WEST SIDE MANHATTAN TRANSPORTATION STUDY

Technical Memorandum No. 2
Future Conditions & Recommendations
Final Report

May 2013

Michael R. Bloomberg
Mayor

Janette Sadik-Khan
Commissioner

A Member of
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West Side Manhattan Transportation Study
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Prepared by:

New York City Department of Transportation

Janette Sadik-Khan, Commissioner

Lori A. Ardito, First Deputy Commissioner

Bruce Schaller, Deputy Commissioner

Ryan Russo, Assistant Commissioner

Margaret Forgione, Manhattan Borough Commissioner

Naim Rasheed, Project Director

Michael Griffith, Deputy Project Director

Carren Simpson, Co-Project Manager

Hau Cho Li (Joe), Co-Project Manager

Ali Jafri, Highway Transportation Specialist

Milorad Ubiparip, Highway Transportation Specialist

Eva Marin, Highway Transportation Specialist

Harvey Lareau, Highway Transportation Specialist

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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 traffic 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 institutional and limited industrial uses.

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 ten 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 services 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, 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 during all peak hours in the future. This likely increase is attributed to increased economic activity,

population growth, and increased 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 report provides a summary of 2009 accidents that was not included in the existing condition report (which looked at accidents that occurred in the study area from 1997-2001 and 2006-2008. "High Accident Locations" are defined as five or more pedestrian accidents or 23 or more reportable accidents in any one year. However, 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 72nd Street & Central Park West
13. West 72nd Street & West End Avenue
14. West 79th Street & Amsterdam Avenue
15. West 79th Street & Broadway
16. West 79th Street & West End Avenue
17. West 79th Street & Riverside Drive
18. West 81st Street & Central Park West
19. 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 to accommodate pedestrian walking speed of 3.5 feet/second instead of 4 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 mobility, traffic circulation, and safety for all street users and modes (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 (2018) future conditions and recommendations. The recommendations/improvement measures, based on extensive community participation, existing and future conditions analysis are geared to enhance safety and mobility in the study area. Figure 1-1 shows the boundaries of the study area.

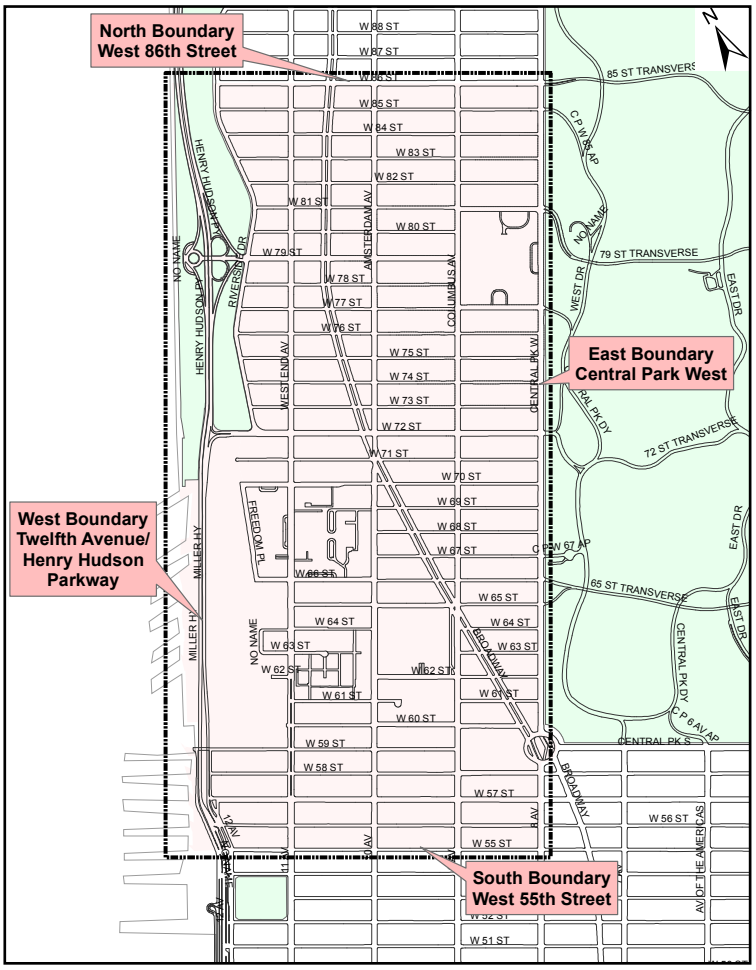

Figure 1-1: Study Area Boundaries

Study Goals and Objectives

The goal of the West Side Manhattan Transportation Study is to improve safety and mobility of all street users and travel modes (vehicle, pedestrian, and bicycle), as well as 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 an appropriate package of traffic and transportation improvement measures;
- 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 site is bounded by West End Avenue and Riverside Drive, and West 59th and W 61st Streets. This involves zoning actions that would permit a mixed-use development of approximately 3,306,552 gsf of above grade space, 206,135 gsf of below grade 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 of 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, 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 lawschool, new dormitory space and approximately 155 parking spaces. The private residential development of 512 units and 68 accessory parking spaces is also expected to be built in phases. Phase II development will create new space for the Schools of Business, Social Services, and Education: also, the 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. 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 suggesting solutions to 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 by mode to help identify trends and determine future travel needs. The analysis relies on data from New York City Department of City Planning (NYCDCP), and the United States Department of Commerce – Bureau of Census. Data were collected and analyzed for 1980, 1990, and 2000 and 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.

*Census tracts partly within study area.

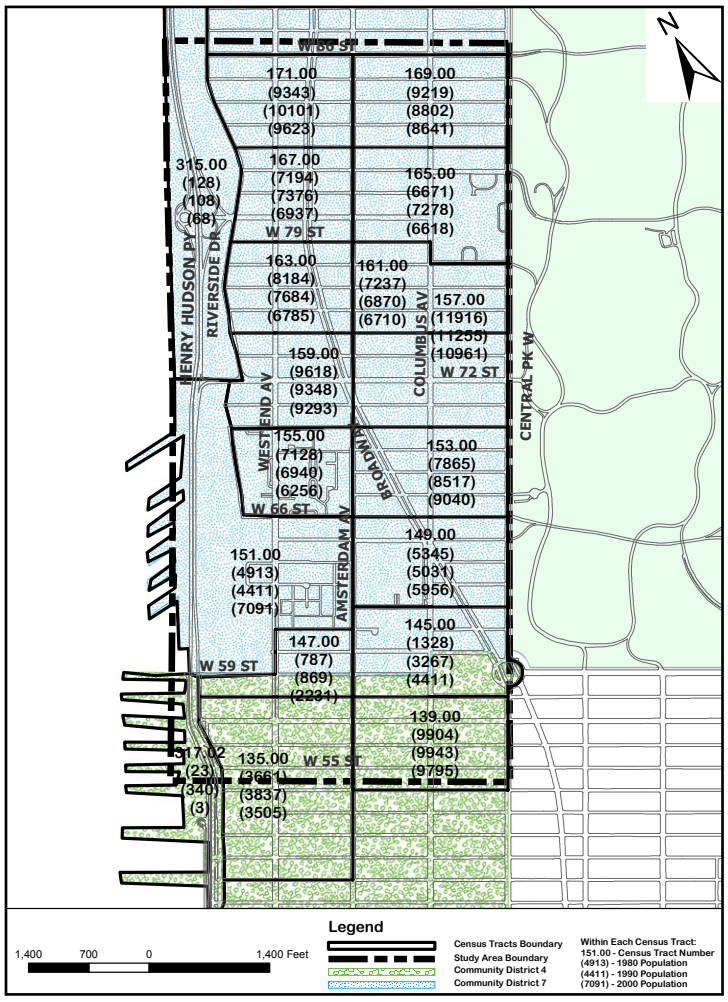

Figure 2.1-1: Community Districts and Population Census Tracts Study Area Boundaries

2.1-1 Population Trends

Between 1980 and 2000, the study area's population grew by approximately 3.5%; a similar growth pattern is anticipated between 2000 and 2018 where the population is expected to change by 3.9%. The 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 were 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.

Table 2.1-2: Household Characteristics

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								

2.1-3 Vehicle Ownership

This section discusses vehicle ownership trends observed in the study area during the period 1980 to 2000, and projected to 2018. Between 1980 and 2000 the percentage of households with one or more vehicles in the study area ranged between 18 – 26% and is projected to be 25% (within the same range) by 2018. The vehicle ownership per household data 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 is projected to be 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 increase in population and households in the study area are projected to be insignificant, thus a significant increase in auto trips is not anticipated due to area demographics.

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 work 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 for the Study Area (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 with commercial land uses (primarily mixed-use) located along three major north-south corridors - Columbus Avenue, Amsterdam Avenue, and Broadway. There is a small pocket zoned for manufacturing in the southern section of the study area. While the relative composition of uses is expected to remain the same, recent development trends indicate higher development densities.

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

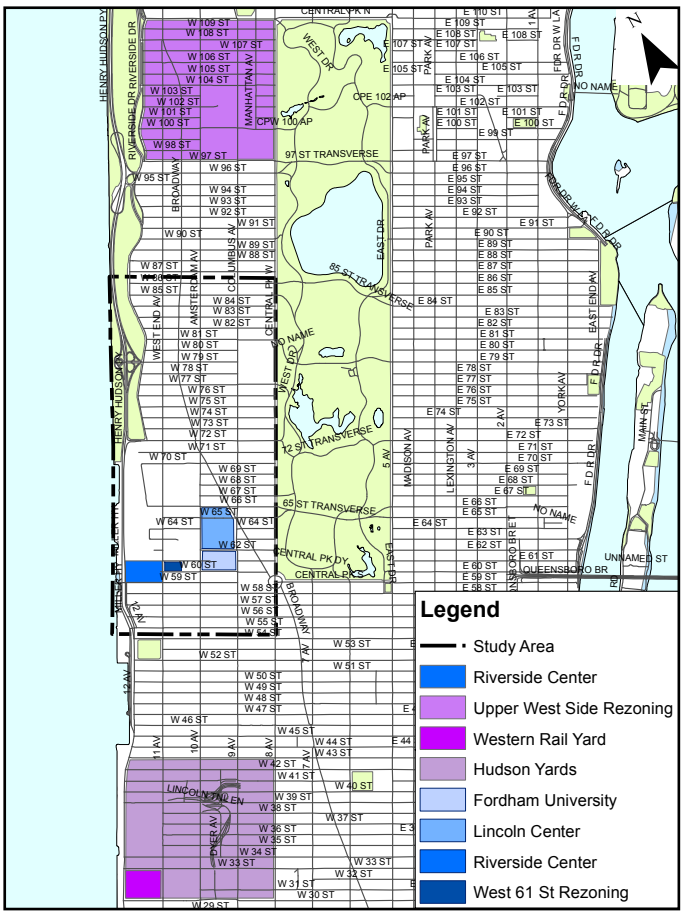

Figure 2.2-1: Planned Developments and Zoning Amendments

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 known 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.

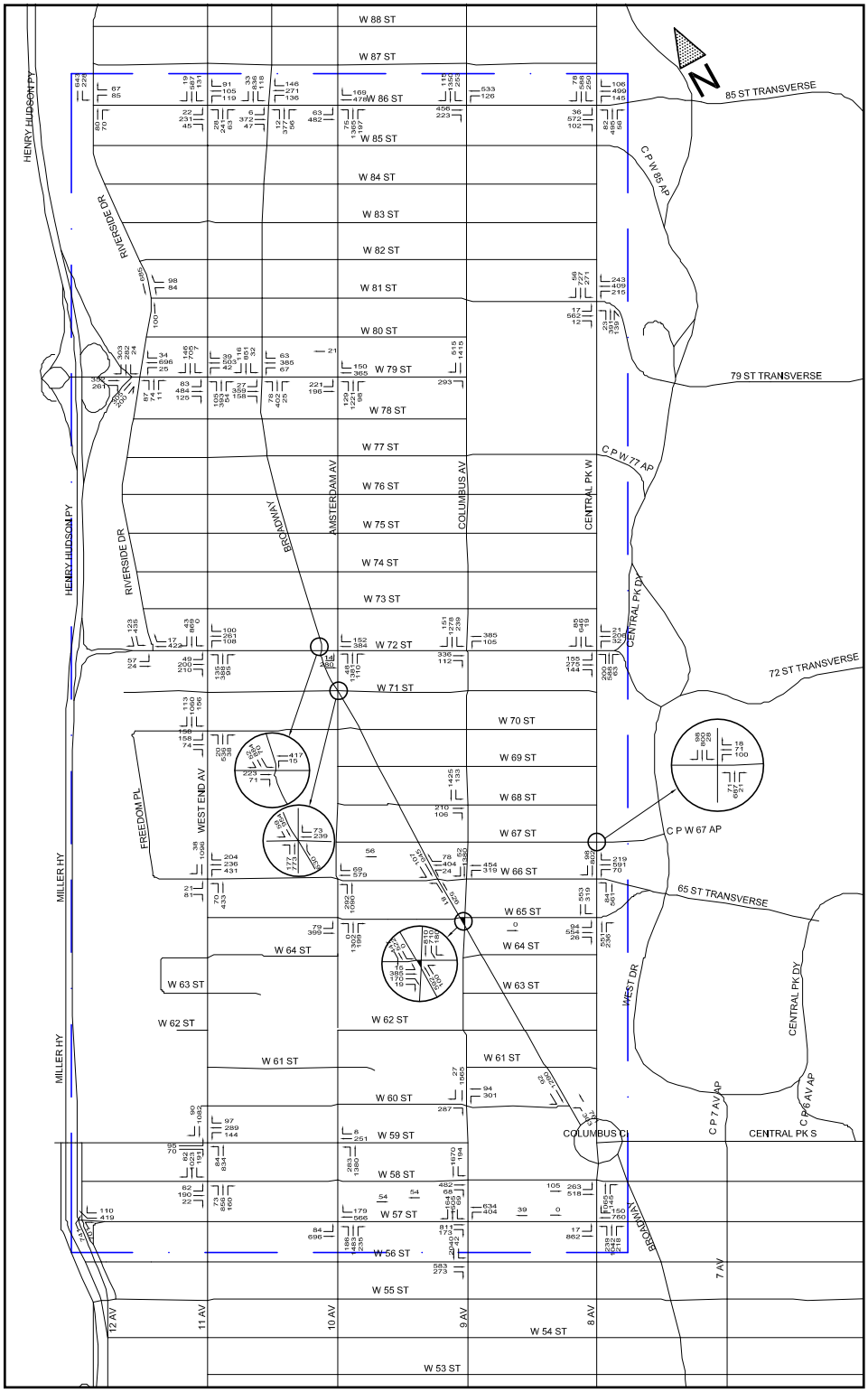

Figure 2.3-1: Projected 2018 AM Peak Hour Traffic Volume

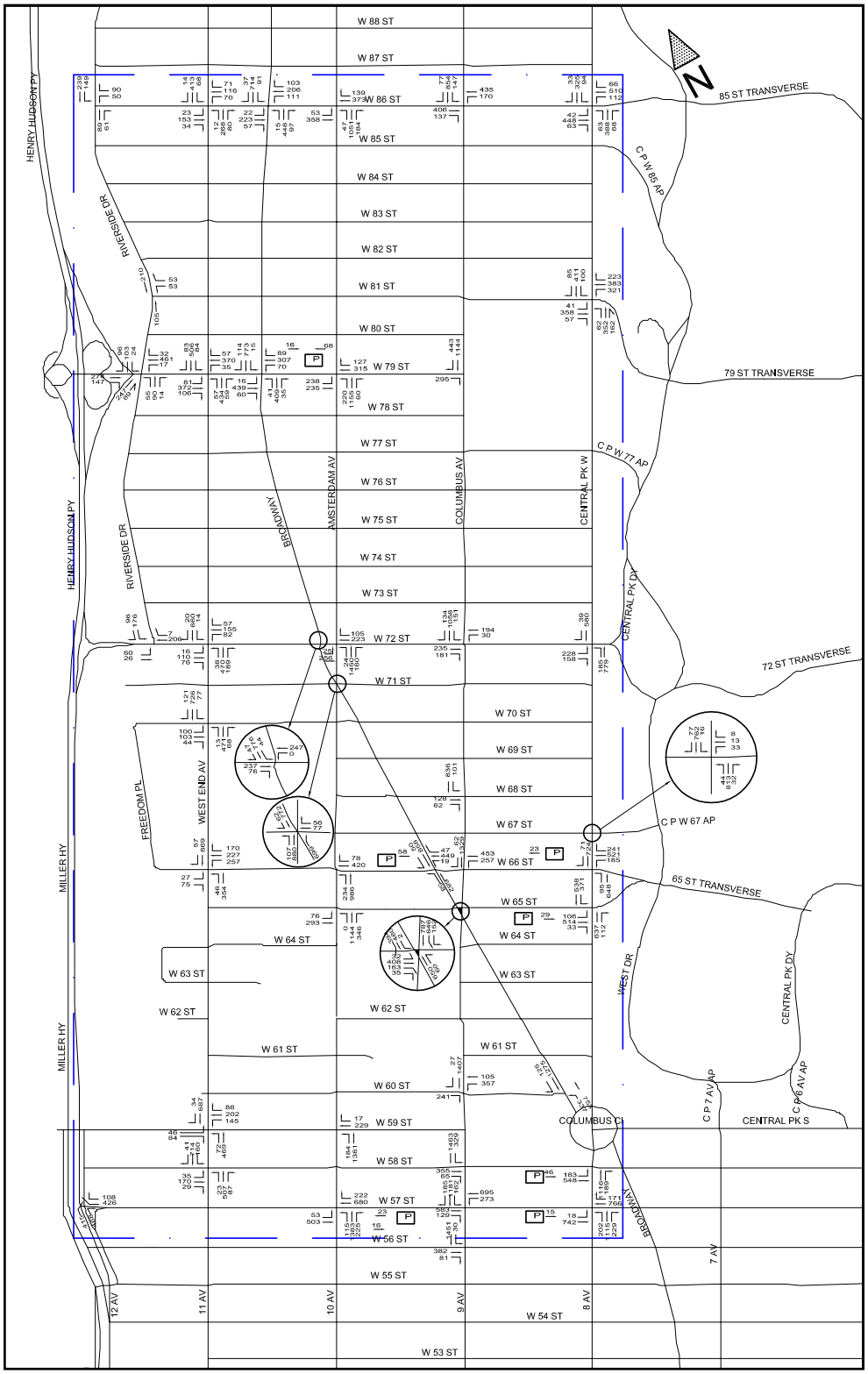

Figure 2.3-2: Projected 2018 Midday Peak Hour Traffic Volume

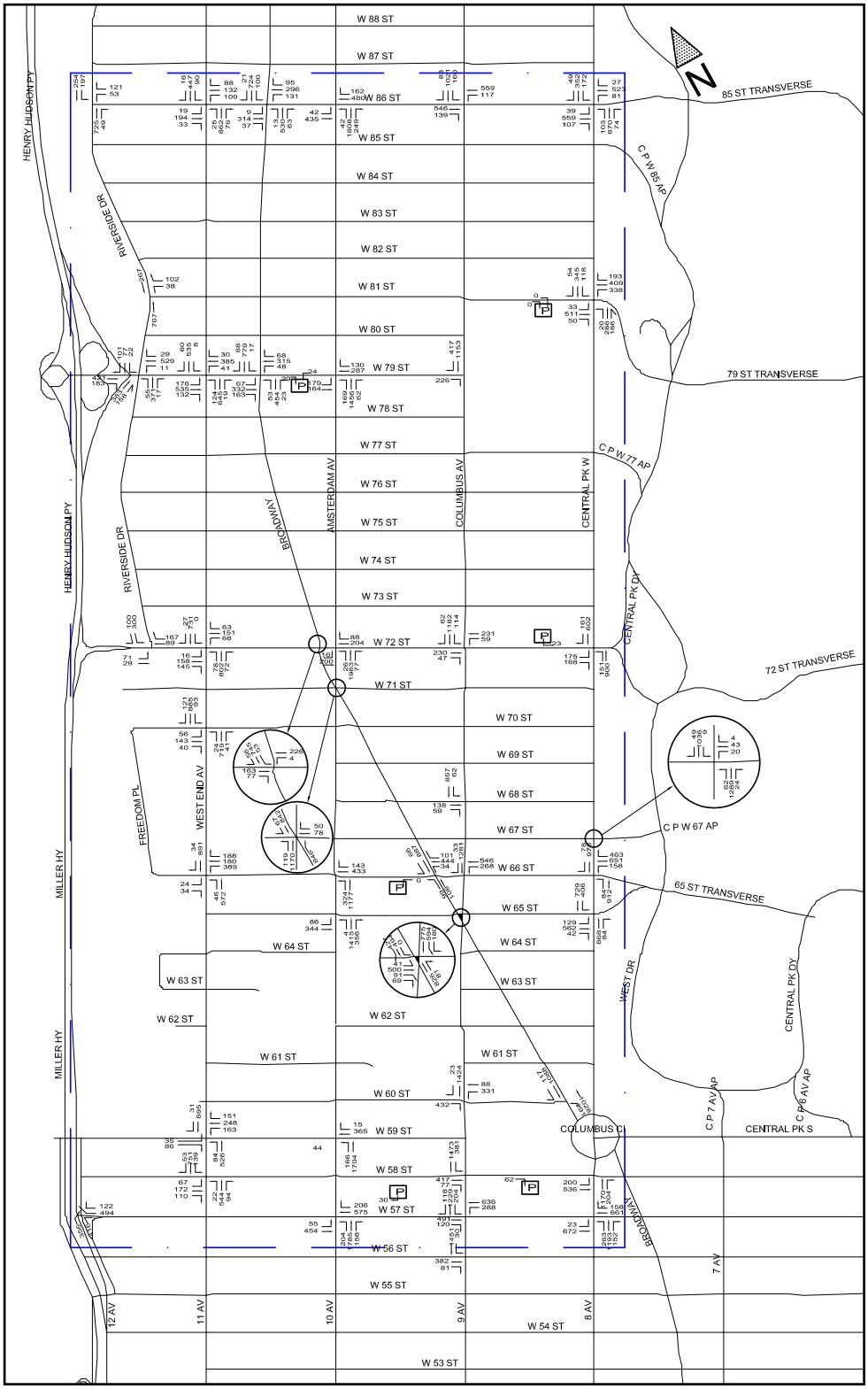

Figure 2.3-3: Projected 2018 PM Peak Hour Traffic Volume

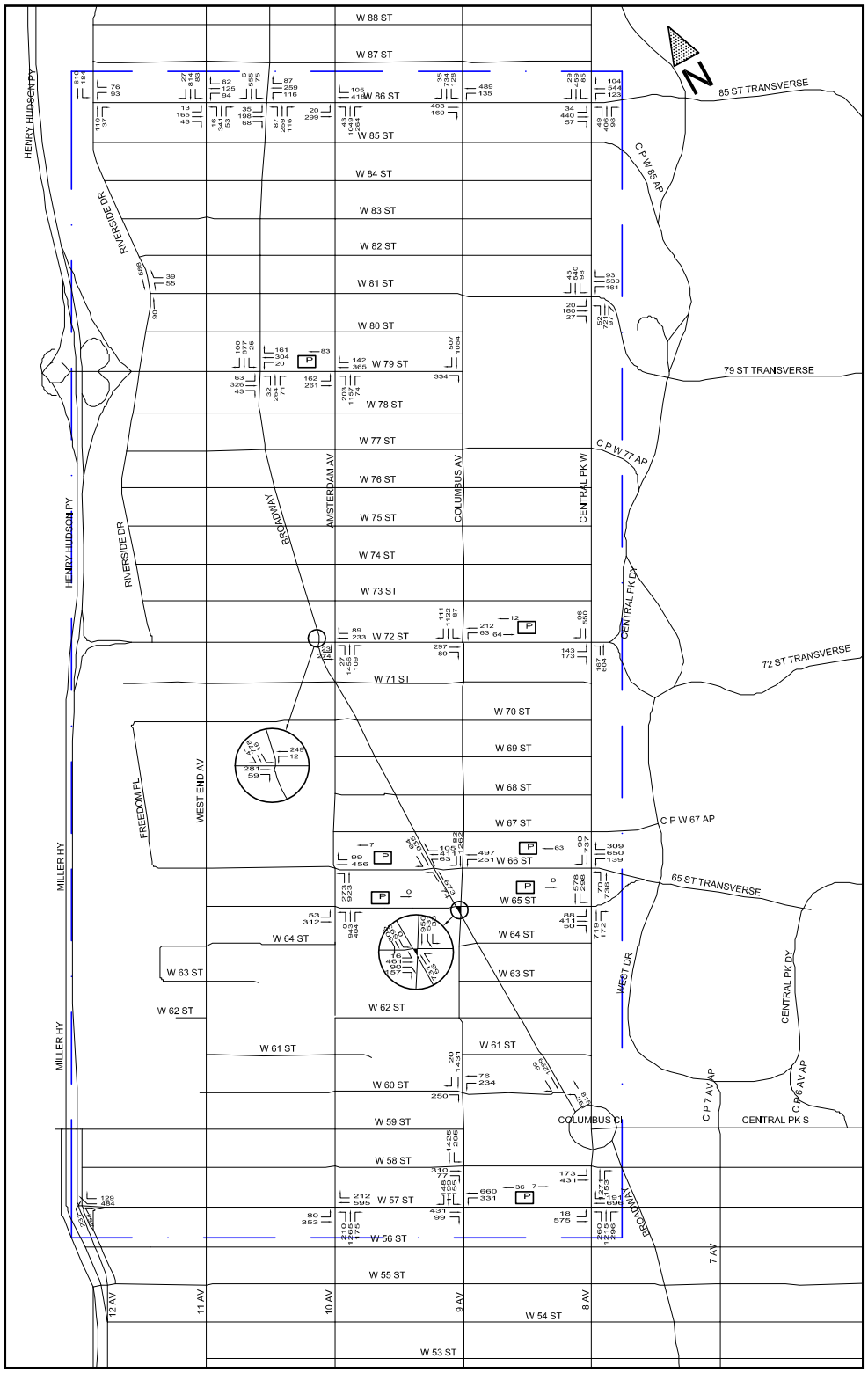

Figure 2.3-4: Projected 2018 Saturday Midday Peak Hour Traffic Volume

2.3.1 Street Capacity and Level of Service

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. Conditions at forty-three signalized intersections in the study area were analyzed.

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).

2.3.2 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														
		NB	TR	0.67	30.8	C	0.60	29.4	C	0.69	31.1	C	0.64	30.2	C
14b		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														
		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
16		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														
		NB	DefL	0.79	52.0	D							0.75	45.4	D
			LT				0.45	13.0	B	0.45	13.0	B			
19			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														
		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			
20		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														
		NB	LTR	0.83	24.5	C	0.89	28.8	C	1.23	129.4	F			
21		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														
		SB	LT	0.73	23.3	C	0.44	18.5	B	0.47	18.7	B			
22		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														
		NB	LTR	0.60	19.6	B	0.53	18.1	B	0.99	48.9	D			
23		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														
		NB	T	0.76	34.4	C	0.72	33.7	C	0.80	36.0	D			
24b		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														
		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
25			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
	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
26		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
	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
27			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
	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
28		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
	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			
29			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			
	W 72nd St & Riverside Dr														
		SB	LR	0.82	29.2	C	0.49	22.3	C	0.70	28.4	C			
30		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			
	W 79th St & Columbus Avenue														
31		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
	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
32		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
	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			
33		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
	W 79th St & West End Avenue														
		NB	LTR	0.81	27.0	C	0.57	16.9	B	1.03	57.3	E			
34		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			
	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			
35		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			
	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
36		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														
		NB	T	0.18	8.2	A	0.16	7.9	A	0.89	28.3	C	0.15	7.8	A
37		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														
		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
38			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														
		SB	L	0.82	50.0	D	0.51	33.5	C	0.47	31.9	C	0.59	35.5	D
39			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														
		NB	LTR	0.85	23.8	C	0.64	18.0	B	0.92	27.7	C	0.68	18.7	B
40		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														
		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	
41		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														
		NB	LTR	0.33	10.2	B	0.32	10.0	B	0.75	17.1	B	0.38	10.6	B
42		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														
		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			
43			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)

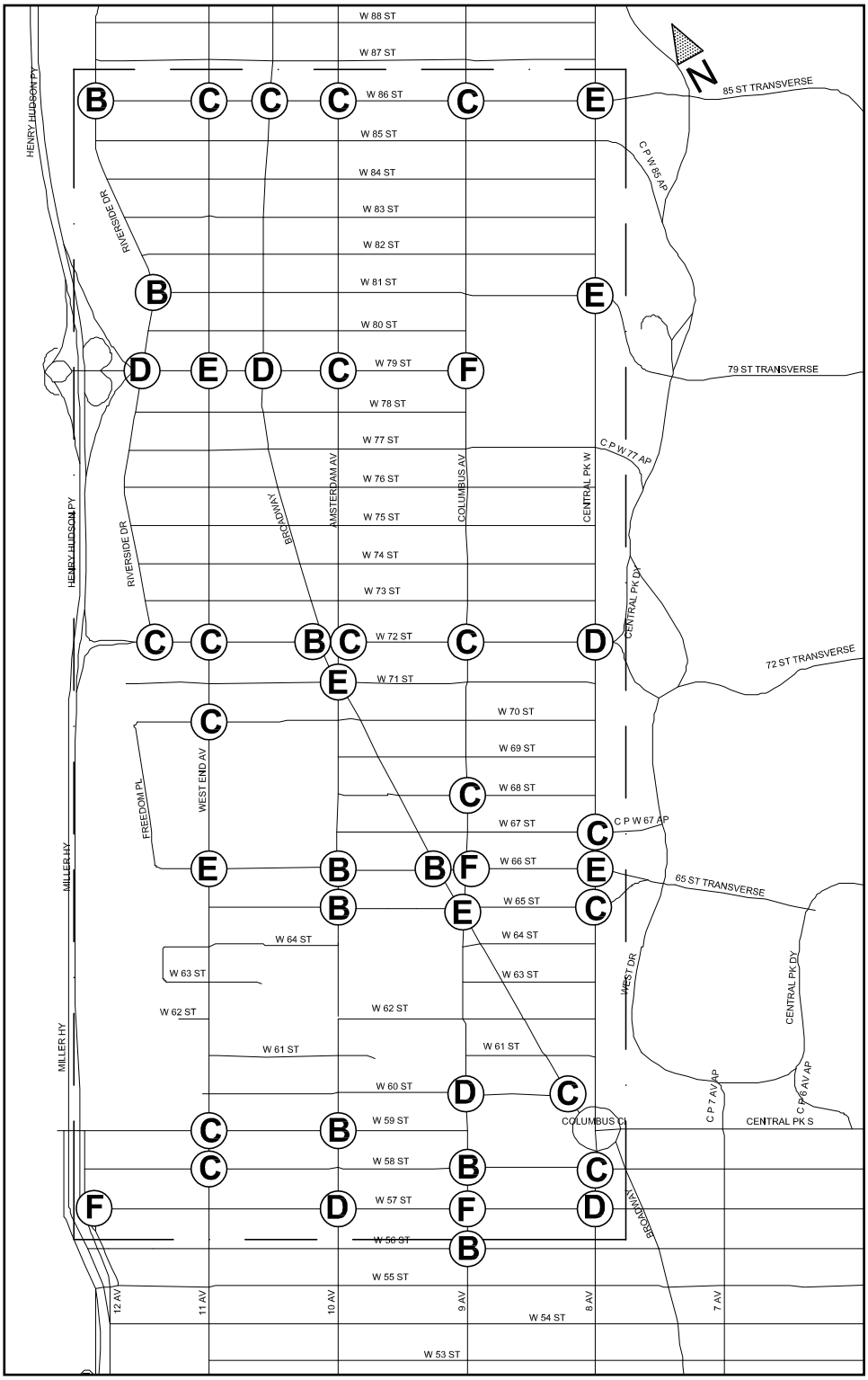

Figure 2.3-5: AM Peak Hour Level of Service

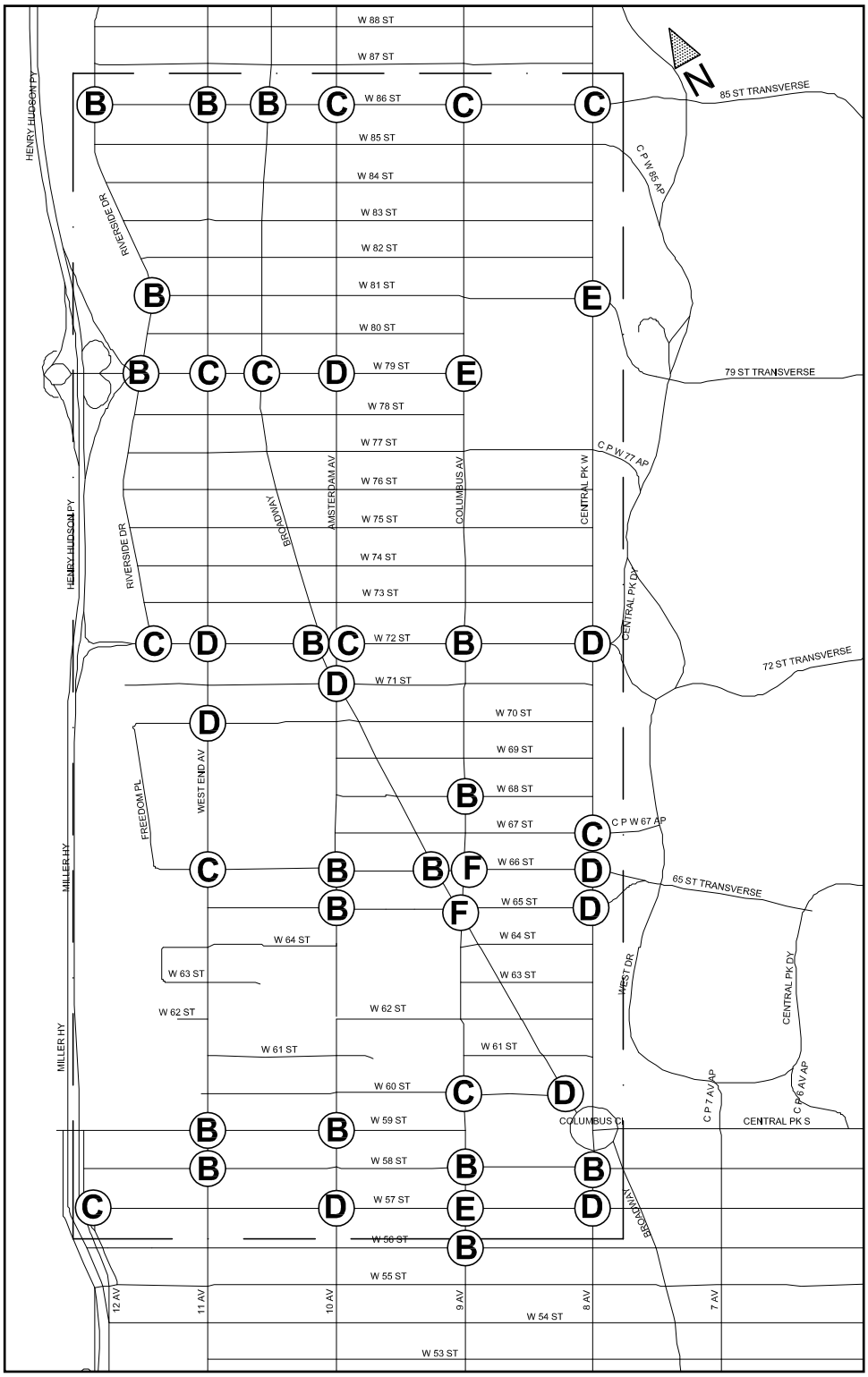

Figure 2.3-6: Midday Peak Hour Level of Service

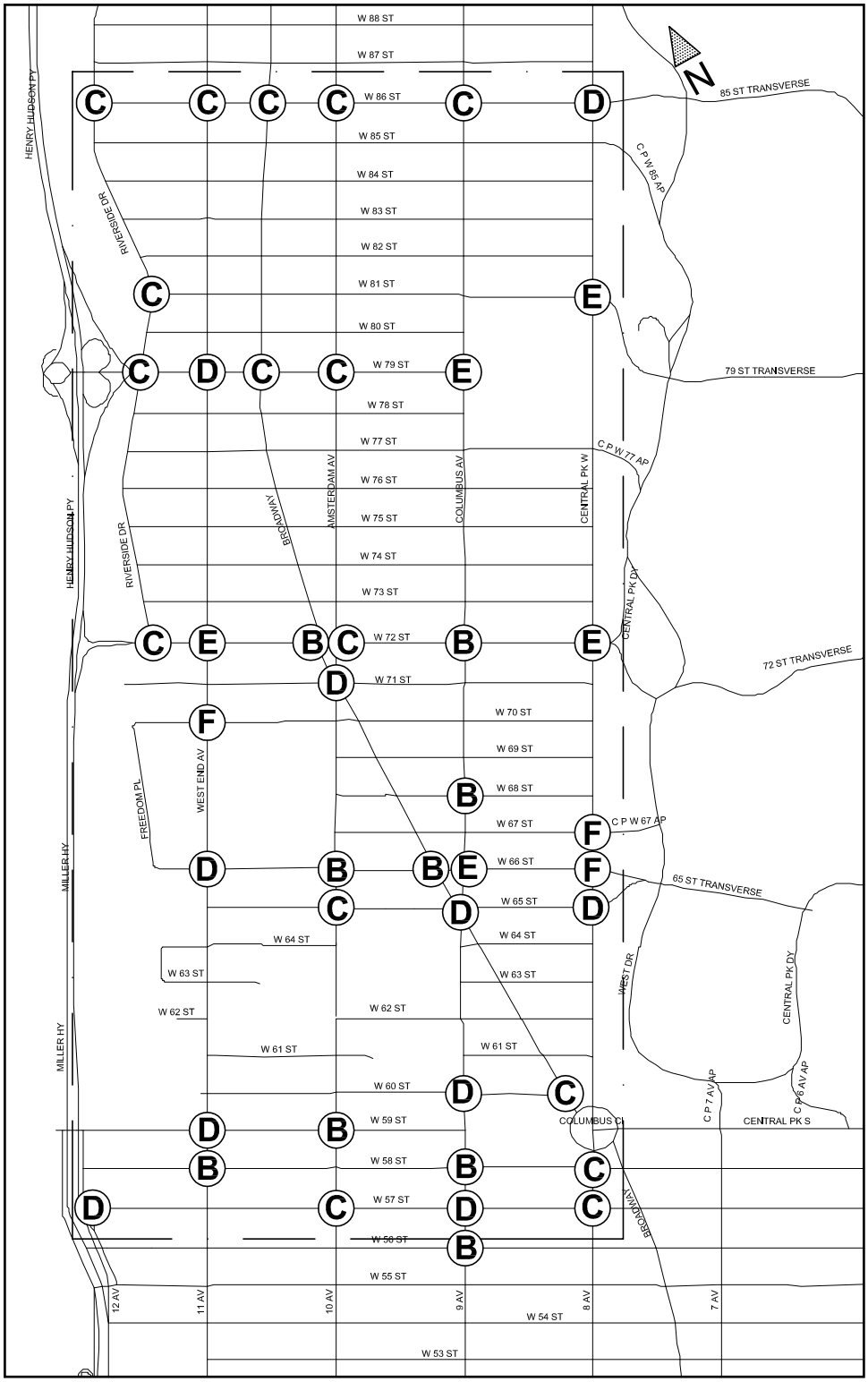

Figure 2.3-7: PM Peak Hour Level of Service

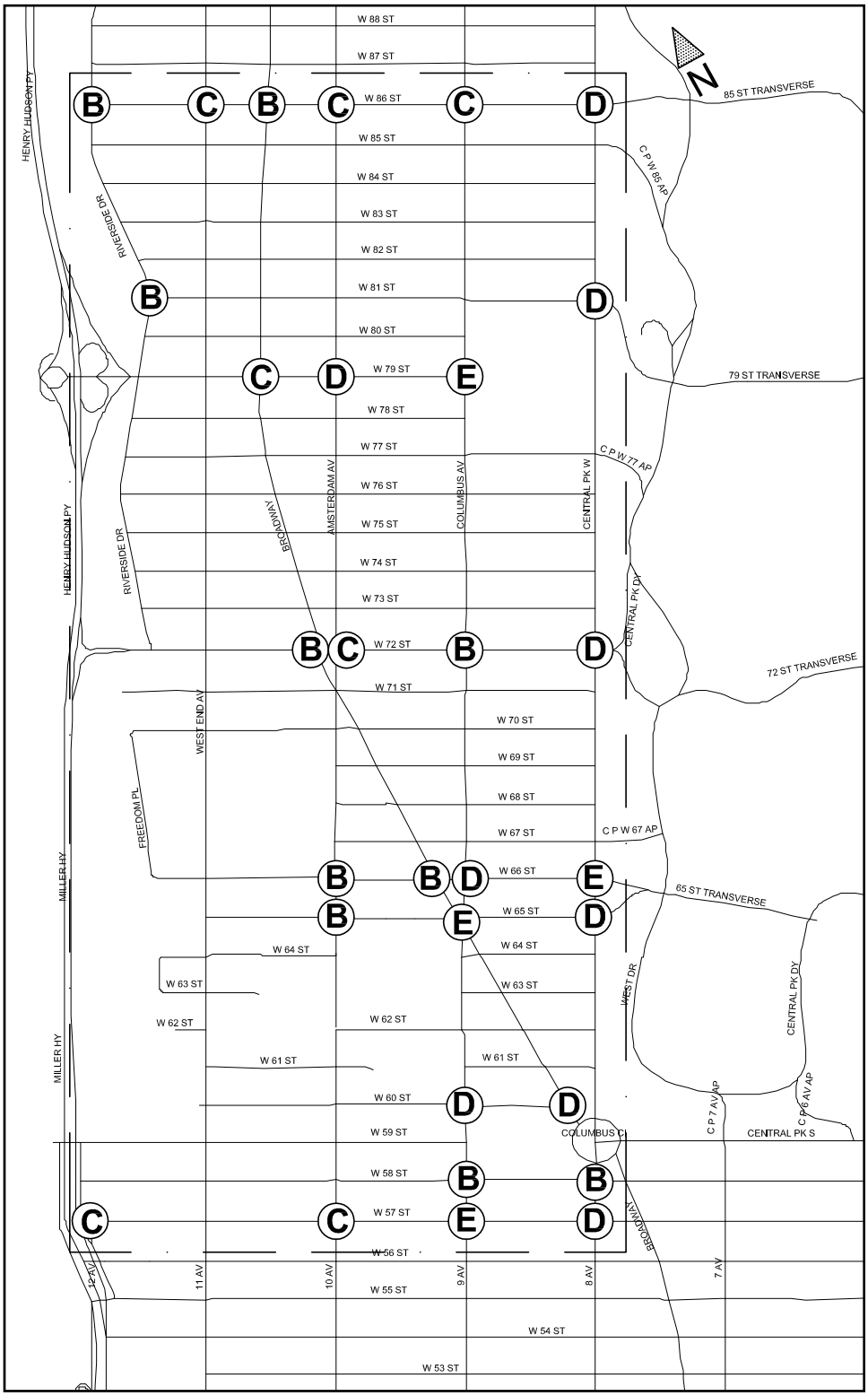

Figure 2.3-8: Saturday Midday Peak Hour Level of Service

2.3.3 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 compute future travel speeds. Future speeds are another factor used in determining congestion along the main corridors. Several factors contribute to slower speeds such as vehicular and pedestrian conflicts, traffic controls, loading/unloading activities, queuing, parking activities (in and out), and roadway geometry. The future travel speeds are projected to be slower than under existing conditions during the various peak hours along all the corridors analyzed. The analyzed corridors are listed below and Figure 2.3-9 shows the average peak hour travel speed in both directions.

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)

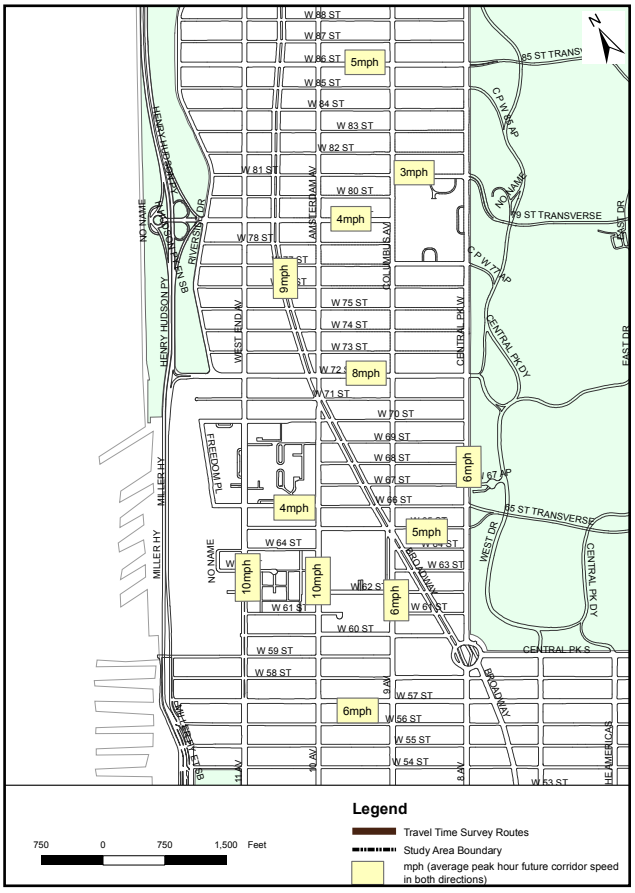

Figure 2.3-9: Speed Run Corridors

Table 2.3-3 summarizes the average existing and future peak hours travel speeds for the corridors by direction. 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 average travel speeds, i.e. less than 10 mph during one or more peak hours.

No	Corridors	Time	Direction	Average Speed (MPH)	
				2008	2018
1	**West 57 St** between Broadway & Twelvth 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	**West 65 St** between Central Park West & West End Ave	AM	EB	6.4	5.0
		MD	EB	5.7	5.6
		PM	EB	5.1	4.3
3	**West 66 St** between Central Park West & West End Ave	AM	WB	5.9	4.7
		MD	WB	5.5	5.3
		PM	WB	5.1	4.4
4	**West 72 St** between Central Park West & 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	**West 79 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	**West 81 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	**West 86 St** between Central Park 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 West 57 St & West 86 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 West 57 St & West 86 St	AM	SB	10.3	6.0
		MD	SB	5.6	4.3
		PM	SB	8.1	6.6
10	**Amsterdam Ave** between West 57 St & West 86 St	AM	NB	10.3	10.2
		MD	NB	11.4	11.2
		PM	NB	10.2	10.0
11	**West End Ave** between West 57 St & West 86 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 West 57 St & West 86 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 was also 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	210 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~~	~~1000~~
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

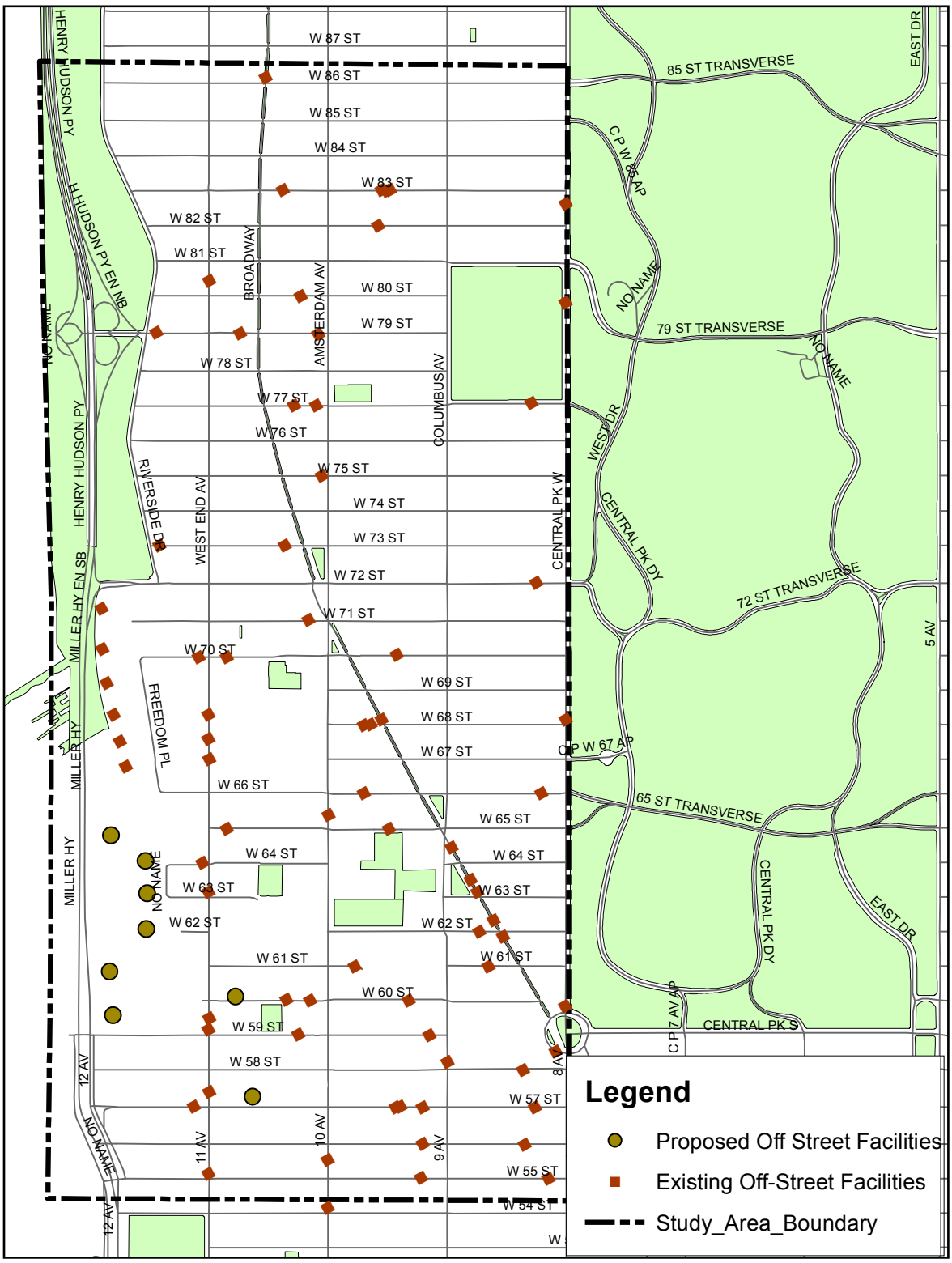

Figure 2.5-1: Off-Street Parking Facilities (Existing 2008 and Proposed 2018)

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 increased 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.

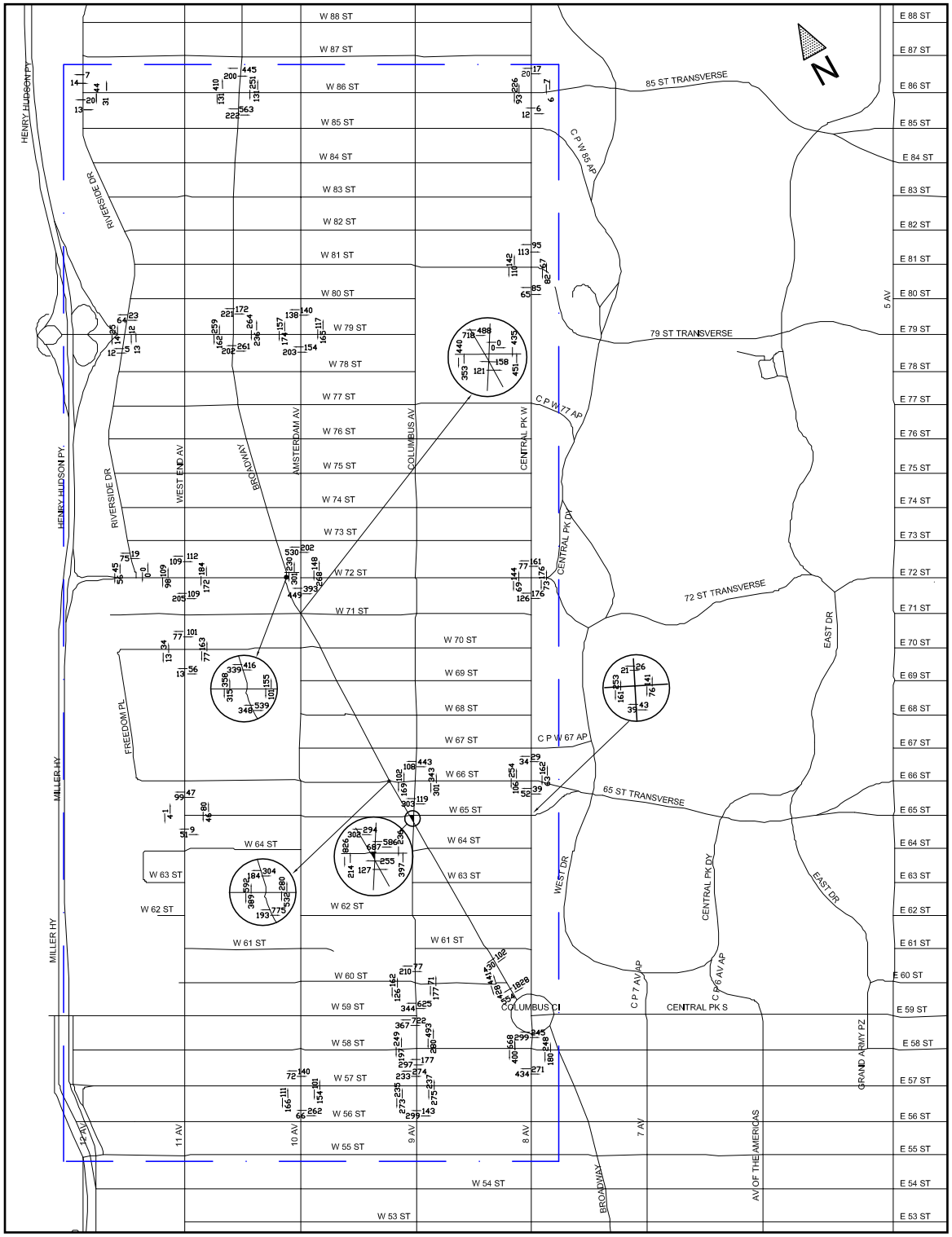

Figure 2.6-1: AM Peak Hour Pedestrian Volumes (2018)

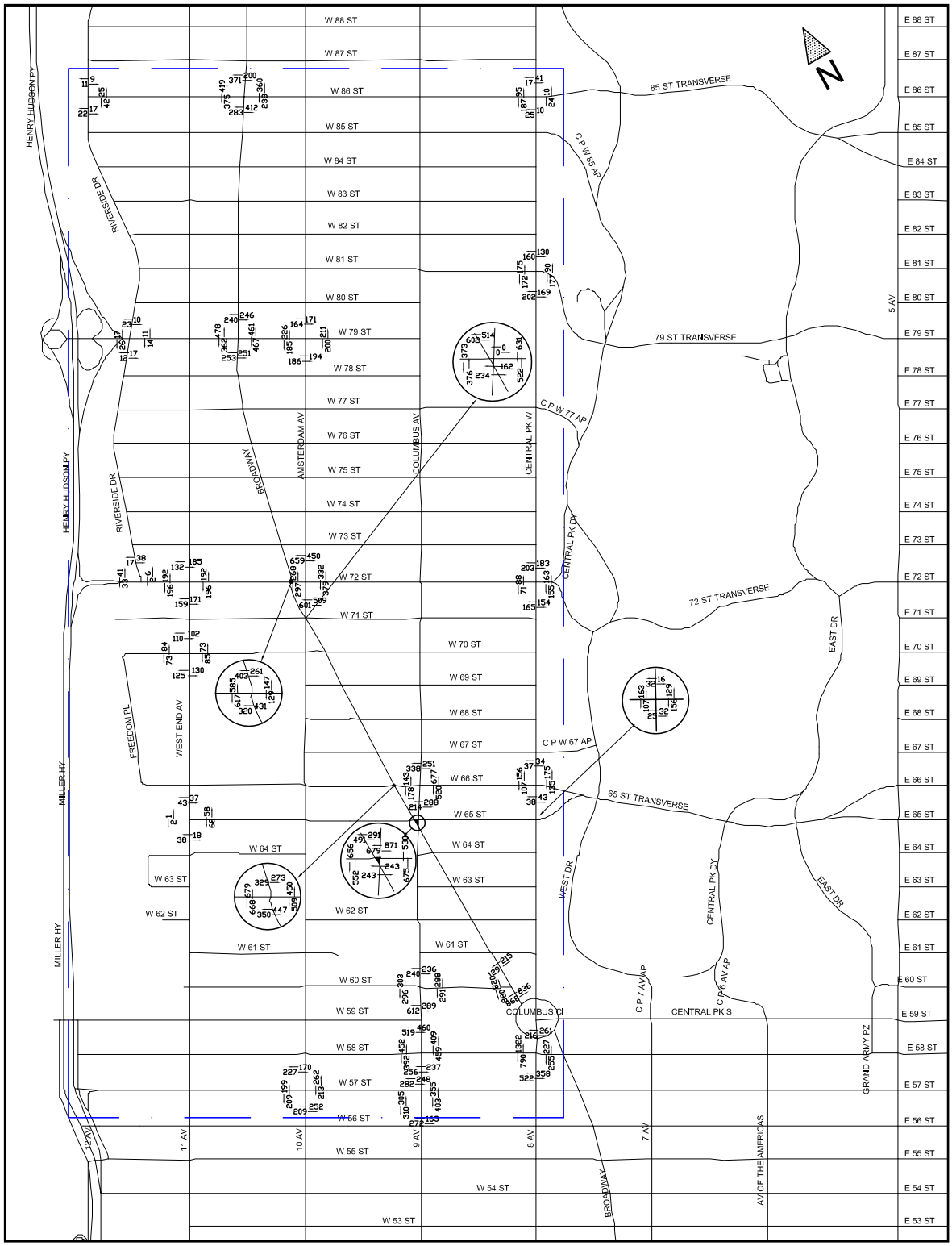

Figure 2.6-2: Midday Peak Hour Pedestrian Volumes (2018)

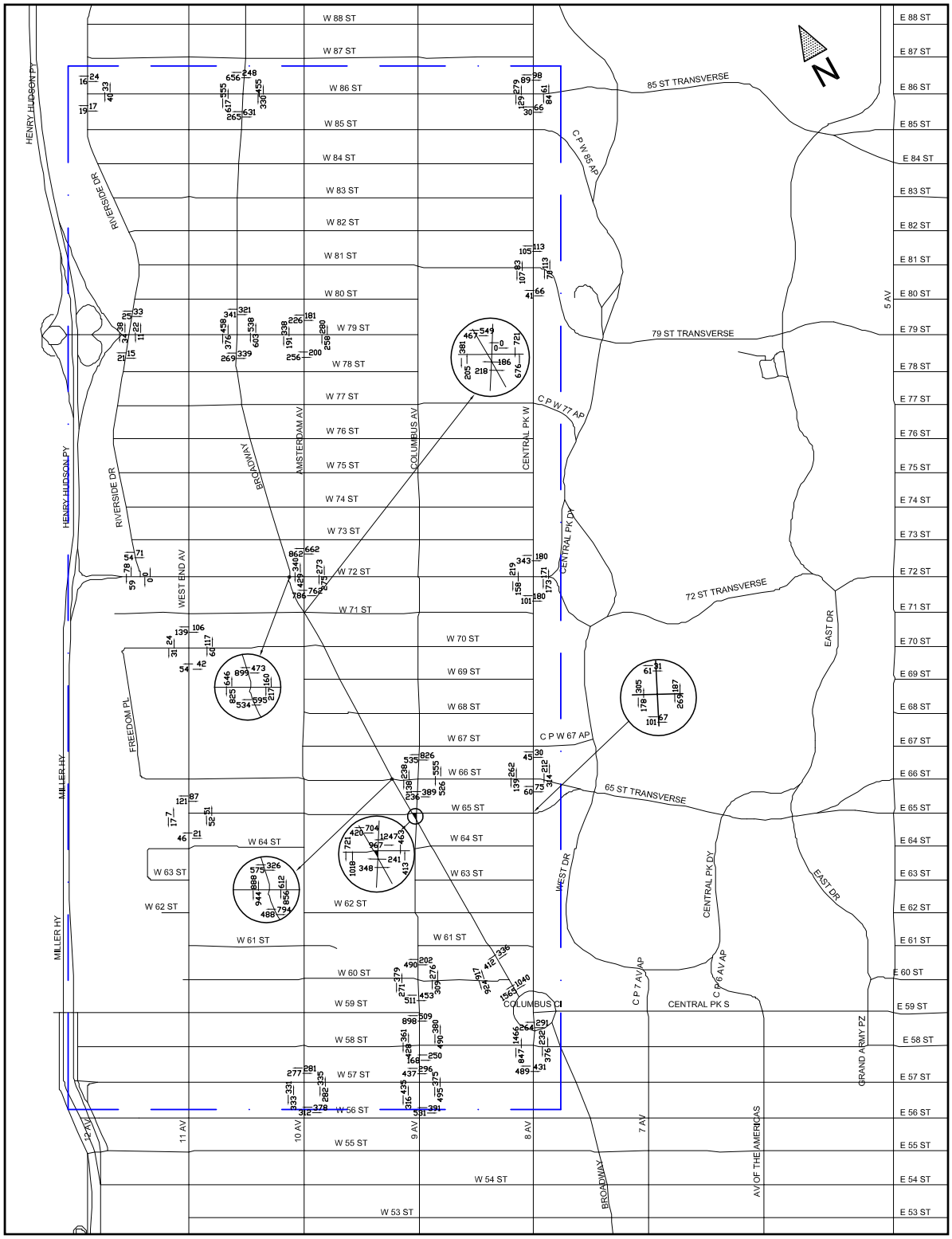

Figure 2.6-3: PM Peak Hour Pedestrian Volumes (2018)

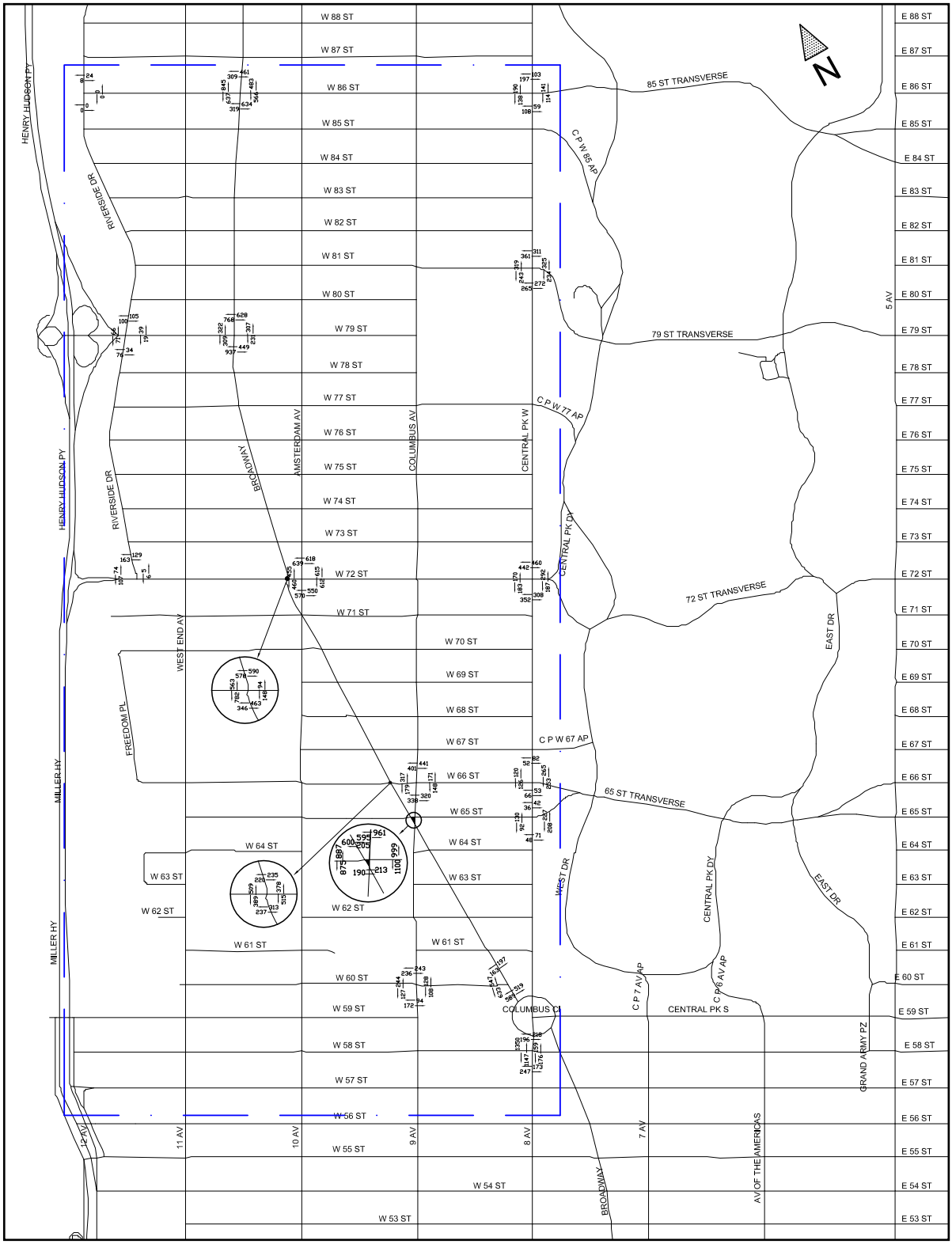

Figure 2.6-4: Saturday Midday Peak Hour Pedestrian Volumes (2018)

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 (2012) 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 (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)

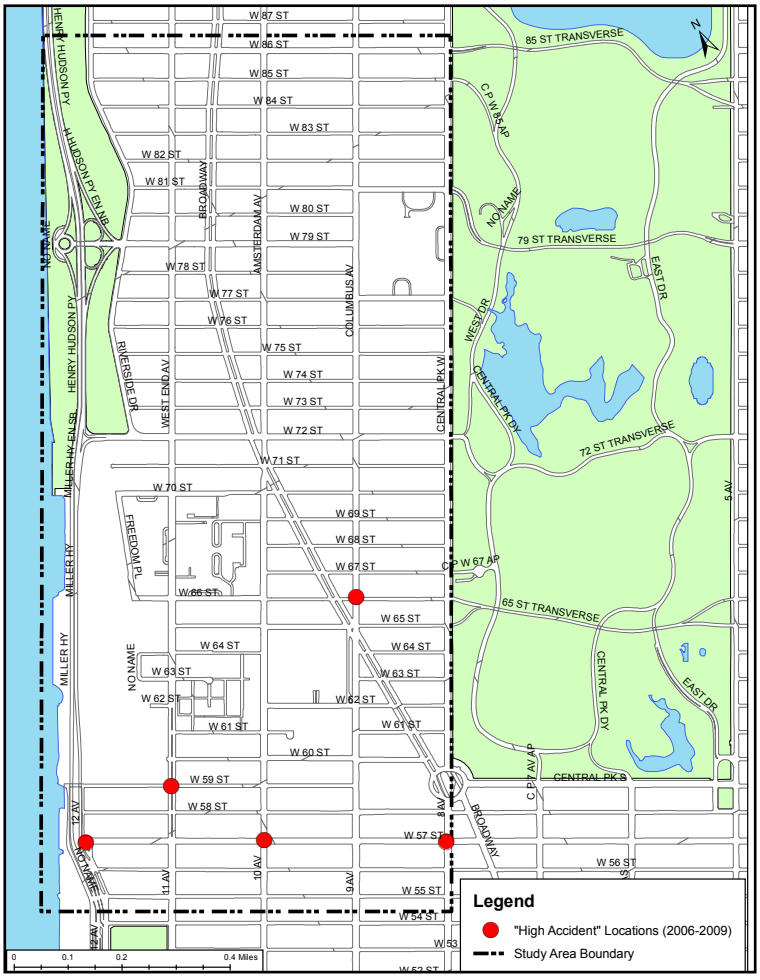

Figure 2.7-1: "High Accident Locations" (2006-2009)

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)

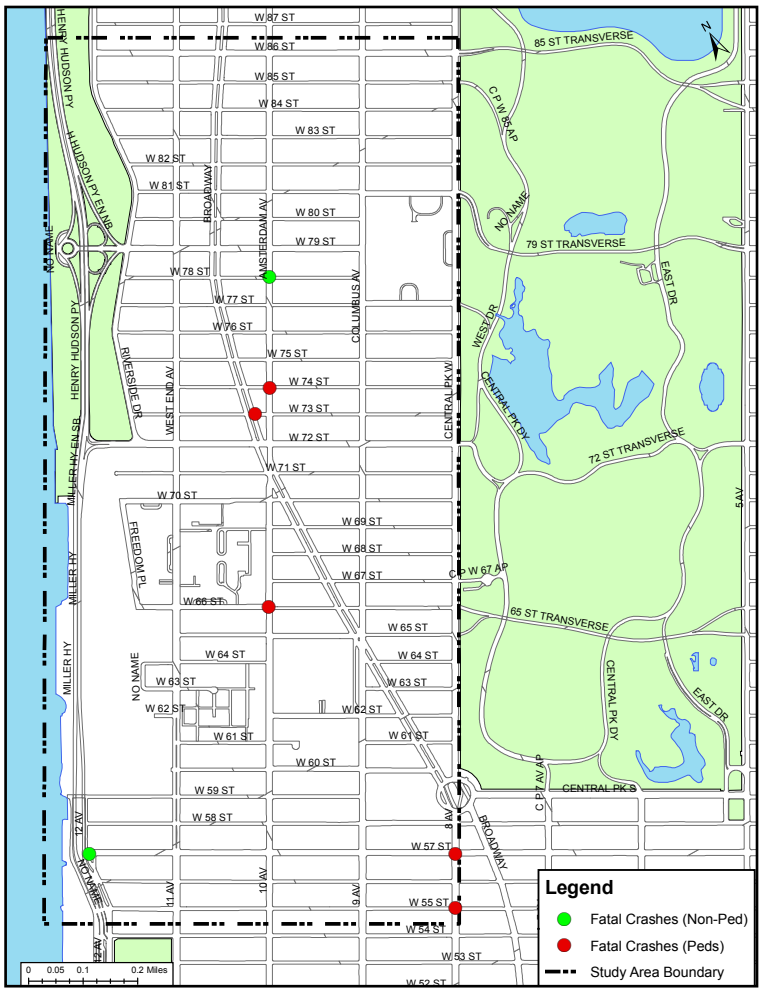

Figure 2.7-2: Fatal Accident Locations (2006-2009)

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 for goods delivery 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 travel-

ing 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) where widespread truck double parking was observed.

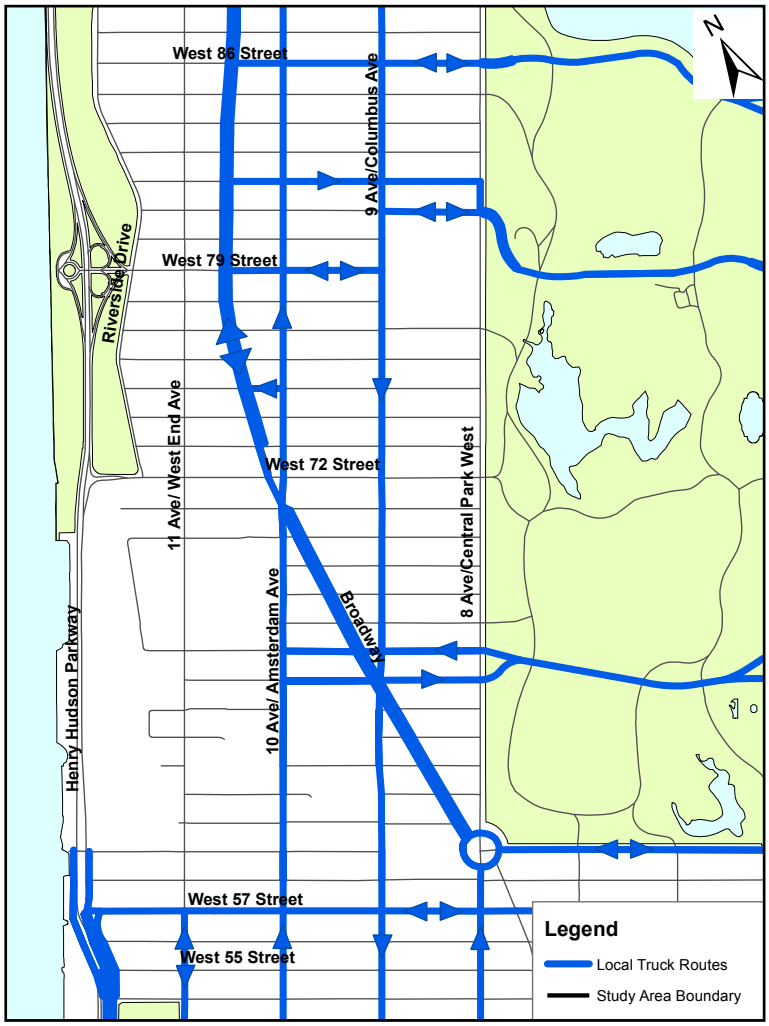

Figure 2.8-1: Local Truck Routes in the Study Area

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 buses 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.

2.9-4 Stakeholder's Meeting, March 30, 2012

NYCDOT met with community stakeholders, including Council Member Gale Brewer, Community Board 7, Lincoln Square BID, Columbus Avenue BID, American Museum of Natural History, Community Board 4, and the West 70th Street Block Association to obtain preliminary community feedback on the recommendations in the draft final report. Comments on specific recommendations/ locations follows:

1. West 58th Street & 8th Avenue
   There was opposition to the recommended painted curb extension and the use of planters to enhance pedestrian safety. The painted neckdown does not conform to the aesthetic design of the Circle. If a curb extension has to be done it should be done in concrete and match the surrounding design.

2. West 58th Street & 9th Avenue
   West 58th Street is one way EB with a very wide unstriped travel lane which looks like 2 lanes. There is heavy pedestrian activity and speeding cabs. A split phase should be used to improve pedestrian safety.

3. West 60th Street & Broadway

- There was opposition to the proposed painted neckdown.
- Inquiry was made as to the feasibility of using one lane on the south curb of West 60th Street for for hired vehicles.
- Lincoln Square BID inquired about the installation of bike parking facilities on the Circle (next to the information center) that was previously approved but not yet installed.

4. West 60th Street & Columbus Avenue

- A concrete neckdown is preferred to a painted one.

5. Columbus Avenue between W 62nd and W 63rd Streets
- Any commercial parking next to the park was opposed.

6. West 66th Street & Columbus Avenue/Broadway
- Maintain the existing marking as the proposal includes too many new signs.

7. West 70th Street & Broadway
- Audible pedestrian signal is not needed. Existing signs are outdated.

8. West 81st Street & Central Park West
- The proposed options are acceptable as long as no left turns are prohibited.
- Banning the NB-L would be problematic for the Museum.

9. Broadway Mall Tips
- There were no objections to the proposal to widen the opening on the mall tips.
- Inquiry was made as to whether bollards could replace the barricades to enhance the aesthethics; the current finish where barricades are "cut back" is not attractive.

10. West 57th Street & 9th Avenue
- The proposed installation of truck advisory signs was approved with a request for immediate implementation.

11. West 70th Street & West End Avenue
- Preference expressed for concrete neckdowns as opposed to painted ones. If neckdowns were painted, the use of flexible bollards to help enhance safety was requested.
- A similar traffic calming treatment as being proposed east of West End Avenue was requested on the west leg.

12. West 86th Street & Central Park West
- Preference for a left turn bay on the eastbound approach as opposed to a concrete median was expressed.

13. West 86th Street & Columbus Avenue
- There is a lot of delays on the WB approach and too much green time for the WB left.
- A request to daylight the WB approach by removing one parking space (next to hydrant) was made.

14. West 66th Street & Broadway
- The proposed designated left turn phase along Broadway would create delays for the westbound movement and block traffic on Columbus Ave.

15. Truck loading/unloading on Columbus and Amsterdam Avenues
- The number of locations proposed for commercial parking caused concern. DOT's response was that the number of locations is likely to be reduced and community consensus would be attained before being finalized.

2.9-5 Public Meeting, April 25, 2012

The third and final public meeting was held at John Jay College on Wednesday, April 25th. The meeting was attended by approximately 50 residents and stakeholders. In attendance were C/M Gale Brewer, representatives from Community Boards 4 and 7, the Manhattan Borough President's office, NYS Senator Tom Duane's office, and Assembly Member Linda Rosenthal's office. The objective of the meeting was to present the study's draft final report and obtain feedback from the community. Following are pertinent comments/questions from the meeting and DOT's reponse:

1. West 79th Street & West End Avenue
- Recently implemented truck loading/unloading zone on West End Avenue blocks the entrance of residential building.

A: It was explained that the new truck loading/unloading zone is part of a pilot for trucks making deliveries to residential buildings and patience to see the efficacy of the program requested.

2. West 86th Street & Central Park West
- Will there be a left turn phase for the proposed left turn lanes on the NB/SB approaches?

A: No. Signal timing is optimized due to an existing LPI; a left turn phase would result in the removal of the LPI.

3. Bike Lanes
- Why is a bike lane proposed on West End Avenue and not Amsterdam Avenue?

A: The bike lane on West End Avenue is part of NYC Bicycle Master Plan and not a proposal of the study.

4. West 79th Street & Columbus Avenue
- Heavy SB right turning vehicles conflict with pedestrians.

A: A neckdown is proposed on the northwest corner of the intersection.

5. Trucks on West Side Highway
- Can the West Side Highway be used as a truck route to take trucks off local streets?

A: Truck weights would compromise the structural integrity of the roadway.

6. West 57th Street at 8th, 10th, and 12th Avenues
- These high accident locations need improvement to enhance safety, maybe introduce a LPI or split phase.
- Change the left turn phase from the beginning to the end of the cycle.

A: Signal timing already operates at the optimal, no time can be taken from any approach to create a LPI.

7. Columbus Avenue & West 60th Street
- Can a 3-phase signal be installed to eliminate pedestrian conflicts?

A: The introduction of a 3-phase cycle would disrupt progression on Columbus Avenue.

8. West 65th Street/Columbus Avenue/Broadway
- Can a left turn phase be introduced for vehicles heading eastbound from Columbus Avenue?

A: With the existence of an LPI, the cycle length is already optimized.

3.0 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.

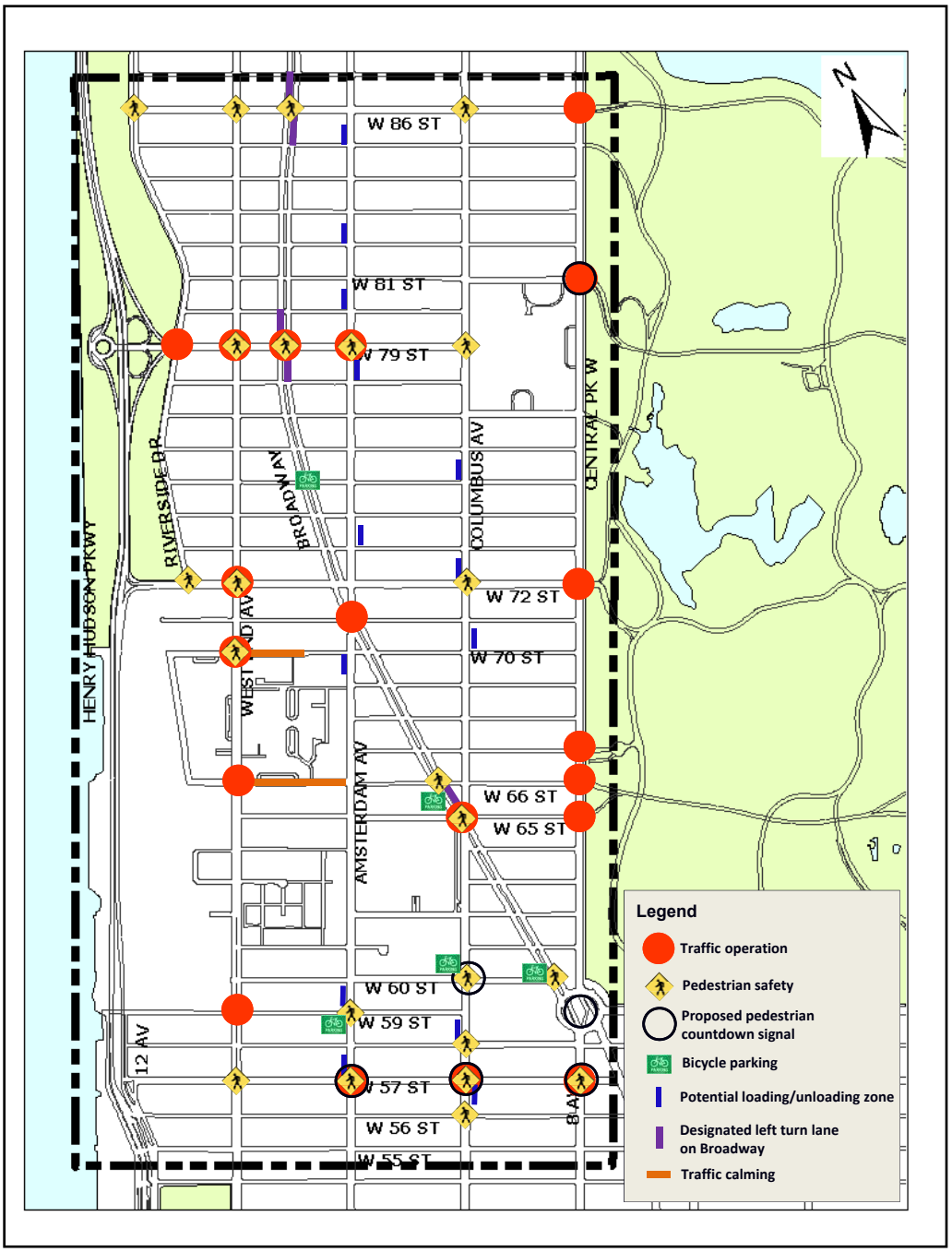

Figure 3-1: Locations with Proposed Improvements

Field observations and the future conditions HCS analysis formed the basis for the recommendations that were developed to improve traffic operations and safety (for all users) in the study area. The recommendations are as follows:

Riverside Drive

1. West 72nd Street & Riverside Drive

West End Avenue

2. West 58th Street & West End Avenue
3. West 59th Street & West End Avenue (AM and PM)
4. West 66th Street & West End Avenue (AM and PM)
5. West 70th Street & West End Avenue (PM)
6. West 70th Street between West End and Amsterdam Avenues
7. West 72nd Street & West End Avenue (PM)
8. West 79th Street & West End Avenue (AM and PM)

Broadway

9. West 79th Street & Broadway (Saturday Midday)
10. Left Turns on Broadway
11. Widening Mall Tip Openings

Amsterdam Avenue/Tenth Avenue

12. West 57th Street & Tenth Avenue (Midday and Saturday Midday)
13. West 79th Street & Amsterdam Avenue (Midday and Saturday Midday)

Columbus Avenue/Ninth Avenue

14. West 57th Street & Columbus Avenue (AM, Midday, and Saturday Midday)
15. West 65th Street & Columbus Avenue/Broadway (AM and Midday)
16. West 86th Street & Columbus Avenue

Central Park West/Eight Avenue

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

Other recommendations

24. Pedestrian Safety - Proposed Neckdown Locations
25. Bicycle Parking
26. Commercial Parking

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

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 to reduce pedestrian crossing distance.
   - Extend curb on the northeast corner.
   - Realign the north and west crosswalks consistent with the proposed curb extensions.

Figure 3-2a and 3-2b show the existing and proposed conditions at this location.

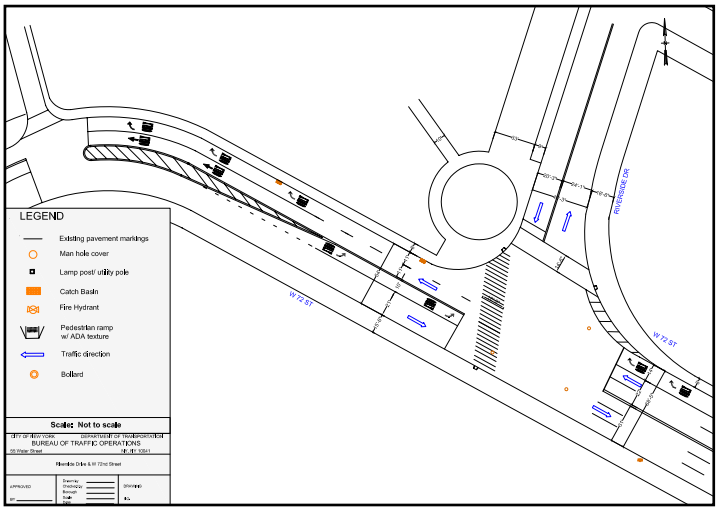

Figure 3-2a: Existing Condition - Riverside Drive & West 72nd Street

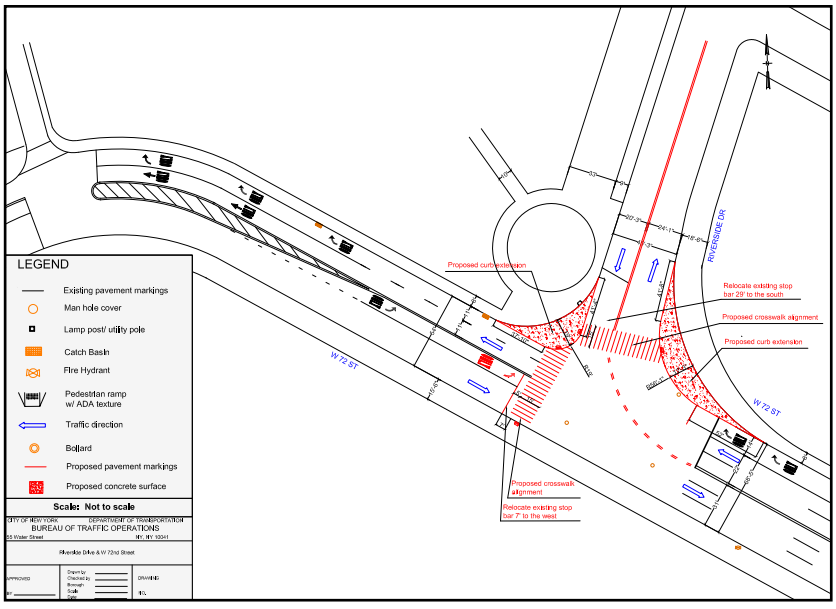

Figure 3-2b: Proposed Condition - Riverside Drive & West 72nd Street

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

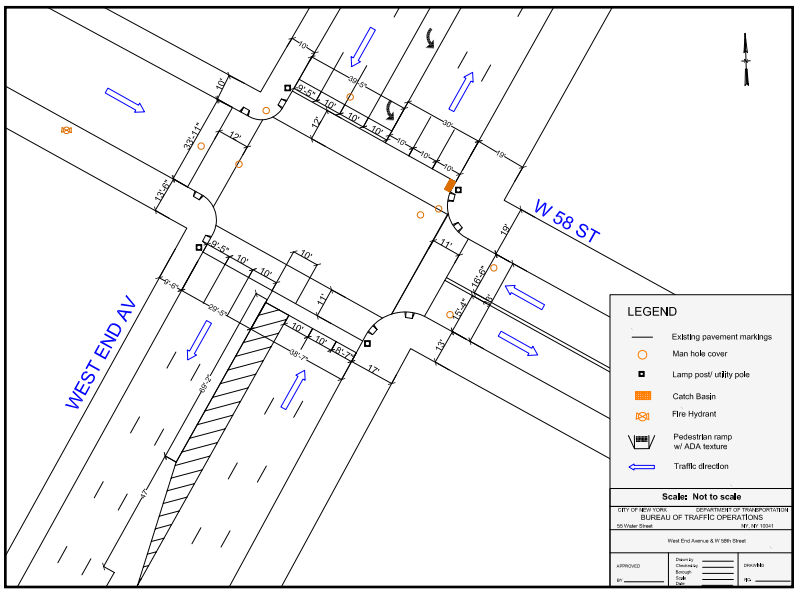

Figure 3-3a: Existing Condition - West End Avenue & West 58th Street

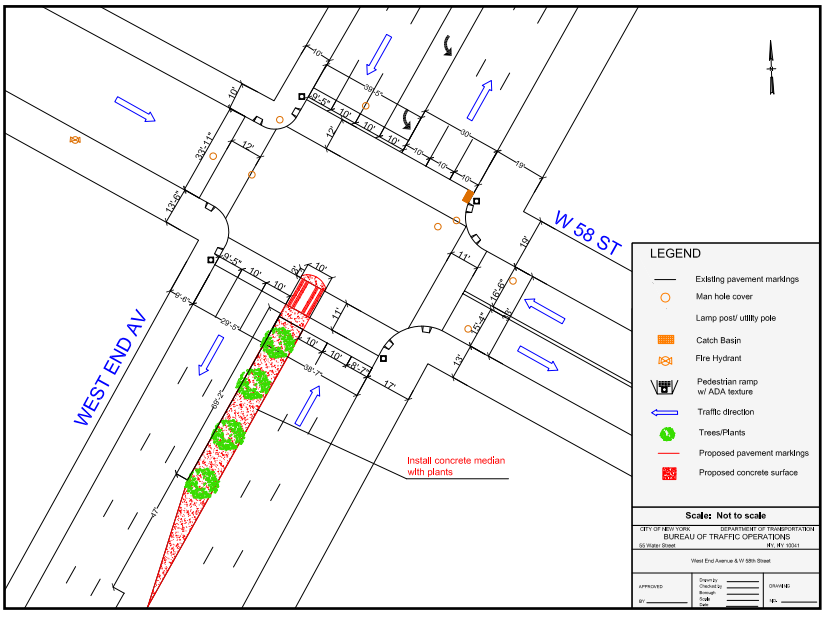

Figure 3-3b: Proposed Condition - West End Avenue & West 58th Street

3. West 59th Street & West End Avenue

Issue(s):

- Heavy delays on the westbound approach during the AM and PM peak periods.
- Need to enhance pedestrian safety.

Recommendation(s):

- During the AM and PM peak hour shift 5 seconds from the NB/SB phase to the EB/WB phase.
- Install a concrete median on the north leg of the intersection.

Figure 3-4a and 3-4b show the existing and proposed conditions at this location.

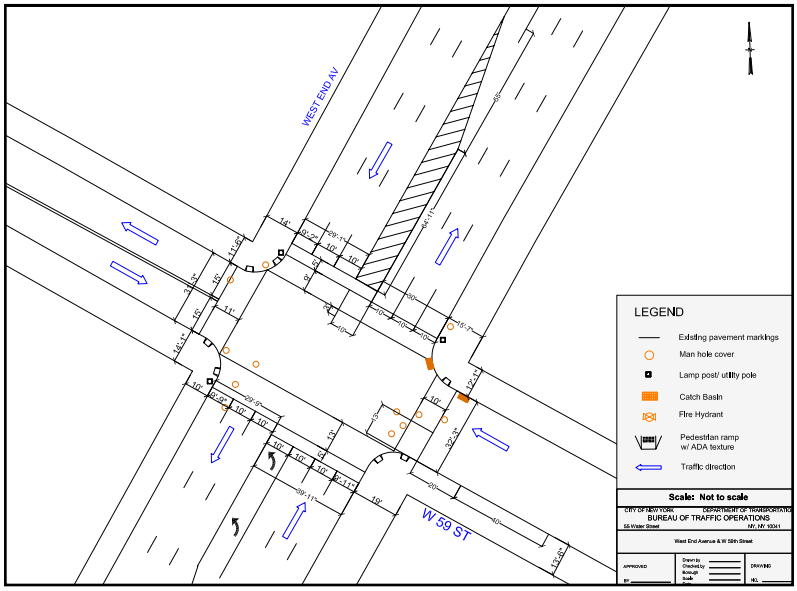

Figure 3-4a: Existing Condition - West End Avenue & West 59th Street

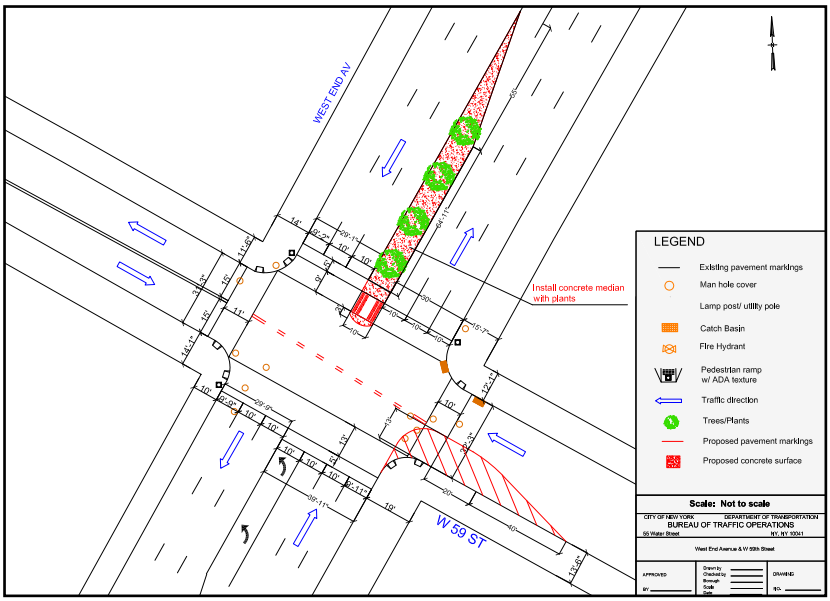

Figure 3-4b: Proposed Condition - West End Avenue & West 59th Street

4. 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 3-5a and 3-5b show the existing and proposed configuration; also, Figures 3-6a to 3-6d illustrate the cross-section view under existing and proposed conditions.

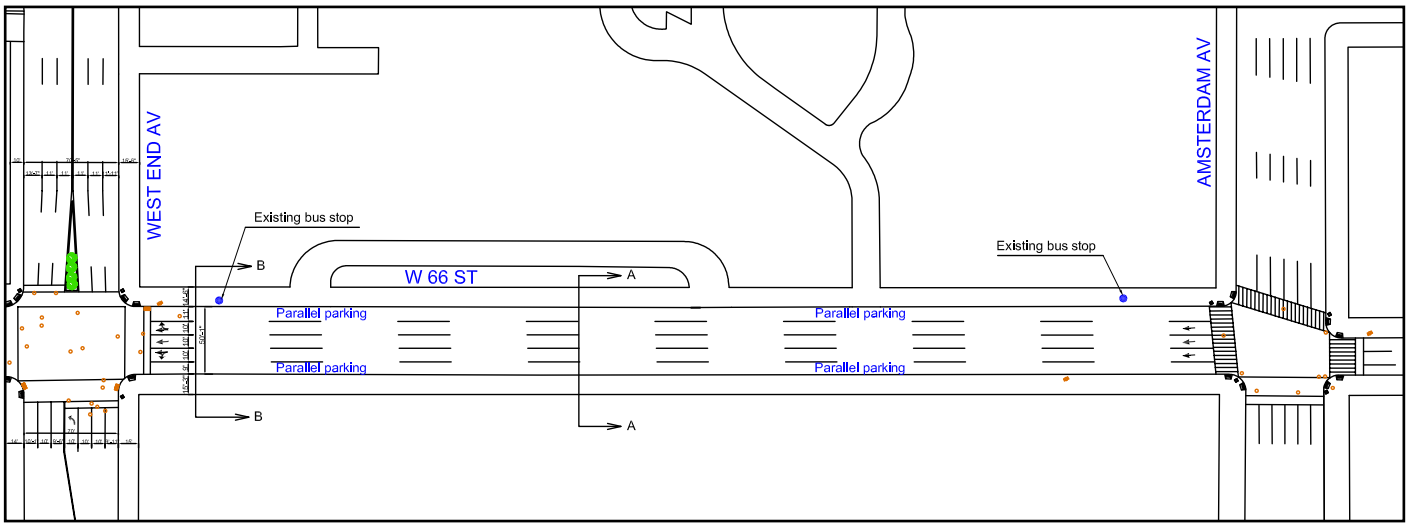

Figure 3-5a: Existing conditions on West 66th Street between Amsterdam Avenue and West End Avenue

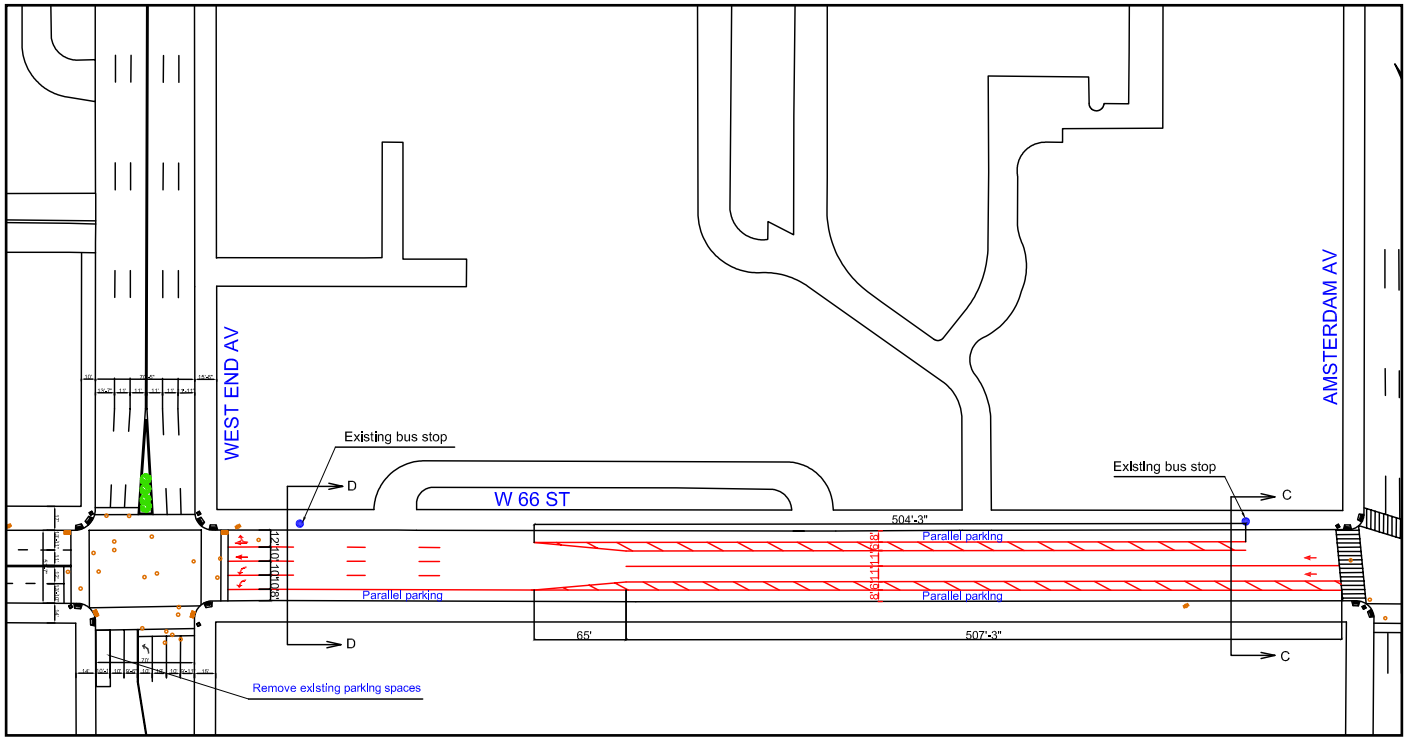

Figure 3-5b: Proposed Condition on West 66th Street between Amsterdam Avenue and West End Avenue

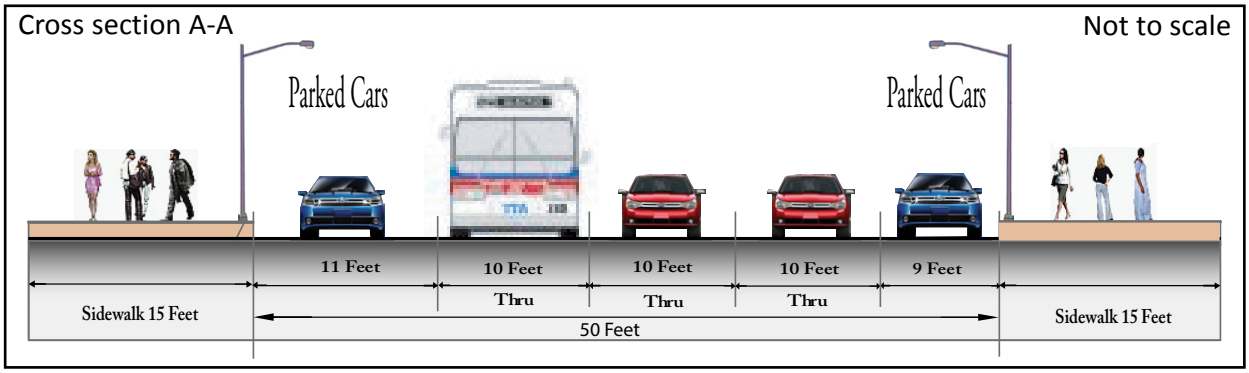

Figure 3-6a: West 66th Street between Amsterdam and West End Avenues (Existing Condition)

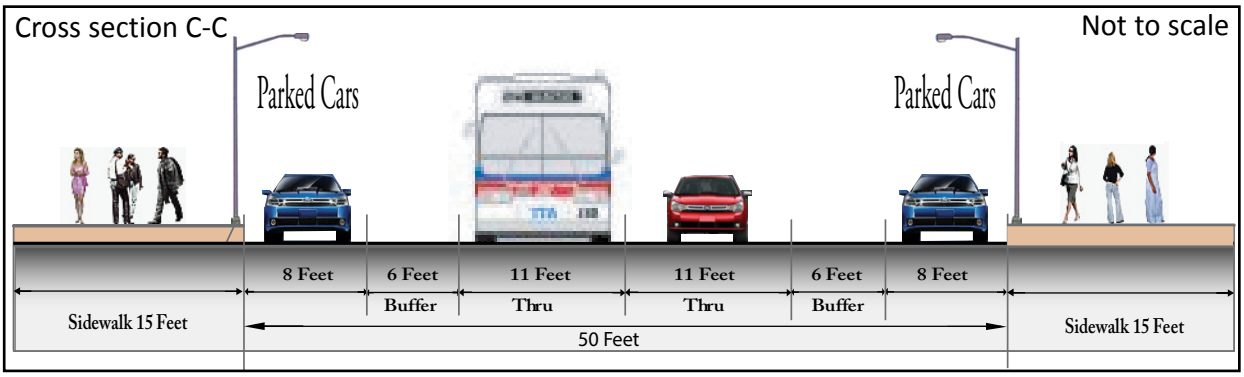

Figure 3-6b: West 66th Street between Amsterdam and West End Avenues (Proposed Configuration)

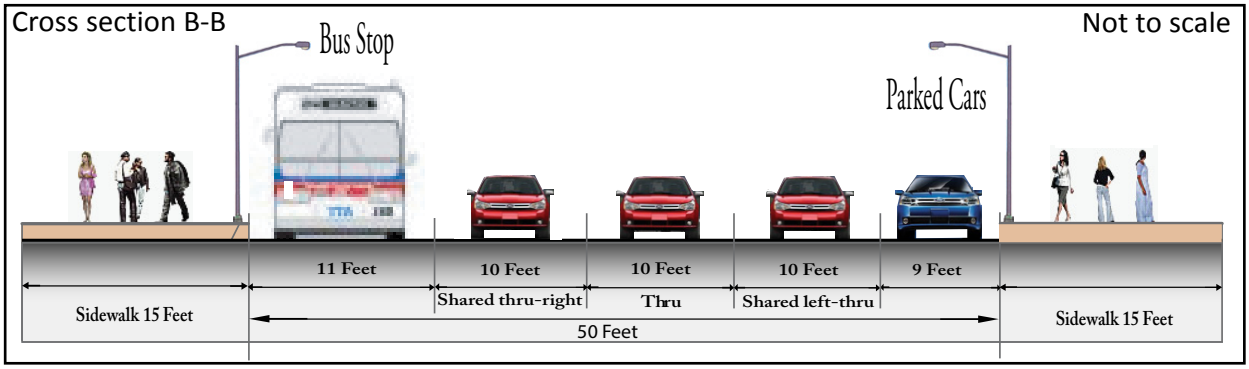

Figure 3-6c: West 66th Street approaching West End Avenue (Existing Condition)

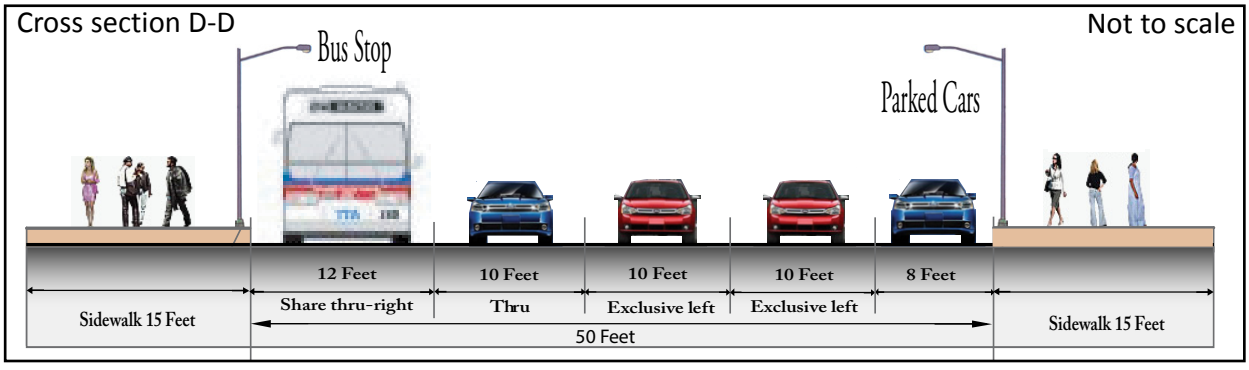

Figure 3-6d: West 66th Street approaching West End Avenue (Proposed Configuration)

5. 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 Standing, 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 3-7a and 3-7b.

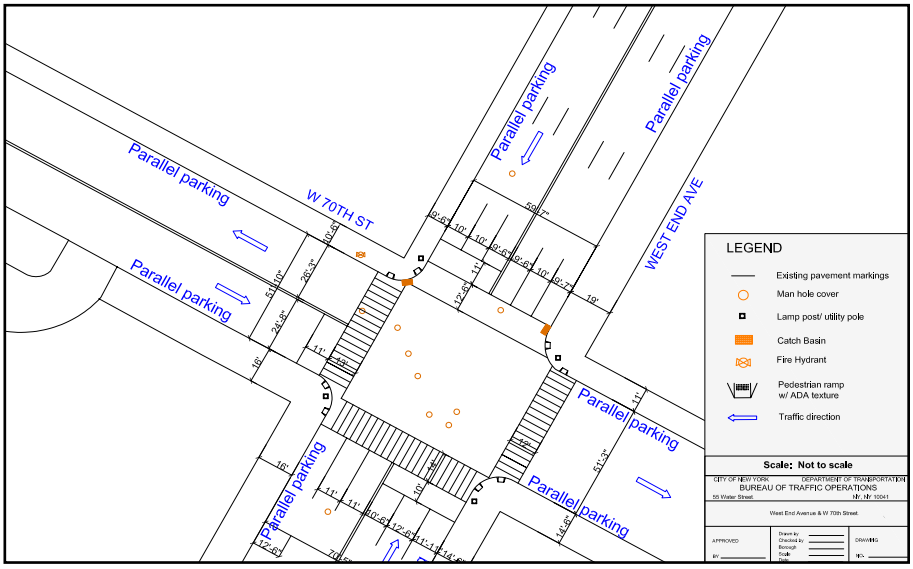

Figure 3-7a: Existing Condition - West End Ave & West 70th Street

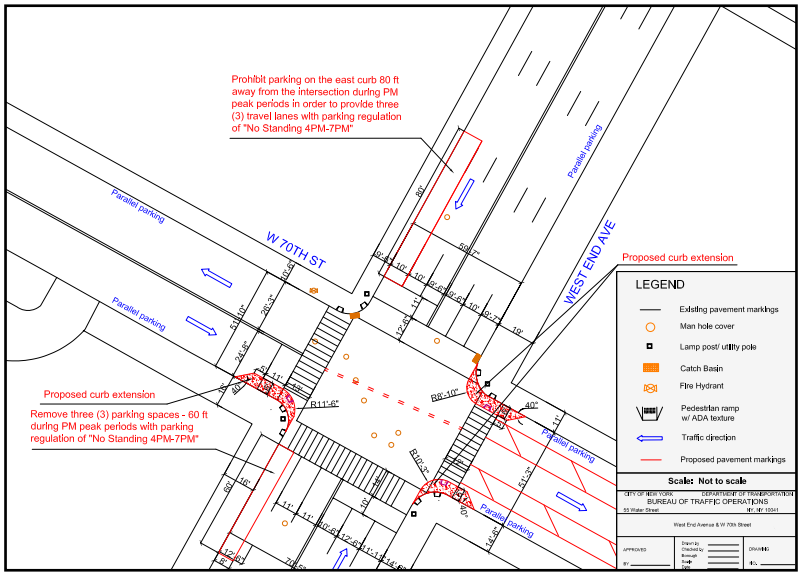

Figure 3-7b: Proposed Lane Configuration on West End Ave & West 70th Street (SB Approach)

6. West 70th Street between Amsterdam Avenue and West End Avenue

Issue(s):

- The relative speed of traffic creates unsafe and uncomfortable conditions for pedestrians.

Recommendation(s):

- Create 8.5 foot buffers between the parking and moving lanes on the north and south curbs for approximately 465’ from West End Avenue.
- Figure 3-8a and 3-8b show the existing and proposed configuration.

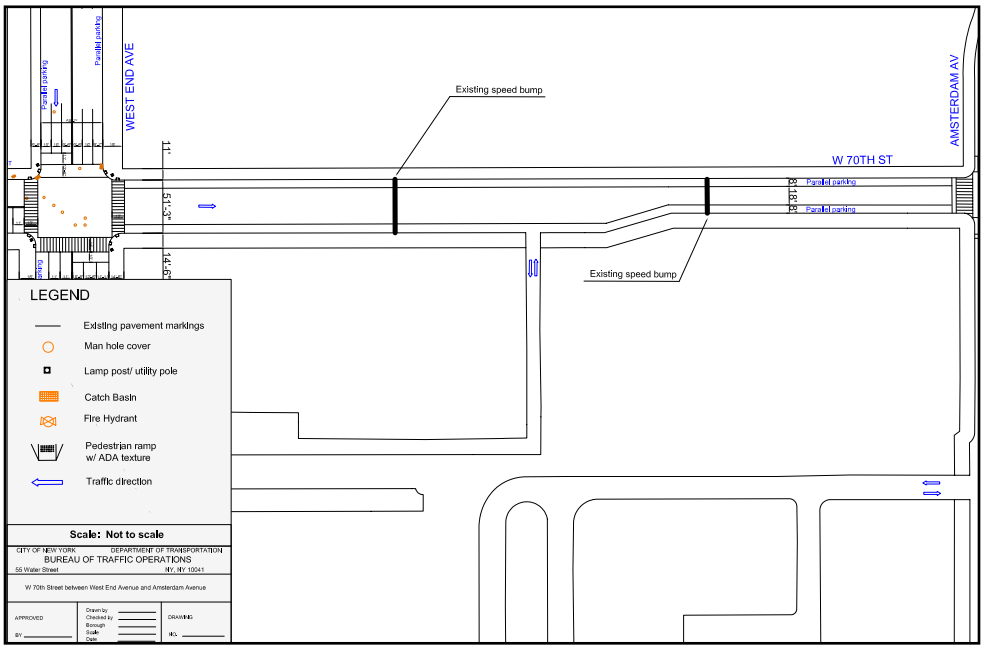

Figure 3-8a: Existing conditions on West 70th Street between Amsterdam Avenue and West End Avenue

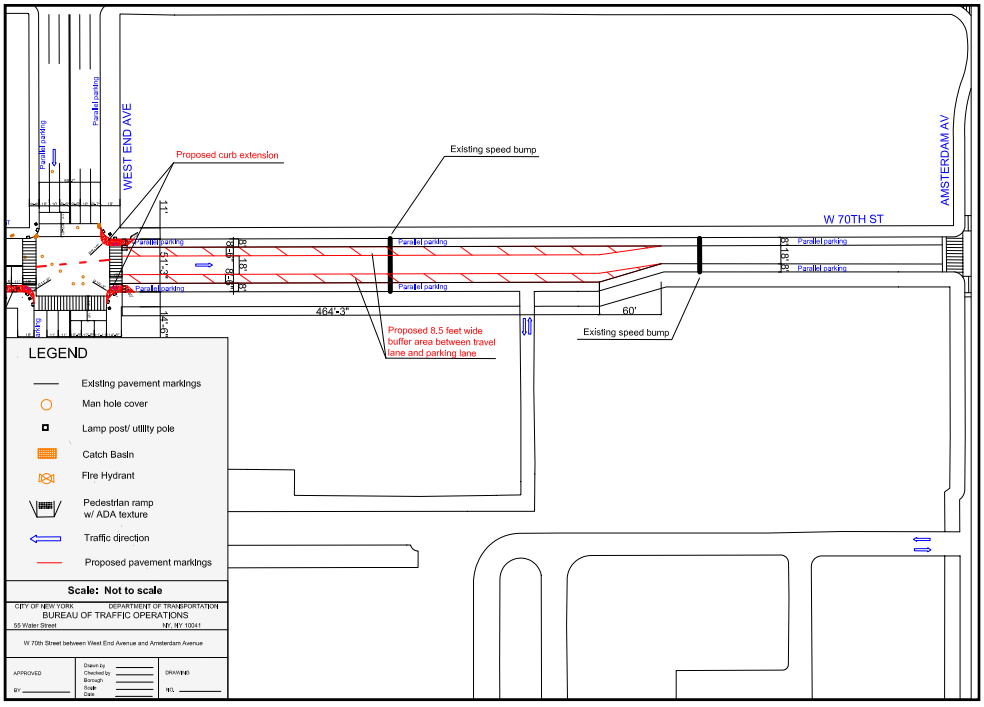

Figure 3-8b: Proposed conditions on West 70th Street between Amsterdam Avenue and West End Avenue

7. 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.

8. 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

9. 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 3-9a and 3-9b.

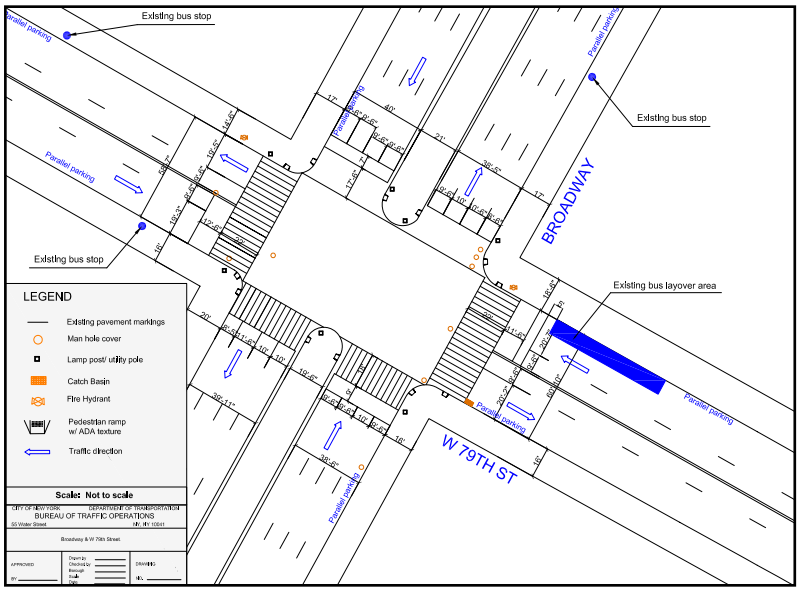

Figure 3-9a: Existing Condition - Broadway & West 79th Street

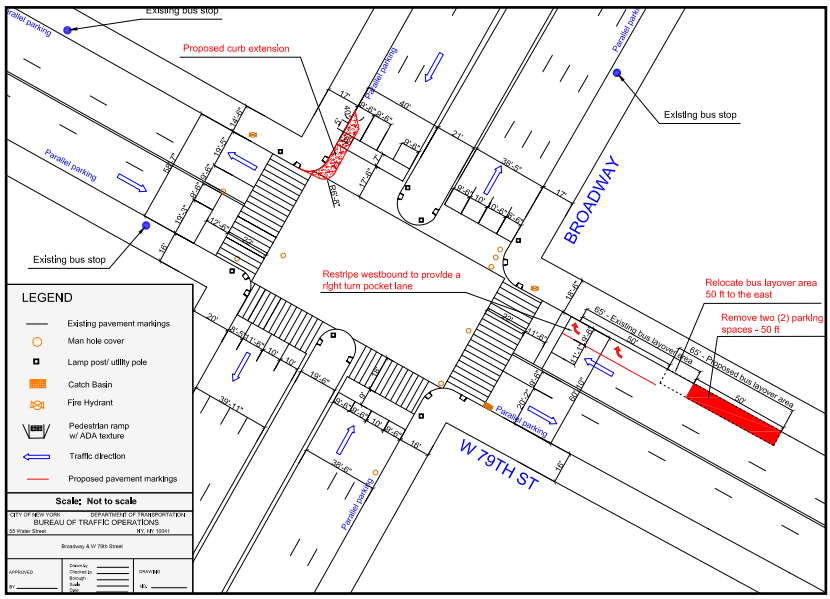

Figure 3-9b: Proposed Lane Configuration - Broadway & West 79th Street

10. Left Turns on Broadway

Issue(s):

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

Recommendation(s):

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

This recommendation is illustrated in Figure 3-10a and 3-10b.

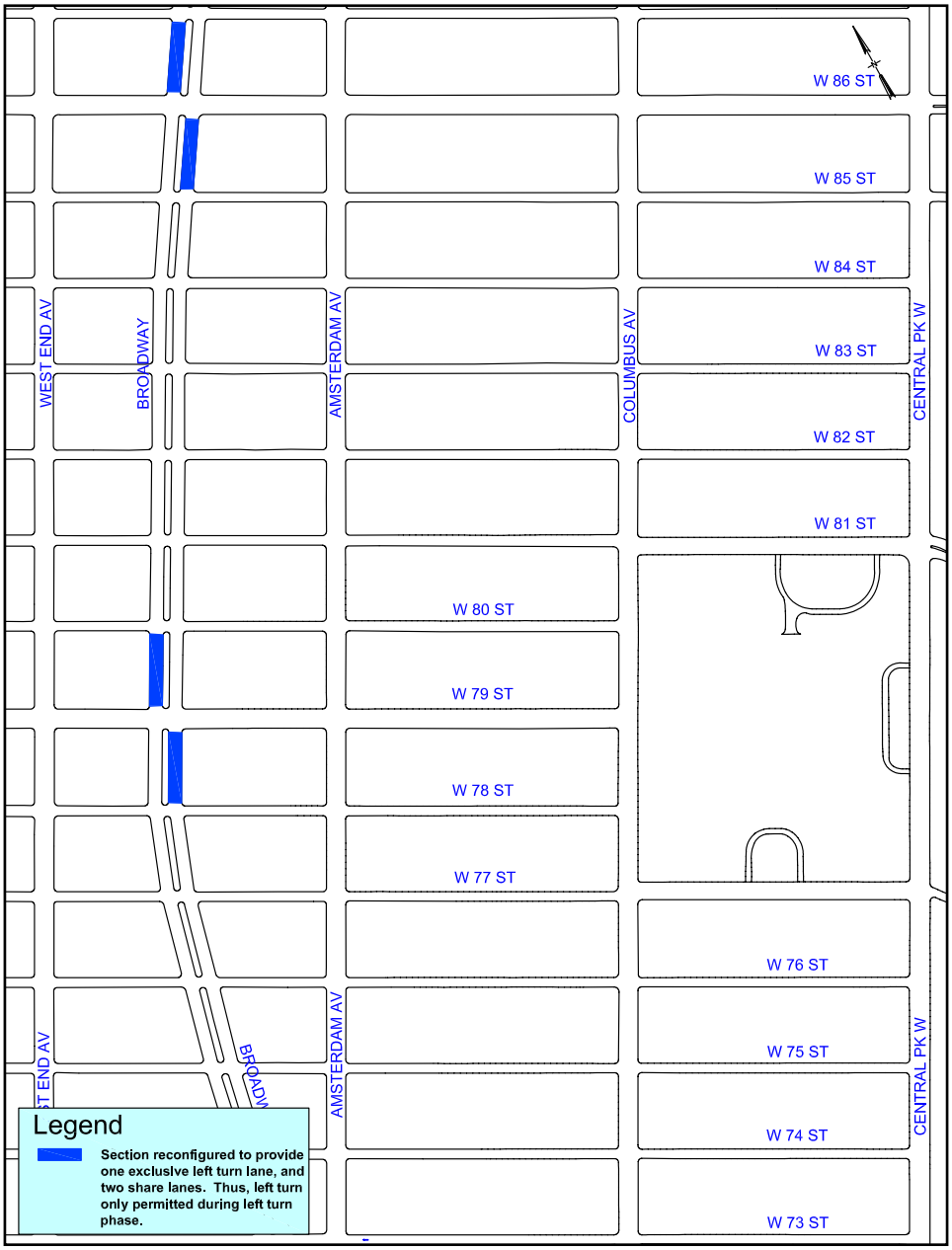

Figure 3-10a: Proposed Designated Left Turn Lane on Broadway at Major Intersections

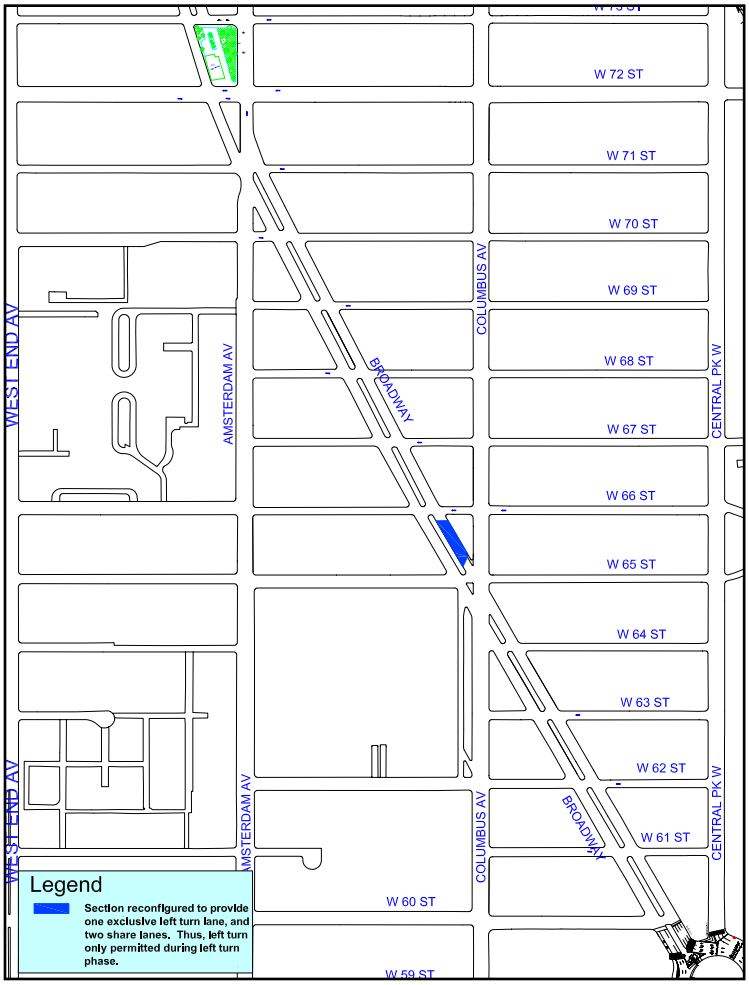

Figure 3-10a: Proposed Designated Left Turn Lane on Broadway at Major Intersections

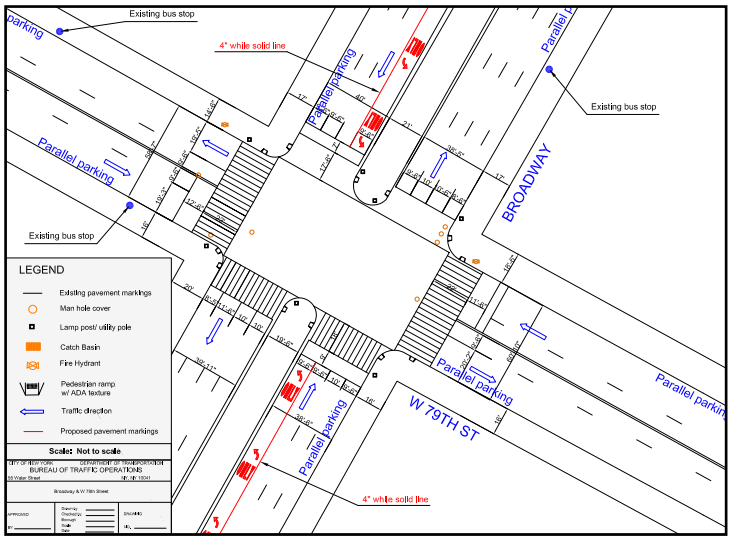

Figure 3-10b: Proposed Configuration on Broadway at Major Intersections

11. Widen Mall Tip Openings on Broadway

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 (width may vary) 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 mall opening is shown in the picture below and an illustration of proposed configuration is shown in Figure 3-11.

West 65th Street & Broadway
(looking west – south crosswalk)

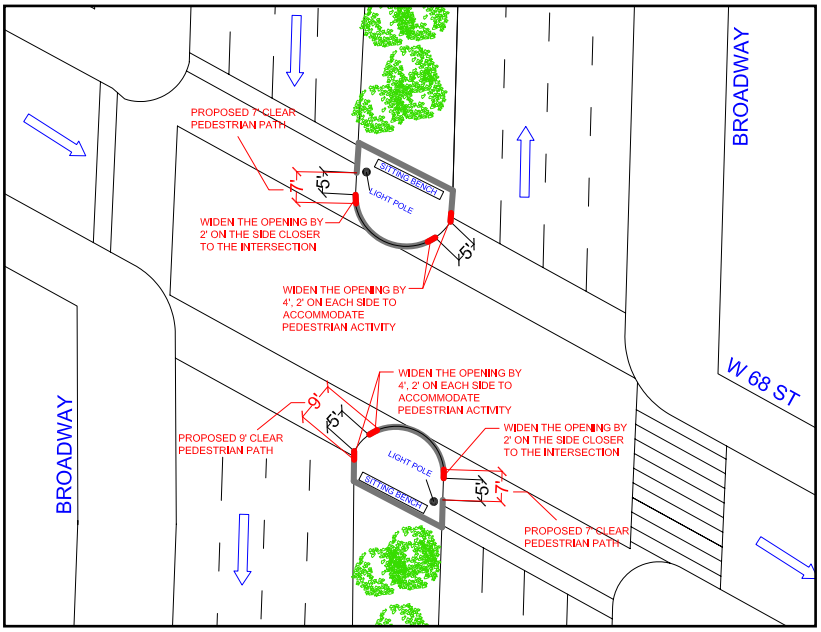

Figure 3-11: Proposed Mall Tip Opening at Selected Locations Along Broadway Mall

Amsterdam Avenue

12. West 57th Street & Tenth Avenue
    Issue(s):
    - Heavy traffic on the eastbound/westbound approaches causes significant delays during the AM and mid-day 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.

13. 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

14. 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.
    - Need to reduce truck traffic on Columbus Avenue south of West 57th Street

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

    This recommendation is illustrated in Figure 3-12.

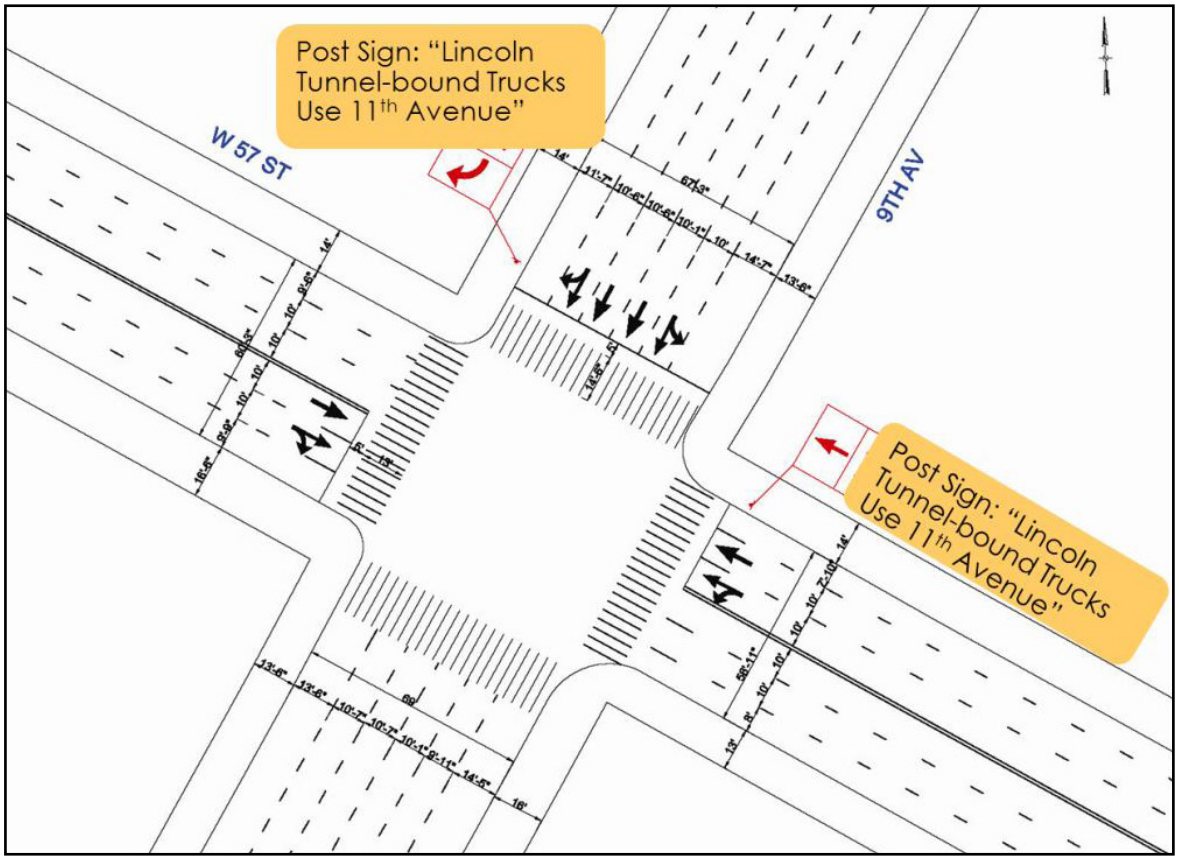

Figure 3-12: Truck Advisory – Ninth Avenue & West 57th Street

15. 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.

16. West 86th Street & Columbus Avenue

Issue(s):

- Insufficient storage for westbound buses at the far side for bus stop.

Recommendation(s):

- Relocate the westbound bus stop 40 feet further west by removing 2 parking spaces.
- Remove one (1) parking space to daylight the westbound approach.

The existing and proposed conditions are shown in Figure 3-13a and 3-13b.

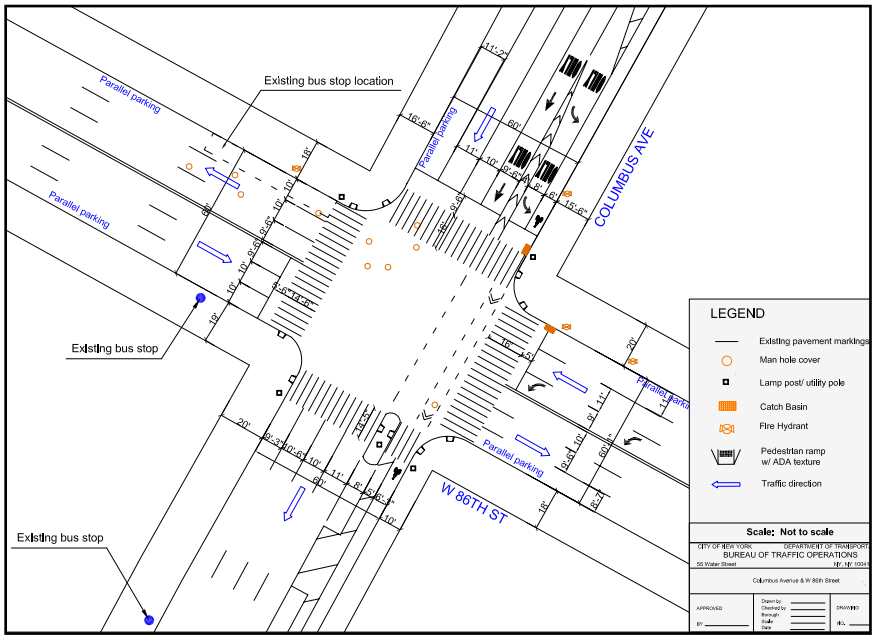

Figure 3-13a: Existing Condition - West 86th Street & Columbus Avenue

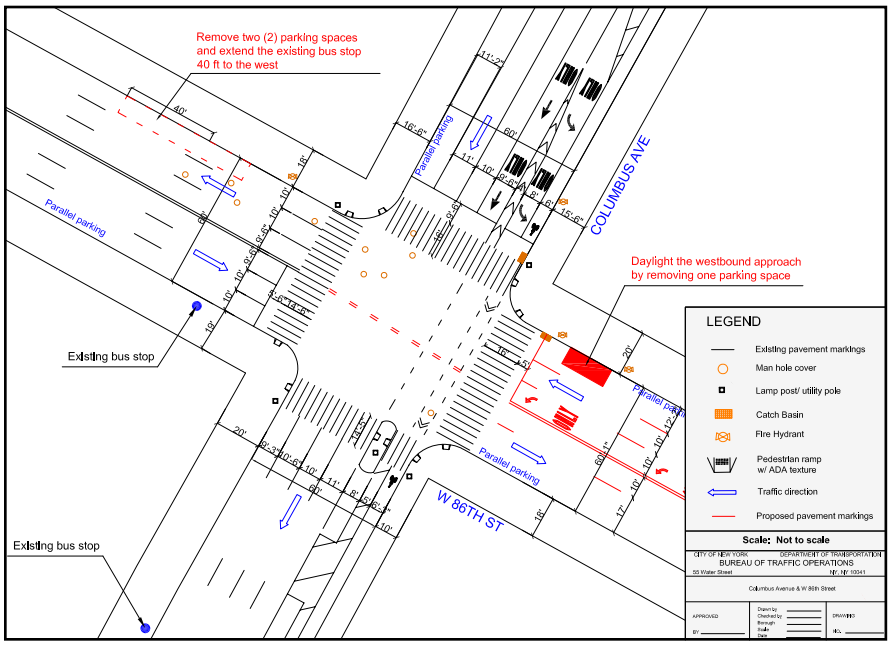

Figure 3-13b: Proposed Condition – West 86th Street & Columbus Avenue

Central Park West/Eight Avenue

17. 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.

18. 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.

19. 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 3-14a and 3-14b.

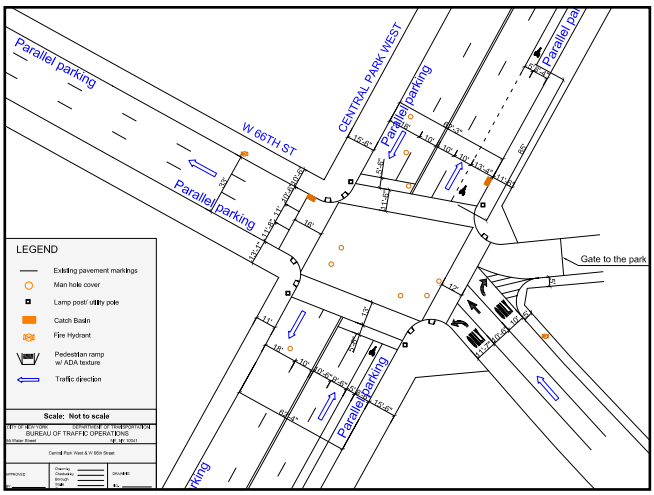

Figure 3-14a: Existing Condition - Central Park West & West 66th Street

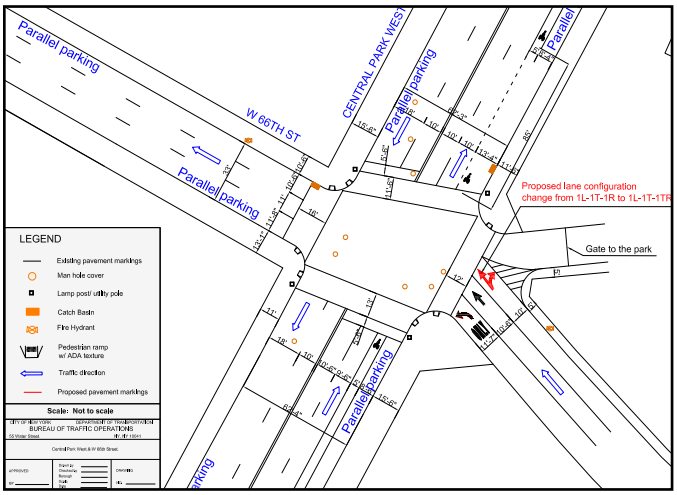

Figure 3-14b: Proposed Lane Assignment - Central Park West &West 66th Street

20. 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.

21. 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.

22. 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):

- Restripe the SB approach to provide three lanes (one left turn bay, one thru lane, and a shared thru/right turn lane).
- Restripe the EB approach to provide one left turn bay, one thru lane and one shared thru-right lane.
- Designate the right most lane on the WB approach to right turn only.
- Remove 5 parking spaces (100 ft) on the NB approach and change the existing bike lane to share traffic lane.
- Extend the concrete median on the WB approach 3.5 feet to the south to create a 10-foot median

The existing and proposed conditions are shown in Figure 3-15a and 3-15b.

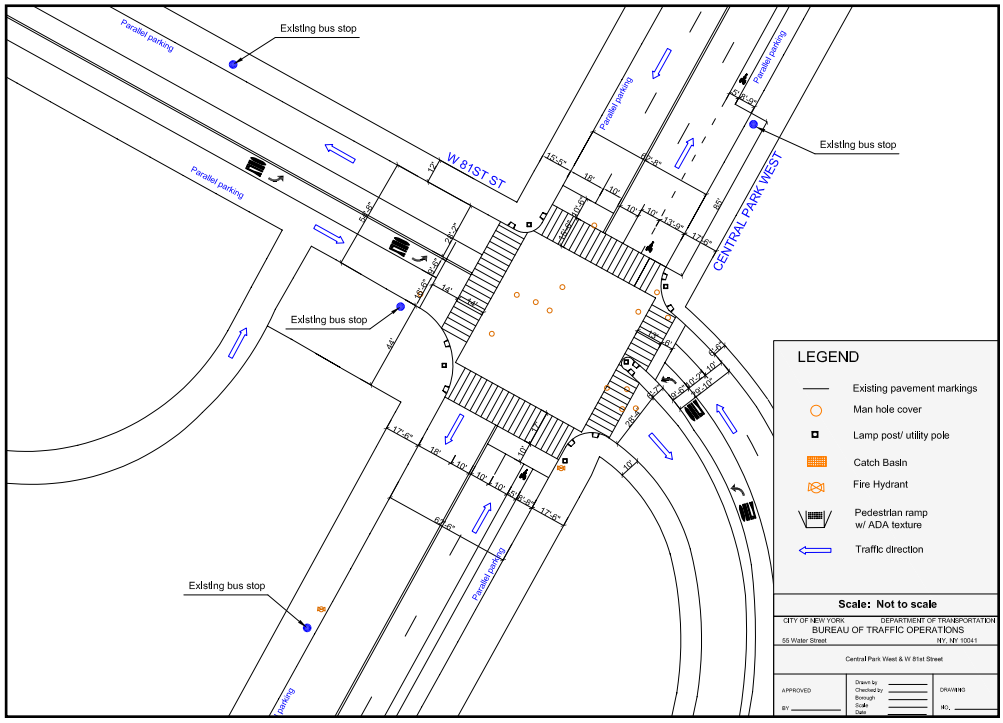

Figure 3-15a: Existing Condition - Central Park West & West 81st Street

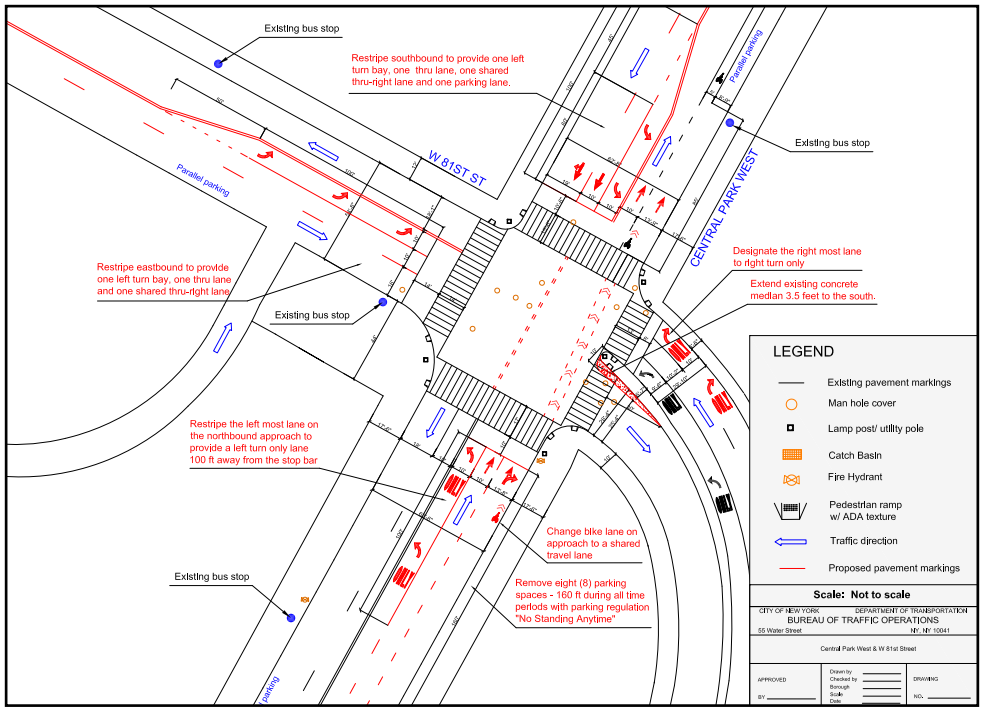

Figure 3-15b: Proposed Roadway Configuration - Central Park West & West 81st Street

23. 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):

- Restripe the eastbound approach to provide one left turn bay, one thru lane and one shared thru-right lane.
- Restripe the southbound approach to provide one left turn bay, one thru lane and one shared thru-right lane.
- Remove 5 parking spaces (100 ft) from the intersection on the northbound approach, make the existing bike lane a shared traffic lane, and restripe to provide one exclusive left turn lane, one thru lane and one shared thru-right lane.
- 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.

The existing and proposed conditions are shown in Figure 3-16a and 3-16b.

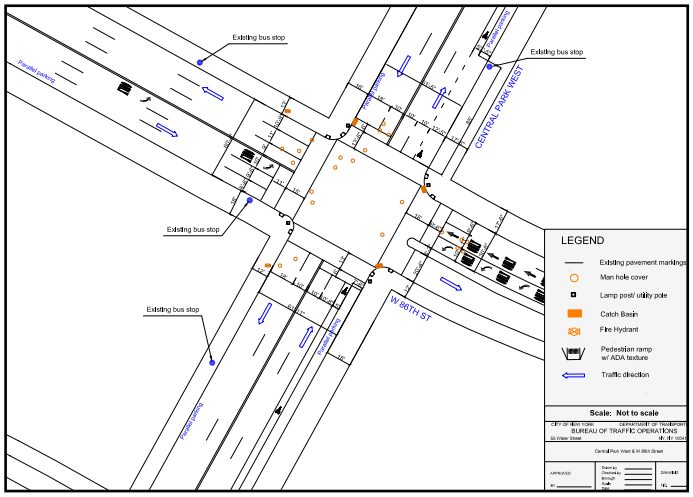

Figure 3-16a: Existing Condition - Central Park West & West 86th Street

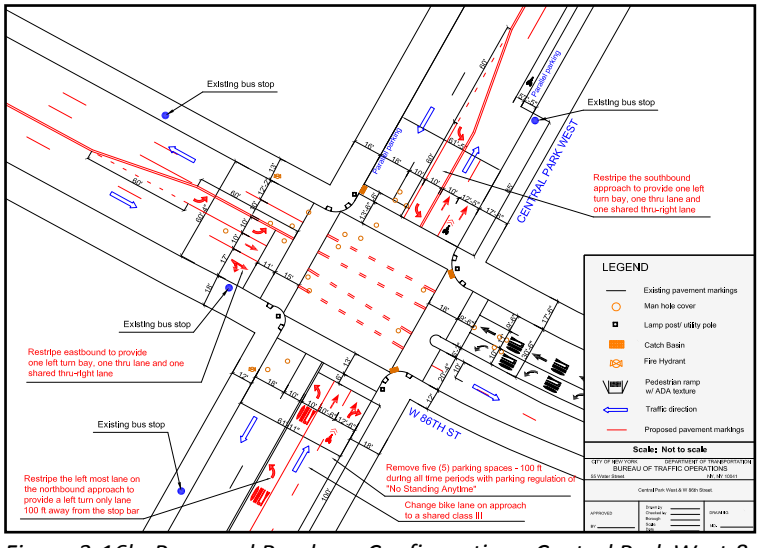

Figure 3-16b: Proposed Roadway Configuration - Central Park West & West 86th Street

24. **Pedestrian Safety - Proposed Neckdowns**

Table 3-1 lists the locations where neckdowns or the installation of street design furniture is recommended; and, Figures 3-17a and b illustrate the recommendation. These locations will be subjected to detail design evalucation.

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 66th St & Broadway			x					
8	West 79th St & Broadway		x						
9	West 86th St & Broadway						x	x	
10	West 57th St & Tenth Ave		x	x	x				
11	West 59th St & Amsterdam Ave			x					x
12	West 79th St & Amsterdam Ave								x
13	West 56th St & Ninth Ave								
14	West 57th St & Ninth Ave			x	x				
15	West 58th St & Columbus Ave	x	x						
16	West 60th St & Columbus Ave					x		x	x
17	West 72nd St & Columbus Ave				x				
18	West 79th St & Columbus Ave						x		
19	West 57th St & Eight Ave						x		x

*See Figure for exact placement of neckdown.

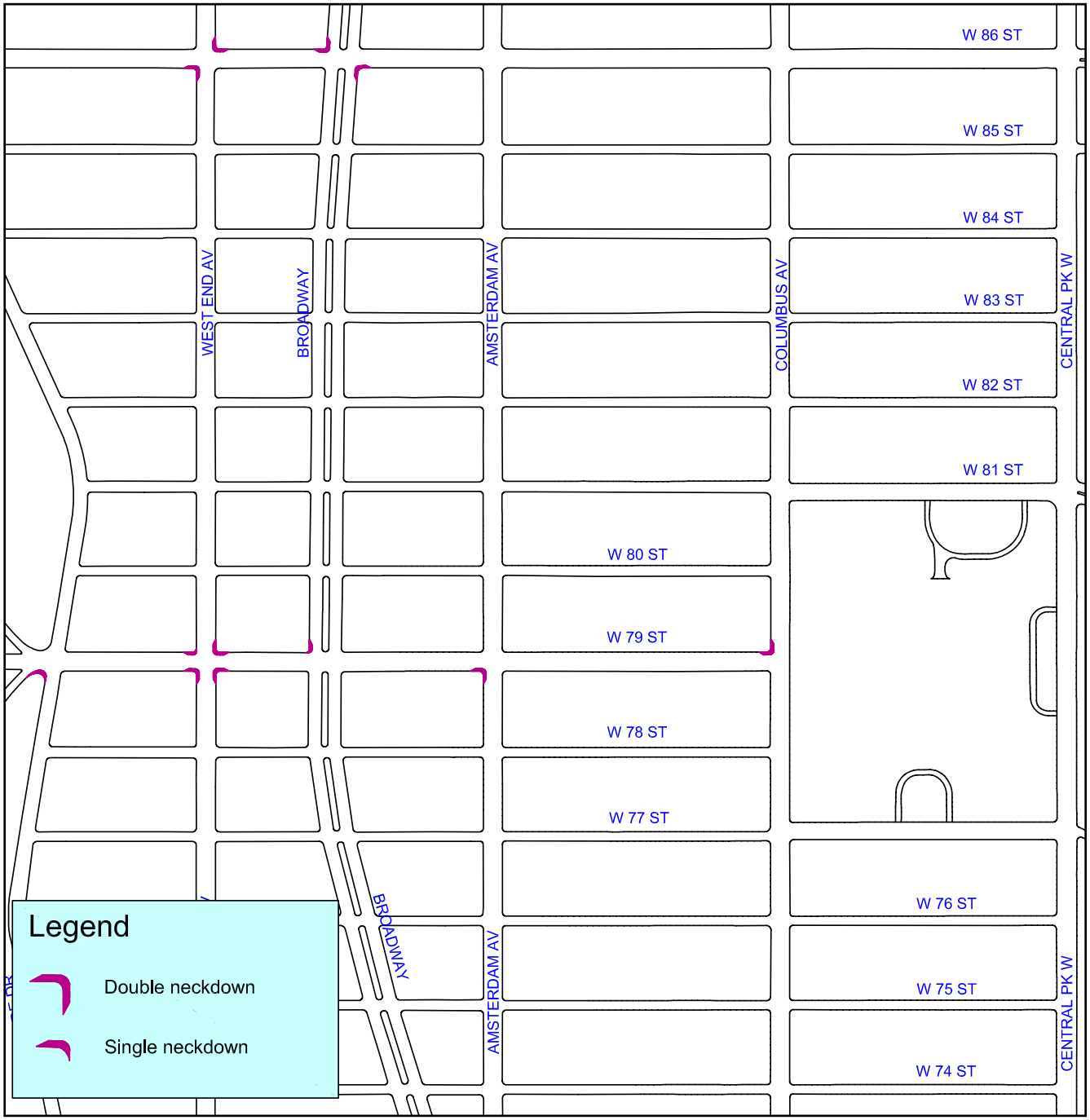

Figure 3-17a: Proposed Neckdowns or Street Furniture
(Page 1 of 3)

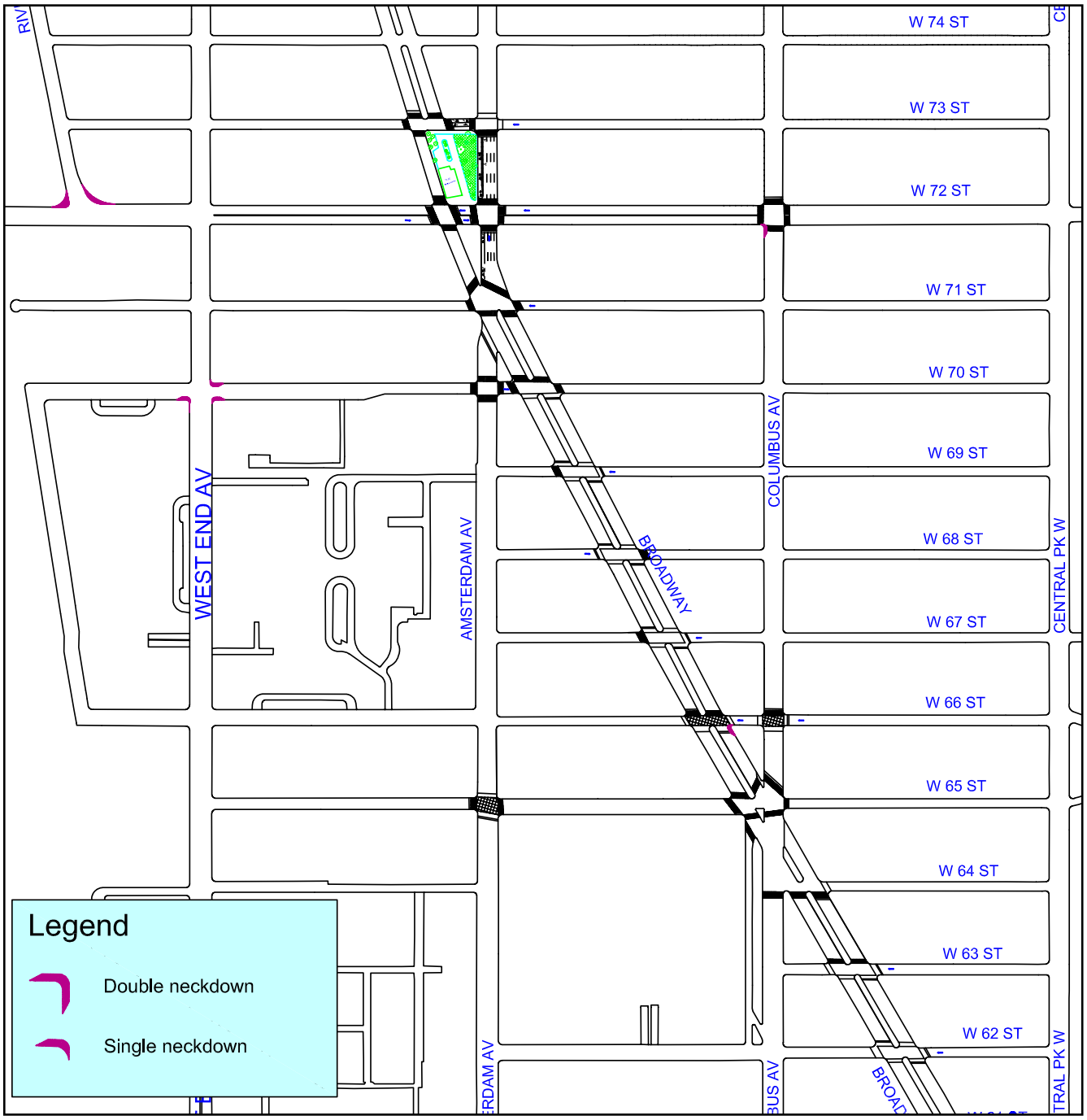

Figure 3-17a: Proposed Neckdowns or Street Furniture
(Page 2 of 3)

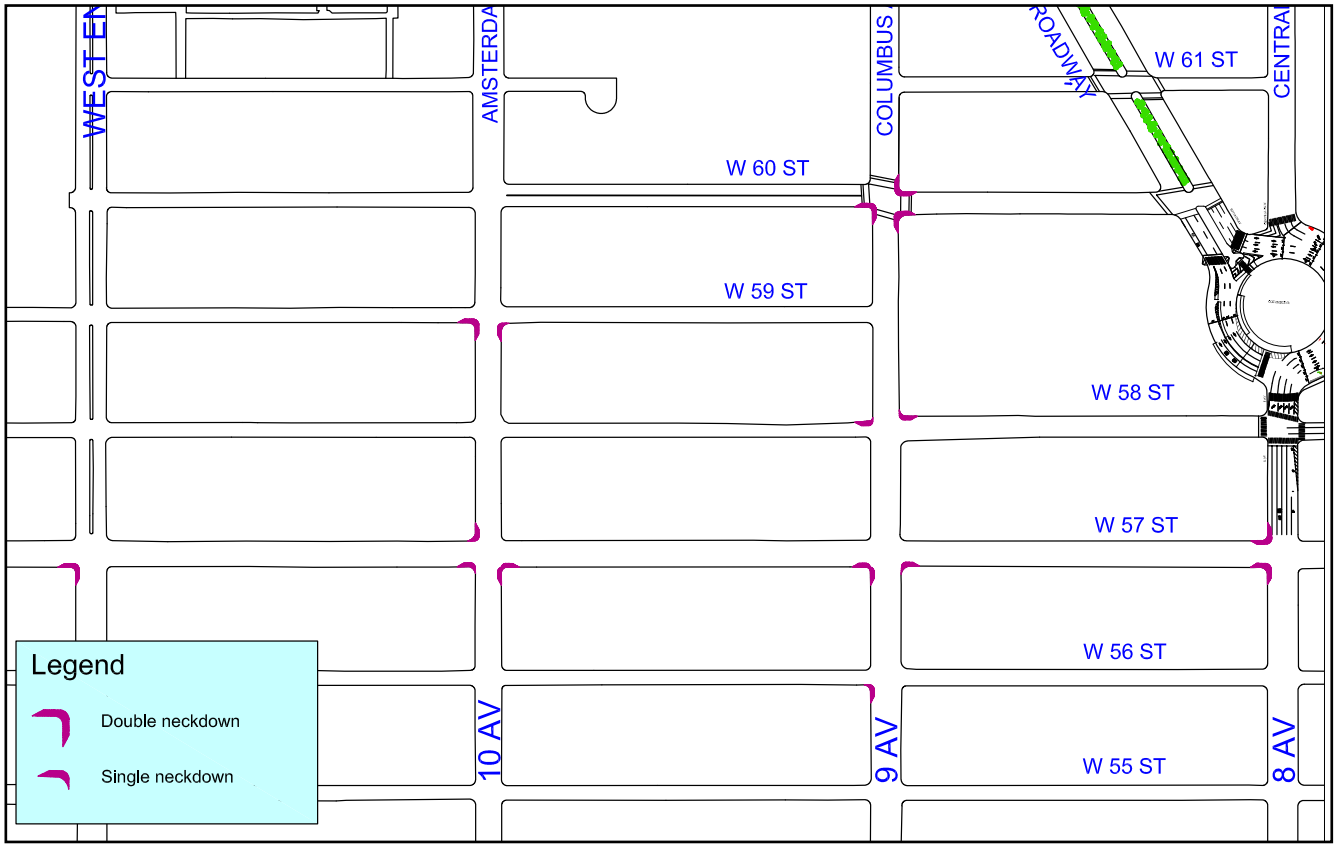

Figure 3-17a: Proposed Neckdowns or Street Furniture
(Page 3 of 3)

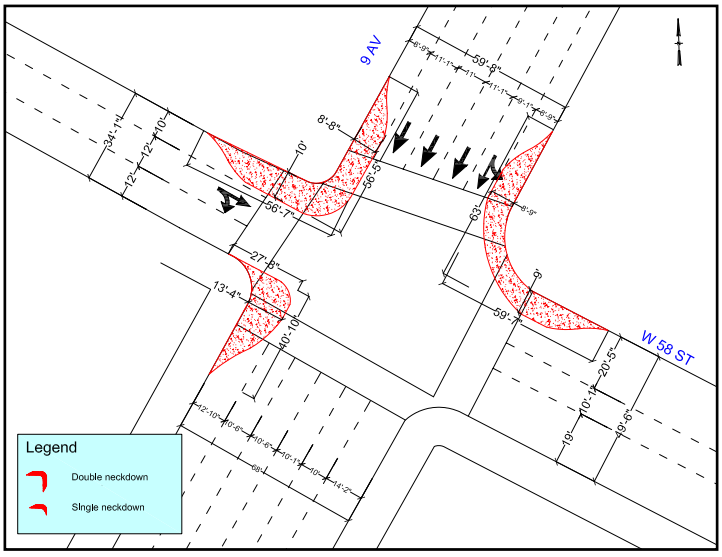

Figure 3-17b: Sample Neckdowns in the Study Area

25. **Bicycle Parking**

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

Potential locations for bicycle parking are:

25.1. 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 3-18.

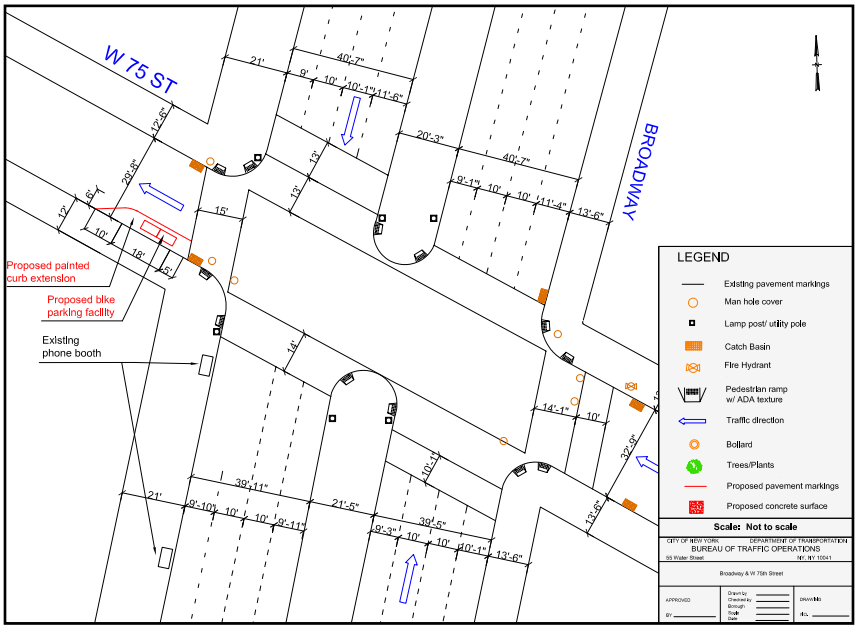

Figure 3-18: Proposed On-Street Bicycle Parking – West 75th Street & Broadway

25.2. 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 3-19.

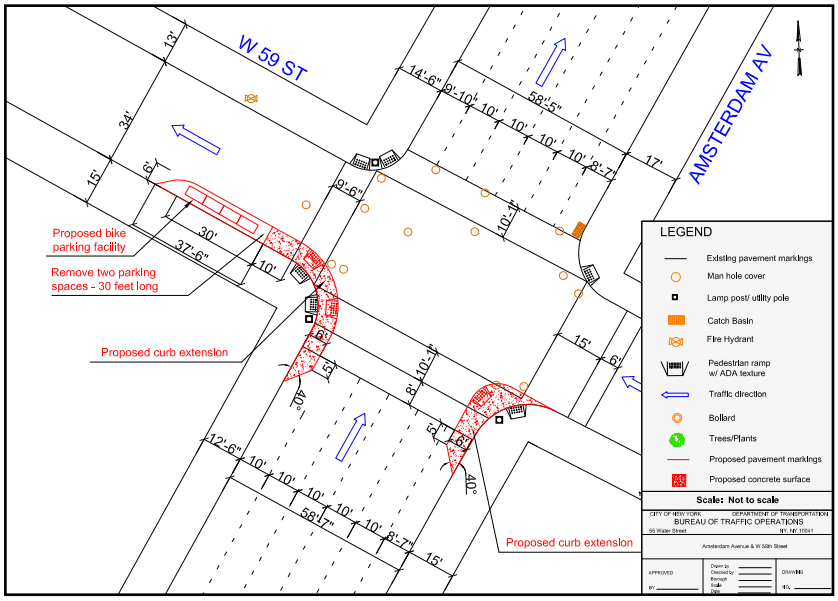

Figure 3-19: Proposed On-Street Bicycle Parking – West 59th Street & Amsterdam Avenue

26. **Commercial Parkings**

Commercial muni-meters on Columbus and Amsterdam Avenues 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):

- Increase the number of truck loading/unloading zones along both corridors by designating commercial parking zones (50 feet long/ two car parking spaces), to be regulated with commercial muni-meters. Specific locations to be identified in consultation with the community.

5.0 Recently Implemented or Proposed Improvements Outside this Study

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.

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

3. Countdown signals installed along Broadway and West Side Highway

4. Audible signal installed at Central Park West and West 65th Street