# WEST SIDE MANHATTAN TRANSPORTATION STUDY

## Technical Memorandum No. 2

### Future Conditions & Recommendations

**P.I.N. - PTDT09D00.G06**

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Commissioner

*A Member of the New York Metropolitan Transpotation Council*

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**PTOT09D00.G06**

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# EXECUTIVE SUMMARY

The West Side Manhattan Transportation Study seeks to address transportation issues on the Upper West Side of Manhattan. The study area is bounded by West 86th Street (north), Central Park West (east), West 55th Street (south), and Twelfth Avenue (west). The study assesses the existing and future traffic and transportation conditions and makes recommendations to enhance safety and improve mobility and traffic operations. Technical Memorandum No. 1 that analyzed the existing conditions and issued in June 2010 complements this volume.

This Technical Memorandum includes the 2018 future conditions analysis as well as improvement measures. Like the existing conditions analysis, the assessment of the study area's future conditions includes an analysis of demographics, land use and zoning, traffic and transportation, pedestrian and bicycle, accidents, goods movement, transit, and parking. Based on the future conditions analysis, the report presents recommendations to enhance safety and operation in the study area.

## S.1 Demographics

The study area incorporates parts of Community Districts 4 and 7, and includes 18 census tracts, fourteen of which are located entirely within the study area. The future demographic analysis of the study area examines the projected conditions to 2018 using Census data from 1980 to 2000 as a base. Future population and other demographics projection relied on a trend analysis of three Census decades (1980-2000) as well as projections made by the Department of City Planning. The 2018 population projection for the study area assumes approximately 4% growth over the period from 2000 to 2018.

## S.2 Zoning and Land Use

Under the 2018 projected future conditions, the relative composition of land uses in the study area is not expected to change significantly. New developments that are occurring or slated to occur will essentially reflect the same land use distribution – predominantly residential with mixed-use commercial along the major north-south corridors interspersed with some institutions and limited industrial use.

## S.3 Traffic and Transportation

The projected 2018 traffic network was developed by applying the CEQR approved growth factor (1.891% for 10 years – 0.25% each year (years 1-5) and 0.125% each year (years 5-10)) to the existing 2008 traffic volumes. The Highway Capacity Software (HCS) analysis showed that under future conditions 22 of the 43 intersections analyzed experienced level of service (LOS) D, E, or F for some or all lane groups during one or more peak periods.

## S.4 Public Transportation

Currently, the study area is well-served by public transportation with 11 bus lines (M5, M7, M10, M31, M57, M66, M72, M79, M86, and M104) and seven subway lines (A, B, C, D, 1, 2, and 3) serving the area. Recent system-wide changes by the MTA have resulted in some route and schedule changes, however service provision have not been critically affected.

## S.5 Parking

The existing conditions parking analysis showed that on-street parking spaces were well utilized in the study area during all peak periods. Utilization during the AM, midday, PM, and Saturday peaks averaged 94%, 101%, 91%, and 92%, respectively. On the other hand, while on-street parking utilization was consistently over 90%, off-street parking was consistently underutilized with approximate utilization of 56%, 63%, and 56% during the AM, midday, and PM peak hours, respectively. Parking utilization for both on- and off-street parking spaces are affected by a variety of factors such as price, availability, location, parking regulation, and surrounding land-use. Under future conditions, both on-street and off-street parking utilization are expected to increase slightly although capacity may change with parking regulations, including the use of muni-meters and other smart parking programs.

## S.6 Pedestrian and Bicycle

Pedestrian volumes are expected to increase in the study area for all peak hours in the future. This likely increase is attributed to increased economic activity, population growth, and development density. As under the existing conditions, the highest pedestrian volumes will be in the vicinity of commercial establishments, transit hubs, and along main corridors such as Broadway, Columbus Avenue, Central Park West, West 72nd Street, West 66th Street, and West 57th Street. Future pedestrian volumes were projected using a 1.891% growth rate (for 10 years, based on CEQR guidelines) over the existing conditions volumes.

## S.7 Accidents/Safety

The 2018 future conditions report provides a summary of 2009 accidents that was not previously analyzed in the existing condition report (which looked at accidents that occurred in the study area from 1997-2001 and 2006-2008. The analysis examined intersections with more than ten (10) reportable accidents and found eight intersections that met this criterion.

## S.8 Goods Movement

The effective movement of goods and services within the study area is a function of truck routes and the distribution of commercial/retail, residential, industrial, and manufacturing land uses. The study area does not contain any through truck routes, but is effectively served by local truck routes on major corridors.

## S.9 Public Participation

Public participation and community involvement is an important part of the planning process. An extensive outreach effort was undertaken to obtain community input regarding traffic and transportation issues and potential solutions. A Technical Advisory Committee meeting was held on June 15, 2006, public meetings were held on September 24, 2007 and September 22, 2009, and a survey of local businesses was conducted in the summer of 2009. The first public meeting was a listening session in which participants were divided into groups where they discussed selected topics in detail. In the second meeting, DOT presented updates to the community in addition to a question and answer session. Many elected officials, Community Boards, residents, businesses, and other interested groups and civic organizations participated in the public meetings and presentations.

## S.10 Recommendations

Based on the analysis of existing and future conditions as well as input from the community, a set of recommendations to enhance traffic operations and safety in the study area were developed. The recommendations are geared towards improving traffic operations, safety of all street users, and goods movements. The proposed recommendations include geometric and signal timing changes, parking restrictions, pedestrian and bike friendly treatments, and signage modifications. Improvement measures are recommended for over 25 locations, including the following:

1. West 57th Street & Eight Avenue
2. West 57th Street & Columbus Avenue
3. West 57th Street & Tenth Avenue
4. West 59th Street & West End Avenue
5. West 65th Street & Central Park West
6. West 65th Street & Columbus Avenue/Broadway
7. West 66th Street & Central Park West
8. West 66th Street & Columbus Avenue
9. West 66th Street & West End Avenue
10. West 67th Street & Central Park West
11. West 70th Street & West End Avenue
12. West 71st Street & Amsterdam Avenue
13. West 71st Street & Broadway
14. West 72nd Street & Central Park West
15. West 72nd Street & West End Avenue
16. West 79th Street & Amsterdam Avenue
17. West 79th Street & Broadway
18. West 79th Street & West End Avenue
19. West 79th Street & Riverside Drive
20. West 81st Street & Central Park West
21. West 86th Street & Central Park West

<u>Recently Implemented Improvement Measures</u>

As part of Upper West Side Senior Pedestrian Focus Study improvements have been implemented at several locations in the study area. Some of the improvement measures were area-wide while others were location-specific. Area-wide improvements includes things such as changing the signal timing for pedestrian crossing time from 4 feet/second to 3.5 feet/second; location-specific improvements includes things such as the installation of neckdowns or medians.

# 1.0 INTRODUCTION

The West Side Manhattan Transportation Study was initiated in response to expressed concerns from elected officials and community boards regarding development trends, safety, increased congestion on the street network, and changes to neighborhood characteristics in the study area. The purpose of the study was to assess current and future traffic and transportation issues and needs and to provide effective solutions to address problems by improving the mobility, circulation, and safety for all street users and mode (vehicle, pedestrian, and bicycle) in the study area. The study area is bounded by West 86th Street to the north, West 55th Street to the south, 12th Avenue/ Henry Hudson Parkway to the west, and Central Park West to the east. The assessment of existing conditions that included an analysis of demographics, land use and zoning, traffic and transportation, pedestrian and bicycle, accidents, transit, parking, and goods movement was documented in Technical Memorandum 1 issued in June 2010.

This report, Technical Memorandum 2, presents an analysis of the projected future conditions (2018) and recommendations. The recommendations, or improvement measures, that are geared to enhance safety and mobility in the study area were developed based on extensive community participation and the analysis of existing and future conditions. Figure 1-1 shows the boundaries of the study area.

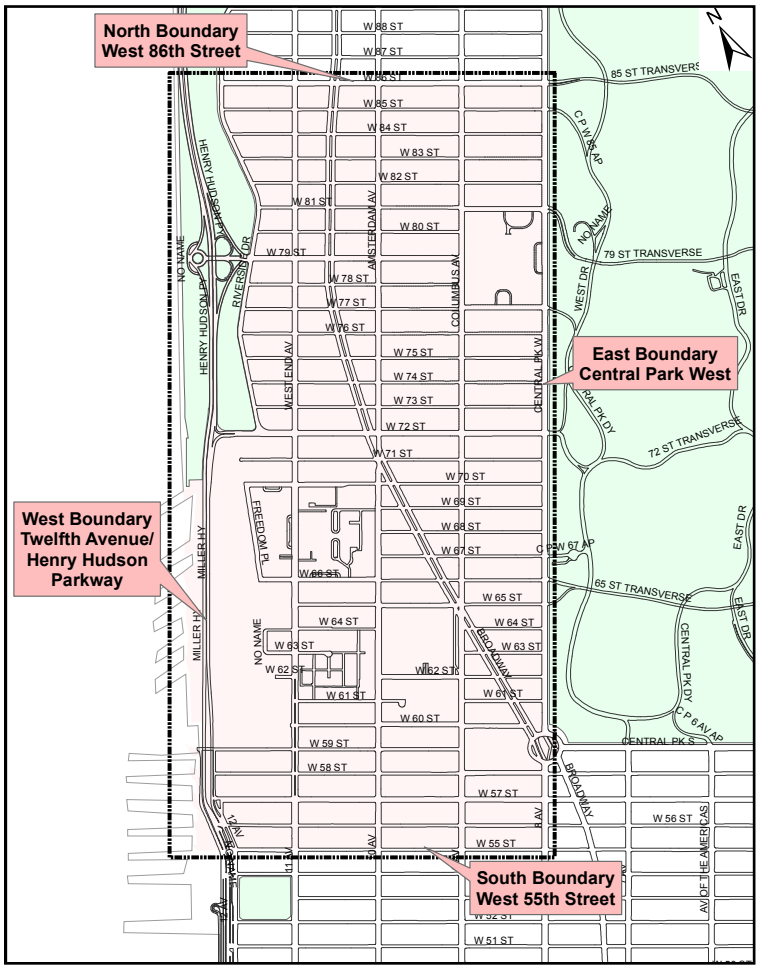


*Figure 1-1: Study Area Boundaries*

## Study Goals and Objectives

The goal of the West Side Manhattan Transportation Study is to improve safety and mobility of all street users and mode (vehicle, pedestrian, and bicycle), and to enhance the quality of life for people who live, work, and visit the area. The study's main objectives are to:

- Assess existing and future traffic and transportation conditions of the area;
- Ascertain community concerns, traffic, and transportation problems, and generate solutions to address community concerns;
- Develop a package of traffic and transportation improvement measures to address community concerns;
- Implement strategies to reduce vehicular congestion, and improve mobility and safety for all street users; and,
- Achieve effective management of curb usage for parking and loading/unloading.

## Major Developments in the Study Area

The following is a summary of some known developments in the area:

1. Riverside Center

   The Riverside Center development is bouned by West End Avenue and Riverside Drive, and West 59th and W 61st Streets. This involves a proposed zoning that would permit a mixed-use development of approximately 3,306,552 gsf of above grade space, 206,135 gsf of below grade space (which includes 197,227 gsf of automotive showroom/service and 8,908 gsf of community facility [public school space]), and 1,800 below grade parking spaces. The proposed development would also include approximately 2,200 dwelling units, a 1,200 room hotel, a 1,011 student elementary public school and up to 1,800 public parking spaces. It is expected that the proposed project would be completed and fully occupied by 2018.

2. Fordham University Lincoln Center Master Plan

   Fordham University's Master Plan identifies the development 2.5 million sq. ft. of additional gross floor area to its Lincoln Center campus located on the superblock bounded by Columbus and Amsterdam Avenues and West 60th and West 62nd Streets. The proposed campus development would include 1.77 million gross sq. ft. of additional academic and dormitory space, an estimated 876 new residential units (736,504 gross sq. ft. in two buildings located on the northwest and southwest corners of the superblock to be built by private developers), and 470 accessory parking spaces in below-grade parking garages. Development would occur in two phases; Phases I and II are expected to be completed by 2014 and 2032, respectively. Phase I would include a new law school, new dormitory space and approximately 155 parking spaces. The private residential development of 512 units and 68 accessory parking spaces is also expected to occur. Phase II development will create new space for the Schools of Business, Social Services, and Education, expansion of the Quinn Library, a new theater, additional dormitory facilities and an additional 110 accessory parking spaces for the University.

3. Western Rail Yard

   The proposed Western Rail Yard project is a mixed-use development over the western section of the MTA Long Island Railroad (LIRR) rail yard, bounded by 11th and 12th Avenues and West 30th and West 33rd Streets. The actions involve three sites – the Western Rail Yard (WRY), comprising of approximately 13 acres, as well as a site near Tenth Avenue and West 48th Street and the other on Ninth Avenue near West 54th Street. Together, these three project sites comprise approximately 14 acres. The proposed actions include the development of an approximately 6.3 million gross square foot (gsf) mixed-use project in a total of eight buildings at the development site. The mixed-use development is expected to include commercial (retail, office and/or hotel) space, residential units (both market rate and affordable), a public school, other community facilities, open space and parking. This project is expected to be completed by 2019.

## Public Outreach

Throughout the course of the study, community input was actively sought and obtained, through public meetings and a questionnaire survey. This afforded elected officials, community boards, residents, businesses and civic organizations to provide input identifying traffic related issues and problems in the study area.

# 2.0 FUTURE CONDITIONS (2018)

## 2.1 Demographics

The future demographic analysis of the study area examines population growth and decline as well as socioeconomic characteristics such as household income, car ownership, and journey to work mode choice to identify trends and help determine future travel needs. It relies on data from New York City Department of City Planning (NYCDCP), and data compiled by the United States Department of Commerce – Bureau of Census. Data were collected and analyzed for the years of 1980, 1990, and 2000 and was used to project the 2010 and 2018 demographic characteristics.

The West Side Manhattan study area consists of the following Census Tracts (in whole or in part): 135.00*, 139.00*, 145.00, 147.00, 149.00, 151.00, 153.00, 155.00, 157.00, 159.00, 161.00, 163.00, 165.00, 167.00, 169.00, 171.00, 315.00*, 317.02*. Fourteen tracts are located entirely within the study area, while four are partially in the study area. In the analysis of the partial census tracts, it is assumed that the population and other related variables are evenly distributed geographically. Figure 2.1-1 shows the community district boundaries and census tracts with 1980, 1990, and 2000 population for the study area.

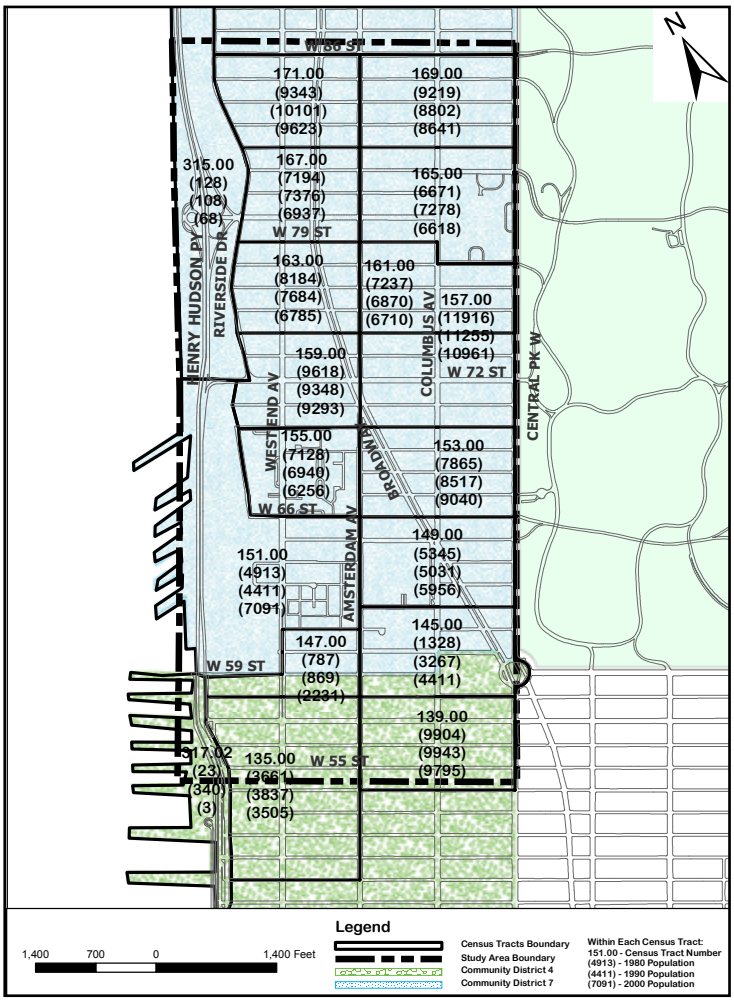


*Figure 2.1-1: Community Districts and Population Census Tracts Study Area Boundaries*

## 2.1-1 Population Trends

Based on trends and assumptions, between 1980 and 2018 the study area's population is projected to be 111,755 – an increase of approximately 7.5 % (7,770) compared to 20.1% (287,622) for Manhattan and 22.1% (1,565,836) for New York City. The future population projection for the study area, Manhattan, and New York City is shown in Table 2.1-1.

*Table 2.1-1: Population by Area*

| | Total Population | | | | | Population Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 2010* | 2018* | 1980 - 1990 | | 1990 - 2000 | | 2000 - 2010 | | 2010 - 2018 | |
| | | | | | | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| New York City | 7,071,639 | 7,322,564 | 8,008,278 | 8,402,213 | 8,637,475 | 250,925 | 3.5% | 685,714 | 9.4% | 393,935 | 4.9% | 235,262 | 2.8% |
| Manhattan | 1,428,285 | 1,487,536 | 1,537,195 | 1,662,701 | 1,715,907 | 59,251 | 4.1% | 49,659 | 3.3% | 125,506 | 8.2% | 53,206 | 3.2% |
| Study Area | 103,985 | 105,162 | 107,607 | 110,082** | 111,755** | 1,177 | 1.1% | 2,445 | 2.3% | 2,475 | 2.3% | 2,091 | 1.5% |

*Projected data based on Department of City Planning estimates – "New York City Population Projections by Age/Sex & Borough 2000-2030"

**For population projections in the study area for 2010 and 2018: between 2000 and 2010 it was assumed that population growth would at least be the same as 1990 to 2000; for 2010-2018, the average growth for the period (1980-2010) was used.

## 2.1-2 Household Characteristics

There are small increases in the number of households in the study area in the decades between 1980 and 2000: between 1980 and 1990 there was a 0.5% increase, from 62,787 to 63,107, and between 1990 and 2000 there was a 0.4% increase, from 63,107 to 63,355. The average household size (persons/household) in the study area remained relatively constant at 1.64 in 1980, 1.65 in 1990, and 1.66 in 2000. Assuming the average household size remains the same in 2010 (1.66) as in 2000, the number of households is projected to increase by 2.6% to 64,988. With a projected household size of 1.65 in 2018, the number of households is expected to be 67,053 (a 3.2% growth). Table 2.1-2 shows the household characteristics for the study area.

| Household Characteristics | Census Year | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 2010 | 2018 | 1980 - 1990 | | 1990 - 2000 | | 2000 - 2010 | | 2010 - 2018 | |
| | | | | | | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Population | 103,985 | 105,162 | 107,607 | 110,082 | 111,755 | 1,177 | 1.1% | 2,445 | 2.3% | 2,475 | 2.3% | 1,673 | 1.5% |
| Population in Households | 102,713 | 103,899 | 105,188 | 107,880 | 110,637 | 1,186 | 1.2% | 1,289 | 1.2% | 2,692 | 2.6% | 2,757 | 2.6% |
| # of Households | 62,787 | 63,107 | 63,355 | 65,382 | 67,053 | 320 | 0.5% | 248 | 0.4% | 2,027 | 3.2% | 1,671 | 2.6% |
| Persons/Household | 1.64 | 1.65 | 1.66 | 1.65 | 1.65 | | | | | | | | |

*Table 2.1-2: Household Characteristics*

## 2.1-3 Vehicle Ownership

This section discusses vehicle ownership trends observed in the study area during the period 1980 to 2000, and those projected for the period from 2000 to 2018. Between 1980 and 2000 the percentage of households with one or more vehicles in the study area ranged between 18 – 26%; between 2000 and 2018, the percentage of household with vehicles is projected to be 25%, being in the same range. Observed and projected vehicle ownership per household as well as 'Percent Share" are shown in Tables 2.1-3a and 2.1-3b.

The number of households in the study area with no vehicles declined gradually from 82% in 1980 to 74% in 2000 and projected to be at 74% in 2018. Coversely, households with one vehicle increased from 17% in 1980 to 24% in 2000; and, households with two vehicles increased from 1% to 1.6%. The changes in population and number of households in the study area are projected to be insignificant, so a significant increase in auto trips is not anticipated.

*Table 2.1-3a: Vehicle Ownership per Household*

| Vehicles/Household | Vehicles/Household | | | | | Vehicle Ownership Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 2010 | 2018 | 1980 - 1990 | | 1990 - 2000 | | 2000 - 2010 | | 2010 - 2018 | |
| | | | | | | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| **Zero** | 51,311 | 48,854 | 46,747 | 48,091 | 49,810 | -2,457 | -5.0% | -2,107 | -4.3% | 1,344 | 2.9% | 1,719 | 3.6% |
| **One** | 10,700 | 13,182 | 15,292 | 15,528 | 15,840 | 2,482 | 18.8% | 2,110 | 16.0% | 236 | 1.5% | 312 | 2.0% |
| **Two** | 568 | 947 | 1,033 | 1,099 | 1,125 | 379 | 40.0% | 86 | 9.1% | 66 | 6.4% | 26 | 2.4% |
| **Three or more** | 47 | 125 | 262 | 270 | 276 | 78 | 62.4% | 137 | 109.6% | 8 | 3.1% | 6 | 2.2% |
| **Total Household w/Vehicles** | 11,315 | 14,253 | 16,588 | 16,897 | 17,241 | 2,938 | 20.6% | 2,335 | 16.4% | 309 | 1.9% | 344 | 2.0% |
| **No. of Households** | 62,626 | 63,108 | 63,334 | 64,988 | 67,051 | 482 | 0.8% | 226 | 0.4% | 1,654 | 2.6% | 2,063 | 3.2% |

*Table 2.1-3b: Vehicle Ownership Share*

| Vehicles/Household | 1980 | Percent | 1990 | Percent | 2000 | Percent | 2010 | Percent | 2018 | Percent |
|---|---|---|---|---|---|---|---|---|---|---|
| **Zero** | 51,311 | 81.9% | 48,854 | 77.4% | 46,747 | 73.8% | 48,091 | 74.0% | 49,810 | 74.3% |
| **One** | 10,700 | 17.1% | 13,182 | 20.9% | 15,292 | 24.1% | 15,528 | 23.9% | 15,840 | 23.6% |
| **Two** | 568 | 0.9% | 947 | 1.5% | 1,033 | 1.6% | 1,099 | 1.7% | 1,125 | 1.7% |
| **Three or more** | 47 | 0.1% | 125 | 0.2% | 262 | 0.4% | 270 | 0.4% | 276 | 0.4% |
| **Total Household w/Vehicles** | 11,315 | 18.1% | 14,253 | 22.6% | 16,588 | 26.2% | 16,897 | 26.0% | 17,241 | 25.7% |
| **No. of Households** | 62,626 | 100.0% | 63,108 | 100.0% | 63,334 | 100.0% | 64,988 | 100.0% | 67,051 | 100.0% |

## 2.1-4 Journey to Work by Mode

Journey to work by mode for 1980, 1990, and 2000, and projected for 2010 and 2018 is summarized in Table 2.1-4. The journey-to-work data for 1980, 1990, and 2000 indicated that public transportation (bus, subway, and railroad) was the most utilized mode by residents representing 69% of labor force in the study area. The future condition 2018 mode shares are not expected to change significantly.

*Table 2.1-4: Summary of Journey to Work by Mode (1980-2018)*

| Journey To Work Mode | Census Year | | | | | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1990 | 2000 | 2010* | 2018* | 1980 - 1990 | | 1990 - 2000 | | 2000 - 2010 | | 2010 - 2018 | |
| | | | | | | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| **Car, Truck or Van** | | | | | | | | | | | | | |
| Drove alone | 3,081 | 4,673 | 4,837 | 4,908 | 5,094 | 1,592 | 34.1% | 164 | 3.5% | 71 | 1.5% | 186 | 3.8% |
| Carpooled | 2,318 | 1,771 | 1,191 | 1,550 | 1,609 | -547 | -30.9% | -580 | -32.7% | 359 | 30.1% | 59 | 3.8% |
| **Total** | **5,399** | **6,444** | **6,028** | **6,458** | **6,703** | **1,045** | **16.2%** | **-416** | **-6.5%** | **430** | **7.1%** | **245** | **3.8%** |
| **Public Transportation** | | | | | | | | | | | | | |
| Bus or street car | 12,567 | 10,186 | 6,359 | 8,524 | 8,848 | -2,381 | -23.4% | -3,827 | -37.6% | 2,165 | 34.0% | 324 | 3.8% |
| Subway, elevated train or rail road | 24,896 | 28,646 | 33,280 | 31,964 | 33,179 | 3,750 | 13.1% | 4,634 | 16.2% | -1,316 | -4.0% | 1,215 | 3.8% |
| Other public transportation | 2,583 | 4,301 | 4,178 | 4,391 | 4,558 | 1,718 | 39.9% | -123 | -2.9% | 213 | 5.1% | 167 | 3.8% |
| **Total** | **40,046** | **43,133** | **43,817** | **44,879** | **46,585** | **3,087** | **7.2%** | **684** | **1.6%** | **1,062** | **2.4%** | **1,706** | **3.8%** |
| **Walked only** | 11,146 | 12,019 | 11,230 | 12,011 | 12,467 | 873 | 7.3% | -789 | -6.6% | 781 | 7.0% | 456 | 3.8% |
| **Other means** | 1,262 | 1,240 | 1,135 | 1,228 | 1,273 | -22 | -1.8% | -105 | -8.5% | 93 | 8.2% | 45 | 3.7% |
| **Total Trips** | **57,853** | **62,836** | **62,210** | **64,576** | **67,028** | **4,983** | **7.9%** | **-626** | **-1.0%** | **2,366** | **3.8%** | **2,452** | **3.8%** |

## 2.2 Zoning and Land Use

A review of existing land use and zoning reveals that the predominant land use in the study area is residential; commercial land uses (primarily mixed-use) are located along three major north-south corridors - Columbus Avenue, Amsterdam Avenue, and Broadway. There is a small pocket zoned for manufacturing uses in the southern section of the study area. While the relative composition of uses in the study area is expected to remain the same, recent development trends indicate that development is occurring at higher densities.

Some of the planned developments in the study area (Figure 2.2-1) are:

- Western Rail Yard – mixed-use development, including residential, commercial, school, open space, and parking areas, over the western section of the MTA Long Island Railroad (LIRR) rail yard, bounded by 11th and 12th Avenues, and West 30th and West 33rd Streets.

- Fordham University Lincoln Center Master Plan – additional 2.35 million square feet of additional gross floor area to its Lincoln Center campus, bounded by Columbus and Amsterdam Avenues, and West 60th and West 62nd Streets.

- Lincoln Center West 65th Street Project – renovation of street and pedestrian areas along West 65th Street between Amsterdam Avenue and Broadway, and a proposed 14,000 square foot restaurant covered by an elevated public green at Lincoln Center Plaza North.

- Riverside Center – mixed-use development, including residential, automotive showroom/service, school, and parking areas, bounded by West End Avenue and Riverside Drive, and West 59th and West 61st Streets.

- West 61st Street Rezoning – rezoning to permit large-scale mixed-use development, including residential, retail, community facility, and parking, bounded by West 61st and West 60th Streets, and West End and Amsterdam Avenues.

Additionally, zoning amendments to the north and south of the study area (Figure 2.2-1) have the potential to increase density within the study area:

- Upper West Side Rezoning – rezone area bounded by West 110th and West 97th Streets to contextual zoning districts and implement a quality housing program which will help ensure that new development relates to the existing scale and character of the neighborhood.
- Hudson Yards – rezone to transform the area, bounded by West 30th and West 43rd Streets, and 8th and 12th Avenues, into a transit-oriented urban center, permitting medium- to high-density mixed-use development, including commercial, residential, open space, cultural, and entertainment. Other actions include extending subway service, establishing new open space network, zoning for appropriate densities and uses, and creating a convention corridor and expand existing convention facilities.

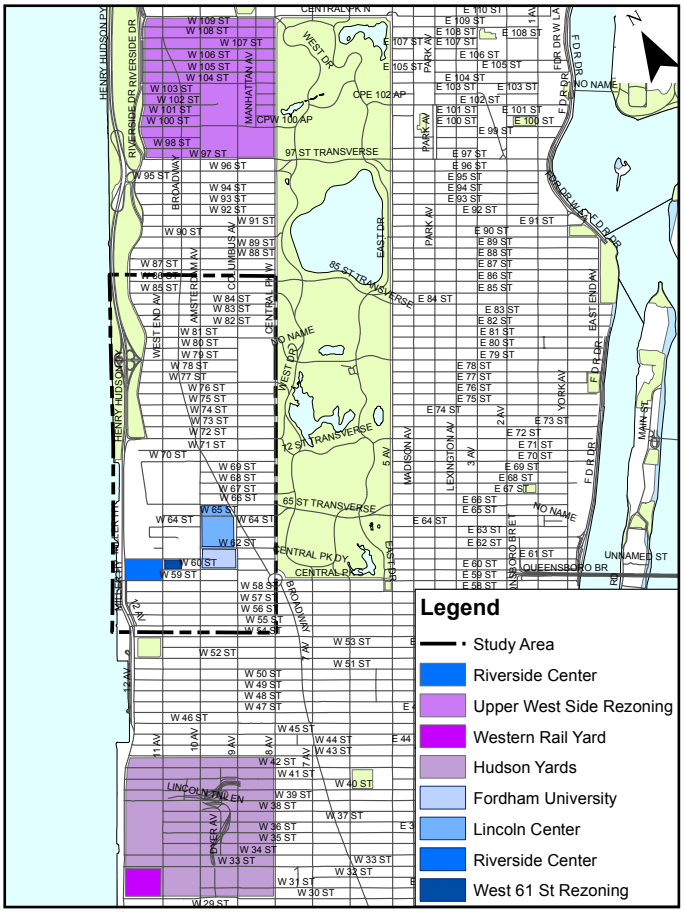


*Figure 2.2-1: Planned Developments and Zoning Amendments*

## 2.3 Traffic and Transportation

In order to assess future conditions, the existing 2008 traffic volumes were projected to 2018 by a background growth rate of 0.25 percent per year for the first five years and 0.125% for the next five years, plus additional traffic generated from other future developments in the study area. The 2018 future traffic network has the same forty-three (43) intersections analyzed under the existing conditions during the AM (8:00 ~ 9:00), Midday (1:00 ~ 2:00), PM (5:00 ~ 6:00), and Saturday Midday (1:00 ~ 2:00) peak hours and are listed below.

1. West 56th Street & Columbus Avenue/9th Avenue
2. West 57th Street & 8th Avenue
3. West 57th Street & Columbus Avenue/9th Avenue
4. West 57th Street & Amsterdam Avenue/10th Avenue
5. West 57th Street & 12th Avenue
6. West 58th Street & 8th Avenue
7. West 58th Street & Columbus Avenue/9th Avenue
8. West 58th Street & West End Avenue
9. West 59th Street & Amsterdam Avenue/10th Avenue
10. West 59th Street & West End Avenue
11. West 60th Street & Columbus Avenue/9th Avenue
12. West 60th Street & Broadway
13. West 65th Street & Central Park West
14. West 65th Street & Broadway
15. West 65th Street & Amsterdam Avenue/10th Avenue
16. West 66th Street & Central Park West
17. West 66th Street & Columbus Avenue/9th Avenue
18. West 66th Street & Amsterdam Avenue/10th Avenue
19. West 66th Street & Broadway
20. West 66th Street & West End Avenue
21. West 67th Street & Central Park West
22. West 68th Street & Columbus Avenue/9th Avenue
23. West 70th Street & West End Avenue
24. West 71st Street & Amsterdam Avenue/Broadway
25. West 72nd Street & Central Park West
26. West 72nd Street & Columbus Avenue/9th Avenue
27. West 72nd Street & Amsterdam Avenue/10th Avenue
28. West 72nd Street & Broadway
29. West 72nd Street & West End Avenue
30. West 72nd Street & Riverside Drive
31. West 79th Street & Columbus Avenue/9th Avenue
32. West 79th Street & Amsterdam Avenue/10th Avenue
33. West 79th Street & Broadway
34. West 79th Street & West End Avenue
35. West 79th Street & Riverside Drive
36. West 81st Street & Central Park West
37. West 81st Street & Riverside Drive
38. West 86th Street & Central Park West
39. West 86th Street & Columbus Avenue/9th Avenue
40. West 86th Street & Amsterdam Avenue/10th Avenue
41. West 86th Street & West End Avenue
42. West 86th Street & Broadway
43. West 86th Street & Riverside Drive

Figures 2.3-1 to 2.3-4 present the 2018 projected peak hour traffic volumes for the four peak hours.

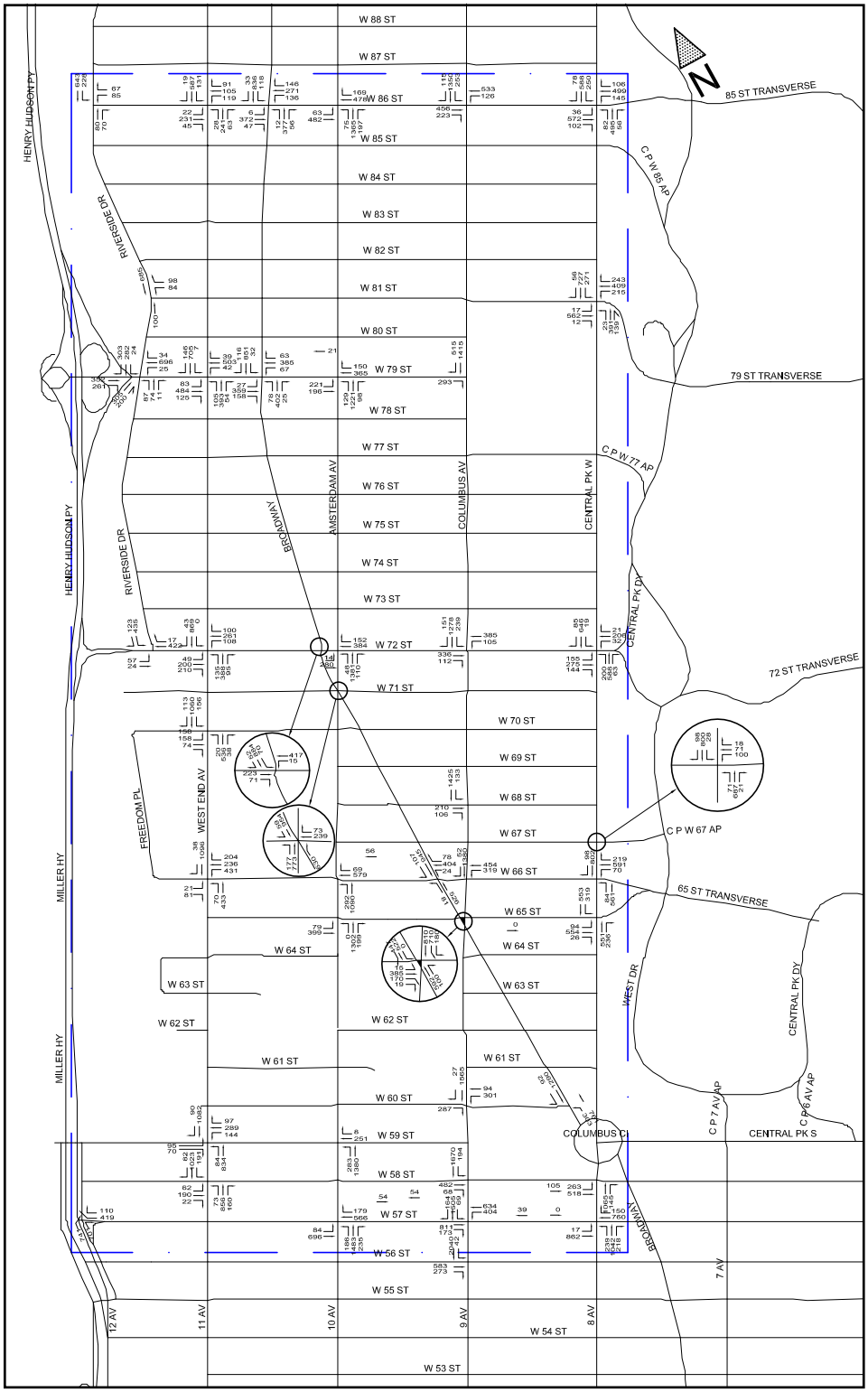


*Figure 2.3-1: Projected 2018 AM Peak Hour Traffic Volume*

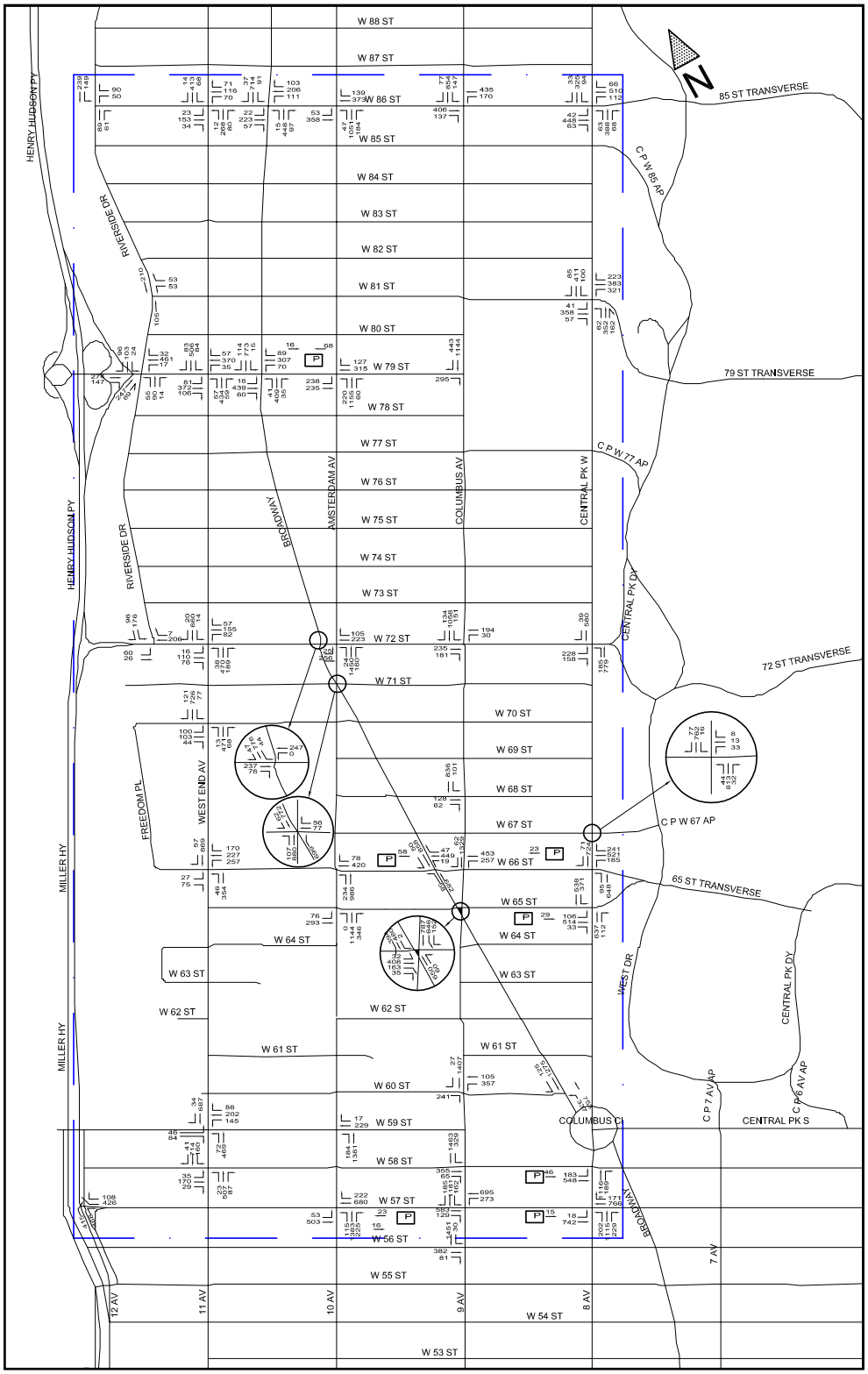


*Figure 2.3-2: Projected 2018 MD Peak Hour Traffic Volume*

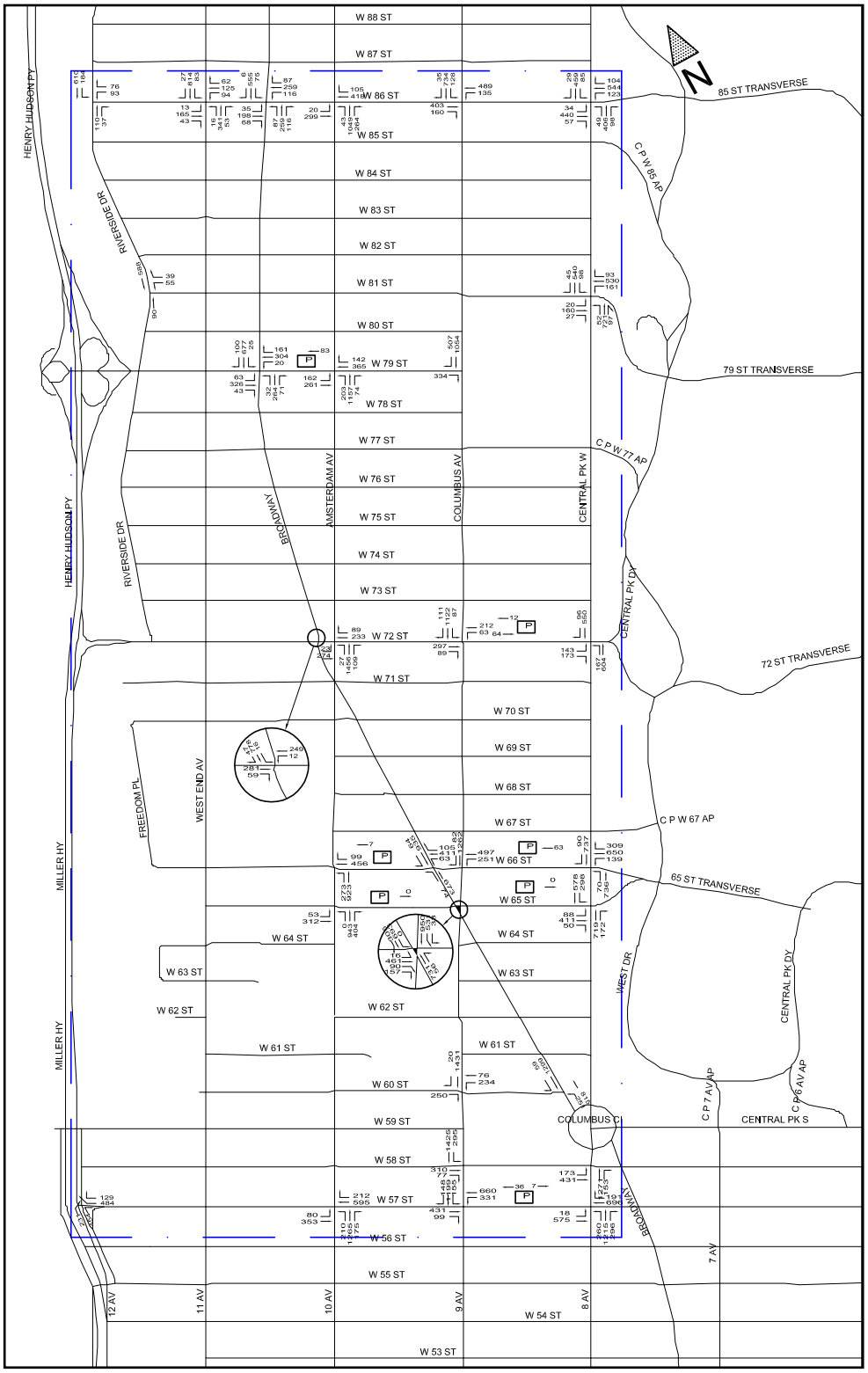


*Figure 2.3-4: Projected 2018 Saturday MD Peak Hour Traffic Volume*

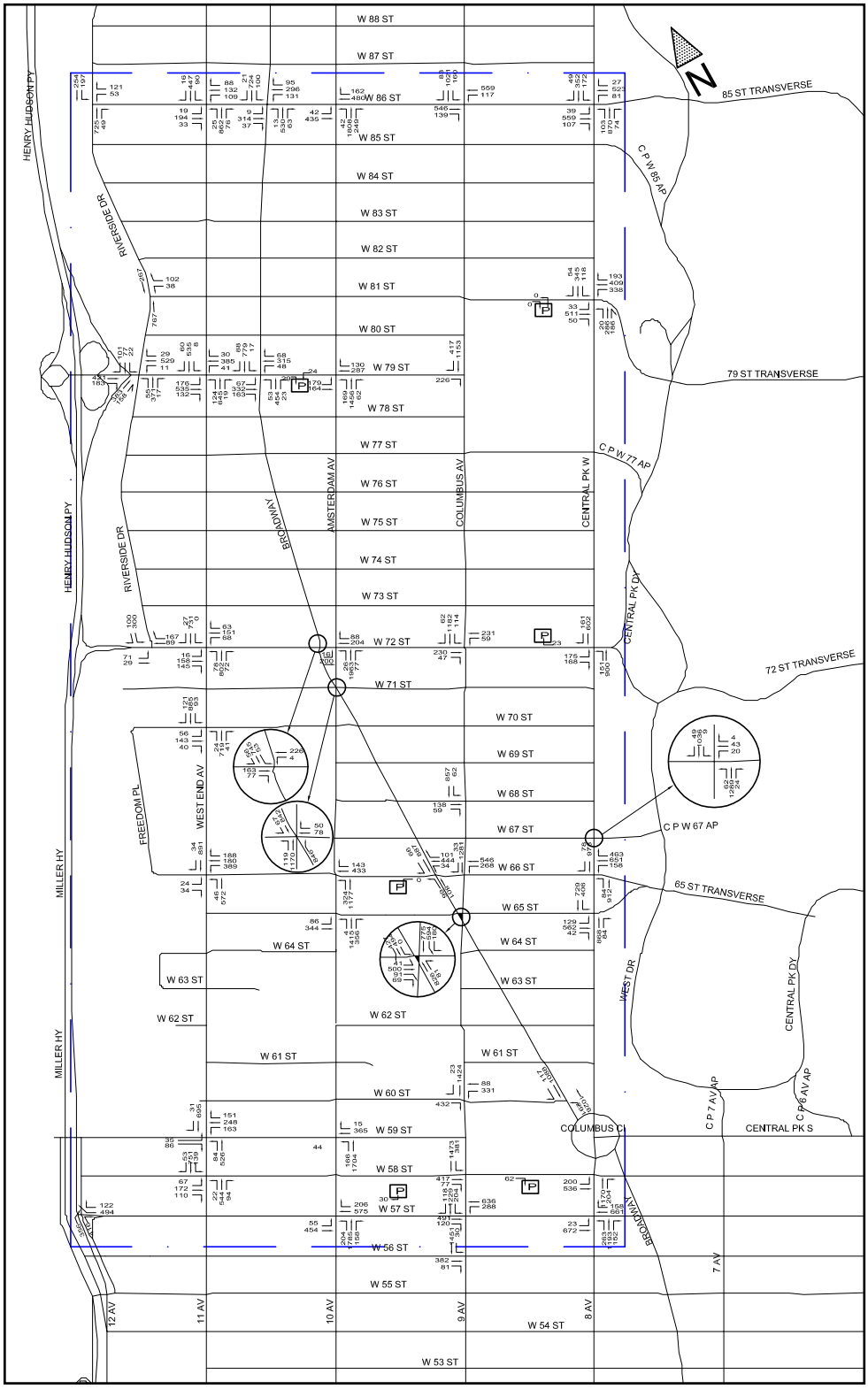


*Figure 2.3-3: Projected 2018 PM Peak Hour Traffic Volume*

## 2.3.2 Street Capacity and Level of Service (LOS)

The capacity of the roadways is the maximum rate of flow which may pass through a section of roadway under prevailing traffic, roadway and signalization conditions. The capacity of a roadway is determined by several factors including turning movements, signal timing, geometric design of the intersection, pedestrian movements, type of vehicle, illegal and/or double parking, grade, roadway conditions, and weather. In determining street capacity within the study area, the 2000 Highway Capacity Manual (HCM) methodology was used. The methodology requires the use of official signal timings, street geometry, and other relevant information for performing capacity and LOS analysis. The study area contains 43 signalized intersections.

The traffic flow characteristics are measured in terms of the volume-to-capacity (v/c) ratios and delays. The quality of the flow is expressed in terms of LOS, which is based on an average delay experienced by a vehicle. When the v/c ratio exceeds 1.0, a facility or intersection operates at or over capacity. In this situation severe congestion occurs in traffic with stop-and-start conditions. And extensive vehicle queuing and delays. Volume-to-capacity ratios of less than 0.85 are considered to be reflective of acceptable traffic conditions, with Average delays of 45 seconds or less. Table 2.3-1 shows the level of service criteria as specified in the 2000 HCM Methodology. The intersections studied were analyzed for roadway capacity, volume-to-capacity (v/c) ratios, vehicular delay, and LOS for the weekday AM, Midday, PM and Saturday peak hours.

*Table 2.3-1: Signalized Intersection Level of Service (LOS)*

| Level of Service | Control Delay per Vehicle | Description of Traffic Condition |
|---|---|---|
| A | ≤ 10.0 | LOS A describes operations with low control delay, up to 10 s/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. |
| B | >10 to 20 | LOS B describes operations with control delay greater than 10 and up to 20 s/veh. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay. |
| C | > 20 to 35 | LOS C describes operations with control delay greater than 20 and up to 35 s/veh. These higher delays may result from only fair progression, longer cycle lengths or both. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping. |
| D | > 35 to 55 | LOS D describes operations with control delay greater than 35 and up to 55 s/veh. The influence of congestion becomes more noticeable at this level. Longer delays may result from a combination of unfavorable progression, long cycle lengths, and/or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. |
| E | > 55 to 80 | LOS E describes operations with control delay greater than 55 and up to 80 s/veh. These higher delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences. |
| F | > 80 | LOS F describes operations with delay in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels. |

Sources: Highway Capacity Manual, Transportation Research Board; National Research Council, Washington D.C., 2000.

Note: Control delay is measured in terms of seconds per vehicle (sec/veh).

### 2.3.3 Future Traffic Conditions

Traffic analyses were done based on the HCS methodology mentioned above. Table 2.3-2 shows the Future Conditions analyses results including v/c ratios, delays, and LOS for the AM, Midday, PM, and Saturday Midday peak hours for the intersections analyzed in the study area. The analyses showed most intersections operating at an acceptable LOS with LOS B or better during the AM, Midday, PM, and Saturday Midday peak periods. For the intersections that experienced LOS D, E and F for some or all lane groups during a peak hour, they will continue to operate at that level or worst under the future conditions. The intersections with approaches or lane groups with mid LOS D (equal to or greater than 45 sec/veh) or worse are listed below. Overall intersection LOS is shown in Figures 2.3-5, 2.3-6, 2.3-7 and 2.3-8.

1. West 57th Street & Columbus Avenue/9th Avenue (AM, Midday, PM, and SAT Midday)
2. West 57th Street & Twelfth Avenue (Midday, PM, and SAT Midday)
3. West 58th Street & Columbus Avenue/9th Avenue (Midday, PM, and SAT Midday)
4. West 59th Street & Amsterdam Avenue/10th Avenue (AM and PM)
5. West 59th Street & West End Avenue (AM, Midday, and PM)
6. West 60th Street & Columbus Avenue/9th Avenue (AM and SAT Midday)
7. West 60th Street & Broadway (Midday, PM, and SAT Midday)
8. West 65th Street & Central Park West (Midday, PM, and SAT Midday)
9. West 65th Street & Columbus Avenue/Broadway (AM, Midday, PM, and SAT Midday)
10. West 66th Street & Central Park West (AM, Midday, PM, and SAT Midday)
11. West 66th Street & Columbus Avenue/9th Avenue (SAT Midday)
12. West 66th Street & Broadway (AM and SAT Midday
13. West 66th Street & West End Avenue (AM)
14. West 67th Street & Central Park West (PM)
15. West 70th Street & West End Avenue (AM, Midday and PM)
16. West 71st Street & Amsterdam Avenue/Broadway (AM, Midday and PM)
17. West 72nd Street & Central Park West (AM, Midday, PM, and SAT Midday)
18. West 72nd Street & West End Avenue (AM, Midday and PM)
19. West 79th Street & Columbus Avenue (AM, Midday, PM, and SAT Midday)
20. West 79th Street & Amsterdam Avenue (AM, Midday, PM, and SAT Midday)
21. West 79th Street & Broadway (AM, Midday, PM, and SAT Midday)
22. West 79th Street & West End Avenue (AM, Midday and PM)
23. West 79th Street & Riverside Drive (AM)
24. West 81st Street & Central Park West (AM, Midday, PM, and SAT Midday )
25. West 86th Street & Central Park West (AM, Midday, PM, and SAT Midday)
26. West 86th Street & Columbus Avenue (AM, Midday, and PM)
27. West 86th Street & Amsterdam Avenue (AM)
28. West 86th Street & Broadway (AM and PM)
29. West 86th Street & West End Avenue (AM and PM)
30. West 86th Street & Riverside Drive (PM)

| Loc. No. | Intersection | Approach | Movement | 2018 Future - Weekday AM | | | 2018 Future - Weekday MD | | | 2018 Future - Weekday PM | | | 2018 Future - Weekday Saturday MD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS |
| 1 | W 56th St & 9th Avenue | | | | | | | | | | | | | | |
| | | SB | LT | 0.63 | 14.4 | B | 0.58 | 15.5 | B | 0.43 | 12.0 | B | | | |
| | | EB | TR | 0.69 | 28.9 | C | 0.36 | 21.5 | C | 0.35 | 23.4 | C | | | |
| | Intersection LOS | Overall | | | 18.4 | B | | 16.8 | B | | 14.6 | B | | | |
| 2 | W 57th St & 8th Avenue | | | | | | | | | | | | | | |
| | | NB | LTR | 0.67 | 18.3 | B | 0.69 | 18.8 | B | 0.67 | 18.2 | B | 0.80 | 21.5 | C |
| | | EB | LT | 1.01 | 58.2 | E | 1.11 | 94.3 | F | 0.79 | 30.7 | C | 1.14 | 106.3 | F |
| | | WB | TR | 1.03 | 63.4 | E | 1.01 | 58.3 | E | 0.82 | 31.9 | C | 0.91 | 38.7 | D |
| | Intersection LOS | Overall | | | 41.2 | D | | 48.0 | D | | 24.5 | C | | 44.4 | D |
| 3 | W 57th St & 9th Avenue | | | | | | | | | | | | | | |
| | | SB | LTR | 0.83 | 31.0 | C | 0.85 | 32.1 | C | 1.02 | 56.9 | E | 0.95 | 40.8 | D |
| | | EB | TR | 1.34 | 197.7 | F | 0.91 | 52.5 | D | 0.82 | 44.1 | D | 0.66 | 36.0 | D |
| | | | R | 0.85 | 64.5 | E | 0.65 | 45.7 | D | 0.60 | 42.5 | D | 0.49 | 37.4 | D |
| | | WB | DefL | 0.98 | 59.0 | E | 0.89 | 47.1 | D | 0.78 | 32.1 | C | 0.96 | 68.4 | E |
| | | | T | 1.10 | 91.8 | F | 1.24 | 146.4 | F | 1.02 | 65.3 | E | 1.14 | 106.0 | F |
| | Intersection LOS | Overall | | | 81.4 | F | | 61.6 | E | | 53.8 | D | | 56.9 | E |
| 4 | W 57th St & 10th Avenue | | | | | | | | | | | | | | |
| | | NB | LTR | 0.70 | 18.7 | B | 0.62 | 17.3 | B | 0.75 | 19.7 | B | 0.59 | 16.7 | B |
| | | EB | LT | 1.21 | 134.5 | F | 0.86 | 37.9 | D | 0.75 | 30.3 | C | 0.78 | 32.7 | C |
| | | WB | TR | 0.90 | 39.4 | D | 1.11 | 92.4 | F | 0.86 | 35.2 | D | 0.90 | 38.9 | D |
| | Intersection LOS | Overall | | | 48.4 | D | | 43.1 | D | | 24.8 | C | | 25.3 | C |
| 5 | W 57th St & 12th Avenue | | | | | | | | | | | | | | |
| | | NB | T | 1.33 | 192.3 | F | 0.52 | 13.5 | B | 0.37 | 11.2 | B | 0.31 | 10.4 | B |
| | | WB | TR | 0.47 | 34.2 | C | 0.59 | 40.1 | D | 0.64 | 53.0 | D | 0.71 | 43.3 | D |
| | Intersection LOS | Overall | | | 129.7 | F | | 28.2 | C | | 37.3 | D | | 34.0 | C |
| 6 | W 58th St & West End Avenue | | | | | | | | | | | | | | |
| | | NB | L | 0.55 | 24.3 | C | 0.10 | 8.0 | A | 0.10 | 8.1 | A | | | |
| | | | T | 0.57 | 11.8 | B | 0.34 | 9.1 | A | 0.36 | 9.3 | A | | | |
| | | | R | 0.25 | 8.8 | A | 0.14 | 7.8 | A | 0.15 | 7.9 | A | | | |
| | | SB | L | 0.95 | 63.8 | E | 0.48 | 14.1 | B | 0.44 | 13.2 | B | | | |
| | | | TR | 0.80 | 17.7 | B | 0.54 | 11.5 | B | 0.58 | 12.1 | B | | | |
| | | EB | LTR | 0.61 | 33.8 | C | 0.53 | 31.5 | C | 0.82 | 45.5 | D | | | |
| | Intersection LOS | Overall | | | 20.4 | C | | 13.5 | B | | 17.1 | B | | | |
| 7 | W 58th St & 9th Avenue | | | | | | | | | | | | | | |
| | | SB | LT | 0.69 | 15.1 | B | 0.66 | 14.5 | B | 0.53 | 12.6 | B | 0.49 | 12.1 | B |
| | | EB | TR | 0.73 | 32.6 | C | 0.55 | 27.8 | C | 0.66 | 30.3 | C | 0.51 | 26.9 | C |
| | Intersection LOS | Overall | | | 19.2 | B | | 17.0 | B | | 16.3 | B | | 14.8 | B |
| 8 | W 58th St & 8th Avenue | | | | | | | | | | | | | | |
| | | NB | TR | 0.53 | 16.1 | B | 0.58 | 16.7 | B | 0.58 | 16.8 | B | 0.57 | 16.7 | B |
| | | EB | L | 0.82 | 43.4 | D | 0.60 | 28.8 | C | 0.60 | 29.3 | C | 0.52 | 26.4 | C |
| | | | T | 0.55 | 23.5 | | 0.58 | 23.9 | | 0.63 | 25.1 | C | 0.43 | 21.3 | |
| | Intersection LOS | Overall | | | 21.6 | C | | 19.8 | B | | 20.2 | C | | 18.6 | B |
| 9 | W 59th St & West End Avenue | | | | | | | | | | | | | | |
| | | NB | L | 0.62 | 28.7 | C | 0.29 | 10.8 | B | 0.33 | 11.7 | B | | | |
| | | | T | 0.59 | 12.3 | B | 0.33 | 9.1 | A | 0.37 | 9.5 | A | | | |
| | | SB | TR | 0.58 | 11.6 | B | 0.35 | 9.1 | A | 0.34 | 9.0 | A | | | |
| | | EB | L | 1.28 | 222.7 | F | 0.34 | 32.2 | C | 0.49 | 46.9 | D | | | |
| | | | R | 0.27 | 27.6 | C | 0.32 | 28.7 | C | 0.32 | 28.7 | C | | | |
| | | WB | L | 0.40 | 29.5 | C | 0.41 | 29.5 | C | 0.48 | 31.4 | C | | | |
| | | | TR | 1.11 | 109.9 | F | 0.75 | 40.8 | D | 1.23 | 158.0 | F | | | |
| | Intersection LOS | Overall | | | 34.5 | C | | 17.3 | B | | 42.0 | D | | | |
| 10 | W 59th St & 10th Avenue | | | | | | | | | | | | | | |
| | | NB | LT | 0.76 | 18.2 | B | 0.66 | 15.7 | B | 0.73 | 17.1 | B | | | |
| | | WB | TR | 0.35 | 23.0 | C | 0.35 | 22.9 | C | 0.51 | 25.4 | C | | | |
| | Intersection LOS | Overall | | | 18.9 | B | | 16.8 | B | | 18.8 | B | | | |
| 11 | W 60th St & Columbus Avenue | | | | | | | | | | | | | | |
| | | SB | TR | 1.03 | 54.7 | D | 0.83 | 26.5 | C | 0.87 | 28.6 | C | 0.99 | 44.5 | D |
| | | EB | R | 0.68 | 33.5 | C | 0.61 | 30.5 | C | 0.99 | 68.1 | E | 0.44 | 25.5 | C |
| | | WB | LT | 0.71 | 32.6 | C | 0.72 | 32.4 | C | 0.64 | 29.9 | C | 0.44 | 25.1 | C |
| | Intersection LOS | Overall | | | 47.9 | D | | 28.4 | C | | 36.9 | D | | 39.3 | D |
| 12 | W 60th St & Broadway | | | | | | | | | | | | | | |
| | | NB | DefL | 0.73 | 36.3 | D | 0.73 | 33.1 | C | 0.78 | 34.8 | C | 0.83 | 43.1 | D |
| | | | T | 0.38 | 10.3 | B | 0.36 | 10.1 | B | 0.51 | 13.8 | B | 0.40 | 12.5 | B |
| | | SB | TR | 0.85 | 33.7 | C | 0.98 | 49.9 | D | 0.95 | 47.2 | D | 1.07 | 78.1 | E |
| | Intersection LOS | Overall | | | 26.6 | C | | 35.6 | D | | 32.6 | C | | 53.8 | D |
| 13 | W 65th St & Central Park West | | | | | | | | | | | | | | |
| | | NB | TR | 0.78 | 31.7 | C | 0.94 | 46.7 | D | 1.05 | 71.6 | E | 1.10 | 88.7 | F |
| | | SB | DefL | 0.73 | 34.4 | C | 0.90 | 52.2 | D | 1.06 | 93.0 | F | 0.74 | 38.2 | D |
| | | | T | 0.40 | 10.2 | B | 0.36 | 9.8 | A | 0.52 | 11.7 | B | 0.38 | 10.0 | B |
| | | EB | LTR | 0.57 | 29.0 | C | 0.80 | 35.4 | D | 0.73 | 33.0 | C | 0.54 | 28.9 | C |
| | Intersection LOS | Overall | | | 25.9 | C | | 35.7 | D | | 48.2 | D | | 48.2 | D |
| 14a | W 65th St & Columbus Avenue | | | | | | | | | | | | | | |
| | | SB | L | 0.74 | 44.0 | D | 0.47 | 32.0 | C | 0.59 | 35.5 | D | 0.11 | 25.5 | C |
| | | | T | 1.12 | 95.5 | F | 1.17 | 119.1 | F | 0.98 | 52.1 | D | 1.04 | 68.4 | E |
| | | EB | LTR | 0.41 | 29.1 | C | 0.50 | 30.3 | C | 0.55 | 31.1 | C | 0.52 | 30.6 | C |
| | | | R | 0.92 | 72.6 | E | 0.94 | 79.3 | E | 0.79 | 55.4 | E | 1.18 | 148.3 | F |
| | Intersection LOS | Overall | | | 76.6 | E | | 90.7 | F | | 45.9 | D | | 67.9 | E |

*Table 2.3-2: Traffic Capacity Analysis for Signalized Intersections*
*2018 Future Conditions (Page 1 of 4)*

| Loc. No. | Intersection | Approach | Movement | 2018 Future - Weekday AM | | | 2018 Future - Weekday MD | | | 2018 Future - Weekday PM | | | 2018 Future - Weekday Saturday MD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS |
| | W 65th St & Broadway | | | | | | | | | | | | | | |
| 14b | | NB | TR | 0.67 | 30.8 | C | 0.60 | 29.4 | C | 0.69 | 31.1 | C | 0.64 | 30.2 | C |
| | | SB | T | 0.68 | 30.9 | C | 0.67 | 30.7 | C | 0.69 | 31.1 | C | 0.74 | 32.0 | C |
| | | EB | LTR | 0.41 | 29.0 | C | 0.49 | 30.1 | C | 0.53 | 30.7 | C | 0.51 | 30.4 | C |
| | | | R | 0.92 | 72.6 | E | 0.94 | 79.3 | E | 0.79 | 55.4 | E | 1.18 | 148.3 | F |
| | Intersection LOS | Overall | | | 34.0 | C | | 34.2 | C | | 32.6 | C | | 41.9 | D |
| | W 65th St & Amsterdam Avenue | | | | | | | | | | | | | | |
| 15 | | NB | TR | 0.63 | 16.3 | B | 0.57 | 15.5 | B | 0.68 | 17.4 | B | 0.45 | 13.9 | B |
| | | EB | LT | 0.55 | 25.0 | C | 0.44 | 22.9 | C | 0.88 | 40.4 | D | 0.44 | 22.9 | C |
| | Intersection LOS | Overall | | | 18.2 | B | | 17.0 | B | | 24.0 | C | | 15.9 | B |
| | W 66th St & Central Park West | | | | | | | | | | | | | | |
| 16 | | NB | LT | 0.80 | 21.6 | C | 0.84 | 23.6 | C | 1.09 | 74.2 | E | 0.81 | 21.2 | C |
| | | SB | TR | 0.85 | 30.1 | C | 0.78 | 26.5 | C | 1.00 | 51.6 | D | 0.72 | 24.1 | C |
| | | WB | L | 0.20 | 24.5 | C | 0.54 | 31.3 | C | 0.46 | 29.3 | C | 0.40 | 28.0 | C |
| | | | T | 1.30 | 179.4 | F | 1.18 | 132.5 | F | 1.31 | 182.3 | F | 1.25 | 158.8 | F |
| | | | R | 0.64 | 35.6 | D | 0.83 | 48.7 | D | 1.20 | 143.8 | F | 0.88 | 55.1 | E |
| | Intersection LOS | Overall | | | 62.4 | E | | 49.7 | D | | 94.9 | F | | 58.3 | E |
| | W 66th St & Columbus Avenue | | | | | | | | | | | | | | |
| 17 | | SB | TR | 1.36 | 198.2 | F | 1.39 | 211.7 | F | 1.13 | 102.0 | F | 0.62 | 13.2 | B |
| | | WB | LT | 0.67 | 15.4 | B | 0.57 | 13.2 | B | 0.72 | 16.5 | B | 1.04 | 75.4 | E |
| | Intersection LOS | Overall | | | 131.8 | F | | 145.2 | F | | 66.0 | E | | 35.4 | D |
| | W 66th St & Amsterdam Avenue | | | | | | | | | | | | | | |
| 18 | | NB | LT | 0.64 | 17.8 | B | 0.59 | 16.9 | B | 0.54 | 16.1 | B | 0.50 | 15.6 | B |
| | | WB | TR | 0.55 | 23.0 | C | 0.38 | 20.5 | C | 0.49 | 22.1 | C | 0.44 | 21.2 | C |
| | Intersection LOS | Overall | | | 19.4 | B | | 17.9 | B | | 17.9 | B | | 17.3 | B |
| | W 66th St & Broadway | | | | | | | | | | | | | | |
| 19 | | NB | DefL | 0.79 | 52.0 | D | | | | | | | 0.75 | 45.4 | D |
| | | | LT | | | | 0.45 | 13.0 | B | 0.45 | 13.0 | B | | | |
| | | | T | 0.32 | 11.7 | B | | | | | | | 0.31 | 11.6 | B |
| | | SB | TR | 0.61 | 15.5 | B | 0.51 | 13.9 | B | 0.56 | 14.5 | B | 0.58 | 14.8 | B |
| | | WB | LTR | 0.45 | 24.2 | C | 0.49 | 24.6 | C | 0.53 | 25.3 | C | 0.56 | 25.8 | C |
| | Intersection LOS | Overall | | | 18.1 | B | | 16.2 | B | | 16.5 | B | | 18.1 | B |
| | W 66th St & West End Avenue | | | | | | | | | | | | | | |
| 20 | | NB | L | 0.98 | 118.4 | F | 0.41 | 26.8 | C | 0.37 | 22.4 | C | | | |
| | | | T | 0.40 | 17.9 | B | 0.33 | 17.0 | B | 0.49 | 17.4 | B | | | |
| | | SB | TR | 0.95 | 39.3 | D | 0.75 | 24.9 | C | 0.72 | 21.8 | C | | | |
| | | | R | 0.11 | 15.2 | B | 0.16 | 15.9 | B | 0.09 | 13.2 | B | | | |
| | | EB | L | 0.09 | 20.7 | C | 0.12 | 21.1 | C | 0.09 | 20.6 | C | | | |
| | | | R | 0.24 | 22.7 | C | 0.23 | 22.4 | C | 0.10 | 20.6 | C | | | |
| | | WB | L | 1.33 | 197.8 | F | 0.80 | 43.3 | D | 1.20 | 144.6 | F | | | |
| | | | LT | 0.49 | 26.4 | C | 0.47 | 26.1 | C | 0.37 | 24.1 | C | | | |
| | | | R | 0.65 | 34.2 | C | 0.54 | 29.8 | C | 0.60 | 31.9 | C | | | |
| | Intersection LOS | Overall | | | 61.5 | E | | 26.0 | C | | 41.8 | D | | | |
| | W 67th St & Central Park West | | | | | | | | | | | | | | |
| 21 | | NB | LTR | 0.83 | 24.5 | C | 0.89 | 28.8 | C | 1.23 | 129.4 | F | | | |
| | | SB | LTR | 0.77 | 20.2 | C | 0.87 | 24.8 | C | 0.82 | 21.8 | C | | | |
| | | WB | LTR | 0.48 | 26.4 | C | 0.16 | 21.2 | C | 0.14 | 20.9 | C | | | |
| | Intersection LOS | Overall | | | 22.7 | C | | 26.4 | C | | 81.0 | F | | | |
| | W 68th St & Columbus Avenue | | | | | | | | | | | | | | |
| 22 | | SB | LT | 0.73 | 23.3 | C | 0.44 | 18.5 | B | 0.47 | 18.7 | B | | | |
| | | EB | TR | 0.48 | 19.3 | B | 0.29 | 16.4 | B | 0.30 | 16.5 | B | | | |
| | Intersection LOS | Overall | | | 22.6 | C | | 18.1 | B | | 18.4 | B | | | |
| | W 70th St & West End Avenue | | | | | | | | | | | | | | |
| 23 | | NB | LTR | 0.60 | 19.6 | B | 0.53 | 18.1 | B | 0.99 | 48.9 | D | | | |
| | | SB | LTR | 0.71 | 20.7 | C | 0.99 | 49.3 | D | 1.22 | 129.7 | F | | | |
| | | EB | LTR | 0.55 | 26.1 | C | 0.37 | 23.3 | C | 0.40 | 23.6 | C | | | |
| | Intersection LOS | Overall | | | 21.5 | C | | 35.2 | D | | 82.8 | F | | | |
| | W 71st St & Amsterdam Avenue | | | | | | | | | | | | | | |
| 24a | | NB | LT | 0.82 | 39.0 | D | 0.91 | 45.5 | D | 1.00 | 57.3 | E | | | |
| | | WB | TR | 1.02 | 80.8 | F | 0.48 | 30.1 | C | 0.45 | 28.2 | C | | | |
| | Intersection LOS | Overall | | | 50.9 | D | | 43.6 | D | | 54.3 | D | | | |
| | W 71st St & Broadway | | | | | | | | | | | | | | |
| 24b | | NB | T | 0.76 | 34.4 | C | 0.72 | 33.7 | C | 0.80 | 36.0 | D | | | |
| | | SB | TR | 1.03 | 67.2 | E | 0.88 | 41.6 | D | 0.92 | 45.4 | D | | | |
| | | WB | TR | 1.02 | 80.8 | F | 0.48 | 30.1 | C | 0.45 | 28.2 | C | | | |
| | Intersection LOS | Overall | | | 57.9 | E | | 37.3 | D | | 39.9 | D | | | |
| | W 72nd St & Central Park West | | | | | | | | | | | | | | |
| 25 | | NB | LT | | | | 1.00 | 53.5 | D | 1.12 | 92.3 | F | 0.87 | 31.6 | C |
| | | | LTR | 0.90 | 34.1 | C | | | | | | | | | |
| | | SB | LTR | 0.89 | 42.0 | D | | | | | | | 0.89 | 41.8 | D |
| | | | TR | | | | 0.83 | 38.7 | D | 1.18 | 124.3 | F | | | |
| | | EB | DefL | 0.71 | 42.1 | D | | | | | | | 0.33 | 24.4 | C |
| | | | L | 0.55 | 27.0 | C | 0.50 | 25.6 | C | 0.32 | 21.9 | C | 0.00 | 20.0 | C |
| | | | LR | | | | 0.00 | 18.0 | B | 0.00 | 18.0 | B | | | |
| | | | TR | 0.55 | 34.1 | C | | | | | | | | | |
| | | | R | | | | 0.60 | 31.5 | C | 0.60 | 31.4 | C | 1.04 | 108.8 | F |
| | | WB | LTR | 0.35 | 42.0 | D | | | | | | | | | |
| | Intersection LOS | Overall | | | 34.6 | C | | 43.4 | D | | 93.4 | F | | 42.6 | D |

*Table 2.3-2: Traffic Capacity Analysis for Signalized Intersections*
*2018 Future Conditions (Page 2 of 4)*

| Loc. No. | Intersection | Approach | Movement | 2018 Future - Weekday AM | | | 2018 Future - Weekday MD | | | 2018 Future - Weekday PM | | | 2018 Future - Weekday Saturday MD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS |
| 26 | W 72nd St & Columbus Avenue | | | | | | | | | | | | | | |
| | | SB | LTR | 0.83 | 22.6 | C | 0.62 | 17.4 | B | 0.58 | 16.8 | B | 0.62 | 17.5 | B |
| | | EB | T | 0.42 | 21.3 | C | 0.26 | 19.3 | B | 0.28 | 19.6 | B | 0.35 | 20.3 | C |
| | | | R | 0.42 | 23.6 | C | 0.57 | 27.8 | C | 0.15 | 18.7 | B | 0.33 | 22.0 | |
| | | WB | LT | 0.74 | 30.4 | C | 0.32 | 20.3 | C | 0.41 | 21.5 | C | 0.51 | 23.7 | C |
| | Intersection LOS | Overall | | | 23.8 | C | | 19.0 | B | | 18.0 | B | | 19.1 | B |
| 27 | W 72nd St & Amsterdam Avenue | | | | | | | | | | | | | | |
| | | NB | L | 0.21 | 12.3 | B | 0.11 | 10.7 | B | 0.18 | 12.2 | B | 0.18 | 11.8 | B |
| | | | TR | 0.78 | 19.4 | B | 0.92 | 28.0 | C | 0.93 | 27.2 | C | 0.80 | 19.9 | B |
| | | EB | LT | 0.26 | 21.8 | C | 0.28 | 22.0 | C | 0.20 | 21.1 | C | 0.30 | 22.2 | C |
| | | WB | TR | 0.52 | 25.2 | C | 0.35 | 22.9 | C | 0.30 | 22.3 | C | 0.37 | 23.2 | C |
| | Intersection LOS | Overall | | | 20.9 | C | | 26.2 | C | | 25.8 | C | | 20.6 | C |
| 28 | W 72nd St & Broadway | | | | | | | | | | | | | | |
| | | SB | LTR | 0.51 | 13.7 | B | 0.45 | 13.0 | B | 0.49 | 13.5 | B | 0.39 | 12.3 | B |
| | | EB | TR | 0.51 | 26.1 | C | 0.46 | 24.8 | C | 0.45 | 25.0 | C | 0.45 | 24.6 | C |
| | | WB | LT | 0.56 | 26.6 | C | 0.28 | 22.1 | C | 0.27 | 22.0 | C | 0.34 | 23.0 | C |
| | Intersection LOS | Overall | | | 19.3 | B | | 17.3 | B | | 17.1 | B | | 17.3 | B |
| 29 | W 72nd St & West End Avenue | | | | | | | | | | | | | | |
| | | NB | DefL | 0.45 | 27.5 | C | | | | | | | | | |
| | | | LTR | | | | 0.52 | 17.6 | B | 0.63 | 17.2 | B | | | |
| | | | TR | 0.47 | 17.2 | B | | | | | | | | | |
| | | SB | LT | | | | | | | 1.24 | 153.8 | F | | | |
| | | | LTR | 0.76 | 30.2 | C | 0.99 | 62.0 | E | | | | | | |
| | | | R | | | | | | | 0.15 | 28.2 | C | | | |
| | | EB | LTR | 0.44 | 29.0 | C | 0.25 | 29.9 | C | 0.34 | 31.0 | C | | | |
| | | | R | 0.66 | 38.1 | D | 0.49 | 40.5 | D | 0.75 | 53.7 | D | | | |
| | | WB | LTR | 0.72 | 37.0 | D | 0.57 | 36.2 | D | 0.52 | 35.0 | D | | | |
| | | | R | 0.42 | 31.5 | C | 0.34 | 34.5 | C | 0.39 | 36.1 | D | | | |
| | Intersection LOS | Overall | | | 29.1 | C | | 38.5 | D | | 66.0 | E | | | |
| 30 | W 72nd St & Riverside Dr | | | | | | | | | | | | | | |
| | | SB | LR | 0.82 | 29.2 | C | 0.49 | 22.3 | C | 0.70 | 28.4 | C | | | |
| | | WB | T | 0.54 | 29.9 | C | 0.20 | 20.6 | C | 0.09 | 19.5 | B | | | |
| | | | R | 0.02 | 1.5 | A | 0.01 | 1.4 | A | 0.16 | 1.9 | A | | | |
| | Intersection LOS | Overall | | | 29.1 | C | | 21.2 | C | | 20.4 | C | | | |
| 31 | W 79th St & Columbus Avenue | | | | | | | | | | | | | | |
| | | SB | TR | 1.32 | 170.9 | F | 1.08 | 70.0 | E | 1.05 | 58.8 | E | 1.08 | 70.4 | E |
| | | EB | R | 0.81 | 44.4 | D | 0.68 | 36.2 | D | 0.56 | 32.3 | C | 0.90 | 54.1 | D |
| | Intersection LOS | Overall | | | 152.6 | F | | 64.8 | E | | 55.5 | E | | 67.3 | E |
| 32 | W 79th St & Amsterdam Avenue | | | | | | | | | | | | | | |
| | | NB | LTR | 0.65 | 22.1 | C | 0.69 | 23.0 | C | 0.72 | 23.3 | C | 0.63 | 21.7 | C |
| | | EB | DefL | 0.91 | 67.6 | E | 1.07 | 111.4 | F | 0.72 | 41.0 | D | 0.89 | 71.1 | E |
| | | | T | 0.34 | 20.9 | C | 0.42 | 22.2 | C | 0.29 | 20.1 | C | 0.48 | 23.3 | C |
| | | WB | TR | 0.96 | 63.5 | E | 0.87 | 50.1 | D | 0.81 | 43.8 | D | 1.02 | 77.6 | E |
| | Intersection LOS | Overall | | | 34.7 | C | | 36.7 | D | | 27.8 | C | | 37.5 | D |
| 33 | W 79th St & Broadway | | | | | | | | | | | | | | |
| | | NB | DefL | 0.73 | 45.3 | D | | | | 0.51 | 25.9 | C | | | |
| | | | LTR | | | | 0.28 | 12.9 | B | | | | 0.22 | 12.3 | B |
| | | | TR | 0.27 | 12.8 | B | | | | 0.25 | 12.6 | B | | | |
| | | SB | LTR | 0.57 | 16.3 | B | 0.48 | 15.0 | B | 0.47 | 14.9 | B | 0.44 | 14.5 | B |
| | | EB | LTR | 0.66 | 32.4 | C | 0.67 | 32.4 | C | 0.80 | 39.6 | D | 0.93 | 56.2 | E |
| | | | R | 0.80 | 49.5 | D | 0.24 | 25.9 | C | 0.70 | 41.9 | D | 0.23 | 26.3 | C |
| | | WB | LTR | 1.11 | 105.8 | F | 1.00 | 71.4 | E | 0.82 | 41.5 | D | 0.96 | 59.4 | E |
| | Intersection LOS | Overall | | | 38.3 | D | | 28.8 | C | | 25.5 | C | | 32.4 | C |
| 34 | W 79th St & West End Avenue | | | | | | | | | | | | | | |
| | | NB | LTR | 0.81 | 27.0 | C | 0.57 | 16.9 | B | 1.03 | 57.3 | E | | | |
| | | SB | LTR | 0.83 | 24.6 | C | 0.83 | 26.6 | C | 0.53 | 15.8 | B | | | |
| | | EB | LTR | 1.12 | 101.0 | F | 0.89 | 42.4 | D | 1.07 | 78.8 | E | | | |
| | | WB | LTR | 1.12 | 97.8 | F | 0.67 | 28.2 | C | 0.72 | 30.6 | C | | | |
| | Intersection LOS | Overall | | | 62.7 | E | | 28.6 | C | | 51.0 | D | | | |
| 35 | W 79th St & Riverside Dr | | | | | | | | | | | | | | |
| | | NB | LTR | 0.72 | 38.7 | D | 0.34 | 21.2 | C | 0.83 | 37.9 | D | | | |
| | | SB | LTR | 1.13 | 105.7 | F | 0.45 | 22.9 | C | 0.41 | 22.4 | C | | | |
| | | EB | T | 0.46 | 15.6 | B | 0.37 | 14.4 | B | 0.57 | 17.2 | B | | | |
| | | | R | 0.68 | 21.8 | C | 0.36 | 15.0 | B | 0.51 | 17.6 | B | | | |
| | | WB | LT | 0.56 | 17.2 | B | 0.37 | 14.5 | B | 0.41 | 15.0 | B | | | |
| | | | R | 0.07 | 11.9 | B | 0.06 | 11.8 | B | 0.06 | 11.8 | B | | | |
| | Intersection LOS | Overall | | | 39.3 | D | | 16.3 | B | | 21.0 | C | | | |
| 36 | W 81st St & Central Park West | | | | | | | | | | | | | | |
| | | NB | LTR | 0.73 | 28.7 | C | 1.02 | 65.5 | E | 0.63 | 25.2 | C | 1.20 | 129.9 | F |
| | | SB | LTR | 1.40 | 212.6 | F | 1.06 | 79.2 | E | 0.79 | 32.1 | C | 1.19 | 129.7 | F |
| | | EB | L | 0.10 | 18.3 | B | 0.30 | 22.7 | C | 0.20 | 19.8 | B | 0.17 | 19.9 | B |
| | | | TR | 1.16 | 123.3 | F | 1.07 | 94.0 | F | 1.11 | 104.2 | F | 0.41 | 28.5 | C |
| | | WB | L | 1.33 | 205.4 | F | 1.28 | 179.7 | F | 2.05 | 510.6 | F | 0.70 | 38.5 | D |
| | | | TR | 0.99 | 62.1 | E | 0.98 | 60.5 | E | 0.85 | 42.1 | D | 0.93 | 49.3 | D |
| | Intersection LOS | Overall | | | 128.0 | F | | 84.2 | F | | 112.8 | F | | 94.4 | F |

*Table 2.3-2: Traffic Capacity Analysis for Signalized Intersections*
*2018 Future Conditions (Page 3 of 4)*

| Loc. No. | Intersection | Approach | Movement | 2018 Future - Weekday AM | | | 2018 Future - Weekday MD | | | 2018 Future - Weekday PM | | | 2018 Future - Weekday Saturday MD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS | V/C Ratio | Avg Delay | LOS |
| | W 81st St & Riverside Dr | | | | | | | | | | | | | | |
| 37 | | NB | T | 0.18 | 8.2 | A | 0.16 | 7.9 | A | 0.89 | 28.3 | C | 0.15 | 7.8 | A |
| | | SB | T | 0.56 | 11.6 | B | 0.14 | 7.6 | A | 0.17 | 7.8 | A | 0.38 | 9.5 | A |
| | | WB | LR | 0.69 | 39.3 | D | 0.35 | 28.6 | C | 0.53 | 33.2 | C | 0.34 | 28.4 | C |
| | Intersection LOS | Overall | | | 16.3 | B | | 12.9 | B | | 24.2 | C | | 11.7 | B |
| | W 86th St & Central Park West | | | | | | | | | | | | | | |
| 38 | | NB | LTR | 0.93 | 45.5 | D | 0.72 | 26.3 | C | 1.02 | 59.0 | E | 0.71 | 26.2 | C |
| | | SB | DefL | | | | | | | 1.06 | 113.3 | F | | | |
| | | | LTR | 1.11 | 91.3 | F | 0.74 | 28.6 | C | | | | 0.97 | 50.6 | D |
| | | | TR | | | | | | | 0.68 | 26.9 | C | | | |
| | | EB | L | 0.31 | 33.3 | C | 0.39 | 36.5 | D | 0.36 | 36.1 | D | 0.36 | 35.2 | D |
| | | | TR | 0.97 | 59.5 | E | 0.89 | 49.8 | D | 1.06 | 85.6 | F | 0.84 | 44.1 | D |
| | | WB | L | 0.73 | 39.4 | D | 0.63 | 31.0 | C | 0.46 | 26.4 | C | 0.55 | 27.8 | C |
| | | | TR | 0.60 | 23.7 | C | 0.71 | 26.4 | C | 0.63 | 24.3 | C | 0.63 | 24.4 | C |
| | Intersection LOS | Overall | | | 57.0 | E | | 32.2 | C | | 54.6 | D | | 36.0 | D |
| | W 86th St & Columbus Avenue | | | | | | | | | | | | | | |
| 39 | | SB | L | 0.82 | 50.0 | D | 0.51 | 33.5 | C | 0.47 | 31.9 | C | 0.59 | 35.5 | D |
| | | | TR | 0.92 | 33.1 | C | 0.62 | 20.9 | C | 0.66 | 21.6 | C | 0.45 | 18.2 | B |
| | | EB | TR | 0.73 | 32.9 | C | 0.54 | 28.3 | C | 0.67 | 30.7 | C | 0.58 | 29.0 | C |
| | | WB | LT | 0.83 | 31.2 | C | 0.75 | 26.9 | C | 0.89 | 36.8 | D | 0.87 | 34.8 | C |
| | Intersection LOS | Overall | | | 34.1 | C | | 25.2 | C | | 28.5 | C | | 27.5 | C |
| | W 86th St & Amsterdam Avenue | | | | | | | | | | | | | | |
| 40 | | NB | LTR | 0.85 | 23.8 | C | 0.64 | 18.0 | B | 0.92 | 27.7 | C | 0.68 | 18.7 | B |
| | | EB | LT | 0.92 | 44.8 | D | 0.60 | 25.4 | C | 0.70 | 28.2 | C | 0.37 | 20.8 | C |
| | | WB | TR | 0.84 | 34.4 | C | 0.64 | 25.8 | C | 0.76 | 29.6 | C | 0.59 | 24.6 | C |
| | Intersection LOS | Overall | | | 30.4 | C | | 21.2 | C | | 28.1 | C | | 20.3 | C |
| | W 86th St & Broadway | | | | | | | | | | | | | | |
| 41 | | NB | LTR | 0.35 | 14.3 | B | 0.43 | 15.3 | B | 0.42 | 15.0 | B | | | |
| | | | DefL | | | | | | | | | | 0.53 | 24.5 | C |
| | | | TR | | | | | | | | | | 0.44 | 15.7 | |
| | | SB | LTR | 0.78 | 22.7 | C | 0.73 | 21.3 | C | 0.69 | 19.8 | B | 0.47 | 15.6 | B |
| | | EB | LTR | 0.36 | 20.3 | C | 0.30 | 19.6 | B | 0.34 | 20.1 | C | 0.29 | 19.6 | B |
| | | WB | DefL | 0.79 | 49.3 | D | 0.53 | 29.3 | C | 0.79 | 49.3 | D | 0.54 | 29.4 | C |
| | | | TR | 0.55 | 24.0 | C | 0.41 | 21.4 | C | 0.47 | 22.1 | C | 0.42 | 21.4 | C |
| | Intersection LOS | Overall | | | 22.5 | C | | 19.9 | B | | 20.9 | C | | 18.7 | B |
| | W 86th St & West End Avenue | | | | | | | | | | | | | | |
| 42 | | NB | LTR | 0.33 | 10.2 | B | 0.32 | 10.0 | B | 0.75 | 17.1 | B | 0.38 | 10.6 | B |
| | | SB | LTR | 0.73 | 17.3 | B | 0.48 | 11.9 | B | 0.70 | 17.4 | B | 0.79 | 19.4 | B |
| | | EB | LTR | 0.56 | 31.5 | C | 0.44 | 29.0 | C | 0.49 | 29.9 | C | 0.44 | 29.0 | C |
| | | WB | LTR | 0.91 | 56.8 | E | 0.62 | 33.9 | C | 0.84 | 47.6 | D | 0.71 | 38.3 | D |
| | Intersection LOS | Overall | | | 26.0 | C | | 18.7 | B | | 23.7 | C | | 21.4 | C |
| | W 86th St & Riverside Dr | | | | | | | | | | | | | | |
| 43 | | NB | TR | 0.26 | 8.9 | A | 0.23 | 8.6 | A | 0.93 | 32.3 | C | 0.21 | 8.3 | A |
| | | SB | DefL | | | | 0.38 | 10.7 | B | 0.81 | 36.8 | D | | | |
| | | | LT | 0.61 | 12.6 | B | | | | | | | 0.52 | 11.2 | B |
| | | | T | | | | 0.29 | 9.0 | A | 0.28 | 8.9 | A | | | |
| | | WB | L | 0.25 | 26.8 | C | 0.14 | 25.1 | C | 0.16 | 25.4 | C | 0.35 | 28.3 | C |
| | | | R | 0.30 | 28.2 | C | 0.35 | 29.3 | C | 0.51 | 33.5 | C | 0.37 | 29.6 | C |
| | Intersection LOS | Overall | | | 14.1 | B | | 12.9 | B | | 28.6 | C | | 14.2 | B |

*Table 2.3-2: Traffic Capacity Analysis for Signalized Intersections*
*2018 Future Conditions (Page 4 of 4)*

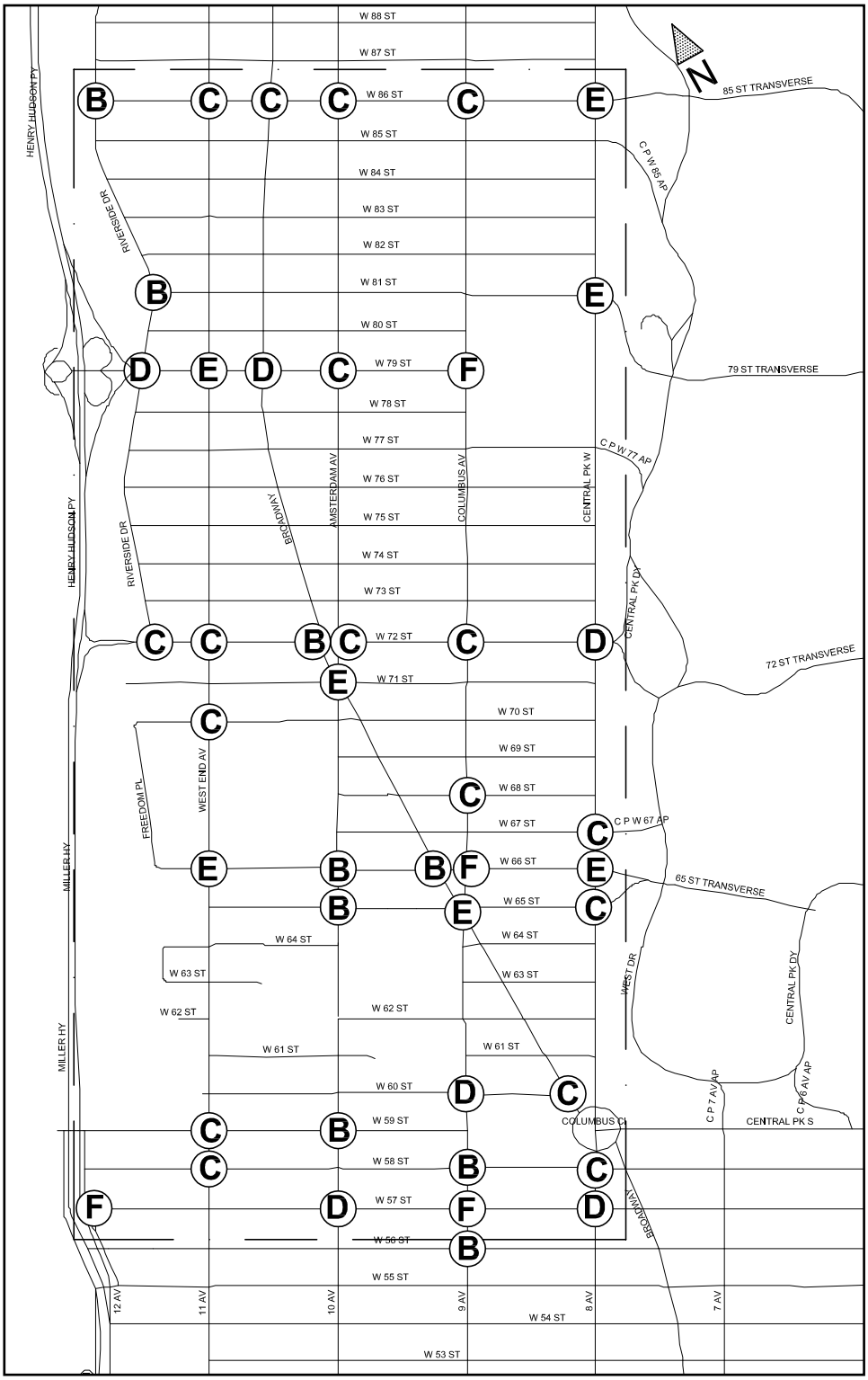


*Figure 2.3-5: AM Peak Hour Level of Service*

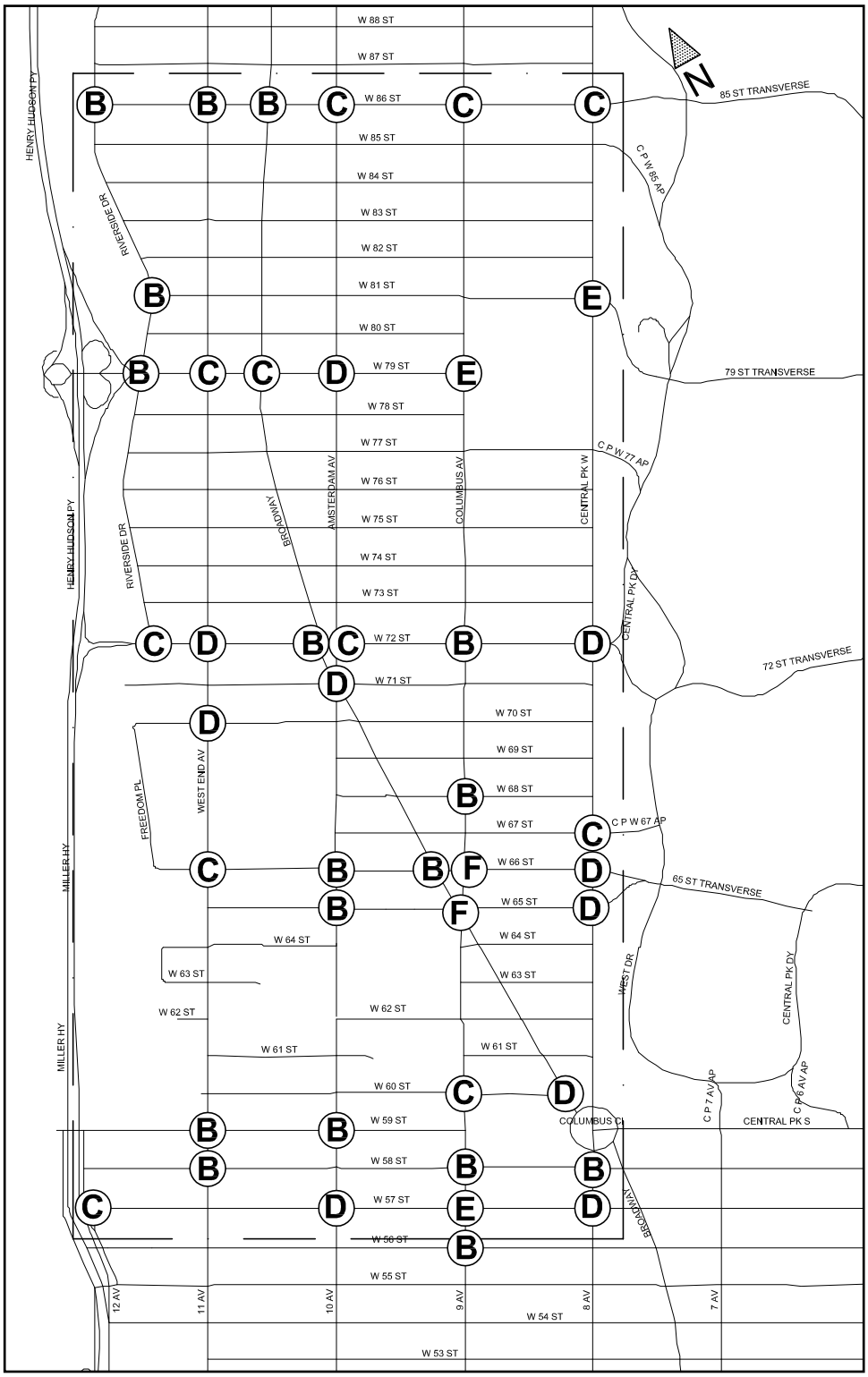


*Figure 2.3-6: MD Peak Hour Level of Service*

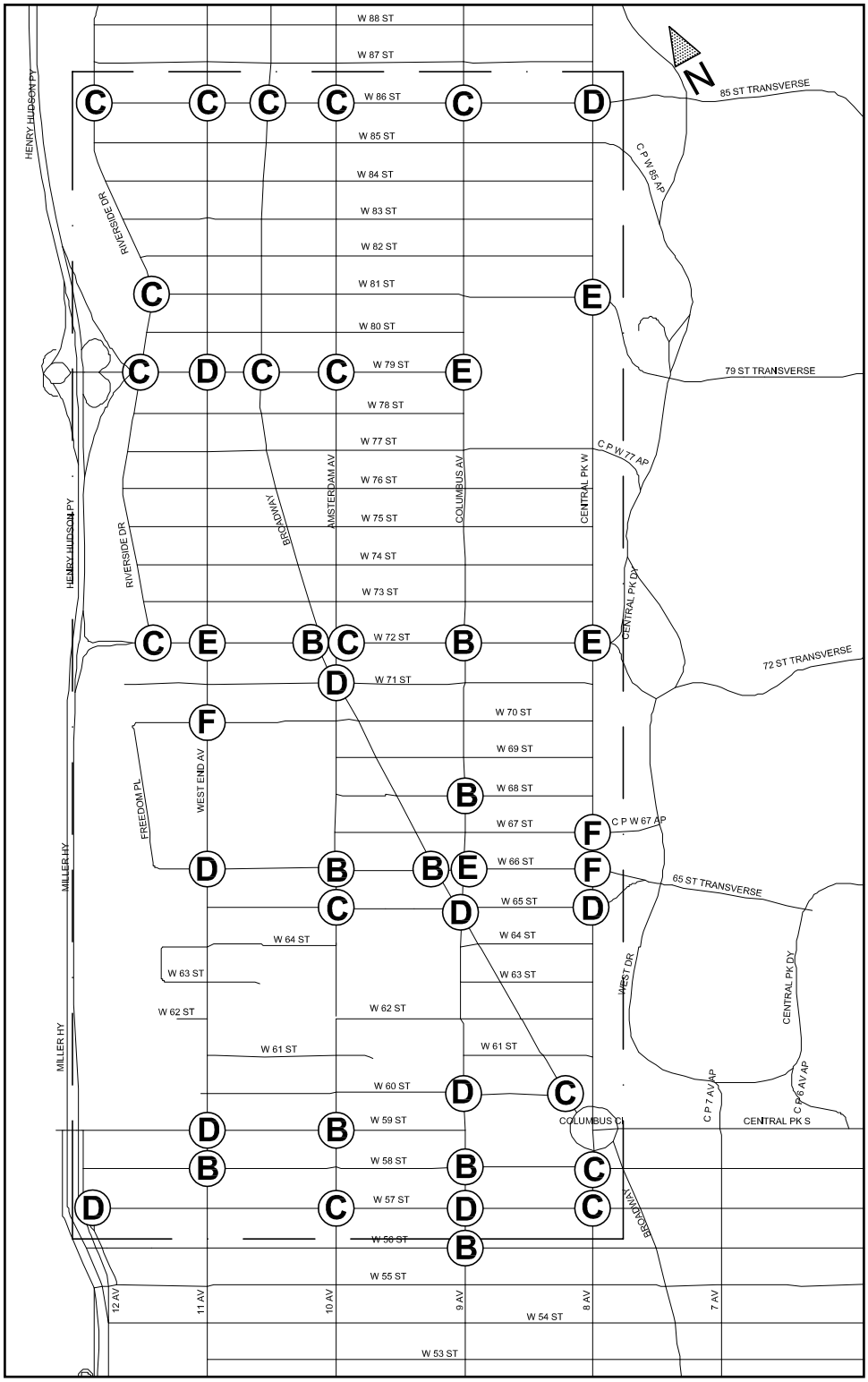


*Figure 2.3-7: PM Peak Hour Level of Service*

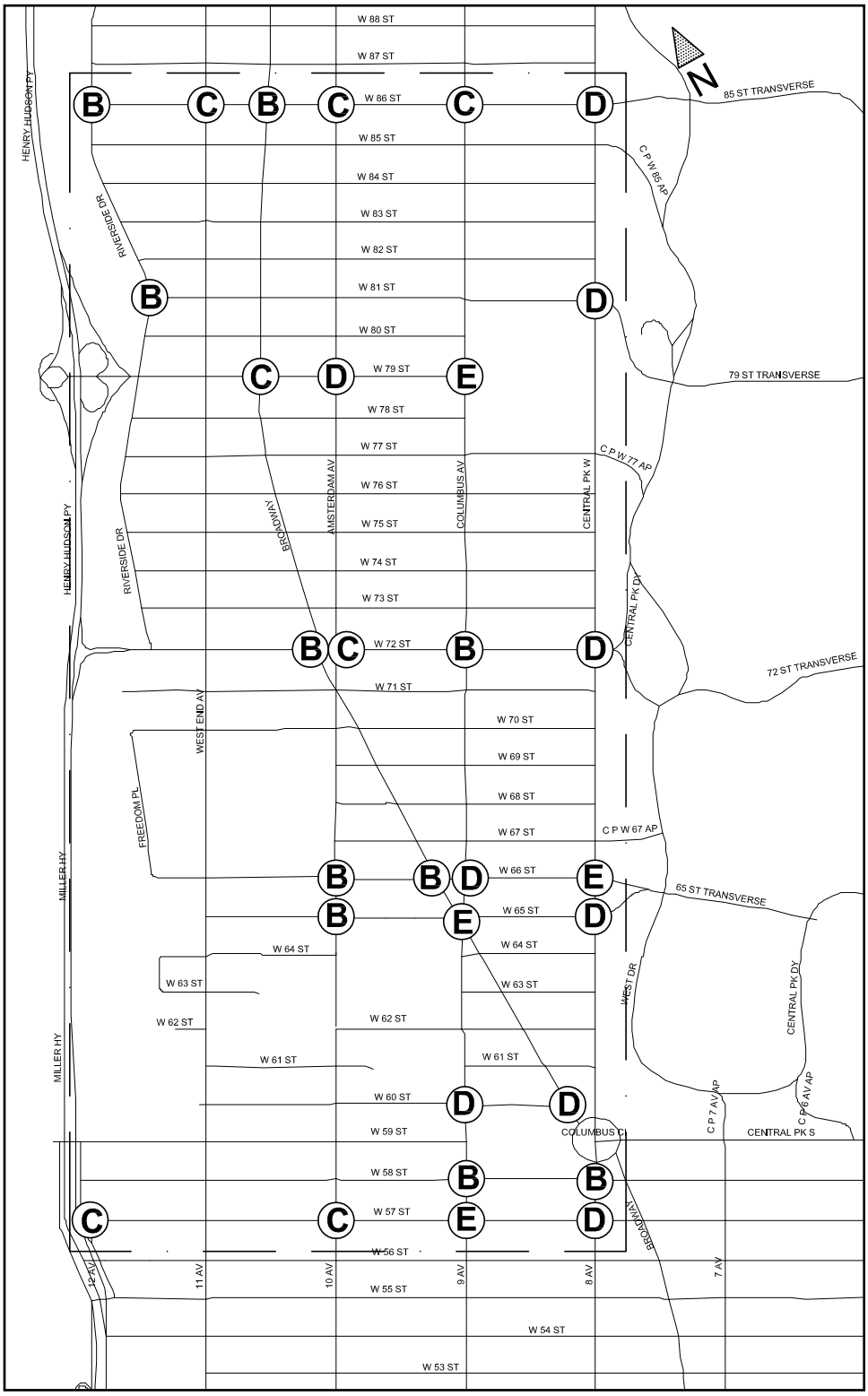


*Figure 2.3-8: Saturday MD Peak Hour Level of Service*

## 2.3.4 Future Vehicle Speeds

The future delays and travel speed along the major corridors within the study area were calculated for the weekday AM, midday, PM, and Saturday midday peak hours. The existing travel time and future delays were used to project future speeds. Future speeds are another factor in determining congestion along the main corridors in the study area. Several factors contribute to slower speed including potential vehicular and pedestrian conflicts, traffic controls, loading/unloading activities, queuing, parking activities (in and out), illegal curbside parking and standing, and roadway geometry. In general, all of the corridors analyzed will have projected future travel speed slower than under existing conditions during the various peak hours. The analyzed corridors are listed below and Figure 2.3-9 shows the average peak hour travel speed in both directions along the corridors analyzed that are listed below.

### East-West Bound

1. West 57th Street between Broadway and Twelfth Avenue (EB & WB)
2. West 65th Street between Central Park West & West End Avenue (EB)
3. West 66th Street between West End Avenue & Central Park West (WB)
4. West 72nd Street between Central Park West & Riverside Drive (EB & WB)
5. West 79th Street between Riverside Drive & Columbus Avenue (EB& WB)
6. West 81st Street between Central Park West & Riverside Drive (WB)
7. West 86th Street between Central Park West and Riverside Drive (EB & WB)

### North-South Bound

8. Central Park West/8th Avenue between West 57th Street & 86th Street (NB & SB)
9. Columbus Avenue/9th Avenue between West 57th and 86th Street (SB)
10. Amsterdam Avenue/10th Avenue between West 57th and 86th Street (NB)
11. West End Avenue/11th Avenue between West 57th and 86th Street (NB & SB)
12. Broadway between West 57th and 86th Street (NB & SB)

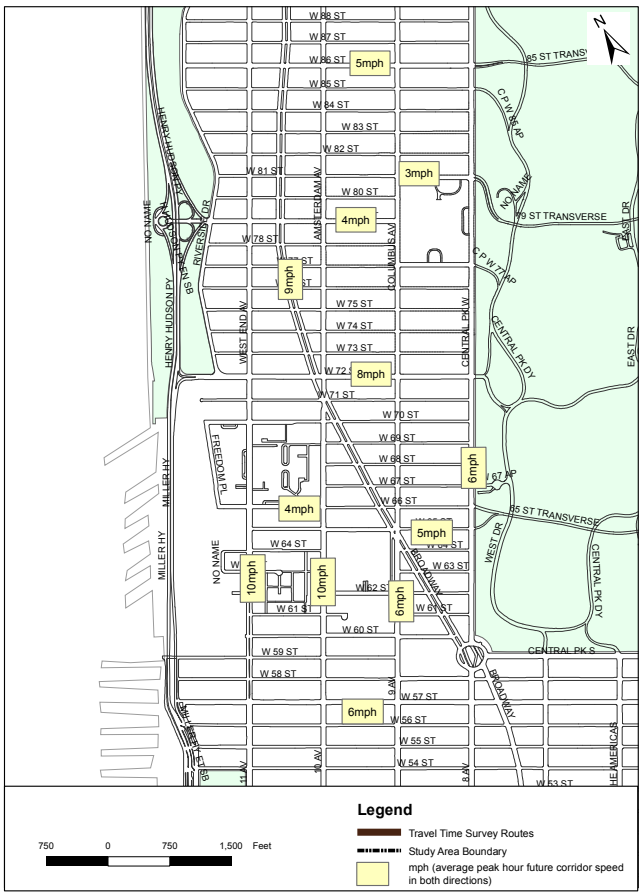


*Figure 2.3-9: Speed Run Corridors*

Table 2.3-3 summarizes the average existing and future/projected travel speeds for each corridor by direction for the various peak hours. Travel speeds throughout the study area for the various peak periods range from 2 mph to 12 mph. As shown in the table, most of the corridors have low speeds, i.e. less than 10 mph during one or more peak hours.

| No | Corridors | Time | Direction | Average Speed (MPH) | |
|---|---|---|---|---|---|
| | | | | 2008 | 2018 |
| 1 | West 57th St between Broadway & 12th Ave | AM | EB | 6.9 | 4.3 |
| | | | WB | 7.6 | 6.2 |
| | | MD | EB | 6.7 | 6.6 |
| | | | WB | 7.2 | 5.2 |
| | | PM | EB | 6.8 | 6.7 |
| | | | WB | 7.4 | 6.7 |
| 2 | W 65th St between Central Park W & West End Ave | AM | EB | 6.4 | 5.0 |
| | | MD | EB | 5.7 | 5.6 |
| | | PM | EB | 5.1 | 4.3 |
| 3 | W 66th St between Central Park W & West End Ave | AM | WB | 5.9 | 4.7 |
| | | MD | WB | 5.5 | 5.3 |
| | | PM | WB | 5.1 | 4.4 |
| 4 | W72nd St between Central Park W & Riverside Dr | AM | EB | 8.9 | 8.8 |
| | | | WB | 9.6 | 9.3 |
| | | MD | EB | 6.7 | 6.6 |
| | | | WB | 6.2 | 6.1 |
| | | PM | EB | 7.8 | 7.7 |
| | | | WB | 8.8 | 8.6 |
| 5 | W 79th St between Riverside Dr & Columbus Ave | AM | EB | 4.4 | 3.8 |
| | | | WB | 4.8 | 4.2 |
| | | MD | EB | 5.9 | 5.5 |
| | | | WB | 4.5 | 4.2 |
| | | PM | EB | 4.4 | 4.1 |
| | | | WB | 4.4 | 4.2 |
| 6 | W 81st St between Riverside Dr & Amsterdam Ave | AM | WB | 3.2 | 3.2 |
| | | MD | WB | 2.6 | 2.6 |
| | | PM | WB | 2.0 | 2.0 |
| 7 | W 86th St between Central Pk West & Riverside Dr | AM | EB | 6.2 | 5.8 |
| | | | WB | 5.1 | 5.0 |
| | | MD | EB | 6.6 | 6.3 |
| | | | WB | 6.9 | 6.8 |
| | | PM | EB | 5.1 | 4.7 |
| | | | WB | 6.1 | 5.8 |
| 8 | Central Park West between W 57th St & W86th St | AM | NB | 7.6 | 6.7 |
| | | | SB | 7.3 | 6.8 |
| | | MD | NB | 8.4 | 7.7 |
| | | | SB | 7.1 | 6.9 |
| | | PM | NB | 8.1 | 6.3 |
| | | | SB | 6.4 | 6.1 |
| 9 | Columbus Ave between W 57th & W 86th St | AM | SB | **10.3** | 6.0 |
| | | MD | SB | 5.6 | 4.3 |
| | | PM | SB | 8.1 | 6.6 |
| 10 | Amsterdam Ave between W57th & W86th St | AM | **NB** | 10.3 | 10.2 |
| | | MD | **NB** | 11.4 | 11.2 |
| | | PM | NB | 10.2 | 10.0 |
| 11 | West End Ave between W 57th & W 86th St | AM | NB | 9.8 | 9.2 |
| | | | SB | 12.2 | 11.8 |
| | | MD | NB | 10.1 | 10.1 |
| | | | SB | 10.9 | 10.2 |
| | | PM | NB | 8.6 | 8.2 |
| | | | SB | 8.8 | 7.9 |
| 12 | Broadway between W 57th & W 86th St | AM | NB | 9.5 | 9.4 |
| | | | SB | 10.3 | 10.3 |
| | | MD | NB | 9.9 | 9.9 |
| | | | SB | 8.2 | 8.2 |
| | | PM | NB | 8.8 | 7.9 |
| | | | SB | 8.5 | 8.6 |

*Table 2.3-3: Corridor Travel Speed Summary*

## 2.4 Public Transportation

The study area is well served by public transportation. There is bus or train service on every major north-south corridor (Riverside Drive, West End Avenue, Broadway, Amsterdam Avenue, Columbus Avenue and Central Park West) as well as major east-west streets (86th Street, 79th Street, 72nd Street, 65th and 66th Streets, and 57th Street). Eleven bus lines (M5, M7, M10, M11, M31, M57, M66, M72, M79, M86, and M104) and seven subway lines (A, B, C, D, 1, 2, and 3) operate in the study area. Recent service changes implemented by the Metropolitan Transportation Authority – New York City Transit (MTA-NYCT) in March 2010 involve service modification on several bus and subway routes that serve the study area. The bus routes with service modifications in the study area are M10, M11, and M66; service on the 1, A, and D trains have also been modified.

### 2.4-1 Buses

The M10 bus provides service between 159th Street and Columbus Circle (previously service was provided to West 31st Street). Within the study area, the M10 bus operates along Central Park West between West 86th Street and Columbus Circle (with southbound buses traveling along West 63rd Street and Broadway).

The M11 bus provides service between West 145th Street/Riverbank State Park and Bethune Street/Hudson Street (Greenwich Village). Within the study area, southbound M11 buses operate along Columbus Avenue between West 86th Street and West 57th Street, and northbound buses operate along Amsterdam Avenue. Service is now provided on this route between 6:00 AM (instead of 4:45 AM) and 12:30 AM.

The M66 bus provides service between York Avenue/East 67th Street and West End Avenue/West 66th Street. Within the study area, eastbound service is provided along 65th Street between West End Avenue and Central Park West, and westbound service is provided along 66th Street between Central Park West and West End Avenue. Service is provided on this route between 5:00 AM and 1:00 AM (previously 24 hours).

*Figure 2.4-1: Bus and Subway Routes*

## 2.4-2 Subway Service

The Metropolitan Transportation Authority – New York City Transit (MTA-NYCT) operates seven subway lines along two routes, which serve a total of eight subway stations within the study area. The trains serving the study area are the 1, 2, 3, A, B, C, and D. Table 2.4-1 lists the subway lines and stations, and Figure 2.4-2 shows the subway routes and stations within the study area.

| Lines | Routes | Stations |
|---|---|---|
| 1 (Local Service) | Broadway | • 59th Street |
| | | • 66th Street |
| | | • 72nd Street |
| | | • 79th Street |
| | | • 86th Street |
| 2 and 3 (Express Service) | Broadway | • 72nd Street |
| A and D (Express Service) B and C (Local Service) | Central Park West | • 59th Street (A, B, C, & D) |
| | | • 72nd Street (B & C) |
| | | • 81st Street (B & C) |
| | | • 86th Street (B & C) |

*Table 2.4-1: Subway Service*

*Figure 2.4-2: Subway Routes*

The "1" subway line provides service from 242nd Street (Bronx) to South Ferry (Manhattan) making local stops. In the study area, it provides service along Broadway at the five stations shown in Table 2.4-1. This line operates at all times. Since March 2010, there are longer passenger waits (approximately one minute) and increased passenger loads (more passengers standing) on weekdays (midday and evenings) and weekend. During the weekend, train frequency would decrease from every 6 to every 8 minutes.

The "A" subway line provides service from 207th Street (Manhattan) to Lefferts Boulevard or Far Rockaway (Queens) making express stops in Manhattan and Brooklyn. During the day, it makes only one stop in the study area at 59th Street; however, after 11 PM it replaces the "C" train and makes local stops in Manhattan and Brooklyn. This line operates at all times. On weekends, Sunday, headways vary from every 8 to every 10 minutes.

The "D" subway line provides service from 205th Street/Norwood (Bronx) to Coney Island/Stillwell Avenue (Brooklyn), making one stop in the study area. During rush hours, this train runs express in the Bronx (peak direction), express in Manhattan, and express along Fourth Avenue in Brooklyn; at other times it operates local in the Bronx, express in Manhattan, and local in Brooklyn. This train operates at all times. On weekends, headways have increased from 8 to 10 minutes.

## 2.5 Parking

The existing conditions parking analysis showed that on-street parking spaces were well utilized in the study area during all peak hours. Utilization during the AM, midday, PM, and Saturday peak hours averaged 94%, 101%, 91%, and 92%, respectively. On the other hand, while on-street parking utilization was consistently over 90%, off-street parking was consistently underutilized with approximate utilization of 56%, 63%, and 56% during the AM, midday, and PM peak hours, respectively. Parking utilization for both on- and off-street parking spaces are affected by a variety of factors such as price, availability, location, parking regulation, and surrounding land-use. Under future conditions, both on-street and off-street parking utilization are expected to increase slightly.

### 2.5-1 On-Street Parking

The existing conditions parking analysis subdivided the study area into three parts based on land use. The southern part (more commercial) lies between Central Park West and the Hudson River from West 54th Street to West 65th Street. The middle section (mixed residential and commercial) includes the area from Central Park West to the Hudson River from West 66th Street to West 75th Street. The northern part (more residential) includes the area between Central Park West and the Hudson River from West 76th Street to West 86th Street.

On-street parking capacity within the study area varies by time of day as a function of existing parking regulations. These parking regulations range from alternate side of the street parking on residential streets including metered-parking, no standing zones, authorized parking and loading zones. The parking analysis showed that the total parking capacity in the study area increased through the day from 7,091 spaces during the AM, 7,615 at midday, and 7,986 during the PM peak hour; capacity peaked during weekends with 8,516 spaces. Parking conditions are expected to change in the future as parking regulations changes are made such as the use of smart parking strategies.

### 2.5-2 Off-Street Parking

The field survey identified over 80 off-street parking facilities (garages and lots), of which data was available for 49. Under future conditions, off-street parking is expected to increase as new developments such as Riverside Center provide more parking facilities in the study area. Some off-street parking facilities may also be eliminated as garages or lots are converted to other uses. The existing (2008) and future (2018) off-street parking facilities (based on known developments) are listed in Table 2.5-1 and shown in Figure 2.5-1.

*Table 2.5-1: Off-Street Parking Facilities*

| License No. | Name | Address | Capacity |
|---|---|---|---|
| 427303 | HAMMER, GEOFFREY ET AL | 267 WEST 87 STREET | 201 |
| 1204604 | KINNEY PARKING SYSTEM INC | 211-15 WEST 87 STREET | 131 |
| 427304 | HAMMER, GEOFFREY ET AL | 271 WEST 87 STREET | 96 |
| 850402 | ACTIVE PARKING LLC | 2361 2379 BROADWAY | 124 |
| 954111 | KINNEY WEST 83RD STREET INC. | 157 161 WEST 83RD STREET | 182 |
| 954109 | KINNEY WEST 83RD STREET INC. | 147 WEST 83 STREET | 182 |
| 1029322 | STANDARD PARKING CORPORATION | 200 CENTRAL PARK WEST | 388 |
| 921454 | RAPID RIVERSIDE CORP | 70 RIVERSIDE DRIVE | 80 |
| 788455 | ULTRA PARK LLC | 424 WEST END AVENUE | 83 |
| 1290227 | WEST 79TH STREET PARKING CORP | 200 WEST 79 STREET | 95 |
| 1331277 | 219 GARAGE CORP | 219 WEST 77 STREET | 225 |
| 1249221 | 77 WEST LLC | 203 WEST 77 STREET | 75 |
| 427562 | THE HERTZ CORP | 21O WEST 77 STREET | 250 |
| 920608 | CAROUSEL PARKING CORP | 201 WEST 75 STREET | 278 |
| 429467 | ELEVEN RIVERSIDE DRIVE GARAGE CORP | 11 RIVERSIDE DRIVE | 200 |
| 1283824 | 2109 BROADWAY PARKING LLC | 2101 BROADWAY | 106 |
| 905127 | 15 WEST 72ND ST CORP | 15 WEST 72 STREET | 176 |
| 1218108 | 240 RIVERSIDE PARKING LLC | 240 RIVERSIDE BOULEVARD | 162 |
| 855640 | ASTRO PARKING LLC | 155 WEST 70 STREET | 43 |
| 1193008 | QUIK PARK HUDSON LLC | 180 RIVERSIDE BOULEVARD | 210 |
| 1304852 | | 200 WEST END AVENUE | 76 |
| 1338621 | QUIK PARK HUDSON LLC | 200 RIVERSIDE BOULEVARD | 284 |
| 959098 | COPLEY ASSOCIATES LLC | 2000 BROADWAY | 57 |
| 1193087 | QUIK PARK HUDSON LLC | 140 RIVERSIDE BOULEVARD | 41 |
| 901087 | LTG PARKING CORP | 165 WEST END AVENUE | 445 |
| 901088 | LTG PARKING CORP | 150 WEST END AVENUE | 163 |
| 813398 | ALLIE GARAGE CORP | 124 WEST 60 STREET | 125 |
| 883451 | 10 W 66TH ST GARAGE CORP | 10 WEST 66 STREET | 80 |
| 1306478 | | 100 RIVERSIDE BOULEVARD | 48 |
| 1061198 | 101 WEST END PARKING LLC | 101 WEST END AVENUE | 166 |
| 761016 | 64TH WEST END PARKING LLC | 110 WEST END AVENUE | 106 |
| 1213869 | Broadway & 64th Parking LLC | 1900-1916 BROADWAY | 400 |
| 964023 | CENTRAL PARKING SYSTEM OF NEW YORK ,INC | 1 WEST END AVENUE | 1850 |
| 948832 | WEST END TOWERS GARAGE CORP | 55 WEST END AVENUE | 446 |
| 1013719 | GARAGE MANAGEMENT CORPORATION | 44 WEST 62 STREET | 143 |
| ~~*1097071~~ | ~~MTP 59 ST LLC~~ | ~~641 WEST 59 STREET~~ | ~~537~~ |
| 1171649 | PROPARK AMERICA NEW YORK LLC | 515 WEST 59 STREET | 190 |
| 884653 | CONCERTO GARAGE CORP | 200 WEST 60 STREET | 265 |
| 1171216 | CENTRAL PARKING SYSTEM OF NEW YORK | 214-216 WEST 80 STREET | 147 |
| 1105005 | CENTRAL PARKING SYSTEM OF NEW YORK, INC | 10 COLUMBUS CIRCLE | 662 |
| 960635 | A.M.D. LLC | 400 WEST 59 STREET | 294 |
| 1137953 | KINNEY PARKING SYSTEM, INC | 838-852 11 AVENUE | 84 |
| 368157 | EFFECTIVE PARKING LLC | 435 WEST 57 STREET | 55 |
| ~~*429031~~ | ~~57 & 11 PARKING CORP~~ | ~~622 WEST 57 STREET~~ | ~~1009~~ |
| 368300 | APEX PARKING LLC | 440 WEST 57 STREET | 378 |
| 1093313 | CHAMPION PARKING 57 LLC | 316 WEST 57 STREET | 372 |
| 1148650 | WORTHY PARKING LLC | 841 10 AVENUE | 86 |
| 427688 | 411 WEST 55TH STREET CORP | 411 WEST 55 STREET | 189 |
| 1010039 | 300 PARKING INC | 300 WEST 55 STREET | 92 |
| **Proposed Off-Street Parking in the Study Area**** | | | |
| | RIVERSIDE SOUTH - BUILDING I | | 253 |
| | RIVERSIDE SOUTH - BUILDING J | | 232 |
| | RIVERSIDE SOUTH - BUILDING K | | 699 |
| | RIVERSIDE SOUTH - BUILDING L | | 149 |
| | RIVERSIDE SOUTH - BUILDING M | | 152 |
| | AVALON BUILDING 57TH STREET | | 500 |
| | DURST WEST 57TH STREET | | 399 |
| | | 243 WEST 60TH STREET | 160 |
| | | 100 RIVERSIDE BOULEVARD | 179 |

*Garages to be closed.

**Source: Riverside Center Final Supplemental Environmental Impact Statement

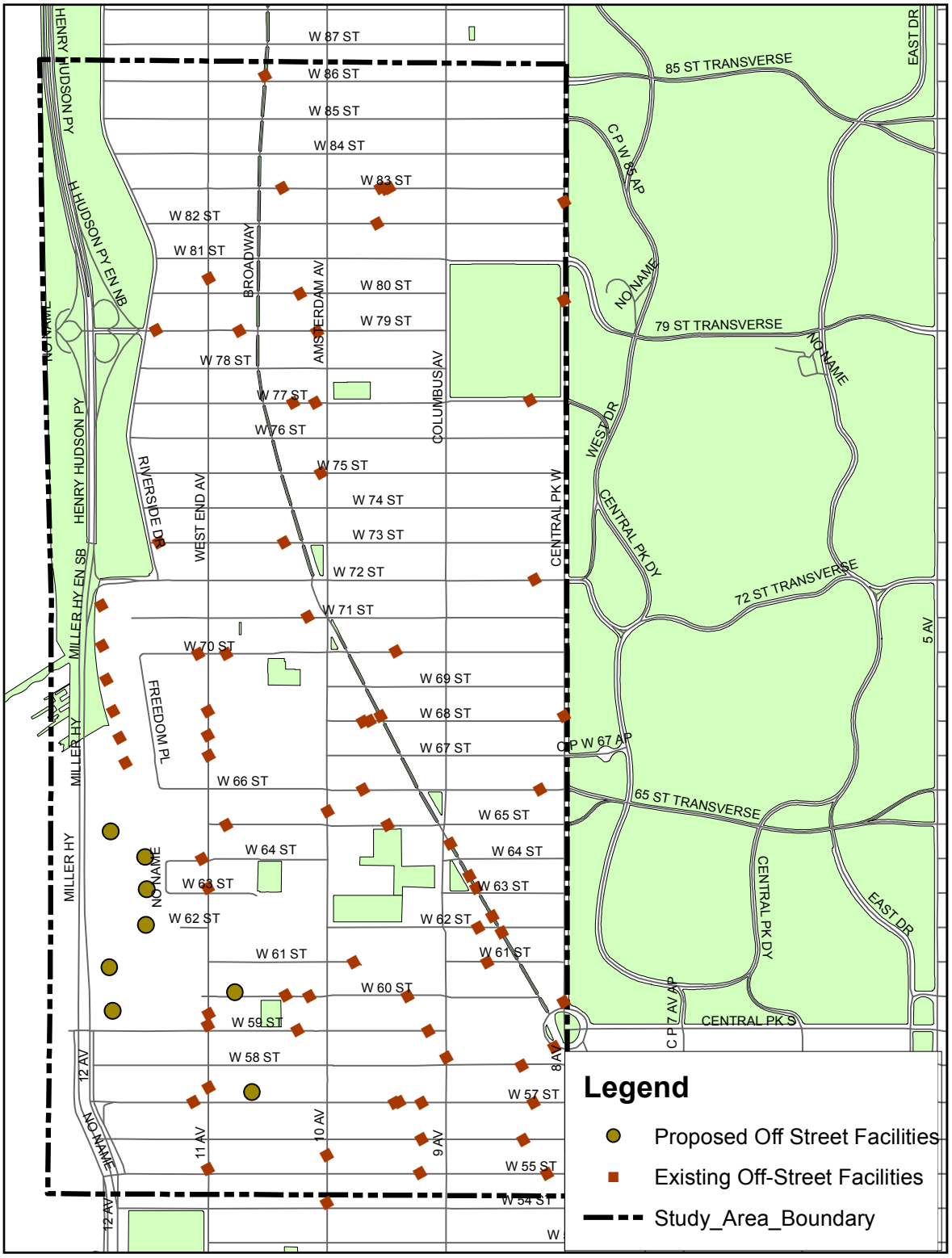


*Figure 2.5-1: Off-Street Parking Facilities (Existing 2008 and Proposed 2018)*

## 2.6 Pedestrains and Bicycles

Pedestrian volumes are expected to increase in the study area for all peak hours in the future. This likely increase is attributed to increased economic activity, population growth, and development density. Generally, all trips generated by transit, autos and taxis contain a walking component at the beginning or at the end. As under the existing conditions, the highest pedestrian volumes will be in the vicinity of commercial establishments, transit hubs, and along main corridors such as Broadway, Columbus Avenue, Central Park West, West 72nd Street, West 66th Street, and West 57th Street. Projected pedestrian volumes are shown in Figures 2.6-1 to 2.6-4. Future pedestrian LOS was determined using the 2000 Highway Capacity Manual methodologies.

The future conditions crosswalk analysis for the 26 intersections studied showed acceptable LOS C or better for most crosswalks. However, ten intersections had one or more crosswalks with LOS D or worse during one or more peak hours. The results of the future conditions crosswalk analyses are shown in Table 2.6-1.

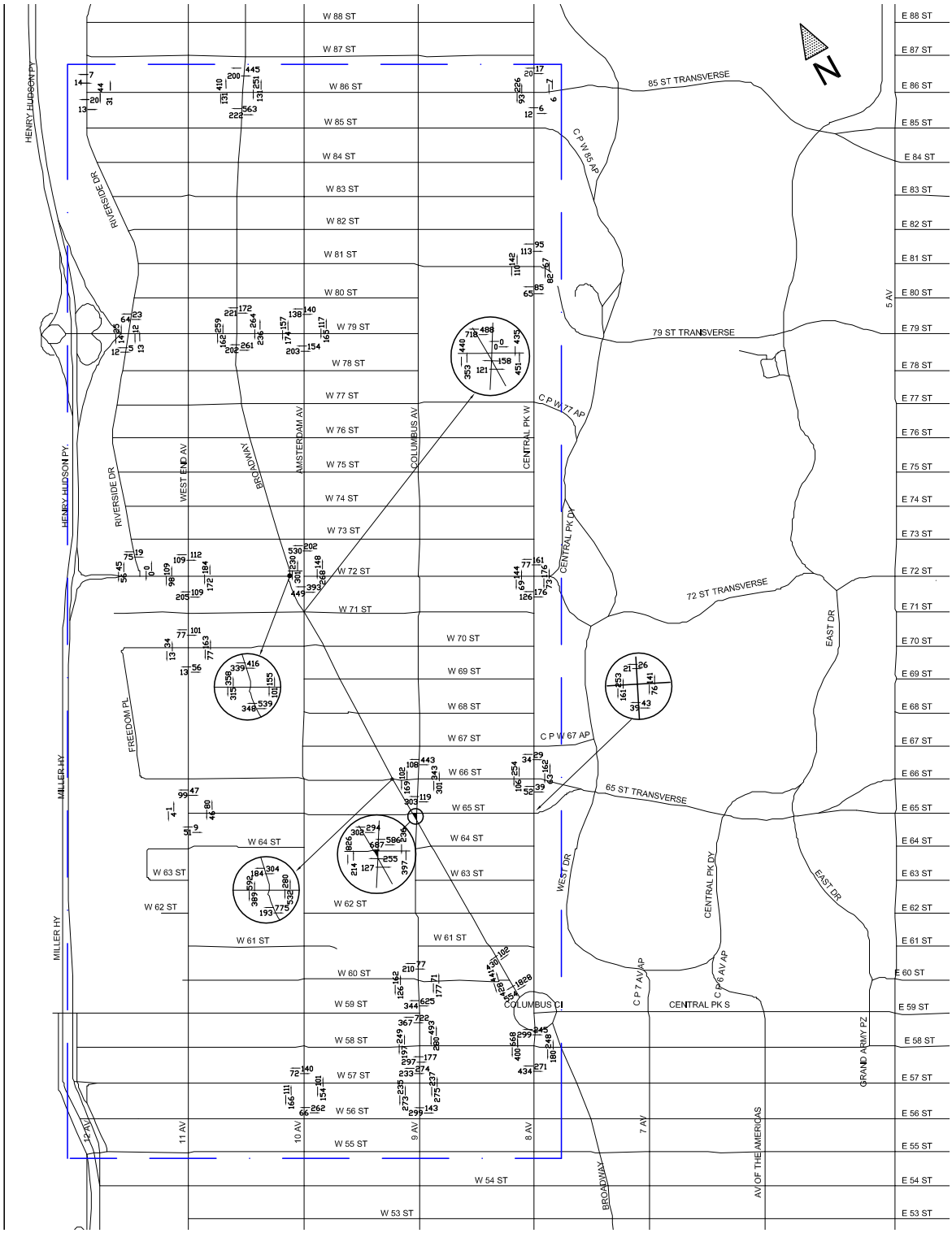


*Figure 2.6-1: AM Peak Hour Pedestrian Volumes (2018)*

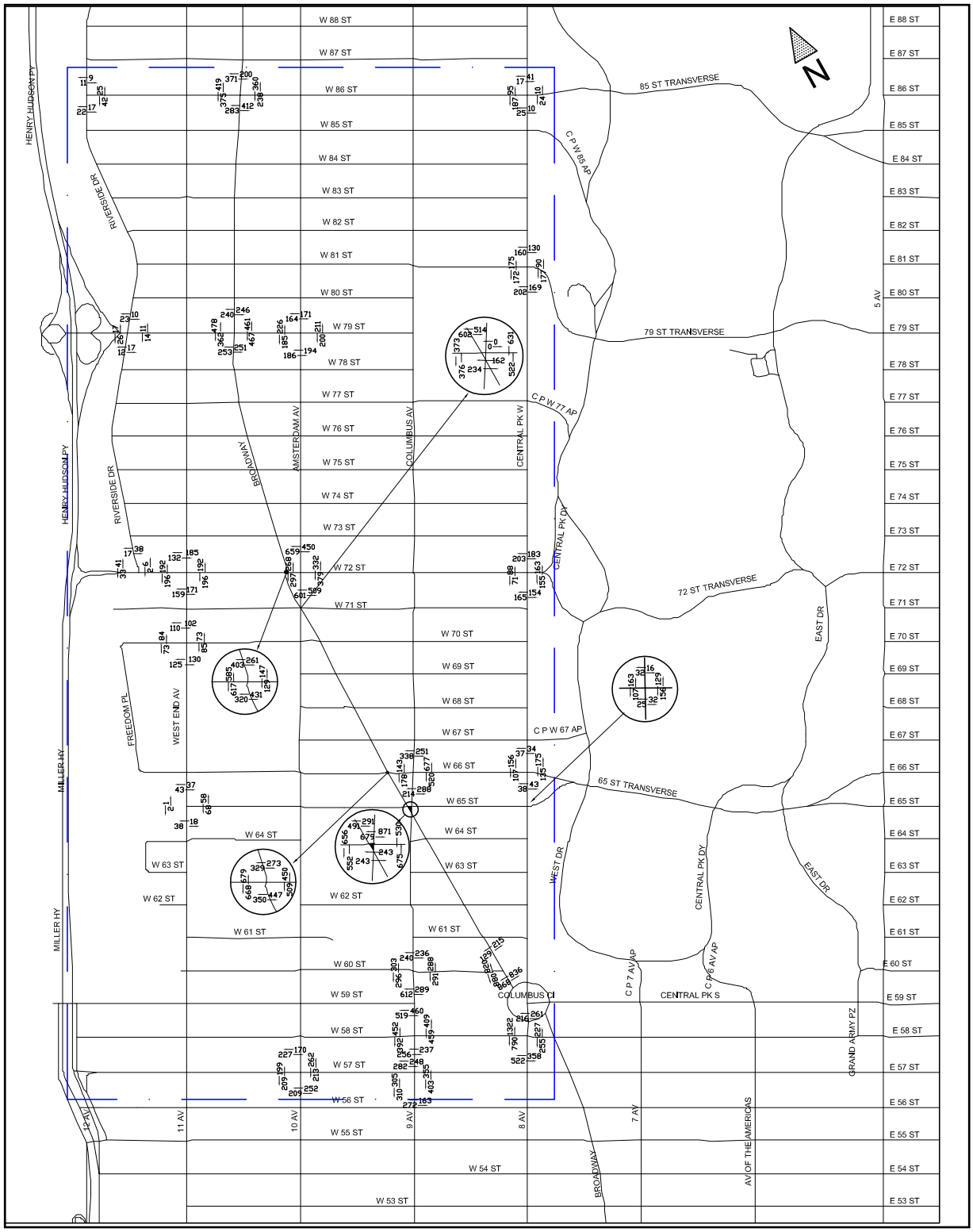


*Figure 2.6-2: MD Peak Hour Pedestrian Volumes (2018)*

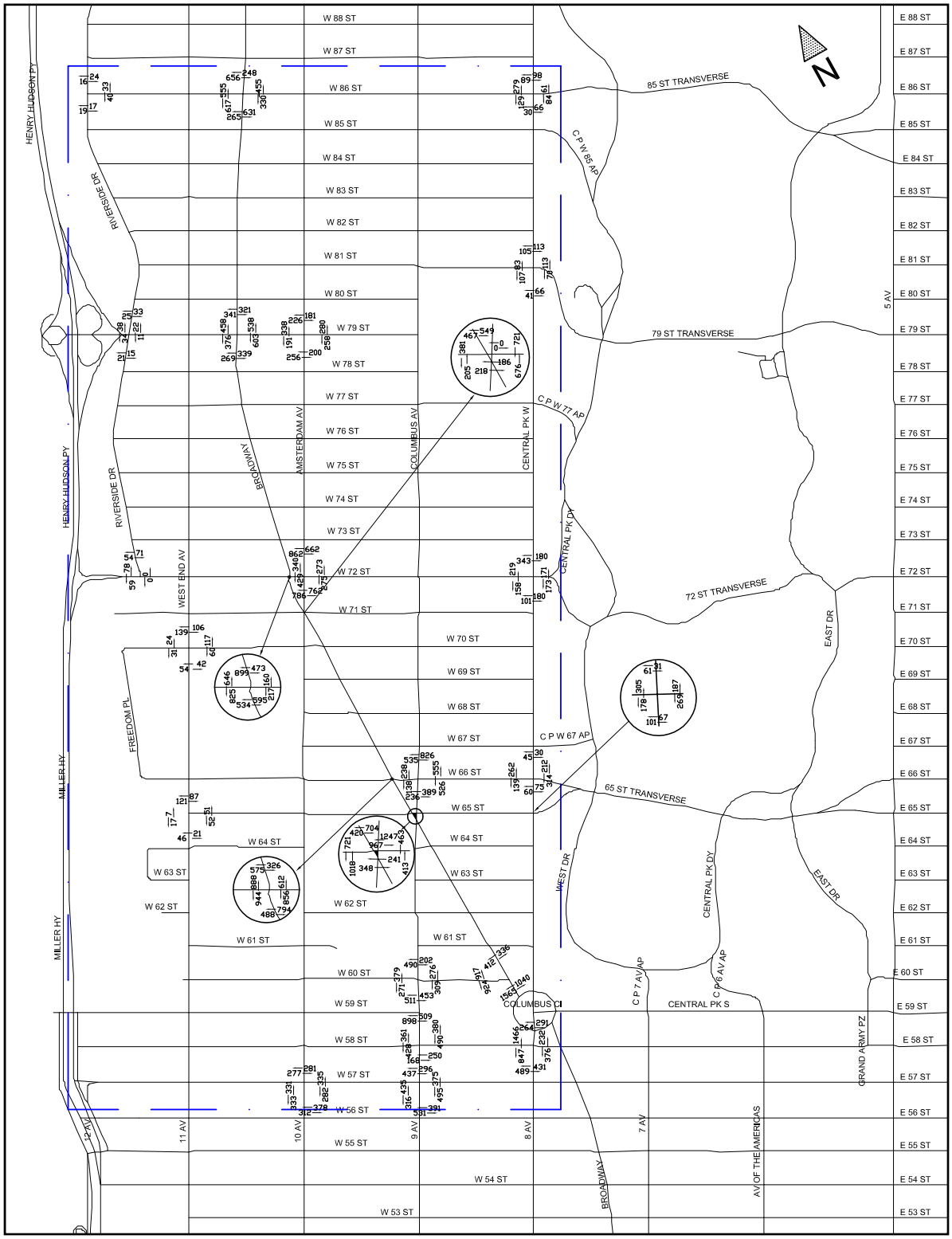


*Figure 2.6-3: PM Peak Hour Pedestrian Volumes (2018)*

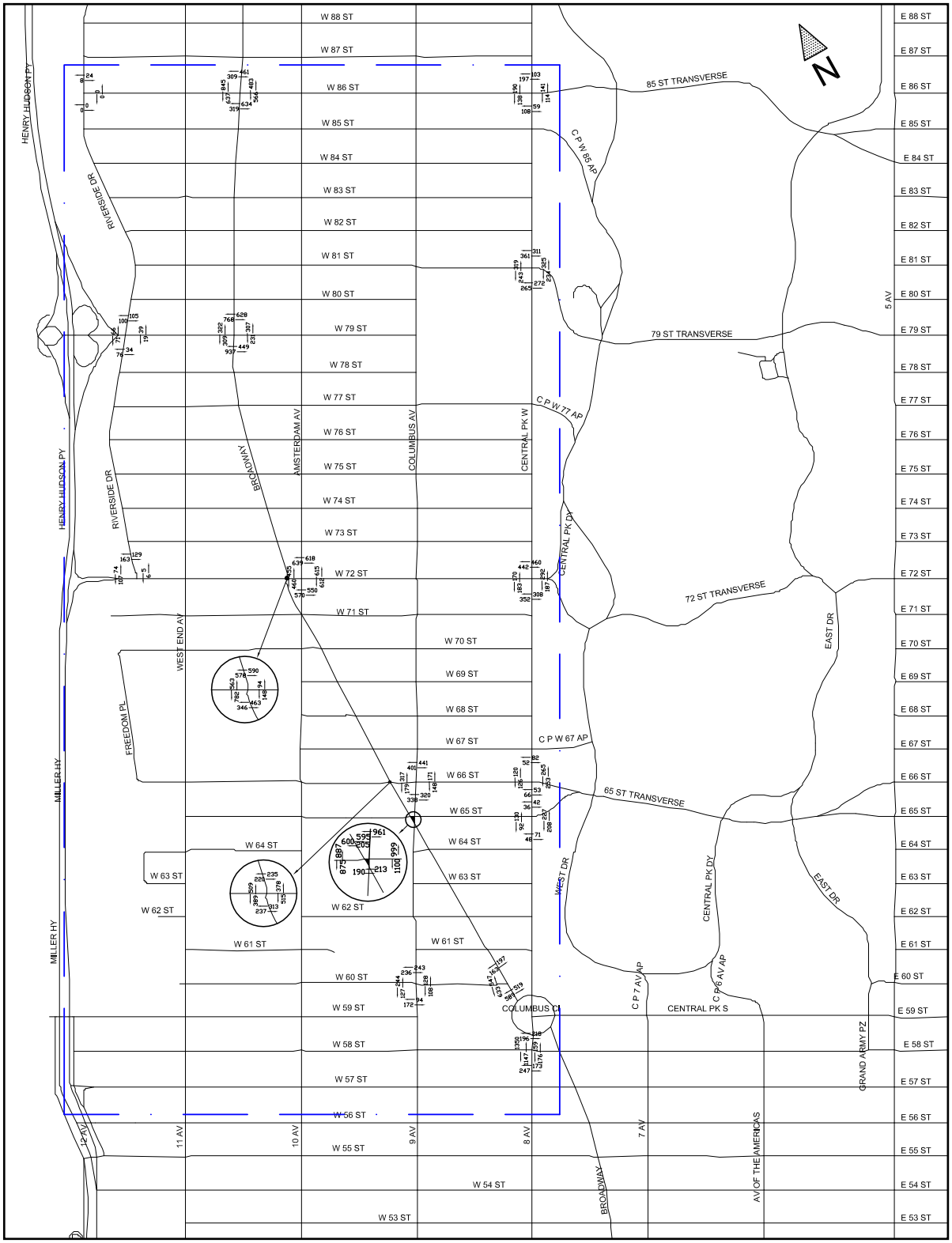


*Figure 2.6-4: Saturday MD Peak Hour Pedestrian Volumes*

| Intersection | Crosswalk | AM | | Midday | | PM | | Sat | |
|---|---|---|---|---|---|---|---|---|---|
| | | SF/P | LOS | SF/P | LOS | SF/P | LOS | SF/P | LOS |
| W 72 Street & Central Park West | North | 292.9 | A | 83.7 | A | 73.2 | A | 49.2 | B |
| | South | 200.1 | A | 107.8 | A | 121.9 | A | 54.4 | B |
| | East | 155.7 | A | 132.9 | A | 103.5 | A | 95.6 | A |
| | West | 198.2 | A | 244.5 | A | 111.1 | A | 107.7 | A |
| W 72 Street & Amsterdam Avenue | North | 45.3 | B | 39.1 | C | 25.2 | C | 36.7 | C |
| | South | 48.4 | B | 40.1 | B | 27.8 | C | 45.1 | B |
| | East | 158.0 | A | 119.2 | A | 145.5 | A | 61.2 | A |
| | West | 126.2 | A | 152.0 | A | 96.1 | A | 86.1 | A |
| W 72 Street & Broadway | North | 70.6 | A | 83.1 | A | 41.5 | B | 49.8 | B |
| | South | 40.7 | B | 53.7 | B | 37.1 | C | 60.4 | A |
| | East | 301.7 | A | 299.4 | A | 219.6 | A | 254.0 | A |
| | West | 130.2 | A | 72.5 | A | 58.9 | B | 71.4 | A |
| W 72 Street & West End Avenue | North | 155.6 | A | 156.5 | A | 111.5 | A | Not Analyzed | |
| | South | 70.6 | A | 204.7 | A | 88.7 | A | | |
| | East | 197.5 | A | 202.4 | A | 187.4 | A | | |
| | West | 81.6 | A | 73.7 | A | 44.4 | B | | |
| W 72 Street & Riverside Drive | North | 103.1 | A | 312.2 | A | 135.4 | A | 72.9 | A |
| | South | Not Applicable | | | | | | | |
| | East | Not Applicable | | | | | | | |
| | West | 586.4 | A | 429.6 | A | 389.4 | A | 268.8 | A |
| W 79 Street & Amsterdam Avenue | North | 51.3 | B | 44.5 | B | 39.0 | C | Not Analyzed | |
| | South | 113.3 | A | 104.6 | A | 91.4 | A | | |
| | East | 234.6 | A | 173.8 | A | 127.0 | A | | |
| | West | 197.8 | A | 108.6 | A | 110.8 | A | | |
| W 79 Street & Broadway | North | 83.1 | A | 61.1 | A | 48.2 | B | 21.1 | D |
| | South | 49.4 | B | 50.2 | B | 38.1 | C | 15.7 | D |
| | East | 163.1 | A | 97.0 | A | 78.5 | A | 147.2 | A |
| | West | 225.7 | A | 100.4 | A | 113.7 | A | 82.8 | A |
| W 79 Street & Riverside Drive | North | 167.0 | A | 462.6 | A | 341.7 | A | 225.0 | A |
| | South | 906.8 | A | 989.8 | A | 445.0 | A | 294.2 | A |
| | East | 841.6 | A | 723.2 | A | 722.0 | A | 576.9 | A |
| | West | 457.2 | A | 458.4 | A | 281.2 | A | 275.4 | A |
| W 81 Street & Central Park West | North | 209.3 | A | 117.9 | A | 161.4 | A | 86.9 | A |
| | South | 238.0 | A | 59.3 | B | 359.1 | A | 91.4 | A |
| | East | 336.7 | A | 139.6 | A | 272.5 | A | 118.3 | A |
| | West | 198.0 | A | 195.5 | A | 265.8 | A | 101.7 | A |
| W 86 Street & Central Park West | North | 415.7 | A | 128.3 | A | 100.0 | A | 75.2 | A |
| | South | 595.3 | A | 436.9 | A | 181.5 | A | 95.1 | A |
| | East | 3487.0 | A | 1456.9 | A | 402.8 | A | 329.8 | A |
| | West | 257.7 | A | 269.5 | A | 192.5 | A | 299.0 | A |
| W 86 Street & Broadway | North | 70.2 | A | 81.6 | A | 50.2 | B | 54.7 | B |
| | South | 59.4 | B | 63.1 | A | 50.6 | B | 46.3 | B |
| | East | 182.5 | A | 102.7 | A | 93.3 | A | 63.8 | A |
| | West | 115.8 | A | 84.9 | A | 61.9 | A | 44.4 | B |
| W 86 Street & Riverside Drive | North | 694.7 | A | 320.6 | A | 432.9 | A | 342.8 | A |
| | South | 617.1 | A | 415.1 | A | 351.6 | A | 749.1 | A |
| | East | 480.8 | A | 916.0 | A | 819.2 | A | 593.4 | A |
| | West | Not Applicable | | | | | | | |

*Table 2.6-1: Crosswalk Level of Service (2018)*
*(1 of 2)*

| Intersection | Crosswalk | AM | | Midday | | PM | | Sat | |
|---|---|---|---|---|---|---|---|---|---|
| | | SF/P | LOS | SF/P | LOS | SF/P | LOS | SF/P | LOS |
| W 72 Street & Central Park West | North | 292.9 | A | 83.7 | A | 73.2 | A | 49.2 | B |
| | South | 200.1 | A | 107.8 | A | 121.9 | A | 54.4 | B |
| | East | 155.7 | A | 132.9 | A | 103.5 | A | 95.6 | A |
| | West | 198.2 | A | 244.5 | A | 111.1 | A | 107.7 | A |
| W 72 Street & Amsterdam Avenue | North | 45.3 | B | 39.1 | C | 25.2 | C | 36.7 | C |
| | South | 48.4 | B | 40.1 | B | 27.8 | C | 45.1 | B |
| | East | 158.0 | A | 119.2 | A | 145.5 | A | 61.2 | A |
| | West | 126.2 | A | 152.0 | A | 96.1 | A | 86.1 | A |
| W 72 Street & Broadway | North | 70.6 | A | 83.1 | A | 41.5 | B | 49.8 | B |
| | South | 40.7 | B | 53.7 | B | 37.1 | C | 60.4 | A |
| | East | 301.7 | A | 299.4 | A | 219.6 | A | 254.0 | A |
| | West | 130.2 | A | 72.5 | A | 58.9 | B | 71.4 | A |
| W 72 Street & West End Avenue | North | 155.6 | A | 156.5 | A | 111.5 | A | Not Analyzed | |
| | South | 70.6 | A | 204.7 | A | 88.7 | A | | |
| | East | 197.5 | A | 202.4 | A | 187.4 | A | | |
| | West | 81.6 | A | 73.7 | A | 44.4 | B | | |
| W 72 Street & Riverside Drive | North | 103.1 | A | 312.2 | A | 135.4 | A | 72.9 | A |
| | South | Not Applicable | | | | | | | |
| | East | Not Applicable | | | | | | | |
| | West | 586.4 | A | 429.6 | A | 389.4 | A | 268.8 | A |
| W 79 Street & Amsterdam Avenue | North | 51.3 | B | 44.5 | B | 39.0 | C | Not Analyzed | |
| | South | 113.3 | A | 104.6 | A | 91.4 | A | | |
| | East | 234.6 | A | 173.8 | A | 127.0 | A | | |
| | West | 197.8 | A | 108.6 | A | 110.8 | A | | |
| W 79 Street & Broadway | North | 83.1 | A | 61.1 | A | 48.2 | B | 21.1 | D |
| | South | 49.4 | B | 50.2 | B | 38.1 | C | 15.7 | D |
| | East | 163.1 | A | 97.0 | A | 78.5 | A | 147.2 | A |
| | West | 225.7 | A | 100.4 | A | 113.7 | A | 82.8 | A |
| W 79 Street & Riverside Drive | North | 167.0 | A | 462.6 | A | 341.7 | A | 225.0 | A |
| | South | 906.8 | A | 989.8 | A | 445.0 | A | 294.2 | A |
| | East | 841.6 | A | 723.2 | A | 722.0 | A | 576.9 | A |
| | West | 457.2 | A | 458.4 | A | 281.2 | A | 275.4 | A |
| W 81 Street & Central Park West | North | 209.3 | A | 117.9 | A | 161.4 | A | 86.9 | A |
| | South | 238.0 | A | 59.3 | B | 359.1 | A | 91.4 | A |
| | East | 336.7 | A | 139.6 | A | 272.5 | A | 118.3 | A |
| | West | 198.0 | A | 195.5 | A | 265.8 | A | 101.7 | A |
| W 86 Street & Central Park West | North | 415.7 | A | 128.3 | A | 100.0 | A | 75.2 | A |
| | South | 595.3 | A | 436.9 | A | 181.5 | A | 95.1 | A |
| | East | 3487.0 | A | 1456.9 | A | 402.8 | A | 329.8 | A |
| | West | 257.7 | A | 269.5 | A | 192.5 | A | 299.0 | A |
| W 86 Street & Broadway | North | 70.2 | A | 81.6 | A | 50.2 | B | 54.7 | B |
| | South | 59.4 | B | 63.1 | A | 50.6 | B | 46.3 | B |
| | East | 182.5 | A | 102.7 | A | 93.3 | A | 63.8 | A |
| | West | 115.8 | A | 84.9 | A | 61.9 | A | 44.4 | B |
| W 86 Street & Riverside Drive | North | 694.7 | A | 320.6 | A | 432.9 | A | 342.8 | A |
| | South | 617.1 | A | 415.1 | A | 351.6 | A | 749.1 | A |
| | East | 480.8 | A | 916.0 | A | 819.2 | A | 593.4 | A |
| | West | Not Applicable | | | | | | | |

*Table 2.6-1: Crosswalk Level of Service (2018)*
*(2 of 2)*

The existing conditions corner analysis for the 18 studied intersections showed an acceptable LOS C or better. However, three intersections had corners that operated at LOS D or worse during one or more peak periods. The future analysis did not reveal any changes. The results of the crosswalk analyses are shown in Table 2.6-2.

| Intersection | Corner | AM | | Midday | | PM | | Sat | |
|---|---|---|---|---|---|---|---|---|---|
| | | SF/P | LOS | SF/P | LOS | SF/P | LOS | SF/P | LOS |
| W 58 Street & 8th Avenue | NE | 69.7 | A | 72.1 | A | 73.1 | A | 110.8 | A |
| | NW | 109.3 | A | 75.5 | A | 74.5 | A | 63.4 | A |
| | SE | 60.2 | A | 49.9 | B | 50.7 | B | 60.4 | A |
| | SW | 35.7 | C | 22.0 | D | 22.8 | D | 18.8 | D |
| W 60 Street & Broadway | NE | Not Applicable | | | | | | | |
| | NW | 110.2 | A | 72.8 | A | 58.7 | B | 72.3 | A |
| | SE | Not Applicable | | | | | | | |
| | SW | 57.0 | B | 52.4 | B | 41.3 | B | 62.2 | A |
| W 60 Street & Columbus Avenue | NE | 89.7 | A | 48.5 | B | 42.1 | B | 64.7 | A |
| | NW | 199.6 | A | 104.6 | A | 81.1 | A | 114.2 | A |
| | SE | 79.8 | A | 78.4 | A | 62.7 | A | 198.4 | A |
| | SW | 32.5 | C | 29.6 | C | 24.2 | C | 50.6 | B |
| W 65 Street & Broadway / Columbus Avenue | NE | 161.9 | A | 141.5 | A | 118.1 | A | 156.6 | A |
| | NW | 112.9 | A | 100.6 | A | 81.8 | A | 74.0 | A |
| | SE | 146.1 | A | 87.4 | A | 101.0 | A | 66.4 | A |
| | SW | 98.4 | A | 88.2 | A | 69.9 | A | 68.2 | A |
| W 65 Street & Central Park West | NE | 444.0 | A | 346.7 | A | 196.4 | A | 222.0 | A |
| | NW | 134.1 | A | 230.3 | A | 120.0 | A | 182.8 | A |
| | SE | 323.5 | A | 279.3 | A | 132.3 | A | 174.8 | A |
| | SW | 119.9 | A | 220.8 | A | 97.6 | A | 177.5 | A |
| W 66 Street & Central Park West | NE | 655.8 | A | 101.4 | A | 364.2 | A | 376.8 | A |
| | NW | 156.2 | A | 168.0 | A | 143.1 | A | 149.5 | A |
| | SE | Not Applicable | | | | | | | |
| | SW | 170.6 | A | 153.9 | A | 144.5 | A | 159.5 | A |
| W 66 Street & Columbus Avenue | NE | 73.3 | A | 53.8 | B | 30.0 | C | 73.4 | A |
| | NW | 136.9 | A | 162.6 | A | 62.8 | A | 93.6 | A |
| | SE | 226.6 | A | 133.2 | A | 143.0 | A | 214.2 | A |
| | SW | 78.8 | A | 74.5 | A | 55.6 | B | 41.7 | B |
| W 66 Street & Broadway | NE | 95.8 | A | 82.9 | A | 61.3 | A | 94.0 | A |
| | NW | 99.3 | A | 79.6 | A | 56.7 | B | 97.0 | A |
| | SE | 33.0 | C | 35.4 | C | 22.9 | D | 50.6 | B |
| | SW | 249.7 | A | 218.9 | A | 158.8 | A | 330.5 | A |
| W 72 Street & Central Park West | NE | 166.6 | A | 87.5 | A | 95.1 | A | 51.8 | B |
| | NW | 98.4 | A | 78.2 | A | 51.0 | B | 37.0 | C |
| | SE | 160.9 | A | 85.5 | A | 96.8 | A | 51.5 | B |
| | SW | 142.9 | A | 111.5 | A | 81.4 | A | 50.2 | B |
| W 72 Street & Amsterdam Avenue | NE | 132.3 | A | 94.5 | A | 71.7 | A | 58.8 | B |
| | NW | 107.6 | A | 100.0 | A | 65.8 | A | 72.0 | A |
| | SE | 123.2 | A | 96.4 | A | 75.2 | A | 72.2 | A |
| | SW | Not Applicable | | | | | | | |
| W 72 Street & Broadway | NE | Not Applicable | | | | | | | |
| | NW | 131.2 | A | 109.9 | A | 72.8 | A | 87.1 | A |
| | SE | Not Applicable | | | | | | | |
| | SW | 73.8 | A | 63.6 | A | 48.5 | B | 65.4 | A |
| W 72 Street & Riverside Drive | NE | 227.1 | A | 537.0 | A | 302.4 | A | 132.4 | A |
| | NW | Not Applicable | | | | | | | |
| | SE | | | | | | | | |
| | SW | | | | | | | | |
| W 79 Street & Broadway | NE | 212.0 | A | 140.7 | A | 112.2 | A | 89.2 | A |
| | NW | 202.7 | A | 116.4 | A | 114.1 | A | 61.4 | A |
| | SE | 194.4 | A | 146.3 | A | 115.6 | A | 88.8 | A |
| | SW | 202.0 | A | 129.7 | A | 142.2 | A | 65.5 | A |
| W 79 Street & Riverside Drive | NE | 431.2 | A | 798.9 | A | 643.1 | A | 456.8 | A |
| | NW | 286.4 | A | 504.0 | A | 331.3 | A | 237.9 | A |
| | SE | 627.4 | A | 768.0 | A | 536.0 | A | 329.5 | A |
| | SW | 924.3 | A | 823.5 | A | 487.4 | A | 311.1 | A |
| W 81 Street & Central Park West | NE | 41.7 | B | 19.9 | D | 32.6 | C | 10.8 | E |
| | NW | 59.1 | B | 72.8 | A | 79.7 | A | 49.2 | B |
| | SE | 120.1 | A | 33.3 | C | 129.1 | A | 38.9 | C |
| | SW | 387.9 | A | 157.1 | A | 493.2 | A | 165.0 | A |
| W 86 Street & Central Park West | NE | 391.5 | A | 123.0 | A | 60.6 | A | 44.6 | B |
| | NW | 60.0 | A | 57.6 | B | 41.4 | B | 53.7 | B |
| | SE | 481.3 | A | 248.0 | A | 72.9 | A | 50.6 | B |
| | SW | 159.3 | A | 186.8 | A | 126.4 | A | 131.6 | A |
| W 86 Street & Broadway | NE | 164.6 | A | 157.7 | A | 119.9 | A | 104.0 | A |
| | NW | 152.6 | A | 143.3 | A | 97.8 | A | 75.0 | A |
| | SE | 124.3 | A | 112.5 | A | 95.0 | A | 76.4 | A |
| | SW | 121.8 | A | 130.0 | A | 101.3 | A | 84.4 | A |
| W 86 Street & Riverside Drive | NE | 810.2 | A | 976.3 | A | 936.0 | A | 765.6 | A |
| | NW | Not Applicable | | | | | | | |
| | SE | 458.5 | A | 639.5 | A | 481.4 | A | 597.5 | A |
| | SW | Not Applicable | | | | | | | |

*Table 2.6-2: Corner Level of Service (2018)*

## Bicycles

The study area currently has four on-street Class 2 bicycle lanes: one along Central Park West (NB only), one each along West 77th Street (between Central Park West and Riverside Drive) and West 78th Streets (between Columbus Avenue and Riverside Drive), and the recently installed lane on Columbus Avenue (between West 77th and West 96th Streets). Also, cyclists in the study area have access to the Class 1 bicycle path along the Hudson River Greenway, which runs through the length of the study area. The New York City Bicycle Master Plan (2011) identifies several proposed bicycle routes in the study area on West 58th, West 60th, and West 61st Streets, Broadway, 11th Avenue, and Riverside Drive. Figure 2.6-5 shows existing and proposed bicycle lanes and paths in the study area.

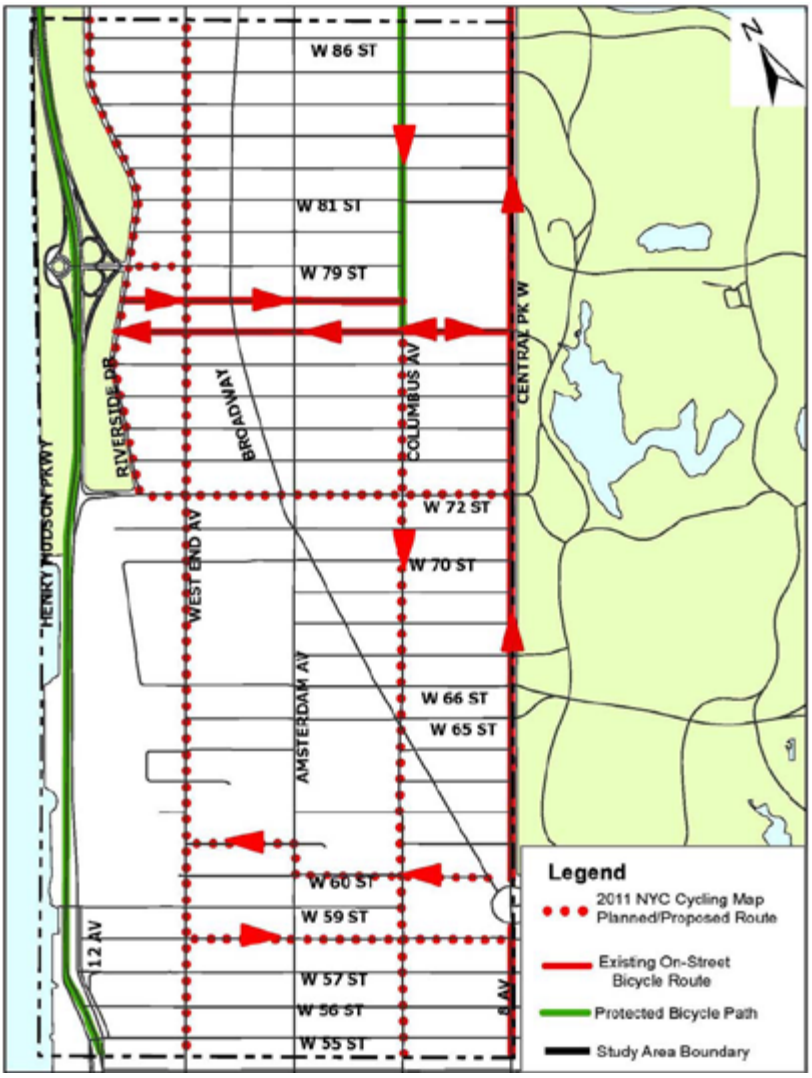


*Table 2.6-5: Existing and Proposed Bicycle Routes*

## 2.7 Accidents/Safety Analysis

The accident and safety analysis for the existing conditions documented accident statistics for a three-year period from 2006 to 2008. However, in order to provide the most recent data, accident statistics for 2009 are also documented in this Technical Memorandum.

## 2006-2009 Analysis

After reviewing all intersections in the study area for the four-year period 2006 to 2009, four intersections were identified as "high pedestrian accident location" for recording five pedestrian accidents at least once during the four-year period. Only one intersection (12 Avenue/West 57th Street) qualified as a "high accident location" for recording 23 reportable accidents in 2009. Table 2.7-1 lists the four "high pedestrian accident locations" and the one "high accident location" in the study area from 2006 to 2009. The intersection of 8th Avenue and West 57th Street recorded five pedestrian crashes in 2006 and in 2008. Between 2006 and 2009, this intersection recorded a total of 55 accidents, 17 of which involved pedestrians.

The total accidents at the five "high accident locations" averaged about 50 accidents per year during the four-year period. The data , shown in Figure 2.7-1, show that the intersection of Twelfth Avenue and West 57th Street had the highest number of accidents, with a total of 57 accidents over the four-year period. Two other intersections along West 57th Street (Eight and Tenth Avenues) were among the locations with the most accidents in the study area, with 55 and 42 accidents, respectively. Most of the accidents at the five "high accident locations" occurred at night (53), followed by the midday peak (40 accidents), the AM peak (37 accidents), and the PM peak (29 accidents). Additionally, there were 47 rear ends, 13 right angles, and 12 accidents that occurred while overtaking. Table 2.7-2 shows the five high accident locations.

| No. | Intersection | 2006 | | 2007 | | 2008 | | 2009 | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Peds | Total | Peds | Total | Peds | Total | Peds | Crashes | Peds |
| 1 | 12th Ave/W 57th St * | 14 | 0 | 9 | 0 | 11 | 0 | **23** | 1 | 57 | 1 |
| 2 | 8th Ave/W 57th St | 20 | 5 | 12 | 4 | 15 | 5 | 8 | 3 | 55 | 17 |
| 3 | 10th Ave/W 57th St | 8 | 3 | 13 | 5 | 7 | 2 | 14 | 4 | 42 | 14 |
| 4 | 11th Ave/W 59th St | 6 | 2 | 6 | 1 | 7 | 3 | 7 | 5 | 26 | 11 |
| 5 | Columbus Ave/W 66th St | 5 | 5 | 9 | 4 | 5 | 3 | 4 | 1 | 23 | 13 |
| **Total Accidents** | | **53** | **15** | **49** | **14** | **45** | **13** | **56** | **14** | **203** | **56** |

* Two non-pedestrian fatalities in 2009

*Table 2.7-1: High Accident Locations (2006 – 2009)*

| No. | Intersection | AM Peak | Midday | PM Peak | Off-Peak | Night | Unknown | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | 12th Ave/W 57th St | 9 | 14 | 11 | 8 | 12 | 3 | 57 |
| 2 | 8th Ave/W 57th St | 4 | 12 | 11 | 4 | 16 | 8 | 55 |
| 3 | 10th Ave/W 57th St | 5 | 6 | 5 | 6 | 14 | 6 | 42 |
| 4 | 11th Ave/W 59th St | 7 | 4 | 2 | 5 | 5 | 3 | 26 |
| 5 | Columbus Ave/W 66th St | 4 | 4 | 8 | 1 | 6 | 0 | 23 |
| **Total** | | **29** | **40** | **37** | **24** | **53** | **20** | **203** |

*Table 2.7-2: Accidents & Time of Day (2006-2009)*

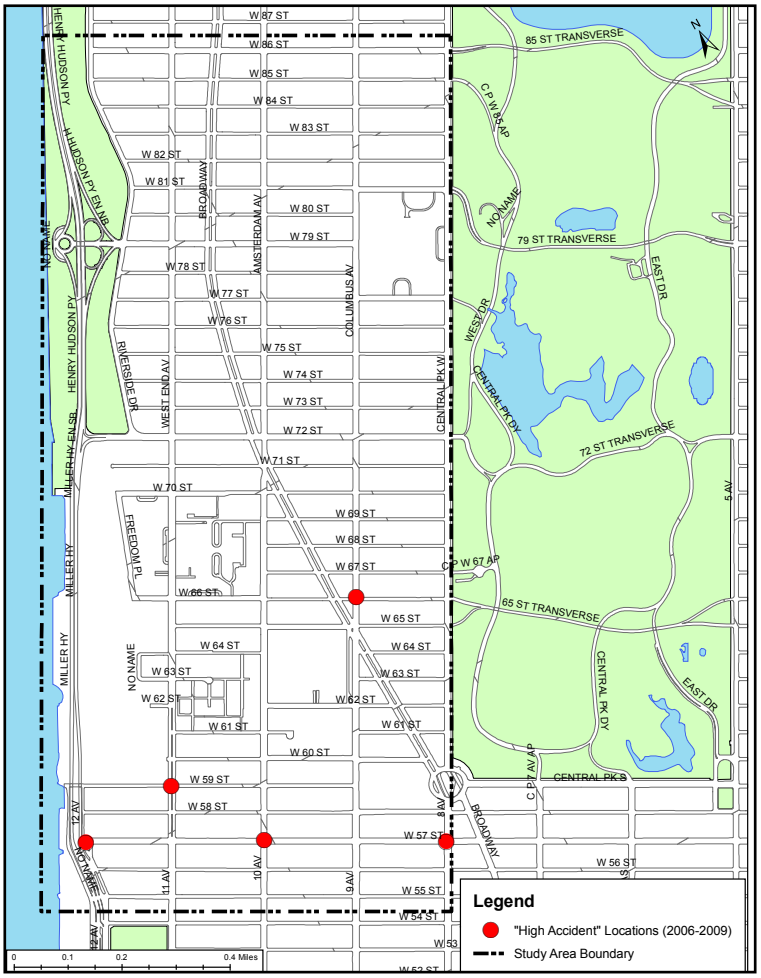


*Figure 2.7-1: "High Accident Locations" (2006-2009)*

## Injuries

Over the four-year period (2006-2009) there were 192 injuries as a result of 203 accidents at the five "High Accident Locations" in the study area. There were 55 injuries involving pedestrians and 123 non-pedestrian injuries. Approximately 61% of the injuries were minor or Type C injuries, while 13% were Type B and only 3% were severe or Type A injuries. Table 2.7-3 provides the details about injuries in the study area between 2006 and 2009.

| No. | Intersection | Total Accidents | Total Injuries | Ped | Non-Ped | Injury Type | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | A | B | C |
| 1 | 12th Ave/W 57th St | 57 | 70 | 1 | 67 | 0 | 6 | 64 |
| 2 | 8th Ave/W 57th St | 55 | 44 | 17 | 22 | 8 | 5 | 31 |
| 3 | 10th Ave/W 57th St | 42 | 30 | 14 | 13 | 2 | 10 | 18 |
| 4 | 11th Ave/W 59th St | 26 | 23 | 10 | 11 | 1 | 4 | 17 |
| 5 | Columbus Ave/W 66th St | 23 | 25 | 13 | 10 | 2 | 5 | 18 |
| **Total Accidents** | | **203** | **192** | **55** | **123** | **13** | **30** | **148** |

*Table 2.7-3: Total Injuries and Injury Types (2006-2009)*

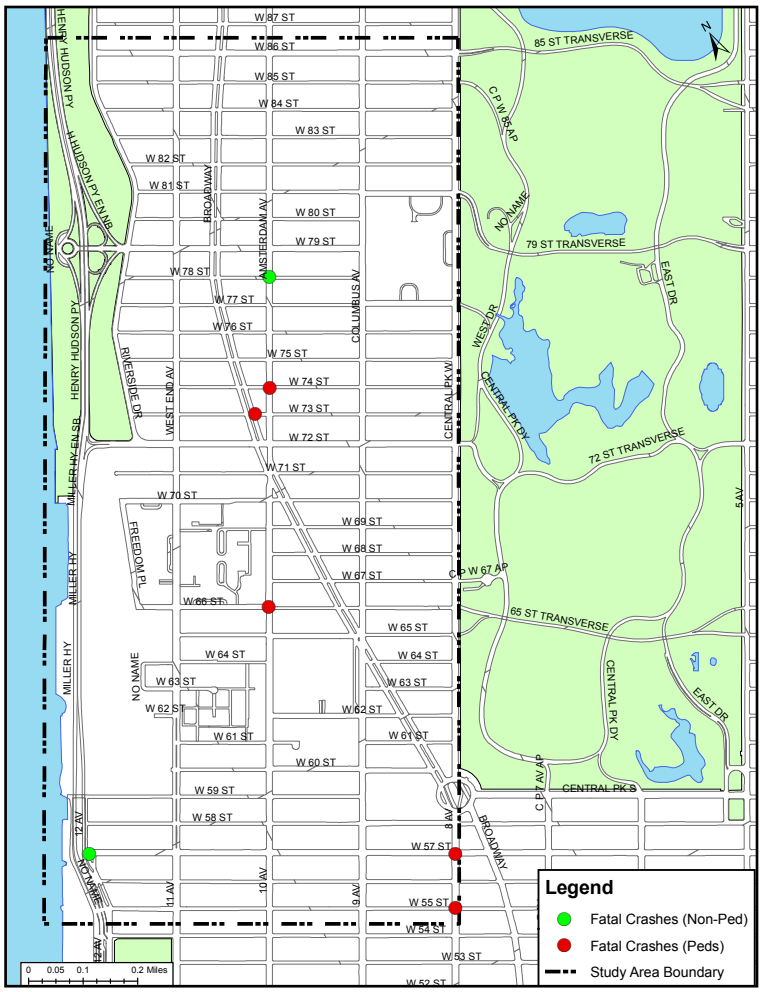


*Figure 2.7-2: Fatal Accident Locations (2006-2009)*

## Fatalities

There were eight fatalities in the study area between 2006 and 2009, three fatalities in 2006, two in 2007, one in 2008, and two in 2009. Five of the eight fatal crashes involved pedestrians. Most of the fatalities occurred on Amsterdam Avenue where two pedestrian fatalities occurred in 2006. Table 2.7-4 summarizes all fatal crashes in the study area from 2006 to 2009. Figure 2.7-2 shows the locations where fatal accidents occurred.

| No. | Year | Location | Fatality (Motorist) | Fatality (Pedestrian) |
|---|---|---|---|---|
| 1 | 2006 | Amsterdam Ave/W 66th St | 0 | 1 |
| 2 | 2006 | Amsterdam Ave/W 74th St | 0 | 1 |
| 3 | 2006 | Broadway NB/W 73rd St | 0 | 1 |
| 4 | 2007 | 12th Ave/W 55th St | 0 | 1 |
| 5 | 2007 | Amsterdam Ave/W 78th St | 1 | 0 |
| 6 | 2008 | 8th Ave/W 57th St | 0 | 1 |
| 7 | 2009 | 12th Ave/W 57th St | 2 | 0 |
| **Total Fatalities/Injuries** | | | **3** | **5** |

*Table 2.7-4: Summary of Fatalities (2006-2009)*

## 2.8 Goods Movement

New York City is heavily dependent on trucks to supply the city with goods and services. Thousands of local and through trucks traverse the city daily to deliver goods and services required to satisfy the demand of residents as well as industrial, commercial, and other enterprises.

New York City's heavy reliance upon trucks makes truck traffic and associated terminals especially important in transportation analyses. Their presence in the traffic stream impacts traffic operating conditions and contributes to congestion, affecting traffic flow. There is also the need to provide adequate space for truck loading and unloading. Numerous quality of life issues are created by truck traffic, including noise and air pollution.

### 2.8-1 Truck Routes in the Study Area

Overall, the study area is well served by numerous local truck routes, designated on both north-south and east-west corridors. Figure 2.8-1 shows the local truck route network in the study area which are listed below:

*North-South Local Truck Routes:*

- Broadway between Columbus Circle and West 86th Street
- Amsterdam Avenue (Tenth Avenue) from West 55th Street to West 86th Street
- Columbus Avenue (Ninth Avenue) from West 86th Street to West 55th Street
- Twelfth Avenue from West 55th Street to West 59th Street
- Eleventh Avenue from West 55th Street to West 57th Street
- Eighth Avenue from West 55th Street to Columbus Circle

*East-West Local Truck Routes:*

- West 57th Street between Eighth Avenue and Twelfth Avenue
- West 65th Street from Amsterdam Avenue to Central Park West
- West 66th Street from Central Park West to Amsterdam Avenue
- West 75th Street from Amsterdam Avenue to Broadway
- West 79th Street between Columbus Avenue and Broadway
- West 81st Street between Central Park West and Columbus Avenue
- West 82nd Street from Broadway to Central Park West
- West 86th Street between Central Park West and Broadway

<u>North-South Local Truck Route Access</u>

Truck activity in the study area is very high, especially along the Columbus Avenue, Amsterdam Avenue, and Broadway, where the commercial retail and offices in the study area are concentrated. Many truck trips terminate along these corridors at various establishments, and require curb space for loading and unloading.

The north-south local truck routes to the north and south of West 57th Street have unique characteristics. North of West 57th Street in the study area, the major north-south local truck routes are Columbus Avenue (one-way, southbound), Amsterdam Avenue (one-way, northbound) and Broadway (two-way), while trucks are not allowed on West End Avenue and Riverside Drive. South of West 57th Street in the study area, all the avenues are local truck routes. Trucks traveling along these north-south local truck routes have access up-town to the George Washington Bridge and down-town to the Lincoln Tunnel.

<u>East-West Local Truck Route Access</u>

The West 57th Street corridor is the east-west local truck route in the southern part of the study area. This two-way cross-town street connects the west and east sides of Manhattan. Trucks traveling along this street have access to the Queensboro Bridge and the Queens Midtown Tunnel to Queens. West 65th Street (one-way eastbound) and West 66th Street (one-way westbound) make up a local truck route couplet and provide trucks access to the east of Central Park via the 65th Street Transverse Road. West 79th Street between Columbus Avenue and Broadway, West 81st Street between Central Park West and Columbus Avenue and West 82nd Street from Broadway to Central Park West also provide trucks access to the east of Central Park via the 79th Street Transverse. Trucks on the West 86th Street corridor (two-way) have access to the east side of Central Park via the 85th Street Transverse Road. These cross-town streets provide opportunities for trucks traveling north-south on Broadway, Amsterdam Avenue and Columbus Avenue to turn and travel eastbound or westbound.

The analysis shows that there is adequate supply of local truck routes servicing the study area. However, adequate space for destination activities (loading and unloading) during the required hours is inadequate. Thus, there are no recommendations to change any of the truck routes in the study area. However, to manage curb usage, commercial loading/unloading zones (commercial muni-meters) are recommended along two truck routes (Columbus Avenue and Amsterdam Avenue) in the study area where widespread truck double parking was observed. These proposals are shown in Figure 3-28.

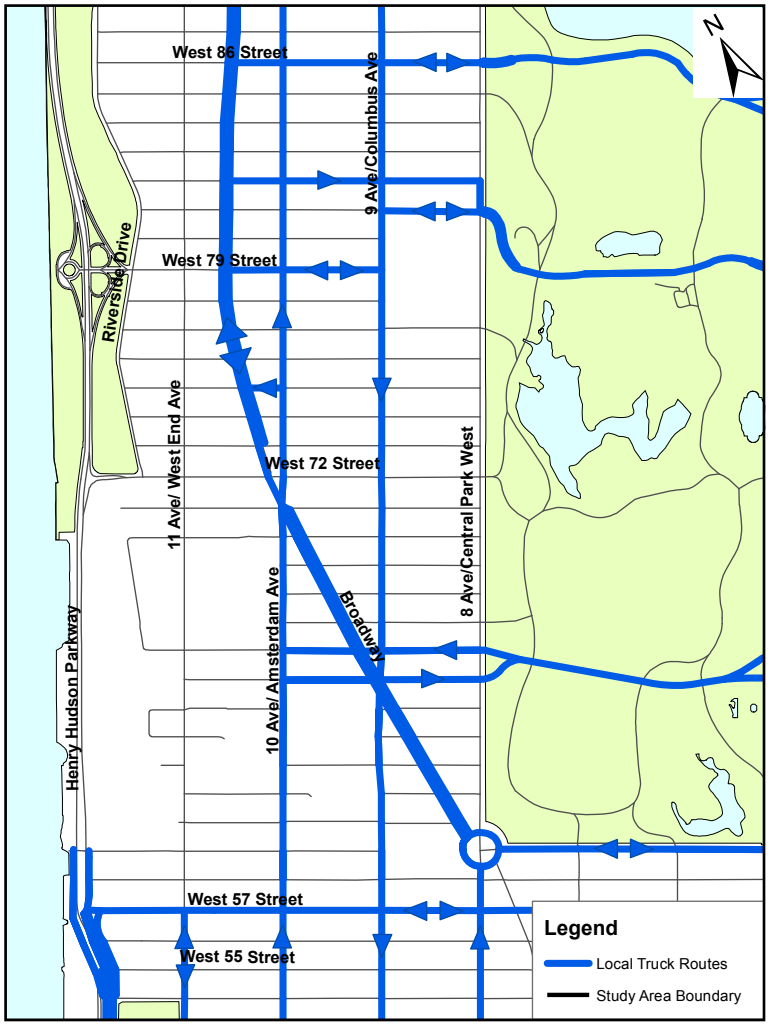


*Figure 2.8-1: Local Truck Routes in the Study Area*

## 2.9 Public Participation

The public outreach effort associated with this study began from its commencement in that the study itself was initiated in response to community request and a series of meetings were held. Two large public forums (with small focus group discussions) were conducted. Technical Memorandum 1 documented in detail the public participation process. For easy reference, further details about the public participation events conducted as part of the study are presented below. The exhaustive list of issues indicates how involved and engaged the community was.

### 2.9-1 Public Meeting, September 24, 2007

The New York City Department of Transportation (NYCDOT) held a Public Listening Session (using their consultant) at John Jay College on Monday, September 24, 2007. The four-hour meeting was well attended by elected officials and members of the public. Stakeholders were given the opportunity and venue to bring their concerns and offer suggestions about the current transportation issues in their neighborhood.

*Breakout Groups*

The meeting was organized as a charrette, wherein four breakout groups each participated in a guided discussion on topic areas under NYCDOT jurisdiction and indirect influence. Five topic areas were discussed in depth:

1. Curb and Sidewalk Space: What are some of the problems with the way curb space is used now?
2. Safety: What safety concerns exist on the West Side that should be addressed?
3. Congestion: What are some of the specific congestion problems that are encountered on the West Side face every day?
4. Public Transportation (Non-Private Automobile Travel Issues): What are the travel challenges for those who don't use cars on the West Side but rely instead on walking, public transportation, taxis, and car services?
5. Quality of Life: What are some of the quality of life concerns within the West Side on the streets and sidewalks, with consideration to the fact that residents and visitors are part of a vibrant and busy neighborhood, borough, city, and region?

The results of the in-depth discussions of each breakout group and topics as listed above follows:

### Topic 1: Curb and Sidewalk Space

The curb space utilization topic had to be explained to each breakout group, as participants did not feel that it was self-explanatory. Examples of street furniture, fire hydrants, sidewalk widths, benches, newspaper boxes, and the like were provided in order to familiarize participants with the types of issues covered under this first topic. Below are some of the issues that were raised by participants.

*Parking*

- Eliminate on-street parking
- Improve enforcement of parking regulations
- Reduce on-street parking during rush hours
- Provide bicycle parking spaces
- Double parking is a problem
- Loading/Unloading zones are needed

*Garbage collection*

- More frequent garbage collection

*Sidewalks*

- Sidewalks are too cluttered
- Café seating outside of restaurants takes up too much space
- Allow for wider sidewalks for a variety of uses

## Topic 2: Safety

The subject of transportation safety drew in-depth discussions covering a wide range of transportation issues concerning safety of pedestrians, bicyclists, parking, deliveries, and automobile traffic. The senior residents in the Upper West Side neighborhoods also had special needs that were of concern.

*Auto Speeding*

- Install speed humps
- Post more speed limit signs
- Speeding through intersections

*Pedestrians*

- Not enough time for some pedestrians to cross the street
- Not enough time to cross the intersections, especially on Avenues
- Jaywalking, not crossing within crosswalks is dangerous
- Double parking cuts sightlines of pedestrians, creating dangerous crossing situations
- Possibility of creating an elderly resident district with special regulations

*Bicycles*

- Danger when there are no bicycle lanes
- Bicycle lane on Central Park West should be between the parked cars and the sidewalk
- Separate bike lanes from vehicle traffic
- When drivers park in bike lanes, bikers must ride in auto lanes
- Bicycles should not be able to ride on sidewalks – violations should be enforced

*Roads*

- Potholes are a big problem
- Illegal left turns
- Snow removal issues of timeliness and altering the curb line
- Drivers running stop signs on West 79th Street and Riverside Drive

## Topic 3: Congestion

Several groups mentioned concerns about Lincoln Tunnel traffic, West End Avenue traffic, and left turns.

*Personal autos*

- Too many people driving alone
- Speed humps would reduce speeding on heavy residential streets

*Transit improvements*

- Increase bus traffic on 11th and 12th Avenues to remove drivers
- Peak travel time causes congestion on all transit (bus and subway), increase service

*Congestion pricing*

- A majority of attendees indicated support for congestion pricing

## Topic 4: Non-personal Automobile Travel Issues

Buses and taxis were two of the main travel problems cited under the topic of non-personal automobile transportation issues. There is also growing concern over the safety and viability of the bicycle as a feasible alternative for travel for Upper West Side residents.

*Taxis and Car Services*

- Taxis should allow ridesharing to reduce congestion
- Stagger the shift change for taxi drivers

*Buses*

- Issues with the spacing of buses on the same route
- Buses should be sticking with the posted schedules
- Removal of bus stops
- Rerouting of the M72
- Pre-recorded bus announcements need improvement

*Pedestrians*

- Accessible crosswalks
- Countdown pedestrian signals at signalized intersections

## Topic 5: Quality of Life

The "quality of life" topic encompassed issues not covered in other sections, ranging from construction to lighted bus shelters, noise and air pollution to the schedule of buses. The theme throughout this discussion was the role that transportation-related improvements could play to enhance the lives of the Upper West Side residents and visitors.

*Pollution*

- Noise and air pollution
- Global warming

*Construction*

- Scaffolding congests sidewalks and makes them unsafe
- Construction trucks, double parking

*Planning improvements*

- Create senior districts
- Create more open space

## *Post-Meeting Comments*

Following the meeting, additional comments were received via comment sheets which had been distributed at the meeting, e-mail, letters, and calls and e-mail routed to DOT through 311. The main issues in those comments were:

*Buses*

- Extend M72 service back to West 66th Street and West End Avenue
- Long wait times for M57
- Buses need to pull up to the curb to pick up passengers – particularly for the elderly
- Make buses quieter and less polluting

*Transit*

- Platform overcrowding at West 72nd Street IRT

*Enforcement*

- Enforce speed limits
- Double parking is a serious issue and restricts bus movement
- Need to be able to double park private cars to load/unload
- Trucks and buses should not be on West End Avenue
- Charter buses park illegally
- Post speed limit and no right on red signs
- Illegal parking in No Parking and No Standing areas

*Pedestrians*

- Difficulty crossing major intersections, example 9th Avenue and West 57th Street, Amsterdam Avenue and West 80th Street
- Pedestrians should have right-of-way when crossing. Turning vehicles ignore this.
- Have longer timed walk signals
- Pedestrian crowding is an issue on sidewalks on the Avenues in the study area

*Safety*

- Speeding vehicles
- Vehicles crossing red lights
- Safety issues at West 66th Street between West End Avenue and Riverside Boulevard
- Introduce traffic calming measures such as speed humps
- Bicycles should not be allowed on sidewalks and their safety should be enforced.

*Quality of life*

- Excessive noise and exhaust fumes
- Reduce street furniture

*Street configuration*

- DOT should not have closed the West 72nd Street off-ramp
- Traffic backs up due to closing of ramp
- Increase in accidents due to ramp closing
- Safety improvements are needed at West 79th Street and the West Side Highway, and West 79th Street and Riverside Drive

*Land Use*

- There is too much development
- New development includes garages which encourages driving

*Trucks*

- Fresh Direct delivery truck double parking
- Delivery trucks clog roadways

*Bicycles*

- Add more designated bike lanes

*Signals*

- Change signal timing on West End Avenue to allow Lincoln Tower residents to turn onto the Avenue.

## 2.9-2 Business Survey, Summer 2009

A total of 99 businesses within the study area completed a survey that asked them about their delivery needs, and the travel behaviors and needs of their customers and employees. Questions were open-ended; responses are generalized here:

*Delivery Needs*

- 19% of businesses report that they have no problems with deliveries
- 12% report that their deliveries frequently receive tickets due to the fact that they must double park or stand in "No Standing" zones in order to complete deliveries
- Curbside space needed for loading and unloading ranges from 20 feet to 50 feet
- Time needed to receive deliveries ranges from 2 minutes to 1 hour; most businesses report requiring approximately 20 minutes
- General need for more curbside space
- Delivery vehicles consistently have trouble finding parking
- Allow a time period when vehicles making deliveries will not be ticketed

*Delivery Times*

- Generally, businesses report that they receive deliveries on weekdays in the mornings or early afternoon
- 24% receive deliveries daily
- 5% receive deliveries monthly
- 68% report that they receive deliveries on varying days of they week (every other day, two days a week, etc.) and at varying times of day

*Night Deliveries*

- 66% are not receptive to night deliveries because they are either too busy or not open
- 16% would or already receive night deliveries

*Employee Travel Behavior*

- 44% report that employees do not drive to work
- 30% report that all or some of their employees drive to work; they either park at meters, on side streets, or in garages

*Mass Transit Incentives*

- 9% offer incentives to employees to take mass transit to work
- 38% expressed interest in learning more about incentives

*Customer Travel and Parking Behavior*

- 51% report that customers either walk or take mass transit
- 10% report that most of their customers drive
- 21% report that customers having trouble parking adversely affects their business
- Problems with parking include:
  - Frequent ticketing
  - Meters/garages too expensive
  - Meters/parking signage difficult to understand
  - Running out to feed the meter
- Increase maximum time allowed to park

*Dedicated- or Mixed-Trip*

- 39% report that their establishment is their customers' sole destination
- 24% report that their establishment is one of many stops
- 14% report a mixture of the two

*Effect of Traffic Enforcement*

- 40% report that traffic enforcement has no effect on their business
- 29% report that traffic enforcement is excessive/unreasonable/relentless, which negatively impacts their businesses

*Sidewalk/Pedestrian Experience*

- Add more benches
- Improve sanitation on street
- More trees, flower beds, etc.
- Repair damaged sidewalks
- Remove scaffolding
- More street fairs
- Remove construction dumpsters
- More regular bus/train schedule

*Outstanding Traffic and Transportation Issues*

- Improve traffic congestion
- Reduce tolls at bridges
- Fix broken meters/add more meters
- Make metered parking easier
  - Muni-meters are difficult to use
  - Lower meter prices
  - Extend maximum meter time
  - Reduce excessive ticketing
- Increase enforcement of double-parking
- Need more bike lanes
- Bike lanes slow traffic
- Enforce no delivery bikes on sidewalks
- Taxi drivers need to drive more safely

## 2.9-3 Public Meeting, September 22, 2009

The New York City Department of Transportation (NYCDOT) held a second public meeting at John Jay College on Tuesday, September 22, 2009. The purpose of the meeting was to provide an update on the progress of the study, including the Department of Transportation's initiatives, and to obtain feedback. The meeting was well attended by residents, businesses, elected officials, and other stakeholders. Following the presentation, which summarized community issues, results of the business survey, analysis findings, and DOT initiatives, attendees were given the opportunity to comment, raise issues, and offer suggestions. The main themes of those comments were:

*Trucks/Goods Movement*

- Merchant opposition to night-time loading because of impact on residents and businesses
- Post signs reinforcing no trucks on West 55th Street
- Allow trucks to use Route 9A instead of local streets
- To avoid double-parking of trucks and delivery vans, set aside mid-block loading zones from which deliveries can be wheeled to destinations elsewhere in the block
- West 79th and 82nd Streets have a significant amount of truck traffic during the AM peak period
- West 86th Street and West End Avenue seems to have no enforcement of trucks
- Trucks making deliveries along West 82nd Street are parked in the crosswalks starting at 8:00am
- There should be intersections other than along West 57th Street where trucks can make left turns

*Bicycles*

- Pedestrian-bicycle conflict on the sidewalk at Riverside Drive & West 72nd Street
- Bicyclists should be licensed like drivers so everyone will know what they can and can't do, and be accountable
- Want protected bike lanes along Columbus Avenue
- Increased enforcement of bicycles on sidewalks is needed
- Bike lanes on the Avenues are good, but on cross streets they are problematic: bikers wearing headphones, not paying attention to pedestrians, not staying in bike lanes
- Concerning traffic lane removals due to construction, creates unsafe conditions for bikes to have one lane to share with traffic; possible to require construction to use less space?
- Add protected bike lanes in conjunction with protected bus lanes (it works in Paris); unprotected bike lanes are dangerous for everyone
- Bikes should have bells to alert pedestrians that they are approaching
- Greenway is still not safe enough for pedestrians and bicyclists; vehicles not yielding to pedestrians and bikes, use stop signs instead
- Lights and signs for bikes should be at eye height and on the same side of the street
- Bicyclists are speeding on the Greenway, dangerous for pedestrians
- "No Parking" in bike lanes should be enforced; created dangerous conditions for bicyclists, and people will not ride bikes until it is safe to do so
- DOT does LOS analyses of traffic and pedestrian conditions; they need to do the same for bike lanes
- Bike lanes need to be protected from traffic and parking vehicles to be effective

*Left Turns*

- West End Avenue & West 72nd Street southbound left turn prohibited, but still not helping in terms of congestion and safety; 'no left turn' signs are too small, even police cars are making the illegal left turn
- West 79th Street & Riverside Drive eastbound left turn prohibited; add a turn light instead?

- Columbus Avenue & West 86th Street southbound leading left turns conflict with pedestrians, pedestrians crossing too soon before they have the light
- Columbus Avenue & West 79th Street and along West End Avenue; illegal left turns being made anyway
- Prohibit left turns that endanger pedestrians in crosswalks

*Parking*

- Illegal parking at MTA bus stops, recommended surveillance cameras to record and enforce incidents
- Issue resident parking permits
- Introduce long-term metered parking after 6:00pm
- Introduce peak-rate parking to increase turnover

*NYCT Bus*

- New bus shelter design lets in rain, snow, and wind
- Snow removal in front of bus shelters is not happening, inconvenient to people who need to ride the bus

*Shuttle Buses*

- Shuttle busses along West 58th Street from Riverside developments are taking up local parking and contributing to AM and PM congestion; coordinate with MTA to add a city bus line
- Along Central Park West, tour busses parking in MTA bus stops and idling at length; create congestion, air pollution, MTA bus riders have to stand in the street to catch their busses

*Pedestrians*

- Need more time to cross the street or separate walk signal for pedestrians to cross the street safely at West 66th Street & West End Avenue
- Pedestrian crosswalk ramps are angled away from the crosswalks
- Pedestrian crosswalk ramps should comply with guidelines to make them safe for the visually impaired
- Bring pedestrian countdown lights to the neighborhood
- Pedestrians need to wait on the sidewalk instead of in the crosswalk for their turn to cross the street; public education?
- Extend Safe Streets for Seniors above West 81st Street
- Install more neck-downs to contribute to pedestrian safety
- Create more taxi stands so people do not have to stand in the street to hail a cab
- Left turning vehicles conflict with pedestrians in crosswalks
- Sidewalks and pedestrian ramps are crumbly and dangerous, specifically along West 57th Street

*Congestion*

- Apply Green Light for Midtown to the Upper West Side
- Central Park West should be northbound only to rationalize the grid like on 5th Avenue
- Concern about increased congestion following the removal of the West 72nd Street exit ramp
- Look at congestion pricing again; help with existing congestion problems and prevent future increases in traffic
- West End Avenue between West 59th and 72nd Streets very congested; completing Riverside Boulevard will help
- Right turns off of West Side Highway; the first light is always red, which contributes to congestion

## *Post-Meeting Comments*

As a supplement to the comments and suggestions offered by attendees of the public meeting, comment sheets were distributed to encourage additional feedback via mail, email, and fax. The main themes of these comments were:

*Bikes*

- Currently, the city is unfriendly for bikes; need to educate taxi drivers about bike courtesy and increase police enforcement of bike lanes
- Add bike racks on city buses

*Congestion*

- Complete Riverside Boulevard to reduce traffic congestion on West End Avenue
- Change direction of traffic on West 61st Street between Amsterdam Avenue and West End avenue (currently eastbound; change it to westbound)
- Bus layover at West 79th Street & Riverside Drive blocks traffic exiting the West Side Highway
- Need to reduce the number of vehicles entering the study area
- The Riverside Center development will likely impact the surrounding traffic network; requires further analysis and mitigation
- West 61st Street cul-de-sac at Amsterdam Avenue is the only access for emergency vehicles to the buildings there; don't add business uses or curb cuts that will increase congestion and reduce accessibility

*Enforcement*

- The stop sign on the highway exit ramp at West 79th Street & Riverside Drive is too small and regularly ignored
- The 'no left turn' on to Riverside Drive at West 79th Street is regularly ignored

*Pedestrians*

- No access to the Hudson River Greenway from West 72nd Street for the elderly or handicapped
- Condition of pedestrian ramps in crosswalks are terrible and some curbs have no ramps; difficult for the elderly or handicapped to navigate.

# RECOMMENDATIONS

The study's recommendations were developed to enhance traffic operations and safety of all street users in the study area. Their development was influenced by the issues raised by community residents and stakeholders. Figure 3-1 shows the locations where improvements are recommended; they fall into six categories:

1. Traffic Operations
2. Pedestrian Safety
3. Bicycles
4. Commercial/Special Parking
5. Recently Implemented Improvements

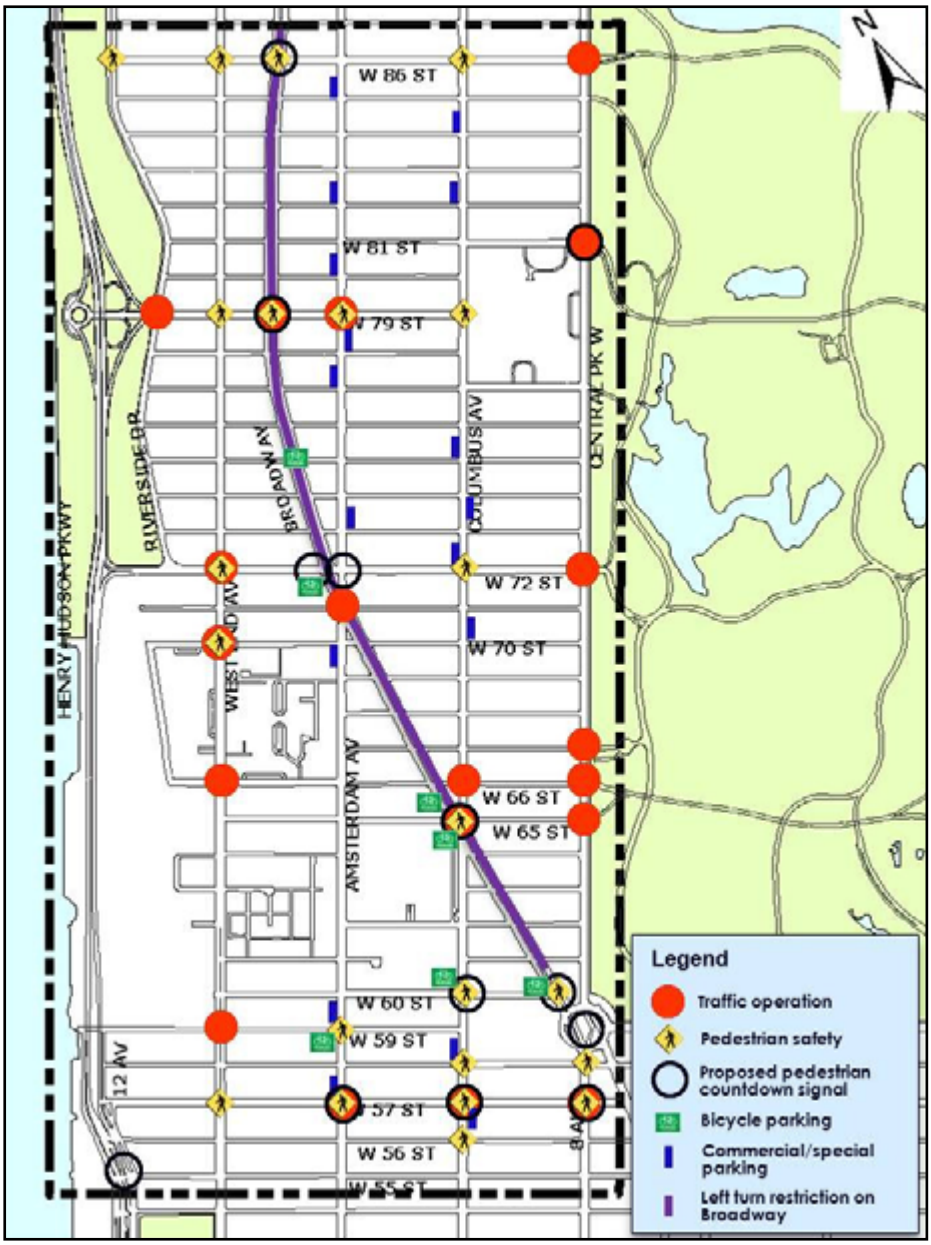


*Figure 3-1: Proposed Recommendations Locations*

## 1. Traffic Operations

Field observations and the future conditions HCS analysis showed that operating conditions (LOS) at some intersections deteriorated between 2008 and 2018. Based on the analysis, operations and safety at the 21 intersections listed below would be improved by implementing certain changes.

*Riverside Drive*

1. West 72nd Street & Riverside Drive

West End Avenue

2. West 59th Street & West End Avenue (AM and PM)
3. West 66th Street & West End Avenue (AM and PM)
4. West 70th Street & West End Avenue (PM)
5. West 72nd Street & West End Avenue (PM)
6. West 79th Street & West End Avenue (AM and PM)

*Broadway*

7. West 71st Street & Broadway (AM)
8. West 79th Street & Broadway (Saturday Midday)

*Amsterdam Avenue/Tenth Avenue*

9. West 57th Street & Tenth Avenue (Midday and Saturday Midday)
10. West 71st Street & Amsterdam Avenue (AM)
11. West 79th Street & Amsterdam Avenue (Midday and Saturday Midday)

*Columbus Avenue/Ninth Avenue*

12. West 57th Street & Columbus Avenue (AM, Midday, and Saturday Midday)
13. West 66th Street & Columbus Avenue (AM, Midday, and Saturday Midday)
14. West 65th Street & Columbus Avenue/Broadway (AM and Midday)

*Central Park West/Eight Avenue*

15. West 57th Street & Eight Avenue (Midday and Saturday Midday)
16. West 65th Street & Central Park West (PM and Saturday Midday)
17. West 66th Street & Central Park West (AM, Midday, and Saturday Midday)
18. West 67th Street & Central Park West (PM)
19. West 72nd Street & Central Park West (AM, Midday, and Saturday Midday)
20. West 81st Street & Central Park West (AM, Midday, and PM)
21. West 86th Street & Central Park West (AM, Midday, and PM)

The issues and recommendations for the intersections listed above are outlined below:

## Riverside Drive

1. West 79th Street & Riverside Drive
   *Issue(s):*
   - Delays on northbound and southbound approaches;
   - Merging conflicts for eastbound vehicles on West 79th Street with those exiting the Henry Hudson Parkway NB exit ramp;
   - Illegal left turns from the eastbound approach to NB Henry Hudson Parkway Entrance ramp and Riverside Drive;
   - Bus layover on the south curb EB approach limits the sight distance for vehicles exiting the ramps thereby compromising safety.

   *Recommendation(s):*
   - During the AM peak hour shift 4 seconds from the EB/WB phase to the NB/SB phase.
   - Install kwik curb on the eastbound approach along West 79th Street for about 100 feet west from the existing stop bar to eliminate illegal EB left turn to Riverside Drive and U-turn to Henry Hudson Parkway NB.
   - Install crosswalk for pedestrian to cross the Henry Hudson Parkway exit ramp;
   - Install stop bar on the eastbound approach.
   - Extend the curb at the southwest corner to restrict vehicle to two travel lanes on the eastbound approach and shorten the pedestrian crossing distance.

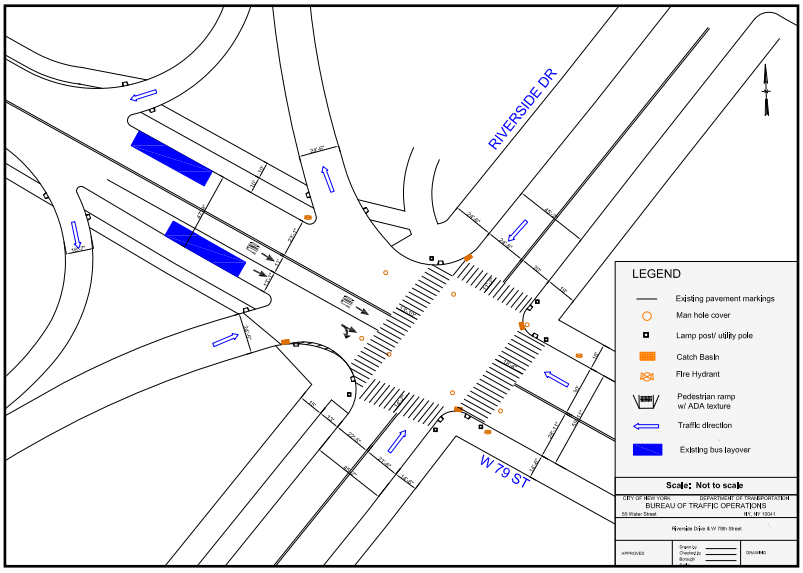


*Figure 3-2a: Existing Condition*

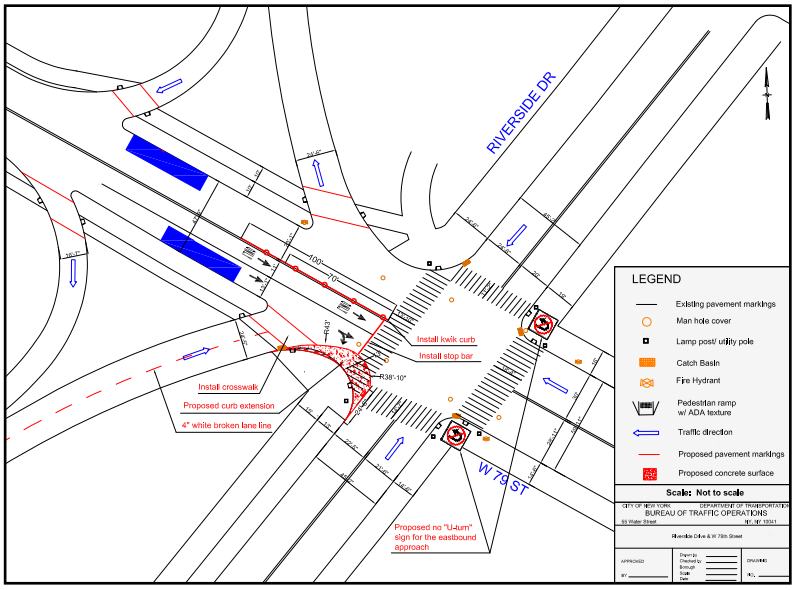


*Figure 3-2b: Proposed Recommendations*

## West End Avenue

1. West 59th Street & West End Avenue
   *Issue(s)*:
   - Heavy delays on the westbound approach during the AM and PM peak periods.

   *Recommendation(s)*
   - During the AM and PM peak hour shift 5 seconds from the NB/SB phase to the EB/WB phase.

2. West 66th Street & West End Avenue
   *Issue(s)*:
   - The relative speed of traffic creates unsafe and uncomfortable conditions for pedestrians.
   - Heavy WB left turn during the AM and PM peak periods.

   *Recommendation(s):*
   - During the AM peak hour shift 5 seconds from the EB/WB phase to the NB/SB phase.
   - Reconfigure West 66th Street between Amsterdam Avenue and West End Avenue to reduce speeding and improve safety.
   - Restripe the westbound approach to provide double exclusive left turn lanes, 1 thru lane, and 1 share thru-right lane. Also, remove two (2) parking spaces on the SB receiving lane to facilitate turning movement of WB left vehicles. This would improve the LOS of the WB left turn movement from F to D and F to C during the AM and PM peak hours, respectively. The overall intersection LOS would improve from E to C, and D to C during the AM and PM peak hours, respectively.
   - Create six-foot buffers between the parking and moving lanes on the north and south curb for approximately 500' from Amsterdam Avenue.
   - Figure 3-3a and 3-3b show the existing and proposed configuration; also, Figures 3-4a to 3-4c illustrate the cross-section view under existing and proposed conditions.

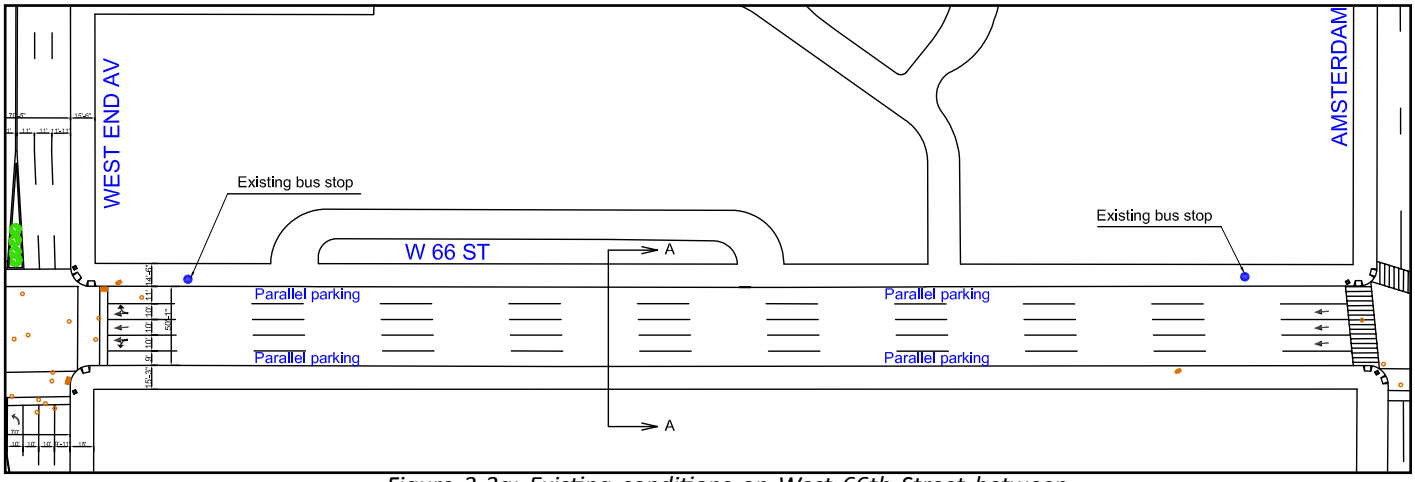


*Figure 3-3a: Existing conditions on West 66th Street between Amsterdam Avenue and West End Avenue*

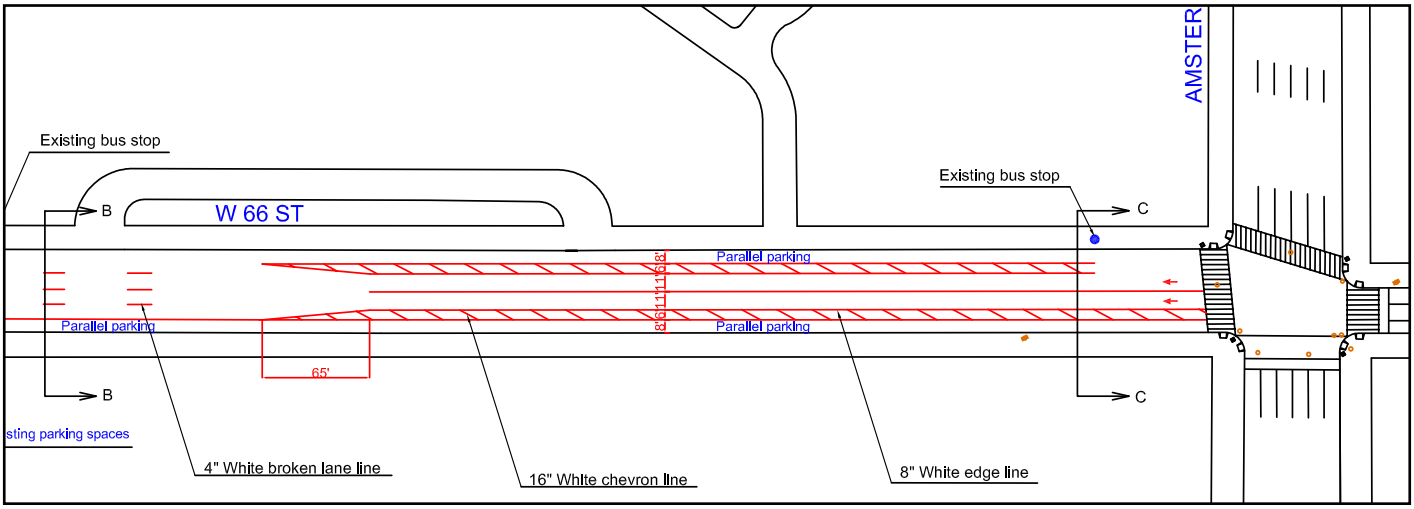


*Figure 3-3b: Proposed Condition on West 66th Street between Amsterdam Avenue and West End Avenue*

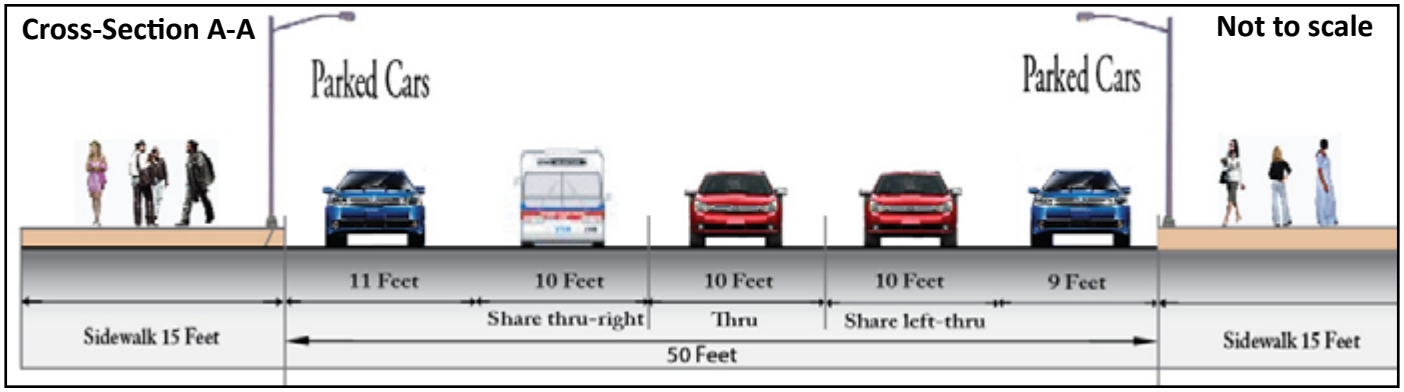


*Figure 3-4a: West 66th Street between Amsterdam and West End Avenues (Existing Condition)*

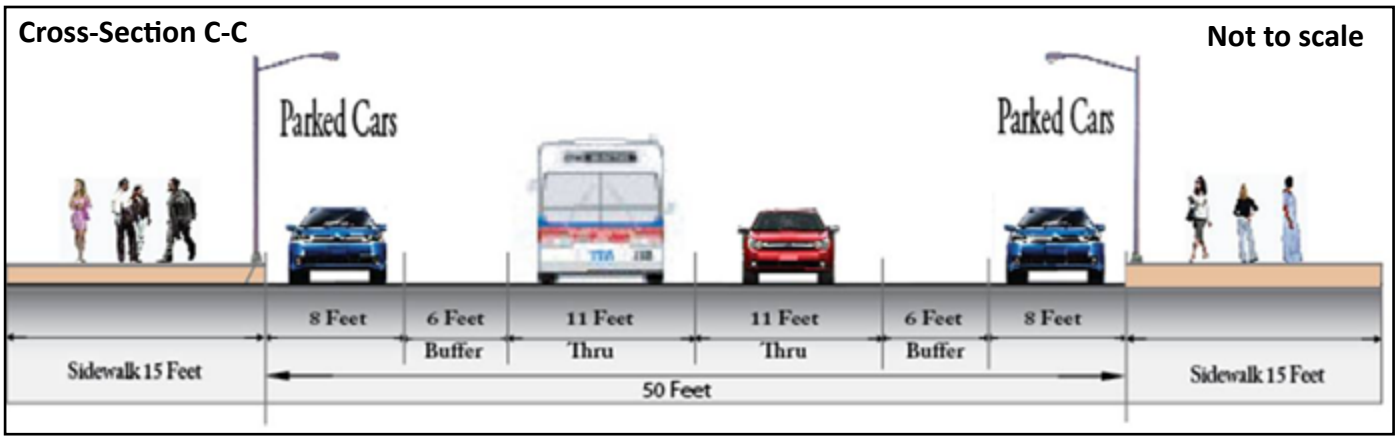


*Figure 3-4b: Proposed Configuration for West 66th Street west of Amsterdam Avenue*

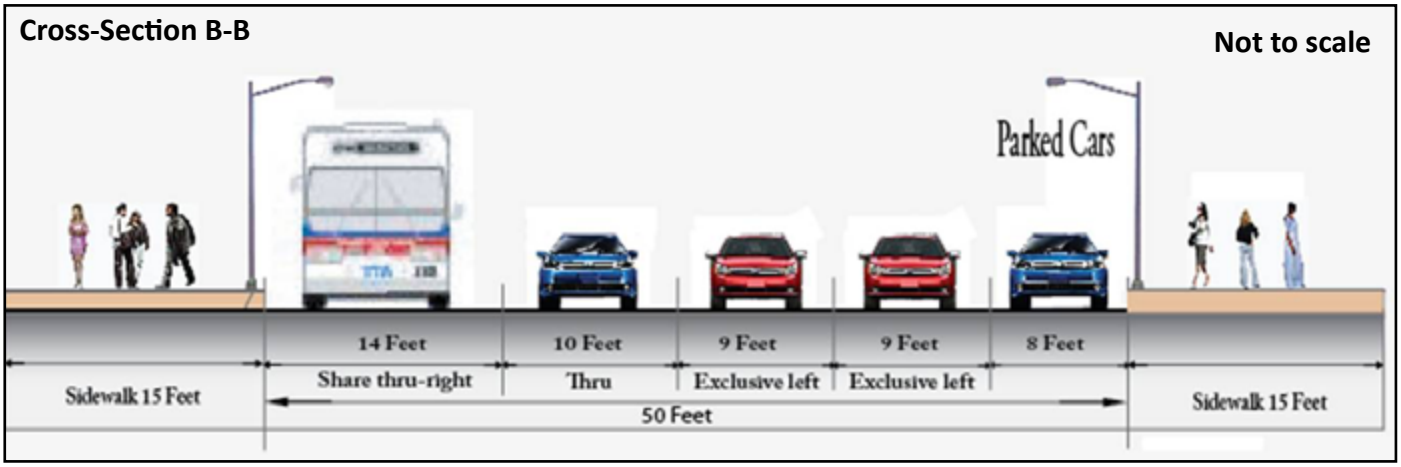


*Figure 3-4c: Proposed Configuration for West 66th Street – approaching West End Avenue*

3. West 70th Street & West End Avenue

   *Issue(s)*:

   - Heavy delays on the southbound approach during the PM peak period.

   *Recommendation(s)*:

   - During the PM peak hour prohibit parking ("No Parking, 4PM – 7PM) on the west curb of the SB approach and on the receiving lane; restripe to provide three lanes (one shared left-thru lane, one thru lane, and one shared thru-right lane).
   - Install neckdown at the northeast, southeast, and southwest corners.

The existing and proposed conditions are shown in Figure 3-5a and 3-5b.

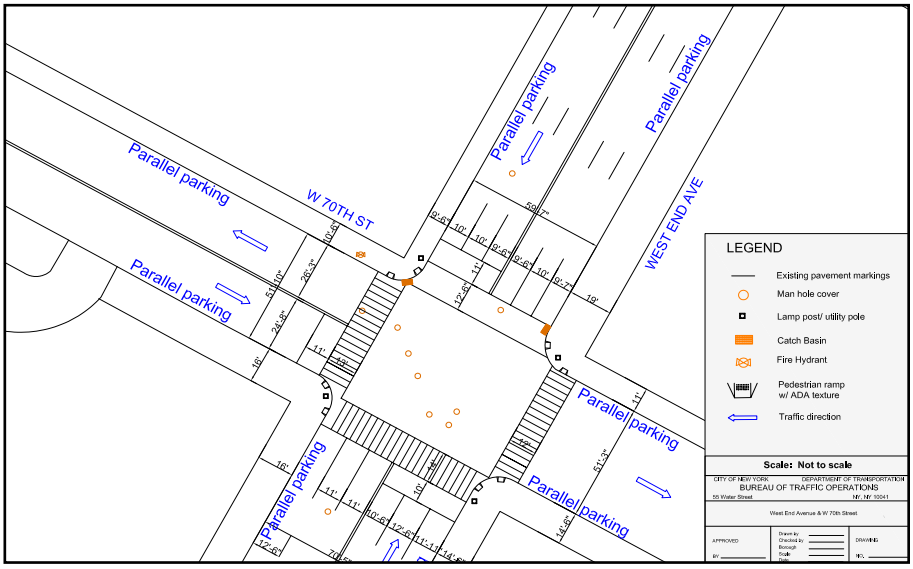


*Figure 3-5a: Existing Condition - West End Ave & West 70th Street*

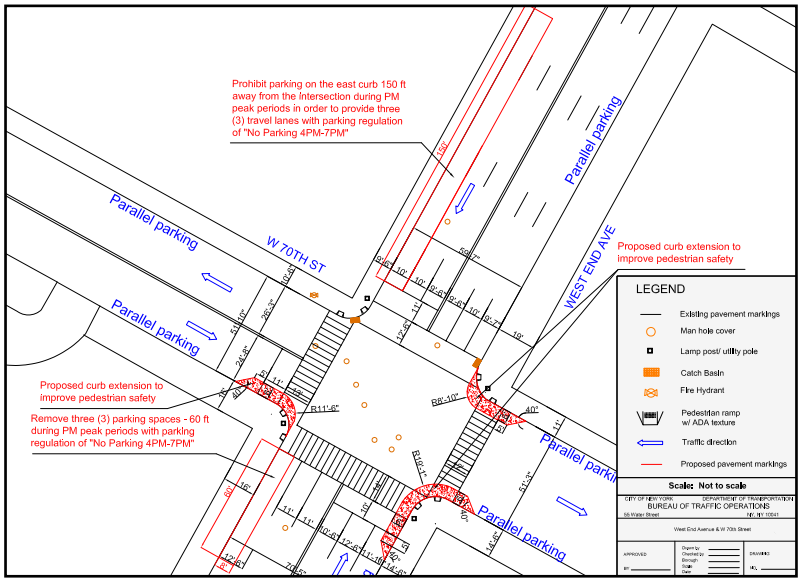


*Figure 3-5b: Proposed Lane Configuration on West End Ave & West 70th Street (SB Approach)*

4. West 72nd Street & West End Avenue
   *Issue(s)*:
   - Heavy delays on the southbound approach during the PM peak hour.

   *Recommendation(s)*:
   - During the PM peak hour shift 5 seconds from the NB lagging phase to the NB/SB phase.

5. West 79th Street & West End Avenue
   *Issue(s)*:
   - Insufficient timing for the EB/WB approaches cause delays.

   *Recommendation(s)*:
   - During the AM peak hour, shift 3 seconds from the NB/SB phase to the EB/WB phase
   - During the PM peak hour, shift 2 seconds from the NB/SB phase to the EB/WB phase

## Broadway

1. West 66th Street & Broadway and Columbus Avenue

   *Issue(s)*:

   - Crosswalk and pavement markings are confusing.

   *Recommendation(s)*:

   - Replace existing "Don't Block the Box" pavement marking with posted "Do Not Block Intersection" signs; the existing and proposed conditions are shown in Figure 3-6a and 3-6b.

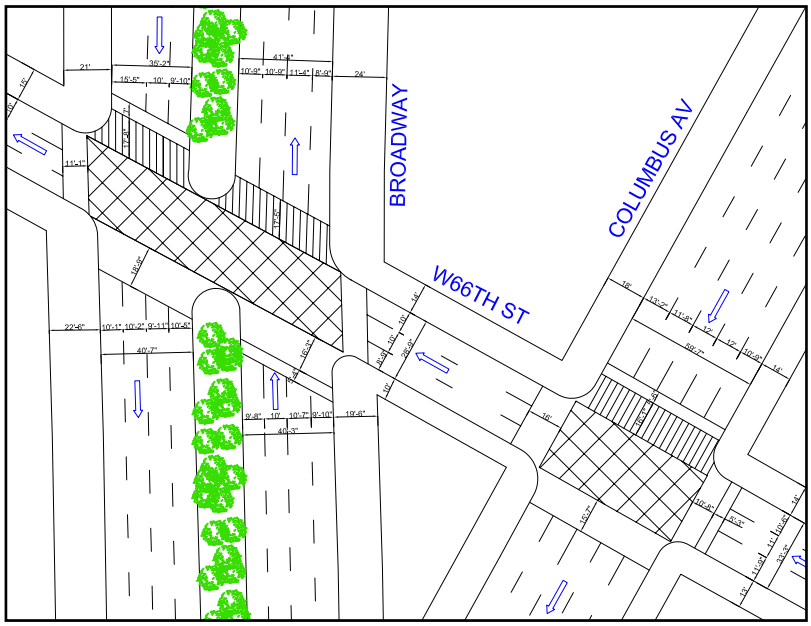


*Figure 3-6a: Existing "Don't Block the Box" Markings*

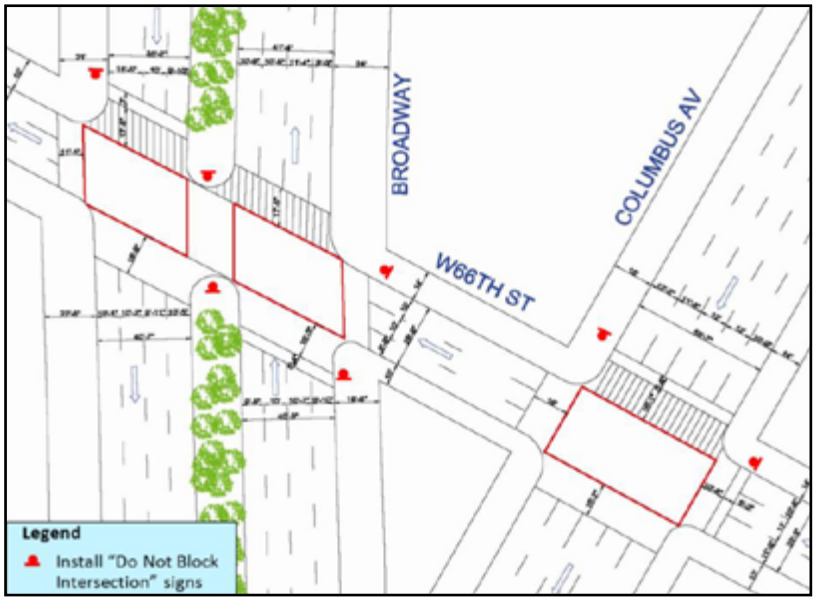


*Figure 3-6b: Proposed "Do Not Block Intersection" Signs*

2. West 79th Street & Broadway

*Issue(s)*:

- Westbound approach experiences delay due to parked vehicles (i.e. bus layover and double parked trucks).
- Buses parked in bus layover on the westbound approach obstruct the vision of motorists making right turns.

*Recommendation(s)*:

- Remove two parking spaces and relocate the bus layover area on the WB approach 50 feet east to provide an exclusive right turn bay and improve sight distance for right turning vehicles.
- During the Saturday midday peak hour shift 5 seconds from the NB/SB phase to the EB/WB phase.
- Install neckdown at the northwest corner.

The existing and proposed conditions are shown in Figure 3-7a and 3-7b.

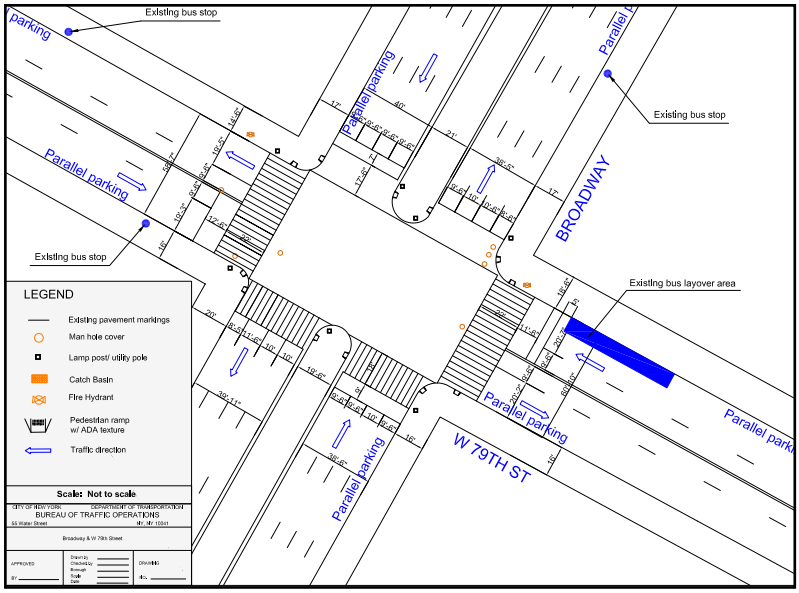


*Figure 3-7a: Existing Condition - Broadway & West 79th Street*

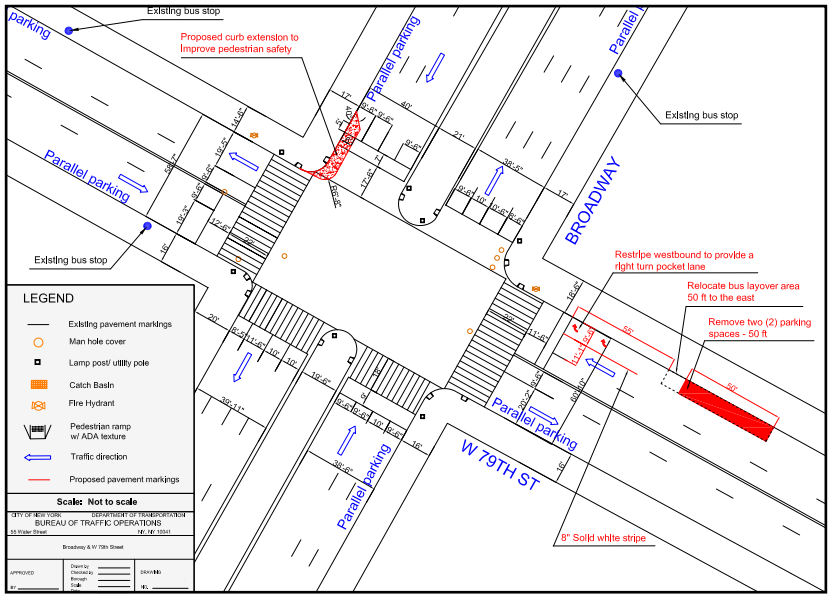


*Figure 3-7b: Proposed Lane Configuration - Broadway & West 79th Street*

## Amsterdam Avenue

1. West 57th Street & Tenth Avenue
   *Issue(s)*:
   - Heavy traffic on the eastbound/westbound approaches causes significant delays during the AM and midday peak periods.

   *Recommendation(s)*:
   - During the AM peak hour shift 5 seconds from the NB phase to the EB/WB phase.
   - During midday peak shift 3 seconds from the NB phase to the EB/WB phase.

2. West 79th Street & Amsterdam Avenue
   *Issue(s)*:
   - Heavy traffic on the eastbound/westbound approaches causes significant delays during the midday and Saturday peak periods.

   *Recommendation(s)*:
   - During the midday peak hour, shift 5 seconds from the NB phase to the EB/WB phase.
   - During the Saturday midday peak hour shift 3 seconds from the NB phase to the EB leading phase.

### Columbus Avenue

1. West 57th Street & Columbus Avenue
   *Issue(s)*:
   - Heavy left turns on the westbound approach create conflicts with pedestrians.
   - Heavy traffic on the eastbound approach cause the westbound left turn traffic to back up with long queues.

   *Recommendation(s)*:
   - During the AM peak hour shift 4 seconds from the SB phase to the EB/WB phase.
   - During the midday shift 4 seconds from the SB phase to the EB/WB phase.
   - During the Saturday midday peak hour shift 3 seconds from the SB phase to the EB/WB phase.
   - Daylight the WB approach (for approximately 40 feet) with “No Standing Anytime” to provide clear site distance for pedestrians and drivers.
   - Install Countdown Pedestrian Signals

2. West 65th Street & Columbus Avenue/Broadway
   *Issue(s):*
   - Heavy traffic on the eastbound approach and Columbus Avenue southbound approach cause significant delay during all peak periods.

   *Recommendation(s)*:
   - During the midday shift 3 seconds from the Broadway NB/SB phase to Columbus Avenue SB phase.

3. West 86th Street & Columbus Avenue

   *Issue(s)*:

   - Insufficient bus stop storage for westbound buses on the far side of intersection.

   *Recommendation(s)*:

   - Relocate the westbound bus stop 50 feet further west by removing 3 parking spaces.

The existing and proposed conditions are shown in Figure 3-8a and 3-8b.

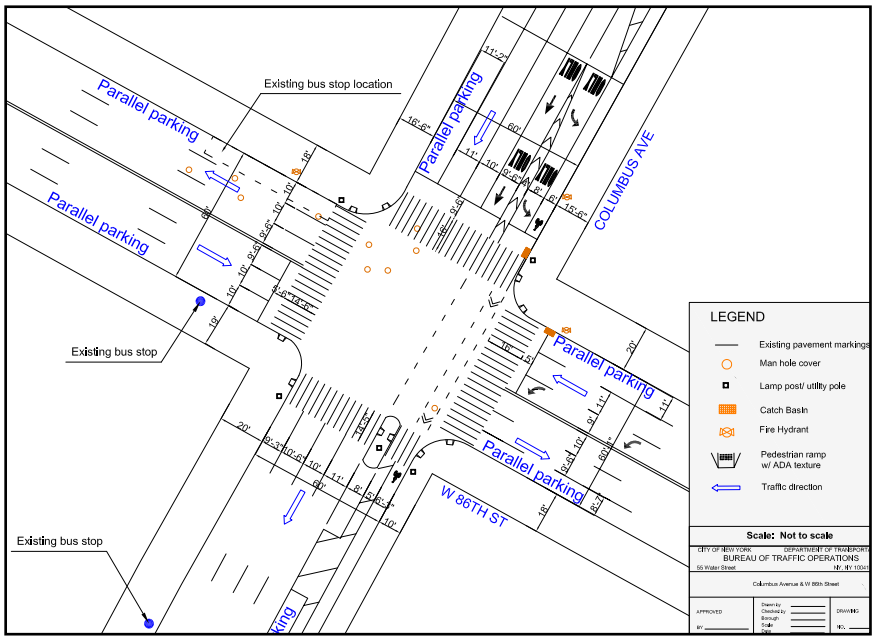


*Figure 3-8a: Existing Condition - West 86th Street & Columbus Avenue*

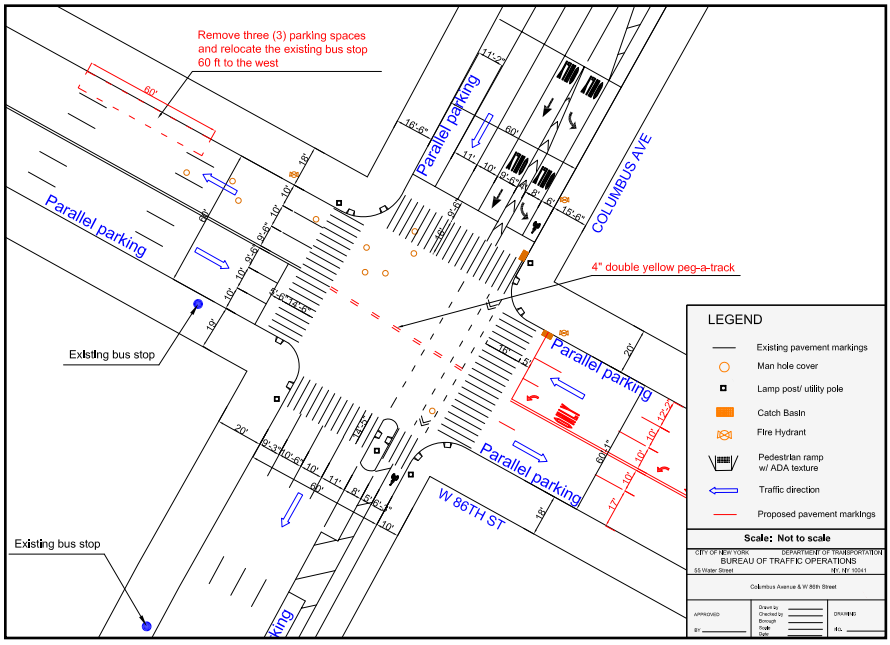


*Figure 3-8b: Proposed Condition – West 86th Street & Columbus Avenue*

## Central Park West/Eight Avenue

1. West 57th Street & Eight Avenue
   *Issue(s)*:
   - Heavy traffic on the eastbound/westbound approaches cause significant delays during the midday and Saturday midday peak periods.

   *Recommendation(s)*:
   - During the midday and Saturday midday peak hours, shift 3 seconds of green time from the NB phase to the EB/WB phase.

2. West 65th Street & Central Park West
   *Issue(s)*:
   - Heavy traffic on the northbound/southbound approaches cause significant delays during the PM and Saturday midday peak periods.

   *Recommendation(s)*:
   - During the PM peak hour, shift 3 seconds from the EB phase to the SB lagging phase.
   - During the Saturday midday peak hour, shift 3 seconds from the EB phase to the NB/SB phase.

3. West 66th Street & Central Park West
   *Issue(s)*:
   - Heavy westbound thru traffic causes significant delay during all peak periods.

   *Recommendation(s)*:
   - Change the WB lane designation from 1L-1T-1R to 1L-1T-1TR.
   - During the AM, midday, and Saturday midday peak hours shift 2 seconds from the NB/SB phase to the WB phase.

The existing and proposed conditions are shown in Figure 3-9a and 3-9b.

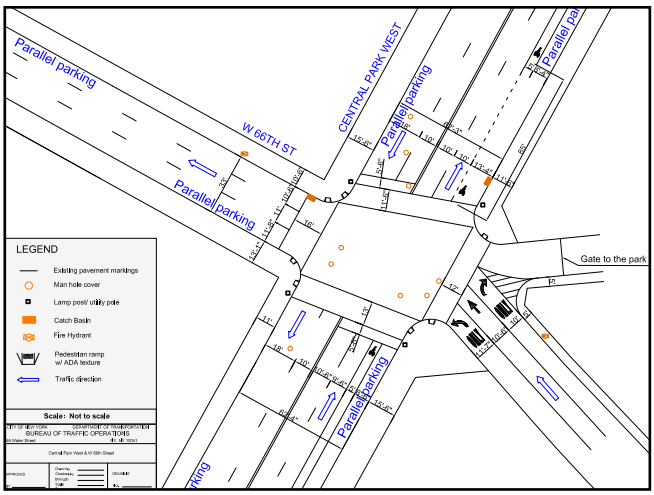


*Figure 3-9a: Existing Condition - Central Park West & West 66th Street*

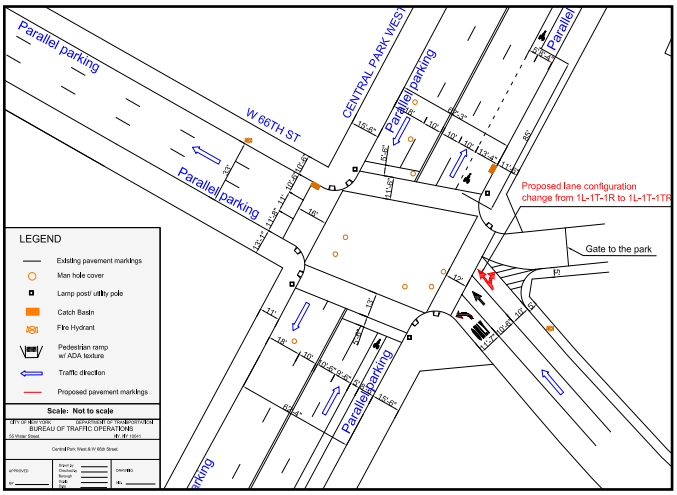


*Figure 3-9b: Proposed Lane Assignment - Central Park West & West 66th Street*

4. West 67th Street & Central Park West
   *Issue(s)*:
   - Heavy northbound thru traffic causes significant delay during the PM peak period.

   *Recommendation(s)*:
   - During the PM peak hour shift 5 seconds from the WB phase to the NB/SB phase.

5. West 72nd Street & Central Park West
   *Issue(s)*:
   - Heavy northbound traffic causes significant delays during the PM and Saturday midday peak periods.

   *Recommendation(s)*:
   - During the PM and midday peak hours shift 4 seconds from the EB phase to the NB/SB phase.
   - During the Saturday midday peak hour shift 2 seconds from the NB/SB phase to the EB phase.

6. West 81st Street & Central Park West
   *Issue(s)*:
   - Heavy delays occur on the eastbound/westbound approaches during all peak periods.
   - Heavy traffic on the southbound approach causes significant delay during the AM peak period.

   *Recommendation(s)*:
   - During the AM, midday, and PM peak hours remove four parking spaces on the west curb and restripe the SB approach and create a left turn bay to provide four lanes, (one left lane, two thru lanes, and one right turn pocket). Additionally, the existing condition and two proposed alternatives for the NB approach are shown in Figures 3-10a, 3-10b, and 3-10c.

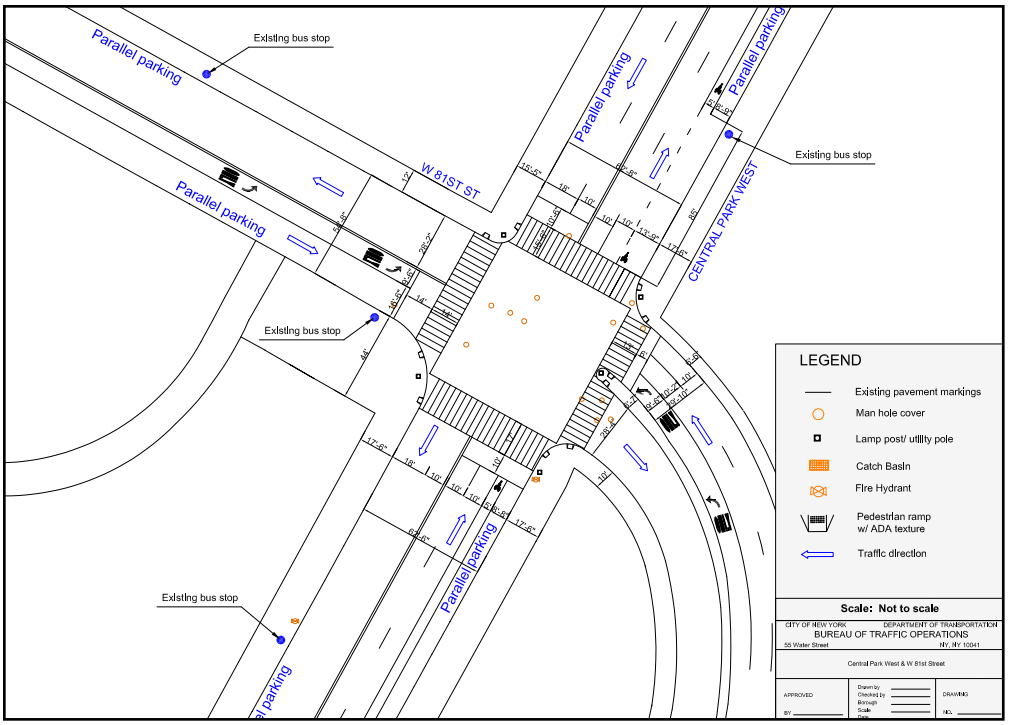


*Figure 3-10a: Existing Condition - Central Park West & West 81st Street*

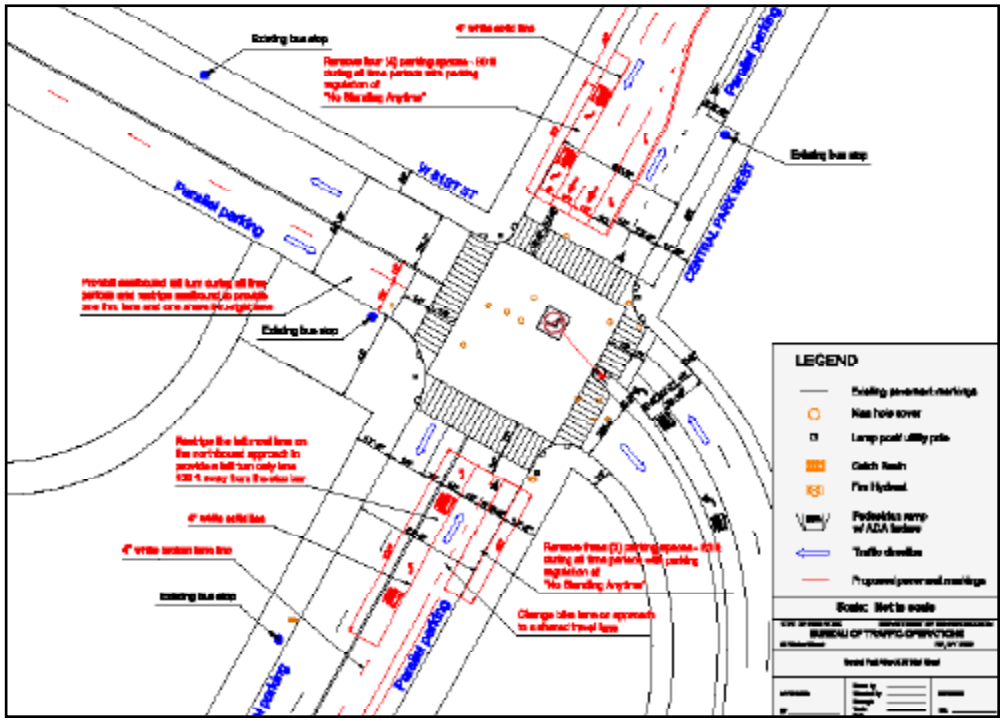


*Figure 3-10b: Proposed Roadway Configuration - Central Park West & West 81st Street (Option 1)*

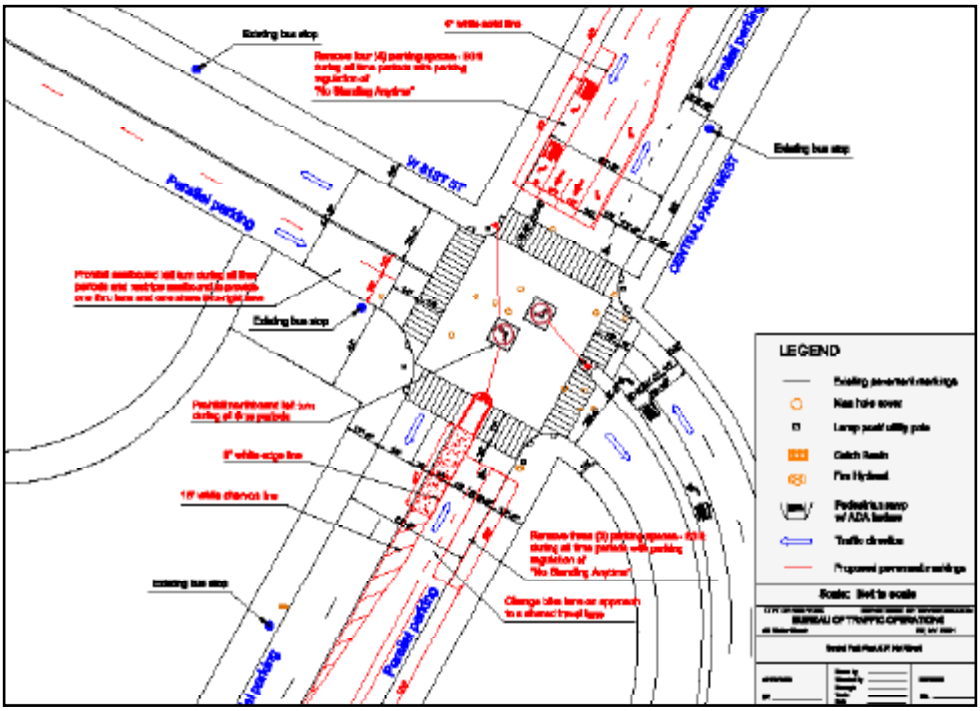


*Figure 3-10c: Proposed Roadway Configuration - Central Park West & West 81st Street (Option 2)*

7. West 86th Street & Central Park West

*Issue(s)*:

- Heavy southbound left turns and northbound volumes create queuing during the AM and PM peak periods.

*Recommendation(s)*:

- Prohibit eastbound left turn as volume is low. Existing left turn traffic will make left turn at Amsterdam Avenue instead.
- Restripe the eastbound approach to provide one thru lane and one shared thru-right lane.
- Change the existing LPI to NB/SB dual left turn phase.
- During the AM peak hour, shift 1 second from the WB leading phase to the EB/WB phase and take 4 seconds from the NB/SB phase to the proposed NB/SB dual left turn phase.
- During the midday peak hour, shift 5 seconds from the NB/SB phase to the proposed NB/SB dual left turn phase.
- During the PM peak hour, shift 3 seconds from the WB leading phase and 2 seconds from the NB/SB phase to the proposed NB/SB dual left turn phase.
- Install neckdown at the southwest corner.

The existing and proposed conditions are shown in Figure 3-11a and 3-11b.

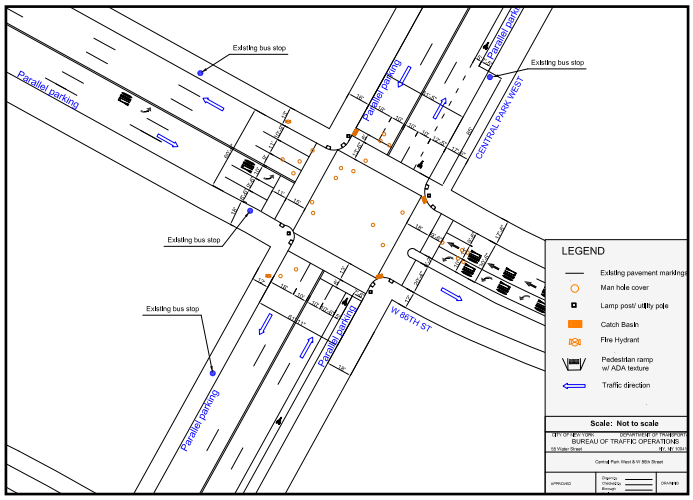


*Figure 3-11a: Existing Condition - Central Park West & West 86th Street*

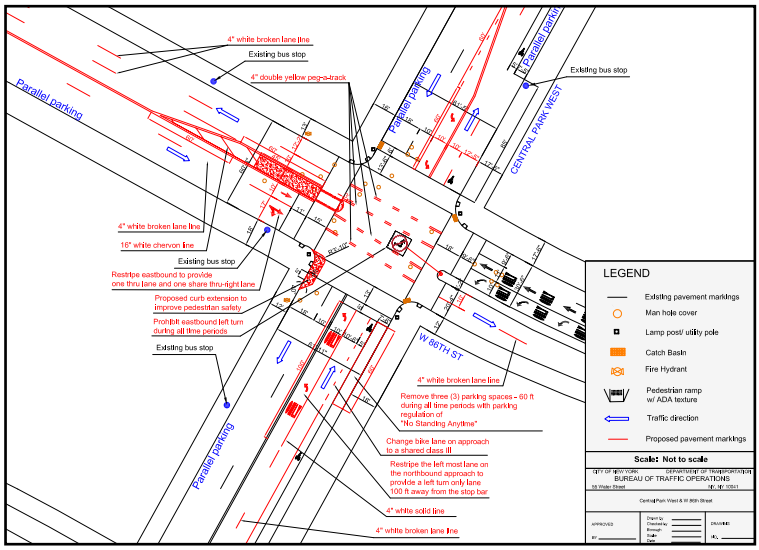


*Figure 3-11b: Proposed Roadway Configuration - Central Park West & West 86th Street*

## Designated Left Turn on Broadway

*Issue(s)*:

- Need to improve pedestrian safety by reducing risks posed by vehicles making left turns.

*Recommendation(s)*:

- Designate a lane and phase for left turns at major intersections, i.e. West 66th, West 72nd, West 79th, and West 86th streets.

This recommendation is illustrated in Figure 3-12.

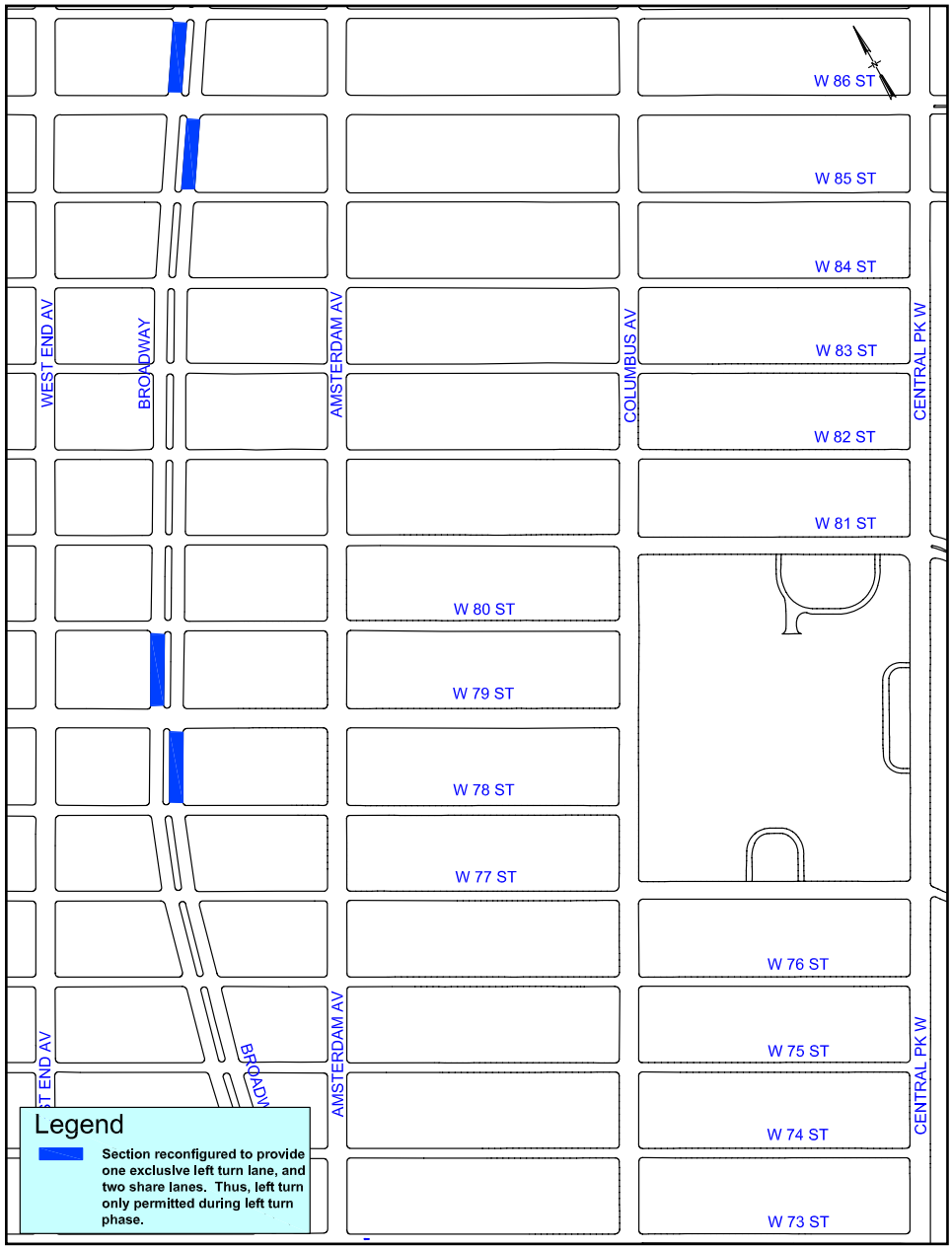


*Figure 3-12a: Designated Left Turn on Broadway Left Turn Permitted at Major Intersections with a Lane and Phase*

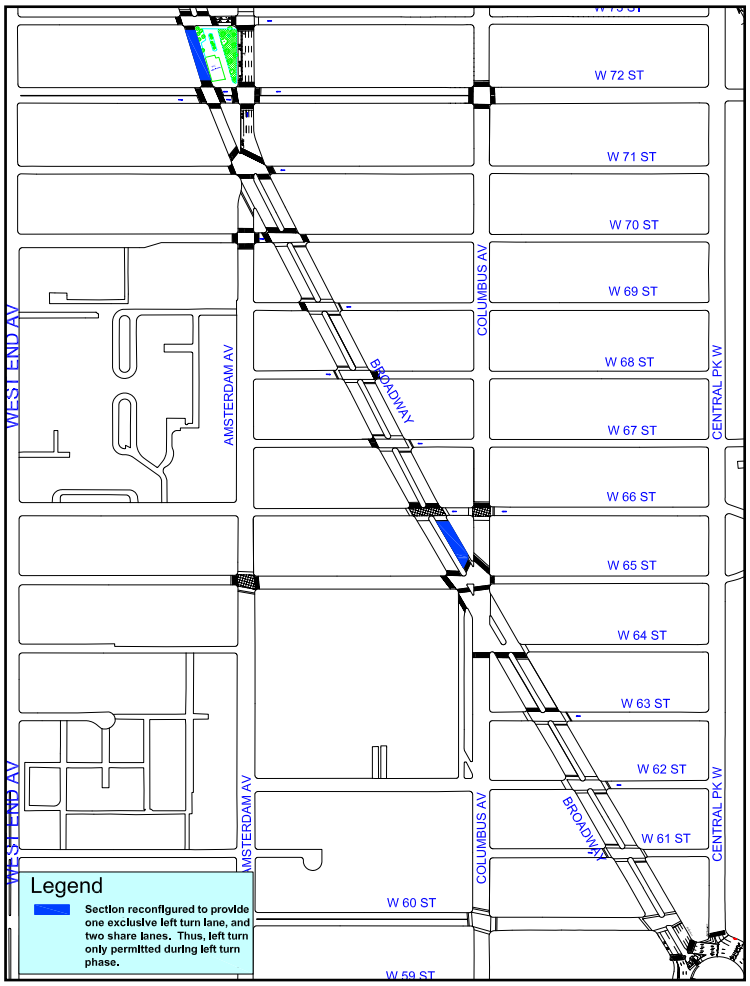


*Figure 3-12b: Left Turn Restriction on Broadway Left Turn Permitted at Major Intersections with a Lane and Phase*

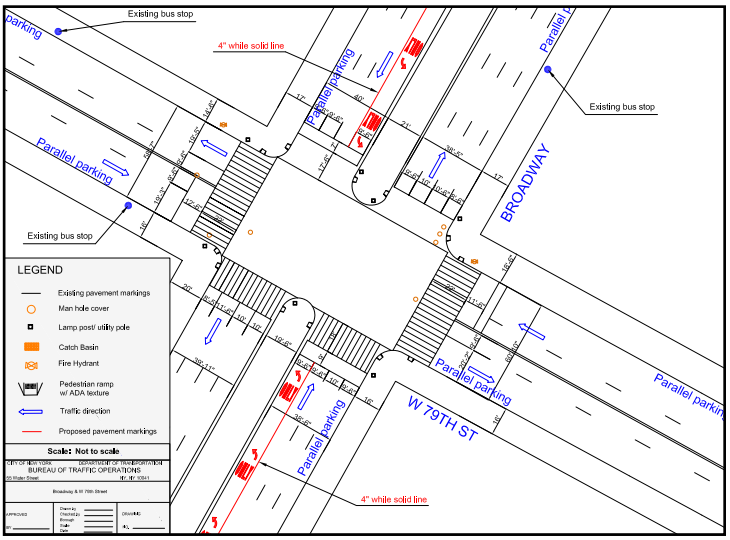


*Figure 3-13: Proposed Configuration on Broadway at Major Intersections*

## Lincoln Tunnel-bound Truck Advisory - Columbus Avenue & West 57th Street

*Issue(s)*:

- Need to reduce truck traffic volume on Columbus Avenue south of West 57th Street

*Recommendation(s)*:

- Post advisory sign(s) on the southbound and westbound approaches directing Lincoln Tunnel bound trucks to use 11th Avenue to access the tunnel.

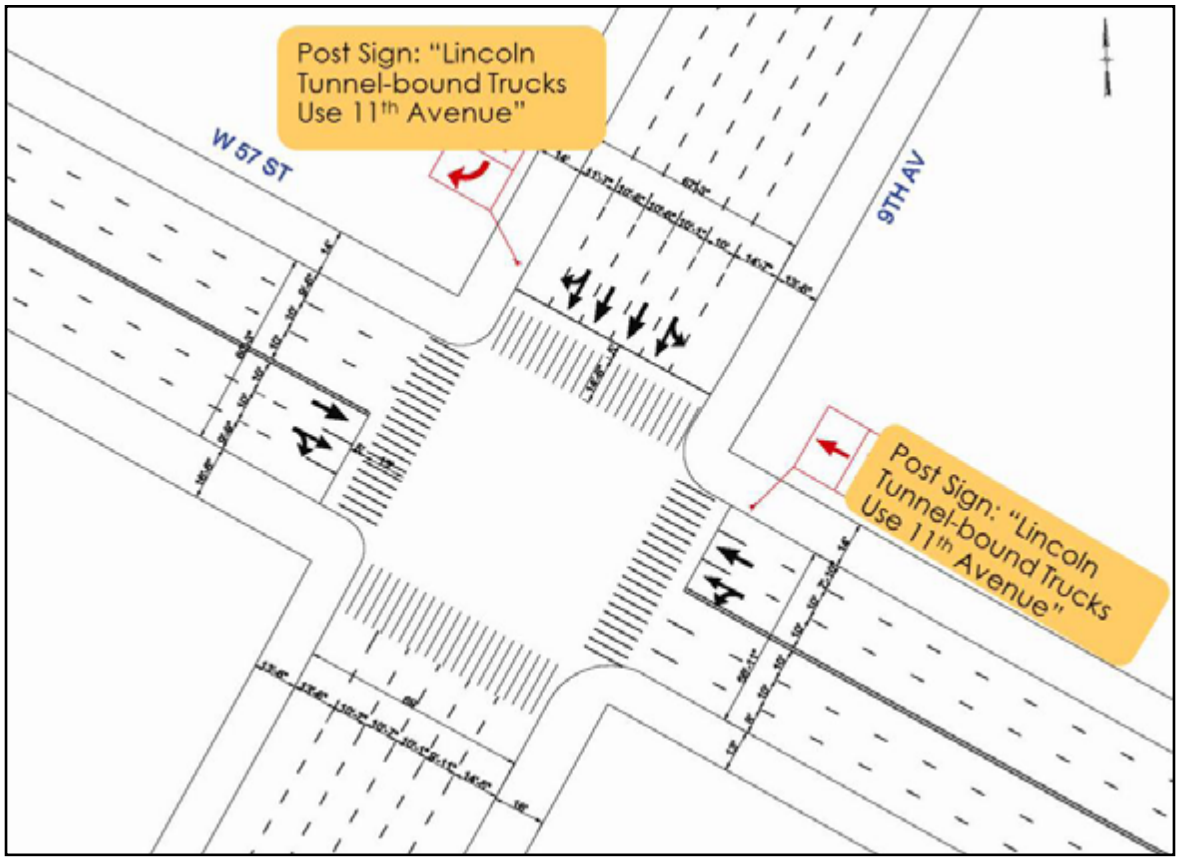


*Figure 3-14: Truck Advisory – Ninth Avenue & West 57th Street*

## 2. Pedestrian Safety

Safety at major intersections with high pedestrian volumes and crosswalks length longer than 50 feet could be improved with targeted measures such as the installation of neckdowns, medians, and street design features. Safety at some of these intersections could also be improved with the installation of countdown signals.

### Installation of Countdown Signals

Several intersections in the study area experience high pedestrian and vehicular traffic with wide streets. The following locations would benefit from countdown signals to improve pedestrian safety:

1. Eight Avenue/West 57th Street
2. Ninth Avenue/West 57th Street
3. Tenth Avenue/West 57th Street
4. Eight Avenue/West 58th Street
5. Columbus Avenue/West 60th Street
6. Amsterdam Avenue/West 72nd Street
7. Central Park West/West 81st Street

### Installation of Audible Signals

1. West 70th Street & Broadway and West 65th Street & Broadway/Columbus Avenue

   *Issue(s)*:
   - Need to enhance safety for the visually impaired as shown in existing signs below.

   *Recommendation(s)*:
   - Install audible crossing signals for visually impaired pedestrians at this location.

## Installation of Medians and Neckdowns

*Riverside Drive*

1. West 72nd Street & Riverside Drive

   *Issue(s)*:

   - The west crosswalk on West 72nd Street is very long (105 feet).

   *Recommendation(s)*:

   - Extend curb on the northwest corner for about 40 feet to reduce pedestrian crossing distance.
   - Extend curb on the northeast corner.
   - Realign the north and west crosswalks based on the proposed curb extensions.

Figure 3-15a and 3-15b show the existing and proposed conditions at this location.

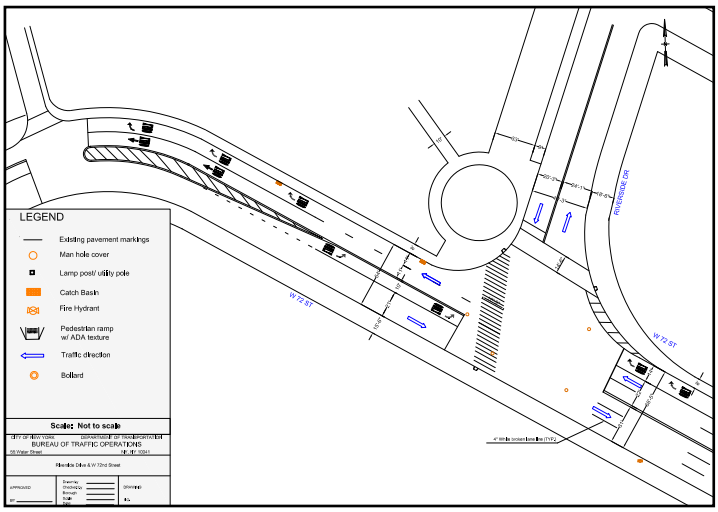


*Figure 3-15a: Existing Condition - Riverside Drive & West 72nd Street*

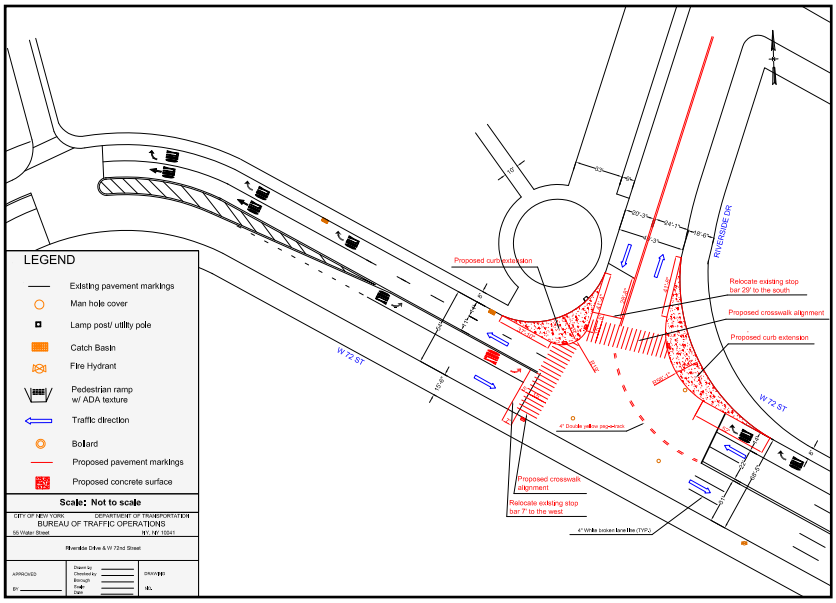


*Figure 3-15b: Proposed Condition - Riverside Drive & West 72nd Street*

West End Avenue

2. West 58th Street & West End Avenue

   *Issue(s)*:

   - Need to enhance pedestrian safety.

   *Recommendation(s)*:

   - Install a concrete median on the northbound approach.

Figure 3-16a and 3-16b show the existing and proposed conditions at this location.

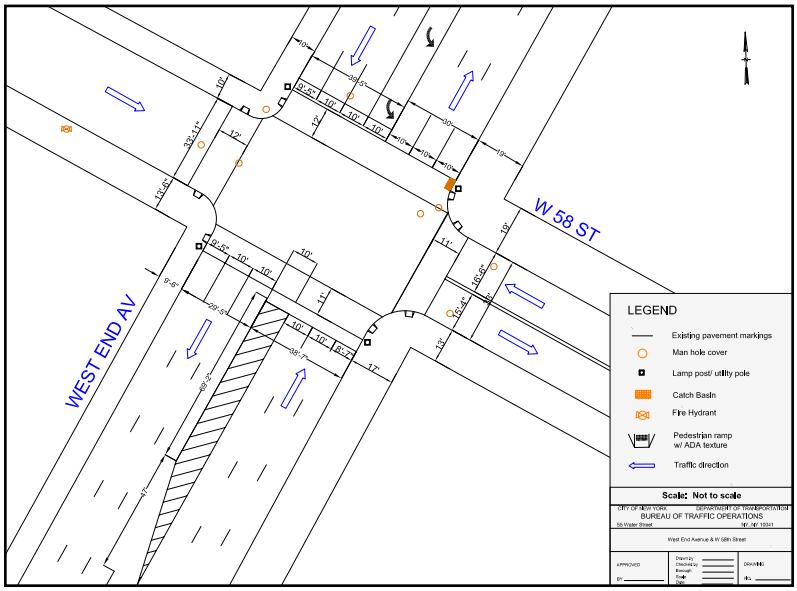


*Figure 3-16a: Existing Condition - West End Avenue & West 58th Street*

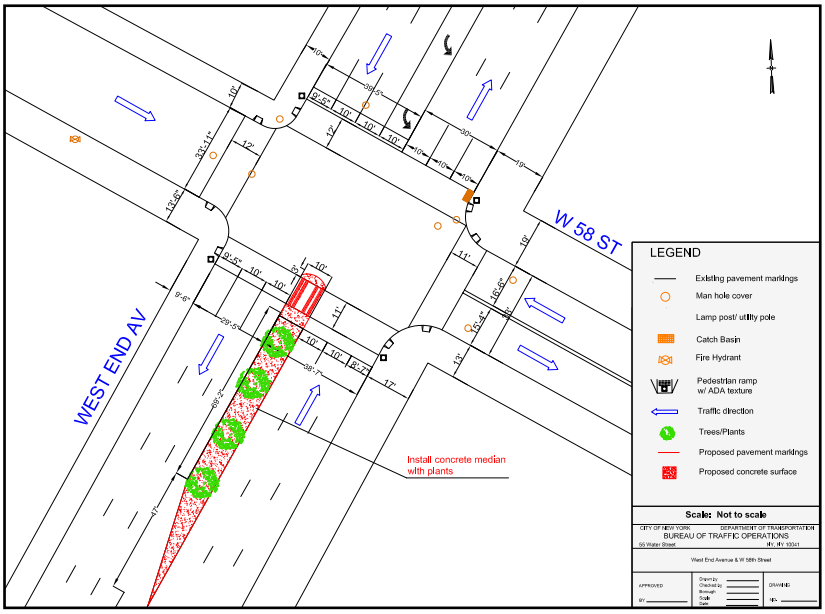


*Figure 3-16b: Proposed Condition - West End Avenue & West 58th Street*

3. West 59th Street & West End Avenue
   *Issue(s)*:
   - Need to enhance pedestrian safety.

   *Recommendation(s)*:
   - Install a concrete median on the southbound approach.

Figure 3-17a and 3-17b show the existing and proposed conditions at this location.

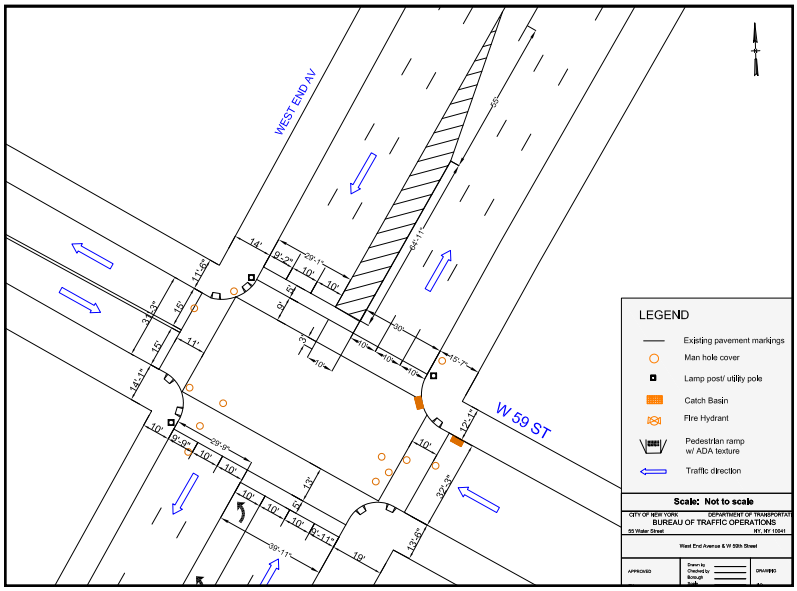


*Figure 3-17a: Existing Condition - West End Avenue & West 59th Street*

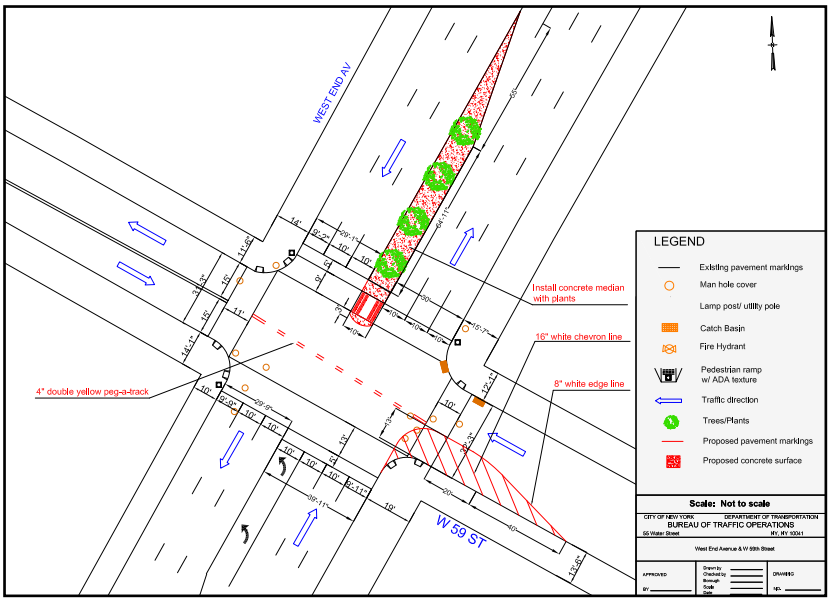


*Figure 3-17b: Proposed Condition - West End Avenue & West 59th Street*

4. West 58th Street & Eighth Avenue

   *Issue(s)*:

   - Need to enhance pedestrian safety.

   *Recommendation(s):*

   - Install a painted neckdown with street design furniture on the northwest and northeast corners.

Figure 3-18a and 3-18b show the existing and proposed conditions at this location.

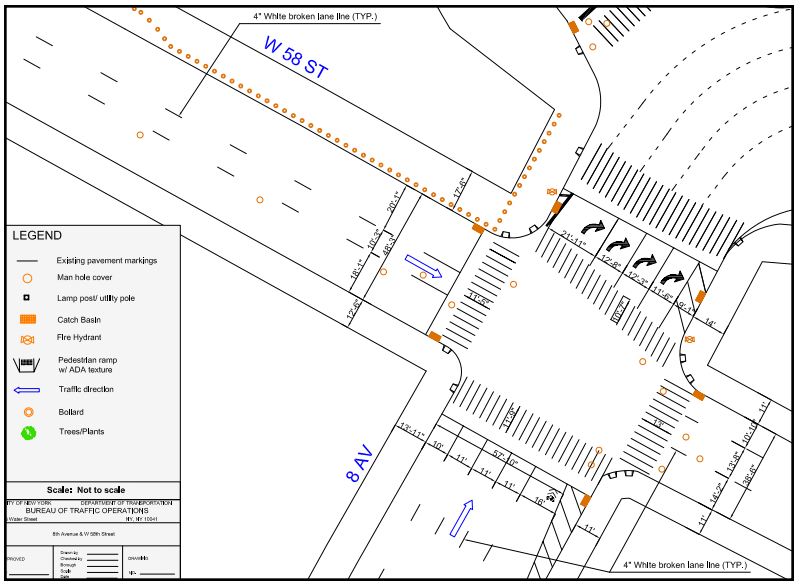


*Figure 3-18a: Existing Condition - Eighth Avenue & West 58th Street*

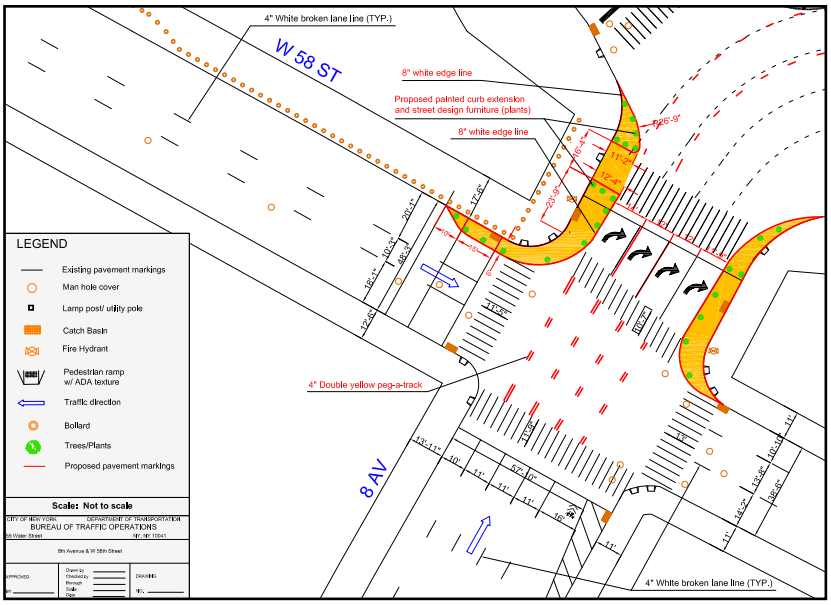


*Figure 3-18b: Proposed Condition - Eighth Avenue & West 58th Street*

Table 3-1 lists the locations where neckdowns or the installation of street design furniture is recommended; and, Figure 3-19a and b maps and illustrates the recommendation. These locations will be subjected detail design considerations.

*Table 3-1: Proposed Neckdown/Street Design Furniture Installation*

| | Intersection | Single Neckdown (corner)* | | | | | Double Neckdown (corner) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NE | NW | SE | SW | | NE | NW | SE | SW |
| 1 | West 86th St & Riverside Dr | x | | x | | | | | | |
| 2 | West 57th St & West End Ave | | x | | | | | | | x |
| 3 | West 70th St & West End Ave | x | | | x | | | | x | |
| 4 | West 72nd St & West End Ave | | | | | | x | x | | |
| 5 | West 79th St & West End Ave | | | | x | | x | x | x | |
| 6 | West 86th St & West End Ave | x | | | | | | | | x |
| 7 | West 60th St & Broadway | | x | | x | | | | | |
| 8 | West 65th St & Broadway | | x | | | | | | | |
| 9 | West 79th St & Broadway | | x | | | | | | | |
| 10 | West 86th St & Broadway | | x | | | | | | x | |
| 11 | West 57th St & Tenth Ave | | x | x | x | | | | | |
| 12 | West 59th St & Amsterdam Ave | | | x | | | | | | x |
| 13 | West 79th St & Amsterdam Ave | | | | | | | | | x |
| 14 | West 56th St & Ninth Ave | | | | | | | | | |
| 15 | West 57th St & Ninth Ave | | | x | x | | | | | |
| 16 | West 58th St & Columbus Ave | | | | x | | x | x | | |
| 17 | West 60th St & Columbus Ave | | | | | | x | | x | x |
| 18 | West 72nd St & Columbus Ave | | | | x | | | | | |
| 19 | West 79th St & Columbus Ave | | | | | | | x | | |
| 20 | West 57th St & Eight Ave | | | | | | | x | | x |
| 21 | West 58th St & Eight Ave | x | x | | | | | | | |
| 22 | West 86th St & Central Park West | | | | x | | | | | |

*See Figure for exact placement of neckdown.

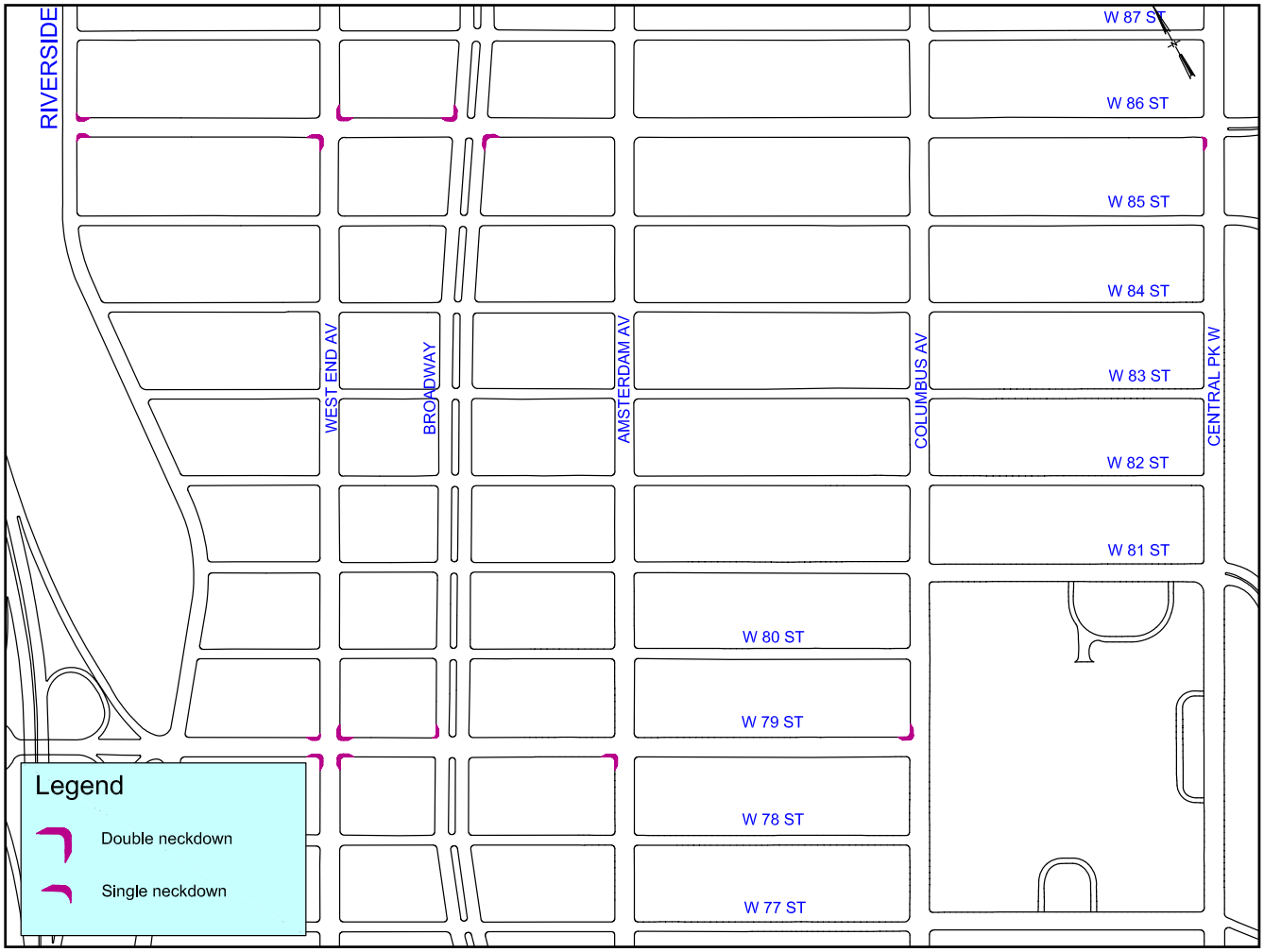


*Figure 3-19a: Proposed Neckdowns or Street Design Furniture (Page 1 of 4)*

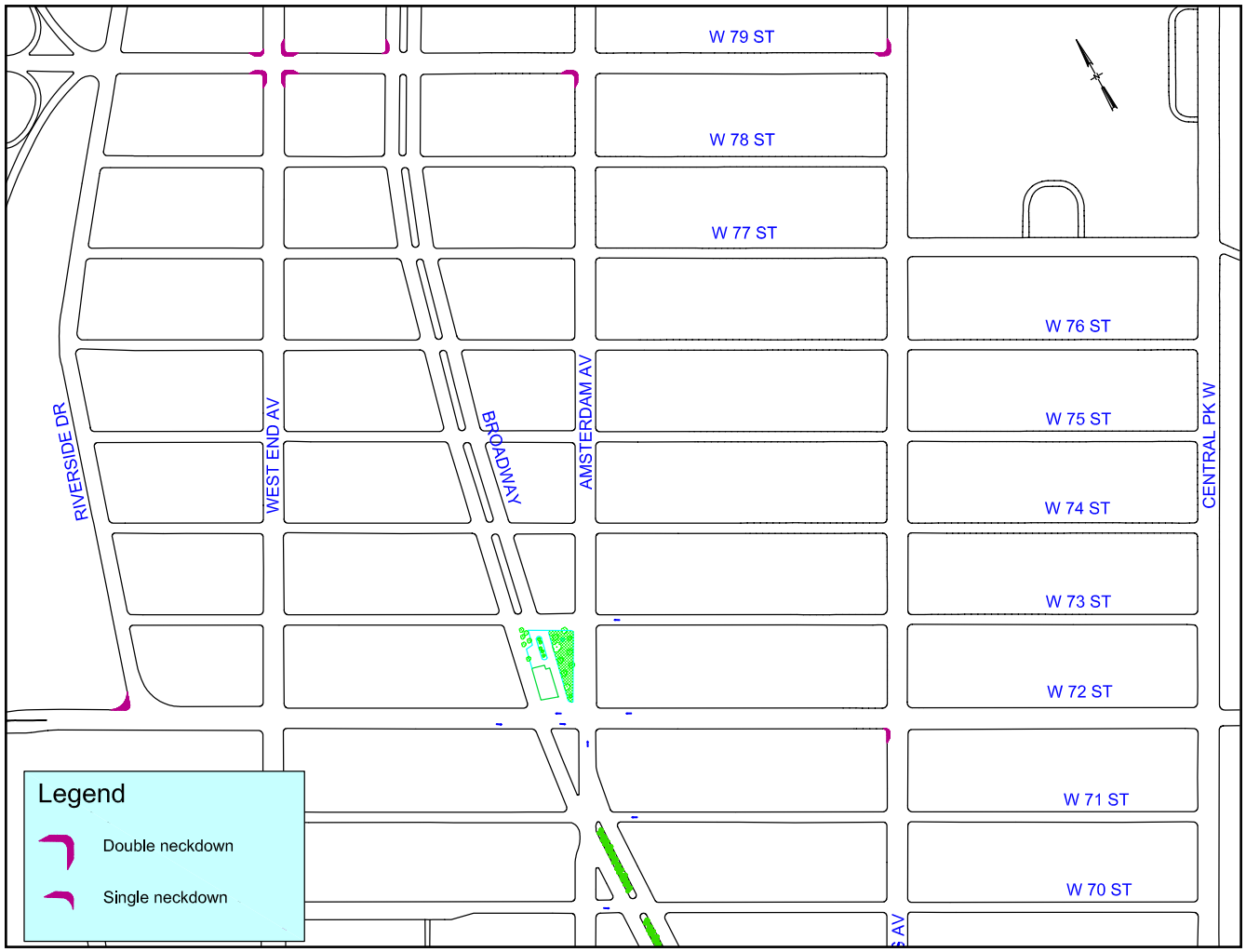


*Figure 3-19a: Proposed Neckdowns or Street Design Furniture (Page 2of 4)*

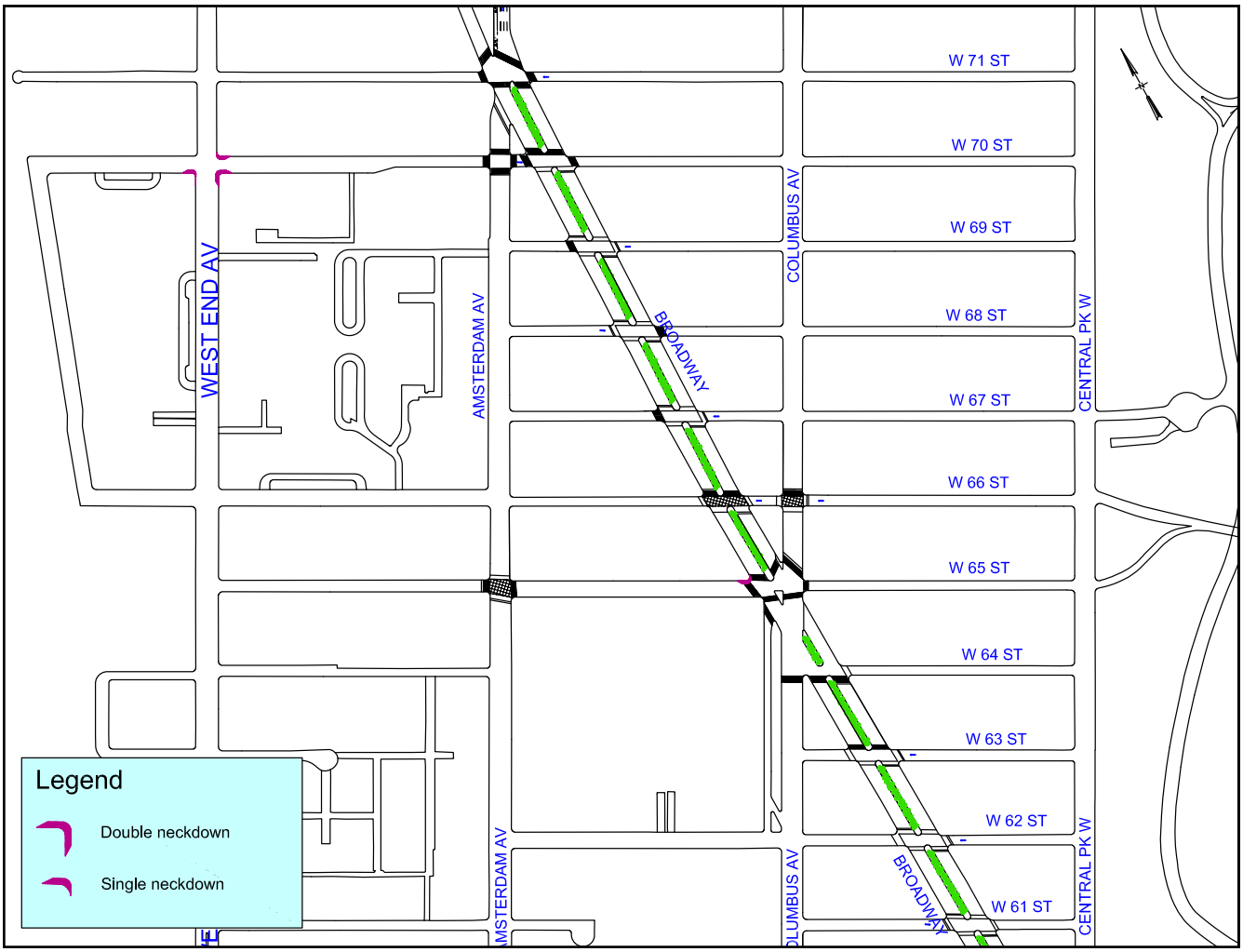


*Figure 3-19a: Proposed Neckdowns or Street Design Furniture (Page 3 of 4)*

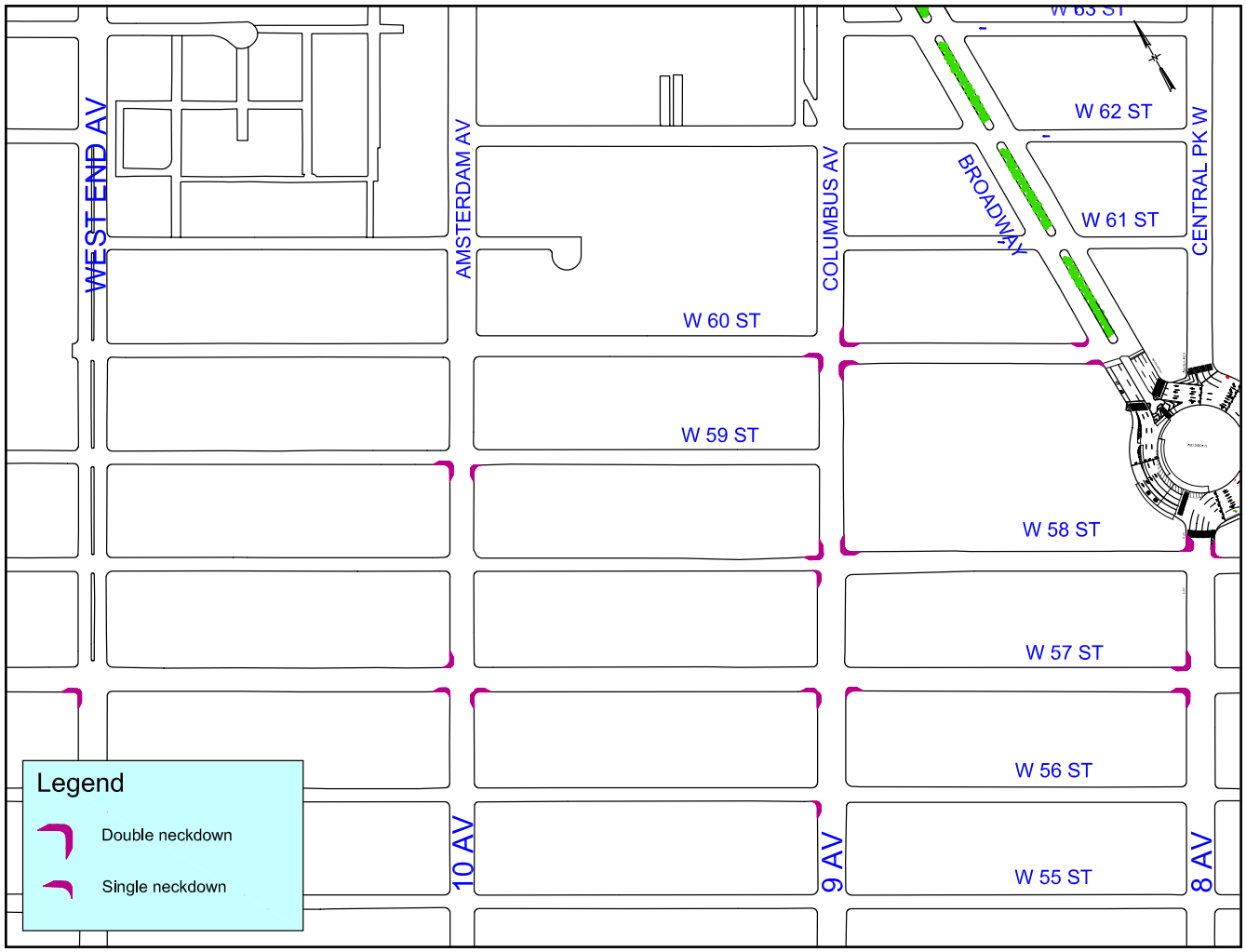


*Figure 3-19a: Proposed Neckdowns or Street Design Furniture (Page 4 of 4)*

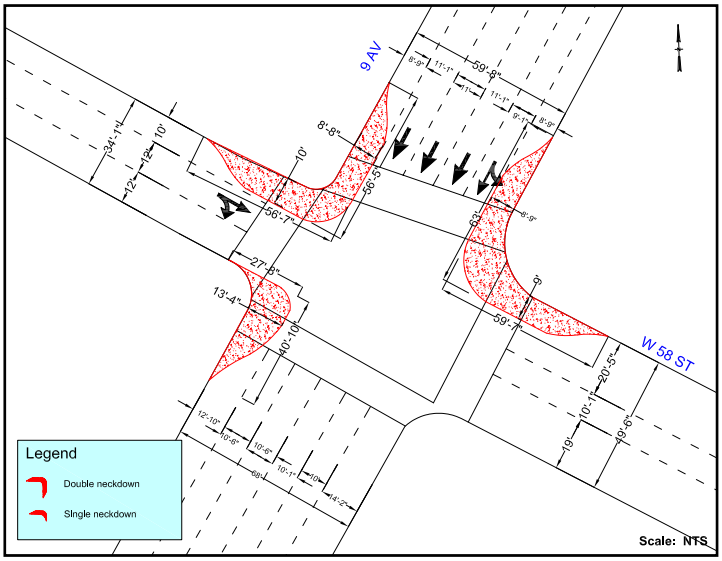


*Figure 3-19b: Sample Neckdowns in the Study Area*

## Widen Opening of Tips on Broadway Mall

Pedestrians crossing the Broadway Mall (center median) are funneled through a small opening in the median (at most intersections) that is generally half or less the width of the striped crosswalk. This slows pedestrian flow and jeopardizes safety by encouraging pedestrian's to cross in the street outside the "secure" area.

*Recommendation(s)*:

- Widen the opening in the median/mall at select locations on the corridor from five feet to approximately eight feet (variations may occur) at the following 22 locations in the study area:

1. Broadway & West 60 Street
2. Broadway & West 61 Street
3. Broadway & West 62 Street
4. Broadway & West 63 Street
5. Broadway & West 64 Street
6. Broadway & West 65 Street
7. Broadway & West 67 Street
8. Broadway & West 68 Street
9. Broadway & West 70 Street
10. Broadway & West 71 Street
11. Broadway & West 73 Street
12. Broadway & West 74 Street
13. Broadway & West 75 Street
14. Broadway & West 76 Street
15. Broadway & West 77 Street
16. Broadway & West 78 Street
17. Broadway & West 80 Street
18. Broadway & West 81 Street
19. Broadway & West 82 Street
20. Broadway & West 83 Street
21. Broadway & West 84 Street
22. Broadway & West 85 Street

A typical existing condition is shown in the picture below and an illustration of proposed configuration is shown in Figure 3-20.

*West 70th Street & Broadway (looking east – north crosswalk)*

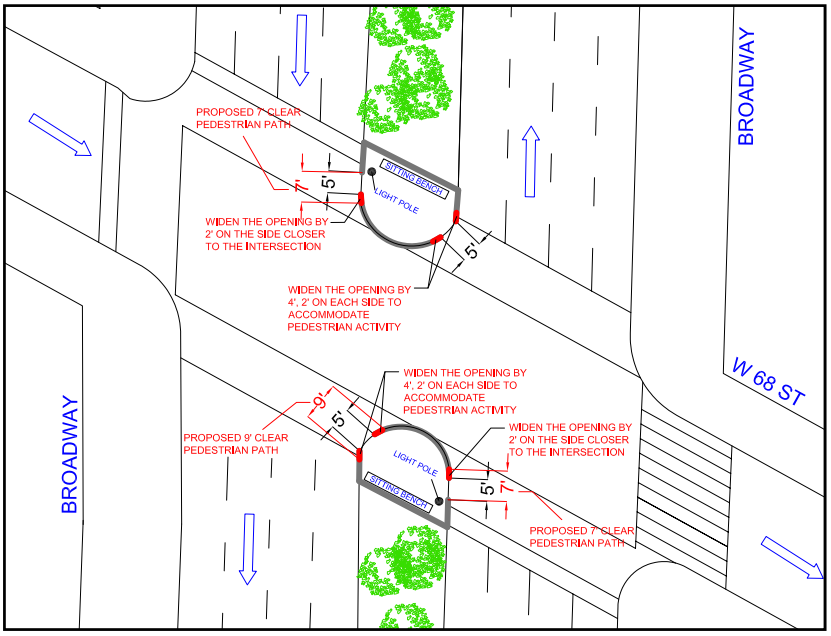


*Figure 3-20: Proposed Mall Tip Opening at Selected Locations Along Broadway Mall*

## 3. Bicycle Parking Amenities

The addition of bicycle parking amenities is recommended in the study area adjacent to major destinations where the need exist. The picture below shows an example of the proposed bicycle parking facility.

*Smith Street, Brooklyn*

The following six locations have been identified as potential locations for bicycle parking:

Lincoln Square

1. Broadway between West 65th and West 66th Streets
   - Install an on-street bike parking facility (approximately 30 feet) on the northeast curb (adjacent to Richard Tucker Square).
2. Columbus Avenue between West 64th and West 63rd Streets
   - Install an on-street bike parking facility (approximately 30 feet) on the east curb on Columbus Avenue (adjacent to Dante Park).
3. West sidewalk on Broadway between West 65th and West 66th Streets
   - Install bike parking amenities in "dead space" on sidewalk between elevator shaft and stairwell.

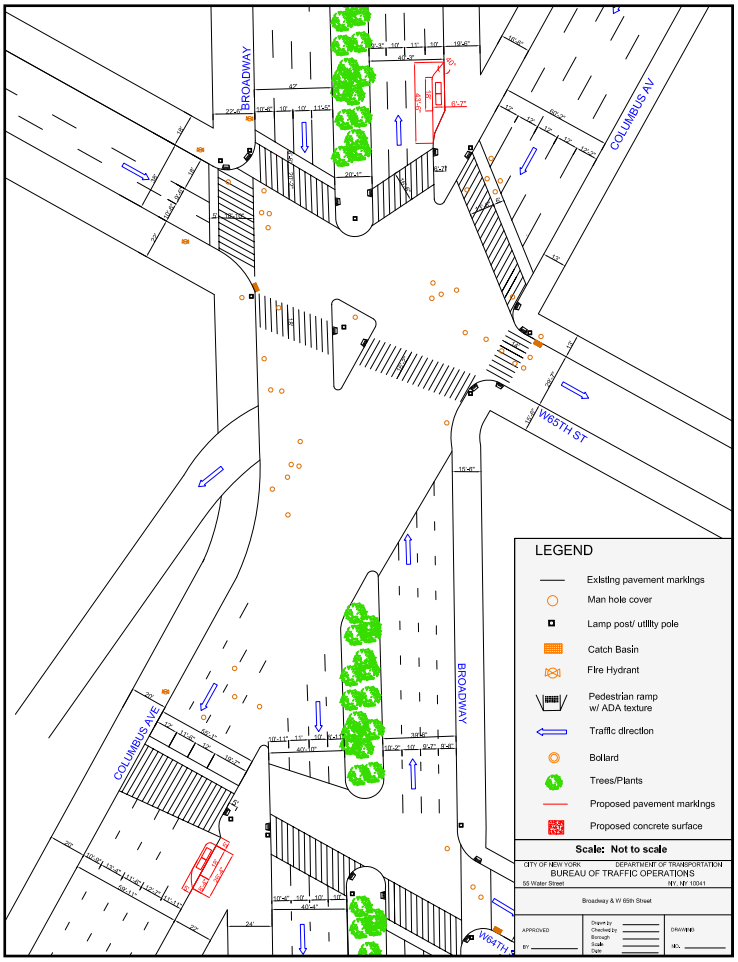


*Figure 3-21: Proposed On-Street Bicycle Parking – Broadway & West 65th Street and Columbus Avenue & West 64th Street*

4. West 75th Street & Broadway
   - Create an on-street bike parking facility (approximately 30 feet) on the south curb of West 75th Street on the southwest corner.

The proposed condition is shown in Figure 3-22.

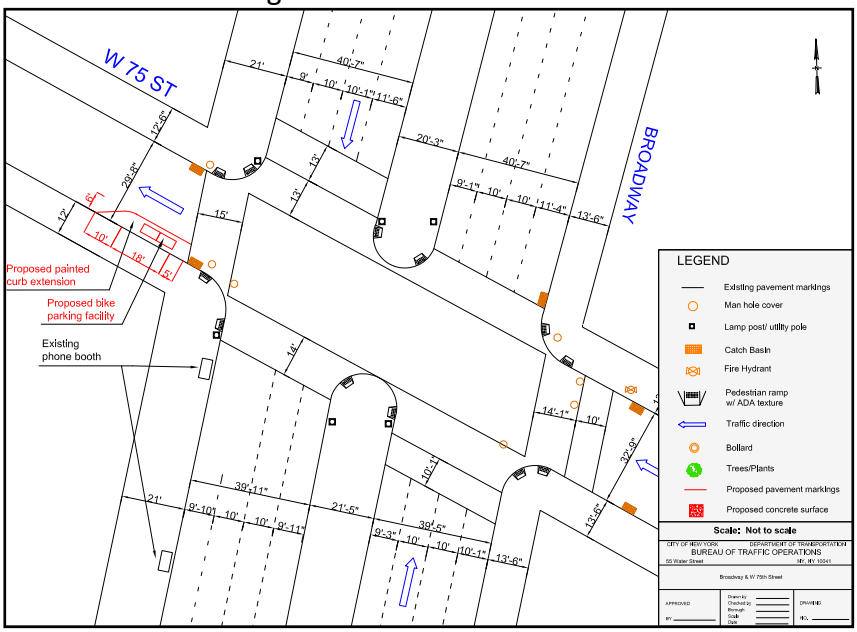


*Figure 3-22: Proposed On-Street Bicycle Parking – West 75th Street & Broadway*

5. West 59th Street & Amsterdam Avenue
   - Create an on-street bike parking facility (approximately 40 feet) on the southwest corner on West 59th Street.
   - Install neckdown at the southeast and southwest corners.

The proposed condition is shown in Figure 3-23.

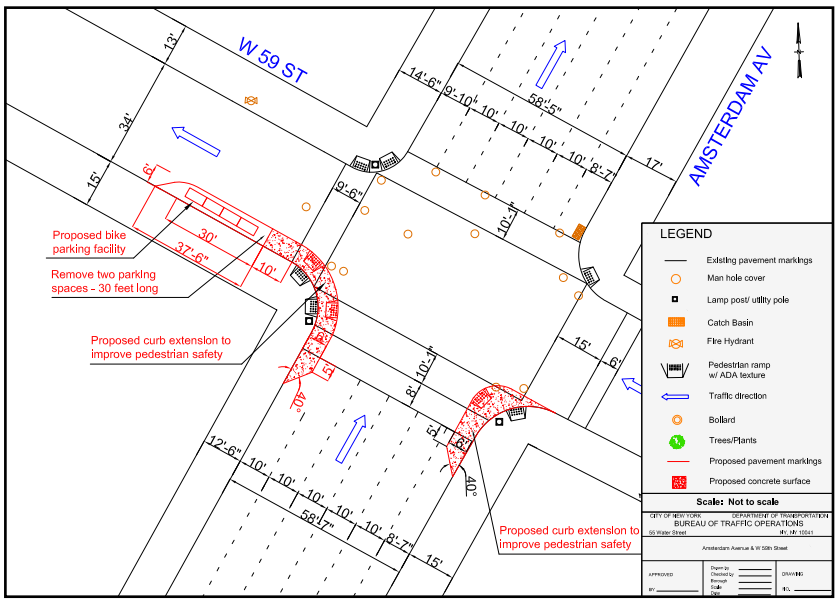


*Figure 3-23: Proposed On-Street Bicycle Parking – West 59th Street & Amsterdam Avenue*

6. West 60th Street & Broadway
   - Create an on-street bike parking facility (approximately 40 feet) on the southwest corner on West 59th Street.
   - Install neckdown at the southwest corner.

The proposed condition is shown in Figure 3-24.

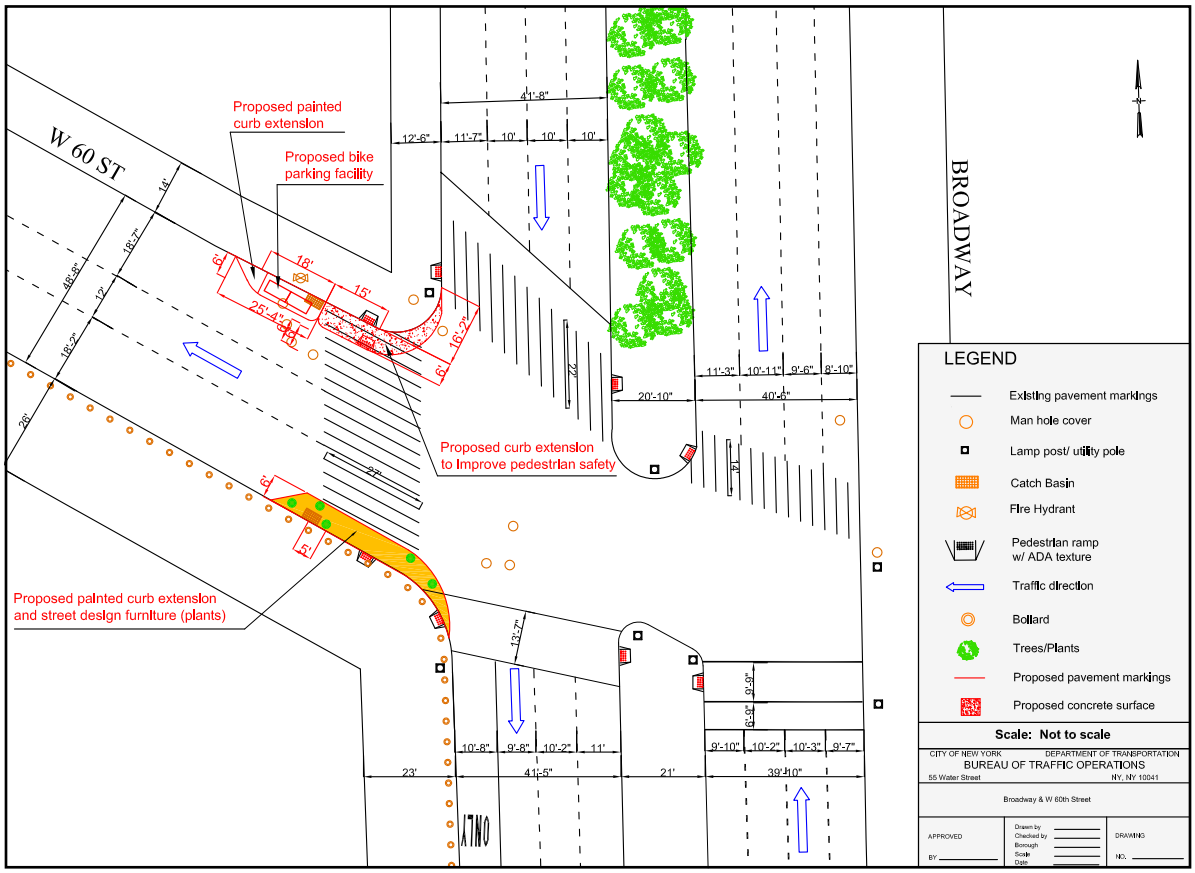


*Figure 3-24: Proposed On-Street Bicycle Parking – West 60th Street & Broadway*

## 4. Commercial/Special Parking

1. Columbus Avenue between West 63rd and West 64th Streets
   *Issue(s)*:
   - Need for "For Hire" Vehicle parking

   *Recommendation(s)*:
   - Provide designated parking for for-hire vehicles during evening entertainment hours (7PM-Midnight) at Lincoln Center. Regular parking fees apply during other times.

See Figure 3-25 for more details.

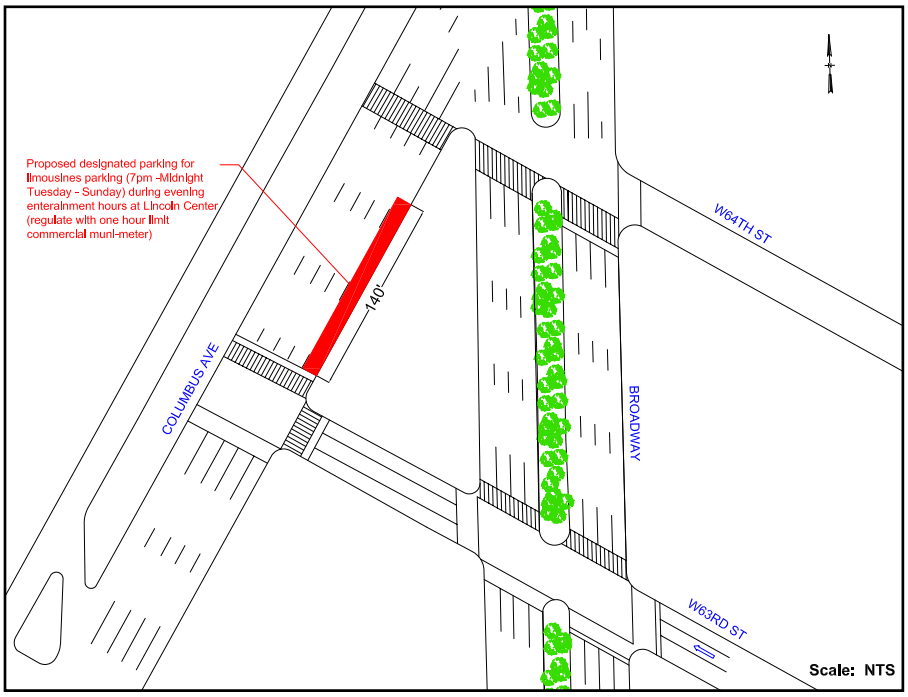


*Figure 3-25: Proposed for-hire vehicles parking zone*
*(Columbus Avenue between W 63rd and W 64th Streets)*

2. West 58th Street between Eight Avenue and Ninth Avenue
   *Issue(s)*:
   - Shuttle buses making ad hoc pick-up and drop-offs blocking traffic and jeopardizing safety.

   *Recommendation(s)*:
   - Designate a shuttle bus stop (53 feet) on the south curb approaching Eight Avenue, and post "No Parking from 7am-7pm Except Sunday/Except Shuttle Bus" regulation.

See Figure 3-26 for more details.

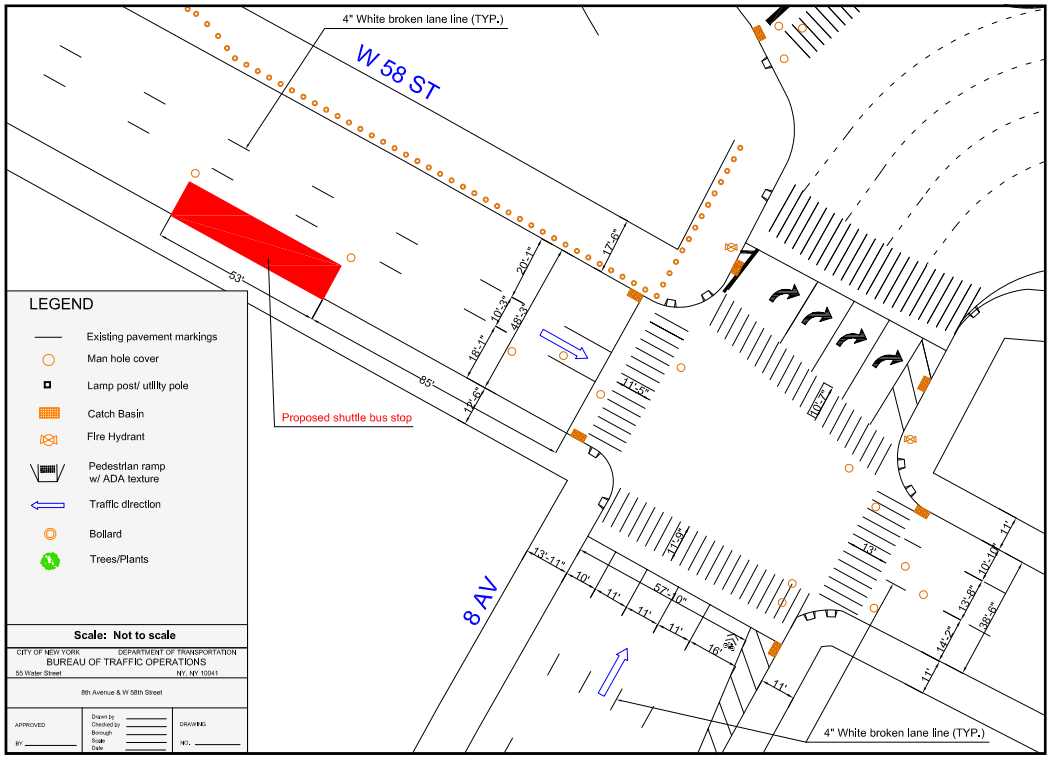


*Figure 3-26: Proposed Shuttle Bus Stop (West 58th Street/Eight Avenue)*

3. West 65th Street & Broadway
   *Issue(s)*:
   - Need to provide curbside parking for commercial vehicles.

   *Recommendation(s)*:
   - Install commercial muni-meters on the east curb approaching West 66th Street (north of proposed bike parking facility).

See Figure 3-27 for more details.

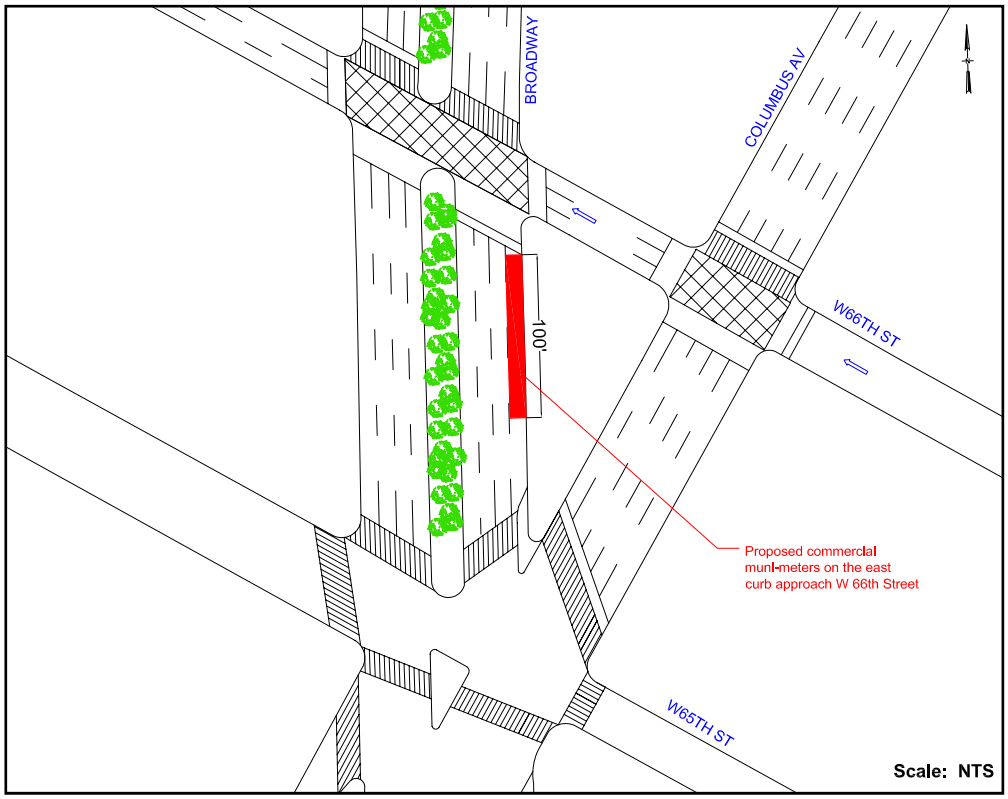


*Figure 3-27: Proposed muni-meter parkings*

4. Install commercial muni-meters on Columbus Avenue and Amsterdam Avenue between West 55th and West 86th streets

   *Issue(s)*:

   - Trucks double parked in moving lanes. Need to provide curbside parking space for commercial vehicles.

   *Recommendation(s)*:

   - Designate commercial parking zones (50 feet long/ two car parking spaces) along both corridors, as shown in Figure 3-28, to be regulated with commercial muni-meters.

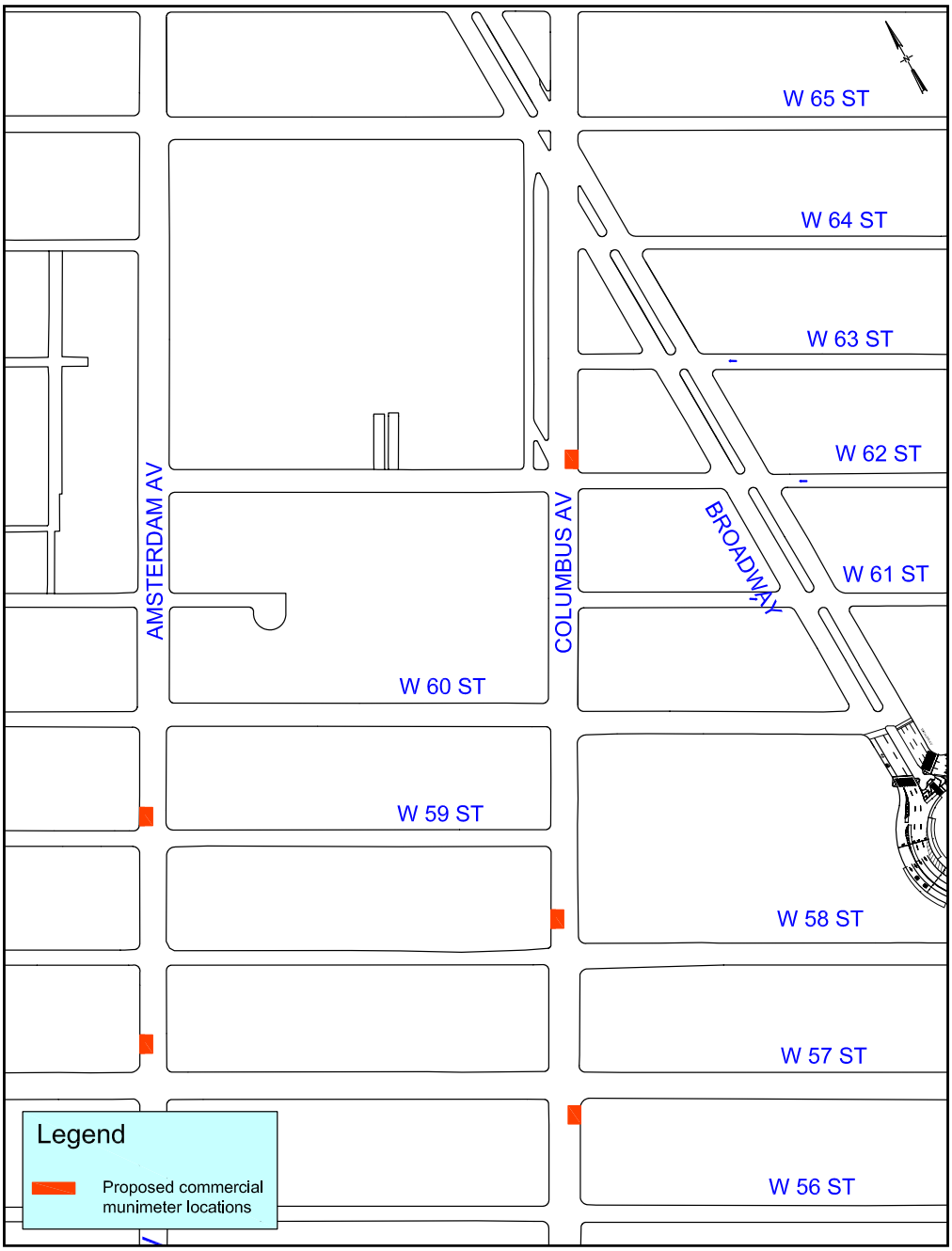


*Figure 3-28: Proposed Commercial Muni-Meter Sites*
*(Page 1 of 3)*

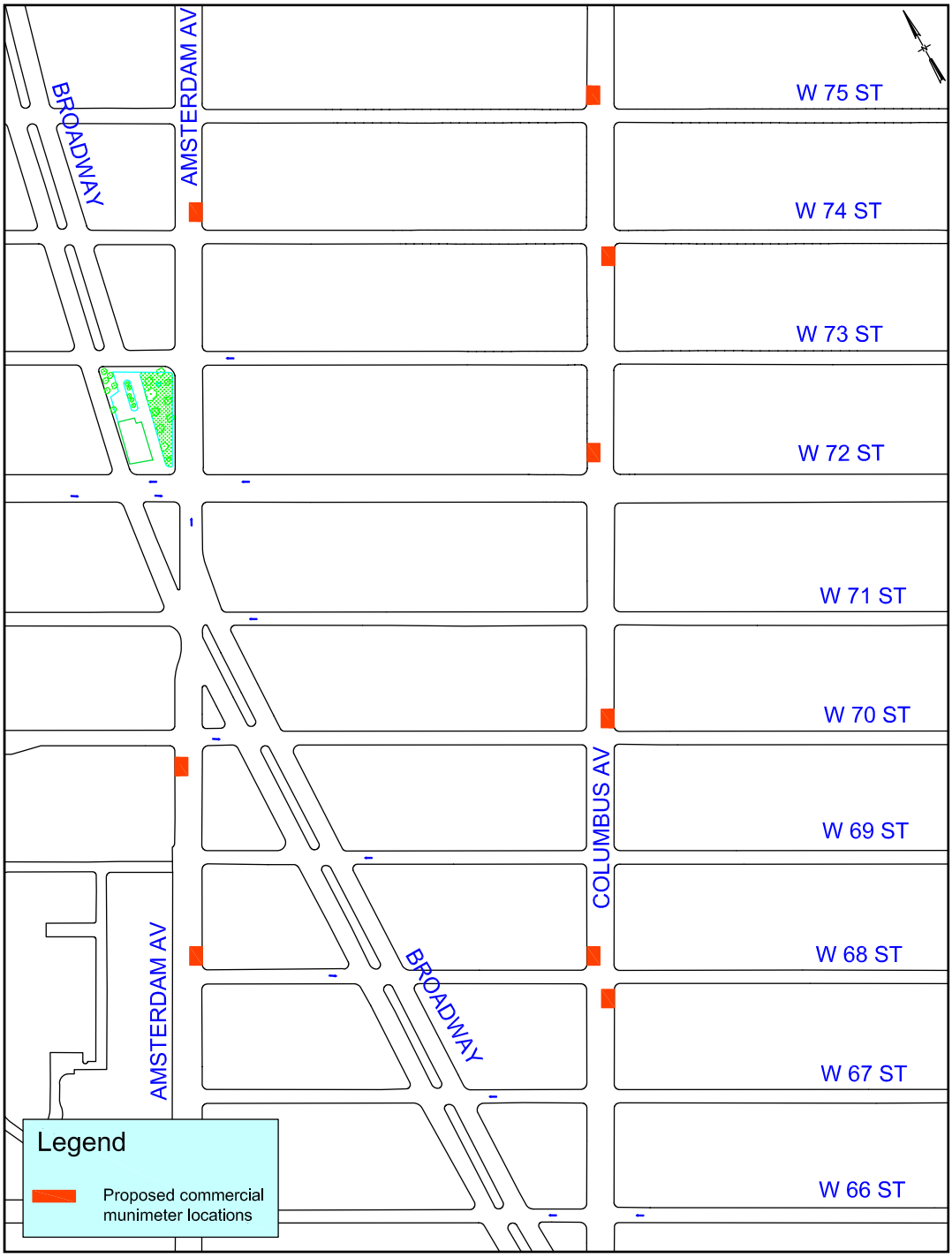


*Figure 3-28: Proposed Commercial Muni-Meter Sites*
*(Page 2 of 3)*

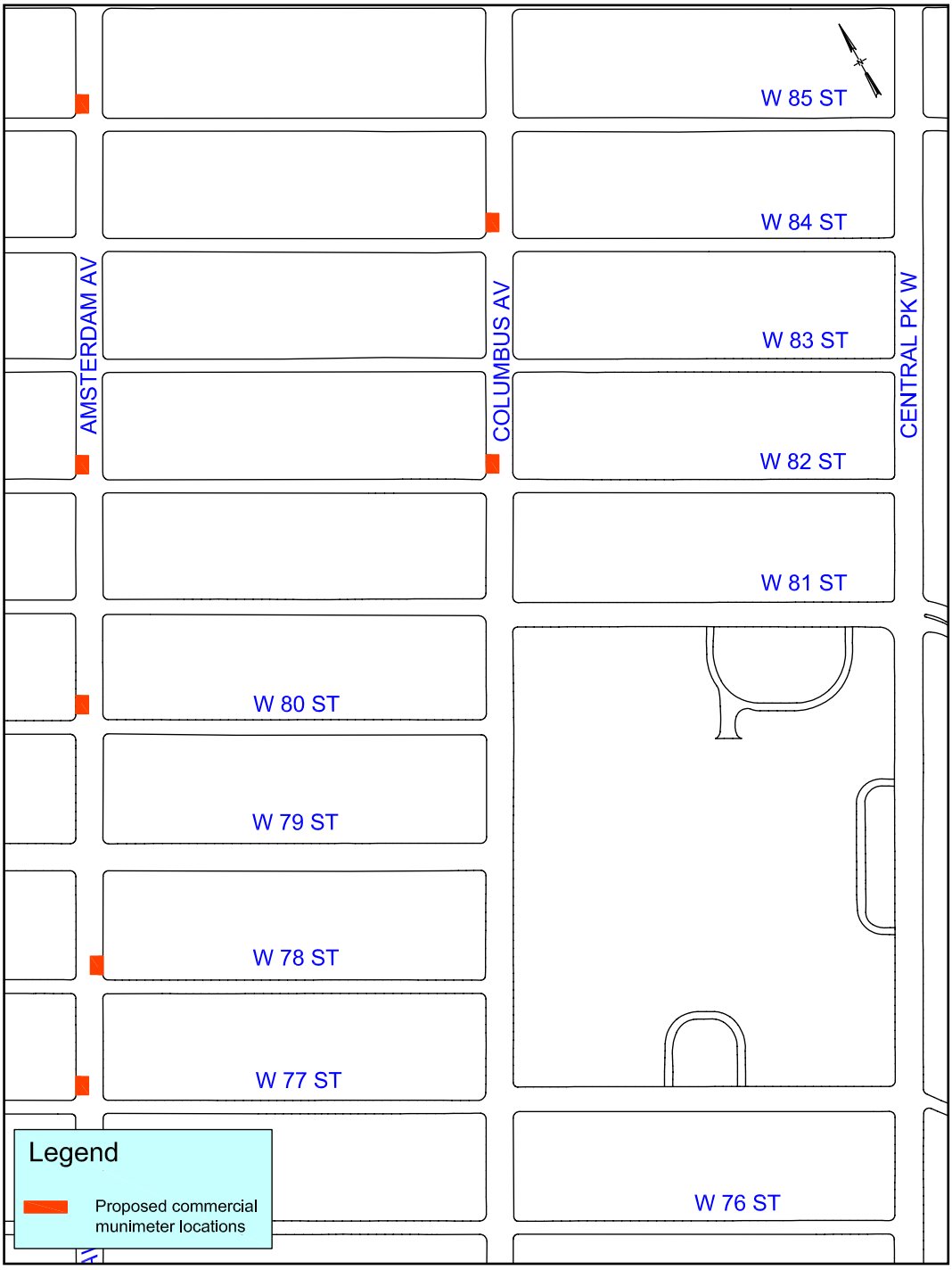


*Figure 3-28: Proposed Commercial Muni-Meter Sites*
*(Page 3 of 3)*

## Other Recently Implemented or Proposed Improvements

1. Upper West Side Senior Focus Area Improvements

As a result of the Upper West Side Senior Study, several improvement measures were implemented or are slated for implementation shortly. They are as follows:

a. Leading Pedestrian Intervals were approved and installed at the following locations:
   - Amsterdam Avenue/West 72nd Street – on Amsterdam Avenue
   - Amsterdam Avenue /West 73rd Street – on West 73rd Street
   - Central Park West/West 81st Street – on West 81st Street/Central Park exit/entrance

b. Neckdowns and/or medians were recommended and/or approved for the following locations:
   - Amsterdam Avenue/West 66th Street
   - West End Avenue/West 75th Street
   - Central Park West/West 72nd Street
   - Broadway/West 79th Street
   - Amsterdam Avenue/West 79th Street
   - Broadway/West 65th Street
   - Broadway/West 71st Street/Amsterdam Avenue
   - Central Park West/West 62nd Street
   - Central Park West/West 65th Street
   - Central Park West/West 72nd Street
   - Central Park West/West 79th Street
   - Central Park West/West 81st Street
   - West End Avenue/West 66th Street
   - West End Avenue & West 61st Street

c. Broadway/West 71st Street/Amsterdam Avenue. Improvements (installation of neckdowns and countdown signals and median extensions) were implemented at this intersection to enhance pedestrian safety. The pre-existing and existing conditions are shown in Figures 3-29a and 3-29b below.

2. West 70th Street between West End & Amsterdam Avenues
   - Installed speed reducer to deter speeding.

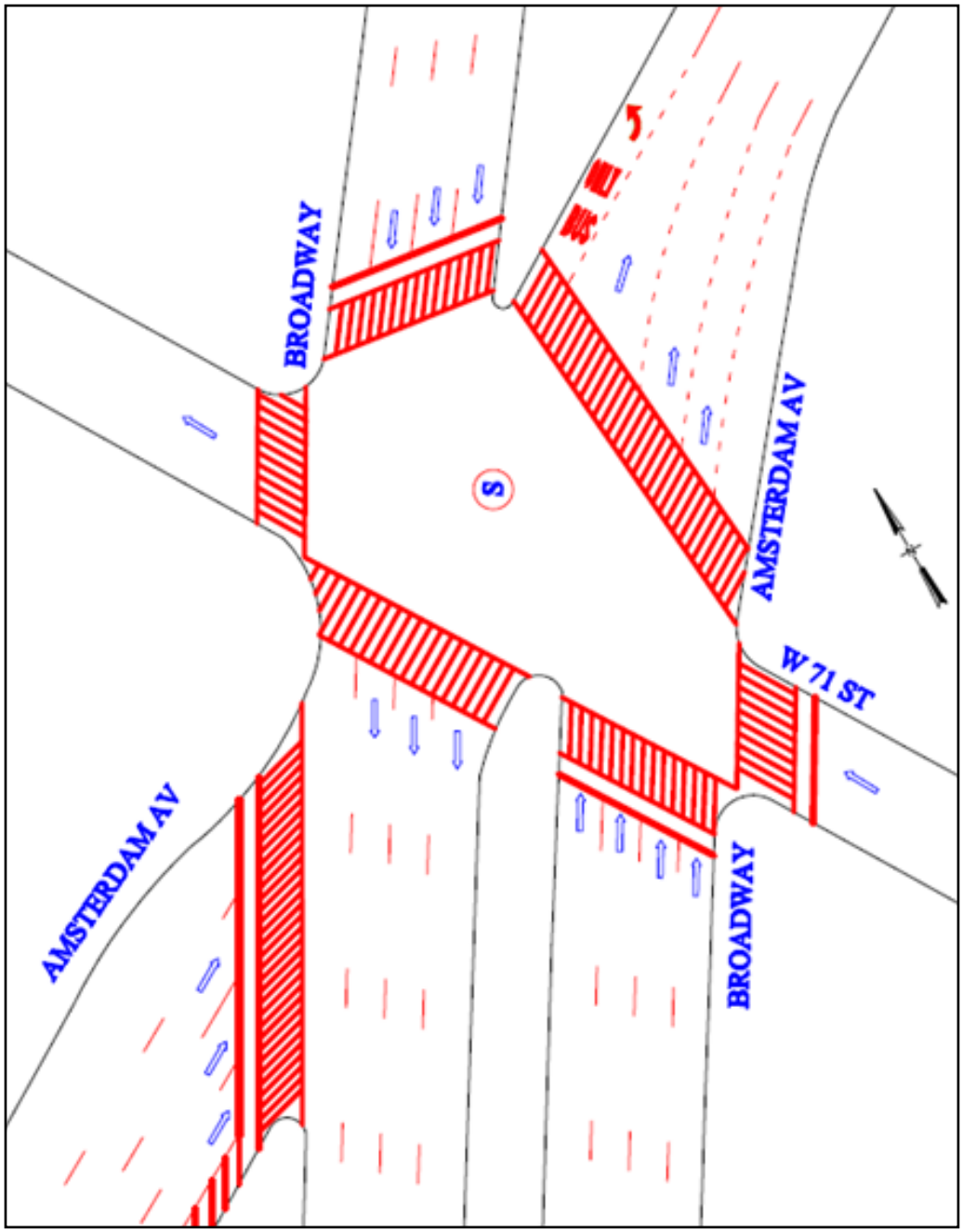


*Figure 3-29a: Broadway/West 71st Street/Amsterdam Avenue (Pre-Existing Conditions)*

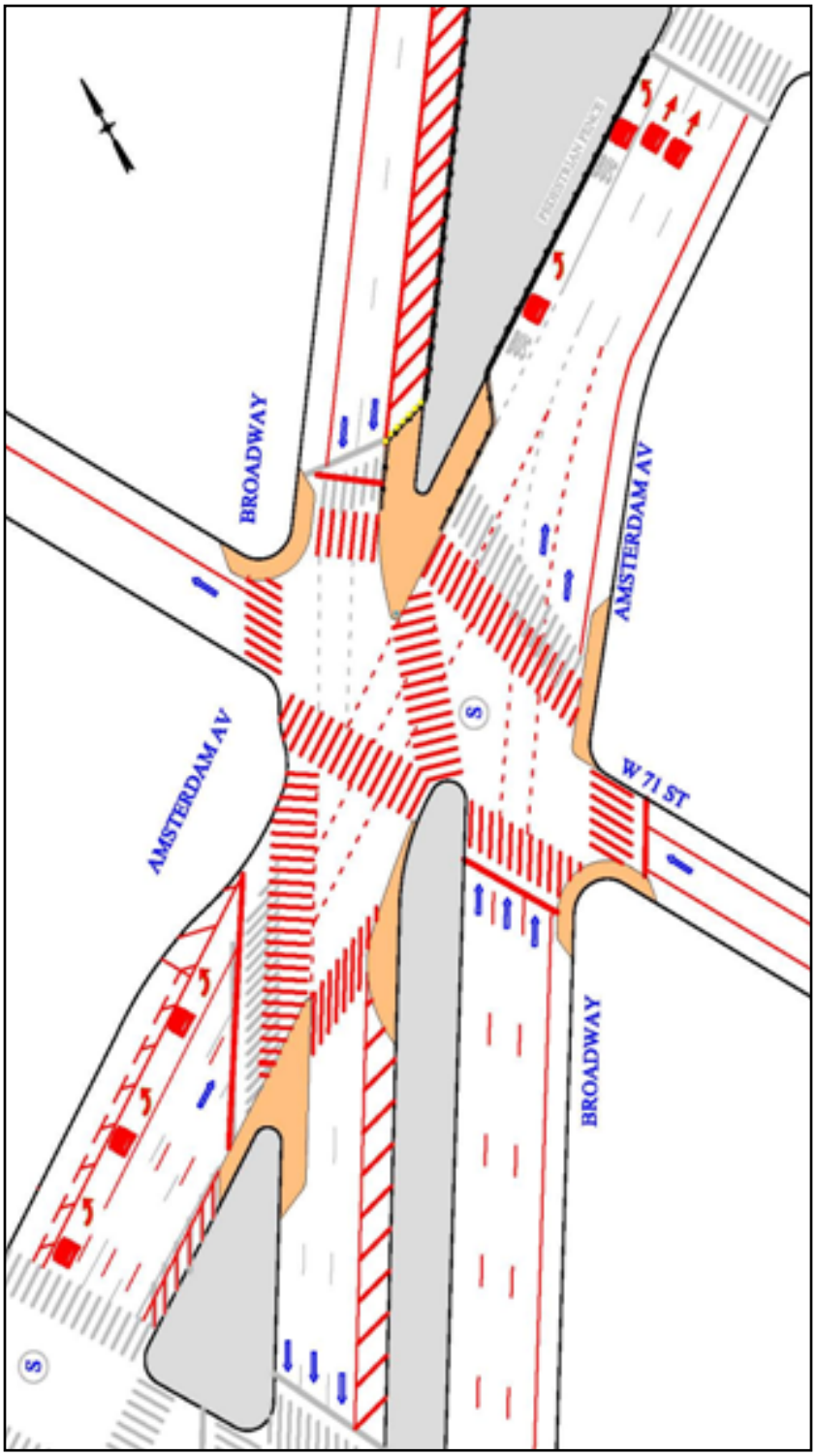


*Figure 3-29b: Broadway/West 71st Street/Amsterdam Avenue (Existing Condition)*