10.0 Transit and Pedestrians

A. INTRODUCTION

The Proposed Action is expected to generate a large volume of public transit and pedestrian trips. This chapter examines the potential impact of trips associated with the Proposed Action on pedestrian and public transit services and facilities in the study area. The evaluation of transit services and facilities and pedestrian movements in the study area are comprised of quantitative analyses, and draws from recent field data collection, New York City Transit (NYCT) data, and previous studies of Long Island City.

The objective of the transit and pedestrian analyses is to determine whether a Proposed Action can be expected to have a significant impact on public transportation facilities and services and on pedestrian flows, including:

- Subway facilities and services, including the capacity of subway lines (known as "line haul" capacity), stairwells, escalators, corridors and passageways, and turnstiles.
- Bus service, including the ability of existing routes and their frequency of service to accommodate the expected level of bus demand without overloading existing services.
- Pedestrian flow and conditions, including the capacity of sidewalks, crosswalks, and intersection corners to process or store the volume of pedestrians expected to be generated at specific locations by the Proposed Action.

One significant transit impact was identified – the Q103 bus would be significantly impacted during the AM and PM peak hours. This impact would be mitigated by the addition of two northbound buses during the AM peak hour and one southbound bus during the PM peak hour. It is MTA NYCT's general policy to provide additional bus service where demand warrants.

The pedestrian crossing locations across Vernon Boulevard at Queens Plaza South and 43rd Avenue, which are most proximate to the Proposed Action, would be significantly impacted. Installing traffic signals at both intersections would mitigate both significant adverse traffic and pedestrian impacts at this location identified within Chapter 9.

B. EXISTING CONDITIONS

1. Subways

This section describes existing subway station and rail service usage so as to determine potential impacts of projected additional passengers generated by the Proposed Action. This section provides subway line haul analyses, subway station usage, and level of service of key subway station elements that have a potential for impact in the Build condition.

Subway service is provided in the project vicinity by eight NYCT lines within five stations. During peak hours, E, V and R subway lines are available at Queens Plaza, with E and V subway service also available at the 23rd Street-Ely Avenue station. F line subway service is provided at the 21st Street-Queensbridge station, and G line subway service to Brooklyn is provided at the Court Square

terminal station. The elevated Queensboro Plaza station provides the N, W and No. 7 train services. On weekends and weekday nights, bi-directional G line service is available at the Queens Plaza and Court Square stations. A map showing the location of each of these NYCT stations is provided in Figure 10-1.

a) Subway Line Haul Analysis

The subway line haul analysis is an assessment of each subway line's capacity to accommodate peak period passengers at acceptable levels per NYCT loading guidelines. The NYCT guideline capacity of a train represents a condition at which standing passengers are provided with an average space of three square feet per person. Subway trains carrying more than their guideline capacity, resulting in volume-to-capacity (v/c) ratios of greater than 1.00, are considered overcrowded. A v/c ratio greater than 1.00 is undesirable from both a customer comfort and a train operations viewpoint. Although undesirable, trains with passenger loads which exceed guidelines operate regularly during peak periods for short segments within the subway system citywide. The maximum potential passenger load of a subway train ranges from 40 to 50 percent greater than loading guidelines, thereby enabling v/c ratios to far surpass 1.00.

Table 10-1 provides a summary of the number of scheduled trains in the peak travel direction, per train and peak hour line haul passenger loading guidelines, existing passenger volumes, and the computed v/c ratio for each analyzed line during the weekday AM peak hour. The weekday AM peak hour in the Manhattan-bound direction represents the peak daily usage of the subway system, and is therefore the most conservative period during which to analyze the impact of additional passengers.

TABLE 10-1 EXISTING SUBWAY LINE HAUL ANALYSIS – AM PEAK HOUR, PEAK DIRECTION

Train Route	Number of Peak Hour Trains	Guideline Capacity per Train	Guideline Peak Hour Line Haul Capacity	NYCT 2004 AM Peak Hour Counts *	Volume to Capacity Ratio (v/c)
E	14	1,450	20,300	20,300	1.00
F	14	1,400	19,600	17,000	0.87
G	9	700	6,300	3,900	0.62
R	9	1,400	12,600	9,200	0.73
V	10	1,400	14,000	7,300	0.52
N / W	14	1,400	19,600	16,000	0.82
No. 7	26	1,210	31,460	23,500	0.75

Source: NYCT Year 2004 data

* NYCT counts were performed during 2004 at the following peak trainload locations: 23rd Street-Ely Avenue (E/V), Roosevelt Island (F), Clinton-Washington (G, Southbound), Queens Plaza (R), Queensboro Plaza (N/W), and Vernon Blvd-Jackson Avenue (7).

During the AM peak hour, all Manhattan-bound lines operate to provide maximum passenger capacity in regard to scheduled trains and train lengths, which are limited by tunnel throughput and platform lengths, respectively. As shown in Table 10-1, the E line is presently accommodating its guideline passenger capacity of 20,300 passengers during the AM peak hour in the Manhattan-bound direction with a v/c ratio of 1.00. Each of the other seven subway lines has varying levels of unused passenger capacity ranging from 13 percent on the F line (v/c ratio of 0.87) to 48 percent available capacity on the V line (v/c ratio of 0.52).

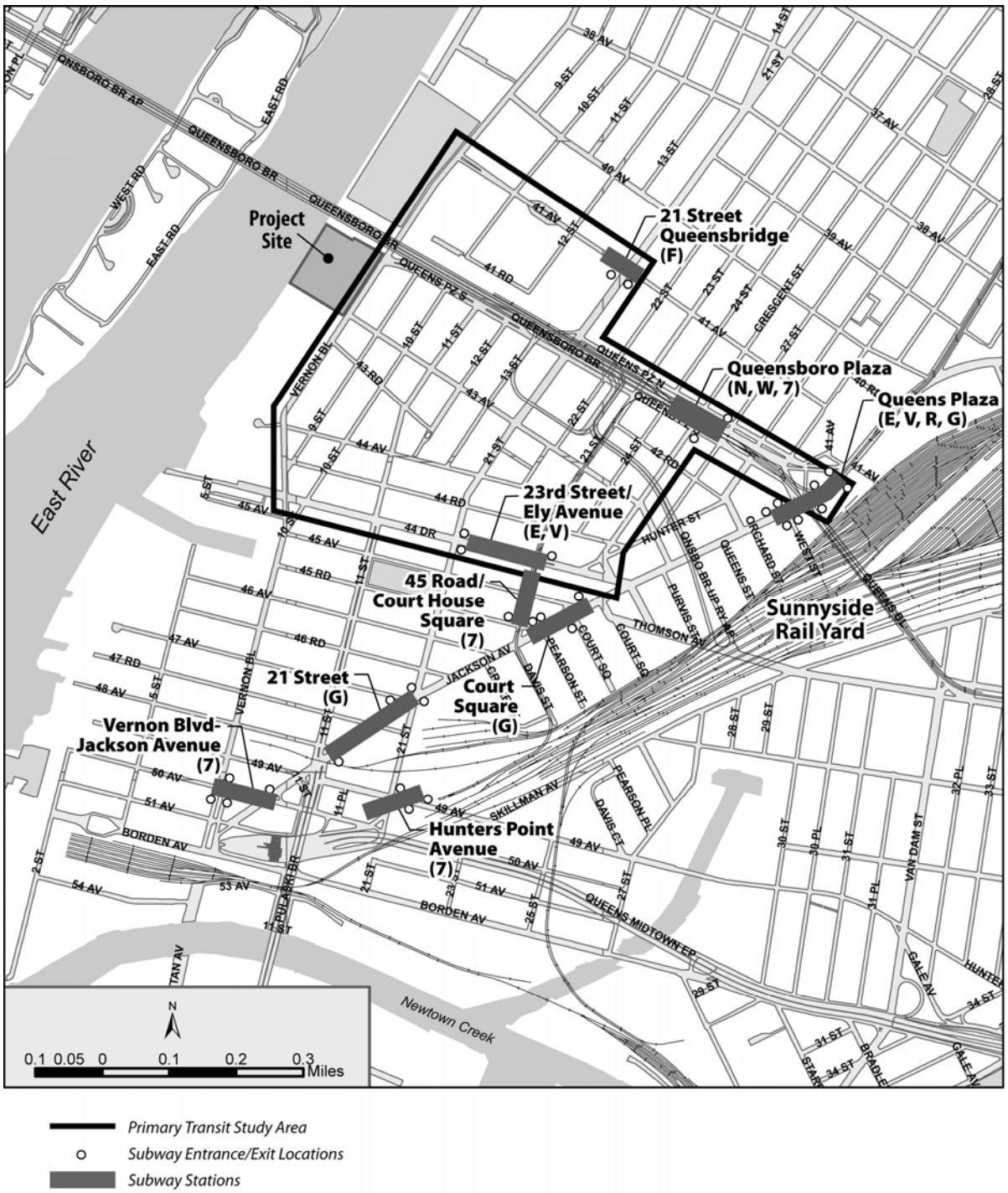

Figure 10-1:
Existing Subway Lines and Stations

Table 10-2 provides the line haul analysis in the reverse peak travel direction during the weekday AM peak hour. As shown in this table, all subway lines have significant amounts of unused capacity, ranging from 95 percent available capacity on the V line (v/c ratio of 0.05) to 41 percent available capacity on the G line (v/c ratio of 0.59).

TABLE 10-2 EXISTING SUBWAY LINE HAUL ANALYSIS – AM PEAK HOUR, REVERSE PEAK DIRECTION

Train Route	Number of Peak Hour Trains	Guideline Capacity per Train	Guideline Peak Hour Line Haul Capacity	NYCT 2003 AM Peak Hour Counts *	Volume to Capacity Ratio (v/c)
E	15	1,450	21,750	3,055	0.14
F	15	1,400	21,000	2,403	0.11
G	9	700	6,300	3,700	0.59
R	10	1,400	14,000	1,428	0.10
V	10	1,400	14,000	729	0.05
N / W	15	1,400	21,000	2,225	0.11
No. 7	24	1,210	29,040	3,456	0.12

Source: NYCT Year 2003 Cordon Count data; NYCT Year 2004 data for G line.

* NYCT counts were performed during 2003 in the Queens-bound location at the following locations: Lexington Avene-53rd Street (E/V), 57th Street-Sixth Avenue (F), Greenpoint Avenue (G), Lexington Avenue-60th Street (N/R/W), and Grand Central Station (7).

b) Subway Station Elements

According to criteria used by MTA NYCT, and specified by the City within the *City Environmental Quality Review (CEQR) Manual*, if the Proposed Action is projected to result in fewer than 200 peak hour riders, further analyses are not typically required. At three of the five subway stations in the project area, which include Queensboro Plaza, 21st Street-Queensbridge, and 23rd Street-Ely Avenue, this threshold was exceeded during the AM and PM peak hours. Therefore, a total of 18 stairways, six escalators, three passageways, and seven turnstile banks were analyzed within these three subway stations to determine existing levels of service (LOS), as well as to determine levels of service in the No Build and Build conditions which are detailed later in this chapter. Figures 10-2 through 10-4 provide the station plans for Queensboro Plaza, 21st Street-Queensbridge, and 23rd Street-Ely Avenue, respectively. These station plans, which were obtained from MTA NYCT, show the location of each of the analyzed elements within each station.

Pedestrian counts were performed on a typical weekday during the AM and PM peak periods in June 2005. The collected pedestrian survey data were then compared with available NYCT turnstile data and it was verified that the survey data represented typical conditions within these stations.

i. Stairways and Corridors

Analyses were conducted using standard pedestrian level of service procedures, which equates pedestrian flow per minute per foot of width, with qualitative measures of pedestrian comfort. The level of service criteria for pedestrian stairways and corridors are defined in Table 10-3. LOS A represents free flow conditions without pedestrian conflicts, and LOS F represents significant capacity limitations and inconvenience.

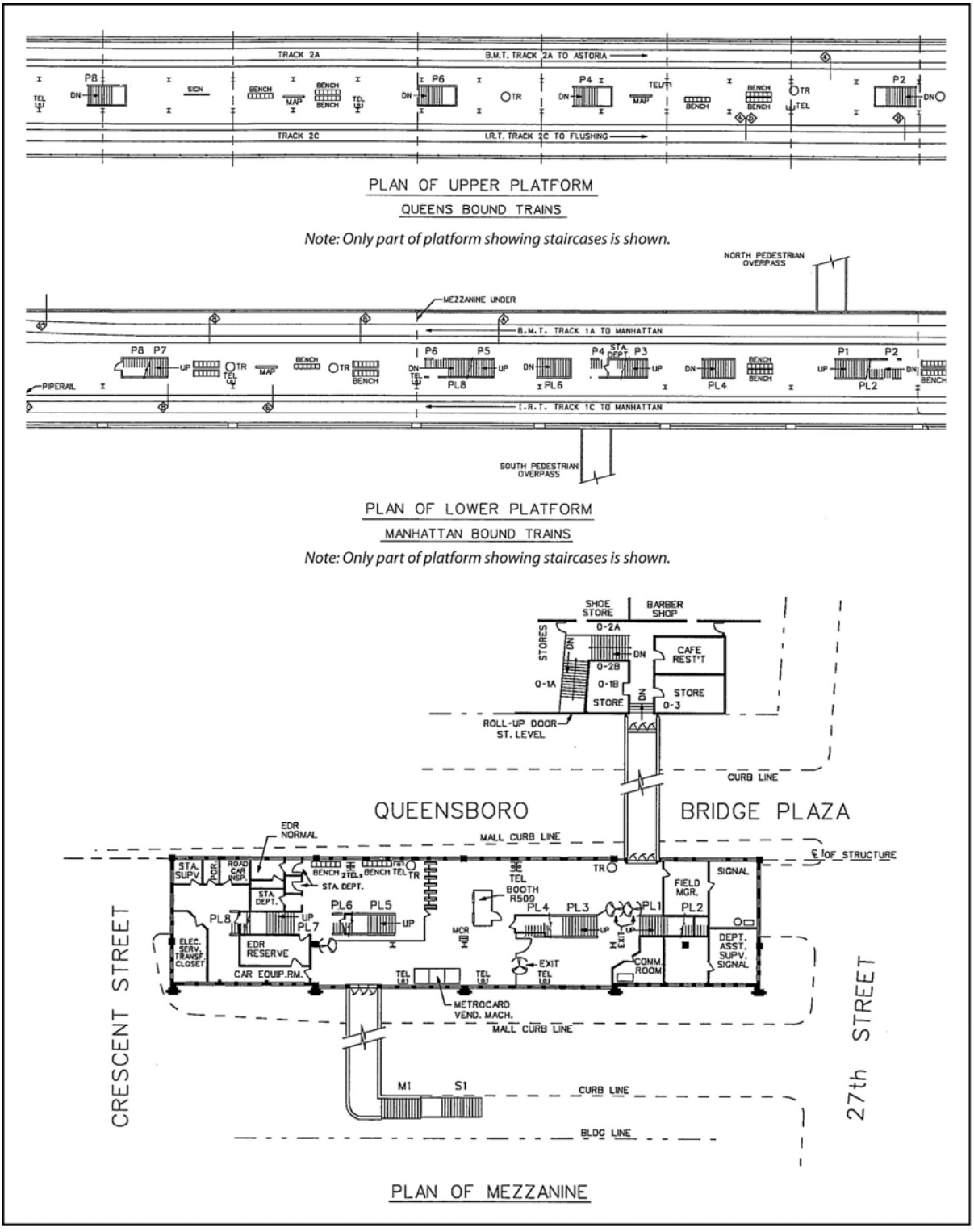

Figure 10-2:
Queensboro Plaza Station Plan

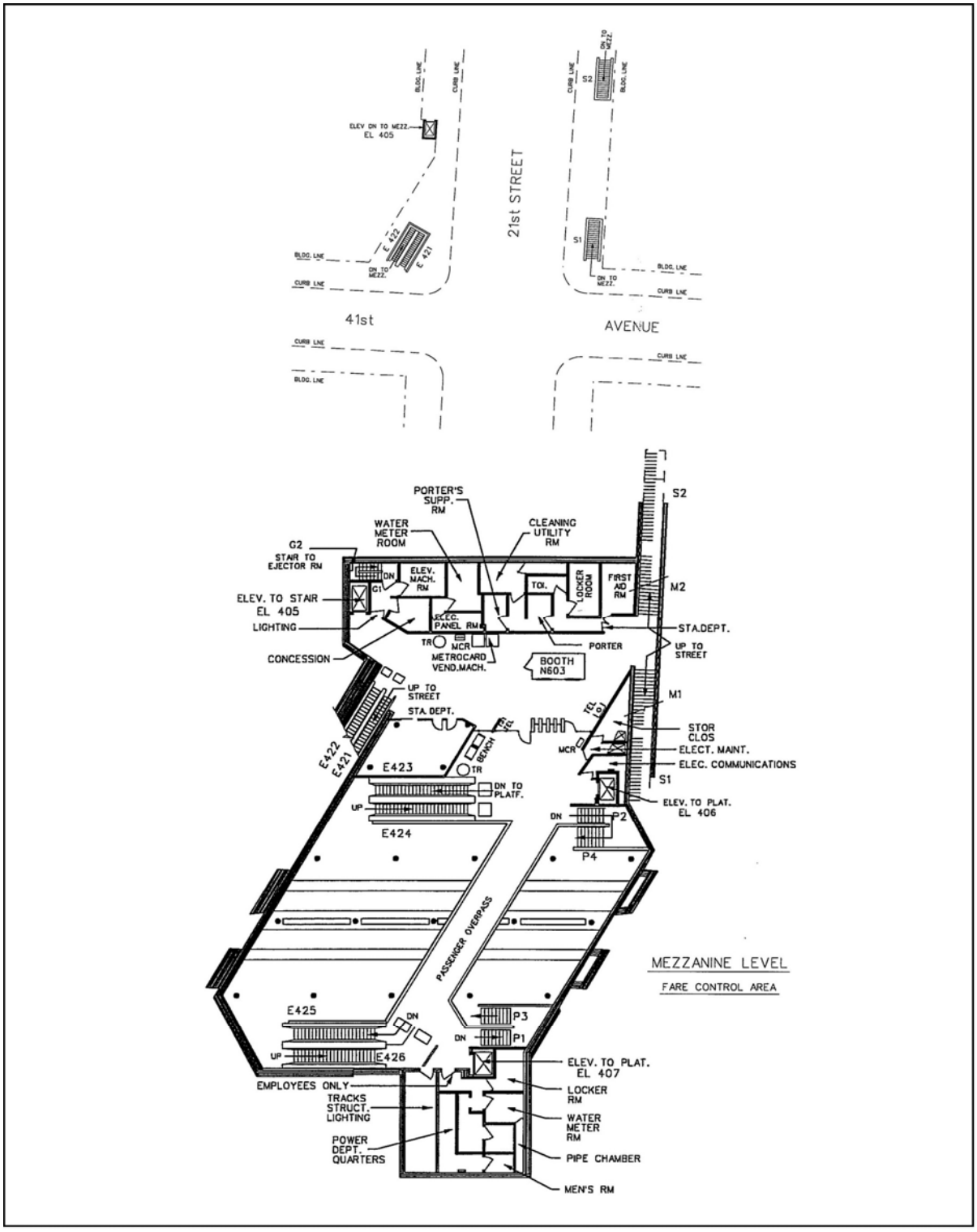

Figure 10-3:
21st Street Queensbridge Station Plan

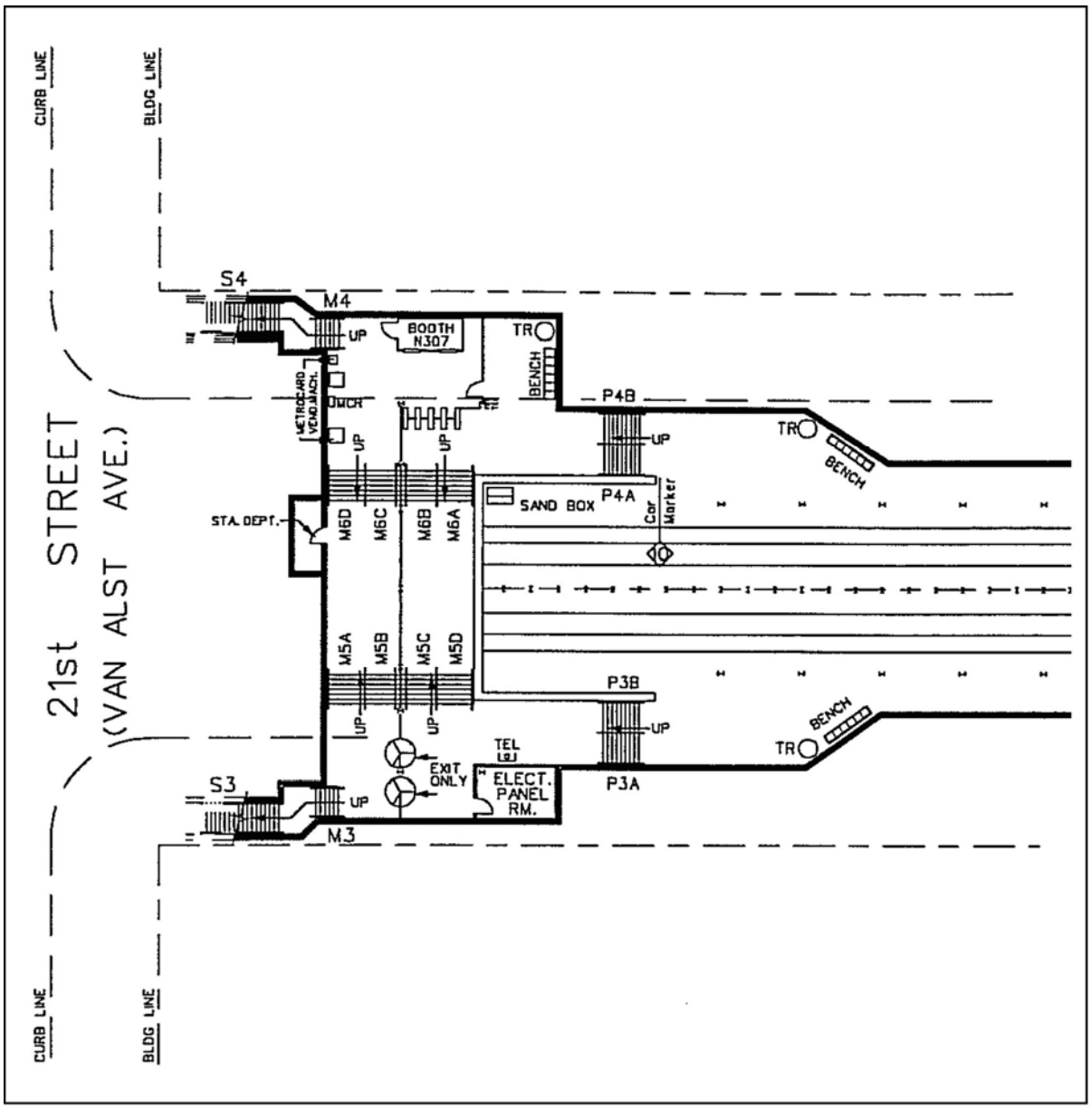

Figure 10-4:
23rd Street-Ely Avenue Station Plan

TABLE 10-3 LOS CRITERIA FOR STAIRWAYS AND CORRIDORS

LOS	Stairways - Pedestrians per Foot of Width per Minute (PFM)	Corridors/Passageways - Pedestrians per Foot of Width per Minute (PFM)	V/C Ratio	Definition
A	5 or less	7 or less	≤ 0.45	Unrestricted
B	5-7	7-10	0.46 to 0.70	Slightly restricted, no impact on speed
C	7-10	10-15	0.71 to 1.00	Speeds reduced, difficult to stop
D	10-13	15-20	1.01 to 1.33	Restricted, reverse flow conflicts
E	13-17	20-25	1.34 to 1.67	Severely restricted
F	17 or more	25 or more	>1.67	Many stoppages, no discernible flow

The levels of service for stairways and corridors were evaluated based on the Volume/SVCD (service volume between LOS C and D) capacity ratio. The breakpoint between LOS C and LOS D at a volume-to-capacity (v/c) ratio of 1.00 was established as the design standard for pedestrian conditions by MTA NYCT. Therefore, LOS C/D was used to determine the design capacity of the critical stairway, corridor, and passageway locations in the stations during each peak 15-minute period within the peak hour. Pedestrian volumes at LOS C/D were decreased by either ten or twenty percent (depending on flow conditions) for these facilities to account for pedestrians traveling in both directions; this is known as a friction factor.

The results of these analyses are provided in Table 10-4. As shown in Table 10-4, all analyzed stairways and corridors experienced an LOS A or B at all three subway stations during both peak hours.

TABLE 10-4 EXISTING LOS AND VOLUMES FOR STAIRWAYS AND CORRIDORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7)										
East-most stairway between lower platform and fare mezzanine (PL1/PL2)	0.22	A	2	150	680	0.04	A	0	31	850
Stairway between lower platform and fare mezzanine (PL3/PL4)	0.2	A	3	133	680	0.06	A	1	43	680
Stairway closest to entry turnstiles, between lower platform and fare mezzanine (PL5/PL6)	0.34	A	139	125	776	0.48	B	295	39	690
West-most stairway between lower platform and fare mezzanine (PL7/PL8)	0.11	A	4	72	680	0.06	A	10	34	680
East-most stairway between upper and lower platforms (PL1/PL2)	0.26	A	154	37	730	0.34	A	216	35	730
Stairway between upper and lower platforms (PL3/PL4)	0.19	A	88	66	799	0.22	A	126	28	710

TABLE 10-4 (CONTINUED) EXISTING LOS AND VOLUMES FOR STAIRWAYS AND CORRIDORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7) (continued)										
Stairway between upper and lower platforms (PL5/PL6)	0.31	A	170	88	833	0.32	A	185	52	740
West-most stairway between upper and lower platforms (PL7/PL8)	0.21	A	96	46	690	0.09	A	26	40	776
Stairway between street level and north pedestrian bridge (O1/O2/O3)	0.51	B	60	342	830	0.26	A	169	47	830
Stairway between street level and south pedestrian bridge (M1/S1)	0.36	A	62	138	560	0.38	A	136	101	630
North pedestrian bridge	0.33	A	80	342	1260	0.17	A	169	47	1260
South pedestrian bridge	0.16	A	62	138	1245	0.17	A	136	101	1401
21st Street-Queensbridge (F)										
Stairway between Manhattan-bound platform and mezzanine (P2/P4)	0.05	A	11	21	585	0.04	A	11	11	585
Stairway between Queens-bound platform and mezzanine (P1/P3)	0.05	A	14	12	574	0.08	A	22	25	574
Stairway between corner of 21st St/41st Ave and mezzanine (M2/S2)	0.13	A	59	8	530	0.14	A	32	51	596
Stairway between 21st St and mezzanine (M1/S1)	0.04	A	15	8	596	0.15	A	31	59	596
Passenger overpass between Queens-bound platform and fare mezzanine	0.08	A	56	107	2008	0.10	A	103	100	2008
23rd Street- Ely Avenue (E/V)										
Stairway between Queens-bound platform and mezzanine (P3A/P3B)	0.08	A	8	96	1350	0.11	A	75	87	1519
Stairway between Manhattan-bound platform and mezzanine (P4A/P4B)	0.10	A	81	67	1519	0.09	A	104	23	1350
Stairway between north side of 44th Drive and mezzanine (M4/S4)	0.26	A	59	95	596	0.26	A	105	33	530
Stairway between south side of 44th Drive and mezzanine (M3/S3)	0.18	A	28	70	550	0.20	A	59	62	619

ii. Turnstiles and Escalators

The capacity of an escalator is based upon the incline speed and the width of the steps. According to *Pedestrian Planning and Design,*[1] an escalator with a width at the hips of 32 inches, width at the treads of 24 inches, and an incline speed of 90 feet per minute has a maximum theoretical capacity of approximately 5,000 persons per hour. An escalator with a width at the hips of 48 inches, width at the treads of 40 inches, and incline speed of 90 feet per minute has a maximum theoretical capacity of approximately 8,000 persons per hour. However, the nominal capacity of an escalator is actually less when unused space on each step is factored in, as well as arrival patterns and boarding characteristics. The nominal capacity is based upon an approximate rate of one person for every other step. The maximum theoretical capacity and nominal capacity of these two types of escalators, which are typical models found within the study area, are presented in Table 10-5. The nominal capacities for a two-way turnstile and a high revolving exit gate are 32 and 30 persons per minute, respectively.

[1] John J. Fruin, *Pedestrian Planning and Design, Revised Edition 1987.*

TABLE 10-5 ESCALATOR CAPACITY

Width at Hip (inches)	Width at Tread (inches)	Maximum Theoretical Capacity (persons/hour)	Maximum Theoretical Capacity (persons/minute)	Nominal Capacity (persons/hour)	Nominal Capacity (persons/minute)
32	24	5,000	83	2,040	40
48	40	8,000	133	4,080	78

Source: MTA NYCT, Division of Operations Planning

The v/c ratios were calculated to determine the levels of service of each escalator for the peak 15-minute conditions during each peak hour.

The volume of passengers processed through a turnstile or escalator was compared with that element's maximum theoretical capacity to determine the v/c ratio and level of service. Any v/c ratio greater than 1.00 signified volumes beyond capacity and would result in extended queues. Level of service for turnstiles or escalators are described in terms of the volume-to-capacity ratios, and are presented in Table 10-6.

TABLE 10-6 LOS FOR TURNSTILES AND ESCALATORS

LOS	V/C Ratio
A	< 0.20
B	0.20 to 0.39
C	0.40 to 0.59
D	0.60 to 0.79
E	0.80 to 1.00
F	>1.01

Source: New York City Environmental Quality Review Manual

The results of these analyses are provided in Table 10-7. As shown in Table 10-7, all turnstiles and escalators experienced an LOS B or better at all three subway stations during the AM and PM peak hours. It should be noted that two high revolving exit gates were out of service at the Queensboro Plaza station on the survey day. It was observed during a subsequent visit to this station, however, that these high revolving exit gates had been returned to service. Therefore, the analysis results that are presented within Table 10-7 assume that these station elements were fully operational.

TABLE 10-7 EXISTING LOS FOR TURNSTILES AND ESCALATORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7)										
High revolving exit gates (near north pedestrian bridge)	0.21	B	0	188	900	0.02	A	0	15	900
High revolving exit gate (near south pedestrian bridge - from landings of PL1/PL2 and PL3/PL4)	0.21	B	0	95	450	0.02	A	0	9	450
High revolving exit gate (near south pedestrian bridge)	0.10	A	0	44	450	0.16	A	0	74	450
Two-Way Turnstiles	0.10	A	143	153	2880	0.12	A	295	50	2880
21st Street-Queensbridge (F)										
Up escalator between corner of 21st St/41st Ave and mezzanine (E421)	0.18	A	110	0	600	0.18	A	106	0	600
Down escalator between corner of 21st St/41st Ave and mezzanine (E422)	0.27	B	0	162	600	0.17	A	0	102	600
Up escalator between Manhattan-bound platform and mezzanine (E424)	0.06	A	66	0	1170	0.05	A	57	0	1170
Down escalator between Manhattan-bound platform and mezzanine (E423)	0.09	A	0	105	1170	0.08	A	0	98	1170
Up escalator between Queens-bound platform and mezzanine(E426)	0.08	A	93	0	1170	0.07	A	78	0	1170
Down escalator between Queens-bound platform and mezzanine (E425)	0.04	A	0	44	1170	0.07	A	0	78	1170
Two-Way Turnstiles	0.19	A	182	184	1920	0.20	B	212	168	1920
23rd Street- Ely Avenue (E/V)										
High revolving exit gate	0.07	A	0	63	900	0.07	A	0	60	900
Two-Way Turnstiles	0.10	A	84	100	1920	0.10	A	163	33	1920

2. Buses

Existing bus service in the area is provided by NYCT, Triboro Coach, and Green Bus Lines. According to current plans, however, MTA Bus is expected to complete the acquisition of bus routes operated by Triboro Coach and Green Bus Lines during the summer of 2005.

The bus routes that serve the study area include the B61, Q19A, Q32, Q39, Q60, Q66, Q67, Q101, Q101R, Q102 and Q103. In addition to local bus service, the X51, X63, X64, and X68 express bus routes operate within the study area using the Queens Boulevard corridor in the afternoon peak period. These express bus routes do not stop in the study area. The following provides a further description of the local bus routes which serve the study area. Only the Q103 serves the project site directly operating along Vernon Boulevard, with the Q102 bus route being next most proximate to the project site as it operates north of the project site on Vernon Boulevard and east of the project area along 41st Avenue. Figure 10-5 illustrates each of these bus routes within the study area.

Figure 10-5:
Existing Bus Routes

Queens Plaza serves as the major east-west corridor for bus service through the study area. Both Queens Plaza North and South have central bus stops near the Queens Plaza and Queensboro Plaza subway stations. The Q32 provides service from approximately 5 AM to 1 AM between Jackson Heights and Penn Station via the Queens Plaza corridor within the study area. The Q60 and Q101 also use the same route as the Q32 to access the Queensboro Bridge. The Q60 operates between South Jamaica and Second Avenue/60th Street in Manhattan from approximately 5 AM to 1 AM. The Q101 provides 24-hour service and operates between Second Avenue/59th Street in Manhattan and 19th Avenue and 49th Street in Astoria.

The Q19A, Q39, Q67, Q101R, and Q102 all share common routing through the Queens Plaza corridor. The Q67 operates from approximately 5 AM to 11 PM between Queensboro Plaza station and Middle Village. The Q101R is a limited stop route that provides 24-hour service between Queens Plaza and Rikers Island. No stops are made between 21st Street-Queensbridge station and Rikers Island. The Q102 operates from approximately 5 AM to 12:30 AM between Astoria Boulevard/8th Street and Roosevelt Island, traversing the Queens Plaza area in the middle of this route.

The B61, Q19A, Q39, and Q67 are common in that they utilize Jackson Avenue for a portion of their route. The B61 is the only bus route which links the study area to Brooklyn. This route provides 24-hour service between Red Hook and Queens Plaza South/Jackson Avenue. The Q19A operates from approximately 5 AM to 12:30 PM and from 5:30 PM to 1 AM. Its route is between 28th Street/Queens Plaza South and Jackson Heights via 21st Street within the project area. Both the Q39 and Q67 provide service for approximately 20 hours per weekday between the Queensboro Plaza area and Ridgewood.

Also within walking distance of the project site is the Q66 bus route. This route operates from 4 AM to 2 AM between 21st Street/Queens Plaza and Flushing.

Finally, the Q103 is the only bus route that operates adjacent to the project site. It operates between Astoria Boulevard/8th Street and Borden Avenue/Vernon Boulevard from approximately 7 AM to 6 PM. The Q103 also provides connection to the Long Island City station of the Long Island Rail Road (LIRR) near the intersection of Borden Avenue and Vernon Boulevard.

The Proposed Action is expected to generate 225 passengers to the bus network during the PM peak hour in the 2009 analysis year. According to MTA Bus, this projected volume of new passengers would be absorbed by the extensive bus route network in the area which operates with available passenger capacity. Nevertheless, a capacity analysis of bus routes was performed using existing data rather than performing field surveys for each of the eleven bus routes in the study area. Existing passenger data on the nine private bus routes, which include the Q19A, Q39, Q60, Q66, Q67, Q101, Q101R, Q102 and Q103, was obtained from the *NYCDOT Bus Ridership Survey and Route Analysis* report completed in May of 2004. The data provided in this report were collected during the Fall of 2002. This data was then increased by a half percent per year so as to best approximate current ridership levels. Existing ridership data pertaining to the Q32 and B61 were obtained from New York City Transit (NYCT), the operator of these two bus routes.

Table 10-8 provides a summary of existing passenger data for each bus route. The *CEQR Technical Manual* defines the capacity of a standard 40-foot long bus as 70 passengers. As shown in Table 10-8, all bus routes are operating with available capacity.

TABLE 10-8 EXISTING BUS SERVICE AND RIDERSHIP DURING AM AND PM PEAK HOURS

Bus Route	AM PEAK HOUR								PM PEAK HOUR							
	To Site				From Site				To Site				From Site			
	Service Frequency	Hourly Passenger Volumes	Passengers (per bus)	Passenger Occupancy Percentage	Service Frequency	Hourly Passenger Volumes	Passengers (per bus)	Passenger Occupancy Percentage	Service Frequency	Hourly Passenger Volumes	Passengers (per bus)	Passenger Occupancy Percentage	Service Frequency	Hourly Passenger Volumes	Passengers (per bus	Passenger Occupancy Percentage
B61	7	317	45	64%	8	425	53	76%	7	344	49	70%	6	268	45	64%
Q19A	9	508	56	80%	9	533	58	83%	6	228	38	54%	7	203	29	41%
Q32	9	465	52	74%	6	202	34	49%	8	223	28	40%	8	411	51	73%
Q39	13	362	27	39%	9	159	17	24%	7	184	26	37%	9	144	16	23%
Q60	9	513	56	80%	7	184	26	37%	8	77	10	14%	7	127	18	26%
Q66	11	456	41	59%	15	299	20	29%	8	194	24	34%	9	194	21	30%
Q67	6	291	48	69%	5	164	33	47%	4	51	13	19%	5	173	34	49%
Q101	6	316	52	74%	6	147	24	34%	4	125	31	44%	6	140	23	33%
Q101R[1]	3	33	11	16%	3	15	5	7%	6	64	11	16%	6	71	12	17%
Q102	4	228	57	81%	4	146	37	53%	3	59	20	29%	3	143	48	69%
Q103[2]	2.5	89	36	51%	2.5	68	27	39%	2.5	15	6	9%	2.5	24	10	14%

* *Existing Q101R passenger volume data was solely available as a bi-directional total. This data was converted to a single direction by proportioning ridership volumes as observed on the Q101, which operates similarly to the Q101R.*

3. Pedestrians

Due to the predominantly low-density and industrial nature of the majority of the study area, pedestrian activity is extremely low, except along the commercial spines of Queens Plaza North and Queens Plaza South. Existing pedestrian conditions were assessed through detailed peak period pedestrian counts and analyses performed at three intersections: Queens Plaza South and Crescent Street; Queens Plaza South and Vernon Boulevard; and 43rd Avenue and Vernon Boulevard. In addition, an analysis was performed to determine the existing level of service on the narrow south sidewalk of Queens Plaza South between 12th and 13th Streets. This sidewalk was selected for analysis because of the combination of its narrow width and the high volume of pedestrians that are projected to use this sidewalk in the Build Condition.

a) Sidewalks

The average level of service was determined using the average pedestrians per minute per foot of effective sidewalk width. Sidewalks, however, are directly influenced by other elements of the transportation network such as traffic signals, effective sidewalk width lost to trees and street furniture, and unloading transit vehicles.

To more accurately estimate the dynamics of walking, a "platoon" factor is applied in the analysis of pedestrian flow. This reflects the tendency of pedestrians to move in congregated groups (platoons) and generally results in a level of service one level poorer than average flow rates. Comfortable walking level is usually LOS C/D or better. At LOS D, individual walking speeds and the ability to bypass other pedestrians may be restricted. At LOS E, individual walking speeds become the function of the pedestrian platoon, often resulting in flow interruptions. At LOS F, severe restriction and unavoidable contact with other pedestrians is the norm. A summary of average 15-minute level of service conditions criteria is presented in Table 10-9, as per the *2000 Highway Capacity Manual*.

TABLE 10-9 LOS CRITERIA FOR WALKWAYS AND SIDEWALKS

LOS	Space (sq. ft./ped.)	Flow Rate (ped./min./ft.)
A	> 130	< 5
B	> 40	5-7
C	> 24	7-10
D	> 15	10-15
E	> 6	15-23
F	< 6	> 23

A level of service analysis was performed for the narrow south sidewalk of Queens Plaza South between 12th and 13th Streets. The effective width of this sidewalk is 4.5 feet. Pedestrian volumes are minimal at this location; a conservative estimate of 50 bi-directional pedestrians was assigned to this sidewalk during the AM peak 15 minutes. After a platoon factor was applied, this sidewalk was determined to operate at LOS A with an average of 4.9 pedestrians per minute per foot of effective walkway width.

b) Crosswalks and Street Corners

Conditions at crosswalks and street corners are influenced by the effects of traffic signals. Crosswalk level of service is also a function of time and space. Crosswalk conditions are expressed as a measurement of the area available (the crosswalk width multiplied by the width of the street) and the signal timing. This measure is expressed as square feet per minute. The average time it takes for a pedestrian to cross the street is calculated based on the width of the street and an assumed walking speed. The ratio of the measure (again expressed as pedestrians per minute) to time and space available in the crosswalk is the LOS measurement of available square feet per pedestrian. A summary of the LOS criteria is presented in Table 10-10. Additionally, in the first seconds of the "walk" cycle, the pedestrians queued to cross the street create a surge effect as they begin to cross. Therefore, the crosswalk LOS analysis includes a factor that adjusts for this "surge" to estimate worst-case conditions during the initial start-up. After the initial surge, the level of service analysis also accounts for vehicles moving through the crosswalk.

Similar to crosswalks, street corners must provide sufficient space for a mix of standing pedestrians (queued to cross a street) and circulating pedestrians (crossing the other street or passing around the corner). The analysis applies a measure of time and space availability based on the area of the corner, signal timing, and the estimated time used by circulating pedestrians.

The total "time-space" available for these activities is the net square footage of the corner multiplied by the cycle length and expressed as square feet per minute. The total circulation time for all pedestrian movements at the corner, expressed as pedestrians per minute, is then determined. The ratio of net time-space divided by pedestrian circulation time provides the level of service measurement of square feet per pedestrian. A summary of average 15-minute level of service conditions criteria is presented in Table 10-10, as per the *2000 Highway Capacity Manual*.

Pedestrian data were collected and analyzed at the following three unsignalized intersections: Queens Plaza South and Crescent Street; Queens Plaza South and Vernon Boulevard; and 43rd Avenue and Vernon Boulevard. These three intersections, two of which are adjacent to the project site, were chosen because they were anticipated to be most affected by the Proposed Action.

TABLE 10-10 LOS CRITERIA FOR CROSSWALKS AND CORNER RESERVOIR SPACES

LOS	Space (sq. ft./ped.)	V/C Ratio
A	> 60	≤ 0.21
B	> 40-60	> 0.21-0.31
C	> 24-40	> 0.31-0.44
D	> 15-24	> 0.44-0.65
E	> 8-15	> 0.65-1.0
F	≤ 8	Variable

For unsignalized intersections, the pedestrian analysis computes the critical gap which is the time, measured in seconds, below which a pedestrian will not attempt to begin crossing the street. Pedestrians use their own judgment to determine if the available gap between vehicles is long enough for safe crossing. If the available gap is greater than the critical gap, it is assumed that the pedestrian will cross, but if the available gap is less than the critical gap, it is assumed that the pedestrian will not cross.

The delay that pedestrians experience waiting for sufficient crossing time determines the level of service for the intersection and the likelihood of risk-taking behavior associated with crossing the roadway. Table 10-11 presents the level of service criteria for pedestrians at unsignalized intersections, as per the *2000 Highway Capacity Manual*.

TABLE 10-11 LOS CRITERIA FOR PEDESTRIANS AT UNSIGNALIZED INTERSECTIONS

LOS	Average Delay/ Pedestrian (seconds)	Likelihood of Risk Taking Behavior
A	< 5	Low
B	≥ 5-10	
C	> 10-20	Moderate
D	> 20-30	
E	> 30-45	High
F	> 45	Very High

Crosswalks do not presently exist across Vernon Boulevard at its "T" intersections with Queens Plaza South and with 43rd Avenue. Crosswalks are present across 43rd Avenue and across Queens Plaza South at their intersections with Vernon Boulevard. These crosswalks, located on the east side of these intersections, are not analyzed for level of service however, because pedestrians have the right-of-way since vehicular traffic is controlled by a stop sign (i.e., pedestrians flow freely across the intersection without delay). Similarly, because vehicular traffic is controlled by a stop sign, pedestrians have the right-of-way at the south crosswalk of Crescent Street and Queens Plaza South which is the only legal crossing at this intersection.

As shown in Table 10-12, the crossing locations most proximate to the project site range from an existing pedestrian LOS C to LOS E depending on time of day. Although pedestrian volumes are presently very low, totaling less than 15 pedestrians at each crosswalk during each 15-minute period, traffic volumes are sufficient at the north crossing of Vernon Boulevard at Queens Plaza South to require pedestrians to wait an unacceptably long period of time to cross the street during the AM and PM peak analysis period.

TABLE 10-12 EXISTING PEDESTRIAN LOS AND VOLUMES AT ANALYZED UNSIGNALIZED INTERSECTIONS

	AM Peak 15-Minutes			Midday Peak 15-Minutes			PM Peak 15-Minutes		
Location	LOS	Average Delay (sec)	Pedestrian Volume	LOS	Average Delay (sec)	Pedestrian Volume	LOS	Average Delay (sec)	Pedestrian Volume
Vernon Boulevard and Queens Plaza South – North Crossing	E	34	0	D	22	0	E	37	0
Vernon Boulevard and Queens Plaza South – South Crossing	D	23	0	C	16	2	D	23	2
Vernon Boulevard and 43rd Avenue – North Crossing	D	22	0	C	15	4	D	23	0
Vernon Boulevard and 43rd Avenue – South Crossing	C	20	4	C	14	8	C	19	0

Note: Painted crosswalks are not present at these crossing locations.

C. FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION (NO BUILD CONDITION—YEAR 2009)

This section establishes the baseline (the No Build) conditions – as detailed within Chapter 2 of this FEIS – against which the impacts of the Proposed Action can be compared. Future transit and pedestrian conditions were analyzed for the year 2009.

1. Subways

Subway service and station analyses in the No Build condition are based on existing data with a half percent annual background growth rate applied as per the *CEQR Technical Manual*, and the addition of passenger volumes projected to be generated by area development projects by the 2009 analysis year. Subway passengers were assigned to stations and to subway lines based on station proximity to each development site, geographic coverage of subway lines serving each station, and estimated origin/destination for passengers for each development site. Passenger assignments to subway stations and lines reflect a general consistency with the *LIC Rezoning EIS*.

a) Subway Line Haul Analysis

Table 10-13 provides the projected passenger volumes and the computed v/c ratio for each subway line during the weekday AM peak hour in the No Build condition. The weekday AM peak hour in the Manhattan-bound direction represents the peak daily usage of the subway system, and is therefore the most conservative period during which to analyze the impact of additional passengers.

TABLE 10-13: NO BUILD CONDITION SUBWAY LINE HAUL ANALYSIS – AM PEAK HOUR, PEAK DIRECTION

Train Route	Number of Peak Hour Trains	Guideline Capacity per Train	Guideline Peak Hour Line Haul Capacity	Year 2009 Projected AM Peak Hour Passengers	Volume to Capacity Ratio (v/c)
E	14	1,450	20,300	21,069	1.04
F	14	1,400	19,600	17,429	0.89
G	9	700	6,300	4,045	0.64
R	9	1,400	12,600	9,547	0.76
V	10	1,400	14,000	7,699	0.55
N / W	14	1,400	19,600	16,551	0.84
No. 7	26	1,210	31,460	24,156	0.77

As shown in Table 10-13, the E line would be expected to accommodate passenger volumes four percent beyond its guideline capacity. Each of the other seven subway lines would have varying levels of unused passenger capacity ranging from 11 percent available capacity on the F line to 45 percent on the V line.

Table 10-14 provides the line haul analysis in the reverse peak travel direction during the weekday AM peak hour. As shown in this table, all subway lines have significant amounts of unused capacity ranging from 35 percent available passenger capacity on the G line to 92 percent on the V line.

TABLE 10-14: NO BUILD CONDITION SUBWAY LINE HAUL ANALYSIS – AM PEAK HOUR, REVERSE PEAK DIRECTION

Train Route	Number of Peak Hour Trains	Guideline Capacity per Train	Guideline Peak Hour Line Haul Capacity	Projected AM Peak Hour Passengers	Volume to Capacity Ratio (v/c)
E	15	1,450	21,750	3,669	0.17
F	15	1,400	21,000	2,477	0.12
G	9	700	6,300	4,118	0.65
R	10	1,400	14,000	1,705	0.12
V	10	1,400	14,000	1,186	0.08
N / W	15	1,400	21,000	2,591	0.12
No. 7	24	1,210	29,040	3,689	0.13

b) Subway Station Elements

As shown in Table 10-15, all analyzed station elements, which include stairways, corridors, escalators and turnstile banks, are projected to experience an LOS C or better at all three subway stations.

TABLE 10-15: NO BUILD CONDITION LOS AND VOLUMES FOR STAIRWAYS, CORRIDORS, TURNSTILES AND ESCALATORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7)										
East-most stairway between lower platform and fare mezzanine (PL1/PL2)	0.31	A	2	208	680	0.04	A	0	38	850
Stairway between lower platform and fare mezzanine (PL3/PL4)	0.27	A	3	184	680	0.07	A	1	49	680
Stairway closest to entry turnstiles, between lower platform and fare mezzanine (PL5/PL6)	0.43	A	158	173	776	0.71	C	439	48	690
West-most stairway between lower platform and fare mezzanine (PL7/PL8)	0.15	A	5	99	680	0.08	A	15	41	680
East-most stairway between upper and lower platforms (PL1/PL2)	0.30	A	160	56	730	0.38	A	240	39	730
Stairway between upper and lower platforms (PL3/PL4)	0.24	A	92	99	799	0.24	A	140	31	710
Stairway between upper and lower platforms (PL5/PL6)	0.37	A	177	134	833	0.36	A	206	57	740
West-most stairway between upper and lower platforms (PL7/PL8)	0.22	A	100	70	776	0.09	A	29	44	776
Stairway between street level and north pedestrian bridge (O1/O2/O3)	0.54	B	84	366	830	0.29	A	186	51	830
Stairway between street level and south pedestrian bridge (M1/S1)	0.67	B	78	298	560	0.70	C	268	125	560
High revolving exit gates (near north pedestrian bridge)	0.30	B	0	268	900	0.02	A	0	17	900
High revolving exit gate (near south pedestrian bridge - from landings of PL1/PL2 and PL3/PL4)	0.29	B	0	130	450	0.05	A	0	21	450
High revolving exit gate (near south pedestrian bridge)	0.14	A	0	61	450	0.18	A	0	82	450
Two-Way Turnstiles	0.13	A	163	211	2880	0.17	A	444	56	2880
North pedestrian bridge	0.36	A	84	366	1260	0.19	A	186	51	1260
South pedestrian bridge	0.3	A	78	298	1245	0.32	A	268	125	1245
21st Street-Queensbridge (F)										
Stairway between Manhattan-bound platform and mezzanine (P2/P4)	0.06	A	11	21	585	0.04	A	11	11	585
Stairway between Queens-bound platform and mezzanine (P1/P3)	0.05	A	14	12	574	0.08	A	22	26	574
Stairway between corner of 21st St/41st Ave and mezzanine (M2/S2)	0.13	A	61	8	530	0.14	A	33	53	596
Stairway between 21st St and mezzanine (M1/S1)	0.04	A	15	8	596	0.15	A	32	60	596
Up escalator between corner of 21st St/41st Ave and mezzanine (E421)	0.19	A	112	0	600	0.18	A	108	0	600
Down escalator between corner of 21st St/41st Ave and mezzanine (E422)	0.28	B	0	165	600	0.17	A	0	104	600
Up escalator between Manhattan-bound platform and mezzanine (E424)	0.06	A	67	0	1170	0.05	A	58	0	1170
Down escalator between corner of 21st St/41st Ave and mezzanine (E422)	0.09	B	0	165	1170	0.09	A	0	104	1170

TABLE 10-15: (CONTINUED) NO BUILD CONDITION LOS FOR STAIRWAYS, CORRIDORS, TURNSTILES AND ESCALATORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7) (continued)										
Up escalator between Queens-bound platform and mezzanine (E426)	0.08	A	96	0	1170	0.07	A	80	0	1170
Down escalator between Queens-bound platform and mezzanine (E425)	0.04	A	0	45	1170	0.07	A	0	80	1170
Two-Way Turnstiles	0.19	A	186	189	1920	0.20	B	217	171	1920
Passenger overpass between Queens-bound platform and fare mezzanine	0.08	A	57	110	2008	0.10	A	105	102	2008
23rd Street / Ely Avenue (E/V)										
Stairway between Queens-bound platform and mezzanine (P3A/P3B)	0.12	A	52	111	1350	0.14	A	91	115	1519
Stairway between Manhattan-bound platform and mezzanine (P4A/P4B)	0.12	A	104	75	1519	0.13	A	131	72	1519
Stairway between north side of 44th Drive and mezzanine (M4/S4)	0.34	A	94	109	596	0.34	A	128	73	596
Stairway between south side of 44th Drive and mezzanine (M3/S3)	0.24	A	63	85	619	0.29	A	79	101	619
High revolving exit gate	0.08	A	0	76	900	0.11	A	0	95	900
Two-Way Turnstiles	0.14	A	152	110	1920	0.15	A	205	92	1920

* *Level of service for stairways and corridors are defined by volume/svcd ratio criteria and service criteria (volume of service at LOS C/D). LOS for turnstiles and escalators are defined by v/c ratio criteria (volume to capacity).*

2. Buses

Bus ridership in the No Build condition is based on existing data with a half percent background annual growth applied, as per the *CEQR Technical Manual*, and additional projected passenger volumes generated by anticipated development expected to be completed by the 2009 analysis year. Bus passengers were assigned to routes based on each route's existing ridership level and schedule frequency, route proximity to each anticipated development site, and the estimated origin/destination of generated passengers.

Table 10-16 provides a summary of passenger ridership projections for each of the eleven bus routes presently operating in the study area. All bus routes are projected to operate with available capacity in the No Build condition. The Q102 and Q60 routes are anticipated to operate with the heaviest usage, with 63 and 61 passengers per bus, respectively, during the AM peak hour toward the project site.

TABLE 10-16: NO BUILD CONDITION BUS RIDERSHIP DURING AM AND PM PEAK HOURS

Bus Route	AM PEAK HOUR								PM PEAK HOUR							
	To Site				From Site				To Site				From Site			
	Service Frequency	Hourly Passenger Volumes	Passengers (per bus)	Passenger Occupancy Percentage	Service Frequency	Hourly Passenger Volumes	Passengers (per bus)	Passenger Occupancy Percentage	Service Frequency	Hourly Passenger Volumes	Passengers (per bus)	Passenger Occupancy Percentage	Service Frequency	Hourly Passenger Volumes	Passengers (per bus	Passenger Occupancy Percentage
B61	8	339	42	60%	8	438	55	79%	7	362	52	74%	6	287	48	69%
Q19A	9	535	59	84%	9	548	61	87%	6	243	41	59%	7	222	32	46%
Q32	9	497	55	79%	7	212	30	43%	9	241	27	39%	9	438	49	70%
Q39	13	385	30	43%	9	167	19	27%	7	198	28	40%	9	161	18	26%
Q60	9	546	61	87%	7	195	28	40%	8	93	12	17%	7	148	21	30%
Q66	11	479	44	63%	15	310	21	30%	8	208	26	37%	9	210	23	33%
Q67	6	311	52	74%	5	171	34	49%	4	62	16	23%	5	188	38	54%
Q101	6	339	56	80%	6	152	26	37%	4	136	39	56%	6	154	26	37%
Q101R	3	34	12	17%	3	16	5	7%	6	69	12	17%	6	78	13	19%
Q102	4	251	63	90%	4	155	39	56%	3	72	24	34%	3	161	55	79%
Q103	2.5	94	38	54%	2.5	70	28	40%	2.5	18	7	10%	2.5	27	11	16%

3. Pedestrians

a) Sidewalks

A level of service analysis was performed for the narrow sidewalk on the south sidewalk of Queens Plaza South between 12th and 13th Streets. Additional anticipated development is not located nearby and is not expected to add pedestrian trips to this sidewalk. Similar to existing conditions, this sidewalk would continue to experience LOS A conditions.

b) Crosswalks and Street Corners

As shown in Table 10-17, the four crossing locations most proximate to the project site are expected to experience an unacceptable LOS E or F during the AM and PM peak analysis periods. In the No Build condition, pedestrian volumes were projected to be similar to existing pedestrian volumes, which did not exceed 15 pedestrians at any crosswalk during each 15-minute peak analysis period. However, when vehicular traffic volume increases were considered, pedestrian level of service deteriorated due to the increased vehicular volumes. At LOS E or F, pedestrians would be required to wait an unacceptably long time to cross the street, possibly encouraging risk-taking behavior at all four crossing locations.

Pedestrians would continue to flow freely across the south crosswalk at the analyzed intersection of Crescent Street and Queens Plaza South. Few pedestrian trips are anticipated to be generated at this intersection by expected development in the No Build condition. Therefore, the volume of pedestrians at this intersection is not projected to be significantly greater than existing volumes.

TABLE 10-17: NO BUILD CONDITION PEDESTRIAN LOS AND VOLUMES AT ANALYZED UNSIGNALIZED INTERSECTIONS

Location	AM Peak 15-Minutes			Midday Peak 15-Minutes			PM Peak 15-Minutes		
	LOS	Average Delay (sec)	Pedestrian Volume	LOS	Average Delay (sec)	Pedestrian Volume	LOS	Average Delay (sec)	Pedestrian Volume
Vernon Boulevard and Queens Plaza South – North Crossing	F	52	0	E	36	0	F	62	0
Vernon Boulevard and Queens Plaza South – South Crossing	E	35	0	D	25	2	E	38	2
Vernon Boulevard and 43rd Avenue – North Crossing	E	34	0	D	24	4	E	39	0
Vernon Boulevard and 43rd Avenue – South Crossing	E	30	4	D	22	8	E	31	0

D. FUTURE CONDITIONS WITH THE PROPOSED ACTION (BUILD CONDITION—YEAR 2009)

In the Traffic and Parking chapters, an extensive discussion of the trip generation methodology and results was provided. Transit passenger and pedestrian projections are summarized in Table 10-18 for the weekday AM, midday, and PM peak hours.

TABLE 10-18: BUILD CONDITION PEDESTRIAN AND TRANSIT PASSENGER TRIP PROJECTIONS

Mode	Person Trips		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Bus	104	150	225
Subway	1,470	778	1,359
Walk	379	485	525

These trips account for the primary mode of transportation to/from the project site. Bus and subway trips eventually become pedestrian trips between the transit facility and the project site and are included in the Build pedestrian analysis. The pedestrian trip volumes presented in Table 10-18 do not account for pedestrian trips made between locations within the site of the Proposed Action.

1. Subways

Subway service and station analyses in the Build condition consist of No Build projections with the addition of projected volumes generated by the Proposed Action. Overall, during each peak hour, about 9 percent of additional subway passengers are projected to use the Court Square station, 24 percent to the 23rd Street/Ely Avenue station, 34 percent to the Queensboro Plaza station, 3 percent to the Queens Plaza station, and 30 percent to the 21st Street-Queensbridge station. These assignments are based upon proximity to the project site, current ridership levels and geographic coverage of

subway lines that serve each station, estimated origin/destination for passengers generated by the Proposed Action.

Table 10-19 presents the projected volume of passengers generated by the Proposed Action during the AM, midday, and PM peak hours to each of the five subway stations in the study area.

TABLE 10-19: BUILD CONDITION SUBWAY STATION PASSENGER VOLUMES GENERATED BY THE PROPOSED ACTION

Subway Station	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Queensboro Plaza (N/W/7)	500	265	462
21st Street-Queensbridge (F)	441	233	408
23rd Street-Ely Avenue (E/V)	353	187	326
Court Square (G)	132	70	122
Queens Plaza (E/R/V)	44	23	41

a) Subway Line Haul Analysis

The *CEQR Technical Manual* specifies that a significant impact is considered to occur if the v/c is over capacity and the Proposed Action generates five or more transit riders per car, or if the route is projected to operate under capacity in the future No Build condition and over capacity in the future Build condition.

Table 10-20 provides the projected passenger volumes and the computed v/c ratio for each analyzed subway line during the weekday AM peak hour under the Build condition. As per the trip generation calculations presented within Chapter 9, 1,470 bi-directional subway passengers are expected to be generated by the Proposed Action in the AM peak hour. Similar to assumptions made within the *LIC Rezoning EIS*, it was assumed that 30 percent of non-G line passengers generated by the Proposed Action would be Manhattan-bound during the AM peak hour and 70 percent would be Queens-bound. It was assumed that 30 percent of G line passengers would be Brooklyn-bound during the AM peak hour and the remaining 70 percent would be Queens-bound.

TABLE 10-20: BUILD CONDITION SUBWAY LINE HAUL ANALYSIS – AM PEAK HOUR, PEAK DIRECTION

Train Route	No Build Condition - Projected AM Peak Hour Passengers	No Build Condition - Volume to Capacity Ratio (v/c)	Additional Build Condition Passengers	Build Condition - Projected AM Peak Hour Passengers	Build Condition - Volume to Capacity Ratio (v/c)
E	21,069	1.04	58	21,127	1.04
F	17,429	0.89	132	17,561	0.90
G	4,045	0.64	40	4,085	0.65
R	9,547	0.76	13	9,560	0.76
V	7,699	0.55	48	7,747	0.55
N / W	16,551	0.84	105	16,656	0.85
No. 7	24,156	0.77	45	24,201	0.77

The E line would continue to accommodate passenger volumes beyond its guideline capacity, with a v/c ratio of 1.04 under both the No Build and Build conditions. The Proposed Action is expected to

contribute an additional 58 passengers to the E line during the AM peak hour. This would translate to less than one additional passenger per car during the peak hour which is not a significant impact.

Each of the other seven subway lines are expected to have varying levels of unused passenger capacity in the Build condition, ranging from 10 percent on the F line to 45 percent on the V line.

Table 10-21 provides the line haul analysis in the reverse peak travel direction during the weekday AM peak hour. As shown in this table, all subway lines have significant amounts of unused capacity, ranging from 33 percent on the G line to 91 percent on the V line.

TABLE 10-21: BUILD CONDITION SUBWAY LINE HAUL ANALYSIS – AM PEAK HOUR, REVERSE PEAK DIRECTION

Train Route	No Build Condition - Projected AM Peak Hour Passengers	Build Condition - Volume to Capacity Ratio (v/c)	Additional Build Condition Passengers	Build Condition - Projected AM Peak Hour Passengers	Build Condition - Volume to Capacity Ratio (v/c)
E	3,669	0.17	136	3,805	0.17
F	2,477	0.12	309	2,786	0.13
G	4,118	0.65	93	4,211	0.67
R	1,705	0.12	31	1,736	0.12
V	1,186	0.08	111	1,298	0.09
N / W	2,591	0.12	245	2,836	0.14
No. 7	3,689	0.13	105	3,794	0.13

b) Subway Station Elements

In the Build condition, as shown in Table 10-22, all analyzed station elements, which include stairways, corridors, escalators and turnstile banks, are projected to experience an LOS C or better at all three subway stations.

TABLE 10-22: BUILD CONDITION LOS FOR STAIRWAYS, CORRIDORS, TURNSTILES AND ESCALATORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7)										
East-most stairway between lower platform and fare mezzanine (PL1/PL2)	0.36	A	2	246	680	0.05	A	0	43	850
Stairway between lower platform and fare mezzanine (PL3/PL4)	0.32	A	3	217	680	0.08	A	1	55	680
Stairway closest to entry turnstiles, between lower platform and fare mezzanine (PL5/PL6)	0.50	B	186	205	776	0.88	C	551	54	690
West-most stairway between lower platform and fare mezzanine (PL7/PL8)	0.18	A	6	117	680	0.10	A	19	47	680
East-most stairway between upper and lower platforms (PL1/PL2)	0.32	A	166	69	730	0.40	A	242	53	730

TABLE 10-22: (CONTINUED) BUILD CONDITION LOS FOR STAIRWAYS, CORRIDORS, TURNSTILES AND ESCALATORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
Queensboro Plaza (N/W/7) (continued)										
Stairway between upper and lower platforms (PL3/PL4)	0.27	A	95	122	799	0.25	A	141	39	710
Stairway between upper and lower platforms (PL5/PL6)	0.42	A	184	165	833	0.37	A	208	69	740
West-most stairway between upper and lower platforms (PL7/PL8)	0.25	A	104	87	776	0.10	A	31	46	776
Stairway between street level and north pedestrian bridge (O1/O2/O3)	0.56	B	87	378	830	0.30	A	198	53	830
Stairway between street level and south pedestrian bridge (M1/S1)	0.91	C	104	407	560	0.92	C	372	146	560
High revolving exit gates (near north pedestrian bridge)	0.33	B	0	296	900	0.02	A	0	18	900
High revolving exit gate (near south pedestrian bridge – from landings of PL1/PL2 and PL3/PL4)	0.38	B	0	173	450	0.07	A	0	31	450
High revolving exit gate (near south pedestrian bridge)	0.16	A	0	72	450	0.20	A	0	89	450
Two-Way Turnstiles	0.15	A	192	250	2880	0.22	B	560	61	2880
North pedestrian bridge	0.37	A	87	378	1260	0.20	A	198	53	1260
South pedestrian bridge	0.41	A	104	407	1245	0.42	A	372	146	1245
21st Street-Queensbridge (F)										
Stairway between Manhattan-bound platform and mezzanine (P2/P4)	0.06	A	15	22	585	0.05	A	13	18	585
Stairway between Queens-bound platform and mezzanine (P1/P3)	0.07	A	24	16	574	0.10	A	27	33	574
Stairway between corner of 21st St/41st Ave and mezzanine (M2/S2)	0.14	A	66	9	530	0.15	A	34	58	596
Stairway between 21st St and mezzanine (M1/S1)	0.06	A	20	9	530	0.16	A	33	65	596
Up escalator between corner of 21st St/41st Ave and mezzanine (E421)	0.35	B	208	0	600	0.21	B	127	0	600
Down escalator between corner of 21st St/41st Ave and mezzanine (E422)	0.31	B	0	188	600	0.33	B	0	196	600
Up escalator between Manhattan-bound platform and mezzanine (E424)	0.08	A	94	0	1170	0.06	A	71	0	1170
Down escalator between corner of 21st St/41st Ave and mezzanine (E422)	0.10	A	0	113	1170	0.14	A	0	166	1170
Up escalator between Queens-bound platform and mezzanine (E426)	0.14	A	161	0	1170	0.07	A	81	0	1170
Down escalator between Queens-bound platform and mezzanine (E425)	0.05	A	0	59	1170	0.09	A	0	103	1170
Two-Way Turnstiles	0.26	B	211	295	1920	0.27	B	319	192	1920
Passenger overpass between Queens-bound platform and fare mezzanine	0.08	A	57	110	2008	0.10	A	105	102	2008

TABLE 10-22: (CONTINUED) BUILD CONDITION LOS FOR STAIRWAYS, CORRIDORS, TURNSTILES AND ESCALATORS

Station Element/Description	AM Peak 15-Minutes					PM Peak 15-Minutes				
	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity	V/ SVCD	LOS	Up Vol	Down Vol	V/SVCD Capacity
23rd Street / Ely Avenue (E/V)										
Stairway between Queens-bound platform and mezzanine (P3A/P3B)	0.17	A	66	171	1350	0.05	A	115	121	1519
Stairway between Manhattan-bound platform and mezzanine (P4A/P4B)	0.12	A	111	101	1519	0.09	A	188	84	1350
Stairway between north side of 44th Drive and mezzanine (M4/S4)	0.54	B	113	186	596	0.68	B	201	88	530
Stairway between south side of 44th Drive and mezzanine (M3/S3)	0.34	A	65	94	619	0.27	A	87	103	619
High revolving exit gate	0.00	A	0	114	900	0.00	A	0	99	900
Two-Way Turnstiles	0.13	A	173	148	1920	0.00	A	286	99	1920

* *Level of service for stairways and corridors are defined by volume/svcd ratio criteria and service criteria (volume of service at LOS C/D). LOS for turnstiles and escalators are defined by v/c ratio criteria (volume to capacity).*

2. Buses

Bus ridership in the Build condition is based on the No Build condition with additional projected passenger trips generated by the Proposed Action. Passengers generated by the Proposed Action were assigned based on projected passenger origin/destination locations, bus schedule frequency, and proximity of the bus route to the project site. Tables 10-23 and 10-24 present a comparison between bus ridership in the No Build and Build condition for the AM and PM peak hours. As shown in Tables 10-23 and 10-24, all bus routes in the Build condition are projected to operate below capacity during both the AM and PM peak hours except for the Q103.

TABLE 10-23: NO BUILD AND BUILD CONDITION BUS RIDERSHIP COMPARISON – AM PEAK HOUR

Bus Route	No Build Condition						Build Condition					
	To Site			From Site			To Site			From Site		
	Peak Hour Passenger Volumes	Passengers Per Bus	Passenger Occupancy Percentage	Peak Hour Passenger Volumes	Passengers Per Bus	Passenger Occupancy Percentage	Peak Hour Passenger Volumes	Passengers Per Bus	Passenger Occupancy Percentage	Peak Hour Passenger Volumes	Passengers Per Bus	Passenger Occupancy Percentage
B61	339	42	60%	438	55	79%	348	43	61%	442	27	39%
Q19A	535	59	84%	548	61	87%	544	60	86%	553	61	87%
Q32	497	55	79%	212	30	43%	508	56	80%	217	57	81%
Q39	385	30	43%	167	19	27%	394	30	43%	170	19	27%
Q60	546	61	87%	195	28	40%	557	62	89%	200	29	41%
Q66	479	44	63%	310	21	30%	487	44	63%	313	21	30%
Q67	311	52	74%	171	34	49%	319	53	76%	174	35	50%
Q101	338	56	80%	154	26	37%	364	61	87%	160	27	39%
Q101R	36	12	17%	16	5	7%	43	14	20%	18	6	9%
Q102	251	63	90%	155	39	56%	260	65	93%	160	40	57%
Q103	94	38	54%	70	28	40%	95	38	54%	197	108 *	154%

* *Denotes a significant impact at peak load point.*

TABLE 10-24: NO BUILD AND BUILD CONDITION BUS RIDERSHIP COMPARISON – PM PEAK HOUR

Bus Route	No Build Condition						Build Condition					
	To Site			From Site			To Site			From Site		
	Peak Hour Passenger Volumes	Passengers Per Bus	Passenger Occupancy Percentage	Peak Hour Passenger Volumes	Passengers Per bus	Passenger Occupancy Percentage	Peak Hour Passenger Volumes	Passengers Per bus	Passenger Occupancy Percentage	Peak Hour Passenger Volumes	Passengers Per Bus	Passenger Occupancy Percentage
B61	362	52	74%	287	48	69%	364	52	74%	306	51	73%
Q19A	243	41	59%	222	32	46%	246	41	59%	242	35	50%
Q32	241	27	39%	438	49	70%	244	27	39%	462	51	73%
Q39	198	28	40%	161	18	26%	200	29	41%	179	20	29%
Q60	93	12	17%	148	21	30%	96	12	17%	172	25	36%
Q66	208	26	37%	210	23	33%	209	26	37%	227	25	36%
Q67	62	16	23%	188	38	54%	64	16	23%	205	41	59%
Q101	146	39	56%	167	26	37%	147	37	53%	168	28	40%
Q101R	69	12	17%	84	13	19%	84	14	20%	91	15	21%
Q102	72	24	34%	161	55	79%	73	24	34%	182	61	87%
Q103	18	7	10%	27	11	16%	119	71 *	101%	30	12	17%

* *Denotes a significant impact.*

The Q103 is expected to experience a large volume of growth in the Build condition. For the most part, this growth is not attributable to passengers using this route as their primary travel mode to/from the site, but rather as access for LIRR passengers traveling between the project site and the Long Island City LIRR station. This station is located approximately one mile south of the project site which is about a twenty minute walk away. Due to this distance, it was assumed that 95 percent of LIRR passengers would use the Q103 between the station and the project site, while the remaining 5 percent would walk. At its peak load point during the AM peak hour, the Q103 would operate with an average of 108 passengers per bus in the northbound direction, which Tables 10-23 and 10-24 identify as "from site." During the PM peak hour, the Q103 would operate with an average of 71 passengers in the southbound direction, which Tables 10-23 and 10-24 identify as "to site." These significant impacts to the Q103 route would be mitigated by the addition of two buses during the AM peak hour in the northbound direction, and one additional bus during the PM peak hour in the southbound direction. It is MTA NYCT's general policy to provide additional bus service where demand warrants. This is typically established once a proposed development is built and occupied, and actual ridership needs can be determined.

3. Pedestrians

a) Sidewalks

In the Build condition, approximately 260 pedestrians are projected to use the south sidewalk of Queens Plaza South between 12th and 13th Streets during the peak 15-minute period. This projected pedestrian volume would encompass trips between the project site and the Queensboro Plaza and Queens Plaza subway stations, various bus routes located on or near Queens Plaza South, as well as other locations. The projected pedestrian volume was calculated by adding the project-generated trips to the No Build pedestrian volume. This sidewalk is the narrowest sidewalk which would be expected to accommodate the greatest volume of project-generated pedestrian trips.

After applying a platoon factor, this sidewalk is projected to experience an LOS C with an average of 8.8 pedestrians per minute per foot of effective walkway width. Therefore, the Proposed Action would not significantly impact this sidewalk.

b) Crosswalks and Street Corners

In the Build condition at the two analyzed Vernon Boulevard intersections, it is anticipated that approximately 900 pedestrians would cross Vernon Boulevard at both locations combined, in either direction during the AM and PM peak hours, and approximately 650 pedestrians during the midday peak hour. These pedestrian trips were assigned equally to the two intersections of Vernon Boulevard with Queens Plaza South and with 43rd Avenue.

In the No Build condition, the levels of service at these two study locations would range from LOS D to LOS F depending on the time of day, with average delays ranging from approximately 20 seconds to 1 minute. As shown in Table 10-25, levels of service would be unacceptable at all four crossing locations in the Build condition in all time periods due to the inability of pedestrians to find suitable opportunities or gaps in the vehicular traffic stream, to cross Vernon Boulevard. Average delays would exceed five minutes at two locations. Therefore, the Proposed Action is expected to significantly impact all four crossing locations when compared with the No Build condition.

TABLE 10-25: BUILD PEDESTRIAN LOS AND VOLUMES AT ANALYZED UNSIGNALIZED INTERSECTIONS

Location	AM Peak 15-Minutes			Midday Peak 15-Minutes			PM Peak 15-Minutes		
	LOS	Average Delay (sec)	Pedestrian Volume	LOS	Average Delay (sec)	Pedestrian Volume	LOS	Average Delay (sec)	Pedestrian Volume
Vernon Boulevard and Queens Plaza South – North Crossing	F	144*	27	E	44	20	F	212	30
Vernon Boulevard and Queens Plaza South – South Crossing	F	> 5 minutes*	243	F	271*	180	F	> 5 minutes*	267
Vernon Boulevard and 43rd Avenue – North Crossing	F	> 5 minutes*	232	F	> 5 minutes*	144	F	> 5 minutes*	246
Vernon Boulevard and 43rd Avenue – South Crossing	F	95*	58	E	31	36	F	297	61

* *Denotes a significant impact.*

4. Pedestrian Safety

Pedestrian safety is an important consideration during the Build condition, in addition to the pedestrian levels of service. Presently, Vernon Boulevard experiences very low pedestrian volumes and moderate vehicular volumes. The Proposed Action would significantly increase pedestrian volumes crossing Vernon Boulevard adjacent to the project site at Queens Plaza South and 43rd Avenue, and vehicular volumes would increase significantly due to development in the area under both No Build and Build conditions.

Under existing and No Build conditions, these crossings are uncontrolled by either traffic signals or by Stop signs. There are also no painted crosswalks for pedestrians needing to cross Vernon

Boulevard. The Proposed Action is also expected to increase vehicular volumes along Vernon Boulevard, making it even more difficult for pedestrians to find suitable gaps in traffic flows to safely cross Vernon Boulevard. There would be physical modifications along Vernon Boulevard that include lanes to accommodate left turns across Vernon Boulevard into the project site at the site entrances/exits and elimination of curbside parking to provide two moving lanes during certain time periods. Implementing these changes without intersection controls that would include safety elements could exacerbate the major pedestrian safety issue.

Presently, Vernon Boulevard consists of one lane of traffic in each direction with on-street parking permitted near the project site. The intersections of Queens Plaza South and 43rd Avenue with Vernon Boulevard are unsignalized intersections with no crosswalks across any approach. As part of the traffic mitigation plan for the Proposed Action, these two intersections would be signalized with pedestrian signal indicators at both intersections. Also, these two intersections would be restriped to provide crosswalks across all approaches. These changes along Vernon Boulevard are illustrated in Figure 9-23, provided within the Traffic and Parking chapter.

These two intersections were analyzed with a traffic signal using the signal timing cycle from the signal located on 41st Avenue and Vernon Boulevard (signals for these locations were also part of the traffic mitigation analysis). With the implementation of the traffic signals and crosswalk stripings discussed above, pedestrian conditions would be fully mitigated and result in an LOS C or better at each crosswalk during all analysis periods.

There are no significant impacts at any other analyzed pedestrian locations.

E. TRANSIT AND PEDESTRIAN MITIGATION (2009)

1. Subways

Since no significant impacts were identified within the subway network, mitigation is not required.

2. Buses

The Q103 bus route would be significantly impacted in the northbound direction during the AM peak hour, and in the southbound direction during the PM peak hour. The significant impact during the AM peak hour would be mitigated by the addition of two buses in the northbound direction. These two additional buses would lower the average number of passengers per bus at its peak load point from 108 to 60. The significant impact during the PM peak hour would be mitigated by the addition of one bus in the southbound direction. This additional bus would lower the average number of passengers per bus at its peak load point from 71 to 51.

New York City Transit, as standard practice, routinely conducts periodic ridership counts and adjusts bus service frequency to meet its service criteria, within physical and operating constraints.

3. Pedestrians

The pedestrian crossing locations across Vernon Boulevard at Queens Plaza South and 43rd Avenue, which are most proximate to the Proposed Action, would be significantly impacted. This impact would be mitigated with a traffic signal installed at both of these intersections, as previously identified within the Traffic and Parking chapter.

F. ASSESSMENT OF VARIATIONS

The Proposed Action that was analyzed within this chapter represents the Preferred Development Program. However, the three additional project variations were also considered with regard to the transit and pedestrian networks.

For Variations 1 and 3, the volumes of transit and pedestrian trips generated would be about the same or lower than the Preferred Development Program during the AM, midday, and PM peak hours. Projected LIRR volumes would be lower than the Preferred Development Program as would associated trips transferring to/from the Q103 bus route. As such, the Q103 would not be significantly impacted under Variations 1 or 3.

For Variation 2, the volumes of trips would be greater than the Preferred Development Program in several instances. These greater volumes would not generate new significant impacts, because the increase in volumes would be slight, although previously identified impacts would be slightly increased for Variation 2. Mitigation measures required for the Preferred Development Program would be the same for Variation 2.

1. Variation 1 (More Residential Space)

The volumes of bus, subway and pedestrian trips expected to be generated by Variation 1 are presented within Table 10-26. When compared with the trips generated by the Preferred Development Program, as presented within Table 10-18, Variation 1 would generate fewer trips for all travel modes during the AM, midday, and PM peak hours, except for buses during the midday peak hour. Variation 1 would generate two more bus passengers during the midday peak hour than the Preferred Development Program, which is an insignificant volume. Since Variation 1 would generate fewer trips than the Preferred Development Program, no additional impacts are expected and mitigation requirements should be similar to the Preferred Development Program.

TABLE 10-26: VARIATION 1: PEDESTRIAN AND TRANSIT PASSENGER TRIP PROJECTIONS

Mode	Person Trips		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Bus	44	152	180
Subway	641	441	729
Walk	261	346	490

2. Variation 2 (More Studio Space)

Bus, subway and pedestrian trips expected to be generated by Variation 2 are shown in Table 10-27. When compared with Table 10-18, Variation 2 would generate an additional six trips by bus, 87 trips by subway, and 15 pedestrian trips during the AM peak hour. During the midday peak hour, Variation 2 would generate an additional 36 subway passenger trips and 19 pedestrian trips. During the PM peak hour, Variation 2 would generate an additional 26 trips by subway. These additional trips would not generate new significant impacts because they are slight. The additional trips would slightly increase significant impacts identified previously for the Preferred Development Program. However, mitigation requirements should still be similar to the Preferred Development Program.

TABLE 10-27: VARIATION 2: PEDESTRIAN AND TRANSIT PASSENGER TRIP PROJECTIONS

Mode	Person Trips		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Bus	110	134	206
Subway	1,557	814	1,385
Walk	394	504	510

3. Variation 3 (More Residential Space and More Studio Space)

The volumes of bus, subway and pedestrian trips expected to be generated by Variation 3 are presented within. When compared with the trips generated by the Preferred Development Program, as presented within Table 10-18, Variation 3 would generate fewer trips for all travel modes during the AM, midday, and PM peak hours. Since Variation 3 would generate fewer trips than the Preferred Development Program, no additional impacts are expected and mitigation requirements should be similar to the Preferred Development Program.

TABLE 10-28: VARIATION 3: PEDESTRIAN AND TRANSIT PASSENGER TRIP PROJECTIONS

Mode	Person Trips		
	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Bus	50	136	161
Subway	727	477	754
Walk	276	364	475