A. INTRODUCTION

This chapter examines the potential for impacts on transportation associated with the proposed actions. As described in detail in the "Future with the Proposed Action" section of this attachment, under the reasonable worst-case development scenario (RWCDS), the Proposed Actions would result in a net increase of 1,076 dwelling units (DUs) and 81,790 sf of local retail on the projected development sites. The traffic study area was selected to include the intersections most likely to be used by concentrations of project-generated vehicles traveling to and from the proposed rezoning area and is bounded on the north by Flushing Avenue, on the south by Melrose Street, on the east by Evergreen Avenue, and on the west by Bushwick Avenue.

The Proposed Actions include a rezoning as well as a change to the official City-map to map two new streets in the study area. The proposed mapping action would map and formally bestow to the City the unbuilt section of Stanwix Street between Forrest Street and Montieth Street and the unbuilt section of Noll Street from Stanwix Street to Evergreen Avenue (see Chapter 1, "Project Description"). With the new completed street system, traffic flow conditions would change and these changes are also reflected in the selected traffic study area.

The study area does not conform to the standard street grid system. The major north-south avenues run parallel to each other; however, Melrose Street, George Street, Stanwix Street, Garden Street, Noll Street and Beaver Street enter the edges of the study area at an angle. Additionally, most of the streets in the study area are discontinuous and segmented within the study area including Noll Street, Stanwix Street, Forrest Street and Melrose Street. As a result of this segmentation most of the vehicles in the study area are diverted to Flushing and Bushwick Avenues, the major avenues within the study area. Outside of the study area project-generated traffic would be substantially dispersed and traffic impacts would be unlikely.

B. PRINCIPAL CONCLUSIONS

Traffic

Weekday AM, midday and PM and Saturday midday peak hour traffic conditions were evaluated at a total of five intersections.

The traffic impact analysis indicates that there would be the potential for significant adverse impacts at four intersections – two in each of the weekday AM and Saturday midday peak hours, three in the weekday midday peak hour, and four in the weekday PM peak hour, as outlined below. Chapter 16, "Mitigation," discusses measures that would fully mitigate all of these significant adverse traffic impacts.

Weekday AM Peak Hour

- Melrose Street and Bushwick Avenue – westbound approach; and
- Noll Street and Bushwick Avenue –westbound left-right movement.

Weekday Midday Peak Hour

- Forrest Street and Bushwick Avenue – northbound approach;
- Arion Place/Beaver Street and Bushwick Avenue – northbound through movement; and
- Noll Street and Bushwick Avenue – westbound left-right movement.

Weekday PM Peak Hour

- Forrest Street and Bushwick Avenue – northbound approach;
- Arion Place/Beaver Street and Bushwick Avenue – eastbound left-right movement;
- Melrose Street and Bushwick Avenue – westbound approach; and
- Noll Street and Bushwick Avenue – westbound left-right movement.

Saturday Midday Peak Hour

- Arion Place/Beaver Street and Bushwick Avenue – northbound through movement; and
- Noll Street and Bushwick Avenue – westbound left-right movement.

Parking

Under future parking conditions, proposed residential and commercial uses would have required accessory parking. In addition, the newly mapped streets would also create new curbside public parking. The analyses indicate that the required accessory parking will exceed the peak overnight projected demand, independent of the newly created curbside public parking spaces. As such, no parking impacts are expected.

Transit

A required detailed analysis of two area subway stations that exceed the 200 trips per hour threshold showed that there would be no significant adverse impacts to any station elements in the AM or PM peak commuter hours.

Pedestrians

Lastly, detailed pedestrian analyses were also conducted at 11 sidewalks, 19 corner elements as well as seven crosswalks for all four peak hours. All pedestrian elements analyzed were found to have level of service B or better under 2016 Build conditions, with no significant adverse impacts.

C. LEVELS 1 AND 2 SCREENING ANALYSES

The RWCDS under the proposed rezoning of two uses- a net increase of 1,076 dwelling units and a net increase of 81,790 square feet spread among several blocks and projected development sites. These new uses would displace 78,915 sf warehouse, 6,000 sf supermarket, 1,000 sf auto care, and a 6 pump gas station. In addition, as noted in Chapter 1, "Project Description", the proposed project would map new street segments along Stanwix Street and Noll Street to complete the area's street system, creating continuity and better functionality.

Table 10-1 shows the transportation planning factors for the different uses, while Table 10-2 shows the travel demand forecast for the RWCDS. As shown in Table 10-2:

-the project generated traffic (independent of the street network diversion) of 95 vehicles per hour (vph), 97 vph, 117 vph, 112 vph in the weekday AM, MD, PM and SAT MD, respectively would exceed the CEQR Level 1 threshold of 50 vph in any peak hour, requiring a Level 2 analysis

-the new peak hour subway trips would be 539, 378, 633 and 565 in the weekday AM, MD, PM and SAT MD, respectively which would exceed the 200 peak hour trip threshold requiring a Level II analysis

-the new peak hour bus transit trips generated by the proposed project would be 86, 167, 136 and 133 in the weekday AM, MD, PM and SAT MD peak hours which would be less than the Level 2 threshold and no further analysis is required

-the new pedestrian demands, including subway, bus and walk-only trips along the area's sidewalks and other pedestrian elements would exceed the 200 persons per hour threshold, requiring a Level 2 analysis.

As noted above, the CEQR Level 1 thresholds were exceeded for traffic, subway and pedestrian flows. Therefore, a Level 2 analyses, shown below, are presented for these conditions. In addition, the Level 2 analysis also includes detailed parking demand/capacity calculations.

As discussed above, a vehicle trip generation forecast for the action generated development shows that an overall increment of 95 vehicle trips is expected during the AM (8-9 am) peak hour, 97 vehicle trips during the midday (1-2 pm) peak hour, 117 vehicle trips during the PM (5-6 pm) peak hour and 112 vehicle trips in the Saturday midday (1-2 pm) peak hour. Also, as noted, the completion of the area's street system would provide more direct paths for existing traffic thereby reducing intersection flows on Flushing Avenue and portions of Bushwick Avenue.

Figure 10-1 shows the incremental demand combining the project generated traffic with the diversion flows for the weekday AM, MD, PM and SAT MD peak hours. As per the *CEQR Technical Manual*, those intersections with less than 50 vph of incremental traffic are not likely to have significant traffic impacts. Figure 10-1 shows that there are four intersections that exceed this threshold in one or more of the analyzed peak hours. It should be noted that one of these intersections, Noll Street at Stanwix Street, does not presently exist. In addition, Figure 10-1 also shows that one additional intersection was included for detailed analysis due to the added traffic on northbound Bushwick Avenue at Forrest Street, though the overall intersection increment is less than 50 vph in all peak hours.

Parking

New development in R6A and R7A zoning districts must provide accessory parking, pursuant to NYC Zoning Resolution requirements. The ~~a~~Applicant's proposed development on Site 1 would require at least 76 accessory parking spaces. In order to comply, the ~~a~~Applicant plans to build a 76-space accessory parking garage in the cellar of the buildings on Site 1. The ~~a~~Applicant's projected development on Site 2 would be required to provide at least 167 accessory parking spaces, which would be provided in a ground floor and cellar parking garage on Site 2. The ~~a~~Applicant's development on Sites 3 and 4 would be required to provide at least 261 accessory parking spaces. These would likely be provided in one accessory parking garage occupying portions of the ground floor and cellar of the buildings proposed for Sites 3 and 4. The projected developments on Sites 5-8 would be required to provide 74 accessory parking spaces.

	Build Conditions		Existing Uses			
Land Use:	Residential	Local Retail	Warehouse/ Wholesale (10)	Autocare	Supermarket	Gas Station
Size/Units:	1076 DUs	81,790 gsf	78,915 gsf	1,000 gsf	6,000 gsf	1,596 gsf 6 Pump
Trip Generation:	(1)	(1)		(5,6)	(1)	(8)
Weekday	8.075	205	N/A	19.42	175	194
Saturday	9.6	240		19.42	231	194
	per DU	per 1,000 sf		per 1000 gsf	per 1,000 sf	per pump
Temporal Distribution:	(1)	(1)		(4)	(1)	(8)
AM	10.0%	3.0%	N/A	13.2%	5.0%	6.2%
MD	5.0%	19.0%		11.0%	6.0%	8.2%
PM	11.0%	10.0%		14.2%	10.0%	8.2%
Saturday MD	8.0%	10.0%		11.0%	9.0%	8.2%
Modal Splits:	(3)	(1)		(4)	(2)	(9)
Auto	12.6%	2.0%	N/A	85.0%	2.0%	95.0%
Taxi	1.9%	3.0%		5.0%	3.0%	0.0%
Subway	60.3%	5.0%		1.0%	5.0%	2.5%
Bus	8.6%	6.0%		1.0%	20.0%	2.5%
Walk	14.5%	84.0%		8.0%	70.0%	0.0%
Other	2.1%	0.0%		0.0%	0.0%	0.0%
	100.0%	100.0%		100.0%	100.0%	100.0%

		(2)		(2)		(4)		(7)		(9)	
In/Out Splits:		In	Out	In	Out	In	Out	In	Out	In	Out
AM		15.0%	85.0%	50.0%	50.0%	65.0%	35.0%	61.0%	39.0%	50.0%	50.0%
MD		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
PM		70.0%	30.0%	50.0%	50.0%	50.0%	50.0%	51.0%	49.0%	50.0%	50.0%
Saturday MD		53.0%	47.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%

Vehicle Occupancy:		(3)		(2)		(4)		(7)		(3)	
Auto		1.13		2.00		1.30		2.00		1.13	
Taxi		1.40		2.00		1.30		2.00		N/A	
Truck Trip Generation:		(1)		(1)		(4)		(7)			
		Weekday	Saturday	Weekday	Saturday	Weekday	Saturday	Weekday	Saturday		
		0.06	0.02	0.35	0.04	0.89	0.01	1.2	0.24	N/A	
		per DU		per 1,000 sf		per DU		per 1,000 sf		per 1,000 sf	
		(1)		(1)		(5)		(7)			
AM		12.0%		8.0%		14.1%		3.0%		N/A	
MD		9.0%		11.0%		9.0%		6.0%		N/A	
PM		2.0%		2.0%		1.0%		7.0%		N/A	
Saturday MD		9.0%		11.0%		9.0%		5.6%		N/A	
		In	Out	In	Out	In	Out	In	Out	In	Out
AM/MD/PM		50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%

Sources:
(1) 2012 CEQR Technical Manual.
(2) Retail Industrial Text Amendment FEIS
(3) Based on 2005-2009 American Community Survey (ACS) Data for tracts 389, 391, 425 and 487.
(4) Greenpoint-Williamsburg Rezoning FEIS, 2004.
(5) Based on ITE Trip Generation Manual, 8th Edition, Landuse Code 942 (Automobile Care Center); weekday trip rate data not available, average weekend rate assumed for weekday.
(6) Person trip rate = ITE average vehicle trip rate x 1.30/0.95.
(7) Admiral Row Plaza EAS, 2011.
(8) Based on ITE Trip Generation Manual, 8th Edition, Landuse Code 945 (Gasoline/Service Station with Convenience Market); weekday midday trip rate data not available, Weekday PM rate assumed to be the same as weekday midday; Weekend trip rate assumed to be the same as weekday trip rate.
(9) Based on Hunts Point Alternative Fueling Facility EAS, August 2011.
(10) Vehicular travel demand was based on counts in 2012. Credit for transit and pedestrian trips are not being taken for conservative purposes.
Note: Gross floor area numbers are approximate.

Land Use:	Proposed Land Uses: Residential	Local Retail	Warehouse/ Wholesale	No Build Land Uses: Autocare	Supermarket	Gas Station	Net Total Increment: Residential	Local Retail	Warehouse/ Wholesale	Autocare	Supermarket	Gas Station
Size/Units:	1,076 Dus	81,790 gsf	-78,915 gsf	-1,000 gsf	-6,000 gsf	-1,596 gsf -6 pump	1076 Dus	74,194 gsf	-78915 gsf	-1000 gsf	-6000 gsf	-1,596 gsf -6 pump
Peak Hour Trips:												
		(1)				(2)						
AM	869	377	N/A	-3	-53	-27	868	377	N/A	-3	-53	-27
MD	434	2389	N/A	-2	-63	-42	434	2389	N/A	-2	-63	-42
PM	956	1258	N/A	-3	-105	-42	956	1258	N/A	-3	-105	-42
SMD	826	1472	N/A	-2	-125	-42	826	1472	N/A	-2	-125	-42

Person Trips:

		In	Out	In	Out	TOTAL		In	Out	In	Out	In	Out	TOTAL
AM	Auto	16	93	4	4	117	N/A	-1	-1	-1	0	-13	-13	-29
	Taxi	2	14	6	6	28		0	0	-1	-1	0	0	-2
	Subway	79	445	9	9	543		0	0	-2	-1	0	0	-3
	Bus	11	64	11	11	97		0	0	-6	-4	0	0	-11
	Walk	19	107	158	158	443		0	0	-22	-14	0	0	-37
	Other	3	16	0	0	18		0	0	0	0	0	0	0
	Total	130	739	189	189	1246		-2	-1	-32	-20	-13	-13	-80
MD	Auto	27	27	24	24	103	N/A	-1	-1	-1	-1	-20	-20	-43
	Taxi	4	4	36	36	80		0	0	-1	-1	0	0	-2
	Subway	131	131	60	60	381		0	0	-2	-2	-1	-1	-4
	Bus	19	19	72	72	181		0	0	-6	-6	-1	-1	-14
	Walk	31	31	1004	1004	2070		0	0	-22	-22	0	0	-44
	Other	5	5	0	0	9		0	0	0	0	0	0	0
	Total	217	217	1195	1195	2824		-1	-1	-32	-32	-22	-22	-109
PM	Auto	84	36	13	13	146	N/A	-1	-1	-1	-1	-20	-20	-44
	Taxi	13	5	19	19	56		0	0	-2	-2	0	0	-3
	Subway	403	173	31	31	639		0	0	-3	-3	-1	-1	-6
	Bus	58	25	38	38	158		0	0	-11	-10	-1	-1	-22
	Walk	97	42	528	528	1195		0	0	-37	-36	0	0	-74
	Other	14	6	0	0	20		0	0	0	0	0	0	0
	Total	669	287	629	629	2213		-1	-1	-54	-51	-22	-22	-152
SMD	Auto	55	49	15	15	134	N/A	-1	-1	-1	-1	-20	-20	-44
	Taxi	8	7	22	22	60		0	0	-2	-2	0	0	-4
	Subway	264	234	37	37	572		0	0	-3	-3	-1	-1	-7
	Bus	38	33	44	44	159		0	0	-12	-12	-1	-1	-26
	Walk	64	56	618	618	1356		0	0	-44	-44	0	0	-87
	Other	9	8	0	0	17		0	0	0	0	0	0	0
	Total	438	388	736	736	2299		-1	-1	-62	-62	-22	-22	-171

Person Trips:

		In	Out	TOTAL
AM	Auto	5	83	88
	Taxi	7	19	26
	Subway	86	453	539
	Bus	16	70	86
	Walk	155	251	406
	Other	3	16	18
	Total	272	892	1164
MD	Auto	30	30	60
	Taxi	39	39	78
	Subway	189	189	378
	Bus	84	84	167
	Walk	1013	1013	2027
	Other	5	5	10
	Total	1360	1360	2720
PM	Auto	75	27	101
	Taxi	30	23	53
	Subway	432	201	633
	Bus	84	52	136
	Walk	588	534	1121
	Other	14	6	20
	Total	1222	842	2064
SMD	Auto	48	42	89
	Taxi	28	28	56
	Subway	297	267	565
	Bus	69	65	133
	Walk	638	631	1269
	Other	9	8	17
	Total	1090	1040	2130

Vehicle Trips :

		In	Out	In	Out	TOTAL	(3) In	Out	In	Out	In	Out	In	Out	TOTAL
AM	Auto (Total)	15	82	2	2	101	-15	-9	-1	-1	0	0	-12	-12	-50
	Taxi	2	9	3	3				0	0	0	0	0	0	
	Taxi (Bal.)	11	11	6	6	34			0	0	0	0	0	0	0
	Truck	4	4	1	1	10			0	0	0	0	0	0	0
						145									-50
		In	Out	In	Out		(3) In	Out	In	Out	In	Out	In	Out	
MD	Auto (Total)	24	24	12	12	72	-13	-16	-1	-1	0	0	-18	-18	-67
	Taxi	3	3	18	18				0	0	0	0	0	0	
	Taxi (Bal.)	6	6	36	36	84			0	0	0	0	0	0	0
	Truck	2	2	2	2	8			0	0	0	0	0	0	0
						165									-67
		In	Out	In	Out		(3) In	Out	In	Out	In	Out	In	Out	
PM	Auto (Total)	75	32	6	6	119	-12	-8	-1	-1	-1	-1	-18	-18	-60
	Taxi	9	4	9	9				0	0	-1	-1	0	0	
	Taxi (Bal.)	13	13	18	18	62			0	0	-2	-2	0	0	-4
	Truck	0	0	0	0	0			0	0	0	0	0	0	0
						181									-64
		In	Out	In	Out		(3) In	Out	In	Out	In	Out	In	Out	
SMD	Auto (Total)	49	43	7	7	106	-9	-11	-1	-1	-1	-1	-18	-18	-60
	Taxi	6	5	11	11				0	0	-1	-1	0	0	
	Taxi (Bal.)	11	11	23	23	68			0	0	-2	-2	0	0	-4
	Truck	1	1	0	0	2			0	0	0	0	0	0	0
						176									-64

Vehicle Trips :

		In	Out	TOTAL
AM	Auto (Total)	-11	62	51
	Taxi			
	Taxi (Bal.)	17	17	34
	Truck	5	5	10
	w/Balanced Taxi	11	84	95
MD	Auto (Total)	4	1	5
	Taxi			
	Taxi (Bal.)	42	42	84
	Truck	4	4	8
	w/Balanced Taxi	50	47	97
PM	Auto (Total)	49	10	59
	Taxi			
	Taxi (Bal.)	29	29	58
	Truck	0	0	0
	w/Balanced Taxi	78	39	117
SMD	Auto (Total)	27	19	46
	Taxi			
	Taxi (Bal.)	32	32	64
	Truck	1	1	2
	w/Balanced Taxi	60	52	112

Notes:
(1)- 25% linked-trip credit applied to local retail use.
(2)- Based on ITE Trip Generation Handbook, Second Edition: Landuse Code 945, (Gasoline/Service Station with Convenience Market) AM= 62%, MD=PM=SMD=56% pass-by rate credit applied to Gas Station use.
(3) Vehicular travel demand was based on counts from June, 2012. Credit for transit and pedestrian trips are not being taken for conservative purposes.

According to the ACS 2005-2009 survey in the area, the number of vehicles per household in the rezoning area and vicinity is 0.45 This rate is used to forecast peak residential parking demand for the proposed development, as the households on the projected development sites are expected to be generally similar to the existing residential population in terms of vehicle ownership.

Using the 0.45 vehicles per DU rate, the proposed development is expected to generate a peak residential parking demand of approximately 439 spaces. This demand would peak during the overnight period, while parking demand generated by the 81,790 of local retail, which is not expected to be substantial, would peak during the day. As the proposed development is expected to provide 504 required accessory parking spaces in three garages on the project site, as required by zoning, all the projected parking demand generated by the proposed project would be accommodated in the proposed garages and there would be an excess of 65 spaces in the overnight. The weekday and Saturday 24-hour parking accumulation tables for the proposed project are shown in Table 10-3.

Using the same 0.45 vehicles per DU rate, Projected Development Sites 5-8 are expected to generate a peak residential parking demand of approximately 45 spaces. As the developments on these sites would provide approximately 74 accessory parking spaces as required by zoning, all projected accessory parking demand would be accommodated on-site and there would be an excess of approximately 29 accessory spaces. The weekday and Saturday 24-hour parking accumulation tables for the Projected Development Sites 5-8 are shown in Table 10-4.

Under Build conditions, it is expected that with the construction of the two new street segments, about 18 new parking spaces would be created on Stanwix Street and about 16 on the south side of Noll Street (the north side adjacent to the existing warehouse would likely have no-standing regulations). These new on-street parking spaces would increase the total number of publicly available on-street parking spaces within a quarter mile of the proposed rezoning area.

As the Proposed Action is not expected to generate significant demand for on-street parking spaces and would have excess overnight parking spaces, no significant adverse parking impacts are expected and no further analysis is provided in this EIS.

Subway

The new residential and commercial uses due to the rezoning would generate 539 subway trips in the AM peak hour and 633 subway trips in the PM peak commuter hours (see Table 10-2). These new subway peak hour trips, when distributed would exceed the 200 trips per hour at the two nearby subway stations – Myrtle Avenue (J, M, Z) and Flushing Avenue (J, M). Table 10-5 shows the expected assignment of subway users among the three subway stations in the area (See Figure 10-11 for station locations). The assignment recognizes the proximity of the stations to each development site, as well as the service provided at each station. As shown in Table 10-5, the subway demand, after assignment, marginally exceeds the 200 trips per hour at the Flushing Avenue (J, M) and the Myrtle Avenue (J, M, Z) stations, and these are analyzed for the AM and PM peak weekday commuter hours. Analyses are not provided for the Saturday midday period as weekend demand for the stations is substantially lower than peak weekday commuter periods and, as shown later in this chapter, the analyses found no significant subway station impacts in either the weekday AM or PM peak hours.

Pedestrians

The proposed project would exceed the CEQR threshold of 200 persons per hour for pedestrian trips on area

Parking Accumulation

Weekday Parking Accumulation Calculations: Demand Allocated to ON-SITE ACCESSORY GARAGE

	Residential 1&2 412 vehicle trips 206 overnight veh.			**Retail Site 1&2** 52 vehicle trips 0 overnight veh.			**Residential 3,4** 466 vehicle trips 233 overnight veh.			**Retail 3,4** 34 vehicle trips 0 overnight veh.			**Total Acc Gar (1), (2)** 964 vehicle trips 439 overnight veh.			(a)	
	In	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**Capacity**	**Available**
12-1 AM	1	0	206	0	0	0	1	1	233	0	0	0	2	1	439	504	65
1-2	1	1	206	0	0	0	1	1	233	0	0	0	2	2	439	504	65
2-3	1	1	206	0	0	0	1	1	233	0	0	0	2	2	439	504	65
3-4	1	1	206	0	0	0	1	1	233	0	0	0	2	2	439	504	65
4-5	1	1	206	0	0	0	1	1	233	0	0	0	2	2	439	504	65
5-6	1	4	203	0	0	0	2	5	230	0	0	0	3	9	433	504	71
6-7	3	12	194	0	0	0	4	14	220	0	0	0	7	26	414	504	90
7-8	4	21	177	0	0	0	5	23	202	0	0	0	9	44	379	504	125
8-9	6	35	148	1	1	0	7	40	169	1	1	0	15	77	317	504	187
9-10	6	17	137	1	1	0	7	19	157	1	1	0	15	38	294	504	210
10-11	6	15	128	2	1	1	7	17	147	1	1	0	16	34	276	504	228
11-12	5	13	120	2	1	2	6	15	138	1	1	0	14	30	260	504	244
12-1 PM	9	11	118	2	2	2	10	13	135	2	1	1	23	27	256	504	248
1-2	10	10	118	5	5	2	12	12	135	3	3	1	30	30	256	504	248
2-3	11	8	121	2	2	2	12	9	138	2	1	2	27	20	263	504	241
3-4	17	7	131	2	2	2	19	7	150	1	2	1	39	18	284	504	220
4-5	21	11	141	2	2	2	24	12	162	1	1	1	48	26	306	504	198
5-6	32	14	159	3	3	2	36	15	183	2	2	1	73	34	345	504	159
6-7	23	9	173	2	2	2	26	10	199	1	1	1	52	22	375	504	129
7-8	21	5	189	1	2	1	24	6	217	1	1	1	47	14	408	504	96
8-9	15	4	200	1	1	1	16	5	228	0	1	0	32	11	429	504	75
9-10	6	2	204	0	1	0	6	2	232	0	0	0	12	5	436	504	68
10-11	3	2	205	0	0	0	3	2	233	0	0	0	6	4	438	504	66
11-12	2	2	205	0	0	0	2	2	233	0	0	0	4	4	438	504	66
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**		
24 hr total	206	206	412	26	26	52	233	233	466	17	17	34	482	482	964		

Notes:

(a) Based on 0.5 spaces/DU (0.25 spaces/DU affordable) in R7A, 0.5 spaces/DU (0.35 spaces/DU affordable) in R6A and 1 space per 1,000 sf commercial C2-4.

Parking accumulation patterns based on data from 2009 *Broadway Triangle FEIS.*

Saturday Parking Accumulation Calculations: Demand Allocated to ON-SITE ACCESSORY GARAGE

	Residential 1&2 490 vehicle trips 206 overnight veh.			Retail Site 1&2 60 vehicle trips 0 min vehicles			Residential 3,4 554 vehicle trips 233 overnight veh.			Retail 3,4 38 vehicle trips 0 overnight veh.			Total Acc Gar (1), (2) 1,142 vehicle trips 439 overnight veh.			(a)	
	In	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**Capacity**	**Available**
12-1 AM	3	0	206	0	0	0	3	0	233	0	0	0	6	0	439	504	65
1-2	0	0	206	0	0	0	0	0	233	0	0	0	0	0	439	504	65
2-3	0	0	206	0	0	0	0	0	233	0	0	0	0	0	439	504	65
3-4	0	0	206	0	0	0	0	0	233	0	0	0	0	0	439	504	65
4-5	0	0	206	0	0	0	0	0	233	0	0	0	0	0	439	504	65
5-6	2	5	203	0	0	0	3	6	230	0	0	0	5	11	433	504	71
6-7	3	16	190	0	0	0	3	18	215	0	0	0	6	34	405	504	99
7-8	3	22	171	1	0	1	3	25	193	0	0	0	7	47	365	504	139
8-9	8	35	144	1	1	1	9	40	162	1	1	0	19	77	307	504	197
9-10	5	16	133	2	2	1	6	18	150	1	1	0	14	37	284	504	220
10-11	11	13	131	2	2	1	12	15	147	1	1	0	26	31	279	504	225
11-12	11	11	131	2	2	1	12	13	146	1	1	0	26	27	278	504	226
12-1 PM	11	11	131	3	3	1	12	13	145	2	2	0	28	29	277	504	227
1-2	21	18	134	3	3	1	23	21	147	2	2	0	49	44	282	504	222
2-3	13	8	139	3	3	1	15	9	153	2	2	0	33	22	293	504	211
3-4	19	5	153	3	3	1	21	6	168	2	2	0	45	16	322	504	182
4-5	22	11	164	3	3	1	25	12	181	2	2	0	52	28	346	504	158
5-6	33	13	184	3	3	1	37	15	203	2	2	0	75	33	388	504	116
6-7	24	11	197	2	2	1	27	12	218	1	1	0	54	26	416	504	88
7-8	16	11	202	1	2	0	19	12	225	1	1	0	37	26	427	504	77
8-9	16	11	207	1	1	0	19	12	232	1	1	0	37	25	439	504	65
9-10	8	9	206	0	0	0	10	9	233	0	0	0	18	18	439	504	65
10-11	8	11	203	0	0	0	9	12	230	0	0	0	17	23	433	504	71
11-12	8	8	203	0	0	0	9	9	230	0	0	0	17	17	433	504	71
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**		
24 hr total	245	245	490	30	30	60	277	277	554	19	19	38	571	571	1,142		

Notes:

(a) Based on 0.5 spaces/DU (0.25 spaces/DU affordable) in R7A, 0.5 spaces/DU (0.35 spaces/DU affordable) in R6A and 1 space per 1,000 sf commercial C2-4.

Parking accumulation patterns based on data from 2009 *Broadway Triangle FEIS.*

Weekday Parking Accumulation Calculations: Site 5 to Site 8

	Residential 5-8 90 vehicle trips 45 overnight veh.			Retail Site 5-8 42 vehicle trips 0 overnight veh.			Total Accumulation 132 vehicle trips 45 overnight veh.			(a)	
	In	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**Capacity**	**Available**
12-1 AM	0	0	45	0	0	0	0	0	45	74	29
1-2	0	0	45	0	0	0	0	0	45	74	29
2-3	0	0	45	0	0	0	0	0	45	74	29
3-4	0	0	45	0	0	0	0	0	45	74	29
4-5	0	0	45	0	0	0	0	0	45	74	29
5-6	0	1	44	0	0	0	0	1	44	74	30
6-7	1	4	41	0	0	0	1	4	41	74	33
7-8	1	5	37	0	0	0	1	5	37	74	37
8-9	1	8	30	1	1	0	2	9	30	74	44
9-10	1	4	27	1	1	0	2	5	27	74	47
10-11	1	3	25	1	1	0	2	4	25	74	49
11-12	1	3	23	1	1	0	2	4	23	74	51
12-1 PM	2	2	23	2	1	1	4	3	24	74	50
1-2	2	2	23	4	4	1	6	6	24	74	50
2-3	2	2	23	2	1	2	4	3	25	74	49
3-4	4	2	25	2	2	2	6	4	27	74	47
4-5	5	2	28	2	2	2	7	4	30	74	44
5-6	7	3	32	2	2	2	9	5	34	74	40
6-7	5	2	35	1	2	1	6	4	36	74	38
7-8	5	1	39	1	2	0	6	3	39	74	35
8-9	4	1	42	1	1	0	5	2	42	74	32
9-10	2	0	44	0	0	0	2	0	44	74	30
10-11	1	0	45	0	0	0	1	0	45	74	29
11-12	0	0	45	0	0	0	0	0	45	74	29
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**		
24 hr total	45	45	90	21	21	42	66	66	132		

Notes:

(a) Based on 0.5 spaces/DU (0.25 spaces/DU affordable) in R7A, 0.5 spaces/DU (0.35 spaces/DU affordable) in R6A and 1 space per 1,000 sf commercial C2-4.

Parking accumulation patterns based on data from 2009 *Broadway Triangle FEIS.*

Saturday Parking Accumulation Calculations: Site 5 to Site 8

	Residential 5-8 132 vehicle trips 45 overnight veh.			Retail Site 5-8 50 vehicle trips 0 overnight veh.			Total Accumulation 182 vehicle trips 45 overnight veh.			(a)	
	In	**Out**	**accum**	**In**	**Out**	**accum**	**In**	**Out**	**accum**	**Capacity**	**Available**
12-1 AM	0	0	45	0	0	0	0	0	45	74	29
1-2	0	0	45	0	0	0	0	0	45	74	29
2-3	0	0	45	0	0	0	0	0	45	74	29
3-4	0	0	45	0	0	0	0	0	45	74	29
4-5	0	0	45	0	0	0	0	0	45	74	29
5-6	1	1	45	0	0	0	1	1	45	74	29
6-7	1	4	42	0	0	0	1	4	42	74	32
7-8	1	6	37	0	0	0	1	6	37	74	37
8-9	2	10	29	1	1	0	3	11	29	74	45
9-10	2	4	27	2	1	1	4	5	28	74	46
10-11	3	4	26	2	1	2	5	5	28	74	46
11-12	3	3	26	2	2	2	5	5	28	74	46
12-1 PM	3	3	26	2	2	2	5	5	28	74	46
1-2	4	4	26	3	3	2	7	7	28	74	46
2-3	4	3	27	3	3	2	7	6	29	74	45
3-4	5	1	31	2	2	2	7	3	33	74	41
4-5	7	3	35	2	2	2	9	5	37	74	37
5-6	10	4	41	2	2	2	12	6	43	74	31
6-7	7	3	45	2	2	2	9	5	47	74	27
7-8	4	3	46	1	2	1	5	5	47	74	27
8-9	4	3	47	1	1	1	5	4	48	74	26
9-10	2	2	47	0	1	0	2	3	47	74	27
10-11	2	3	46	0	0	0	2	3	46	74	28
11-12	1	2	45	0	0	0	1	2	45	74	29
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**		
24 hr total	66	66	132	25	25	50	91	91	182		

Notes:

(a) Based on 0.5 spaces/DU (0.25 spaces/DU affordable) in R7A, 0.5 spaces/DU (0.35 spaces/DU affordable) in R6A and 1 space per 1,000 sf commercial C2-4.

Parking accumulation patterns based on data from 2009 *Broadway Triangle FEIS.*

sidewalk and intersections. These pedestrians include both walk-only trips as well as trips to/from area transit facilities. Table 10-6 shows the incremental pedestrian demand for the four analyzed peak hours. As shown in the table, although the rezoning area encompasses several blocks, the overall demand week exceeds the CEQR threshold, with 1,049, 2,582, 1,910 and 1,984 pedestrian trips in the area. Based on the pedestrian assignment, 11 sidewalks, 19 corners and seven crosswalks are expected to exceed the 200 persons per hour threshold as shown in Figure 10-2. All of these pedestrian elements are analyzed in all four peak hours and shown in Figure 10-3.

The following section describes the 2012 existing conditions in the study area for traffic, subway and pedestrians during peak hours. The 2016 future conditions without the proposed action (the No-Build condition) are also described. Included are increases in demand due to background growth and new developments in and around the study area that are expected by 2016. The change in travel demand resulting from the proposed action is then projected and added to No-Build conditions to develop the 2016 future with the proposed action (Build) condition, including changes to the study area street-grid system proposed as part of the action. Potential significant impacts, if any, from action-generated trips and changes to the street grid are then identified and described in detail.

D. VEHICULAR TRAFFIC

As shown on Figure 10-4, the traffic study area consists of an area bounded by Flushing Avnue to the north, Melrose Street to the south, Evergreen Avenue to the east and Bushwick Avenue to the west, analyzed for the weekday AM, MD, PM and Saturday midday (SAT MD) peak hours. The 5 existing intersections chosen for analysis are those expected to receive the highest concentrations of added vehicular traffic as a result of the Proposed Actions. However, as diversions are expected from traffic throughout the study area, the entire network was counted. Data on the existing traffic conditions in the network were developed based on manual field counts conducted on Saturday June 2nd, 2012 and Tuesday June 5th, 2012. Seven automatic traffic recorders (ATRs) were placed in the study area for a 12 day period starting Friday June 1st, 2012 and ending on Wednesday June 13th, 2012; the locations are also shown in Figure 10-4. The traffic data collection also included vehicle classification and field inventory including parking regulations and curbside activity. Intersection signal timings were obtained from the New York City Department of Transportation (NYCDOT). Figure 10-5 shows the resulting peak hour traffic volumes for 2012 Existing conditions during the weekday AM, MD, PM and SAT MD peak hours within the study area street network.

Street Network

The traffic study area in western Bushwick includes two major two-way arterials –Flushing Avenue and Bushwick Avenue. Bushwick Avenue is a major north-south arterial that carries the heaviest traffic in the study area. The east-west local streets, typically narrower and more numerous in this area of Brooklyn, provide land service in the study area. The study area has an irregular street pattern which is composed of different grid orientations and discontinuous streets (e.g. Beaver Street in the study area becomes Bushwick Avenue and Stanwix and Noll Streets in the study are both discontinuous). Given this interruption in the center of the street grid, traffic volumes on several local streets are typically lower than on other local streets in the area.

Broadway and Bushwick Avenue are the major north-south arteries near the study area. Bushwick Avenue on the western edge of the study area has one northbound lane and one southbound lane, with the curb lanes typically used for metered parking. However, during AM peak hour in northbound direction and PM peak hour in the southbound direction the curb lanes become a No Standing lane creating two moving lanes for

Table 10-6
Project Generated Transit and Pedestrian Trips

Weekday AM				
	Subway	**Bus**	**Walk**	**Total**
Site 1 & 2	231	41	190	462
Site 3 & 4	256	41	150	447
Site 5	20	5	38	63
Site 6	9	3	21	33
Site 7	16	3	38	57
Site 8	7	-7	-13	-13
Total	539	86	424	1049
Weekday MD				
	Subway	**Bus**	**Walk**	**Total**
Site 1 & 2	160	74	842	1076
Site 3 & 4	156	54	552	762
Site 5	22	16	206	244
Site 6	10	9	120	139
Site 7	20	16	222	258
Site 8	10	-2	95	103
Total	378	167	2037	2582
Weekday PM				
	Subway	**Bus**	**Walk**	**Total**
Site 1 & 2	272	66	495	833
Site 3 & 4	293	59	349	701
Site 5	26	11	112	149
Site 6	12	6	63	81
Site 7	22	9	118	149
Site 8	8	-15	4	-3
Total	633	136	1141	1910
Saturday MD				
	Subway	**Bus**	**Walk**	**Total**
Site 1 & 2	242	66	558	866
Site 3 & 4	260	57	385	702
Site 5	25	12	130	167
Site 6	11	6	75	92
Site 7	20	10	140	170
Site 8	7	-18	-2	-13
Total	565	133	1286	1984

traffic. Bushwick Avenue carries approximately 1,700 vehicles per hour (vph), 1,100 vph, 1,700 vph and 1200 vph in the AM, midday, PM and Saturday midday peak hours, respectively.

The major east-west artery in the study area is Flushing Avenue which serves as a local truck route and accommodates NYC Transit bus route B57 in the study area. Flushing Avenue is two-way east-west. Two-way traffic volumes on Flushing Avenue east of Bushwick Avenue are approximately 950 vph, 900 vph, 1100 vph and 950 vph in the AM, midday, PM and Saturday midday peak hours, respectively.

Local streets in the study area are one directional with alternating traffic movements. One-way traffic volumes on Evergreen Avenue are 350 vph, 250 vph, 250 vph and 200 vph in the AM, midday, PM and Saturday midday peak hours, respectively. Traffic volumes on all other local streets in the study area do not exceed 150 vph in any of the peak hours.

Analysis Methodology

The capacity analyses at study area intersections is based on the methodology presented in the *Highway Capacity Manual (HCM) Software 2000 Release 5.5*. Traffic data required for these analyses include vehicle volumes on each approach and various other physical and operational characteristics. Signal timing for each signalized intersection was obtained from the NYCDOT. Field inventories were conducted to document curbside parking regulations, vehicle classifications, shared lane usage, and other relevant characteristics needed for the analysis.

The *HCM* methodology provides a volume-to-capacity (v/c) ratio for each signalized intersection approach. The v/c ratio represents the traffic volumes on an approach to the approach's carrying capacity. At a v/c ratio of between 0.95 and 1.0, near-capacity conditions are reached and delays can becomes substantial. Ratios of greater than 1.05 indicate saturated conditions with queuing. The *HCM* methodology also expresses quality of flow in terms of level of service (LOS), which is based on the amount of delay that a driver typically experiences at an intersection. Levels of service range from A, with minimal delay (10 seconds or less per vehicle), to F, which represents long delays (80 seconds or greater per vehicle).

For unsignalized intersections, the *HCM* methodology generally assumes that major street traffic is not affected by minor street flows. Left turns from the major street are assumed to be affected by the opposing, or oncoming major street flow. Minor street traffic is obviously affected by all conflicting movements. Similar to signalized intersections, the *HCM* methodology expresses the quality of flow at unsignalized intersections in terms of level of service based on the amount of delay that a driver experiences. This relationship differs somewhat from the criteria used for signalized intersections, primarily because drivers expect somewhat different levels of performance from the two different kinds of transportation facilities. For unsignalized intersections, levels of service range from A, with minimal delay (10 seconds or less per vehicle), to F, which represents long delays (over 50 seconds per vehicle).

Table 10-7 shows the LOS/delay relationship for signalized and unsignalized intersections using the *HCM* methodology. Levels of service A, B and C generally represent extremely favorable to fair levels of traffic flow; at LOS D the influence of congestion becomes noticeable as delay increases; LOS E is considered to be the limit of acceptable delay; and LOS F is considered to be unacceptable to most drivers, with traffic operations at or over capacity. In this study, a signalized lane grouping operating at LOS E or F and/or with a v/c ratio of 0.95 or above is identified as congested. For unsignalized intersections, a movement with LOS E or worse is also identified as congested.

Table 10-7: Roadway Level of Service (LOS) Criteria

Level of Service	Average Delay per Vehicle (seconds)	
	Signalized Intersections	Unsignalized Intersections
A	less than 10.1	less than 10.1
B	10.1 to 20.0	10.1 to 15.0
C	20.1 to 35.0	15.1 to 25.0
D	35.1 to 55.0	25.1 to 35.0
E	55.1 to 80.0	35.1 to 50.0
F	greater than 80.0	greater than 50.0

Source: *2000 Highway Capacity Manual*

Table 10-8 shows the results of the 2012 existing conditions capacity analysis at the 5 analyzed intersections in the AM, midday, PM and Saturday midday peak hours. As shown in this table, the analyzed intersections generally operate at acceptable levels of service during the three analyzed peak hours. Of the 5 intersections studied, only one has congested movements in one or more peak hours. The congested intersection and movements are detailed below:

Bushwick Avenue at Beaver Street/Arion Place - During the AM and PM peak hours, the eastbound Arion Place approach is congested with a v/c ratio of 0.66 and a delay of 61.5 seconds (LOS E) in the AM peak hour, and a v/c ratio of 0.76 and a delay of 69.2 seconds (LOS E) in the PM peak hour. The southbound Beaver Street approach is congested in the AM, PM and Saturday midday peak hours, which operated at with a v/c ratio of 0.57 and a delay of 55.1 seconds (LOS E) in the AM peak hour, a v/c ratio of 1.03 and a delay of 112.3 seconds (LOS F) in the PM peak hour, and a v/c of 0.72 and a delay of 56.6 seconds (LOS E) in the Saturday midday peak hour. This three phase signalized intersection allocates very limited green time to Arion Place and to Beaver Street yielding the resultant congested conditions.

Future Without The Proposed Action (No-Build)

In the future without the Proposed Action (also referred to as the No-Action condition), the Proposed Action would not occur and existing uses on the projected development sites would remain. During the 2012 to 2016 period, it is expected that transportation demands in the study area would change due to development projects in the surrounding area as well as general background growth. In order to forecast these future demands without the Proposed Action, the development projects listed in Chapter 2, "Land Use, Zoning, and Public Policy," were considered in addition to an annual growth rate of 0.5 percent per year applied to existing conditions.

As shown in Chapter 2, only the Bedford-Stuyvesant North Rezoning is anticipated and the trips generated by the rezoning was reviewed and considered as part of the background growth rate, as the number of assigned trips along Flushing Avenue was negligible (i.e., 8, 13, 9, and 9 through trips in the weekday AM, midday, PM, and Saturday midday peak hours, respectively). Therefore, for all transportation analyses,

Table 10-8

2012 Existing Conditions Level of Service Analysis

Intersection	Lane Group	Weekday AM Peak Hour V/C Ratio	Weekday AM Peak Hour Delay (sec.)	Weekday AM Peak Hour LOS		Weekday MD Peak Hour V/C Ratio	Weekday MD Peak Hour Delay (sec.)	Weekday MD Peak Hour LOS	Weekday PM Peak Hour V/C Ratio	Weekday PM Peak Hour Delay (sec.)	Weekday PM Peak Hour LOS		Saturday Midday Peak Hour V/C Ratio	Saturday Midday Peak Hour Delay (sec.)	Saturday Midday Peak Hour LOS	
1. Forrest Street (W) @	WB-LTR	0.43	42.0	D		0.16	27.5	C	0.39	46.3	D		0.13	27.1	C	
Bushwick Ave (N-S)	NB-LT	0.67	13.5	B		0.85	32.7	C	0.71	13.8	B		0.80	27.9	C	
	SB-TR	0.43	10.1	B		0.54	18.3	B	0.44	7.3	A		0.54	18.2	B	
2. Noll Street (E) @	SB-LT	0.04	11.8	B		0.02	9.8	A	0.03	9.7	A		0.01	9.8	A	
Bushwick Avenue (N-S)																
(Unsignalized Two-Way Stop)																
3. Arion Place (E)/ Beaver Street (S) @	EB-LR	0.66	61.5	E	*	0.50	47.1	D	0.76	69.2	E	*	0.33	42.3	D	
Bushwick Avenue (N-S)	NB-T	0.65	20.1	C		0.82	37.3	D	0.62	20.7	C		0.83	37.8	D	
Bushwick Avenue	SB-T	0.47	17.6	B		0.64	28.9	C	0.56	18.3	B		0.65	29.0	C	
Beaver Street	SB-T	0.57	55.1	E	*	0.65	53.1	D	1.03	112.3	F	*	0.72	56.6	E	*
4. Melrose Street (W) @	WB-LTR	0.38	46.3	D		0.25	37.7	D	0.32	44.6	D		0.20	36.7	D	
Bushwick Avenue (N-S)	NB-LT	0.57	8.8	A		0.61	13.8	B	0.61	10.6	B		0.66	20.4	C	
	SB-TR	0.54	9.2	A		0.71	16.6	B	0.59	9.0	A		0.72	16.5	B	
5. Noll Street (E) @	EB-L	0.06	9.7	A		0.03	9.2	A	0.05	9.4	A		0.02	9.2	A	
Stanwix Street (N)																

Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, DfL-Analysis considers a defacto left-turn lane on this approach

V/C ratio - volume to capacity ratio

LOS - level of service

***** - Denotes a congested movement (LOS E or F, or V/C ratio greater than or equal to 0.9)

only background growth from 2012-2016 is considered in the No-Build condition to reflect smaller developments in the area.
In the future without the Proposed Actions the mapping of two new streets would not take place and Noll Street and Stanwix Street would remain discontinuous within the study area, as under existing conditions. No other changes to the street network are expected by 2016.

Figure 10-6 shows the expected 2016 No-Build weekday AM, midday, PM and Saturday midday peak hours traffic volumes at analyzed intersections within the study area, while Table 10-9 shows the corresponding 2016 No-Build v/c ratios, delays, and levels of service and compares them to Existing conditions. As shown in Table 10-9, presently congested movements at the Bushwick Avenue/ Arion Place intersection generally become worse with the increased background traffic. However, no new congested traffic movements would occur at other intersections.

Future With The Proposed Action

As described in detail in Chapter 1, "Project Description," and noted at the beginning of this chapter, projected development sites are analyzed herein for future traffic and parking conditions as the RWCDS. There would 977 new dwelling units on the project site, and 99 new dwelling units on the other projected development sites for a total of 1,076 new DUs. Selected new residential buildings would have ground floor uses, primarily local retail, typical of the Bushwick neighborhood. Each site would provide required accessory parking, and it is also assumed that there would be no new public parking garages incorporated in the projected development sites.

In addition to the new housing and local retail development, there would be a re-structuring of the local street systems including the mapping of two new street segments and change in traffic flow direction of selected streets in the study area. The Proposed Action would map and open Stanwix Street from Forrest Street to Montieth Street, making Stanwix Street a north-south street continuous from Bushwick Avenue to Flushing Avenue. Similarly, the mapping and opening of Noll Street from Stanwix Street to Evergreen Avenue would also make that east-west street continuous in the study area.

Further, with a fully developed and continuous grid in the area, new street directions were established by NYCDOT and NYCDCP. Figure 10-7 shows the Build roadway network configuration including each street direction, highlighting those that have changed. For example, Stanwix Street, which is one-way northbound under existing and No-Build conditions, would be converted to one-way southbound over its entire length. Forrest Street would be converted from westbound to eastbound operation and Noll Street would be converted from eastbound operation within the study area to westbound operation. These changes in the street system, discussed in more detail below, would result in revised traffic volumes as a result of diverted trips, independent of the additional demand associated with the proposed new residential and local retail development generated by the Proposed Action.

Trip Generation and Assignment

As noted earlier, trip generation was calculated separately for each land use component related to the Proposed Action. Under the Proposed Action, existing land uses would be eliminated and redeveloped in the future with residential buildings and ground floor local retail. As a result, the trip generation analysis takes credit for trips and parking demands generated by existing land uses that would be displaced. This includes the warehouse, auto-care, supermarket and gas station on projected development sites. Table 10-1 above shows the transportation planning assumptions used to estimate the weekday demand for each of the project components and No-Build land uses. The table includes the daily trip generation rates, temporal distributions, modal splits, hourly in/out splits, vehicle occupancy, and truck trip generation for all uses.

Table 10-9

2016 No-Build Conditions Level of Service Analysis

Intersection	LANE GROUP	Weekday AM Peak Hour						Weekday MD Peak Hour					
		2012 Existing			2016 No-Build			2012 Existing			2016 No-Build		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
1. Forrest Street (W) @	WB-LTR	0.43	42.0	D	0.44	42.4	D	0.16	27.5	C	0.17	27.6	C
Bushwick Avenue (N-S)	NB-LT	0.67	13.5	B	0.69	13.9	B	0.85	32.7	C	0.88	35.1	D
	SB-TR	0.43	10.1	B	0.44	10.2	B	0.54	18.3	B	0.55	18.5	B
2. Noll Street (E) @	SB-LT	0.04	11.8	B	0.04	12.0	B	0.02	9.8	A	0.02	9.9	A
Bushwick Avenue (N-S)													
(Unsignalized Two-Way Stop)													
3. Arion Place (E)/ Beaver Street (S) @	EB-LR	0.66	61.5	E *	0.68	62.6	E *	0.50	47.1	D	0.51	47.3	D
Bushwick Avenue (N-S)	NB-T	0.65	20.1	C	0.66	20.4	C	0.82	37.3	D	0.83	38.5	D
Bushwick Avenue	SB-T	0.47	17.6	B	0.49	17.8	B	0.64	28.9	C	0.65	29.3	C
Beaver Street	SB-T	0.57	55.1	E *	0.58	55.6	E *	0.65	53.1	D	0.66	53.7	D
4. Melrose Street (W) @	WB-LTR	0.38	46.3	D	0.38	46.4	D	0.25	37.7	D	0.25	37.7	D
Bushwick Avenue (N-S)	NB-LT	0.57	8.8	A	0.58	9.0	A	0.61	13.8	B	0.62	14.1	B
	SB-TR	0.54	9.2	A	0.55	9.4	A	0.71	16.6	B	0.73	17.0	B
5. Noll Street (E) @	EB-L	0.06	9.7	A	0.06	9.7	A	0.03	9.2	A	0.03	9.2	A
Stanwix Street (N)													

Intersection	LANE GROUP	Weekday PM Peak Hour						Saturday Midday Peak Hour					
		2012 Existing			2016 No-Build			2012 Existing			2016 No-Build		
		V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS	V/C Ratio	Delay (sec.)	LOS
1. Forrest Street (W) @	WB-LTR	0.39	46.3	D	0.40	46.5	D	0.13	27.1	C	0.14	27.1	C
Bushwick Avenue (N-S)	NB-LT	0.71	13.8	B	0.73	14.6	B	0.80	27.9	C	0.83	29.8	C
	SB-TR	0.44	7.3	A	0.45	7.4	A	0.54	18.2	B	0.55	18.4	B
2. Noll Street (E) @	SB-LT	0.03	9.7	A	0.04	9.7	A	0.01	9.8	A	0.01	9.9	A
Bushwick Avenue (N-S)													
(Unsignalized Two-Way Stop)													
3. Arion Place (E)/ Beaver Street (S) @	EB-LR	0.76	69.2	E *	0.78	70.9	E *	0.33	42.3	D	0.33	42.4	D
Bushwick Avenue (N-S)	NB-T	0.62	20.7	C	0.63	21.1	C	0.83	37.8	D	0.85	39.1	D
Bushwick Avenue	SB-T	0.56	18.3	B	0.58	18.5	B	0.65	29.0	C	0.67	29.4	C
Beaver Street	SB-T	1.03	112.3	F *	1.05	118.5	F *	0.72	56.6	E *	0.74	57.4	E *
4. Melrose Street (W) @	WB-LTR	0.32	44.6	D	0.33	44.8	D	0.20	36.7	D	0.20	36.8	D
Bushwick Avenue (N-S)	NB-LT	0.61	10.6	B	0.62	11.0	B	0.66	20.4	C	0.68	15.5	B
	SB-TR	0.59	9.0	A	0.60	9.1	A	0.72	16.5	B	0.73	17.0	B
5. Noll Street (E) @	EB-L	0.05	9.4	A	0.05	9.4	A	0.02	9.2	A	0.02	9.2	A
Stanwix Street (N)													

Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Dfl-Analysis considers a defacto left-turn lane on this approach

V/C ratio - volume to capacity ratio

LOS - level of service

***** - Denotes a congested movement (LOS E or F, or V/C ratio greater than or equal to 0.9)

Table 10-2, also above, shows the net weekday peak-hour person-trip and vehicle-trip forecasts for each component of the Proposed Action. Overall, Table 10-2 shows that the Proposed Action would generate an estimated 95, 97, 117 and 112 vehicle trips (in and out combined) in the weekday AM, MD, PM and SAT MD peak hours, respectively.

Auto and taxi trips were assigned to the study area based on their origins and destinations, and were then assigned to the most direct routes to and from each projected development site in the proposed rezoning area. Autos and trucks were assigned to each site while taxis were assigned to one or more interfaces surrounding each site.

Street Network

As noted above, as part of the Proposed Action, two new street segments would be mapped in the study area resulting in Noll Street and Stanwix Street being continuous in the study area and re-connecting the proposed rezoning area with neighborhoods to the east and south. The proposed mapping would provide greater street frontage to the project site for deliveries and on-street parking and would re-establish the proposed rezoning area as a residential neighborhood with pedestrian and visual connections to existing residential neighborhoods to the east and south.

Stanwix Street would have a mapped width of 50 feet, including a 30-foot travel way and two 10-foot sidewalks. Noll Street would also have a width of 50 feet, including a 30-foot travel way and two 10-foot sidewalks. These widths are consistent with the adjacent streets connecting to these newly mapped street segments. The NYC Department of City Planning and NYC Department of Transportation have consulted on the area's circulation plan and recommended the opening of these newly mapped streets.

Three streets in the study area would change in traffic flow direction as a result of the proposed mapping (see Figure 10-7). Stanwix Street which currently operates northbound between Jefferson Street and Forrest Street in the study area would be converted to southbound operation throughout its length, forming a north-south pair with Evergreen Avenue to the east. Vehicles that accessed new developments on Forrest Street, Noll Street and Renaissance Court through northbound Stanwix Street would now access these blocks through northbound Evergreen Avenue and westbound Noll Street or Flushing Avenue. Forrest Street would switch from westbound operation to eastbound operation between Bushwick Avenue and Stanwix Street in the study area. Vehicles that used to access Forrest Street through northbound Stanwix Street would now travel north and south on Bushwick Avenue to access eastbound Forrest Street. Noll Street would be converted from eastbound operation from Bushwick Avenue to Stanwix Street to westbound operation throughout its length within the study area. Vehicles that previously used Bushwick Avenue north and south to access the one eastbound portion of Noll Street would now use southbound Stanwix Street or northbound Evergreen Avenue to access westbound Noll Street within the study area. Trucks in the study area are expected to continue to use Flushing Avenue as the main through truck route in the area.

Capacity Analysis

Figure 10-1 above shows the traffic assignment of the net incremental vehicle trips generated by the Proposed Action during the AM, MD, PM and SAT MD peak hours. This incremental traffic reflects the combination of new demand and the reconfigured street system. Figure 10-8 shows the incremental generated peak hour traffic, which Figure 10-9 shows the expected diversions with the completed traffic network. Figure 10-10 shows the Build condition traffic network for the four peak hours, which is a combination of the net increment vehicle trips from the Proposed Action and added to the No-Build traffic

volume network. Table 10-11 presents the resulting traffic capacity analysis under the 2016 Build condition with all the network changes in place and compares it to the No-Build condition.

Significant Impact Criteria

The identification of significant adverse traffic impacts at analyzed intersections is based on criteria presented in the *CEQR Technical Manual*. According to *CEQR Technical Manual* criteria, if a lane group under the With-Action condition is within LOS A, B or C, or marginally acceptable LOS D (average control delay less than or equal to 45.0 seconds/vehicle for signalized intersections and 30.0 seconds/vehicle for unsignalized intersections), the impact is not considered significant. If the lane group LOS deteriorates from LOS A, B, or C in the No-Action condition to worse than mid-LOS D (i.e., delay greater than 45 seconds/vehicle at signalized intersections or 30 seconds/vehicle at unsignalized intersections) or to LOS E or F under the With-Action condition, then a significant traffic impact has occurred. For a lane group operating at LOS D under the No-Action condition, an increase of five or more seconds is considered significant if the With-Action delay exceeds mid-LOS D. For a lane group operating at LOS E under the No-Action condition, an increase in projected delay of 4.0 or more seconds is considered significant, and for a lane group operating at LOS F under the No-Action condition, an increase in projected delay of 3.0 or more seconds is considered significant.

The same criteria apply to both signalized and unsignalized intersections, however, for the minor street at an unsignalized intersection to trigger significant impacts, 90 passenger-car equivalents (PCEs) must be identified in the future With-Action condition in any peak hour.

Table 10-10 shows a summary comparison of intersection levels of service for future No-Action and With-Action conditions, and an overview of the number of significant adverse traffic impacts that would be generated in the future with the Proposed Action based on the *CEQR Technical Manual* criteria discussed previously in, "Analysis Methodology." As shown in Table 10-10, in the weekday AM peak hour, the number of intersections that are projected to operate at overall LOS E or F would total one, versus none under the No-Action condition. Overall, two of the five analyzed intersections would have significant adverse impacts in the AM peak hour. The number of traffic movements projected to operate at LOS E or F in the AM would total four versus two in the No-Action.

In the weekday midday peak hour, no intersections are projected to operate at overall LOS E or F in the With-Action condition, unchanged from the No-Action condition. Overall, three of the five analyzed intersections would have significant adverse impacts in the weekday midday. The number of traffic movements projected to operate at LOS E or F in the midday would total one in the With-Action condition compared to none in the No-Action condition.

In the weekday PM peak hour, the number of intersections that are projected to operate at overall LOS E or F would total one, which would not change from the No-Action condition. Overall, four of the five analyzed intersections would have significant adverse impacts in the weekday PM. The number of traffic movements projected to operate at LOS E or F would total three in the With-Action condition compared to two in the No-Action condition.

Table 10-11

2016 Build Condition Level of Service Analysis

Intersection	LANE GROUP	Weekday AM Peak Hour								Weekday MD Peak Hour							
		2016 No-Build			2016 Build					2016 No-Build			2016 Build				
		V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	
1. Forrest Street (E) @	WB-LTR	0.44	42.4	D		-	-	-		0.17	27.6	C		-	-	-	
Bushwick Avenue (N-S)	NB-LT	0.69	13.9	B	NB-LTR	0.78	16.7	B		0.88	35.1	D	NB-LTR	1.04	67.8	E	*
	SB-TR	0.44	10.2	B	SB-LTR	0.48	11.1	B		0.55	18.5	B	SB-LTR	0.55	18.6	B	
2. Noll Street (W) @	SB-LT	0.04	12.0	B		-	-	-		0.02	9.9	A		-	-	-	
Bushwick Avenue (N-S)	WB-LR					0.88	137.1	F	*					0.40	33.8	D	*
(Unsignalized Two-Way Stop)																	
3. Arion Place (E)/ Beaver Street (S) @	EB-LR	0.68	62.6	E		0.71	65.8	E		0.51	47.3	D		0.59	51.5	D	
Bushwick Avenue (N-S)	NB-T	0.66	20.4	C		0.73	22.4	C		0.83	38.5	D		0.94	51.1	D	*
Bushwick Avenue	SB-T	0.49	17.8	B		0.47	17.5	B		0.65	29.3	C		0.63	28.7	C	
Beaver Street	SB-T	0.58	55.6	E		0.58	55.6	E		0.66	53.7	D		0.66	54.0	D	
4. Melrose Street (W) @	WB-LTR	0.38	46.4	D		0.97	99.1	F	*	0.25	37.7	D		0.50	44.5	D	
Bushwick Avenue (N-S)	NB-LT	0.58	9.0	A		0.60	9.3	A		0.62	14.1	B		0.67	15.3	B	
	SB-TR	0.55	9.4	A		0.54	9.1	A		0.73	17.0	B		0.72	16.7	B	
5. Noll Street (W) @	EB-L	0.06	9.7	A		-	-	-		0.03	9.2	A		-	-	-	
Stanwix Street (S)	WB-LT	-	-	-		0.04	10.0	B		-	-	-		0.06	11.3	B	
(Unsignalized)																	

Intersection	LANE GROUP	Weekday PM Peak Hour								Saturday Midday Peak Hour							
		2016 No-Build			2016 Build					2016 No-Build			2016 Build				
		V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS		V/C Ratio	Delay (sec.)	LOS	
1. Forrest Street (E) @	WB-LTR	0.40	46.5	D		-	-	-		0.14	27.1	C		-	-	-	
Bushwick Avenue (N-S)	NB-LT	0.73	14.6	B	NB-LTR	1.03	56.1	E	*	0.83	29.8	C	NB-LTR	0.95	43.8	D	
	SB-TR	0.45	7.4	A	SB-LTR	0.48	7.7	A		0.55	18.4	B	SB-LTR	0.55	18.4	B	
2. Noll Street (W) @	SB-LT	0.04	9.7	A		-	-	-		0.01	9.9	A		-	-	-	
Bushwick Avenue (N-S)	WB-LR					0.51	33.4	D	*					0.42	45.8	E	*
(Unsignalized Two-Way Stop)																	
3. Arion Place (E)/ Beaver Street (S) @	EB-LR	0.78	70.9	E		0.90	90.5	F	*	0.33	42.4	D		0.37	43.8	D	
Bushwick Avenue (N-S)	NB-T	0.63	21.1	C		0.72	24.1	C		0.85	39.1	D		0.95	51.7	D	*
Bushwick Avenue	SB-T	0.58	18.5	B		0.57	18.4	B		0.67	29.4	C		0.64	28.6	C	
Beaver Street	SB-T	1.05	118.5	F		1.05	118.5	F		0.74	57.4	E		0.74	57.4	E	
4. Melrose Street (W) @	WB-LTR	0.33	44.8	D		0.57	52.7	D	*	0.20	36.8	D		0.45	42.3	D	
Bushwick Avenue (N-S)	NB-LT	0.62	11.0	B		0.67	12.1	B		0.68	15.5	B		0.72	16.8	B	
	SB-TR	0.60	9.1	A		0.60	9.1	A		0.73	17.0	B		0.72	16.5	B	
5. Noll Street (W) @	EB-L	0.05	9.4	A		-	-	-		0.02	9.2	A		-	-	-	
Stanwix Street (S)	WB-LT	-	-	-		0.07	11.0	B		-	-	-		0.05	10.7	B	
(Unsignalized)																	

Notes:

EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound

L-Left, T-Through, R-Right, Dfl-Analysis considers a defacto left-turn lane on this approach

V/C ratio - volume to capacity ratio

LOS - level of service

***** - denotes an impacted movement

TABLE 10-10
Intersection Level of Service Summary Comparison
No-Action vs. With-Action Conditions

	No-Action				With-Action			
	AM	**Midday**	**PM**	**Saturday Midday**	**AM**	**Midday**	**PM**	**Saturday Midday**
Overall LOS A/B/C	5	4	4	4	4	2	3	3
Overall LOS D		1		1		3	1	1
Overall LOS E			1				1	1
Overall LOS F					1			
Number of intersections with significant impacts					2	3	4	2
Number of movements at LOS E or F (of approximately 12 movements analyzed)	2		2	1	4	1	3	2

Lastly, in the Saturday midday peak hour, one intersection is projected to operate at overall LOS E or F, versus none in the No-Action condition. Overall, two of the five analyzed intersections would have significant adverse impacts in the Saturday midday. The number of traffic movements projected to operate at LOS E or F would total two, compared to one in the No-Action condition.

As show in Table 10-11 and discussed below, one or more approaches or lane groups at a total of four analyzed intersections would be significantly adversely impacted in one or more peak hours with the Proposed Action. Potential measures to mitigate these significant adverse traffic impacts are discussed in Chapter 16, "Mitigation."

Forrest Street and Bushwick Avenue

As shown in Table 10-11, the northbound approach on Bushwick Avenue would be significantly adversely impacted in the weekday MD and PM peak hours. In the With-Action condition, this movement would operate at LOS E in the weekday MD peak hour with 67.8 seconds of delay, an increase of 32.7 seconds compared to the No-Action condition. In the With-Action condition, this movement would operate at LOS E in the weekday PM peak hour with 56.1 seconds of delay, an increase of 41.5 seconds compared to the No-Action condition.

As discussed in Chapter 16, "Mitigation," the significant adverse MD and PM peak hours impact to the Forrest Street and Bushwick Avenue intersection would be fully mitigated with the implementation of a no standing 7AM to 7PM Monday through Friday regulation for 100' on the east curb of the northbound approach.

Noll Street and Bushwick Avenue

The westbound left-right movement on Noll Street would be significantly adversely impacted in the weekday AM, midday, PM and Saturday midday peak hours. In the With-Action condition, the left-right movement on this approach would operate at LOS F in the AM with 137.1 seconds of delay. Increases in delay compared to the No-Action condition would total 33.8 seconds in the weekday midday and 33.4 seconds in the PM peak hour. In the Saturday midday period, the left-right movement would operate at LOS E with 45.8 seconds of delay.

As discussed in Chapter 16, "Mitigation," the significant adverse AM, MD, PM and Saturday MD peak hours impact to the Noll Street and Bushwick Avenue intersection would be fully mitigated with the installation of a traffic light at this intersection.

Arion Place/Beaver Street and Bushwick Avenue

As shown in Table 10-11, the northbound approach on Bushwick Avenue would be significantly adversely impacted in the weekday MD and Saturday midday peak hours and the eastbound left-right movement would be impacted in the weekday MD peak hour. In the With-Action condition, the northbound through movement would operate at LOS D with an increase of 12.6 seconds of delay in both the weekday MD peak hour and Saturday MD peak hours, compared to the No-Action. In the With-Action condition, the eastbound left-right movement would operate at LOS F in the PM peak hour with 90.5 seconds of delay, an increase of 19.6 seconds compared to the No-Action condition.

As discussed in Chapter 16, "Mitigation," the significant adverse MD, PM, and Saturday MD peak hours impact to the Arion Place/Beaver Street and Bushwick Avenue intersection would be fully mitigated with the implementation of a no standing 7AM-7PM Monday through Friday regulation for 100' on the south curb of the eastbound approach, the transfer of one second of green time from the eastbound and southbound approaches to the northbound/southbound in the weekday MD peak hour, and transfer two seconds of green time from the eastbound approach to the northbound/southbound approaches in the Saturday MD peak hour. As discussed in Chapter 16, "Mitigation," while the Proposed Action would not result in a significant adverse impact in the AM peak period at this location, because the no standing 7AM-7PM Monday through Friday standard regulation being proposed would be required to be implemented during the AM peak period as well, the LOS for the eastbound left-right movement would be improved as a result.

Melrose Street and Bushwick Avenue

As shown in Table 10-11, the westbound approach on Melrose Street would be significantly adversely impacted in the weekday MD and Saturday midday peak hours and the eastbound left-right movement would be impacted in the weekday AM and PM peak hours. In the With-Action condition, the westbound approach would operate at LOS F in the AM peak hour with 99.1 seconds of delay, an increase of 52.7 seconds compared to the No-Action condition. In the With-Action condition, the westbound approach would operate at LOS D in the PM peak hour with 52.7 seconds of delay, an increase of 7.9 seconds compared to the No-Action condition.

As discussed in Chapter 16, "Mitigation," the significant adverse AM and PM peak hours impact to the Melrose Street and Bushwick Avenue intersection would be fully mitigated with the implementation of a no standing 7AM-10AM Monday through Friday regulation for 100' on the north curb of the westbound approach and the transfer of three seconds of green time from the northbound/southbound approaches to the westbound approach in the AM and PM peak hours.

E. SUBWAY TRANSIT

As noted above, the rezoning area is served by three subway stations: the Flushing Avenue (J, M), the Myrtle Avenue (J, M, Z) and the Morgan Avenue (L); as shown in Figure 10-11. As presented above in Table 10-5, only the Flushing Avenue and Myrtle Avenue stations are expected to attract more than 200 project generated trips in either the weekday AM or PM peak commuter hours.

Both analyzed stations are on elevated lines, with each station served by two street stairs (see Figure 10-12). Within each station, there are two-way turnstiles, while the Flushing Avenue station also has high-exit

Table 10-5
Project Generated Subway Trips (by Station)

AM Peak Hour

Sites	Subway Trips Generated	Morgan Avenue Station (L Train)		Flushing Avenue Station (J & M Trains)		Myrtle Avenue Station (J, M & Z Trains)	
		Percentage	Volume	Percentage	Volume	Percentage	Volume
1 & 2	231	42.0%	97	58.0%	134	0.0%	0
3, 4 & 5	276	10.0%	28	10.0%	28	80.0%	220
6, 7 & 8	32	0.0%	0	100.0%	32	0.0%	0
Total	539	Total	125	Total	194	Total	220

Midday Peak Hour

Sites	Subway Trips Generated	Morgan Avenue Station (L Train)		Flushing Avenue Station (J & M Trains)		Myrtle Avenue Station (J, M & Z Trains)	
		Percentage	Volume	Percentage	Volume	Percentage	Volume
1 & 2	160	42.0%	67	58.0%	93	0.0%	0
3, 4 & 5	178	10.0%	18	10.0%	18	80.0%	142
6, 7 & 8	40	0.0%	0	100.0%	40	0.0%	0
Total	378	Total	85	Total	151	Total	142

PM Peak Hour

Sites	Subway Trips Generated	Morgan Avenue Station (L Train)		Flushing Avenue Station (J & M Trains)		Myrtle Avenue Station (J, M & Z Trains)	
		Percentage	Volume	Percentage	Volume	Percentage	Volume
1 & 2	272	42.0%	114	58.0%	158	0.0%	0
3, 4 & 5	319	10.0%	32	10.0%	32	80.0%	255
6, 7 & 8	42	0.0%	0	100.0%	42	0.0%	0
Total	633	Total	146	Total	232	Total	255

SAT MD Peak Hour

Sites	Subway Trips Generated	Morgan Avenue Station		Flushing Avenue Station		Myrtle Avenue Station	
		Percentage	Volume	Percentage	Volume	Percentage	Volume
1 & 2	242	42.0%	102	58.0%	140	0.0%	0
3, 4 & 5	285	10.0%	29	10.0%	29	80.0%	227
6, 7 & 8	38	0.0%	0	100.0%	38	0.0%	0
Total	565	Total	131	Total	207	Total	227

turnstiles. Based on 2011ridership data from NYC Transit, both stations are moderately used. Of the over four hundred stations in the system, Flushing Avenue is ranked 180th, while Myrtle Avenue is ranked 156th.

Existing Conditions

Ridership count data was collected in the AM and PM peak hours on Wednesday, June 6th, 2012. As shown in Table 10-12, approximately 444 riders use the Flushing Avenue station in the AM peak 15 minute period versus 446 in the PM. At Myrtle Avenue, 292 riders were counted in the AM peak 15 minutes, while 458 were counted in the PM. Table 10-12 also shows the existing capacity analyses for the entrance control elements for each station, while Table 10-13 provides the peak period LOS analyses for the stairways for each station. As shown in these tables, all analyzed elements operate at LOS B or better under 15 minute surge conditions.

Future Without The Proposed Action (No-Build)

Similar to other transportation analyses, a background annual growth factor of 0.5% per year was applied to existing conditions at each station, and the level of service analysis conducted for 2016 future No-Build conditions. Table 10-14 and 10-15 provide the resulting analyses for the entrance controls and stairways, respectively. As shown in the tables, peak period operating conditions under 2016 No-Build remain at LOS B or better with no change from existing conditions.

Future With The Proposed Action (With-Action)

As presented earlier in Table 10-5, based on the transportation planning factors and subway assignments, the two analyzed stations would attract weekday AM and PM hourly demands ranging from 194 to 232 at Flushing Avenue and 220 to 255 at Myrtle Avenue. These hourly demands were translated into peak 15 minute increments, combined with No-Build conditions to create future ridership demands to each station's street stairways and entrance control elements. The future With-Action conditions for the entrance controls and street stairs are shown in Tables 10-16 and 10-17, respectively.

Significant Impact Criteria

Under *CEQR Technical Manual* guidelines, the capacity of a stairway or passageway is determined based on four factors: the NYC Transit guideline capacity, the effective width, and surging and counter-flow factors, if applicable. NYC Transit guideline capacity is 10 passengers per minute per foot-width (pmf) for stairs and 15 pmf for passageways. The effective width of a stair or passageway is the actual width adjusted to reflect pedestrian avoidance of sidewalls and for center handrails, if present. A surging factor is applied to existing pedestrian volumes to reflect conditions where pedestrian flows tend to be concentrated (or surged) during shorter periods within the 15-minute analysis interval. This factor, which is based on the size of the station and the proximity of the pedestrian element to the station platforms, can reduce the calculated capacity by up to 25 percent. Lastly, a friction (or counterflow) factor reducing calculated capacity by 10 percent is applied where opposing pedestrian flows use the same stair or passageway. (No friction factor is applied if the flow is all or predominantly in one direction.)

By contrast with stairways and passageways, under *CEQR Technical Manual* guidelines, the capacity of an escalator or turnstile is determined based on only two factors: the NYC Transit guideline capacity for a 15-minute interval and a surging factor of up to 25 percent. Table below shows the *CEQR Technical Manual* level of service criteria for all subway station elements. As shown in Table 10-18, six levels of service are defined with letters A through F. LOS A is representative of free flow conditions without pedestrian conflicts and LOS F depicts severe congestion and queuing.

Table 10-12
2012 Existing Subway Control Area Analysis
at the Flushing Avenue (J,M) and Myrtle Avenue (J,M,Z) Station

Peak Period	Fare Array	Control Element	Quantity	15-Minute Pedestrian Volumes		Surging Factor	Friction Factor	V/C Ratio	LOS
				In	Out				
Flushing Avenue (J,M) Station									
AM	J-07	Two-way Turnstile	4	278	166	0.8	0.9	0.25	A
		High Exit Turnstile	2						
PM	J-07	Two-way Turnstile	4	179	267	0.8	0.9	0.22	A
		High Exit Turnstile	2						
Myrtle Avenue (J,M,Z) Station									
AM	J-09	Two-way Turnstile	4	241	51	0.9	0.9	0.18	A
PM	J-09	Two-way Turnstile	4	168	290	0.9	0.9	0.25	A

Notes:
Methodology based on 2012 CEQR Technical Manual guidelines
Surging factors applied only to exiting volumes

Table 10-13
2012 Existing Subway Stair Analysis
at the Flushing Avenue (J,M) and Myrtle Avenue (J,M,Z) Station

Peak Period	Stairway	Width (ft.)	Effective Width	15-Minute Pedestrian		Surging Factor	Friction Factor	V/C Ratio	LOS
				Down	Up				
Flushing Avenue (J,M) Station									
AM	S3	5.8	4.8	83	86	0.8	0.9	0.29	A
	S4	5.8	4.8	83	192	0.8	0.9	0.50	B
PM	S3	5.8	4.8	139	83	0.8	0.9	0.37	A
	S4	5.8	4.8	128	96	0.8	0.9	0.38	A
Myrtle Avenue (J,M,Z) Station									
AM	S1	5.8	4.8	23	131	0.9	0.9	0.26	A
	S2	5.8	4.8	28	110	0.9	0.9	0.23	A
PM	S1	5.8	4.8	151	94	0.9	0.9	0.39	A
	S2	5.8	4.8	139	74	0.9	0.9	0.34	A

Notes:
Methodology based on 2012 CEQR Technical Manual guidelines
Surging factors applied only to exiting volumes

Table 10-14
2016 No-Build Subway Control Area Analysis
at the Flushing Avenue (J,M) and Myrtle Avenue (J,M,Z) Station

Peak Period	Fare Array	Control Element	Quantity	15-Minute Pedestrian		Surging Factor	Friction Factor	V/C Ratio	LOS
				In	Out				
Flushing Avenue (J,M) Station									
AM	J-07	Two-way Turnstile	4	284	170	0.8	0.9	0.25	A
		High Exit Turnstile	2						
PM	J-07	Two-way Turnstile	4	183	273	0.8	0.9	0.22	A
		High Exit Turnstile	2						
Myrtle Avenue (J,M,Z) Station									
AM	J-09	Two-way Turnstile	4	261	57	0.9	0.9	0.20	A
PM	J-09	Two-way Turnstile	4	171	296	0.9	0.9	0.25	A

Notes:
Methodology based on 2012 CEQR Technical Manual guidelines
Surging factors applied only to exiting volumes

Table 10-15
2016 No-Build Subway Stair Analysis
at the Flushing Avenue (J,M) and Myrtle Avenue (J,M,Z) Station

Peak Period	Stairway	Width (ft.)	Effective Width	15-Minute Pedestrian		Surging Factor	Friction Factor	V/C Ratio	LOS
				Down	Up				
Flushing Avenue (J,M) Station									
AM	S3	5.8	4.8	85	88	0.8	0.9	0.30	A
	S4	5.8	4.8	85	196	0.8	0.9	0.51	B
PM	S3	5.8	4.8	142	85	0.8	0.9	0.38	A
	S4	5.8	4.8	131	98	0.8	0.9	0.39	A
Myrtle Avenue (J,M,Z) Station									
AM	S1	5.8	4.8	23	134	0.9	0.9	0.27	A
	S2	5.8	4.8	34	127	0.9	0.9	0.27	A
PM	S1	5.8	4.8	154	96	0.9	0.9	0.40	A
	S2	5.8	4.8	142	75	0.9	0.9	0.35	A

Notes:
Methodology based on 2012 CEQR Technical Manual guidelines
Surging factors applied only to exiting volumes

TABLE 10-18
Level of Service Criteria for Subway Station Elements

LOS	Description	Pmf
A	Free Flow	≤ 0.5
B	Fluid Flow	≤ 3
C	Fluid, somewhat restricted	≤ 6
D	Crowded, walking speed restricted	≤ 11
E	Congested, some shuffling and queuing	≤ 18
F	Severely congested, queued	> 18

Source: *CEQR Technical Manual*
Pmf: *Persons per minute per foot width*

The *CEQR Technical Manual* identifies a significant impact for stairways and passageways in terms of the minimum width increment threshold (WIT) based on the minimum amount of additional capacity that would be required to restore conditions to either their No-Action v/c ratio or to a v/c ratio of 1.00 (LOS C/D), whichever is greater. Stairways that are substantially degraded in level of service or which experience the formation of extensive queues are classified as significantly impacted. Significant adverse stairway or passageway impacts are typically considered to have occurred once the thresholds shown in Table 10-19 below are reached or exceeded.

For turnstiles, escalators, and high-wheel exit gates, the *CEQR Technical Manual* defines a significant impact as an increase from a No-Action volume-to-capacity ratio of below 1.00 to a v/c ratio of 1.00 or greater. Where a facility is already at a v/c ratio of 1.00 or greater, a 0.01 change in v/c ratio is also considered significant.

TABLE 10-19
Significant Impact Thresholds for Stairways and Passageways

With-Action V/C Ratio	WIT for Significant Impact (inches)	
	Stairway	Passageway
1.00-1.09	8	13
1.10-1.19	7	11.5
1.20-1.29	6	10
1.30-1.39	5	8.5
1.40-1.49	4	6
1.50-1.59	3	4.5
≥1.6	2	3

Source: *CEQR Technical Manual*

As shown above in Tables 10-16 and 10-17, the With-Action v/c ratios and levels of service for all analyzed elements, both entrance control and street stairs, are well below a v/c ratio of 1.0 for both stations. Tables

Table 10-16
2016 Build Subway Control Area Analysis
at the Flushing Avenue (J,M) and Myrtle Avenue (J,M,Z) Station

Peak Period	Fare Array	Control Element	Quantity	15-Minute Pedestrian		Surging Factor	Friction Factor	V/C Ratio	LOS
				In	Out				
Flushing Avenue (J,M) Station									
AM	J-07	Two-way Turnstile	4	334	179	0.8	0.9	0.29	A
		High Exit Turnstile	2						
PM	J-07	Two-way Turnstile	4	206	322	0.8	0.9	0.26	A
		High Exit Turnstile	2						
Myrtle Avenue (J,M,Z) Station									
AM	J-09	Two-way Turnstile	4	319	62	0.9	0.9	0.24	A
PM	J-09	Two-way Turnstile	4	196	351	0.9	0.9	0.30	A

Notes:
Methodology based on 2012 CEQR Technical Manual guidelines
Surging factors applied only to exiting volumes

Table 10-17
2016 Build Subway Stair Analysis
at the Flushing Avenue (J,M) and Myrtle Avenue (J,M,Z) Station

Peak Period	Stairway	Width (ft.)	Effective Width	15-Minute Pedestrian		Surging Factor	Friction Factor	V/C Ratio	LOS
				Down	Up				
Flushing Avenue (J,M) Station									
AM	S3	5.8	4.8	85	88	0.8	0.9	0.30	A
	S4	5.8	4.8	94	246	0.8	0.9	0.62	B
PM	S3	5.8	4.8	142	85	0.8	0.9	0.38	A
	S4	5.8	4.8	180	121	0.8	0.9	0.51	B
Myrtle Avenue (J,M,Z) Station									
AM	S1	5.8	4.8	26	163	0.9	0.9	0.32	A
	S2	5.8	4.8	36	156	0.9	0.9	0.32	A
PM	S1	5.8	4.8	182	109	0.9	0.9	0.47	B
	S2	5.8	4.8	169	88	0.9	0.9	0.41	A

Notes:
Methodology based on 2012 CEQR Technical Manual guidelines
Surging factors applied only to exiting volumes

10-16 and 10-17 show that the highest v/c ratio (0.46, LOS B) is reached at Myrtle Avenue in the PM peak hour for the entrance control elements, and (0.57, LOS B) at the Flushing Avenue station stairway S4 in the AM peak hour. All analyzed elements will operate at LOS B or better in both peak hours, and there would be no significant subway impacts.

F. PEDESTRIANS

Data on peak period pedestrian flow volumes were collected along analyzed sidewalks, corner areas and crosswalks on Wednesday June 6th and Saturday June 9th 2012 at the study area locations shown earlier in Figure 10-3. The counts were done from 7-9AM, 12-2PM and 4-6PM on the weekday and 12-2PM on Saturday. Peak hours were determined by comparing rolling hourly averages, and the highest 15-minute volumes within the selected peak hours were used for analysis.

Peak 15-minute pedestrian flow conditions during the weekday AM, midday and PM and Saturday midday peak hours are analyzed using the *2000 Highway Capacity Manual* methodology and procedures outlined in the *CEQR Technical Manual*. Using this methodology, the congestion level of pedestrian facilities is determined by considering pedestrian volume, measuring the sidewalk or crosswalk width, determining the available pedestrian capacity and developing a ratio of volume flows to capacity conditions. The resulting ratio is then compared with LOS standards for pedestrian flow, which define a qualitative relationship at a certain pedestrian traffic concentration level. The evaluation of street crosswalks and corners is more complicated as these spaces cannot be treated as corridors due to the time incurred waiting for traffic lights. To effectively evaluate these facilities a "time-space" analysis methodology is employed which takes into consideration the traffic light cycle at intersections.

LOS standards are based on the average area available per pedestrian during the analysis period, typically expressed as a 15-minute peak period. LOS grades from A to F are assigned, with LOS A representative of free flow conditions without pedestrian conflicts and LOS F depicting significant capacity limitations and inconvenience. Table 10-20 defines the LOS criteria for pedestrian crosswalk/corner area and sidewalk conditions, as based on the *Highway Capacity Manual* methodology.

The analysis of sidewalk conditions includes a "platoon" factor in the calculation of pedestrian flow to more accurately estimate the dynamics of walking. "Platooning" is the tendency of pedestrians to move in bunched groups or "platoons" once they cross a street where cross traffic required them to wait. Platooning generally results in a level of service one level poorer than that determined for average flow rates.

TABLE 10-20
Pedestrian Crosswalk/Corner Area and Sidewalk Levels of Service Descriptions

LOS	Crosswalk/Corner	Crosswalk/Corner Area Criteria (sf/ped)	Non-Platoon Sidewalk Criteria (pmf)	Platoon Sidewalk Criteria (pmf)
A	(Unrestricted)	≥ 60	≤ 5	≤ 0.5
B	(Slightly Restricted)	≥ 40	≤ 7	≤ 3
C	(Restricted but fluid)	≥ 24	≤ 10	≤ 6
D	(Restricted, necessary to continuously alter walking stride and direction)	≥ 15	≤ 15	≤ 11
E	(Severely restricted)	≥ 8	≤ 23	≤ 18
F	(Forward progress only by shuffling; no reverse movement possible)	≤ 8	> 23	> 18

Notes: Based on average conditions for 15 minutes
sf/ped – square feet of area per pedestrian
pmf – pedestrians per minute per foot of effective sidewalk width
Source: *2000 Highway Capacity Manual*

Existing Conditions

As shown in Figure 10-2 and discussed previously in Section C, "Level 1 and 2 Screening Assessment," a total of 11 sidewalks, 19 corner reservoir areas and seven crosswalks where project-generated pedestrian trips are expected to exceed the 200-trip *CEQR Technical Manual* analysis threshold in one or more peak hours have been selected for analysis. These pedestrian elements are generally located along Flushing and Bushwick Avenues, as well as along Evergreen Avenue. Existing peak 15-minute pedestrian flow volumes and levels of service along these sidewalks, corner areas and crosswalks during the weekday AM, midday, PM and Saturday midday peak hours are shown in Tables 10-21 through 10-23, respectively. As shown in Tables 10-21through 10-23, all analyzed sidewalks, corner areas and crosswalks are currently operating at an uncongested LOS A in all analyzed peak hours.

The Future Without the Proposed Action (No-Action)

Estimates of peak hour trips on analyzed sidewalks, corner areas and crosswalks in the No-Action condition were developed by applying the annual background growth rates consistent with the other transportation analyses The No-Action peak 15-minute trip projections were then assigned to the analyzed pedestrian facilities. Tables 10-24 through 10-26 show the forecasted 2016 No-Action peak 15-minute pedestrian flow volumes and levels of service along these sidewalks, corner areas and crosswalks during the weekday AM, MD, PM, and SAT MD peak hours. As shown, all analyzed pedestrian facilities are projected to continue to operate at an acceptable LOS A in all four peak periods analyzed in the No-Action condition.

The Future With the Proposed Action (With-Action)

The Proposed Action would generate new pedestrian demand on analyzed sidewalks, corner areas and crosswalks by 2016. This new demand would include trips made solely by walking, as well as pedestrian trips en route to and from subway station entrances and, bus stops. Pedestrian trips generated by the Proposed Action are expected to be widely distributed due to the dispersed locations of the development sites within the proposed rezoning area. It is also anticipated, that pedestrian trips would be most concentrated along corridors connecting to the three nearby subway station entrances.

As shown earlier in Table 10-6 the proposed rezoning is expected to generate a net total of 1,049, 2,582, 1,910 and 1,984 pedestrian trips in the AM, MD, PM and SAT MD peak hours, respectively. The peak 15-minute incremental pedestrian volumes were developed by dividing the hourly incremental volumes by four and accounting for peaking characteristics within each peak hour. These pedestrian volumes were added to the projected No-Action volumes to generate the With-Action pedestrian volumes for detailed analysis.

Tables 10-27 through 10-29 show the forecasted With-Action peak 15-minute pedestrian flow volumes and resulting levels of service along analyzed sidewalks, corner areas and crosswalks, respectively, during the weekday AM, MD, PM and SAT MD peak hours.

Impact Criteria

Sidewalks

For areas of the city outside of the Central Business District, *CEQR Technical Manual* criteria define a significant adverse sidewalk impact to have occurred under platoon conditions if the average pedestrian flow rate under the No-Action condition is less than 3.5 pedestrians/minute/foot (pmf) of effective sidewalk

Table 10-21
2012 Existing Sidewalk Conditions

Sidewalk No.	Location		Total Width	Effective Width (1) (ft)	Peak 15-Minute Volumes				Flow Rate (persons/foot/min)				Average Flow Level of Service				Platoon-Adjusted Level of Service			
					AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
S1	Flushing Av between Beaver St and Garden St	South	15	11	55	62	55	59	0.3	0.4	0.3	0.4	A	A	A	A	A	A	A	A
S2	Flushing Av between Garden St and Bushwick Av	South	15	11	28	27	30	46	0.2	0.2	0.2	0.3	A	A	A	A	A	A	A	A
S3	Flushing Av between Bushwick Av and Stanwix St	South	10	4	48	55	51	33	0.8	0.9	0.9	0.5	A	A	A	A	B	B	B	B
S4	Flushing Av between Stanwix St and Evergreen Av	South	13	9	26	27	28	16	0.2	0.2	0.2	0.1	A	A	A	A	A	A	A	A
S5	Bushwick Av between Flushing Av and Montieth St	East	10	6	32	19	21	19	0.4	0.2	0.2	0.2	A	A	A	A	A	A	A	A
S6	Bushwick Av between Montieth St and Forrest St	East	14	10	26	17	10	24	0.2	0.1	0.1	0.2	A	A	A	A	A	A	A	A
S7	Bushwick Ave between Forrest St and Noll St	West	13	9	19	13	12	11	0.1	0.1	0.1	0.1	A	A	A	A	A	A	A	A
S8	Stanwix St between Flushing Av and Montieth St	West	15	11	1	2	3	4	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	A
S9	Evergreen Av between Noll St and Melrose St	West	14	10	9	8	8	7	0.1	0.1	0.1	0.0	A	A	A	A	A	A	A	A
S10	Melrose St between Evergreen Av and Stanwix St	North	12	8	7	16	14	8	0.1	0.1	0.1	0.1	A	A	A	A	A	A	A	A

Notes:

(1) Effective width excludes a minimum of 1.5 ft for wall avoidance and 1.5 ft for curbside avoidance.

Table 10-22
2012 Existing Corner Conditions

No.	Intersection	Corner	Peak Hour Volume				Avg Pedestrian Space (sq-ft/ped)				Level of Service			
			AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
C1	Beaver St @ Flushing Av	SE	26	47	35	49	360.1	232.7	344.5	325.3	A	A	A	A
C2	Garden St @ Flushing Av	SE	42	9	32	29	243.2	325.9	266.8	297.6	A	A	A	A
C3	Garden St @ Flushing Av	SW	53	37	53	48	280.8	313.0	305.7	329.6	A	A	A	A
C4	Bushwick Av @ Flushing Av	NE	8	6	7	12	459.7	716.0	577.3	814.8	A	A	A	A
C5	Bushwick Av @ Flushing Av	SE	33	25	29	25	158.7	200.0	227.9	221.3	A	A	A	A
C6	Bushwick Av @ Flushing Av	SW	1	1	4	37	850.4	904.7	957.1	691.5	A	A	A	A
C7	Bushwick Av @ Flushing Av	NW	94	37	26	22	228.1	378.8	323.6	436.4	A	A	A	A
C8	Evergreen Av @ Flushing Av	NE	19	19	9	22	521.9	496.2	338.2	383.4	A	A	A	A
C9	Evergreen Av @ Flushing Av	SE	7	1	14	23	757.0	784.2	642.1	984.2	A	A	A	A
C10	Evergreen Av @ Flushing Av	SW	3	6	18	21	804.8	830.3	727.5	642.0	A	A	A	A
C11	Evergreen Av @ Flushing Av	NW	22	5	5	6	912.3	1,204.6	735.9	528.5	A	A	A	A
C12	Garden St/Forrest St @ Bushwick Av	NE	9	3	8	11	554.8	1,346.6	1,602.6	870.7	A	A	A	A
C13	Garden St/Forrest St @ Bushwick Av	SE	13	6	9	9	281.3	581.9	646.5	504.3	A	A	A	A
C14	Garden St/Forrest St @ Bushwick Av	SW	42	24	34	17	407.8	682.5	481.2	657.5	A	A	A	A
C15	Garden St/Forrest St @ Bushwick Av	NW	3	0	0	0	3,164.5	10,056.3	2,972.5	4,599.7	A	A	A	A
C16	Noll St @ Evergreen Av	SW	4	5	4	0	1,986.2	2,300.8	2,059.7	4,294.1	A	A	A	A
C17	Noll St @ Evergreen Av	NW	3	2	10	3	2,605.2	1,707.3	1,710.9	4,104.6	A	A	A	A

Table 10-23
2012 Existing Crosswalk Conditions

	Intersection	Crosswalk	Length	Width	Peak Hour Volume				Avg. Pedestrian Space (sq-ft/ped)				Level of Service			
			L (Ft)	W (Ft)	AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
X1	Bushwick Av @ Flushing Av	South	48	14	104	114	97	100	414.0	345.5	439.5	373.5	A	A	A	A
X2	Bushwick Av @ Flushing Av	East	44	13	119	66	63	48	271.9	488.9	517.8	605.3	A	A	A	A
X3	Bushwick Av @ Flushing Av	West	50	12	55	30	33	35	601.1	1,162.3	962.6	771.7	A	A	A	A
X6	Evergreen Av @ Flushing Av	South	30	12	89	97	85	21	451.2	402.0	453.9	1,462.9	A	A	A	A
X7	Evergreen Av @ Flushing Av	West	43	15	25	6	22	89	586.7	1,572.9	573.8	200.3	A	A	A	A
X6	Garden St/Forrest St @ Bushwick Av	East	30	15	93	42	29	46	617.3	1158.2	2664.9	880.1	A	A	A	A
X7	Garden St/Forrest St @ Bushwick Av	West	32	14	40	10	29	24	1705.4	3317.6	1527.9	1859.7	A	A	A	A

Table 10-24
2016 No-Build Sidewalk Conditions

Sidewalk No.	Location		Total Width	Effective Width (1) (ft)	Peak 15-Minute Volumes				Flow Rate (persons/foot/min)				Average Flow Level of Service				Platoon-Adjusted Level of Service			
					AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
S1	Flushing Av between Beaver St and Garden St	South	15	11	56	63	56	60	0.3	0.4	0.3	0.4	A	A	A	A	A	A	A	A
S2	Flushing Av between Garden St and Bushwick Av	South	15	11	29	27	31	47	0.2	0.2	0.2	0.3	A	A	A	A	A	A	A	A
S3	Flushing Av between Bushwick Av and Stanwix St	South	10	4	49	56	52	33	0.8	0.9	0.9	0.6	A	A	A	A	B	B	B	B
S4	Flushing Av between Stanwix St and Evergreen Av	South	13	9	27	27	29	16	0.2	0.2	0.2	0.1	A	A	A	A	A	A	A	A
S5	Bushwick Av between Flushing Av and Montieth St	East	10	6	33	20	22	19	0.4	0.2	0.2	0.2	A	A	A	A	A	A	A	A
S6	Bushwick Av between Montieth St and Forrest St	East	14	10	26	17	10	25	0.2	0.1	0.1	0.2	A	A	A	A	A	A	A	A
S7	Bushwick Ave between Forrest St and Noll St	West	13	9	20	13	12	11	0.1	0.1	0.1	0.1	A	A	A	A	A	A	A	A
S8	Stanwix St between Flushing Av and Montieth St	West	15	11	1	2	3	4	0.0	0.0	0.0	0.0	A	A	A	A	A	A	A	A
S9	Evergreen Av between Noll St and Melrose St	West	14	10	9	8	8	7	0.1	0.1	0.1	0.0	A	A	A	A	A	A	A	A
S10	Melrose St between Evergreen Av and Stanwix St	North	12	8	7	16	14	8	0.1	0.1	0.1	0.1	A	A	A	A	A	A	A	A

Notes:

(1) Effective width excludes a minimum of 1.5 ft for wall avoidance and 1.5 ft for curbside avoidance.

Table 10-25
2016 No-Build Corner Conditions

No.	Intersection	Corner	Peak Hour Volume				Avg Pedestrian Space (sq-ft/ped)				Level of Service			
			AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
C1	Beaver St @ Flushing Av	SE	26	48	35	50	352.8	227.1	338.1	318.1	A	A	A	A
C2	Garden St @ Flushing Av	SE	43	9	32	29	238.3	319.6	262.3	293.8	A	A	A	A
C3	Garden St @ Flushing Av	SW	54	37	54	49	275.7	308.3	299.6	324.3	A	A	A	A
C4	Bushwick Av @ Flushing Av	NE	8	6	7	12	448.6	697.2	565.2	798.4	A	A	A	A
C5	Bushwick Av @ Flushing Av	SE	34	25	29	25	154.7	195.9	222.9	217.6	A	A	A	A
C6	Bushwick Av @ Flushing Av	SW	1	1	4	37	834.8	892.4	944.3	683.8	A	A	A	A
C7	Bushwick Av @ Flushing Av	NW	96	37	26	22	223.0	373.5	319.7	430.2	A	A	A	A
C8	Evergreen Av @ Flushing Av	NE	19	19	9	22	517.3	489.8	334.2	376.4	A	A	A	A
C9	Evergreen Av @ Flushing Av	SE	7	1	14	23	745.7	771.6	638.2	984.2	A	A	A	A
C10	Evergreen Av @ Flushing Av	SW	3	6	18	21	791.6	816.0	722.3	633.3	A	A	A	A
C11	Evergreen Av @ Flushing Av	NW	22	5	5	6	904.3	1,183.5	725.0	514.3	A	A	A	A
C12	Garden St/Forrest St @ Bushwick Av	NE	9	3	8	11	550.5	1,346.6	1,602.6	855.7	A	A	A	A
C13	Garden St/Forrest St @ Bushwick Av	SE	13	6	9	9	276.9	581.9	637.5	498.6	A	A	A	A
C14	Garden St/Forrest St @ Bushwick Av	SW	43	24	34	17	397.9	682.5	475.8	657.5	A	A	A	A
C15	Garden St/Forrest St @ Bushwick Av	NW	3	0	0	0	3,115.5	10,056.3	2,972.5	4,599.7	A	A	A	A
C16	Noll St @ Evergreen Av	SW	4	5	4	0	1,986.2	2,300.8	2,059.7	4,294.1	A	A	A	A
C17	Noll St @ Evergreen Av	NW	3	2	10	3	2,605.2	1,707.3	1,710.9	4,104.6	A	A	A	A

Table 10-26
2016 No-Build Crosswalk Conditions

	Intersection	Crosswalk	Length L (Ft)	Width W (Ft)	Peak Hour Volume				Avg. Pedestrian Space (sq-ft/ped)				Level of Service			
					AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
X1	Bushwick Av @ Flushing Av	South	48	14	106	116	99	102	405.6	339.0	429.8	365.4	A	A	A	A
X2	Bushwick Av @ Flushing Av	East	44	13	122	68	65	49	264.7	473.6	500.7	593.9	A	A	A	A
X3	Bushwick Av @ Flushing Av	West	50	12	56	30	33	35	590.1	1,161.6	962.0	770.8	A	A	A	A
X4	Evergreen Av @ Flushing Av	South	30	12	91	99	86	21	441.0	393.7	449.0	1,462.9	A	A	A	A
X5	Evergreen Av @ Flushing Av	West	43	15	25	6	22	91	585.8	1,568.1	572.0	195.5	A	A	A	A
X6	Garden St/Forrest St @ Bushwick Av	East	30	15	94	42	29	47	611.5	1158.2	2664.9	860.8	A	A	A	A
X7	Garden St/Forrest St @ Bushwick Av	West	32	14	41	10	29	24	1662.2	3315.4	1525.4	1858.4	A	A	A	A

Table 10-27
2016 Build Sidewalk Conditions

Sidewalk No.	Location		Total Width	Effective Width (1) (ft)	Peak 15-Minute Volumes				Flow Rate (persons/foot/min)				Average Flow Level of Service				Platoon-Adjusted Level of Service			
					AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
S1	Flushing Av between Beaver St and Garden St	South	15	11	87	143	104	113	0.5	0.9	0.6	0.7	A	A	A	A	B	B	B	B
S2	Flushing Av between Garden St and Bushwick Av	South	15	11	61	127	90	123	0.4	0.8	0.5	0.7	A	A	A	A	A	B	B	B
S3	Flushing Av between Bushwick Av and Stanwix St	South	10	4	60	130	90	75	1.0	2.2	1.5	1.3	A	A	A	A	B	B	B	B
S4	Flushing Av between Stanwix St and Evergreen Av	South	13	9	76	118	107	146	0.6	0.9	0.8	1.1	A	A	A	A	B	B	B	B
S5	Bushwick Av between Flushing Av and Montieth St	East	10	6	69	122	90	113	0.8	1.4	1.0	1.3	A	A	A	A	B	B	B	B
S6	Bushwick Av between Montieth St and Forrest St	East	14	10	41	135	53	112	0.3	0.9	0.4	0.7	A	A	A	A	A	B	A	B
S7	Bushwick Ave between Forrest St and Noll St	West	13	9	34	110	61	80	0.3	0.8	0.4	0.6	A	A	A	A	A	B	A	B
S8	Stanwix St between Flushing Av and Montieth St	West	15	11	12	81	49	53	0.1	0.5	0.3	0.3	A	A	A	A	A	A	A	A
S9	Evergreen Av between Noll St and Melrose St	West	14	10	41	240	94	251	0.3	1.6	0.6	1.7	A	A	A	A	A	B	B	B
S10	Melrose St between Evergreen Av and Stanwix St	North	12	8	38	133	124	76	0.3	1.1	1.0	0.6	A	A	A	A	A	B	B	B
S11	Noll St between Evergreen Av and Stanwix St	South	12	8	59	137	109	115	0.5	1.1	0.9	1.0	A	A	A	A	A	B	B	B

Notes:

(1) Effective width excludes a minimum of 1.5 ft for wall avoidance and 1.5 ft for curbside avoidance.

Table 10-28
2016 Build Corner Conditions

No.	Intersection	Corner	Peak Hour Volume				Avg Pedestrian Space (sq-ft/ped)				Level of Service			
			AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
C1	Beaver St @ Flushing Av	SE	26	82	40	55	258.6	134.8	221.9	207.5	A	A	A	A
C2	Garden St @ Flushing Av	SE	43	9	32	29	153.2	128.1	134.4	146.9	A	A	A	A
C3	Garden St @ Flushing Av	SW	54	37	54	49	201.9	171.8	189.8	199.8	A	A	A	A
C4	Bushwick Av @ Flushing Av	NE	8	6	7	12	309.2	212.3	261.1	273.5	A	A	A	A
C5	Bushwick Av @ Flushing Av	SE	53	48	54	49	92.7	55.3	83.1	69.5	A	B	A	A
C6	Bushwick Av @ Flushing Av	SW	15	10	21	52	417.1	225.1	281.7	230.2	A	A	A	A
C7	Bushwick Av @ Flushing Av	NW	96	37	26	22	155.7	112.8	135.8	138.5	A	A	A	A
C8	Evergreen Av @ Flushing Av	NE	19	19	9	22	256.7	144.8	164.3	134.3	A	A	A	A
C9	Evergreen Av @ Flushing Av	SE	7	1	14	23	381.1	220.2	264.0	243.2	A	A	A	A
C10	Evergreen Av @ Flushing Av	SW	3	6	18	21	274.2	142.3	175.7	183.7	A	A	A	A
C11	Evergreen Av @ Flushing Av	NW	22	5	5	6	309.2	166.9	183.6	189.7	A	A	A	A
C12	Garden St/Forrest St @ Bushwick Av	NE	9	3	8	11	166.7	67.1	100.8	81.8	A	A	A	A
C13	Garden St/Forrest St @ Bushwick Av	SE	13	6	9	9	166.8	99.6	153.0	127.5	A	A	A	A
C14	Garden St/Forrest St @ Bushwick Av	SW	43	24	34	17	204.4	93.4	108.2	131.7	A	A	A	A
C15	Garden St/Forrest St @ Bushwick Av	NW	3	0	0	0	465.5	146.8	174.0	206.9	A	A	A	A
C16	Noll St @ Bushwick Av	NE	19	17	11	13	502.2	266.9	454.8	424.8	A	A	A	A
C17	Noll St @ Bushwick Av	SE	58	112	61	69	398.9	230.7	373.8	356.1	A	A	A	A
C18	Noll St @ Evergreen Av	SW	45	241	130	148	214.5	59.2	91.0	64.6	A	B	A	A
C19	Noll St @ Evergreen Av	NW	3	2	10	3	500.9	142.4	201.0	141.8	A	A	A	A

Table 10-29
2016 Build Crosswalk Conditions

	Intersection	Crosswalk	Length L (Ft)	Width W (Ft)	Peak Hour Volume				Avg. Pedestrian Space (sq-ft/ped)				Level of Service			
					AM	MD	PM	SMD	AM	MD	PM	SMD	AM	MD	PM	SMD
X1	Bushwick Av @ Flushing Av	South	48	14	171	310	223	238	253.7	125.7	189.5	154.5	A	A	A	A
X2	Bushwick Av @ Flushing Av	East	44	13	187	268	198	198	167.8	112.9	159.3	137.7	A	A	A	A
X3	Bushwick Av @ Flushing Av	West	50	12	124	228	165	186	263.0	148.4	187.4	140.6	A	A	A	A
X4	Evergreen Av @ Flushing Av	South	30	12	142	235	185	126	277.6	161.4	193.6	234.3	A	A	A	A
X5	Evergreen Av @ Flushing Av	West	43	15	161	218	227	299	92.9	45.4	54.9	58.5	A	B	B	B
X6	Garden St/Forrest St @ Bushwick Av	East	30	15	145	276	164	202	359.2	164.6	444.7	189.6	A	A	A	A
X7	Garden St/Forrest St @ Bushwick Av	West	32	14	145	240	211	217	434.1	117.2	204.7	181.4	A	A	A	A

width, and the average flow rate under the With-Action condition is greater than 6.0 pmf (LOS D or worse). If the average flow rate under the With-Action condition is less than or equal to 6.0 pmf (LOS C or better), the impact should not be considered significant. If the No-Action pedestrian flow rate is between 3.5 and 19 pmf, an increase in average flow rate under the With Action condition should be considered significant based on Table 10-30, which shows a sliding-scale that identifies what increase is considered a significant impact for a given flow rate. If the increase in average pedestrian flow rate is less than the value shown in Table 10-30**,** the impact should not be considered significant. If the average pedestrian flow rate under the No-Action condition is greater than 19 pmf, then an increase in pedestrian flow rate greater than or equal to 0.6 pmf should be considered significant.

TABLE 10-30
Significant Impact Criteria for Sidewalks with Platooned Flow in a Non-CBD Location

No-Action Condition Pedestrian Flow (pmf)			With-Action Condition Pedestrian Flow Increment to be Considered a Significant Impact (pmf)
< 3.5			With Action Condition > 6.0
3.5	to	3.8	Increment ≥ 2.6
3.9	to	4.6	Increment ≥ 2.5
4.7	to	5.4	Increment ≥ 2.4
5.5	to	6.2	Increment ≥ 2.3
6.3	to	7.0	Increment ≥ 2.2
7.1	to	7.8	Increment ≥ 2.1
7.9	to	8.6	Increment ≥ 2.0
8.7	to	9.4	Increment ≥ 1.9
9.5	to	10.2	Increment ≥ 1.8
10.3	to	11.0	Increment ≥ 1.7
11.1	to	11.8	Increment ≥ 1.6
11.9	to	12.6	Increment ≥ 1.5
12.7	to	13.4	Increment ≥ 1.4
13.5	to	14.2	Increment ≥ 1.3
14.3	to	15.0	Increment ≥ 1.2
15.1	to	15.8	Increment ≥ 1.1
15.9	to	16.6	Increment ≥ 1.0
16.7	to	17.4	Increment ≥ 0.9
17.5	to	18.2	Increment ≥ 0.8
18.3	to	19.0	Increment ≥ 0.7
> 19.0			Increment ≥ 0.6

Source: *CEQR Technical Manual*

Corner Areas and Crosswalks

For non-CBD areas of Manhattan, *CEQR Technical Manual* criteria define a significant adverse corner area or crosswalk impact to have occurred if the average pedestrian space under the No-Action condition is greater than 26.6 square feet/pedestrian (sf/ped) and, under the With-Action condition, the average pedestrian space decreases to 24 sf/ped or less (LOS D or worse). If the pedestrian space under the With-Action condition is greater than 24 sf/ped (LOS C or better), the impact should not be considered significant. If the average pedestrian space under the No-Action condition is between 5.1 and 26.6 sf/ped, a decrease in pedestrian space under the With-Action condition should be considered significant based on

Table 10-31 which shows a sliding-scale that identifies what decrease in pedestrian space is considered a significant impact for a given amount of pedestrian space in the No-Action condition. If the decrease in pedestrian space is less than the value in Table 10-31, the impact is not considered significant. If the average pedestrian space under the No-Action condition is less than 5.1 sf/ped, then a decrease in pedestrian space greater than or equal to 0.2 sf/ped should be considered significant.

TABLE 10-31
Significant Impact Criteria for Corners and Crosswalks in a Non-CBD Location

No-Action Condition Pedestrian Space (sf/ped)			With-Action Condition Pedestrian Space Reduction to be Considered a Significant Impact (sf/ped)
> 26.6			With Action Condition ≤ 24.0
25.8	to	26.6	Reduction ≥ 2.6
24.9	to	25.7	Reduction ≥ 2.5
24.0	to	24.8	Reduction ≥ 2.4
23.1	to	23.9	Reduction ≥ 2.3
22.2	to	23.0	Reduction ≥ 2.2
21.3	to	22.1	Reduction ≥ 2.1
20.4	to	21.2	Reduction ≥ 2.0
19.5	to	20.3	Reduction ≥ 1.9
18.6	to	19.4	Reduction ≥ 1.8
17.7	to	18.5	Reduction ≥ 1.7
16.8	to	17.6	Reduction ≥ 1.6
15.9	to	16.7	Reduction ≥ 1.5
15.0	to	15.8	Reduction ≥ 1.4
14.1	to	14.9	Reduction ≥ 1.3
13.2	to	14.0	Reduction ≥ 1.2
12.3	to	13.1	Reduction ≥ 1.1
11.4	to	12.2	Reduction ≥ 1.0
10.5	to	11.3	Reduction ≥ 0.9
9.6	to	10.4	Reduction ≥ 0.8
8.7	to	9.5	Reduction ≥ 0.7
7.8	to	8.6	Reduction ≥ 0.6
6.9	to	7.7	Reduction ≥ 0.5
6.0	to	6.8	Reduction ≥ 0.4
5.1	to	5.9	Reduction ≥ 0.3
< 5.1			Reduction ≥ 0.2

Source: *CEQR Technical Manual*

As shown, all analyzed pedestrian facilities are projected to operate at an acceptable LOS B or better in all peak periods in the With-Action condition. This reflects both the lightly travelled area sidewalks along with the distribution of pedestrian demands in the study area. Therefore, under *CEQR Technical Manual* criteria, the Proposed Action would not result in any significant adverse pedestrian impacts at any sidewalks, corners or crosswalks in the study area.

G. VEHICULAR AND PEDESTRIAN SAFETY EVALUATION

Under *CEQR Technical Manual* guidelines, an evaluation of vehicular and pedestrian safety is needed for locations within the traffic and pedestrian study areas that have been identified as high accident locations. These are defined as locations where 48 or more total reportable and non-reportable crashes or five or more pedestrian/bicyclist injury crashes have occurred in any consecutive 12 months of the most recent three-year period for which data are available. (Reportable accidents are defined as those involving injuries, fatalities, and/or $1,000 or more in property damage.)

Table 10-32 shows summary accident data for the years 2008 through 2010 that were obtained from the New York City Department of Transportation. This is the most recent three year period for which data are available. The table shows the total number of reportable and non-reportable crashes each year and the numbers of crashes each year involving pedestrians and cyclists at intersections in proximity to the rezoning area. No intersections were found to have experienced a total of 48 or more crashes in any one year. However, as shown in Table 10-32, one intersection experienced five or more pedestrian and/or bicyclist injury crashes in one or more years and are therefore considered high accident locations. This location is the Flushing Avenue/Evergreen Avenue intersection. At all other locations, the number of pedestrian/bicyclist injury crashes per year totaled four or fewer during the 2008 through 2010 period.

The Flushing Avenue/Evergreen Avenue intersection is signal controlled. From 2008 thru 2010, Table 10-32 shows that there were a total of 7 pedestrian/bicycle accidents, with 5 such accidents in 2010. Evergreen Avenue is one-way northbound while Flushing Avenue has two-way operation. Field visits to the intersection show that two of the crosswalks are high-visibility due to the nearby school along Evergreen Avenue. The intersection has street lights on two corners and sidewalks are of adequate width. The only "non-standard" item noted was a street tree on Evergreen Avenue in close proximity (at the stop bar) to the intersection.

A review of the three pedestrian accidents in 2010 indicates two occurred at night. All three pedestrian accidents occurred while crossing with the signal, while one of the two bicycle accidents occurred while riding against traffic.

The proposed rezoning would increase pedestrian flows at this Flushing Avenue/Evergreen Avenue intersections (see Table 10-27) while the street network changes would marginally reduce overall traffic (see Figure 10-1) at this intersection. As the development would not measurably change operating conditions at this location, the proposed project would not affect safety at this location. However, in conjunction with the NYCDOT reviews/coordination required to construct the new Stanwix and Noll Streets, change street directions and install new signalization, the Applicant would also coordinate with NYCDOT regarding monitoring of the post-2010 accident records, to insure appropriate safety measures are implemented, if needed at the Flushing Avenue/Evergreen Avenue intersection.

Table 10-32
Summary Motor Vehicle Accident Data 2008-2010

Intersection		Pedestrains Injury Accidents			Bicycle Injury Accidents			Total Pedestrian/Bicyclist Injury Accidents			Total Accidents (Reportable + Non-Reportable)		
		2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
Flushing Ave @	Beaver Street	1	0	1	1	1	1	2	1	2	5	2	2
	Garden Street	1	0	0	0	0	0	1	0	0	4	2	1
	Stanwix St	0	0	0	0	0	0	0	0	0	0	1	0
	Evergreen Ave	0	1	3	0	1	2	0	2	5*	0	2	8
Bushwick Ave @	Flushing Ave	0	1	1	0	3	1	0	4	2	5	8	10
	Montieth Street	0	0	0	1	0	0	1	0	0	1	0	2
	Forrest Street	0	2	0	1	0	0	1	2	0	5	5	1
	Arion Pl/Beaver St	0	0	0	0	0	0	0	0	0	0	0	1
	Melrose Street	1	0	1	1	0	0	2	0	1	3	1	2
	Jefferson Street	0	0	0	0	0	0	0	0	0	3	2	6
Stanwix St @	Noll Street	1	0	0	0	0	0	1	0	0	1	0	0
	Jefferson Street	0	0	0	0	0	0	0	0	0	1	0	0

Notes:
* Denotes 48 or more total reportable and non-reportable crashes or five or more total pedestrian and/or bicycle injury accidents at an intersection in one year.
Source: NYCDOT data.