

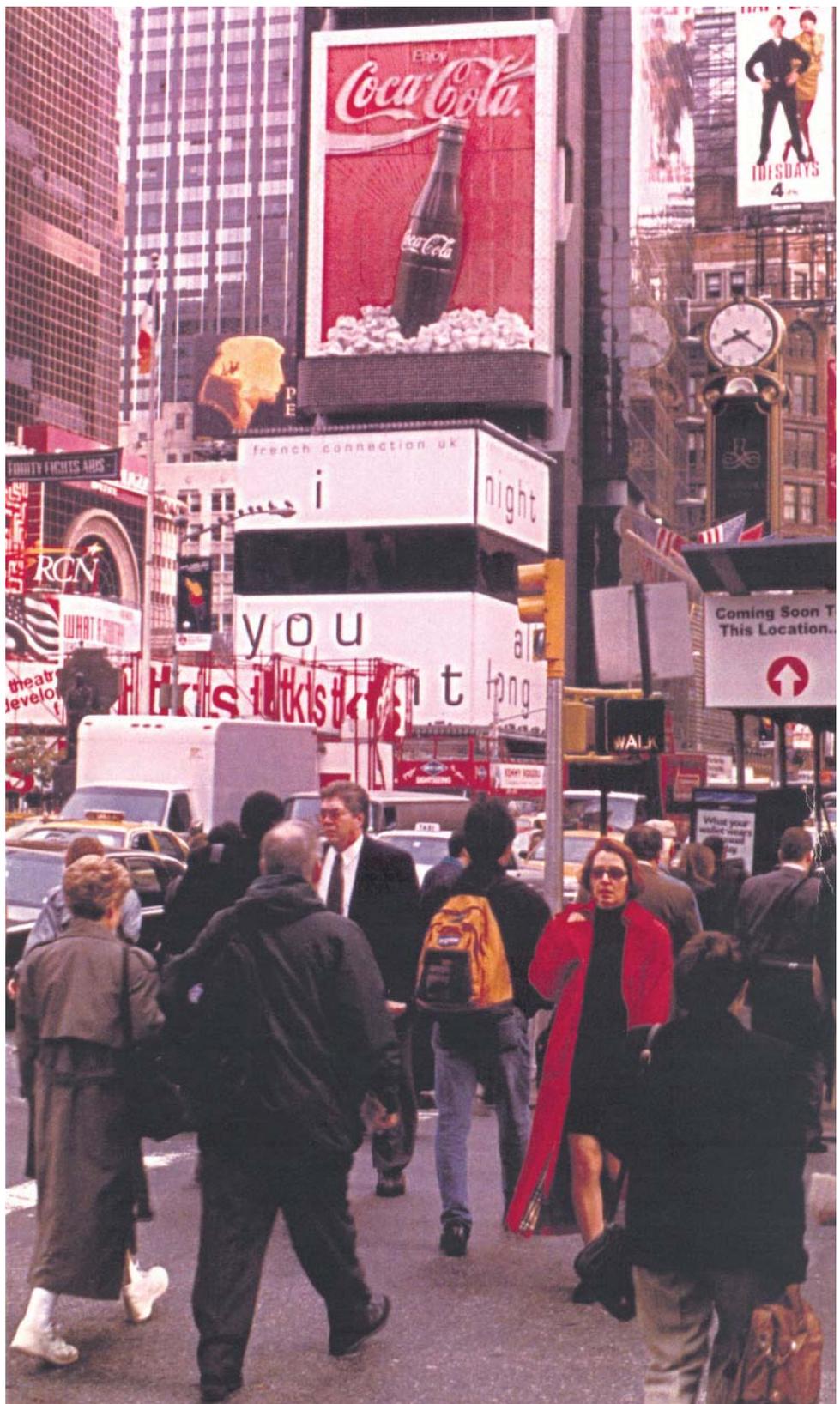
Midtown Manhattan Pedestrian Network Development Project

Rudolph W. Giuliani
Mayor
New York City

Joseph B. Rose
Director
Department of City Planning

Wilbur L. Chapman
Commissioner
Department of Transportation

June 2000



**MIDTOWN MANHATTAN
PEDESTRIAN NETWORK DEVELOPMENT PROJECT
PHASE I**

Final Report

June 2000

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City of New York

Joseph B. Rose, Director
Department of City Planning

Wilbur L. Chapman, Commissioner
Department of Transportation

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EXECUTIVE SUMMARY

Transportation and access issues are important considerations in maintaining and strengthening the City's core areas. This project, a joint effort of the Department of City Planning and the Department of Transportation, evaluates pedestrian as well as vehicular circulation to reduce pedestrian-vehicular conflicts and pedestrian and vehicular congestion, and to improve safety, access, convenience and the urban environment.

This first phase of the Midtown Manhattan Pedestrian Network Development project focuses on West Midtown, from West 38th Street to West 53rd Street between Sixth and Eighth avenues. The study area contains the Theater District, parts of the Garment District, and borders the Port Authority Bus Terminal.

New York City and State initiatives to reverse the deterioration of Times Square and West 42nd Street, have spurred new private-sector investments resulting in the development of hotels, entertainment facilities, offices and even residential buildings. The distinctive Times Square islands are vibrant with visitors, reflecting their confidence in and endorsement of the transformations. With the completion of the on-going developments, and more on the way, the pedestrian volumes in the area are expected to increase further.

General problems, prevalent area-wide, include: pedestrian congestion; pedestrian-vehicular conflicts; inefficient curbside management; underutilized taxi stands; lengthy truck loading/unloading hours; inappropriate signage; vehicular non-compliance with existing curb and moving regulations; and the absence of amenities for pedestrians. Vehicular congestion and delay, particularly due to turning vehicles, double parking, taxi pick-up and drop-offs, and truck delivery, contribute to the reduced capacity of the streets and, in many cases, obstruct buses from reaching curbside bus stops.

Priority locations for improvement were identified within the study area based on pedestrian-vehicular conflicts as reflected in locations with high pedestrian accidents, and prominent pedestrian corridors - including: West 42nd Street between Sixth and Eighth avenues; Eighth Avenue between West 40th and West 43rd streets; and the Times Square Bow-Tie between West 43rd and West 47th streets.

More specifically, the problems observed in the area were due to factors including: signal timing, and street geometry. Signal timing was inadequate for pedestrians on Broadway at West 45th Street and on Eighth Avenue at West 42nd Street.

The study recommends exploring the possibility of increased green time for pedestrians in the pre-theater hours, in conjunction with exploring alternatives to reduce traffic on West 42nd Street. In Times Square at West 45th Street, Broadway and Seventh Avenue decrease in street width and then increase again to the south. This provides excess roadbed space to the north and south sides of this narrowed intersection and creates an opportunity to widen the sidewalks.

Recommended Actions

Address Pedestrian Congestion and Safety

- Change curb lines to widen sidewalks and street corners;
- Mark widened high-visibility crosswalks at accident locations; a Barnes dance cross walk; and a new crosswalk and traffic signal on West 42nd Street;
- Clear corners and relocate street furniture that obstructs pedestrian circulation; and
- Increase signal time for pedestrians in the Bow Tie and near PABT during evening off peak hours.

Address Pedestrian-Vehicular Conflict and Vehicular Congestion and Delay

- Prohibit turns and channelize traffic through lane markings, signs, and enforcement;
- Limit truck delivery hours to off peak hours, i.e. 10 AM - 4 PM; extend bus stops; institute no stopping/parking regulations; and
- Improve taxi circulation through increased use of taxi stands; new taxi dispatch locations.

Enhance Pedestrian Space and Facilitate Traffic in the Times Square Bow-Tie (*Map 13: Recommended Sidewalk Widening in the Times Square Bow Tie*)

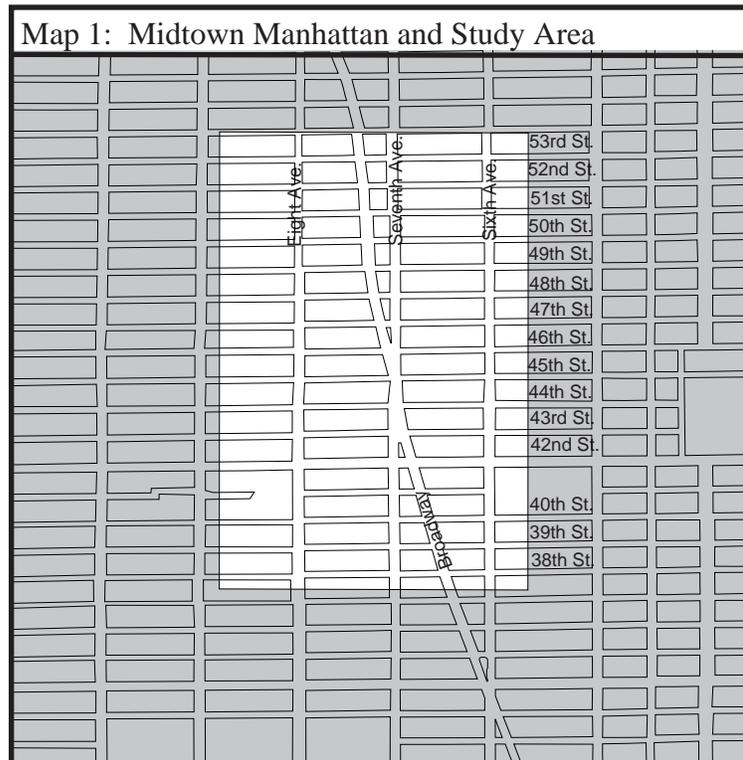
- Widen sidewalks by taking advantage of excess roadbed north and south of the bottle neck while maintaining the existing three traffic lanes each on Broadway and Seventh Avenue; and
- Alternatively, widen sidewalks and reconfigure Broadway with two traffic lanes and Seventh Avenue with four traffic lanes to facilitate through traffic.

INTRODUCTION

One of the densest, busiest, and most vibrant places in the world, Midtown Manhattan is the largest business district in the country. Midtown's core is an area of approximately four square miles bounded by Third Avenue to the east, Ninth Avenue to the west, 59th Street and Central Park South to the north, and 30th Street to the south (*Map 1: Midtown Manhattan and Study Area*). It contains an intense variety of activities, including commercial, residential, institutional, entertainment, and tourist uses. Three regional transportation hubs and an outstanding mass transit system are used daily by millions of people to access the area. In addition, the city's street grid and the Queensboro Bridge and Lincoln and Midtown tunnels provide vehicular access to Midtown from the city and the region.

Goals and Objectives

The study focuses on the Times Square and the Theater District based on an analysis of factors important to pedestrian and vehicular circulation: existing land uses; growth of new tourist and entertainment activities; new development; shift of the CBD west; US Census journey-to-work data; transportation hubs; mass transit access; pedestrian and vehicular volumes; pedestrian accidents; street and sidewalk widths; and the involvement of business improvement districts (BIDs) and other entities in street improvement projects. This project evaluates the pedestrian and vehicular network and the existing infrastructure in Times Square and the Theater District and recommends implementation measures to improve safety, mobility, and convenience for pedestrians and vehicles.



The study area, from Sixth to Eighth avenues and West 38th to West 53rd streets, has enormous volumes of pedestrian and vehicular traffic. This is due to the proximity of the Port Authority Bus Terminal and 15 subway lines; the renaissance of New York City as a mecca for tourists; the redevelopment activity on West 42nd Street and Times Square, and the growth of commerce, theaters, and hotels. The high pedestrian and vehicular volumes contribute to congestion and create conflict and unsafe conditions, that are exacerbated by the irregular geometry of the Times Square Bow Tie (where Broadway crosses Seventh Avenue between West 42nd and 47th streets). The competition for space is intense and the resulting pedestrian environment is impeded by obstructed sidewalks, conflicts with traffic, and poor directional and informational signs.

Project Scope

The work program includes reviewing past studies for Midtown and analyzing the recommended actions; collecting data and analyzing existing conditions of pedestrian/vehicular activity and conflicts; inventorying and mapping street furniture; developing priority recommendations for short- and long-range improvements; and producing conceptual and schematic designs. The traffic impacts of the proposals will be analyzed, and the feasibility of recommended actions will be tested and evaluated, while simultaneously installing immediate low-cost improvements.

The project develops a range of site-specific design proposals for physical and operational street improvements varying in scope, complexity, cost and term. Selected streets with the most immediate links to mass transit, retail corridors, activity nodes and tourist attractions, will be given priority for recommended improvements. Measures to improve the pedestrian network include: widened sidewalks and street corners; removal of pedestrian obstructions on sidewalks; crosswalk treatments; high-visibility pavement markings; changes in signal timing and turning regulations; curb use changes; restriped lanes to channel traffic; improved lighting and directional signs; and street furniture. Low cost tests and recommended measures for improvement would be implemented by DOT during the second phase of the project.

On-Going Street Improvement Projects

The City has developed a number of policies and programs to alleviate pedestrian congestion and improve the streetscape. A 1995 mayoral executive order mandates clearing street corners of unnecessary clutter. In northern Midtown, the Departments of City Planning and Transportation propose to reconfigure the street geometry within Columbus Circle to improve pedestrian and vehicular circulation and transform the circle into a major civic space. Improved pedestrian connections within a renovated Grand Central Terminal are currently underway. DOT's Midtown projects include the reconfiguration of Herald Square at Broadway, Sixth Avenue, and West 34th Street, street sign improvements from West 51st to 54th streets between Fifth and Eighth avenues, and the relocation of designated tour bus layovers in Times Square. DOT, in conjunction with DCP and the New York Police Department (NYPD), has installed pedestrian separators and mid-block crosswalks at West 50th Street and Fifth and Sixth avenues in a pilot program intended to lessen pedestrian-vehicular conflict and improve crosstown vehicular flow. Street corner extensions, or neckdowns, identifying pylons, and other street improvements on West 47th Street between Fifth and Sixth avenues planned by the NYC Economic Development Corporation (EDC) will enhance the Diamond District's appeal as a specialty retail street.

Other organizations addressing circulation within Midtown include: the Times Square Business Improvement District (BID), Grand Central Partnership, 34th Street Partnership, Bryant Park Restoration Corporation, Fifth Avenue Association, Rockefeller Association, Fashion Center BID, and the Cityscape Institute.

The Grand Central Partnership, 34th Street Partnership, and the Fifth Avenue Association have reduced sidewalk clutter and congestion by installing clear corner zones; new street lighting, banners, planters, news boxes, trash cans; and distinctive crosswalks. The Fashion Center BID is reinforcing the unique identity of the area with banners and a sculpture of a button and a needle, symbolic of the garment district. The Cityscape Institute has initiated a demonstration project to redesign the streetscape on West 55th Street between Fifth and Eighth avenues.

The Times Square BID faces the challenge of accelerated changes on the New 42nd Street and in the Theater District, which is quickly becoming the most popular destination for tourists and retailers. Their efforts in the area are visible through an area-wide map, the (existing and) planned Times Square visitors center to be housed in a former theater; directional maps, and banners for street identity. The BID will also be recommending improvements to mid-block pedestrian connections and the traffic islands in the Times Square Bow Tie.

EXISTING CONDITIONS

Land Use

The predominant land use within Midtown Manhattan is commercial office buildings. Other commercial uses includes theaters, hotels, retail, and tourist attractions. Broadway theaters are concentrated north of West 42nd Street between Sixth and Eighth avenues. Hotels are clustered in the Theater District, north and south of Grand Central Station, and south of Central Park. Streets with major ground floor retail uses include: 34th Street and Herald Square; West 42nd to West 51st streets from Fifth to Sixth avenues; 57th Street from Lexington to Ninth avenues; and Third Avenue from East 34th to East 38th streets. The Empire State Building, Times Square, the Theater District, Rockefeller Center, Fifth Avenue, Bryant Park, the New York Public Library, and Central Park are among the tourist attractions in Midtown. Residential buildings are clustered around Columbus Circle and along Ninth Avenue; around Bloomingdale's at East 59th Street; and south and east of Third Avenue and East 34th Street.

Special streets include: 42nd Street; Fifth and Madison avenues; the Millinery district on West 37th Street; Club Row on West 44th Street, Little Brazil on West 46th Street, the Diamond District on West 47th Street, all between Fifth and Sixth avenues; Restaurant Row on West 46th Street between Eighth and Ninth avenues; Music Row on West 48th Street between Sixth and Seventh avenues; East 53rd Street with the Museum of Modern Art, Lever House, the CBS, Seagram's, and Citicorp buildings; 57th Street, with theme restaurants and retail outlets, second-floor art galleries, and Carnegie Hall; and 59th Street, with Columbus Circle, Central Park, first-class hotels, Bloomingdale's, and the Queensboro Bridge.

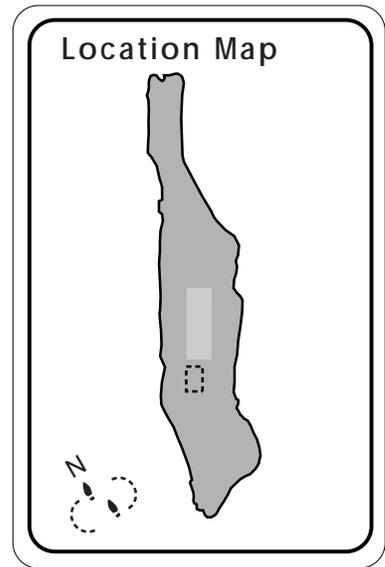
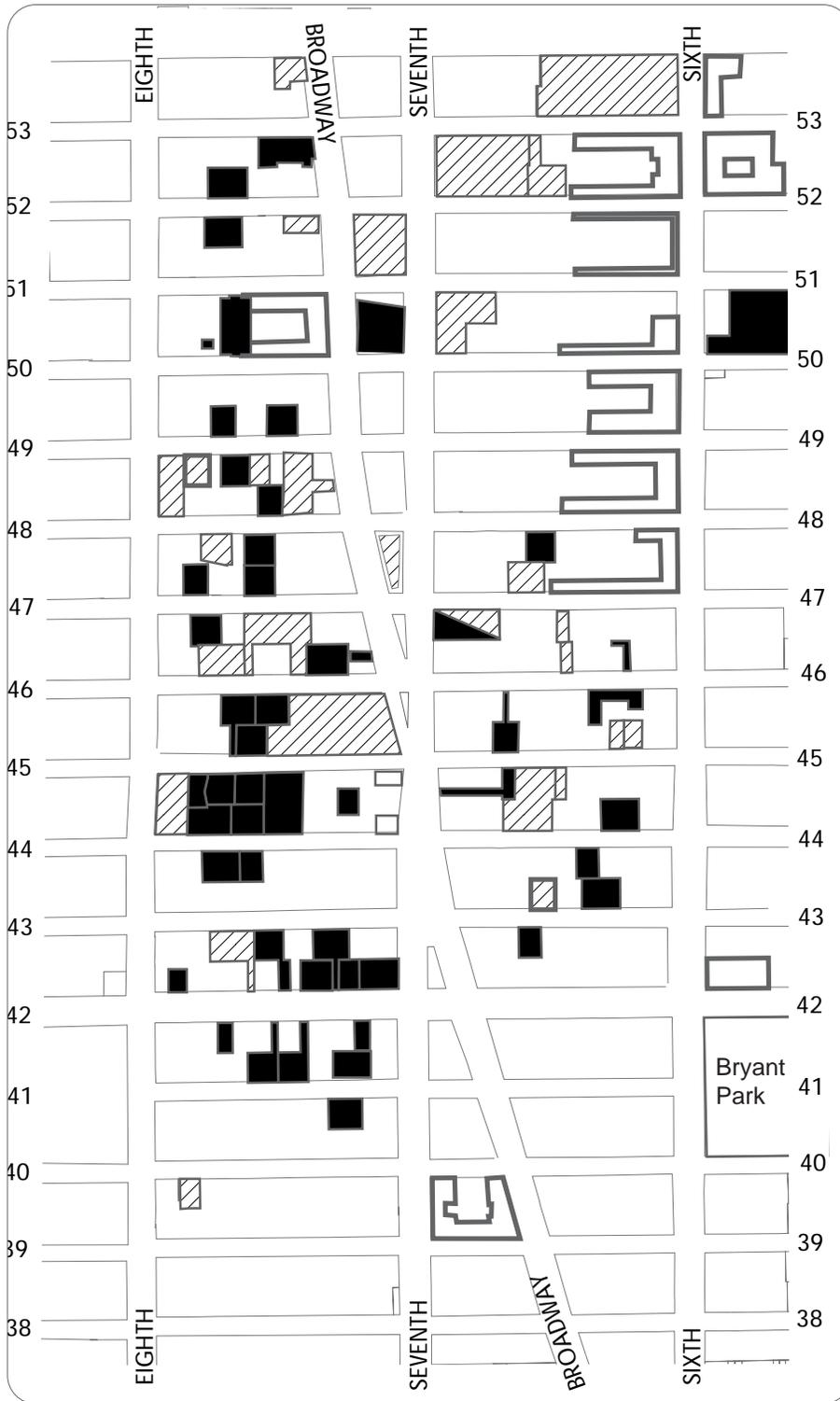
Times Square and the Theater District are the center of the city's cultural, theatrical, and entertainment world, generating significant pedestrian and vehicular traffic: it is estimated that the area attracts 31 million tourists annually. Times Square is "the crossroads of the world" and Broadway is synonymous internationally with theater. Outside of London there is no greater concentration of legitimate theaters: each year the 39 Broadway theaters, 33 of which are landmarks, draw nine million people. The district's 20 hotels, with one-fifth of all hotel rooms in the city, lodge 1.7 million guests. The area also boasts 200 restaurants and several museums, cinemas, and concert halls. There are 46 open spaces in or on the edge of the study area (*Map 2: Land Use*), including Central Park, Bryant Park, Rockefeller Center, and 11 mid-block building plazas and passageways accessible to the public.

New Development

New York City's recovering economy is reflected in low real estate vacancies, conversions of older buildings to office or residential use, and new construction. New York has regained its position as a world class tourist destination, as evidenced by hotel occupancy rates. The state-sponsored redevelopment of West 42nd Street is in full swing, thereby reversing the deterioration of Times Square and preserving a part of the city's heritage. The proposed development of eight million square feet includes office buildings planned or under construction, hotels, stores, reconstructed theaters such as the New Victory and New Amsterdam theaters, and other tourist attractions, which are expected to generate over 1200 new vehicle trips in the PM peak hour. Other new projects nearby include stores, six hotels, and two residential buildings on Eighth Avenue near West 50th Street (*Map 3: New Development*).

DCP has proposed to rezone the Theater Subdistrict (boundaries) to allow the wider transfer of available development rights from traditional Broadway Theaters in exchange for the preservation of the Theaters for legitimate theater use and a contribution to a theater subdistrict fund. The proposal also proposes new land use and urban design controls for both sides of Eighth Avenue to ensure the orderly growth and development of the corridors and to establish a better streetscape and pedestrian environment and a built form that is compatible with the surrounding context and neighborhood character.

Map 2 Land Use: Theaters, Hotels and Open Space



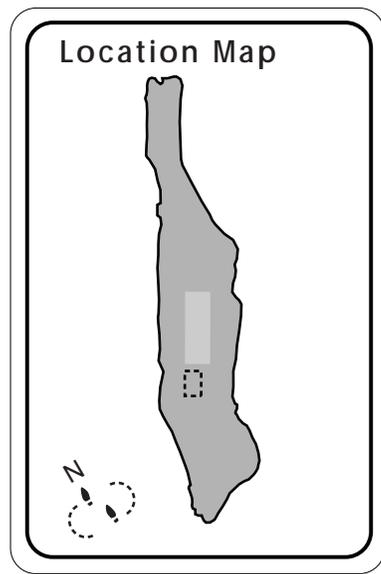
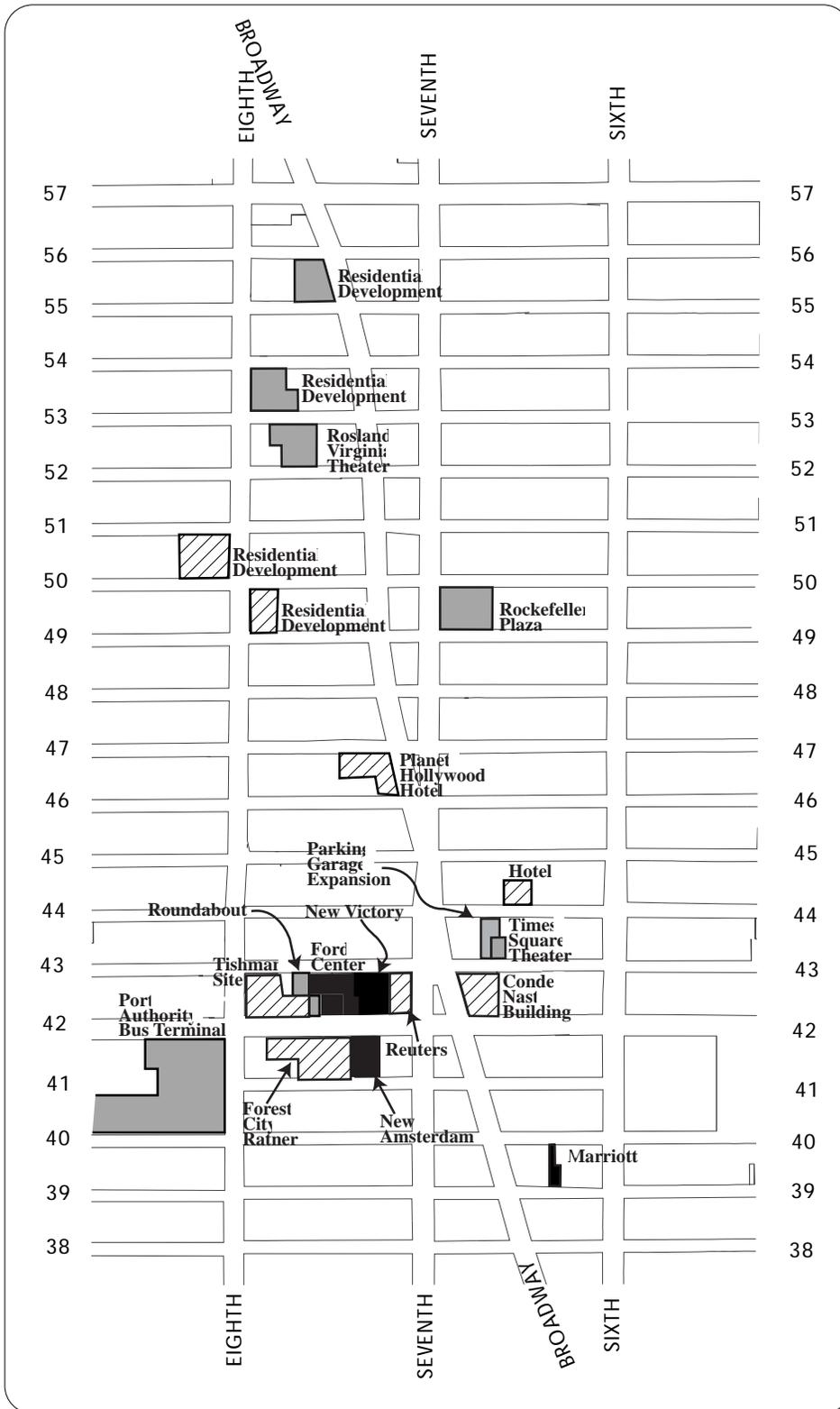
Legend

-  Hotels
-  Theaters
-  Open Space

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Map 3 New Developments



Legend

- Proposed Developments
- Under Construction
- Completed

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Journey to Work

The 1990 US Census Journey to Work (JTW) data was analyzed to rank clusters of census tracts by concentration of working population (*Appendix: Table A*). Daily, approximately 800,000 people journey to work in Midtown Manhattan. Grand Central Terminal and vicinity draws 22 percent of the workforce; the tracts north of Grand Central Terminal and south of Central Park each employ 17 percent. The study area (Census Tracts 113, 119, 125, and 131, from West 38th to 55th streets and Sixth to Eighth avenues) employs 136,375 people, or 17 percent of Midtown Manhattan's workers. Approximately 80 percent of these workers rely on transit as their primary commute mode.

Transportation Hubs

The region's three transportation hubs are located in Midtown Manhattan, in or near the study area. Penn Station at West 34th Street and Seventh Avenue serves New Jersey and Long Island commuters and Amtrak; the Port Authority Bus Terminal (PABT) at West 42nd Street and Eighth Avenue primarily serves New Jersey and the Hudson Valley region, and Grand Central Terminal at East 42nd Street and Park Avenue serves the northern suburbs and Connecticut. The Port Authority Trans-Hudson (PATH) station at West 33rd Street and Sixth Avenue also links New York and New Jersey. Integrated within these complexes are connections to NYC Transit subways. The 1996 Hub-Bound Travel Report registers approximately 670,000 passengers (in and out bound) for the three hubs on a fall business day; 310,000 passengers at Penn Station, 185,000 at the PABT, and 175,000 at Grand Central Terminal.

Subways

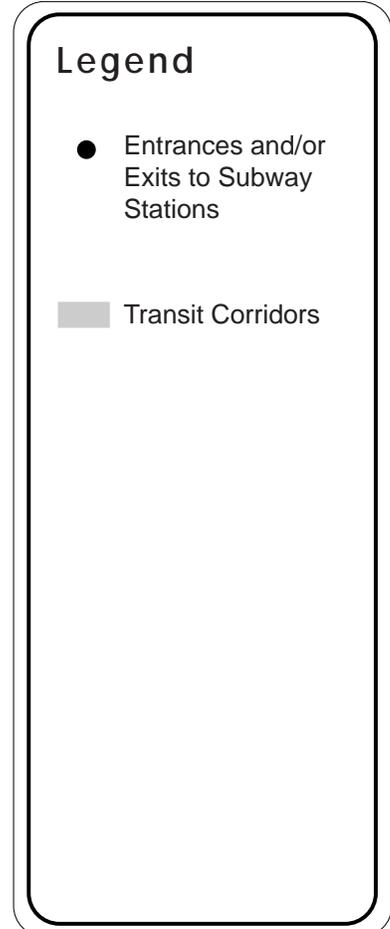
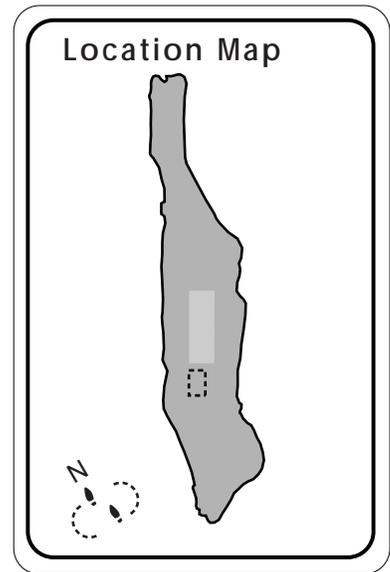
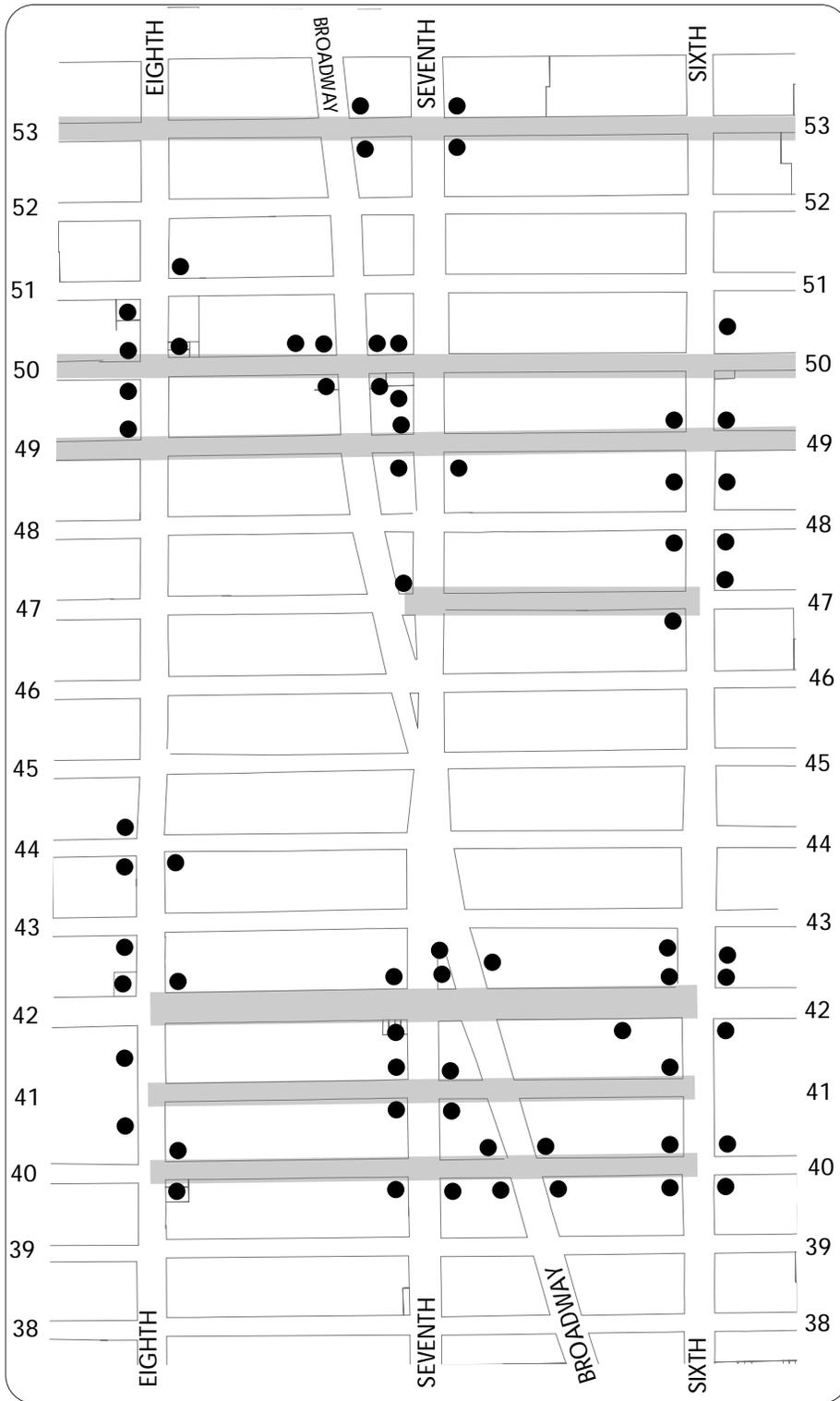
Times Square and the Theater District are served by 15 subway lines: the Eighth Avenue IND A, C and E; the Seventh Avenue/Broadway IRT 1, 2, 3 and 9; the Broadway BMT N and R; the Sixth Avenue IRT B, D, Q and F; the Flushing IRT 7; and the 42nd Street shuttle. Subway stations on these north-south routes are generally aligned in three east-west catchment areas along West 40th to 42nd streets, West 47th to 50th streets, and West 53rd Street (*Map 4: Transit Nodes and Corridors*). A weekday average¹ of almost 118,000 people enter the Times Square/PABT stations, where eleven converging lines are connected by underground walkways, making it the second busiest in the system. Twenty-six entrances/exits between West 40th and 44th streets provide access to the complex.

Buses

MTA bus routes servicing the area include: the M6 and M7 on Sixth Avenue and Broadway/Seventh Avenue; the M10 and M104 on Broadway/Seventh Avenue and Eighth Avenue; the M42 and M104 on West 42nd Street; the M27 on Broadway/Seventh Avenue, Eighth Avenue, West 49th and 50th streets; the M50 on West 49th and 50th streets; and the M30, M31, and M57 on West 57th Street. Peak hour bus lanes are designated on 42nd and 57th streets and Sixth and Eighth avenues; 49th and 50th streets are designated transit corridors for buses and taxis. Express and tour buses also operate in the area.

¹ The 1995 Subway Registration Report does not provide the exact location where people enter the system. For instance, registrants at Times Square and 42nd Street/PABT include all people using entrances on West 42nd Street between Sixth and Eighth avenues.

Map 4 Major Transit Nodes and Corridors

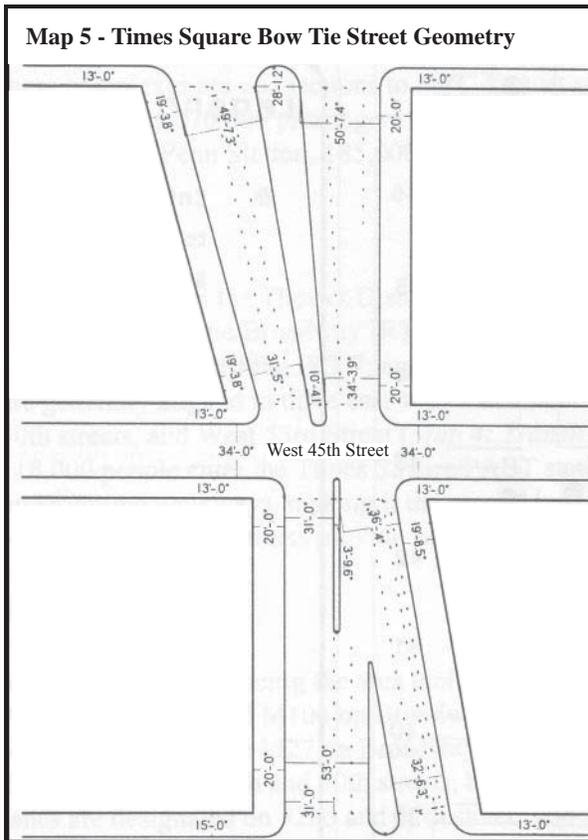


Midtown Manhattan Pedestrianization Project

Street Directions and Widths

Midtown's streets are laid out on a grid. Avenues are north-south corridors, usually wide streets carrying one way traffic. Third, Madison, Sixth and Eighth avenues are northbound; Lexington, Fifth, Seventh, and Ninth avenues and Broadway are southbound. In general, the avenues are 100 feet wide, with 60-70 foot roads and 15-20 foot sidewalks. Fifth Avenue has a 55 foot roadbed and 22.5 foot sidewalks. Park Avenue is two way and the widest avenue at 140 foot. The narrowest, Lexington Avenue has a 51 foot roadbed and 12 foot sidewalks.

Streets are east-west corridors. The most important Midtown crosstown streets -- 34th Street, 42nd Street, 57th Street, and 59th Street/Central Park South -- carry heavy two-way traffic and are 100 feet wide, with 55-60 foot roads and wide sidewalks of 20-22.5 feet. All other crosstown streets are narrow one-way streets; in general, eastbound streets are even numbered and westbound streets are odd numbered. These directions are reversed on segments of West 33rd, West 41st, and East 59th streets. One-way streets typically have 30-35 foot roadbeds and 13-15 foot sidewalks.



Map 5 Times Square Bow Tie Street Geometry The grid of the street network is interrupted by the diagonal of Broadway, forming major public spaces at Columbus Circle at Eighth Avenue and Central Park South (West 59th Street), Times Square at Seventh Avenue and West 45th Street, and Herald Square at Sixth Avenue and West 34th Street.

The two northbound corridors in the study area, Sixth and Eighth avenues, carry more traffic and fewer pedestrians than Broadway and Seventh Avenue. Sixth Avenue has a 66 foot roadbed, with five travel lanes, a parking lane, a bike lane, and 17 foot sidewalks. Eighth Avenue, a local truck route, has a 70 foot roadbed divided into four moving lanes and two parking lanes. Sidewalks are 15 feet wide.

The southbound avenues, Broadway and Seventh Avenue, typically have 60 foot roads and 20 foot sidewalks. Broadway has four moving

lanes, two parking lanes, and a bike lane. Seventh Avenue has four moving and two parking lanes. Where Broadway diagonally crosses Seventh Avenue at West 45th Street, creating short blocks and the traffic islands known as the Times Square Bow Tie, both avenues decrease from 60 feet to 34 feet and 31 feet, respectively, then increase again to 60 feet to the south (*Map 5: Times Square Bow Tie Street Geometry*). Seventh Avenue and Broadway each have three moving lanes at West 45th Street; to the north and south of the Bow Tie intersection lanes are not clearly marked nor uniform in width.

Pedestrian Volumes

Midtown Manhattan has extremely high pedestrian volumes. Grand Central Partnership's and 34th Street Partnership's Fall 1996 average AM, MD, and PM peak hour pedestrian counts recorded over 9,200 pedestrians at Fifth Avenue and East 42nd Street and 11,040 pedestrians at Seventh Avenue and West 34th Street.

Times Square and the Theater District are heavily traversed by pedestrians -- commuters, visitors, and tourists -- throughout the day. Pedestrian counts conducted in August 1997 by Philip Habib and Associates for the Times Square BID, on Seventh Avenue and Broadway between West 42nd and West 44th streets show that from 12:00 PM noon onwards, hourly volumes on matinee Wednesdays range from 3,700 to 7,000 pedestrians. On an average Saturday at midnight, there are almost 5,000 pedestrians in Times Square on West 42nd Street at Seventh Avenue, despite the fact that major sites in the area are vacant, being prepared for redevelopment, or under construction. In September 1996, high volumes of pedestrians were noted along Eighth Avenue and in the Times Square Bow Tie: the most pedestrians were located on West 44th Street at Broadway during the evening peak hour. The 1992 42nd Street Light Rail Transit Line Final Environmental Impact Statement (CEQR 92DOT008M) recorded peak hour pedestrian volumes on West 42nd Street between Seventh Avenue and Broadway of about 4,890 during the AM peak hour; 4,150 during the midday peak hour; and 6,400 during the PM peak hour, at a time prior to the development of millions of square feet of commercial space.

Field observations reveal that the major pedestrian corridors are those avenues and streets nearest theaters and hotels -- Broadway and Seventh Avenue and West 44th to West 47th streets -- and those connecting to transit nodes such as the Port Authority Bus Terminal at Eighth Avenue between West 40th and West 42nd streets and the Times Square subway complex at West 42nd Street and Broadway, Seventh and Eighth avenues. Crosstown streets with subway entrances/exits at two or more intersections between Sixth and Eighth avenues -- West 40th Street (4 entrances/exits), West 42nd Street (3), West 47th Street (3), West 49th Street (2), West 50th Street (3), and West 53rd Street (2) -- are important pedestrian corridors.

On the avenues, the heaviest pedestrian volumes were observed on: the west side of Seventh Avenue between West 39th and West 45th streets, then continuing on Broadway between West 45th and West 47th streets; the east side of Seventh Avenue between West 44th and West 50th streets; and on both sides of Broadway between West 47th and West 53rd streets. On crosstown streets high pedestrian volumes are found on the north side of West 40th and West 41st streets; both sides of West 42nd, West 45th, and West 47th streets; the south side of West 50th Street between Sixth and Eighth avenues; and both sides of West 44th, West 46th, and West 53rd streets between Broadway and Eighth Avenue.

Certain mid-block through passageways, such as Shubert Alley, are also important pedestrian paths between the Port Authority Bus Terminal, the Theater District, and the Midtown office core and carry significant pedestrian traffic, particularly in the peak commuter hours.

Pedestrian Accidents

Pedestrian safety is one of the most critical factors in assessing the circulation network. DOT's pedestrian accident data over five years was analyzed to identify Midtown locations with high numbers of accidents and fatalities. There were 4,840 pedestrian accidents, 3,583 at intersections and 1,257 at mid-block locations, including 31 fatalities, over the five-year period, 1989-1994. Every intersection within Midtown's core had at least one pedestrian accident. The north-south avenues with the most pedestrian accidents are Fifth Avenue, Seventh Avenue, and Eighth Avenue. The most dangerous east-west streets are the wide, two-way streets: 34th Street, 42nd Street, and 57th Street. One-way east-west streets where pedestrians are most vulnerable are 33rd, 40th, and 50th streets.

Forty Midtown intersections had twenty or more pedestrian accidents during the five-year period studied. Exceptionally large numbers of pedestrian were injured at East 33rd Street and Park Avenue (97), West 34th and West 42nd streets at Eighth Avenue (70 each), and West 34th Street, Broadway and Sixth Avenue [Herald Square] (57). Thirty or more pedestrians were injured at 13 intersections, (five of which are in the study area): West 34th Street at Seventh Avenue; West 40th Street at Eighth Avenue; 42nd Street at Third, Lexington, Fifth, Sixth, Seventh, and Ninth avenues and Broadway; West 45th Street at Broadway/Seventh Avenue; and 57th Street at Third, Lexington, and Ninth avenues (*Appendix: Table B*).

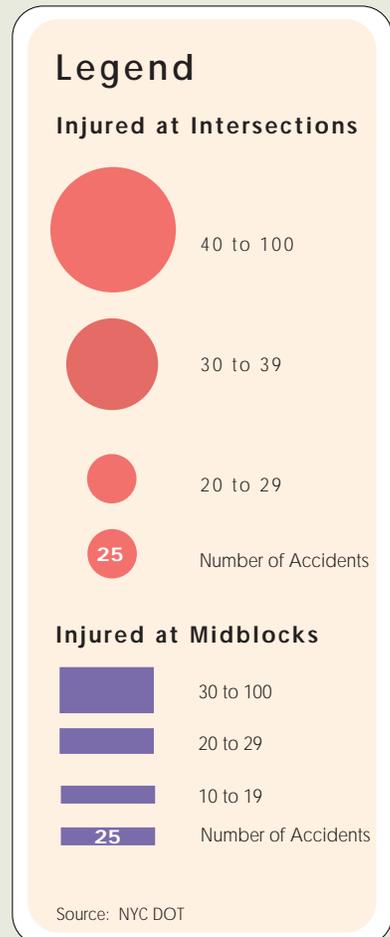
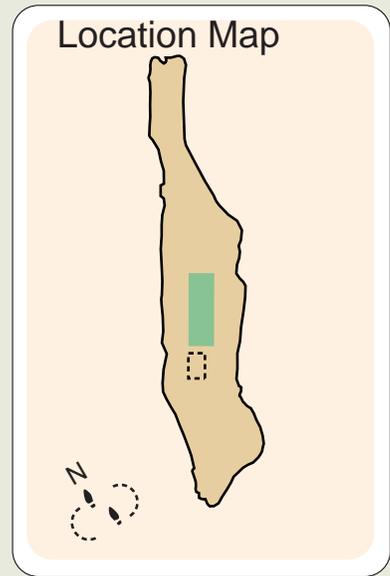
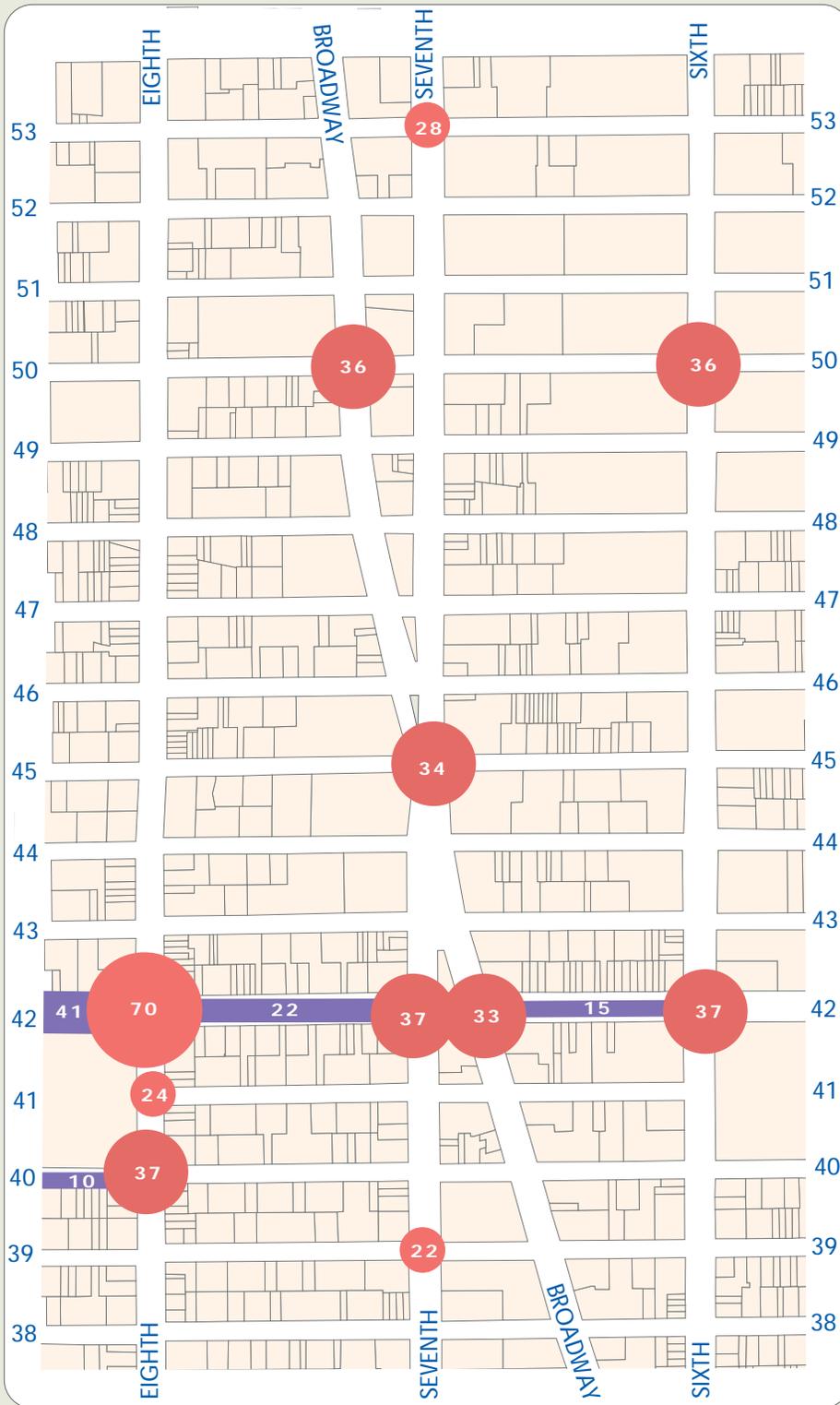
Seventeen mid-block locations had ten or more pedestrian accidents. Mid-block pedestrian accidents took place more frequently on east-west cross streets than on north-south avenues. The most mid-block accidents happened along 34th, 42nd, and 57th streets, wide, two-way streets. Crosstown streets in the block between Fifth and Sixth avenues had high numbers of mid-block accidents compared to other one-way streets (*Appendix: Table C*).

Thirty-one pedestrian fatalities occurred in Midtown, 19 at intersections and 12 at mid-block. Two fatalities were recorded at intersections along 45th, 48th, 49th, 52nd and 55th streets. Between Fifth and Sixth avenues mid-block fatalities happened on West 47th, 50th, and 59th streets (*Appendix: Table D*).

In the study area, eleven intersections and two mid-blocks ranked among Midtown's highest pedestrian accident locations: West 42nd Street between Sixth and Eighth avenues is the most dangerous street in the study area and in Midtown. Pedestrian accidents are also high on Eighth Avenue between West 40th Street and West 42nd streets, on Seventh Avenue at West 39th, West 45th, and West 53rd streets; and on Broadway and Sixth Avenue at West 50th Street (*Map 6: Pedestrian Accidents*). Five pedestrian fatalities took place within the study area: on Sixth Avenue at West 52nd Street; on Seventh Avenue at West 43rd and West 47th streets; on Broadway at West 50th Street; and on Eighth Avenue at West 48th Street.

Map 6

Locations with High Numbers of Pedestrian Accidents: 1989-1994



Midtown Manhattan Pedestrianization Project

Vehicular Volumes

As part of the screening process, available vehicular volumes for Midtown were studied. The 1995 DOT screenline count on 60th Street and at Manhattan tunnels and bridges, recorded southbound traffic (entries to CBD), which ranged from 21,576 vehicles in the AM peak hour to 19,476 in the PM peak hour; and northbound traffic (departures from CBD), which ranged from 18,520 vehicles in the AM peak hour to 22,806 in the PM peak hour. Vehicle entering the CBD via the Queensboro bridge, Midtown and Lincoln Tunnels ranged from 13,920 in the AM peak hour to 8,408 in the PM peak hour; vehicles departing the CBD at these locations ranged from 6,082 in the AM peak hour to 12,162 in the PM peak hour. Thus between 40,000 to 60,000 vehicles may be expected in Midtown in the peak hours.

The vehicular volume counts from the 42nd Street Light Rail Transit EIS (CEQR 92DOT008M) as shown in Table 1 reveal that in the study area, Sixth and Eighth avenues carry the most traffic with approximately 2,000 to 2,400 northbound vehicles in peak hours; the southbound avenues carry far fewer vehicles, about 1,200 on Broadway and 1,675 on Seventh Avenue. On 42nd Street between 500 and 900 vehicles travel in each direction. Peak hour volumes on one way streets ranged from 300 to 600 vehicles.

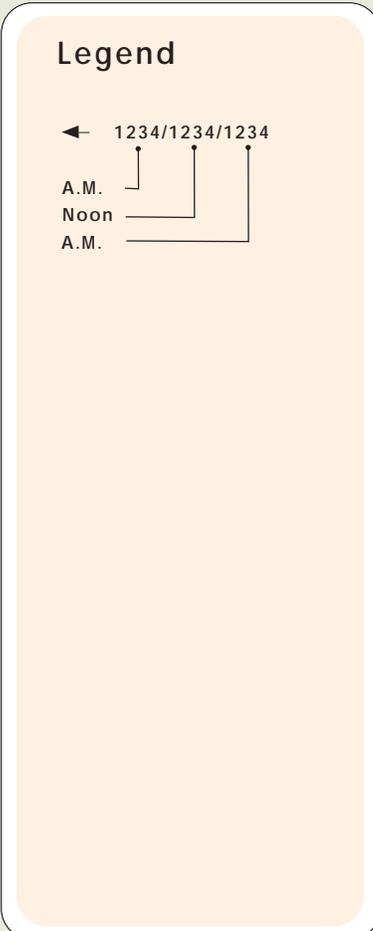
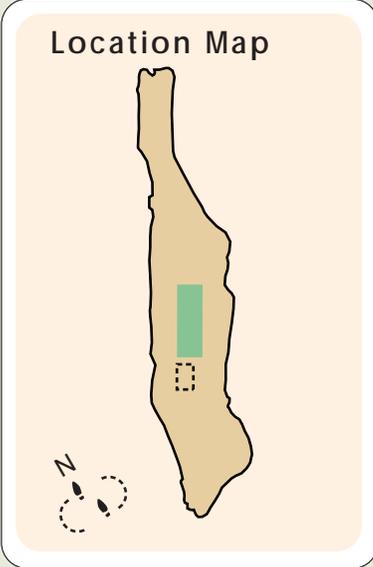
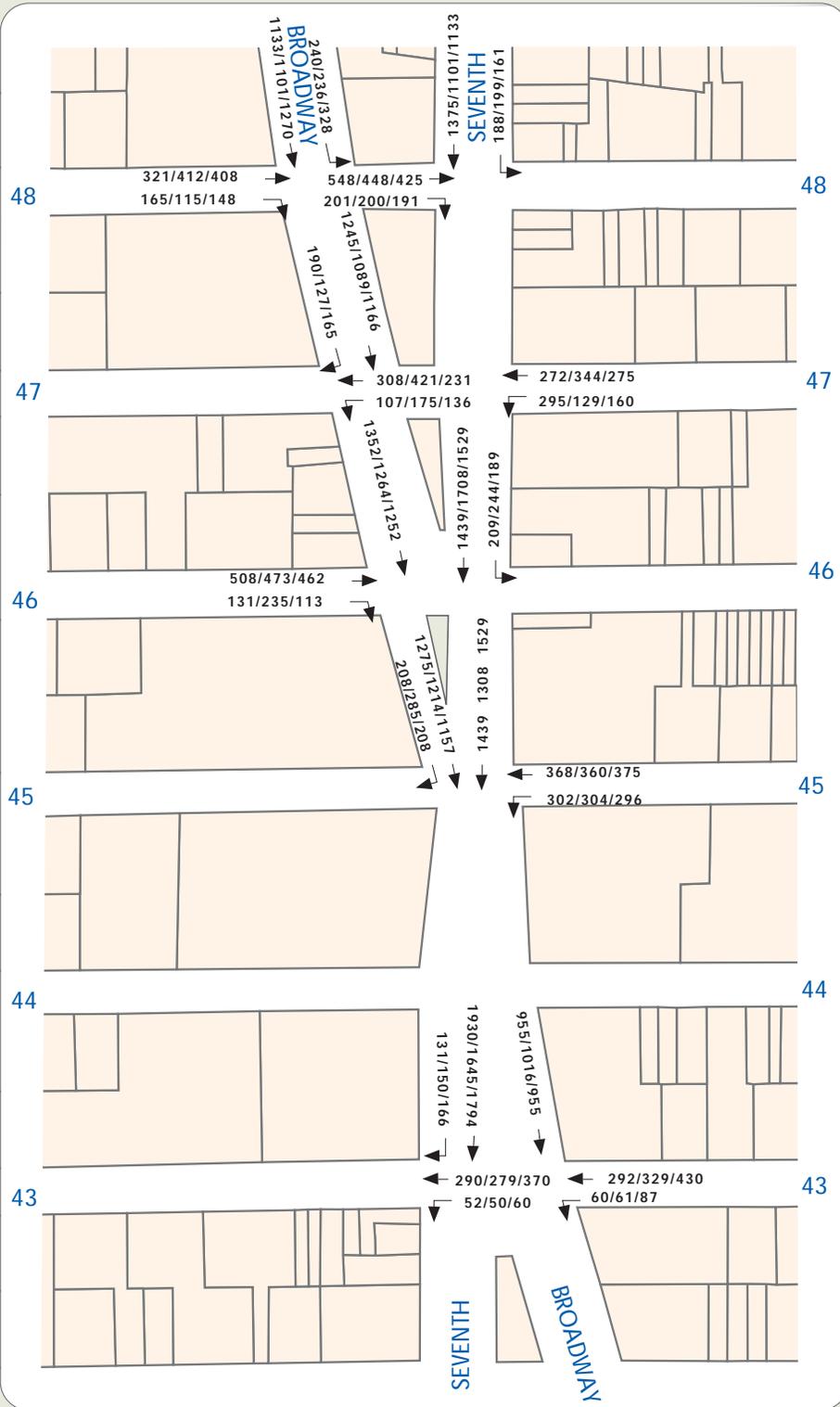
DOT's 1997 peak period vehicular volumes and turning movements on selected streets in the Times Square Bow Tie (*Map 7: Vehicular Volumes and Turning Movements*) indicate the link between poor traffic flow and the high number of turning movements. The irregular street geometry and the short crosstown blocks with limited vehicular storage capacity in the Times Square Bow Tie area further increases the conflict and confusion. The pre-theater traffic causes a fourth peak hour between 7 and 8 PM, and an additional one on matinee Wednesdays. On Seventh Avenue, approximately 60 percent of the traffic is taxis and five percent heavy vehicles (buses and trucks). On Broadway, approximately 30 percent of the traffic is taxis and 10 percent buses and trucks.

Table 1 - Vehicular Volumes

| Approaching N/S Traffic on 42nd Street | AM Peak hour | PM Peak Hour | AM Peak hour | PM Peak Hour | Approaching E/W Traffic on Eighth Avenue | AM Peak Hour | PM Peak Hour | AM Peak Hour | PM Peak Hour |
|--|--------------|--------------|--------------|--------------|--|--------------|--------------|--------------|--------------|
| | Southbound | | Northbound | | | Eastbound | | Westbound | |
| Ninth Avenue | 1880 | 1940 | | | West 39th Street | | | | 650 |
| Eighth Avenue | | | 2135 | 2395 | West 40th Street | | 550 | | |
| Seventh Avenue | 1670 | 1675 | | | West 41st Street | | | | 585 |
| Broadway | 1450 | 1190 | | | West 42nd Street | | 625 | | 625 |
| Sixth Avenue | | | 1990 | 2140 | West 43rd Street | | | | 545 |
| Fifth Avenue | 1840 | 1720 | | | West 44th Street | | 380 | | |
| Madison Avenue | | | 1455 | 1520 | West 45th Street | | | | 435 |
| Lexington Avenue | 1610 | 1425 | | | West 46th Street | | 300 | | |
| Third Aveue | | | 2530 | 2650 | West 47th Street | | | | 475 |

Source: 42nd Street Light Rail Transit Line EIS (CEQR 92DOT008M)

Map 7 Vehicular Volumes and Turning Movements



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Signalization

All study area intersections are signalized, with a 90-second signal cycle. Traffic has typically 45-49 seconds of green time on the avenues and 31-35 seconds on the streets, with 5 seconds amber and all-red for each phase. In the Bow Tie, the avenues have 45 seconds green time and the streets 35 seconds which is a recent change to improve crosstown movement from the previous timing of 53 seconds green time for the avenues and 26 seconds for the streets which aimed to expedite traffic through the bottleneck at West 45th Street. At Eighth Avenue and West 42nd Street the 13 seconds green signal timing dedicated to the eastbound left turn reduces northbound signal timing (*Map 8: Signal Timing*). The T-intersection at Sixth Avenue and West 41st Street, a major entrance to Bryant Park, has an all-pedestrian phase.

Pavement Markings

Pavement markings include: lane markings; stop lines; crosswalks; “don’t block the box” striping; turning lane arrows; bus lanes; and fire lanes. These white markings are often faded by use. Travel lanes are generally marked on the avenues, while crosstown streets, though wide enough to accommodate two vehicles, are usually not marked. All intersections have crosswalks, but the few intersections east of Eighth Avenue marked with high-visibility crosswalks do not necessarily correspond with high accident locations. On Broadway and Seventh Avenue, only West 42nd and 43rd streets have ladder crosswalk markings. “Don’t block the box” grids are marked at Sixth Avenue at West 50th and 53rd streets; Seventh Avenue at West 38th Street; and Broadway at West 40th Street.

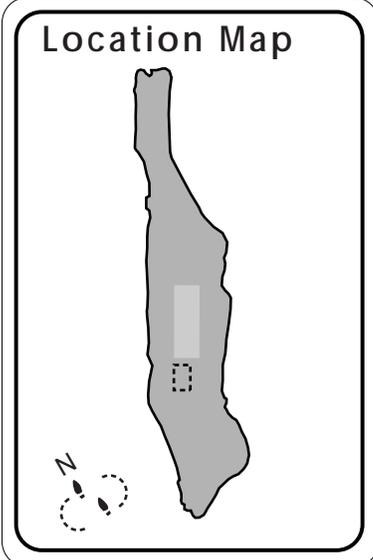
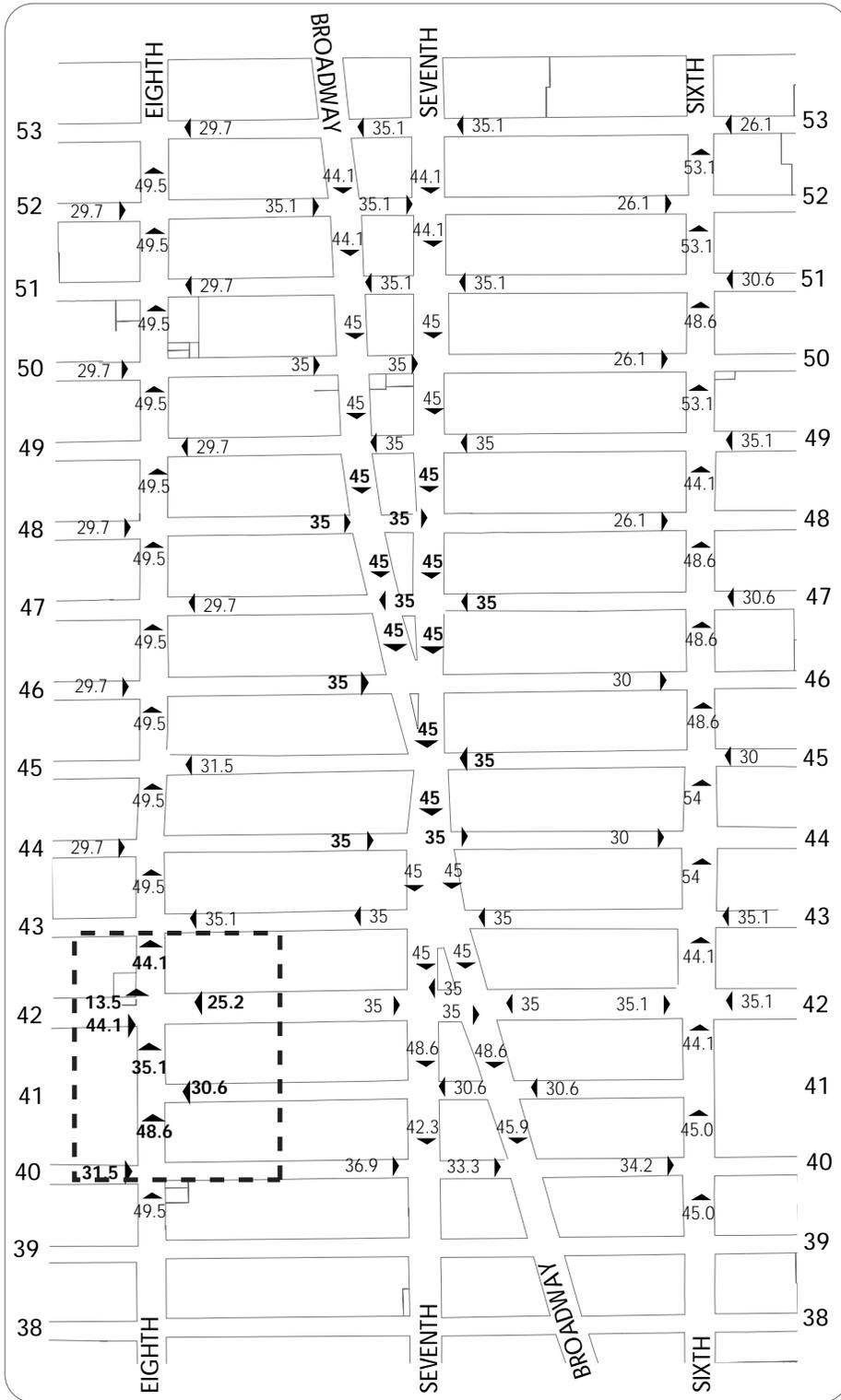
Curb and Moving Regulations

Curbside functions include truck delivery, taxi pick up/drop off, official or diplomatic parking, hotel loading, bus stops/layovers, and parking. Designated curb uses in the Theater District are predominantly no stopping/no standing/no parking; hotel loading zones; truck delivery; tour/express/MTA bus stops; and taxi stands (*Map 9: Curb and Moving Regulations*). On-street metered parking is prevalent on crosstown streets in the north part of the study area. Truck loading and unloading hours, which in other parts of Midtown are between 10 AM and 4 PM, range in the Theater District from 6 AM to 7 PM. The 23 taxi stands in the study area are underutilized by taxis and passengers, resulting in pickups and drop offs at congested or unsafe locations, such as the Times Square traffic islands. There is one taxi dispatch stand at PABT and DOT is in the process of locating a second on Broadway at West 50th Street. Hotel loading zones often function as informal taxi dispatch locations. Tour buses also have designated curbside layover areas. Existing turn prohibitions in the Times Square Bow Tie are designed to minimize confusion and conflicts.

Off-Street Parking

There are approximately 86 parking garages and lots located in the vicinity of the study area from West 38th to 57th streets and Sixth to Ninth avenues (*Map 10: Off-Street Parking*). Five garages are concentrated on West 41st Street between Seventh and Eighth avenues; five more are located on West 42nd Street from Eighth to Ninth avenues adjacent to the Port Authority. Four garages are on West 40th Street and three each are on West 43rd, 47th, 48th, 56th and 57th streets. On the major avenues, seven garages are on Sixth Avenue, six on Broadway; four on Seventh Avenue, and five on Eighth Avenue.

Map 8 Signal Timing

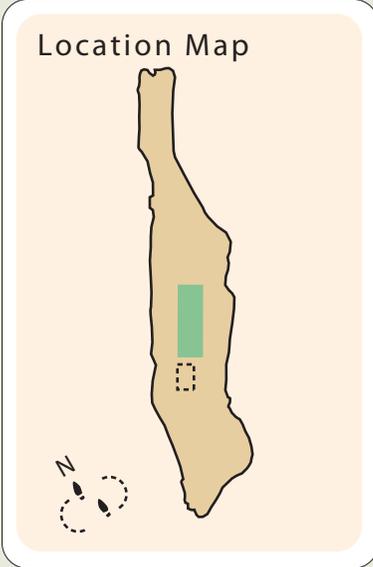
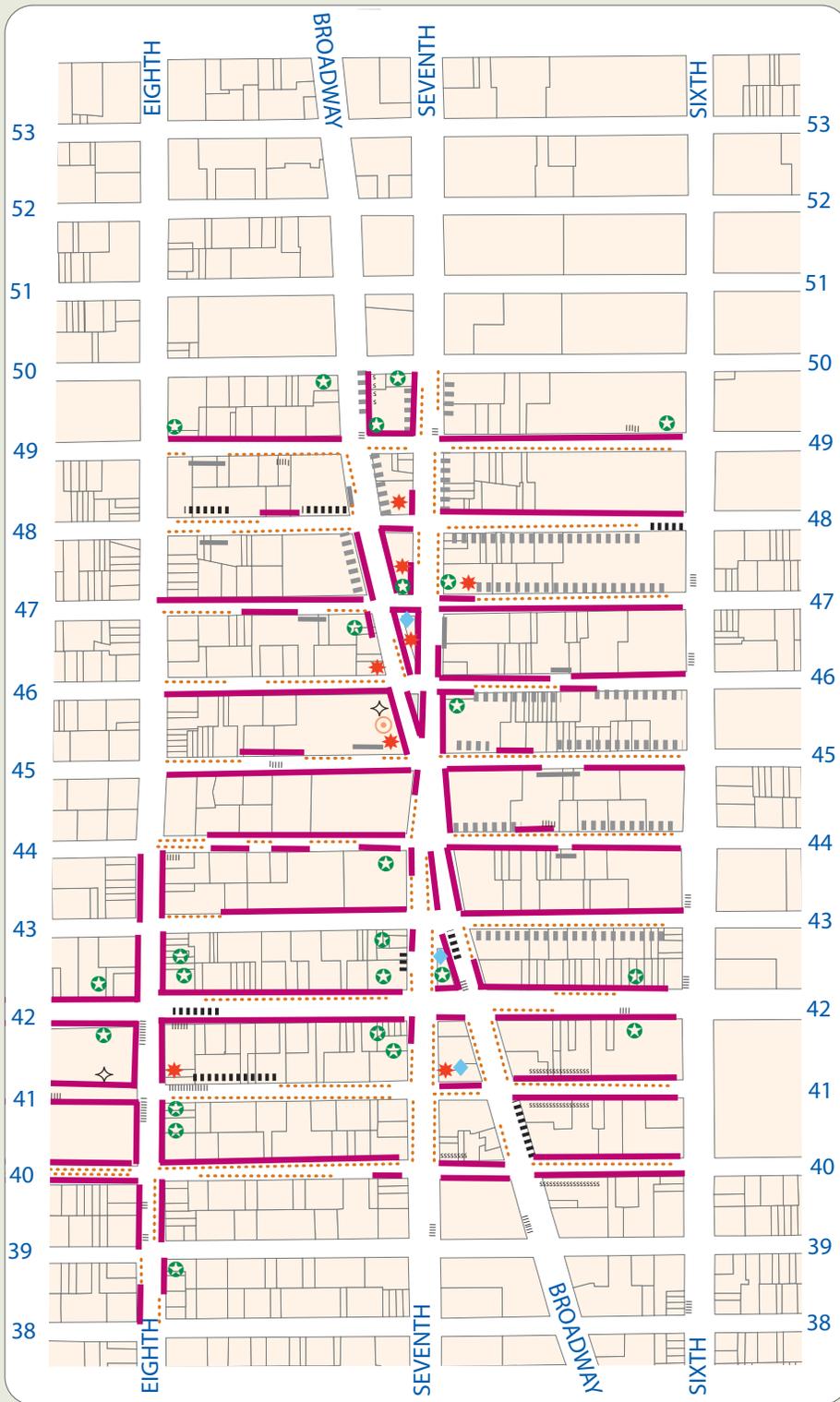


Legend

- ◀ 35.1 Green Time in Seconds
- ▭ Areas with a difference in the timing pattern

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Map 9 Existing Curb and Moving Regulations



Legend

Existing Curb Regulations

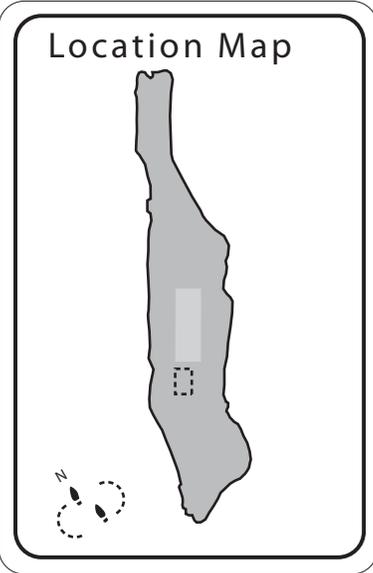
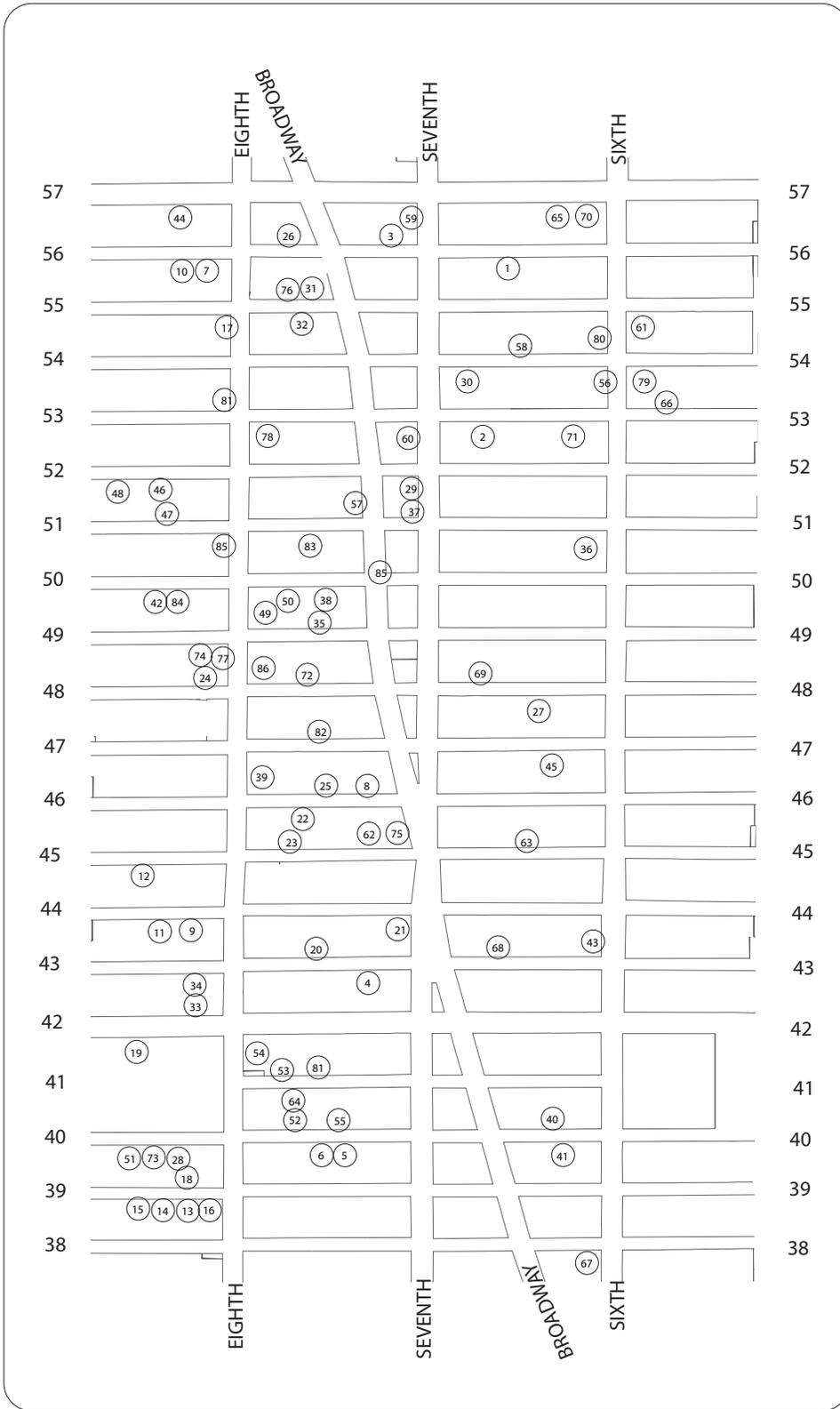
- No Parking, No Standing, No Stopping
- - - - No Standing, Trucks Loading & Unloading
- No Standing, Hotel Loading Zone
- · - · - Authorized Parking (Police, Fire, Medical, Diplomatic)
- | | | | Limited Metered Parking
- s s s s s Restricted Parking
- | | | | Taxi Stand

Bus Stops

- ★ MTA Bus with Handicap Symbol
- ◆ MTA Bus
- Airport Bus
- ◇ Express Bus
- ★ Tour Bus

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Map 10 Off-Street Parking



- Garages and Lots:**
- | | |
|-----------------------------|-----------------------------|
| 1 132 West 56th Garage | 45 Irene Garages Corp |
| 2 159 West 53rd Parking | 46 Jay B Realty Corp |
| 3 211 West 56th Garage | 47 Jay B Realty Corp |
| 4 250 West Parking Garage | 48 Jay B Realty Corp |
| 5 251 West 40th Garage | 49 July Garages |
| 6 252 West 40th Garage | 50 July Garages |
| 7 30-30 Parking Corp | 51 Kinney 40th |
| 8 303 West 46th Corp | 52 Kinney Systems |
| 9 306 West 44th Corp | 53 Kinney 42nd St Inc |
| 10 330 West 56th Corp | 54 Kinney 42nd St Inc |
| 11 333 West 46th Corp | 55 Kinney Systems |
| 12 344 West 45th Corp | 56 Kinney Systems |
| 13 379 5th Realty Corp | 57 Kinney Systems |
| 14 379 5th Realty Corp | 58 Kinney Systems |
| 15 379 5th Realty Corp | 59 Kinney Systems |
| 16 39th Parking | 60 Leslie Craig Corp |
| 17 8th Avenue Parking | 61 Manhattan Parking |
| 18 A&W Parking | 62 Marriot Hotels inc |
| 19 ABL Parking | 63 MBS 605 Parking Corp |
| 20 Advance Parking | 64 Mets Parking Inc |
| 21 Astor Parking | 65 Meyers Parking |
| 22 Bowser 45th Parking | 66 Meyers Parking |
| 23 Bowser 45th Parking | 67 Meyers Parking |
| 24 Bright Management | 68 Meyers Parking |
| 25 Canal Development | 69 New York Kinney Inc |
| 26 Central Parking System | 70 PM Associates |
| 27 Chapman | 71 Park-Serve |
| 28 Cherry Parking | 72 Port Parking Systems |
| 29 Circle Parking | 73 Quick Parking Corp |
| 30 Command Parking | 74 Ravner and Zigeal |
| 31 Delta Parking | 75 Resource Parking Corp |
| 32 Dependable Parking | 76 Second Parking |
| 33 DynamicPark | 77 Square Lebanon Corp |
| 34 Dynamic Park | 78 Stramac Parking |
| 35 Eastway Tenant | 79 Sundance Parking |
| 36 Elzab Development Corp | 80 The Fisher Sixth |
| 37 Equitable Center | 81 Times Square Garage |
| 38 Friars Garage | 82 West 47th St Garage Corp |
| 39 Garfield Parking | 83 West 50th Corp |
| 40 Global Parking | 84 West 50th Corp |
| 41 Guardian 40th Corp | 85 Zenith Parking Corp |
| 42 Guardian 8th Avenue | 86 Zenith Parking Corp |
| 43 Guardian Hippodrome Corp | |
| 44 Irvin Garage | |

Midtown Manhattan Pedestrianization Project

SITE-SPECIFIC FINDINGS

The analysis of existing conditions identified certain study area streets and avenues, described below, as most important for pedestrian and vehicular circulation (*Map 11: Pedestrian Corridors*).

Sixth Avenue

Sixth Avenue carries heavy northbound vehicular traffic. The corridor is distinguished by office buildings setback from the street, creating a nearly continuous ribbon of public plazas and open spaces that link Bryant Park at West 42nd Street to Central Park at West 59th Street. The avenue is the gateway to special retail streets between West 44th and West 47th streets, such as Club Row, Little Brazil, and the Diamond District. Sixth Avenue is a local bus route and provides subway access at West 40th, West 42nd, West 47th, West 48th, West 49th, and West 50th streets. Pedestrian accidents are high at West 42nd and West 50th streets.

Broadway

Broadway is the most important north-south pedestrian corridor, linking Columbus Circle, Times Square, and Herald Square. It is heavily congested with pedestrians, generated by the concentration of offices, theaters, hotels, and retail stores. Broadway has transit nodes, including subway and bus stops, at West 40th, West 42nd, West 47th, West 49th, West 50th and West 53rd streets. The street's unusual geometry as it slices through the street grid provides excellent view corridors, particularly for tourists, while aggravating traffic causing, delay, and congestion. While Broadway has relatively light traffic, vehicular congestion is most acute between West 44th to West 53rd streets, where the road capacity is reduced by double parking and non-compliance with curb regulations.

Seventh Avenue

Seventh Avenue has pronounced pedestrian and vehicular traffic, much of it taxis, which constitute as much as half the vehicles along the corridor. Seventh Avenue has high pedestrian volumes due to office buildings on the avenue and the concentration of theaters and hotels on either side of the avenue. Transit nodes are located at West 40th, West 41st, West 42nd, West 43rd, West 47th, West 49th, West 50th, and West 53rd streets. Seventh Avenue carries the bulk of southbound traffic in the area. Vehicular problems on Seventh Avenue are concentrated south of the Bow Tie between West 40th and West 44th streets.

Times Square Bow Tie

The Times Square Bow Tie intersections (where Broadway crosses Seventh Avenue between West 42nd and 47th streets) are the most critical in the study area. The high pedestrian and vehicular volumes on Broadway and Seventh Avenue that contribute to congestion, conflict, and unsafe pedestrian conditions are exacerbated by the unique and irregular geometry of the Times Square Bow Tie. The street geometry is not only misaligned and confusing for drivers as they continue southbound, but at West 45th Street, where the avenues intersect diagonally,

the roadbeds each narrow from 60 feet to 31-34 feet. Traffic on Broadway and Seventh Avenue is constrained by the six lanes at this intersection, resulting in surplus roadbed on the avenues to the north and south. Sidewalks are overcrowded, suggesting an imbalance in the overall allocation of street space.

Pedestrian volumes in the Bow Tie are extremely heavy in the PM and pre-theater peak hours with theatergoers and commuters. The traffic islands within Times Square, particularly Duffy Square and the TKTS booth, offer the best places to experience the excitement and cacophony of Times Square and are important destinations for tourists and local people alike. A walk into Duffy Square before or after a Broadway show often caps a visit to the Theater District. Pedestrian congestion is severe; pedestrians often spill off the traffic islands into the roadbed or occupy the street in front of tour buses standing at designated layovers in the Bow Tie. Broadway/Seventh Avenue and West 45th Street is one of only two high accident intersections without subway access.

Eighth Avenue

Eighth Avenue has the heaviest peak hour vehicular traffic in the area. Commuters from the transportation hub and transit nodes through the area. Eighth Avenue has transit nodes on West 40th, West 42nd, West 43rd, West 44th, West 49th, West 50th, and West 51st streets. The most dangerous locations for pedestrians are between West 40th and West 42nd streets, those streets near the Port Authority Bus Terminal that provide access to the Lincoln Tunnel or where changes in signal timing contribute to vehicular delay and congestion. With the recent development activity on Eighth Avenue, pedestrian and vehicular traffic may increase in the future.

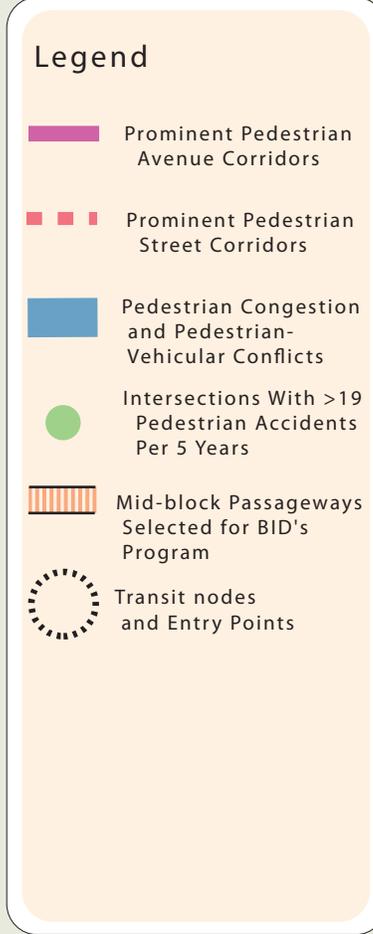
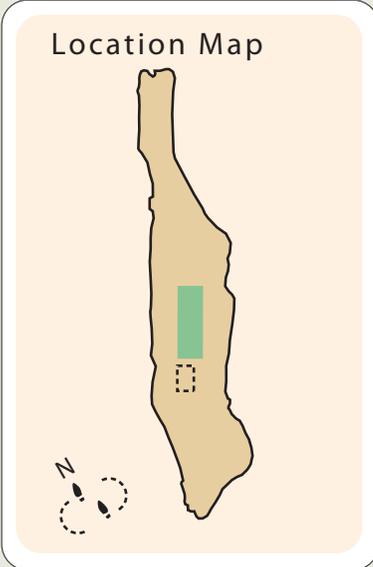
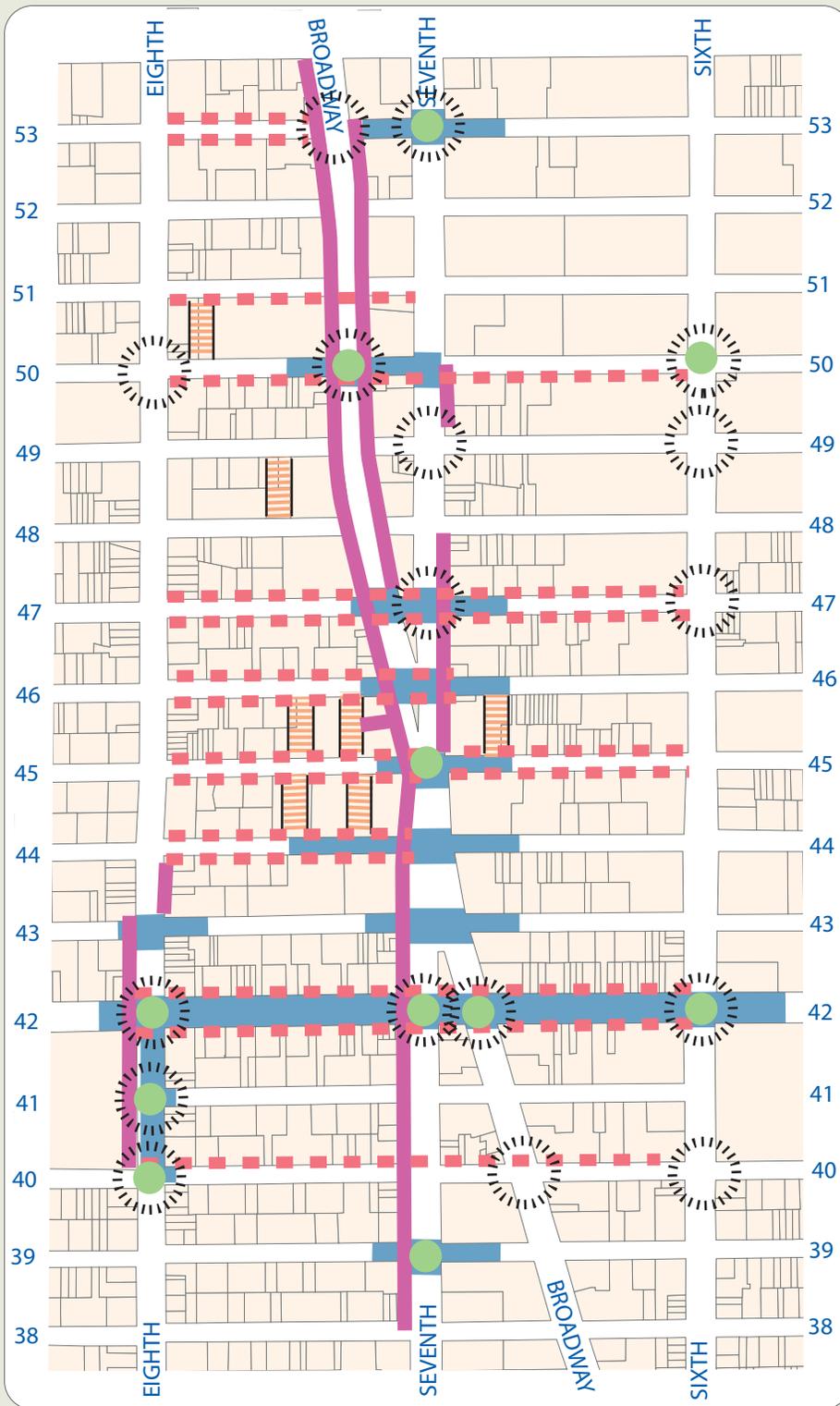
West 42nd Street

Arguably the most important street in the area, and perhaps Midtown Manhattan, West 42nd Street is a wide, two-way east-west street with heavy pedestrian and vehicular flows. The most significant transit corridor in the area, it links the Port Authority Bus Terminal, numerous subway stations, and Grand Central Station, and connects Times Square with Bryant Park to the east. The street is the epicenter of new and planned office, hotel, theater, entertainment, and retail development, that will add substantially to the congestion in the area. West 42nd Street has the highest number of pedestrian accidents, both in the Theater District and in Midtown.

West 40th and West 41st streets

These two one-way crosstown streets define the southern edge of the Theater District. The short street segments between Sixth and Eighth avenues, a direct link between the Port Authority Bus Terminal and Bryant Park, are transit corridors with high peak hour pedestrian volumes, particularly on the north sidewalks. The concentration of off-street parking facilities on these streets leads to frequent mid-block pedestrian-vehicular conflicts. West 41st Street and Sixth Avenue has an all-pedestrian signal phase.

Map 11 Pedestrian Corridors



Midtown Manhattan Pedestrianization Project