vision42

Initiative for an auto-free light rail boulevard on 42nd Street by the institute for Rational Urban Mobility, Inc. (IRUM)



Traffic Study March 31st, 2005

Sam Schwartz PLLC

In association with

Urbanomics of New York and Hallcrow LLC vision42 an auto-free light rail boulevard for 42nd Street

Traffic Study

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The **vision42** proposal is a citizens' initiative sponsored by the Institute for Rational Urban Mobility, Inc. (IRUM), a New York City-based not-for-profit corporation concerned with advancing cost-effective transport investments that improve the livability of dense urban places.

This study, one of three technical studies that address key concerns about the feasibility of the **vision42** proposal, was made possible through a generous grant from the New York Community Trust/Community Funds, Inc., John Todd McDowell Environmental Fund.

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Executive Summary

The 42nd Street corridor has been a major pedestrian, tourist and vehicular attraction since the turn of the century in New York City. In the days of the streetcar, trolley service was provided on 42nd Street. Now, as streetcars have metamorphosed into modern, light rail, incorporating low-floor, handicapped accessible boarding and automated fare collection, 42nd Street can return to its roots by providing high-quality street level transit.

An EIS was completed in 1994 for providing light rail service on 42nd Street and converting the corridor to a one-way westbound street. This study examines the effects of closing the entire street to vehicles and providing a corridor that the light rail system will share with pedestrians only. In order to determine the impacts of this closure, traffic volumes were gathered from existing sources, including EIS's of major projects along the corridor. Manual traffic counts were also required. Extensive field surveys were conducted to determine existing conditions in the area, as well as building access and loading operations. These conditions were analyzed and recommendations were proposed to maintain access and to provide loading zones where appropriate.

Background growth generated by developments planned in the study area were added to the existing traffic volumes to determine No Build Volumes. These volumes were analyzed to determine their impact on the street and intersection network.

These 2010 No Build Volumes were then rerouted in the study area to account for the closure of 42nd Street. Rerouting was based on census data and available capacity. Mode shift and taxi shrinkage were determined and applied to the rerouted volumes. Based on future volume to capacity ratios, mitigation was proposed for the effected roadways.

With these mitigation measures in place, the Sam Schwartz Company concludes that closing 42nd Street to motor vehicles is feasible, with very positive results for both pedestrians and surface transit.

Existing Conditions

Vision 42 Study Area Network

The study area roadway network includes 37th Street to 47th Street from Route 9A (12th Avenue) to 1st Avenue. This area includes over 200 signalized intersections, of which 61 intersections are included for analysis. These intersections are shown in Figure 1. These intersections were chosen because they were the study area intersections previously analyzed in the 1994 42nd Street Light Rail Project and would provide a basis for comparison. The primary corridor of analyses and study is the 42nd Street corridor from River to River. This corridor includes the following signalized intersections from west to east:

- Route 9A (12th Avenue)
- 11th Avenue
- 10th Avenue
- Dyer Avenue
- 9th Avenue
- 8th Avenue
- 7th Avenue
- Broadway
- 6th Avenue (Avenue of the Americas)
- 5th Avenue
- Madison Avenue
- Vanderbilt Avenue
- Park Avenue
- Lexington Avenue
- 3rd Avenue
- 2nd Avenue
- 1st Avenue

Static data collection was conducted for the entire study area and specifically for the study area intersections. Information regarding roadway width, lane usage, bus stop locations, parking regulations, traffic control and prohibited turns was collected at each study area intersection.

FIGURE 1: STUDY AREA INTERSECTIONS





42nd Street provides an approximately 60 foot wide cross section with three lanes in each direction. The curb lanes on both the north and south sides are used as exclusive bus lanes during the peak hours, and are used for loading and unloading during off peak hours. The bus lane is also used as exclusive right-turning lanes at intersections in the corridor. In order to decrease pedestrian/vehicle conflicts and improve progression through the corridor, left and or right-turns are prohibited during the peak periods at several Avenues in the corridor. Parking is generally permitted on 42nd Street only for truck loading and unloading controlled by muni-meters. Towards the western end of 42nd Street parking is permitted for police vehicles to accommodate the Police Station. At the eastern end of 42nd Street approximation of 42nd Street are shown in Figure 2.

Traffic Changes Since 1994

<u>Thru Streets Program</u>

To facilitate easier cross-town movements from river to river between the hours of 10am and 6pm, the NYCDOT introduced the "THRU" Street program in 2002. This program increases progression by prohibiting turns, increasing parking restriction enforcement and facilitating deliveries on non-THRU streets. Thru Streets in the study area include 37th, 45th and 46th Streets.

Electronic Toll Collection

The EZ Pass program has been introduced at toll plazas in the tri-state area. The program allows vehicles to prepay tolls and allows for faster toll processing. EZ Pass lanes at the Lincoln and Midtown tunnels have increased the volume of vehicles entering the study area from these tunnels during the peak hour.

Neighborhood Character

There have been many changes to the character of the study area that have contributed to shifts in traffic flow, heavy vehicle volumes and traffic volumes. Rezoning of the study area caused many industrial uses to close or relocate. The garment district was full of factories producing clothing and the trucks that delivered them. Traffic gridlock and congestion resulting from the industrial activity has now eased and the new garment district is undergoing a rebirth as a trendy residential area. The New York Times printing plant closed and moved.

west side



east side



FIGURE 2: **42 STREET PARKING REGULATIONS**







Today, 42nd Street and Times Square have dramatically changed to provide more office and residential uses. In addition, what was already a tourist area has grown into an even greater attraction. The area was also the home of many "adult" facilities that attracted an unsavory crowd, giving the area an unsafe reputation. Today the area is attractive to tourists of all ages and no longer has the stigma of being dangerous. This has greatly increased pedestrian volumes, not just during the weekday peak hours, but during weeknight and weekend hours.

Existing Traffic Counts

In order to determine existing baseline 2003 traffic volumes in the study area, SSC utilized traffic counts from different sources. These sources included previously conducted traffic counts included in existing Environmental Impact Statements (EIS) conducted in the area. Primarily, the EIS's reviewed included the following:

- Hudson Yards Far West Midtown EIS
- ConEd East Side Development EIS
- One Bryant Park EIS

The study area and study area intersections for this study are the same as the original study conducted for the 42nd Street Light Rail Transit Line in 1994. Where possible, traffic volumes from the 1994 EIS were updated based on new counts contained in the three EISs reviewed. In other cases a growth factor was applied to the 1994 EIS volumes based on traffic growth trends in the area and then balanced with traffic counts from the EISs. In addition, traffic counts were conducted at intersections where no updated count information was available and/or no adjacent data was available to adequately project new traffic volumes. The traffic network was then balanced between adjacent intersections and the 2003 existing baseline was established. Figure 3, Figure 4, Figure 5 and Figure 6 present the balanced traffic network during the morning and evening peak hours.

FIGURE 3: MORNING PEAK HOUR **EXISTING TRAFFIC VOLUMES**









MORNING PEAK HOUR EXISTING TRAFFIC VOLUMES





FIGURE 5: EVENING PEAK HOUR EXISTING TRAFFIC VOLUMES









EVENING PEAK HOUR EXISTING TRAFFIC VOLUMES





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Existing Traffic Conditions

<u>42nd Street</u>

Based on a review of the traffic counts, several trends were noticed along 42nd Street. First the predominant direction of travel during the AM peak hour is eastbound and is westbound during the PM peak hour. Curbside lanes are typically unusable by moving automobiles on 42nd Street, either because of bus usage or curbside loading. This activity reduces the capacity of the corridor.

Previous studies indicate that 42nd Street is not used as a "cross-town" street, but is predominantly used for local travel. This trend is personified by the high taxi usage of the corridor, both for people arriving and leaving the Times Square area. SSC conducted taxi surveys at three locations on 42nd Street during the AM, midday and PM peak hours. The survey included counting occupied and unoccupied taxis along the corridor. The percentage of taxis on 42nd Street can be as high as 40 percent during a peak period and accounts for an average of approximately 25 percent at all locations and during all peak time periods. Taxi occupancy can be as high as over 90 percent during the peak periods in the Times Square area.

Existing Traffic Operations

In order to determine existing traffic operations and levels of service (LOS) in the study area, Synchro/SimTraffic software was used to model existing conditions. Synchro is the input and analysis portion of the software, which determines delay, LOS and volume to capacity ratios according to the Highway Capacity Manual (HCM) method. Syncrho was utilized for analysis of the study area because it takes into account adjacent queuing of intersections and their effect on upstream and downstream intersections. This allowed the study area to be viewed as a system of signals and intersections instead of looking at each intersection as if it existed in a vacuum. SimTraffic is the simulation tool in the software suite. A simulation of the entire peak hour was recorded and viewed to determine where traffic breakdowns, bottlenecks and failure occurred. By recording the same peak hour several times, we were able to get average values like area wide running speed, vehicle miles traveled and corridor running speeds.

The Synchro model was input using the existing balanced traffic network, existing signal timings obtained from the New York City Department of Transportation (NYCDOT) and existing lane usage in the study area determined by field observations.

Synchro Output

LOS results and volume to capacity ratios were calibrated based on field observations conducted during the morning, afternoon and evening peak hours. Volume to capacity ratios (V/C) were used to determine corridor capacity in the study areas. Typically, a V/C ratio greater than 0.95 indicates that a roadway or intersection is operating at or near capacity. The NYCDOT criteria states that any V/C ratio above 0.95 is operating unacceptably. LOS results and V/C ratios are included in Appendix A.

In addition to the traditional LOS and V/C outputs, using SimTraffic allowed the inclusion of additional analysis variables. Average corridor speeds were determined for the existing AM and PM peak hours, as well as an area wide average speed. A more detailed discussion of these measures of effectiveness is presented below.

Existing Pedestrian Conditions

In order to determine pedestrian activity in the study area, the same three EIS were referenced. Due to the fact that less pedestrian data was available than traffic count data, a distribution model was used to determine pedestrian crossing values in the study area. Using several control intersections where pedestrian crossing data was known, pedestrians were distributed throughout the study area based on several dispersion patterns, including subway entrances, building entrances and travel centers (Port Authority, Grand Central etc.).

Grand Central Terminal

There are more visitors to Grand Central Terminal each year than to any other landmark in New York. 500,000 people arrive at the terminal every day. Grand Central has become a midtown destination for its many amenities within the building, in addition to the transportation usage the Terminal serves.

The high number of users creates complex pedestrian and taxi patterns, which are difficult to summarize and simplify. Existing access to Grand Central is addressed in the appendix and also shown in Figure 7.

Bus Lane taxi operations prohibited Inactive Taxi Stand Elevated Roadway Pedestrian Tunnel Active Taxi Stand Subway Stairs Jersey Barrier Entrance/Exit SAM SCHWARTZ LLC LEGEND 2 5 П **Ξ**UN**Ξ**VA **Ω***Π***ΗΙ** EAST 42 STREET EAST 40 STREET EAST 44 STREET EAST 43 STREET EAST 41 STREET EAST 46 STREET EAST 45 STREET EAST 47 STREET **LEXINGTON ΑVENUE** _____ S PARK AVENUE ЗОИЗVA ТЛІВЯЗОИАV **MADISON AVENUE** S 5 FIGURE ΕΙΓΤΗ ΑΛΕΝΟΕ

GRAND CENTRAL TERMINAL EXISTING VEHICLE & PEDESTRIAN ACCESS

Existing Access, Delivery and Goods Movement

The 42nd Street corridor is a prominent destination for residents, tourists and workers alike, located in midtown Manhattan. The mix of land uses in the corridor includes upscale hotels, Class A office space as well as residential high rises and ground floor retail and restaurants. This combination of land uses requires the need for deliveries, taxi operations as well as vehicle access along 42nd Street.

Access Locations on 42nd Street

42nd Street has a minimal number of access drives/curb cuts in use. These are shown in Figure 8(Curb Cut Locations). The most significant of these locations is the access to the parking structure located across from Dyer Avenue, as this curb cut serves as the main access for this garage. In addition, the Helmsley Hotel provides a lay-by with access to 42nd Street for passenger loading and unloading.





FIGURE 8: **42 STREET ACCESS POINTS**





Delivery

Land uses along 42nd Street utilize different methods for deliveries. Most of the larger buildings on 42nd Street have alternate access points on the adjacent side streets and/or have loading docks that are not accessed by 42nd Street. In general, most buildings along the north side of 42nd Street use 43rd Street for loading, while buildings on the south side of 42nd Street use 41st Street for loading. Below is a survey table for the major buildings located on 42nd Street. As shown in the table, most of the major buildings in the corridor do not use 42nd Street for deliveries.

Many of the buildings support ground floor retail uses. These uses rely mostly on curbside delivery and do not utilize off-street loading docks. Truck parking (for loading) is permitted on 42nd Street and is utilized to conduct deliveries for these land uses. Most of the deliveries are hand trucked from 42nd Street into the individual store front.

Taxi / Black Car

There are no major taxi stands along 42nd Street, outside of those adjacent to Grand Central Station (discussed below). Taxi loading/unloading, however, is prevalent on the corridor, driven by the Port Authority Bus terminal, hotels and tourist destinations. Black car use is also prevalent in the corridor with hotels and major office uses. Black cars typically load on-street.

Sanitation

The City of New York provides sanitation services to the land uses along 42nd Street. City sanitation moves up and down the avenues and uses 42nd Street only as a turn around. Most City sanitation operations occur twice a week in the area. Of greater use along the corridor is the private sanitation that occurs in the area. This private sanitation can occur from once a day to four times a day, depending on the land use. Most of the private sanitation operations occur off 42nd Street in the service areas located on the Avenues or other east-west streets.

Table 1 – Building Delivery Locations

Building / Address	Delivery Location	Building / Address	Delivery Location
1 River Place, Big Apartment Building	On 41st St.	500 5th Avenue	42nd St. freight entrance
605 42nd St.Verizon	42nd St.	501 5th Avenue	42nd St.
560 W 43rd St., Riverbank West	43rd St.	330 Madison Avenue	Loading dock 43rd St.
560 W 42nd St.Fedex	42nd St.	300 Madison Avenue, Price Waterhouse Coopers	Loading dock 41st St.
Manhattan Plaza-2 Buildings betw een 9th and 10th Ave. Office at 400 W. 43rd Street	400 W. 43rd Street	50 E 42nd Street	42nd St. on street
543 W 43rd St.All Stars Proj Inc	On 42nd St.	317 Madison Avenue	43rd St.
529 W 42nd St.The Armory	42nd St.	51 E 42nd Street	Hand trucks enter on 42nd Street, how ever unloading trucks must park elsew here
510 42nd St.Homeless Shelter	Some 42nd St.	60 E. 42nd Street, Lincoln Building	41st St.
515 42nd St.Travel In	42nd St.	110 E 42nd Street	41st St.
W 42nd St.CVS.Corner of 10th Ave.& 42nd St.	10th Ave.	Chanin Building	41st St.
420 42nd St.	Everything on 41st St.	135 E. 42nd Street, Chrysler Building	43rd St.
330 42nd St.Large commercial building 10 Floor	41st St.	675 3rd Avenue	43rd St.
West In Hotel	Loading dock 43rd St.	200 E 42nd Street	41st St.
Hilton ,Next to 234 42nd St.	41st St.	205 E. 42nd Street	43rd St.
220 W 42nd St.	41st St.	Helmsley Hotel	and 43rd on east side of
5 Times Square,Ernst & young	Nothing on 42nd St.	235 E. 42nd Street, Pfizer World Headquarters	43rd St.
Reuters,NW Corner of 42nd St.& 7th Ave.	43rd st. Loading Dock	800 2nd Avenue	2nd Ave. and 43rd St.
7 Times Square ,Times Square Tow er	41st St.	305 E 42nd Street, Crow ne Plaza	41st St.
4 Times Square ,Conde Nast Bld.	43rd St.	Woodstock Tow er	42nd St.
6Times Square	41st st.	1114 Ave.of Americas	43rd St.
Bush Tow er	135 W 41st St.	33 W. 42nd Street, Suny State College of Optometry	43rd St.
		5 E. 42nd Street	43rd St.

No Build 2010

Growth in Study Area

The analysis of future traffic conditions without the Proposed Project (i.e., the future No Build condition) serves as the baseline against which the impacts of the project are compared. The future No Build analysis reflects increases in background traffic volumes and traffic from proposed developments in the area. Beside the closure of 39th, 40th, and 41st Streets between 11th and 12th Avenues to accommodate expansion of the Javits Center, there are no other expected roadway changes scheduled in the study area by the year 2010.

In developing future traffic volumes for the year 2010 No Build condition, a 0.5 percent background traffic growth factor per year was assumed for Midtown Manhattan, as required by the 2001 CEQR Technical Manual. Since the majority of traffic data was collected in 2003, a period of seven years was used to estimate future 2010 traffic volumes. To forecast future demands without the Proposed Project, the development projects described in the appendix were considered in addition to the annual background growth rate applied to existing conditions.

The base of the traffic network for this project was the traffic volumes submitted by the No. 7 Subway Extension EIS. The 2010 No Build traffic volumes included incremental traffic volumes associated with major projects in the primary study area, as well as an annual background growth rate of 0.5% per year (as described above.)

These traffic networks were then combined and adjusted for the primary study area. Priority was given to balancing 42nd Street Eastbound (EB) and Westbound (WB) volumes.

Proposed projects not included in this EIS but included in the One Bryant Park EIS or the ConEd EIS were added to the traffic network prior to balancing.

Figure 9, Figure 10, Figure 11, and Figure 12, present the No Build 2010 balanced traffic networks for the weekday AM and PM peak hours.





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FIGURE 9: MORNING PEAK F **NO BUILD 2010**







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No Build Roadway System Changes Under No Build

The No. 7 Subway Extension EIS indicates the closure of three streets intersecting Route 9A to accommodate the proposed Convention Center Expansion. These existing streets would be closed by 2010 to through traffic.

- West 33rd Street between Eleventh and Twelfth Avenues (Due to the Multi-Use Facility;)
- West 39th Street between Eleventh and Twelfth Avenues (Due to the Convention Center Expansion); and
- West 40th Street between Eleventh and Twelfth Avenues (Due to the Convention Center Expansion).
- West 41st Street between Eleventh and Twelfth Avenues would be reconfigured and effectively closed to through traffic.

While these blocks would be closed to vehicular traffic, a through-block pedestrian passageway would be provided in place of West 39th Street.

2010 No Build LOS

During the AM and PM peak hours, the most common impacts would occur at left turn approach movements, where many are projected to operate at LOS E.

During the AM and PM peak hours, 65 signalized intersections were studied. In the AM peak hour, 25 intersections would have at least one approach movement that would operate at LOS E, or F; 26 intersections would have at least one approach movement during the PM peak hour that would operate at LOS E, or F.

V/C Ratio

Throughout the study area, several movements are at, or close to capacity. Vehicular traffic and congestion varies depending on the zoning, major through avenues, and location of major transportation hubs. The edges of the study area usually experience low traffic, while major cross-town corridors are congested through out the day.

The AM peak is overall less congested, with only 29 movements with v/c ratio of 0.96 or higher. The PM pea, on the other hand, has 52 movements with v/c ratio of 0.96 or higher.

While overall the PM is more congested, 42nd Street is worse in the AM peak, with 15 movements with v/c ratio of 0.96 or higher, five more than the PM peak. Figure 13 and Figure 14 present v/c ratios in graphical form. As shown in the figures, as a result of significant additional traffic generated from the Hudson Yards project and other No Build background projects in the area, there will be more congestion in the study area.





FIGURE 13: 2010 NO BUILD AM VOLUME TO CAPACITY RATIOS









FIGURE 14: 2010 NO BUILD PM VOLUME TO CAPACITY RATIOS



Off-Street Parking

As part of the anticipated office and residential developments included in the 2010 No Build scenario, off-street parking is anticipated to be more highly utilized, particularly during the weekday evening and weekday afternoon periods, when parking is anticipated to increase to 51 and 63 percent, respectively.

On-Street Parking

The NYCDOT is currently expanding its commercial on-street parking program to cover the area bounded by 60th Street on the north, 33rd Street on the south, Second Avenue on the east, and Ninth Avenue on the west. The program allows trucks making deliveries to pay in advance for parking; the rate structure is geared towards staying for one hour or less. According to the NYCDOT, no additional changes to on-street parking regulations are anticipated.

In the Future No Build scenario, the supply of on-street parking is anticipated to remain consistent with the current inventory. Anticipated increases in background traffic and the related parking demand are expected to increase the utilization of the existing supply and reduce or eliminate any surplus.

No Build VMT and Speeds

While level of service analysis can describe the changes on the traffic network, another measure of effectiveness can also be used to better understand traffic characteristics in the area. All the data collected was analyzed un a Synchro model to calculate No Build Average Speed and Vehicle Miles Traveled (VMT). Table 2 presents the average arterial speed in the study area by arterial street/avenue.

Overall, the average speed in 2010 decreases an average of 1 mile per hour compared to the existing 2003 analysis. The AM peak hour drops from 6 to 5 mph, and from 5 to 4 mph in the PM peak. An areawide decrease in running speed under No Build is significant and represents an overall increase in congestion and delay.

Table 2 – Average	Arterial Speed	and Vehicle	Miles Traveled	(VMT)
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		Distanco	CE AM Speed			PM Speed		
Arterial	Direction	(miles)	2003	2010 No Build	2010 Build	2003	2010 No Build	2010 Build
12th Avenue	NB	0.7	8	8	6	8	7	6
	SB	0.7	14	14	12	12	12	11
11th Avenue	NB	0.5	15	15	16	14	14	15
Thin Avenue	SB	0.6	18	9	17	16	14	14
10th Avenue	NB	0.5	15	13	9	10	10	7
Dyer Avenue	NB	0.2	3	3	17	4	2	10
9th Avenue	SB	0.4	6	7	7	6	4	5
8th Avenue	NB	0.5	9	8	10	13	8	9
7th Avenue	SB	0.5	8	8	6	8	8	8
Broadway	SB	0.4	17	17	15	13	13	13
6th Avenue	NB	0.5	13	10	6	5	5	4
5th Avenue	SB	0.3	7	6	8	15	8	8
Madison Avenue	NB	0.3	16	15	14	16	16	17
Vanderbilt Avenue	NB	0.2	12	14	12	23	12	14
vanderbiit Avenue	SB	0.1	7	6	6	9	8	8
Park Avenue	NB	0.1	11	6	NA	3	5	21
T ark Avenue	SB	0.1	8	8	13	8	11	14
Lexington Avenue	SB	0.3	12	6	14	7	6	9
3rd Avenue	NB	0.5	5	4	17	13	7	16
2nd Avenue	SB	0.5	14	6	18	15	12	20
1st Avenue	NB	0.4	19	19	21	21	19	19
46th Street	EB	0.6	9	7	9	9	9	9
45th Street	WB	0.6	15	15	13	14	15	20
44th Street	EB	1.8	13	11	8	12	10	5
43rd Street	WB	1.9	11	15	12	8	13	12
10md Otro of	EB	1.9	7	6	NA	10	13	13
42nd Street	WB	2	5	3	NA	6	7	12
41at Streat	EB	0.7	2	1	17	14	8	NA
4 ISt Street	WB	0.2	31	2	11	11	11	NA
40th Street	EB	1.9	10	9	8	13	9	10
39th Street	WB	0.3	3	2	6	9	4	6
38th Street	EB	0.3	5	5	9	7	8	10
37th Street	WB	0.3	8	8	9	9	8	11
Average Speed (mph):			6	5	5	5	4	4
Total Travel Time (hours):(1,000s)			5	6	5	5	7	7
Vehicle Miles Traveled (mi): (1,000s)			25	27	25	25	27	26

Build 2010 – Traffic Conditions

Geometry Changes

The proposed Light Rail Transit (LRT) system and pedestrian street will dramatically change the way 42nd Street is used. Several street modifications will have to take effect to safely redirect traffic away from 42nd Street:

Eliminate turning movements into 42nd St

Motor vehicles on all the Avenues that intersect 42nd Street will be prohibited from turning into 42nd Street by the installation of traffic calming devices (such as speed tables, raised sidewalks, planters and/or bollards. In the interest of emergency vehicle access, collapsible bollards may be used at the 42nd Street / Avenue intersections. In other areas of Manhattan, bollards are also used that rise from the pavement and can be lowered into the pavement if an emergency vehicle needs to access the roadway.

FDR Geometry Changes

Ramps that lead into 42nd Street will need to be modified or closed for vehicular traffic. The NB off ramp will remain open, while the SB ramp will be closed or modified to be used as the LRT right of way. It should be noted that the FDR Ramps were not included in the study area, further study of the ramp configurations will need to be conducted.

Traffic Diversions

Traffic currently using 42nd Street will be rerouted to reach their final destination using alternate routes. Several calibration methods were used to determine the most likely routes used:

Information from the 1994 42nd Street Light Rail Transit Line EIS

42nd Street, like other Midtown cross streets, serves as a distributor. The 1994 study found very little river-to-river traffic using 42nd Street. Accordingly, a vehicle entering 42nd Street at either the western or eastern end is not likely to reach the opposite terminus. This condition affects how many vehicles need to be redirected from the 42nd Street corridor.

<u>Census Data</u>

Journey to Work information is compiled by the U.S. Census Bureau using data derived from the long form questionnaire administered during the decennial Census of Population. The Journey to Work tables help answer questions such as where workers live and how they commute to work. The information also serves a variety of transportation planning related purposes. The Census data for the year 1990 was used to determine journey-to-work characteristics for this study, since the 2000 data was not available yet in its final form.

This data was used to determine the number of vehicles bound for each census tract in the study area. From this data the likely routes used for ingress and egress to each census tract was determined. The combined data produced Table 3 and Figure 15.

Using the journey to work data and likely routes of travel, traffic was rerouted based on several factors including No Build running speed, existing roadway capacity and shortest distance. All traffic using 42nd Street in the No Build condition was rerouted off 42nd Street to alternate routes in the study area during the AM and PM peak hours.

Baseline 2010 Build Synchro Analysis

The rerouted traffic volumes were entered into the Synchro simulation model to determine the increase in delay and loss of capacity on the Avenues and Streets absorbing the 42nd Street traffic. V/C ratios were determined in order to make adjustments in the traffic rerouting. Obviously, traffic would not continue diverting to already above-capacity routes when an alternate below capacity route may exist. In addition, average running speeds were generated for the baseline build condition to determine if there was a change in overall travel speed in the study area. This data was used to project mode shifts and taxi shrinkage.

Future Access, Delivery and Goods Movement

Access Locations on 42nd Street

In the future, curb cuts along 42nd Street will be closed, except as indicated below. As already noted, currently few curb cuts exist and most land uses also have alternate access to their property.

The public parking facility on 42nd Street has access aligned with Dyer Avenue and will require special design consideration. In order to maintain access to the garage, the curb cut will remain open, and the garage will be accessible from Dyer Avenue.

Vehicles will be able to access Dyer Avenue from 40th and 41st Streets as well as from the Lincoln Tunnel. Vehicles exiting the garage will travel south on Dyer Avenue to 41st Street, where they will be forced to turn right.

Proposed Intersection Signage and Regulations

Fortunately most of the larger buildings along 42nd Street provide loading docks that are accessed from the Avenues or other east-west streets. However, the closure of 42nd Street to vehicles will result in the loss of on-street truck parking for delivery of goods to the storefront retail and other commercial uses on the street. In order to accommodate these deliveries, corners along 42nd Street will be designed to provide a loading zone for trucks. Figure 16 shows a typical intersection design for 42nd Street. The intersection design also includes areas for taxi and black car loading.

Grand Central Terminal Design

The taxi stand on 42nd Street would need to be closed in the future condition. A new taxi stand on the west side of Vanderbilt Avenue will need to be established, to replace the one that was closed on the street's east side, which was closed because of police concerns about security. Vanderbilt will be one-way, southbound, between 44th and 43rd Streets, and will be closed to traffic between 43rd and 42nd Streets.

Table 3 – 42nd Street Likely Routes of Vehicular Traffic by Area

Origin		Lił	ely Routes	Percentag	jes		Total
Ongin	HH SB	HH NB	Local SB	Local NB	FDR SB	FDR NB	TOLAT
СТ	80%	0%	20%	0%	0%	0%	100%
Up NY	80%	0%	20%	0%	0%	0%	100%
NJ	20%	30%	10%	40%	0%	0%	100%
LI	0%	10%	0%	90%	0%	0%	100%
NYC							
Bronx	50%	0%	50%	0%	0%	0%	100%
Queens	0%	0%	30%	70%	0%	0%	100%
Brooklyn	0%	50%	0%	50%	0%	0%	100%
SI	0%	80%	0%	20%	0%	0%	100%

Origin		Lik	cely Routes	Percentag	es		Total
Oligili	HH SB	HH NB	Local SB	Local NB	FDR SB	FDR NB	TOLAT
СТ	20%	0%	30%	30%	20%	0%	100%
Up NY	20%	0%	30%	30%	20%	0%	100%
NJ	20%	30%	10%	40%	0%	0%	100%
LI	0%	20%	10%	30%	10%	30%	100%
NYC							
Bronx	30%	0%	30%	10%	30%	0%	100%
Queens	0%	0%	20%	70%	10%	0%	100%
Brooklyn	0%	20%	0%	50%	0%	30%	100%
SI	0%	15%	0%	50%	0%	35%	100%

Origin		Lik	cely Routes	Percentag	es		Total
Oligin	HH SB	HH NB	Local SB	Local NB	FDR SB	FDR NB	TOLAT
СТ	0%	0%	30%	20%	50%	0%	100%
Up NY	0%	0%	30%	20%	50%	0%	100%
NJ	0%	0%	20%	30%	20%	30%	100%
LI	0%	0%	30%	30%	20%	30%	110%
NYC							
Bronx	0%	0%	50%	20%	30%	0%	100%
Queens	0%	0%	50%	30%	20%	0%	100%
Brooklyn	0%	0%	10%	60%	30%	0%	100%
SI	0%	0%	10%	60%	30%	0%	100%

Notes: HH SB (or NB) - Henry Hudson Parkway Southbound (Northbound), FDR SB (or NB) - Franklin D. Roosvelt Expressway Southbound (or Northbound), Local - using any other avenues within the study area




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Shrinkage and Elasticity

Mode Changes and Taxi Shrinkage

The introduction of high quality surface transit would result in a mode change to the light rail for existing trips in the study area. Some suburban drivers would continue taking a train or a bus into Grand Central or the Port Authority Bus Terminal, and switch to the light rail. In addition, many taxi trips might be attracted to light rail. In order to account for these shifts, Komanoff Energy Associates conducted a mode shift analysis for taxi trips, as well as suburban commuter trips. The mode shift model was based on several variables including: time of trip, convenience, cost, price-elasticity, travel speed and wait time. The complete study is included in the Appendix.

Major findings of the study include the projection that taxi trips in the study area will decrease by approximately 13 percent. The greatest element of this reduction is an average mode shift of 9.9 percent, depending on the start and end point of the taxi trip. In addition, taxi cruising in general is expected to decrease by approximately 3.3% in the entire study area. The auto driver mode study found that the two most likely commuter driver shifts would be by commuters residing in New Jersey and Westchester County. Approximately 3 percent of New Jersey driving commuters and 5 percent of Westchester driving commuters are expected to switch to express bus and commuter train, and then to light rail, through the Port Authority and Grand Central Terminal respectively.

Congestion Pricing

The mode shift study also analyzed the effect of congestion pricing in Manhattan. Congestion pricing has been an effective tool in cities like London for reducing traffic volumes, delay and congestion in central business districts (CBD). Congestion pricing can be applied in several different ways, from charging all crossings into Manhattan to more aggressive measures like charging a per hour fee for vehicles in the CBD. In the mode shift study conducted for this project, it was determined that simply increasing the Lincoln Tunnel toll by \$5 increased mode shifts to the light rail by 60 percent. In addition, applying a \$5 fee for Westchester driving commuters would increase the mode shift by 18 percent. Based on the mode shift model, nominal charges would have a substantial impact on commuters who drive into the CBD. In order to remain conservative, the rerouted build volumes did not assume any congestion pricing in the area. However, the effect of congestion pricing would be pronounced.

Traffic Shrinkage

Traffic shrinkage is a phenomenon that occurs when a road is closed without providing a new alternate route or detour. Traffic shifts to alternate travel modes, but also it shifts to other hours of the day to different routes or consolidates itself in the form of car pooling. In "Traffic Impact of Highway Capacity Reductions: Assessment of the Evidence" (MVA, March 1998, Landor Publishing), researchers at a large British transportation consulting firm present their findings from a study of more than 60 different road closings around the globe--from Germany to Japan. Some of the roads were closed by design, others were shut down by acts of nature, such as earthquakes. The findings stated that none of the road closings resulted in long-term traffic problems.

The MVA's study found an average of 24% reduction in overall traffic in cases where road capacity is reduced. The New York City Department of Transportation's 1991 study of the impact of closing Central Park used a far more modest estimate of 15% shrinkage, despite the more flexible and diverse transportation system NYC enjoys.

Build 2010 Traffic Volumes

The final 2010 traffic volumes for the AM and PM peak periods was determined by adding the traffic rerouted from 42nd Street to the No Build traffic networks. Reductions in traffic were taken to account for the predicted mode shifts from automobile to the light rail, for the taxi mode shift and for the taxi shrinkage in the area. In order to remain conservative no reductions were taken for possible congestion pricing that may occur in the future. In addition, although traffic shrinkage will almost undoubtedly occur, in order to present a conservative analysis, the Build 2010 volumes do not assume any traffic shrinkage.

2010 Build LOS

Figure 17, Figure 18, Figure 19 and Figure 20 present the 2010 Build scenario incremental traffic volumes for the weekday AM and PM peak hours. During these peak hours, the most common impacts would occur at left turn approach movements, where many are projected to operate at LOS E.

During the AM and PM peak hours, 65 signalized intersections were studied. In the AM peak hour, 22 intersections would have at least one approach movement that would operate at LOS E, or F; 31 intersections would have at least one approach movement during the PM peak hour that would operate at LOS E, or F.

FIGURE 17: MORNING PEAK HOUR BUILD 2010TRAFFIC VOLUMES





BUILD 2010 TRAFFIC VOLUMES



SAM SCHWARTZ LLC

FIGURE 19: EVENING PEAK HOUR BUILD 2010 TRAFFIC VOLUMES









EVENING PEAK HOUR 2010 TRAFFIC VOLUMES BUILD



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Volume/Capacity Ratios

Using Synchro, the V/C ratios for the AM and PM peak hours were determined and are shown in Figure 21 and Figure 22. As shown in the figures, the greatest impact to the street network of rerouting traffic is to 40th Street, 44th Street, the West Side Highway, Dyer Avenue and 10th Avenue. The major causes of these impacts are the following:

40th and 44th Streets

Due to the significant increase in traffic on the west side, specifically caused by the Hudson Yards development, eastbound traffic will have grown considerably in the corridor while westbound traffic will have grown at a smaller rate. The major diverted routes for this traffic are the first available eastbound streets to the north and south of 42nd Street.

<u>West Side Highway</u>

There is not a specific increase in traffic on Route 9A, however due to the closing of several streets related to the Hudson Yards project and the proposed closing of 42nd Street, accessing the study area from Route 9A is considerably more limited. This increase in through vehicles north of 34th Street cannot discharge until 44th Street. 44th Street is also the best street to enter the study area from the north. This increase in southbound left-turns is significant enough to affect the roadway approaches capacity.

Dyer Avenue

With the closing of 42nd Street to traffic, Dyer Avenue will become exclusively an access drive for the Manhattan Plaza parking garage. All vehicles currently turning left or right at 42nd Street will now be rerouted to either 40th Street for eastbound or 41st for westbound.

<u>10th Avenue</u>

Impacts to 10th Avenue are two fold. First, there will be significant additional vehicles accessing 10th Avenue from the Lincoln Tunnel and 41st Street. Almost all of these vehicles will turn onto 10th Avenue because of 41st Street being closed at 11th Avenue as part of the northward expansion of the Javits Center. Secondly, due to the closure of eastbound and westbound streets between 34th Street and 43rd Street, the first opportunity to travel west to Route 9A is at 43rd Street. This increases the through volumes northbound on 10th Avenue. If the City decides to advance the vision42 project, it would make sense to consider modifying the Javits Center expansion plan, and retaining vehicular use of 41st Street between 11th and 12th Avenues.



FIGURE 21: 2010 BUILD AM VOLUME TO CAPACITY RATIOS







FIGURE 22: 2010 BUILD PM VOLUME TO CAPACITY RATIOS





Mitigation

In order to accommodate the roadway changes necessitated by the 42nd Street closure and the traffic shifted to other east/west roadways in the study area, mitigation measures were determined. The main goal of this mitigation is to lower v/c ratios currently at 1.05 or above in the Build condition. These measures include roadway re-striping, signal changes, parking regulation changes and directional signage. It is important to note that mitigation was only recommended for the intersections reviewed in the study area. Recommended improvements are concentrated on the affected corridors discussed in the previous section.

Lincoln Tunnel Area

In order to accommodate the relocation of traffic currently exiting the Lincoln Tunnel at Dyer Avenue and 42nd Street to 41st and 40th Street, Dyer Avenue would be re-striped. Mitigation includes:

- 40th Street and Dyer Avenue northbound Dyer Avenue would provide two through lanes, a shared through/right-turn lane and an exclusive right-turn lane.
- 41st Street and Dyer Avenue northbound Dyer Avenue would provide dual leftturn lanes and a shared left-turn/through lane. Southbound Dyer Avenue would provide a single right-turn lane to accommodate vehicles exiting the parking garage at 42nd Street. Due to the geometry of the intersection, the signal would be retimed to operate with split phasing.
- 41st Street and 10th Avenue westbound 41st Street would provide two through lanes, a shared through/right-turn lane and dual right-turn lanes. This configuration would only be required during peak hours of operation and could be maintained by Police Control. Through traffic will become minimal in the future due to proposed closing of 41st Street at 11th Avenue by the Hudson Yards project.

40th Street

A significant volume of eastbound 42nd Street trips would be rerouted to 40th Street. In the EIS prepared for the 42nd Street conversion in 1994, mitigation was proposed for 40th Street to accommodate the increased vehicle demand. It is recommended that this mitigation be used for the complete closure of 42nd Street as well. General mitigation on 40th Street will include signal timing changes and parking regulation changes to provide greater roadway capacity. Mitigation proposed for 40th Street includes the following at the intersections of:

- 11th Avenue signal timing changes and channelization of Lincoln Tunnel bound traffic.
- 9th Avenue re-striping to provide three eastbound through lanes and an exclusive right-turn lane.
- 8th Avenue re-stripping to provide an exclusive left-turn lane and two eastbound through lanes.
- 7th Avenue additional green time given to 40th Street.
- Broadway additional green time given to 40th Street.
- 6th Avenue change-parking restrictions to allow three lanes to be striped to provide a shared left-turn/through lane and two through lanes. Also provide additional green time for 40th Street.
- Park Avenue provide additional green time to 40th Street.
- Lexington Avenue provide additional green time to 40th Street.
- 3rd Avenue- change parking restrictions on the south curb to allow three lanes to be striped to provide a shared left-turn/through lane and two through lanes. Also provide additional green time for 40th Street.
- 2nd Avenue- change parking restrictions on the south curb to allow three lanes to provide two through lanes and an exclusive right-turn lane. Also provide additional green time for 40th Street.

<u>44th Street</u>

Signal timing adjustments to give additional green time to 44th Street can be utilized in the study area:

- 11th Avenue-Shift green time to eastbound 44th Street.
- 10th Avenue-Shift green time to eastbound 44th Street.
- 8th Avenue- Shift green time to eastbound 44th Street.
- 7th Avenue/Broadway Shift green time to eastbound 44th Street
- 6th Avenue Shift green time to eastbound 44th Street.

Future VMT and Speeds with Mitigation

All the data collected were analyzed using a Synchro model to calculate 2010 Build Average Speed and Vehicle Miles Traveled (VMT). Table 2 shows the average arterial speed in the study area by arterial street/avenue. Overall, the average speed increased an average of 1 mile per hour compared with the 2010 no build conditions in the AM peak hour, from 5mph to 6 mph. The PM peak speeds did not change.

Volume/Capacity Ratio with Mitigation

Volume to capacity ratios were recalculated with the proposed mitigation outlined above. As shown in Figure 23 and Figure 24, with the mitigation in place the intersections approaches with V/C ratios above 1.05 are reduced from twelve to zero in the AM peak hour and from 14 to 4 in the PM peak hour.

Conclusion

Using several EIS conducted in the midtown area and referencing the original 1994 42nd Street Light Rail EIS, a baseline of existing traffic volumes for over 60 intersections in the midtown area were identified for study. The traffic volumes were grown to account for the myriad of development proposed for this area, the most significant of which is the Hudson Yards project. Using a year 2010 horizon, traffic volumes were shifted to other routes in the area if 42nd Street were closed based on census data and available capacity. Traffic was reduced based on probable mode shifts to light rail as well as a reduction in taxi cruising and usage in the corridor.

The proposed closure of 42nd Street in order to accommodate a light-rail line and to offer a pedestrianized street can be accomplished through the use the of parking regulation changes, enforcement, re-striping and signal timing changes. Although the effect of traffic shrinkage has been less pronounced in Manhattan than in other cities around the globe, the continual increase of traffic congestion in the midtown area may lead toward a change in the current trend. Programs like congestion pricing may also contribute to this trend in the near future.

Most major buildings on 42nd Street provide loading docks or delivery areas on the neighboring side streets or the adjacent avenues. In addition, few curb cuts exist on 42nd Street to provide access to any of these buildings. However, many smaller buildings and retail storefronts use 42nd Street for loading of goods. In order to provide for this loading area, designated loading zones would be provided on the avenues at each block. These zones would be used for truck and taxi loading, as well as black car. The parking garage located on 42nd Street across from Dyer Avenue would remain open and access to the garage would be provided only from Dyer Avenue.



FIGURE 23: 2010 BUILD AM MITIGATED VOLUME TO CAPACITY RATIOS











FIGURE 24: 2010 BUILD PM MITIGATED VOLUME TO CAPACITY RATIOS



Grand Central Terminal would require its main taxi stand, currently located on 42nd Street, east of Vanderbilt to be relocated. The best solution for a new taxi stand is to establish one on the west side of Vanderbilt between 44th and 43rd Streets, with appropriate safeguards from traffic for pedestrians crossing Vanderbilt. This will require inter-agency coordination to re-open a stand that has been closed in light of terrorist events in the city.

Next Steps

Through the use of the mitigation proposed in this report, the closure of 42nd Street can be a reality. However, a more detailed study of traffic will need to be conducted before final implementation. A limitation of this study was in the intersection chosen for study. The 1994 EIS for 42nd Street was conducted before programs like THRU streets had taken affect, therefore few intersections on 45th or 46th Streets were included in the study area. The effect of traffic rerouting on this streets needs to be studied further. Coordination among several New York City agencies will be required to implement the many recommendations made in this study.

vision42 an auto-free light rail boulevard for 42nd Street

Appendix

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in association with Urbanomics of New York and Hallcrow LLC

March 31, 2005

vision42 Roxanne Warren, AIA, Chair George Haikalis, ASCE, Co-Chair

The **vision42** proposal is a citizens' initiative sponsored by the Institute for Rational Urban Mobility, Inc. (IRUM), a New York City-based not-for-profit corporation concerned with advancing cost-effective transport investments that improve the livability of dense urban places.

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LOS Analysis Tables

Existing LOS Analysis

Sam Schwartz PLLC Vision 42 Existing Conditions LOS Summary

		Lano	Morr	ning Peak	Hour	Mid	day Peak I	Hour	Ever	ning Peak l	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	WB	R	0.53	65.2	E	0.51	48	D	0.86	74.7	E
47th Street & 12th Ave	NB	Т	0.49	11.5	В	0.65	0.9	A	0.74	49	D
	SB	Т	0.92	92.8	F	0.82	13.3	В	0.95	123.7	F
		Int.		60.3	E		8.7	Α		86.3	F
	NB	TR	0.72	97.8	F	0.93	16.9	В	0.95	68.6	E
46th Street & 12th Ave.	SB	L	0.28	61.5	E	0.94	99.7	F	0.53	51.1	D
			0.94	251.2	-	0.83	14.6	В	0.95	181.7	
		Int.	0.4	184.3	F	0.05	18.2	В	0.05	122.5	
	WB SD	R	0.4	48.Z		0.25	38.1		0.35	105.6	
45th Street & 12th Ave.		R I	0.95	241.1 153.2	_ Г	0.75	3.7	A	0.00	134.7	
	INED	∟ Int	0.54	100.2 199.2	F	0.09	53	Α Δ	0.77	153.4	F
	NEB	TR	0.64	12.1	B	0.83	83	Δ	0.95	149.5	F
	SWB		0.04	55.1	F	0.03	53.8		0.65	55.5	F
44th Street & 12th Ave.	0110	T	0.55	0.3	A	0.43	0.1	A	0.54	0.6	A
		Int.	0.00	6.5	Α	01.10	6.2	A	0.01	80.6	F
	WB	L	0.26	53.6	D	0.18	36.2	D	0.17	36.2	D
		LT	0.35	56.2	E	0.34	40	D	0.23	37.9	D
		R	0.29	54.8	D	0.33	39.5	D	0.21	37.1	D
43th Street & 12th Ave.	NEB	L	0.94	148.4	F	0.3	76.8	E	0.42	76.9	Е
		Т	0.53	2.2	А	0.74	8.5	Α	0.93	14.6	В
	SWB	Т	0.84	34.6	С	0.78	12.1	В	0.95	40.6	D
		Int.		24.1	С		12.0	В		27.1	C
	WB	L	0.23	47.7	D	0.1	31.5	С	0.19	32.6	С
		R	0.49	29.7	С	0.28	15.6	В	0.53	29.6	С
	NB	Т	0.62	7.9	A	0.95	55.2	E	0.95	32.7	С
42nd Street & 12th Ave.		R	0.42	9.5	A	0.29	17.7	В	0.3	10.5	В
	SWB	L	0.31	22.1	C	0.43	12	B	0.76	23.6	C
			0.95	11.1	В	0.85	15.3	В	0.93	12.2	В
		Int.	0.07	12.1	Б	0.40	34.0		0.00	23.5	
	WB		0.07	36.5		0.12	24.4	C C	0.09	31.3	C
41st Street & 12th Ave	ND	R T	0.07	266 1		0.17	20.1		0.00	31.4 76.7	
	SB	T	0.74	12.1	B	0.33	23		0.95	4.5	
	00	Int.	0.00	118.7	F	0.70	42.2	D	0.00	43.4	
	NB		0.28	2.3	A	0.43	17.9	B	0.8	67.6	F
	110	TR	0.43	0.5	A	0.5	1.5	A	0.64	63	E
40th Street & 12th Ave.	SB	TR	0.71	15.4	В	0.51	2.6	Α	0.68	63.3	Е
		Int.		8.9	Α		2.1	Α		63.2	E
	NB	L	0.35	57.4	E	0.16	55.7	E	0.24	72	Е
		TR	0.76	51.8	D	0.93	33.6	С	0.95	46.9	D
39th Street & 12th Ave.	SB	L	0.57	76.3	E	0.63	45.9	D	0.94	92	F
		Т	0.95	197.5	F	0.78	8.8	Α	0.95	76.8	E
		Int.		126.9	F		23.9	C		60.9	E
	WB	L	0.51	56	E	0.79	62.7	E	0.52	41.1	D
		R	0.5	37.3	D	0.78	39.5	D	0.5	34	C
24th Street & 40th Aug	NR		0.77	29.1	C	0.89	33.1	C	0.94	30.3	C
34th Sheet & 12th Ave.	SD	ĸ	0.36	21.4	E	0.32	20.7	C P	0.19	13.5	Б Б
	30	<u></u> Т	0.79	00.9 2		0.43	17.0 2.5		0.95	94.0 25.2	
		Int	0.70	20 5	л С	0.52	2.0 23.8	А С	0.05	34 9	0
	WB	I TR	0.39	17.5	B	0.32	15.2	R	0.59	19	B
	NB	1	0.17	4.9	A	0.16	5.6	A	0.3	8.8	A
		T	0.3	3.7	A	0.23	3.9	A	0.38	3	A
47th Street & 11th Ave.	SB	TR	0.45	8.2	A	0.48	8.5	A	0.56	9.5	A
		R	0.01	5.5	А	0	0	0	0.07	5.9	Α
		Int.		8.1	Α		8.2	Α		9.1	Α

		Lano	Morr	ning Peak	Hour	Mid	day Peak I	lour	Ever	ing Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	EB	LTR	0.26	27.9	С	0.46	30.7	С	0.41	29.8	С
	NB	TR	0.3	2.9	Α	0.23	3.1	Α	0.39	2.2	A
46th Street & 11th Ave.	SB	L	0.21	2.5	A	0.17	1.1	A	0.11	1.9	A
		1	0.42	2.7	A	0.64	4.5	A	0.55	3.5	A
		Int.	0.40	5 .1	A	0.05	8.1	A	0.05	6.1	A
	VVB		0.46	26.2	C	0.35	28.1		0.25	27.4	C A
45th Street 8 11th Ave	NB		0.26	2.2	A	0.19	0.8	A	0.54	8.6	A
45th Sheet & Thin Ave.	30		0.42	2.3	A	0.5	4.3	A 0	0.57	3.Z 0.7	A
		Int	0.1	7 4	Δ	0	7.8	Δ	0.03	70	
	FB	I TR	0.63	34.2	C.	0 74	37.4	D	0.87	46.3	D
	NB	TR	0.22	3.5	A	0.19	8.2	A	0.23	7.3	A
44th Street & 11th Ave.	SB	L	0.25	5.4	A	0.14	3.2	A	0.04	2.2	A
		Т	0.42	5.9	Α	0.51	5.5	Α	0.58	5.3	А
		Int.		11.4	В		13.2	В		15.2	В
	WB	LT	0.36	37.9	D	0.31	41	D	0.3	47.6	D
		TR	0.37	36.4	D	0.45	42.2	D	0.41	48.3	D
43th Street & 11th Ave.	NB	LT	0.22	19.3	В	0.25	20.9	С	0.26	21	С
	SB	TR	0.45	1.8	Α	0.52	1.9	Α	0.6	2.6	Α
		Int.		11.6	В		12.1	В		12.1	В
	EB	L	0.69	41	D	0.17	20.8	C	0.58	34.4	C
			0.33	21	C	0.43	22.3	C	0.41	22	
42nd Street & 11th Ave.	WB		0.4	24.5	C C	0.39	29.2	0	0.49	35.4	
	SB		0.40	20.0	B	0.42	30.7	B	0.49	30.5	B
	30	Int	0.40	19.1	B	0.01	18.0	B	0.01	20.3	C
	WB		0.28	29.1	C	0.32	25.9	C	0 14	17.9	B
		LT	0.25	28.4	C	0.78	43.5	D	0.27	20.3	C
41st Street & 11th Ave.	SB	Т	0.3	1	A	0.34	1	Α	0.41	2	A
		Int.		3.7	Α		7.4	Α		2.7	Α
	EB	TR	0.24	27.5	С	0.22	27.3	С	0.15	26.6	С
	NB	R	0.17	4.2	A	0.18	6.3	A	0.19	2.7	A
40th Street & 11th Ave.	SB	L	0.27	2.8	A	0.21	2	A	0.35	1.6	A
		T	0.3	3.2	A	0.42	4.1	A	0.41	2.1	A
	50	Int.	0.50	5.3	A	0.44	5.6	A	0.54	3.1	A
		R	0.52	27.0		0.44	25.8		0.51	21.4	
	VVD	L R	0.40	12.7	B	0.0	20.4		0.07	31.0	
39th Street & 11th Ave.	NB	T	0.12	12.7	A	0.21	1.9	A	0.07	2	A
	SB	Ť	0.36	4.5	A	0.5	3.7	A	0.46	3.7	A
	-	Int.		9.9	Α		10.5	В		7.8	Α
	NB	TR	0.13	5.2	А	0.12	5.1	А	0.16	5.2	А
38th Street & 11th Ave.		LT	0.69	11	В	0.86	12.7	В	0.71	8.9	Α
		Int.		9.9	Α		11.6	В		8.1	Α
	WB	LR	0.17	11.6	В	0.18	7.2	A	0.23	13.1	В
37th Street & 11th Ave	NB	T	0.13	4.2	A	0.12	4.2	A	0.16	4.2	A
	SB	Ť	0.45	3.3	A	0.63	5.5	A	0.48	4.2	A
		Int.	0.44	4.6	A		5.5	A		5.8	A
	WB	L -	0.11	1/.1	В	0	0	0	0	0	
36th Street & 11th Ave.			0.12	6.1	В	0.12	12.1 7	<u>В</u>	0.15	12.4	<u>ь</u>
	36	Int	0.51	0.1 7 9	A A	0.7	/ 7 8	A A	0.50	0.1 Q N	A A
	WB	TR	04	25.2	C.	0.35	24.3	C.	0.59	29.7	Ĉ
		R	0.31	24	Č	0.2	22.3	Č	0.21	22.4	č
47th Street & 10th Ave.	NB	LT	0.58	2.2	Ā	0.6	3.2	Ā	0.79	3.9	Ā
		Int.		5.3	Α		5.8	Α		6.8	Α
	EB	L	0.14	21.4	С	0.13	22	С	0.08	27.4	С
		LT	0.3	24	С	0.33	25.4	С	0.47	35.8	D
46th Street & 10th Ave.	NB	T	0.72	3.5	A	0.62	4.6	A	0.95	14.8	B
		IR	0.49	3.7	A	0.32	3.9	A	0.33	3	A
		int.		5.3	А		v./	А		15.9	Б

		Lane	Morr	ning Peak	Hour	Mid	day Peak I	lour	Ever	ning Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	WB	TR	0.28	21.4	С	0.25	21.1	С	0.22	20.8	С
45th Street & 10th Ave.	NB	LT	0.67	3.1	A	0.65	3.9	Α	0.83	3.7	Α
		Int.		5.8	Α		6.6	Α		5.4	Α
	EB		0.25	11.6	B	0.17	7	A	0.14	6.8	A
44th Street & 10th Ave	ND		0.58	16.9	B	0.93	37.1		0.43	10.1	B
44th Street & Toth Ave.	IND	I TR	0.70	0.3	A A	0.04	5.9 3.1	Δ	0.00	3	
		Int.	0.55	7.5	A	0.24	12.3	B	0.24	10.2	B
	WB	TR	0.32	16.4	B	0.37	17.6	B	0.46	19.7	В
43rd Street & 10th Ave.	NB	LT	0.76	14.6	B	0.63	10.2	B	0.88	14.2	B
		Int.		14.8	В		11.4	В		15.0	В
	EB	L	0.89	101.1	F	0.32	19.3	В	0	0	0
		Т	0.34	11.1	В	0.37	14.6	В	0.33	11.1	В
	WB	TR	0.92	34.9	С	0.62	19.2	В	0.91	31	С
42nd Street & 10th Ave.		R	0.84	40.2	D	0.58	23.4	C	0.86	41.6	D
	NB		0.23	4.6	A	0.26	4.3	A	0.14	0.9	<u>A</u>
		I K Int	0.51	4.5	A	0.47	3.8 0 /	A	0.65	3.4 127	A P
	WB	π. т	0.21	0.7	Δ	03	3.4 11 /	R	0 17	10.2	R B
		R	0.21	9.7 11.8	R	0.3	13	B	0.17	22.2	C.
41st Street & 10th Ave.	NB	LT	0.43	5.1	A	0.55	6.5	A	0.42	7.3	Ā
		T	0.62	3.5	A	0.58	3.7	A	0.89	8.1	A
		Int.		6.3	Α		7.3	Α		10.8	В
	EB	LT	0.18	10.3	В	0.16	8	А	0.16	5.5	А
40th Street & 10th Ave.	NB	TR	0.72	12	В	0.69	9.7	Α	0.9	47.1	D
		Int.		11.8	В		9.5	Α		43.5	D
	WB	Т	0.21	38.5	D	0.38	37.2	D	0.12	30.3	С
39th Street & 10th Ave.		R	0.29	41.3	D	0.22	34.7	C	0.17	31.7	C
	NB	LI	0.62	4.3	A	0.69	/./	A	0.95	44.5	
	ED	INL.	0.10	7.2		0.2	14.3	D	0.20	43.0	
			0.19	7.3 8	A A	0.3	9.4		0.29	9.5	
38th Street & 10th Ave.	NB	TR	0.63	3.8	A	0.64	4	A	0.87	15	B
		Int.	0.00	4.6	Α	0.01	5.1	A	0.01	14.4	B
	WB	TR	0.48	25.5	С	0.57	28.8	С	0.95	49.7	D
37th Street & 10th Ave.	NB	LT	0.62	15.3	В	0.62	15.3	В	0.94	26.8	С
		Int.		16.5	В		17.2	В		30.6	С
	WB	TR	0.44	27.9	С	0.51	23.2	С	0.53	12	В
41st Street & Dyer Ave.	NB	L	0.91	210	F	0.76	82	F	0.07	22	C
5		LI	0.92	251		0.77	119		0.63	43	
	ED		0.26	102.3		0.21	1 9. 1		0.46	27.0	
			0.20	0.6		0.51	11.0	B	0.40	9 9	
40th Street & Dyer Ave.		TR	0.45	1.3	A	0.54	13	B	0.41	10.7	B
		Int.	50	2.1	Α	5.01	12.3	B	2	11.4	В
	EB	TR	0.49	17.4	В	0.64	10.8	В	0.4	15.6	В
50: 44th Street & 9th Ave.	SB	LT	0.71	18.3	В	0.71	18.6	В	0.74	19.1	В
		Int.		18.1	В		16.5	В		18.6	В
	WB	LT	0.31	7.7	A	0.29	35.9	D	0.42	9.2	Α
43th Street & 9th Ave.	SB	TR	0.62	2.5	A	0.56	4.1	A	0.7	5.2	A
		Int.	0.50	3.2	A	0.01	8.5	A	0.40	5.8	A
	EB		0.52	19	В	0.01	26.4		0.43	17.0	С В
42nd Street & 9th Ave	WB		0.30	20	C C	0.29	31 7	C C	0.30	23.6	C C
	SB	LTR	0.84	11.2	В	0.72	9.4	Ā	0.94	17.9	B
	-	Int.		15.2	В		17.5	В		19.0	В
	WB	LT	0.22	11.8	В	0.3	22.8	С	0.58	23.1	С
41st Street & 9th Ave.	SB	TR	0.62	19.6	В	0.6	17.4	В	0.73	301.5	F
		Int.		18.8	В		18.1	В		245.6	F
	EB	Т	0.95	47.6	D	0.57	33.7	С	0.76	36.2	D
40th Street & 9th Ave		TR	0.94	68.3	E	0.51	35.5	D	0.35	29.7	С
	SB	LT	0.47	110.1	F F	0.45	111.3	F	0.68	382.6	F
	1	Int.		85.7	F	I	86.4	F	l	291.3	l F

		Lane	Morr	ning Peak	Hour	Mid	day Peak I	lour	Ever	ning Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	WB	LT	0.38	31	С	0.52	20.7	С	0.28	18.2	В
39th Street & 9th Ave.	SB	TR	0.58	24.6	С	0.53	21	С	0.76	119.6	F
		Int.		25.8	С		20.9	С		108.4	F
	EB	TR	0.48	19	В	0.38	16.7	В	0.22	15.1	В
38th Street & 9th Ave.	SB	LT	0.65	20	В	0.58	18.1	В	0.85	118.5	F
		Int.		19.8	В		17.8	В		108.5	F
	WB	L	0.5	10.8	В	0.39	18.2	В	0.36	6.3	A
37th Street & 9th Ave.			0.2	8.2	A	0.31	16.3	В	0.53	7.2	A
	SB	IR	0.62	4.4	A	0.6	4.9	A	0.84	4.8	A
		Int.	0.01	5.7	A	0.00	1.6	A	0.04	5.3	A
	VVB		0.21	22.2	0	0.29	16.8	В	0.61	30.6	
47th Street & 8th Ave	ND		0.14	21.4		0.19	10.0		0.01	31.0	
47 in Street & Stil Ave.	IND		0.25	3.3	Δ	0.27	9.2	Δ	0.20	0.7	Α
		Int	0.50	5.4	Δ	0.01	10.3	B	0.02	13.8	B
	FB	Т	0.49	25.3	C	0.37	17.1	B	0.62	27.7	C
	NB	T	0.43	4.9	A	0.07	8.4	A	0.62	57	A
46th Street & 8th Ave.		R	0.5	8	A	0.48	12.3	B	0.55	9	A
		Int.	0.0	9.4	A	0.10	10.9	B	0.00	11.1	B
	WB	Т	0.61	19.3	В	0.5	27.9	С	0.66	21.5	С
		R	0.6	19.7	В	0.35	24.6	C	0.63	21.4	C
45th Street & 8th Ave.	NB	LT	0.58	2	Α	0.57	7.9	A	0.62	2.7	A
		Int.		6.2	Α		13.1	В		7.2	Α
	EB	LT	0.7	16	В	0.57	12.6	В	0.42	11.3	В
14th Street & 8th Ave	NB	Т	0.56	4	Α	0.55	8.9	Α	0.59	3.7	Α
44th Street & Still Ave.		R	0.25	4.2	Α	0.55	14	В	0.31	4.7	Α
		Int.		7.5	Α		10.6	В		5.1	Α
	WB	TR	0.42	28.2	С	0.33	31.6	С	0.47	29.9	С
43th Street & 8th Ave.	NB	LT	0.51	1.4	Α	0.48	5.1	Α	0.56	1.9	Α
		Int.		7.0	Α		11.1	В		8.0	Α
	EB	LT	0.77	36.3	D	0.78	32.5	С	0.4	21.5	С
	WB	TR	0.72	12.1	В	0.6	21.3	С	0.67	18.5	В
42nd Street & 8th Ave.		R	0.23	5.1	A	0.11	21.1	C	0.25	13.7	B
	NB	LT	0.74	6.6	A	0.59	9.8	A	0.8	6.9	A
		R	0.87	27.6	C	0.47	12.3	В	0.39	1.4	A
		Int.	0.00	16.1	В	0.01	18.4	В	0.40	11.3	В
11st Street 8 8th Ave	WB		0.29	10.9	B	0.21	/	A	0.48	12.4	B
4 ISt Stieet & Stil Ave.	IND	LI	0.76	3.3 4 400	A 	0.05	14.1	B	0.70	4.Z	A •
	EB	π.	0.71	25.4	^	0.36	17.2	B	0.58	23.8	<u> </u>
40th Street & 8th Ave		TR	0.71	9.6	Δ	0.50	10.7	B	0.30	23.0	
		Int.	0.70	15.2	B	0.01	12.4	B	0.70	13.1	B
	WB	TR	0.51	19.9	B	0.51	8.2	A	0.35	22.3	C
39th Street & 8th Ave.	NB	LT	0.62	8.8	A	0.54	6.9	A	0.66	6.4	A
		Int.	0.02	11.6	В	0.01	7.3	A	0.00	9.1	A
	EB	LT	0.71	18.9	В	0.42	15.6	В	0.41	10.4	В
38th Street & 8th Ave.	NB	TR	0.69	8.7	A	0.61	6	A	0.76	10	Ā
		Int.		12.1	В		8.6	Α		10.0	В
	WB	TR	0.49	29.6	С	0.33	11.2	В	0.67	33.7	С
37th Street & 8th Ave.	NB	LT	0.64	17.4	В	0.66	20.7	С	0.66	18	В
		Int.		20.4	С		18.7	В		22.6	С
	EB	Т	0.52	15.8	В	0.3	11.7	В	0.51	12.9	В
46th Street & Broadway	SB	Т	0.61	20.2	С	0.45	16.6	В	0.55	18.4	В
		Int.		18.7	В		15.1	В		16.3	В
	WB	LT	0.92	55.7	E	1	173.6	F	0.89	49.8	D
45th Street & 7th Ave	SB	TR	0.94	31.2	С	0.74	17.7	В	0.9	25	С
	SWB	L	0.95	387.4	F	0.61	112.1	F	0.78	240.5	F
		Int.		216.3	F		94.6	F		132.5	F
	EB	TR	0.59	30.7	C	0.59	12.2	B	0.27	22.7	C
		R	0.17	24.4	C	0.23	11.8	B	0.19	23.5	C
44th Street & /th Ave.	SB		0.67	12.6	В	0.52	23.6	C	0.51	8.2	A
		K	0.78	28.2	C	0.64	33.1	C	0.71	11.5	B
		ιητ.		22.1	U U	I	24.3	U		11.6	В

		Lano	Morr	ning Peak	Hour	Mid	day Peak I	lour	Ever	ing Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	WB	LT	0.57	26.8	С	0.62	35	С	1.07	148	F
43th Street & Broadway	SB	Т	0.45	12.2	В	0.31	0.7	Α	0.31	9.3	A
		Int.		15.2	В		10.6	В		64.9	E
	EB	T	0.75	20.6	C	0.48	5.1	A	0.29	24.2	C
42nd Street & Broadway	WB	LT	0.63	34.4	C	0.67	34.3	C	0.48	4.8	A
, ,	SB	LIR	0.7	102.7		0.5	10.4	В	0.53	20.9	C
		Int.	0.00	62.7	E	0.00	15.2	B	0.00	17.4	В
11st Street & Preadway	WB NB		0.28	0.4	A	0.23	8.4	A	0.26	11	B
4 ISt Street & Bloadway	3B	IR	0.51	2.8	A 	0.45	23.7 21.1		0.47	4.4 5.8	A
	EB	TD	0.80	37.8		0.33	21.1 0.1	ر	0.50	18.6	
		R	0.09	10.2	B	0.33	9.1 10.8	R	0.59	21.0	
40th Street & Broadway	SB		0.57	3.8	A	0.55	83.6	F	0.31	1.5	A
	00	Int.	0.00	19.8	B	0.07	57.1	Ē	0.41	10.3	В
	WB	I T	0.51	18.3	B	0.67	25	C	0.5	17.2	B
39th Street & Broadway	SB	TR	0.62	3.9	Ā	0.55	27.4	Č	0.52	5.4	Ā
,		Int.		8.7	Α		26.3	C		9.7	Α
	EB	TR	0.54	10.1	В	0.33	7.7	Α	0.4	7.5	А
38th Street & Broadway	SB	LT	0.63	5.5	А	0.61	9.7	Α	0.55	7.1	Α
		Int.		7.1	Α		9.1	Α		7.2	Α
	WB	LT	0.38	11.8	В	0.29	7.7	А	0.63	6.8	А
37th Street & Broadway	SB	TR	0.52	2.5	А	0.48	1.2	А	0.52	3.2	Α
		Int.		5.4	Α		2.8	Α		4.7	Α
	EB	TR	0.58	3.2	Α	0.35	1.8	Α	0.57	3.7	Α
46th Street & 7th Ave.	SB	LT	0.91	439	F	0.75	91	F	0.82	266.4	F
		Int.		321.8	F		71.1	E		189.0	F
	WB	LT	0.51	3.6	A	0.58	3.1	A	0.78	8.1	A
43th Street & 7th Ave.	SB	TR	0.62	64.1	E	0.48	1.6	A	0.57	26.9	C
		Int.		55.6	E		1.9	A	<u> </u>	22.8	C
	EB		0.92	38.4	D	0.58	15.8	В	0.45	16.2	B
42nd Street & 7th Ave.	WB		0.54	1.5	A	0.35	6.2	A	0.43	5.9	A
	5B	LIR	0.59	148.7	F	0.53	10.2	B	0.59	123.8	
		III L. ⊥⊤	0.22	10.1	Г	0.21	10.0	D	0.27	10.2	
41st Street & 7th Ave	SB		0.23	7.8		0.21	38.3		0.57	7.2	
	00	Int.	0.02	7.0 8.1	A	0.47	34.5	C	0.0	9.5	<u> </u>
	FB	TR	0 77	12	B	0.9	40.1	D	0.61	6.3	A
40th Street & 7th Ave.	SB	IT	0.74	3.6	A	0.58	38.5	D	0.6	2.4	A
		Int.		7.2	A		39.1	D		4.0	Α
	WB	LT	0.54	17.5	В	0.59	14.1	В	0.41	17.2	В
39th Street & 7th Ave.	SB	TR	0.65	3	Α	0.55	24.7	С	0.54	2.8	А
		Int.		7.0	Α		21.1	С		6.5	Α
	EB	TR	0.6	<u>12.</u> 3	В	0.4	27.4	С	0.4	<u>13.</u> 6	В
38th Street & 7th Ave.	SB	LT	0.66	8.7	А	0.62	16.2	В	0.63	6.5	A
		Int.		9.9	Α		19.1	В		8.4	Α
	WB	LT	0.53	12.5	В	0.3	9	А	0.62	18.8	В
37th Street & 7th Ave.	SB	TR	0.64	3.8	A	0.59	5.7	Α	0.59	3.7	A
		Int.		6.2	Α		6.3	Α		8.7	Α
	WB	R	0.27	26.4	С	0.27	26.4	С	0	0	0
47th Street & 6th Ave.	NB	Т	0.59	2.5	A	0.58	3.4	A	0.49	3.4	A
		Int.		3.8	A	<u> </u>	4.6	A	0.05	3.4	A
Acth Charact & Olly Asso	EB		0.59	25.5	C	0.54	24	C	0.69	25.9	C
46th Street & 6th Ave.	NB	IR Int	0.8	30	C	0.72	17.1	В	0.69	17.4	B
	\ M/D		0.5	23.0		0.50	0.01	B C	0.5	13./	
15th Street & 6th Ave			0.5	30.4		0.59	28		0.5	20.3	
Hour Gueel & Our Ave.		LI Int	0.78	13.4	D D	0.09	201.0 189.9		0.07	47.5	
	FB	нц. ТТ	0.70	21 7		0 82	22 /	Г С	0.53	16.6	R
			0.79	5	Δ	0.62	100 /	F	0.00	244.2	F
44th Street & 6th Ave.		R	0.59	9.1	A	0.62	23.6	c	0.65	43.6	D
		Int.	5.00	11.9	В	5.02	137.5	F	5.00	186.3	F

		Lano	Morr	ning Peak	Hour	Mid	day Peak I	Hour	Ever	ing Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	WB	TR	0.4	23.4	С	0.36	46.8	D	0.71	50.9	D
43th Street & 6th Ave.	NB	LT	0.68	7.3	Α	0.63	11.2	В	0.58	110.2	F
		Int.		9.4	Α		15.8	В		95.4	F
	EB	LT	0.91	32.7	C	0.5	4.4	A	0.31	30.9	C
12nd Streat & Sth Ava	WB		0.64	53.5	D	0.62	19.1	В	0.53	1.5	A
42nd Street & 6th Ave.	ND		0.57	55.8 1.0	E A	0.53	22.1		0.48	5 96 7	A E
	IND	Int	0.01	20.8	A C	0.57	9.0	A A	0.55	57 3	F
	NB		0.43	5	A	0.48	10.3	B	0.59	23.7	C
41st Street & 6th Ave.		LT	0.72	4	A	0.61	7.8	A	0.59	19.4	B
		Int.		4.1	Α		8.1	Α		20.0	С
	EB	LT	0.89	19.2	В	0.38	13.4	В	0.51	25.3	С
10th Street & 6th Ave	NB	TR	0.71	6.7	Α	0.71	58.9	E	0.68	198.6	F
		R	0.25	3.7	Α	0.45	15.4	В	0.52	25.5	С
		Int.		11.1	В		46.0	D		137.3	F
	WB	TR	0.63	24.3	С	0.82	31.1	С	0.58	23.1	С
39th Street & 6th Ave.	NB	LT	0.8	6	A	0.75	19.2	B	0.72	117.1	F
		Int.	0.00	10.5	В	0.40	23.0	C	0.45	94.8	
29th Street & 6th Ave	EB		0.69	15.4	В	0.49	10.8	В	0.45	10.8	В
Sour Sueer & our Ave.	NB	IR Int	0.82	10.6	B	0.75	10.9	B	0.73	10.1	B
	W/B	TD	0.51	23.7	C D	0.40	23.4	Б С	0.82	32.0	Б С
37th Street & 6th Ave	NB		0.51	17.7	B	0.49	15.7	B	0.02	15.5	B
	NB	Int.	0.71	18.9	B	0.0	17.4	B	0.55	21.5	C
	FB	TR	0.76	29.4	C -	0.77	36.4	D D	0.52	18.8	B
	SB	L	0.59	22	C	0.49	23	C	0.42	18	B
44th Street & 5th Ave	-	LT	0.92	30.6	С	0.92	32.4	С	0.77	20.9	С
		Int.		29.5	С		33.1	С		20.2	С
	WB	Т	0.38	13.2	В	0.38	25.9	С	0.63	29.9	С
43th Street & 5th Ave	SB	Т	0.57	1.4	Α	0.79	5.7	Α	0.7	3.8	А
		Int.		3.4	Α		8.3	Α		9.5	Α
	EB	TR	0.87	19.1	В	0.52	35.8	D	0.34	33.5	С
42nd Street & 5th Ave	WB	LT	0.81	44.4	D	0.78	24.2	C	0.67	39.4	D
	SB	 Int	0.95	190.8		0.95	18	В	0.75	4.8	A
	SD.	Int.	0.71	110.1	Г ^	0.72	22.5		0.64	17.8	Ь
41st Street & 5th Ave	36	LI Int	0.71	1.9	A A	0.75	2.1	A A	0.04	2.0	Α Δ
	FB	TR	0.9	13.3	B	0.47	15.8	B	0.64	22.7	Ĉ
	SB		0.46	4.8	A	0.28	3.8	A	0.35	3.3	A
40th Street & 5th Ave	01	 T	0.86	6	A	0.93	9.8	A	0.65	2.9	A
		Int.		8.3	Α		10.6	В		9.2	Α
	EB	LT	0.49	21.9	С	0.33	16.6	В	0.46	21.4	С
46th Street & Madison Avo	NB	TR	0.5	1.4	Α	0.71	261.3	F	0.86	10.3	В
		R	0.21	0.8	A	0.18	14.8	В	0.13	0.5	A
		Int.		8.1	Α		190.9	F		13.1	В
	WB	T	0.32	21.3	С	0.43	20.3	С	0.42	24.7	C
45th Street & Madison Ave.	NB	LT	0.67	10	В	0.62	81.1	F	0.71	11.8	B
	EP		0.64	12.0	В	0.50	40.0		0.44	15.0	В
			0.01	31.9		0.52	166 7	B C	0.41	32.3 7.5	
44th Street & Madison Ave.		R	0.5	0.8	Δ	0.0	12.3	Г В	0.79	0.2	Δ
		Int.	0.10	11.0	B	5.12	112.0	F	0.00	13.8	В
	WB	TR	0.19	2.2	Ā	0.26	3.9	A	0.43	5.3	A
43th Street & Madison Ave.	NB	Т	0.27	0.1	A	0.47	10.5	В	0.57	2	A
		Int.		0.6	Α		9.2	Α		3.0	Α
	EB	LT	0.91	432.3	F	0.47	<u>37.</u> 5	D	0.35	29.5	С
42nd Street & Madison Ave	WB	TR	0.7	200.7	F	0.62	13.8	В	0.58	95.4	F
	NB	LTR	0.54	1.7	A	0.56	7.4	A	0.55	1.5	A
		Int.		191.9	F		16.3	В		31.6	С
	EB	T	0.45	36.9	D	0.38	8	Α	0.44	36.3	D
41st Street & Madison Ave.	NB	T	0.66	6.3	A	0.6	4.3	A	0.63	5.1	A
		Int.		11.1	В	<u> </u>	4.9	A		10.1	В

		Long	Morr	ning Peak	Hour	Mid	day Peak I	lour	Ever	ing Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	EB	LT	0.9	25.6	С	0.42	21.9	С	0.65	16.2	В
40th Street & Madison Ave.	NB	TR	0.65	17.9	В	0.71	22.3	С	0.67	18.3	В
		Int.	0.07	21.2	C	0.07	22.2	C	0.40	17.5	В
	EB		0.37	17.3	В	0.37	33.3	C	0.43	22.9	C
46th Street & Vanderbilt Ave.			0.76	19.2		0.33	7.Z 22.1	A	0.22	13.1	B
	30	L⊺ Int	0.30	10.2 39.2	D D	0.59	23.1 24.6	0 C	0.27	10.4 20 1	□ □
	WB	TR	0.38	25.2	C	0.23	2.8	A	0.33	34.2	C
	NB	Т	0.26	17	B	0.26	7.9	A	0.19	7.4	Ă
45th Street & Vanderbilt Ave.	SB	R	0.4	13.2	В	0.61	20.5	С	0.38	9.9	Α
		Int.		19.8	В		10.2	В		22.3	С
	EB	Т	0.22	12.5	В	0.17	17.3	В	0	0	0
44th Street & Vanderbilt Ave.	NB	Т	0.27	3.8	A	0.27	2.2	A	0.22	10.4	В
		Int.		9.2	Α		10.7	В		8.4	A
12th Street & Vandarbilt Ava	WB	T	0.35	16.7	B	0.22	25.3	C	0.41	28.3	C
43th Street & Vanderbilt Ave.	NB	 Int	0.28	8.9	A	0.28	19.6	A	0.23	8	A
	FB	нц. 1 Т	0.72	580.3	F	0.44	Q 1	Δ	0.36	24.0 28.1	
	WB	TR	0.61	311.4	F	0.61	249.1	F	0.50	113.4	F
42nd Street & Vanderbilt Ave.		R	0.56	37.2	D	0.56	33.2	C	0.46	28	C
		Int.		443.4	F		138.1	F		77.8	E
	EB	LT	0.35	17.1	В	0.45	6.1	А	0.44	14.3	В
		R2	0.06	14.4	В	0.15	5.5	А	0.16	12.7	В
46th Street & Park Overpass NB	NB	TR	0.59	20.5	С	0.72	23.6	С	0.85	29	С
	SB	LTR	0.52	31.7	С	0.48	34.1	С	0.64	63	E
		R	0.16	14.9	B	0.19	15.2	B	0.27	16.1	B
		Int.	0.07	19.4	В	0.00	17.0	В		23.7	C
	EB		0.67	5/6./		0.39	39.8	D	0.3	/6./ 25.4	E
	WB		0.65	36.6		0.30	125.0	С F	0.29	0.4 0.5	
42nd Street & Park Ave	NB		0.03	20.1	C	0.03	25.8	C	0.5	9.J 18.4	B
		R	0.23	21.2	C	0.37	26.3	C	0.46	20.7	C
		Int.		265.5	F		82.3	F		32.2	С
	EB	Т	0.39	1.5	Α	0.35	35.6	D	0.41	1.6	Α
41st Street & Park Ave	NB	Т	0.08	7	Α	0	0	0	0.17	6	Α
	SB	Т	0.43	59.3	E	0.27	24.2	С	0.16	29.9	С
		Int.		28.2	С		30.2	C		8.7	Α
	EB	LTR	0.88	15.4	B	0.52	16.7	B	0.69	13.2	B
40th Street & Park Ave	NB		0.75	19	В	0.41	12.5	В	0.57	14.9	В
	30	Int	0.02	15.5	B	0.04	15.9	B	0.56	10.2	B
	EB	TR	0.3	9.3	A	0.34	4.6	A	0.38	11.1	B
46th Street & Lexington Ave.	SB	LT	0.41	14.7	B	0.79	23.7	C	0.34	11.4	B
		Int.		13.4	В		20.1	С		11.3	В
	WB	Т	0.3	<u>17.</u> 5	В	0.14	<u>35.</u> 6	D	0.82	<u>43.</u> 8	D
45th Street & Lexington Ave.	SB	Т	0.42	8	A	0.72	2.6	A	0.42	9.4	A
		Int.		10.6	В		5.8	Α		19.9	В
	WB	LT	0.6	15.6	B	0.25	11.5	B	0.42	21.3	C
43th Street & Lexington Ave.	SB	 m4	0.51	8.5	A	0.66	16.3	В	0.68	303.1	
	EB	TD	0.00	11.3	В	0.69	1 3.4	В	0.59	220./	
	WB		0.09	23 41.2		0.00	36.4		0.58	20.1	C
42nd Street & Lexington Ave.	SB		0.68	8.8	A	0.63	1.8	A	0.65	148	F
		Int.	0.00	20.8	Ċ	0.00	18.0	B	5.00	95.0	F
	EB	Т	0.43	4.9	А	0.37	12.5	В	0.43	5.1	А
41st Street & Lexington Ave.	SB	Т	0.67	5.3	Α	0.51	3.4	Α	0.5	4.9	Α
		Int.		5.2	Α		4.7	Α		4.9	Α
	EB	TR	0.94	47.4	D	0.45	31.5	С	0.69	34.3	С
40th Street & Lexington Ave.	SB	LT	0.57	6.7	A	0.44	12.3	В	0.43	4.2	A
		Int.		20.0	В		17.0	В		14.1	В

		Lane	Morr	ning Peak	Hour	Mid	day Peak I	Hour	Ever	ing Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	EB	L	0.51	50.5	D	0.95	77.2	E	0.36	47.2	D
46th Street & 3rd Ave		Т	0.17	21	С	0.23	14.6	В	0.16	20.6	С
	NB	TR	0.44	0.4	A	0.95	10.9	В	0.62	0.7	A
		Int.	0.45	6.8	A	0.40	15.8	В	0.04	4.4	A
45th Street & 3rd Ave	WB		0.15	0.3	A	0.19	0.6	A	0.24	8.5	A
45th Sheet & Sid Ave.	IND	LI Int	0.49	1.2	A A	0.92	35.8		0.05	36 36	Α Δ
	FB	T	0.31	9.1	A	0.56	23.8	C	0 44	35.1	
44th Street & 3rd Ave.	NB	TR	0.01	40.5	D	0.88	79.8	Ē	0.84	79	E
		Int.	•	37.9	D	0.00	73.5	E	0.01	74.5	E
	WB	Т	0.52	29.8	С	0.42	28.1	С	0.23	18	В
43th Street & 3rd Ave.	NB	LT	0.76	7.7	Α	0.76	10.8	В	0.81	12.3	В
		Int.		11.6	В		13.0	В		12.7	В
	EB	LT	0.81	9.8	Α	0.3	5.2	Α	0.8	20.2	С
	WB	TR	0.63	34.3	С	0.59	36	D	0.47	28.2	С
42nd Street & 3rd Ave.		R	0.62	42.5	D	0.57	42.9	D	0.49	34	С
	NB	LTR	0.9	13.9	В	0.9	12.4	В	0.92	15.8	В
		Int.	0.50	16.9	В	0.45	18.3	B	0.50	18.4	В
	EB		0.52	14.4	B	0.45	5.3	A	0.52	15.9	В
41st Street & 3rd Ave.			0.47	7.9	A 	0.31	0.2	A 	0.44	21.9	
		Int.	0.00	9.0 10.1	B	0.7	7.2	A A	0.72	8.8	Ā
	FB	I T	0.7	8.2	A	0.48	6.9	A	0.65	9.2	A
40th Street & 3rd Ave.	NB	TR	0.62	6.9	A	0.67	6.5	A	0.69	5.3	A
		Int.	0.01	7.2	A	0.01	6.6	A	0.00	6.2	A
	WB	TR	0.83	37.4	D	0.89	46.2	D	0.7	30.5	C
39th Street & 3rd Ave.	NB	LT	0.6	5.2	Α	0.64	5.9	Α	0.71	5.6	A
		Int.		11.7	В		14.1	В		9.4	Α
	EB	LT	0.64	29.9	С	0.94	53.6	D	0.95	53.9	D
38th Street & 3rd Ave.	NB	TR	0.58	11	В	0.6	9.9	Α	0.68	8.5	Α
		Int.		14.0	В		19.1	В		18.2	В
	WB	TR	0.9	38.1	D	0.87	31.7	С	0.77	30.3	C
37th Street & 3rd Ave.		R	0.87	47.4	D	0.84	40.6	D	0.75	37.6	D
	NB	LI	0.44	12.3	В	0.48	12.8	В	0.58	13.9	В
	ED	TD	0.42	23.4		0.56	22.0		0.5	20.0	
	SB		0.43	12.2	B	0.30	10.0	B	0.5	11 3	B
46th Street & 2nd. Ave	00	T	0.42	16	B	0.04	13.7	B	0.00	15.2	B
		Int.	0.0	17.6	B	•	17.3	B	0.1.0	17.5	B
	WB	Т	0.21	14.7	В	0.26	18.1	В	0.25	15.8	В
45th Street & 2nd. Ave	SB	Т	0.78	2.9	Α	0.71	4	А	0.79	5.7	А
		Int.		3.5	Α		5.1	Α		6.4	Α
	EB	TR	0.84	39.9	D	0.47	30.5	С	0.83	37.2	D
44th Street & 2nd. Ave	SB	LT	0.81	2.6	A	0.74	2	A	0.79	1.8	A
		Int.		6.5	Α		3.9	Α		5.4	Α
	WB	LT	0.63	30.5	C	0.53	27.7	C	0.34	23.9	C
43th Street & 2nd. Ave	SB	IR Int	0.88	7.9	A	0.79	5.4	A	0.88	8.5	A
		INT.	0.60	10.1	_∧	0.50	1.4	A	0.65	9.2	A
			0.00	9.8 74	A E	0.52	12.2	B	0.05	13.2	В
42nd Street & 2nd Ave		L T	0.33	/4 1⊿	R	0.30	10.0	R	0.49	20.0 Q 2	Δ
	SB	LTR	0.91	7.9	A	0.84	6	A	0.86	6.3	A
	-	Int.		11.3	В		7.6	Α		8.0	Α
	EB	TR	0.42	15.5	В	0.29	16.2	В	0.36	16	В
41st Street & 2nd. Ave	SB	LTR	0.82	7.4	А	0.73	4.9	А	0.79	7.4	А
		Int.		8.0	Α		5.5	Α		7.9	Α
	EB	TR	0.72	27.3	С	0.45	22.4	С	0.68	27.1	С
40th Street & 2nd. Ave	SB	LT	0.39	5.2	Α	0.18	2.4	Α	0.25	2.8	A
		T	0.71	7.1	A	0.67	6	A	0.8	9.6	A
		Int.	0.00	11.5	B	0.42	8.5	A	0.50	12.8	В
30th Street & and Ave	NAR MR		0.66	30.4	C A	0.46	27.5	C	0.58	24.5	
	30	1 K Int	0.74	2.ð	A •	0.71	3.Z	A •	0.84	4.1 6.1	A
	1			0.5		1	0.0			0.1	I ~

		Lane	Mor	ning Peak	Hour	Mid	day Peak I	Hour	Ever	ing Peak	Hour
Intersection	Approach	Group	V/C	Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS
	EB	TR	0.71	39.5	D	0.86	51.9	D	0.94	55.2	E
38th Street & 2nd Ave	SB	LT	0.23	1.8	Α	0.14	1.3	A	0.15	1.1	Α
		Т	0.64	1.5	A	0.63	1.8	A	0.76	1.8	A
		Int.		7.2	A		10.9	В		10.8	В
	WB	LT	0.48	43.9	D	0.64	40.8	D	0.23	33.6	C
37th Street & 2nd. Ave	SB	T	0.68	2.3	A	0.68	3	A	0.82	3.8	A
		Int.		9.6	A		11.3	В		6.1	A
47th Street & 1st Ave	NB	LT	0.72	10.8	В	0.57	10.6	В	0.66	9.5	A
		Int.		10.8	B		10.6	В		9.5	A
ACthe Chronet 9 dat Aug	EB		0.3	21.6	C	0.29	16.7	В	0.27	24.5	C
46th Street & 1st Ave	NB		0.58	1	A	0.44	0.6	A	0.54	0.9	A
	ND	Int.	0.04	4.7	A	0.50	4.1	A	0.04	5 .1	A
45th Street & 1st Ave	NB	LI	0.64	5.2	A	0.52	0.0	A	0.61	5.8	A
		Int.	0.42	3.2	A	0.47	0.0	A	0.50	5.6	A
14th Street & 1st Ave			0.43	25.2		0.47	29		0.53	20.9	
4411 Sileer & TSI AVE	IND	Int	0.57	0.0 3.2	A 	0.43	0.4	A A	0.52	0.5	A •
	ND		0.57	3.2		0.42	4.5	A D	0.52	4.0	A
43th Street & 1st Ave	IND	Int	0.57	12.3	B	0.43	13.0	B	0.52	9.4	
	EB	1	0.84	60.1		0.04	72.8		0.48	34.2	<u> </u>
	ED		0.04	10.1 10.6		0.94	/12.0		0.40	 /0_1	
	W/B	TR	0.67	20.0	C	0.00	20.7	C	0.07	25.1	C
#VALUE!	110	R	0.07	41		0.00	37.5	D	0.38	27.4	C C
	NB	I TR	0.44	27	A	0.00	2.6	A	0.00	27	A
		Int.	••••	22.1	C	0.20	26.1	C	••••	17.7	B
	EB	L	0.29	17.3	В	0.26	18.5	В	0.2	17.5	В
	WB	R	0.14	20.8	С	0.11	20.4	С	0.13	20.6	С
41st Street & 1st Ave	NB	TR	0.84	19.7	В	0.57	9.5	А	0.88	18.6	В
		Int.		19.6	В		10.3	В		18.6	В
	EB	L	0.75	26.3	С	0.33	19.8	В	0.54	22	С
40th Street & 1st Ave	NB	Т	0.62	2	Α	0.48	0.7	Α	0.73	2.5	Α
		Int.		8.2	Α		3.8	Α		5.9	Α
	WB	Т	0.28	22.4	С	0.26	22.2	С	0.16	20.9	С
39th Street & 1st Ave	NB	LT	0.67	1.6	А	0.51	0.5	Α	0.8	1.1	Α
		Int.		2.9	Α		2.1	Α		1.7	Α
	EB	Т	0.4	16.1	В	0.4	10.7	В	0.43	10.9	В
38th Street & 1st Ave	NB	Т	0.62	1.1	A	0.51	0.9	A	0.79	1.5	A
		Int.		3.5	A		2.8	Α	<u> </u>	2.8	A
	WB	Т	0.34	22.3	С	0.34	22.3	С	0.12	20	В
37th Street & 1st Ave.	NB	LT	0.67	15.3	В	0.6	14.3	В	0.82	18.9	B
		Int.	0.00	16.2	B	0 = 1	15.4	В		18.9	В
	EB	T -	0.28	33.1	C	0.51	38.6	D	0.32	36.2	D
	WB	T ,	0.7	21.4	C	0.47	23	C	0.67	21.9	C -
42nd Street & Dyer Ave.	NB		0.6	182.2		0.41	33.3	C F	0.45	66.7	
-	CD		0.59	1/3.2		0.40	67		0.44	01.0	
	30	Int.	0.01	106.9	F	0.03	38.6	D	0.14	41.7	D

2010 No Build LOS Analysis

Sam Schwartz PLLC Vision 42 Summary Report No Build AM and PM Peak Signalized Intersection

						AM Pe	eak			PM Peak						
Intersection	Dir	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
	EB	R	0	0.00	0.0	0	0	0.0	0	31	0.10	35.6		0	35.0	D
	NB	I R	2407	0.77	130.0	F	804 0	130.0	F	3654 214	1.04	119.7 119.7	F	~981	119.7	F
46th Street & 12th Ave	0.0	L	127	0.50	78.6	E	122	000.0	-	134	0.79	51.9	D	115	044 7	-
	5B	Т	3466	0.99	298.0	F	1391	290.0	F	3499	1.00	217.8	F	~630	211.7	F
	Inte	rsection			222.8	F						163.7	F			
	NIM/	Т	2273	0.68	34.4	С	154	34.4	C	3718	1.03	224.2	F	~1045	224.2	E
	INVV	R	333	0.68	34.4	С	0	34.4	U	373	1.03	224.2	F	0	224.2	
44th Street & 12th Ave	NF	L	191	0.52	77.0	E	153	4.5	А	311	0.84	149.5	F	231	13.8	в
		Т	3275	0.57	0.3	A	0			3219	0.57	0.7	A	231	.0.0	
	Inte	rsection			17.4	В						125.2	F			
	14/5	L	94	0.27	53.7	D	66			36	0.11	35.2	D	24	07.4	
	WB		10	0.35	56.2	E	83	55.0	D	0	0.23	37.6	D	49	37.1	D
		R	07	0.30	54.9 155.9	D E	100			70	0.24	37.7		50		
43nd Street & 12th Ave.	NW	L 	97 2401	0.57	3.2		00	8.9	Α	3052	1.00	12.9		~357	43.3	D
		т Т	2491	0.57	36.6	A	90			3183	0.98	42.0		~357		
	NE	R	5	0.07	8.8	Δ	2	36.6	D	36	0.06	18.2	B	20	51.8	D
	Inte	rsection		0.01	25.4	C	2			50	0.00	46.8	D	20		
			187	0.29	48.6	D	85			179	0.22	33.1	C	59		
	WB	R	453	0.74	39.8	D	382	42.4	D	497	0.92	84.7	F	388	71.0	E
		Т	2135	0.62	7.1	A	55			3520	0.97	50.9	D	139		_
42st Street & 12th Ave.	NB	R	312	0.55	9.4	A	30	7.4	A	262	0.42	11.1	B	39	48.0	D
	0.0	Т	291	0.42	351.1	F	105	40.4	-	344	0.92	33.4	С	97	44.0	
	SB	R	3073	0.96	13.9	В	37	43.1	D	2875	0.93	11.8	В	144	14.2	в
	Inter	rsection			29.5	С						35.9	D			
	NB	Т	2444	0.79	286.6	F	627	286.6	F	3775	1.00	109.2	F	~627	109.2	F
41st Street & 12th Ave.	SB	Т	3260	0.97	19.2	В	75	19.2	В	3054	0.90	5.8	Α	57	5.8	A
	Inte	rsection			135.9	F						63.0	E			
	EB	L	36	0.12	49.0	D	0	49.0	D	36	0.09	34.0	С	0	34.0	С
	NB	L	92	1.08	152.8	F	~111	49.9	D	41	0.50	75.7	E	32	73.0	F
39st Street & 12th Ave.		Т	2511	0.73	46.1	D	664	10.0		3849	0.97	72.9	E	846	10.0	_
	SB	Т	3108	0.98	205.8	F	1075	205.8	F	2968	0.99	84.8	F	473	84.8	F
	Inte	rsection			133.0	F						78.0	E			
	WB	L	374	0.80	67.4	E	235	60.7	E	280	1.08	66.4	E	272	63.7	Е
		R	413	0.78	52.0	D	331			737	0.89	59.3	E	328		
34th Street & 12th Ave	NB		2190	0.71	27.3	C	491	26.8	С	2935	0.82	23.5		537	22.9	C
			J10 //12	0.40	23.7	E	202			315	1.13	136.0	B E	~145		
	SB	T	2737	0.82	31		11	10.5	В	2756	0.90	37.4	D	799	47.0	D
	Inte	rsection	2101	0.02	23.0	C				2100	0.00	39.2	D	100		
		L	72	0.40	17.3	B	0			98	0.61	19.1	B	0		
	WB	T	138	0.40	17.3	B	38	17.3	В	196	0.61	19.1	B	53	19.1	В
		R	67	0.40	17.3	B	0			124	0.61	19.1	B	0		
47th Otre at 0 44th Ave	ND	L	30	0.26	8.0	А	3	0.7		35	0.44	21.0	С	5	0.0	
4/III Street & THII Ave.	IND	Т	607	0.33	3.5	Α	34	3.7	A	880	0.47	5.7	Α	65	0.3	A
	eр	Т	1398	0.55	9.3	Α	160	0.2	۸	1622	0.64	10.6	В	204	10.4	D
	30	R	10	0.01	5.5	А	2	9.5	A	53	0.08	6.0	Α	12	10.4	D
	Inte	rsection			8.7	A						10.4	В			
		L	66	0.35	29.1	С	0			41	0.50	31.3	С	0		
	EB	Т	100	0.35	29.1	С	63	29.1	С	242	0.50	31.3	С	96	31.3	С
		R	73	0.35	29.1	С	0			65	0.50	31.3	С	0		
46th Street & 11th Ave.	NB	T	571	0.34	2.7	A	40	2.7	А	874	0.48	4.3	A	33	4.3	А
		R	51	0.34	2.7	A	0			24	0.48	4.3	A	0		· ·
	SB		88	0.24	2.4	A	3	2.6	А	37	0.15	2.1	A	2	3.7	А
	Into	I	1382	0.52	2.1	A	16			1683	0.63	3./	A	23		
	inte	13001011		1	5.4	A	1	1	1		1	7.1	A		1	1

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

			AM Peak				PM Peak									
							Average						1 101 1 0	Average		
Intersection	Dir	ection			Delav		Queue	Approach	Approach			Delav		Queue	Approach	Approach
			Volume	v/c Ratio	(sec)	LOS	Length	Delay	LOS	Volume	v/c Ratio	(sec)	LOS	Length	Delay	LOS
							(ft)	(sec)						(ft)	(sec)	
		L	181	0.48	26.5	С	0			141	0.27	28.0	С	0		
	WB	T	164	0.48	26.5	C	103	26.5	С	18	0.27	28.0	C	56	28.0	С
		R	121	0.48	20.5		0			99 70	0.27	28.0	C B	0		
45th Street & 11th Ave.	NB	T	501	0.30	1.0	A	17	1.8	A	799	0.97	11.5	B	217	11.5	В
	0.0	T	1383	0.55	3.7	A	18			1686	0.67	4.8	A	16		
	5B	R	72	0.10	1.4	Α	2	3.6	A	62	0.09	1.1	Α	2	4.7	A
	Inte	rsection			7.6	Α						8.8	Α			
		L	87	0.76	38.6	D	0			315	0.99	65.2	E	0	05.0	_
	EB		308	0.76	38.6	D	157	38.6	D	269	0.99	65.2	E	221	65.2	E
		R T	438	0.76	30.0		35			545	0.99	05.2 7.6		106		
44th Street & 11th Ave.	NB	R	42	0.26	4.2	A	0	4.2	A	43	0.32	7.6	A	0	7.6	A
	CD.	L	150	0.35	5.6	A	12		^	31	0.08	2.2	A	2	5.0	
	90	Т	1404	0.52	5.5	Α	40	5.5	A	1807	0.67	5.6	А	35	5.0	A
	Inte	rsection			12	В						19.1	В			
		L	123	0.38	38.7	D	76	07.0		125	0.40	40.4	D	76	40.4	
	WB		1/0	0.42	37.5		86	37.9	D	132	0.95	44.3	D	133	43.4	D
			24	0.42	19.7	B	0			59	0.95	22.2	C	0		
43th Street & 11th Ave.	NB	T	378	0.27	19.7	B	125	19.7	В	313	0.88	22.2	C	117	22.2	С
	0.0	T	1523	0.57	2.3	Ā	36			1873	0.71	4.6	Ā	24	4.0	
	5B	R	10	0.57	2.3	Α	0	2.3	A	34	0.71	4.6	А	0	4.6	A
	Inte	rsection			11.4	В						14.3	В			
		L	186	1.00	93.8	F	112			142	0.92	81.5	F	82		
	EB	T	261	0.50	23.4	C	117	43.0	D	278	0.56	24.6	C	136	36.4	D
-		R	180	0.50	23.4		103			264	0.56	24.0		123		
	WB	T	517	0.59	28.2	C C	247	28.0	С	576	0.66	37.5	D	308	37.5	D
42th Street & 11th Ave.		R	216	0.59	28.2	C	0		-	230	0.66	37.5	D	0		_
		L	93	0.62	12.8	В	0			68	0.74	14.0	В	0		
	SB	Т	1435	0.62	12.8	В	110	12.8	В	1836	0.74	14.0	В	72	14.0	В
	Inte	R	118	0.62	12.8	B	0			94	0.74	14.0	B	0		
	Inte W/B	rsection	151	0.27	23.4	C	21	27.2	C	151	0.27	24.7	C	50	10.0	B
41th Street & 11th Ave	SB	T	1836	0.27	19	Δ	12	1.9	A	2344	0.27	29	 Д	18	2.9	A
	Inte	rsection		0.00	3.8	A				2011	0.10	3.9	A			
	NB	R	484	0.26	5.5	А	33	5.5	Α	466	0.25	4.0	А	20	4.0	Α
40th Street & 11th Ave.	SB	L	783	0.30	3.3	Α	16	47	А	1007	0.39	2.8	Α	19	4.3	Α
		T	1204	0.45	5.7	A	26		~	1488	0.55	5.3	A	30		
	Inte	rsection	211	0.60	4.9	A	206			107	0.01	4.3	A	67		
	WB	R	109	0.02	20.8	C	206	28.0	С	71	0.21	32.9	C	07 44	32.4	С
39th Street & 11th Ave.	NB	Т	375	0.17	1.6	A	1	1.6	Α	395	0.10	2.2	A	23	2.2	Α
	SB	Т	1204	0.53	5.3	Α	17	5.3	Α	1488	0.65	4.9	Α	26	4.9	Α
	Inte	rsection			9.4	Α						6.7	Α			
	WB	T	201	0.41	25.4	C	97	24.9	С	299	0.61	30.4	C	158	28.6	С
47th Street & 10th Ave		ĸ	129	0.32	24.2		61			88 110	0.22	22.6	C	40		
47 III Sueel & Tour Ave.	NB	T	2085	0.63	2.2	A 	11	2.2	A	2896	0.00	26.9	C	13	26.9	С
	Inte	rsection	2000	0.00	5.2	A				2000	0.00	27.1	C	10		
	FD	L	67	0.14	22.0	С	32	24.4	0	43	0.09	27.1	С	27	25.0	D
	ED	Т	172	0.34	25.4	С	95	24.4	C	260	0.51	36.3	D	172	35.0	U
46th Street & 10th Ave	NB	Т	2094	0.78	3.9	A	11	3.9	А	2972	1.07	54.2	D	~632	50.9	D
		R	284	0.51	3.7	A	6			194	0.35	2.9	A	6		_
	me	T	357	0.30	5.8 21.6	A	67			197	0.33	49.5 20.0	D C	40		
	WB	R	63	0.30	21.0	C.	0	21.6	С	129	0.23	20.9	C C	-+9 0	20.9	С
45th Street & 10th Ave.		L	109	0.72	3.2	Ă	0 0	2.0		71	0.92	10.4	B	0	10.4	
	NB	Т	2315	0.72	3.2	Α	20	3.2	A	3037	0.92	10.4	В	17	10.4	В
	Inte	rsection			5.9	А						11.3	В			
	EB	L	121	0.26	12.8	В	48	18.3	в	65	0.14	7.4	Α	9	10.3	в
11th Street & 10th Ave		T	379	0.67	20.1	C	201		_	278	0.47	10.9	В	68		
ידיוו טווכבו מ וטנוו אעפ.	NB	P	2303	0.84	0.0	A	14	8.0	Α	3043	0.97	ວວ.∠ 3 ∩		38 7	52.8	D
	Inte	rsection	203	0.07	9.7	A	-			140	0.20	48.6	D	1	-	

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

	Direction		AM Peak								PM Peak							
Intersection			Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS		
	WB	Т	286	0.35	17.7	В	104	17.7	В	337	0.54	22.2	С	166	22.2	С		
	5	R	91	0.35	17.7	В	0		-	223	0.54	22.2	C _	0		Ŭ		
43th Street & 10th Ave.	NB		109	0.82	16.5	В	0	16.5	В	195	1.03	60.2	E	0	60.2	E		
	Inte	I	2421	0.82	16.5	B	337			2965	1.03	60.2 54.5	E	~529	<u> </u>			
	inte		77	0.64	57.7	F	Q			35	0.52	36.2		7				
	EB	<u> </u>	277	0.57	19.2	B	35	23.4	С	311	0.34	12.6	B	32	15.0	В		
	14/5	T	655	1.00	49.3	D	~298	40 -	_	819	1.02	50.8	D	~309	50.4			
42th Street & 10th Ave	WB	R	558	0.93	51.0	D	195	49.7	D	432	0.97	60.3	E	185	53.1	D		
42th Street & Toth Ave.		L	258	0.32	6.2	А	28			231	0.29	5.1	Α	17				
	NB	Т	1895	0.56	5.8	Α	66	5.8	Α	2693	0.78	42.0	D	49	39.2	D		
	-	R	97	0.56	5.8	Α	0			84	0.78	42.0	D	0				
	Inte	rsection			21.4	С						41.1	D					
	WB	T	437	0.22	9.8	A	47	12.1	В	382	0.19	16.3	B	86	22.4	С		
41th Street & 10th Ave		R	657	0.62	13.7	В	119			619	0.59	26.2	C	231				
4 IIII Sileel & Tulli Ave.	NB	L 	190	0.44	5.5	A	9	4.1	А	187	0.43	8.1	A	22	53.9	D		
	Inte	rsection	1593	0.66	3.9	A	15			2389	0.99	57.5	E	62				
	inte		41	0.22	5.9	A 	0			53	0.16	40.1	Δ	0				
	EB	T	273	0.22	5.9	A	50	5.9	A	182	0.10	3.1	A	14	3.1	A		
40th Street & 10th Ave.		T	1748	0.22	13.2	B	137			2523	1.00	98.5	F	~221				
	NB	R	173	0.81	13.2	B	0	13.2	В	200	1.00	98.5	F	0	98.5	F		
	Inte	rsection		0.01	12.1	B	Ű			200		90.7	F					
39th Street & 10th Ave.		Т	286	0.25	38.2	D	88	20.0	D	200	0.18	32.1	C	54	00.0	0		
	WB	R	155	0.31	40.4	D	93	39.0	D	93	0.19	32.8	С	48	32.3	C		
	ND	L	158	0.73	4.9	Α	0	4.9	٨	762	1.06	132.9	F	0	132.0	-		
	IND	Т	1766	0.73	4.9	А	26		~	2630	1.06	132.9	F	~641	132.9	r		
	Inte	rsection			11.3	В						124.7	F					
	EB	L	98	0.22	10.6	В	24	10.8	в	265	0.37	14.8	В	52	14.1	в		
		Т	382	0.41	10.8	В	52		_	245	0.38	13.8	В	57		_		
38th Street & 10th Ave.	NB	T	1826	0.77	4.4	A	45	4.4	А	3127	1.00	90.5	F	~123	90.5	F		
	Into	R	348	0.77	4.4	A	0			168	1.00	90.5	F	0				
	Inte	TSection	161	0.61	5.5	A	170			200	- 1.09	80.0	E	- 428				
	WB	I D	145	0.01	20.3		0	28.3	С	200	1.09	04.4 91.4		~420	84.4	F		
37th Street & 10th Ave			140	0.01	18.4	B	0			143	1.09	66.1	F	0				
	NB	<u>-</u> Т	2029	0.77	18.4	B	287	18.4	В	2890	1.00	66.1	E	~616	66.1	E		
	Inte	rsection	2020	0.11	19.6	B	201			2000	1.00	69.1	E	010		+ +		
	14/10	Т	565	0.55	29.9	C	190	29.9	2	907	0.79	19.4	В	159	10.4	В		
	WB	R	82	0.55	29.9	С	0		С	35	0.79	19.4	В	0	19.4			
41st Street & Dyer Ave.		L	571	0.96	239.2	F	287	267.6	E	42	0.09	22.0	С	16	47.0	D		
	IND	Т	898	0.97	279.7	F	338	207.0	F	696	0.65	48.8	D	157	47.2	D		
	Inte	rsection			194.4	F						31.6	С					
	FB	L	53	0.37	12.6	В	0	12.6	в	112	0.48	19.4	В	0	19.4	в		
40th Street & Dyer	20	Т	393	0.37	12.6	В	58			270	0.48	19.4	В	72		5		
Ave.	NB	T	1416	0.49	0.6	A	0	0.8	0.8 A	626	0.40	9.1	A	100	9.6	А		
-	R		915	0.47	1.5	A	0			576	0.42	10.9	B	96				
	Inte	rsection	E10	0.54	2.7	A	74			070	0.44	11.9	В	50				
44th Street & 9th Ave.	EB		510	0.54	16.3	B	74	16.3	В	2/3	0.44	15.0	B	53	15.0	В		
		R	237	0.54	20.0	B	0			150	0.44	20.8	Б	0				
	SB	<u> </u>	2131	0.78	20.0	B	279	20.0	В	2203	0.80	20.0	C	203	20.8	С		
	Intersection		2101	0.70	19.3	B	215			2235	0.00	19.9	B	200				
	==	Т	580	0.62	24.0	C	137			338	0.56	25.7	Č	93				
	EB WB	R	185	0.62	30.7	C	78	25.5 30.2	c c	264	0.49	37.8	D	52	28.3	С		
		L	96	0.66	30.2	С	0			132	0.70	32.6	С	0	32.6	0		
42th Street & 9th Ave		Т	597	0.66	30.2	С	146			586	0.70	32.6	С	158	32.0	U U		
4∠ui Sueet & 9th AVê.		L	198	0.93	16.7	В	0			104	1.02	38.1	D	0	38.1			
	SB	Т	1893	0.93	16.7	В	62	16.7	В	2188	1.02	38.1	D	~73		D		
		R	80	0.93	16.7	В	0			93	1.02	38.1	D	0				
I	Inte	reaction			21.2			1	1			25.4				1		

intersection
Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

	Direction		AM Peak								PM Peak							
Intersection							Average	Approach Delay Approa				_		Average	Approach			
			Volume	v/c Ratio	Delay	1.05	Queue		Approach	Volume	v/c Ratio	Delay	1.05	Queue	Delay	Approach		
			volume	w/c rtatio	(sec)	200	Length	(sec)	LOS	r olamo	v/c rtatio	(sec)	200	Length	(sec)	LOS		
		т	1006	1.07	70.2	E	(ft)	()		744	0.70	27.7	D	(ft)	()			
40th Street & 9th Ave.	EB	R	302	1.07	79.2 82.0	F	~362	79.9	E	102	0.79	29.0	D C	240 51	36.6	D		
		L	252	0.58	141.4	F	0		_	140	0.32	470.6	F	0		_		
	SB	T	1669	0.58	141.4	F	298	141.4	F	2476	0.77	470.6	F	419	470.6	F		
	Inte	rsection			116.5	F						364.5	F					
	WB	Т	105	0.21	22.3	С	47	22.0	С	292	0.64	31.3	С	166	31.9	С		
		R	56	0.14	21.5	C	25		, °	263	0.63	32.7	C	132	01.0	Ů		
47th Street & 8th Ave.	NB	L	116	0.25	3.3	A	7	3.5	Α	118	0.27	3.6	A	8	12.2	В		
	Inte	I	1655	0.60	3.5	A	25			1999	0.91	12.7	B	465				
			120	0.52	25.8	C	0			166	0.65	28.6	C	0				
	EB	T	382	0.52	25.8	C	128	25.8	С	454	0.65	28.6	C	168	28.6	С		
46th Street & 8th Ave.	ND	Т	1651	0.55	4.8	A	44	5.2	۸	1951	0.71	5.7	Α	58	6.2	^		
	IND	R	315	0.54	8.2	Α	0	- J.Z	~	234	0.62	9.9	Α	27	0.2	A		
	Inte	rsection			9.4	A						11.1	В					
	WB	T	293	0.66	18.4	B	193	18.4	В	286	0.71	21.7	C	212	21.8	С		
45th Street & 8th Ave		R	2/8	0.65	18.5	B	152			309	0.08	21.9		164				
45th Stieet & oth Ave.	NB	T	1688	0.64	2.1	A 	21	2.1	Α	1876	0.71	2.0	Α Δ	29	2.8	A		
	Inte	rsection	1000	0.04	6.0	A	21			1070	0.71	7.2	A	25				
	ED	L	112	0.80	20.6	С	0	00.0	0	148	0.47	12.3	В	0	40.0			
44th Street & 8th Ave.	EB	Т	650	0.80	20.6	С	107	20.6	C	276	0.47	12.3	В	56	12.3	в		
	NB	Т	1684	0.61	3.9	Α	40	4.0	Δ	1841	0.67	3.6	Α	38	3.6	Δ		
		R	121	0.26	4.0	A	11	-1.0	~	106	0.33	4.4	Α	8	0.0	~		
43th Street & 8th Ave.	Intersection		000	0.40	8.9	A	1.10			000	0.50	5.2	A	405				
	WB		233	0.46	27.8	0	142	27.8	С	330	0.53	30.6	C	185	30.6	С		
		R	207	0.46	27.0		0			193	0.55	22		0				
	NB	T	1598	0.56	1.0	A	11	1.6	A	1754	0.65	2.2	A	14	2.2	A		
	Inte	rsection		0.00	6.9	A					0.00	8.3	A					
	FB	L	24	0.87	41.2	D	0	41.2	р	49	0.49	25.9	С	0	25.9	C		
	LD	Т	754	0.87	41.2	D	247	41.2		393	0.49	25.9	С	120	- 20.0	C		
	WB	T	652	0.83	16.2	B	109	15.6	в	632	0.80	21.5	С	158	20.9	С		
42th Street & 8th Ave.		R	52	0.24	7.5	A	3			52	0.26	13.2	В	10				
	NB	 Т	41	0.82	0.0	A	50	18.1	в	1825	0.95	18.2	B	75	17.6	в		
	ND	R	340	1.05	64 1	F	~47			135	0.55	9.1 A 18	18	- 17.0				
	Inte	rsection	0.10		22.7	C				100	0.01	19.5	В					
	W/B	Т	258	0.39	9.2	Α	70	0.2	٨	678	0.69	15.1	В	165	15 1	в		
	VVD	R	204	0.39	9.2	Α	0	9.2	~	224	0.69	15.1	В	0	15.1	Ь		
41th Street & 8th Ave.	NB	L	136	0.88	7.2	A	0	7.2	А	302	1.15	23.3	С	0	23.3	С		
	Into	T	1811	0.88	7.2	A	8			1822	1.15	23.3	C	~25				
	FB	T	1258	0.90	7.0 27.0	A	434	27.9	C	884	0.64	20.9	C C	284	24.2	C		
40th Street & 8th Ave.		Ť	1947	0.89	13.0	B	54		-	2124	0.92	18.0	B	158		-		
	NB	R	206	0.89	13.0	B	0	13.0	В	144	0.92	18.0	В	0	18	В		
	Intersection				18.5	В						19.7	В					
39th Street & 8th Ave.	WB	Т	365	0.61	22.6	С	152	22.6	С	275	0.62	21.8	С	157	21.8	С		
		R	286	0.61	22.6	C	0		-	371	0.62	21.8	C	0	*	-		
	NB	L	107	0.73	10.8	B	0	10.8	В	164	0.78	10.1	В	0	10.1	В		
	Inte	I	1867	0.73	10.8	В	98			1897	0.78	10.1	B	50				
38th Street & 8th Ave.			400	0.86	25.5	C	0			269	0.54	10.9	B	0		_		
	EB	T	581	0.86	25.5	Č	193	25.5	С	369	0.54	10.9	B	94	10.9	В		
		Т	1574	0.78	9.3	A	52	0.2		1792	0.93	15.8	В	60	15.0	P		
	IND	R	264	0.78	9.3	А	0	9.0	A	339	0.93	15.8	В	0	10.0	P		
	Inte	rsection			14.9	B	1.5.1		L			14.6	В					
	WB	Ť	377	0.58	31.2	C	191	31.2	С	538	0.75	36.1	D	262	36.1	D		
37th Street & 8th Ave		ĸ	225	0.58	31.Z	С Р	0			239	0.75	30.1		0				
o, in outcel à our AVE.	NB	Т	1613	0.74	19.0	B	242	19.6	В	1892	0.82	23.1	C C	294	23.1	С		
	Inte	rsection	1010	5.17	22.5	C	L7L	1	t	1002	0.02	26.7	č	207		1		

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

	Direction		AM Poak								PM Poak							
			 				Average					1		Average	Ι.			
Intersection					Delay		Average	Approach Delay	Approach		1	Delav		Average	Approach Delay	Approach		
			Volume	v/c Ratio		LOS	Length			Volume	v/c Ratio	(sec)	LOS	Length				
					(360)		(ft)	(sec)	103			(360)		(ft)	(sec)	L03		
44th Street & 7th Ave.		т	569	0.68	33.4	C	238			264	0.31	24.7	C	(II) C 93				
	EB	R	122	0.68	33.4	C	238	32.6	С	50	0.01	24.7	C	93	24.8	С		
		R2	80	0.23	26.1	C	52		-	68	0.22	25.4	C	40		Ŭ		
		L	207	0.73	26.5	C	154			233	0.54	8.5	Ă	114	4			
	SB	Т	1306	0.73	26.5	С	154	42.8	D	878 1563	0.54	8.5	Α	114 13.5	В			
		R	1745	0.83	57.0	E	178				0.75	17.0	В	164	1			
	Inte	rsection			40.9	D						14.9	В					
	EB	Т	945	0.81	52.2	D	85	52.2	D	432	0.37	21.3	С	0	21.3	С		
42th Street &	WB	L	76	0.95	59.0	E	0	59.0	E	58	0.59	5.2	A	0	5.2	А		
		T	608	0.95	59.0	E	241		_	521	0.59	5.2	A	17	•			
Broadway.	0.0	L	175	0.79	158.9	- F	0	450.0	-	51	0.56	24.3	C	0	04.0	0		
	5B		1240	0.79	158.9		355	158.9	F	982	0.56	24.3	C	119	24.3	C		
	Inte	rsection	/4	0.79	104.6	Г Б	0			52	0.50	18.4	B	0				
	inte	T	1111	0.95	59.1	F	296			817	0.70	10.4	B	97				
	EB	R	114	0.38	16.7	B	30	55.1	E	159	0.53	16.9	B	37	19.1	В		
40th Street &			145	0.60	3.5	A	0			66	0.00	1.5	A	0				
Broadway.	SB	T	1095	0.61	3.5	A	23	3.5	A	836	0.44	1.5	A	6	1.5	A		
	Inte	rsection			29.1	С						10.7	В					
	FD	Т	914	1.08	82.0	F	~376	00.0	F	396	0.56	21.4	С	91	21.4	C C		
	ED	R	180	1.08	82.0	F	0	02.0	Г	132	0.56	21.4	С	0	21.4	C		
	WB	Т	682	0.62	15.5	В	26	15.5	В	573	0.52	5.8	Α	18	5.8	A		
42th Street & 7th Ave.		L	31	0.64	195.3	F	0			36	0.63	159.1	F	0				
	SB	Т	1649	0.64	195.3	F	324	195.3	F	1459	0.63	159.1	F	296	159.1	F		
		R	22	0.64	195.3	F	0			111	0.63	159.1	F	0		├		
	Inte	rsection	1000		124.4	F	100					99.8	F	100				
40th Street & 7th Ave	EB		1022	0.84	20.3	C	182	20.3	С	896	1.01	42.6	D	~188	42.6	D		
		R	202	0.04	20.3		0			430	0.62	42.0		0				
40th Street & Ath Ave.	SB	 Т	203	0.70	6.1	A 	17	6.1	Α	1247	0.03	2.5	A	7	2.5	A		
	Inte	rsection	1420	0.70	12.1	B	17			1247	0.05	2.5	C C	'				
44th Street & 6th Ave.			194	0.84	34.7	C	0			222	0.58	16.4	B	0				
	EB	T	582	0.84	34.7	C	246	34.7	С	275	0.58	16.4	B	90	16.4	В		
		T	2130	0.77	5.7	A	62	1 . ·		1750	0.72	292.6	F	350	270.7	_		
	NB	R	224	0.61	9.8	Α	25	6.1	A	298	0.69	46.3	D	135	270.7	ſ		
	Inte	rsection			13.2	В						221	F					
	EB	L	6	0.99	42.1	D	0	42.1	р	33	0.41	34.5	С	0	34.5	C		
	LD	Т	1114	0.99	42.1	D	375	42.1	D	450	0.41	34.5	С	125	54.5	C		
	WB	Т	633	0.71	52.4	D	278	52 7	D	528	0.61	2.1	Α	0	28	Δ		
42th Street & 6th Ave.	110	R	296	0.66	54.1	D	136	02.1	D	304	0.53	6.0	A	0	2.0	~		
		L	51	0.64	2.2	A	0	2.2		51 0 1670 0	0.60	124.4	F	0 300 124.4		_		
	NB	T	2034	0.64	2.2	A	9		A		0.60	124.4	F		124.4	F		
	Into	R	61	0.64	2.2	A	0			68	0.60	124.4		0				
	IIILE	ISECIION	240	0.05	23.9	C C	0			204	0.60	78.2	E	0				
	EB	т	007	0.95	23.1	C	205	23.1	С	204	0.00	20.0	C	210	28.8	С		
40th Street & 6th Ave.		T	2123	0.95	23.1	Δ	54	•		1846	0.00	251.2	F	350				
	NB	R	133	0.28	4.6	A	13	8.6	A	196	0.59	27.6	Ċ	146	229.7	F		
	Inte	rsection			13.8	B		1	1			169.1	F		1			
44th Street & 5th Ave.	ED	Т	412	0.85	31.4	С	189	31 /	C	315	0.57	20.1	С	137	20.1	C		
	ED	R	394	0.85	31.4	С	0	31.4	U U	258	0.57	20.1	С	0	20.1	U U		
	SB	L	250	0.61	22.8	С	120	36.1	р	150	0.43	18.3	В	63	25.9	C		
	00	Т	1903	0.96	37.9	D	416	00.1	D	1764	0.89	26.6	С	361	20.0	Ŭ		
	Intersection				34.8	С						24.6	С					
42th Street & 5th Ave.	EB	T	1165	0.94	30.4	C	135	30.4	С	558	0.45	34.3	C	183	34.3	С		
	WB	R	10	0.94	30.4	C	0	58.5		6	0.45	34.3	C	0		<u> </u>		
		<u></u> Т	020	0.98	58 5	E	0		E	0 802	0.83	42.0		U 315	42.6	D		
	SB	T	929	0.90	208.0	F	401	208.9	F	2022	0.83	42.0		60	8.0	Δ		
	Intersection		22.51	0.00	129.4	F		_00.0		2022	0.00	21.2	ĉ		0.0			
46th Street & Madison Ave			197	0.51	22.2	C	0	00.0	_	31	0.48	21.6	č	0	01.0			
	EB	T	362	0.51	22.2	Č	133	22.2	С	509	0.48	21.6	Č	127	21.6	С		
	ND	Т	1683	0.85	11.8	В	381	110	-	1448	1.00	46.5	D	491	44.0			
	NB	R	110	0.22	2.1	Α	4	11.2	в	73	0.13	0.5	A	0	44.3	U		
	Intersection				13.8	В						38.3	D					
	FR	L	429	0.64	32.6	С	0	32.6	C	330	0.47	34.4	С	0	34.4	C		
44th Street & Madison		Т	233	0.64	32.6	С	216	52.0	Ŭ	135	0.47	34.4	C	151	04.4	Ŭ		
Ave.	NB	Т	1364	0.52	1.9	Α	6	1.8	А	1191	0.82	9.0	A	187	8.9	А		
		R	78	0.15	1.1	A	1			26	0.06	0.2	A	0	0.0			
	Intersection				11.5	В	1	1	1	1	1	15.9	В	1	1	1		

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Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
						AM Pe	ak						PM Pe	ak		
							Average							Average		
Intersection	Dir	ection	Maluma	ula Datia	Delay	1.00	Queue	Approach	Approach	\/_l	ula Datia	Delay	1.00	Queue	Approach	Approach
			volume	V/C Ratio	(sec)	LOS	Length	Delay	LOS	volume	v/c Ratio	(sec)	LOS	Length	Delay	LOS
							(ft)	(Sec)						(ft)	(SEC)	
	EB	L	7	0.98	520.3	F	0	520.3	F	10	0.48	30.2	С	0	30.2	С
		T	1158	0.98	520.3	F	416	200.0	-	548	0.48	30.2	C	199	014.0	-
42nd Street & Madison	VVD		916	0.80	289.9	F	326	209.9	г	818	0.72	214.9	F	290	214.9	г
Ave.	NB	T	1435	0.50	1.7		0	1.7	А	1209	0.59	1.7	Δ	0	1.7	А
		R	9	0.56	1.7	A	0			146	0.59	1.7	A	0		
	Inte	rsection			246.4	F						69.4	Е			
		L	10	0.38	18.0	В	0			0	0.00	0.0	0	0		
	EB	Т	390	0.38	18.0	В	80	18.0	В	582	0.45	17.6	В	79	17.6	В
ACth Ctract 9		R	72	0.38	18.0	B	0			0	0.00	0.0	0	0		
Vanderbilt Ave	NB		513	0.78	76.4	E	218	76.4	E	122	0.28	4.8	A	33	4.8	Α
vanderbiit Ave.		R I	31	0.78	18.6	B	0			43	0.28	4.0	B	0		
	SB	T	174	0.38	18.6	B	81	18.6	В	176	0.27	16.5	B	68	16.5	В
	Inte	rsection			43.8	D						15.1	В			
	FB	L	12	0.79	668.9	F	0	668.9	F	13	0.47	31.8	С	0	31.8	C
42nd Street &	LD	Т	1155	0.79	668.9	F	416	000.0		681	0.47	31.8	С	203	51.0	Ŭ
Vanderbilt Ave.	WB	T	916	0.68	355.2	F	305	325.1	F	818	0.58	67.0	E	26	62.1	Е
	Into	R	177	0.63	40.8	<u>D</u>	64			139	0.56	14.5	В	5	-	
	IIILE		145	0.37	16.0	F	0			210	0.47	49.1	D	0		
	EB	T	265	0.37	16.9	B	57	16.7	в	336	0.47	20.3	C C	86	20.1	С
		R	28	0.06	14.0	B	7		_	88	0.17	18.3	B	26		-
46th Street & Park	ND	Т	788	0.61	20.8	С	187	20.0	C	1126	0.88	31.0	С	323	21.0	C
Overpass NB	IND	R	5	0.61	20.8	С	0	20.0	C	8	0.88	31.0	С	0	31.0	C
	SB	L	77	0.55	34.9	С	0	21.0	С	45	0.28	16.2	В	0	26.7	С
	Into	R	178	0.55	34.9	<u>C</u>	34	-	_	244	0.28	16.2	B	50	-	
	me	T	027	0.72	19.6	<u> </u>	264			551	0.4	27.0	C	2		
	EB	R	318	0.72	63.8	F	132	570.1	F	130	0.38	4.7	A A	1	1.7	A
	14/15	L	17	0.72	118.8	F	0	440.0	-	11	0.61	16.2	B	0	40.0	
42nd Street & Park Ave	WB	Т	1045	0.72	118.8	F	194	118.8	F	897	0.61	16.2	В	281	16.2	В
	NB	L	48	0.27	21.0	С	27	21.3	С	60	0.46	38.2	D	109	37.9	D
		R	95	0.24	22.1	С	13	21.0	Ŭ	202	0.4	37.2	D	72	07.0	
	Inte	rsection	50	0.04	333.9	F	0			50	0.77	14.0	В	0		
	FB	L T	50 753	0.94	18.4	B	108	18.4	в	59	0.77	13.0	B	0 117	13.6	в
	LD	R	197	0.94	18.4	B	0	10.4	D	167	0.77	13.6	B	0	10.0	D
40th Street & Park Ave	ND	Т	989	0.79	20.6	C	282	00.0	0	712	0.61	15.5	B	176	45.5	
	NB	R	178	0.79	20.6	С	0	20.6	C	154	0.61	15.5	В	0	15.5	В
	SB	Т	1037	0.66	12.8	В	134	12.8	В	963	0.61	17.0	В	157	17.0	В
	Inte	rsection	074	0.04	17.4	B				000	0.40	15.5	B	54		
	EB		274	0.31	9.4	A	38	9.4	Α	368	0.46	13.2	B	51	13.2	В
46th Street & Lexington	-	rt 	102	0.31	9.4 14.8	B	0			82	0.40	11.2	B	0	<u> </u>	
Ave.	SB	T	970	0.42	14.8	B	115	14.8	В	917	0.35	11.5	B	93	11.5	В
	Inte	rsection			13.5	В						12.0	В			
	EB	Т	691	0.95	27.9	С	333	27.9	С	614	0.74	37.5	D	268	37.5	P
		R	241	0.95	27.9	C	0		, in the second	139	0.74	37.5	D	0		
12nd Street & Levington	WB	L	11	0.92	46.1	D	0	46.1	D	8	0.72	38.1	D	0	38.1	D
Ave			909 124	0.92	40.1		0			245	0.72	183.6	F	239		
,	SB	T	1569	0.72	9.9	A	131	9.9	А	1239	0.69	183.6	F	307	183.6	F
		R	93	0.72	9.9	A	0			142	0.69	183.6	F	0		
	Inte	rsection			24.0	С						113.0	F			
	EB	Т	610	1.00	57.9	E	~236	57.9	E	579	0.77	37.7	D	169	37.7	P
40th Street & Lexington		R	321	1.00	57.9	E	0			160	0.77	37.7	D	0		<u> </u>
Ave.	SB	L - T	117	0.59	7.4	A	0	7.4	Α	123	0.45	5.3	A	0	5.3	А
	Inte	rsection	1704	0.59	24.2	<u>А</u> С	04			1203	0.40	16.4	B	30		
		L	147	0.53	51.1	D	96	00.0	C	96	0.38	49.3	D	63	00.0	6
	EB	Т	229	0.18	21.1	Ċ	60	32.9	С	354	0.24	23.6	C	106	29.2	C
46th Street & 3rd Ave.	NR	Т	1388	0.46	0.9	А	4	0.9	Δ	1947	0.61	2.0	А	12	20	Δ
		R	135	0.46	0.9	Α	0	0.0	^	147	0.61	2.0	Α	0	2.0	
	Inte	rsection		1	72	Δ		1				68	Δ		1	1

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

						AM Pe	ak						PM Pe	ak		
	1			1		/	Average	Ι	r – –		1			Average		r d
Intersection	Dire	ection	Volumo	v/o Dotio	Delay	1.08	Queue	Approach	Approach	Volumo	v/o Dotio	Delay	1.08	Queue	Approacn	Approach
	l		volume	V/C Ralio	(sec)	103	Length	(sec)	LOS	volume	V/C Ralio	(sec)	L03	Length	(sec)	LOS
	<u> </u>						(ft)	(360)						(ft)	(360)	
	EB	L	234	0.87	12.3	В	0	12.3	в	277	1.03	49.7	D	0	49.7	D
		T	581	0.87	12.3	В	43		-	582	1.03	49.7	D	~95		_
	WB		600	0.71	37.1	D	158	38.7	D	521	0.61	33.6	C	132	34.6	С
42th Street & 3rd Ave.		ĸ	380	0.00	44.0		264			253	0.00	39.U		0		
	NB	Т	2169	0.97	41.1 22.9	C C	454	26.1	С	2575	1.04	54.0	D	~503	54.6	п
		R	105	0.98	22.9	ç		20.1	Š	160	1.04	54.6	D	0	01.0	
	Inter	rsection			25.6	C	-					50.8	D	-		
	ED	L	394	0.76	8.5	Α	0	0 5	٨	272	0.72	10.0	В	0	10.0	Б
	ED	Т	333	0.76	8.5	Α	45	0.0	А	430	0.72	10.0	В	47	10.0	D
40th Street & 3rd Ave.	NB	Т	1951	0.64	6.9	Α	34	69	Δ	2424	0.79	6.8	Α	30	6.8	Δ
		R	151	0.64	6.9	A	0	0.0	~	159	0.79	6.8	A	0	0.0	~
	Inter	rsection			7.3	A						7.5	A			
	EB	Ť	203	0.45	34.7	C	100	34.7	С	192	0.63	41.6	D	153	41.6	D
A6th Street & 2nd Ave		ĸ	161	0.45	34.7	C	U			309	0.63	41.6	D	U 01		
40ui Sueel a zha. Avo	SB	L T	240 2831	0.43	12.5	В	336	16.5	В	2865	0.37	17.5	В	01 343	17.2	В
	Inter	rsection	2001	0.00	18.5	B	330			2005	0.04	20.6	C	343		
		T	494	0.69	10.0	A	75			474	0.78	12.9	В	155		
	EB	R	192	0.69	10.0	A	0	10.0	A	268	0.78	12.9	В	0	12.9	В
		L	143	1.01	91.2	F	~94	20.2	C	91	0.72	41.2	D	15	12.7	ь
42nd Street & 2nd Ave	VVD	Т	550	0.48	13.1	В	78	29.2	C	439	0.39	8.0	Α	37	13.7	D
42110 Stiect & 2110. Ave		L	197	0.94	12.3	В	0			350	0.96	31.4	С	0		
	SB	Т	2363	0.94	12.3	В	32	12.3	В	2593	0.96	31.4	С	53	31.4	С
		R	198	0.94	12.3	В	0			204	0.96	31.4	С	0		
	Inter	rsection	540	0.70	14.7	В	240			110	0.70	26.1	C	000		
	EB		549	0.76	28.6	C	213	28.6	С	412	0.70	28.4	C	203	28.4	С
40th Street & 2nd Ave		Γ. I	205	0.70	20.0 4.2		Q Q			240 125	0.70	20.4		6		
Four ouroot of End. 7.00	SB	Т	2330	0.40	6.2		74	6.1	A	2799	0.20	28.2	Ĉ	303	27.1	С
	Inter	rsection	2000	0.14	11.0	B	14			2100	0.00	27.4	č	000		
		T	291	0.75	40.7	D	262	40.7	5	430	0.78	46.3	D	280	40.0	5
	EB	R	126	0.75	40.7	D	0	40.7	U	395	0.78	46.3	D	0	40.3	U
38th Street & 2nd. Ave	SB	L	137	0.24	1.8	A	3	16	Δ	137	0.24	2.0	A	3	26	Δ
	55	Т	2212	0.66	1.5	Α	0	1.0	~	2772	0.83	2.6	Α	14	2.0	~
	Inter	rsection			7.5	Α			_			12.1	В			
43th Street & 1st Ave	NB	T	1980	0.59	12.1	В	130	12.1	В	1813	0.54	9.5	A	106	9.5	A
	Inter	rsection	057	4.00	12.1	В	. 00			220	0.60	9.5	A	64		
	EB	 Т	207	0.80	69.4 50.2	Г	~90	65.1	E	220	0.60	30.5		04	78.3	E
		T	434	0.60	31.7	D C	209			596 404	0.52	94.3 26.4	Г С	~421		
	WB	R	458	0.75	43.0	D	137	34.7	С	225	0.32	30.1	C	73	27.2	С
42nd Street & 1st Ave		L	269	0.46	1.9	A	0			126	0.43	3.4	Ă	0		
	NB	Т	1265	0.46	1.9	A	7	1.9	А	1360	0.43	3.4	A	19	3.4	А
		R	31	0.46	1.9	Α	0	1		20	0.43	3.4	Α	0		
	Inter	rsection			24.8	С						28.9	С			
	EB	L	754	0.78	27.6	С	235	27.6	С	537	0.56	23	С	161	23	С
40th Street & 1st Ave	NB	Т	2163	0.64	3.7	Α	6	3.7	A	2541	0.75	2.4	Α	4	2.4	A
	Inter	rsection			9.9	Α			_			6.0	A			_
	EB	T	374	0.46	36.5	D	120	36.5	D	395	0.48	35.9	D	126	35.9	D
42nd Street & Dyre Ave	WB	1	6//	0.82	25.2	C	164	25.Z	ι L	679	0.83	25.5	C	1/1	25.5	ι L
	ND	L	526	0.62	209.8		343	205.4	E	463	0.46	89.1		1/2	95 1	E
	IND	P	00 301	0.62	200.6	F	309	200.4	F	207	0.45	00.0 80.8	Г Г	101	05.1	F
	SB	R	10	0.02	200.0	Γ Δ	2	6.6	Δ	109	0.43	7.6	Γ Δ	25	7.6	Δ
		reaction	10	0.01	112 7		2	0.0		105	0.14	40.4		25	7.0	~

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

2010 Build LOS Analysis

Sam Schwartz PLLC Vision 42 Summary Report 2010 Build AM and PM Peak Signalized Intersection

						AM Pe	eak						PM Pe	ak		
Intersection	Dire	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
	EB	R	0	0	0	0	0	0	0	31	0.1	35.6	D	0	35.6	D
	NB	Т	2300	0.77	131.4	F	798	131.4	F	3647	1.07	107.5	F	~1022	107.5	F
46th Street & 12th Ave		R	207	0.77	131.4	F	0			298	1.07	107.5	F	0		
	SB	L	213	0.85	246	F	218	226.9	F	246	1.45	240.5	F	~282	205.9	F
	Into	I	3135	0.9	225.6	- F	1258			3320	0.95	203.3	- F	479		
	IIILE		0176	0.7	185.3		227			2712	4.07	153.7	A	1100		
	NW	I R	487	0.7	12.7	B	237	12.7	В	515	1.07	254	F	~1123	254	F
44th Street & 12th Ave			337	0.91	311.9	F	325			497	1.35	368.5	F	~545		
	NE	T	2916	0.51	0.3	A	0	32.5	С	2983	0.52	0.5	A	~545	53	D
	Inte	rsection			23.6	C						161.9	F			
		L	94	0.29	49.6	D	86			94	0.28	38.5	D	66		
	WB	Т	21	0.49	72.5	Е	136	61.9	E	0	0.46	43.2	D	103	41.7	D
		R	232	0.41	59.4	E	112			264	0.44	42.5	D	98		
43nd Street & 12th Ave	NW	L	91	0.94	161.6	F	103	92	Δ	69	0.42	78.3	E	60	48.2	п
	1400	Т	2326	0.56	3.3	Α	62	5.2	~	3894	0.99	47.6	D	525	40.2	
	NE	Т	3068	0.87	46.2	D	1003	46.1	D	3137	0.96	40.6	D	0	40.3	D
		R	5	0.01	15	B	2	-		36	0.06	18.1	В	20		
	Inte	rsection	0075	0.00	31.8	C	00	7.6	٨	0.470	0.00	44.6	D	400	60.4	-
12st Street & 12th Ave	NB		2275	0.66	7.6	A	62	7.6	A	3478	0.96	62.1	E	128	02.1	
4231 30 661 & 1201 AVE.	Job	R rsection	2940	0.92	9	A	112	9	A	2690	0.94	12.3	D	149	12.3	Б
	NB	Т	2275	0.73	264.8	F	561	264.8	F	3717	0.99	100.2	F	535	100.2	F
41st Street & 12th Ave.	SB	Ť	3112	0.93	6	A	28	6	A	3063	0.9	6.2	A	34	6.2	A
	Inte	rsection	0112	0.00	117.3	F	20			0000	0.0	57.7	E	04	0.2	
	ND	L	86	1	139	F	95	47.0		41	0.5	76	E	32	05	F
20at Streat 9 10th Ave	NB	Т	2338	0.68	44.5	D	605	47.8	D	3790	0.96	64.8	E	824	65	E
Sast Street & 12th Ave.	SB	Т	2970	0.94	195.3	F	952	195.3	F	2978	0.99	86.3	F	493	86.3	F
	Inte	rsection			127.9	F						74.5	E			
	WB	L	352	0.75	64.7	E	219	57.7	F	277	1.07	64.8	E	268	62.2	F
		R	389	0.74	48.5	D	304	01.1	_	728	0.88	57.8	E	321	02.2	
	NB	T	2049	0.67	26	С	442	25.7	С	2894	0.81	23.1	С	523	22.5	С
34th Street & 12th Ave.		R	325	0.47	24	C	208	-	_	196	0.28	14.6	В	81	-	-
	SB	L	420	0.88	62.4	E	244	10.5	В	345	1.24	1/4./	+	~171	51.4	D
	Into	I	2571	0.77	2	A	9			2719	0.89	30.8	D	/8/		
	inte		81	0.45	20.4	C	0			108	0.67	40.7	C	0		
	WB	T	154	0.45	20.4	C	55	20.4	С	215	0.67	22	C	71	22	С
		R	75	0.45	20.4	c	0		Ŭ	136	0.67	22	c	0		Ű
		L	31	0.24	5.9	Ă	3			42	0.51	25.7	C	7		
47th Street & 11th Ave.	NB	Т	608	0.33	3	Α	32	3.1	A	1009	0.54	6.8	A	90	7.6	A
	0.0	Т	1308	0.52	8.9	A	144			1599	0.63	10.4	В	199	10.0	
	5B	R	10	0.01	5.5	Α	2	8.9	A	52	0.07	5.9	Α	11	10.3	в
	Inte	rsection			8.8	Α						11.1	В			
		L	81	0.6	33.4	С	0			49	0.77	38.9	D	0		
	EB	Т	246	0.6	33.4	С	119	33.4	С	415	0.77	38.9	D	163	38.9	D
		R	90	0.6	33.4	С	0			78	0.77	38.9	D	0		
46th Street & 11th Ave.	NB	T	558	0.33	4.2	A	49	4.2	А	1002	0.55	7.5	A	80	7.5	А
46th Street & 11th Ave.	_	Ř	52	0.33	4.2	A	0			27	0.55	7.5	A	0		· ·
	SB	L	113	0.31	3.7	A	5	2.9	Α	59	0.29	4.1	A	2	3.7	Α
	Inte	I	1263	0.47	∠.ŏ	A	18			1037	0.61	3./ 10.7	A	25		
	inte	10000001		1	0.0	7		1	1			10.7	D			1

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
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							ak			[PM Pe	ak		
						/	Average				1			Average		1
Intersection	Dire	ection			Delav		Queue	Approach	Approach			Delav		Queue	Approach	Approach
			Volume	v/c Ratio	(sec)	LOS	Length	Delay	LOS	Volume	v/c Ratio	(sec)	LOS	Length	Delay	LOS
					. ,		(ft)	(sec)				. ,		(ft)	(sec)	
		L	171	0.45	27.7	С	0			139	0.27	29.4	С	0		
	WB	Т	154	0.45	27.7	С	95	27.7	С	18	0.27	29.4	С	54	29.4	С
		R	114	0.45	27.7	С	0			98	0.27	29.4	С	0		
45th Street & 11th Ave.	NB	L	11	0.3	3.6	A	0	3.6	А	82	1.09	21.5	С	0	21.5	С
		T	495	0.3	3.6	A	29			931	1.09	21.5	C	348	-	_
	SB	T	1284	0.51	4	A	22	3.9	А	1654	0.65	4.9	A	19	4.8	Α
	Into	R	69	0.1	1.7	A	3			61	0.09	1.2	A	2		
	IIIte	ISECIION	102	4.47	0.4	A E	0			267	1.44	12.0		0		
	FB	Т	560	1.17	121		~318	121	F	522	1.44	249.7	-	~140	249 7	F
	LD	R	152	1.17	121	F	~310	121		118	1.44	249.7	F	~449	245.7	
		T	416	0.25	82	A	74			637	0.37	11.2	B	172		
44th Street & 11th Ave.	NB	R	43	0.25	8.2	A	0	8.2	A	51	0.37	11.2	B	0	11.2	В
		L	194	0.44	7.7	A	16			68	0.2	3	Ā	4		
	SB	Т	1252	0.47	5.1	Α	36	5.4	A	1737	0.65	5.3	Α	34	5.2	A
	Inter	rsection			40.5	D						76.7	E			
		L	254	0.79	43.1	D	150			226	0.72	30.2	С	130		
	WB	Т	350	0.86	41.6	D	170	42	D	238	1.71	148.7	F	~309	120.8	F
		R	211	0.86	41.6	D	0			497	1.71	148.7	F	0		
43th Street & 11th Ave.	NB	L	19	0.2	6.5	A	0	6.5	А	53	0.28	7.2	A	0	72	Α
		Т	290	0.2	6.5	A	35	0.0		270	0.28	7.2	A	38		~
	SB	Т	1283	0.53	2.5	A	35	2.5	А	1730	0.7	5.1	A	29	5.1	А
		R	122	0.53	2.5	A	0			125	0.7	5.1	A	0		
	Intel	rsection	1110	0.50	15.7	В	100	40.7		1050	0.00	40.7	D		40.4	
42th Street & 11th Ave.	SB	I	1410	0.52	13.7	В	109	13.7	В	1853	0.68	13.4	В	83	13.4	В
	W/R	ISECIION	250	0.62	13.7	D	100	38.6	D	0	0	0.00	0	0	0	0
41th Street & 11th Ave	SB	 Т	350	0.02	30.0		100	17		2096	0.44	0	0	0	22	^
	Inte	rsection	1505	0.00	8.5	Δ	5	1.7		2000	0.77	0.44	0	0	2.2	
	NB	R	456	0.24	5.5	A	31	5.5	А	460	0.25	4	Ă	7	4	А
40th Ohrs at 0 44th Aus	0.0	L	709	0.27	5.6	A	31	7.0		943	0.36	1.3	A	7	0.5	
40th Street & 11th Ave.	SB	Т	1052	0.39	8.4	Α	108	7.2	A	1371	0.51	3.3	Α	10	2.5	A
	Inter	rsection			6.9	Α						2.8	Α			
	WB	L	293	0.58	29.5	С	193	27.3	C	106	0.21	32.1	С	64	31.8	C
	VVD	R	103	0.23	20.9	С	67	21.5	U	70	0.16	31.4	С	42	51.0	C
39th Street & 11th Ave.	NB	Т	353	0.16	1.6	A	1	1.6	A	390	0.17	2.2	A	23	2.2	A
	SB	Т	1052	0.46	2.4	A	1	2.4	A	1371	0.6	1.8	A	7	1.8	A
	Intel	rsection	100		7.7	A						4.6	A			
	WB	<u> </u>	189	0.38	25	C	91	24.5	С	295	0.6	30.1	C	156	28.4	С
47th Street & 10th Ave		R	121	0.3	23.9		00			87	0.21	22.5	С Г	40		
	NB	 Т	2159	0.67	2.0	A	15	2.8	A	2120	0.96	70.1		15	70.1	E
	Inte	rsection	2100	0.07	2.0	A	10			3129	0.90	65.8		15		
	inte		90	0.19	26.3	Ċ	51			55	0.12	25.7	C	35		
	EB	T	317	0.13	36.3	D	200	34.1	С	442	0.12	50.5	D	308	47.8	D
46th Street & 10th Ave		T	2202	0.82	3.9	A	11			3248	1.17	117.2	F	~719		
	NB	R	323	0.57	4.2	A	7	4	A	236	0.42	2.8	A	7	109.2	F
	Inter	rsection	020	0.01	8.2	A				200	0.12	101.4	F			
		Т	357	0.3	21.6	С	67	04.0	<u> </u>	187	0.23	20.9	C	49	20.0	0
	WB	R	63	0.3	21.6	С	0	21.6	C	129	0.23	20.9	С	0	20.9	C
45th Street & 10th Ave.	ND	L	161	0.78	4.4	A	0	4.4		121	1.03	55.4	E	0	5E 4	
	INB	Т	2465	0.78	4.4	А	25	4.4	А	3356	1.03	55.4	E	~41	55.4	-
	Inter	rsection			6.8	А						52.5	D			
44th Street & 10th Ave.	FB	L	155	0.33	11.6	В	52	69.4	F	94	0.2	6.8	Α	13	17	в
		Т	636	1.12	83.4	F	~486	03.4		538	0.92	18.9	В	347		U
	NB	Т	2483	0.9	33.5	С	14	30.6	C	3390	1.08	156.2	F	~735	147 4	F
		R	264	0.47	3.1	Α	6	00.0	, J	201	0.36	3.6	Α	9		
	Inter	rsection		1	39.2	D	1	1	1		1	127.8	F	1	1	

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						AM Pe	eak						PM Pe	ak		
Intersection	Dir	ection			Delay		Average	Approach	Annragah			Delay		Average	Approach	Annraach
Intersection	Dir	COUCH	Volume	v/c Ratio	(sec)	LOS	Length	Delay (sec)	LOS	Volume	v/c Ratio	(sec)	LOS	Length	Delay (sec)	LOS
		Т	284	0.35	17.1	В	98			347	0.56	22.2	С	166		
	WB	R	90	0.35	17.1	В	0	17.1	В	229	0.56	22.2	C	0	22.2	С
43th Street & 10th Ave.	ND	L	544	1.05	59	E	0	50	-	627	1.31	193.7	F	0	102.7	-
	IND	Т	2661	1.05	59	E	~541	- 59	E	3371	1.31	193.7	F	~780	195.7	- F
	Inte	rsection			54.6	D						172.1	F			
42th Street & 10th Ave	NB	Т	2629	0.74	18.2	В	290	18.2	В	3518	0.98	154.6	F	539	154.6	F
	Inte	rsection			18.2	В						154.6	F			
	WB	Т	427	0.21	7.1	A	32	49.6	D	394	0.2	11.3	В	58	71.5	Е
		R	1149	1.09	65.4	E	~455			1193	1.13	91.4	F	~497	-	
41th Street & 10th Ave.	NB	L	184	0.41	5.1	A	9	4	А	185	0.43	8	A	21	101.8	F
	Into	I	1483	0.62	3.8	A	14			2354	0.98	109.1		55		
	IIILE	ISECUUII	20	0.2	26.1		0			50	0.16	90.1	F	0		
	EB	L 	39	0.2	6.9	A	55	6.9	A	52 190	0.16	2.3	A	12	2.3	A
40th Street & 10th Ave		т Т	207	0.2	0.9	A	20			100	0.16	2.3	A E	207	-	
	NB	P	163	0.75	11.7	B	0	11.7	В	108	0.99	90.0	Г Б	207	90.8	F
	Inte	rsection	105	0.75	11.7	B	0			190	0.33	83.6	F	0		
		Т	275	0.24	40.2	D	87			203	0.18	12.5	B	34		
	WB	R	150	0.3	42.4	D	92	41	D	94	0.19	13.1	B	30	12.7	В
39th Street & 10th Ave.		L	149	0.68	4.5	Ā	0			753	1.04	120.4	F	0		-
	NB	Т	1647	0.68	4.5	Α	24	4.5	A	2592	1.04	120.4	F	~627	120.4	F
	Inte	rsection			11.5	В						111.4	F			
	FD	L	92	0.21	9.3	Α	21	0.5	٨	262	0.36	15.1	В	54	14.2	р
	ED	Т	360	0.38	9.6	Α	46	9.5	~	242	0.37	13.9	В	59	14.5	D
38th Street & 10th Ave.	ND	Т	1703	0.72	4.2	Α	42	4.2	٨	3083	0.99	79.8	Е	122	70.0	E
	ND	R	328	0.72	4.2	Α	0	4.2	~	166	0.99	79.8	E	0	79.0	L
	Inte	rsection			5.2	Α						70.7	E			
	WB	Т	151	0.57	27.8	С	160	27.8	С	198	1.07	80.2	F	~420	80.2	F
		R	137	0.57	27.8	C	0			400	1.07	80.2	F	0		
37th Street & 10th Ave.	NB	L	126	0.72	17.2	В	0	17.2	В	141	1.07	79.7	E	0	79.7	E
	Into		1894	0.72	17.2	В	256			2849	1.07	79.7	E	~600		
	Inte		500	0.50	18.5	В	176			006	0.70	10.7	E	171		
	WB	P	78	0.52	20	C	0	26	С	35	0.78	10.7	B	171	18.7	В
41st Street & Dver Ave			1035	1 13	311.8	F	~412			489	0.76	87.2	F	178		
4 lot officer a Dyel / We.	NB	Т	59	0.98	47.8		155	172.8	F	672	0.70	110.5	F	210	109.9	F
	Inte	rsection	- 55	0.50	120.2	F	100			012	0.11	0	0	210		
	==	L	50	0.34	12.4	B	0	10.1		111	0.48	23.4	Č	0		
40th Otre at 8 Dura	EB	Т	371	0.34	12.4	В	55	12.4	в	267	0.48	23.4	C	74	23.4	С
40th Street & Dyer	ND	Т	1289	0.52	0.6	Α	0			603	0.44	9.5	Α	111	40.7	
Ave.	NB	R	1232	0.56	2.3	Α	0	1	A	769	0.56	13.6	В	146	10.7	в
	Inte	rsection			2.6	Α						13.4	В			
	FB	Т	917	0.92	24.7	С	206	24.7	C	585	0.79	17.9	В	113	17 0	в
		R	94	0.92	24.7	С	0	24.7	U U	212	0.79	17.9	В	0	17.5	U U
44th Street & 9th Ave.	SB	L	330	0.72	18.5	В	0	18.5	в	213	0.78	20.3	С	0	20.3	С
		T	1824	0.72	18.5	В	241			2170	0.78	20.3	C	281		
	Inte	rsection	4070	0.77	20.5	C		0.0	٨	0000	0.04	19.7	В	60	20.0	
42th Street & 9th Ave.	3D Inte	I	1879	0.77	9.9	A	55	9.9	А	2293	0.94	20.8 20.9		°∠	20.0	U U
	111111111111111111111111111111111111111	13000001		1	9.9			1	1			∠∪.o			1	1

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

						AM Pe	ak						PM Pe	ak		
							Average							Average		
Intersection	Dir	ection	Volumo	v/a Datia	Delay	1.00	Queue	Approach	Approach	Valuma	v/a Datia	Delay	1.00	Queue	Approach	Approach
			volume	WC Ratio	(sec)	105	Length	(sec)	LOS	volume	V/C Ratio	(sec)	105	Length	(sec)	LOS
							(ft)	(360)						(ft)	(360)	
	EB	T	1234	1.31	176.1	F	~545	172.5	F	911	0.97	57.1	E	320	54.1	D
10th Street 9 Oth Ave		R	374	1.24	160.9	F	~318			127	0.4	32.5	C	70		
40th Street & 9th Ave.	SB		221	0.51	80.2		250	80.2	F	129	0.72	407.9		0	407.9	F
	Inte	rsection	1470	0.51	125.2	F	200			2307	0.72	302.2	F	360		
		Т	105	0.21	22.3	Ċ	47		_	292	0.63	31.3	C	165		
	WB	R	52	0.13	21.4	C	23	22	С	260	0.63	32.5	C	131	31.8	С
47th Street & 8th Ave.	NB	L	114	0.25	3.3	Α	7	3.5	٨	121	0.28	3.5	Α	8	13.6	в
	IND	Т	1595	0.58	3.5	Α	27	3.5	A	2043	0.93	14.2	В	485	13.0	D
	Inte	rsection			5.1	Α						17.3	В			
	EB	L	135	0.75	31.4	С	0	31.4	С	183	0.87	38.2	D	0	38.2	D
AOth Ohne at 9 Oth Aver		T	585	0.75	31.4	C	204	• • • •	-	644	0.87	38.2	D	248		_
46th Street & 8th Ave.	NB	I	1574	0.54	4.7	A	41	5.1	А	1981	0.72	5.9	A	58	6.1	А
	Inte	R	333	0.53	8	A	26			204	0.54	8.2	A	23		
	inte	Т	277	0.62	28.6	C	201			283	0.7	31.3	C	225		
	WB	R	262	0.61	29.4	C C	160	29	С	305	0.68	31.8	C	173	31.5	С
45th Street & 8th Ave.	NIE	L	105	0.62	2.5	Ă	0	0.5		115	0.71	3.6	Ā	0		
	NB	Т	1644	0.62	2.5	Α	29	2.5	A	1879	0.71	3.6	Α	44	3.6	A
	Inte	rsection			8.8	Α						10	А			
	FB	L	152	1.21	124.6	F	0	124.6	F	224	0.89	31	С	0	31	C
	LD	Т	994	1.21	124.6	F	~443	124.0		586	0.89	31	С	151	51	Ŭ
44th Street & 8th Ave.	NB	T	1597	0.59	3.6	A	35	4.2	А	1769	0.64	3.6	A	39	3.9	А
	Inte	R	297	0.59	7.4	A	23			179	0.55	7.8	A	16		
	Inte	TSECLION	224	0.44	49.5	D	104			260	0.57	11.9	В	107		
	WB	I P	224	0.44	27.1		134	27.1	С	360	0.57	30.3	C C	197	30.3	С
43th Street & 8th Ave.			126	0.44	1	Δ	0			212	0.57	15	Δ	0		
	NB	T	1699	0.6	1	A	3	1	A	1757	0.68	1.5	A	6	1.5	A
	Inte	rsection			5.9	A						7.9	A			
42th Street & 8th Ave	NB	Т	1773	0.86	9.8	Α	48	9.8	A	1883	0.91	13.7	В	71	13.7	В
	Inte	rsection			9.8	Α						13.7	В			
	WB	Т	250	0.38	9.4	A	72	9.4	А	711	0.72	16.3	В	181	16.3	в
		R	196	0.38	9.4	A	0			234	0.72	16.3	В	0		_
41th Street & 8th Ave.	NB	L	148	0.78	4.5	A	0	4.5	А	340	1.29	17.4	В	0	17.4	В
	Inte	I	1559	0.78	4.5	A	1			1662	1.29	17.4	В	20		
	EB	Т	1472	1.06	56	F	~554	56	E	1050	0.75	25.9	C.	350	25.9	С
40th Otherst 9, 0th 1		T	1708	0.91	12.2	B	51		_	2003	0.94	19.1	B	214		
40th Street & 8th Ave.	NB	R	294	0.91	12.2	В	0	12.2	в	242	0.94	19.1	В	0	19.1	в
	Inte	rsection			30.8	С						127.7	С			
	WB	Т	344	0.57	22.5	С	146	22.5	С	272	0.61	22.1	С	159	22.1	С
		R	270	0.57	22.5	С	0			367	0.61	22.1	С	0		
39th Street & 8th Ave.	NB	L	101	0.68	10	В	0	10	В	162	0.77	10	В	0	10	В
	Inte	T	1733	0.68	10	В	84			1879	0.77	10	В	49		
	Inte	rsection	277	0.01	13.1	В	0			266	0.52	12.9	В	0		
	EB		5/8	0.01	22.2	C	165	22.2	С	200	0.53	19	B	176	19	В
38th Street & 8th Ave		T	1456	0.01	87	Δ	48	-		1775	0.00	14.8	B	59	1	
	NB	R	249	0.73	8.7	A	0	8.7	A	335	0.92	14.8	В	0	14.8	В
37th Street & 8th Ave.	Inte	rsection			13.4	В	-	1				15.8	В	-		
	\//P	Т	355	0.55	30.4	С	180	30.4	C	532	0.74	35.7	D	258	35.7	Р
	VVD	R	212	0.55	30.4	С	0	30.4	C	236	0.74	35.7	D	0	33.7	
	NB	L	189	0.68	18.4	В	0	18.4	В	150	0.81	22.6	C	0	22.6	С
		T	1493	0.68	18.4	B	215		_	1874	0.81	22.6	C	288		
	. inte	13561011			1/14	- U						20.2	- U			

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						AM Pe	eak						PM Pe	ak		
Intersection	Dir	action					Average	Approach						Average	Approach	
Intersection		ection	Volume	v/c Ratio	Delay	LOS	Queue	Delay	Approach	Volume	v/c Ratio	Delay	LOS	Queue	Delay	Approach
					(sec)		(ff)	(sec)	105			(sec)		(ff)	(sec)	105
		Т	951	1.14	94.9	F	~472		1	528	0.62	29.5	С	204		
	EB	R	204	0.68	33.4	C	238	87.9	F	100	0.31	24.7	č	93	29.7	С
		R2	131	0.37	26.2	č	80			136	0.43	30.9	č	85		-
44th Street & 7th Ave.		L	297	0.73	26.5	С	154			326	0.54	8.5	A	114		1
	SB	Т	1012	0.63	11	В	118	28	С	645	0.47	8.2	Α	89	26.5	С
		R	1747	0.84	40.7	D	160			1631	0.78	37.4	D	156		
	Inter	rsection			45.7	D						27.2	С		2.0	
42th Street &	SB	T	1169	0.57	33.7	C	167	33.7	С	970	0.47	20	В	120	20	В
Broadway.	Inter	rsection	1071	4.00	33.7	C	474			006	0.77	20	В	114	1	┢────┤
	EB		12/1	0.43	119.5	F	~4/4	109.7	F	900	0.77	20.9		30	25.1	С
40th Street &		R I	130	0.43	32		0			65	0.30	13.7		39		┨────┦
Broadway.	SB		1028	0.57	3.2	Δ	21	3.2	A	825	0.43	1.3	Δ	5	1.3	А
	Inte	rsection	1020	0.57	61.4	E	21			020	0.45	14.4	B			
	SB	Т	1638	0.61	170.5	F	313	170.5	F	1517	0.56	123.1	F	238	123.1	F
42th Street & 7th Ave.	Inte	rsection			170.5	F		-				123.1	F		-	
		Т	1208	0.99	98.1	F	253	09.1	e e	1003	1.13	95.2	F	~535	05.0	
	EB	R	202	0.99	98.1	F	0	98.1	F	491	1.13	95.2	F	0	95.2	F
40th Street & 7th Ave.	SB	L	180	0.69	3.5	Α	0	3.5	Δ	74	0.57	2.2	Α	0	22	Δ
	30	Т	1248	0.69	3.5	Α	16	3.5	A	1141	0.57	2.2	Α	7	2.2	~
	Inter	rsection			50.5	D						53	D			
	FB	L	288	1.24	238.7	F	0	238.7	F	339	0.94	35.3	D	0	35.3	Го
		Т	860	1.24	238.7	F	~482	200		419	0.94	35.3	D	174	00.0	L
44th Street & 6th Ave.	NB	T	2065	0.75	5.2	A	45	5.7	А	1732	0.72	287	F	349	265.5	F
	Into	R	226	0.62	9.8	A	19	-		304	0.69	45.8	D	135		
	ND	TSECLION	2014	0.50	83.5		0	10	٨	1700	0.55	203.1		200	102.1	
42th Street & 6th Ave.	Inte	reaction	2014	0.59	1.0	A	0	1.0	~	1/20	0.55	103.1		200	103.1	F
	into		301	1.06	1.0		0			313	0.66	30.2	F C	0		
	EB	<u>г</u>	1016	1.00	40.5	D	~365	46.9	D	659	0.00	30.2	C	234	30.2	С
40th Street & 6th Ave.		T	1976	0.72	7.3	A	50	1		1799	0.00	234.2	F	339	1	
	NB	R	144	0.3	4.9	A	14	7.1	A	213	0.64	31	C	160	212.7	F
	Inte	rsection	<u> </u>	V	23	C					0.0.	153.2	F			
		Т	388	0.76	30.7	С	185	20.7	<u> </u>	311	0.57	18	В	140	10	
	ED	R	372	0.76	30.7	С	0	30.7	C	255	0.57	18	В	0	10	Б
44th Street & 5th Ave.	SB	L	246	0.6	22.4	С	117	30.7	C	155	0.44	18.6	В	66	26.1	C
	05	Т	1836	0.93	31.8	С	389	00.7	Š	1768	0.89	26.8	С	362	20.1	C
	Inte	rsection			30.7	С						24.3	С			
42th Street & 5th Ave.	SB	T	2298	0.99	209.2	F	491	209.2	F	2067	0.89	9.7	A	74	9.7	A
	Inter	rsection	045	0.50	209.2	F	0				0.50	9.7	A	0	1	
	EB		215	0.56	23.1	C	0	23.1	С	32	0.52	22.3	C	0	22.3	С
46th Street & Madison			400	0.56	23.1	C	151			554	0.52	22.3		141	-	
Ave	NB	R	101	0.00	12.2		394	11.6	В	1490 Q4	0.17	0.5		~540	55.3	E
	Inte	rsection	101	0.2		B	5			34	0.17	46.4		U		
			546	0.76	38.8	D	263			399	0.56	34.3	C	0		
44th Street & Madison Ave.	EB	Т	296	0.77	39.2	D	277	39	D	163	0.56	34.3	C	176	34.3	С
		T	1282	0.49	1.6	Ā	4			1209	0.83	9.8	Ă	156		l .
	NB	R	77	0.15	1	A	1	1.6	A	66	0.15	0.5	A	0	9.3	A
	Inte	rsection			15.9	В						17	В			+ +

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						AM Pe	eak						PM Pe	ak		
Intersection	Dire	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
42nd Street & Madison	NB	Т	1359	0.52	1.6	Α	0	1.6	A	1279	0.61	2.1	Α	0	2.1	A
Ave.	Inter	rsection			1.6	Α						2.1	Α			
		L	25	0.42	20.4	С	0			12	0.48	19.5	В	0		
	EB	Т	412	0.42	20.4	С	95	20.4	С	614	0.48	19.5	В	97	19.5	В
		R	79	0.42	20.4	С	0			0	0	0	0	0		
46th Street &	NB	Т	461	0.71	85.2	F	249	85.2	F	109	0.25	4.8	Α	36	4.8	Δ
Vanderbilt Ave.	ND	R	17	0.71	85.2	F	0	05.2		41	0.25	4.8	Α	0	4.0	~
	SB	L	30	0.34	17.7	В	0	177	в	7	0.27	16.5	В	0	16.5	в
	00	Т	169	0.34	17.7	В	77		D	174	0.27	16.5	В	67	10.0	5
	Inter	rsection			45.8	A						16.6	В			
		L	158	0.37	16.2	В	0			232	0.49	18.8	В	0		
	EB	Т	250	0.37	16.2	В	53	15.9	В	331	0.49	18.8	В	81	18.5	В
		R	38	0.08	13.6	В	9			103	0.19	17.1	В	28		
46th Street & Park	NB	Т	743	0.58	20.2	С	173	20.2	C	1113	0.87	30.2	С	316	30.2	C
Overpass NB	ND	R	5	0.58	20.2	С	0	20.2	Ŭ	8	0.87	30.2	С	0	00.2	Ŭ
	SB	L	73	0.48	28.9	С	0	19.1	в	44	0.27	16.2	В	48	25.7	C
	00	R	168	0.48	28.9	С	32	10.1	D	241	0.27	16.2	В	48	20.7	Ŭ
	Inter	rsection			18.7	В						25.8	С			
		L	53	0.98	22.1	С	0			61	0.8	14.5	В	0		
	EB	Т	785	0.98	22.1	С	125	22.1	С	609	0.8	14.5	В	127	14.5	В
		R	205	0.98	22.1	С	0			174	0.8	14.5	В	0		
40th Street & Park Ave	NB	Т	937	0.84	23	С	303	23	C	707	0.81	21.8	С	258	21.8	C
	ne -	R	259	0.84	23	С	0	20	Ŭ	349	0.81	21.8	С	0	21.0	Ŭ
	SB	Т	648	0.41	15.1	В	113	15.1	В	843	0.53	21.3	С	154	21.3	С
	Inter	rsection			20.9	С						19.4	В			
	EB	Т	258	0.29	9.9	A	35	9.9	А	364	0.46	13.4	В	49	13.4	в
46th Street & Lexington		R	69	0.29	9.9	A	0			79	0.46	13.4	В	0		_
Ave.	SB	L	155	0.42	14.8	В	0	14.8	В	155	0.36	11.6	В	0	11.6	В
		T	900	0.42	14.8	В	113			852	0.36	11.6	В	93		
40m d Otra at 9 L avria ata a	Inter	rsection	4504	0.50	13.6	B	445	0.0	•	1070	0.50	12.1	В	050	00.5	
42nd Street & Lexington	SB	l	1561	0.59	8.2	A	115	8.2	A	1373	0.52	89.5	F	256	89.5	F
Ave.	Inter	section	00.4	4.00	8.2	A	004			500	0.70	89.5	F	100		
	EB		624	1.03	62.2	E	~261	62.2	E	596	0.79	36.3	D	193	36.3	D
40th Street & Lexington		R	329	1.03	62.2	E	0			165	0.79	36.3	D	0		
Ave.	SB		132	0.51	5.9	A	0	5.9	А	187	0.48	2.5	A	0	2.5	Α
	- الم	l nantian	1436	0.51	5.9	A	43			1242	0.48	2.5	A	10		
	Inter	section			26.9	C						14	В			
	EB	L	148	0.53	47.6	D	95	29.8	С	105	0.41	46.8	D	68	26.8	С
46th Street & 3rd Ave.		 	230	0.18	18.2	В	52			387	0.26	21.1	C	104	4	
	NB		1199	0.4	1.2	A	6	1.2	А	1854	0.58	1.5	A	9	1.5	Α
	ler (R	129	0.4	1.2	A	0			155	0.58	1.5	A	0		
	Inter	rsection			7.5	A						6.5	A			

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						AM Pe	eak						PM Pe	ak		
Intersection	Dire	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
12th Street & 3rd Ave	NB	Т	2085	0.68	7.5	Α	55	7.5	A	2607	0.85	13.8	В	63	13.8	В
42th Street & Stu Ave.	Inter	rsection			7.5	Α						13.8	В			
	EB	L	417	0.87	10.6	В	0	10.6	р	306	0.81	14.7	В	0	14.7	В
	LD	Т	353	0.87	10.6	В	53	10.0	D	483	0.81	14.7	В	94	14.7	D
40th Street & 3rd Ave.	NB	Т	1781	0.59	6.7	Α	32	67	Δ	2332	0.77	6.6	Α	29	6.6	Δ
	ND	R	154	0.59	6.7	Α	0	0.7	А	172	0.77	6.6	Α	0	0.0	~
	Inter	rsection			7.8	A						8.5	A			
	EB	Т	205	0.45	34.5	С	104	34.5	С	210	0.86	42.7	D	173	42.7	D
	25	R	161	0.45	34.5	С	0	00	Ű	337	0.86	42.7	D	0		-
46th Street & 2nd. Ave	SB L Intersection	L	238	0.42	12.2	В	94	14.6	В	213	0.38	11.5	В	82	14.9	в
		Т	2568	0.75	14.8	В	278		_	2601	0.76	15.1	В	285		_
	Intersection SB T			16.9	В						19.4	В				
42nd Street & 2nd. Ave	SB T Intersection	2332	0.75	4.2	A	28	4.2	A	2683	0.76	4.9	A	32	4.9	A	
	Inte	rsection			4.2	A						4.9	A			
	EB	T	538	0.74	27	С	204	27	С	443	0.75	34.9	C	223	34.9	С
		R	178	0.74	27	C	0		_	267	0.75	34.9	C	0		_
40th Street & 2nd. Ave	SB	L	100	0.2	2.2	A	3	5.3	А	0	0	0	0	0	0	0
	Inte		2164	0.68	5.5	A	57			0		0	0	0		
	Intel		202	0.70	10.5	В	252			400	0.70	34.9		202		
	EB		202	0.72	39.5		252	39.5	D	433	0.70	40.1		202	46.1	D
38th Street & 2nd Ave		ĸ	121	0.72	39.5		2			126	0.76	40.1		0		
Jour Oucci & Zhu. Ave	SB	 Т	1057	0.22	1.4	A	10	1.5	Α	2650	0.24	2.1	A	15	2.3	A
	Inte	rsection	1957	0.59	7.6	Δ	12			2030	0.0	12.4	R	15		
	NB	Т	1719	0.51	9	Δ	87	9	Α	1742	0.52	6.9	A	60	6.9	А
43th Street & 1st Ave	Inte	rsection	1710	0.01	9	A	01			1744	0.02	6.9	A	00	0.0	
	WB	R	408	0.67	37.5	D	117	30.6	С	217	0.38	27.4	C	56	24.7	С
42nd Street & 1st Ave	NB	Т	1192	0.34	1.3	A	6	1.3	Ă	1344	0.38	2.1	Ā	6	2.1	A
	Inte	rsection			8.7	A	-					5.3	A	-		
	EB	L	711	0.74	27.1	С	230	27.1	С	531	0.55	23	С	178	23	С
40th Street & 1st Ave	NB	Т	2026	0.6	2.1	Α	5	2.1	А	2511	0.74	2.1	Α	4	2.1	А
	Inter	rsection			8.6	Α						5.8	Α			
42nd Street & Dure Ave	NB	Т	59	0.07	4.7	Α	9	4.7	А	60	0.07	3	Α	9	3	А
42110 Street & Dyre AVe	Inter	rsection			4.7	А						3	Α			

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.
 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

2010 Builds Mitigated LOS Analysis

Sam Schwartz PLLC Vision 42 Summary Report Mitigated AM and PM Peak Signalized Intersection

						AM Pe	eak						PM Pe	ak		
Intersection	Dir	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
	EB	R	0	0	0	0	0	0	0	31	0.1	35.6	D	0	35.6	D
	NB	T	2421	0.81	154.1	F	849	154.1	F	3647	1.07	107.5	F	~1022	107.5	F
46th Street & 12th Ave		R	215	0.81	154.1	F	0			298	1.07	107.5	F	0		
	SB	L	222	0.88	2/1.5		229	262	F	246	1.45	240.5		~282	205.9	F
	Inte	I	3323	0.95	201.4	г с	1334			3320	0.95	203.3	F	479		
	inte	Т	2291	0.74	12.3	B	242		_	3713	1.07	254	F	~1123		
	NW	R	504	0.7	12.7	B	0	12.3	В	515	1.07	254	F	0	254	F
44th Street & 12th Ave	NE	L	349	0.94	332.5	F	344	05.0		497	1.35	368.5	F	~545	50	
	NE	Т	2974	0.52	0.3	Α	0	35.2	D	2983	0.52	0.5	Α	~545	53	D
	Inte	rsection			24.8	С						161.9	F			
		L	94	0.29	49.7	D	86			94	0.28	38.5	D	66		
	WB	T	21	0.5	84.2	F	139	67.6	E	0	0.46	43.2	D	103	41.7	D
		R	238	0.42	62.8	E	116			264	0.44	42.5	D	98		
43nd Street & 12th Ave.	NW	L	96	0.99	1/3	+	108	9.2	А	69	0.42	78.3	E	60	48.2	D
		T	2451	0.59	2.8	A	3/			3894	0.99	47.6	D	525		
	NE	D D	5225	0.91	40.0		1050	48.8	D	3137	0.96	40.0	D	20	40.3	D
	Inte	rsection	5	0.01	33.4	C	2			30	0.00	44.6	D	20		
	NB	Т	2111	0.62	7.5	A	58	7.5	А	3478	0.96	62.1	F	128	62.1	E
42st Street & 12th Ave.	SB	R	3062	0.96	12.9	B	160	12.9	В	2890	0.94	12.3	B	149	12.3	В
	Inte	rsection			10.7	В						39.5	D			
	NB	Т	2394	0.77	280.6	F	608	280.6	F	3717	0.99	100.2	F	535	100.2	F
41st Street & 12th Ave.	SB	Т	3242	0.97	12.6	В	31	12.6	В	3063	0.9	6.2	Α	34	6.2	Α
	Inte	rsection			128.5	F						57.5	E			
	NB	L	91	1.06	150.9	F	~109	49.4	D	41	0.5	76	E	32	65	F
39st Street & 12th Ave.	110	Т	2460	0.71	45.7	D	646	40.4	D	3790	0.96	64.8	E	824	00	-
	SB	Т	3092	0.98	204.5	F	1059	204.5	F	2978	0.99	86.3	F	493	86.3	F
	Inte	rsection	070		133.2	F						74.5	E			
	WB	L	370	0.79	66.8	E	231	60	E	2//	1.07	64.8	E	268	62.2	E
		R T	408	0.77	51.1	D	325			728	0.88	57.8	E	527		
34th Street & 12th Ave	NB	D D	2107	0.7	24.5	C	210	26.6	С	2094	0.01	23.1		923	22.5	С
			431	0.49	62	F	219			345	1 24	174.0	F	~171		
	SB	T	2701	0.81	2.8	A	10	10.9	В	2719	0.89	36.8	D	787	51.4	D
	Inte	rsection			23	C						40.7	D			
		L	84	0.47	20.1	С	0			108	0.67	22.1	С	0		
	WB	Т	161	0.47	20.1	С	56	20.1	С	215	0.67	22.1	С	71	22.1	С
		R	78	0.47	20.1	С	0			136	0.67	22.1	С	0		
47th Street & 11th Ave	NB	L	33	0.28	7.4	Α	3	32	Δ	42	0.51	25.6	С	7	75	Δ
	11D	Т	647	0.35	3	Α	33	0.2	~	1009	0.54	6.8	Α	85	1.0	~
	SB	T	1377	0.54	9.2	A	156	9.2	А	1599	0.63	10.4	В	199	10.3	в
	- Lata	R	10	0.01	5.5	A	2	-		52	0.07	5.9	A	11		
	Inte	rsection	05	0.00	y Q	A	0			40	0.77	11.1	В	0		
	FR		05 254	0.62	34	C	U 104	34	C	49	0.77	30.9		U 162	38.0	р
	D	R	∠04 94	0.62	34	C	124	- 34	Ŭ	415	0.77	38.9		0	30.5	
	NE	T	595	0.35	4.3	Ă	55	4.5	· .	1002	0.55	8.5	Ā	95	0.7	
46th Street & 11th Ave.	NB	R	53	0.35	4.3	A	0	4.3	A	27	0.55	8.5	A	0	8.5	A
	СD	L	118	0.34	4	А	5	20	٨	59	0.29	4.1	Α	2	37	^
	30	Т	1330	0.5	2.8	A	19	2.9	~	1637	0.61	3.7	A	25	3.1	A
	Inte	rsection			8.6	A						11.1	В			
	14/5	L	192	0.52	29	C	0			139	0.27	29.2	C	0		
	WB	T	187	0.52	29	C	113	29	С	18	0.27	29.2	C	53	29.2	С
		R	132	0.52	29	C	0			98	0.27	29.2	C	0		
45th Street & 11th Ave.	NB	L	11	0.32	3.0	A	0	3.6	А	82	1.09	128.9	F	~53	36.9	D
		T	528 1251	0.32	3.0	A	30			931	0.95	28.8		10		
	SB	R	73	0.55	1.1	A A	20	4	A	61	0.00	4.9	A A	2	4.8	A
	Inte	rsection			9.1	A	, v	1	1		0.00	17.8	B	-	1	1
		L	108	0.99	60.1	E	0	1	1	367	1.44	443.6	F	0	1	
	EB	Т	579	0.99	60.1	E	272	60.1	E	522	1.44	443.6	F	~449	443.6	F
		R	159	0.99	60.1	Ē	0	1		118	1.44	443.6	F	0	1	
44th Street & 11th Avo		Т	445	0.29	9.8	А	83	0.9	٨	637	0.37	10.9	В	172	10.0	Р
Han oueer & ThirAve.	IND	R	45	0.29	9.8	A	0	9.0	~	51	0.37	10.9	В	0	10.9	O O
	SB	L	201	0.52	10.1	В	18	6.5	А	68	0.2	3	Α	4	5.2	А
		L T	1319	0.54	5.9	A	43			1737	0.65	5.2	A	34		
	Inte	rsection	1	1	22.9	С	1	1	1		1	132.4	F	1	1	1

Intersection
 Intersection
 Volume for 95th percentile queue is metered by upstream signal.
 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

						AM Pe	eak						PM Pe	ak		
Intersection	Dir	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
		L	0	0	0	0	0		0	0	0	0	0	0		0
	EB	R	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		L	261	0.81	45.4	D	160			226	0.67	31.2	C	120		
10/1- 0/1	WB	T	359	0.89	44	D	182	44.5	D	238	0.67	30.7	С	132	201.6	F
43th Street & 11th Ave.		R	216	0.89	44	D	0			497	1.63	361.2	F	~449		
	NB	T	316	0.22	6.6	A	38	6.6	A	270	0.28	7.2	A	38	7.2	A
	CD.	T	1354	0.56	2.6	A	36	26	^	1730	0.7	5.1	A	29	51	^
	30	R	124	0.56	2.6	Α	0	2.0	~	125	0.7	5.1	A	0	5.1	~
	SB	rsection	1476	0.54	16.3	B	108	13.4	в	1853	0.68	65.5 13.5	E	83	13.5	в
42th Street & 11th Ave.	Inte	rsection	1470	0.34	13.4	B	100	10.4	D	1000	0.00	13.5	B	00	10.0	D
	WB	L	149	0.26	26.5	С	27	26.5	С	0	0	0	0	0	0	0
41th Street & 11th Ave.	SB	T	1659	0.35	1.9	A	6	1.9	A	2086	0.44	2.2	A	8	2.2	A
	NB	R	479	0.26	5.3	A	32	0	0	460	0.25	2.2	A	19	0	0
40th Street & 11th Ave	CD.	L	745	0.29	3.3	A	16	10	٨	943	0.36	1.3	A	7	25	٨
four ouccu a murave.	30	Т	1114	0.42	6	Α	25	4.5	~	1371	0.51	3.3	Α	10	2.5	~
	Inte	rsection	307	0.61	5	A	197			106	0.21	2.8	A	64		
	WB	R	108	0.01	19.8	В	59	0	0	70	0.21	31.3	c	42	0	0
39th Street & 11th Ave.	NB	Т	371	0.16	1.6	Α	1	1.6	Α	390	0.17	2.2	Α	23	2.2	A
	SB	Т	1114	0.49	2.6	A	2	2.6	A	1371	0.6	1.8	A	7	1.8	A
	Inte	rsection	100	0.41	7.6	A	96			205	0.6	4.6	A	156		-
	WB	R	128	0.31	24.2	C	60	24.9	С	87	0.21	22.5	C	40	28.4	С
47th Street & 10th Ave.	NB	L	131	0.7	3	Α	0	3	А	172	0.96	40.1	D	0	40.1	D
	IND Late	Т	2274	0.7	3	A	15	Ů	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3129	0.96	40.1	D	15	40.1	
	Inte	rsection	95	0.2	5.6 26.3	A	54			55	0.12	38.9	D	35		
	EB	T	327	0.65	36.7	D	206	34.3	С	442	0.12	50.5	D	308	47.8	D
46th Street & 10th Ave	NB	Т	2319	0.86	4.6	Α	11	4.6	А	3248	1.06	63.5	E	~664	59.3	F
	Into	R	338	0.6	4.4	A	6			236	0.42	3.2	A	7	00.0	
	IIILE	T	357	0.3	21.6	A C	67			187	0.23	20.9	E C	49		
	WB	R	63	0.3	21.6	Č	0	21.6	С	129	0.23	20.9	C	0	20.9	С
45th Street & 10th Ave.	NB	L	168	0.82	5.6	Α	0	5.6	А	121	0.94	39.4	D	0	39.4	D
	Into	T	2595	0.82	5.6	A	26			3356	0.94	39.4	D	22		
		L	161	0.73	19.3	B	0		_	94	0.2	6.8	A	13		_
	EB	T	659	0.73	19.3	В	236	19.3	В	538	0.92	18.9	В	347	17	В
44th Street & 10th Ave.	NB	T	2614	0.95	14.8	В	17	13.7	в	3390	1.08	122.2	F	~735	115.3	F
	Inte	R	276	0.49	3.3	A	7			201	0.36	3.4	A	9		
		T	297	0.42	22	C	103	22	0	347	0.56	22.3	C	166	22.2	6
	WB	R	95	0.42	22	С	0	22	C	229	0.56	22.3	С	0	22.3	C
43th Street & 10th Ave.	NB	L	552	0.99	26	C	0	26	С	627	1.19	133.1	F	0	133.1	F
	Inte	rsection	2800	0.99	25.6	C	494			3371	1.19	133.1	F	~/2/		
42th Stroot & 10th Avo	NB	Т	2730	0.76	15.8	B	221	15.8	В	3518	0.98	118.2	F	506	118.2	F
	Inte	rsection			15.8	В						118.2	F			
	WB	P T	448 1180	0.73	24.5	C	206	25.2	С	394	0.49	13.1	B	131 290	18.1	В
41th Street & 10th Ave.	ND	L	194	0.44	5.6	A	9	4.2	•	185	0.43	8	Ā	21	04.7	-
	INB	Т	1565	0.65	4.2	Α	15	4.3	А	2354	0.98	87.5	F	55	81.7	F
	Inte	rsection	41	0.22	0.77	B	0			50	0.16	57.3	E	0		
	EB	T	270	0.22	6.4	A	54	6.4	A	180	0.16	2.3	A	12	2.3	А
40th Street & 10th Ave.	ND	T	1718	0.79	12.5	В	135	12.5	Б	2486	0.99	90.5	F	207	00.5	E
		R	171	0.79	12.5	В	0	12.5	В	198	0.99	90.5	F	0	30.5	'
	Inte	rsection	288	0.25	11.6	B	57			203	0.18	83.3	F	34		-
	WB	R	156	0.23	17	B	62	15.8	В	94	0.10	13.1	B	30	12.7	В
39th Street & 10th Ave.	NB	L	156	0.72	4.8	Α	0	4.8	А	753	1.04	120.3	F	0	120.3	F
	Into	T	1736	0.72	4.8	A	25			2592	1.04	120.3	F	~628		-
		L	97	0.22	9.9	A	23		_	262	0.36	15.1	В	54		_
	EB	T	378	0.4	10.2	В	48	10.1	В	242	0.37	13.9	В	59	14.3	В
38th Street & 10th Ave.	NB	T	1795	0.75	4.3	A	44	4.3	А	3083	0.99	83	F	129	83	F
	Inte	rsection	344	0.75	4.3 5.4	A	U			166	0.99	83 73.5	F	U		<u> </u>
		T	159	0.6	28.7	C	170	29.7	C	198	1.14	107.5	F	~443	107 5	-
	VVD	R	143	0.6	28.7	С	0	20.7	C	400	1.14	107.5	F	0	107.5	F
37th Street & 10th Ave.	NB		132	0.76	18.1	B	0	18.1	В	141	0.98	43.4	D	0	43.4	D
	Inte	rsection	1990	0.70	19.4	B	219			2049	0.98	43.4 54	P	484		<u> </u>
m Volume for 95th perce # 95th percentile volum Queue shown is maxii ~ Volume exceeds capa Queue shown is maxii	entile que le exceeds mum after acity, que mum after	eue is metered s capacity, qu two cycles. ue is theoretic two cycles.	d by upstre eue may t cally infinite	eam signal be longer. e.					•	-	•					

							ak			1			DM Do	ak		
				1			an		1		1		FINIFE	Average	1	1
Intersection	Dir	ection			Delay		Average	Approach	Approach			Delay		Queue	Approach	Approach
			Volume	v/c Ratio	(sec)	LOS	Queue	Delay	LOS	Volume	v/c Ratio	(sec)	LOS	Length	Delay	LOS
					(/		Length (ft)	(sec)				()		(ft)	(sec)	
	W/B	T	559	0.61	34	С	137	34	C	927	0.81	22.8	С	191	22.8	C
	WD	R	81	0.61	34	С	0	54	U	35	0.81	22.8	С	0	22.0	U
41st Street & Dyer Ave.	NB	L	1071	0.56	45.8	D	164	56.9	Е	654	0.48	27.7	C	102	29.3	С
,	00	T	62	0.59	75.8	E	194		0	25	0.48	32.2	C	114		0
	3D Inte	rsection	50	0.35	39.5		30	0	0	0	0	25.5	0 C	0	0	0
	into		52	0.36	12.5	B	0		_	111	0.48	20.5	C C	0		
	EB	T	389	0.36	12.5	B	58	12.5	В	267	0.48	20.5	C	74	20.5	С
40th Street & Dyer Ave.	ND	Т	1376	0.55	0.6	А	0	1		603	0.44	9.5	Α	111	10.7	Б
	IND	R	1282	0.59	2.3	Α	0		A	769	0.56	13.6	В	146	10.7	Б
	Inte	rsection			2.6	A						12.8	В			
	EB	T	949	0.96	34.4	C	358	34.4	С	585	0.79	17.9	В	113	17.9	В
44th Street & 9th Ave		R	343	0.56	34.4 10.4	B	0			212	0.79	20.3	В	0		
	SB	T	1925	0.75	19.4	B	261	19.4	В	2170	0.78	20.3	c	281	20.3	С
	Inte	rsection	1020	0.10	24.1	C	201			20	0.10	19.7	B	201		
12th Street & 0th Ave	SB	Т	1968	0.81	10.9	В	57	10.9	В	2293	0.94	20.8	С	62	20.8	С
42th Offeet & Still Ave.	Inte	rsection			10.9	В						20.8	С			
	EB	Т	1285	0.98	45.9	D	321	49.6	D	911	0.68	34.7	C	211	34.6	С
40th Street & Oth Ave		R	389	0.95	68	E	193			127	0.43	33.4	C	74		-
40th Street & 9th Ave.	SB	 	231	0.57	111.6	F	269	111.6	F	129	0.72	407.9	F	296	407.9	F
	Inte	rsection	1559	0.57	81.6	F	200			2307	0.72	296.4	F	300		
	14/5	T	105	0.21	22.3	C	47	00	0	292	0.63	31.3	C	165	04.0	0
	WB	R	55	0.14	21.5	С	24	22	C	260	0.63	32.5	С	131	31.8	C
47th Street & 8th Ave.	NB	L	119	0.26	3.2	Α	7	34	Δ	121	0.28	3.5	Α	8	13.6	в
		Т	1672	0.61	3.5	Α	27	5.4	~	2043	0.93	14.2	В	485	13.0	D
	Inte	rsection	4.40	0.70	5	A	0			400	0.07	17.3	B	0		
	EB	L	140	0.78	32.6	C	0	32.6	С	183	0.87	38.2	D	0	38.2	D
46th Street & 8th Ave		T	609 1651	0.78	32.6		215			044 1081	0.87	<u>38.2</u>		248		
	NB	R	349	0.57	8.3	A	27	5.2	A	204	0.72	8.2	A	23	6.1	A
	Inte	rsection	0.10	0.00	12.7	B				201	0.01	14.9	В			
	\//D	Т	290	0.65	29.3	С	211	20.6	C	283	0.7	31.3	С	225	31.5	C
	VVD	R	275	0.64	30	С	168	29.0	C	305	0.68	31.8	С	173	31.5	C
45th Street & 8th Ave.	NB	L	110	0.65	2.9	A	0	2.9	А	115	0.71	3.6	A	0	3.6	А
	Into	T	1726	0.65	2.9	A	30	-		1879	0.71	3.6	A	44		
	Inte	ISECUOII	157	4.02	9.2	A	0			224	0.90	10	A	0		
	EB	T	1030	1.02	49.2	D	~264	49.2	D	586	0.89	31	C	151	31	С
44th Street & 8th Ave.		Ť	1679	0.69	4.3	A	39			1769	0.64	3.6	Ă	39		
	NB	R	307	0.69	11.7	В	25	5.4	A	179	0.55	7.8	Α	16	3.9	A
	Inte	rsection			21.8	С						11.9	В			
	WB	Т	236	0.46	26.9	С	140	26.9	С	360	0.57	30.3	C	197	30.3	С
10th Chroat 9 Oth Aug		R	210	0.46	26.9	C	0		-	211	0.57	30.3	C	0		-
Hour Sueet & Bur AVE.	NB		131	0.63	1.1	A	0	1.1	A	1757	0.68	1.5	A	0	1.5	А
	Inte	rsection	1701	0.00	6	A	-		<u> </u>	1131	0.00	7.9	Ā	3	<u> </u>	<u> </u>
12th Stract 9 Oth Acc	NB	Т	1854	0.9	11	В	48	11	В	1883	0.91	18.5	В	90	18.5	В
4201 Street & Stri AVe.	Inte	rsection			11	В						18.5	В			
	WB	T	261	0.4	10	A	79	10	А	711	0.78	20	В	185	20	В
Atth Stract 9 Oth Arra		R	207	0.4	10	A	0		<u> </u>	234	0.78	20	B	0		
4 fth Street & 9th Ave.	NB	L	154	0.82	5.9	A	0	5.9	А	340	0.84	16.6	В	1	4.8	А
	Inte	rsection	1052	0.82	5.9	A 	17			1002	0.87	3.5	A	1		
		L	100	0.2	13.6	B	0			230	13.2	<i>з.т</i> В	29.7	m7	-	<u> </u>
	EB	T	1434	0.96	37	D	511	35.5	D	0	29.8	C	29.7	424	С	43
40th Street & 9th Ave.		Т	1807	0.9	17	В	61	2/ 3	C	0	17.3	В	19.1	#328	B	37
		R	304	1.03	67.5	E	~83	24.0	Ŭ	600	17.3	В	19.1	0		51
	Inte	rsection	004		29	C	457			070	0.01	0.94	0	404		
	WB		361	0.6	23.2	C C	15/	23.2	С	2/2	0.61	22.2	C	161	22.2	С
39th Street & 8th Ave		r I	203 106	0.0	23.2 10.8	R	0		<u> </u>	307	0.01	22.2 10	R	0	<u> </u>	<u> </u>
	NB	T	1828	0.71	10.8	B	95	10.8	В	1879	0.77	10	B	49	10	В
	Inte	rsection			13.9	B						12.9	В			
	ED	L	395	0.85	32.4	С	0	32.4	C	266	0.53	19	В	0	10	D
204h Chroat & Oth Aug	ĽD	Т	574	0.85	32.4	С	309	JZ.4	Ŭ	365	0.53	19	В	176	19	
38th Street & 8th Ave.	NB	T	1538	0.77	9.1	A	51	9.1	А	1775	0.92	14.8	B	59	14.8	В
	Into	R	261	0.77	9.1	A	0			335	0.92	14.8	В	0		
		CONTRACTOR OF THE OWNER OWNER OF THE OWNER OF THE OWNER			17.3							1.0.0				

Intersection
 Volume for 95th percentile queue is metered by upstream signal.
 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

						AM Pe	ak						PM Pe	ak		
Intersection	Dire	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
	WB	T	373	0.58	30.9	С	189	30.9	С	532	0.74	35.7	D	257	35.7	D
37th Street & 8th Ave.		R	199	0.58	30.9 19.3	B	0			230	0.74	22.6	C	0		
Intersection 37th Street & 8th Ave 44th Street & 7th Ave 42th Street & 8th Ave 40th Street & 8th Ave 40th Street & 7th Ave 40th Street & 7th Ave 40th Street & 6th Ave 42th Street & 6th Ave 44th Street & 6th Ave 44th Street & 5th Ave 44th Street & 5th Ave 44th Street & 5th Ave 44th Street & Madison Ave.	NB	T	1577	0.72	19.3	B	234	19.3	В	1874	0.81	22.6	C	288	22.6	С
	Inter	rsection			22.2	С						26.2	С			
	ED	T	987	0.74	28.3	C	319	40.9	D	528	0.62	29.3	C	204	20.6	C
	EB	R2	135	0.68	33.4	0	238	40.8	D	100	0.31	24.7	C C	93 85	29.0	U
44th Street & 7th Ave.		L	307	0.73	26.5	Č	154			326	0.54	8.5	Ă	114		
	SB	Т	1078	0.77	48.5	D	163	106.3	F	645	0.47	8.2	A	89	26.5	С
	Into	R	1830	1.01	150	F	~313			1631	0.78	37.4	D	156		
4011 01	SB	Т	1226	0.6	45.2	D F	164	45.2	D	970	0.47	27.2	B	120	20	В
42th Street & 8th Ave.	Inter	rsection			45.2	D					-	20	В			
	EB	T	1325	0.97	67.2	E	197	62.2	Е	906	0.77	28.2	С	152	26.4	С
40th Street & 8th Ave		R	135	0.39	13	B A	34			176	0.58	17.3	В	4/		
	SB	T	1081	0.69	4.4	A	23	4.4	A	825	0.43	1.3	A	5	1.3	A
	Inter	rsection			35.8	D						15.1	В			
42th Street & 7th Ave.	SB	T	1715	0.64	199	F	327	199	F	1517	0.56	123.1	F	238	123.1	F
	Inter	T	1259	1.01	71.5	F	~248			1003	1.03	58	F	~260		
	EB	R	211	1.01	71.5	E	0	71.5	E	491	1.03	58	E	0	58	E
40th Street & 7th Ave.	SB	L	186	0.74	5	Α	0	5	А	74	0.64	4.5	Α	0	4.5	А
	Inter	T	1320	0.74	5	A	16	ů		1141	0.64	4.5	A	10		
	Inter		298	1.03	37.8	F	0			339	0.94	56.9	F	148		_
	EB	T	895	1.03	88.1	F	~425	88.1	F	419	0.79	34	C	183	44.2	D
44th Street & 6th Ave.	NB	Т	2164	0.89	15.5	В	121	16.2	в	1732	0.72	287	F	349	265.5	F
	Into	R	236	0.73	22.3	C	53			304	0.69	45.8	D	135		
	NB	T	2109	0.61	40.1	A	8	2	А	1720	0.55	103.1	F	288	103.1	F
42th Street & 6th Ave.	Inter	rsection			2	A						103.1	F			
	EB	L	409	0.99	27.2	С	0	27.2	С	313	0.66	30.3	С	0	30.3	С
40th Street & 6th Ave.		T	2078	0.99	9.6		360			659 1799	0.66	30.3 234.2	F	234	-	
	NB	R	150	0.35	5.4	A	17	9.3	A	213	0.64	31	Ċ	160	212.7	F
	Inter	rsection			16.4	В						153.3	F			
	EB	T	407	0.8	27.3	C	174	27.3	С	311	0.57	18.4	B	140	18.4	В
44th Street & 5th Ave.	0.0	L	257	0.62	23.6	C	125	40.0	P	155	0.44	18.6	B	66	00.4	0
	5B	T	1923	0.97	43.1	D	425	40.8	D	1768	0.89	26.8	С	362	20.1	U
	Inter	rsection T	2406	1.04	37.2	D	~504	224	F	2067	0.80	24.4	C	74	9.7	Δ
42th Street & 5th Ave.	Inter	rsection	2400	1.0-	224	F	554	224		2007	0.03	9.7	A	/4	0.1	~
	FB	L	226	0.58	23.6	С	0	23.6	C	32	0.52	22.3	С	0	22.3	C
46th Street & Madison	LD	T	417	0.58	23.6	C	160	20.0	Ū	554	0.52	22.3	C	141	22.0	Ũ
Ave	NB	R	1/82	0.9	15.6	B A	422	14.8	В	94	0.17	58.8	E	~540	55.3	E
	Inter	rsection	100	0.21	17	B				01	0.11	46.4	D	,		
	EB	L	569	0.79	40.4	D	276	40.6	D	399	0.56	34.3	С	0	34.3	С
44th Street & Madison		T	310	0.8	40.9	D	292			163	0.56	34.3	C	176		-
Ave.	NB	R	80	0.51	1.7	A	4	1.7	Α	66	0.83	9.8	A	0	9.3	A
	Inter	rsection			16.5	В						17	В			
42nd Street & Madison	NB	T	1425	0.54	1.6	A	0	1.6	Α	1279	0.61	2.1	A	0	2.1	Α
Ave.	Intel	19601011	26	0.43	1.0 21.2	A C	0			12	0.48	2.1 19.5	R	0		1
	EB	T	420	0.43	21.2	č	99	21.2	С	614	0.48	19.5	B	97	19.5	В
40th Ohn +4.0.14		R	81	0.43	21.2	С	0			0	0	0	0	0		
46th Street & Vanderbilt	NB	T	488	0.74	70	E	190	70	Е	109	0.25	4.8	A	36	4.8	А
	0.0	L	31	0.36	18.2	B	0	40.0	P	7	0.23	16.5	B	0	40.5	
	28	Т	172	0.36	18.2	В	79	18.2	в	174	0.27	16.5	В	67	16.5	в
	Inter	rsection	405	0.20	40.6	D	0			000	0.40	16.6	B	0		
	EB	T	262	0.38	10	B	54	15.7	В	331	0.49	18.8	B	81	18.5	в
		R	40	0.08	13.2	B	10			103	0.19	17.1	B	28		_
46th Street & Park	NB	T	779	0.61	20.7	C	184	20.7	С	1113	0.87	30.2	C	316	30.2	С
Overpass NB		R	5	0	0	0	0			8 44	0	0	0	0		
	SB	R	176	0.54	33.3	Č	34	20.5	С	241	0.27	16.2	B	48	25.7	С
	Inter	rsection			19.1	В						25.8	С			
	FR	L T	54 810	1.03	40.5	Ď	0	40.5	р	61 600	0.8	14.5	B	0	14.5	R
		R	215	1.03	40.5	D	0	-0.5	U	174	0.8	14.5	B	0	14.5	Ъ
40th Street & Park Ave	NR	Т	987	0.88	25.8	Ċ	332	25.8	C	707	0.81	21.8	Ċ	258	21.8	C
		R	269	0.88	25.8	C	0			349	0.81	21.8	C	0		+ Ť
	SB	T	696	0.44	16.4	B	124	16.4	В	843	0.53	21.3	C	154	21.3	С
	Inter	rsection			28.9	С						19.4	В	-		

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. ~ Volume exceeds capacity, queue is theoretically infinite.

						AM Pe	eak						PM Pe	ak		
Intersection	Dir	ection	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS	Volume	v/c Ratio	Delay (sec)	LOS	Average Queue Length (ft)	Approach Delay (sec)	Approach LOS
	EB	T	271	0.31	10	В	37	10	В	364	0.46	13.4	В	49	13.4	В
46th Street & Lexington		R I	161	0.31	10	В	0			79 155	0.46	13.4	В	0		
42nd Street & Lexington Ave. 40th Street & Lexington Ave. 40th Street & 3rd Ave. 40th Street & 3rd Ave. 40th Street & 3rd Ave. 40th Street & 3rd Ave.	SB	L T	949	0.44	15	B	121	15	В	852	0.30	11.0	B	93	11.6	В
	Inte	rsection	0.0	0	13.9	B				002	0.00	12.1	B		1	
42nd Street & Lexington	SB	Т	1635	0.62	8.4	A	120	8.4	Α	1373	0.52	89.5	F	256	89.5	F
Ave.	Inte	rsection			8.4	А						89.5	F			
	FB	Т	653	0.97	44.5	D	264	44.5	D	596	0.79	36.3	D	193	36.3	D
40th Street & Lexington		R	343	0.97	44.5	D	0		-	165	0.79	36.3	D	0	00.0	-
Ave.	SB	L	138	0.57	10.7	В	0	10.7	В	187	0.48	2.5	A	0	2.5	А
	Into	reaction	1516	0.57	10.7	В	86			1242	0.48	2.5	A	10		
	IIILE		154	0.55	23.3		08			105	0.41	46.8	D	68		
	EB	 Т	2/1	0.55	18.4	B	90 55	30	С	387	0.41	21.1	C	104	26.8	С
42th Street & 3rd Ave.		T T	1269	0.13	10.4	A	6			1854	0.58	1.5	A	9		
	NB	R	135	0.42	1.2	A	0 0	1.2	A	155	0.58	1.5	A	0	1.5	A
	Inte	rsection			7.5	Α						6.5	Α			
46th Street & 3rd Ave	NB	Т	2184	0.71	7.7	Α	58	7.7	А	2607	0.85	13.8	В	63	13.8	В
40th Street & Stu Ave.	Inte	rsection			7.7	Α						13.8	В			
	FB	L	437	0.91	26.2	С	151	17.2	в	306	0.81	14.7	В	0	14 7	в
	20	T	368	0.36	6.6	A	25		5	483	0.81	14.7	В	94		-
40th Street & 3rd Ave.	NB	T	1884	0.63	6.9	A	33	6.9	А	2332	0.77	6.6	A	29	6.6	А
	Into	R	160	0.63	6.9	A	0			172	0.77	6.6	A	0		
	Т		215	0.47	9.8	A	100			210	0.86	8.5	A	173		
	EB	P	170	0.47	34.7	C	0	34.7	С	337	0.86	42.7		0	42.7	D
46th Street & 2nd, Ave		L	249	0.44	12.6	B	101		_	213	0.38	11.5	B	82		_
	SB	T	2705	0.79	15.8	B	307	15.5	В	2601	0.76	15.1	В	285	14.9	в
	Inte	rsection			17.7	В						19.4	В			
A2nd Street & 2nd Ave	SB	Т	2443	0.79	5.1	А	29	5.1	Α	2683	0.76	4.9	А	32	4.9	A
42hd Olicet & 2hd. Ave	Inte	rsection			5.1	A						4.9	Α			
	EB	T	563	0.56	24.6	С	151	24.7	С	443	0.75	34.9	С	223	34.9	С
40th Street & 2nd. Ave		R	186	0.43	25	C	94		-	267	0.75	34.9	C	0		-
	inte	rsection	205	0.70	24.7	C	000			400	0.70	34.9	C	202		
	EB		295	0.76	40.8		200	40.8	D	433	0.78	40.1		282	46.1	D
38th Street & 2nd, Ave			131	0.70	40.8	A	5			136	0.76	21	A	3		
	SB	T	2067	0.62	1.9	A	15	1.9	A	2650	0.8	2.4	A	15	2.3	A
	Inte	rsection			8.2	A						12.3	В			
43th Stroot & 1st Avo	NB	Т	1825	0.54	9.6	Α	94	9.6	Α	1742	0.52	6.9	Α	60	6.9	A
45th Stieet & Ist Ave	Inte	rsection			9.6	Α						6.9	Α			
	WB	R	441	0.72	41	D	130	32.5	С	217	0.38	27.4	С	56	24.7	С
42nd Street & 1st Ave	NB	T	1251	0.36	1.7	A	6	1.7	A	1344	0.38	2.1	A	6	2.1	A
	Inte	rsection			9.7	A						5.3	A	170		
40th Street 9 1et Aug	EB		745	0.77	32	C	251	0	U	531	0.55	23	C	178	0	0
HOUT SUPEL & ISLAVE	INB	reaction	2133	0.63	3.1 10.6	A	6	3.1	А	2511	0.74	2.1	A	4	Z.1	A
	NR	Т	62	0.07	10.0		17	4.8	Δ	60	0.07	0.0 8.0	Δ	16	89	Δ
42nd Street & Dyre Ave	SB	Γ Τ	50	0.05	6.9	A	11	0	0	0	0.07	0.9	0	0	0	Ô
	Inte	rsection		0.00	5.7	A		Ť	, v	Ť		8.9	Ă	Ť	Ť	Ť

Volume for 95th percentile queue is metered by upstream signal.
 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

List of Background Projects

Table 1: No Build Projects in Primary Study Area

1

1.

Project Name/Address	Development Proposal	Build Year	Remains in Build?	Development Site?
Pennsylvania Station Redevelopment	435,900 sf office space; 230,000 sf retail; 382,500	2008		
W 37th Street Arts Baryshnikov Center for				
Dance	46,000 sf theater and performing arts	2004		
450 West 37th Street	folore of allocial and pollorining and			
Theater Row II				
460 West 42nd Street between Dver and Tenth	264 residential units with 497-seat theater	2006	No	Site 19
Avenues				
360 West 43rd Street	256 residential units: 19.000 sf retail	2003		
Ivy Tower 343 West 42nd Street:	320 residential units: 24.000 sf ground floor and			
between Eighth and Ninth Avenues	second floor commercial	2003		
River Place II				
Eleventh Avenue between West 41st and 42nd	532 residential units	2004	No	Convention
Streets				
Hudson Place/Block 1090 Rezoning 627 West 42nd Street	377 residential units; 61,000 sf ground floor retail	After 2010	No	Site 17
	Bikeway/walkway, get-down, passive and active			
Hudson River Park	open spaces, Pier 72 decking removed and pilings	2005		
Segment 6 and portions of Segments 5 and 7	retained to support wildlife, boathouses, and a			
	major civic plaza with fountain near 42nd Street			
	33.914 gsf terminal - 29.000 sf for passenger			
West Midtown Intermodal Ferry Terminal	operations, 1,100 sf of office and 32,810 sf of café	2004	1	
(Piers 78 and 79)	and concessions	2001		
306 West 44th Street				
West 44th Street and Fighth Avenue	564 residential units; 13,750 sf retail	2005		
Biltmore Theater Project	460 residential units: 38,906 sf office: 6,101sf retail:			
770-780 Fighth Avenue	650 theater seats	2003		
New York Times Headquarters				
8 Times Square	1,400,000 sf office; 31,600 sf retail	2006		
11 Times Square				
West 42nd Street / Eighth Ave.	725,000 sf office; 50,000 sf retail	2005		
Studio City				Per 4. P. 11-2-
592-608 Eleventh Avenue between West 44th	750,000 sf TV production; 45,000 sf office; 3,500 sf	2006		
and 45th Streets	retail		1	
435 Seventh Avenue				
between West 33rd and 34th Streets	180,000 sf office	2007		
Eriars Tower				
West 31st Street between Seventh Avenue and	534 residential units	2005		
Broadway		2000		
158 West 25th Street				
between Sixth and Seventh Avenues	100-room hotel	2004		
Crobar	2			
530 West 28th Street	40,000 sf nightclub - 1,500 person occupancy	2004		
Eighth Avenue and West 20th Street	37 residential units; 7,000 sf ground-floor retail	2004		
	4,256 dwelling units, 102,542 sf of regional retail,	(
Special West Chelsea District Rezoning	307,626 sf local retail, 201,832 sf community facility	2013	1	
	space			
Schulweis Railyards Development	070 000 -6 -6 -6 -	400040	A1.	04. 00104
406-422 West 33rd Street	aro,ooo si oi onice	After 2010	NO	Sile 32/34
Black 1000 Demokan		Before		011.40
Block 1090 Rezoning	110 residential units; 10,050 st retail	2010	NO	Site 18
		Before		0.1 00
Ninin Avenue Rezoning	174 residential units; 15,980 st retail	2010	NO	Site 22
		Before		<u></u>
NINTR Avenue Rezoning	192 residential units; 14,518 sf retail	2010	No	Site 24
34th Street Rezoning	295.000 sf office: 23.000 sf retail	After 2010	No	Site 41
Chelsea Rezoning	81 residential units	After 2010	No	Site 42
······································				
Ninth Avenue Rezoning	171 residential units; 16,849 sf retail; 5,616 sf office	After 2010	No	Site 28

	Residential	Retail	Hotel	Office	Hospital
Project Name	(du)	(sf)	(rooms)	(sf)	(sf)
1 Ave/E 100 St (between 100th and 101st, 1st and 2nd Av)	250	6,000		10,000	
10 Liberty Street/William Street	288			3,000	
101 Worth Street	329				
10-14 E 29 St	321			J	
102 Fuiton Street	14				
104 Charlton St.	04		· · · · · · · · · · · · · · · · · · ·		
106 Fulton Street	64		100		
108 W 24 SI	73				
108-110 Noriolk St, Delanosy-Rivington	151				
10th Avenue at 20th Street	70				1
11 Hanover Sg	40				
110 E 14 St	174				
110/120 Church St.	356				
110-112 Greenwich Street	60				
110-112 Liberty St	13				
1117-1125 York Avenue	210		}	<u> </u>	
114 Franklin Street				f	
114 Fullon St.	38				
115th St. Martison-5th Ava. Sac 202 Fidarty	99				1
117 Worth Street	330				
118 SVSt. Nicholas Ave (Rosa Parks Gardens) block 1924	60				
119th St/ Madison Ave (Madison Park)	129				
12 John Street	18				ļ
120 Greenwich St (warehouse conver.)	113				
120 St/ Federick Douglass Blvd (Harriet Tubman Gdns) block 1947	101			8,400	
121 Reade St, sw comer of Hudson St	123			<u> </u>	
121-133 Hudson Street	3				
122 Massau Siteet	137				
123 Chambers Street	6			1	
123-127 W 21st St	28				
1234 First Ave.	200	5,000			10000
124 Hudson	26				
125 St/ Lexington Ave (Gateway Plaza)	I	26,000			
126-30 Avenue C & E 9 St (Police Station)				3,000	
130 Duane at Church			45		
130 Fulton Street	62				
136 William Street	18				
137 Duane Street	79				
14 SV 6-7 Aves	285				
140 Franklin Street	14				
1400 5 Ave ANCHOR (bet. 115 and 116)	129	25,000			
142-148 East 57th	144	1,000			
143-45 Avenue D (9-10 St) - El Boringuen	16				
144 Duane Street	3				
145 East 76th	20				
145 Hudson Street	12			48.000	
145 W 5/th	146			40,000	
15 Dutch Street	140				
15 Gold Stilloliday Ion				85,000	
15 William St	373				
150 Madison St					
150 Nassau Street	145				
151 E 69 S (Wesibury Holel)	47				
15-17 S. William Street	12				
156 Rivington St, Clinton-Suffolk (Harmony House)	16				
16 Maiden Lane	5			55 000	
1630 Bway (50-51)				55,000	I
17 Avenue B, EBSI 200 IO 310 31	25				
17 KVing Field* 10-10 OL 17 John Shnal	114				
170 Seventh Av	25				
174-78 Avenue A at E 11th St - Alliance Apts.	52				
18 Leonard Street	20				
18 Murray St, Church-B'way	5				
184 E 76 SI	129				
184-86 Forsyth St, Rivington-Stanton (Tanya)	21				
189-191 Stanton St, Atlomey and Ridge	13				
19 Beach Street	6				
190 East /m St	129	12 000			
199 Downly 1st Avenue habineen Ofth Ofth Ctr	100	4 200			
181 AVOING DOIWOOBIT 3407-5041 305 2 West End Ave @ 60th (Combridge Co.)	245	6734			
200 Church Street	20				
201 West 94th	284	22,000			
202 Spring St	4				
203 Rivington St, Ridge-Pitt	60				
206 1 Ave.	5				
21 -23 Maiden Lane	30				
21 Astor Place	71			112,000	
21 West Street	292				
2121 Broadway		19,000			I
214-220 E 34 St	300	10.000			
2180 Broadway (77th St)	↓	13,000		80.000	
220 W SOLVED OF ED	200			40,000	

Table 2: 2003-2025 Total Manhattan Projected Development (does not include Proposed Action or No Build Sites in Primary Study Area)

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		Residential	Retail	Hotel	Office	Hospital
· · · · ·	Project Name	(du)	(sf)	(rooms)	(sf)	(sf)
1	228 232 E 3 St (Carol Wateon Ante)	100			60,000	
	220-232 E 3 St (Galor Watson Apis)	60	22,000	1		
	23 - 23 Greene St		22,000			
	200 E 04 St	328				
	233 Broadway (Woolworth Blog)	8/				
	235 W 63rd St	242				
	24 Vanck Street / 240 W. Broadway	32				
	240 E 39 St	446				
	243 Lexington Ave - 34-35 St - Dormitory	100	1		1.5	
	25 Ann Street	10			1	
	25 Avenue D	90				
	25 Broad St	345		1	1	
	25 N. Moore St	48		1		
	25 W 14 St		70,000	1		
	258 West Street	110		1		
	25th Street & 3rd Avenue	100		1		{
	28 Cliff Street	2		t		
•	260 11 4up		20.000		+	
	200 11 AVE		30,000	-		
	200 W 2001 St		9,000			
	20-20 Laight Street	32				
	270 Broadway	87		1		
	270 Seventh	257				
	27-29 N. Moore St. Hudson-Varick	49			1	
	275 Church Street	3				
	286 - 290 E 3 St (Henry Street SRO)	53				
•	29 E 2nd St (SW corner) @ 2 Ave (SRO)	54				
	299-307 F 3 St (Bitman Rivas Apis)	60				I
	200 5 64 64	102				
	201 E 20 St (Churchill Scheell)	103		·····		II
	204 Elected Allector C					
	JUT EIZADEIN (2) HOUSION ST	195				
	306 - 312 E 3 St (Positively 3rd St- low income/ elderly)	52				
	306 E 72 St - Knickerbocker	182				
	311 West 50th Street at 8th Avenue- The Carneo	102	39,000	1	1	
	318 Amsterdam		20,000	1		
	32 Bond St	97		1		
	320 Pead St (Pead Hotel)					
	221 W 64 CL	110				
	321 19 34 31	140				
	32-36 Pean St.	23				
	325 E 26 St	200				
10	3280 Broadway (Harlem Office Technology Bidg)				20,000	
	33 Rector St	15				
	339 Greenwich Street	10				
	340 E 34 St	· 201				
	341 E 62 St	15				
}	345 E 64th St	60				
1	350 Madison Avenue				20.000	
×*.	355 E Edit (under anget into fell 2004)				30,000	
	COT 2 Self (trider Cots), late fail 2001)	12				
	35-37 N. MOORE SI, HUDSON-Vanck	17				
	362 Ninth Av (@ 30th St)	77				
	38-36 Hudson Street	12	1000			
	366-344 Broadway	147				
	37 W 24 St	1.			41.300	
	387-397 Greenwich (whse conver.)	33				
	3-9 Hubert Street	34				
	4 Columbus Circle/981 8th Ave		7 000		100.000	
	ADD E BA St	+00	7,000		100,000	
	400 E 60 D	100				
		5/				
	40-44 Delancey St at Forsyth	77				
	408 Greenwich Street		44,000			
	414-418 E. 59 St - First Ave-Sution Pl	76				
	415 E 60	75				
	416 Washington Street	87				
	42 Avenue A	35				
	424 W 33 St	100	11.000			
	425 Fifth Avenue (at 38th)	405	10,000		20 040	
	424 5 61 00	781	10,000		30,000	
		206				
	HA CONTRACTOR	15				
	443. Greenwich Street	256				
	445-447 W 18th St	32			5 million 19	
	448 Greenwich Street	120	_	1		
	44th-45th/10th to 11th Avs	740		1	î	
	46th St/10th Ave (Ryan Health Center)	84	25.000	1		
	47 Ann Street	12				
	47 West St					
	47-50 West Street				i	
	AR Label Ct / 166 . 172 Lindean St	10				
	10 Long it 317 100 + 172 MUSUTI 31	5	2,300	1		
	Hour Street Diwn Sin and /In	482	[
	Hay Greenwich (D/w Leroy and Morton)	205	1,700	1		1
	1502 and 506 W 42 St @southeast of 10th Av (Clinton Housing Dev, Corp)	67				
	515 Park at 60th	50				
	52 Franklin Street	30				
	520 W 43rd St	375	8,000			
	52-54 Cooper So		0,000			
	61 Leannid Ch / Cummer 2000	20				
	so contard St (Summer 2002)	8	1			
	53 Park Place	116	T	T		
	535-45 E 13th St, Avenue A-B (Dora Collazo Plaza)	38	1		·····	
	54 Pine Street	4				
	54-55, 8th Ave (ES)	484				
1	55 White St			ł		
-	S6 Remor SI					1
24	ER Davide Shared	40				
17	Contract Street	5				
	Da momas St	8		1		[
	58 Walker St	5	T	1		
 *) 	58-74 West 23rd (The Caroline)	431	1	I		

,

	Residential	Retail	Hotel	Office	Hospital
Project Name	(du)	(sf)	(rooms)	(\$1)	(\$1)
60 E 55 St - Madison-Park Ave	6			130,000	
60 Lineanard Street	9				
610 Broadway, north of Houston, halveen Crosby Street				65,600	a second contract
63 Wall Street	475				
630 E 11 St - Avenue B-C	10				
632 - 636 E 9 St (Dona Petra Santiago Apts)	82				
643 E 9 St, Avenue B-C	10				
65 Worth Street				100.000	
655 Sixth				100,000	
66 Leonard	40				i
66 Second Avenue	120		+	150,000	
6-8 Fast 30 St	75				
704 Broadway	5				
71 Broadway	250				
722 E 8th St - 749 E 9th St	56				
724 Second Av	400				
74 E 79 St	60				I
75 West Street /110 Washington Street	221				
79 Laight St (whiter 2001) / Sugar Warehouse	26		1		
79 Laight Street (Sugar Warehouse)	400				
79 White Street	11				
79 Worth Street	35			1	
8 West 70th St (Synagogue)					
80 Nassau Streel	11				
80 South Street	125				
80-92 Ridge SI, Delancey-Rivington St	• 100				
83 Walker Street	8				
85 John Street	160				
871 LIN Plaza			1	112,000	
890 - 908 8th Ave. / 53rd-54th Sts. (Recent Tower)	400	11,600			
90 John St	328			19 19 19 19	
90 Nassau Street	7				
90 West Street	400				
94 E 4 S1	85				
95-99 Suffolk St, Delancey-Rivington St	28				
99 Jane	63		I		
99 John Street	442				7
ASPCA 1755 York Ave	272				
Block 559 1 of 32 SW 3rd Ave/14th St	59	5,175			6
Block 896, Lot 1-5 (NE 3rd Ave/14-15 St)	0	9,800			
Block 921, Lot 36 (SW 1st Ave/15th St)		10,500			
Block 97 (Front St, Beeckman, Peck)	300				
Bowery and Bond (ES of Bowery)	10				
Cathedral Pixwy @ Manhatlan Ave (Cathedral Gdns) block 1845	112		I 1		
E 100/1-2 Avec	98		1		
E 117 St/Madison Ave (Madison Courd)	- 98		1		
E 118 St (Madison Court)	54				
E 119th b/w First and Second Av (Block 1795)	48				
E 119th b/w First and Second Av (Block 1796)	50				
East 55th and Lexington	120		135		
East 76-77 and Second Ave. (Seville)	136				
East 77-78 and Third Ave. (Empire)	32	• •• • • • • • • • • • •			
Findre Zast meater	128				
Grand Beekman - 400 East 51st Street	89				
Grand Street Senior Housing (705 - 717 E 6th St)	74			- 4	
Hotel - Baxter & Hester St			153		
HPD Residential Sites (pre-constr, constr or cmplete.)	386		ļ		
HPD Residential Siles (pre-constr, constr or cmplete.)	223		↓		
HPD Sites	40		<u> </u>		
nubert / West of Hudson (condos)		80.000	<u>├</u> ───┤		
Laminaria 385 First Av (2)2341	134	00,000			
Madison Avenue @ 118 St (Mt. Morris)	60		11		
Madison Avenue @ 118 St (Mt. Morris) block 1745	86	5,000			
Madison Avenue/E131 St	92				
Maple Court - 121-122 St, Park-Mad	135.				
Maple Plaza - 122-124 St, Park-Mad	155				
Maple Plaza #3 - 119-120 St, Park-Mad	155		<u> </u>	76 000	
Metropolis Studio Expansion, 107 St, Park-Lex Ave				/5,000	
Preignoomood Entrepreneur Program					
Park Place Tower 19 Park Place	14		1		
Pachership Housing, 109-112 St. Lex-1st Ave	102				
Prinship Housing (Suffolk St bet, Rivington&Stanton-Bk 349)	64				
Related 15th St/Seventh Av and 15th St	212				
Ronald McDonald House (E. 73 St. bet, First & York)			106		
Shabazz Gardens (117 bet. Lenox & 7; 118 bet. 5 & Lenox)	28				
Site 18A BPC N (20 River Terrace/Solaire Bld)	335				
Site 188 BPC N	268	14,000	┟{		
Sile 22 ADC N	323	7 000	¦₿		
Site 24 BPC N	350	7.000			
Site 5B+5C/ 815 Tenth Av/505 W 54th St. (The Foundry)	222	13,500	11		
Sixth Ave Rezoning, block 801 (25-26 Sts. bet. 6 & 7 Aves.)	212	16,400			
Sixth Ave Rezoning, block 802 (26-27 Streets bet. 6 & 7 Ave.)	203	15,700			
Sixth Ave Rezoning, block 825 (23-24 Sts. bet. 5 & 6 Aves.)	121	9,400			
Sixth Ave Rezoning, block 826 (24-25 Sts. bet. 5 & 6 Ave.)	327	25,200			

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Project Name	(du)	(\$1)	(rooms)	(31)	(sf)
Sixth Ave Rezoning, block 827 (25-26 Sts. bet. 5 & 6 Aves.)	322	24,900			
Sixth Ave Rezoning, block 828 (26-27 Sts. bet, 5 & 6 Aves.)	91	7,000			
Sixth Ave Rezoning, block 828 (26-27 Sts. bel. 5 & 6 Aves.)	308	23,800	ļ	1	-
Sixth Ave Rezoning, block 829 (27-28 Streets bet. 5 &6 Ave)	244	18,800			
Soho Gallery Building / 420 W Broadway	9				
Strivers Gardens (block 1959) blw 134th and 135th @ FD Blwt	170	20,000		1	<u> </u>
SW comer of 2nd Av and 2nd St (SRO)	46	50,000		+	
The Chatham Third Ave at 65th Street	94				
The Impala First and 75-76th (404 E 76th)	181				
The Seasons 328 Spring St	50				<u> </u>
Trumo World Tower, First Avenue - 47-48th	370				
United Mutual Houses - 535-41 E 5th St - Ave A & B	29			1	
W 112/ AC JR Blvd-St, Nicholas Ave	41				
W 116 St ANCHOR (The Ellington) block 1599	222	51,000			
W 117 St ANCHOR (Lenox Gardens) blwn. 117 & 118	49	8,000			[
W 117 SV FD Blvd (Block 1923)	138	11,000			
W 117 SVFD Blvd-SL Nicholas Avenue (Block 1922)	8				
W 117/ FD Blvd (Bblock 1943)	96	8,800			
W 117-118 SV Momingside Ave (Momingside Parc)	49				1
W 118 SV FLI BIVE (BIOCK 1945)	50	30,000			
W 122 SV St Michalan Aven-redenck Dougrass Bivo (block 1946)		£ 000		<u> </u>	
W 138 SV 5 Ave Matcale X Blud	40	6,000			
W 145 St/ FD Blvd, (block 2045)	200	20,000			
W 145 St/ FD Blvd_ANCHOR (Bradhurst Ct)	126	54,000	·····		
W 145/Bradhurst-Edgecomb Aves (block 2051)	77	15,000			
West & Laight Sts.	154				
1 Wall St					
10 Barday St	328			72,000	
11 Broadway					
113th St/Broadway	722				
115 Nassau Street					
110 St ANCHUR-Renaissance (116-117 on Lenox)	241	60,000			
125 SV Lexington Ave (Golham Plaza)		270,000			
123 Solvadison Avenue (namen Unionen's Zone)	· · · ·		CED.		
130 Liberty Street (Deutsche Back)			550	1 400 000	
140 Liberty St - One World Plaza (Milstein)				500,000	
140 West Street (Verizon)	1			1 171 540	
1800 Second Ave at E 93 St				1,111,040	
2 Gold Street	650	24,500			
200 Water Street / 190 John Street	575				
22 Warren Street	3				
23 Wall Street / 15 Broad Street	1,321				
250 Water St, Peck-Beekman St	500	480,950			
270 Greenwich (WSURA Site 58)	1,120	25,000			
U Broad St					
10 Trest Dioduway	200			55.000	
Ave-109-110 St (M. of African Art/Edison Schools	. 232	0,000		90,000	
606 E 76th St -Lycee Francais				30,000	
5 Broad St			-		
5 Water Street				518,050	
0 Broad St	200			800,000	
60 12th Av (foundation being made, fall 2001)				1	
0 Pine					
5 Broad Street - Millenium High School					
U Church Street (Post Office; Federal Office Building)				626,260	1975
to reading Hoalth Care Center, 199 St 2 and Aug	600				
Ann Evolution Building MW 125h St & Deck Ave	- 			004 000	Expand
e Buroos Latino Cultural Center (1680 Lay, hat 105-108 SN				004,000	
elancey Street @ Essex SI (EDC RFP)	1,306	76.005			
Melancey Street @ Essex St (EDC RFP)	954	170,190			
ast 96 - 97 St, and Lexington (New high-income rental bldg.)	576	27,280			
ast River Plaza, 116-119 St, Pleasant Ave-River		475,000	1	33,000	
arism Center (W 125th b/w Malcolm X and ACP Blvd)		330,000	150	100,000	
arlem USA/Magic Johnson Theater (125 SL/FD Blvd.)	T	186,000	1	1	
PD Residential Sites (pre-constr, constr or cmplete.)	617	1		I	
IPD Kesidential Sites (pre-constr, constr or cmplete.)	5,151				
IS OT 125m brw ACP and HD (Victoria Theater)		40,000	150		
NEW DATE OF THE AVE					300 emp
MI Downlown Hospital	600			1 200 000	
aca Liniv -NY Downlown Hoso, Parking 7 at (100 Wallson St)	500			1,200,000	
ite 14B BPC S (expansion)				1,200,000	
1e 16/17 BPC N	471	223,955			
ite 2 BPC S	628				
ite 26N BPC N				1.887.570	
ile 3 BPC S	500			.,	
nion Settlement, 106 St, 2-3 Ave, Clinic Expansion					XXX
/ashington Heights Plaza		30,000	300		
Bryant Park (42-43 street, 6th and Broadway)	-1			1,370,000	
Columbus Circle (AOL/Time Warner)	600	535,000	585	1,059,000	
00 Morton St.				390,000	
25 W. 14th Street (Armory)	180	119,000			
12-144 W 14 St (Pratt Institute)					
551 Broadway (46-47)	-		S & S	650,000	
92 Broadway (47-48)				297,000	
				1	
7 Lexington Avenue (Baruch College) - 23rd and Lex.					
/ Lexington Avenue (Baruch College) - 23rd and Lex. 745 Broadway (Random House) 160 Broadway (Mandow Alexing)	550			700,000	

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	Residential	Retail	Hotel	Office	Hospital
Project Name	(du).	(sf)	(rooms)	(51)	(\$1)
206-212 E 67 St	0				
209 E 36 St					
21 Warker St at Church St		7 000	382		
230-239 W 51/SINerstein Hotes	630	30.000	002	1	
248 E 34 St	0.00	50.000	150		
200 Medicon (bby E 41et and 42nd)		12.000	100	850,750	· ·
30th St/EDR Dr. (NYLISOM Research Bidg)				1	180,000
31 F 21st St				1	
345 F 87 St				1	
353-59 Broadway					
360 Madison Ave		4,000		336,000	
383 Madison (Bear Steams)		5,000		1,200,000	
394 Second Ave (bet 22-23 St)					
396 Fifth Ave				280,000	
400 E 61 St - former Glick site	266	95,000			
400 Fifth Ave				280,000	
401 W 31st St - Brookfield					
40th blwn 5th & 6th (Homestead Village Hotel)		68,000	150		
42 SV Site 8N (NE corner 8th Av) Milstein		01000		720,000	
42nd SL, Site 4 (7th Av, 41st St)		37,000		852,000	
42nd St., Site One		105 000		905,400	
142nd St., Snes tw, 10, 8E		105,000		225 000	
1444 W 5000 St				640,000	
44/-449 IERO AVE	<u> </u>	30.000	560	040,000	
(47-souri and photomer of A2nd)	<u> </u>	10,000	500	250 000	
Stor Straw Inter Content of 4210	335	10,000		200,000	
Et to Et & Tooth Ave CLIPA - Clinics Green	600	11.600			
52 52 B way and Bla Alminia)	471	24 500			
52-55, B-way and but (virginia)				583,000	
55-56, 8th Ave (ES)	600				
61st Street rezoning (at West End)	400	73,000			
71 St/FDR Drive (Hosp. Spec Surgery)					
727 Eleventh Ave (bet 51 and 52 SL)				57,500	
735-751 Sixth Av				224,000	
745 Seventh Avenue (Rockefetler Plaza West) / MSDW		34,500		969,000	
762 Madison Ave at 66 St			1.		
796-812 Sixth Avenue	269	59,000			
610 8 Ave.	550	39,000		L	
845 9 Ave (Alvin Alley)	250	276 838			
90 Leonard Street	330	213,030			
Sin AV Kezonikig, 35-40th Alexandede Site 58-504 ex., Third (Bloombern)	200	100.000	500	280,000	7
Bellava Hoenital Ambulatory Care Facility (462 First Ave.)		100,000			207.000
Bellavue Hospital DNA lab (462 First Ave.)					321,620
Block 559 Lot 22- East 14th &13th Sts (bet, 3 and 4 Aves.)	232	61,980			
Bond Site, 1514 Broadway				900,000	
Chem Bank/Saloon Gnil (1920 Broadway, 64th Street)	176	25,000		76,000	
Con Edison East Side Sites, commercial scenario	1,039	13,493			
Con Edison East Side Sites, commercial scenario	2,053	51,758		2,650,175	
Cooper Sq Urban Renewal (mixed-use development)	260	127,000			
Cooper Square URA	363	72,000			
Durst 57th St. bet, 11 and 12 Ave.		77,700		1,135,000	
East River Science Park (b/w 1st and FDR, 29th and 30th)				1,200,000	
Hearst HQ, 959 8th Ave (at 57 SL)				650,000	
Hudson River Studios (Houston, West)		200,000			
John Jay, W 59th (blwn 10th and 11th)					
Liberty Theoles (41st Street)					
MoMA Evonesion (11 W 53rd)					
MSKCC 353 E 68th St - (outpatient facility)					55,300
MSKCC 67th-68th St/ 1-2 Ave Research Bldo					61,000
MSKCC infil project E67-68 SI/1-2 Ave					
MSKCC Rezoning (3 blocks b/w First and York, E 66th and 69th)					
NY Law School Expansion/bhurch blwn Leonard and Worth					
NYU Kimmel Center/ 60 Washington Sq. So.				100,000]
Partnership Housing Ave A-C, 10th to 14th St	120				
Pennmark Towers / 315 W 33rd St (new Loews movie theater)	327	80,000			
Ponte Sites	2,880				
Riverside South (northern portion West End Av, 64th and 72nd - Trump Place)	1,500	57,600		90,000	
Rockefeller U Lab 1230 York Ave at E 58th St					390,000
Sofilel Hotel (45th blwn 5th and 6th)			400		[
SW comer of 2nd Av and 29th St					[
I wo Bridges Sile - north of Manh Bridge near South St				000.000	
UNDC				1,610,000	
TO OLIVECOMING DOW TO OF OLIVITY SOUL THUL ON TANK	64,397	5,909,658	4,758	35,146,545	1,214,920

Source: AKRF, Inc (2003)

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Grand Central Taxi Stand Locations Memorandum

vision42 an auto-free light rail boulevard for 42nd Street

Grand Central Taxi Stand Locations

Dan Plottner, Project Manager Erich Arcement, P.E, PTOE; Project Director

Sam Schwartz PLLC

The Cable Building 611 Broadway, Suite 415 New York, NY 10012 212-598-9010

in association with Urbanomics of New York and Hallcrow LLC

March 31, 2005

vision42 Roxanne Warren, AIA, Chair George Haikalis, ASCE, Co-Chair

The **vision42** proposal is a citizens' initiative sponsored by the Institute for Rational Urban Mobility, Inc. (IRUM), a New York City-based not-for-profit corporation concerned with advancing cost-effective transport investments that improve the livability of dense urban places.

This study, one of three technical studies that address key concerns about the feasibility of the **vision42** proposal, was made possible through a generous grant from the New York Community Trust/Community Funds, Inc., John Todd McDowell Environmental Fund.

Institute for Rational Urban Mobility, Inc. P.O. Box 409, New York, NY 10014 (212) 475-3394 www.irum.org www.vision42.org.

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Т Ε С н Ν С Ε Μ R U Μ Μ Ο Α Ν D

DATE: September 29, 2004

TO: Vision 42 Team

FROM: Dan Plottner

PROJECT: VF-04-048

RE: Grand Central Taxi Stand Locations

Introduction

The Sam Schwartz Company (SSC) was retained by Vision 42 to conduct a traffic analysis in midtown Manhattan to find the impacts that would be generated by closing 42nd Street to vehicular traffic.

One such impact will be to Grand Central Terminal. The closure of 42nd Street will impact taxi pick-ups/ drop-offs to this transit hub. This memorandum explores the current pick-up/ drop-off points.

Site Conditions

Grand Central Terminal is a major railway hub, servicing the MTA New York City Subway and the MTA MetroNorth Railroad. The facility extends from 42nd Street to 46th Street and from Vanderbilt Avenue to Lexington Avenue.

There are several pedestrian entrances to Grand Central all along its perimeter. There are entrances at the following locations:

- Park Avenue and 42nd Street
- Lexington Avenue and 42nd Street
- Vanderbilt Avenue and 43rd Street
- Lexington Avenue and 43rd Street
- Within each of the two pedestrian tunnels extending from 45th to 46th Streets between Vanderbilt and Lexington Avenues

In addition, there are other entrances to Grand Central leading directly to the subway. These subway entrances are located as follows:

• 42nd Street and Lexington Avenue

 42nd Street between 5th and Madison Avenues, mid-block; there are two separate entrances on either side of 42nd Street.

Most loading and unloading activity at Grand Central is conducted by taxis. There are three taxi stands in the area. They are located as follows:

- 42nd Street, between Lexington and Park Avenues; north side of the street
- Lexington Avenue, between 44th and 42nd Streets; east side of the street
- Vanderbilt Avenue between 44th and 43rd Streets; east side of the street. (This taxi stand is currently closed for security reasons.)

Taxi Activity: 42nd Street

One taxi stand is located on the north side of 42^{nd} street at Vanderbilt Avenue. There is also a queuing area for pedestrians waiting for taxis at this location.



Figure 1: Taxi stand on 42nd Street between Park and Vanderbilt Avenues

East of this taxi stand, Jersey barriers block pedestrian access to and from the street. These barriers extend from the taxi stand pictured (Fig 1) to the hotel-loading zone east of the

entrances to Grand Central. The barriers are constant except for breaks at the pedestrian crosswalks at Park Avenue. These barriers prevent effective taxi pick-ups and drop- offs, as passengers must find breaks in the barriers to access Grand Central.

An eastbound bus lane on the southern side of 42nd street prohibits taxi pick-ups and dropoffs on the south side of the street.



Figure 2: A Jersey barrier along the sidewalk on the north side of 42nd Street. The taxi stand along 42nd Street is visible on the left side of the photograph.



Figure 3: Jersey barriers along the north side of 42nd Street (with breaks for the Crosswalk)

Taxi Activity: Lexington Avenue

The longest taxi stand in the Grand Central area is located along the eastern side of Lexington Avenue between 44th and 42nd Streets.





A bus lane extends along the western side of Lexington Avenue. Therefore, signage exists along Lexington Avenue directing taxis to use the east side of the avenue for drop-offs and pick-ups.



Figure 5: Signage directing taxi pick-ups and drop-offs to the east side of Lexington Avenue, in the background, taxis can be seen queuing in the taxi stand.

Taxi Activity: Vanderbilt Avenue

Signage exists for a taxi stand on the eastern side of Vanderbilt Avenue. However, this taxi stand has been closed due to security concerns. Currently, vehicles are parked along this defunct taxi stand and along the rest of this block, making curbside taxi pick-ups and drop-offs in the area difficult. Also, Jersey barriers along Vanderbilt serve to further inhibit taxi activity.



Figure 6: Parking along Vanderbilt Avenue. The police van is parked directly in front of the entrance to Grand Central from Vanderbilt Avenue. The far parking regulation sign prohibits standing due to a taxi stand.

Taxi Activity: 45th and 46th Streets

No organized taxi activity to Grand Central exists along these streets. The only entrances to Grand Central in this area are within the pedestrian tunnels that connect 45th and 46th Streets.

Taxi pick-up and drop-off space is limited on 45th Street by a large crosswalk and this limited space is shared with pick-ups and drop-offs to the large entrance to the Metlife building on 45th Street.



Figure 7: Large Crosswalk on 45th Street; also the main entrance to the Metlife Building

46th Street also has limited available pick-up and drop-off space due to the large Park Avenue intersection and parking in the area. Pick-up and drop-off space is available on 46th between Park Avenue and Lexington Avenue.



Figure 8: Park Avenue and 46th Street; the pedestrian tunnels to 45th Street straddle Park Avenue on the left. Limited pick-up and drop-off space is available.



Figure 9: Parked cars on 46th Street between Vanderbilt and Park Avenues



Figure 10: 46th Street between Park Avenue and Lexington Avenue
Vision42 Project Mode Shift

vision42 an auto-free light rail boulevard for 42nd Street

Vision42 Project Mode Shift

By Komanoff Energy Associates

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in association with Urbanomics of New York and Hallcrow LLC

March 31, 2005

vision42 Roxanne Warren, AIA, Chair George Haikalis, ASCE, Co-Chair

The **vision42** proposal is a citizens' initiative sponsored by the Institute for Rational Urban Mobility, Inc. (IRUM), a New York City-based not-for-profit corporation concerned with advancing cost-effective transport investments that improve the livability of dense urban places.

This study, one of three technical studies that address key concerns about the feasibility of the **vision42** proposal, was made possible through a generous grant from the New York Community Trust/Community Funds, Inc., John Todd McDowell Environmental Fund.

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- To: Dan Plottner, Sam Schwartz Co.
- From: Charles Komanoff, Komanoff Energy Associates (KEA)
- Date: November 10, 2004
- Re: Vision42 Project Mode Shift

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Via: e-mail
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Following are my findings for mode shifts to light-rail from the following motor vehicle modes (i) <u>current taxi trips</u> within the study area (37th-47th Streets), (ii) <u>current car commutes</u> from the New Jersey suburbs to the study area; and (iii) <u>current car commutes from</u> Westchester County to the study area. These results are derived in the spreadsheet, CK_Mode Shifts to Light-Rail, which is attached separately.

1. Mode Shift from Taxi Trips to Light-rail

Results

I have estimated the percentage of taxi-fare trips (trips with passengers) <u>taking place</u> <u>entirely within the study area</u> that will shift to the light-rail. The figure varies with the proximity of the trip start and end points to 42nd Street. Of taxi-fare trips both originating and arriving on 42nd Street, an estimated 15% will shift to light-rail. For trips originating and/or ending one or more blocks away, the percentage is less, although still greater than 10% for many O/D pairs. For all 121 pairs (corresponding to 11 origin streets and 11 destination streets), the average mode shift is 10%.

The predicted mode-shift percentages for each O/D pair of taxi-fare trips are as follows:

Street of	Destina	ation										
Origin	37	38	39	40	41	42	43	44	45	46	47	mean
37	0%	1%	4%	7%	10%	12%	12%	11%	11%	11%	10%	8.1%
38	1%	1%	4%	7%	10%	13%	12%	12%	11%	11%	11%	8.5%
39	4%	4%	4%	7%	10%	13%	13%	12%	12%	11%	11%	9.3%
40	7%	7%	7%	8%	11%	14%	13%	13%	12%	12%	11%	10.3%
41	10%	10%	10%	11%	11%	14%	14%	13%	13%	12%	12%	11.7%
42	12%	13%	13%	14%	14%	15%	14%	14%	13%	13%	12%	13.2%
43	12%	12%	13%	13%	14%	14%	11%	11%	10%	10%	10%	11.7%
44	11%	12%	12%	13%	13%	14%	11%	8%	7%	7%	7%	10.3%
45	11%	11%	12%	12%	13%	13%	10%	7%	4%	4%	4%	9.3%
46	11%	11%	11%	12%	12%	13%	10%	7%	4%	1%	1%	8.5%
47	10%	11%	11%	11%	12%	12%	10%	7%	4%	1%	0%	8.1%
mean:	8.1%	8.5%	9.3%	10.3%	11.7%	13.2%	11.7%	10.3%	9.3%	8.5%	8.1%	9.9%

Table 1 – Mode-Shift Percentage for O/D Taxi-fare trips

Note: O/D pairs for which the predicted reduction in cab usage is 10% or greater are shown in red.

<u>Taxi-cruising trips</u> in the study area will also diminish due to the light-rail, but not to the same extent since the number of taxi-fare trips from the study area to other parts of the city is likely to remain unchanged. Absent detailed O/D data for taxi trips in the study area, there's no straightforward way to estimate the likely shrinkage in cruising trips. For purposes of the traffic analysis, <u>I suggest estimating the reduction in cruising trips at 33% (one-third)</u> of the percentages in the matrix just above.¹

Method

I calculated the total cost — both out-of-pocket costs and "time costs" — of traveling to and from various points within the study area by taxi, and by a combination of walking plus light-rail. I found that for all combinations of origins and destinations, the estimated total cost is less for trips by light-rail (plus walking) than by taxi.

Of course, a cost advantage for light-rail doesn't dictate that all taxi trips will switch. To estimate the share of taxi trips that will in fact switch, I assumed that the cost saving offered by the light-rail functions as an increase in the price of a taxi trip. Thus, if for a given origin and destination the calculated cost of the taxi trip is, say, 10% greater than the cost of the light-rail, I modeled the advent of the light-rail alternative as if taxi trips had increased in cost by 10%. By applying the assumed <u>price elasticity</u> of the demand for taxi trips, I was able to estimate the rate of reduction in such trips.

Sensitivities

<u>Vehicular travel speeds</u> — I assumed that the average speed of taxis in the study area is just 4 mph — the value reported in SSC model runs for the AM period in 2010 under the "build" scenario. Raising this to just 5 mph reduces the expected mode-shifting by 35% (from an average of 10% to 6.5%), indicating that the attractiveness of the light-rail is extremely sensitive to the prevalence and extent of traffic congestion in the study area. Raising it to 6 mph reduces mode-shifting by a very substantial 60% from the 4 mph assumption (from 10% to 4%).

<u>"Lateral" trip distance</u> — I assumed that all taxi trips have an "east-west" (lateral) component of exactly 2/3 of a mile. Raising this to 1 mile increases the amount of mode-shifting by more than a third, as the speed advantage of light-rail over taxicabs is manifested over a longer trip. Reducing the length of the east-west leg of the taxi trips to half-a-mile reduces the amount of mode-shifting to light-rail by almost one-fourth.

<u>Price-elasticity</u> — I assumed a price-elasticity of taxi trips in the study area of (negative) 0.3. This figure, denoting relative but not ironclad "inelasticity" of taxi use to its price, is in line with work by taxi-industry expert Bruce Schaller (see citations in spreadsheet) as well as my own analysis of car-commute trips to the CBD (ditto). Increasing the price-elasticity to 0.4 raises the mode-shifting by around 30% (e.g., to an average of 13% from 10% previously). Reducing the price-elasticity to 0.2 shrinks the mode-shifting by almost a third (to 6.7-6.8% from 10%).

¹ Assume for argument's sake that the light-rail eliminated *all* taxi-fare trips originating and ending in the study area, and that a quarter of all taxi pickups in the study area end in the study area. Since all fare trips immediately segue into cruising trips, a quarter of cruising trips would disappear (by these assumptions). Cruising trips originating outside and then entering the study area would also diminish somewhat since fewer people would be hailing cabs there. This suggests that the rate of reduction in cruising trips should be greater than the share of trips in the study area that originate and end there. If that share is indeed a quarter, it could plausibly be bumped upwards to one-third.

<u>Value of traveler's time</u> — I assume travelers implicitly assign a value of \$25 an hour to their travel time. Increasing this to \$30 reduces mode-shifting by around 15% (since taxis' door-to-door service is generally faster than that of light-rail, even under very congested conditions); reducing the value of time to \$20/hour increases mode-shifting by around 20%.

<u>Note</u>: To keep the analysis manageable, I made a number of simplifying assumptions. One of these is that all taxicab trips have just one passenger. Obviously, multi-passenger cab trips would be less inclined to shift to light-rail since the fare can be spread among two or more riders. If in fact a significant share of cab trips in the study area are multi-passenger trips, the analysis should be re-run to reflect this.

How to Apply these Results

I feel comfortable applying the percentage figures in the 11x11 matrix above to taxi trips with passengers that begin and end in the study area. Taxi trips with only one end point in the study area are a different matter. Judging from the "gradients" in the matrix, it appears plausible that a significant number of forecast taxi trips — around 10% — originating on 42nd Street and ending within several blocks of the study area would also shift to the light-rail. Conversely, no trips starting or ending near the edge of the study area and ending outside would be attracted to the light-rail. You may wish to extend the O/D matrix to produce the precise mode-shift percentages for all such trips.

For taxi <u>cruising</u>, as noted earlier I suggest you apply one-third of the percentage figures shown in the matrix.

2. Mode Shift from Drive-from-NJ to Bus + Light-Rail

I next estimated the percentage of solo-commuter car trips from the New Jersey suburbs into the study area that will disappear due to the light-rail. For this analysis I "costed" an alternative consisting of NJ Transit bus service to the Port Authority terminal at 42nd Street, "chaining" to the light-rail line. The notion is that some travelers who now drive from New Jersey to midtown would shift to a commuter bus if they could complete their journey on an attractive and reliable light-rail line.

Results

As in the taxi analysis, the share of current SOV commute trips from NJ into midtown via the Lincoln Tunnel depends on the destination street. Thus, my results are shown as a vector, as follows. (Below each street number is the estimated percentage of solo-driver trips ending in that street that are predicted to disappear with the advent of the light-rail line.)

Table 2 – Predicted Reduction in Driving to Work to 42nd St. Area from NJ, due to advent of Light-rail

37	38	39	40	41	42	43	44	45	46	47	mean
2%	2%	2%	3%	3%	4%	4%	4%	3%	3%	3%	2.9%

Sensitivities

<u>Vehicular travel speeds</u> — I again assumed an average motor vehicle speed in the study area of 4 mph. Raising this has some impact — assuming a 5 mph speed reduces the

expected mode-shifting by 21% (from an average of 2.9% to 2.3%). Similarly, making car speeds in New Jersey 20% faster than bus speeds (rather than the 10% differential I assumed) shrinks the amount of mode-shifting by more than 40%, to 1.7%.

<u>"Lateral" trip distance</u> — To keep the analysis manageable, I assumed that every NJ commute trip ends at 6th Avenue, regardless of the particular street (e.g., 37th, 42nd, 47th, etc.), so that the lateral (east-west) car distance from the Lincoln Tunnel egress to 6th Avenue is approximately half-a-mile. Doubling this distance to one mile (e.g., putting the trip destination at Madison or Park Avenues) increases the amount of mode-shifting by around 30%, to an average of 3.8%, as the speed advantage of light-rail over automobiles is manifested over a longer trip.

<u>Price-elasticity</u> — I assume a price-elasticity of taxi trips in the study area of (negative) 0.3. As noted in the preceding taxi discussion, this is in line with my analysis of car-commute trips to the CBD across the East River. Increasing the price-elasticity to 0.4 raises the mode-shifting by a third, from an average of 2.9% to 3.9%. Reducing the price-elasticity to 0.2 shrinks mode-shifting by a third, to 2.0%.

<u>Value of traveler's time</u> — Because the door-to-door commute is considerably faster by car than via the bus and light-rail combination, the propensity of drivers to mode-shift is extremely sensitive to their implicit value of travel time. Increasing it from the assumed \$25 an hour to \$30 reduces mode-shifting by more than 45%, to 1.6%. Conversely, reducing the value of time to \$20/hour increases mode-shifting by almost 60%, to an average of 4.6%.

Free parking in Manhattan — I have assumed average after-tax parking costs of \$17 a day. This cost accounts for almost 60% of the out-of-pocket cost of driving to work (the balance is gasoline, the Lincoln Tunnel toll, and applicable "incremental" maintenance and insurance), and it easily exceeds the average differential between the total costs (including time) of car commuting vs. the bus/light-rail combination. Thus, eliminating this cost by assuming free (e.g., employer-paid) parking makes the average car commute cheaper (when time costs are included) than the alternative combination, suggesting that the advent of the light-rail line will have no effect on driving to work by commuters with access to free parking.

Congestion Pricing — Proposals to charge or raise vehicle entry fees to the Manhattan Central Business District are gaining consideration as possible new revenue sources and effective means of thinning midtown traffic and reducing gridlock. I have modeled the effect of imposing a flat \$10 fee for all motor vehicles entering the CBD during the day. Since vehicles entering via the Lincoln Tunnel already pay a \$5 toll (assuming peak-period travel and EZ-Pass use), the \$10 fee would be administered as a \$5 charge for vehicles entering the Manhattan street system at the egress of the Lincoln Tunnel. This charge would raise the average amount of mode-shifting from car to bus plus light-rail from 2.9% to 4.6%, an increase of almost 60%.

<u>Note</u>: I made a number of simplifying assumptions, including that all car-commute trips have no passengers other than the driver. Obviously, car trips with two or more riders would be less inclined to shift to bus plus light-rail since out-of-pocket costs such as gas and tolls can be spread among two or more riders. Indeed, a simple calculation indicates that carpoolers will find car-commuting cheaper (in out-of-pocket plus time costs) than switching to bus and light-rail. Accordingly, no carpool commute trips from New Jersey to midtown should be assumed to be shifted to light-rail.

How to Apply these Results

I think it's alright to apply the percentage figures in the vector above to solo-car commute trips from the New Jersey suburbs to the study area. On the other hand, given that those

percentage estimates are fairly sensitive, it might be preferable to apply the <u>average</u> percentage reduction, 2.9% (which could be rounded to 3%), throughout the study area.

Also, judging from the gradients in the vector, it's possible that some trips through the Lincoln Tunnel to destinations south of 37th Street or north of 47th Street might also shift to bus plus the light-rail. Nevertheless, for conservatism I would suggest ignoring any such shifts in your analysis.

3. Mode Shift from Drive-from-Westchester County to Train + Light-Rail

I also estimated the percentage of solo-commuter car trips from the northern suburbs into the study area that will disappear due to the light-rail. For this analysis I "costed" an alternative consisting of Metro-North train service to Grand Central Station at 42nd Street, "chaining" to the light-rail line. The notion is that some travelers who now drive from Westchester or other points north to midtown would shift to commuter rail if they could complete their journey on an attractive and reliable light-rail line.

Results

As in the two foregoing analyses, the share of current SOV commute trips from Westchester into midtown depends on the destination street. Thus, my results are shown as a vector, as follows. (Below each street number is the estimated percentage of solo-driver trips ending in that street that are predicted to disappear with the advent of the light-rail line.)

Table 3 - Pre Predicted Reduction in Driving to Work to 42nd St. Area from Westchester, due to Light-rail

37	38	39	40	41	42	43	44	45	46	47	mean
8%	8%	8%	8%	8%	8%	7%	7%	7%	7%	6%	7.5%

However, I believe that these percentage figures are implausibly high. Applying judgment, I would reduce them by one-third. (See discussion further below, under heading, How to Apply these Results.)

Sensitivities

<u>Vehicular travel speeds</u> — I again assumed an average motor vehicle speed in the study area of 4 mph. Raising this has some impact — assuming a 5 mph speed reduces expected mode-shifting by 12% (from an average of 7.5% to 6.6%). Similarly, adding 10% to the assumed car speed in Westchester and the Bronx shrinks the amount of mode-shifting by 18% to 6.1%.

<u>"Lateral" trip distance</u> — To keep the analysis manageable, I assumed that every commute trip from Westchester ends at 6th Avenue, regardless of the particular street (e.g., 37th, 42nd, 47th, etc.), so that the lateral (east-west) car distance from the Lincoln Tunnel egress to 6th Avenue is approximately half-a-mile. Moving the destination away from the center of the island and closer to either the Hudson or East Rivers would probably reduce the amount of mode-shifting by shortening the auto trip from either highway (the FDR Drive or the West Side Highway).

<u>Price-elasticity</u> — I assume a price-elasticity of taxi trips in the study area of (negative) 0.3. As noted in the preceding taxi discussion, this is in line with my analysis of car-commute trips to the CBD across the East River. Increasing the price-elasticity to 0.4 raises the mode-shifting by almost a third, from an average of 7.5% to 9.9%. Reducing the price-elasticity to 0.2 shrinks mode-shifting by almost a third, to 5.1%.

<u>Value of traveler's time</u> — Because total door-to-door travel times from Westchester to midtown are comparable between the car mode and the train and light-rail combination, the propensity of drivers to mode-shift is relatively insensitive to the value of travel time. Varying it from the assumed \$25 an hour to either \$20 or \$30 changes mode-shifting by only 5% to 7%.

Free parking in Manhattan — I have assumed average after-tax parking costs of \$17 a day. This cost accounts for over 60% of the out-of-pocket cost of driving to work from Westchester County, and it accounts for almost the entire difference between the total costs of car commuting vs. the train/light-rail combination. Eliminating this cost by assuming free (e.g., employer-paid) reduces the propensity to mode shift to light-rail to an average of only 2.0%, a reduction of roughly three-fourths from the average of 7.5%.

<u>Congestion Pricing</u> — Imposing a flat \$5 fee to enter the CBD during the day would raise the average amount of mode-shifting from car to train plus light-rail from 7.5% to 8.9%, an increase of 18%. With a \$10 fee, mode-shifting would rise by 36%, to an average of 10.2%.

<u>Note</u>: The foregoing results apply to car-commute trips with no passengers other than the driver. Car trips with two riders rather than one would be expected to mode-shift 60% less than single-occupant vehicles, i.e., at an average rate of 3.1% instead of 7.5%.

How to Apply these Results

My strong hunch is that the percentage figures in the vector above overstate somewhat the true share of solo-car commute trips from Westchester to the study area that will switch to commuter rail plus light-rail.² I would feel more comfortable reducing the percentages in the vector by one-third. I also think it may be preferable to apply the <u>average</u> percentage reduction, 5.0% (calculated by reducing the mean of 7.5% by a third) throughout the study area rather than doggedly applying the street-specific figures shown.

Finally, for conservatism I suggest ignoring possible mode-shifting for trips ending outside the study area.

4. Other Mode Shifts

It seems to me implausible that the advent of the light-rail will provoke any significant mode-shifting of current car-commute trips into the study area from Long Island (Nassau, Suffolk and Queens). The most attractive alternative, L.I.R.R. train service, terminates in Penn Station, which is 8-10 blocks south of the light-rail line. Although it is possible to envision trips from, say, Nassau or Suffolk to East 42nd Street that might switch to train plus light-rail, I suspect that conversions predicted by the model used here would be relatively few. I suggest ignoring them for conservatism.

² I constrained car trips from Westchester to use the FDR Drive. Some trips to the study area may be faster, and thus cheaper on a total cost basis, if they use the West Side Highway instead.