerns regarding the traffic safety of the school children in the area, limited parking and congestion. The Department, in coordination with Community Board 12 convened a task force to address these concerns. Members included the Department of Parks and Recreation, the Department of Sanitation, the Fire Department, the Community League and the Board of Education. As a result, the Department identified specific problems and in July 2002 implemented a series of improvements to ensure that the needs of the community were met.



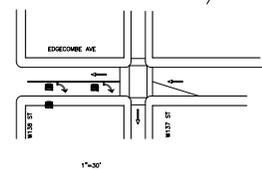
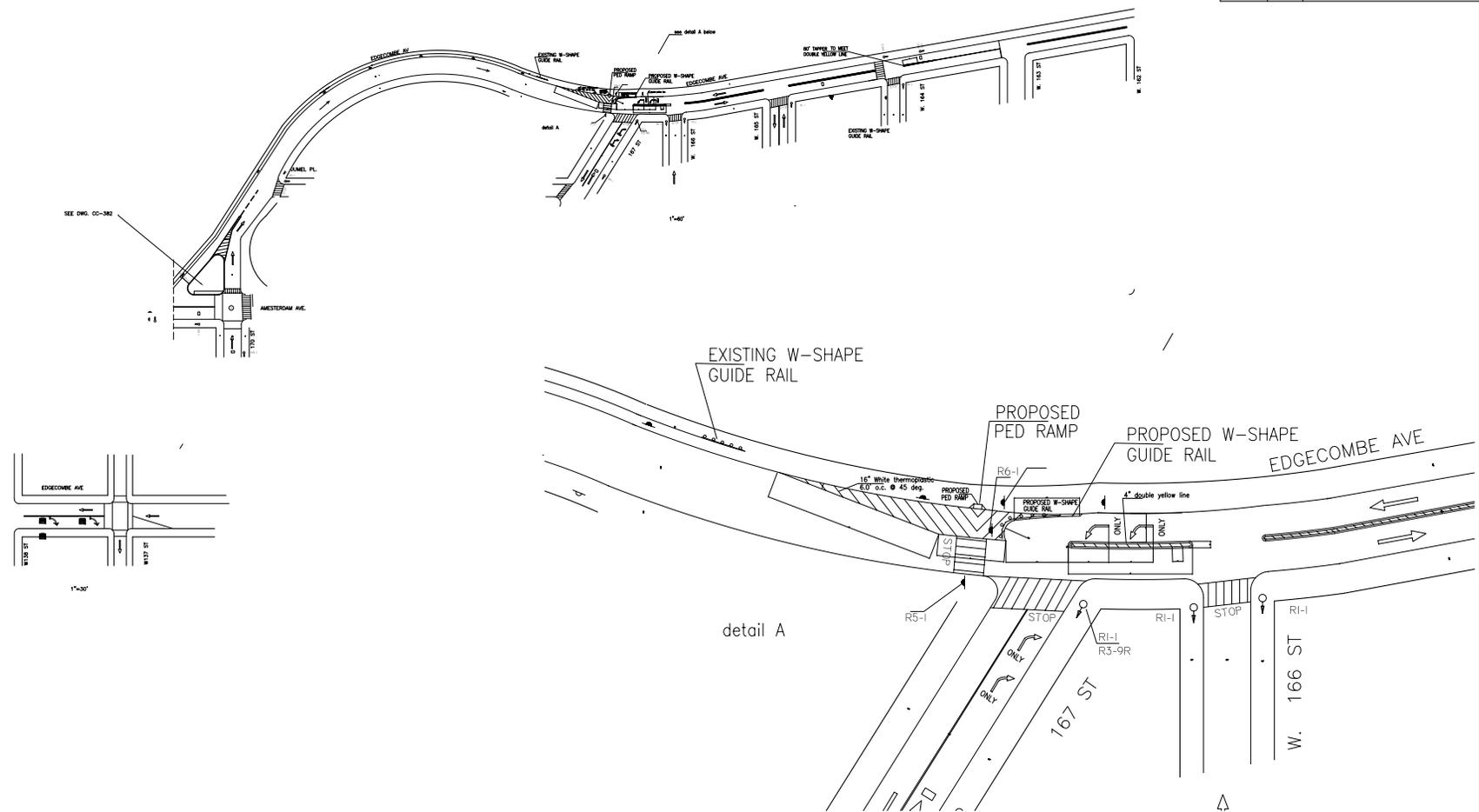
**As part of the review of the corridor, the Department examined the accident history for Edgecombe Avenue between West 155<sup>th</sup> Street and Amsterdam Avenue. Accidents along this corridor have been volatile, fluctuating between 16 and 35 before improvements were implemented in 2002. Pedestrian accidents were on the rise from 1998 to 2000, declined in 2001 and fluctuated between one and three from 2002 to 2005. While the improvements made in 2002 might not have been effective immediately, evidenced by the high number of accidents in 2003, the Department believes that the low numbers of accidents in 2004 and 2005 (17 and 15, respectively) can be attributed to these safety improvements.**

## Improvements Implemented In July 2002

- Converted Edgecombe Avenue to one-way southbound (from two-way operation) from Jumel Place to West 167<sup>th</sup> Street.
- Converted Jumel Place to one-way northbound (from two-way operation) from West 167<sup>th</sup> Street to Edgecombe Avenue.
- Converted West 168<sup>th</sup> Street to one-way eastbound (from two-way operation) from Amsterdam Avenue to Jumel Place.
- Installed angle parking on West 168<sup>th</sup> Street between Amsterdam Avenue and Jumel Place.
- Narrowed Edgecombe Avenue with pavement markings between West 167<sup>th</sup> Street and West 164<sup>th</sup> Street.
- Installed additional school crosswalks and appropriate signage around PS 8 and IS 90.
- Installed curve warning signs on Edgecombe Avenue.

The implemented improvements are shown on the following page.

REVISIONS		
DATE	APPD	DESCRIPTION



CITY OF NEW YORK		DEPARTMENT OF TRANSPORTATION	
BUREAU OF TRAFFIC OPERATIONS		BUREAU OF TRAFFIC OPERATIONS	
28-11 Queens Plaza North		L.I.C., N.Y. 11101	
<b>EDGECOMBE AVENUE</b>			
<b>FROM AMSTERDAM AV. TO 163 ST</b>			
APPROVED	Drawn by <u>SB</u>	DRAWING	
BY <u>SAM BARKHO, P.E.</u>	Checked by <u>SM</u>	NO. <u>MD-488</u>	
	Borough <u>MANHATTAN</u>		
	Scale <u>AS SHOWN</u>		
	Date <u>7/05/02</u>		



# UPPER PARK AVENUE

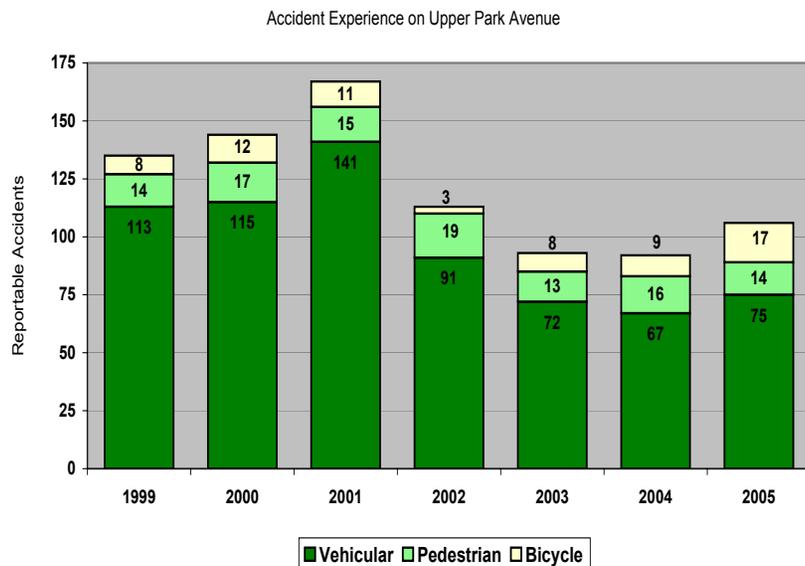
## Description

Beginning at East 96<sup>th</sup> Street, the Park Avenue roadway is divided by the Metro-North Viaduct which runs above the roadway from East 96<sup>th</sup> Street to East 132<sup>nd</sup> Street. The viaduct splits the Park Avenue roadway into separate northbound and southbound corridors with a typical width of 24 to 26 feet and vehicles often use it as a two-lane roadway. Along the entire corridor, a stone fascia is closely aligned to the curb line, and along a ten-block portion between East 101<sup>st</sup> Street and East 111<sup>th</sup> Street, the fascia of the viaduct is aligned approximately one foot from the curb line. This contributes to limited sight distances as motorists are not able to clearly view or react to a pedestrian's presence as they emerge from behind the stone fascia. Motorists also have a difficult time seeing other vehicles emerging from underneath the viaduct. The impacts in pedestrian and traffic flow on the roadway from these characteristics is most evident between East 101<sup>st</sup> and East 111<sup>th</sup> Streets and in the vicinity of the Metro-North station at East 125<sup>th</sup> Street.

The Metro-North station at East 125<sup>th</sup> Street is a highly congested area with high volumes of pedestrians and passengers discharging and loading. Additionally, the roadway narrows at this intersection to 19 feet due to the columns supporting the rail station and tracks above. Much of the street below the station is leased from the City for vehicle parking by private entities.



Aerial view of the Park Avenue corridor with improved markings and buffer zone



The accident experience for this corridor indicates a rising trend in accidents along the length of the corridor between 1999 and 2001. Reportable accidents increased each year starting at 113 in 1999, reaching 167 in 2001. Pedestrian accidents remained relatively constant ranging between 13 and 17 per year, while bicycle accidents fluctuated between eight and 15 a year. The rising accident trends predate the improvements that were implemented in September 2002. In 2002, reportable accidents decreased by 32%, to 113 from 167 in 2001, and bicycle accidents fell to only three. The next two years were similar with approximately 92 accidents, and in 2005 accidents increased slightly. Although vehicular accidents declined post-implementation, pedestrian accidents, on average, remained constant. Bicycle accidents decreased slightly from 2001 to 2004. The treatments that were implemented reflect the Department’s concern for the increase in accidents along this corridor.

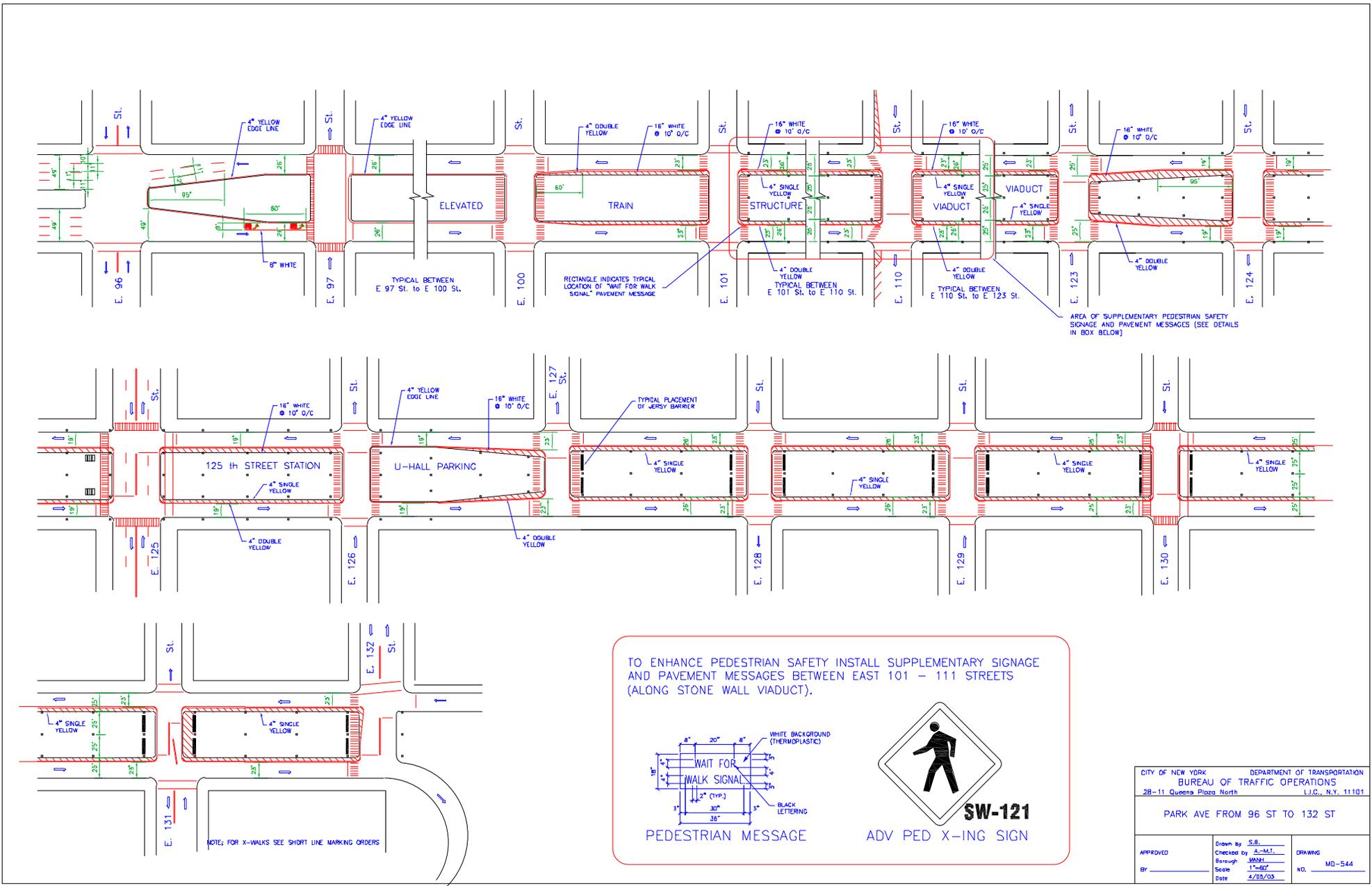
## Improvements Implemented in September 2002

In conjunction with a DDC Engineering Resurfacing project between East 96<sup>th</sup> and East 132<sup>nd</sup> Streets, the following improvements were implemented in September 2002:

- Installed a three-foot wide thermoplastic ‘buffer’ (flush channelization) using pavement marking between East 101<sup>st</sup> and East 132<sup>nd</sup> Streets. The buffer is intended to realign the single travel lane away from the pedestrian refuge area in the center of Park Avenue’s north and south roadways. The buffer markings improve the line of sight between motorist and pedestrian as well as cause motorists to reduce speed by creating the appearance of a narrowed roadway.

- Installed “Wait for Walk Signal” pavement messages to advise pedestrians to wait for a fresh walk signal between East 101<sup>st</sup> and East 111<sup>th</sup> Streets where the stone walls of the viaduct severely limit visibility for both pedestrians and motorists.
- Installed 20-foot jersey barriers at the north and south ends of each block in advance of the crosswalks between East 127<sup>th</sup> and East 132<sup>nd</sup> Streets to prevent motorists from traveling beneath the elevated structure. Some of these barriers have been removed as space beneath the tracks has been leased for parking purposes.
- Installed edge lines between East 97<sup>th</sup> and East 100<sup>th</sup> Streets south of the new bus terminal.
- Installed “No Standing 7-10AM Mon-Fri” regulations on the west curb (southbound) from East 132<sup>nd</sup> Street to East 130<sup>th</sup> Street to provide a second travel lane during the morning peak period.
- Removed signal faces (for northbound and southbound traffic) within the area beneath the elevated structure north of East 127<sup>th</sup> Street.
- Upgraded crosswalk markings to high visibility at all signalized intersections.
- Installed advance pedestrian crossing warning signs in the section of the stone viaduct between East 101<sup>st</sup> and East 111<sup>th</sup> Streets.

The improvements are shown on the following pages.



TO ENHANCE PEDESTRIAN SAFETY INSTALL SUPPLEMENTARY SIGNAGE AND PAVEMENT MESSAGES (ALONG STONE WALL VIADUCT).

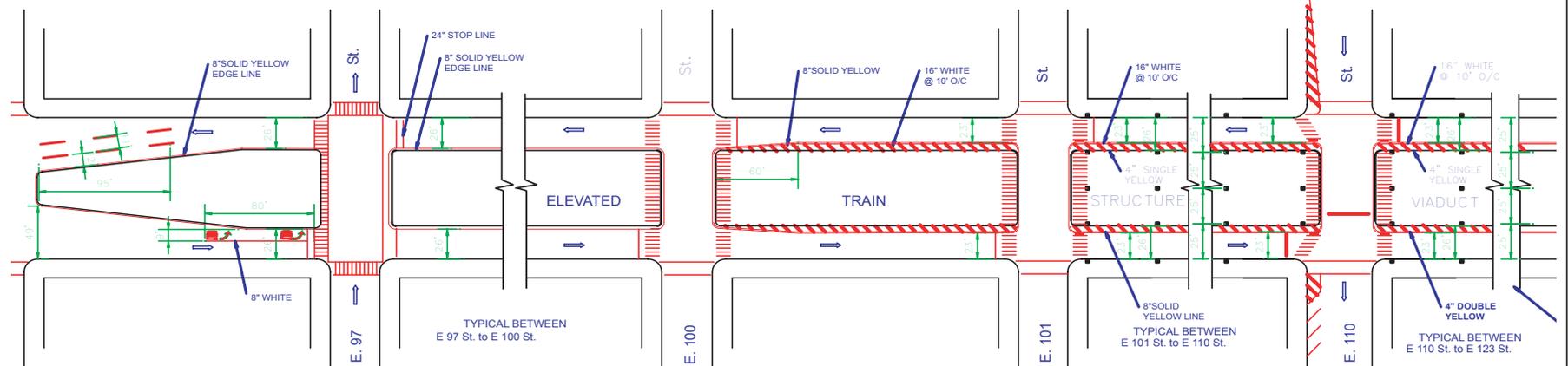
PEDESTRIAN MESSAGE

**SW-121**  
ADV PED X-ING SIGN

CITY OF NEW YORK		DEPARTMENT OF TRANSPORTATION
BUREAU OF TRAFFIC OPERATIONS		L.I.C., N.Y. 11101
28-11 Queens Plaza North		
PARK AVE FROM 96 ST TO 132 ST		
APPROVED	Drawn by <u>S.B.</u> Checked by <u>A.M.L.</u> Design <u>JMM</u> Scale <u>1"=60'</u> Date <u>4/18/03</u>	DRAWING NO. <u>MD-544</u>

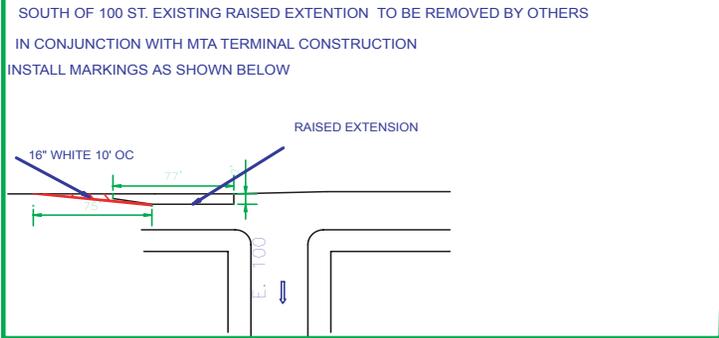
REVISIONS

DATE	APPD	DESCRIPTION



ON S/B PARK AV @ 98 STREET TAPER FROM 30 FT. IN ADVANCE OF EXTENDED E. CURB EDGE LINE AROUND THE EXPOSED CURBLINE

OFFSET X-WALKS ON PARK AVE. BETWEEN E. 101-111 STREETS SO THAT X-WALKS LEAD TO OPENING PROVIDED INSTONE WALL FOR PED. PASSAGE.



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

**PARK AVE. FROM 97 ST. TO 110 ST.**

Drawn by: <u>S. BARKHO</u>	DRAWING NO. <u>CC-812</u>
Checked by: <u>B.M.</u>	
Borough: <u>MANHATTAN</u>	
Scale: <u>1\"/&gt; </u>	



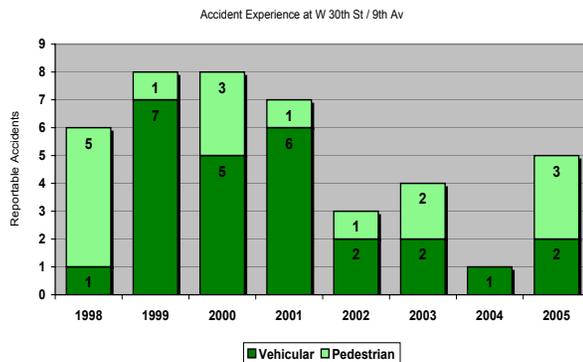
# WEST 30<sup>TH</sup> STREET/ 9<sup>TH</sup> AVENUE



Aerial view of West 30<sup>th</sup> Street and Ninth Avenue

## Description

The intersection of West 30<sup>th</sup> Street and 9<sup>th</sup> Avenue is a complex intersection. At this location, traffic travels southbound along 9<sup>th</sup> Avenue while Lincoln Tunnel traffic travels eastbound along West 30<sup>th</sup> Street. Midblock, between 9<sup>th</sup> and 10<sup>th</sup> Avenues are the approach and exit ramps to and from the Lincoln Tunnel which contribute to most of the traffic on West 30<sup>th</sup> Street. Traffic on West 30<sup>th</sup> Street is separated by striping on the western end and a raised median east of the Tunnel roadway, generally known as Dyer Avenue. At certain times of the day, the Port Authority allows buses to layover on the northern portion of the roadway separated by the median. Additionally, a large number of United States Postal Service vehicles utilize this roadway, as there are postal facilities on both sides of West 30<sup>th</sup> Street.



With the high amount of vehicular traffic associated with the Lincoln Tunnel, there are pedestrian/vehicle conflicts at this location, especially during peak hours when post office employees cross West 30<sup>th</sup> Street while vehicles enter and exit the Lincoln Tunnel.

**From 1998 to 2001, there were between six and eight reportable accidents each year. In 1998, five of these involved pedestrians. After the implementation of the safety improvements in September 2002, accidents began to decline.**

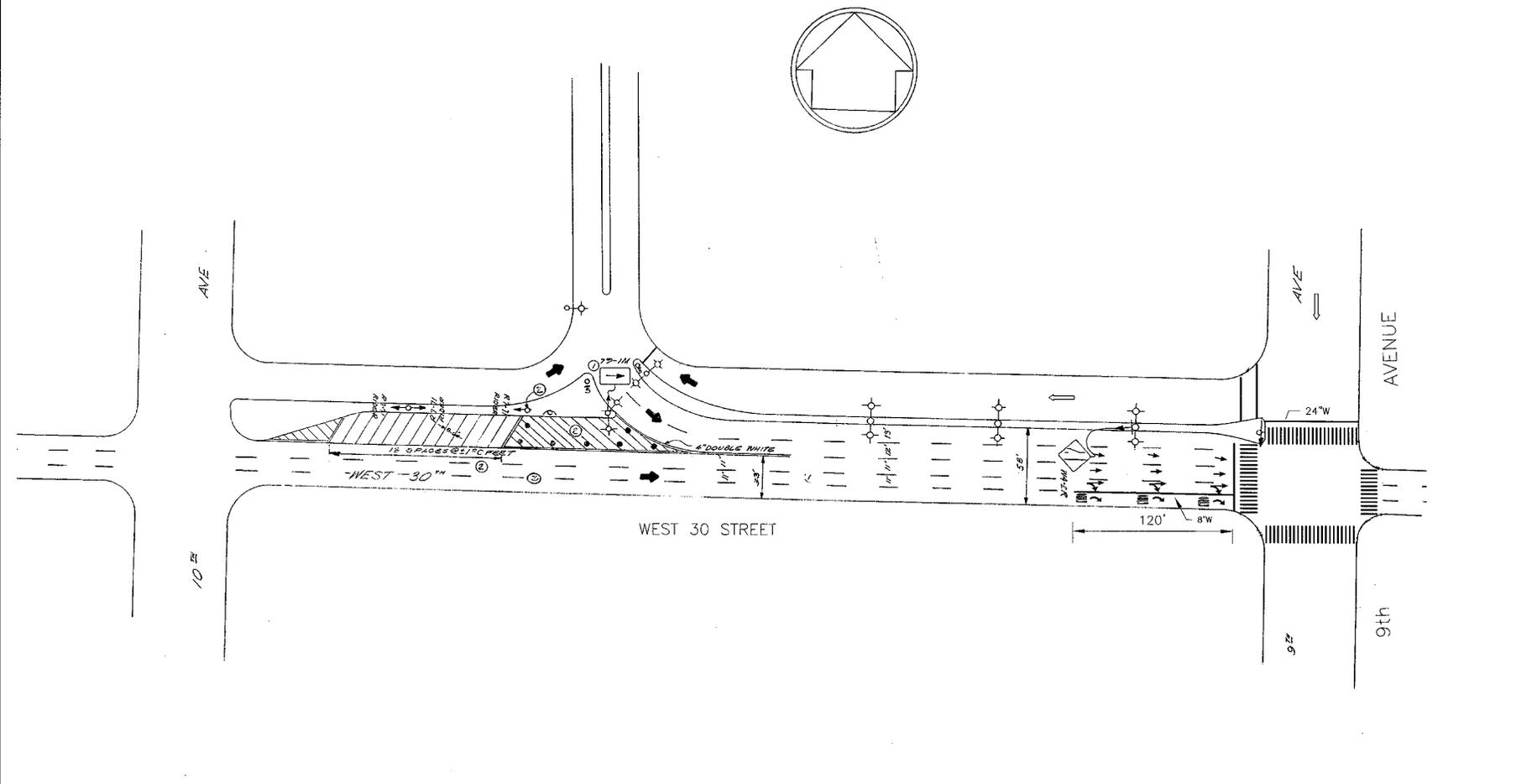
**Accidents fell to three, four, one and five in 2002, 2003, 2004 and 2005, respectively. There were no pedestrian accidents in 2004 and only one vehicular accident. The Department believes that the decline in accidents can be attributed to the safety improvements that positively impacted the intersection.**

## **Implemented Improvements**

- Old pedestrian crossing signs were repositioned for improved visibility in September 2002.
- “Yield to Pedestrian” signs were installed on the southeast and southwest corners in September 2002.
- Lane assignment markings were installed in November 2002 to improve vehicular movements and decrease conflicts.
- All crosswalks were upgraded to high visibility to improve pedestrian safety in November 2002.
- A Leading Pedestrian Interval (LPI) was installed on the south leg of the intersection in December 2002.
- Two new pedestrian signals for the westerly crossing of West 30<sup>th</sup> Street were installed and signal timing modifications were completed in December 2002.

The improvements are shown on the following page.

REVISIONS		
DATE	APPD	DESCRIPTION
1. 9/02	B.M.	Right Turn Bay and Arrows



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

**CHANNELIZATION**  
 WEST 30TH ST.; BET 9TH AND 10TH AVE

APPROVED	Drawn by J. Ahsan	DRAWING NO. <b>CC-515</b>
BY: <i>[Signature]</i>	Checked by B. Morgenbesser	
	Borough Manhattan	
	Scale 1" = 50'	
	Date 08-07-02	

# TRIANGLE @ CANAL, LAIGHT AND VARICK STREETS

## Description

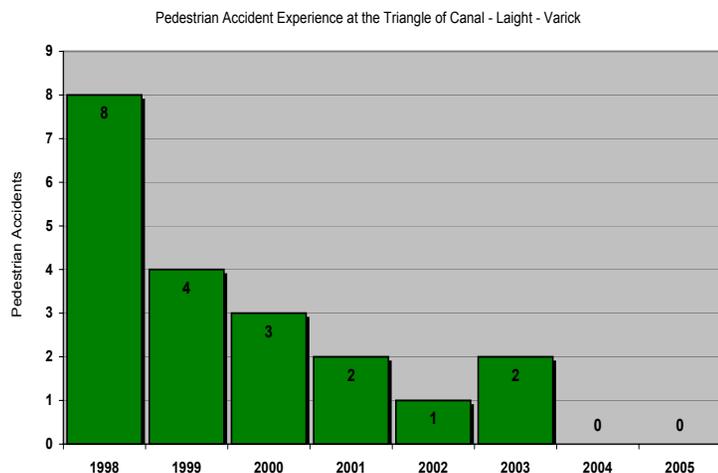
The triangle formed by Canal, Laight and Varick Streets has become a key gateway into the growing neighborhood of Tribeca and Lower Manhattan. Its status as an ungraded cobble-stoned parking area with no usable sidewalk or curb was aesthetically unpleasant for both pedestrians and vehicles. In its original configuration, there was no separation between the cobblestoned pedestrian area and the roadway, leaving pedestrians without a defined sidewalk and unprotected from vehicles. In addition, the sidewalk on the western curb of Varick Street was substandard.

The triangle lies due east of the Holland Tunnel Exit Rotary and experiences significant traffic exiting from the Tunnel and heading onto Canal Street and into Lower Manhattan. Currently, traffic signals and street lights within the triangle are on concrete cylinders. There is no curb or graded sidewalk separating the non-roadway portion of the area with the marked street. Parking within the triangle was largely unregulated and the area was frequently used as a storage area for disabled vehicles from the Holland Tunnel.

For pedestrians, both the 8<sup>th</sup> Avenue Subway Line (A,C,E) and the 7<sup>th</sup> Avenue Line (1,9) have exits/entrances on corners directly adjacent to the triangle. As the neighborhood around it has grown, pedestrian traffic crossing the triangle and the area around it has increased noticeably.



In its original configuration, the triangle was used as a temporary parking lot and did not provide adequate pedestrian space



New bars, restaurants, and shops have opened and complemented the growing residential population.

**In terms of the accident experience, the number of pedestrian accidents has been declining since 1998 when there were a total of eight. In 1999, pedestrian accidents fell by 50% to four. By 2000, pedestrian accidents had decline to three, however, a fatality occurred during this year. By 2004 and 2005, there were no pedestrain accidents at this location. The dramatic decline over this seven year time period can be attributed to changes in the flow of traffic to and from the Holland Tunnel.** In 2001, the decline can also be attributed to the resulting traffic patterns in Lower Manhattan

after September 11<sup>th</sup> and the restrictions placed on trucks traveling through the Holland Tunnel. The downward trend also parallels the overall decline in accidents citywide over this period.

The Department's safety improvement plan for this location involved several key partners:

- Port Authority of NY and NJ - partial owners of the triangle and operators of the Holland Tunnel
- Department of Design and Construction – water main project on Varick Street
- Parks Department
- Police Department – First Precinct and Transit Police
- Community Board 1

Central to these efforts to improve the safety and aesthetic values of the triangle is the creation of a pedestrian-friendly park. This park, built under the Parks Department GreenStreets Program would serve several key purposes:

- Create a welcoming and safe environment for pedestrians crossing the area in and around the triangle.

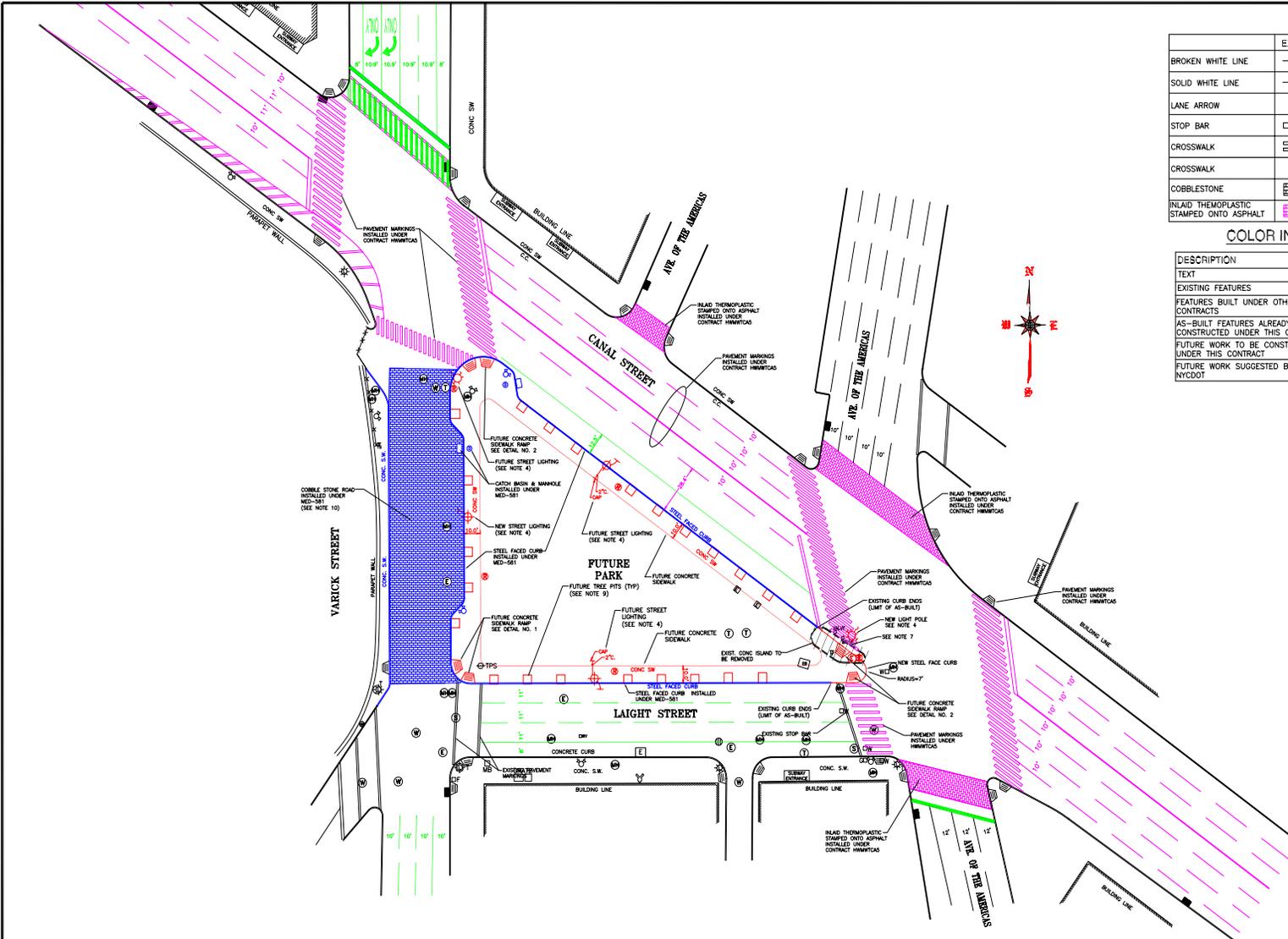
- Provide the growing residential and business community with valuable green space.
- Establish clear markings and curb lines to improve vehicle safety.
- Offer regulated parking for Police Department vehicles.
- Act as a visual gateway into Lower Manhattan for vehicles coming from New Jersey (via the Tunnel) and northern Manhattan.

## Implemented Improvements

- March 2003
  - DOT – Manhattan Street Maintenance excavated the triangle area and prepared it for construction
- June 2003
  - Department of Design and Construction – Restoration of Varick Street roadway and replacement of the sidewalk on the western side and the curb on the eastern side
- Fall 2003
  - DOT - Installed new streetlights on Canal Street, Laight Street and Varick Street
- September 2004
  - DOT – Relocated and modified street light and signal poles and traffic and pedestrian signals to accommodate the new street alignment
- October 2004
  - Port Authority of New York and New Jersey – Construction of the sidewalk around the triangle and installation of curbs on Laight and Canal Streets
- Winter/Spring 2006
  - New York City Parks Department – Redesign Park
- Spring 2006
  - Implementation of interim plan that includes site cleanup and installation of sod lawn

- **Spring 2007**
  - **Finalize contract documents**
- **Early Summer 2007**
  - **Anticipated ground-breaking and construction of park with completion by Fall 2008**

The improvements and redesigned park are shown on the following two pages.

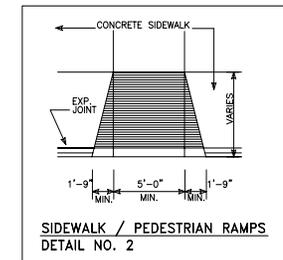
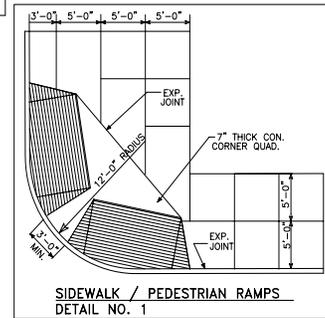


**LEGEND**

	EXISTING	FUTURE		EXISTING	PROPOSED
BROKEN WHITE LINE	---	---	SIDEWALK RAMP		
SOLID WHITE LINE	---	---	SIDEWALK		CONC SW
LANE ARROW	→	→	BUILDING LINE		
STOP BAR	▬	▬	CONCRETE CURB		
CROSSWALK	▬▬▬	▬▬▬	PARAPET WALL		
CROSSWALK	▬▬▬	▬▬▬	LIGHT POLE		
COBBLESTONE			CATCH BASIN		
INLAID THERMOPLASTIC STAMPED ONTO ASPHALT			ELECTRIC MANHOLE		
			WATER MANHOLE		
			TELEPHONE MANHOLE		
			DRAINAGE MANHOLE		
			UNKNOWN MANHOLE		
			FIRE HYDRANT		
			TRAFFIC SIGN		

**COLOR INDEX**

DESCRIPTION	COLOR
TEXT	BLACK
EXISTING FEATURES	BLACK
FEATURES BUILT UNDER OTHER CONTRACTS	MAGENTA
AS-BUILT FEATURES ALREADY CONSTRUCTED UNDER THIS CONTRACT	BLUE
FUTURE WORK TO BE CONSTRUCTED UNDER THIS CONTRACT	RED
FUTURE WORK SUGGESTED BY NYCDOT	GREEN

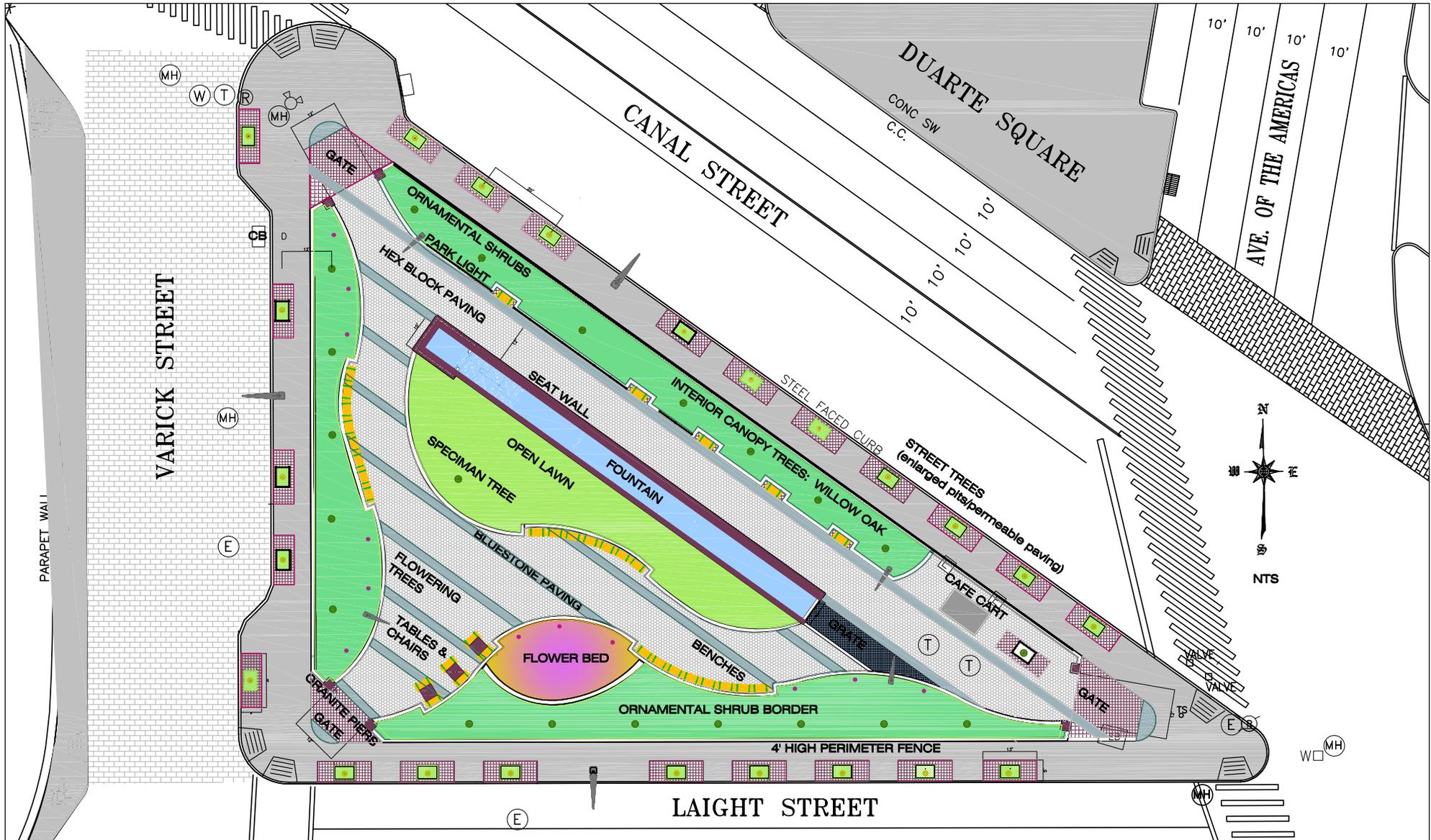


REVISIONS	
DATE	DESCRIPTION
10/30/03	REV. LOCATION OF CANAL PED RAMP
10/30/03	REV. CURB TO AVOID CON ED MANHOLE
1/05/03	REV. TO SHOW AS-BUILT CONDITIONS

1. THIS PLAN IS FOR CONSTRUCTION GUIDANCE ONLY FOR THE FUTURE PARK. ACTUAL CONSTRUCTION WILL BE AS ORDERED, MANAGED AND DIRECTED BY NYCDOT AND NYCCDC.
2. WORK ASSIGNMENTS AND LIMITS TO BE DETERMINED BY NYCCDC AND NYCDOT AND CONFIRMED PRIOR TO CONSTRUCTION.
3. THIS PLAN SHOWS AS-BUILT CURB, DRAINAGE, PAVEMENT MARKINGS AND COBBLESTONE LOCATIONS.
4. SEE NYCDOT DIVISION OF STREET LIGHTING CONTRACT NO. 84102MBTR317 DRAWING NO. M31112 FOR STREET LIGHTING LAYOUT. LOCATION OF LIGHTING MAY BE FIELD ADJUSTED DEPENDING ON EXISTING CONDITIONS AS ORDERED BY NYCDOT STREET LIGHTING.
5. ALL PAVEMENT MARKINGS ON THIS DRAWING ARE EXISTING AS PER CONTRACT HMMWTCAS.
6. THE CONTRACTOR SHALL BE AWARE THAT THE LOCATIONS OF UTILITIES SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY AND THE CONTRACTOR IS RESPONSIBLE FOR INVESTIGATING THE EXACT LOCATIONS OF THE UTILITIES BEFORE WORK IS BEGUN.

7. COMMUNICATION DUCTS WITHIN THE PROJECT AREA HAVE A MINIMUM COVER OF 1'-9" AS DETERMINED BY ECS. THE CONTRACTOR IS WARNED TO HAND DIG IN THESE AREAS WITH EXTREME CAUTION.
8. SKEW CURB AT THIS POINT APPROX. 4 1/2 DEGREES TO AVOID CON ED MANHOLE TO THE SOUTH. IF FIELD CONDITIONS PERMIT AND THE NEW CURB WILL NOT BE PLACED ABOVE THE CON ED STEAM LINE, PLACE CURB AROUND TRAFFIC SIGNAL POLE TO AVOID RELOCATION.
9. SEE NYC PARKS & RECREATION ALCA STREET TREE LAYOUT DRAWING UNDER CONTRACT NO. MG-703M FOR TREE PIT LOCATIONS, DETAILS AND NOTES.
10. HI VIS CROSSWALK AND PAVEMENT MARKINGS ON COBBLESTONE ARE ELIMINATED FROM FUTURE PLAN.
11. PROPOSED GRID LOCK PAVEMENT MARKINGS ARE ELIMINATED FROM FUTURE PLAN.

<p>City of New York Department of Design and Construction</p>	<p>NEW YORK CITY </p>	
	<p>JOB TITLE: LOWER MANHATTAN INFRASTRUCTURE PROJECT</p>	
<p><b>LiRo-Kassner, Inc.</b> 3 Aerial Way Syosset, New York</p>	<p>DRAWING TITLE: <b>CANAL STREET / VARICK STREET LAYOUT PLAN</b></p>	
	<p>DATE: JANUARY, 2004 DESIGNED BY: R.M. DRAWN BY: J.J.D.</p>	<p>DATE: 02-44-2050 CHECKED BY: R.M. PROJ. ENG: J.J.D.</p>



City of New York  
Parks & Recreation  
Olmsted Center  
Flushing Meadows Corona Park  
Flushing, New York 11368

TRIANGLE AT  
CANAL, VARICK & LAIGHT STREETS

SCHEMATIC SITE PLAN

March 2006  
Michael R. Bloomberg, Mayor  
Adrian Benepe, Commissioner



# IMPROVEMENTS IN THE VICINITY OF THE HENRY HUDSON PARKWAY INTERCHANGE AND WEST 95<sup>TH</sup> AND 96<sup>TH</sup> STREETS

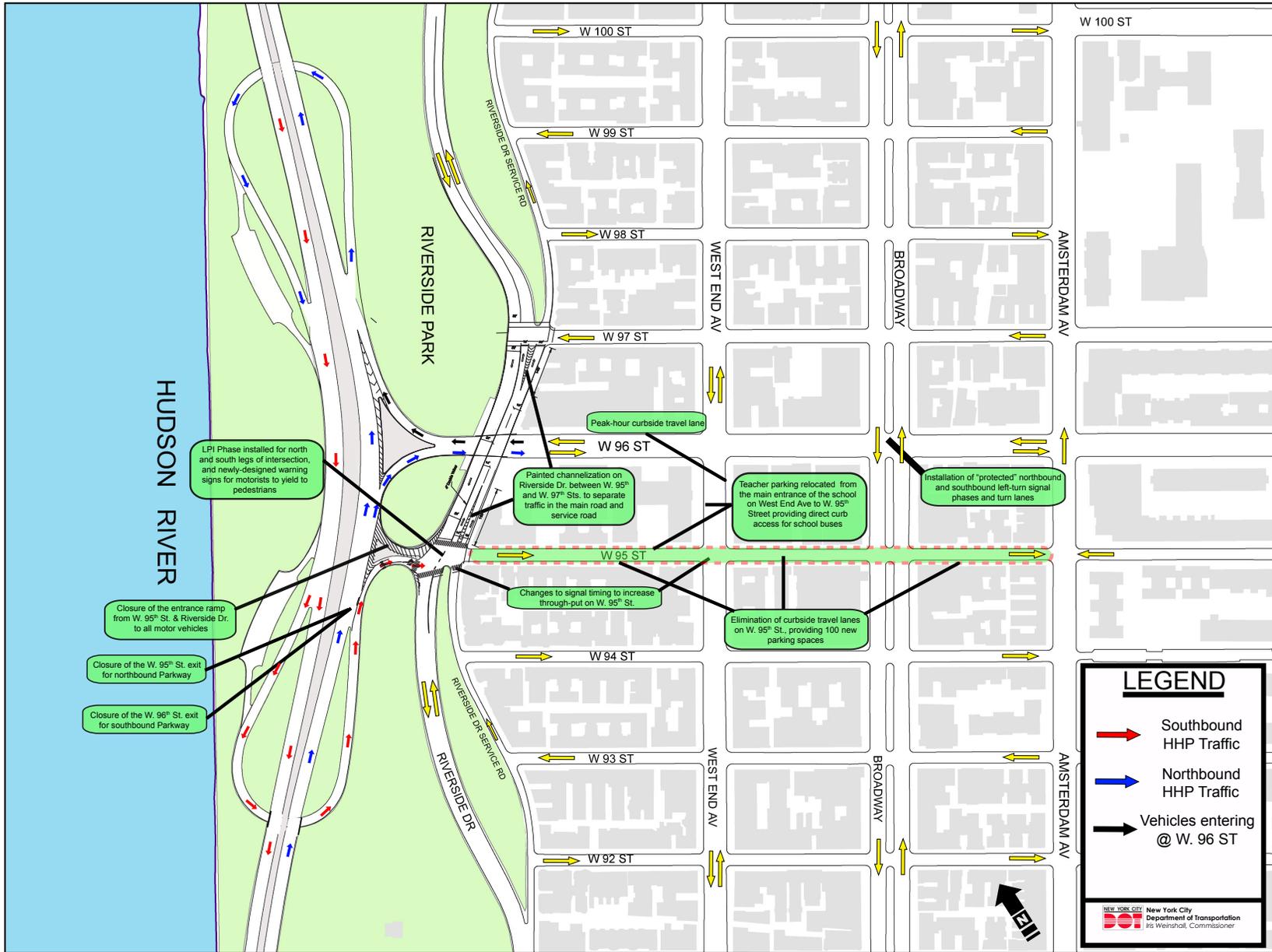
## Description

For motorists and pedestrians alike, using the Henry Hudson Parkway (HHP) at the West 95<sup>th</sup>/96<sup>th</sup> Street interchange and the area roadways was a challenge, presenting numerous conflicts and safety issues, as well as traffic flow problems. In 2003, the Manhattan Borough President's Office retained a consultant to perform a traffic study on the West 96<sup>th</sup> Street Corridor. Working with the recommendations of this report, the Department developed a plan to improve traffic and pedestrian safety throughout this corridor.

There are four primary locations that were addressed as a result of this initiative:

- The Henry Hudson Parkway Interchange at West 95<sup>th</sup> and West 96<sup>th</sup> Streets
- The intersection of Riverside Drive and West 95<sup>th</sup> Street
- West 95<sup>th</sup> Street between Riverside Drive and Amsterdam Avenue
- The intersection of Broadway and West 96<sup>th</sup> Street

While the operation of the Henry Hudson Parkway interchange was the central component of this initiative, the safety improvements and changes in regulations on the interchange's supporting intersections provide for a substantial improvement in pedestrian and vehicular safety throughout the area. Although each component is detailed in the following pages, the illustration on the following page summarizes the overall improvements.





# HENRY HUDSON PARKWAY INTERCHANGE

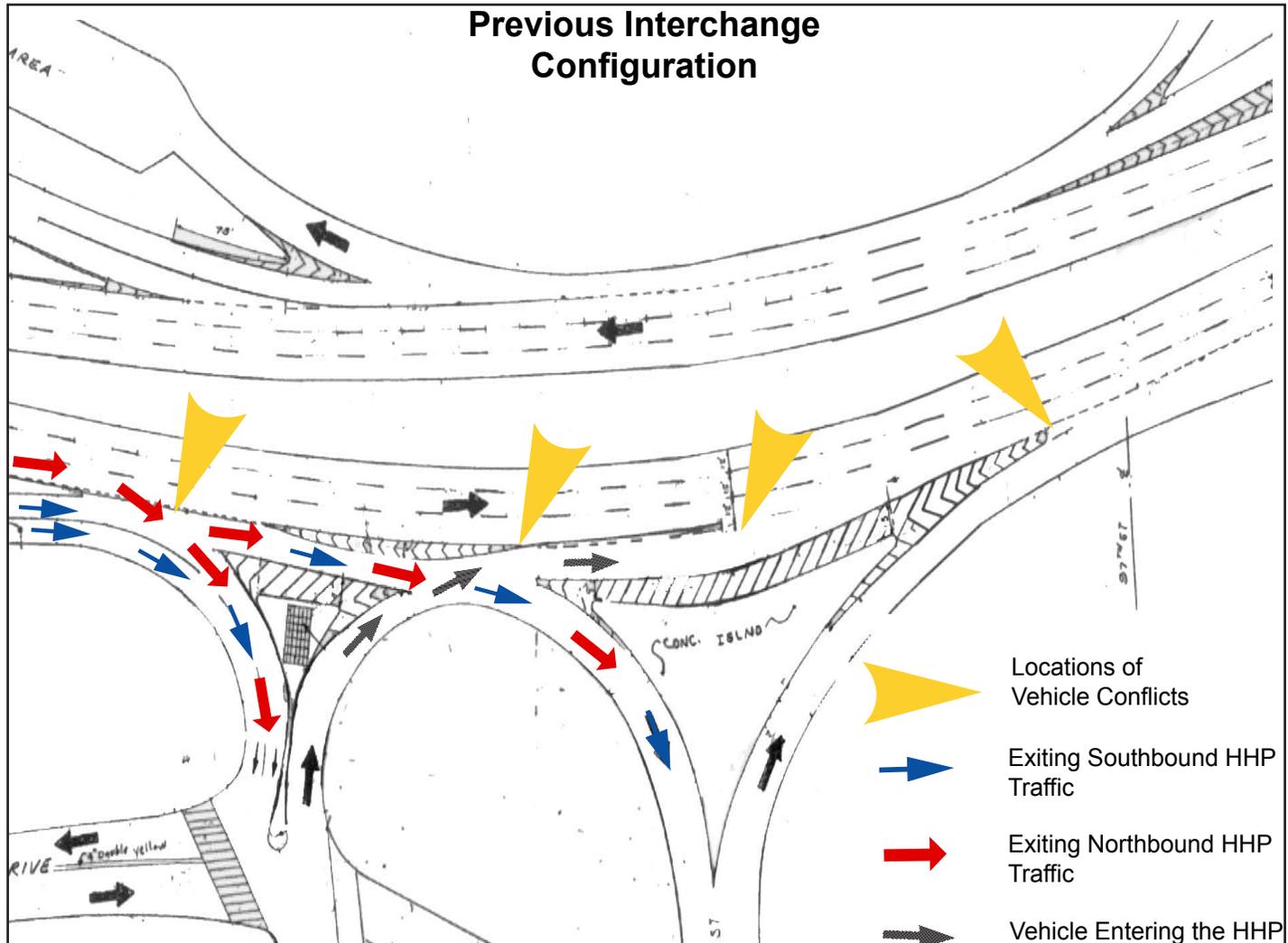
## Description

For motorists traveling along the Henry Hudson Parkway, utilizing the West 95<sup>th</sup>/96<sup>th</sup> Street interchange had been a challenging event. The interchange, constructed in the mid-1930's, no longer met the safety and operational needs of this intensely-used roadway. The Henry Hudson Parkway is limited to passenger vehicles only, as all trucks, buses and commercial vehicles are prohibited from using the entire corridor. The corridor carries 120,000 vehicles daily with three lanes in each direction.

The interchange had provided two pairs of closely spaced entrance and exit ramps, all with substandard conditions for weaving, accelerating/decelerating and queuing. This design required all vehicles exiting the Parkway from both the northbound and southbound directions to utilize a single ramp. From this ramp, they had the option to exit at either West 95<sup>th</sup> or West 96<sup>th</sup> Street. Additionally, the exit ramp also served as the entrance ramp for vehicles entering the northbound parkway from West 95<sup>th</sup> Street. The substandard weaving section created chronic vehicle conflicts resulting in frequent overtaking and rear-end crashes. Vehicle merges were made more difficult by the large speed differential in traffic entering and exiting the Parkway. Furthermore, the interchange created undesirable demands on nearby local streets that served the access and egress needs of the Parkway.

The operation of the interchange also affected pedestrians. The intersection is located at a major entrance to the popular 267-acre Riverside Park, which is frequented by users traveling on foot, skates or bicycles. To access or exit the park, it is necessary for park-goers to cross Riverside Drive, a busy two-way street with a service road at the eastern edge of the park.

The original configuration of the interchange, as well as conflict points is illustrated graphically below:



## Improvements Implemented in November 2003

In order to alleviate the conflict between vehicles exiting and entering the highway, the Department minimized the weaving conflicts by:

- Closing the entrance ramp from West 95<sup>th</sup> Street and Riverside Drive to all traffic
- Eliminating the West 95<sup>th</sup> Street exit for exiting northbound HHP traffic
- Eliminating the West 96<sup>th</sup> Street exit for southbound traffic

In this configuration, the weaving conflicts between northbound and southbound exiting vehicles are completely eliminated. Southbound vehicles are required to exit at the West 95<sup>th</sup> Street exit, while northbound vehicles are required to exit at the West 96<sup>th</sup> Street exit. Additionally, vehicles entering at the West 96<sup>th</sup> Street entrance are provided with a longer acceleration lane and have fewer conflicts with vehicles on the mainline HHP.

These treatments were implemented through the use of new markings on the roadway, advance signage, and the use of flexible bollards and delineators on all approaches and ramps. This represented a highly effective, low cost mitigation strategy that effectively improved vehicular safety at the interchange. **A**

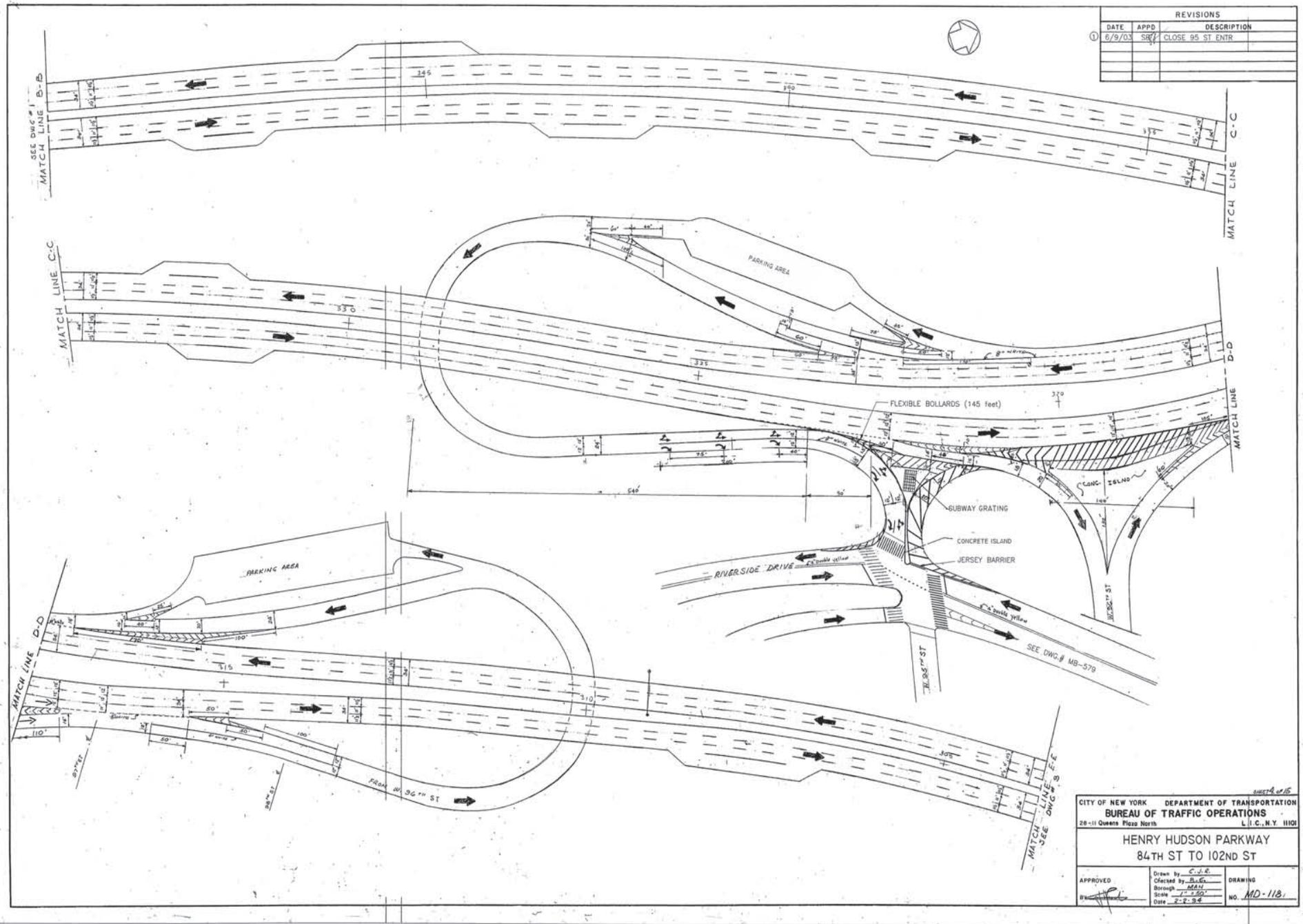
**comparison using NYPD data for the nine months prior to implementation versus two similar nine month periods after indicates a 60.5% reduction in the number of crashes at critical locations.**

The improvements and resulting changes in traffic flow are shown on the following two pages.

NYPD Accident Data for the Henry Hudson Parkway Interchange - Before and After Implementation

Intersection	Number of Crashes			Percent Change Before compared to After 2
	Before (11/30/02 - 8/31/03)	After 1 (11/30/03 - 8/31/04)	After 2 (11/30/04 - 8/31/05)	
Henry Hudson Parkway and West 96th Street	43	27	15	-65.1%
Henry Hudson Parkway and West 95th Street	21	7	11	-47.6%
Riverside Drive and West 95th Street	12	4	4	-66.7%
<b>Total</b>	<b>76</b>	<b>38</b>	<b>30</b>	<b>-60.5%</b>

REVISIONS		
DATE	APPD	DESCRIPTION
6/9/03	SBV	CLOSE 95 ST ENTR



SHEET 4 OF 15

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

**HENRY HUDSON PARKWAY**  
 84TH ST TO 102ND ST

APPROVED	Drawn by C.J.E.	DRAWING
	Checked by B.K.G.	NO. MD-118
	Borough - MASH	
	Scale 1" = 50'	
Date 2-2-94		

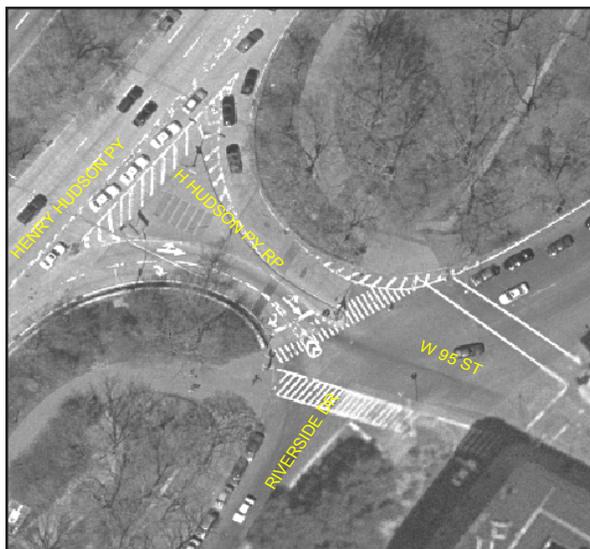


Clockwise from above: The operation of the Henry Hudson Parkway/ West 95<sup>th</sup>/96<sup>th</sup> Street Interchange under the new configuration. Flexible delineators, traffic barrels and improved markings for southbound vehicles exiting at West 95<sup>th</sup> Street. Advanced signage advises motorists of approaching signal. Oversized gantry mounted signage advises motorists of approaching exit ramp.





# WEST 95<sup>TH</sup> STREET/ RIVERSIDE DRIVE

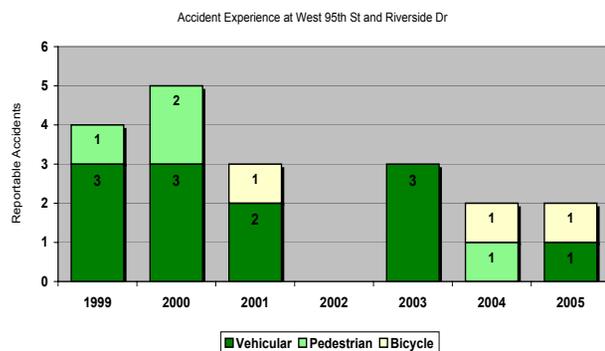


Original configuration of Intersection

## Description

The intersection of West 95<sup>th</sup> Street and Riverside Drive was a signalized four-way intersection with an entrance and exit ramp to the Henry Hudson Parkway along its western leg. Due to the curvature of the exit ramps from the northbound Henry Hudson Parkway, motorists had little time to react to pedestrians crossing the southwest side of the intersection. Motorists entering the northbound Henry Hudson Parkway, especially those turning from southbound Riverside Drive had limited visibility of pedestrians crossing on the northwest side of the intersection. Additionally, there was insufficient refuge area for pedestrians crossing between the exit and exit ramps.

**The accident experience at this location varied between 1999 and 2001. In 1999, there were four reportable accidents, of which one involved a pedestrian. In 2000, pedestrian accidents increased to two and in 2001, there were no pedestrian accidents, but one involving a bicyclist. In 2002, the Department installed several immediate treatments to improve safety for pedestrians and motorists at this intersection. They were clearly successful as there were no reportable accidents during this year. These treatments were upgraded as part of the overall improvements taking place on the Henry Hudson Parkway and the resulting changes in traffic flow in 2003. There has only been one pedestrian accident since these improvements were implemented, and there were only two reportable accidents in 2004 and 2005.**



## Improvements implemented in 2002

In September 2002, the Department installed several improvements aimed at improving safety at the intersection of West 95<sup>th</sup> Street and Riverside Drive at the entrance and exit ramps to the HHP. These included:

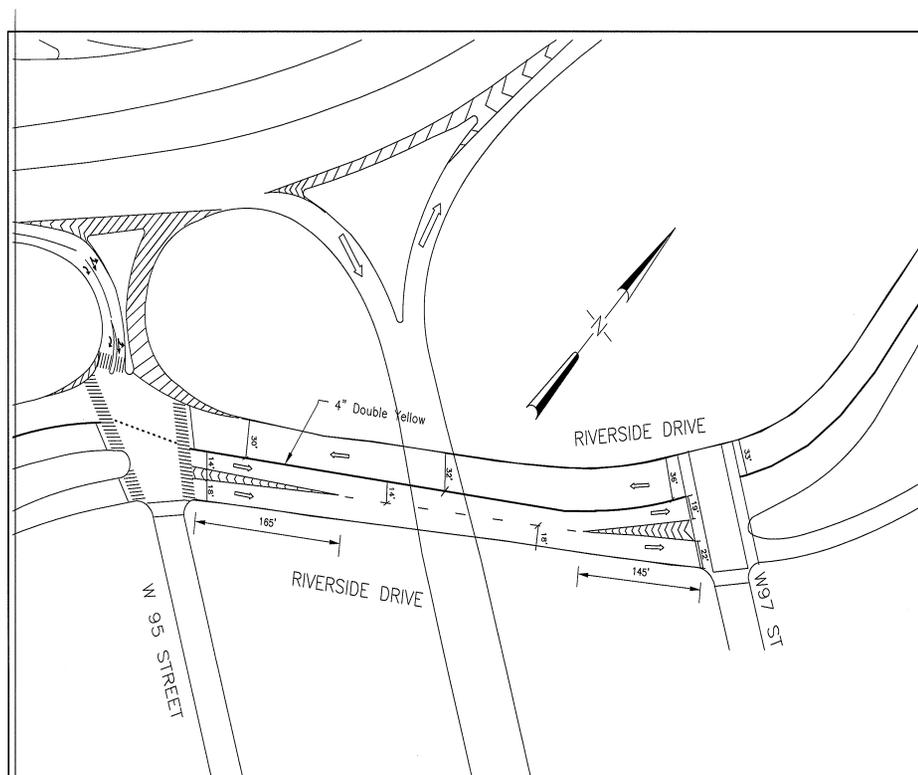
- High visibility crosswalks were installed on the north and south legs of the intersection.
- The west crosswalk was widened by three feet to provide additional pedestrian space.
- The radius of the northwest corner was modified and an expanded neckdown was installed using markings.
- A temporary neckdown using roadway markings was created to provide shorter crossing distance and to prevent motorists from making wide turns from the Henry Hudson Parkway exit to southbound Riverside Drive on the southwest corner.

## Improvements Implemented in February 2003

- Installed five newly designed “Turning Vehicles Yield to Pedestrians” signs.
- A neckdown was installed on the northwest corner to provide shorter crossing distance and to slow motorist making turns onto the HHP entrance from southbound Riverside Drive.

## Improvements Implemented in November 2003

- As part of the overall changes in the operation of the Henry Hudson Parkway interchange, the Department closed the entrance ramp from West 95<sup>th</sup> Street and Riverside Drive to reduce conflicts on the Parkway. This closure was implemented through the use of signage and barriers.
- In an effort to better channelize traffic and organize weaving movement between the main roadway and service road of Riverside Drive, the Department installed additional roadway markings between West 95<sup>th</sup> and West 97<sup>th</sup> Streets. The improvement is illustrated below.



Details of new roadway markings and channelization on Riverside Drive

## Improvements Implemented in 2004

- A six second Leading Pedestrian Interval (LPI) was installed to cross Riverside Drive at West 95<sup>th</sup> Street. (April 2004)
- Adjusted signal timing at intersection to provide for additional green time for vehicles exiting at West 95<sup>th</sup> Street. (August 2004)



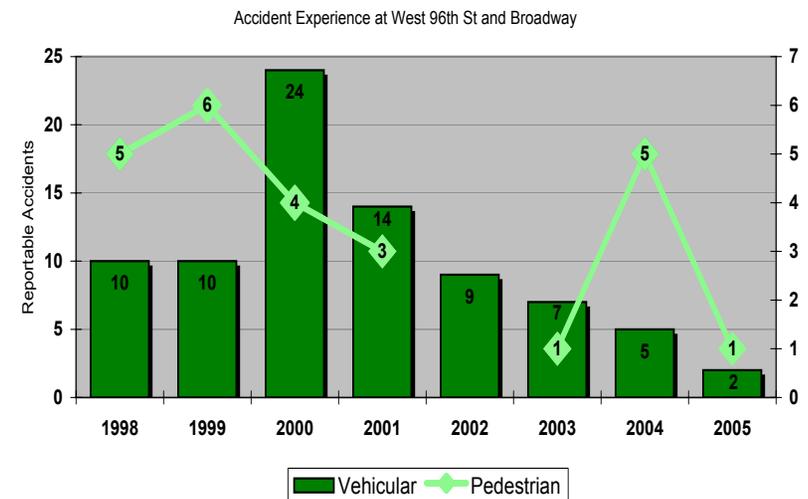
# WEST 96<sup>TH</sup> STREET/ BROADWAY

## Description

Broadway is the major two way, north-south arterial in the area. This intersection experiences extremely high vehicular and pedestrian traffic. Contributing factors include high density residential/commercial land uses, the 96<sup>th</sup> Street Subway station (1, 2, 3 and 9 lines), the M96 bus, and West 96<sup>th</sup> Street serving as one of the area's main east-west corridors due to the fact that it is two way and links up with the eastbound Central Park Transverse roadway as well as the West 96<sup>th</sup> Street entrance to the Henry Hudson Parkway. The roadway is split by a center median situated between the north and south travel lanes of Broadway that serves as a pedestrian refuge.

Overall, this was a poorly performing intersection due to the turning movements of vehicles. Double parking, buses making turns, and the lack of dedicated turn signals created numerous conflicts for motorists and pedestrians. Previously, left turns were prohibited in both directions daily between the hours of 7 AM and 7 PM. There was also some illegal turning activity that took place during these hours. Additional left turn prohibitions were also in place for westbound 95<sup>th</sup> Street which diverted eastbound traffic to West 94<sup>th</sup> Street and other residential streets.

**In both 1998 and 1999, pedestrian accidents accounted for approximately 30% of total reportable accidents. While vehicular accidents increased significantly in 2000, pedestrian accidents, as a percentage of all reportable accidents, declined to less than 15%. Starting in 2001, vehicular accidents began a**



**downward trend from a high of 24 in 2000 to a low of 2 in 2005. Pedestrian accidents declined fairly steadily from a high of six in 1999 to one in 2005. As with the other improvements implemented throughout this corridor, the treatments at this location are part of an overall plan for improving traffic and safety throughout the area.**

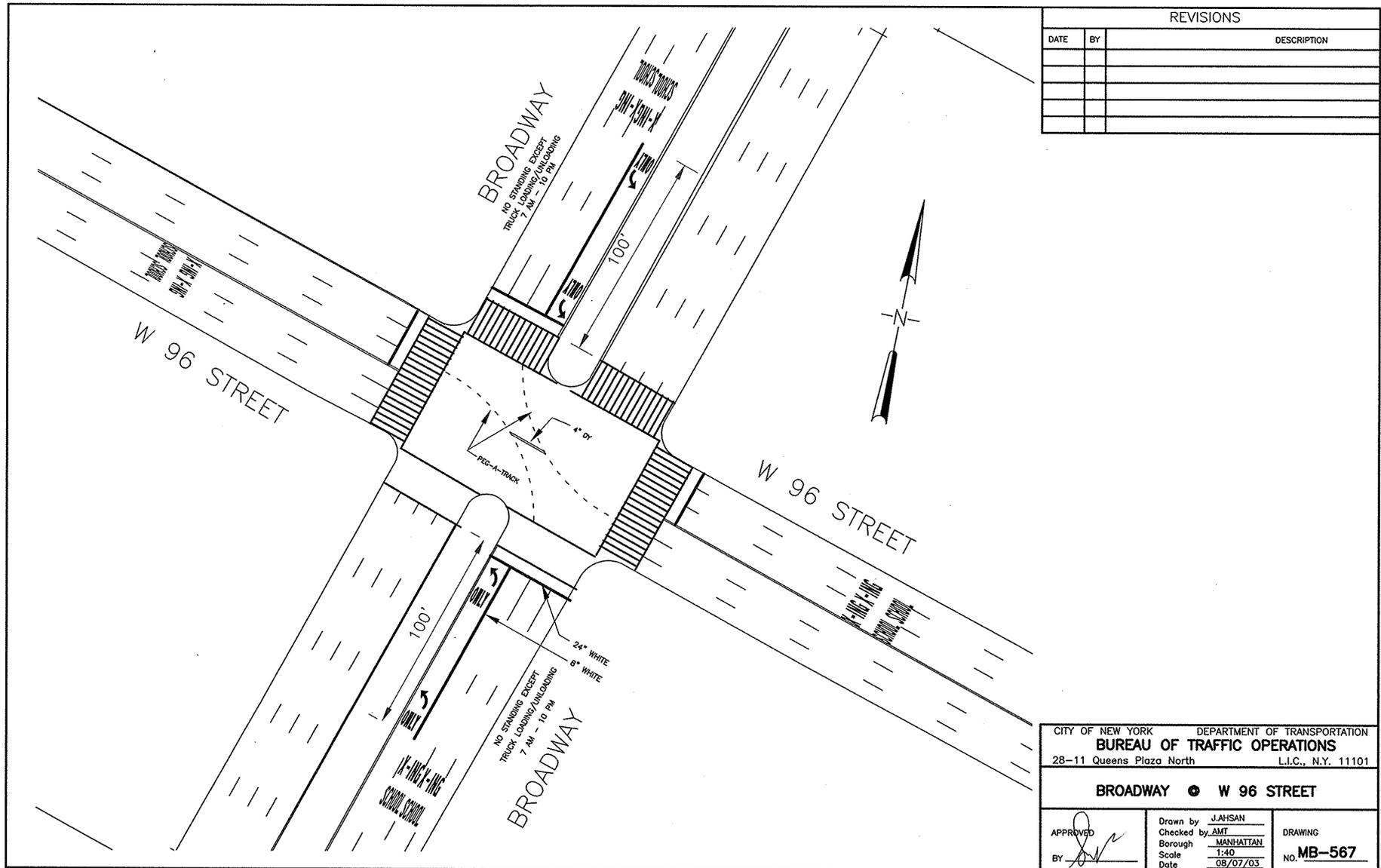
### **Improvements Implemented in November 2003**

- Installation of a left turn signal phase and left turn bays on Broadway at West 96<sup>th</sup> Street to improve the performance of the intersection and to enable left turns.
- Replacement of meters on two blockfaces with truck loading zones to prevent double parking and ensure that at least two travel lanes are available for through traffic.

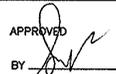
### **Improvements Implemented in 2004**

- As a result of the left turn signals, there was a greater need for pedestrians to comply with traffic signals. Pedestrians were not fully aware that during one phase of the signal cycle, when through traffic on Broadway was stopped, vehicles are permitted to make left turns from Broadway. As such, the Department installed and upgraded pedestrian informational signage at the intersection (March 2004).
- Installed “dual left turn” signs to complement lane markings on the roadway to guide left-turning vehicles (September 2004)

The improvements are shown on the following page.



REVISIONS		
DATE	BY	DESCRIPTION

CITY OF NEW YORK		DEPARTMENT OF TRANSPORTATION	
<b>BUREAU OF TRAFFIC OPERATIONS</b>			
28-11 Queens Plaza North		L.I.C., N.Y. 11101	
<b>BROADWAY • W 96 STREET</b>			
APPROVED BY 	Drawn by J.AHSAN	Checked by AMT	DRAWING
	Borough MANHATTAN	Scale 1:40	No. MB-567
	Date 08/07/03		



# WEST 95<sup>TH</sup> STREET BETWEEN RIVERSIDE DRIVE AND AMSTERDAM AVENUE

## Description

West 95<sup>th</sup> Street is one of the two exits from the Henry Hudson Parkway. The roadway operates one-way eastbound for three blocks to Amsterdam Avenue. Between Amsterdam Avenue and its terminus at Central Park West, it operates one-way westbound (resulting in a “head-on” condition at Amsterdam Avenue). The roadway is 32 feet wide along the entire corridor. Before implementation of the changes, West 95<sup>th</sup> Street operated more as an arterial roadway than a local street because of its relationship to the Parkway exit and its width and parking restrictions provided for three possible travel lanes during much of the day. These factors contributed to a speeding problem along this corridor. In addition, there is a public school located on the northwest corner of West End Avenue which contributes to pedestrian activity along this corridor.

## Improvements Implemented in November 2003

In order to decrease speeding, the Department amended the parking regulations along West 95<sup>th</sup> Street from Riverside Drive to Amsterdam Avenue. The new restrictions discourage vehicles from using West 95<sup>th</sup> Street as a through street by effectively reducing the number of available travel lanes. The new parking regulations also provide an additional 100 community parking spaces. The number of travel lanes available on weekdays was reduced from three to two on the block between Riverside Drive and West End Avenue, and from three to one on the blocks between West End Avenue and Broadway and between Broadway and Amsterdam Avenue. Signal timing changes were implemented for the intersections of West 95<sup>th</sup> Street at Riverside Drive and at West End

Avenue to meet the needs of traffic flow with fewer travel lanes. The changes in the regulations are described below:

## Improvements Implemented in September 2004

At the intersection of West 95<sup>th</sup> Street and West End Avenue, signal timing was adjusted to provide for additional green time for traffic on West 95<sup>th</sup> Street, providing an additional four seconds of green time between 7AM - 11AM and 4PM - 10PM, Monday through Friday, and nine additional seconds from 2:15 PM - 11:45 PM on Saturday and Sunday.

<b>West 95th Street</b>	<b>Before</b>	<b>After</b>
<b>North Side</b>		
Between Riverside Drive and West End Avenue	No Standing 1PM - 7PM Except Sunday	No Parking 11:30AM - 1PM Monday & Thursday
Between West End Avenue and Broadway	No Standing 1PM - 7PM Except Sunday	No Parking 11:30AM - 1PM Monday & Thursday
Between Broadway and Amsterdam Avenue	No Parking Anytime	No Parking 11:30AM - 1PM Monday & Thursday
<b>South Side</b>		
Between Riverside Drive and West End Avenue	No Parking 8AM - 6PM Monday Through Friday	No Parking 8AM - 6PM Monday Through Friday
Between West End Avenue and Broadway	No Parking 8AM - 6PM Monday Through Friday	No Parking 11:30AM - 1PM Monday & Thursday
Between Broadway and Amsterdam Avenue	No Parking Anytime	No Parking 11:30AM - 1PM Monday & Thursday



# WEST 96<sup>TH</sup> STREET/ WEST END AVENUE

## Description

At West 96<sup>th</sup> Street and West End Avenue conflicts primarily resulted from vehicles turning west from West End Avenue onto West 96<sup>th</sup> Street. This is a particularly sensitive location because the west leg of the intersection is a designated school crosswalk for P.S. 75, a grade school located on the west side of West End Avenue between West 95<sup>th</sup> and West 96<sup>th</sup> Streets. Before the changes to the interchange there existed a six second Leading Pedestrian Interval (LPI) to allow school children and other pedestrians to start crossing the west leg across West 96<sup>th</sup> Street before traffic was permitted to move on West End Avenue. This allowed pedestrians to establish themselves in the crosswalk before experiencing conflicts with turning vehicles. During the hours of school arrival and dismissal, two school crossing guards assisted crossing this intersection.

Vehicle volumes increased most significantly at this intersection as a result of changes in traffic flow related to the closure of the West 95<sup>th</sup> Street entrance to Henry Hudson Parkway and the subsequent diversion of traffic to West 96<sup>th</sup> Street. These changes led to an increase in peak hour volumes.

## Improvements Implemented in Summer 2004

- Installed “No Standing 7AM-10AM, 4PM-7PM, Mon-Fri” regulations on the east curb of West End Avenue for 120 feet south of West 96<sup>th</sup> Street to provide peak-hour northbound curbside travel lanes and restriped northbound approach to three moving lanes (July 2004).
- Relocated teacher parking regulations from the west side of West End Avenue to the north side of West 95<sup>th</sup> Street, and installed “No Standing School Days 7AM-4PM” regulations on West End Avenue to accommodate school buses and drop off/pick up of children.