TRAFFIC CAPACITY ANALYSIS ASSUMPTIONS

For the street intersection capacity analysis, Stantec will use Highway Capacity Software (HCS) 2000, Version 4.1f. The specific assumptions are as follows:

- *Traffic Volumes* – The Existing conditions traffic volumes would be balanced. All sinks and sources actually used in the balancing of the Existing condition networks would be identified. Sinks and sources used in the No Build and Build condition networks would also be identified.
- *Illegal Turns* – Illegal turn volumes will be removed as part of balancing the Existing condition traffic volumes. In addition, No Build and Build trips will not be assigned to make any illegal turns.
- *Physical Inventories* – Intersection physical inventories will be provided in order to verify the bus stops, bike lanes, street width, number of observed moving lanes and any other physical characteristics that affect the HCS analysis.
- *Lane Widths and Configurations* – Lane widths and configurations initially assumed in the traffic analysis were based on a project field data. At high volume intersection approaches, it was sometimes observed that the approach was operating with a defacto "turning pocket", similar to daylighting. In those cases, a turning pocket was included in the HCS analysis during the affected analysis hour(s), as noted in the footnotes in the capacity and LOS analysis tables. Some approaches had lane widths in excess of 16 feet. The maximum lane width HCS allows is 16 feet so in these cases a lane width of 16 feet was used.
- *Right Turn on Red* – Not permitted.
- *Peak Hour Factor* – Peak hour factors were determined for each individual turning movement based on the turning movement counts performed on the study area intersections.
- *Base Saturation Flow Rate* – 1,900 passenger cars per hour per lane.
- *Heavy Vehicle Percentages* – Sample classification counts were performed for each of the peak periods at various locations in the study area. Results of the sample classification counts were applied to similar and surrounding intersections. Minor streets being studied that were not truck routes were given heavy vehicle percentages of 5%.
- *Upstream Filtering/Metering Adjustment* – The intersections are analyzed as isolated intersections, where this adjustment factor equals 1.
- *Conflicting Pedestrians* – Pedestrian count data was collected at selected intersections in the study area at the same time the turning movement counts were collected. The counts were then applied to similar intersections in the zones around where the counts were taken. Later, more pedestrian counts were collected for the pedestrian analysis and these counts were reviewed to adjust the existing conflicting pedestrian values.
- *Arrival Type (AT)* – An arrival type of 3 was used for all approaches for intersections in the study area.
- *Bus Blockages* -- Bus blockages would be addressed where there is a near-side bus stop (far-side bus stops will not be analyzed). The number of bus blockages per hour would be based upon the cumulative number of buses per hour would be based on published bus schedule information on the MTA Web-site. All buses are accounted for in the heavy vehicle percentages, regardless of the presence of bus stops.
- *Adjacent Parking Lane* – This information is based on the existing parking regulations inventory, as the initial assumption, and field observations as a

supplement, which may vary by analysis hour, depending on curbside parking regulations and motorist's behavior.

- *No Standing / No Parking Regulations* – Where illegal standing or parking is commonly observed on streets or avenues with posted No Standing/No Parking regulations, HCS analysis would select the "adjacent parking lane with zero (0) parking maneuvers" option. This would result in a parking adjustment factor slightly less than 1.00. Where the No Standing / No Parking regulations are typically obeyed, the HCS analysis would select the "no adjacent parking" option.
- *Parking Maneuvers* – A conservative value of10 parking maneuvers per hour has been used for the study area where parking exists. This falls in accordance with the *15 Penn EIS* in coordination with the *Western Rail Yards DEIS*.
- *Signal Timing/Phasing* – Official NYCDOT 2009 traffic signal timing/phasing plans will be used for the 2009 Existing Conditions. At the intersection of East Tremont Avenue and East 177th Street, official signal timings did not exist. For this signal timing/phasing observed in the field was used. No notable traffic signal phasing/timing differences from the official signal timings were observed through field observations.
- *Bicycle Lanes* – Existing bicycle lanes within the traffic study area were noted on the physical inventories and will be included in the capacity and level of service analyses and shown on all schematics where mitigation is proposed.
- *Pedestrian Walking Speed* – A pedestrian walking speed of 4.0 ft/sec was used.
- *Adjustment to Analysis Factors* – Adjustments often need to be made to analysis factors to reduce high v/c rations in the Existing conditions to 1.05. The Existing condition's capacity and level of service summary table in SEIS Chapter 16 – Traffic and Parking, includes a notes column, where the Stantec documented the adjustments that were made to the analysis factors, so as to lower the v/c ratio for a particular lane group to 1.05. Details are available in the HCS analysis sheets. [If additional documentation is needed by NYCDOT, it was agreed that the Stantec would provide it in a technical memo.]
    - Input parameters would be carefully reviewed based upon field observations before adjustments are made to the Analysis Factors.
    - Adjustment factors that result in a linear proportioning of capacity and remain constant in future years can be modified to bring v/c ratio down, so long as those adjustments reflect observed field conditions. The order in which changes would be made to Analysis Factors are as follows:
        - Reductions in the number of parking maneuvers per hour and/or the percentage of heavy vehicle factor; would be based on actual field verified information;
        - Increase ideal saturation flow rate. The maximum allowable rate without justification is 2,050 pcphgpl;
        - Increase the lane utilization factor (fLU);
        - Increase the percentage of left-turns using the protected portion of a protected-plus-permitted phase;
        - Extension of effective green to a maximum of 3 seconds;
        - Increase the percent of left-turning vehicles using a designated left + thru shared lane;
        - Adjust the peak hour factor (PHF) based on volume changes done when balancing network and field observations.
    - Adjustments would be applied to the left-turn and right-turn factors only as a last resort, because they are calculated based upon other input parameters.

In addition, because the left and right turn factors vary depending on competing volumes and other parameters in the future year, they need be adjusted in the future analysis years based upon the percentage adjustment made to the Existing conditions, so that these factors remain consistent for all scenarios.

- An effort would be made not adjust more than 2 or 3 factors, as multiple adjustments raise flags.
- Adjustments to factors, including the lane utilization factor and ideal saturation flow rate, would only be applied to the particular lane group during the analysis hours where the Existing conditions v/c ratio had been greater than 1.05. If the other lane groups or analysis hours do not require adjustments to lower the v/c ratio, then the standard values, as cited above would be used.
- If the above adjustments to analysis factors, including adjustments to the left-turn and right-turn factors, cannot reduce the Existing Conditions v/c ratio to 1.05, an increase in the base saturation flow rate would be tested up to a maximum of 2,100 vph and the results would be reported to NYCDOT in a brief memo, before this step would be formally submitted.
- Modified factors will be carried through to the No-Build and Build scenarios for the affected analysis hours.

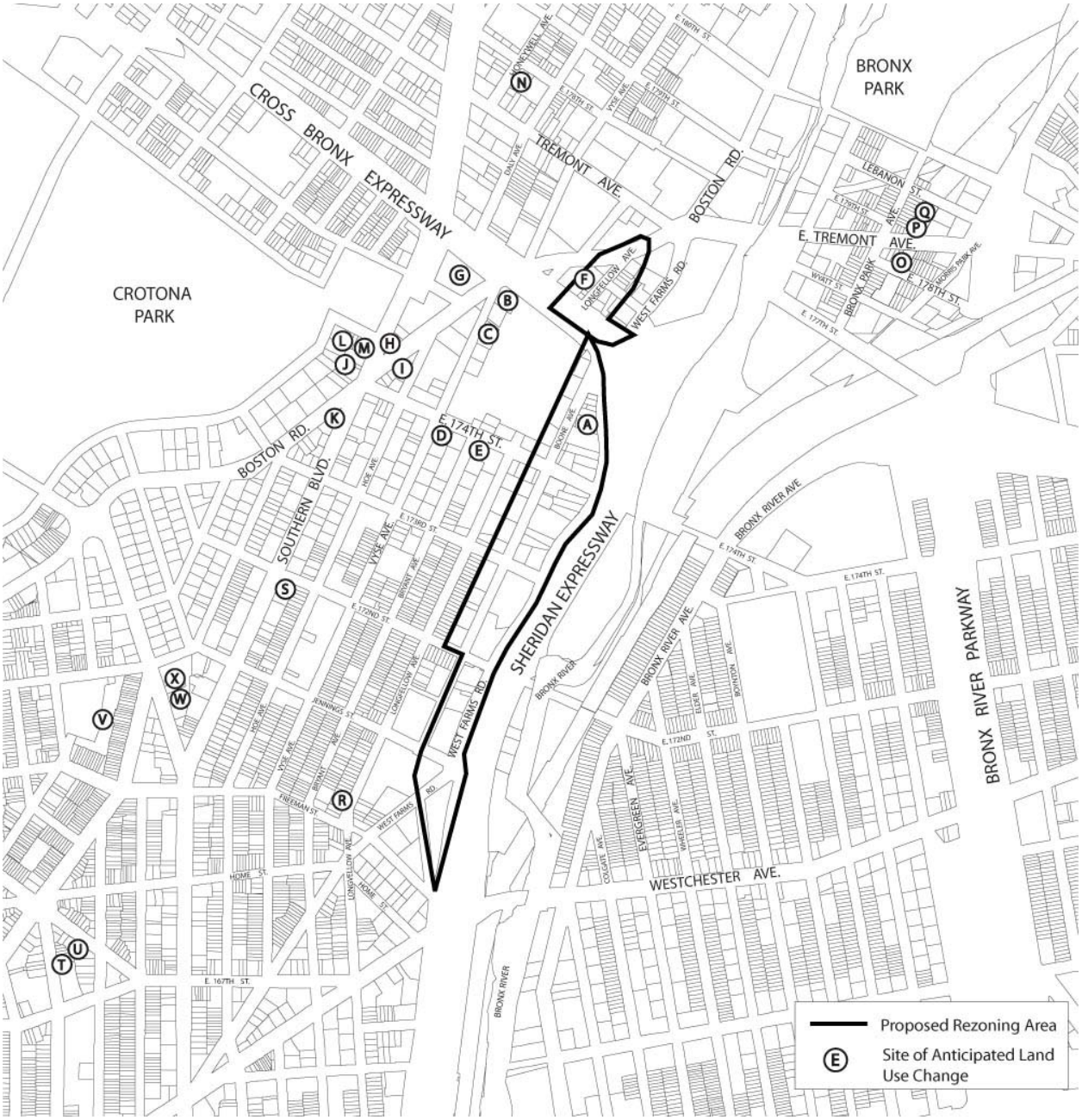
2018 No Action Traffic Assumptions

In order to determine the future 2018 No Build conditions, background growth and traffic due to major developments in the area was applied to the existing 2009 conditions. Major projects in the study area and their locations are listed in Table 1 below. Figure 1 below shows the locations of the major developments. Trip generation was conducted for these projects based on their land uses in accordance with the *2010 CEQR Technical Manual*.

Table 1 Major Developments in the Study Area

Map Location	Address	Residential Units (DU's)	Local Retail Floor Area (sf)	Community Facility Floor Area (sf)	Medical Center Floor Area (sf)	Daycare Floor Area (sf)
A	1817 West Farms Rd.		4,960			
B & C	Vyse Ave.	150				
D	1710 Vyse Ave.	65				
E	1704 Bryant Ave.	40	1,547	1,555		
F	1872-1880 Boston Rd.	120		168,116	70,048	
G	1825 Boston Rd.	175				
H	1778 Southern Blvd.	68	9,903	724		
I	1776 Boston Rd. Rezoning	65				
J	1767 Southern Blvd.	23	4,473			
K	1693 Southern Blvd.		4,248			
L	1810 Crotona Park East	55				
M	1779 Southern Blvd.	18				
N	906 E 178th St.	35				
O	1172 East Tremont Ave.	36				
P	1175 East Tremont Ave.	54	4,900			
Q	1160 Lebanon St.	51				
R	1411, 1413, 1415 Longfellow Ave.	9				
S	1510 Southern Blvd.	60				
T	1140 Tiffany St. & 922 East 169th St	84				
U	922 East 169th Street	10				
V	850 Jennings St.	103				6,080
W	1340 Louis Nine Blvd	207				
X	870 Jennings Street	84	5,118	6,711		
Total		1,512	35,149	177,106	70,048	6,080

Figure 1 Major Developments in the Study Area



Background Growth

In accordance with the *2010 CEQR Technical Manual*, background growth was applied to the 2009 existing traffic conditions. For the first five years a background growth rate of 0.25% was used. For years six through nine, a background growth rate of 0.125% was applied. These growth rates were applied to the 2009 existing traffic network

Residential Auto Trips (No Action Projects)

The Future without the Proposed Project includes several development sites with substantial residential components.

Trip Generation: Weekday residential trip generation rates used were those recommended in the *2010 CEQR Technical Manual* at 8.075 trips per residential dwelling unit.

Temporal Distribution and In/Out Splits: The temporal distribution for the residential components was from the *2010 CEQR Technical Manual*. In/out splits used for the various development sites were based on those used in the *Lower Concourse Rezoning and Related Actions FEIS.* The temporal distribution and in/out splits are shown in Appendix A-1.

Mode Splits: Mode splits proposed for the additional development sites were initially derived from Census journey-to-work data for all census tracts that were at least 50% in the half mile radius study area of the proposed project. Trips were divided into auto, taxi, transit and walk trips using the Census data. Transit trips were further divided into subway and bus trips. The mode splits that were used are shown in Appendix A-1.

Vehicle Occupancy: An auto vehicle occupancy of 1.5 was used for the additional No Action development sites while a taxi vehicle occupancy of 1.4 was used. The occupancies used were based on the *Lower Concourse Rezoning and Related Actions FEIS*.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *2010 CEQR Technical Manual*. The truck trip characteristics are shown in Appendix A-1.

Retail Auto Trips (No Action Projects)

The Future without the Proposed Project includes several development sites with substantial retail components.

Trip Generation: Local retail trip generation rates proposed to be used for No Action development sites are the same as those presented in the *2010 CEQR Technical Manual*. The trip generation rate used was 205 trips per 1,000 gsf.

Temporal Distribution and In/Out Splits: The temporal distribution for the local retail component and the in/out splits proposed to be used for the No Action development sites are the same as those presented in the *2010 CEQR Technical Manual*. The temporal distribution and in/out splits are shown in Appendix A-2.

Mode Splits: Mode splits proposed for the local retail element for No Action development sites are from *Lower Concourse Rezoning and Related Actions FEIS*. The mode splits that were used are shown in Appendix A-2.

Vehicle Occupancy: Vehicle occupancy proposed for the local retail element of for No Action development sites are from *Lower Concourse Rezoning and Related Actions FEIS*. A vehicle occupancy of 1.6 is used for automobiles and 1.2 is used for taxis.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *2010 CEQR Technical Manual*. The truck trip characteristics are shown in Appendix A-2.

Community Facility Auto Trips (No Action Projects)

The Future without the Proposed Project includes several undefined community facilities.

Trip Generation: Community facility trip generation rates proposed to be used for the No Action development sites are the same as those used in the *Jamaica Plan FEIS*. The trip generation rate used was 48 trips per 1,000 gsf.

Temporal Distribution and In/Out Splits: The temporal distribution for the community facility and the in/out splits proposed to be used for the No Action development sites are the same as those in the *Jamaica Plan FEIS*. The temporal distribution and in/out splits are in Appendix A-3.

Mode Splits: Mode splits proposed for the community facility elements of the proposed No Action developments are from the *Jamaica Plan FEIS*. The mode splits that were used are shown in Appendix A-3.

Vehicle Occupancy: Vehicle occupancy proposed for the community facility elements of the proposed No Action developments are from *Jamaica Plan FEIS*. A vehicle occupancy of 1.65 is used for automobiles and 1.2 is used for taxis.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *Jamaica Plan FEIS*. The truck trip characteristics are shown in Appendix A-3.

Medical Facility Auto Trips (No Action Projects)

The Future without the Proposed Projects includes a medical facility. Trip Generation for the facility was done for both staff and visitors.

Trip Generation: Medical Facility trip generation rates proposed to be used for the No Action development sites are the same as those used in the *Jamaica Plan FEIS*. The trip generation used for staff was 10 trips per 1,000 gsf and for visitors it was 33.6 trips per 1,000 gsf.

Temporal Distribution and In/Out Splits: The temporal distribution for the Medical Facility and the in/out splits proposed to be used for the No Action development sites are the same as those in the *Jamaica Plan FEIS*. The temporal distribution and in/out splits are shown in Appendices A-4 and A-5.

Mode Splits: Mode splits proposed for the Medical Facility element of the proposed No Action developments are from *Jamaica Plan FEIS*. The mode splits that were used are shown in Appendices A-4 and A-5.

Vehicle Occupancy: Vehicle occupancy proposed for the Medical Facility elements of the proposed No Action developments are from *Jamaica Plan FEIS*. For staff, a vehicle occupancy of 1.0 is used for automobiles and 1.4 is used for taxis. For visitors, a vehicle occupancy of 1.65 is used for automobiles and 1.2 is used for taxis.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *Jamaica Plan FEIS*. The truck trip characteristics are shown in Appendices A-4 and A-5.

Day Care Facility Auto Trips (No Action Projects)

The Future without the Proposed Project includes one Day Care Facility.

Trip Generation: Day Care Facility trip generation rates proposed to be used for the proposed No Action developments are the same as those used in the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. The Day Care Facility will generate 138 trips per 1,000 gsf daily.

Temporal Distribution and In/Out Splits: The temporal distribution for the Day Care Facility in the No Action development sites and the in/out splits proposed to be used are the same as those in the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. The temporal distribution and in/out splits are shown in Appendix A-6.

Mode Splits: Mode splits for the Day Care Facility in the No Action development sites are were developed in consultation with the Department of City Planning and are the same as those assumed for the proposed Project. The mode splits that were used are shown in Appendix A-6.

Vehicle Occupancy: Mode splits proposed for the Day Care Facility in the No Action development sites are from *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. Vehicle occupancy of 1.65 is used for automobiles and 1.4 is used for taxis.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS*. The truck trip characteristics are shown in Appendix A-6.

Automobile and Taxi Trip Assignments

Automobile and taxi trips were assigned to the No Action project locations. The assignments followed the same assumptions used in assigning trips for the build project and are described below.

The Census journey-to-work information was used to determine general routings. Three percent of trips were out of state. Based on the location of the Project, these trips were assumed to be to/from New Jersey and were routed the most direct path to the Cross Bronx Expressway. The Census also indicated that 43 percent of all journey-to-work trips stayed within the county: 23 percent were assumed to be local trips and were routed out of the study area via West Farms Road, Westchester Avenue, Tremont Avenue and Boston Road; 20 percent were assumed to travel further from the study area and were assigned via local access routes to the highway system. The remaining 54 percent (out-of-county) of the trips were distributed to Manhattan (25 percent), Queens/Brooklyn (19 percent) and Westchester (10 percent). These out-of-county trips were distributed on the local roads to the closest highway access point. Fifty percent of the Manhattan trips used the Cross Bronx Expressway and the remaining fifty percent used the Sheridan Expressway.

Truck Trip Assignments

The Project generated truck trips were assigned to the individual Project blocks using the most direct route along the NYCDOT designated truck routes in the study area and were assigned in generally the same geographic distribution as the auto trips.

Appendix A-1
No Build Traffic Analysis Factors

Land Use:	**Residential**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	8.075 Trips per DU		2010 CEQR Technical Manual
Temporal Distribution			Source:
AM	10.0%		2010 CEQR Technical Manual
MD	5.0%		
PM	11.0%		
In/Out Splits	IN	OUT	Source:
AM	15%	85%	Lower Concourse Rezoning and Related Actions FEIS
MD	50%	50%	
PM	70%	30%	
Modal Splits			Source:
AUTO	31%		2000 US Journey To Work Data for Census Tracts in Study Area:
TAXI	1%		52, 54, 56, 58, 60, 62, 121.02, 123, 125, 127.01, 153, 155, 157,161
BUS	21%		220, 359, 361, 363, 365.01, 365.01, 365.02, and 367
SUBWAY	40%		As approved by DCP
WALK	7%		
	100%		
Vehicle Occupancy			Source:
Auto	1.50		Lower Concourse Rezoning and Related Actions FEIS
Taxi	1.40		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.06		2010 CEQR Technical Manual
Truck Temporal Dist			Source:
AM	12.0%		2010 CEQR Technical Manual
MD	9.0%		
PM	2.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
Truck PCE Factor	2.00		

Appendix A-2
No Build Traffic Analysis Factors

Land Use:	**Retail**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	205	Trips per 1,000 sf	2010 CEQR Manual
Temporal Distribution			Source:
AM	3.0%		2010 CEQR Manual
MD	19.0%		
PM	10.0%		
In/Out Splits	IN	OUT	Source:
AM	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
MD	50%	50%	
PM	50%	50%	
Modal Splits			Source:
AUTO	3%		Lower Concourse Rezoning and Related Actions FEIS
TAXI	2%		
BUS	10%		
SUBWAY	5%		
WALK	80%		
	100%		
Vehicle Occupancy			Source:
Auto	1.60		Lower Concourse Rezoning and Related Actions FEIS
Taxi	1.20		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.35		Lower Concourse Rezoning and Related Actions FEIS
Truck Temporal Dist			Source:
AM	8.0%		2010 CEQR Manual
MD	11.0%		
PM	2.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
Truck PCE Factor	2.00		2010 CEQR Manual

Appendix A-3
No Build Traffic Analysis Factors

Land Use:	**Community Facilites**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	48.0	Trips per 1,000 sf	Jamaica Plan FEIS, June 2007
Temporal Distribution			Source:
AM	7.1%		Jamaica Plan FEIS, June 2007
MD	10.0%		
PM	7.2%		
In/Out Splits	IN	OUT	Source:
AM	61%	39%	Jamaica Plan FEIS, June 2007
MD	55%	45%	
PM	29%	71%	
Modal Splits			Source:
AUTO	5%		Jamaica Plan FEIS, June 2007
TAXI	1%		
BUS	3%		
SUBWAY	6%		
WALK	85%		
	100%		
Vehicle Occupancy			Source:
Auto	1.65		Jamaica Plan FEIS, June 2007
Taxi	1.40		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.29		Jamaica Plan FEIS, June 2007
Truck Temporal Dist			Source:
AM	9.6%		Jamaica Plan FEIS, June 2007
MD	11.0%		
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Jamaica Plan FEIS, June 2007
Truck PCE Factor	2.00		

Appendix A-4
No Build Traffic Analysis Factors

Land Use:	**Medical Facility - Staff**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	10.0 Trips per 1,000 sf		Jamaica Plan FEIS, June 2007
Temporal Distribution			Source:
AM	24.0%		Jamaica Plan FEIS, June 2007
MD	17.0%		
PM	24.0%		
In/Out Splits	IN	OUT	Source:
AM	94%	6%	Jamaica Plan FEIS, June 2007
MD	50%	50%	
PM	12%	88%	
Modal Splits			Source:
AUTO	20%		Jamaica Plan FEIS, June 2007
TAXI	10%		
BUS	30%		
SUBWAY	30%		
WALK	10%		
	100%		
Vehicle Occupancy			Source:
Auto	1.00		Jamaica Plan FEIS, June 2007
Taxi	1.40		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.29		Jamaica Plan FEIS, June 2007
Truck Temporal Dist			Source:
AM	9.6%		Jamaica Plan FEIS, June 2007
MD	11.0%		
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Jamaica Plan FEIS, June 2007
Truck PCE Factor	2.00		

Appendix A-5
No Build Traffic Analysis Factors

Land Use:	**Medical Facility - Visitors**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	33.6	Trips per 1,000 sf	Jamaica Plan FEIS, June 2007
Temporal Distribution			Source:
AM	6.0%		Jamaica Plan FEIS, June 2007
MD	9.0%		
PM	5.0%		
In/Out Splits	IN	OUT	Source:
AM	94%	6%	Jamaica Plan FEIS, June 2007
MD	50%	50%	
PM	12%	88%	
Modal Splits			Source:
AUTO	25%		Jamaica Plan FEIS, June 2007
TAXI	25%		
BUS	11%		
SUBWAY	29%		
WALK	10%		
	100%		
Vehicle Occupancy			Source:
Auto	1.65		Jamaica Plan FEIS, June 2007
Taxi	1.20		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.29		Jamaica Plan FEIS, June 2007
Truck Temporal Dist			Source:
AM	9.6%		Jamaica Plan FEIS, June 2007
MD	11.0%		
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Jamaica Plan FEIS, June 2007
Truck PCE Factor	2.00		

Appendix A-6
No Build Traffic Analysis Factors

Land Use:	**Day Care**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	138.0 Trips per 1,000 sf		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP for the Project's proposed Daycare Facility
Temporal Distribution			Source:
AM	16.0%		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
MD	5.0%		As Approved by DCP for the Project's proposed Daycare Facility
PM	19.0%		
In/Out Splits	IN	OUT	Source:
AM	53%	47%	No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
MD	50%	50%	As Approved by DCP for the Project's proposed Daycare Facility
PM	47%	53%	
Modal Splits			Source:
AUTO	15%		Department of City Planning
TAXI	5%		
BUS	10%		
SUBWAY	20%		
WALK	50%		
	100%		
Vehicle Occupancy			Source:
Auto	1.65		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
Taxi	1.40		As Approved by DCP for the Project's proposed Daycare Facility
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.07		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP for the Project's proposed Daycare Facility
Truck Temporal Dist			Source:
AM	9.6%		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
MD	11.0%		As Approved by DCP for the Project's proposed Daycare Facility
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP for the Project's proposed Daycare Facility
Truck PCE Factor	2.00		

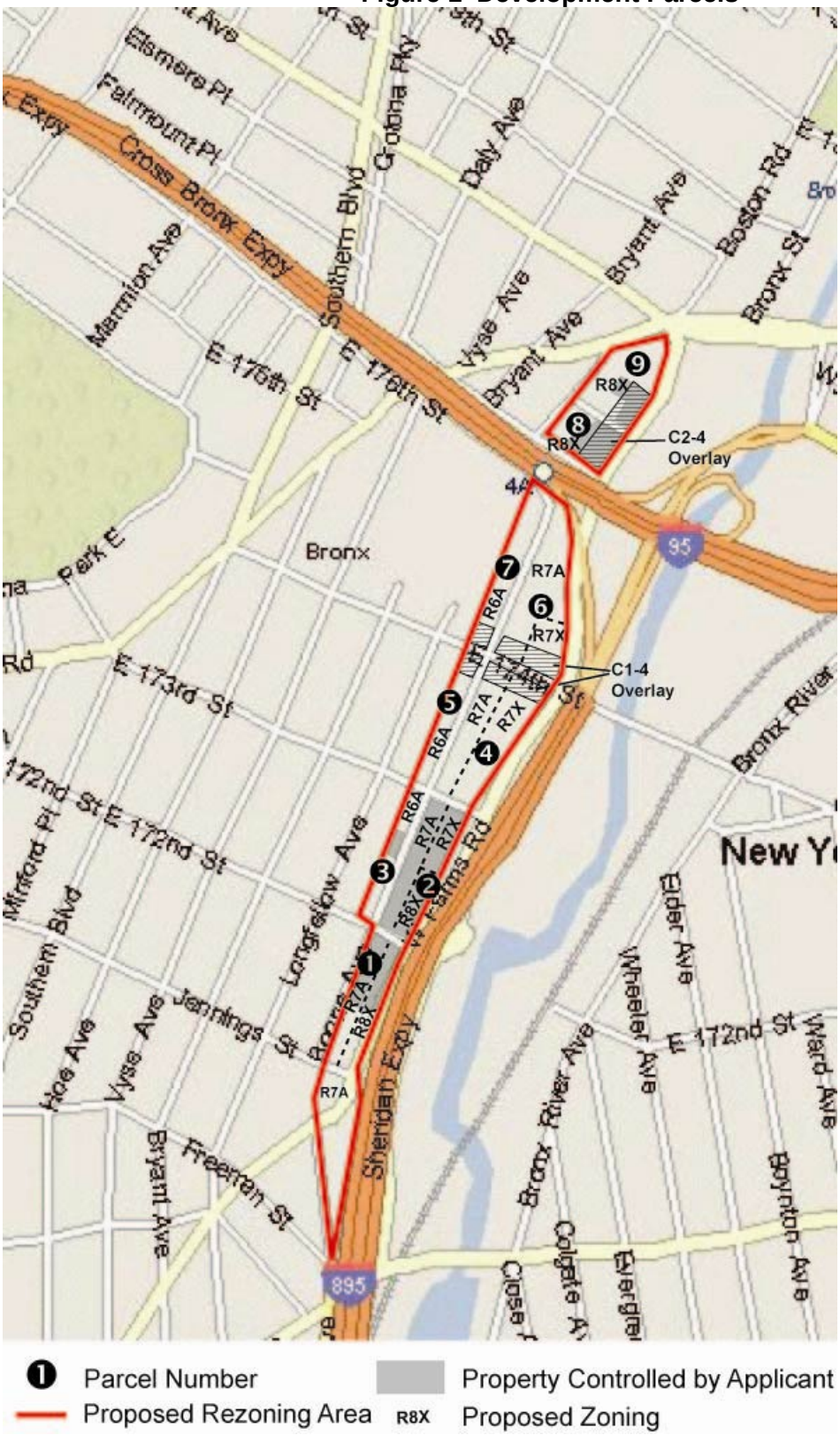
This memorandum summarizes the transportation planning assumptions to be used for the analysis of traffic conditions for the proposed Crotona Park East Rezoning. Estimates of the proposed projects peak hour travel demand and trip assignment patterns are provided. Assumptions are consistent with *2010 CEQR Technical Manual* guidelines.

PROJECT PROGRAM

The proposed action consists of a rezoning of all or part of eleven blocks in the Crotona Park East area of the Bronx essentially along the strip of land between Boone Avenue and West Farms Road, between Freeman Street on the south, and Boston Post Road on the north. (See Figure 1.) Within this document, the "proposed action" refers to the entire area to be rezoned, and the "proposed project" refers to the development of the parcels within the proposed action area controlled by the applicant. Starting from the south, the blocks included in this proposed rezoning include: the block bounded by the Sheridan Expressway, West Farms Road and Boone Avenue (Block 3012, now a playground); the northeast portion of the block bounded by West Farms Road, Jennings Street, Longfellow Avenue and Freeman Street (Block 3007, now a part of the IS 84 property); the entire block bounded by West Farms Road, East 172nd Street, Boone Avenue and Jennings Street (Block 3013, the southern half of which is occupied by HS 682 Fannie Lou Hamer Freedom High School and the northern half of which is a soft site (Lots 12, 29, 31 and 46 – designated herein as **Parcel 1**)); the entire block bounded by West Farms Road, East 173rd Street, Boone Avenue and East 172nd Street (Block 3014, designated herein as **Parcel 2**); the eastern half of the block bounded by Boone Avenue, East 173rd Street, Longfellow Avenue and East 172nd Street (Block 3009, Lots 25, 33, 37, 38, and 44 – designated herein as **Parcel 3**); the entire block bounded by West Farms Road, East 174th Street, Boone Avenue and East 173rd Street (Block 3015, designated herein as **Parcel 4**); the eastern half of the block bounded by Boone Avenue, East 174th Street, Longfellow Avenue and East 173rd Street (Block 3010, Lots 16, 25, 29, 33, and 49 – designated herein as **Parcel 5)**; the entire block bounded by West Farms Road, Boone Avenue and East 174th Street (Block 3015 – designated herein as **Parcel 6**); the eastern portion (100 foot depth) of the block bounded by Boone Avenue, the Cross Bronx Expressway, Vyse Avenue and East 174th Street, (Block 2998, Lots 92, 97, 104, 113, 124 and 135 – designated herein as **Parcel 7**); the entire block bounded by West Farms Road, Rodman Place, Longfellow Avenue and the Cross Bronx Service Road North (Block 3016, Lots 11, 13, and 21 – designated herein as **Parcel 8**); and the entire block bounded by West Farms Road, Old Post Road, Longfellow Avenue and Rodman Place (Block 3016, Lots 60 and 66 – designated herein as **Parcel 9**). (See Figure 1 for a map of the area to be rezoned.)

The area to be rezoned is currently zoned as an M1-1 zoning district and is proposed to be rezoned to residential districts with some commercial overlays. The parcels west of Boone Avenue and south of the Cross Bronx Expressway (Parcels 3, 5 and 7) would be rezoned as R6A; parcels east of Boone Avenue and south of the Cross Bronx Expressway (Parcels 1, 2, 4 and 6) are proposed to be rezoned as R7A; along Boone Avenue and as R8X; and, along West Farms Road as R7X. The parcels north of the Cross Bronx Expressway (Parcels 8 and 9) are proposed to be rezoned as R8X. (See Figure 1 for the proposed rezoning delineation.)

Figure 1 Development Parcels



There are 8 actual proposed sites that are owned by the applicant. These sites are spread across the following blocks: 3009, 3013-N, 3014, 3016-S, and 3016-N. There are 11 added rezoned area that are not owned by the applicant. These sites are spread across the following blocks: 3012, 3013-S, 3009, 3010, 3015-S, 2998, 3015-N, 3016-S, and 3016-N.

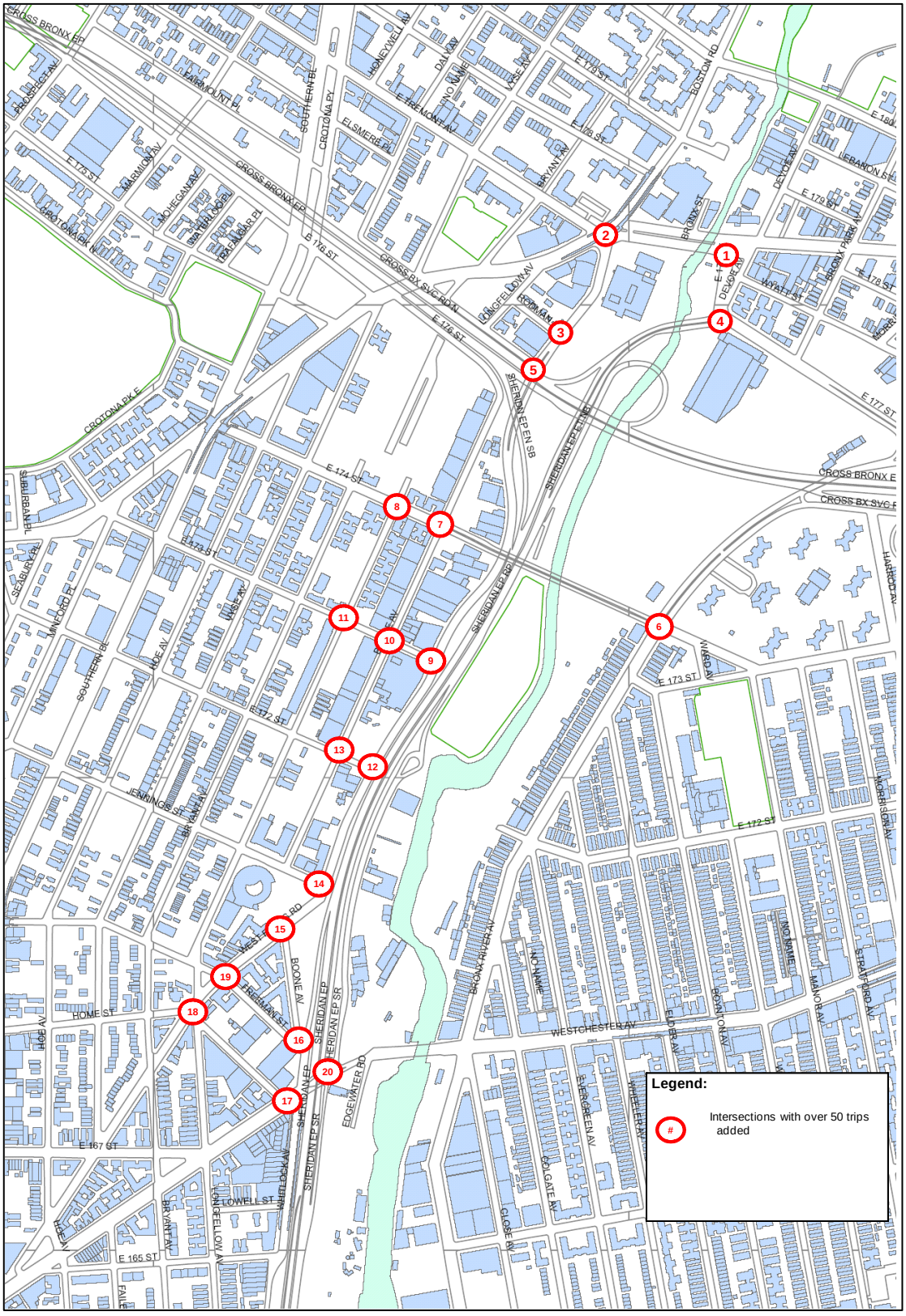
This assumptions memo summarizes development that would be expected to result from the proposed rezoning both for parcels controlled by the applicant and parcels that are not controlled by the applicant. The proposed project, which necessitates the zoning change, is the construction of up to 1,270 residential units, approximately 35,000 square feet of commercial space, and approximately 12,000 square feet of community facility space on the properties controlled by the project sponsor on blocks 3009, 3013, 3014, and 3016. The reasonable worst case development scenario includes an additional 1,450 residential units and 73,300 square feet of commercial space on the lots not controlled by the project sponsor.

In total, the reasonable worst case development scenario consists of 2,720 residential units, 108,385 square feet of commercial floor area, and 11,888 square feet of community facility floor area. As compared to the future no-action condition, this development represents a net of 2,580 residential units, 69,457 square feet of commercial floor area, 11,888 square feet of community facility floor area, and a net decrease of 391,684 square feet of industrial floor area.

STUDY AREA

Preliminary trip generation and assignment patterns suggested that 35 intersections would have more than 50 additional cars added due to the rezoning action. Trip assignment patterns were submitted and approved. Since these intersections were approved, the build project changed significantly and trips were reduced. Revised trip generation and assignments indicate that only 20 of these intersections would still have an additional 50 cars added due to the rezoning action. Figure 1 below shows the intersections that will need to be studied according to the *2010 CEQR Technical Manual*.

Figure 2 Crotona Park Rezoning Traffic Study Intersections



SELECTION OF PEAK HOURS FOR ANALYSIS

On weekdays, the proposed project's residential and retail components are expected to generate their highest demand during 7:30 – 8:30 AM and 4:30 – 5:30 PM commuter periods as well as during the 1-2 PM midday (lunch time) period.

TRANSPORTATION PLANNING ASSUMPTIONS

The transportation planning assumptions used to forecast travel demand from the project's residential and retail components are discussed below. The trip generation rates, temporal distributions and mode choice assumptions were based on accepted CEQR criteria, standard professional references, and studies that have been done for similar uses in the Bronx. These sources were supplemented by data from the 2000 Census and the ITE Trip Generation, 7th Edition. All trip generation assumptions made are detailed in Table 1 of Appendix B.

Residential Auto Trips

Trip Generation: Weekday residential trip generation rates used were those recommended in the *2010 CEQR Technical Manual* at 8.075 trips per residential dwelling unit. The 2,637 maximum allowed residential dwelling units allowed in the Project by the proposed rezoning would generate 21,294 weekday person trips. Person trip generation by Garage Entrance is shown in Appendix B-1.

Temporal Distribution and In/Out Splits: The temporal distribution for the residential component was from the *2010 CEQR Technical Manual* and is shown in Appendix B-1. In and out splits match those used in the *Lower Concourse Rezoning and Related Actions FEIS*.

Mode Splits: Mode splits proposed for the additional development sites were initially derived from Census journey-to-work data for all census tracts that were at least 50% in the half mile radius study area of the proposed project. Trips were divided into auto, taxi, transit and walk trips using the Census data. Transit trips were further divided into subway and bus trips. Mode split assumptions are shown in Appendix C-1

Vehicle Occupancy: Census data for the Project area shows an auto vehicle occupancy of 1.5, which coincides with the *Lower Concourse Rezoning and Related Actions FEIS*. Taxi vehicle occupancy is proposed to be the same as that in the *Lower Concourse Rezoning and Related Actions FEIS* at 1.4.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *2010 CEQR Technical Manual*. The truck trip characteristics are shown in Appendix B-1.

Retail Auto Trips

Trip Generation: Local retail trip generation rates proposed to be used for the Project are 205 trips per 1,000 gsf as presented in the *2010 CEQR Technical Manual*. The 97,387 gsf of local retail proposed by the Project would generate 19,964 person trips per day (weekday) as shown in Appendix B-2.

Temporal Distribution and In/Out Splits: The temporal distribution for the local retail component of the Project was obtained from the *2010 CEQR Technical Manual*. The in/out splits proposed to be used for this Project are the same as those in the Lower Concourse Rezoning and Related Actions FEIS which are based on Pushkarev and Zupan's "Urban Space for Pedestrians" (1975) and the analysis in the *Jamaica Plain FEIS* (2007). The retail trip temporal distribution is shown in Appendix B-2.

Mode Splits: Mode splits proposed for the local retail element of the Project are from *Lower Concourse Rezoning and Related Actions FEIS* and are shown in Appendix C-2.

Vehicle Occupancy: Vehicle occupancy proposed for the local retail element of the Project is from *Lower Concourse Rezoning and Related Actions FEIS*. An occupancy of 1.60 is used for autos and 1.20 is used for taxis.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *2010 CEQR Technical Manual*. The truck trip characteristics are shown in Appendix B-2.

Light Industrial Auto Trips

Trip Generation: Light industrial trip generation rates proposed to be used for the Project are taken from the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS* where a rate of 11.5 trips per 1,000 gsf was used. Light industrial trip generation is used to account for trips lost due to the elimination of current light industrial sites in the area. The 127,959 gsf of light industrial space proposed to be rezoned would account for a decrease of 1,472 person trips per day (weekday) as shown in Appendix B-3.

Temporal Distribution and In/Out Splits: The temporal distribution for the light industrial component was also taken from the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS.* The in/out splits proposed to be used for this Project are also the same as those in the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS.* The light industrial trip temporal distribution and in/out splits are shown in Appendix B-3.

Mode Splits: Mode splits proposed for the light industrial element of the Project are from 2000 US Census Reverse Journey to Work Data for Census Tracts that are at least 50% in the study area and are shown in Appendix C-3.

Vehicle Occupancy: Vehicle occupancy used for the light industrial element of the Project are from *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS* for Light Industrial land use. Auto occupancy is 1.65 and taxi occupancy is 1.40.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. The truck trip characteristics are shown in Appendix B-3.

Warehouse Auto Trips

Trip Generation: The Warehouse land use trip generation rate was taken from the *Lower Concourse Rezoning and Related Actions FEIS* and is 5.8 trips per 1,000 gsf. Warehouse trip generation is used to account for trips lost due to the rezoning of current light warehousing sites in the area. The 215,364 gsf of warehouse space proposed to be rezoned would account for a decrease of 1,249 person trips per day (weekday) as shown in Appendix B-4.

Temporal Distribution and In/Out Splits: The temporal distribution for the warehouse component and the in/out splits proposed to be used for this Project are the same as those in the *Lower Concourse Rezoning and Related Actions FEIS* which are based on *Port Morris/Bruckner Boulevard Rezoning EAS*. The warehouse trip temporal distribution is shown in Appendix B-4.

Mode Splits: Mode splits proposed for the warehouse element of the Project are from *Lower Concourse Rezoning and Related Actions FEIS* and are shown in Appendix C-4.

Vehicle Occupancy: Mode splits proposed for the warehouse element of the Project are from *Lower Concourse Rezoning and Related Actions FEIS*. Auto occupancy is 1.04 and taxi occupancy is 2.00.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *Lower Concourse Rezoning and Related Actions FEIS*. The truck trip characteristics are shown in Appendix B-4.

Automobile Care Center Auto Trips

Trip Generation: The Automobile Care Center trip generation rate proposed to be used for the Project are the same as those used in the *Lower Concourse Rezoning and Related Action FEIS* and concurrent with the ITE Trip Generation Manual, 8th Edition, Land Use Code 942. The Automobile Care Center produces 19.4 trips per 1,000 gsf daily. Automobile Care Center trip generation is used to account for trips lost due to the rezoning of current light automobile care sites in the area. The 45,970 gsf of Automobile Care Center space proposed to be rezoned would account for a decrease of 893 person trips per day (weekday) as shown in Appendix B-5.

Temporal Distribution and In/Out Splits: The temporal distribution for the Automobile Care Center component and the in/out splits proposed to be used for this Project are the same as those in the *Lower Concourse Rezoning and Related Actions FEIS*. The Automobile Care Center trip temporal distribution is shown in Appendix B-5.

Mode Splits: Mode splits proposed for the Automobile Care Center element of the Project are from *Lower Concourse Rezoning and Related Actions FEIS* and are shown in Appendix C-5.

Vehicle Occupancy: Vehicle occupancies proposed for the Automobile Care Center element of the Project are from *Lower Concourse Rezoning and Related Actions FEIS*. Vehicle occupancy for autos and taxis are both 1.30.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *Lower Concourse Rezoning and Related Actions FEIS*. The truck trip characteristics are shown in Appendix B-5.

Day Care Facility Auto Trips

Trip Generation: Through discussion with New York Department of City Planning, it has be determined to use trip generation rates used in the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS* for the Day Care Facility element of the Project. The Day Care Facility will generate 138 trips per 1,000 gsf daily. The 11,888 gsf of day care facility in the proposed action would account 1640 person trips per day (weekday) as shown in Appendix B-6.

Temporal Distribution and In/Out Splits: The temporal distribution for the Day Care Facility component and the in/out splits proposed to be used for this Project are the same as those in the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. The community facility trip temporal distribution is shown in Appendix B-5.

Mode Splits: Mode splits proposed for the Day Care Facility element of the Project were determined through discussions between Stantec Consulting and the Department of City Planning and are shown in Appendix C-6.

Vehicle Occupancy: Mode splits proposed for the community facility element of the Project are from *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. An auto occupancy of 1.65 and a taxi occupancy of 1.40 will be used.

Trucking Characteristics: Truck trip generation rates and temporal distributions are based on the *No. 7 Subway Extension – Hudson Yards Rezoning and Development Program FEIS*. The truck trip characteristics are shown in Appendix B-6.

Automobile and Taxi Trip Assignments

The residential development portion of the Project is assumed to include onsite parking garages. Trips have been assigned to the anticipated garage entry sites. Onsite parking garages have been proposed at mid-block locations for the project. In order to simplify trip generation and assignments for the proposed action, parking garage locations have been numbered and are proposed in the following locations:

1	Boone Ave between 174th Street and 173rd Street
2	Boone Ave between 173rd Street and 172nd Street
3	173rd Street between Longfellow Ave and Boone Ave
4	173rd Street between Boone Ave and West Farms Road
5	172nd Street between Longfellow Ave and Boone Ave
6	174th Street between Boone Ave and West Farms Road
7	Boone Ave North of 174th Street
8	Rodman Place West of West Farms Road
9	Cross Bronx Expressway Service Road West of West Farms Road
10	West Farms Road North of 173rd Street
11	172nd Street between Boone Ave and West Farms Road
12	West Farms Road North of Rodman Place
13	West Farms South of 172nd Street
14	West Farms South of 173rd Street

The Census journey-to-work information was used to determine general routings. Three percent of trips were out of state. Based on the location of the Project, these trips were assumed to be to/from New Jersey and were routed the most direct path to the Cross Bronx Expressway. The Census also indicated that 43 percent of all journey to work trips stayed within the county: 23 percent were assumed to be local trips and were routed out of the study area via West Farms Road, Westchester Avenue, Tremont Avenue and Boston Road; 20 percent were assumed to travel further from the study area and were assigned via local access routes to the highway system. The remaining 54 percent (out-of-county) of the trips were distributed to Manhattan (25 percent), Queens/Brooklyn (19 percent) and Westchester (10 percent). These out of county trips were distributed on the local roads to the closest highway access point. Half of the Manhattan trips used the Cross Bronx Expressway and the other half used the Sheridan Expressway.

Truck Trip Assignments

The project generated truck trips were assigned to the individual Project blocks using the most direct route along the NYCDOT designated truck routes in the study area and were assigned in generally the same geographic distribution as the auto trips.

Table 1
Build Traffic Analysis Factors

Land Use:	**Residential**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	8.075 Trips per DU		2010 CEQR Technical Manual
Temporal Distribution			Source:
AM	10.0%		2010 CEQR Technical Manual
MD	5.0%		
PM	11.0%		
In/Out Splits	IN	OUT	Source:
AM	15%	85%	Lower Concourse Rezoning and Related Actions FEIS
MD	50%	50%	
PM	70%	30%	
Modal Splits			Source:
AUTO	31%		2000 US Journey To Work Data for Census Tracts in Study Area:
TAXI	1%		52, 54, 56, 58, 60, 62, 121.02, 123, 125, 127.01, 153, 155, 157,161
BUS	21%		220, 359, 361, 363, 365.01, 365.01, 365.02, and 367
SUBWAY	40%		As approved by DCP
WALK	7%		
	100%		
Vehicle Occupancy			Source:
Auto	1.50		Lower Concourse Rezoning and Related Actions FEIS
Taxi	1.40		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.06		2010 CEQR Technical Manual
Truck Temporal Dist			Source:
AM	12.0%		2010 CEQR Technical Manual
MD	9.0%		
PM	2.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
Truck PCE Factor	2.00		

Table 1 (continued)
Build Traffic Analysis Factors

Land Use:	**Retail**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	205	Trips per 1,000 sf	2010 CEQR Manual
Temporal Distribution			Source:
AM	3.0%		2010 CEQR Manual
MD	19.0%		
PM	10.0%		
In/Out Splits	IN	OUT	Source:
AM	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
MD	50%	50%	
PM	50%	50%	
Modal Splits			Source:
AUTO	3%		Lower Concourse Rezoning and Related Actions FEIS
TAXI	2%		
BUS	10%		
SUBWAY	5%		
WALK	80%		
	100%		
Vehicle Occupancy			Source:
Auto	1.60		Lower Concourse Rezoning and Related Actions FEIS
Taxi	1.20		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.35		Lower Concourse Rezoning and Related Actions FEIS
Truck Temporal Dist			Source:
AM	8.0%		2010 CEQR Manual
MD	11.0%		
PM	2.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
Truck PCE Factor	2.00		2010 CEQR Manual

Table 1 (continued)
Build Traffic Analysis Factors

Land Use:	**Light Industrial**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	11.5 Trips per 1,000 sf		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
Temporal Distribution			Source:
AM	13.0%		No. 7 Subway Extension - Hudson Yards Rezoning
MD	10.0%		and Development Program FEIS
PM	14.0%		
In/Out Splits	IN	OUT	Source:
AM	88%	12%	No. 7 Subway Extension - Hudson Yards Rezoning
MD	50%	50%	and Development Program FEIS
PM	12%	88%	
Modal Splits			Source:
AUTO	52%		2000 US Reverse Journey To Work Data for Census Tracts in
TAXI	1%		Study Area:
BUS	16%		52, 54, 56, 58, 60, 62, 121.02, 123, 125, 127.01, 153, 155, 157,161
SUBWAY	22%		220, 359, 361, 363, 365.01, 365.01, 365.02, and 367
WALK	9%		
	100%		
Vehicle Occupancy			Source:
Auto	1.65		No. 7 Subway Extension - Hudson Yards Rezoning
Taxi	1.40		and Development Program FEIS
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.52		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
Truck Temporal Dist			Source:
AM	14.0%		No. 7 Subway Extension - Hudson Yards Rezoning
MD	8.6%		and Development Program FEIS
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
Truck PCE Factor	2.00		

Table 1 (continued)
Build Traffic Analysis Factors

Land Use:	**Warehouse**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	5.8 Trips per 1,000 sf		Lower Concourse Rezoning and Related Actions FEIS
Temporal Distribution			Source:
AM	17.0%		Lower Concourse Rezoning and Related Actions FEIS
MD	14.0%		
PM	13.0%		
In/Out Splits	IN	OUT	Source:
AM	83%	17%	Lower Concourse Rezoning and Related Actions FEIS
MD	50%	50%	
PM	25%	75%	
Modal Splits			Source:
AUTO	46%		Lower Concourse Rezoning and Related Actions FEIS
TAXI	2%		
BUS	16%		
SUBWAY	29%		
WALK	7%		
	100%		
Vehicle Occupancy			Source:
Auto	1.04		Lower Concourse Rezoning and Related Actions FEIS
Taxi	2.00		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.67		Lower Concourse Rezoning and Related Actions FEIS
Truck Temporal Dist			Source:
AM	14.0%		Lower Concourse Rezoning and Related Actions FEIS
MD	9.0%		
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
Truck PCE Factor	2.00		

Table 1 (continued)
Build Traffic Analysis Factors

Land Use:	**Automotive Care Facilities**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	19.4 Trips per 1,000 sf		Lower Concourse Rezoning and Related Actions FEIS
Temporal Distribution			Source:
AM	13.2%		Lower Concourse Rezoning and Related Actions FEIS
MD	11.0%		
PM	14.2%		
In/Out Splits	IN	OUT	Source:
AM	65%	35%	Lower Concourse Rezoning and Related Actions FEIS
MD	50%	50%	
PM	50%	50%	
Modal Splits			Source:
AUTO	85%		Lower Concourse Rezoning and Related Actions FEIS
TAXI	5%		
BUS	1%		
SUBWAY	1%		
WALK	8%		
	100%		
Vehicle Occupancy			Source:
Auto	1.30		Lower Concourse Rezoning and Related Actions FEIS
Taxi	1.30		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.89		Lower Concourse Rezoning and Related Actions FEIS
Truck Temporal Dist			Source:
AM	14.0%		Lower Concourse Rezoning and Related Actions FEIS
MD	9.0%		
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	Lower Concourse Rezoning and Related Actions FEIS
Truck PCE Factor	2.00		

Table 1 (continued)
Build Traffic Analysis Factors

Land Use:	**Day Care**		
Trip Generation:	Weekday		Source:
Daily Person Trips:	138.0	Trips per 1,000 sf	No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP
Temporal Distribution			Source:
AM	16.0%		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP
MD	5.0%		
PM	19.0%		
In/Out Splits	IN	OUT	Source:
AM	53%	47%	No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP
MD	50%	50%	
PM	47%	53%	
Modal Splits			Source:
AUTO	15%		Department of City Planning
TAXI	5%		
BUS	10%		
SUBWAY	20%		
WALK	50%		
	100%		
Vehicle Occupancy			Source:
Auto	1.65		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP
Taxi	1.40		
Truck Trip Generation:	Weekday		Source:
Daily Truck Trips:	0.07		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
Truck Temporal Dist			Source:
AM	9.6%		No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS As Approved by DCP
MD	11.0%		
PM	1.0%		
Truck In/Out Splits	IN	OUT	Source:
	50%	50%	No. 7 Subway Extension - Hudson Yards Rezoning and Development Program FEIS
Truck PCE Factor	2.00		As Approved by DCP