

PROBLEMS AND OPPORTUNITIES

The problems observed in the study area and identified in the findings have been categorized into four types: Pedestrian Safety; Pedestrian Congestion; Quality of Pedestrian Environment; and Vehicular Congestion and Delay. These categories are interconnected and impact each other. Pedestrian and vehicular congestion and urban environment affect pedestrian safety; congestion and safety affect quality of urban environment, and so forth. Site-specific problems are listed in a matrix (*Appendix: Table E*) and mapped (*Map 12: Problems and Opportunities*). The opportunities include easily available resources which may be used for improving pedestrian and vehicular circulation, such as excess roadbed width, wide sidewalks, midblock passageways, unused taxi stands and such.

Pedestrian Safety

Pedestrian safety is endangered by conflicts with moving vehicles, at intersections and sometimes at sidewalk curb cuts; insufficient corner queuing space; encroaching vehicles; pedestrian hazards, such as protruding signs and slippery or uneven walking surfaces; and illegally-parked vehicles that force buses to drop off and pick up people in the street. General safety problems prevalent area-wide include: narrow and/or obstructed crosswalks; sidewalks with uneven, pitted surfaces and narrow curb cuts at crosswalks; poor design and condition of subway ventilation grates; and a lack of appropriate street markings, such as high-visibility ladder crosswalks.

Pedestrian-vehicular conflicts are prevalent throughout the area and are most pronounced along prominent pedestrian corridors. The 42nd Street Development study¹ found the worst traffic congestion during AM, midday, PM, and pre-theater peak hours on West 42nd Street at Eighth, Seventh, Sixth, and Ninth avenues, in that order. Broadway and Seventh Avenue, at West 43rd, West 44th, and West 45th streets, also experience significant problems during peak hours. The incidence of conflict at these critical locations is evidenced by the high number of pedestrian accidents at West 42nd Street between Sixth and Eighth avenues; Eighth Avenue between West 40th Street and West 42nd Street, the Times Square Bow Tie, Broadway and Seventh Avenue between West 43rd and 47th streets; and West 39th Street between Broadway and Seventh Avenue. Pedestrian-vehicular conflicts at mid-block are accentuated by through-block pedestrian passageways that offer alternatives to walking on the major north-south avenues.

¹ New Development and Mitigation Measures: According to the January 1994, 42nd Street Development Project FEIS, projects on 42nd Street are expected to generate a substantial number of trips and incur significant traffic impacts. Signal phasing, timing modification, curb parking regulation modifications, and enforcement of curbside parking and standing prohibitions could mitigate impacts substantially but not fully. Five-foot sidewalk widenings at two locations on Seventh Avenue would not mitigate midday impact. Impacts on several other sidewalks, including the corner at Seventh Avenue and West 43rd Street would remain unmitigated. The very serious congestion at the intersection of West 42nd Street and Seventh Avenue/Broadway could not be fully mitigated even with re-striping of the affected crosswalks. Pedestrians would be expected to adjust their street-crossing behavior to accommodate the overcrowding.

Pedestrian Congestion

Seventh Avenue and Broadway carry the heaviest pedestrian volumes. The major east-west pedestrian streets link offices, hotels, theaters and transit nodes. Transit corridors -- crosstown streets with two or more intersections with subway entrances/exits between Sixth and Eighth avenues -- include 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). (The existence of plazas and mid-block passageways also accentuates the importance for pedestrians on certain minor streets.)

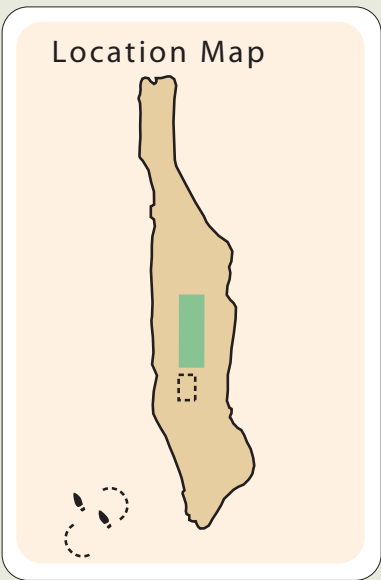
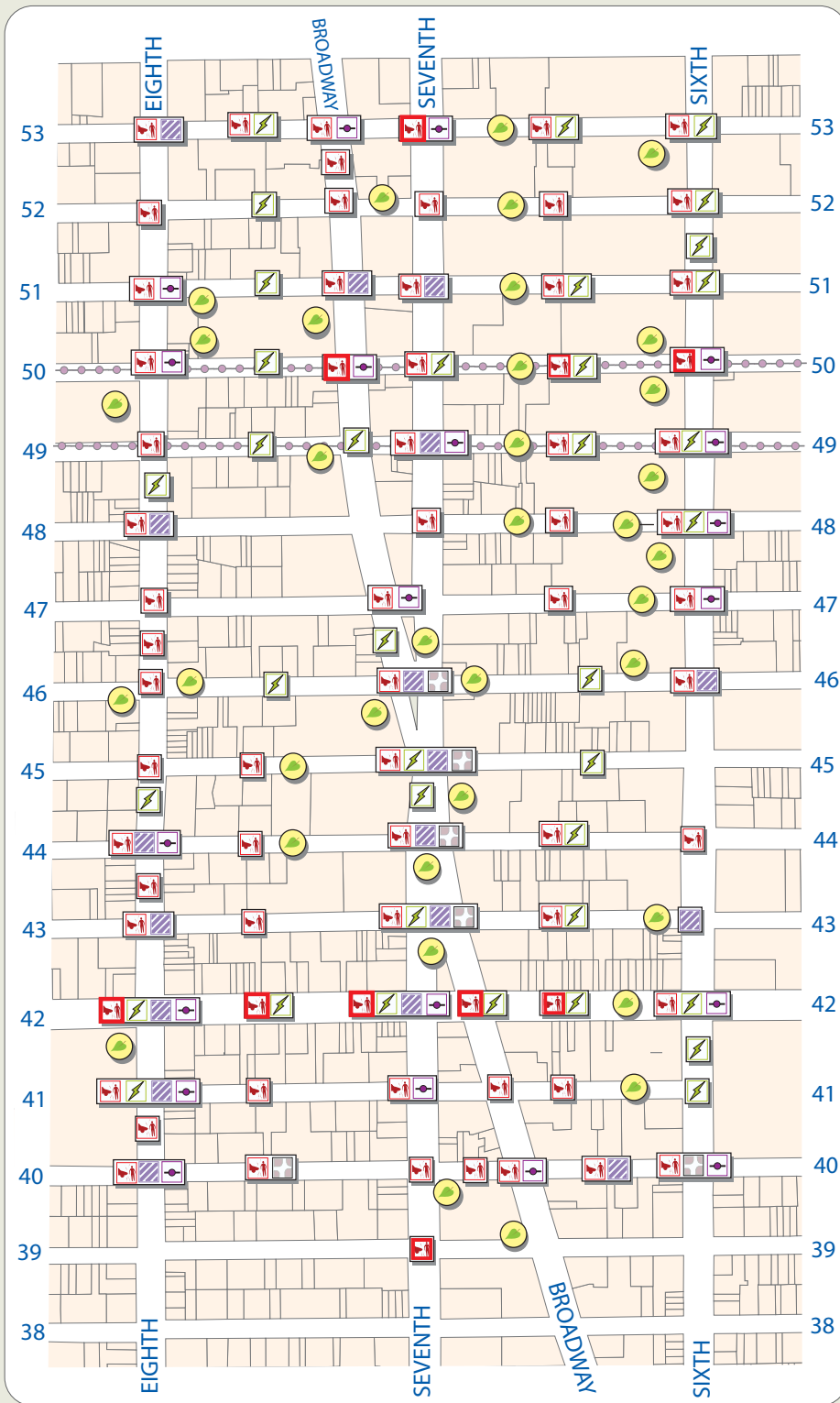
Critical intersections with severe pedestrian congestion, as identified by high pedestrian volumes accidents; and limited corner and crosswalk space, are near the PABT on Eighth Avenue at West 40th, West 41st, and West 42nd streets and in Times Square on Seventh Avenue and Broadway between West 42nd Street and West 47th Street. The traffic islands within Times Square are important destinations, particularly Duffy Square and the TKTS booth. They offer the best places to experience (and photograph.) However, accessing these islands or negotiating the intersections at other critical locations is a challenge. The sidewalks along these corridors are congested and frequently obstructed. Pedestrians often spill off the street corner into the roadbed due to inadequate queuing space, contributing to pedestrian-vehicular conflict, delay, and congestion.

Quality of Pedestrian Environment

The quality of the pedestrian environment is affected by the ability to easily orient oneself and navigate the area, the availability of public amenities, and the general quality of the urban streetscape. The study area, in general, lacks necessary directional signs and maps showing prominent destinations as well as taxi stands, bus stops, subway entrances, and open spaces, to assist people in getting around. For instance, while familiar to the work population in the area, the public spaces fronting Sixth Avenue between West 47th and West 53rd streets may be unknown to tourists and theater-goers in Times Square. Taxi stands are conveniently located throughout the Theater District, but the lack of signs directing tourists, theater-goers, hotel guests, and business visitors to them contributes to their underutilization.

Public amenities, including, seating, public toilets, landscaping, and pedestrian lighting, are also inadequate. Despite the crowds, public seating in the Times Square traffic islands is limited to planters and statue pedestals, and public toilets are absent. The condition of sidewalks, crosswalks, pedestrian islands and plazas are important to the appeal of an area: the walking experience is affected by the quality of the sidewalk paving material, the finish, and the uninterrupted flow of spaces. Subway ventilation grates, which constitute a large part of the sidewalks in this transit-rich area, are poorly maintained and their design is not suitable for certain type of footwear with heels.

Map 12 Problems and Opportunities



Legend

- Pedestrian Vehicular Conflicts**
 - heavy pedestrian volumes
 - heavy vehicular volumes
 - signal timing
- Illegal Vehicular Action**
 - gridlock
 - spillbacks
- Narrow Obstructed Walkway**
 - on corner/sidewalk
 - narrow sidewalk
 - pedestrian congestion
- Geometric Design & Condition**
 - intersection street geometry
 - pavement markings
- Transit Node**
- Opportunity and Resources**

Midtown Manhattan Pedestrianization Project

Vehicular Congestion and Delay

Vehicular congestion and delay result from heavy pedestrian and vehicular volumes, pedestrian conflict with turning vehicles, un-channelized and disrupted traffic movements, irregular geometric roadbed design, and poor traffic and curbside management. While many taxis, trucks, and buses directly service the area and others drive there for specific reasons, many additional vehicles simply enter the area to cross the town east/west or north/south. During peak hours, the existing conditions, which include the number of moving lanes, fail to process the high volume of pedestrian and vehicular traffic, resulting in gridlock conditions.

Vehicular congestion and delay is also caused due to vehicles blocking the crosswalk, intersection or bus lane; loss of moving lanes due to double-parked vehicles or stopped taxis interrupting traffic; truck delivery hours which conflict with the peak traffic hours; illegally parked vehicles; and aggressive or unsafe driver actions, such as illegal turns; sudden speeds; weaving, and lane changing.

Taxis comprise 30 to 50 percent of the total traffic. There are approximately 23 designated taxi stands within the Theater District that most people are not aware of and are therefore not used optimally, contributing to unnecessary taxi trips and passenger pick-ups from the middle of the road. Most of the curb sides in the Bow Tie area are reserved for truck loading/unloading, bus stops, and authorized vehicles. Curbside loading hours of 7 AM to 7 PM conflict with the morning and evening peak hours and the Wednesday 2:00 and 4:30 PM matinee peak hours. Restrictions limiting curb use to standing tour buses are complied with infrequently, as are signs prohibiting vehicle idling.

While the road geometry and lane widths are fairly standard on Sixth and Eighth avenues, this is not the case on Broadway and Seventh Avenue where they intersect diagonally, forming the Times Square Bow Tie, at West 45th Street. Here the roadbed narrows to 31-34 feet from 60 feet. The loss of traffic lanes due to under-/inappropriate utilization and mismanagement of existing space exacerbates the poor traffic flow. Uneven lane widths, confusing lane striping, and inadequate signs to guide motorists contribute to chaotic traffic conditions and turning vehicles in the short blocks between Broadway and Seventh Avenue add to the traffic congestion. As noted in the *Times Square 'Bow Tie' Pedestrian and Vehicular Circulation Improvement Study* (1988), and as confirmed by field observations, the traffic flows on Broadway and Seventh Avenue are constrained by the six lanes at West 45th Street, resulting in surplus roadbed on the avenues to the north and south; and sidewalks are crowded, suggesting an imbalance in the overall allocation of street space.

PROBLEMS AND OPPORTUNITIES

A package of complementary recommended-actions has been developed to achieve area-wide improvements targeted to address identified problems and opportunities. General recommendations to improve the project area include the improvement of sidewalk and crosswalk paving surfaces, wider high-visibility crosswalks, lane channelization and dedicated turning lanes, and other such measures. Site-specific recommendations, developed to work separately or in combination, include physical and operational improvements, such as wider sidewalks and street corners; roadbed and sidewalk management; enforcement of existing and new curb and moving regulations; taxi circulation improvements; and using available resources to make pedestrian improvements without impacting traffic.

Large volumes of pedestrians are to be expected in an area such as Times Square and the Theater District, given the special attractions and the exceptional access by public transport. Pedestrian congestion and inconvenience can be alleviated by the improved management of sidewalks and roadbeds. Sidewalk management includes: clearing corners of clutter and locating street furniture and commercial activities to allow uninterrupted pedestrian movement; changing curb regulations to minimize loading activity conflicts with peak pedestrian demand hours; identifying optional locations for vehicles parked by officials on the pedestrian islands; cooperating with building owners/occupants to keep sidewalks clear and unobstructed (building extensions, awning poles, cellar doors, garbage awaiting pick-up, and other barriers); setting standards for mitigating the displacement of pedestrians from sidewalks during construction activities; and coordinating trash collection days and hours.

The operational factors of roadbed management include: regulating curb use to optimize use of the number of moving lanes; restricting turning movements at severely congested intersections; limiting access hours for heavy vehicles; prohibiting long vehicles in the area; allowing loading and unloading activities only during selected hours; acknowledging the heavy volumes of pedestrians and integrating their needs in the larger design; and informing people of their obligations through signage and outreach, and enforcing compliance. Other management factors, dealing with geometric design, include clearly striping crosswalks and traffic lanes of uniform width, and marking dedicated lanes for vehicular movements and buses.

Design Rationale and Constraints

- Create a safe area for pedestrians and motorists by minimizing conflicts and obstructions
- Increase pedestrian space (sidewalk widenings) where roadbeds have excess width resulting in underutilized areas
- Provide neckdowns near accident areas, transit nodes, taxi stands, express and tour bus stops
- Use underutilized resources to minimize capital costs and physical changes
- Reduce traffic volume entering the area and channelize traffic with clear signs and markings
- Coordinate with and reinforce other improvement efforts in Midtown

Priority Areas

Four priority subareas within the study boundaries have been selected based on their critical importance to pedestrians and the identification of multiple problems and/or opportunities. These are:

- Seventh Avenue and Broadway from West 42nd to 47th Street in the Times Square Bow Tie;
- West 42nd Street between Sixth Avenue and Eighth Avenue;
- Eighth Avenue between West 40th and 42nd streets in front of the Port Authority Bus Terminal; and
- West 44th to 47th streets between Seventh and Eighth avenues and West 50th Street between Sixth and Eighth avenues.

The individual locations selected are:

- Seventh Avenue and West 53rd Street
- Broadway and West 50th Street
- Seventh Avenue and West 39th Street

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 crosswalk; and a new crosswalk and traffic signal on West 42nd Street;
- Clear corners, 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, 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 (*Maps 13 and 14: Recommended Sidewalk Widening in the Times Square Bow Tie*)

- Widen sidewalks by taking advantage of excess roadbed north and south of the bottleneck 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.

Map 13

Proposed Recommendations for Sidewalk Widening in the Times Square Bow Tie

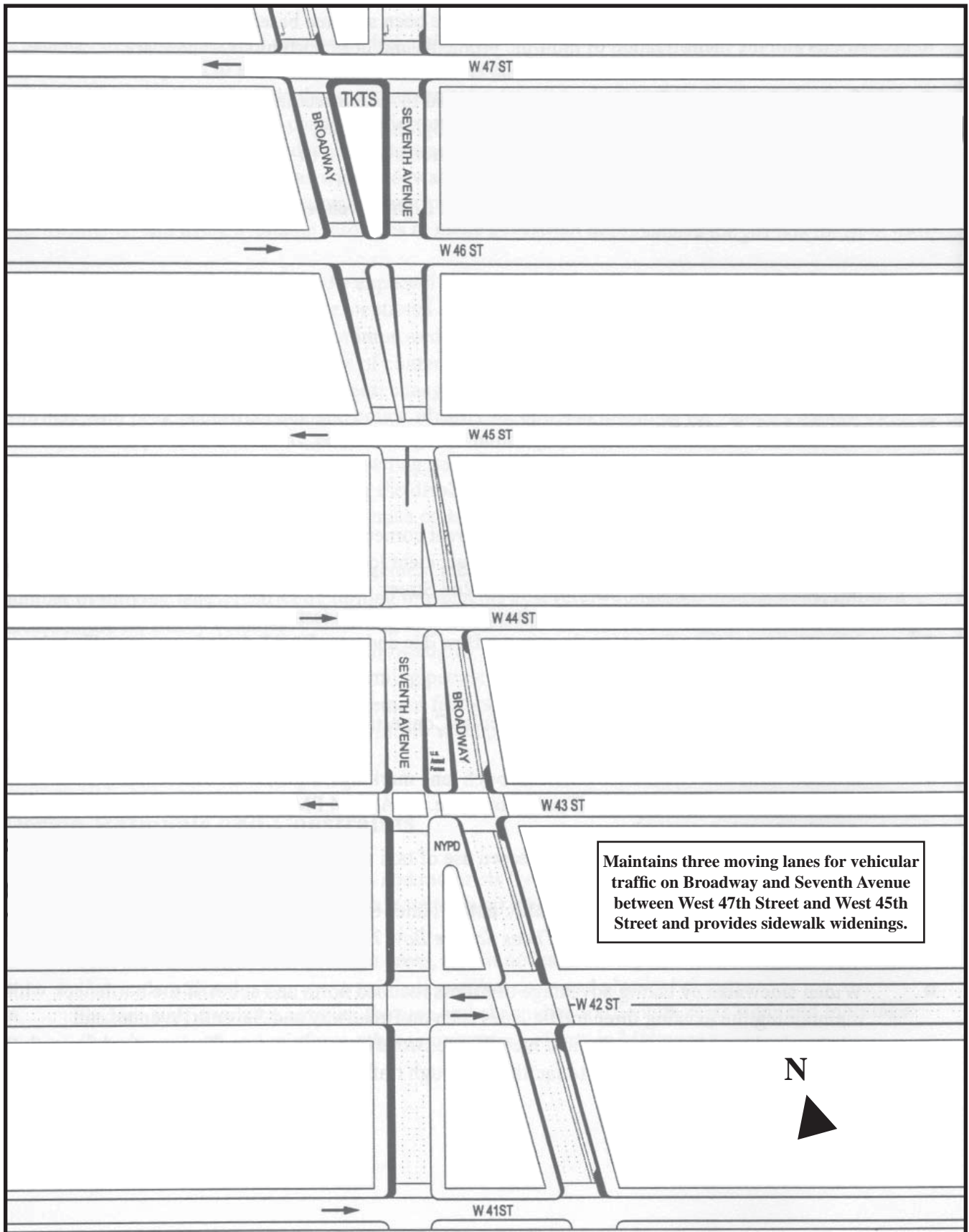


Table 2 - Recommended Actions Table

COMPONENT	RATIONALE	TIME FRAME (TERM)			AGENCY
		SHORT	MID	LONG	
Street Design and Geometry					
Improve and maintain condition of walkways and ventilation grates	Improve pedestrian safety and mobility on the sidewalks and crosswalks; increase effective sidewalk space by using ventilation grates with smaller gaps, properly flushed with sidewalks		✓		MTA/DOT
Provide enhanced crosswalks and roadbed treatments at mid-block passageways and in Times Square Bow Tie	Improve pedestrian safety through high-visibility crosswalks which clearly demarcate and differentiate the pedestrian zone from the vehicular street space and encourage motorist caution		✓		DOT
Change curb lines to widen sidewalks and street corners in the Bow Tie; on Eighth Avenue at the PABT; at mid-block passageways; and at high-accident intersections	Improve pedestrian safety and reduce congestion by enhancing pedestrian space		✓		DOT
Change curb lines to widen roadbed on Seventh Avenue at West 45th Street, such that there are two lanes on Broadway and four lanes on Seventh Avenue	Redistribute the six southbound lanes in the Bow Tie to encourage use of Broadway for local traffic and Seventh Avenue for through traffic			✓	DOT
Clear street corners by relocating street furniture/uses within 20 feet of existing location	Improve effective sidewalk and street corner space on congested pedestrian corridors, implemented incrementally with curb line changes		✓		BID/DOT
Install appropriately-located and designed panels/posts for maps and signs	Improve orientation in Theater District for tourists, visitors, and commuters through informational signs and maps designed and placed to avoid signage clutter		✓		BID/DOT
Landscape public spaces and locate amenities	Improve streetscape and convenience for visitors through an integrated design for the Bow Tie islands		✓	✓	Parks/DOT
Encourage building setbacks, widened sidewalks, and the relocation of subway entrances within new buildings in Times Square/West 42nd Street	Mitigate impacts of West 42nd Street development as per the 42nd Street Development Project SEIS		✓	✓	NYS ESDC/BID
Explore additional safety measures on West 42nd Street between Seventh and Eighth avenues	Improve pedestrian safety on congested high-accident corridor where development is expected to attract additional pedestrian/vehicular traffic			✓	

COMPONENT	RATIONALE	TIME FRAME (TERM)			AGENCY
		SHORT	MID	LONG	
Traffic Movement and Turn Prohibitions					
Prohibit exiting Lincoln Tunnel traffic to make right turns from Dyer Avenue onto West 42nd Street as per the 42nd Street Light Rail EIS	Reduce eastbound volume of traffic on West 42nd Street			✓	NYPD/DOT
Prohibit right turns from West 44th Street to Broadway	Reduce congestion and conflicts caused by turning vehicles		✓		NYPD/DOT
Prohibit left turns from West 45th Street to Seventh Avenue	Reduce congestion and conflicts caused by turning vehicles		✓		NYPD/DOT
Prohibit right turns from West 46th Street to Seventh Avenue and Broadway	Reduce congestion and conflicts caused by turning vehicles		✓		
Prohibit left turns from West 47th Street to Broadway	Reduce congestion and conflicts caused by turning vehicles		✓		NYPD/DOT
Encourage taxis to pick up and drop off passengers from taxi stands only	Use 23 underutilized, conveniently-located taxi stands in the Theater District and Port Authority Bus Terminal vicinity to reduce congestion caused by circulating taxis		✓		TLC/DOT
Restrict entry onto Broadway between West 44th and 47th streets for all traffic except buses, trucks with permits, bicycles, horse-cabs, service/emergency vehicles	Encourage use of Broadway to serve local traffic needs and divert the remaining through traffic to a widened Seventh Avenue as a long range goal to enhance pedestrian space in the Bow Tie			✓	DOT
Curb Use Regulations					
Limit truck delivery to off peak hours 10 AM to 4 PM	7 AM to 7 PM delivery hours conflict with AM and PM peak hour traffic	✓			DOT
Extend MTA bus stops	Reduce congestion caused by buses queuing at intersections	✓			MTA/DOT
Locate new taxi dispatch stands	Allow people to safely and conveniently find a taxi and minimize empty taxis congesting the area in search of customers		✓		BID/TLC/DOT
Designate no stopping zones at curbs adjacent to mid-block passageways	Ensure pedestrian safety and clear sight lines at mid-block crossings	✓			DOT

COMPONENT	RATIONALE	TIME FRAME (TERM)			AGENCY
		SHORT	MID	LONG	
Timing Changes					
Provide an early release pedestrian walk signal	Improve safety on Eighth Avenue near the Port Authority Bus Terminal		✓		DOT
Provide longer green time for pedestrians	Improve pedestrian safety by increasing green time in the Times Square Bow Tie during pre-theater peak hours and on West 42nd Street/Eighth Avenue during PM peak hours		✓		DOT
Street Markings Signal					
Mark widened and/or high-visibility crosswalks	Increase pedestrian safety and minimize pedestrian-vehicular conflicts in areas with high pedestrian volumes	✓			DOT
Mark Barnes dance crosswalk	T-intersection with a pedestrian phase at West 41st Street/Sixth Avenue (Bryant Park)	✓			DOT
Stripe pedestrian zone on the surplus roadbed in the Bow Tie as an interim measure	Provide additional space for pedestrians on the north and south sides of West 45th Street and ensure consistent lane widths	✓			DOT
Regulatory and Informational Signs for Motorists					
Sign special pedestrian areas	Caution motorists to be aware of pedestrians	✓			DOT
Install signs to channelize traffic	Reduce confusion and congestion and optimize street space	✓			DOT
Install "Don't block the box" signs	Discourage vehicles from blocking congested intersections	✓			DOT
Install turn prohibition and next available turn signs	Reduce confusion and allow motorists to plan ahead before approaching Theater District or exiting the Lincoln Tunnel	✓			DOT
Install signs showing the best routes to and from tunnel	Guide motorists to the best route to their destination	✓			DOT
Install missing regulatory signs	Turn prohibitions and taxi stand locations in the Theater District	✓			DOT

COMPONENT	RATIONALE	TIME FRAME (TERM)			AGENCY
		SHORT	MID	LONG	
Informational Signs for Pedestrians					
Install maps and signs to guide pedestrians to taxi stands, bus stops, subways, and open spaces	Increase use of existing resources, improve orientation and mobility, and encourage use of mid-block passageways and plazas with seating	✓			BID/DOT
Install signs to guide people to photography areas	Increase safety by discouraging photography from the road	✓			BID/DOT
Public Amenities					
Provide automated public toilets (APTs); seating and drinking water	Improve pedestrian comfort and convenience		✓		CB4/CB5/ DOT/ DEP
Enforcement and ITS (Intelligent Transportation Systems)					
Enforce existing curb regulations	Increase street space by restricting illegal parking, which reduces effective number of lanes, particularly during peak hours	✓			NYPD
Enforce existing turning regulations	Increase safety and reduce conflicts caused by inappropriate and illegal turning movements, particularly in the Times Square Bow Tie and on West 42nd Street	✓			NYPD
Enforce existing transit way regulations which permit buses and taxis with passengers only	Increase safety, reduce conflicts, and channelize traffic on West 49th and West 50th streets	✓			NYPD
Enforce existing prohibitions on engine idling	Maintain air quality from deteriorating further.	✓			NYPD
Install wide-area detection system	Monitor illegal parking in Times Square area with ITS cameras	✓			DOT
Congestion Pricing					
Manage travel demand through ITS	To be planned comprehensively for Midtown Manhattan			✓	NYMT

CONCLUSIONS

Recommendations resulting from this study include changes in curb widths to take advantage of excess roadbed capacity throughout the larger Bow-Tie area. These changes occur from south of 50th Street on Broadway and South of 48th Street on Seventh Avenue to just north of 41st Street on both Broadway and Seventh Avenue. Throughout the Bow-Tie area, restricting curbside delivery parking to the hours of 10 a.m. to 4 p.m. has been proposed. These guidelines are consistent with much of the rest of Midtown. At 42nd Street and Eighth Avenue, a leading pedestrian indicator has been recommended to ease congestion caused by the large numbers of pedestrians associated with the Port Authority Bus Terminal. Finally, proposed turning restrictions in the Bow-Tie area would encourage channelization of traffic this improving circulation for both pedestrians and vehicles.

Summary of Level of Service Analysis (LOS)

The traffic impact analysis for the proposed recommendations has been prepared, which discloses the effects of each action, and evaluates the level of service (LOS) for vehicles and pedestrians based on City Environmental Quality Review (CEQR) criteria. Among other factors, the LOS for vehicular traffic depends on the volume; turning movements and traffic composition; number and width of lanes; curb uses; signal timing; and conflicts with pedestrians. Factors affecting the LOS for pedestrians include: pedestrian volumes; effective sidewalk widths; conditions on corners and at intersections; signal timing and vehicular volumes. The range of LOS can vary from A, highly desired, to F as undesirable. Improved LOS for pedestrians in the study area, should not come at the cost of deteriorated LOS for vehicles within the area or elsewhere. New traffic and pedestrian volume data was gathered to assess the feasibility of recommended turn prohibitions, curb line changes and signal timing. A summary of the results of the LOS analysis is presented in the appendix.

Background

To conduct the no-build network analysis, background growth of half a percent per year over four years and adjusted project growth from the 42nd Street Development Project have been added to the existing conditions traffic network. Alternatively, the build network incorporates the NYCDCP recommendations for turning restrictions, a leading pedestrian indicator, and lane changes resulting from curb widenings.

Five sets of recommendations developed in the Midtown Manhattan Pedestrian Project impact the traffic network: neckdowns and curb widenings in the Times Square Bow-Tie area; changes in curb regulations for deliveries; turning restrictions in the Bow-Tie; a leading pedestrian indicator (lpi) at 42nd Street and Eighth Avenue; and a turning restriction at Dyer Avenue and 42nd Street.

Analysis

Turning Restrictions. To address the proposed turning restrictions in the Bow-Tie area, trips were reassigned to alternate turning movements. In total, there are four proposed turning restrictions and resultant trip reassignments.

- Left turns from West 47th Street to Broadway are restricted; turning cars are reassigned to the preceding left turn onto Seventh Avenue.
- Similarly, right turns from 46th Street to Broadway are restricted and trips are reassigned to the following right turn onto Seventh Avenue.
- At 45th Street and Times Square the second left turn is restricted.
- At 44th Street, turn restrictions prohibit cars from turning right onto Broadway.

For the first three trip reassignments, changes in the network occur north of 44th Street. For example, between 45th and 44th streets, vehicles return to the avenue onto which they would have originally turned. These cars are reassigned to the earlier right turn onto Seventh Avenue. Vehicles affected by the fourth turning restriction would return to Broadway through a left turn from Seventh Avenue onto 42nd Street and a subsequent right turn from 42nd Street onto Broadway.

Leading Pedestrian Indicator. At 42nd Street and Eighth Avenue, a leading pedestrian indicator (LPI) is recommended to ease congestion caused by the large pedestrian volumes generated by the Port Authority Bus Terminal. To analyze the effects of this proposal, an eight second LPI was integrated into the analysis of build conditions. Three seconds were taken from the northbound avenue traffic, and two seconds were taken from each of the east-west movements – the protected eastbound to northbound left turn and the combined eastbound-westbound phases.

Finally, As per the recommendations made by NYCDOT in the 42nd Street Light Rail FEIS, it is recommended that right turns off of Dyer Avenue onto eastbound 42nd Street are restricted. For analysis, trips were reassigned using the same methodology as the Light Rail FEIS.

Mitigation Measures

The LOS analysis of the future build scenario generated eight intersections which may experience significant negative impacts. A series of standard mitigation measures has been proposed to offset these impacts. They are as follows:

Impacts by the Dyer Avenue Turn Restriction

Intersection: 40th and Broadway

Mitigation: Timing - Shift of 3 seconds (from SB to EB) during AM
Parking - Daylighting on south side of 40th

Intersection: 40th and Seventh

Mitigation: Timing - Shift of 1 second during AM.

Intersection: 40th and Eighth
Mitigation: Timing - Shift of 3 seconds in signal timing during all periods.
Parking - Daylighting (as in 42nd St. Light Rail EIS)

Intersection: 42nd and Tenth
Mitigation: Timing - New signal phase during all times.

Impacted by Leading Pedestrian Indicator

Intersection: 42nd and Eighth
Mitigation: Timing - Shift of 3 seconds (to NB) signal timing during MD and 5 seconds (to NB) during AM. (2 seconds taken from lpi in both periods)

Impacted by Bow-Tie Turn Restrictions

Intersection: 42nd and Seventh
Mitigation: Timing - Shift of 3 seconds in signal timing during MD
Parking - Daylighting on east side of Seventh Avenue

Intersection: 43rd and Seventh
Mitigation: Timing - Shift of 3 seconds (from WB to SB) in signal timing during AM.
Parking - Daylighting on east side Seventh Avenue

Intersection: 45th and Seventh
Mitigation: Timing - Shift of 2 to 3 seconds in signal timing during all periods.
Parking - Daylighting on north side of 45th Street.

Next Steps

To further assess the feasibility of the proposed recommendations, a preliminary design investigation will be conducted. This includes an engineering site survey to determine the physical features and infrastructure of the study area, both surface and subsurface. The preliminary design investigation explores such features topography, utilities, vaults, and the drainage system, since these factors are critical in determining the feasibility of geometric design changes.

In addition, existing curb regulations, particularly designated taxi stands and truck loading/unloading, will be explored in relation to existing and future land uses to determine their most appropriate locations. Currently, DCP is initiating meetings with DOT and the Taxi and Limousine Commission (TLC) to explore possible recommendations related to taxi stands. The results of this process will appear as supplementary text to this document.

In summary, following necessary approvals from the appropriate agencies, field tests would be conducted to evaluate the effectiveness of proposed measures such as: striping the pavement to temporarily widen the sidewalks; prohibiting turns; changing off peak signal timing; and improving street markings and signage. These would be undertaken jointly with DOT. Low-cost physical and operational improvements would be permanently implemented depending on the success of the tests.

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APPENDIX

APPENDIX

Table A
1990 US Census Journey to Work for Census Tracts in Midtown Manhattan

Census Tract	Total	Drive Alone	Car Pool	Motor cycle	Taxi	Subway	Bus	Railroad	Ferry	Bike	Walk	Other	Home
72	16683	1553	824	30	130	7158	9667	2234	70	21	1588	86	290
74	26086	2483	1427	0	493	11394	3927	4167	130	28	1732	175	130
76	14255	1382	764	2	246	6957	1943	2090	63	18	646	44	100
80	30176	2595	1347	0	486	13446	4832	5239	145	56	1703	118	209
82	38327	3424	1624	12	728	17401	6205	6623	160	148	1798	98	106
84	24514	2138	1333	0	405	11827	3782	3710	92	64	990	81	92
92	66595	5540	2560	15	1329	30406	10403	12500	399	86	2999	317	41
94	57919	5204	2526	10	1292	26740	8831	10163	549	83	2326	195	0
96	52879	4498	2872	17	941	25223	9146	8083	240	101	1602	148	8
100	44732	3918	1896	17	1106	20016	7195	6988	320	107	2888	166	115
101	20112	2049	935	0	366	9403	2282	4113	188	23	616	85	52
102	53361	4492	2389	22	1569	23889	9147	8164	265	76	3077	249	22
103	7182	749	553	0	43	3858	841	698	35	9	296	4	96
104	44545	3789	1848	18	935	20801	7580	6727	174	106	2326	182	59
109	31633	2723	1762	31	700	15983	4337	4956	102	37	794	125	83
111	7916	869	500	0	101	4065	908	826	43	85	418	15	86
112.01	15174	1478	621	0	555	6660	2557	1768	98	39	1240	49	109
112.02	24638	2476	890	18	949	10368	3981	3522	121	31	1983	191	41
112.03	10665	899	777	0	328	4876	1802	872	13	23	973	51	51
113	41051	3594	2429	9	966	19407	6876	6327	134	43	1146	97	23
115	10360	1082	702	0	198	5196	1475	1042	30	26	504	10	95
119	25914	2623	1311	0	407	12637	3789	3902	102	39	1027	55	22
121	5911	673	331	0	114	2334	593	556	20	33	953	27	277
125	28627	2435	1115	27	490	13395	4614	5032	162	57	1153	127	20
127	6915	706	306	10	219	2802	898	872	66	22	1223	24	137
131	40783	4071	1630	0	991	19416	6222	5741	163	119	2191	145	94
133	5078	766	447	0	51	1790	595	340	35	10	812	29	203
137	34563	3377	1482	17	883	16232	5376	3961	142	70	2482	104	437
139	7097	660	389	10	102	2923	892	513	30	26	1136	51	365
Total	793691	72246	37590	265	17123	366603	130696	121729	4091	1586	42622	3048	3363
% Total	100.00%	9.10%	4.74%	0.03%	2.16%	46.19%	16.47%	15.34%	0.52%	0.20%	5.37%	0.38%	0.42%
Aggregate % Total	100.00%	16.03%				78.51%				5.57%		0.81%	

Source: 1990 US Census Transportation Planning Package

Table B - Midtown Manhattan Pedestrian Accidents at Intersections

RANK	#	LOCATION	RANK	#	LOCATION
1	97	East 33rd Street and Park Avenue	21	27	West 41st Street and Ninth Avenue
2	70	West 34th Street and Eighth Avenue	27	27	East 42nd Street and Madison Avenue
	70	West 42nd Street and Eighth Avenue	27	27	West 57th Street and Sixth Avenue
4	57	West 34th Street and Sixth Avenue/Broadway	27	27	West 33rd Street and Broadway
5	43	West 42nd and Fifth Avenue	25	25	West 42nd Street and Park Avenue
	43	West 42nd Street and Ninth Avenue	25	25	West 34th Street and Lexington Avenue
7	38	West 34th Street and Seventh Avenue	27	24	West 41st Street and Eighth Avenue
8	37	West 40th Street and Eighth Avenue	24	24	West 57th Street and Broadway
	37	West 42nd Street and Sixth Avenue	24	24	West 57th Street and Eighth Avenue
	37	West 42nd Street and Seventh Avenue	30	23	East 32nd Street and Third Avenue
	37	East 42nd Street and Lexington Avenue	31	22	West 33rd Street and Seventh Avenue
12	36	West 57th Street and Ninth Avenue	22	22	West 36th Street and Eighth Avenue
13	34	West 45th Street and Seventh Avenue/Broadway	22	22	West 39th Street and Seventh Avenue
	34	East 57th Street and Lexington Avenue	22	22	West 44th Street and Ninth Avenue
15	33	East 57th Street and Third Avenue	22	22	West 51th Street and Fifth Avenue
	33	West 42nd Street and Broadway	36	21	West 34th Street and Park Avenue
17	31	East 42nd Street and Third Avenue	37	20	West 35th Street and Eighth Avenue
18	29	East 40th Street and Park Avenue	20	20	West 36th Street and Seventh Avenue
19	28	East 34th Street and Third Avenue	20	20	West 50th Street and Sixth Avenue
	28	West 53rd Street and Seventh Avenue	20	20	West 50th Street and Broadway
			20	20	West 53rd Street and Fifth Avenue

Table C - Midtown Manhattan Pedestrian Accidents at Midblocks 1989 - 1994

RANK	#	LOCATIONS	RANK	#	LOCATIONS
1	41	W 42nd St. between Eighth & Ninth avenues	11	13	W 34th St. between Eighth & Ninth avenues
2	39	W 34th St. between Seventh & Eighth avenues	12	12	E 42nd St. between Park & Lexington avenues
3	23	W 42nd St. between Fifth & Sixth avenues	12	12	W 47th St. between Fifth & Sixth avenues
4	22	W 42nd St. between Seventh & Eighth avenues	14	11	E 40th St. between Fifth & Madison
5	21	W 57th St. between Sixth & Seventh avenues	11	11	E 42nd St. between Lex & Third avenues
	21	W 33rd St. between Seventh & Eighth avenues	16	10	W 40th St. between Eighth & Ninth avenues
7	18	E 42nd St. between Fifth & Madison avenues	10	10	W 57th St. between Fifth & Sixth avenues
8	15	W 42nd St. between Sixth Avenue & Broadway	10	10	W 57th St. between Seventh Avenue & Broadway
9	14	E 34th St. between Fifth & Madison avenues			
	14	W 57th St. between Eighth & Ninth avenues			

Table D - Midtown Manhattan Pedestrian Fatalities 1989 - 1994

#	FATALITIES AT INTERSECTION	#	FATALITIES AT MID-BLOCKS
3	Third Avenue at East 31st, 41st and 52nd streets	2	Ninth Avenue between - W 29th & 30th streets; & W 44th & 45th streets
3	Seventh Avenue at West 37th, 43rd, 47th streets	2	40th Street between - Madison & Fifth avenues; & Eighth & Ninth avenues
2	Lexington Avenue at East 48th and 59th streets	1	Park Avenue between East 56th and 57th streets
2	Park Avenue at East 33rd and 49th streets	1	Madison Avenue between East 49th and 50th streets
2	Eighth Avenue at West 48th and 57th streets	1	Fifth Avenue between West 54th and 55th streets
2	Ninth Avenue at West 49th and 55th streets	1	West 36th Street between Seventh and Eighth avenues
2	Broadway at West 50th and 55th street	1	East 41st Street between Park and Lexington avenues
1	Madison Avenue at East 45th Street	1	West 47th Street between Fifth and Sixth avenues
1	Sixth Avenue at West 52nd Street	1	West 50th Street between Fifth Avenue and Rockefeller Plaza
1	Vanderbilt Avenue at East 45th Street	1	Central Pk South between Grand Army Plaza and Sixth Avenue

Source: NYC Department of Transportation, Pedestrian Accidents 1989 - 1994

Table E - Problems and Opportunities Matrix

LOCATION		PROBLEM	OPPORTUNITY
6th Avenue <i>One-way northbound</i>			
At 53 rd Street	<i>One-way westbound</i>	Gridlock situations created by westbound 53 rd St. traffic Pedestrian congestion on crowded corners	Public plaza and open landscaped spaces with seating Prominent pedestrian movement corridor Destination: 53 rd Street museums
Between 52 nd and 53 rd Streets			Excess space on sidewalks for placing maps/signage
At 52 nd Street	<i>One-way eastbound</i>	Vehicular encroachments and spillbacks Turning conflicts	Public plaza and open landscaped spaces with seating
Between 51 st and 52 nd Streets		Noncompliance of bus lane regulations	Excess space on sidewalks for placing maps/signage
At 51 st Street	<i>One-way westbound</i>	Vehicular encroachment	Midblock passage Public plaza and open landscaped spaces with seating
At 50 th Street	<i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes and conflicts vehicular congestion High accident location Vehicular encroachments and spill backs Transit node: pedestrian congestion	Public plaza and open landscaped spaces with seating Photo opportunity Destination: Radio City
At 49 th Street	<i>One-way westbound</i>	Transit node: pedestrian congestion Heavy pedestrian and vehicular congestion and conflict	Public plaza and open landscaped spaces with seating
At 48 th Street	<i>One-way eastbound</i>	Transit node: pedestrian congestion Vehicular spillbacks	Public plaza and open landscaped spaces with seating Destination: Music Row
At 47 th Street	<i>One-way westbound</i>	Transit node: pedestrian congestion on southwest corner Subway exit & 3 vendors Trucks loading in bus lane	Prominent pedestrian movement corridor Public plaza and open landscaped spaces with seating Destination: Diamond District
Between 46 th and 47 th Streets		Lacks characteristics of surrounding business district	Excess space on sidewalks for placing maps/signage
At 46 th Street	<i>One-way eastbound</i>	Pedestrian congestion at corners	Prominent pedestrian movement corridor Destination: Little Brazil
Between 45 th and 46 th Streets			Excess space on sidewalks for placing maps/signage
At 45 th Street	<i>One-way westbound</i>		Public plaza and open spaces
At 44 th Street	<i>One-way eastbound</i>	Pedestrian - vehicular conflict where Eastbound 44 th St traffic turns left onto 6 th Avenue	Destination: Clubs
Between 43 rd and 44 th Streets			Excess space on sidewalks for placing maps/signage
At 43 rd Street	<i>One-way westbound</i>	Congestion on corners (6 news boxes, 2 trashcans, 6 pay phones, 4 food vendors)	Public plaza and open landscaped spaces with seating
At 42 nd Street	<i>Two-way east-west</i>	Pedestrian and vehicular volumes and conflicts High accident location Vehicles block intersection Transit node: pedestrian congestion	Prominent pedestrian movement corridor
Between 41 st and 42 nd Street		"No standing anytime" regulations on left curb not obeyed Right side bus lane not obeyed	View corridor to be developed and photo opportunity
At 41 st Street	<i>One-way westbound</i>	Buses standing in right part of t - intersection Buses can not reach bus stop and discharge passengers within intersection	All-pedestrian phase stoplight View corridor to be developed and photo opportunity
At 40 th Street	<i>One-way eastbound</i>	Transit node: pedestrian congestion	Prominent pedestrian movement corridor

LOCATION		PROBLEM	OPPORTUNITY
7th AVENUE	<i>One-way southbound</i>		
At 53 rd Street	<i>One-way westbound</i>	High accident location Transit node: pedestrian congestion	Prominent pedestrian movement corridor
At 52 nd Street	<i>One-way eastbound</i>	Taxis and black cars standing for hotels	
At 51 st Street	<i>One-way westbound</i>	Pedestrian congestion on cluttered corners	
At 50 th Street	<i>One-way eastbound</i>	Heavy pedestrian volumes Vehicular encroachments and spill backs	
At 49 th Street	<i>One-way westbound</i>	Transit node: pedestrian congestion	
At 48 th Street	<i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes and conflicts	Prominent pedestrian movement corridor Destination: Music Row
At 47 th Street	<i>One-way westbound</i>	Heavy pedestrian and vehicular volumes and conflicts Transit node: pedestrian congestion	Prominent pedestrian movement corridor
Between 46 th and 47 th Street		Persons queuing at TKTS stand end up in roadway MTA and tour buses compete for bus stop	<u>Excess roadbed width</u> Destination: TKTS stand
At 46 th Street	<i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes and conflicts High accident location Misaligned intersection Congestion on obstructed corners	<u>View corridor and photo opportunity</u> <u>Excess roadbed width</u>
Between 45 th and 46 th Streets			Destinations: Marriott Hotel and Virgin Mega Store
At 45 th Street	<i>One-way westbound</i>	Heavy pedestrian and vehicular volumes and conflicts High accident location Misaligned intersection Pedestrian congestion on obstructed corners	Prominent pedestrian movement corridor
At Broadway	<i>One-way so. bound</i>	Misaligned intersection High accident location Illegally standing vehicles causes loss of roadway	
At 44 th Street	<i>One-way eastbound</i>	Misaligned intersection Pedestrian congestion on obstructed corners	Prominent pedestrian movement corridor
At 43 rd Street	<i>One-way westbound</i>	Misaligned intersection Vehicles standing in bus lane	<u>Excess roadbed width</u> <u>Photo opportunity</u>
At 42 nd Street	<i>Two-way east-west</i>	Heavy pedestrian and vehicular volumes High accident location Vehicles block intersection Transit node: pedestrian congestion	Prominent pedestrian movement corridor
At 41 st Street	<i>One-way westbound</i>	Heavy Pedestrian - vehicular volumes and conflicts Transit node: pedestrian congestion	
At 40 th Street	<i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes	Public plaza and open space
Between 39 th and 40 th Streets			<u>Excess space</u> on sidewalk for placing maps/signage
At 39 th Street	<i>One-way westbound</i>	High accident location	Public plaza and open space

LOCATION	PROBLEM	OPPORTUNITY
BROADWAY <i>One-way Southbound</i>		
At 53 rd Street <i>One-way westbound</i>	Transit node: pedestrian congestion	Public plaza and open space Destination: CBS / David Letterman
Between 52 nd and 53 rd Street	Pedestrian - vehicular conflict at parking garage	
At 52 nd Street <i>One-way eastbound</i>		Public plaza and open space
At 51 st Street <i>One-way westbound</i>	Pedestrian congestion on cluttered corners	Public plaza and open space
Between 50 th and 51 st Street		<u>Excess space</u> on sidewalks for placing maps/signage
At 50 th Street <i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes and conflicts High accident location Transit node: pedestrian congestion Difficult to locate downtown train entrance	Public plaza and open landscaped space with seating
At 49 th Street <i>One-way westbound</i>	Vehicular encroachments and spill backs	
At 48 th Street <i>One-way eastbound</i>		Prominent pedestrian movement corridor
Between 47 th and 48 th Street		Taxi stand and bike lane
At 47 th Street <i>One-way westbound</i>	Heavy pedestrian and vehicular volumes and conflicts Pedestrian congestion on obstructed corners	Prominent pedestrian movement corridor
Between 46 th and 47 th Street	MTA and tour buses compete for bus stop Persons queuing at TKTS booth end up in roadway	<u>Destination: TKTS</u>
At 46 th Street <i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes and conflicts Misaligned intersection Pedestrian congestion on obstructed corners	<u>Excess roadbed width</u> Photo opportunity
Between 45 th and 46 th Streets		Destinations: Marriott Hotel and Virgin Mega Store
At 45 th Street <i>One-way westbound</i>	Heavy pedestrian and vehicular volumes and conflicts Misaligned intersection	Prominent pedestrian movement corridor
At 7 th Avenue <i>One-way southbound</i>	See 7 th Avenue problems and opportunities	
At 44 th Street <i>One-way eastbound</i>	Misaligned intersection	<u>Excess roadbed width</u>
At 43 rd Street <i>One-way westbound</i>	Misaligned intersection	<u>Excess roadbed width</u> Photo opportunity
Between 42 nd and 43 rd Streets		<u>4 Times Square Building's excess space</u> on sidewalk and placing maps/signage
At 42 nd Street <i>Two-way east-west</i>	Heavy pedestrian volumes High accident location Vehicular encroachment and spill back	Prominent pedestrian movement corridor
At 41 st Street <i>One-way westbound</i>	Pedestrian - vehicular conflicts	
At 40 th Street <i>One-way eastbound</i>	Transit node: pedestrian congestion	Public plaza and open landscaped space with seating
Between 39 th and 40 th Streets		<u>Excess space</u> on sidewalk for landscaping and placing maps/signage

LOCATION	PROBLEM	OPPORTUNITY
8th AVENUE <i>One-way northbound</i>		
At 53 rd Street <i>One-way westbound</i>	Heavy pedestrian and vehicular volumes Store protrudes at southwest corner	
At 52 nd Street <i>One-way eastbound</i>		
At 51 st Street <i>One-way westbound</i>	Transit node: pedestrian congestion Vehicular traffic moves at high velocity	
At 50 th Street <i>One-way eastbound</i>	Pedestrian volumes and conflicts Transit node: pedestrian congestion M27 bus right turn onto 50 th from 8th	
Between 49 th and 50 th Street		Public plaza and open landscaped areas with seating <u>Space for maps/signage</u>
At 49 th Street <i>One-way westbound</i>	Transit node: pedestrian congestion	
Between 48 th and 49 th Street	Hotel loading zone conflicts with designated bus lane	
At 48 th Street <i>One-way eastbound</i>	Phone booths on every corner Store on northwest corner protrudes into sidewalk space	
At 47 th Street <i>One-way westbound</i>	Pedestrian - vehicular conflicts	
Between 46 th and 47 th Street	Pedestrian - vehicular conflict at parking lot entrance	
At 46 th Street <i>One-way eastbound</i>	Heavy pedestrian volumes High accident location	<u>Neckdown</u> , Prominent pedestrian movement corridor Destination: Restaurant Row
At 45 th Street <i>One-way westbound</i>	Heavy pedestrian volumes	Prominent pedestrian movement corridor Destination: theaters
Between 44 th and 45 th Street	Hotel loading zone conflicts with designated bus lane	
At 44 th Street <i>One-way eastbound</i>	Heavy pedestrian and vehicular volumes Transit node: pedestrian congestion Retail display obstructs southeast corner	Prominent pedestrian movement corridor
Between 43 rd and 44 th Streets	Frequent midblock crossings (esp. Pm rush)	Prominent pedestrian movement
At 43 rd Street <i>One-way westbound</i>	Pedestrian congestion on corners	Ventilation shafts on corners
At 42 nd Street <i>Two-way east-west</i>	Pedestrian and vehicular volumes and conflicts High accident location (70 injured = highest in study area) Transit node: pedestrian congestion	Prominent pedestrian movement corridor Destination: Port Authority
Between 41 st and 42 nd Streets		<u>Excess space</u> on west sidewalk for signage/maps
At 41 st Street <i>One-way westbound</i>	Heavy pedestrian and vehicular volumes and conflicts High accident location Pedestrian congestion on obstructed corners Vehicles block intersection (spillbacks)	Prominent pedestrian movement corridor Destination: Port Authority
Between 40 th and 41 st Streets		<u>Excess space</u> on west sidewalk for signage/maps
At 40 th Street <i>One-way eastbound</i>	Heavy pedestrian and vehiculars volumes High accident location Transit node: pedestrian congestion	Prominent pedestrian movement corridor Destination: Port Authority

LOCATION	PROBLEM	OPPORTUNITY
53rd Street <i>One-way westbound</i>		
Between 6 th and 7 th Avenues	Pedestrian - Vehicular conflicts at loading dock Turning conflicts at hotel, garage, and loading dock Illegal standing reduces roadway to one lane	<u>Midblock passage</u> Prominent pedestrian movement corridor
Between 7 th Avenue and Broadway	Transit node (midblock exits)	Open landscaped space with seating
Between Broadway and 8 th Avenue	Illegal standing reduces roadway capacity to one lane Northside sidewalk blocked by theater equipment	<u>Excess roadbed width</u> (4ft wider than in other blocks)
52nd Street <i>One-way eastbound</i>		
Between 6 th and 7 th Avenue	Frequent midblock pedestrian crossings Conflicts at loading docks	<u>Midblock passage</u> <u>Excess space</u> on sidewalks for maps, signage
Between 7 th Avenue and Broadway	Pedestrian-vehicular conflicts at curb cuts Turning conflicts at loading docks	
Between Broadway and 8 th Avenue	Heavy vehicular congestion Lack identity of surrounding streets	Public plaza and open space
51st Street <i>One-way westbound</i>		
Between 6 th and 7 th Avenue	Pedestrian - vehicular conflicts at loading docks Illegal standing and parking reduces roadway to one lane Turning conflicts at loading docks	<u>Midblock passage</u> <u>Excess space</u> on sidewalks for maps, signage
Between Broadway and 8 th Avenue	Pedestrian - vehicular conflicts at loading docks Lacks identity of surrounding streets	<u>Excess space</u> on sidewalks for maps, signage
50th Street <i>One-way eastbound</i>		
Between 6 th and 7 th Avenues	Midblock pedestrian crossings Noncompliance of transit corridor regulations	<u>Midblock passage</u> <u>Excess space</u> on sidewalks for maps, signage
Between Broadway and 8 th Avenue	Heavy vehicular volumes Noncompliance of transit corridor regulations Turning conflicts at loading bays	<u>Excess space</u> on sidewalks for maps, signage
49th Street <i>One-way westbound</i>		
Between 6 th and 7 th Avenues	Frequent midblock crossings Noncompliance of transit corridor regulations	<u>Midblock passage</u>
Between 7 th Avenue and Broadway	Heavy congestion creates vehicular spillbacks Noncompliance of transit corridor regulations	
Between Broadway and 8 th Avenue	Noncompliance of transit corridor regulations	
48th Street <i>One-way eastbound</i>		
Between 6 th and 7 th Avenues	Turning conflicts with parking facility and at loading docks	<u>Midblock passage</u> Inconsistent roadbed width Destination: Music Row
Between 7 th Avenue and Broadway	Heavy congestion creates vehicular spillbacks	
Between Broadway and 8 th Avenue	Frequent midblock crossings Turning conflicts with parking facility Heavy vehicular congestion (esp. Pre-theater)	Public plaza and open landscaped space with seating <u>Midblock passage</u>
47th Street <i>One-way westbound</i>		
Between 6 th and 7 th Avenues	Heavy vehicular congestion created by turning movements at intersections	Prominent pedestrian movement corridor
Between Broadway and 8 th Avenue		<u>Midblock passage</u>

LOCATION	PROBLEM	OPPORTUNITY
46th Street <i>One-way eastbound</i>		
Between 6 th and 7 th Avenues	Illegal parking and standing Turn conflicts at loading docks	<u>Midblock passage</u>
Between Broadway and 8 th Avenue	Illegal parking and standing reduces roadway to one lane	Prominent pedestrian movement corridor
45th Street <i>One-way westbound</i>		
Between 6 th Avenue and Broadway	Double parking reduces 45 th street to one lane Pedestrian - vehicular conflicts at loading docks	
Between Broadway and 8 th Avenue	Frequent midblock crossings (esp. PM rush)	<u>Midblock passage</u> Prominent pedestrian movement corridor
44th Street <i>One-way eastbound</i>		
Between 6 th Avenue and Broadway	Turning conflicts with parking garage Double parking on north curb and illegal standing on south curb reduces level of service	
Between 7 th and 8 th Avenues	Frequent midblock crossings (esp. PM rush) Curb cuts with major activities	Prominent pedestrian movement corridor
43rd Street <i>One-way westbound</i>		
Between 6 th Avenue and Broadway	Pedestrian - vehicular conflicts with garages Merchant protruding far into southside sidewalk Illegal standing reduces 43 rd street to one lane	
Between 7 th and 8 th Avenues	Curb cuts with major activity (6 along north curb) Trucks loading at theaters	
42nd Street <i>Two-way east-west</i>		
Between 6 th Avenue and Broadway	Frequent midblock crossings, dangerous conditions Illegal parking and standing blocks bus lane	<u>Midblock passage</u> Prominent pedestrian movement corridor
Between 7 th and 8 th Avenues	Frequent midblock crossings, dangerous conditions Illegal parking and standing blocks bus lanes	Prominent pedestrian movement corridor
Between 8 th and 9 th Avenues	Frequent midblock crossings, dangerous conditions Taxi pick ups at PABT; Illegal parking and standing	Prominent pedestrian movement corridor
At 9 th Avenue <i>One-way so. bound</i>	Heavy vehicular volumes High accident location	Prominent pedestrian movement corridor
41st Street <i>One-way westbound</i>		
Between 6 th Avenue and Broadway	Pedestrian conflicts with driveways and loading docks	<u>Midblock passage</u>
Between 7 th and 8 th Avenues	Pedestrian conflicts with driveways Heavy vehicular volumes (pm rush)	Prominent pedestrian movement corridor (PM rush)
Between 8 th and 9 th Avenues	Dark tunnel underneath PABT Driver confusion	
At 9 th Avenue <i>One-way so. bound</i>	High accident location Misaligned intersection	<u>Excess roadbed, curb line changes in DCP West Midtown Transit Study</u>
40th Street <i>One-way eastbound</i>		
Between 6 th Avenue and Broadway	Pedestrian - vehicular conflicts with garages Vendors block sidewalk	
Between Broadway and 7 th Avenue	Curb cuts with major activity	<u>Excess space on sidewalk for maps/signage</u>
Between 7 th and 8 th Avenues	Curb cuts with major activity Difficult to locate subway entrance	Prominent pedestrian movement corridor
Between 8 th and 9 th Avenues	High accident location: mid-block crossings	

Midtown Manhattan Pedestrian Project			Key: Lane group or Peak Hour not Analyzed in HCS												
Table F: HCS Summary for Peak Hours			EXISTING			NO BUILD			FUTURE (Revised)			FUTURE (Mitigated)			
Signalized Intersection	Dir/Lane Grp	Peak Period	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	
40th St & Bway	EB / TR	AM	0.726	19.20	C	0.771	20.5	C	1.048	56.0	E	0.822	20.2	C	
		MD	0.577	16.60	C	0.646	17.6	C	0.841	23.1	C				
		PM	0.620	17.20	C	0.732	19.3	C	0.925	29.2	D				
	SB / LT	AM	0.462	10.00	B	0.477	10.1	B	0.477	10.1	B	0.509	11.6	B	
		MD	0.443	9.80	B	0.464	10.0	B	0.464	10.0	B				
		PM	0.447	9.90	B	0.472	10.0	B	0.472	10.0	B				
40th St & 7th Av	EB / TR	AM	0.683	16.90	C	0.716	17.5	C	0.969	33.9	D	0.900	23.7	C	
		MD	0.540	14.80	B	0.587	15.4	C	0.767	18.8	C				
		PM	0.380	13.20	B	0.451	13.9	B	0.630	15.9	C				
	SB / LT	AM	0.804	15.60	C	0.841	16.6	C	0.841	16.6	C	0.902	20.4	C	
		MD	0.654	13.10	B	0.703	13.8	B	0.703	13.8	B				
		PM	0.750	14.50	B	0.791	15.3	C	0.791	15.3	C				
40th St & 8th Av	EB / L	AM										0.457	15.5	C	
													0.609	17.7	C
													0.493	15.9	C
	EB / LT	AM	0.936	33.50	D	0.983	41.4	E	1.467	386.8	F	0.904	26.8	D	
		MD	0.801	23.20	C	0.896	28.9	D	1.231	157.1	F	0.639	17.4	C	
		PM	0.558	17.80	C	0.704	20.2	C	0.994	43.1	E	0.517	15.8	C	
	NB / TR	AM	0.562	9.60	B	0.582	9.7	B	0.562	9.7	B	0.619	11.3	B	
		MD	0.538	9.40	B	0.567	9.6	B	0.567	9.6	B	0.602	11.2	B	
		PM	0.438	8.60	B	0.460	8.7	B	0.460	8.7	B	0.489	10.2	B	
41st St & Bway	WB / LT	AM	0.650	20.00	C	0.677	20.6	C	0.677	20.6	C				
		MD	0.534	17.80	C	0.573	18.4	C	0.573	18.4	C				
		PM	0.618	19.20	C	0.646	19.8	C	0.646	19.8	C				
	SB / TR	AM	0.625	10.40	B	0.488	9.0	B	0.669	11.0	B				
		MD	0.415	8.50	B	0.629	10.4	B	0.629	10.4	B				
		PM	0.607	10.20	B	0.656	10.8	B	0.656	10.8	B				
41st St & 7th Av	WB / LT	AM	0.526	17.70	C	0.548	18.0	C	0.548	18.0	C	0.548	18.0	C	
		MD	0.396	16.30	C	0.428	16.6	C	0.428	16.6	C	0.365	16.0	C	
		PM	0.514	17.50	C	0.573	18.3	C	0.573	18.3	C	0.573	18.3	C	
	SB / T	AM										0.932	19.3	C	
		MD										0.761	12.4	B	
		PM										0.88	15.9	C	
	SB / TR	AM	0.941	19.50	C	0.984	25.4	D	1.358	261.5	F	0.485	9.3	C	
		MD	0.741	11.90	B	0.794	12.9	B	1.096	65.2	F	0.38	8.4	B	
		PM	0.808	13.20	B	0.877	15.4	C	1.210	132.5	F	0.359	8.2	B	
41st St & 8th Av	WB / TR	AM	0.624	18.90	C	0.688	20.1	C	0.688	20.1	C				
		MD	0.549	17.80	C	0.692	20.2	C	0.692	20.2	C				
		PM	0.564	18.00	C	0.708	20.5	C	0.708	20.5	C				
	NB / LT	AM	0.598	9.90	B	0.623	10.2	B	0.658	10.5	B				
		MD	0.568	9.60	B	0.608	10.0	B	0.631	10.2	B				
		PM	0.458	8.70	B	0.493	9.0	B	0.508	9.1	B				
42nd St & Bway	EB / TR	AM	0.325	13.70	B	0.347	13.9	B	0.155	12.7	B				
		MD	0.317	13.70	B	0.366	14.0	B	0.342	13.9	B				
		PM	0.279	13.40	B	0.324	13.7	B	0.224	13.1	B				
	WB / DFL	AM	0.668	21.70	C	0.774	28.8	D	0.455	15.3	C				
		WB / T	0.284	13.50	B	0.328	13.8	B	0.328	13.8	B				
		WB / LT	MD	0.478	15.00	B	0.594	13.6	C	0.581	16.1	C			
	SB / LTR	AM	0.451	10.30	B	0.473	10.5	B	0.597	11.7	B				
		MD	0.449	10.30	B	0.483	10.5	B	0.558	11.3	B				
		PM	0.421	10.10	B	0.459	10.4	B	0.576	11.5	B				
42nd St & 7th Av No Build Dot restriped lanes Ex 5, No Bld 4	EB / TR	AM	0.495	15.20	C	0.592	16.3	C	0.569	17.1	C	0.569	17.1	C	
		MD	0.447	14.70	B	0.617	16.6	C	0.478	15.1	C	0.478	15.1	C	
		PM	0.419	14.50	B	0.549	15.7	C	0.509	15.6	C	0.523	16.2	C	
	WB / LT	AM	0.261	13.30	B	0.305	13.6	B	0.288	13.5	B	0.288	13.5	B	
		MD	0.358	14.00	B	0.443	14.6	B	0.435	14.6	B	0.435	14.6	B	
		PM	0.404	14.30	B	0.462	14.8	B	0.496	15.2	C	0.510	15.8	C	
	SB / LTR	AM	0.874	16.90	C	0.937	20.7	C	1.439	351.0	F	0.965	23.5	C	
		MD	0.762	14.00	B	0.825	15.4	C	1.289	195.7	F	0.864	16.6	C	
		PM	0.855	16.20	C	0.896	17.9	C	1.543	492.9	F	1.013	32.4	D	
42nd St & 8th Av	EB / LT	AM	0.427	10.20	B	0.472	10.5	B	0.161	10.5	B	0.173	11.9	B	
		MD	0.492	10.70	B	0.608	11.9	B	0.404	12.1	B	0.414	12.6	B	
		PM	0.317	9.40	B	0.398	9.9	B	0.207	10.8	B				
	WB / TR	AM	0.335	18.70	C	0.403	19.2	C	0.511	19.3	C	0.570	21.5	C	
		MD	0.575	20.80	C	0.718	23.0	C	0.822	25.4	D	0.851	27.4	D	
		PM	0.589	21.00	C	0.680	22.2	C	0.765	23.3	C				
	NB / LTR	AM	0.828	19.50	C	0.867	20.6	C	1.052	49.7	E	0.917	22.1	C	
		MD	0.771	18.30	C	0.843	19.9	C	0.998	34.5	D	0.917	23.0	C	
		PM	0.665	16.70	C	0.734	17.7	C	0.853	21.6	C				

Midtown Manhattan Pedestrian Project			Key:												
Table F: HCS Summary for Peak Hours			Lane group or Peak Hour not Analyzed in HCS												
Signalized Intersection	Dir/Lane Grp	Peak Period	EXISTING			NO BUILD			FUTURE (Revised)			FUTURE (Mitigated)			
			v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	
42nd St & Dyer	EB / T	AM	0.350	14.40	B	0.397	14.7	B	0.397	14.7	B				
		MD	0.308	14.10	B	0.379	14.6	B	0.379	14.6	B				
		PM	0.264	13.80	B	0.313	14.1	B	0.313	14.1	B				
	WB / T	AM	0.133	13.00	B	0.146	13.1	B	0.147	13.1	B				
		MD	0.258	13.80	B	0.298	14.0	B	0.298	14.0	B				
		PM	0.316	14.10	B	0.362	14.5	B	0.362	14.5	B				
	NB / L	AM	0.410	9.60	B	0.418	9.7	B	0.261	8.7	B				
		MD	0.270	8.70	B	0.275	8.8	B	0.173	8.2	B				
		PM	0.236	8.50	B	0.241	8.6	B	0.153	8.1	B				
	NB / R	AM	0.424	9.80	B	0.456	10.0	B							
		MD	0.265	8.70	B	0.304	8.9	B							
		PM	0.253	8.60	B	0.281	8.8	B							
42nd St & 10th Av	EB / LT	AM	0.383	14.20	B	0.430	14.6	B	0.454	14.8	B	0.345	12.5	B	
		MD	0.256	13.30	B	0.323	13.7	B	0.333	13.8	B	0.261	12.0	B	
		PM	0.921	62.90	F	1.151	163.9	F	1.275	264.0	F	EB / LT			
	EB / T	AM	0.156	12.70	B	0.198	12.9	B	0.198	12.9	B	0.288	12.1	B	
		MD	0.528	15.40	C	0.549	15.6	C	0.667	17.1	C	0.822	24.9	C	
		PM	0.566	15.80	C	0.610	16.3	C	0.693	17.5	C	0.826	24.6	C	
	WB / TR	AM	0.577	15.90	C	0.629	16.6	C	0.703	17.7	C	0.838	25.0	C	
		MD	0.727	13.20	B	0.750	13.6	B	0.750	13.6	B	0.801	15.9	C	
		PM	0.772	14.00	B	0.801	14.6	B	0.801	14.6	B	0.856	17.4	C	
	NB / LTR	AM	0.820	15.00	B	0.845	15.6	C	0.845	15.6	C	0.903	19.2	C	
		MD	0.371	14.10	B	0.408	14.4	B	0.408	14.4	B				
		PM	0.402	14.40	B	0.474	15.0	B	0.474	15.0	B				
43rd St & Bway	WB / LT	AM	0.352	14.00	B	0.457	14.8	B	0.457	14.8	B				
		MD	0.602	11.80	B	0.628	12.1	B	0.544	11.1	B				
		PM	0.605	11.80	B	0.644	12.3	B	0.569	11.4	B				
43rd St & 7th Av	WB / LT	AM	0.576	11.50	B	0.619	12.0	B	0.532	11.0	B				
		MD	0.367	14.10	B	0.411	14.5	B	0.411	14.5	B	0.448	16.2	C	
		PM	0.397	14.30	B	0.484	15.2	C	0.484	15.2	C				
44th St & Bway No Build Dot restriped lanes Ex 2, No Bld 3	SB / T	AM	0.348	13.90	B	0.467	15.0	B	0.467	15.0	B				
		MD	0.710	12.90	B	0.767	13.8	B	1.057	47.6	F	0.994	27.0	D	
		PM	0.636	12.00	B	0.717	13.0	B	0.983	26.8	D				
44th St & 7th Av	EB / TR	AM	0.654	12.20	B	0.723	13.1	B	0.999	29.4	D				
		MD	0.613	16.90	C	0.691	18.4	C	0.398	14.3	B				
		PM	0.515	15.50	C	0.646	17.4	C	0.411	14.4	B				
	EB / R	AM	0.548	15.80	C	0.722	18.9	C	0.454	14.8	B				
		MD	0.971	29.70	D	0.704	13.2	B	0.704	13.2	B				
		PM	1.025	42.00	E	0.744	13.9	B	0.744	13.9	B				
45th St & Bway	SB / LT	AM	1.032	44.40	E	0.746	14.0	B	0.746	14.0	B				
		MD	0.763	20.20	C	0.863	25.0	C	1.285	191.4	F	0.827	23.4	C	
		PM	0.740	19.40	C	0.887	26.7	D	1.165	115.2	F	0.782	20.8	C	
	EB / R	AM	0.836	23.00	C	0.971	36.7	D	1.288	202.6	F	0.545	15.7	C	
		MD										0.87	32.4	D	
		PM										0.864	31.2	D	
45th St & 7th Av	SB / T	AM	0.792	14.40	B	0.837	15.5	C	0.837	15.5	C	0.875	17.7	C	
		MD	0.680	12.60	B	0.738	13.4	B	0.738	13.4	B	0.771	14.9	B	
		PM	0.726	13.20	B	0.777	14.1	B	0.777	14.1	B	0.777	14.1	B	
	WB / LT	AM	0.763	20.50	C	0.771	20.7	C	0.387	14.2	B				
		MD	0.555	15.90	C	0.777	21.1	C	0.393	14.3	B				
		PM	0.710	18.80	C	0.728	19.2	C	0.375	14.1	B				
46st St & 7th Av	EB / TR	AM	0.881	18.20	C	0.905	19.7	C	0.803	15.3	C				
		MD	0.918	21.00	C	0.945	23.6	C	0.783	15.0	B				
		PM	0.769	14.40	B	0.792	14.9	B	0.694	13.0	B				
45th St & 7th Av	WB / L	AM										0.739	21.9	C	
		MD										0.777	24.2	C	
		PM										0.709	20.5	C	
	WB / LT	AM	0.844	23.40	C	0.897	27.4	D	1.334	244.8	F	0.564	15.9	C	
		MD	0.856	24.30	C	0.945	33.5	D	1.386	297.5	F	0.581	16.2	C	
		PM	0.784	20.60	C	0.866	24.6	C	1.266	185.1	F	0.532	15.5	C	
	SB / T	AM	0.765	14.40	B	0.810	15.2	C	0.907	19.0	C	0.907	19.0	C	
		MD	0.714	13.20	B	0.771	14.2	B	0.928	20.5	C	0.928	20.5	C	
		PM	0.771	14.20	B	0.817	15.3	C	0.913	19.2	C	0.913	19.2	C	
46st St & 7th Av	EB / R	AM	0.697	18.10	C	0.715	18.50	C	0.907	27.8	D				
		MD	0.675	17.80	C	0.698	18.20	C	1.036	54.9	E	0.846	25.8	D	
		PM	0.451	14.80	B	0.475	15.00	B	0.592	16.4	C				
	SB / LT	AM											0.692	20.3	C
		MD													
		PM	0.715	13.10	B	0.756	13.80	B	0.796	14.6	B				
46st St & 7th Av	EB / R mitigation	AM	0.708	13.00	B	0.755	13.80	B	0.688	12.8	B	0.688	12.8	B	
		MD	0.716	13.10	B	0.750	13.70	B	0.801	14.7	B				
		PM													

Midtown Manhattan Pedestrian Project			Key:											
Table F: HCS Summary for Peak Hours			Lane group or Peak Hour not Analyzed in HCS											
Signalized Intersection	Dir/Lane Grp	Peak Period	EXISTING			NO BUILD			FUTURE (Revised)			FUTURE (Mitigated)		
			v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS	v/c Ratio	Lane Grp Delay	Lane Grp LOS
46th St & Bway	EB / TR	AM	0.894	26.70	D	0.916	28.9	D	0.723	18.6	C			
		MD	0.936	32.20	D	0.960	35.9	D	0.644	17.1	C			
		PM	0.582	16.30	C	0.602	16.5	C	0.482	15.1	C			
	SB / T	AM	0.579	11.40	B	0.596	11.6	B	0.759	14.2	B			
		MD	0.548	11.10	B	0.566	11.3	B	0.673	12.7	B			
		PM	0.532	11.00	B	0.548	11.1	B	0.674	12.7	B			
47th St & 7th Av	WB / L	AM	0.991	56.80	E	1.020	65.0	F	1.379	304.2	F	0.752	23.8	C
		MD	0.305	13.70	B	0.323	13.8	B	0.713	20.2	C			
		PM	0.379	14.30	B	0.397	14.5	B	0.726	20.9	C			
	WB / T	AM	0.615	17.60	C	0.625	17.9	C	0.625	17.9	C	0.691	18.5	C
		MD	0.736	21.00	C	0.753	21.6	C	0.753	21.6	C			
		PM	0.575	16.70	C	0.589	17.0	C	0.589	17.0	C			
	SB / TR (SB / T for build)	AM	0.587	11.50	B	0.618	11.8	B	0.562	11.2	B	0.562	11.2	B
		MD	0.625	11.90	B	0.662	12.3	B	0.595	11.6	B			
		PM	0.544	11.00	B	0.572	11.3	B	0.625	11.9	B			
	SB / R	AM							0.362	9.8	B	0.371	9.9	B
		MD							0.507	11.3	B			
		PM							0.163	8.5	B			
47th St & Bway	WB / LT	AM	0.645	17.30	C	0.658	17.6	C	0.412	14.4	B			
		MD	0.804	21.80	C	0.821	22.6	C	0.416	14.5	B			
		PM	0.538	15.80	C	0.553	16.0	B	0.223	13.1	B			
	SB / TR (SB / T for build)	AM	0.687	12.80	B	0.704	13.0	B	0.693	12.9	B			
		MD	0.543	11.10	B	0.560	11.2	B	0.587	11.6	B			
		PM	0.598	11.60	B	0.614	11.8	B	0.604	11.8	B			
SB / R	AM							0.387	10.0	B				
	MD							0.240	9.0	B				
	PM							0.339	9.6	B				
48th St & 7th Av	EB / TR	AM	0.620	16.50	C	0.639	16.8	C	0.639	16.8	C			
		MD	0.540	15.60	C	0.557	15.8	C	0.557	15.8	C			
		PM	0.476	14.90	B	0.498	15.1	C	0.498	15.1	C			
	SB / LT	AM	0.771	14.20	B	0.811	15.1	C	0.811	15.1	C			
		MD	0.820	15.40	C	0.868	17.0	C	0.868	17.0	C			
		PM	0.739	13.50	B	0.776	14.2	B	0.776	14.2	B			
48th St & Bway	EB / TR	AM	0.832	23.40	C	0.859	25.1	D	0.859	25.1	D			
		MD	0.659	17.50	C	0.679	18.0	C	0.679	18.0	C			
		PM	0.710	18.70	C	0.738	19.4	C	0.738	19.4	C			
	SB / LT	AM	0.832	15.90	C	0.859	16.8	C	0.859	16.8	C			
		MD	0.646	12.20	B	0.667	12.5	B	0.667	12.5	B			
		PM	0.634	12.10	B	0.653	12.3	B	0.653	12.3	B			
49th St & Bway	WB / LT	AM	0.590	16.30	C	0.604	16.5	C	0.604	16.5	C			
		MD	0.346	13.90	B	0.514	15.4	C	0.514	15.4	C			
		PM	0.446	14.70	B	0.456	14.8	B	0.456	14.8	B			
	SB / TR	AM	0.673	12.50	B	0.691	12.8	B	0.691	12.8	C			
		MD	0.532	11.00	B	0.549	11.1	B	0.549	11.1	B			
		PM	0.598	11.60	B	0.615	11.8	B	0.615	11.8	B			

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