WEST SIDE MANHATTAN TRANSPORTATION STUDY

Technical Memorandum No. 1
Existing Conditions

May 2010

City of New York
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New York City
Department of Transportation
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A Member of
the New York Metropolitan
Transpotation Council

West Side Manhattan Transportation Study

Technical Memorandum No. 1

Existing Conditions 2008

PTOT09D00.G06

The preparation of this report has been financed in part through funds from the U.S. Department of Transportation, Federal Highway Administration under the Federal Highway Act of 1965, as amended, and the Urban Mass Transportation Act of 1964, as amended. The New York City Department of Transportation disseminates this document in the interest of information exchange. It reflects the views of the New York City Department of Transportation (NYCDOT) which is responsible for the facts and the accuracy of the data presented. The report does not necessarily reflect any official views or policies of the Federal Transit Administration, the Federal Highway Administration, or the State of New York. This report does not constitute a standard, specification, or regulation.

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S.0 EXECUTIVE SUMMARY

S.1 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 is to assess current and future traffic and transportation issues and needs and to provide effective solutions to address problems by improving the mobility, circulation, and safety for all street users (vehicle, bus, 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 includes an analysis of demographics, land use and zoning, traffic and transportation, pedestrian and bicycle, accidents, transit, parking, and goods movement.

S.2 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 demographic analysis of the study area examined population trends from 1980 to 2000.

The study area had a population of 103,985, 105,162, and 107,607 in 1980, 1990, and 2000, respectively. This shows an overall population increase of 3.4% for the 20-year period. However, over the same period, five census tracts in the southern third of the study area experienced a population increase of more than 30%, while the remaining census tracts in the study area experienced a slight decline of 5%. During the same period, New York City's population grew by 13% and Manhattan's by 7.5%. The number of households in the study area increased by less than 1% during the analysis period; in Manhattan the number of households increased by 4.8%, while in New York City it increased by 8.3%.

The median household income in the study area was consistently higher than that of both Manhattan and New York City; in 2000, the median household income of the study area

was $74,561, which was approximately 59% higher than that of Manhattan and nearly twice than that of New York City.

Vehicle ownership by household in the study area has increased by 46.6% from 18.1% in 1980 to 26.2% in 2000. Vehicle ownership increased in Manhattan and New York City as well, albeit more slowly, with a 20% increase to 22.5% in Manhattan and a 16.2% increase to 44.3% in New York City. Households in the study area with one vehicle increased from 17% in 1980 to 21% in 1990 and 24% in 2000.

Journey to work by mode information shows that the majority of residents in the study area in 2000 used public transportation (subway and buses) to travel to work; similar behavior was observed of New York City and Manhattan residents.

S.3 Land Use and Zoning

A review of existing land use and zoning reveals that the predominant land use in the study area is residential; commercial land uses (primarily mixed-use) are located along the major north-south corridors, such as Columbus Avenue, Amsterdam Avenue, and Broadway. There is a small pocket zoned for manufacturing uses in the southern section of the study area. Recent development trends indicate that development is occurring at higher densities which will contribute to increased traffic in the area. Major institutions in the study area include the Museum of Natural History, Lincoln Center for the Performing Arts, Alice Tully Hall, and the Time Warner Center at Columbus Circle; additionally, Central Park, which bounds the study area to the east, is a significant draw.

S.4 Traffic and Transportation

Existing 2008 traffic condition data were collected from field surveys, which included an inventory of street geometry, signal timing, traffic volumes, and parking regulations; the collected data were analyzed with Highway Capacity Software and methodologies. Manual turning movements and vehicle classification counts were conducted during peak periods at 43 signalized intersections, and Automatic Traffic Recorder (ATR) machines were used at 18 locations to record 24-hour traffic volumes.

The analyses showed that most intersections operated at an acceptable level of service (LOS) with LOS C or better during the AM, Midday, PM, and Saturday Midday peak periods. However, there were 23 intersections that experienced LOS D, E, or F for some or all lane groups during one or more peak periods.

S.5 Public Transportation

An examination of public transportation in the study area reveals that the study area is well-served by mass transit, with bus and/or subway service on every major corridor. There are eleven 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). There are eight subway stations in the study area (59th Street/Columbus Circle – A, B, C, D, and 1; 66th Street – 1; 72nd Street/Broadway – 1, 2, and 3; 72nd Street/Central Park West – B and C; 79th Street/Broadway – 1; 81st Street/Central Park West – B and C; 86th Street/Broadway – 1; and 86th Street/Central Park West – B and C). There are also numerous existing and proposed taxi stands located in the study area.

S.6 Parking

A parking analysis of the study area was conducted, that identified existing on and off-street parking spaces and the extent to which the facilities are available and utilized. There are 80 off-street parking facilities (garages and lots) in the study area. Data was available for 49 of these facilities, which accounts for approximately 12,068 parking spaces. The utilization rates of off-street parking facilities were 56%, 63% and 56% during the AM, Midday and PM peaks respectively. Parking utilization rates were not collected during the Saturday Midday peak. There are no municipal off-street parking facilities in the study area.

The number of on-street parking spaces is dictated by existing parking regulations; as a result, total on-street parking varies by time of day from 7,091 spaces in the AM peak, 7,615 spaces in the Midday peak, and 7,986 spaces in the PM peak; to 8,516 spaces on the weekend. The on-street parking utilization in the study area was 94.2%, 101.1%, 90.6%, and 91.9% during the AM, Midday, PM, and Saturday Midday peak hours, respectively.

S.7 Pedestrian and Bicycle

Pedestrian and bicycle activities were examined in the study area. Areas with high pedestrian concentrations such as subway stations, bus stops, and adjacent land uses were given special attention.

The pedestrian analysis focused on crosswalks and corners. The majority of the crosswalks at the 26 analyzed intersections in the study area operated at acceptable LOS. However, there were 10 intersections where one or more crosswalk operated at LOS D or worse during one or more peak hour. Of the 18 intersections where corners were analyzed, the majority operated at acceptable LOS. However, there were 3 intersections where one or more corner operated at LOS D or worse during one or more peak period.

An examination of the existing and proposed bicycle facilities in the study area, as described in the New York City Bicycle Master Plan and the New York City Cycling Map, was undertaken. Peak hour bike volumes, collected for the NYMTC Bicycle Data Collection Program on the Hudson River Greenway within the study area ranged from 57 bicyclists during the midday peak hour to 338 bicyclists during the PM peak hour.

S.8 Accidents/Safety

A detailed accident analysis was conducted for 1997-2001 and 2006-2008. In the first analysis period, 1997-2001, 12 intersections were identified as high accident locations. Only four intersections qualified as high accident locations in the second analysis period, 2006-2008: Eighth Avenue & West 57th Street, Tenth Avenue & West 57th Street, Columbus Avenue & West 66th Street, and Amsterdam Avenue & West 86th Street.

S.9 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.10 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 public meetings and presentations.

1.0 INTRODUCTION

1.1 The Study Area

The West Side Manhattan study area, within what is generally referred to as the Upper West Side (UWS), is located in the borough of Manhattan in New York City, between Central Park West and 12th Avenue/Henry Hudson Parkway, and between West 55th Street and West 86th Street. Figure 1-1 shows the boundaries of the study area. The major arterials within the study area, which run north/south, include: the West Side Highway, Riverside Drive (12th Avenue), West End Avenue (11th Avenue), Amsterdam Avenue (10th Avenue), Columbus Avenue (9th Avenue), and Central Park West (8th Avenue). Broadway runs generally north/south and cuts across the grid diagonally, creating complex intersections with avenues and cross streets. The major two-way east/west cross streets are: West 86th Street, West 79th Street, West 72nd Street, and West 57th Street.

The Upper West Side is primarily a residential, entertainment, and shopping area, many of whose residents work in the business areas of downtown and midtown Manhattan. The West Side Manhattan study area contains the neighborhoods of Lincoln Square and Columbus Circle, as well as cultural attractions such as the American Museum of Natural History, the New York Historical Society, and the Children's Museum of Manhattan.

The focus of the Lincoln Square neighborhood is the Lincoln Center for the Performing Arts, located between West 61st and West 66th Streets along Broadway. It is home to the New York State Theater, the New York City Ballet, the New York City Opera, the Metropolitan Opera House, Avery Fischer Hall, the New York Philharmonic Orchestra, the Vivian Beaumont Theater, the Library and Museum of the Performing Arts, Alice Tully Hall for Chamber Music, and the Julliard School of Music. Lincoln Square also contains Fordham University and John Jay College of Criminal Justice.

Columbus Circle, a major landmark and point of attraction in New York City, is located in the southeast corner of the study area at the intersection of Broadway, Central Park West, 8th Avenue, and Central Park South (West 59th Street). The traffic circle at this intersection was designed with many early innovations in road safety and traffic control.

Renovations to the circle, completed in 2005, included the addition of water fountains, benches, and plantings encircling the monument to Christopher Columbus. Time Warner Center, the world headquarters of the Time Warner Corporation, is located on the west side of Columbus Circle on the site of the old New York Coliseum. The Center also hosts the Shops at Columbus Circle, Jazz at Lincoln Center, and the headquarters of CNN. Trump International Hotel and Tower is on the north side of Columbus Circle, and the Museum of Arts and Design on the south side of the circle opened in September of 2008.

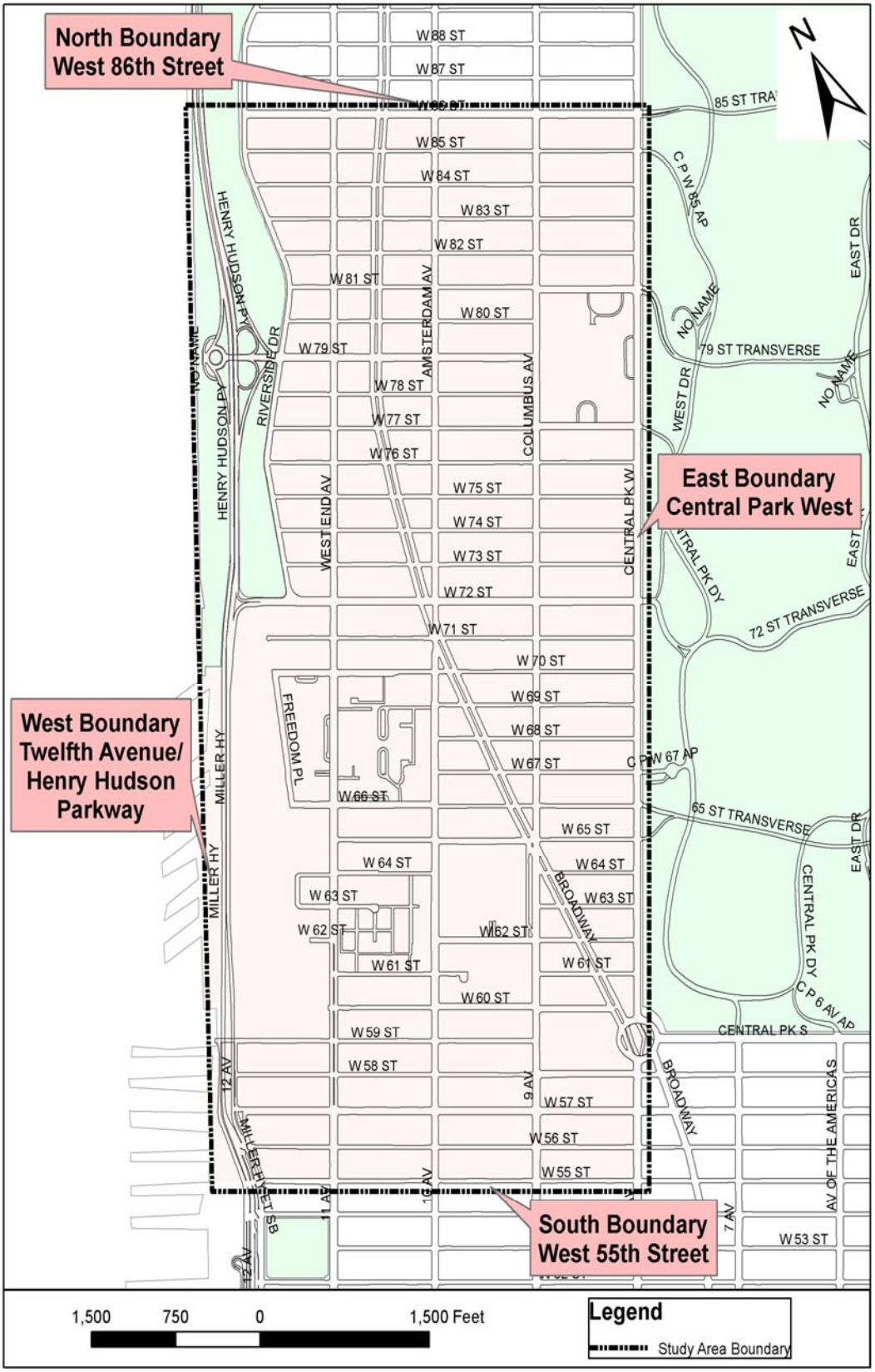
1.2 Goals and Objectives

The goals of the West Side Manhattan Transportation Study are to improve safety and mobility of all street users (vehicle, pedestrian, and bicycle), and to enhance the quality of life of the people who visit as well as live and work in the study area. Throughout the process of this study it is a high priority to bring the various stakeholders of the community together and build consensus on problem identification and potential solutions. Specifically, 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;
- Implement strategies to reduce vehicular congestion, and improve mobility and safety for all street users (vehicle, pedestrian, and bicycle);
- Achieve effective management of curb usage for parking and loading/unloading; and
- Develop a package of traffic and transportation improvement measures to address community concerns.

The existing conditions analysis includes demographics, land use and zoning, traffic and transportation, pedestrian and bicycle, accidents, transit, parking, goods movement, and issues raised by the community.

Figure 1 - 1: Study Area Boundaries



1.3 Developments in the Study Area

In recent years, the study area and surrounding areas have seen growth in major mixed-use developments. These developments have generated or will generate significant vehicle trips that require an effective traffic management response to the increased travel demand. Below are some examples of major developments planned that can affect traffic in the study area.

1.3.1 Western Rail Yard

The Metropolitan Transportation Authority (MTA) and the New York City Planning Commission (CPC) are co-lead agencies for the environmental review to facilitate development of a housing site at 10th Avenue & West 48th Street, a site at 9th Avenue & West 54th Street, and the Western Rail Yard site. 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. In addition to zoning map and text amendments, the project would include 6.2 million to 6.4 million gross square feet of mixed use development, including residential, commercial (retail and office or hotel space), a PS/IS school, publicly accessible open space, and enclosed accessory parking areas. 3.8 million square feet (4,624 units) to 4.8 million square feet (5,762 units) would be devoted to residential space; twenty percent of all rental housing units will be affordable housing under the terms of the applicable 80/20 program. The project would include 1,600 on-site parking spaces: 1,330 accessory residential spaces and 270 accessory commercial spaces. This project is expected to be completed by 2019.

1.3.2 Fordham University Lincoln Center Master Plan

Fordham University's Master Plan identifies development of 2.35 million square feet of additional gross floor area to its Lincoln Center campus, located on a Manhattan superblock bounded by Columbus and Amsterdam Avenues and West 60th and West 62nd Streets, during Phases I (2014) and II (2032).

During Phase I, 382,667 square feet of new academic space, 210,870 square feet of new dormitory space (695 beds), and 120 accessory parking spaces are planned; private

development is planned to result in 736,504 square feet of new residential condominiums (a maximum of 512 units), and 205 parking spaces. Private development may occur during either Phase I or II.

1.3.3 Lincoln Center West 65th Street Project

Lincoln Center Development Project, Inc. has proposed several actions that would affect portions of the Lincoln Center for Performing Arts, located between Columbus and Amsterdam Avenues, and West 62nd and West 66th Streets. The first of the actions involves the renovation of the street and pedestrian areas along West 65th Street between Amsterdam Avenue and Broadway pursuant to the removal of the pedestrian overpass and elimination of the bridge foundation easement. West 65th Street is currently 80 feet wide with two sidewalks of 15 feet each and a roadway of 50 feet. The proposed action would provide a widening of the sidewalk on the southern side to 27 feet, a narrowing of the roadway to 38 feet, and a narrowing of the sidewalk on the northern side to 14 feet, 7 inches. The widened sidewalk on the southern side will accommodate significant streetscape improvement consisting of new paving, seating, informational signage, and a new street-level entrance to Alice Tully Hall. Additionally, a modification to the public space designation covering Lincoln Center Plaza North has been proposed that would facilitate the construction of a 14,000 square foot restaurant, above which an elevated public green would be located. The proposed build year is 2018.

1.3.4 Riverside Center

The Riverside Center Project site is bounded by West End Avenue and Riverside Drive, and West 59th and W 61st Streets. The proposed zoning actions would permit a mixed-use development at the project site with a total of approximately 3,306,552 gsf of above grade space, 206,135 gsf of below grade space (which includes 197,227 gsf of automotive showroom/service and 8,908 gsf of community facility[public school space]), and 1,800 below grade parking spaces. Several reasonable worst case development scenarios (RWCDSs) were considered to determine the program that would yield the maximum number of person trips. The RWCDS that was found to yield the maximum number of person trips maximizes both retail and hotel uses and includes the following

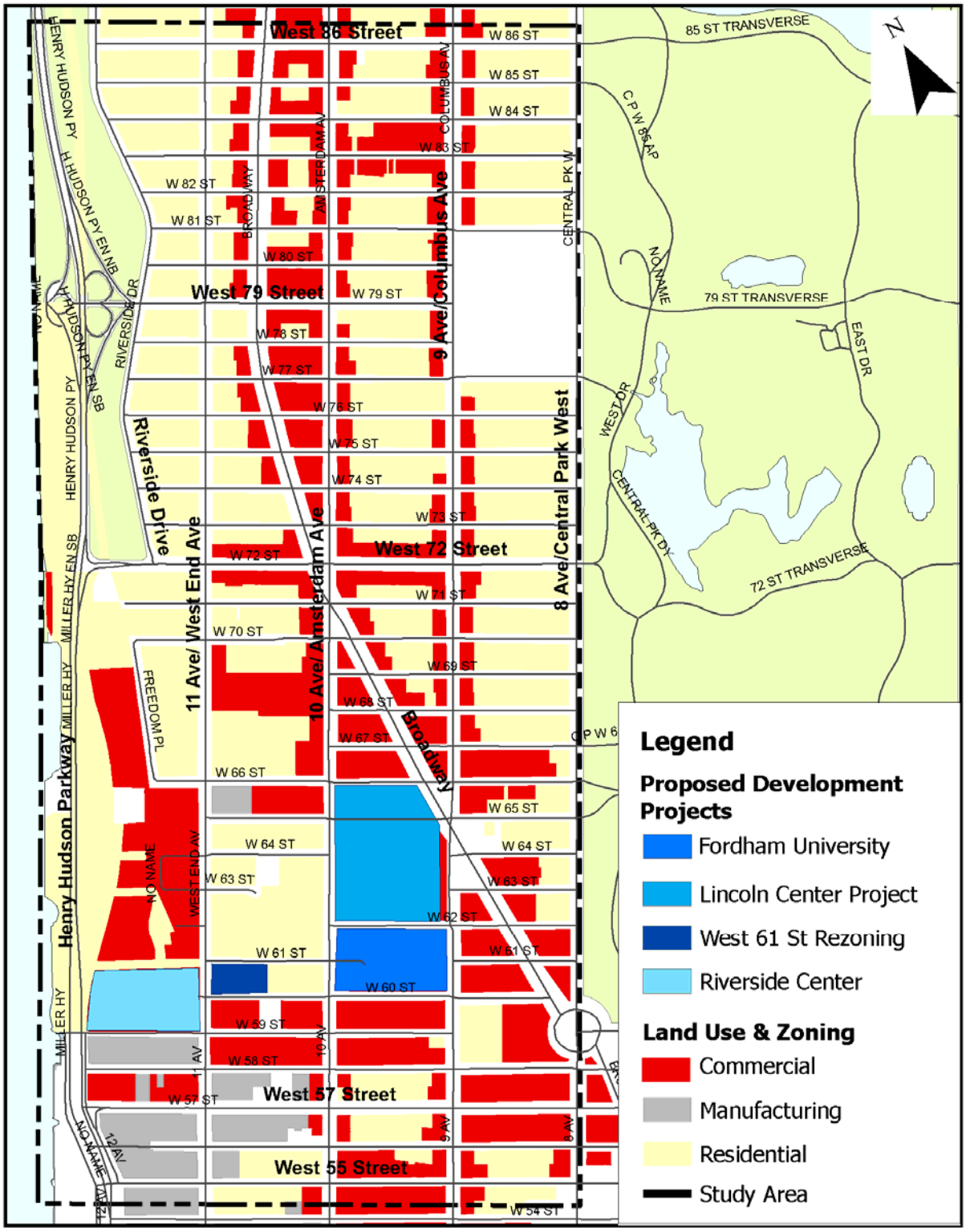
(all approximate): 2,200 dwelling units, 197,227 gsf of underground automotive showroom and service space, 268,420 gsf of retail, a 1,200 room hotel, a 1,011 student elementary public school and up to 1,800 public parking spaces. Twelve percent of the residential units would be affordable housing with the remaining being a mix of market rate condominiums and rental units. It is expected that the proposed project would be completed and fully occupied by 2018.

1.3.5 West 61st Street Rezoning

West End Enterprises, LLC, and West 60th Street Associates, LLC, propose to rezone the western half of the block bounded by West End and Amsterdam Avenues, and West 61st and West 60th Streets. Additionally, the applicants are requesting a special permit for a public parking garage, a special permit for a general large-scale development, and a zoning text amendment. The proposed action in the 2006 FEIS re-zoning, special permits, and text amendment would facilitate the construction of a new residential building with ground floor retail, community facility use, and below-grade parking by 2010.

As a result of these major urban development initiatives, the West Side Manhattan study area will experience substantial increases in traffic by 2018. The traffic implications of new developments at increased densities require a comprehensive analysis of the existing traffic and transportation conditions and the development of improvement measures to meet these demands. Figure 1-2 shows the proposed developments overlaid with land use in the study area.

Figure 1 - 2: Land Use and Proposed Development in the Study Area



1.4 Project Organization and Methodology

The detailed work program that describes the tasks, task products, and work schedule are shown in Figure 1-3.

1.4.1 Methodology

The approach taken to the traffic analysis of the study area is as follows:

- Assess the existing (2008) and future (2018) conditions
- Identify issues/problems/deficiencies and recommend potential solutions
- Develop immediate actions (6 months), medium term (6 mo.-1 year), and long term (1-5 years) improvement measures in consultation with stakeholders in the study area.

1.4.2 Organization

Based on the above methodology, the project was organized as a series of tasks. Figure 1-2 illustrates the process and issues of the study.

- Task 1: Project Organization and Management – Develop a detailed work program that outlines tasks, subtasks, and products.
- Task 2: Literature Search – Identify relevant studies of projects in the study area from the Department of Transportation's Environmental Impact Statement Library, and from the Department of City Planning and other public and private sectors.
- Task 3: Data Collection and Identification of Issues – Collect data related to vehicular traffic, transit, parking, pedestrians and bicycles, accidents, and goods movement at critical intersections and corridors in the study area; create an inventory of the assembled information.
- Task 4: Public Participation – Conduct community outreach to insure the involvement of community stakeholders throughout all aspects of the study process.
- Task 5: Analysis of Existing Conditions – Conduct a comprehensive analysis of the collected data pertaining to demographics, land use and zoning, traffic and transportation, parking, pedestrian and bicycles, transit, accidents, and goods movement to determine the existing conditions (2008) within the study area. Identify problems and issues based on this analysis and prepare a report (Technical Memorandum No.1) describing these findings.
- Task 6: Analysis of Future Conditions – Conduct an analysis of future (2018) conditions for all issues examined in the existing conditions analysis (demographics, land use and zoning, traffic, transit, parking, pedestrian and bicycle, accidents, and goods movement).

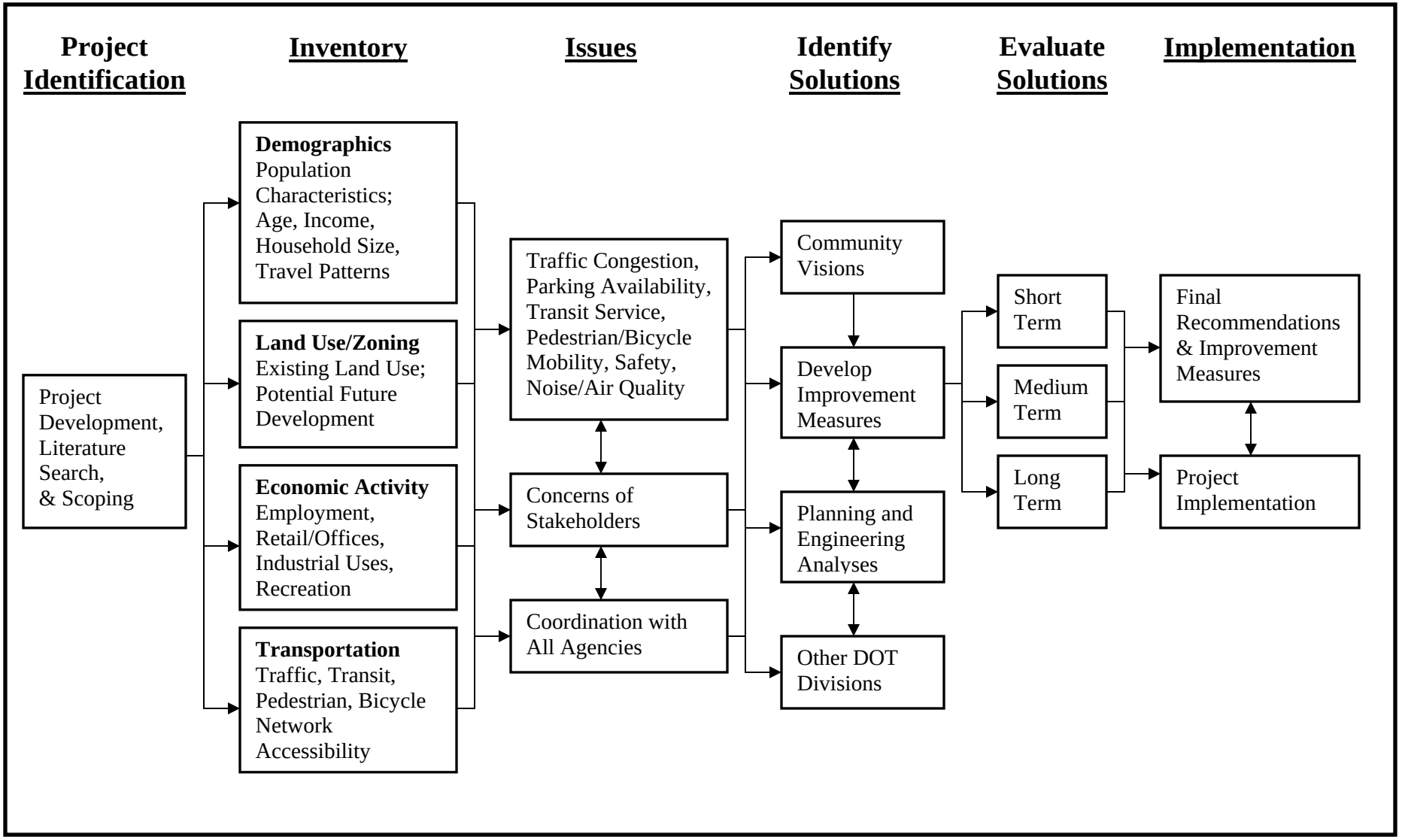
- Task 7: Development & Evaluation of Improvement Packages – Generate a package of recommendations of improvement measures designed to safely accommodate the future transportation needs.
- Task 8: Draft Report – Prepare a report that summarizes:
    - Goals and objectives of the study;
    - Community outreach and TAC coordination effort;
    - Data collection effort and results;
    - Existing conditions analyses;
    - Future conditions analyses;
    - Future conditions analyses with proposed short-, medium-, and long-term improvement measures;
    - Prioritization of the short-, medium-, and long-term improvements and strategy for sequencing of implementation to achieve the greatest benefit; and
    - Recommendations
- Task 9: Final Report – Incorporate the input and recommendations of relevant agencies and community stakeholders into the Draft Report.

1.5 Public Outreach

A public outreach program to obtain community input regarding issues and problems and to develop conservative improvement measures is ongoing. Elected officials, Community Boards, residents, businesses, and other interested groups and civic organizations are involved in the process and participated in a series of presentations and meetings.

Subsequent meetings will be conducted with stakeholders to keep all parties informed of the study's progress and to obtain feedback as proposals and improvement measures are developed.

Figure 1 - 3: West Side Manhattan Study Process & Issues



2.0 DEMOGRAHPIC ANALYSIS

The demographic/socioeconomic analysis of the study area examines population trends such as growth and decline, age distribution, and socioeconomic characteristics such as household size, employment, income, and car ownership rate.

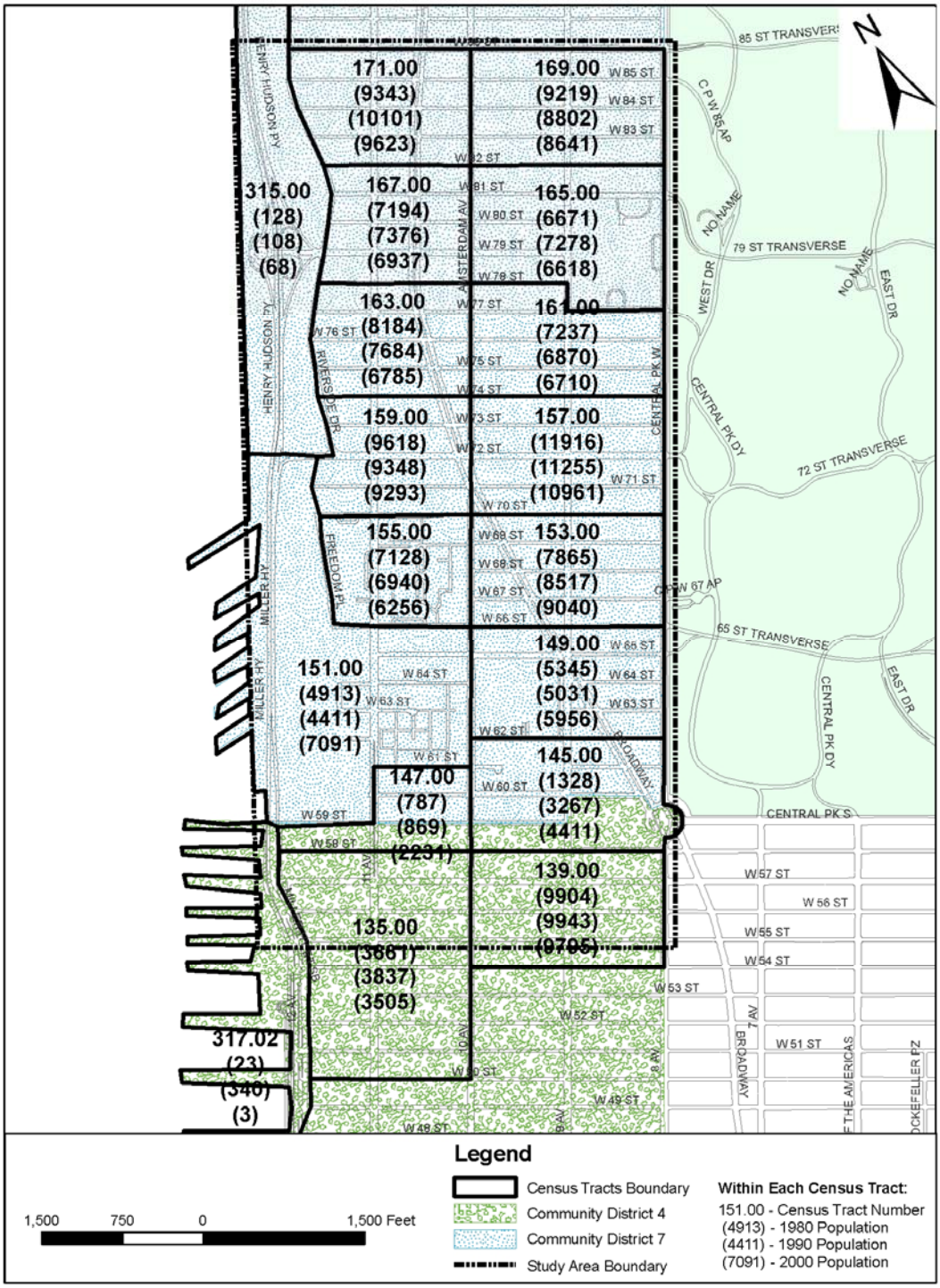
The demographic analysis relies on data from New York City Department of City Planning (NYCDCP), and data compiled by the United States Department of Commerce – Bureau of Census. Data were collected and analyzed for the years of 1980, 1990, and 2000. To better assess the population dynamics of the study area, comparisons were made with the Borough of Manhattan and New York City, where applicable.

The West Side Manhattan study area cuts across two Community Districts: 4 and 7, and 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 located 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 shows the community districts boundaries and census tracts with 1980, 1990, and 2000 population for the study area.

* Tracts partially within the study area.

Figure 2 - 1: Community Districts and Population by Census Tract



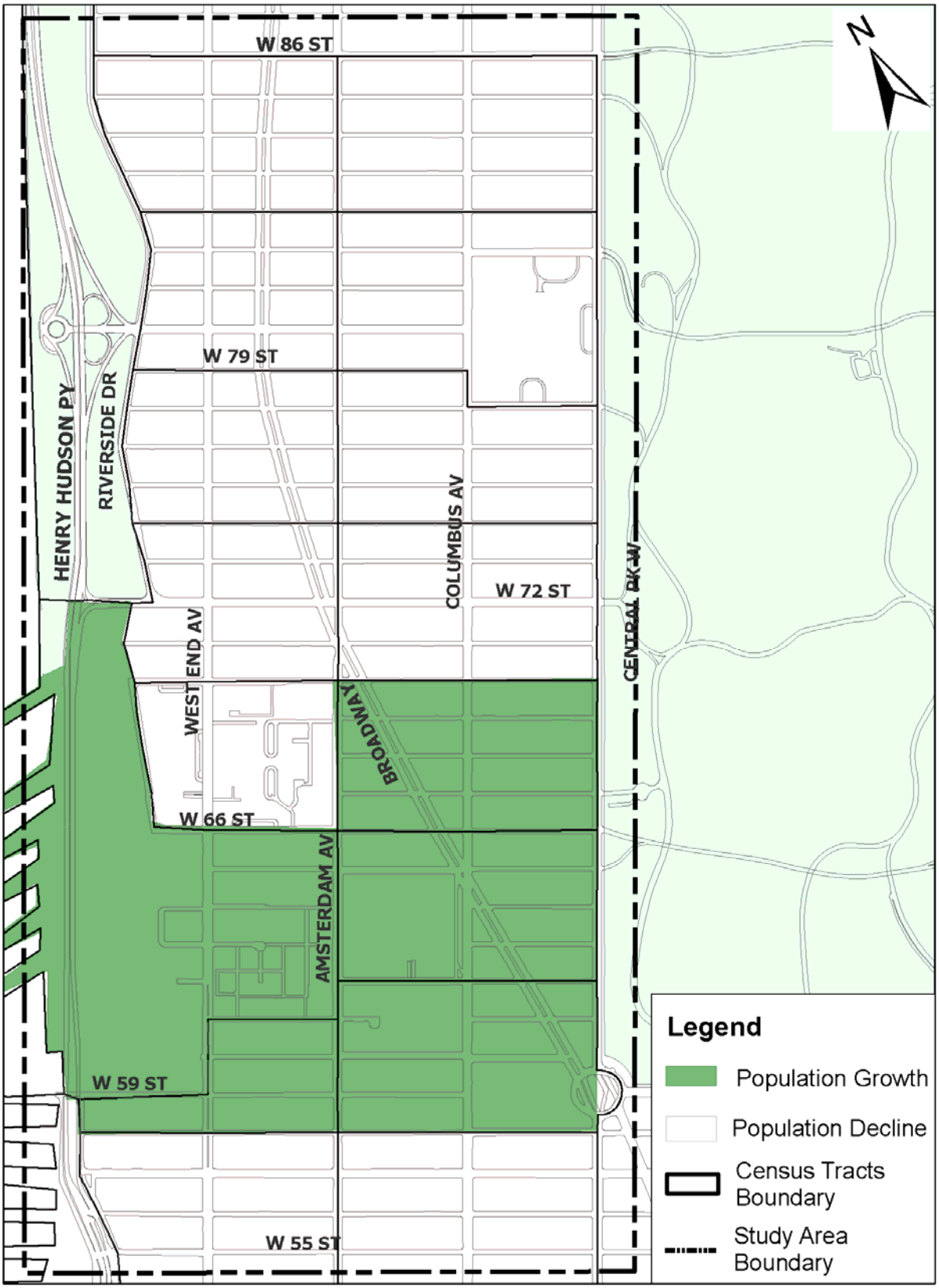
2.1 Population Trends

The population analysis covers three decennial years 1980, 1990, and 2000, as shown in Table 2-1 below. The study area had a population of 103,985, 105,162, and 107,607 in the years 1980, 1990, and 2000, respectively. This shows a population increase of 3.4% over the 20-year period. However, over the same period, five census tracts in the southern third of the study area experienced a population increase of more than 30%, while the remaining census tracts in the study area experienced a slight decline of approximately 5%. See Figure 2-2. The overall population increased by 1.1% between 1980 and 1990, and by 2.3% between 1990 and 2000. Comparing the population changes in the study area with the borough of Manhattan and New York City, analysis shows that all areas recorded population growth over the two decades: New York City grew by 13% and Manhattan grew by 7.5% over the 20-year period, respectively. The population growth rate in the study area was much lower than in Manhattan and New York City.

Table 2 - 1: Population by Area

Census Year	New York City	% Change	Manhattan	% Change	Study Area	% Change
1980	7,071,639		1,428,285		103,985	
1990	7,322,564	3.5%	1,487,536	4.1%	105,162	1.1%
2000	8,008,278	9.4%	1,537,195	3.3%	107,607	2.3%

Figure 2 - 2: Population Change by Census Tract



The travel needs and characteristics of the school-attending population are different from those of working and retired populations. To capture that difference the analysis was applied to six age groups: ages 0-4, 5-9, 10-14, 15-19, 20-64, 65+. The analysis reflects pre-school, elementary, junior high school, high school, employable, and retired populations, respectively. The age of 19 was chosen as cut-off for school age population because even though the legal working age is 16 years, DCP statistics show that less than 40% of the 0-17 year population is employed. The age for the retired population (65+) was supported by the fact that less than 20% of this population is employed according to DCP. The 0-19 year age groups are made up predominately of school attending population. Their trips tend to be made slightly outside of the work trip peak hours. Work trips are more directly related to the 20-64 years age group. The majority of the 65+ age group trips tend to be made outside of both the work trip and school trip peak hours. Table 2-2 shows comparison in the age distribution among the study area, Manhattan, and New York City.

Table 2 - 2: Population by Area and Age Group

Census Year & Age Group	New York City	% Share	Manhattan	% Share	Study Area	% Share
1980	7,071,639	100.0%	1,428,285	100.0%	103,985	100.0%
0 - 4	470,694	6.7%	69,152	4.8%	2,725	2.6%
5 - 9	447,327	6.3%	62,687	4.4%	2,582	2.5%
10 - 14	506,283	7.2%	72,059	5.0%	3,217	3.1%
15 - 19	563,492	8.0%	86,072	6.0%	3,608	3.5%
20 - 64	4,132,111	58.4%	933,878	65.4%	74,379	71.5%
65+	951,732	13.5%	204,437	14.3%	17,475	16.8%
1990	7,322,564	100.0%	1,487,536	100.0%	105,162	100.0%
0 - 4	509,740	7.0%	78,590	5.3%	3,840	3.7%
5 - 9	457,477	6.2%	66,340	4.5%	2,623	2.5%
10 - 14	450,072	6.1%	63,563	4.3%	2,290	2.2%
15 - 19	470,786	6.4%	72,557	4.9%	2,740	2.6%
20 - 64	4,481,172	61.2%	1,009,102	67.8%	78,537	74.7%
65+	953,317	13.0%	197,384	13.3%	15,133	14.4%
2000	8,008,278	100.0%	1,537,195	100.0%	107,607	100.0%
0 - 4	540,878	6.8%	76,048	4.9%	4,630	4.3%
5 - 9	561,115	7.0%	73,358	4.8%	3,133	2.9%
10 - 14	530,816	6.6%	69,288	4.5%	2,611	2.4%
15 - 19	520,641	6.5%	75,186	4.9%	2,802	2.6%
20 - 64	4,916,971	61.4%	1,056,539	68.7%	80,280	74.6%
65+	937,857	11.7%	186,776	12.2%	14,150	13.2%

2.2 Labor Force

According to the U.S. Census Bureau, the labor force includes all persons in civilian labor force plus members the Armed Forces (persons 16 years and over on active duty with the U.S. Army, Navy, Air Force, Marine Corps, or Coast Guards). The "civilian labor force" consists of persons classified as employed or unemployed. Those not in the labor force are mainly students, housewives, retired workers, seasonal workers, inmates of institutions, disabled persons, and persons doing only incidental unpaid family work.

As expected, the labor force fluctuated with changes in the total population. Table 2-3 shows the labor force distribution for 1980, 1990, and 2000. The data indicate that between 1980 and 1990 the percentage of people in the labor force in New York City increased by 13.2% even though the population of those over 16 years of age increased by only 5%. Manhattan's labor force and population over 16 years of age increased by 10.9% and 4.7%, respectively, during the same period. In the study area, the labor force increased by 7.9%, while population over 16 years old only increased 1.1% during the same period. From 1980 to 1990 in New York City, civilians employed increased by 11.6% while civilians unemployed increased by 32.5%. Manhattan experienced an increase of 10.2% and 21.2% of civilians employed and unemployed, respectively, while in the study area, civilians employed increased by 9.1% and civilians unemployed dropped by 8.9% for the same period.

Between 1990 and 2000 the percentage of people in the labor force in New York City decreased by 1.1% even though the population over 16 years of age increased by 7.9%. Manhattan's labor force increased by 0.3% while during the same period the over 16 years of age population increased by 3.2%. The study area labor force decreased 1.7%, while the over 16 years of age population increased by 1.1%. Civilians employed and unemployed from 1990 to 2000 increased by 0.6% and 7.6% respectively for New York City. Manhattan remained almost constant for civilian employed, while civilians unemployed increased by 6.2%. In the study area, the civilian employed population dropped by 1.3% and civilian unemployed dropped by 8.0%.

Table 2 - 3: Labor Force Distribution

Census Year	New York City	% Change	Manhattan	% Change	Study Area	% Change
1980 (Total Pop)	7,071,639		1,428,285		103,985	
Pop over 16 years	5,538,851		1,209,444		94,916	
Pop 16 years & over in labor force	3,167,698		756,899		67,534	
% in labor force of total pop 16 years & over	57.2%		62.6%		71.2%	
Civilian Employed	2,918,183		698,727		63,388	
Civilian Unemployed	243,138		55,324		4,091	
1990 (Total Pop)	7,322,564	3.5%	1,487,536	4.1%	105,162	1.1%
Pop over 16 years	5,817,015	5.0%	1,266,398	4.7%	95,929	1.1%
Pop 16 years & over in labor force	3,586,428	13.2%	839,205	10.9%	72,890	7.9%
% in labor force of total pop 16 years & over	61.7%	7.8%	66.3%	5.9%	76.0%	6.8%
Civilian Employed	3,257,637	11.6%	770,084	10.2%	69,134	9.1%
Civilian Unemployed	322,125	32.5%	67,074	21.2%	3,728	-8.9%
2000 (Total Pop)	8,008,278	9.4%	1,537,195	3.3%	107,607	2.3%
Pop 16 years & over	6,279,431	7.9%	1,307,423	3.2%	96,937	1.1%
Pop 16 years & over in labor force	3,626,865	1.1%	841,633	0.3%	71,661	-1.7%
% in labor force of total pop 16 years & over	57.8%	-6.3%	64.4%	-2.9%	73.9%	-2.7%
Civilian Employed	3,277,825	0.6%	770,283	0.03%	68,231	-1.3%
Civilian Unemployed	346,741	7.6%	71,208	6.2%	3,430	-8.0%

2.3 Household Characteristics

There are small increases in the number of households in the study area in the decades between 1980 and 2000: between 1980 and 1990 there was a 0.5% increase, from 62,787 to 63,107 households, and between 1990 and 2000 there was a 0.4% increase, from 63,107 to 63,355 households. In Manhattan, the number of households increased at a higher rate between 1980 and 2000, from 704,502 to 716,422 households in 1990, and to 738,644 households in 2000, representing 1.7% and 3.1% increases, respectively. In New York City between 1980 and 1990, the number of households increased by 1.1% from 2,788,530 to 2,819,401 households in 1990, and by 7.2% to 3,021,588 households in 2000.

The average household size (persons/household) in the study area showed a marginal increase from 1.64 to 1.65 between 1980 and 1990, and a similar increase to 1.66 between 1990 and 2000. Manhattan's household size showed a similar trend, increasing from 1.96 to 1.99 between 1980 and 1990, and to 2.00 between 1990 and 2000. The average household

size for New York City is larger than that in the study area and Manhattan, but it also followed a similar trend, increasing from 2.49 to 2.54 between 1980 and 1990, to 2.59 by 2000. Table 2-4 shows the household characteristics for the New York City, Manhattan, and the study area.

Table 2 - 4: Household Characteristics

Census Year	New York City	% Change	Manhattan	% Change	Study Area	% Change
1980 Population	7,071,639		1,428,285		103,985	
Population in households	6,948,332		1,382,686		102,713	
# of Households	2,788,530		704,502		62,787	
Persons Per Household	2.49		1.96		1.64	
1990 Population	7,322,564	3.5%	1,487,536	4.1%	105,162	1.1%
Population in households	7,154,691	3.0%	1,428,973	3.3%	103,899	1.2%
# of Households	2,819,401	1.1%	716,422	1.7%	63,107	0.5%
Persons Per Household	2.54	1.9%	1.99	1.5%	1.65	0.6%
2000 Population	8,008,278	9.4%	1,537,195	3.3%	107,607	2.3%
Population in households	7,825,848	9.4%	1,477,358	3.4%	105,188	1.2%
# of Households	3,021,588	7.2%	738,644	3.1%	63,355	0.4%
Persons Per Household	2.59	2.0%	2.00	0.5%	1.66	0.8%

2.4 Median Household Income

The household income for the study area is best represented in comparison with New York City and Manhattan. Table 2-5 shows median household income (constant in 2000 dollars) for the study area, Manhattan, and New York City for the period 1980-2000.

Table 2 - 5: Median Household Income by Area (in 2000 dollars)

Census Year	New York City	% Change	Manhattan	% Change	Study Area	% Change
1980	$28,952		$29,058		$36,026	
1990	$39,292	35.7%	$42,506	46.3%	$60,416	67.7%
2000	$38,293	-2.5%	$47,030	10.6%	$74,561	23.4%

*For comparability, income values have been adjusted for inflation to 2000 constant dollars, per the U.S. Bureau of Labor Statistics.

Median household income has grown in general over the decades between 1980 and 2000 at a faster rate for the study area than for the borough and the city. Between 1980 and 1990, incomes (in 2000 dollars) increased by 35.7%, 46.3%, and 67.7% for residents of New York City, Manhattan, and the study area, respectively. From 1990 to 2000 the residents of the study area and Manhattan experienced income increases of 23.4% and 10.6%, respectively, while New York City residents' income dropped by 2.5%.

2.5 Vehicle Ownership

This section discusses the trends observed in vehicle ownership during the period 1980 to 2000 in New York City, Manhattan, and the study area. Vehicle ownership per household is shown in Table 2-6.

Between 1980 and 1990, the number of households with vehicles increased in New York City, Manhattan, and the study area; vehicle ownership continued to increase between 1990 and 2000, but at a slower rate. In 1980, approximately 41% of New York City households owned vehicles, while only approximately 20% of Manhattan households and 18% of the study area households did. Household vehicle ownership increased to approximately 44%, 22%, and 23% of total households in New York City, Manhattan, and the study area, respectively, in 1990. In 2000, household vehicle ownership increased slightly to 44.3% and 22.5% of total households in New York City and Manhattan, respectively, while in the study area vehicle ownership increased by more than 16% to 26.2% of total households.

The demographic analysis shows that in New York City the number of households increased by 1.1% from 1980 to 1990 and by 7.2% from 1990 to 2000, while percentage of households with vehicles increased by 8.0% between 1980 and 1990 and by 7.6% between 1990 and 2000. In Manhattan the number of households increased by 1.7% from 1980 to 1990 and by 3.1% from 1990 to 2000, while households with vehicles increased by 14.5% between 1980 and 1990 and by 4.9% between 1990 and 2000. The study area's data show that the number of households increased by 0.5% from 1980 to 1990 and by 0.4% from 1990 to 2000, while households with vehicles increased by 26.0% between 1980 and 1990 and by 16.4% between 1990 and 2000.

Table 2 - 6: Vehicle Ownership by Household

Vehicles / Household	New York City							
	1980	%	1990	%	% Change	2000	%	% Change
Zero	1,636,988	58.7%	1,575,217	55.9%	-3.8%	1,682,946	55.7%	6.8%
One	902,529	32.4%	887,309	31.5%	-1.7%	955,165	31.6%	7.6%
Two	211,518	7.6%	282,593	10.0%	33.6%	305,267	10.1%	8.0%
Three or more	37,495	1.3%	74,282	2.6%	98.1%	78,210	2.6%	5.3%
Total Household w/Vehicles	1,151,542	41.3%	1,244,184	44.1%	8.0%	1,338,642	44.3%	7.6%
No. of Households	2,788,530	100.0%	2,819,401	100.0%	1.1%	3,021,588	100.0%	7.2%
Vehicles/Household	**Manhattan**							
	1980	%	1990	%	% Change	2000	%	% Change
Zero	565,823	80.3%	557,662	77.8%	-1.4%	572,094	77.5%	2.6%
One	128,942	18.3%	144,644	20.2%	12.2%	149,476	20.2%	3.3%
Two	8,629	1.2%	12,090	1.7%	40.1%	13,172	1.8%	8.9%
Three or more	1,108	0.2%	2,026	0.3%	82.9%	3,902	0.5%	92.6%
Total Household w/Vehicles	138,679	19.7%	158,760	22.2%	14.5%	166,550	22.5%	4.9%
No. of Households	704,502	100.0%	716,422	100.0%	1.7%	738,644	100.0%	3.1%
Vehicles/Household	**Study Area**							
	1980	%	1990	%	% Change	2000	%	% Change
Zero	51,311	81.9%	48,854	77.4%	-4.8%	46,747	73.8%	-4.3%
One	10,700	17.1%	13,182	20.9%	23.2%	15,292	24.1%	16.0%
Two	568	0.9%	947	1.5%	66.7%	1,033	1.6%	9.1%
Three or more	47	0.1%	125	0.2%	166.0%	262	0.4%	110.0%
Total Household w/Vehicles	11,315	18.1%	14,253	22.6%	26.0%	16,588	26.2%	16.4%
No. of Households	62,626	100.0%	63,107	100.0%	0.8%	63,334	100.0%	0.4%

2.6 Travel Behavior

2.6.1 Journey to Work by Mode

Journey to work for 1980, 1990, and 2000 was examined; Tables 2-7, 2-8, 2-9, 2-10, and 2-11 show a summary of journey to work trips by mode for the respective years.

The 1980 journey-to-work data for public transportation and other modes were not available at the same level of detail as for 1990 and 2000 census years. However, the data clearly represent the most commonly used modes for journey to work in the study area, Manhattan, and New York City, as seen in Table 2-7. In 1980, the predominant mode used for journey to work was public transportation in New York City, Manhattan, and the study area, representing 56.8%, 62.7%, and 69.2%, of total trips, respectively. Journey by rail (subway, elevated train, or rail road) was most popular, representing approximately 42% of all trips in New York City and Manhattan, and 43% in the study area. Automobile travel represented the second most commonly used mode in New York City with 30.5% of total trips; 20.5% were drive alone and 10% were carpool. In Manhattan and the study area, automobile share was considerably less with 11.3% and 9.3%, respectively. Walking trips were 24.2% and 19.3% of trips in Manhattan and the study area, respectively, while the New York City walk trips were 11.5% of total trips. Trips by other means were less than 3% of the trips in New York City, Manhattan, and the study area.

In 1990 also, public transportation was the predominant mode, accounting for 54.5% of all work trips in New York City, 61.5% in Manhattan, and 68.6% in the study area. Travel by subway was the most common form of public transportation in the study area, accounting for 44.4% of all work trips. Similarly, in Manhattan and New York City the subway share was 40.3% and 37.6%, respectively. Surface transit (Bus) was the second most popular mode in the study area, Manhattan, and New York City making up 16.2%, 15.1% and 13% of trips, respectively. About 6.8% of the study area residents used taxis, compared to 4.9% in Manhattan and 1.6% in New York City. Generally, ferry and railroad were rarely used. Approximately 19.1% of the study area's labor force walked to work, compared to 24.3% in Manhattan and 10.9% in New York City. Automobile share in the study area was 10.2% of total trips with 7.4% drive alone and 2.8% carpool. In Manhattan and New York City,

automobile share was 12.3% and 33.4% of total trips, respectively. The 1990 journey-to-work data is shown in Table 2-8.

The journey-to-work data in 2000, shown in Table 2-9, indicate a similar trend to the previous decades. In New York City, Manhattan, and the study area, 54.2%, 63.2%, and 70.4% of trips, respectively, were public transit. In the study area, 52.5% were subway and 10.2% were bus. In Manhattan and New York City, 46.3% and 38.7% of total trips were made by subway, respectively, and 10.7% and 11.8% of total trips were made by bus, respectively. Taxicabs represented 6.6% of the work trips in the study area, 5.0% in Manhattan, and 1.7% in New York City. Among the other modes, walking represented 18.1% of trips in the study area, 23.3% in Manhattan, and 10.7% in New York City. Automobile accounted for only 9.7% of work trips in the study area, 11.7% in Manhattan, and 33.9% in New York City.

Table 2 - 7: Journey to Work by Mode - 1980

1980 Census Year	New York City	Mode Share %	Manhattan	Mode Share %	Study Area	Mode Share %
Car, Truck or Van						
Drove alone	567,774	20.4%	41,721	6.4%	3,081	5.3%
Carpooled	278,273	10.0%	31,791	4.9%	2,318	4.0%
Total	**846,047**	**30.5%**	**73,512**	**11.3%**	**5,399**	**9.3%**
Public Transportation						
Bus or street car	384,393	13.8%	113,059	17.4%	12,567	21.7%
Subway, elevated train or rail road	1,157,634	41.7%	270,856	41.8%	24,896	43.0%
Other public transportation	34,949	1.3%	22,720	3.5%	2,583	4.5%
Total	**1,576,976**	**56.8%**	**406,635**	**62.7%**	**40,046**	**69.2%**
Walked only	320,308	11.5%	156,861	24.2%	11,146	19.3%
Other means	33,166	1.2%	11,571	1.8%	1,262	2.2%
Total Trips	**2,776,497**	100.0%	**648,579**	100.0%	**57,853**	100.0%

Table 2 - 8: Journey to Work by Mode - 1990

1990 Census Year	New York City	% Mode Share	Manhattan	% Mode Share	Study Area	% Mode Share
Car, Truck or Van						
Drove alone	765,151	24.6%	59,097	8.3%	4,673	7.4%
Carpooled	271,503	8.7%	28,415	4.0%	1,771	2.8%
Total	**1,036,654**	**33.4%**	**87,512**	**12.3%**	**6,444**	**10.3%**
Public Transportation						
Bus	403,477	13.0%	107,521	15.1%	10,186	16.2%
Subway	1,168,346	37.6%	287,412	40.3%	27,925	44.4%
Railroad	54,716	1.8%	8,336	1.2%	721	1.1%
Ferry	16,619	0.5%	360	0.1%	47	0.1%
Taxicab	50,096	1.6%	34,798	4.9%	4,254	6.8%
Total	**1,693,254**	**54.5%**	**438,427**	**61.5%**	**43,132**	**68.6%**
Other Modes						
Motorcycle	1,711	0.1%	545	0.1%	35	0.1%
Bicycle	9,643	0.3%	4,892	0.7%	510	0.8%
Walked	340,077	10.9%	173,619	24.3%	12,019	19.1%
Other means	24,930	0.8%	8,051	1.1%	695	1.1%
Total	**376,361**	**12.1%**	**187,107**	**26.2%**	**13,260**	**21.1%**
Total Trips	**3,106,269**	100.0%	**713,046**	100.0%	**62,836**	100.0%

Table 2 - 9: Journey to Work by Mode - 2000

2000 Census Year	New York City	% Mode Share	Manhattan	% Mode Share	Study Area	% Mode Share
Car, Truck or Van						
Drove alone	794,422	25.6%	57,150	8.1%	4,837	7.8%
Carpooled	254,974	8.2%	25,604	3.6%	1,191	1.9%
Total	**1,049,396**	**33.9%**	**82,754**	**11.7%**	**6,028**	**9.7%**
Public Transportation						
Bus	364,408	11.8%	75,859	10.7%	6,359	10.2%
Subway	1,199,226	38.7%	328,246	46.3%	32,676	52.5%
Railroad	51,141	1.6%	8,309	1.2%	605	1.0%
Ferry	11,193	0.4%	411	0.1%	45	0.1%
Taxicab	53,781	1.7%	35,187	5.0%	4,133	6.6%
Total	**1,679,749**	**54.2%**	**448,012**	**63.2%**	**43,817**	**70.4%**
Other Modes						
Motorcycle	1,488	0.0%	437	0.1%	48	0.1%
Bicycle	15,024	0.5%	6,410	0.9%	584	0.9%
Walked	332,264	10.7%	164,934	23.3%	11,230	18.1%
Other means	21,998	0.7%	6,714	0.9%	502	0.8%
Total	**370,774**	**12.0%**	**178,495**	**25.2%**	**12,364**	**19.9%**
Total Trips	**3,099,919**	100.0%	**709,261**	100.0%	**62,210**	100.0%

2.6.2 Auto Travel Characteristics

Table 2-10 shows a summary of auto travel by year in New York City, Manhattan, and the study area between 1980 and 2000. The data indicate that between 1980 and 1990 drive alone increased substantially; in New York City it increased by 34.8%, in Manhattan by 41.6%, and in the study area by 51.7%. Carpool, on the other hand, decreased by 2.4% in New York City, 10.6% in Manhattan, and 23.6% in the study area. Travel by other means increased in New York City, Manhattan and the study area by 8.5%, 10.4% and 9.3%, respectively.

The increase in drive alone trips between 1980 and 1990 slowed between 1990 and 2000; New York City drive alone trips increased by 3.8%, and by 3.5% in the study area, while in Manhattan it declined by 3.3%. Carpooling in New York City and Manhattan decreased by 6.1% and 9.9%, respectively, while in the study area it decreased significantly by 32.7%.

Table 2 - 10: Auto Travel Characteristics

Census Year & Driving Characteristics	New York City	% Change	Manhattan	% Change	Study Area	% Change
1980						
Drove alone	567,774		41,721		3,081	
Carpool	278,273		31,791		2,318	
Other means	1,978,942		603,716		56,146	
1990						
Drove alone	765,151	34.8%	59,097	41.6%	4,673	51.7%
Carpool	271,503	-2.4%	28,415	-10.6%	1,771	-23.6%
Other means	2,146,434	8.5%	666,636	10.4%	61,368	9.3%
2000						
Drove alone	794,422	3.8%	57,150	-3.3%	4,836	3.5%
Carpool	254,974	-6.1%	25,604	-9.9%	1,191	-32.7%
Other means	2,142,674	-0.2%	670,360	0.6%	61,103	-0.4%

According to 2000 census data, the study area population has a very high percentage (71.5%) of residents between 20-64 years of age. It also has the lowest unemployment rate of 4.8% compared to Manhattan's 8.5% and New York City's 9.6%. The stable demographics and healthy economic climate of the study area are also reflected in car ownership rates that increase at a greater rate in the study area than in Manhattan or New York City. In conclusion, it appears that no specific transportation need can be identified for the study area.

3.0 LAND USE AND ZONING

3.1 Zoning

As outlined in the NYC DCP Zoning Handbook (2006), New York City has three basic zoning districts: residential (R), commercial (C), and manufacturing (M). The three basic categories are further subdivided by density into low, medium, and high to describe varying bulk and coverage. Development within these districts is regulated by zoning resolution that governs use, building size, and parking.

Residential District (R)

There are ten residential districts – R1 through R10 – in New York City. These numbers refer to the permitted bulk and density (R1 having the lowest density and R10 the highest) and other controls such as required parking. A second letter or number, such as R4-1 and R7A, signifies that additional controls are required in certain districts.

Commercial District (C)

There are eight commercial zoning districts – C1 through C8 – in New York City. These districts allow commercial activity, ranging from local retail and service establishments to high density retail, entertainment, and office uses. C1 and C2 districts are designed to serve local needs (e.g. corner stores), C3, C7, and C8 districts are designed for special purposes (waterfront activity, large commercial amusement parks and heavy repair services), the C4 district permits shopping centers outside the central business district, and C5 and C6 districts are for the central business districts with office, retail, and commercial functions that serve the city and region. The eight commercial districts are further subdivided, as indicated by a numerical suffix, to reflect variations in bulk, and parking and loading requirements.

Manufacturing District (M)

There are three manufacturing districts – M1, M2, and M3 – in New York City. Industrial uses are permitted in the three manufacturing districts according to the characteristics of their operations. Each of the three districts incorporates performance standards limiting the amount and type of industrial nuisance permitted. More noxious uses are restricted to M3 districts, but they may be permitted in districts M1 and M2 if they comply with the more stringent performance standards of those districts. Retail and commercial uses are permitted in manufacturing districts with some exceptions, but residential and community facility uses are excluded from most manufacturing districts.

3.1.1 Residential Zoning Districts in the Study Area

The study area is predominantly zoned for residential use with R8, R8B, R10, and R10A zoning districts. Figure 3-1 shows the existing zoning within the study area.

R8 zoning districts allow for apartment buildings that range from mid-rise, eight- to ten-story buildings, to much taller, narrower buildings set back from the street on large zoning lots. There are five R8 districts in the study area. The largest district is bounded by Amsterdam Avenue (east), Freedom Place (west), West 70th Street (north), and West 66th Street (south). The second largest district is bounded by Amsterdam Avenue and West End Avenue from West 66th Street to West 60th Street. The third district lies between 9th Avenue and 10th Avenue from West 58th Street to West 56th Street. The other districts are located between Central Park West and Columbus Avenue from West 68th Street to West 67th Street, West 65th Street to West 64th Street, and West 60th Street to West 58th Street,

R8B zoning districts usually presents unified blocks of tall row houses and apartment buildings that are commonly found on narrow side streets. R8B zoning districts are dispersed throughout the study area; approximately 30% of the study area is zoned R8B. The R8B districts are flanked by R10A and commercial zoning in the study area. Most of the R8B zoned lots are located between Columbus Avenue and Broadway/Amsterdam Avenue from West 68th Street to West 85th Street.

R10 districts permit the highest residential density in the city, and height factor regulations do not apply. R10 districts are located along major corridors in Manhattan and in the central business district in Manhattan and Brooklyn. The R10 district in the study area extends from Riverside Drive to the Hudson River from West 72nd Street to West 59th Street.

R10A districts typically produce 22-story apartment buildings with high lot coverage and street walls set to the street line along avenues and wide cross streets. Towers are not permitted in R10A districts. The R10A district in the study are extend, in pockets, from Central Park West to Riverside Drive from West 86th Street to West 62nd Street; and along the Hudson River from West 79th Street to West 72nd Street.

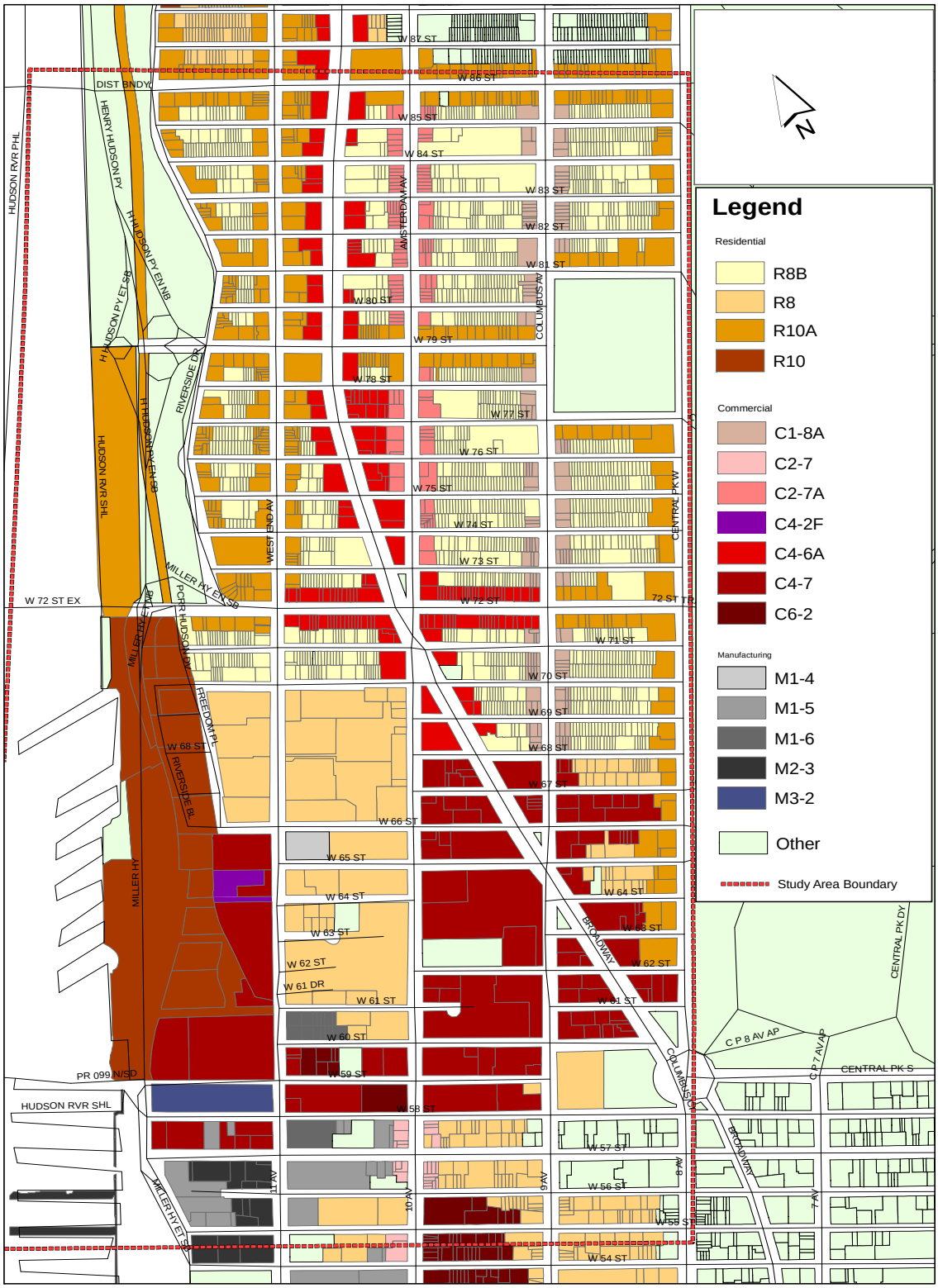
Table 3-1 below shows the floor area ratio (FAR) for each residential zoning district located within the West Side Manhattan study area.

Table 3 - 1: Residential Zoning Districts Within Study Area

Zoning District	Maximum Residential FAR	Maximum Commercial FAR*
R8	6.02	2.00
R8B	4.0	2.00
R10	10	2.00
R10A	10	2.00

*****Represents maximum FAR for commercial overlay district which permits a wide range of local retail and personal service establishments needed in a residential neighborhood. Typical uses include grocery stores, small dry cleaning establishments, restaurants and barber shops.

Figure 3 - 1: Existing Zoning



3.1.2 Commercial Zoning Districts in the Study Area

The commercial zoning districts in the study area are located along the avenues (Columbus Avenue, Amsterdam Avenue, and Broadway) and major streets (72nd Street, 59th Street, 58th Street, and 57th Street). Commercial zoning in the study area includes: C1-8A, C2-7, C2-7A, C4-2F, C4-6A, C4-7, C6-2, C6-4, and C6-6.

C1 and C2 districts are predominantly commercial overlays within residential districts, and are mapped along streets that serve the local retail needs of the surrounding residential neighborhood. Typical retail uses include grocery stores, restaurants, beauty salons, and local clothing stores. C2 districts permit a slightly wider range of uses than C1 districts, and might include funeral homes, small lumber stores, businesses, and trade schools. In buildings with residential uses, commercial uses are limited to one or two floors, and must always be located below the residential use. The C1-8A districts in the study area are located along Columbus Avenue from West 68th Street to West 86th Street. The C2-7 and C2-7A districts in the study area are located along Amsterdam Avenue between West 58th and West 56th Streets and from West 73rd Street to West 85th Street.

C4 districts are mapped for regional commercial centers that are located outside of the central business districts. In these areas, specialty retail and department stores, theaters, and other commercial and office uses serve a larger area and generate more traffic than neighborhood shopping areas. Suffixes attached to a C4 district usually indicate differences in FAR and parking requirements. A C4-2F zoning district is not a contextual district; developments in this district require special permission from the City Planning Commission. The C4-2F district in the study area is located along West End Avenue between West 64th and West 65th Streets. C4-6A zoning has a commercial FAR of 3.4 and a residential FAR of 10.0. This district in the study area is located along Broadway and is bounded by 86th Street on the north and West 68th Street. C4-7 districts have a commercial FAR of 10.0 and are usually exempt from parking requirements for commercial uses. The C4-7 district in the study area is concentrated in the area bounded by West 68th Street on the north, West 58th Street on the south, Broadway on the east, and West Side Highway in some parts.

C6 districts permit a wide range of high-bulk commercial uses requiring a central location, and permit corporate headquarters, large hotels, entertainment facilities, retail stores, and high-rise residences in mixed buildings. The C6-2 district is a general commercial district located outside central business districts, the C6-4 allows medium bulk offices, and the C6-6 district allows high bulk offices. The C6-2 districts in the study area are located along West 55th and West 56th streets between 9th and 10th avenues as well as on West 58th and West 59th Street between Amsterdam Avenue and West End Avenue. The C6-4 districts in the study area are located in the area bounded by 9th Avenue, West 58th Street, 8th Avenue, and West 55th Street. The C6-6 district is located in the area adjacent to Columbus Circle, bounded by West 61st Street, West 56th Street, 9th Avenue, and 8th Avenue.

Table 3-2 below shows the floor area ratio (FAR) for each commercial zoning district located within the West Manhattan study area.

Table 3 - 2: Commercial Zoning Districts Within Study Area

Zoning District	Maximum Residential FAR	Maximum Commercial FAR
C1-8A	7.52	2.00
C2-7	7.52	2.00
C2-7A	7.52	2.00
C4-6A	10	3.4
C4-7	10.0	10.0
C6-2	6.02	6.00
C6-4	10.0	10.0
C6-6	10	15.0

*Maximum residential FAR in these commercial districts is governed by the regulations of the surrounding residential district.

3.1.3 Manufacturing Zoning Districts

Industrial uses are permitted in three manufacturing districts – M1, M2, and M3 – according to the characteristics of their operations. Each of the three districts incorporates performance standards limiting the amount and type of industrial nuisance permitted. M1 districts contain light to heavy manufacturing, and conform to stringent M1 performance standards, so often act as a buffer between M2 or M3 districts and adjacent residential or commercial uses. M2 districts occupy the middle ground between light and heavy manufacturing uses. M3 districts

are for heavy industries that generate noise, traffic, or pollutants; even in M3 districts, uses with potential nuisance effects are required to conform to minimum performance standards. Parking and loading requirements vary with the district and use. The manufacturing zoning districts that exist in the study area are located in the south-western tip of the study area.

A M1-4 district is located along West End Avenue between West 65th and 66th Streets. The allowable FAR is 1.0. A M1-5 manufacturing zoning district is located in the area bounded by 10th Avenue, the West Side Highway, West 58th Street, and West 55th Street. A M1-6 district is located along West End Avenue and is bounded by West 60th and West 61st Street.

The M2-3 manufacturing zoning district in the study area is located on 11th Avenue between West 57th Street and West 56th Street (west side), and between West 57th and West 58th Streets (east side).

The only M3-2 district occupies an entire block bounded by West 59th Street, West 58th Street, 11th Avenue, and Joe DiMaggio Highway. .

The Table 3-3 below shows the floor area ratio (FAR) for each manufacturing zoning district located within the West Side Manhattan study area.

Table 3 - 3: Manufacturing Zoning Districts Within Study Area

Zoning District	Maximum Commercial FAR	Maximum Manufacturing FAR
M1-4	2.00	2.00
M1-5	2.00	2.00
M1-6	5.00	5.00
M2-3	2.00	2.00
M3-2	2.00	2.00

3.2 Land Use

The zoning districts in the study area permit various types of development uses and densities that are reflected in the existing land uses. See Figure 3-2 for existing land uses. The predominant land use is residential, including townhouses, multi-family buildings, and mixed residential/commercial buildings. Townhouses and small multi-family buildings are located mid-block on minor cross-streets, while larger multi-family buildings are located on major

cross streets such as 86th Street, 81st Street, 79th Street, 72nd Street, etc. Many of the mixed residential/commercial buildings are located along the major north-south corridors, with the exceptions of Central Park West, West End Avenue, and Riverside Drive.

Commercial activity in the study area is located primarily on three of the major north-south corridors – Columbus Avenue, Amsterdam Avenue, and Broadway. Uses along these corridors include supermarkets (Fairway, Whole Foods, Citraella, Zabar's, D'Agostino's), movie theatres, drug stores, shoe stores, clothing stores, retail chain stores (Gap, Victoria's Secret, Vitamin Shoppe, Filene's Basement, Radio Shack, etc.), bookstores (Barnes and Noble), household (Laytiners, Gracious Home, Bed, Bath & Beyond), restaurants, and several specialty stores. Additionally, there are several buildings occupied by offices and businesses. These buildings are primarily located in the southern portion of the study area around Lincoln Center and Columbus Circle.

There are some industrial uses in the study area including parking garages, storage facilities, and warehouses. Except for parking lots, industrial uses are concentrated in the southwest portion of the study area.

There are several institutional/community facilities dispersed throughout the study area. The largest and most well known is the Museum of Natural History which occupies the superblock bounded by Central Park West, Columbus Avenue, West 81st Street, and West 77th Street. In addition to the museum, other cultural facilities include Lincoln Center, bounded by Amsterdam Avenue, West 66th Street, Broadway, Columbus Avenue, and West 62nd Street; The Beacon Theatre on Broadway between West 75th Street and West 74th Street; the American Folk Art Museum Branch Location on West 61st Street between Broadway and Columbus Avenue; and the Children's Museum located on West 83rd Street between Broadway and Amsterdam Avenue. There are several educational facilities such as John Jay College whose buildings stretch along 10th Avenue between West 54th Street and West 59th Street; New York Institute of Technology with buildings on West 61st Street and Broadway between West 60th Street and West 61st Street; the Lincoln Center Campus of Fordham University between Amsterdam and Columbus Avenues and West 60th Street and West 62nd Street; and there are many public and private elementary and secondary schools that serve the

study area. The sole hospital in the study area, St. Luke's Roosevelt Hospital Center, is located between 9th and 10th Avenues and West 58th and West 59th Streets.

There are numerous recreational facilities, parks, and open spaces in the study area. A significant portion of the study area abuts Central Park (from 59th Street to 86th Street) on the east and Riverside Park (from 72nd Street to 86th Street) on the west. There are also several small playgrounds and parks dispersed throughout the area.

There are very few vacant lots in the study area. The largest concentration of vacant land in the study area is located along the Hudson River between West 59th Street and West 72nd Street.

The intensity of high trip generating uses in some locations accounts for significant pedestrian and vehicular traffic. This is also supported by transit provision/hubs in the area. Pedestrian and traffic volumes, which are addressed in depth in following chapters, clearly show the areas and corridors with high volumes.

Figure 3 - 2: Existing Land Use

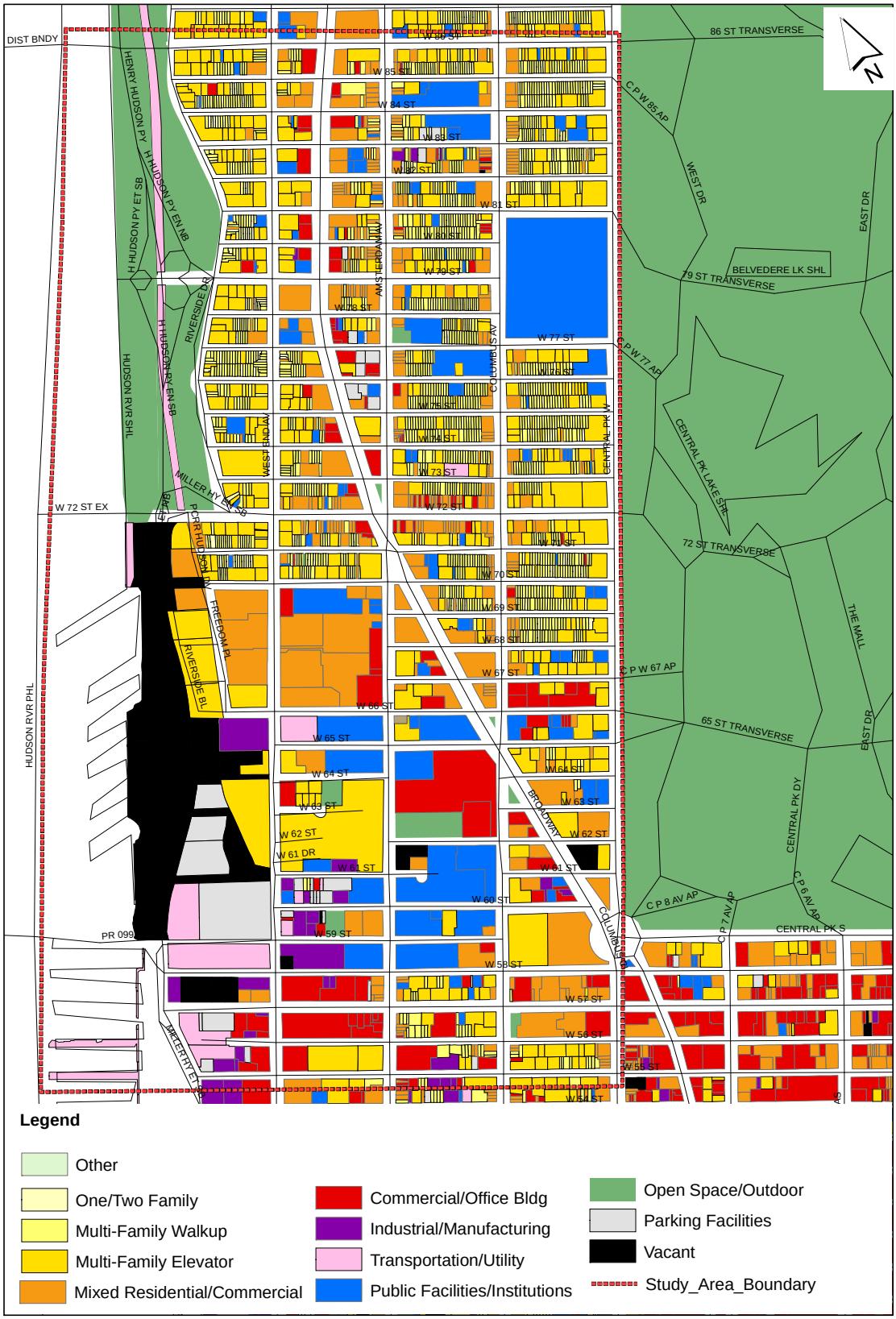


Figure 3 - 3: Three-Dimensional Perspective of the Study Area

4.0 TRAFFIC AND TRANSPORTATION

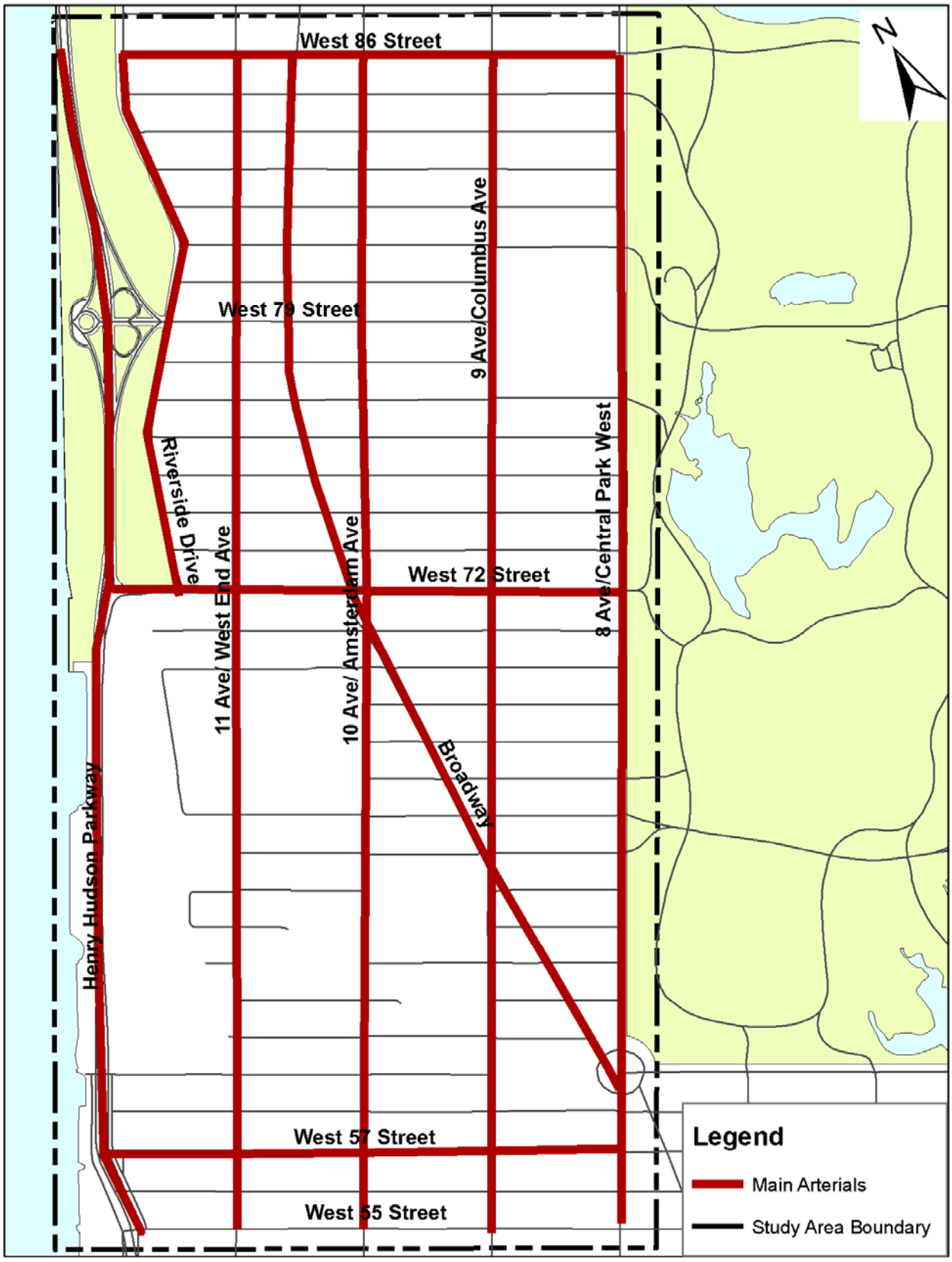
4.1 Existing Conditions

The study area is located on the west side of Manhattan and is bounded by West 86th Street to the north, West 55th Street to the south, Central Park West to the east, and the 12th Avenue/Henry Hudson Parkway to the west.

The study area is composed of a grid pattern of major north-south avenues and cross-streets. Broadway traverses the grid diagonally, intercepting the pattern at West 59th Street/Columbus Circle and West 86th Street between West End Avenue and Amsterdam Avenue within the study area.

The major north-south arterials within the study area include: Joe DiMaggio Highway/Henry Hudson Parkway, Riverside Drive, West End Avenue (11th Avenue), Amsterdam Avenue (10th Avenue), Broadway, Columbus Avenue (9th Avenue), and Central Park West (8th Avenue). The Henry Hudson Parkway stretches from West 59 Street in Manhattan to the Bronx-Westchester County boundary, where it meets the Saw Mill River Parkway. South of West 59 Street, the highway, known as the Joe DiMaggio Highway, runs along the Hudson River to the southern tip of Manhattan. Cross-streets in the study area run from Central Park West to Henry Hudson Parkway, Riverside Drive or to West End Avenue. In the east-west direction, the main cross streets in the study area are West 86th Street, West 79th Street, West 72nd Street, and West 57th Street. Figure 4-1 shows the main arterials in the study area.

Figure 4 - 1: Main Arterials in the Study Area



4.2 Street System & Roadway Characteristics

Joe DiMaggio Highway/Henry Hudson Parkway runs the length of the western boundary of the study area, and extends from Henry Hudson and George Washington Bridges in the north to South Ferry and the Brooklyn Battery Tunnel at the southern tip of Manhattan. It is the only north-south uninterrupted flow facility in the study area, and the six-lane express highway is the westernmost arterial in Manhattan.

Riverside Drive is a two-way arterial with one traffic lane in each direction, in addition to parking lanes. Riverside Drive begins at West 72nd Street between the Henry Hudson Parkway and West End Avenue, and runs north to the northern tip of Manhattan where it terminates at Dyckman Avenue.

Eleventh Avenue (West End Avenue north of 60th Street) is a two-way arterial with two lanes in each direction, in addition to parking lanes. The segment approximately between West 39th Street and West 59th Street accommodates the largest concentration of auto dealerships in Manhattan.

Tenth and Ninth Avenues are adjacent one-way arterials that form a main north-south arterial couplet and truck route on the west side. *Tenth Avenue (Amsterdam Avenue* north of 59th Street) is one-way northbound, with five traffic lanes in addition to parking lanes. Traffic flow on Amsterdam Avenue is constricted at West 71st Street where the Broadway crossing requires three-phase signalization. *Ninth Avenue (Columbus Avenue* north of 59th Street) is one-way southbound, with three traffic lanes in addition to parking lanes north of West 65th Street. South of West 65th Street, the avenue expands to four traffic lanes in addition to parking lanes. Traffic flow on Columbus Avenue is constricted at West 65th Street where Broadway crosses the avenue.

Eighth Avenue (Central Park West north of Columbus Circle) runs the length of the eastern boundary of the study area. South of Columbus Circle, it is one-way northbound, with five traffic lanes in addition to parking lanes. North of Columbus Circle, Central Park West is two-way with two lanes in each direction, in addition to parking lanes and one bike lane. Central Park West forms the western edge of Central Park. It runs 51 blocks from Columbus

Circle (at 59th Street) to Frederick Douglass Circle (at 110th Street). The IND subway line (A, B, C, D) runs beneath Eighth Avenue in the study area.

Broadway is a busy four- and three-lane north-south corridor in the study area. North of Columbus Circle, it is two-way except the segment between West 71st and 73rd Streets where it only runs southbound due to the 72nd subway station (to the south of Columbus Circle, which lies outside of the study area, Broadway runs one-way southbound). Broadway crosses Eighth Avenue at West 59th Street at Columbus Circle, the southwest corner of Central park; and intersects Columbus Avenue at West 65th Street, Amsterdam Avenue at West 71st Street, and passes West 86th Street between Amsterdam and West End Avenues. The IRT subway line (1, 2, 3) runs beneath Broadway in the study area; on the surface, MTA New York City Transit's M1, M5, M7, M10, M20, and M104 bus services all use Broadway in the study area.

The principal cross-streets in the study area are West 57th, West 65th, West 66th, West 72nd, West 77th, West 79th, West 81st, and West 86th Streets. These cross streets connect with east-west transverse streets through Central Park and/or with exit/entrance ramps on the Henry Hudson Parkway/Route 9A, and thus provide connections to the rest of the borough.

West 57th, *West 72nd* and *West 86th Streets* are two-way streets with connections to Route 9A, and are therefore popular cross-streets for through traffic flows.

The *West 65th – 66th Street* eastbound-westbound couplet generally has two or more travel lanes plus parking lanes in each direction, and is heavily used for its east side-west side transverse through Central Park.

West 79th Street is a two-way street with connections to Route 9A to the west, and terminates at Columbus Avenue to the east. Eastbound traffic is diverted north to West 81st Street at Amsterdam Avenue or south to West 77th Street at Columbus Avenue.

West 77th and 81st Streets are wide two-way streets on the single block between Central Park West and Columbus Avenue, but become narrower and operate one-way west of Columbus Avenue. West 81st Street operates one-way eastbound between Amsterdam and Columbus

Avenues, and one-way westbound west of Amsterdam Avenue. West 77th Street operates one-way westbound west of Columbus Avenue.

Generally, the avenues range in width between approximately 59 and 63 feet, and those that operate one-way have three to five moving lanes. The two-way east-west streets are generally between 58 and 60 feet wide, while the one-way east-west streets are generally between 29 and 35 feet wide. Central Park West and the major cross-town streets generally operate with two moving lanes and a parking lane in each direction. The others typically function with one to two moving lanes plus a parking lane. However, the number of effective moving lanes available on the various streets and avenues is sometimes compromised by truck loading and unloading activity, double-parking buses, autos, and service vehicles, and other illegal curbside use.

4.3 Activity Centers and the Transportation Network

Peak hour trips in the study area are primarily work and shopping oriented. The area's economic activities, local retail/offices, and entertainment centers make it a destination point, and the large number of residences means many trips originate within the area. A significant amount of vehicle trips pass through the area from the north and south via Route 9A (West Side Highway/Henry Hudson Parkway), and east-west via 57th, 72nd, and 86th Streets.

In general, trips destined to the study area are concentrated in three main locations, or activity centers. The three major activity centers are as follows:

Activity Center #1: Lincoln Square. The Lincoln Square area lies roughly between West 57th and West 72nd Streets, and between Central Park West and Route 9A. It is centered on the intersection of Broadway and Columbus Avenue at West 65th and 66th Streets. The area contains Columbus Circle, Lincoln Center for the Performing Arts, Fordham University Lincoln Center campus, the John Jay College of Criminal Justice, Lincoln Tower and Lincoln House (which have a combined total of 4,256 residential units), the Jewish Guild for the Blind, Manhattan New York Temple, the West Side Young Men's Christian Association (YMCA), Roosevelt's Hospitals, as well as many other institutions and residential and commercial developments.

The variety of cultural, religious, and business institutions within Lincoln Square attract a sizable daytime population. This activity center attracts vehicular and pedestrian traffic, and can be accessed by both public transportation and automobiles. One major transportation hub in this area is Columbus Circle; the M5, M7, M10, M20, and M104 buses all stop there, as well as the A, B, C, D, and 1 trains. West 66th Street provides easy access to Lincoln Center: the 1 train and the M5, M7, M11, M66, and M104 buses stop at the intersection of West 66th Street and Broadway. The M66 bus runs along West 66th Street westbound and West 65th Street Eastbound, and crosses Central Park via transverse road to/from the east side of Manhattan.

Activity Center #2: West 72nd Street Corridor & Verdi Square. The West 72nd Street Corridor is largely a commercial area, with more than 150 stores and restaurants. There are two New York City Subway's train stations on West 72nd Street: the IRT Broadway-Seventh Avenue Line (1 2 3), located at the intersection of Broadway, 72nd Street and Amsterdam Avenue (also known as Verdi Square), and the IND Eighth Avenue Line (B C), located along Central Park West. Bus lines including M5, M7, M57, M72, and M104 stop at Verdi Square, and the M10 and M72 stop on West 72nd Street at Central Park West. The M72 bus runs along 72nd Street.

Activity Center #3: American Museum of Natural History & Hayden Planetarium. The American Museum of Natural History is one of the largest and most celebrated museums in world. Located at 79th Street and Central Park West, between West 77th and West 81st Streets, Central Park West, and Columbus Avenue, the museum comprises 25 interconnected buildings that house 46 permanent exhibition halls, research laboratories, and its renowned library. It is one of the world's preeminent scientific, educational, and cultural institutions, which attracts millions of on-site visitors from around the world each year. The museum is easily reached by the B and C subway lines, which stop at West 81st Street & Central Park West, and by the M79 bus, which stops at the same intersection.

Activity Center #4: Central Park. The Central Park is one of New York City's historic landmarks. It is located east of the eastern boundary of the study area. It is estimated that more than 25 million visitors enjoy Central Park each year. It is busiest during the summer

time when concerts, sport events, and other public events are held in the park. Being located in the eastern limit of the study area, a significant part of the traffic it generates passes through the study area en-route to the park hence affecting everyday vehicular and pedestrian traffic. Figure 4-2 shows the four activity centers in the study area.

4.4 Data Collection and Traffic Operations

Existing traffic conditions were determined from field surveys conducted in 2006 and 2008, and supplemented with information from recent environmental impact statements (EIS) conducted for proposed projects within the study area.

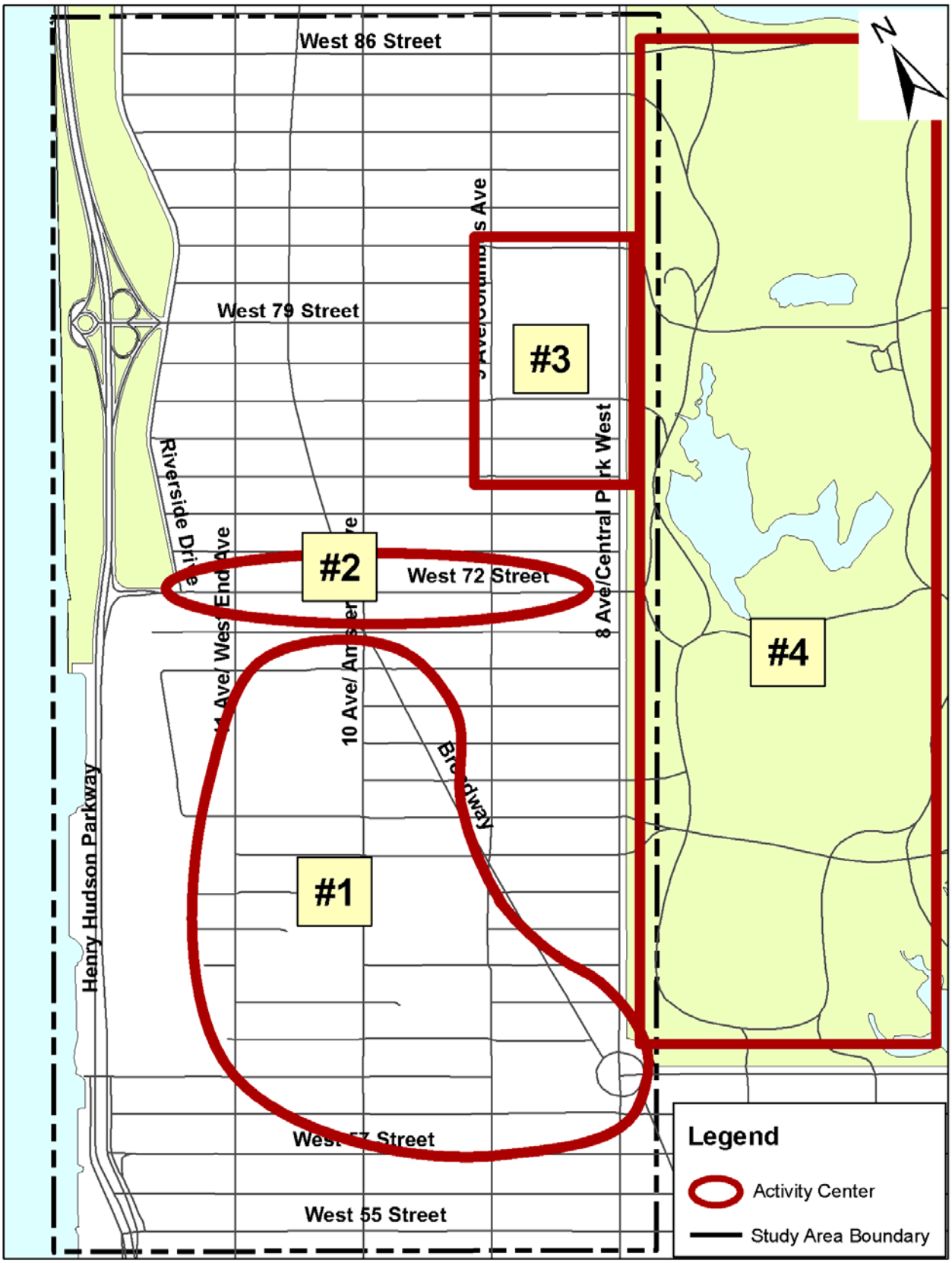
Traffic volume counts were collected during three midweek days (Tuesday, Wednesday, and Thursday) during the AM, Midday, and PM peak hours, as well as during Saturday Midday peak hour. These traffic counts recorded vehicle classification and turning movements. Automatic Traffic Recorder (ATR) machines were placed at 18 locations for the duration of seven days, and supplemented the information manually collected during traffic volume counts. Figure 4-3 shows the ATR and manual traffic count locations in the study area. Speed and delay runs were also conducted during peak hours.

ATR machines were placed at the following 18 locations:

- West 57th Street between Eighth Ave & Columbus Avenue/9th Avenue – EB, WB
- West 66th Street between Central Park West & Columbus Avenue/9th Avenue – EB, WB
- West 79th Street between Columbus Ave & Amsterdam Avenue/10th Avenue – EB, WB
- West 79th Street between West End Ave & Riverside Drive – EB, WB
- West 81st Street between Central Park West & Columbus Avenue/9th Avenue – EB, WB
- West 86th Street between Central Park West & Columbus Avenue/9th Avenue – EB, WB
- West 86th Street between West End Ave & Riverside Drive – EB, WB
- Riverside Drive between 72nd and 73rd Street – NB, SB
- West End Avenue between 56th Street & 57th Street – NB, SB
- West End Avenue between 78th Street & 79th Street – NB, SB
- Amsterdam Avenue/10th Avenue between 72nd Street & 73rd Street – NB, SB
- Columbus Avenue/9th Avenue between 66th Street & 67th Street – NB, SB

- Broadway between 60th Street & 61st Street – NB, SB
- Broadway between 65th Street & 66th Street – NB, SB
- Broadway between 72nd Street & 73rd Street – NB, SB
- Eighth Avenue between 57th Street & 58th Street – NB
- Columbus Avenue/9th Avenue between 57th Street & 58th Street – SB
- Amsterdam Avenue/10th Avenue between 57th Street & 58th Street – NB

Figure 4 - 2: Activity Centers in the Study Area

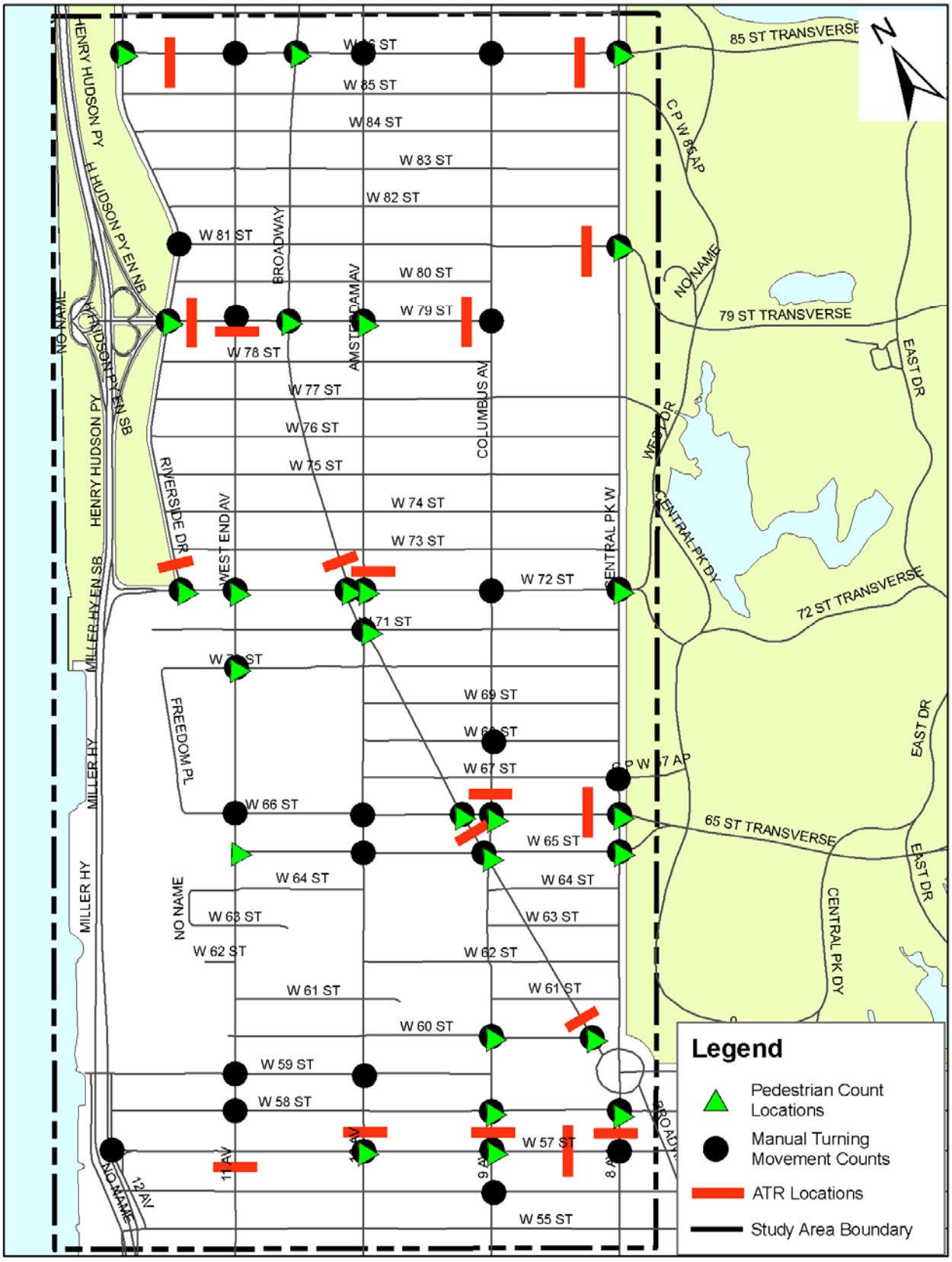


Vehicle classification and turning movement counts were conducted during peak periods at the following 43 signalized locations:

- West 56th Street & Columbus Avenue/9th Avenue
- West 57th Street & 8th Avenue
- West 57th Street & Columbus Avenue/9th Avenue
- West 57th Street & Amsterdam Avenue/10th Avenue
- West 57th Street & 12th Avenue
- West 58th Street & 8th Avenue
- West 58th Street & Columbus Avenue/9th Avenue
- West 58th Street & West End Avenue
- West 59th Street & Amsterdam Avenue/10th Avenue
- West 59th Street & West End Avenue
- West 60th Street & Columbus Avenue/9th Avenue
- West 60th Street & Broadway
- West 65th Street & Central Park West
- West 65th Street & Broadway
- West 65th Street & Amsterdam Avenue/10th Avenue
- West 66th Street & Central Park West
- West 66th Street & Columbus Avenue/9th Avenue
- West 66th Street & Amsterdam Avenue/10th Avenue
- West 66th Street & Broadway
- West 66th Street & West End Avenue
- West 67th Street & Central Park West
- West 68th Street & Columbus Avenue/9th Avenue
- West 70th Street & West End Avenue
- West 71st Street & Amsterdam Avenue/Broadway
- West 72nd Street & Central Park West
- West 72nd Street & Columbus Avenue/9th Avenue
- West 72nd Street & Amsterdam Avenue/10th Avenue
- West 72nd Street & Broadway

- West 72nd Street & West End Avenue
- West 72nd Street & Riverside Drive
- West 79th Street & Columbus Avenue/9th Avenue
- West 79th Street & Amsterdam Avenue/10th Avenue
- West 79th Street & Broadway
- West 79th Street & West End Avenue
- West 79th Street & Riverside Drive
- West 81st Street & Central Park West
- West 81st Street & Riverside Drive
- West 86th Street & Central Park West
- West 86th Street & Columbus Avenue/9th Avenue
- West 86th Street & Amsterdam Avenue/10th Avenue
- West 86th Street & West End Avenue
- West 86th Street & Broadway
- West 86th Street & Riverside Drive

Figure 4 - 3: ATRs and Count Locations



4.5 Network Traffic Volumes

Balanced traffic networks for the various peak hours were prepared using the ATRs and the manual turning movement counts. This information has been plotted on traffic flow maps for the AM (8:00 ~ 9:00), Midday (12:00 ~ 1:00), PM (5:00 ~ 6:00), and Saturday Midday (1:00 ~ 2:00) peak hours. Figures 4-4, 4-5, 4-6, and 4-7 present the 2008 existing peak hour traffic volumes for the four peak hours, respectively.

Data collected from the ATRs show that the north-south corridors in the study area, Amsterdam Avenue (one-way northbound), Columbus Avenue (one-way southbound), Broadway (southbound), and West End Avenue (southbound), processed the highest number of vehicles during all four peak periods. In the east-west direction, West 57th Street is the corridor that processed the most vehicles. Analysis of the traffic volume data revealed the following:

- Amsterdam Avenue/10th Avenue northbound between West 57th and West 58th Streets carries approximately 1,545, 1,455, 1,800 and 1,340 vehicles per hour during the AM, Midday, PM, and Saturday peaks, respectively, and between West 72nd and West 73rd Streets carries 2,068, 1,481, 2,387, and 1,566 vehicles per hour during the AM, Midday, PM and Saturday peaks, respectively.
- Columbus Avenue/9th Avenue southbound between West 57th and West 58th Streets carries 1,632, 1,341, 1,346 and 1,443 vehicles per hour during the AM, Midday, PM and Saturday peaks, respectively.
- Broadway southbound between West 60th and West 61st Streets carries approximately 1,227, 1,213, 1,035 and 1,236 vehicles per hour during the AM, Midday, PM and Saturday peaks, respectively.
- West 57th Street eastbound between 8th and 9th Avenues carries approximately 682, 599, 534, and 442 vehicles per hour during the AM, Midday, PM and Saturday peaks, respectively, while the westbound direction carries approximately 711, 835, 883, and 816 vehicles per hour during the AM, Midday, PM, and Saturday peaks, respectively.

Figure 4 - 4: AM Peak Hour Traffic Volumes

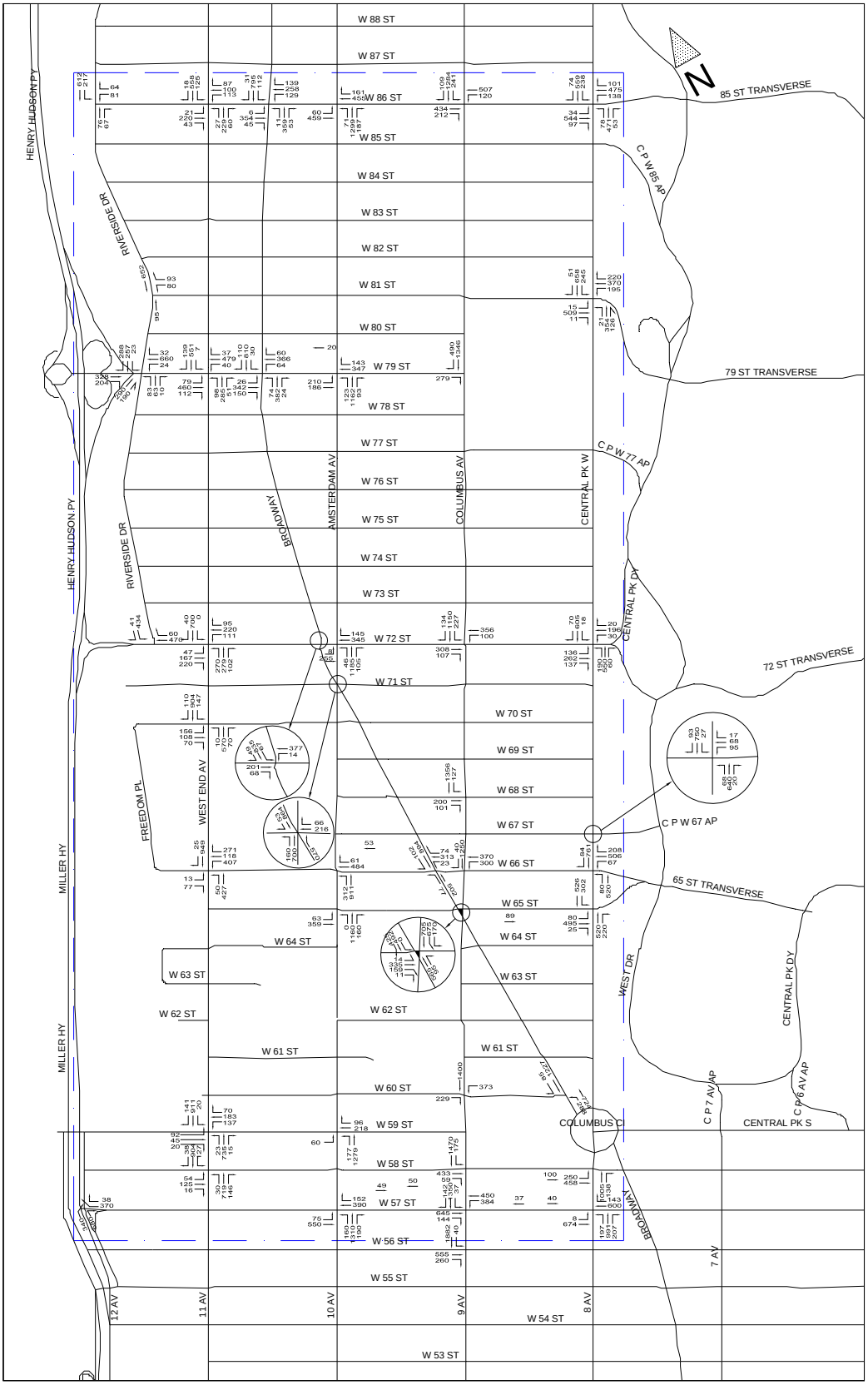


Figure 4 - 5: Midday Peak Hour Traffic Volumes

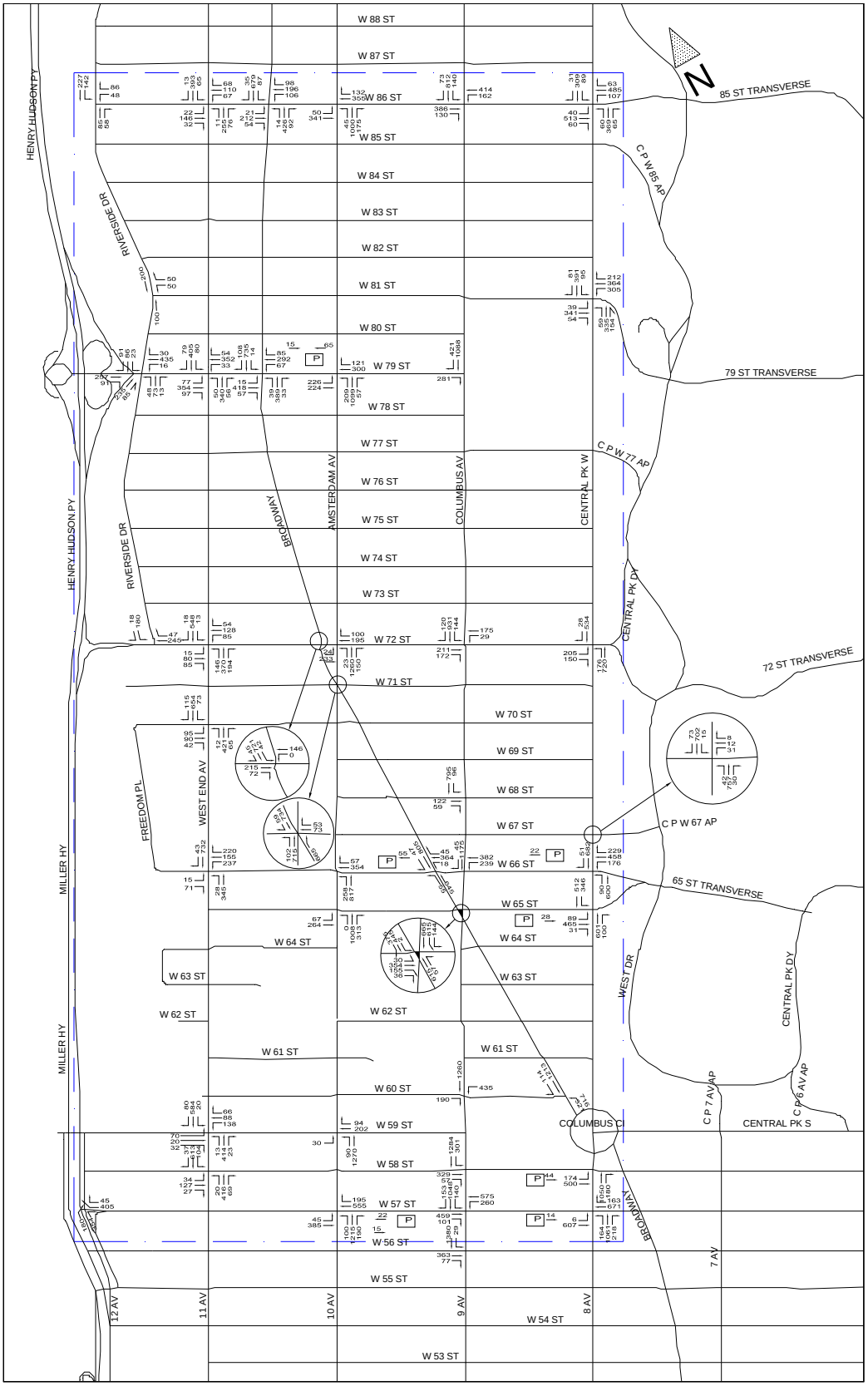


Figure 4 - 6: PM Peak Hour Traffic Volumes

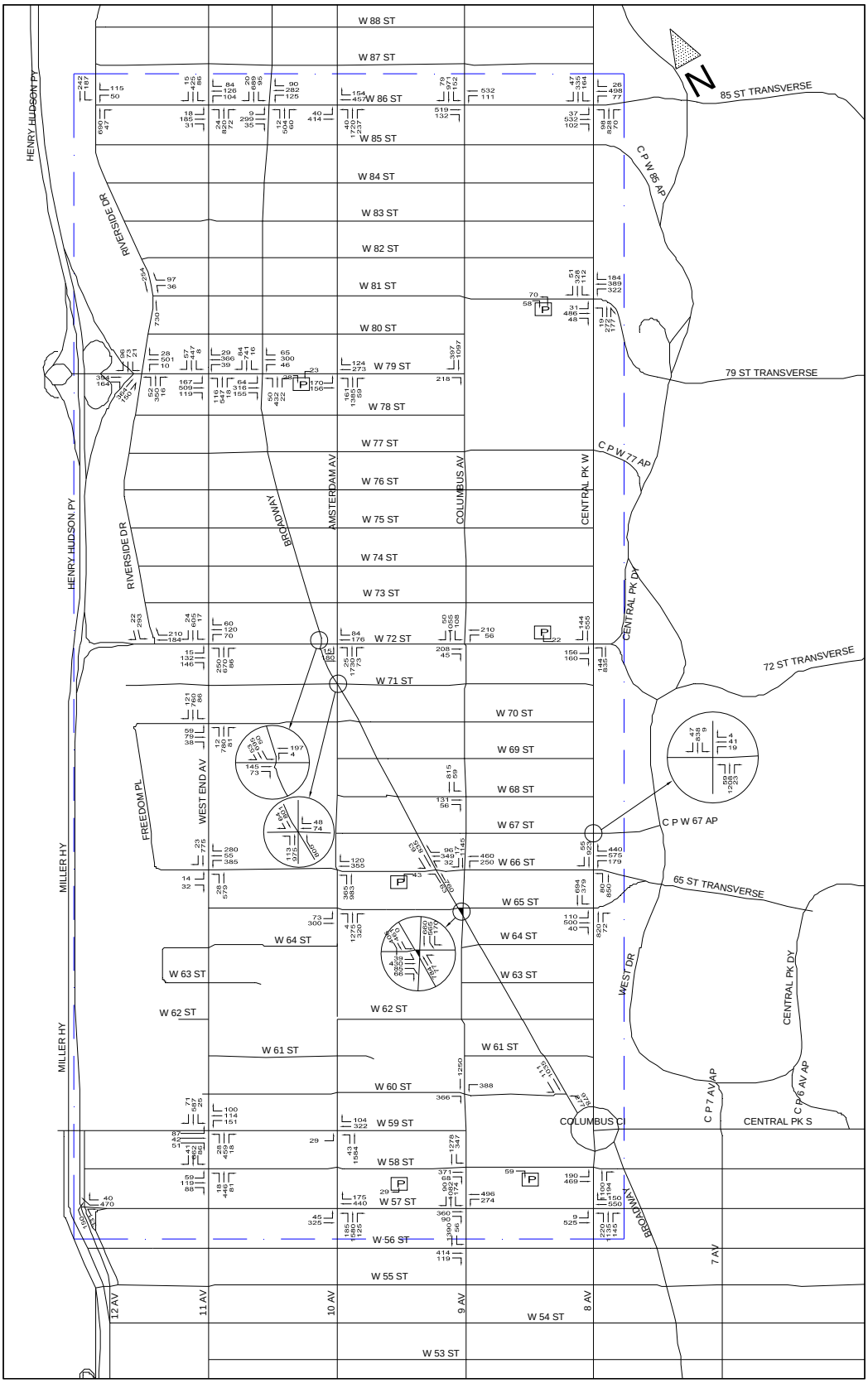
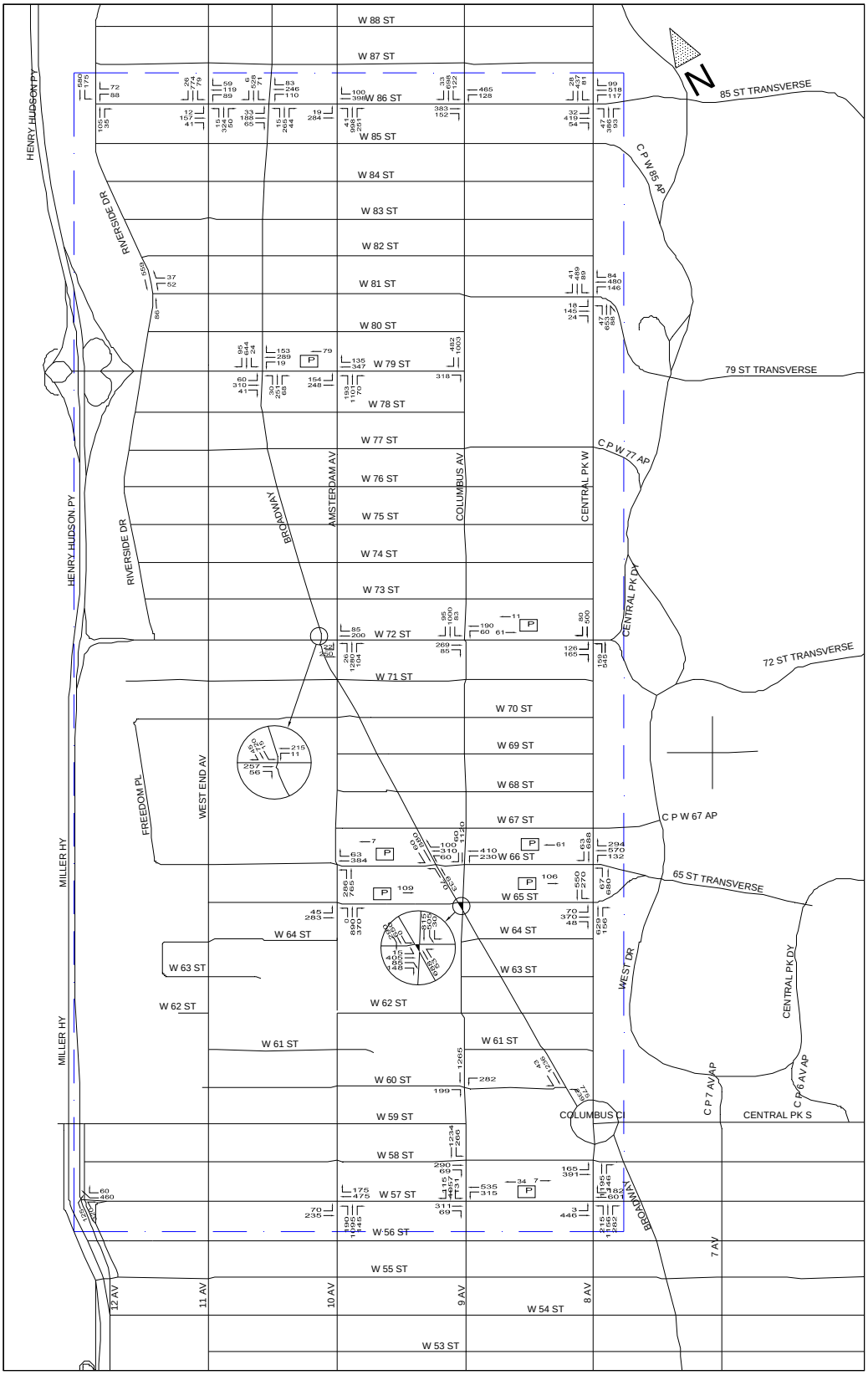


Figure 4 - 7: Saturday Midday Peak Hour Traffic Volumes



4.6 Street Capacity and Level of Service (LOS)

The capacity of a roadway is the maximum rate of flow which can pass through a section of roadway under prevailing traffic, roadway and signalization conditions. Capacity is determined by analyzing the interaction of 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. The 2000 Highway Capacity Manual (HCM) methodology was used to determine street capacity within the study area. The methodology requires the use of official signal timings, street geometry, and other relevant information for performing capacity and LOS analyses. Within the study area, 43 signalized intersections were analyzed, and field visits were conducted in order to observe prevailing conditions.

Traffic flow characteristics are measured in terms of volume-to-capacity (v/c) ratios and delays. The quality of 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 is operating at or over capacity. In this situation, severe traffic congestion occurs with stop-and-start conditions, and extensive vehicle queuing and delays. Volume-to-capacity ratios of less than 0.85 reflect acceptable traffic conditions, with average delays of 45 seconds or less. Table 4-1 shows the LOS criteria as specified in the 2000 HCM. The studied intersections were analyzed for roadway capacity, v/c ratios, vehicular delay, and LOS for the weekday AM, Midday, and PM peak hours, as well as the Saturday Midday peak hour.

Table 4 - 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 sec/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 sec/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 sec/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 sec/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 sec/veh. These higher delay values generally indicate poor progression, long cycle length, 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 over-saturation, 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).	

4.7 Existing Traffic Conditions

Table 4-2 shows the 2008 Existing Conditions v/c ratios, delays, and level of service (LOS) for the AM, Midday, PM, and Saturday peaks for the intersections analyzed in the study area. The analysis showed that most intersections operated at an acceptable level-of-service with LOS B or better during all peak periods. However, some intersections experienced LOS D, E or F for some or all lane groups during one or more peak.

Overall intersection LOS for the AM, Midday, PM, and Saturday peaks are shown in Figures 4-8, 4-9, 4-10 and 4-11; and approaches with LOS F are shown in Figure 4-12. The intersections with approaches or lane groups with mid-LOS D (equal to or greater than 45 sec/veh) or worse are listed below.

- West 57th Street & Columbus Avenue/9th Avenue (AM, MD, PM, and SAT Midday)
- West 57th Street & Amsterdam Avenue/10th Avenue (MD)
- West 57th Street & Twelfth Avenue (PM)
- West 59th Street & West End Avenue (AM, MD, and PM)
- West 60th Street & Broadway (SAT Midday)
- West 65th Street & Central Park West (PM and SAT Midday)
- West 65th Street & Columbus Avenue/9th Avenue/Broadway (AM, MD, PM, and SAT Midday)
- West 66th Street & Central Park West (AM, MD, PM, and SAT Midday)
- West 66th Street & Columbus Avenue/9th Avenue (SAT Midday)
- West 67th Street & Central Park West (PM)
- West 70th Street & West End Avenue (PM)
- West 71st Street & Amsterdam Avenue/Broadway (AM and PM)
- West 72nd Street & Central Park West (AM, MD, PM, and SAT Midday)
- West 72nd Street & West End Avenue (AM and PM)
- West 79th Street & Columbus Avenue (SAT Midday)
- West 79th Street & Amsterdam Avenue/10th Avenue (AM, MD, and SAT Midday)
- West 79th Street & Broadway (AM, MD, and SAT Midday)
- West 79th Street & West End Avenue (AM and PM)

- West 79th Street & Riverside Drive (AM)
- West 81st Street & Central Park West (AM, MD, and PM)
- West 86th Street & Central Park West (AM and PM)
- West 86th Street & Columbus Avenue/9th Avenue (AM)
- West 86th Street & Broadway (AM and PM)
- West 86th Street & West End Avenue (AM and PM)

Table 4 - 2: Traffic Capacity Analysis for Signalized Intersections
2008 Existing Conditions (1 of 6)

Loc. No.	Intersection	Approach	Lane Group	AM			Midday			PM			Saturday Midday		
				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	0.58	14.1	B	0.55	15.1	B	0.42	11.9	B			
		EB	TR	0.66	28.1	C	0.35	21.3	C	0.41	24.1	C			
	Intersection LOS	Overall			17.8	B		16.4	B		15.1	B			
2	W 57th St & 8th Avenue	NB	LTR	0.62	17.4	B	0.64	17.9	B	0.62	17.4	B	0.74	19.9	B
		EB	LT	0.54	22.7	C	0.49	21.9	C	0.41	20.9	C	0.42	20.9	C
		WB	TR	0.59	23.7	C	0.63	24.4	C	0.49	22.0	C	0.57	23.1	C
	Intersection LOS				20.3	C		20.6	C		19.2	B		20.9	C
3	W 57th St & 9th Avenue	SB	LTR	0.70	27.2	C	0.72	27.8	C						
			L							0.69	35.6	D	0.37	24.7	C
			TR							0.56	24.9	C	0.57	25.1	C
		EB	TR	1.05	82.0	F	0.96	61.1	E	0.82	44.7	D	0.64	36.0	D
		WB	DefL	1.05	79.1	E	0.83	38.6	D	0.88	44.9	D	0.89	43.9	D
			T	0.78	30.0	C	1.03	67.5	E	0.80	30.3	C	0.93	44.4	D
	Intersection LOS				47.8	D		43.3	D		32.2	C		33.0	C
4	W 57th St & 10th Avenue	NB	LT	0.64	17.7	B	0.54	16.2	B	0.58	16.7	B	0.56	16.5	B
			R	0.47	17.6	B	0.56	20.5	C	0.35	15.8	B	0.28	14.4	B
		EB	LT	0.84	35.4	D	0.59	25.0	C	0.48	22.6	C	0.50	23.2	C
		WB	TR	0.66	26.4	C	0.93	43.4	D	0.69	26.8	C	0.73	28.2	C
	Intersection LOS				23.2	C		25.9	C		19.6	B		20.4	C
5	W 57th St & 12th Avenue	NB	T	0.61	27.5	C	0.22	9.5	A	0.16	8.9	A	0.17	9.0	A
		WB	TR	0.33	31.7	C	0.45	37.3	D	0.51	49.7	D	0.60	40.3	D
	Intersection LOS				29.7	C		28.8	C		40.0	D		34.1	C
6	W 58th St & West End Avenue	NB	L	0.17	9.5	A	0.07	7.6	A	0.07	7.6	A			
			T	0.48	10.6	B	0.28	8.6	A	0.30	8.8	A			
			R	0.23	8.6	A	0.11	7.6	A	0.13	7.7	A			
		SB	L	0.51	16.7	B	0.28	9.9	A	0.24	9.4	A			
			TR	0.67	13.9	B	0.47	10.5	B	0.50	11.0	B			
		EB	LTR	0.44	29.5	C	0.43	29.3	C	0.63	34.9	C			
	Intersection LOS				14.0	B		12.2	B		14.1	B			
7	W 58th St & 9th Avenue	SB	LT	0.49	12.2	B	0.50	12.3	B	0.52	12.5	B	0.45	11.7	B
		EB	TR	0.66	30.1	C	0.51	26.9	C	0.59	28.5	C	0.47	26.2	C
	Intersection LOS				16.4	B		15.1	B		15.9	B		14.5	B
8	W 58th St & 8th Avenue	NB	TR	0.50	15.7	B	0.54	16.3	B	0.54	16.3	B	0.54	16.2	B
		EB	LT	0.61	24.2	C	0.57	23.3	C	0.59	23.7	C	0.44	21.3	C
	Intersection LOS				18.9	B		18.8	B		19.0	B		17.8	B

Table 4 - 2: Traffic Capacity Analysis for Signalized Intersections
2008 Existing Conditions (2 of 6)

Loc. No.	Intersection	Approach	Lane Group	AM			Midday			PM			Saturday Midday		
				V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
9	W 59th St & West End Avenue	NB	L	0.16	9.7	A	0.05	7.3	A	0.10	8.0	A			
			TR	0.53	11.4	B	0.31	9.0	A	0.34	9.2	A			
		SB	L	0.08	7.8	A	0.06	7.3	A	0.07	7.4	A			
			TR	0.77	16.7	B	0.48	10.8	B	0.46	10.5	B			
		EB	LTR	0.77	51.4	D	0.50	33.8	C	0.78	50.0	D			
		WB	LTR	1.05	91.7	F	0.91	60.0	E	1.05	93.4	F			
	Intersection LOS				29.4	C		21.3	C		31.6	C			
10	W 59th St & 10th Avenue	NB	LT	0.67	16.1	B	0.57	14.3	B	0.62	15.1	B			
		EB	L	0.52	34.7	C	0.32	26.7	C	0.40	31.6	C			
		WB	TR	0.46	24.8	C	0.41	23.9	C	0.59	26.9	C			
	Intersection LOS	Overall			18.5	B		16.4	B		18.2	B			
11	W 60th St & Columbus Avenue	SB	TR	0.62	20.3	C	0.49	18.5	B	0.51	18.7	B	0.59	19.8	B
		EB	R	0.48	25.0	C	0.43	23.7	C	0.75	33.3	C	0.31	21.4	C
		WB	LT	0.73	31.8	C	0.70	30.2	C	0.61	27.3	C	0.39	22.4	C
	Intersection LOS				23.2	C		21.9	C		23.2	C		20.4	C
12	W 60th St & Broadway	NB	DefL	0.69	34.3	C	0.69	31.3	C	0.75	32.5	C	0.80	39.4	D
			T	0.36	10.1	B	0.34	9.9	A	0.48	13.5	B	0.38	12.3	B
		SB	TR	0.81	31.9	C	0.92	42.3	D	0.91	41.5	D	1.00	55.9	E
	Intersection LOS				25.3	C		31.0	C		29.4	C		40.3	D
13	W 65th St & CPW	NB	TR	0.91	42.6	D	0.88	39.1	D	0.95	46.8	D	0.97	51.8	D
		SB	DefL	0.69	32.3	C	0.82	41.2	D	0.99	71.7	E	0.65	31.7	C
			T	0.38	9.9	A	0.34	9.6	A	0.50	11.3	B	0.36	9.8	A
		EB	LTR	0.75	33.8	C	0.72	32.5	C	0.65	30.8	C	0.48	28.0	C
	Intersection LOS				30.6	C		30.7	C		36.5	D		32.5	C
14a	W 65th St & Columbus/ Broadway	SB	LT	0.84	34.6	C	0.82	34.0	C	0.72	30.9	C	0.68	30.1	C
		EB	LTR	0.36	28.4	C	0.44	29.4	C	0.48	30.1	C	0.46	29.7	C
			R	0.82	58.1	E	0.91	73.0	E	0.75	50.9	D	1.05	105.5	F
	Intersection LOS				35.6	D		36.6	D		32.3	C		38.8	D
14b	W 65th St & Columbus/ Broadway	NB	TR	0.72	34.3	C	0.64	32.4	C	0.74	34.7	C	0.69	33.2	C
		SB	T	0.73	34.3	C	0.71	33.8	C	0.74	34.4	C	0.78	35.7	D
		EB	LTR	0.36	28.4	C	0.43	29.2	C	0.46	29.7	C	0.46	29.6	C
			R	0.82	58.1	E	0.91	73.0	E	0.75	50.9	D	1.05	105.5	F
	Intersection LOS				35.3	D		35.9	D		34.7	C		40.3	D
15	W 65th St & Amsterdam Avenue	NB	TR	0.56	15.2	B	0.51	14.6	B	0.53	14.8	B	0.42	13.6	B
		EB	LT	0.49	23.7	C	0.39	22.3	C	0.42	22.6	C	0.39	22.2	C
	Intersection LOS				17.0	B		16.2	B		16.3	B		15.4	B

Table 4 - 2: Traffic Capacity Analysis for Signalized Intersections
2008 Existing Conditions (3 of 6)

Loc. No.	Intersection	Approach	Lane Group	AM			Midday			PM			Saturday Midday		
				V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
16	W 66th St & Central Park West	NB	LT	1.02	52.5	D	0.76	19.2	B	1.03	54.3	D	0.70	16.4	B
		SB	TR	0.79	26.9	C	0.71	23.9	C	0.81	27.6	C	0.56	20.3	C
		WB	L	0.19	24.4	C	0.49	29.9	C	0.41	28.3	C	0.38	27.5	C
			TR	1.00	62.0	E	0.96	54.5	D	1.05	76.6	E	0.89	42.8	D
	Intersection LOS				46.4	D		32.3	C		51.8	D		26.9	C
17	W 66th St & Columbus Avenue	SB	TR	0.83	33.5	C	0.61	28.5	C	0.57	27.7	C	0.36	9.9	A
		WB	LT	0.68	15.7	B	0.50	12.2	B	0.62	14.2	B	0.81	38.3	D
	Intersection LOS				27.4	C		22.4	C		22.2	C		18.5	B
18	W 66th St & Amsterdam Avenue	NB	LT	0.59	16.9	B	0.54	16.1	B	0.53	15.9	B	0.44	14.9	B
		WB	TR	0.47	21.6	C	0.31	19.7	B	0.29	19.5	B	0.19	18.5	B
	Intersection LOS				18.3	B		17.0	B		16.7	B		15.5	B
19	W 66th St & Broadway	NB	DefL	0.70	38.8	D									
			LT				0.42	12.7	B	0.42	12.8	B	0.29	11.4	B
			T	0.31	11.6	B									
		SB	TR	0.58	15.0	B	0.48	13.5	B	0.56	14.6	B	0.64	15.8	B
		WB	LTR	0.37	23.1	C	0.50	25.0	C	0.41	23.6	C	0.61	27.2	C
	Intersection LOS				16.8	B		16.0	B		15.6	B		17.3	B
20	W 66th St & West End Avenue	NB	L	0.55	38.0	D	0.19	17.7	B	0.15	14.8	B			
			T	0.40	17.9	B	0.32	16.9	B	0.37	15.7	B			
		SB	TR	0.82	27.8	C	0.63	21.7	C	0.55	18.2	B			
			R	0.07	14.6	B	0.11	15.2	B	0.06	12.8	B			
		EB	L	0.11	22.0	C	0.09	21.0	C	0.10	21.4	C			
			R	0.23	22.5	C	0.21	22.2	C	0.10	20.5	C			
		WB	LTR	0.79	32.3	C	0.56	26.0	C	0.68	28.7	C			
	Intersection LOS	Overall			27.4	C		22.0	C		21.3	C			
21	W 67th St & Central Park West	NB	LTR	1.05	63.0	E	0.80	22.1	C	1.05	61.0	E			
		SB	LTR	0.74	19.4	B	0.80	21.2	C	0.67	17.1	B			
		WB	LTR	0.46	25.9	C	0.15	21.1	C	0.14	20.8	C			
	Intersection LOS	Overall			41.3	D		21.6	C		42.3	D			
22	W 68th St & Columbus Avenue	SB	LT	0.56	14.2	B	0.34	11.7	B	0.35	11.9	B			
		EB	TR	0.61	29.5	C	0.38	24.2	C	0.41	24.8	C			
	Intersection LOS	Overall			16.9	B		13.9	B		14.1	B			
23	W 70th St & West End Avenue	NB	LTR	0.51	17.8	B	0.63	19.9	B	1.04	59.6	E			
		SB	LTR	1.05	63.5	E	0.96	43.0	D	1.05	67.1	E			
		EB	LTR	0.49	25.0	C	0.46	24.6	C	0.28	22.2	C			
	Intersection LOS	Overall			45.5	D		31.2	C		59.0	E			
24a	W 71st St & Amsterdam Avenue	NB	LT	1.05	73.6	E	0.79	38.6	D	1.05	73.0	E			
		WB	TR	1.05	91.1	F	0.47	29.9	C	0.48	29.0	C			
	Intersection LOS	Overall			77.8	E		37.4	D		68.5	E			

Table 4 - 2: Traffic Capacity Analysis for Signalized Intersections
2008 Existing Conditions (4 of 6)

Loc. No.	Intersection	Approach	Lane Group	AM			Midday			PM			Saturday Midday		
				V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
24b	W 71st St & Broadway	NB	T	0.69	32.3	C	0.69	32.7	C	0.97	53.0	D			
		SB	TR	0.93	46.5	D	0.83	38.6	D	0.88	41.1	D			
		WB	TR	0.92	58.6	E	0.46	29.4	C	0.48	29.0	C			
	Intersection LOS	Overall			43.5	D		35.3	D		46.0	D			
25	W 72nd St & Central Park West	NB	LTR	1.00	56.3	E	0.98	49.6	D	1.02	58.0	E	0.85	30.1	C
		SB	LTR	0.59	20.4	C	0.49	18.5	B	0.64	19.6	B	0.52	17.3	B
		EB	L	0.55	29.8	C	0.45	24.5	C	0.32	23.9	C	0.29	23.7	C
			TR	0.47	23.5	C									
			LR				0.00	18.0	B	0.00	20.0	C	0.00	20.0	C
			R				0.57	30.2	C	0.67	38.4	D	0.99	95.2	F
		WB	LTR	0.30	21.1	C									
	Intersection LOS				34.0	C		35.1	D		39.6	D		31.5	C
26	W 72nd St & Columbus Avenue	SB	LTR	0.75	20.2	C	0.55	16.4	B	0.52	15.9	B	0.55	16.5	B
		EB	TR	0.41	20.9	C	0.36	20.3	C	0.23	18.8	B	0.32	19.8	B
		WB	DefL												
			LT	0.71	29.0	C	0.31	20.1	C	0.38	21.0	C	0.48	23.0	C
			T												
	Intersection LOS				21.8	C		17.7	B		17.2	B		18.2	B
27	W 72nd St & Amsterdam Avenue	NB	L	0.20	12.1	B	0.11	10.7	B	0.18	12.1	B	0.17	11.7	B
			TR	0.68	16.7	B	0.81	20.7	C	0.82	20.4	C	0.71	17.4	B
		EB	LT	0.23	21.4	C	0.25	21.7	C	0.18	20.9	C	0.28	22.0	C
		WB	TR	0.48	24.5	C	0.32	22.6	C	0.27	21.9	C	0.34	22.8	C
	Intersection LOS				19.1	B		21.0	C		20.5	C		18.8	B
28	W 72nd St & Broadway	SB	LTR	0.48	13.4	B	0.42	12.7	B	0.46	13.1	B	0.36	12.0	B
		EB	TR	0.48	25.4	C	0.42	24.2	C	0.42	24.4	C	0.41	24.0	C
		WB	LT	0.51	25.6	C	0.17	20.9	C	0.23	21.6	C	0.30	22.4	C
	Intersection LOS				18.6	B		16.5	B		16.5	B		16.9	B
29	W 72nd St & West End Avenue	NB	DefL	0.91	61.8	E	0.46	28.4	C	0.58	27.8	C			
			TR	0.38	15.9	B	0.55	18.5	B	0.62	17.4	B			
		SB	LTR				0.82	38.4	D	1.05	83.7	F			
			LT	0.78	32.5	C									
			R	0.15	21.4	C									
		EB	LTR	0.38	28.0	C	0.19	29.2	C	0.29	30.3	C			
			R	0.69	39.7	D	0.55	43.4	D	0.75	54.1	D			
		WB	LTR	0.65	34.3	C	0.52	35.1	D	0.47	33.8	C			
			R	0.40	31.0	C	0.33	34.0	C	0.37	35.6	D			
	Intersection LOS	Overall			33.6	C		30.3	C		43.3	D			
30	W 72nd St & Riverside Dr	SB	LR	0.69	22.6	C	0.34	19.6	B	0.54	23.3	C			
		WB	T	0.60	31.1	C	0.24	20.9	C	0.18	20.3	C			
			R	0.06	1.6	A	0.04	1.5	A	0.20	2.1	A			
	Intersection LOS	Overall			25.4	C		18.5	B		16.3	B			

Table 4 - 2: Traffic Capacity Analysis for Signalized Intersections
2008 Existing Conditions (5 of 6)

Loc. No.	Intersection	Approach	Lane Group	AM			Midday			PM			Saturday Midday		
				V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
31	W 79th St & Columbus Avenue	SB	TR	0.87	24.5	C	0.96	35.8	D	0.93	30.8	C	0.96	36.0	D
		EB	R	0.50	29.2	C	0.61	33.5	C	0.54	31.7	C	0.89	54.9	D
	Intersection LOS				25.2	C		35.4	D		30.9	C		39.6	D
32	W 79th St & Amsterdam Avenue	NB	LTR	0.62	21.5	C	0.66	22.3	C	0.68	22.6	C	0.60	21.2	C
		EB	DefL	0.84	54.7	D	1.00	89.1	F	0.67	36.9	D	0.82	58.0	E
			T	0.17	18.3	B	0.21	18.7	B	0.14	18.1	B	0.24	19.0	B
		WB	TR	0.92	55.2	E	0.83	46.0	D	0.77	41.4	D	0.97	65.5	E
	Intersection LOS				31.3	C		33.0	C		26.5	C		33.1	C
33	W 79th St & Broadway	NB	DefL	0.64	35.2	D				0.46	22.7	C			
			LTR				0.26	13.2	B				0.20	12.2	B
			TR	0.26	12.7	B				0.23	12.5	B			
		SB	LTR	0.54	15.8	B	0.46	15.2	B	0.45	14.6	B	0.42	14.2	B
		EB	DefL										0.82	71.4	E
			LTR	0.64	30.7	C	0.54	28.9	C	0.71	32.7	C			
			TR										0.48	27.9	C
		WB	LTR	1.05	85.7	F	0.92	55.3	E	0.40	28.0	C	0.92	50.7	D
	Intersection LOS				32.4	C		25.3	C		20.3	C		27.0	C
34	W 79th St & West End Avenue	NB	LTR	0.61	18.3	B	0.46	14.9	B	0.85	27.5	C			
			TR												
		SB	LTR	0.69	19.0	B	0.67	19.5	B	0.45	14.6	B			
		EB	LTR	1.05	77.2	E	0.82	35.7	D	1.01	59.6	E			
		WB	LTR	1.05	74.8	E	0.63	26.9	C	0.65	28.0	C			
	Intersection LOS	Overall			49.8	D		24.5	C		35.5	D			
35	W 79th St & Riverside Dr	NB	LTR	0.61	31.5	C	0.29	20.3	C	0.79	34.4	C			
		SB	LTR	1.05	79.1	E	0.40	22.1	C	0.39	22.0	C			
		EB	T	0.44	15.3	B	0.35	14.2	B	0.53	16.7	B			
			R	0.58	19.1	B	0.27	13.9	B	0.47	16.8	B			
		WB	LT	0.53	16.7	B	0.34	14.2	B	0.39	14.7	B			
			R	0.07	11.9	B	0.06	11.8	B	0.06	11.8	B			
	Intersection LOS	Overall			32.1	C		15.7	B		20.0	C			
36	W 81st St & Central Park West	NB	LTR	0.50	17.8	B	0.75	24.7	C	0.49	17.7	B	0.83	28.2	C
		SB	LTR	1.00	51.3	D	0.77	25.7	C	0.59	19.8	B	0.79	27.1	C
		EB	L	0.07	23.1	C	0.20	26.4	C	0.13	23.7	C	0.10	24.5	C
			TR	1.05	85.4	F	1.02	79.0	E	1.05	86.3	F	0.37	27.7	C
		WB	L	0.85	64.4	E	1.04	98.0	F	1.05	99.0	F	0.53	27.9	C
			TR	0.89	46.2	D	0.93	51.7	D	0.81	39.1	D	0.84	40.2	D
	Intersection LOS				51.2	D		48.2	D		48.7	D		31.0	C

Table 4 - 2: Traffic Capacity Analysis for Signalized Intersections
2008 Existing Conditions (6 of 6)

Loc. No.	Intersection	Approach	Lane Group	AM			Midday			PM			Saturday Midday		
				V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS	V/C Ratio	Avg Delay	LOS
37	W 81st St & Riverside Dr	NB	T	0.17	8.1	A	0.15	7.9	A	0.85	24.1	C	0.14	7.8	A
		SB	T	0.53	11.2	B	0.13	0.8	A	0.16	7.7	A	0.36	9.3	A
		WB	LR	0.65	37.7	D	0.33	28.3	C	0.51	32.4	C	0.32	28.1	C
	Intersection LOS				15.7	B		12.7	B		21.6	C		11.5	B
38	W 86th St & Central Park West	NB	LTR	0.86	35.8	D	0.68	25.0	C	0.96	43.5	D	0.66	24.5	C
		SB	DefL							1.02	99.7	F			
			LTR	1.05	71.2	E	0.68	26.1	C				0.91	40.5	D
			TR							0.64	25.7	C			
		EB	LTR	0.79	38.4	D	0.78	39.2	D	0.88	46.0	D	0.73	37.1	D
		WB	L	0.66	32.9	C	0.54	26.0	C	0.42	23.8	C	0.48	24.3	C
			TR	0.58	23.2	C	0.67	25.4	C	0.60	23.7	C	0.60	23.7	C
	Intersection LOS				43.9	D		28.7	C		39.9	D		31.2	C
39	W 86th St & Columbus Avenue	SB	LTR	1.05	62.9	E	0.73	23.5	C	0.76	24.4	C	0.60	20.5	C
		EB	TR	0.69	31.8	C	0.52	27.9	C	0.63	29.9	C	0.56	28.5	C
		WB	LT	0.78	28.2	C	0.71	25.2	C	0.83	32.0	C	0.81	30.6	C
	Intersection LOS				48.7	D		25.0	C		27.8	C		25.6	C
40	W 86th St & Amsterdam Avenue	NB	LTR	0.81	22.2	C	0.61	17.5	B	0.87	24.7	C	0.65	18.0	B
		EB	LT	0.85	36.9	D	0.56	24.3	C	0.65	26.4	C	0.35	20.5	C
		WB	TR	0.80	31.9	C	0.60	25.0	C	0.72	28.1	C	0.57	24.0	C
	Intersection LOS				27.3	C		20.5	C		25.7	C	0.61	19.7	B
41	W 86th St & Broadway	NB	LTR	0.33	14.0	B	0.41	15.0	B	0.39	14.7	B	0.24	13.1	B
		SB	LTR	0.73	21.1	C	0.69	20.0	C	0.64	18.8	B	0.44	15.2	B
		EB	LTR	0.35	20.1	C	0.28	19.5	B	0.33	19.9	B	0.28	19.4	B
		WB	DefL	0.73	42.7	D	0.50	28.0	C	0.74	43.2	D	0.51	28.0	C
			TR	0.53	23.4	C	0.39	21.1	C	0.44	21.8	C	0.40	21.1	C
	Intersection LOS				21.3	C		19.2	B		20.0	C		17.6	B
42	W 86th St & West End Avenue	NB	LTR	0.32	10.0	B	0.30	9.8	A	0.71	16.0	B	0.36	10.3	B
		SB	LTR	0.69	16.1	B	0.45	11.6	B	0.64	15.7	B	0.75	17.6	B
		EB	LTR	0.53	30.8	C	0.42	28.6	C	0.47	29.4	C	0.42	28.6	C
		WB	LTR	0.86	49.7	D	0.59	32.8	C	0.79	43.3	D	0.68	36.6	D
	Intersection LOS				24.0	C		18.2	B		22.0	C		20.2	C
43	W 86th St & Riverside Dr	NB	TR	0.24	8.8	A	0.22	8.5	A	0.88	26.9	C	0.20	8.2	A
		SB	DefL				0.36	10.4	B	0.73	28.4	C			
			LT	0.58	12.1	B							0.49	10.8	B
			T				0.27	8.9	A	0.26	8.8	A			
		WB	L	0.24	26.6	C	0.13	25.0	C	0.15	25.3	C	0.33	27.9	C
			R	0.28	27.9	C	0.34	29.0	C	0.48	32.6	C	0.35	29.2	C
	Intersection LOS				13.7	B		12.8	B		24.4	C		13.9	B

Figure 4 - 8: Intersection Level of Service - AM Peak Hour

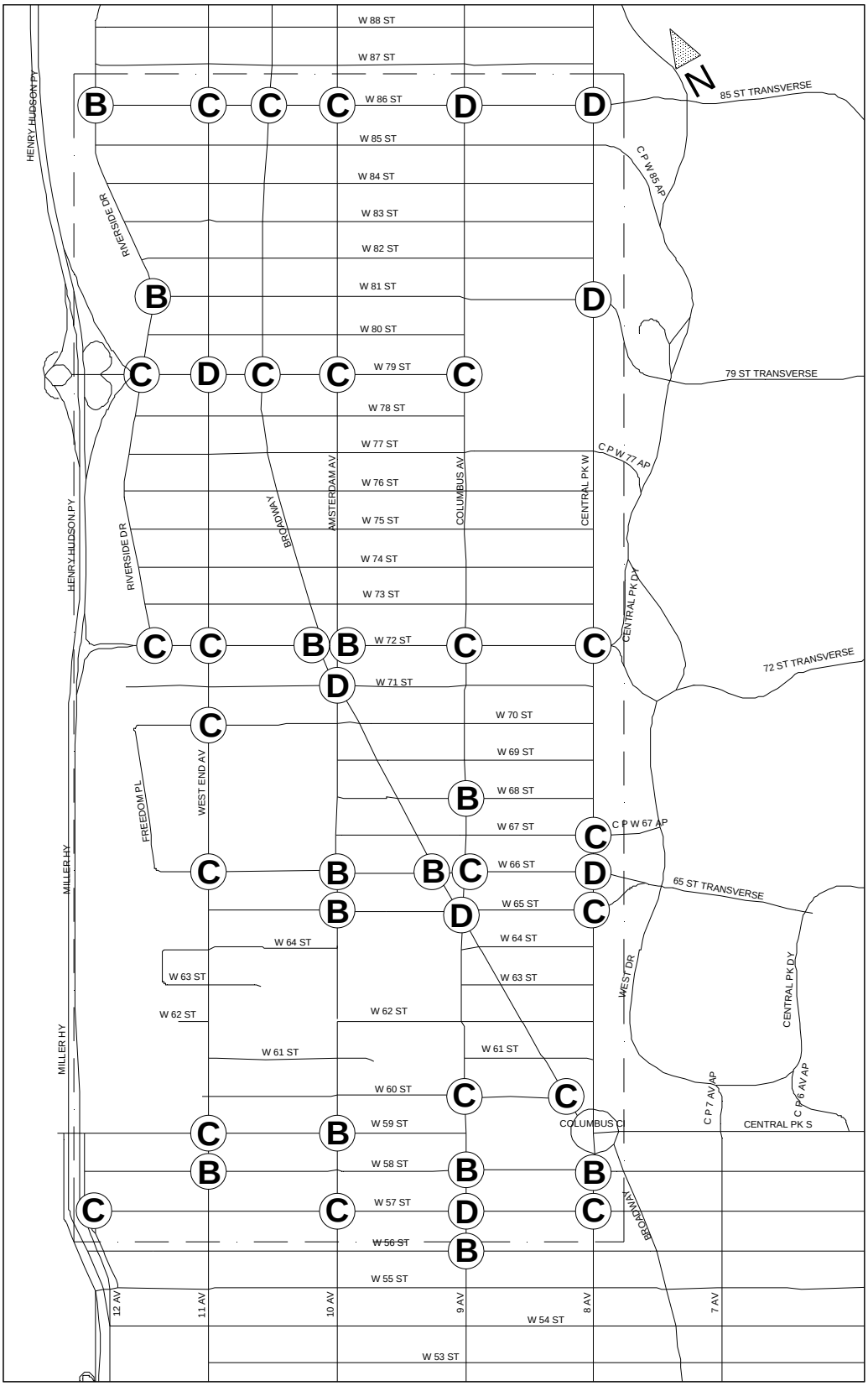


Figure 4 - 9: Intersection Level of Service - Midday Peak Hour

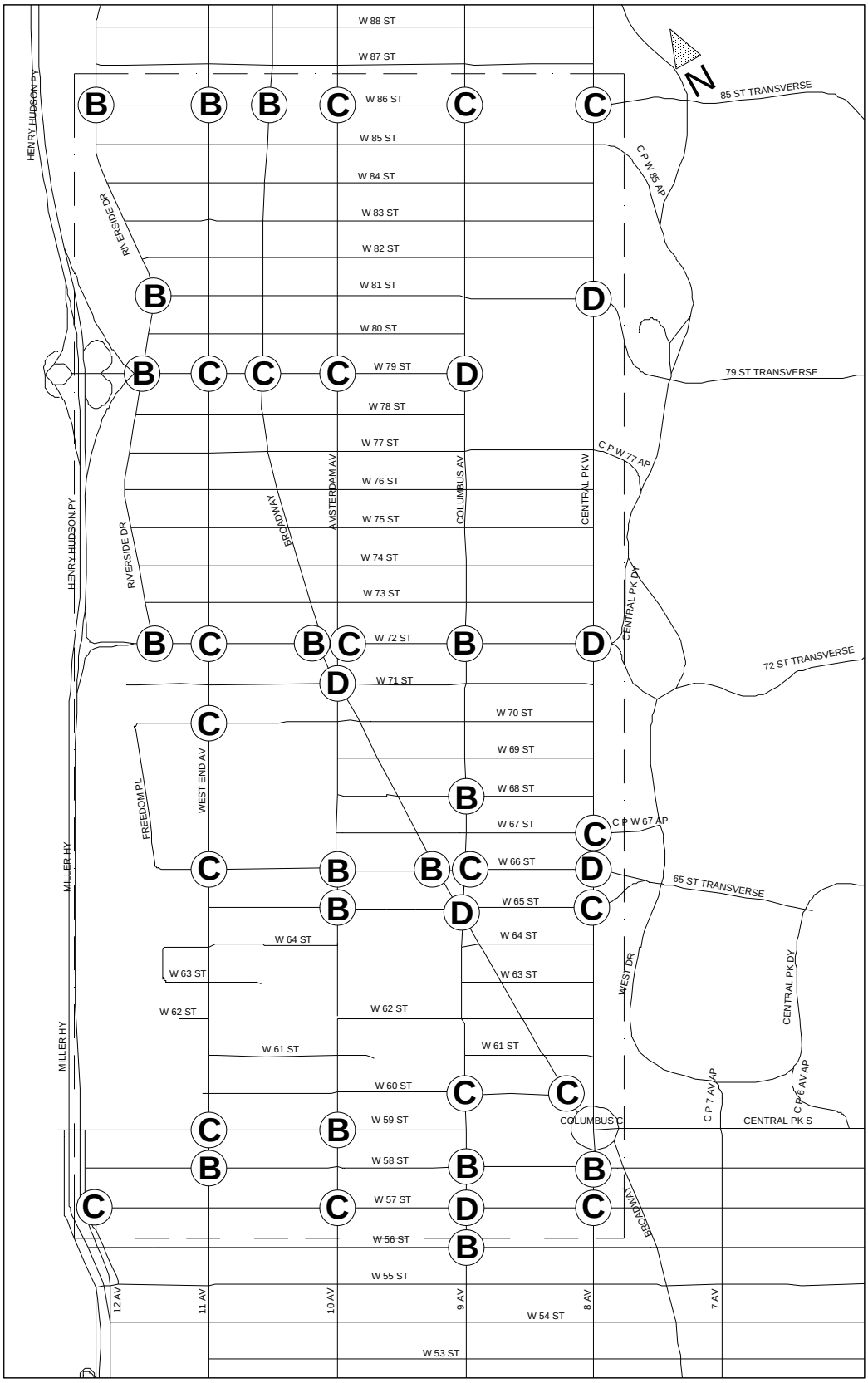


Figure 4 - 10: Intersection Level of Service - PM Peak Hour

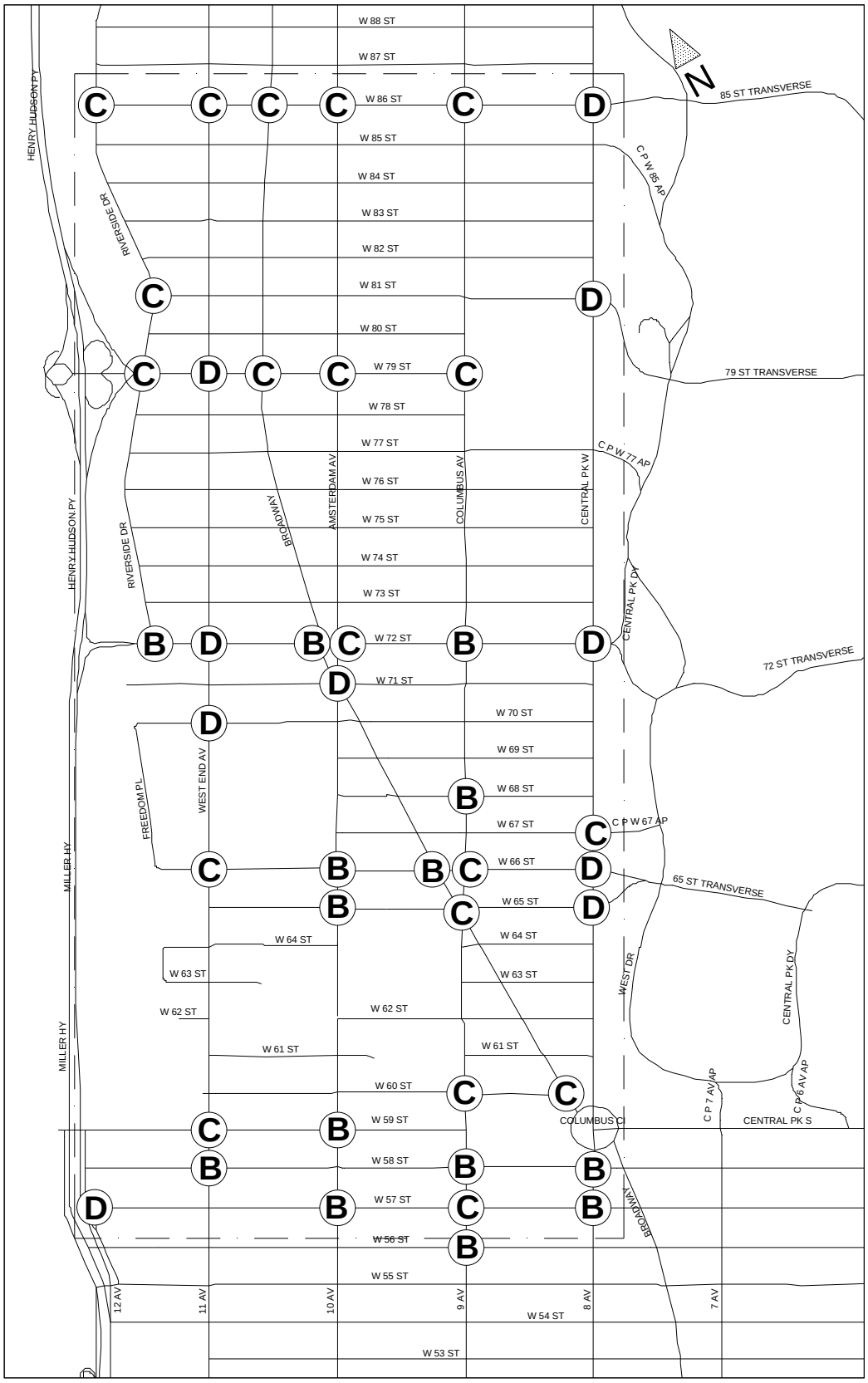


Figure 4 - 11: Intersection Level of Service - Saturday Midday Peak Hour

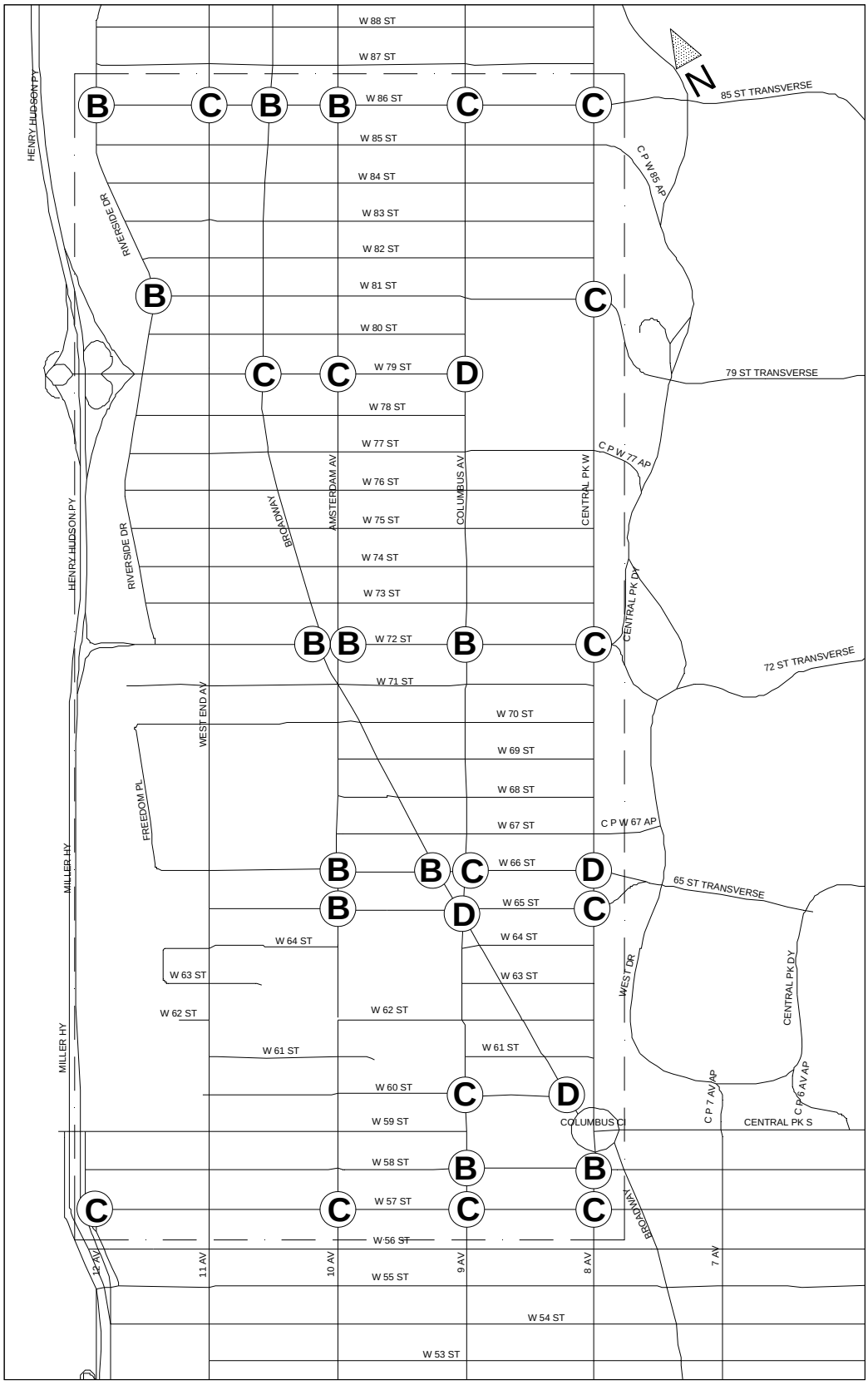
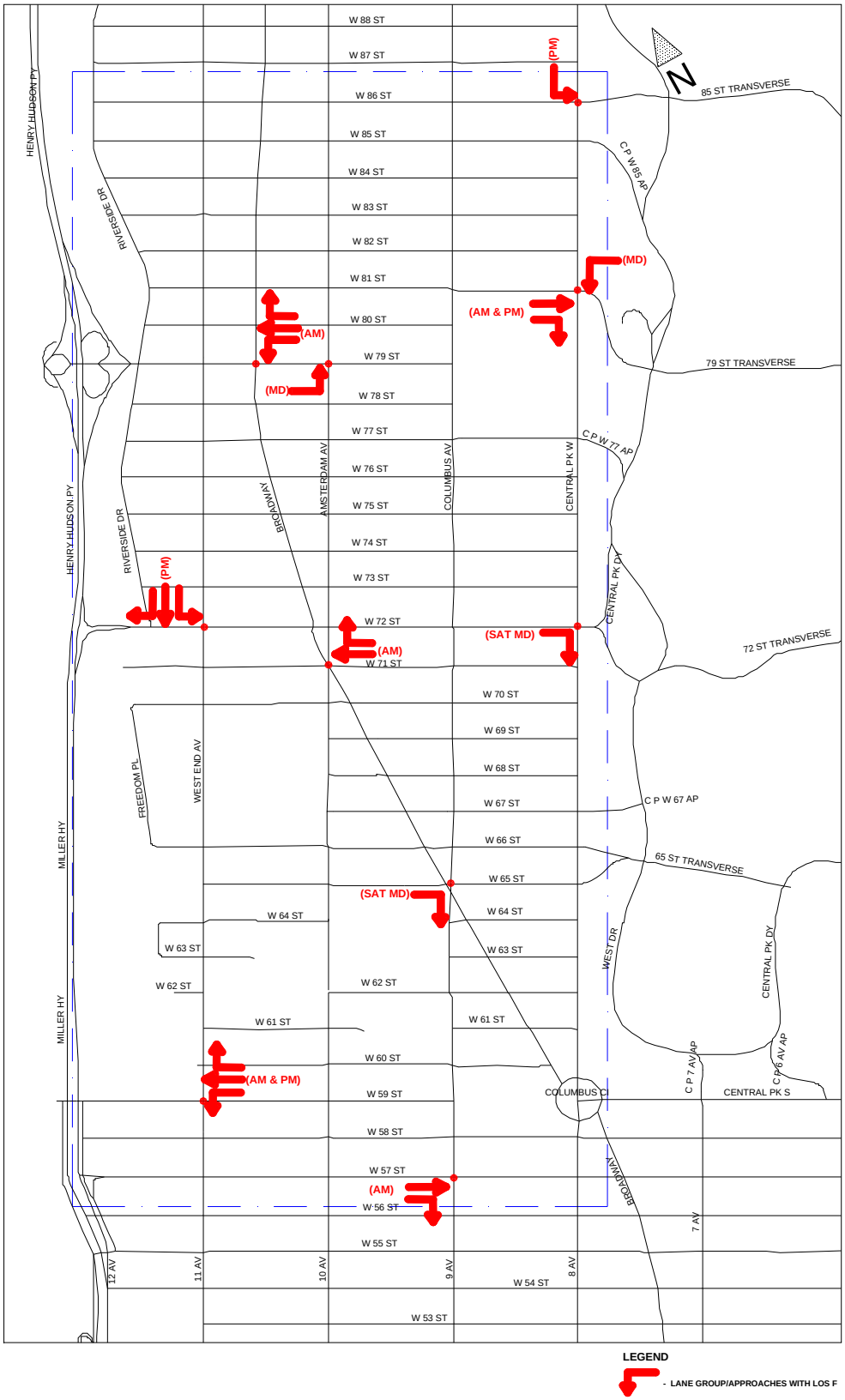


Figure 4 - 12: Lane Group/Approaches with LOS F



4.8 Vehicular Speeds

Several corridors within the study area experience congestion, particularly during peak hours. Congestion is attributed to factors including bus/car/truck/pedestrian conflicts, illegal curbside parking, double parking, and standing, all of which contribute to reduced roadway capacity, and result in delays and reduced travel speeds.

To measure peak hour travel time and vehicular speeds in the study area and thus identify locations where traffic delays exist, speed and travel time runs were conducted. The "floating car" method (a technique whereby a field vehicle travels at speeds under prevailing traffic conditions) was used to measure peak hour travel speeds on the following corridors:

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/9th 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)

The travel time runs were conducted for each peak period on three consecutive weekdays concurrently with traffic volume data collection. Three travel runs were performed for each link during each peak travel period.

Figure 4-13 shows the corridors where travel time runs were conducted, and Table 4-3 summarizes the average travel speeds for each corridor by direction for the various peak hours. Travel speeds throughout the study area for the various peak periods range from 2 mph to 13 mph. As shown in Table 4-3, most of the corridors experience low speeds of less than 10 mph during one or more peak hours.

Figure 4 - 13: Speed Run Corridors – Average of All Peak Periods

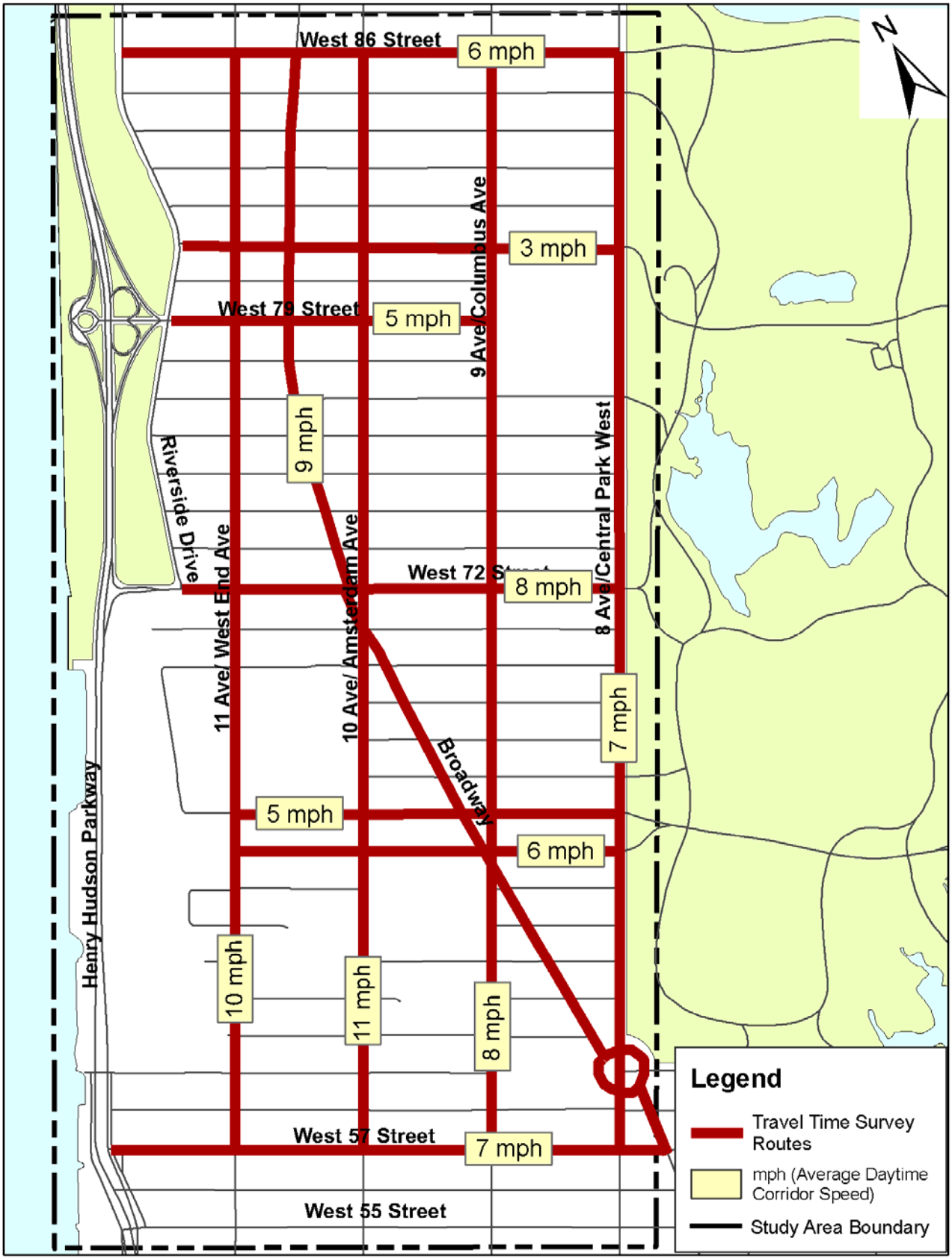


Table 4 - 3: Corridor Travel Speeds Summary (1 of 2)

No.	Corridors	Time	Direction	Existing Conditions Average Speed (MPH)
1	West 57th St between Broadway & Twelfth Avenue	AM	EB	6.9
			WB	7.6
		MD	EB	6.7
			WB	7.2
		PM	EB	6.8
			WB	7.4
2	West 65th St between Central Park West & West End Avenue	AM	EB	6.4
		MD	EB	5.7
		PM	EB	5.1
3	West 66th St between Central Park West & West End Avenue	AM	WB	5.9
		MD	WB	5.5
		PM	WB	5.1
4	West 72nd St between Central Park West & Riverside Dr	AM	EB	8.9
			WB	9.6
		MD	EB	6.7
			WB	6.2
		PM	EB	7.8
			WB	8.8
5	West 79th St between Riverside Dr & Columbus Avenue	AM	EB	4.4
			WB	4.8
		MD	EB	5.9
			WB	4.5
		PM	EB	4.4
			WB	4.4
6	West 81st St between Riverside Dr & Amsterdam Avenue	AM	WB	3.2
		MD	WB	2.7
		PM	WB	2.0

Table 4 - 3: Corridor Travel Speeds Summary (2 of 2)

No.	Corridors	Time	Direction	Existing Conditions
				Average Speed (MPH)
7	West 86th St between Central Park West & Riverside Dr	AM	EB	6.2
			WB	5.1
		MD	EB	6.6
			WB	6.9
		PM	EB	5.1
			WB	6.1
8	Central Park West between West 57th St & West 86th St	AM	NB	7.6
			SB	7.3
		MD	NB	8.4
			SB	7.1
		PM	NB	8.1
			SB	6.4
9	Columbus Avenue between West 57th St & West 86th St	AM	SB	10.3
		MD	SB	5.6
		PM	SB	8.1
10	Amsterdam Avenue between W 57th St & West 86th St	AM	NB	10.3
		MD	NB	11.4
		PM	NB	10.2
11	West End Avenue between West 57th St & West 86th St	AM	NB	9.8
			SB	12.2
		MD	NB	10.1
			SB	10.9
		PM	NB	8.6
			SB	8.8
12	Broadway between West 57th St & West 86th St	AM	NB	9.5
			SB	10.3
		MD	NB	9.9
			SB	8.2
		PM	NB	8.8
			SB	8.5

5.0 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, and 66th Street, 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.

5.1 Buses

The M5 bus provides service between the George Washington Bridge (West 178th Street) and West Houston Street. Within the study area, the M5 bus travels along Broadway (from West 59th Street to West 72nd Street), along West 72nd Street (between Broadway and Riverside Drive), and along Riverside Drive (from West 72nd Street to West 86th Street). Major transfer points along this line in the study area are 59th Street (access to the A, B, C, D, and 1 trains, and the M7, M10, M20, and M104 buses), 66 Street (access to the 1 train), and 72nd Street (access to the 1, 2, and 3 trains). Along Broadway the bus makes limited stops between West 59th Street and West 72nd Street during rush hour.

The M7 bus provides service between West 147th Street/Lenox Avenue and East 13th Street/Broadway. Within the study area, the M7 bus travels along Broadway, Columbus Avenue, and Amsterdam Avenue. The bus travels two-way on Broadway between West 59th Street and West 66th Street, one-way northbound on Broadway between West 66th Street and West 86th Street, and one-way southbound on Columbus Avenue between West 86th Street and Broadway. The major transfer points along this route are 59th Street/Columbus Circle and 72nd Street.

The M10 bus provides service between 159th Street and West 31st Street. Within the study area, the M10 bus operates along Central Park West between West 86th Street and West 57th Street. Southbound buses also travel along West 63rd Street and Broadway to Columbus Circle. The major transfer point along this route is 59th Street/Columbus Circle (access to the A, B, C, D, 1, 2, and 3 trains).

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.

The M31 bus provides service between West 57th Street/11th Avenue and York Avenue/East 92nd Street. Within the study area, service is provided along 57th Street between West End Avenue and Central Park West. Transfer to the subway system is possible at 57th Street/8th Avenue for access to the A, B, C, D, and 1 trains.

The M57 bus provides service between 72nd Street/Broadway and East 60th Street/York Avenue. Within the study area, service is provided along West 57th Street between Broadway and West End Avenue, along West End Avenue from West 57th Street to West 72nd Street, and along West 72nd Street between West End Avenue and Broadway. Major transfer points along this route are 72nd Street (1, 2, and 3 trains) and Columbus Circle (A, B, C, D, and 1 trains).

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. Transfer to the subway system is possible at 66th Street (1 train).

The M72 bus provides service from York Avenue/East 72nd Street to Freedom Place/West 70th Street. Within the study area, the M72 bus provides service along Central Park West between West 65th and West 72nd Street, West 72nd Street between Central Park West and West End Avenue, West End Avenue, West 70th Street, Riverside Drive, West 68th Street, and Freedom Place. Major transfer points are Central Park West/West 72nd Street (B and C trains, and M10 bus) and Broadway/West 72nd Street (1, 2, and 3 trains, and M5, M7, M11 and M104 buses).

The M79 bus provides service between East 79th Street/East End Avenue and West 79th Street/Riverside Drive. Within the study area, the bus provides service along West 79th

Street, Amsterdam Avenue, Columbus Avenue, and West 81st Street. The major transfer points along the route are Central Park West/81st Street where there are connections to the B and C trains, and M10 bus, and West 79th Street/Broadway where there are connections to the 1 train and M104 bus.

The M86 bus provides service between York Avenue/East 92nd Street and West End Avenue/West 86th Street. Within the study area, the bus operates along West 86th Street, Broadway, West 87th Street, and West End Avenue. The major transfer points along the route are Central Park West/West 86th Street (B and C trains, and M10 bus) and West 86th Street/Broadway (1 train and M104 bus).

The M104 bus provides service between West 129th Street/Amsterdam Avenue and East 41st Street/First Avenue. Within the study area, the bus provides service along Broadway and 8th Avenue between West 86th Street and West 55th Street. Transfers to the subway system and cross town buses are possible at West 86th Street, West 79th Street, West 72nd Street, West 66th Street, and West 59th Street.

Figure 5-1 shows the bus routes and subway lines in the study area and Tables 5-1 to 5-5 provide a summary of bus service during the AM, midday, PM, and Saturday midday peak hours.

Figure 5 - 1: Bus and Subway Routes

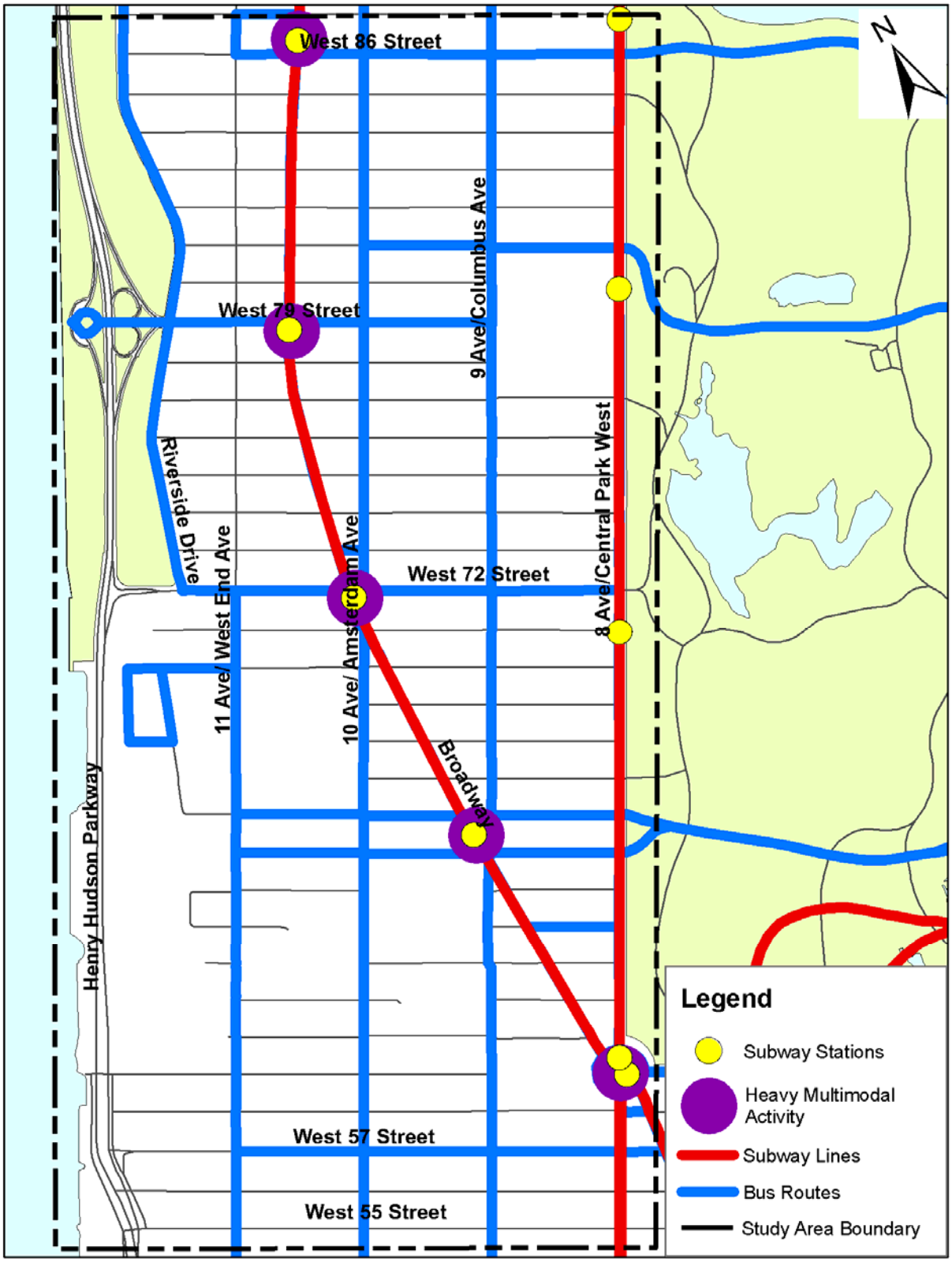


Table 5 - 1: Bus Ridership - Average Weekday AM Peak

Bus Route	Bus Route Description	Direction	Maximum Load Point	Buses Per Hour	Hourly Passenger Volume	Bus Capacity Per Hour	Average Ridership Bus	Available Capacity	Hourly Passenger Volume
M5	Between Broadway/West 178th Stteet and Houston Street/West Broadway	NB	6th Avenue/West 14th Street & 6th Avenue/West 34th Street	6	214	420	36	206	659
		SB	Columbus Circle & West 72nd Street/Broadway	10	445	700	45	255	
M7	Between West 146th Street/Lenox Avenue and Broadway/East 13th Street	NB	6th Avenue/West 34th Street & Amsterdam Avenue/West 99th Street	4	129	280	32	151	549
		SB	Columbus Avenue/West 106th Street & Columbus Avenue/West 79th Street	8	420	560	53	140	
M10	Between 8th Avenue/West 159th Street and West 31st Street/8th Avenue	NB	Frederick Douglas Blvd/West 116th Street & Frederick Douglas Blvd/West 125th Street	5	109	350	22	241	442
		SB	Frederick Douglas Boulevard/West 145th Street	8	333	560	42	227	
M11	Between West 145th Street/Riverbank State Park and Bethune Street/Hudson Street	NB	Amsterdam Avenue/West 66th Street & Amsterdam Avenue/West 99th Street	6	240	420	40	180	647
		SB	Columbus Avenue/West 96th Street & Columbus Avenue/West 66th Street	9	407	630	45	223	
M31	Between East 92nd Street/York Avenue and West 54th Street/11 Avenue	NB	West 57th Street/6th Avenue	8	338	560	42	222	1167
		SB	York Avenue/East 72nd Street & East 5th Street/2nd Avenue	21	829	1470	39	641	
M57	Between East 60th Street/York Avenue and West 72nd Street/Broadway	EB	West 57th Street/Broadway & West 57th Street/6th Avenue	6	310	420	52	110	493
		WB	West 57th Street/Broadway	6	183	420	31	237	
M66	Between East 67th Street/York Avenue and West 66th Street/West End Avenue	EB	East 68th Street/Lexington Avenue	12	598	840	50	242	1282
		WB	East 67th Street/Lexington Avenue	16	684	1120	43	436	
M72	Between East 72nd Street/York Ave and Freedom Place/West 70th Street	EB	West 72nd Street/Central Park West	5	293	350	59	57	536
		WB	East 72nd Street/5th Avenue	5	243	350	49	107	
M79	Between West 79th Street/Riverside Drive and West 79th Street/East End Avenue	EB	East 79th Street/5th Avenue & West 81st Street/Central Park West	15	1169	1050	78	-119	2588
		WB	East 79th Street/Lexington Avenue	18	1419	1260	79	-159	
M86	Between East 92nd Street/York Avenue and West 86th Street/West End Avenue	EB	East 84th Street/5th Avenue	17	1212	1190	71	-22	2777
		WB	East 86th Street/Lexington Avenue	22	1565	1540	71	-25	
M104	Between West 129th Street/Amsterdam Avenue and East 41st Street/1st Avenue	NB	Grand Central Station & West 42nd Street/Broadway	7	300	490	43	190	866
		SB	Broadway/West 96th Street & Broadway/West 61st Street	14	566	980	40	414	

Notes:

1. Dervied from NYCT Ridercheck Survey
2. Maximum load point is defined as the peak passenger accumulation point on a bus route.
3. The hourly volume is calculated by adding the highest accumulation on each bus during the peak hour.
4. Available capacity is calculated by multiplying the existing bus frequency by the bus capacity and substracting the hourly volume.
5. Maximum capacity of buses is 70 passengers per bus.

Source: New York City Transit (NYCT)

Table 5 - 2: Bus Ridership - Average Weekday Midday Peak

Bus Route	Bus Route Description	Direction	Maximum Load Point	Buses Per Hour	Hourly Passenger Volume	Bus Capacity Per Hour	Average Ridership Bus	Available Capacity	Hourly Passenger Volume
M5	Between Broadway/West 178th Street and Houston Street/West Broadway	NB	Broadway/West 157th Street	6	112	420	19	308	240
		SB	Broadway/West 157th Street	6	128	420	21	292	
M7	Between West 146th Street/Lenox Avenue and Broadway/East 13th Street	NB	Amsterdam Avenue/West 99th Street	6	178	420	30	242	372
		SB	Lenox Avenue/West 125th Street	8	194	560	24	366	
M10	Between 8th Avenue/159th Street and 31st Street/8th Avenue	NB	Frederick Douglas Boulevard/West 125th Street	6	154	420	26	266	304
		SB	Frederick Douglas Boulevard/West 145th Street	7	150	490	21	340	
M11	Between West 145th Street/Riverbank State Park and Bethune Street/Hudson Street	NB	Amsterdam Avenue/West 77th Street	7	248	490	35	242	447
		SB	9th Avenue/West 54th Street	7	199	490	28	291	
M31	Between East 92nd Street/York Avenue and West 54th Street/11 Avenue	NB	West 57th Street/6th Avenue	7	180	490	26	310	371
		SB	West 57th Street/Park Avenue	7	191	490	27	299	
M57	Between East 60th Street/York Avenue and West 72nd Street/Broadway	EB	West 57th Street/6th Avenue	6	204	420	34	216	364
		WB	West 57th Street/Broadway	6	160	420	27	260	
M66	Between East 67th Street/York Avenue and West 66th Street/West End Avenue	EB	West 68th Street/Lexington Avenue	8	253	560	32	307	458
		WB	5th Avenue/West 67th Street	7	205	490	29	285	
M72	Between West 72nd Street/York Ave and Freedom Place/West 70th Street	EB	West 72nd Street/Central Park West	5	136	350	27	214	302
		WB	West 72nd Street/5th Avenue	5	166	350	33	184	
M79	Between West 79th Street/Riverside Drive and West 79th Street/East End Avenue	EB	West 81st Street/Central Park West	9	389	630	43	241	810
		WB	West 81st Street/Central Park West	9	421	630	47	209	
M86	Between East 92nd Street/York Avenue and West 86th Street/West End Avenue	EB	West 81st Street/Central Park West	12	518	840	43	322	1015
		WB	West 81st Street/Central Park West	11	497	770	45	273	
M104	Between West 129th Street/Amsterdam Avenue and East 41st Street/1st Avenue	NB	Broadway/West 79th Street	11	269	770	24	501	564
		SB	Broadway/West 79th Street	12	295	840	25	545	

Notes:

1. Dervied from NYCT Ridercheck Survey
2. Maximum load point is defined as the peak passenger accumulation point on a bus route.
3. e hourly volume is calculated by adding the highest accumulation on each bus during the peak hour.
4. Available capacity is calculated by multiplying the existing bus frequency by the bus capacity and substracting the hourly volume.
5. Maximum capacity of buses is 70 passengers per bus.

Source: New York City Transit (NYCT)

Table 5 - 3: Bus Ridership - Average Weekday PM Peak

Bus Route	Bus Route Description	Direction	Maximum Load Point	Buses Per Hour	Hourly Passenger Volume	Bus Capacity Per Hour	Average Ridership Bus	Available Capacity	Hourly Passenger Volume
M5	Between Broadway/West 178th Street and Houston Street/West Broadway	NB	West 72nd Street/Broadway	6	223	420	37	197	398
		SB	Broadway/West 157th Street	7	175	490	25	315	
M7	Between West 146th Street/Lenox Avenue and Broadway/East 13th Street	NB	Amsterdam Avenue/West 77th Street & Amsterdam Avenue/West 99th Street	8	349	560	44	211	548
		SB	Lenox Avenue/West 125th Street	8	199	560	25	361	
M10	Between 8th Avenue/159th Street and 31st Street/8th Avenue	NB	Frederick Douglas Boulevard/West 125th Street	6	330	420	55	90	491
		SB	Frederick Douglas Boulevard/West 125th Street	6	161	420	27	259	
M11	Between West 145th Street/Riverbank State Park and Bethune Street/Hudson Street	NB	Amsterdam Avenue/West 77th Street & Amsterdam Avenue/West 99th Street	6	268	420	45	152	522
		SB	9 Avenue/West 54 Street & 9 Avenue/West 42 Street	6	254	420	42	166	
M31	Between East 92nd Street/York Avenue and West 54th Street/11 Avenue	NB	West 57th Street/Lexington Avenue	10	345	700	35	355	675
		SB	West 57th Street/2 Avenue & West 57 Street/Park Avenue	11	330	770	30	440	
M57	Between East 60th Street/York Avenue and West 72nd Street/Broadway	EB	West 57th Street/9 Avenue & West 57th Street/Lexington Avenue	9	250	630	28	380	610
		WB	West 57th Street/Broadway	8	360	560	45	200	
M66	Between East 67th Street/York Avenue and West 66th Street/West End Avenue	EB	West 65th Street/Columbus Avenue	16	821	1120	51	299	1231
		WB	West 67th Street/Lexington Avenue	12	410	840	34	430	
M72	Between West 72nd Street/York Ave and Freedom Place/West 70th Street	EB	West 72 Street/Central Park West	6	192	420	32	228	515
		WB	West 72 Street/5th Avenue & West 72nd Street/Central Park West	6	323	420	54	97	
M79	Between West 79th Street/Riverside Drive and West 79th Street/East End Avenue	EB	East 79th Street/5th Avenue	12	633	840	53	207	1661
		WB	West 81 Street/Central Park West	13	1028	910	79	-118	
M86	Between East 92nd Street/York Avenue and West 86th Street/West End Avenue	EB	East 79th Street/5th Avenue	13	764	910	59	146	1763
		WB	West 81st Street/Central Park West	14	999	980	71	-19	
M104	Between West 129th Street/Amsterdam Avenue and East 41st Street/1st Avenue	NB	Grand Central Station & Broadway/West 79th Street	12	538	840	45	302	889
		SB	Broadway/West 79th Street & Broadway/West 96th Street	10	351	700	35	349	

Notes:

1. Dervied from NYCT Ridercheck Survey
2. Maximum load point is defined as the peak passenger accumulation point on a bus route.
3. e hourly volume is calculated by adding the highest accumulation on each bus during the peak hour.
4. Available capacity is calculated by multiplying the existing bus frequency by the bus capacity and substracting the hourly volume.
5. Maximum capacity of buses is 70 passengers per bus.

Source: New York City Transit (NYCT)

Table 5 - 4: Bus Ridership - Average Saturday Midday Peak

Bus Route	Bus Route Description	Direction	Maximum Load Point	Buses Per Hour	Hourly Passenger Volume	Bus Capacity Per Hour	Average Ridership Bus	Available Capacity	Hourly Passenger Volume
M5	Between Broadway/West 178th Street and Houston Street/West Broadway	NB	Broadway/West 157th Street	7	155	490	22	335	336
		SB	Broadway/West 157th Street	7	181	490	26	309	
M7	Between West 146th Street/Lenox Avenue and Broadway/East 13th Street	NB	Amsterdam Avenue/West 77th Street	8	221	560	28	339	384
		SB	Columbus Avenue/West 78th Street	8	163	560	20	397	
M10	Between 8th Avenue/159th Street and 31st Street/8th Avenue	NB	Central Park West/West 72nd Street	8	144	560	18	416	347
		SB	Frederick Douglas Blvd/West 125th Street	7	203	490	29	287	
M11	Between West 145th Street/Riverbank State Park and Bethune Street/Hudson Street	NB	Amsterdam Avenue/West 77th Street	6	144	420	24	276	336
		SB	West 54th Street/9th Avenue	6	192	420	32	228	
M31	Between East 92nd Street/York Avenue and West 54th Street/11 Avenue	NB	East 57th Street/Lexington Avenue	6	130	420	22	290	300
		SB	East 57th Street/2nd Avenue	8	170	560	21	390	
M57	Between East 60th Street/York Avenue and West 72nd Street/Broadway	EB	East 57th Street/6th Avenue	5	131	350	26	219	245
		WB	East 57th Street/Park Avenue	5	114	350	23	236	
M66	Between East 67th Street/York Avenue and West 66th Street/West End Avenue	EB	West 65th Street & Columbus Circle	6	199	420	33	221	447
		WB	5th Avenue/East 67th Street	7	248	490	35	242	
M72	Between West 72nd Street/York Ave and Freedom Place/West 70th Street	EB	East 72nd Street/5th Avenue	5	103	350	21	247	238
		WB	East 65th Street/Madison Avenue	5	135	350	27	215	
M79	Between West 79th Street/Riverside Drive and West 79th Street/East End Avenue	EB	East 79th Street/5th Avenue	9	318	630	35	312	702
		WB	East 79th Street/Lexington Avenue	9	384	630	43	246	
M86	Between East 92nd Street/York Avenue and West 86th Street/West End Avenue	EB	East 79th Street/5th Avenue	10	480	700	48	220	1037
		WB	East 79th Street/Lexington Avenue	10	557	700	56	143	
M104	Between West 129th Street/Amsterdam Avenue and East 41st Street/1st Avenue	NB	Broadway/West 96th Street	11	292	770	27	478	679
		SB	Broadway/West 96th Street	14	387	980	28	593	

Notes:

1. Dervied from NYCT Ridercheck Survey
2. Maximum load point is defined as the peak passenger accumulation point on a bus route.
3. Hourly volume is calculated by adding the highest accumulation on each bus during the peak hour.
4. Available capacity is calculated by multiplying the existing bus frequency by the bus capacity and substracting the hourly volume.
5. Maximum capacity of buses is 70 passengers per bus.

Source: New York City Transit (NYCT)

Table 5 - 5: Bus Service Frequency (Headway in Minutes)

		Weekday						Saturday						Sunday				
Bus Route	**Direction**	**AM**	**Midday**	**PM**	**Evening**	**Night**		**AM**	**Midday**	**PM**	**Evening**	**Night**		**AM**	**Midday**	**PM**	**Evening**	**Night**
M5	NB	10	10	9	10	15		12	10	10	12	20		20	10	10	12	20
	SB	10	10	10	15	20		12	10	12	12	20		15	10	12	15	20
M7	NB	12	10	8	8	10		10	8	6	6	10		15	10	7	9	12
	SB	10	8	10	12	12		10	8	10	8	12		8	8	8	10	15
M10	NB	12	10	10	10	15		15	9	9	10	10		20	10	10	12	20
	SB	10	10	10	10	15		10	8	10	10	15		15	10	12	15	20
M11	NB	12	8	10	8	20		20	10	8	10	15		20	10	8	8	15
	SB	10	8	8	12	15		12	10	10	10	30		15	10	8	12	30
M31	EB	8	9	8	9	15		20	9	10	10	12		30	10	10	15	20
	WB	4	8	8	12	15		15	10	10	10	15		30	10	10	15	25
M57	EB	8	10	8	10	15		20	12	10	12	15		30	12	12	15	20
	WB	10	10	8	8	12		30	12	10	12	15		30	12	12	15	20
M66	EB	5	7	6	7	10		15	9	8	10	12		20	12	10	12	15
	WB	6	8	6	8	10		15	9	7	10	12		20	12	10	12	15
M72	EB	10	10	9	12	20		15	12	12	12	20		30	15	15	15	20
	WB	10	10	8	10	20		20	12	12	12	20		20	15	15	20	20
M79	EB	5	7	5	10	12		10	8	7	10	15		15	6	7	12	15
	WB	4	7	5	8	12		4	7	7	7	8		20	6	7	10	20
M86	EB	4	5	4	7	10		10	6	6	6	9		10	6	6	9	11
	WB	3	6	5	5	10		10	7	6	7	8		12	6	7	9	12
M104	EB	6	6	5	6	10		15	6	6	6	7		20	7	6	8	12
	WB	6	7	7	8	15		8	5	5	7	7		12	5	8	9	12

5.2 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 lines serving the study area are the 1, 2, 3, A, B, C, and D trains. Within the study area, these trains make stops at five stations on the IRT line: 59th Street/Columbus Circle (1), 66th Street/Broadway (1), 72nd Street/Broadway (1, 2, and 3), 79th Street/Broadway (1), and 86th Street/Broadway (1); and four stops on the IND line: 59th Street/Columbus Circle (A, B, C, and D), 72nd Street/Central Park West (B and C), 81st Street/Central Park West (B and C), and 86th Street/Central Park West. Table 5-6 lists the subway lines and stations, and Figure 5-1 shows the subway routes and stations within the study area.

Table 5 - 6: Subway Service

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, B, C, and D (Express and Local Service)	Central Park West	• 59th Street (A, B, C, & D)
		• 72nd Street (B & C)
		• 81st Street (B & C)
		• 86th Street (B & C)

Subway Line Description:

- The "1" subway line provides service from 242nd Street (Bronx) to South Ferry (Manhattan) making local stops along the way. In the study area, it provides service along Broadway at the five stations shown in Table 5-6. This line operates at all times.
- The "2" subway line provides service from 241st Street (Bronx) to Flatbush Avenue/Brooklyn College (Brooklyn) making express stops in Manhattan from 96th Street to Chambers Street, and making one stop in the study area at 72nd Street. This line operates at all times.

- The "3" subway line provides service from West 148th Street (Manhattan) to New Lots Avenue (Brooklyn) making express stops in Manhattan from 96th Street to Chambers Street, and making one stop in the study area at 72nd Street. This line does not operate overnight.
- 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.
- The "C" subway line provides service from 168th Street/Washington Heights (Manhattan) to Euclid Avenue (Brooklyn), making four stops in the study area. This line makes local stops between 5AM to 11PM, daily.
- The "B" subway line provides service from Bedford Park (Bronx) to Brighton Beach (Brooklyn), making four stops in the study area. During rush hours, this train runs express in the Bronx, midtown Manhattan, and Brooklyn (peak direction); at other times it makes local stops. This train operates on weekdays only, at all times except for late nights.
- 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 the 4th Avenue segment in Brooklyn; at other times it operates local in the Bronx, express in Manhattan, and local in Brooklyn. This train operates at all times.

5.3 Taxi/Livery Stands

There are several taxi stands in the study area and the department is continuing efforts to increase the number of taxi stands in the area. Table 5-7 provides details about the existing taxi stands in the study area.

Table 5-7: Taxi Stand Locations in the Study Area

Location (Main street, side of the street, between streets)	**Regulations**	**Number of Spaces**
8th Avenue, west side, W. 55th Street - W. 56th Street	No Standing Anytime Taxi Stand	4
8th Avenue, west side, W. 56th Street - W. 57th Street	No Standing Anytime Taxi Stand	2
Broadway, east side, W. 64th Street – W. 65th Street	Taxi Symbol / No Standing Anytime Except Taxis	3
Central Park West, west side, Columbus Circle - W. 64th Street	No Standing Anytime Taxi	4
Columbus Avenue, west side, W. 65th Street – W.64th Street	No Standing Anytime Taxi Stand	5
Columbus Circle, west side, W. 60th Street - 8th Avenue (Central Park W)	No Standing Anytime Taxi Stand	4
W. 55th Street, south side, 10th Avenue - 11th Avenue	Taxi Relief Stand / 1 hr limit / No Parking 7am-4pm Except Taxi	1
W. 56th Street, south side, 12th Avenue - 11th Avenue	No Standing 7pm-7am Taxi Stand	2
W. 58th Street, south side, 9th Avenue - 8th Avenue	No Standing 7pm-7am Taxi Stand	3
W. 60th Street, south side, Broadway - Columbus Ave (9th Avenue)	Taxi Symbol / No Standing Anytime Taxi Stand	4 - 5
W. 61st Street, north side, Columbus Avenue (9th Avenue) – Broadway	No Standing Anytime Taxi Stand	3 - 4
W. 72nd Street, north side, Broadway - West End Avenue	Taxi Symbol / No Standing Anytime Except Taxis	2 - 3
8th Avenue, east side, W.56th - W.57th Streets	Taxi Symbol / No Standing Except Taxis 6am-10am Mon-Fri	2 - 3
Columbus Avenue (9th Ave), east side, W.73rd Street - W.72nd Street	Taxi Symbol / No Standing Except Taxis 6am-10am Mon-Fri	2 - 3

6.0 PARKING

Existing on-street and off-street parking play an important role in the overall operation of the traffic network. Inadequate on and off street parking has the potential to lead to unnecessary circulation as motorists search for parking spaces, or to illegal and double parking, thus reducing roadway capacity. This section examines the extent to which on and off-street parking is available and utilized within the study area; it will also identify areas where parking shortfalls exist.

The study area contains both on-street and off-street parking facilities. On-street parking is generally permitted on all streets, except where restricted by regulations to facilitate street cleaning or to designate for specific purposed (e.g., authorized vehicles). Off-street public parking facilities are also located throughout the study area, but tend to be accessory parking to large multi-unit residential buildings, commercial and entertainment buildings, and other business establishments.

The parking analysis involved surveys of on-street and off-street parking facilities. The surveys were performed during the weekday peak periods (7:00 AM – 9:00 AM, 12:00 PM – 2:00 PM, and 4:00 PM – 6:00 PM) in order to determine the supply and demand for parking.

6.1 Off-Street Parking

An inventory of parking lots and garages in the study area was conducted, which identified 80 parking facilities (garages and lots). Detailed information was collected for 49 facilities (access was not provided to the remaining 31). Figure 6-1 displays the location of these facilities.

The 49 off-street parking facilities for which data was available have a total capacity of 12,068 parking spaces (see Table 6-1). The capacity of these facilities ranges from 41 to 1,850 spaces with an average capacity of 246 parking spaces, and a median of 166 spaces. There are no municipal parking facilities in the study area.

The price for parking varied by location and duration of stay, but the average price of parking was approximately $9.25 dollars for half an hour, approximately $11.85 for an hour,

approximately $15.30 for two hours, approximately $25 for six hours and approximately $26.25 for 12 hours. Monthly contracts rates range from $200 to $680 per month.

During weekdays, the average occupancy of the off-street facilities during the AM, Midday, and PM peaks were 56%, 63%, and 56%, respectively. Figure 6-1 shows the locations of the off-street facilities, and corresponds with Table 6-1, which describes the facility addresses, license numbers, capacities, and utilizations for the AM, Midday, and PM peak periods. Figures 6-2, 6-3 and 6-4 show the AM, Midday and PM utilization of parking facilities respectively.

Figure 6-1: Off-Street Parking Facilities

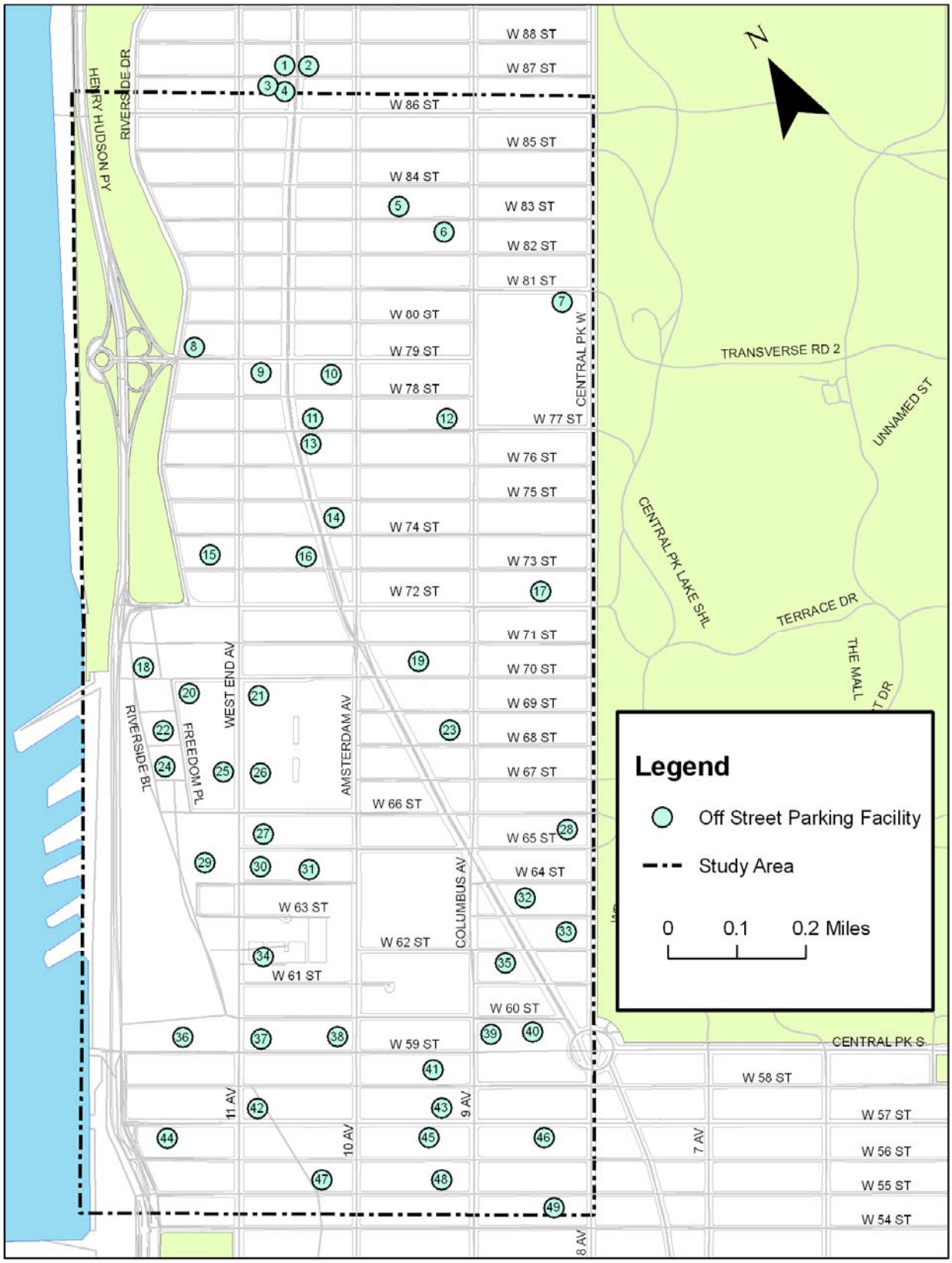


Table 6-1: Off-Street Parking Facilities Utilization Rate

					Occupancy (%)		
Map#	**LicNo**	**EntityName**	**Address**	**Capacity**	**AM**	**MD**	**PM**
1	427303	HAMMER, GEOFFREY ET AL	267 WEST 87 STREET	201	90	90	90
2	1204604	KINNEY PARKING SYSTEM INC	211-15 WEST 87 STREET	131	61	106	76
3	427304	HAMMER, GEOFFREY ET AL	271 WEST 87 STREET	96	90	90	90
4	850402	ACTIVE PARKING LLC	2361 2379 BROADWAY	124	109	97	109
5	954111	KINNEY WEST 83RD STREET INC.	157 161 WEST 83RD STREET	182	88	82	77
6	954109	KINNEY WEST 83RD STREET INC.	147 WEST 83 STREET	182	47	38	49
7	1029322	STANDARD PARKING CORPORATION	200 CENTRAL PARK WEST	388	25	60	75
8	921454	RAPID RIVERSIDE CORP	70 RIVERSIDE DRIVE	80	88	75	81
9	788455	ULTRA PARK LLC	424 WEST END AVENUE	83	78	72	100
10	1290227	WEST 79TH STREET PARKING CORP	200 WEST 79 STREET	95	63	89	63
11	1331277	219 GARAGE CORP	219 WEST 77 STREET	225	8	18	4
12	1249221	77 WEST LLC	203 WEST 77 STREET	75	112	97	91
13	427562	THE HERTZ CORP	21O WEST 77 STREET	250	62	64	62
14	920608	CAROUSEL PARKING CORP	201 WEST 75 STREET	278	65	65	65
15	429467	ELEVEN RIVERSIDE DRIVE GARAGE CORP	11 RIVERSIDE DRIVE	200	15	25	20
16	1283824	2109 BROADWAY PARKING LLC	2101 BROADWAY	106	79	81	80
17	905127	15 WEST 72ND ST CORP	15 WEST 72 STREET	176	80	63	77
18	1218108	240 RIVERSIDE PARKING LLC	240 RIVERSIDE BOULEVARD	162	68	63	63
19	855640	ASTRO PARKING LLC	155 WEST 70 STREET	43	5	9	100
20	1193008	QUIK PARK HUDSON LLC	180 RIVERSIDE BOULEVARD	210	35	50	70
21	1304852		200 West End Ave	76	86	78	75
22	1338621	QUIK PARK HUDSON LLC	200 Riverside Blvd	284	25	25	25
23	959098	COPLEY ASSOCIATES LLC	2000 BROADWAY	57	105	70	88
24	1193087	QUIK PARK HUDSON LLC	140 RIVERSIDE BOULEVARD	41	85	85	183
25	901087	LTG PARKING CORP	165 WEST END AVENUE	445	90	90	90
26	901088	LTG PARKING CORP	150 WEST END AVENUE	163	98	92	95
27	813398	ALLIE GARAGE CORP	124 WEST 60 STREET	125	50	70	65
28	883451	10 W 66TH ST GARAGE CORP	10 WEST 66 STREET	80	63	56	13
29	1306478		100 Riverside Boulevard	48	79	79	79
30	1061198	101 WEST END PARKING LLC	101 WEST END AVENUE	166	102	96	78
31	761016	64TH WEST END PARKING LLC	110 WEST END AVENUE	106	94	108	94
32	1213869	Broadway & 64th Parking LLC	1900-1916 Broadway	400	50	60	70
33	964023	CENTRAL PARKING SYSTEM OF NEW YORK ,INC	1 WEST END AVENUE	1850	50	75	60
34	948832	WEST END TOWERS GARAGE CORP	55 WEST END AVENUE	446	18	29	34
35	1013719	GARAGE MANAGEMENT CORPORATION	44 WEST 62 STREET	143	59	66	59
36	1097071	MTP 59 ST LLC	641 WEST 59 STREET	537	50	85	2
37	1171649	PROPARK AMERICA NEW YORK LLC	515 WEST 59 STREET	190	60	75	85
38	884653	CONCERTO GARAGE CORP	200 WEST 60 STREET	265	50	75	40
39	1171216	CENTRAL PARKING SYSTEM OF NEW YORK	214-216 WEST 80 STREET	147	90	90	90
40	1105005	CENTRAL PARKING SYSTEM OF NEW YORK, INC	10 COLUMBUS CIRCLE	662	65	70	80
41	960635	A.M.D. LLC	400 WEST 59 STREET	294	51	10	14
42	1137953	KINNEY PARKING SYSTEM, INC	838-852 11 AVENUE	84	35	35	0
43	368157	EFFECTIVE PARKING LLC	435 WEST 57 STREET	55	64	82	82
44	429031	57 & 11 PARKING CORP	622 WEST 57 STREET	1000	80	50	25
45	368300	APEX PARKING LLC	440 WEST 57 STREET	378	36	45	50
46	1093313	CHAMPION PARKING 57 LLC	316 WEST 57 STREET	372	16	40	27
47	1148650	WORTHY PARKING LLC	841 10 AVENUE	86	47	58	70
48	427688	411 WEST 55TH STREET CORP	411 WEST 55 STREET	189	11	26	48
49	1010039	300 PARKING INC	300 WEST 55 STREET	92	49	98	49

Figure 6-2: Off-Street Parking Facilities AM Utilization

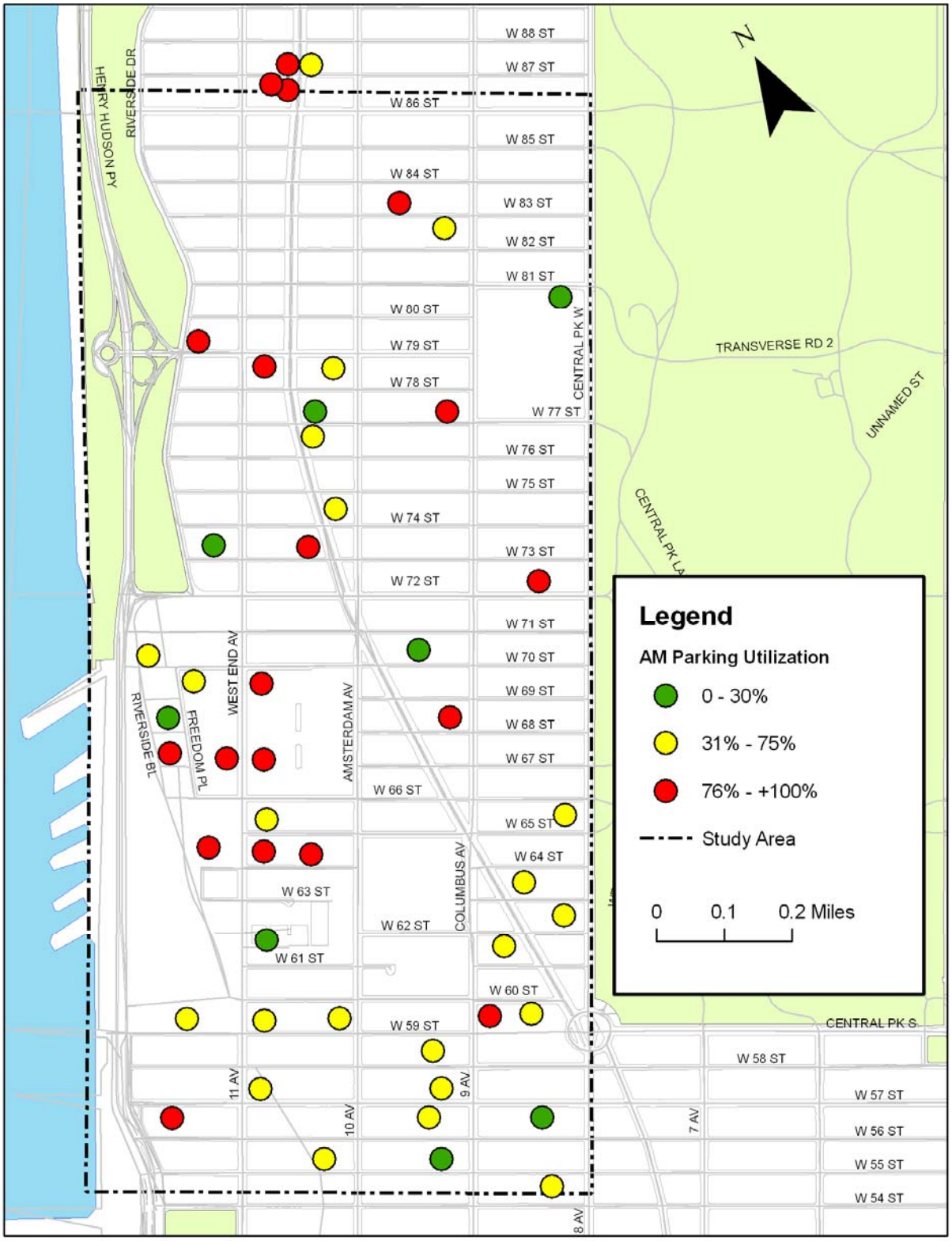


Figure 6-3: Off-Street Parking Facilities Midday Utilization

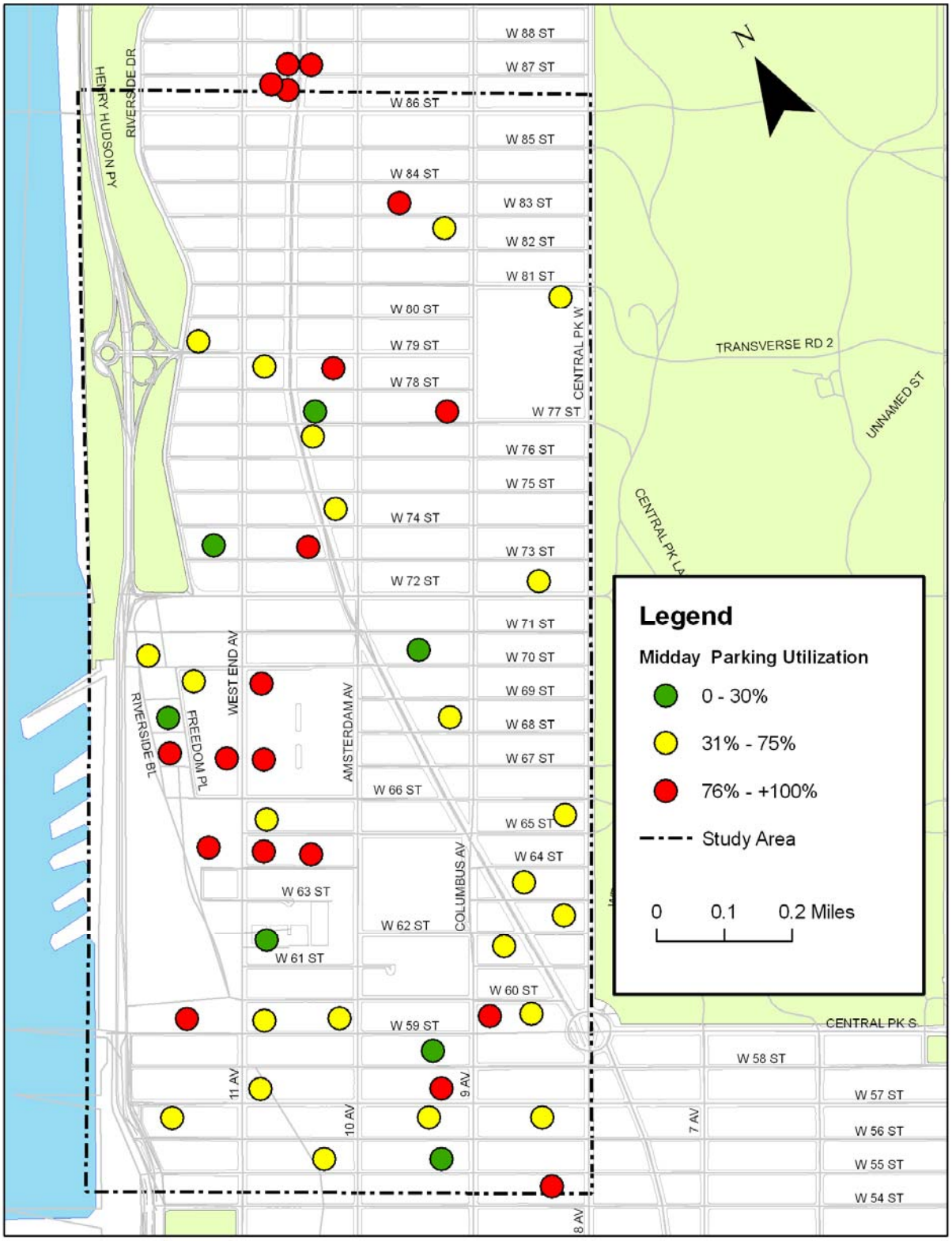
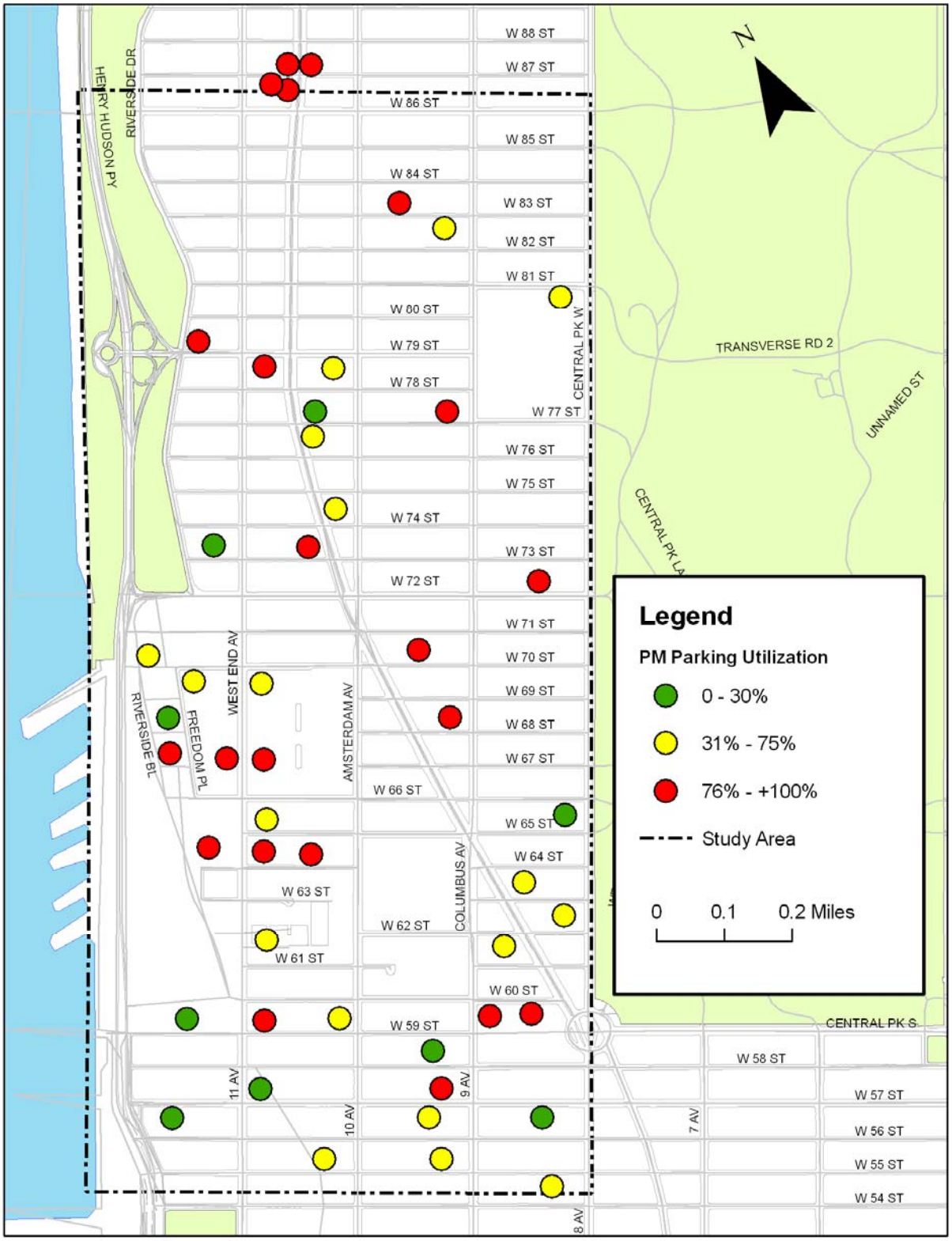


Figure 6-4: Off-Street Parking Facilities PM Utilization



6.2 On-Street Parking

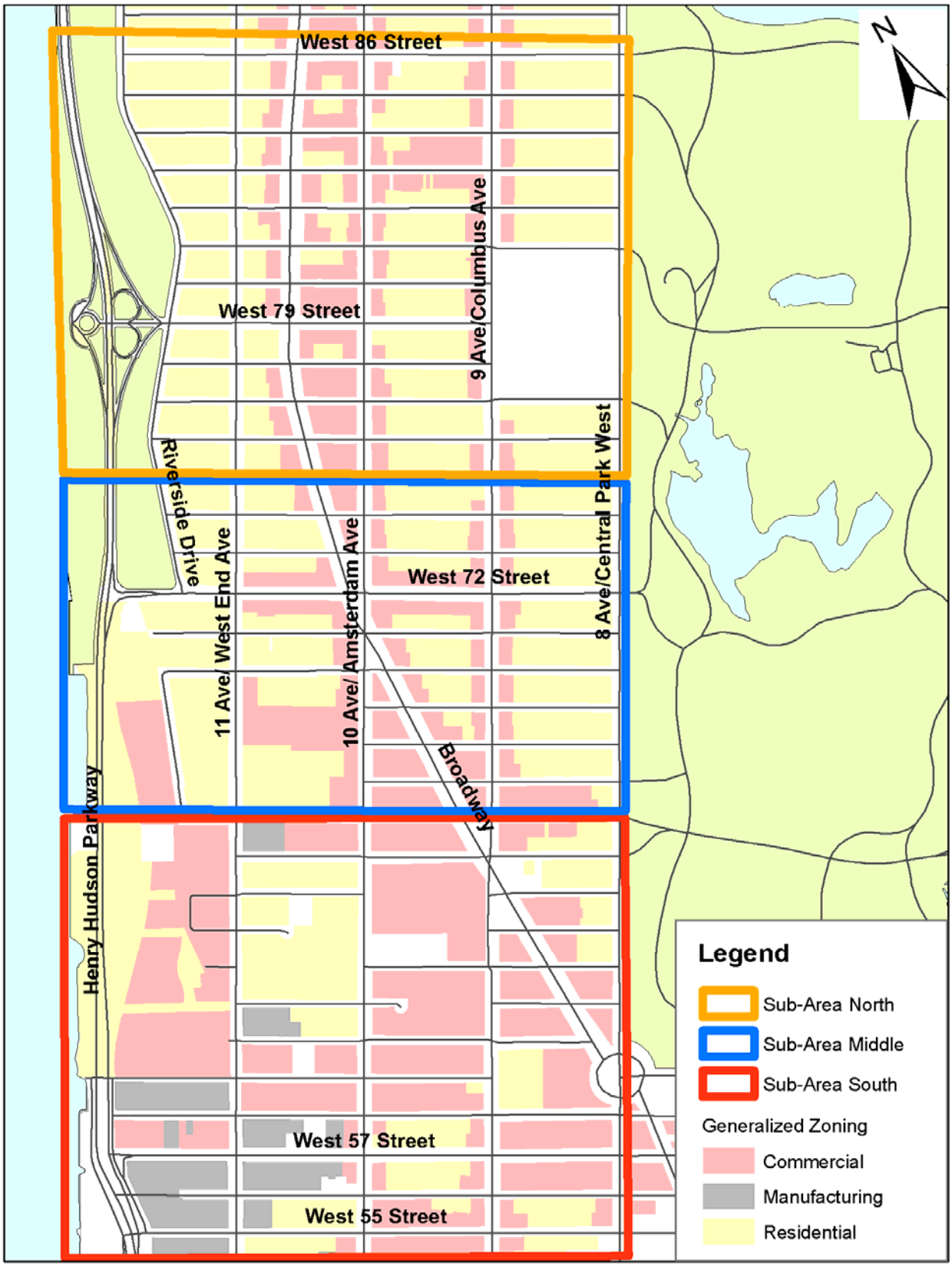
Parking utilization rates for both on- and off-street parking spaces are affected by a variety of factors such as price, availability, location, time of day and surrounding land-use. In order to determine whether parking supply is meeting the current parking demand, the study area's on-street parking utilization rates, parking capacity, price, and other factors were examined. A parking survey was conducted to ascertain the parking capacity, on-street parking regulations, metered locations, and price throughout the study area. A summary of the survey results is displayed below in Table 6-2.

Table 6-2: On -Street Parking Summary

Peak Period	Capacity	Occupancy	Double Parked	Util. Rate
AM	7,091	6,603	79	94.23%
MID	7,615	7,574	129	101.16%
PM	7,986	7,205	34	90.65%
Sat. MID	8,516	7,716	109	91.89%

The study area has a variety of land uses but has a larger amount of land dedicated to residential uses in the north and a larger percent of land dedicated to commercial uses in the south. Therefore, to facilitate analysis, the study area was broken down into three sections of approximately equal on street parking capacity. Figure 6-5 displays these divisions on top of the existing land use in the study area. The southern sub-area lies between Central Park West and the Hudson River from West 54th Street to West 65th Street. The middle sub-area includes the area from Central Park West to the Hudson River from West 66th Street to West 75th Street. The northern sub-area includes the area between Central Park West and the Hudson River from West 76th Street to West 86th Street.

Figure 6-5: Land Use Zones and Study Sub-Areas

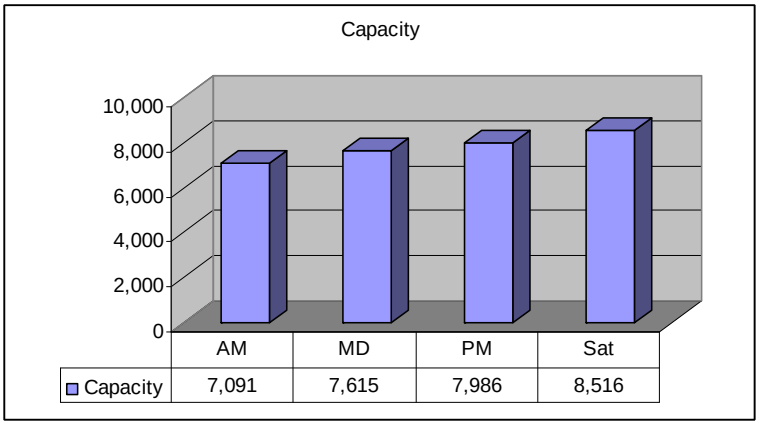


6.2.1 On-Street Parking Capacity

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 to restricted parking on commercial streets including metered-parking, time restricted parking, no standing zones, bus stops, fire hydrants, authorized parking zones and loading zones. Figure 6-15 provides on-street parking regulations within the study area.

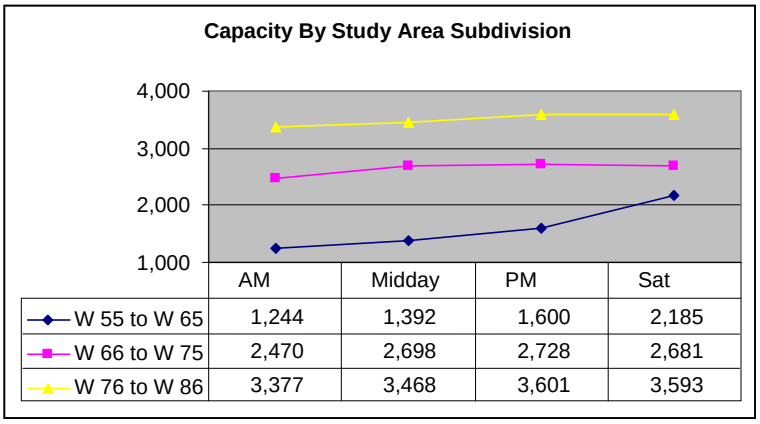
The analysis shows that the total parking capacity in the study area increases through the day from 7,091 spaces during the AM peak period to 7,615 at the midday peak and 7,986 at the PM peak period. The capacity peaks during the weekend with 8,516 spaces available within the study area (Figure 6-6).

Figure 6-6: On-Street Parking Capacity by Peak Period



During the AM peak period, capacity in the southern sub-area is approximately 1,244 spaces, which increases to nearly 1,400 during midday peak, to 1,600 during the PM peak period, and reaches a high of 2,185 spaces during the weekend peak. Capacity varies considerably in the southern sub-area because of the amount of commercial parking and truck loading and unloading in this heavily commercial area. Capacity in the middle sub-area during the AM peak period is approximately 2,470 spaces, which increases to 2,698 during the midday peak, and to 2,728 during the PM peak period. During the weekend peak, capacity in the middle sub-area is approximately 2,681 spaces. The northern sub-area consistently has the most parking paces with a capacity of approximately 3,377 spaces during the AM peak period, 3,468 during the midday peak, 3,601 during the PM peak period, and 3,593 spaces during the weekend peak. See Figure 6-7 for parking capacity by sub-area.

Figure 6-7: On-Street Parking Capacity by Sub-Area

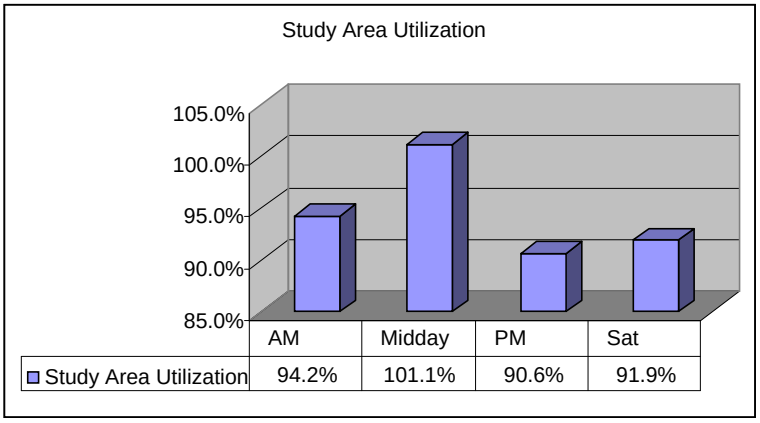


	AM	Midday	PM	Sat
W 55 to W 65	1,244	1,392	1,600	2,185
W 66 to W 75	2,470	2,698	2,728	2,681
W 76 to W 86	3,377	3,468	3,601	3,593

6.2.2 On-Street Parking Occupancy

The average utilization for the entire study area is 94.2% during the AM period, 101.1% during the midday period, and 90.6% during the PM period. The weekend utilization rate is 91.9%. Figure 6-8 shows the peak hour on-street parking utilization of the study area.

Figure 6-8: On-Street Parking Utilization by Peak Period

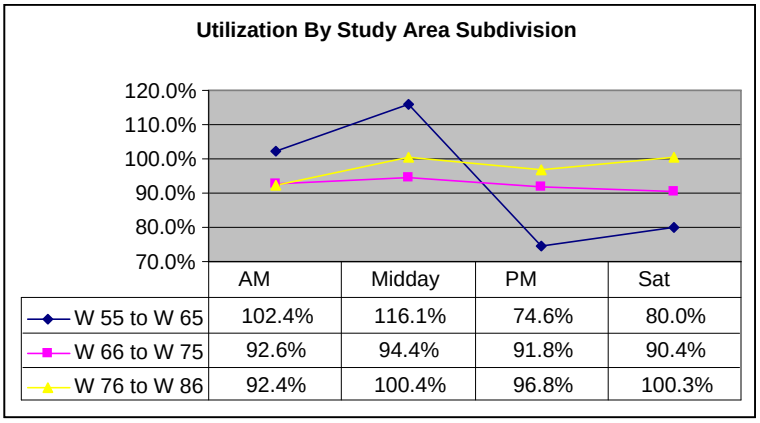


	AM	Midday	PM	Sat
Study Area Utilization	94.2%	101.1%	90.6%	91.9%

The southern section has the highest AM utilization of 102.4%, and 116.1% during the midday period. This high demand is associated with commercial activities in the area, which was identified as an activity center. Utilization falls to 74.6% during the PM period, and is 80% on the weekends. The middle section is relatively consistent between the AM 92.6%, the midday of 94.4%, the PM of 91.8% and the weekend of 90.4%. The northern section's AM utilization is 92.4% with 100.4% at midday, and 96.8% during the PM period. The weekend utilization of

100.3% is the highest of all sections for this period. Figure 6-9 shows on-street parking utilization by the study area sub-divisions.

Figure 6-9: On-Street Parking Utilization by Sub-Area



	AM	Midday	PM	Sat
W 55 to W 65	102.4%	116.1%	74.6%	80.0%
W 66 to W 75	92.6%	94.4%	91.8%	90.4%
W 76 to W 86	92.4%	100.4%	96.8%	100.3%

Double Parking

Double parking, in the study area, was more prevalent on the Avenues where 3.1%, 4.3%, 1.5%, and 1.7% of the vehicles double parked during the AM, midday, PM, and Saturday peaks, respectively. Double parking was less common on side streets where there were less than .05% during the week and 1.3 % on Saturdays.

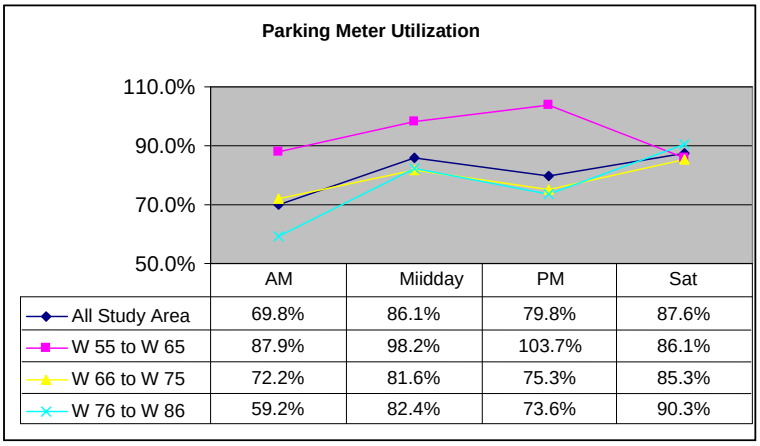
Metered Parking

Metered parking is generally used in commercial areas with high demand for parking. Parking duration, restrictions, parking spaces and pricing are tools used to facilitate higher parking turnover to provide more for users. There are approximately 1,447 metered parking spaces in the study area. The cost ranges from $1.00 to $2.00 per hour with 80% of the spaces priced at $1.50 per hour.

Overall, the metered locations had lower utilization than the entire study area which includes both metered and non-metered spaces. During the AM period it was less than 70%, 86% during midday, and 80% during the PM period. Parking meters are generally not in effect between 7:00 PM and 7:00 AM; this could account for the higher PM occupancy. The occupancy peaked at approximately 87.6% during the weekends.

The southern sub-area of the study area has the least amount of metered parking and the highest weekday utilization. The area parking demand peaks during the PM period at 103.7%. The middle sub-area utilization remains in the 70% range and peaks during weekends at 85.3%. The northern sub-area has the lowest utilization during the AM with 59.2% occupancy, but also peaks on the weekends at 90.3%. Figure 6-10 shows the metered parking utilization rates throughout the study area and in the study area subdivisions.

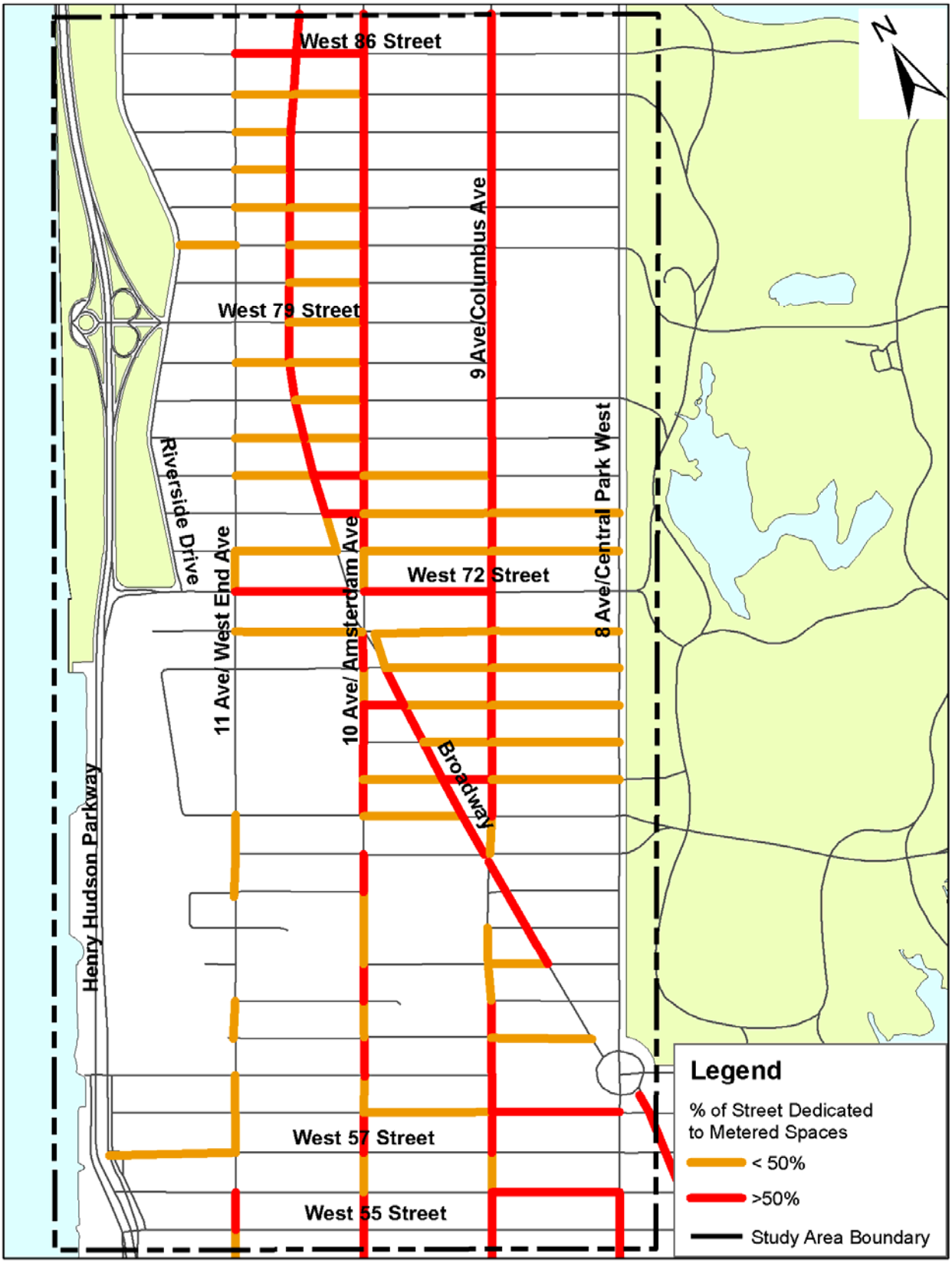
Figure 6-10: Metered Parking Utilization Rate



	AM	Miidday	PM	Sat
All Study Area	69.8%	86.1%	79.8%	87.6%
W 55 to W 65	87.9%	98.2%	103.7%	86.1%
W 66 to W 75	72.2%	81.6%	75.3%	85.3%
W 76 to W 86	59.2%	82.4%	73.6%	90.3%

A high concentration of metered parking spaces can be found primarily along the commercial corridors of Broadway, Amsterdam Avenue and Columbus Avenue as well as West 72nd Street between West End Avenue and Columbus Avenue. Metered parking spaces also exist along many of the side streets that intersect these corridors but they do not make up the majority of the parking along the street as shown in Figure 6-11.

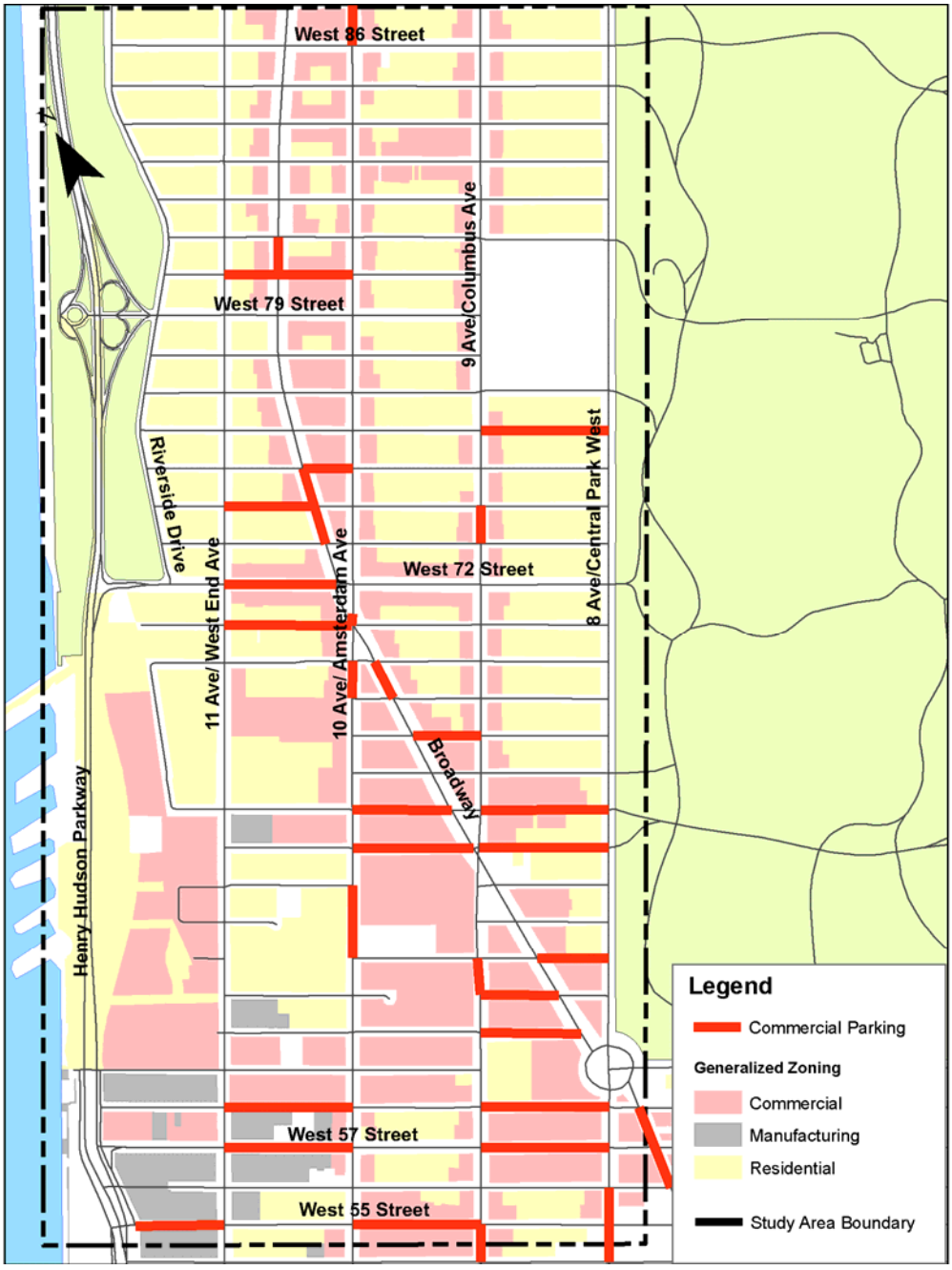
Figure 6-11: Metered Parking Concentrations



Commercial Parking

Commercial parking within the study area is comprised of metered and non-metered parking spaces that are designated for truck loading and unloading. Commercial parking is mainly concentrated in the southern sub-area and often along side streets that intersect Broadway. Figure 6-12 displays the location of commercial parking within the study area.

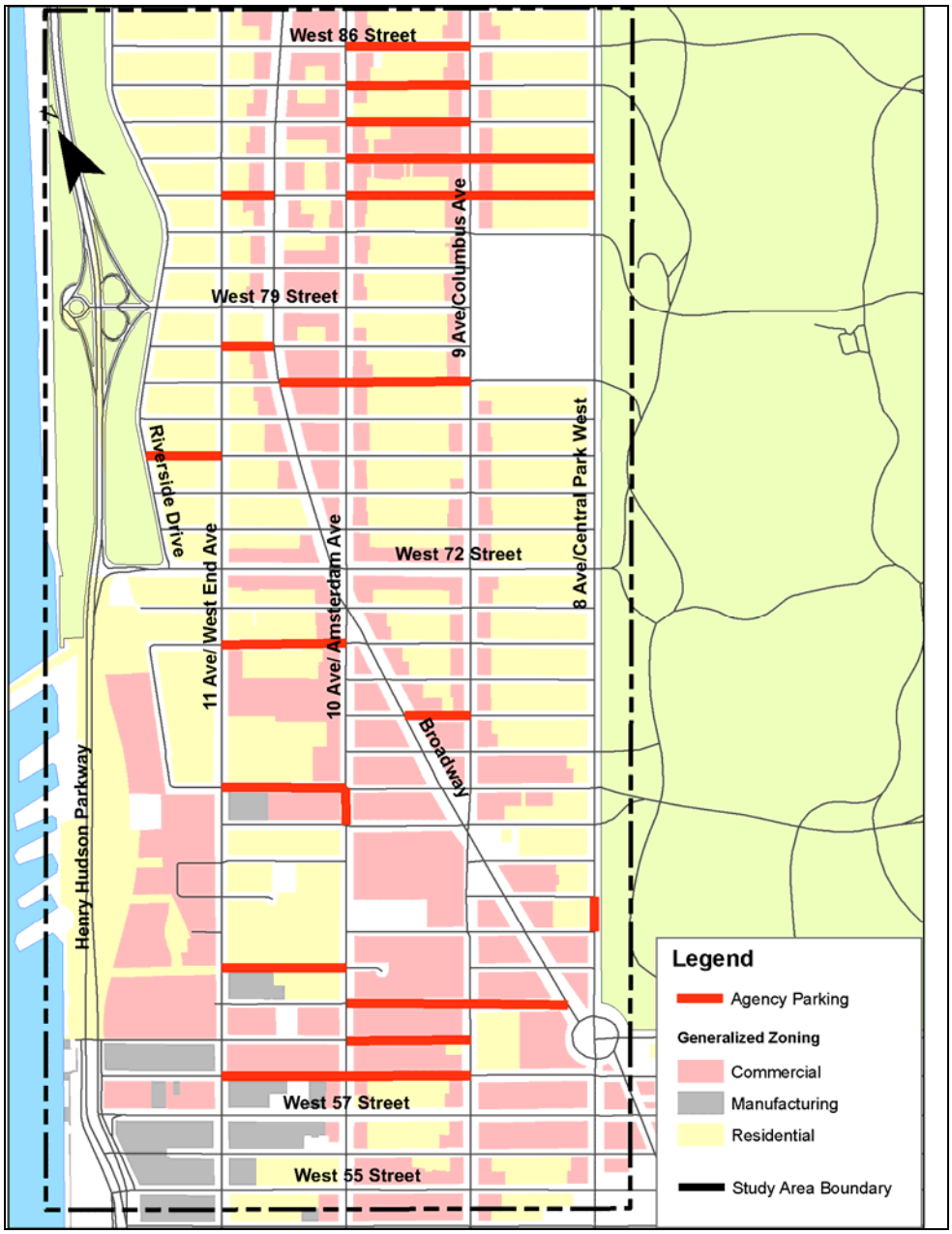
Figure 6-12: Commercial Parking



Agency Parking

There are parking spaces that are specifically designated for government agencies as per posted parking regulations. These include spaces for NYPD, NYFD, schools, colleges, hospitals and other agency vehicles. Such authorized spaces can be found throughout the entire study area. There are concentrations of agency parking in the northern sub-area between West 81st and West 86th Streets as well as in the southern sub-area between West 58th and West 61st Streets. Figure 6-13 shows the location of authorized agency parking within the study area.

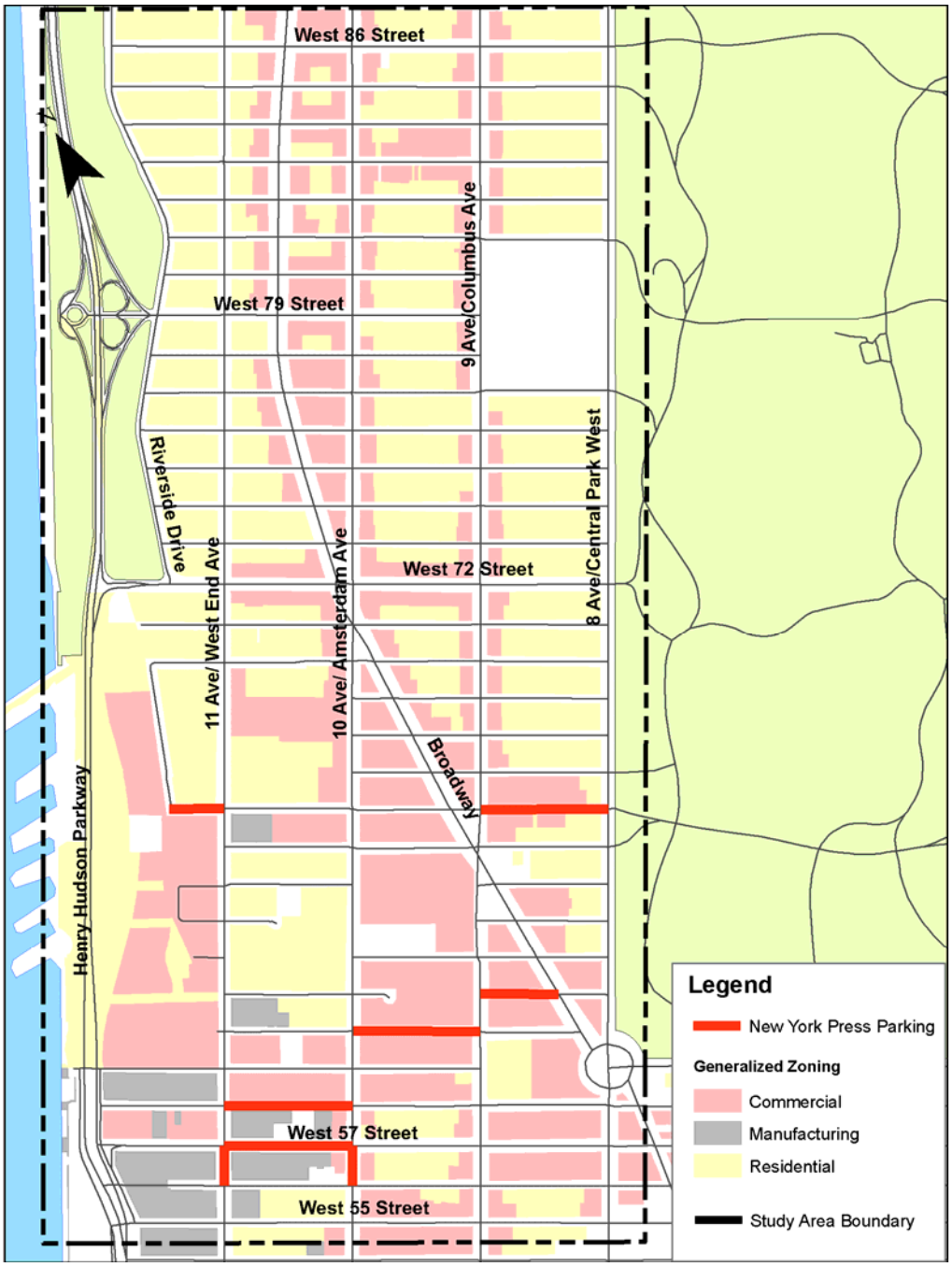
Figure 6–13: Designated Agency Parking



New York Press Parking

There are parking spaces designated for New York media/press vehicles. These spaces exist in the study area's southern sub-area and are often located near major media or entertainment facilities. Figure 6-14 shows the location of New York Press permit parking within the study area.

Figure 6-14: New York Press Parking



In summary, the analysis shows that the on-street parking capacity is nearly fully utilized while off street parking facilities have some unused capacity. Demand fluctuates within the study area based upon price, function (monthly, events, etc.) and land use. Table 6-3 shows the average weekday peak hour parking utilization, capacity, and cost for the various parking options.

Table 6-3: Summary of Average Parking Capacity and Utilization

	Capacity	**Average WD Utilization**	**Average Price (1 Hour)**
Off-Street Facilities	12,068	58%	$11.85
On-Street Parking	8,516	95%	N/A
Metered Parking	1,447	78%	$1.50

Figure 6-15: On-Street Parking Regulations (North Study Area: 1 of 2)

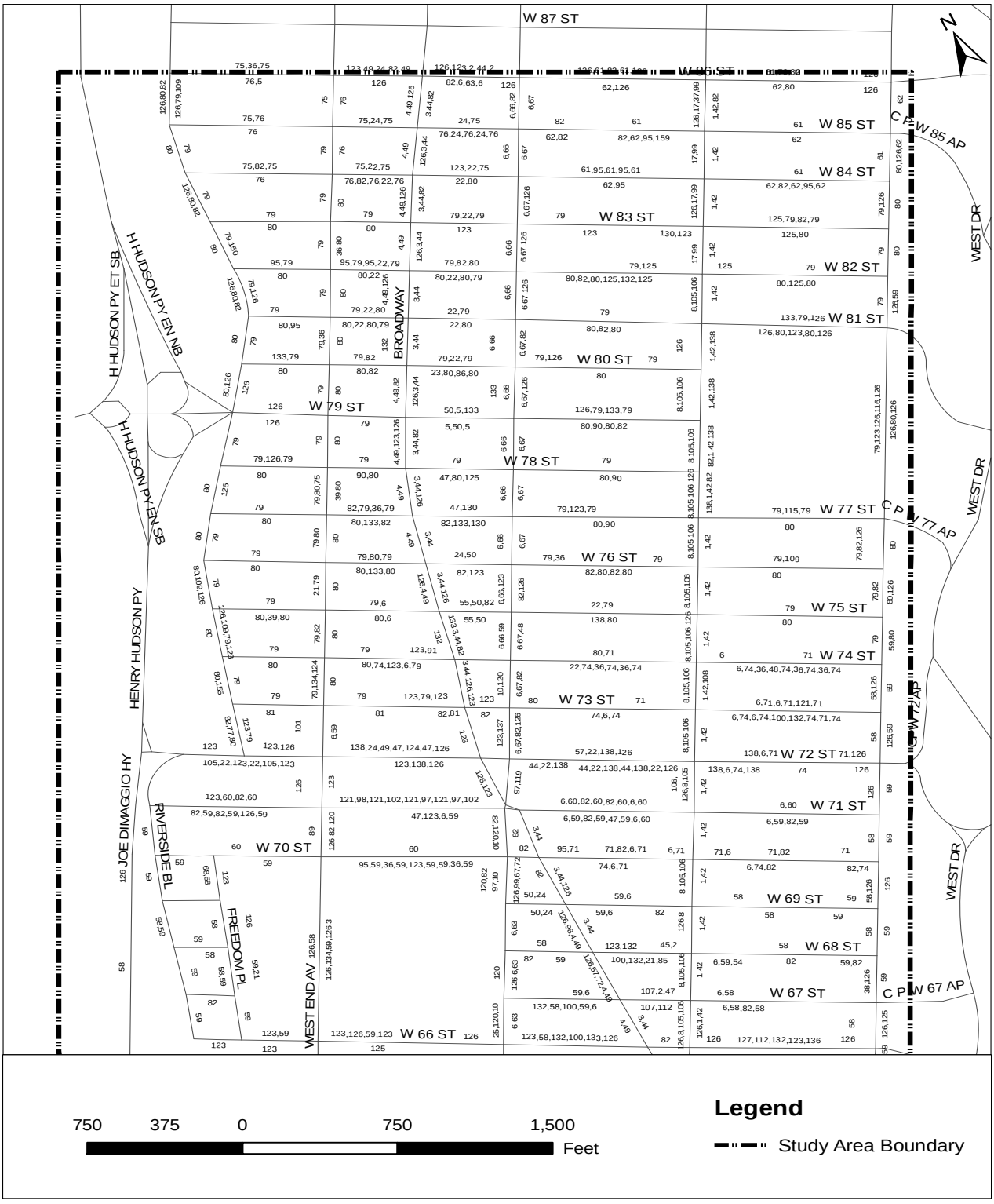


Figure 6-15: On-Street Parking Regulations (South Study Area: 2 of 2)

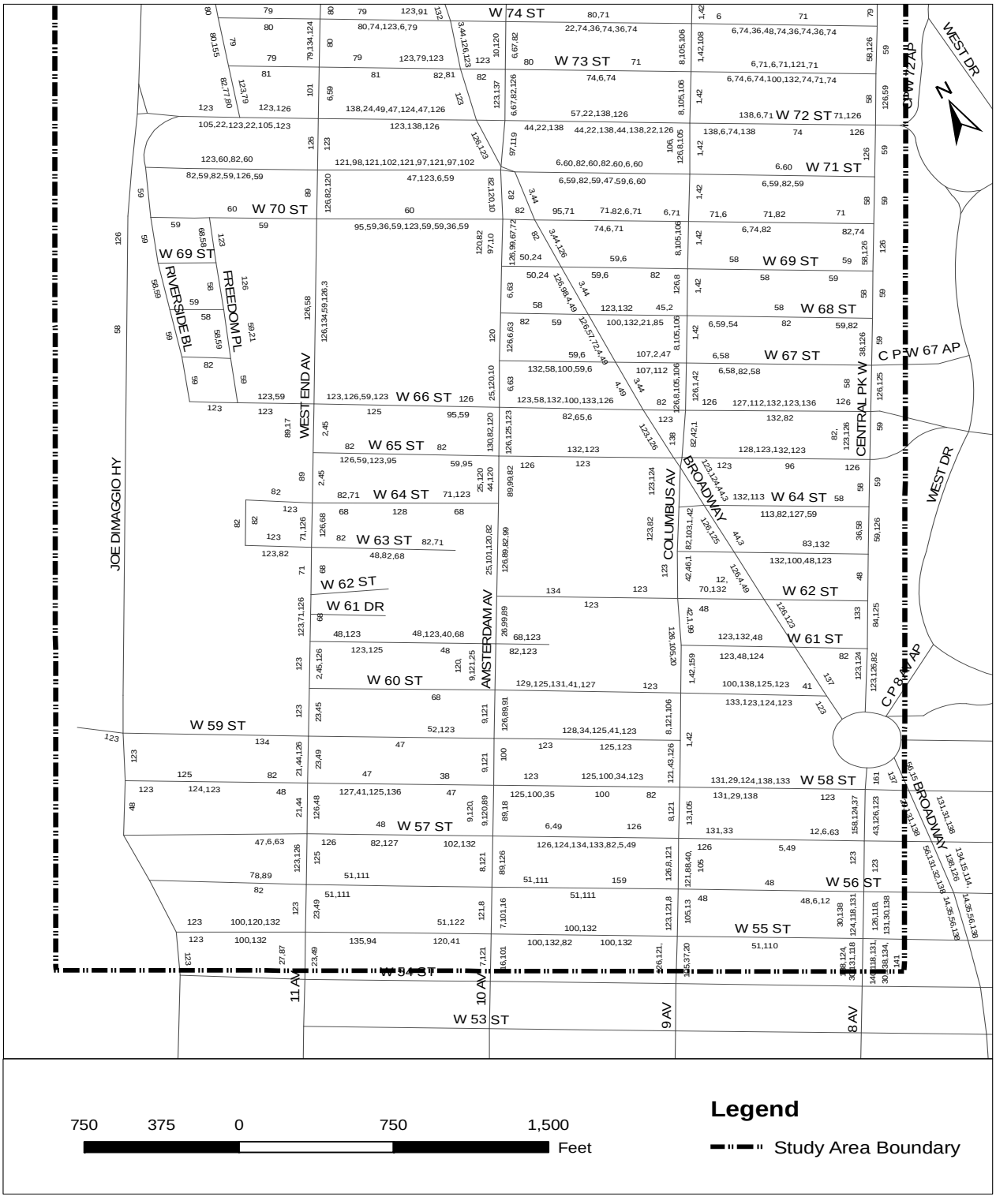


Table 6-4: On-Street Parking Regulations Key (1 of 3)

1	1 Hr Parking 7:30 AM - 7 PM except Sunday
2	1hr Parking 8:00 AM -7 PM except Sunday
3	1 Hr Parking 8 AM- 10 PM except Sunday
4	1 Hr Parking 8:30 AM - 10 PM except Sunday
5	1 Hr Parking 8:30 AM -7 PM except Sunday
6	1 Hr Parking 9 AM - 7 PM except Sunday
7	1 Hr Parking 9 AM - 4 PM including Sunday
8	1 Hr Parking 9 AM - 4 PM Monday- Saturday 9AM - 7 PM Sunday
9	1 Hr Parking 9 AM - 4 PM Monday- Friday 9AM - 7 PM Saturday –Sunday
10	1 Hr Parking 9 AM - 4 PM Monday - Friday 9AM -7 PM Only Saturday
11	1 Hr Parking 9 AM -10 PM except Sunday
12	1 Hr Parking 9 AM – Midnight except Sunday
13	1 Hr Parking 10 AM - 4 PM Monday - Saturday 9 AM - 7 PM Sunday
14	1 Hr Parking 10 AM - 6 PM except Sunday
15	1 Hr Parking 10 AM - 10 PM except Sunday
16	1 Hr Parking 10 AM - 4 PM Monday - Friday 9AM - 7 PM Saturday- Sunday
17	1 Hr Parking 10 AM- 7 PM Monday-Friday 9AM- 7 PM Saturday
18	1 Hr Parking 10 AM- 7 PM Monday-Friday 9AM- 7 PM Saturday – Sunday
19	1 Hr Parking 10 AM- 7 PM except Sunday
20	1 Hr Parking 10 AM - 4 PM Monday, Thursday, Saturday 9 AM - 7 PM Sunday
21	2 Hr Parking 8 AM - 7 PM except Sunday
22	2 hr Parking 9 AM - 10 PM except Sunday
23	2 hr Parking 9 AM - 10 PM including Sunday
24	2 hr Parking 8:30 AM - 7 PM except Sunday
25	2 Hr Parking 10 AM - 4 PM Monday - Friday 9 AM -7 PM Saturday – Sunday
26	2 Hr Parking 10 AM - 4 PM Monday - Friday 9 AM -7 PM Saturday
27	2 Hr Parking 11 AM - 7 PM including Sunday
28	3 hr Parking 7 AM - 6 PM except Sunday
29	3 Hr Parking 7 AM - 7 PM except Sunday
30	3 Hr Parking 7 AM - 4 PM except Sunday
31	3 Hr Parking 8 AM - 7 PM except Sunday
32	3 Hr Parking 10 AM - 6 PM except Sunday
33	3 hr Meter Parking except Sunday
34	3 Hr Parking Limit for Doctor Vehicles Only
35	6 Hr Parking 6 PM - Midnight except Sunday
36	No Parking 7:00am - 4:00pm School Days
37	No Parking 7:00am - 7:00pm Except Sunday
38	No Parking 7:00am - 7:00pm Monday thru Friday
39	No Parking 7 AM- 6 PM School Days
40	No Parking 7 AM - 7 PM except Sunday
41	No Parking 7 AM - 7 PM School Days
42	No Parking 7 AM - 7:30 AM except Sunday
43	No Parking 7 AM - 4 PM except Sunday
44	No Parking 7:30am - 8:00am Except Sunday
45	No Parking 7:30 AM - 8 AM Monday, Tuesday, Thursday, Friday
46	No Parking 7:30 AM - 10 PM
47	No Parking 8:00am - 6:00pm Except Sunday
48	No Parking 8:00am - 6:00pm Monday thru Friday
49	No Parking 8:00am - 8:30am Except Sunday
50	No Parking 8 AM- 8:30 Am Monday, Tuesday, Thursday, Friday
51	No Parking 8 AM - 7PM Monday – Friday
52	No Parking 8 AM - Midnight including Sunday
53	No Parking 8 AM - 5 PM Monday - Friday
54	No Parking 8 AM - 4 PM Monday – Friday
55	No Parking 8 AM - 7 PM except Sunday
56	No Parking 8 AM - 10 AM except Sunday

Table 6-4: On Street Parking Regulations Key (2 of 3)

57	No Parking 8 AM - 9 AM except Sunday
58	No Parking 8 AM - 9:30 AM Monday and Thursday
59	No Parking 8 AM - 9:30 AM Tuesday and Friday
60	No Parking 8 AM - 9:30 AM Monday - Thursday
61	No Parking 8:30am - 10:00am Monday & Thursday
62	No Parking 8:30am - 10:00am Tuesday & Friday
63	No Parking 8:30am - 9:00am Except Sunday
64	No Parking 8:30 AM - 9:00 AM including Sunday
65	No Parking 8:30 AM - 9 AM Tuesday & Friday
66	No Parking 8:30 AM - 9 AM Tuesday, Thursday, Saturday
67	No Parking 8:30 AM - 9 AM Monday, Wednesday, Friday
68	No Parking 9 AM - 10:30 AM Tuesday and Friday
69	No Parking 9 AM- 6 PM Monday - Friday AMBULETTE
70	No Parking 9 AM- 9:30 AM Monday - Thursday
71	No Parking 9 AM - 10 :30 AM Monday & Thursday
72	No Parking 9 AM - 10 PM except Sunday
73	No Parking 9 AM - 10:30 AM Monday and Thursday
74	No Parking 9 AM - 10:30 AM Tuesday and Friday
75	No Parking 9:30am - 11:00am Monday & Thursday
76	No Parking 9:30am - 11:00am Tuesday & Friday
77	No Parking 10AM - 4 PM Monday - Friday
78	No Parking 10AM - 7 PM Monday - Friday
79	No Parking 11:00am - 12:30pm Monday & Thursday
80	No Parking 11:00am - 12:30pm Tuesday & Friday
81	No Parking 11:00am - 12:30pm Wednesday
82	No Parking Anytime
83	No Parking Passenger Loading Zone
84	No Parking except Authorized Vehicles
85	No Standing except Authorized Vehicles- US Mail 5 AM - 9 PM Monday - Friday & 5 AM - 6 PM Saturday
86	No Standing except Trucks Loading and Unloading 6 AM - 10 AM except Sunday
87	No Standing 6 AM - 11 AM Monday – Friday
88	No Standing 6 AM - 6 PM Wednesday and Saturday except Farmer's Market
89	No Standing 7:00am - 10:00am Monday thru Friday
90	No Standing 7:00am - 4:00pm School Days
91	No Standing except Trucks Loading and Unloading 7 AM - 7 PM including Sunday
92	No Standing except Trucks Loading and Unloading 7 AM - 10 PM except Sunday
93	No Standing except Trucks Loading and Unloading 7 AM - 7 PM except Sunday
94	No Standing 7 AM - 4 PM except Authorized Vehicles
95	No Standing 7 AM - 4 PM School Days
96	No Standing 7 AM - 11 PM including Sunday
97	No Standing except Trucks Loading and Unloading 7 AM - 4 PM except Sunday
98	No Standing except Trucks Loading and Unloading 7 AM - Midnight except Sunday
99	No Standing except Trucks Loading and Unloading 7 AM - 7 PM Monday thru Friday
100	No Standing 7 AM - 7 PM Monday – Friday
101	No Standing 7 AM - 10 AM / 4 PM - 7 PM Monday - Friday
102	No Standing 7 AM - 7 PM except Sunday
103	No Standing 7 AM - 10 AM including Sunday
104	No Standing 7 AM - 7 PM Monday, Thursday, Friday except authorized vehicles
105	No Standing 7 AM - 10 AM / 4 PM - 7 PM except Sunday
106	No Standing 7 AM - 4 PM except Sunday
107	No Standing 7:30 AM -8 AM Monday, Tuesday, Thursday, Friday
108	No Standing except Trucks Loading and Unloading 7:30 AM - 7 PM including Sunday
109	No Standing except Trucks Loading and Unloading 8 AM - 6 PM except Sunday
110	No Standing 8 AM - 9:30 AM & 1 PM - 7 PM Monday - Friday
111	No Standing 8 AM - 9:30 AM Monday – Friday
112	No Standing 8 PM - 10 PM Monday – Saturday
113	No Standing 8 AM - 7 PM Monday – Friday
114	No Standing 8 AM - 10 AM except Sunday

Table 6-5: On-Street Parking Regulations Key (3 of 3)

115	No Standing 9 AM - 3 PM Monday - Friday except School Buses
116	No Standing 9 AM - 6 PM Monday - Friday
117	No Standing except Trucks Loading and Unloading 10 AM - 7 PM except Sunday
118	No Standing 4 PM - Midnight except Sunday
119	No Standing 4 PM - 7 PM including Sunday
120	No Standing 4 PM - 7 PM Monday - Friday
121	No Standing 4:00pm - 7:00pm Except Sunday
122	No Standing 5 PM - 7 PM Monday - Friday
123	No Standing Anytime
124	No Standing Anytime Taxi Standing
125	No Standing Except Authorized Vehicles
126	Bus Stop No Standing

127	No Standing Anytime except vehicles with License Plates (New York Press)
128	No Standing Access-a-Ride Bus Stop
129	No Standing Doctor's Vehicles only
130	No Standing Anytime Fire Zone
131	No Standing except Commercial Vehicle
132	No Standing except Trucks Loading and Unloading
133	No Standing Hotel Loading Zone
134	No Standing Bus Layover Zone
135	1 HR Limit Taxi Relief Stand
136	3 HR Limit New York Press License Plate Only
137	No Stopping Anytime
138	Pay at Munimeter
139	No Right Turn 8 AM - 7 PM except Sunday

7.0 PEDESTRIAN AND BICYCLE

7.1 Existing Conditions Pedestrian Analysis

Residential, commercial, and institutional activities within the study area are responsible for a majority of the pedestrian traffic. Generally, all person trips generated by land uses within the study area (including mass transit, vehicles, taxi, etc.) contain a walking component either at the beginning or at the end of each trip. Each trip contributes to the pedestrian loads/volumes contained on sidewalk space. The main commercial corridors that were observed to have significant pedestrian volumes are Broadway, Columbus Avenue, Central Park West, West 72nd Street, West 66th Street, and West 57th Street. Other places where pedestrian traffic is significant during the peak hours are the entrances/exits at subway stations and bus transfer points. High pedestrian volume intersections with subway stations include:

- West 66th Street & Broadway
- West 71st Street & Broadway
- West 72nd Street & Broadway
- West 72nd Street & Central Park West
- West 86th Street & Broadway
- West 86th Street & Central Park West

The existing conditions pedestrian analysis focused on crosswalks and corners at select intersections. Pedestrian counts were conducted at 26 intersections along major corridors in the study area. The studied intersections are listed below and shown in Figure 7-1:

- West 57th Street & 9th Avenue
- West 57th Street & 10th Avenue
- West 58th Street & 8th Avenue
- West 58th Street & 9th Avenue
- West 60th Street & Broadway
- West 60th Street & Columbus Avenue
- West 65th Street & Central Park West
- West 65th Street & Broadway/Columl

- West 65th Street & West End Avenue
- West 66th Street & Central Park West
- West 66th Street & Columbus Avenue
- West 66th Street & Broadway
- West 70th Street & West End Avenue
- West 71st Street & Broadway/Amster
- West 72nd Street & Central Park West
- West 72nd Street & Amsterdam Aven
- West 72nd Street & Broadway
- West 72nd Street & West End Avenue
- West 72nd Street & Riverside Drive
- West 79th Street & Amsterdam Avenu
- West 79th Street & Broadway
- West 79th Street & Riverside Drive
- West 81st Street & Central Park West
- West 86th Street & Central Park West
- West 86th Street & Broadway
- West 86th Street & Riverside Drive

Generally, the pedestrian volumes in the northern section of the study area are highest during the AM peak period. The middle and southern sections of the study area experience the highest pedestrian volumes during the PM peak period. The midday volumes tend to be somewhere between the AM and PM volumes. See figures 7-2 to 7-5 for peak hour pedestrian volumes.

Figure 7 - 1: Pedestrian Count Locations

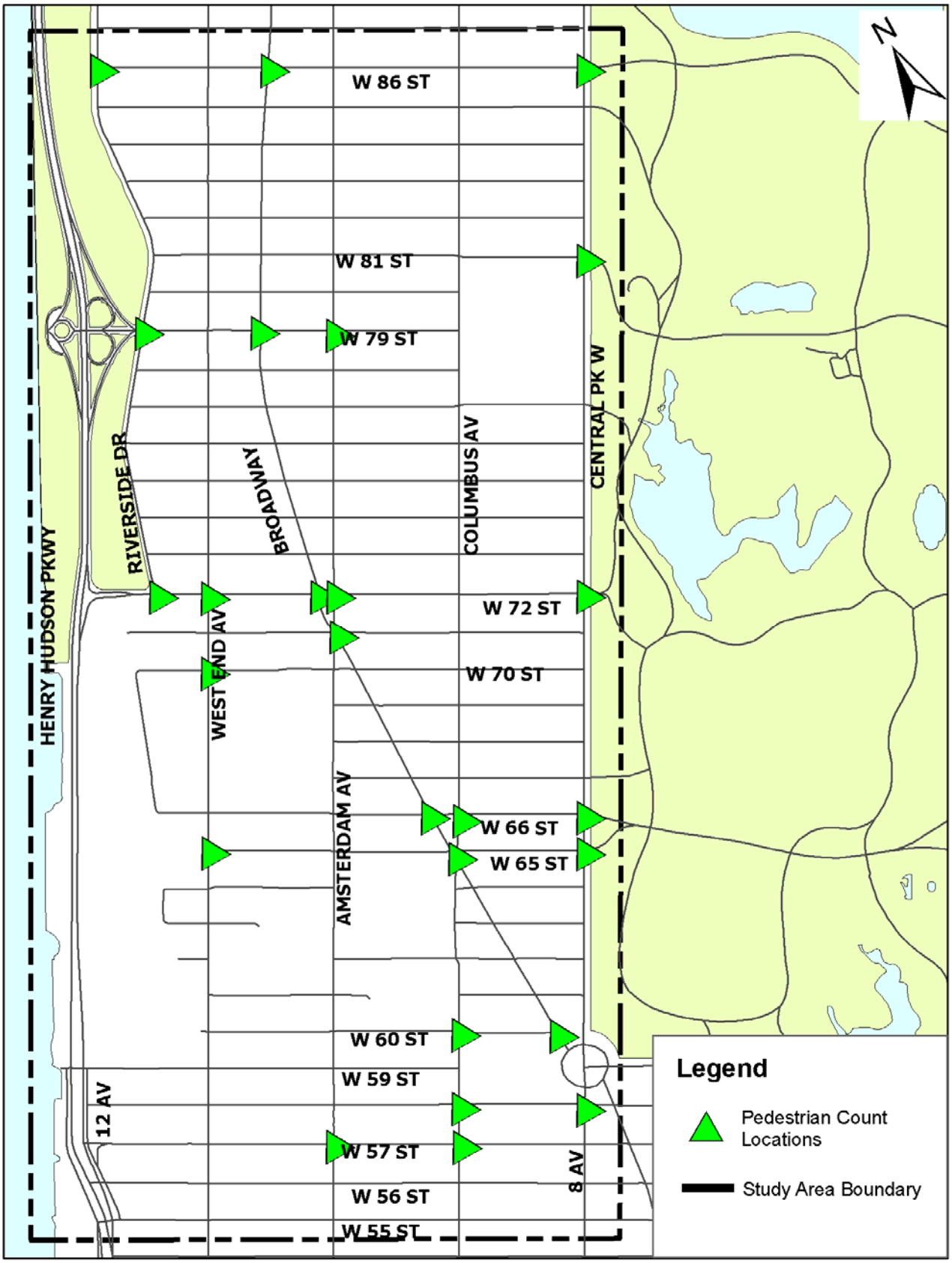


Figure 7 – 2: AM Peak Pedestrian Volumes

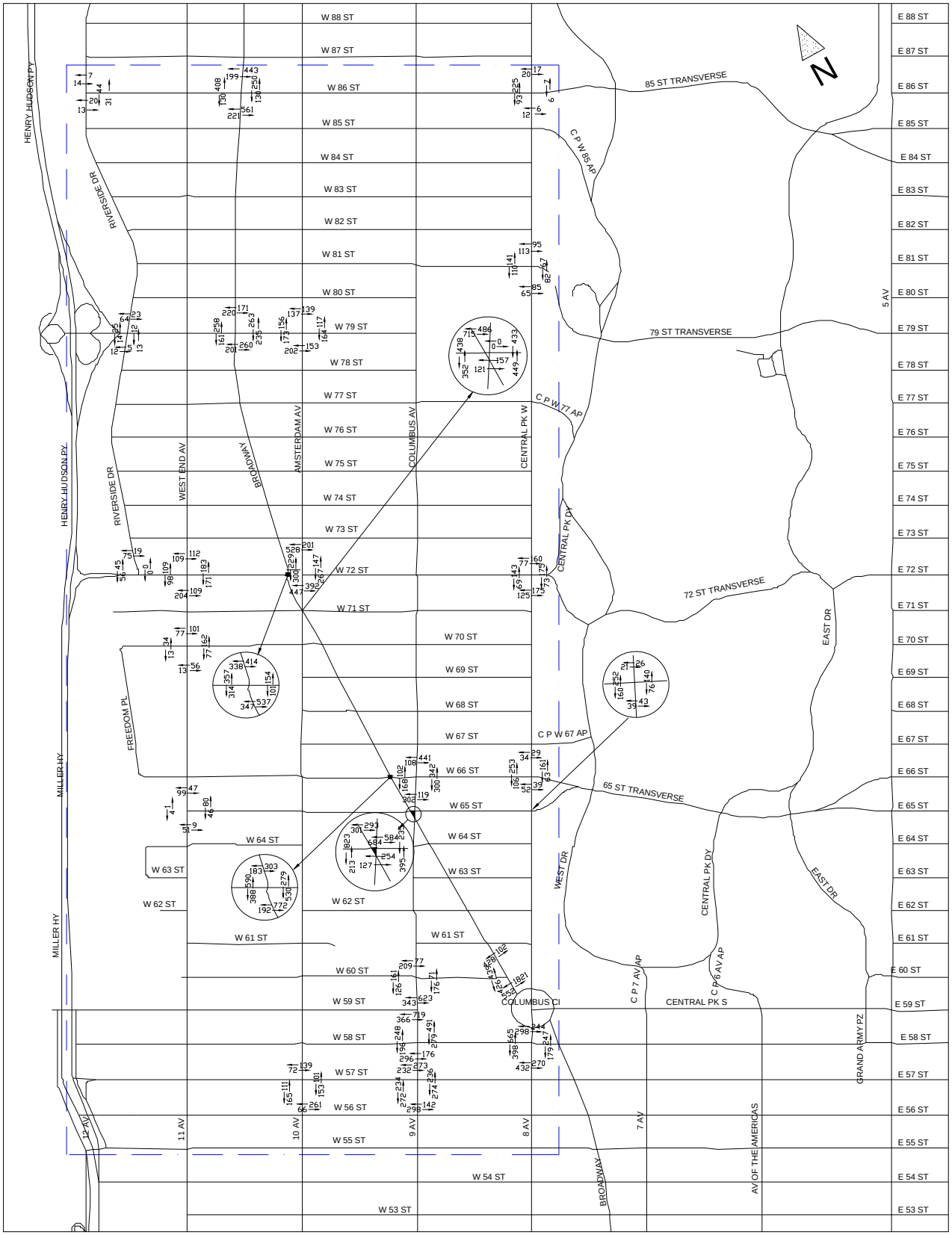


Figure 7 – 3: Midday Peak Pedestrian Volumes

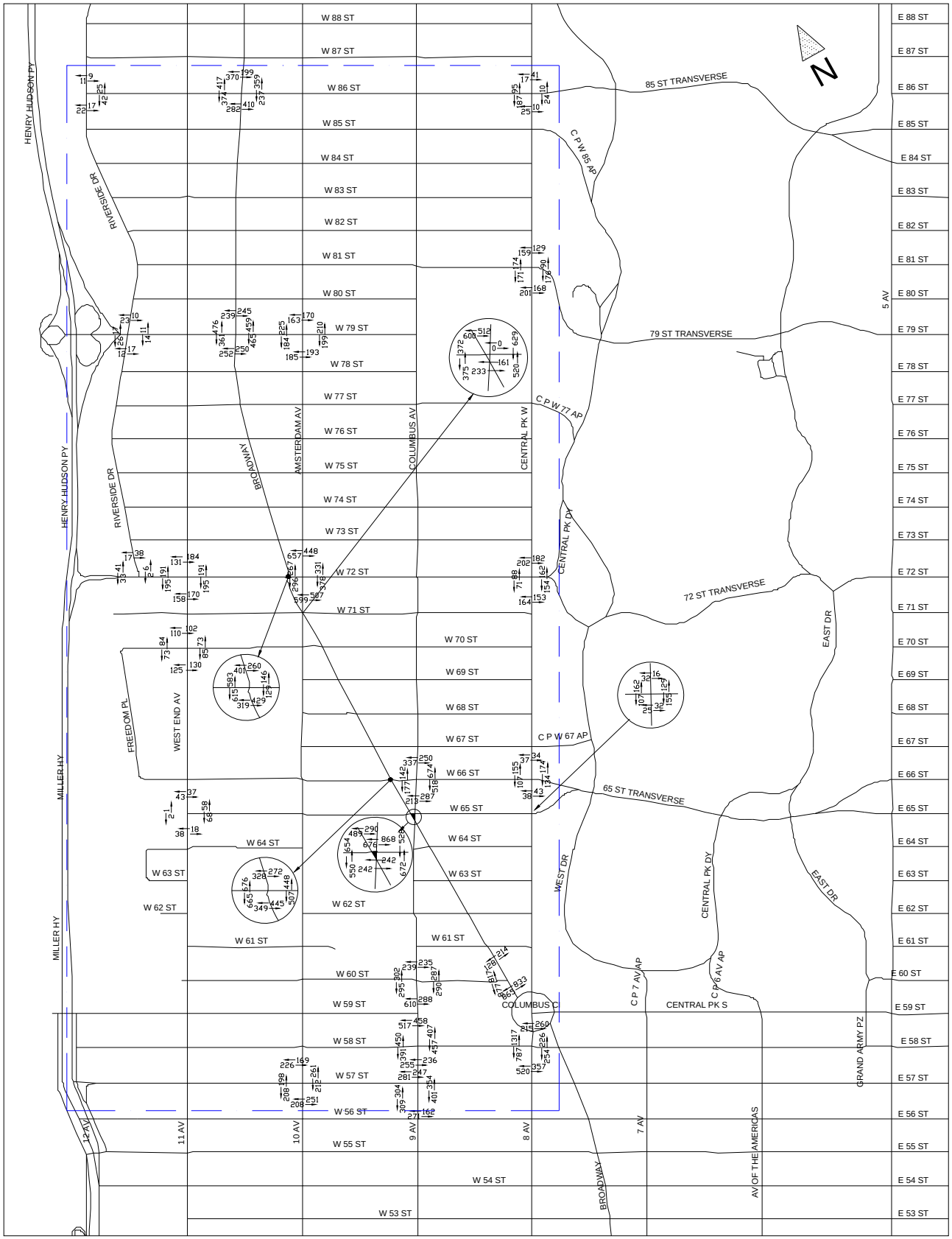


Figure 7 – 4: PM Peak Pedestrian Volumes

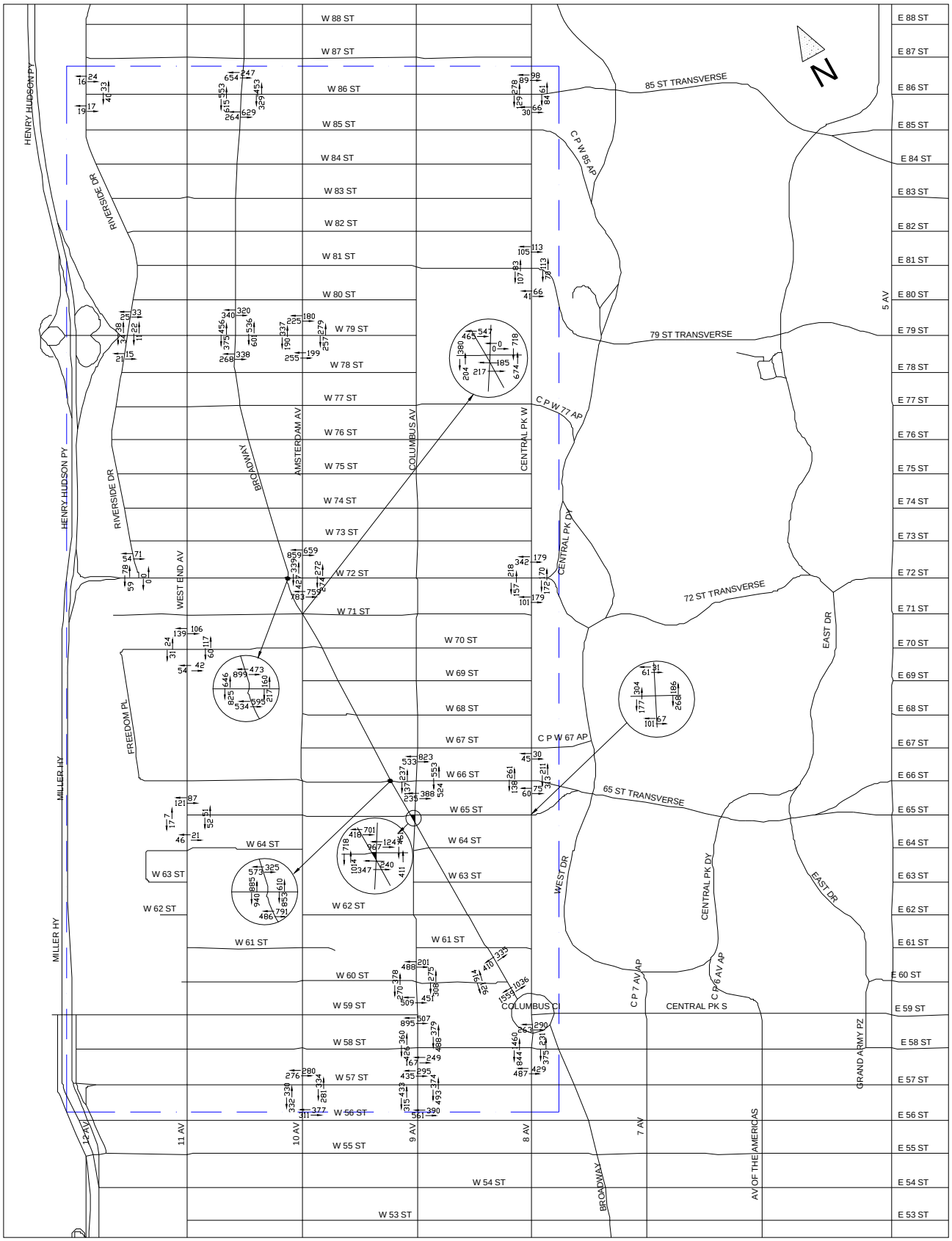
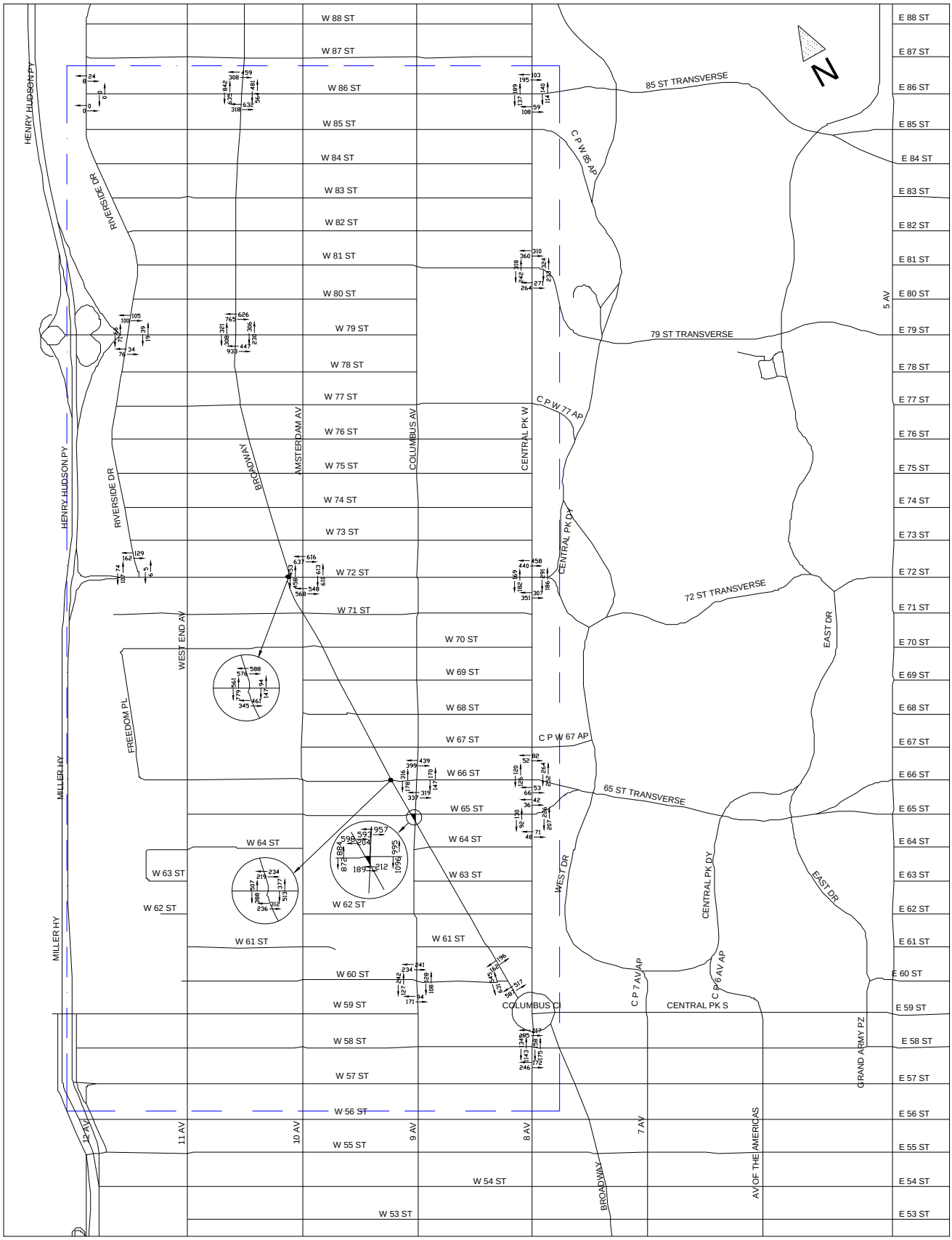


Figure 7 – 5: Saturday Midday Peak Pedestrian Volumes



7.2 Level of Service Analysis & Methodology

The pedestrian level of service (LOS) analysis was done by using the 2000 Highway Capacity Manual methodologies. Pedestrian LOS is measured as the pedestrian flow rate per minute per foot of width (p/min/ft). This indicates the quality of pedestrian movement and comfort, and is defined in a density-comfort relationship. Table 7-1 shows the LOS criteria for crosswalks and corners, which are measured in square feet of space per pedestrian. Pedestrian volumes were collected in 15-minute increments during peak hours; the weekday peak hours are 8-9 AM, 1-2 Midday, and 5-6 PM, and the weekend peak hour is Saturday midday 1-2pm.

Table 7 - 1: Level of Service Definitions for Pedestrians

LOS	Descriptions	Space (ft^2/p)	Flow Rate (p/min/ft)	Speed (ft/s)	v/c Ratio
A	Unrestricted	>60	< or = 5	>4.25	< or = 0.21
B	Slightly restricted	40 – 60	5 – 7	4.17 – 4.25	0.21 – 0.31
C	Restricted but fluid	24 – 40	7 – 10	4.00 – 4.17	0.31 – 0.44
D	Restricted; necessary to continuously alter walking stride and direction	15 – 24	10 – 15	3.75 – 4.00	0.44 – 0.65
E	Severely restricted	8 – 15	15 – 23	2.50 – 3.75	0.65 – 1.00
F	Forward progress only by shuffling; no reverse movement possible	< or = 8	variable	< or = 2.50	variable

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

7.2.1 Existing Crosswalk Conditions Analysis

The pedestrian analysis of crosswalks shows that the majority of the crosswalks at the 26 intersections operated at an acceptable LOS of C or better. However, there were ten intersections where one or more crosswalks operated at LOS D or worse during one or more peak hours:

- W. 57th Street & 9th Avenue – South: AM (D), PM (E)
- W. 58th Street & 8th Avenue – West: Midday (D), PM (D), Saturday (D)
- W. 58th Street & 9th Avenue – North: PM (D)

- W. 60th Street & Broadway – North: AM (D), PM (E); South: AM (F), Midday (F), PM (F), Saturday (E); West: AM (E), Midday (F), PM (F), Saturday (F)
- W. 65th Street & Broadway/Columbus Avenue – North-West: AM (D), Midday (D), PM (E), Saturday (E); South: PM (D)
- W. 66th Street & Central Park West – East: Midday (D)
- W. 66th Street & Columbus Avenue – North: PM (D)
- W. 66th Street & Broadway – West: AM (D), Midday (D), PM (E)
- W. 71st Street & Broadway/Amsterdam Avenue – North-East: PM (D)
- W. 79th Street & Broadway – North: Saturday (D); South: Saturday (D)

The results of the crosswalk analysis are shown in Table 7-2.

Table 7 - 2: Existing Conditions Crosswalk Level of Service
(Page 1 of 3)

Intersection	Crosswalk	AM		MD		PM		Sat	
		SF/P	LOS	SF/P	LOS	SF/P	LOS	SF/P	LOS
W 57 Street & 9th Avenue	North	94.3	A	96.5	A	73.8	A	x	x
	South	17.0	D	32.3	C	10.3	E	x	x
	East	84.1	A	52.6	B	42.2	B	x	x
	West	57.1	B	55.2	B	59.2	B	x	x
W 57 Street & 10th Avenue	North	219.6	A	126.7	A	92.7	A	x	x
	South	139.7	A	120.5	A	79.5	A	x	x
	East	210.1	A	140.2	A	97.9	A	x	x
	West	148.6	A	152.4	A	97.4	A	x	x
W 58 Street & 8th Avenue	North	36.0	C	47.4	B	53.4	B	79.4	A
	South	38.6	C	33.7	C	36.9	C	39.9	C
	East	102.1	A	81.5	A	61.8	A	126.8	A
	West	46.6	B	23.3	D	22.5	D	17.4	D
W 58 Street & 9th Avenue	North	28.5	C	33.3	C	18.1	D	x	x
	South	48.4	B	50.6	B	60.7	A	x	x
	East	66.2	A	58.2	B	56.2	B	x	x
	West	118.9	A	63.2	A	73.5	A	x	x
W 60 Street & Broadway*	North	20.1	D	25.1	C	13.3	E	28.9	C
	South	5.5	F	8.3	E	5.8	F	14.4	E
	East	x	x	x	x	x	x	x	x
	West	11.3	E	4.8	F	4.1	F	5.9	F
W 60 Street & Columbus Avenue	North	159.3	A	96.5	A	60.0	B	89.2	A
	South	25.1	C	33.3	C	24.5	C	80.5	A
	East	254.8	A	112.7	A	127.4	A	253.9	A
	West	147.6	A	84.8	A	61.1	A	112.8	A
W 65 Street & Central Park West	North	340.2	A	203.0	A	227.8	A	163.1	A
	South	233.2	A	199.9	A	86.1	A	231.9	A
	East	53.7	B	97.5	A	44.2	B	39.0	C
	West	93.3	A	242.9	A	90.3	A	173.7	A
W 65 Street & Broadway / Columbus Avenue	North-East	39.5	C	36.9	C	29.3	C	40.9	B
	North-West	23.6**	D	18.3**	D	13.9**	E	14.7**	E
	South	35.2	C	28.0	C	22.5	D	28.0	C
	East	53.6	B	37.1	C	47.9	B	24.3	C
	West	50.0	B	52.7	B	39.9	C	39.9	C
W 65 Street & West End Avenue	North	170.3	A	299.8	A	136.8	A	x	x
	South	363.5	A	512.8	A	458.8	A	x	x
	East	260.4	A	381.7	A	425.1	A	x	x
	West	x	x	x	x	x	x	x	x
W 66 Street & Central Park West	North	467.6	A	226.3	A	372.2	A	257.5	A
	South	344.8	A	147.5	A	237.6	A	255.6	A
	East	168.3	A	15.2	D	82.6	A	93.1	A
	West	136.1	A	179.8	A	125.3	A	139.1	A
W 66 Street & Columbus Avenue	North	50.0	B	65.7	A	16.9	D	32.0	C
	South	54.3	B	49.9	B	40.6	B	33.3	C
	East	110.2	A	53.0	B	64.4	A	231.1	A
	West	206.7	A	203.7	A	178.8	A	139.4	A

* This intersection was under construction for the duration of the study, so this analysis does not reflect normal operating conditions.

** Unique conditions apply: a pedestrian refuge obstructs significant portions of the crosswalk. See Appendix.

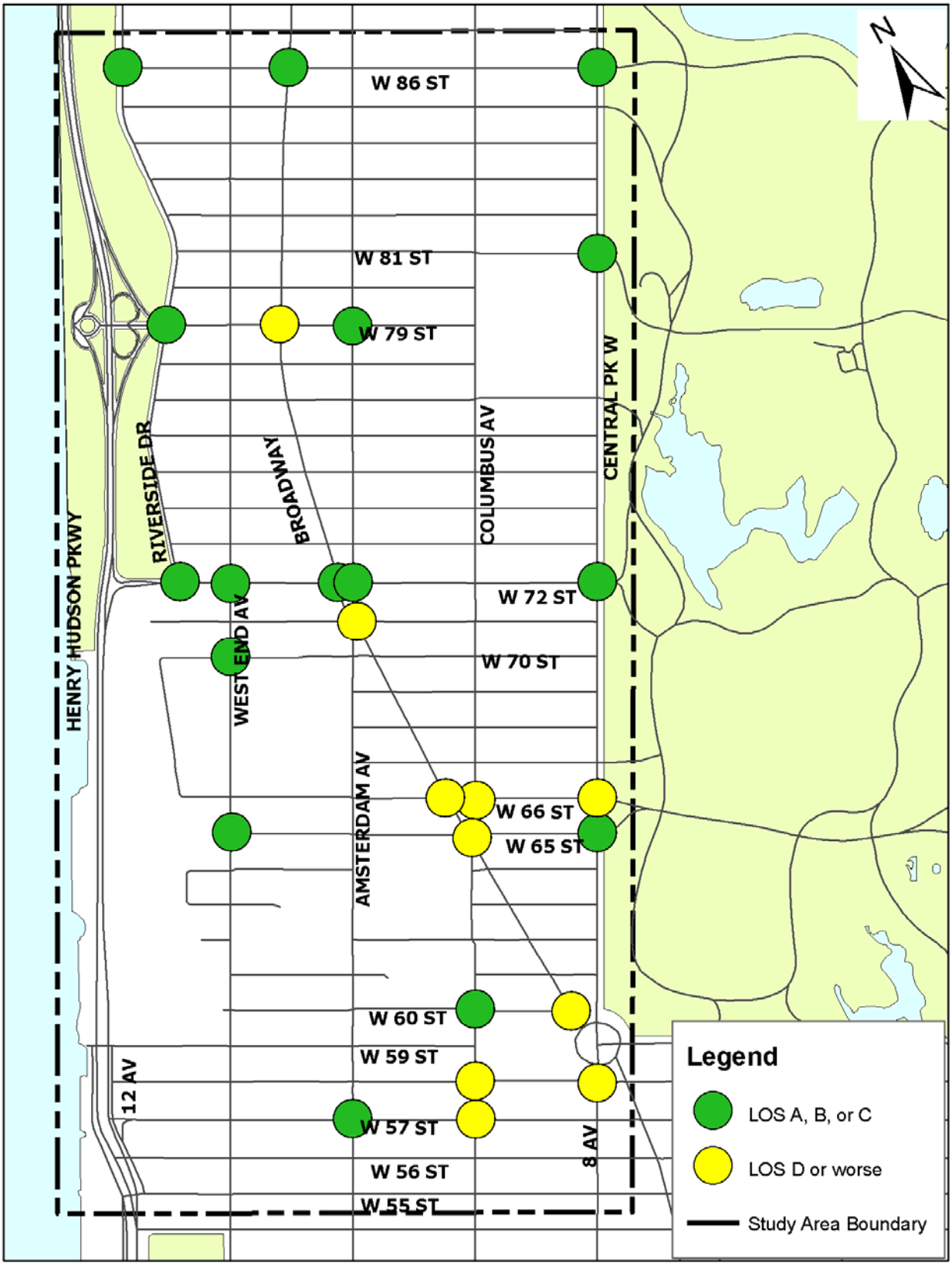
Table 7 – 2: Existing Conditions Crosswalk Level of Service
(Page 2 of 3)

Intersection	Crosswalk	AM		MD		PM		Sat	
		SF/P	LOS	SF/P	LOS	SF/P	LOS	SF/P	LOS
W 66 Street & Broadway	North	58.7	B	46.6	B	34.3	C	44.1	B
	South	44.1	B	45.2	B	32.2	C	92.2	A
	East	45.0	B	44.0	B	29.2	C	51.4	B
	West	18.9	D	18.1	D	11.8	E	26.4	C
W 70 Street & West End Avenue	North	130.6	A	125.2	A	109.0	A	x	x
	South	330.2	A	83.5	A	183.1	A	x	x
	East	185.1	A	307.0	A	183.0	A	x	x
	West	1078.0	A	325.6	A	598.2	A	x	x
W 71 Street & Broadway / Amsterdam Avenue	North-East	30.1	C	30.3	C	23.4	D	x	x
	North-West	99.6	A	93.2	A	72.0	A	x	x
	South-East	56.1	B	60.4	A	75.3	A	x	x
	South-West	28.6	C	31.8	C	39.8	C	x	x
	East	236.4	A	169.1	A	153.6	A	x	x
	West	60.6	A	73.6	A	75.0	A	x	x
W 72 Street & Central Park West	North	294.4	A	84.0	A	73.5	A	49.4	B
	South	201.2	A	108.2	A	122.4	A	54.6	B
	East	156.4	A	133.5	A	104.0	A	96.0	A
	West	199.3	A	245.5	A	111.6	A	108.2	A
W 72 Street & Amsterdam Avenue	North	45.5	B	39.3	C	25.3	C	36.9	C
	South	48.6	B	40.2	B	28.0	C	45.3	B
	East	158.7	A	119.7	A	146.1	A	61.5	A
	West	126.7	A	152.6	A	96.5	A	86.4	A
W 72 Street & Broadway	North	70.9	A	83.4	A	41.7	B	50.0	B
	South	40.9	B	53.9	B	37.2	C	60.7	A
	East	302.9	A	300.6	A	220.5	A	255.0	A
	West	130.7	A	72.8	A	59.1	B	71.7	A
W 72 Street & West End Avenue	North	156.1	A	157.2	A	112.0	A	x	x
	South	71.0	A	205.7	A	89.2	A	x	x
	East	198.3	A	203.2	A	188.1	A	x	x
	West	81.9	A	74.0	A	44.6	B	x	x
W 72 Street & Riverside Drive	North	103.5	A	312.3	A	136.0	A	73.2	A
	South	x	x	x	x	x	x	x	x
	East	x	x	x	x	x	x	x	x
	West	588.4	A	431.8	A	391.1	A	270.0	A
W 79 Street & Amsterdam Avenue	North	51.6	B	44.8	B	39.3	C	x	x
	South	113.8	A	105.0	A	91.8	A	x	x
	East	235.5	A	174.4	A	127.5	A	x	x
	West	198.7	A	109.0	A	111.3	A	x	x
W 79 Street & Broadway	North	83.4	A	61.3	A	48.4	B	21.2	D
	South	49.6	B	50.4	B	38.3	C	15.8	D
	East	163.8	A	97.4	A	78.8	A	147.7	A
	West	226.7	A	100.8	A	114.2	A	83.1	A
W 79 Street & Riverside Drive	North	167.5	A	464.5	A	342.8	A	225.8	A
	South	908.1	A	990.4	A	445.4	A	294.9	A
	East	841.7	A	723.2	A	725.3	A	579.0	A
	West	457.5	A	458.5	A	282.7	A	276.7	A

Table 7 – 2: Existing Conditions Crosswalk Level of Service
(Page 3 of 3)

Intersection	Crosswalk	AM		MD		PM		Sat	
		SF/P	LOS	SF/P	LOS	SF/P	LOS	SF/P	LOS
W 81 Street & Central Park West	North	210.1	A	118.4	A	162.0	A	87.3	A
	South	239.1	A	59.6	B	360.4	A	91.9	A
	East	338.3	A	140.3	A	273.6	A	118.8	A
	West	198.8	A	196.3	A	266.7	A	102.1	A
W 86 Street & Central Park West	North	415.9	A	128.9	A	100.3	A	75.6	A
	South	596.1	A	437.2	A	182.3	A	95.6	A
	East	3488.3	A	1457.1	A	404.5	A	331.4	A
	West	258.6	A	270.5	A	193.4	A	300.2	A
W 86 Street & Broadway	North	70.4	A	82.0	A	50.5	B	54.9	B
	South	59.7	B	63.3	A	50.9	B	46.5	B
	East	183.3	A	103.1	A	93.7	A	64.0	A
	West	116.3	A	85.2	A	62.2	A	44.6	B
W 86 Street & Riverside Drive	North	694.8	A	320.7	A	433.1	A	343.0	A
	South	617.3	A	415.2	A	351.7	A	749.4	A
	East	482.3	A	916.3	A	819.5	A	595.6	A
	West	x	x	x	x	x	x	x	x

Figure 7 – 6: Crosswalk Level of Service



*Intersections in Figure 7-6 are represented as 'LOS D or worse' if one or more crosswalk was LOS D, E, or F during one or more peak hour.

7.2.2 Existing Conditions Corner Analysis

The pedestrian analysis of corners at the 18 intersections selected for detailed study shows that the majority operated at an acceptable LOS of C or better. However, there were three intersections with corners that operated at LOS D or worse during one or more peak period:

- W. 58th Street & 8th Avenue – Southwest: Midday (D), PM (D), Saturday (D)
- W. 66th Street & Broadway – Southeast: PM (D)
- W. 81st Street & Central Park West – Northeast: Midday (D), Saturday (E)

The results of the corner analysis are shown in Table 7-3.

Table 7 – 3: Existing Conditions Corner Level of Service
(Page 1 of 2)

Intersection	Corner	AM		MD		PM		Sat	
		SF/P	LOS	SF/P	LOS	SF/P	LOS	SF/P	LOS
W 58 Street & 8th Avenue	NE	70.0	A	72.4	A	73.4	A	111.2	A
	NW	109.7	A	75.8	A	74.8	A	63.7	A
	SE	60.4	A	50.1	B	51.0	B	60.6	A
	SW	35.9	C	22.1	D	22.9	D	18.9	D
W 60 Street & Broadway	NE	x	x	x	x	x	x	x	x
	NW	110.6	A	73.1	A	59.0	B	72.5	A
	SE	x	x	x	x	x	x	x	x
	SW	57.2	B	52.7	B	41.5	B	62.5	A
W 60 Street & Columbus Avenue	NE	90.1	A	48.7	B	42.2	B	64.9	A
	NW	200.5	A	105.1	A	81.5	A	114.7	A
	SE	80.1	A	78.7	A	62.9	A	199.2	A
	SW	32.6	C	29.8	C	24.4	C	50.8	B
W 65 Street & Broadway / Columbus Avenue	NE	162.6	A	142.1	A	118.6	A	157.2	B
	NW	113.4	A	101.0	A	82.1	A	74.4	A
	SE	146.7	A	87.7	A	101.4	A	66.6	A
	SW	98.7	A	88.5	A	70.2	A	68.5	A
W 65 Street & Central Park West	NE	445.0	A	348.0	A	197.1	A	222.6	A
	NW	134.6	A	231.3	A	120.5	A	183.3	A
	SE	324.4	A	280.5	A	132.8	A	175.6	A
	SW	120.4	A	221.9	A	98.0	A	178.2	A
W 66 Street & Central Park West	NE	657.6	A	101.8	A	365.7	A	378.5	A
	NW	156.7	A	168.8	A	143.7	A	150.2	A
	SE	x	x	x	x	x	x	x	x
	SW	171.3	A	154.5	A	145.1	A	160.2	A
W 66 Street & Broadway	NE	96.2	A	83.3	A	61.5	A	94.4	A
	NW	99.7	A	80.0	A	59.6	B	97.4	A
	SE	33.1	C	35.6	C	23.0	D	50.8	B
	SW	250.6	A	219.7	A	159.4	A	331.7	A
W 66 Street & Columbus Avenue	NE	73.6	A	54.1	B	30.1	C	73.7	A
	NW	137.5	A	163.3	A	63.1	A	94.0	A
	SE	227.5	A	133.8	A	143.6	A	215.0	A
	SW	79.1	A	74.8	A	55.9	B	41.9	B
W 72 Street & Central Park West	NE	167.4	A	87.9	A	95.5	A	52.0	B
	NW	98.9	A	78.6	A	51.3	B	37.2	C
	SE	161.6	A	85.8	A	97.3	A	51.7	B
	SW	143.6	A	111.9	A	81.7	A	50.4	B
W 72 Street & Broadway	NE	x	x	x	x	x	x	x	x
	NW	131.7	A	110.4	A	73.1	A	87.5	A
	SE	x	x	x	x	x	x	x	x
	SW	74.1	A	63.9	A	48.8	B	65.7	A
W 72 Street & Amsterdam Avenue	NE	132.8	A	94.9	A	72.0	A	59.0	B
	NW	108.1	A	100.4	A	66.1	A	72.3	A
	SE	123.7	A	96.8	A	75.5	A	72.5	A
	SW	x	x	x	x	x	x	x	x

Table 7 – 3: Existing Conditions Corner Level of Service
(Page 2 of 2)

Intersection	Corner	AM		MD		PM		Sat	
		SF/P	LOS	SF/P	LOS	SF/P	LOS	SF/P	LOS
W 72 Street & Riverside Drive	NE	227.9	A	537.0	A	303.5	A	133.0	A
	NW	x	x	x	x	x	x	x	x
	SE	x	x	x	x	x	x	x	x
	NW	x	x	x	x	x	x	x	x
W 79 Street & Broadway	NE	212.8	A	141.3	A	112.6	A	89.5	A
	NW	203.6	A	116.8	A	114.5	A	61.6	A
	SE	195.2	A	146.9	A	116.1	A	89.2	A
	SW	202.9	A	130.3	A	142.8	A	65.8	A
W 79 Street & Riverside Drive	NE	432.1	A	800.5	A	645.2	A	458.3	A
	NW	287.1	A	505.0	A	332.5	A	238.7	A
	SE	627.4	A	768.0	A	537.1	A	330.4	A
	SW	924.3	A	823.5	A	489.0	A	312.1	A
W 81 Street & Central Park West	NE	41.9	B	20.0	D	32.7	C	10.9	E
	NW	59.3	B	73.1	A	80.0	A	49.4	B
	SE	120.6	A	33.5	C	129.5	A	39.1	C
	SW	389.4	A	157.7	A	494.9	A	165.7	A
W 86 Street & Central Park West	NE	391.5	A	123.5	A	60.8	A	44.8	B
	NW	60.2	A	57.9	B	41.6	B	54.0	B
	SE	481.3	A	248.0	A	73.2	A	50.8	B
	SW	158.8	A	187.4	A	126.9	A	132.1	A
W 86 Street & Broadway	NE	165.2	A	158.3	A	120.4	A	104.4	A
	NW	153.2	A	143.8	A	98.2	A	75.3	A
	SE	124.8	A	112.9	A	95.4	A	76.7	A
	SW	122.3	A	130.5	A	101.7	A	84.7	A
W 86 Street & Riverside Drive	NE	811.8	A	976.3	A	936.0	A	767.0	A
	NW	x	x	x	x	x	x	x	x
	SE	459.3	A	639.5	A	482.2	A	598.8	A
	SW	x	x	x	x	x	x	x	x

7.3 Bicycle Lanes and Paths

The study area has the potential for the provision of an extensive bicycle network, based on the existing and planned facilities. There are currently three on-street Class 2 bicycle lanes in the study area: one along Central Park West, and one each along the lengths of West 77th and West 78th 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 current New York City Cycling Map (2010) identifies several proposed routes in the study area. See Figure 7-6 for bicycle lanes and paths in the study area.

East-West streets:

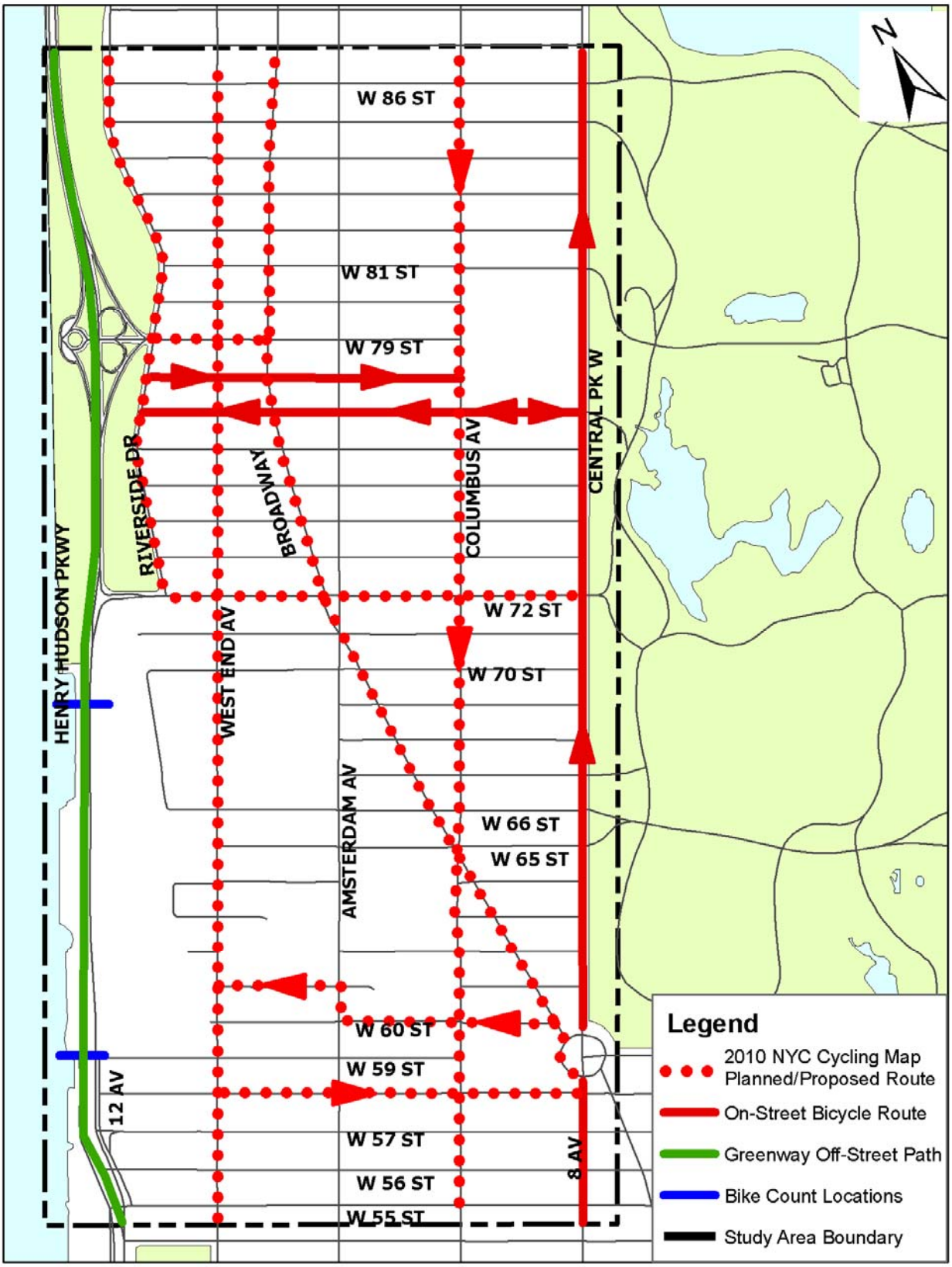
- West 58th Street from 11th Avenue to 8th Avenue
- West 60th Street from Broadway to 10th Avenue
- West 61st Street from 10th Avenue to 11th Avenue

North-South corridors:

- Broadway (through the study area)
- 11th Avenue/West End Avenue (through the study area)
- Riverside Drive (north of West 72nd Street)

In an effort to monitor non-motorized modes of transportation, a comprehensive data-collecting effort, initiated by the New York Metropolitan Transportation Council (NYMTC), has been conducted. The NYMTC Bicycle Data Collection Program counted bicyclists, rollerbladers, joggers, walkers, and other non-motorized mode users during peak periods at 476 study locations over six years. Of the 283 study locations in the five boroughs of New York City (including 115 multi-use path locations and 168 on-street locations), two multi-use path locations monitored in the summer of 2008 are within the study area; they are located along the Hudson River Greenway at West 68th Street and West 59th Street. The counts at these locations (see Figure 7-6) indicate that the highest bicycle volumes occur during the PM peak (227 and 338 bicycles, respectively), followed by the AM peak (141 and 256 bicycles, respectively), then the Midday peak (57 and 125 bicycles, respectively). The location at West 68th Street was also counted in the summer of 2004; the counts indicated little change in the AM and PM (164 and 226 bicycles, respectively), but almost twice as many bicycles were observed during the Midday peak (112 bicycles).

Figure 7 - 7: Existing and Proposed Bike Routes



8.0 ACCIDENTS/SAFETY ANALYSIS

8.1 Introduction

The analysis of accidents and safety is an important component in traffic and transportation planning studies, as transportation related accidents lead to loss of life and property damage. The main purpose of this analysis is to identify locations in the study area needing special attention and possible implementation of safety improvement measures.

In order to identify locations with safety issues and prevalent accidents in the study area, it was necessary to examine the accident history data to see if any patterns can be established. Initially, existing reportable and non-reportable accident data for a period of five years (1997 to 2001) was assembled and analyzed in this study. These records were collected from the New York City Department of Transportation (NYCDOT) accident database which includes New York State Department of Motor Vehicle (NYSDMV) and New York Police Department (NYPD) reported accidents. The data provides information on locations, severity, collision type, weather conditions, time of accidents, and other pertinent factors, that can be used to identify locations with high accidents (frequency) and locations where motorists, pedestrians, and bicyclists were either killed or injured (severity) in the study area.

8.2 (1997-2001)

The criteria for a “High Accident Location” are: any such location having 49 or more total accidents (including reportable and non-reportable accidents) or 5 preventable pedestrian accidents in one year.

After reviewing all the intersections in the study area for a five-year period (1997 to 2001); 12 locations meet the criteria for a “High Accident Location” at least once between 1997 and 2001. Table 8-1 lists the 12 “High Accident Locations,” total pedestrian accidents as well as total accidents.

Table 8 - 1: "High Accident Locations" in the Study area (1997-2001)

	1997		1998		1999		2000		2001		Total 5 Years	
Location	**Total**	**Peds**	**Total**	**Peds**	**Total**	**Peds**	**Total**	**Peds**	**Total**	**Peds**	**Peds**	**All Accidents**
8th Ave/Broadway	74	2	73	8	72	2	70	0	48	1	13	337
11th Ave/W. 57th St.	51	1	48	2	42	2	37	2	43	2	9	221
12th Ave/W. 57th St.	46	0	57	0	25	0	27	0	23	1	1	178
8th Ave/W. 57th St.	42	4	48	9	44	3	48	3	36	4	23	218
CPW/W. 86th St.	39	5	35	3	25	2	36	1	16	0	11	151
10th Ave/W. 57th St.	32	2	34	3	37	6	39	0	30	1	12	172
9th Ave/W. 57th St.	31	8	51	9	27	1	30	2	27	3	23	166
Amsterdam Ave/W. 73rd St.	24	6	26	5	16	4	19	1	11	1	17	96
Broadway/W. 57th St.	21	0	26	2	31	6	37	4	30	3	15	145
Columbus Ave/W. 66th St.	18	1	26	5	17	0	16	2	12	1	9	89
Columbus Ave/W. 63rd St.	10	5	10	1	7	2	6	0	7	1	9	40
Broadway SB/W. 75th St.	6	1	16	5	8	1	7	0	9	1	8	30
Total Qualifying Locations	**6**		**4**		**3**		**1**		**0**			
Total Accidents	**394**	**35**	**450**	**52**	**351**	**29**	**372**	**15**	**292**	**19**		

Out of a total 12 "High Accident Locations" 6 are along the West 57th Street corridor; as a result, this corridor will be examined more closely. The data show that each year the intersection of Eighth Avenue and Broadway had the highest number of accidents, averaging 67 accidents per year. The highest number of pedestrian accidents occurred at Eighth Avenue and West 57th Street and Ninth Avenue and 57th Street, averaging 5 pedestrian crashes per year. Figure 8-1 shows the 12 "High Accident Intersections" on a map of the study area and table 8-2 provides vital statistics for the 12 "High Accident Locations" (1997-2001).

Figure 8 - 1: "High Accident Locations" (1997-2001)

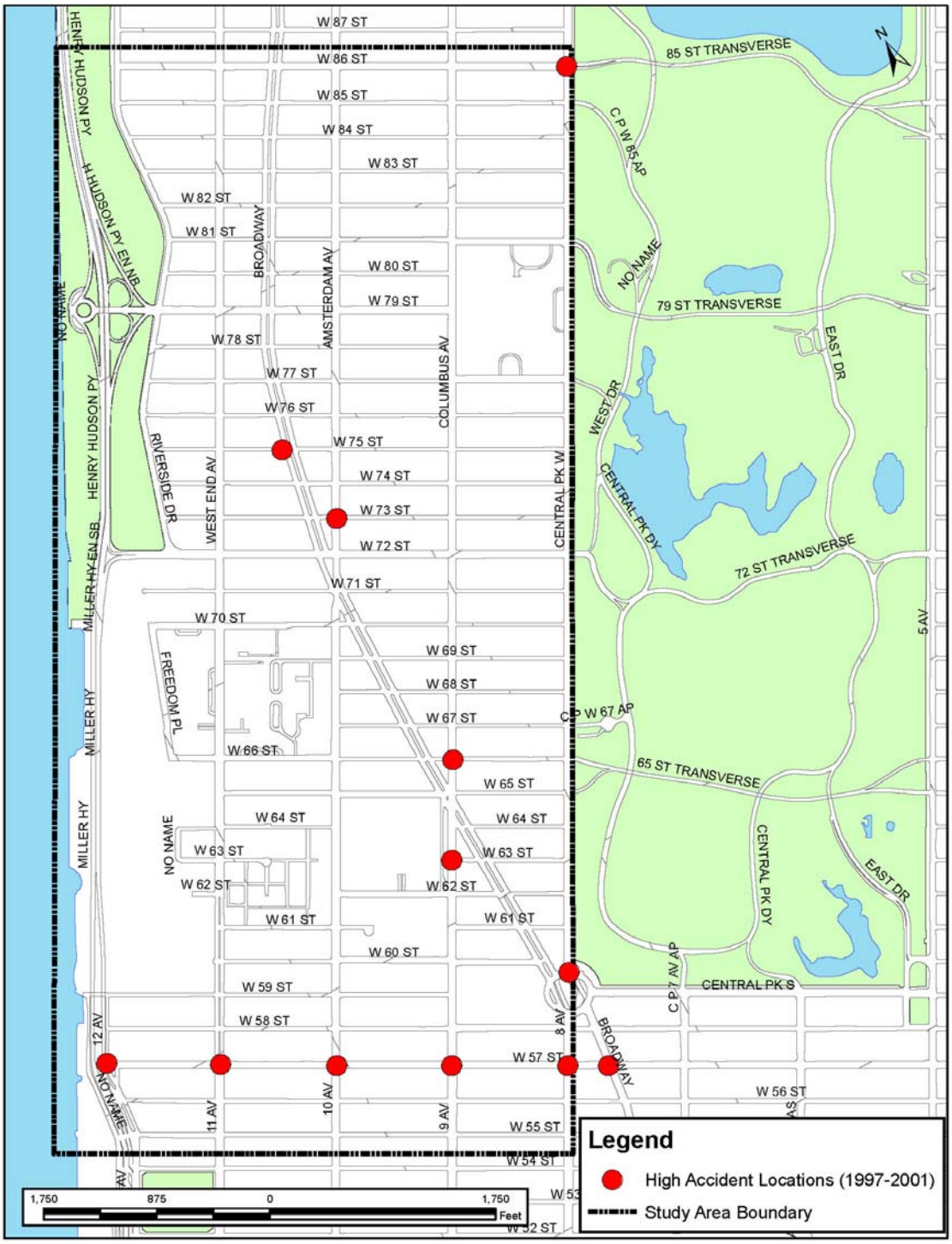


Table 8 - 2: Vital Statistics for "High Accident Locations" (1997-2001)

Location	Total Accidents	% During Peak Hour	Light Conditions	Collision Type	Seasons	% Pedestrian Involved	% Bicycles Involved
8th Ave/ Broadway	337	56%	71% Day light 18% Night time	9% Right Angle 36% Overtaking 9% Rear End	23% Fall 24% Winter 26% Spring 27% Summer	4%	1%
11th Ave/ W. 57th St.	216	50%	60% Daylight 25% Night time	12% Left Turn 25% Right Turn 8% Rear End	27% Fall 22% Winter 29% Spring 22% Summer	4%	1%
12th Ave/ W. 57th St.	178	38%	52% Daylight 37% Night time	15% Right Angle 12% Overtaking 37% Rear End	23% Fall 28% Winter 17% Spring 32% Summer	1%	0%
8th Ave/ W. 57th St.	223	47%	53% Daylight 38% Night time	8% Right Turn 8% Right Angle 25% Overtaking 9% Rear End	28% Fall 22% Winter 20% Spring 30% Summer	10%	2%
CPW/ W. 86th St.	151	54%	58% Daylight 27% Night time	23% Left Turn 13% Right Angle 12% Rear End	25% Fall 23% Winter 25% Spring 26% Summer	7%	3%
10th Ave/ W. 57th St.	172	42%	43% Daylight 43% Night time	27% Overtaking 21 Rear End	28% Fall 21% Winter 28% Spring 23% Summer	7%	1%
9Th Ave/ W. 57th St.	166	46%	49% Daylight 40% Night time	11% Right Angle 12% Overtaking 11% Rear End	27% Fall 23% Winter 27% Spring 23% Summer	14%	3%
Amsterdam Ave/ W. 73rd St.	96	N/A	17% Night time	3.1% Rear End 7.3% Overtaking	N/A	17.7%	3.1%
Broadway/ W. 57th St.	145	56%	54% Daylight 35% Night time	10% Right Angle 20% Overtaking 14% Rear End	30% Fall 17% Winter 26% Spring 27% Summer	10%	4%
Columbus Ave/ W. 66th St.	84	N/A	10% Night time	1% Left Turn 6% Overtaking	N/A	12%	0%
Columbus Ave/ W. 63rd St.	40	N/A	8% Night time	5% Rear End 5% Overtaking 3% Right Angle	N/A	23%	10%
Broadway SB/ W. 75th St.	46	N/A	15%	7% Rear End 4Right Angle 2% Overtaking	N/A	17%	11%

8.2.1 Fatalities

There were 18 fatalities in the study area during the five-period from 1997 to 2001. Most of the fatal crashes occurred along Broadway, where there were 6 crashes during the five year period, including two fatalities within the same year. The Highest number of fatal accidents occurred in 1998 and in 2001 with 5 fatalities each. In 2001, there were two fatalities as a result of one crash on Columbus Avenue and West 78th Street.

8.3 (2006-2008)

In 2001, NYSDMV stopped reporting "Non-Reportable accidents." In the absence of the "Non-Reportable accidents" category, the total accidents criteria obviously changed. Generally the ratio of "Non-Reportable" to "Reportable Accidents," has been 1 to 1.13, or 53% "Non-Reportable" accidents to 47% Reportable Accidents. Thus, the ratio of 1:1.3 was applied to "Reportable Accidents" alone to identify "High Accident Locations" defined as either 23 or more "Reportable Accidents" or 5 preventable pedestrian crashes per year.

After reviewing all the intersections in the study area for the most recent three years (2006-2008) using the new criteria, four locations qualified as "High Accident Locations" with five pedestrian accidents in at least one year. One of these intersections, Eight Avenue and West 57th Street experienced five pedestrian accidents in both 2006 and in 2008. However, of the 18 locations within the study area that experienced 5 or more "Reportable Accidents" in one or more of the three years studied, 7 locations had 10 or more accidents at least once in the same period. These 7 locations were subjected to further detailed analysis. Table 8-2 lists the 18 locations and the summary of accident history from 2006 to 2008; while Figure 8-2 shows the locations on a study area map.

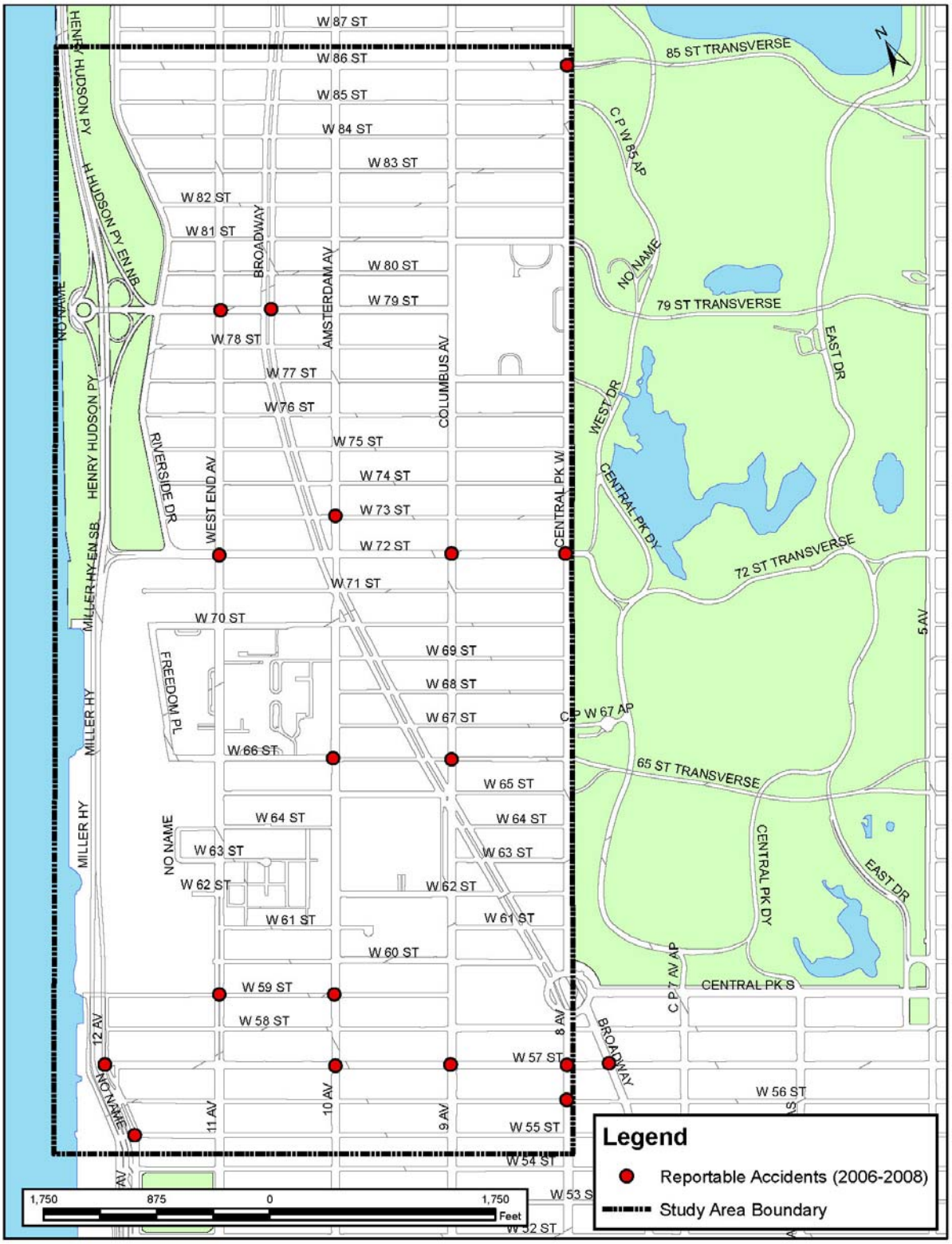
Table 8 - 3: Reportable Accident History in Study Area (2006-2008)

No.	MAIN ST	2006	2007	2008	TOTAL
1*	8th Ave/W. 57th St..	20	12	15	47
2*	CPW/W. 86th St.	21	11	7	39
3*	12th Ave/W. 55th St.	15	5	7	27
4*	12th Ave/57th St..	14	9	12	35
5*	Amsterdam Ave/W. 66th St.	10	6	6	22
6*	9th Ave/W. 57th St.	9	8	13	30
7*	10th Ave/W. 57th St.	8	13	7	28
8	West End Ave/W. 72nd St.	8	8	5	21
9	Broadway SB/W. 79th St.	7	8	5	20
10	11th Ave/W. 59th St.	6	6	8	20
11	8th Ave/W. 56th St.	6	7	6	19
12	Columbus Ave/W. 72nd St.	6	7	5	18
13	West End Ave/W. 79th St.	6	5	7	18
14	CPW/W. 72nd St.	6	6	5	17
15	10th Ave W. 59th St.	6	5	6	17
16	Columbus Ave/W. 66th St.	5	9	5	19
17	Amsterdam Ave/W.73rd St.	5	6	6	17
18	Broadway/W. 57th St.	5	5	7	17
	Total Accidents	**163**	**136**	**132**	**431**

*Locations subjected to detailed analysis

The data show that the intersection at Eighth Avenue and West 57th Street had the highest number of accidents, with a total of 47 accidents over the three-year period. Four other intersections along West 57th Street were among the locations with the most accidents in the study area, with 35 total accidents on Twelfth Avenue, 30 total accidents on Ninth Avenue, 28 total accidents on Tenth Avenue, 17 total accidents on Broadway.

Figure 8 - 2: Reportable Accident Locations (2006-2008)



8.3.1 Fatalities & Injuries

Over the three-year period (2006-2008) there were 6 fatalities and 32 injuries as a result of accidents at six locations in the study area. There were three fatalities in 2006, two in 2007, and one in 2008. Out of 6 total fatal crashes, 5 involved pedestrians. Most of the fatalities occurred on Amsterdam Avenue, where two pedestrian fatalities occurred in the same year. Table 8-4 summarizes fatal accidents and injuries from 2006 to 2008, in the study area. Figure 8-3 shows fatal accident locations in the study area.

Table 8 - 4: Summary of Fatalities and Injuries (2006-2008)

Year	Location	Fatal	Ped Fatal	Injury
2006	Amsterdam Ave/W. 66th St.		1	15
2006	Amsterdam Ave/W. 74th St.		1	1
2006	Broadway NB/W. 73rd St.		1	0
2007	12th Ave/W. 55th St.		1	5
2007	Amsterdam Ave/W. 78th St.	1		2
2008	8th Ave/W. 57th St.		1	9
	Total Fatalities/Injuries	**1**	**5**	**32**

8.3.2 Accidents Involving Pedestrians and Bicyclists

Four locations, 8th Avenue/W. 57th Street, 10th Avenue/W. 57th Street, Columbus Avenue/W. 66th Street, and Amsterdam Avenue/W. 86th Street qualify as 'High Pedestrian Accident Locations" having 5 pedestrian accidents in at least one year between 2006 and 2008. However, it was felt that examination of intersection with at least three pedestrian accidents or two bicycle accidents per year, during the three-year period (2006-2008), might yield some useful insights. During the three-year period there were 168 pedestrian and 51 bicycle accidents at 32 locations in the study area. Table 8-5 shows the locations with the numbers of pedestrian and bicycle accidents.

Figure 8 - 3: Fatal Accident Locations (2006-2008)

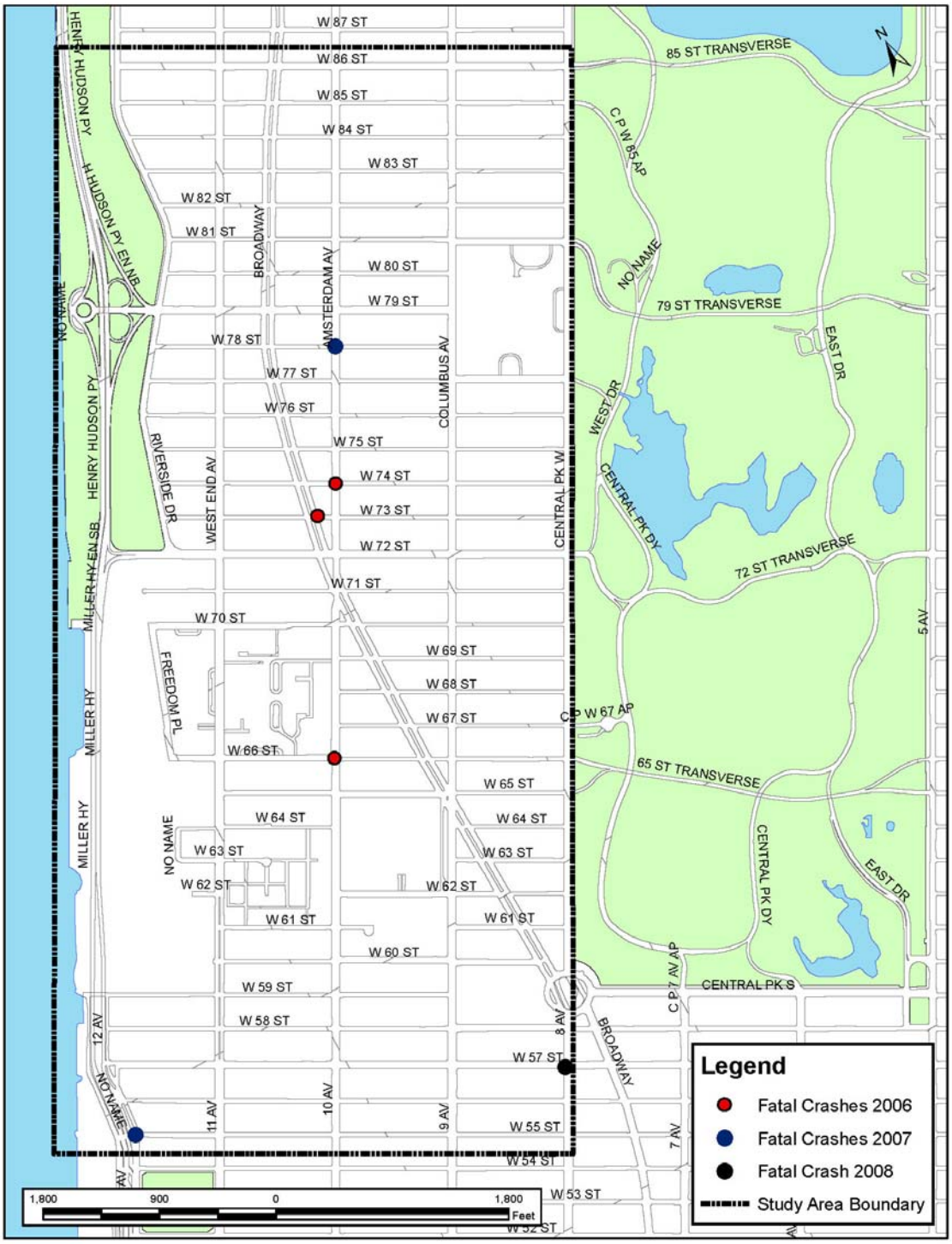


Table 8 - 5: Pedestrian and Bicycle Accidents (2006-2008)

Location	2006		2007		2008		Total	
	Ped	Bike	Ped	Bike	Ped	Bike	Ped	Bike
8th Ave/57th St.	5	3	4	3	5	0	14	6
10th Ave/W. 57th St.	3	2	5	0	2	0	10	2
Columbus Ave/W. 66th St.	5	0	4	0	3	1	12	1
Amsterdam Ave/W. 86th St.	0	0	5	1	1	0	6	1
9th Ave/W. 58th St.	4	0	2	0	3	1	9	1
Broadway SB/W. 73rd St.	4	2	2	0	1	0	7	2
Amsterdam Ave/W. 66th St.	4	0	3	0	2	1	9	1
10th Ave/W. 55th St.	4	0	0	0	0	1	4	1
Columbus Ave./W. 86th St.	1	0	4	2	3	0	8	2
11th Ave/W. 59th St.	2	1	1	1	4	0	7	2
8th Ave./Broadway	3	1	3	0	0	0	6	1
9th Ave./W. 57th St.	3	0	2	0	2	2	7	2
Amsterdam Ave./W. 72nd St.	3	0	0	1	0	1	3	2
Broadway/W. 57th St.	3	0	3	0	3	0	9	0
Columbus Ave/W. 77th St.	3	0	3	1	0	0	6	1
Amsterdam Ave./W. 80th St.	3	0	0	0	2	0	5	0
CPW/W. 64th St.	3	0	0	0	1	0	4	0
Amsterdam Ave./W.59th St.	0	1	3	0	1	0	4	1
8th Ave./W. 58th St.	2	1	0	0	3	0	5	1
Amsterdam Ave./W. 81st St.	0	0	1	0	3	0	4	0
West End Ave./W. 71st St.	1	0	1	0	3	0	5	0
Broadway SB/W. 66th St.	2	0	0	0	3	0	5	0
11th Ave./W. 57th St.	0	2	0	0	1	0	1	2
12th Ave./W. 55th St.	0	2	1	0	1	1	2	3

Location	2006		2007		2008		Total	
West End Ave./W. 72nd St.	1	2	1	2	1	2	3	6
CPW/W. 81st St.	2	2	1	0	0	0	3	2
CPW/W. 67th St.	1	2	1	0	0	0	2	2
11th Ave./W. 56th St.	0	3	0	0	3	0	3	3
Columbus Ave./W. 72nd St.	1	2	3	0	0	2	4	4
Broadway/W. 65th St.	0	2	1	0	0	0	1	2
Total Ped/Bike Accidents	**63**	**28**	**54**	**11**	**51**	**12**	**168**	**51**

The two locations with the most accidents involving bicyclists during the analysis period were Eighth Avenue/57th Street and West End Avenue/West 72nd Street; both locations had a total of 6 accidents involving bicyclists.

8.3.3 Accidents by Collision Type and Driving Conditions

Analysis of contributing factors in relation to frequency of accidents from 2006-2008 revealed that 33% of the accidents occurred during night time, and wet roadway contributed to 15% of the accidents. The distribution of accident by collision type showed that 22% were rear end, 5% left turn and 7% right angle. The location with the highest frequency of rear end collision type was *Twelfth Avenue/West 57th Street* with 19 rear end accidents representing 22% of total rear end accidents, while the location with highest frequency of left turn collision type was *Central Park West/West 86th Street* with seven left turn accidents. The highest number of right angle collision occurred at Eighth Avenue/West 57th Street. Following are the most prominent collision types and conditions by location and frequency.

- Rear End
  - *Twelfth Avenue/West 57th Street* (19)
  - *Central Park West/West 86th Street* (9)
  - *Twelfth Avenue/West 55th Street* (9)
- Left Turn

    - Central Park West/West 86th Street (7)

- Right Angle
    - Eleventh Avenue/West 57th Street (6)
    - Central Park West/West 86th Street (5)

- During Night Time
    - Eighth Avenue/West 57th Street (13)
    - Twelfth Avenue/West 55th Street (11)

- Wet Roadway
    - Columbus Avenue/West 86th Street (6)
    - Central Park West/West 86th Street (6)
    - Tenth Avenue/West 57th Street (6)
    - Eighth Avenue/West 57th Street (5)

9.0 GOODS MOVEMENT

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

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

This study undertakes a preliminary assessment of the impact of truck traffic in the study area. For this purpose, field data were gathered and other studies were consulted to effectively assess this issue. The recent New York City Department of Transportation (NYCDOT), *Citywide Truck Route Management & Community Impact Reduction Study,* was aimed at responding to citywide concerns about impacts of truck traffic on quality of life, traffic congestion, and the regional transportation system. The study provided recommendations to address the needs of both NYC's residential and business communities while seeking to mitigate many of the negative consequences of truck traffic. Some of the ideas and preliminary conclusions from the study were drawn on in the West Side Manhattan Transportation Study.

The rules and regulations governing truck traffic in New York City can be found in the New York City Traffic Rules and Regulations (Chapter 4 of Title 34 of the Rules of the City of New York). According to Section 4-13, a truck generally is defined as any vehicle or combination of vehicles designed for the transportation of property which has either of the following characteristics: two axels, six tires, or three or more axels.

In New York City, trucks, as defined above, should confine themselves to the local and through truck route system except that in order to reach their origin or destination, they may operate on a street not designated as a truck route. This may be accomplished by leaving a

designated truck route at the intersection that is nearest and provides the most direct route to their destination, and then returning to the nearest designated truck route by the most direct route. Through truck routes are to be utilized by vehicles with neither an origin nor a destination within the borough that it is crossing. There are no through truck routes in the study area. Figure 9-1 shows the truck routes (local and through) for the borough of Manhattan.

9.1 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 9-2 shows the local truck route network in the study area. The local truck routes in the study area are:

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

Based on the information gathered through the *Citywide Truck Route Management & Community Impact Reduction Study*, field observations, and the spatial distribution of commercial establishments, there are a significant number of trucks accessing the study area.

Given that many trucks undertake deliveries to commercial properties, the primary delivery times are in the late morning and early afternoon from 10 am to 3 pm. Generally, inbound delivery volumes are highest during the morning and midday peak. The number of trucks coming to the city decreases after 4 pm.

9.1.1 North-South Local Truck Route Access

Truck activity in the study area is very high, especially along the Columbus Avenue, Amsterdam Avenue, and Broadway corridors, where the commercial retail and offices in the study area are concentrated. Many truck trips terminate along these corridors at activity centers, 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 and Holland Tunnels.

9.1.2 East-West Local Truck Route Access

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

Figure 9-1: Through & Local Truck Routes: Manhattan & Surrounding Area

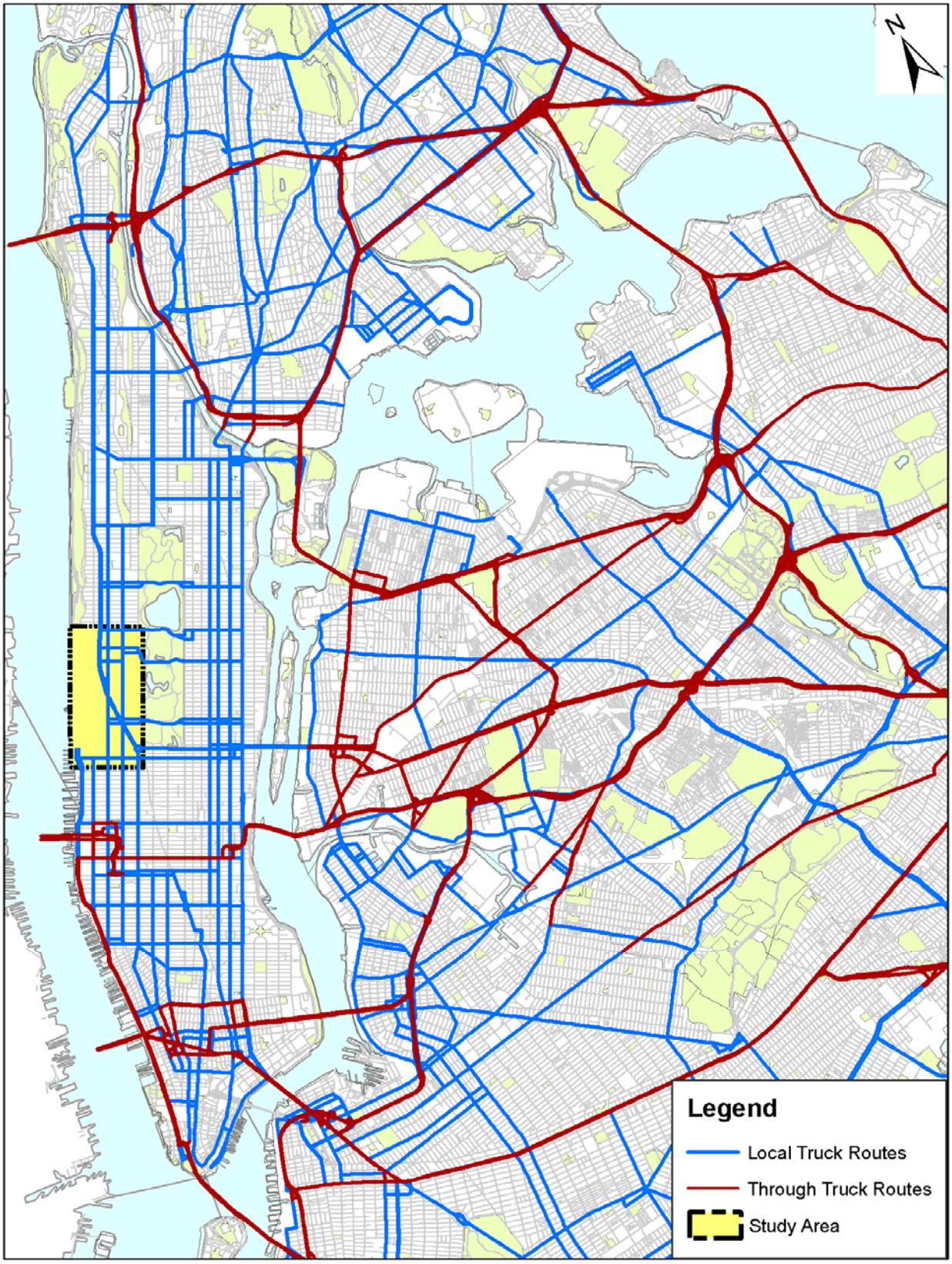
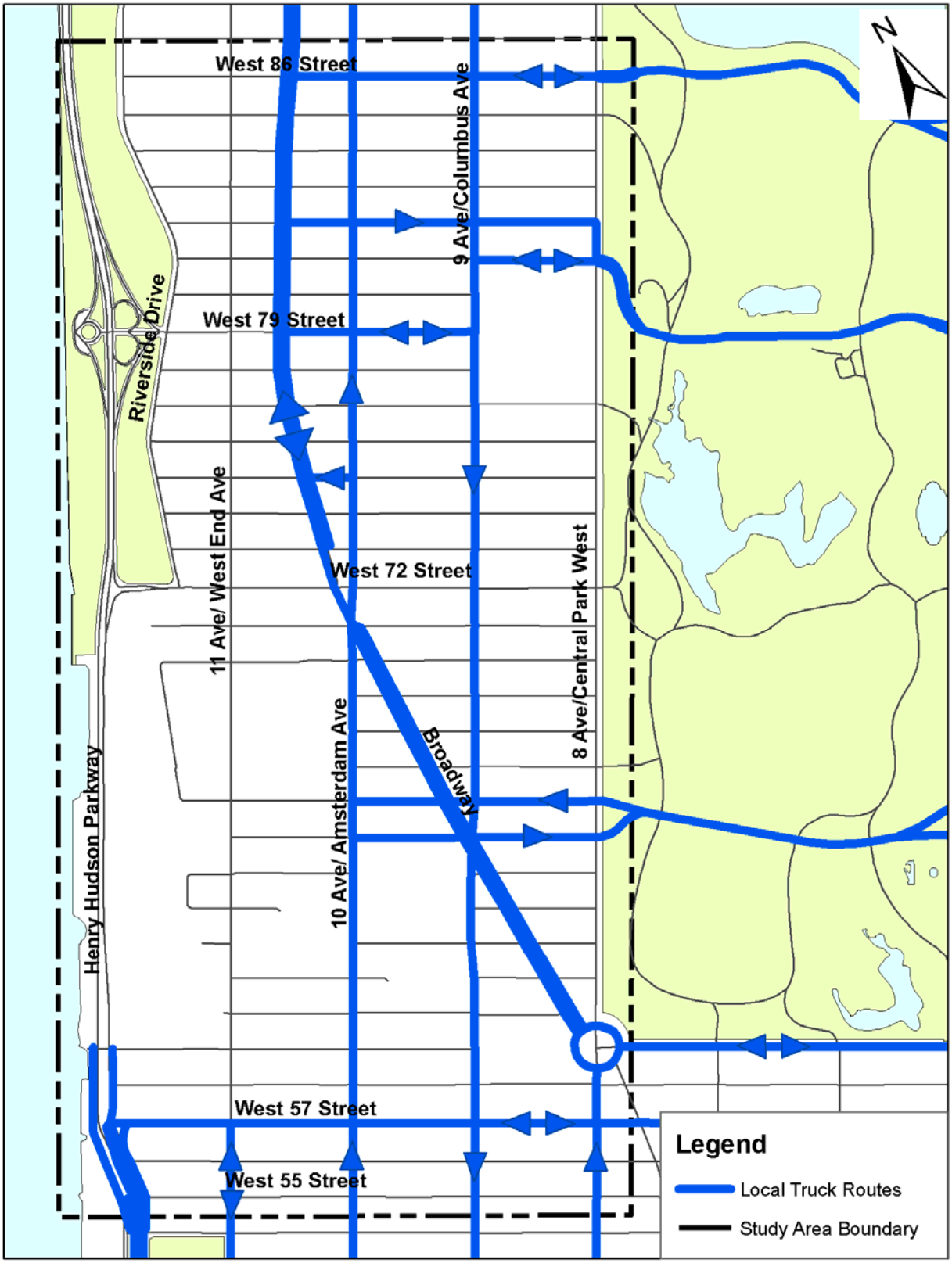


Figure 9-2: Local Truck Routes in the Study Area



10.0 PUBLIC PARTICIPATION

Public outreach is an ongoing effort to obtain community input on issues of importance to them. Their views on problem identification were as critical as their suggestions on improvement measures throughout the process, as a series of meetings and presentations were held, and will be held. The participants have included elected officials, community boards, residents, businesses, and other interested groups and civic organizations. In addition to public meetings, local businesses were asked to complete a survey designed to measure the service needs and preferences of the business community.

The following summarizes the public participation events conducted as part of the study; all actionable items have been investigated.

10.1 Public Meeting, September 24, 2007

The New York City Department of Transportation (NYCDOT) held a Public Listening Session (facilitated by Howard/Stein-Hudson Associates and Greenman-Pedersen, Inc.) 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.

10.1.1 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

10.1.2 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.

10.2 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

10.3 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.

10.3.1 Public Participation

Following the presentation, which summarized community issues, results of the business survey, analysis findings, and DOT initiatives, attendees were given the opportunity to comment, raise issues, and offer suggestions. The main themes of those comments were:

Trucks/Goods Movement

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

Bicycles

- Pedestrian-bicycle conflict on the sidewalk at Riverside Drive & West 72nd Street
- Bicyclists should be licensed like drivers so everyone will know what they can and can't do, and be accountable
- Want protected bike lanes along Columbus Avenue
- Increased enforcement of bicycles on sidewalks is needed

- Bike lanes on the Avenues are good, but on cross streets they are problematic: bikers wearing headphones, not paying attention to pedestrians, not staying in bike lanes
- Concerning traffic lane removals due to construction, creates unsafe conditions for bikes to have one lane to share with traffic; possible to require construction to use less space?
- Add protected bike lanes in conjunction with protected bus lanes (it works in Paris); unprotected bike lanes are dangerous for everyone
- Bikes should have bells to alert pedestrians that they are approaching
- Greenway is still not safe enough for pedestrians and bicyclists; vehicles not yielding to pedestrians and bikes, use stop signs instead
- Lights and signs for bikes should be at eye height and on the same side of the street
- Bicyclists are speeding on the Greenway, dangerous for pedestrians
- "No Parking" in bike lanes should be enforced; created dangerous conditions for bicyclists, and people will not ride bikes until it is safe to do so
- DOT does LOS analyses of traffic and pedestrian conditions; they need to do the same for bike lanes
- Bike lanes need to be protected from traffic and parking vehicles to be effective

Left Turns

- West End Avenue & West 72nd Street southbound left turn prohibited, but still not helping in terms of congestion and safety; 'no left turn' signs are too small, even police cars are making the illegal left turn
- West 79th Street & Riverside Drive eastbound left turn prohibited; add a turn light instead?
- Columbus Avenue & West 86th Street southbound leading left turns conflict with pedestrians, pedestrians crossing too soon before they have the light
- Columbus Avenue & West 79th Street and along West End Avenue; illegal left turns being made anyway
- Prohibit left turns that endanger pedestrians in crosswalks

Parking

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

NYCT Bus

- New bus shelter design lets in rain, snow, and wind

- Snow removal in front of bus shelters is not happening, inconvenient to people who need to ride the bus

Shuttle Buses

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

Pedestrians

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

Congestion

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

10.3.2 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

11.0 FINDINGS

11.1 Summary of Major Issues and Recent Improvements

The southern part of the study area experienced significant population growth compared to the rest of the study area, suggesting additional trips will be generated in the area as a result. Trucks in the area can be expected to exacerbate the heavy traffic volumes on Amsterdam and Columbus Avenues, as well as the general congestion that occurs along Central Park West, Columbus Avenue, Broadway, West 57th, West 66th, West 72nd, West 79th, West 80th, and West 86th streets. In addition to traffic congestion, Broadway in particular experiences heavy pedestrian volumes and significant double parking and other illegal parking. Below West 59th Street, off-street parking demand is consistently greater than the available supply; the most commercial parking also occurs in this area between 8th and 10th Avenues. Intersections where one or more approach was found to have failing level of service (LOS) F were generally distributed throughout the study area, although West 79th and West 72nd Streets had the highest instances of these intersections. The West 57th Street corridor consistently had the highest concentration of accidents in the study area.

Figure 11-1 provides a composite view of the activities and issues, and attempts to map areas of high population growth, heavy truck volume, double parking, intersections with poor LOS, and corridors with low travel speeds.

Addressing these complex issues, NYCDOT's recently implemented short-term initiatives include (see Figure 11-3):

- Installing muni-meters on Columbus & Amsterdam Avenues
- Installing new bus shelters
- Installing a speed reducer on West 61st Street between Amsterdam & West End Avenues
- Removing a bus layover on West 62nd Street between Amsterdam & Columbus Avenues
- Completing Safe Routes to School Study and recommendations for three priority schools
- Initiating Safe Streets for Seniors program and adjusting signal timing at more than 100 locations (June 2009)

Pedestrian crossing times have been increased along the following corridors in the Senior Focus Areas:

- West End Avenue between West 60th – 81st Streets;
- Amsterdam Avenue between West 60th – 81st Streets;
- Broadway between West 60th – 81st Streets;
- Central Park West between West 60th – 81st Streets; and
- Columbus Avenue between West 60th – 81st Streets.

As part of the improvements to the Upper West Side Senior Area, single neckdowns have been proposed for the following locations:

- Amsterdam Avenue & West 66th Street (north of SW corner)
- Broadway/Amsterdam Avenue & West 71st Street (south NW corner)
- Central Park West & West 72nd Street Transverse (east of NW corner)
- Broadway & West 79th Street (east of NW corner)
- Amsterdam Avenue & West 79th Street (east of NW corner)
- Columbus Avenue & West 81st Street (west of SE corner)

Figure 11 - 1: Major Issues Locations in the Study Area

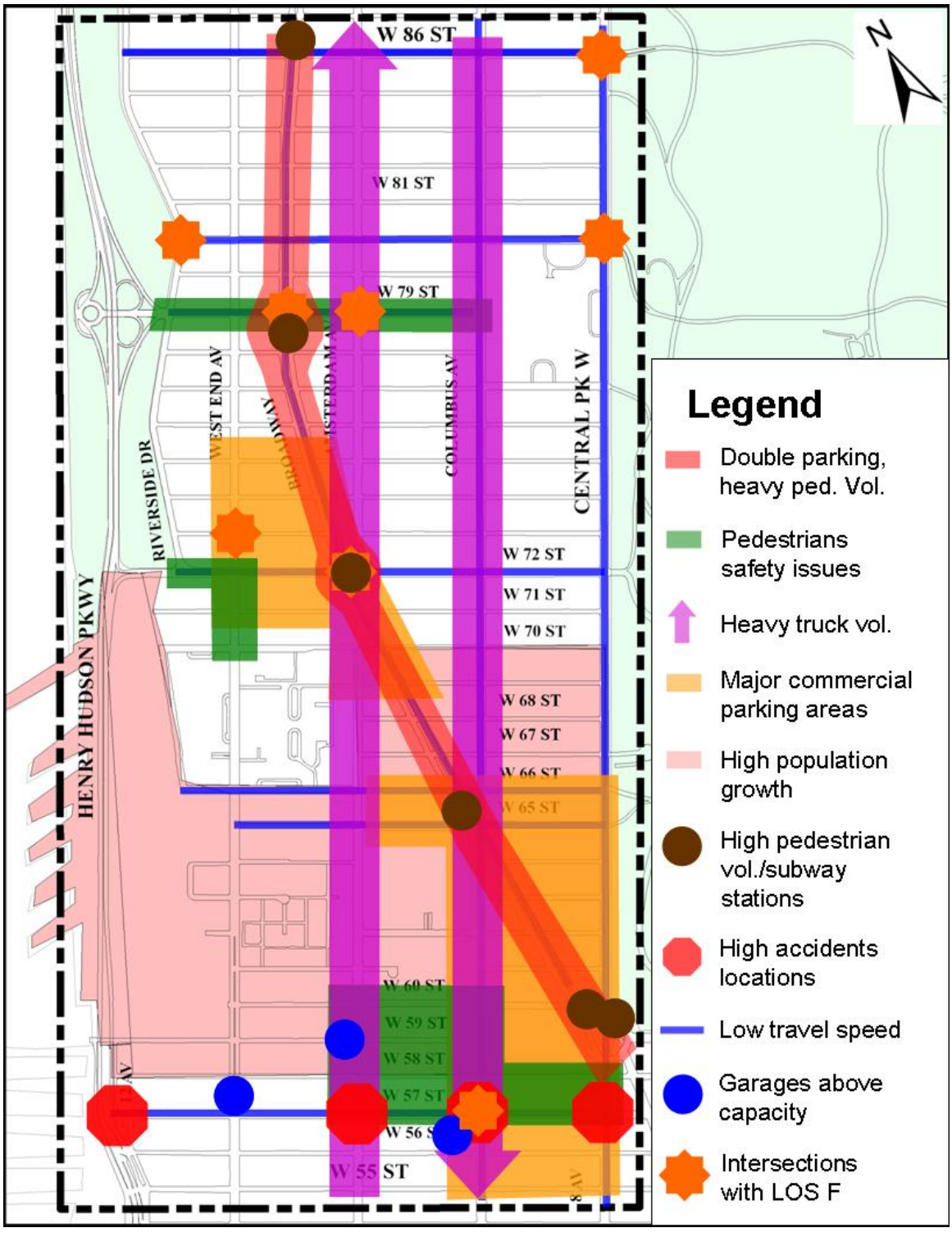
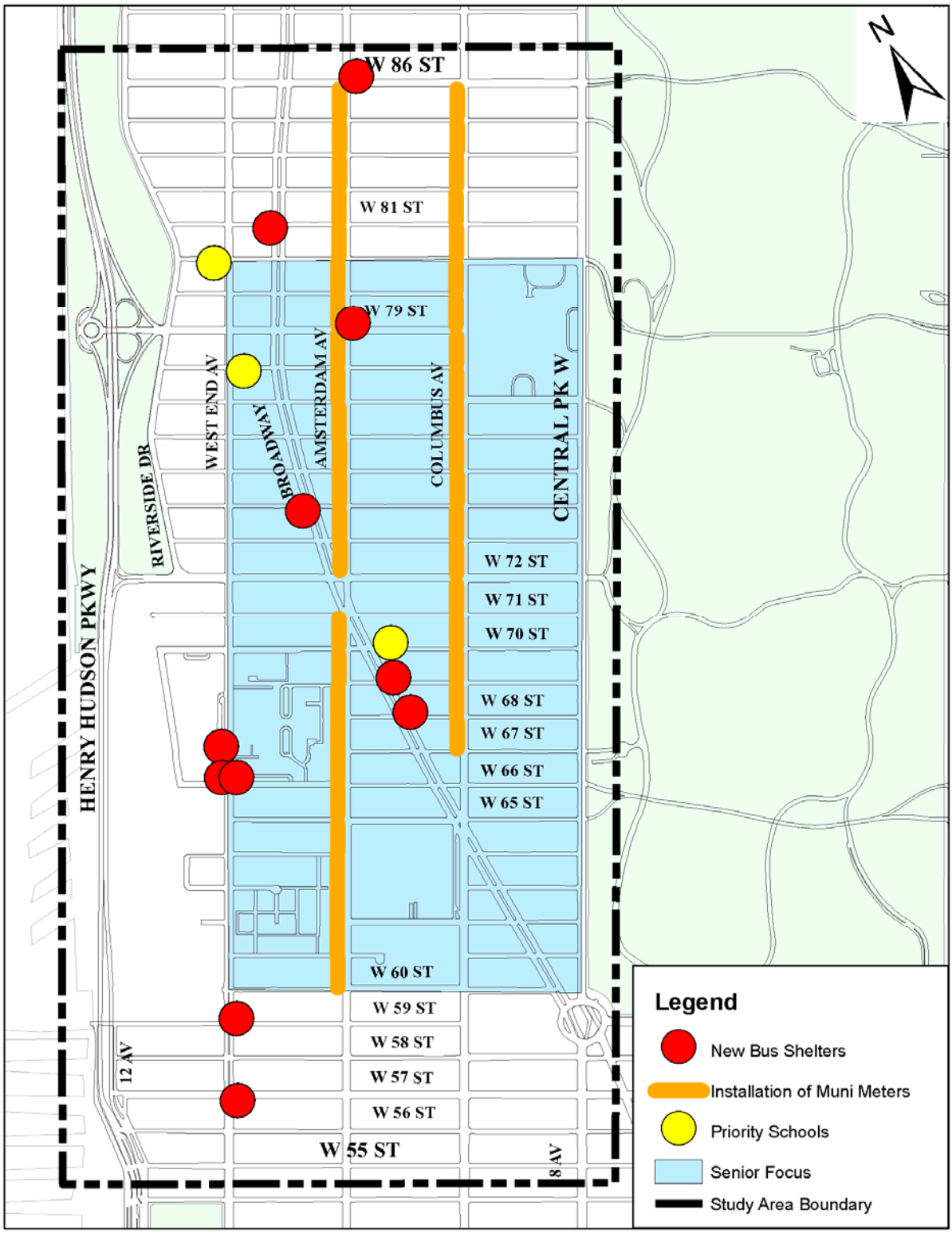


Figure 11 - 2: Recently Implemented Initiatives



11.2 Locations for Potential Future Improvements

Based on field observations, community concerns, and preliminary traffic analyses, the following locations and associated issues were identified for future attention. The locations for potential improvements, with the issues identified, are listed below and shown in Figure 11-3.

1. Ninth Avenue/Columbus Avenue & West 56th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy eastbound right turns conflict on the south crosswalk during the AM and PM peak periods; possible LPI.

2. Eight Avenue/Central Park West & West 57th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy northbound left turns conflict on the west crosswalk during all peak periods; possible LPI.

3. Columbus Avenue & West 57 Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy westbound left turns conflict on the south crosswalk; also, pedestrians do not yield to signal controls and warning signs.

4. Columbus Avenue & West 60th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy westbound left and eastbound right turns conflict on the south crosswalk.

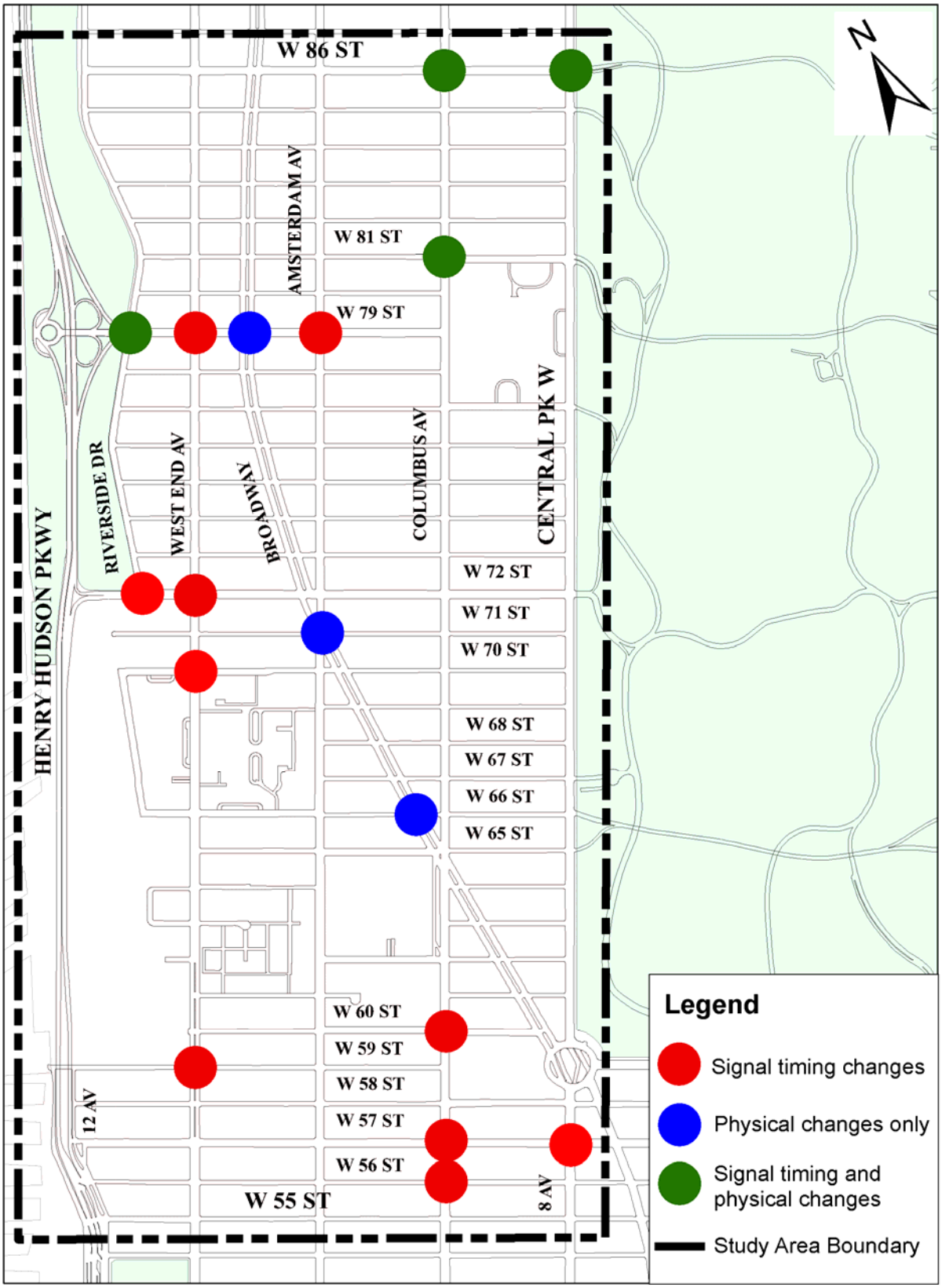
5. Broadway & West 66th Street

Roadway Markings and Pedestrian Obstructions. The crosswalk and the pavement markings fail to communicate clearly what road users should do. Also, several light/signal poles are in the pedestrian path and impedes pedestrian flow.

6. West End Avenue & West 70th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy eastbound left turns conflict on the north crosswalk during all peak hours.

Figure 11 - 3: Locations for Potential Improvements



7. West End Avenue & West 72nd Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy eastbound right and northbound left turns conflict on the south and west crosswalks during all peak hours.

8. Amsterdam Avenue & West 79th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy eastbound left turns conflict on the north crosswalk during the AM and PM peak periods.

9. West End Avenue & W 79th Street

Traffic Congestion. Heavy northbound left turns without an exclusive left turn phase experience delays.

10. Riverside Drive & West 79th Street

Various Traffic Issues. 1) Merging conflicts for northbound left and southbound right turns on Riverside Drive, as well as eastbound through/right and Henry Hudson Parkway NB exit ramp vehicles; 2) Illegal left turns from the eastbound approach going to the Henry Hudson Parkway NB Entrance ramp and Riverside Drive; 3) Bus layovers on the west leg limits the sight distance for vehicles exiting the ramps and can compromise safety.

11. Central Park West & West 81st Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy westbound left turns conflict on the south crosswalk during all peak periods.

12. Central Park West & West 86th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). Heavy pedestrian volumes and heavy southbound left turns conflict on the east crosswalk during AM and PM peak periods

13. West End Avenue & West 59th Street

TrafficCongestion. There are heavy delays on the westbound approach during the AM and PM peak periods.

14. Broadway & West 60th Street

Pedestrian & Vehicular Conflict (Pedestrian Safety). There are several conflicts associated with the subway station on the south-east corner; very narrow south crosswalk due to on-going MTA construction temporary barriers; and failure of pedestrians and motorists to obey the traffic signals - especially on the west crosswalk. Additionally, there is no storage area for northbound left turn vehicles.

15. Amsterdam Avenue/Broadway & West 71st Street

Pedestrian Safety. Pedestrian view and movement on the southwest corner (Amsterdam Avenue/West 71st Street) are blocked by a public phone booth in the crosswalk path.

16. Riverside Drive & West 72nd Street

Unutilized Signal Phase. A signal still exists on the eastbound approach although exit ramp is closed.

17. Broadway & West 79th Street

Traffic Obstruction. The westbound and northbound approaches experience delay due to inadequate parking supply capacity (i.e. bus layover and double parked trucks).

18. Columbus Avenue & West 86th Street

Limited Bus Stop Storage. The bus stop for westbound routes located on the far side is not long enough to accommodate two buses. Thus, when two buses are in the stop, spillback occurs, blocking the intersection.