Chapter 16: Transit and Pedestrians

A. INTRODUCTION

This chapter assesses the potential impacts resulting from the proposed action on transit and pedestrian facilities in the vicinity of the project site. As detailed below, the proposed action would result in significant adverse pedestrian impacts on the north crosswalk at Columbus Avenue and West 60th Street during the PM and evening pre-theater peak hours in 2032. Potential measures to mitigate these projected significant adverse impacts are described in Chapter 21, "Mitigation."

B. METHODOLOGY

The *City Environmental Quality Review (CEQR) Technical Manual* provides criteria to determine whether transit and pedestrian analyses are necessary for a proposed action based on the number of new trips that it would generate. If a project's travel demand forecast is below the CEQR screening thresholds, as summarized below, it is generally considered unlikely for the project-generated trips to result in significant adverse impacts. Hence, a detailed analysis would not be required.

- For subway station elements, detailed analysis is considered appropriate if an action would generate more than 200 peak hour trips at a single subway station entrance or control area.
- For buses, detailed analysis is considered appropriate if an action would generate more than 200 peak hour trips.
- For sidewalks, crosswalks, and corner reservoirs, detailed analysis is considered appropriate if an action would generate more than 200 peak hour trips at a single location (sidewalk, corner, or crosswalk).

As described in Chapter 15, "Traffic and Parking," a travel demand projection was developed to identify the transportation elements likely to be affected by the proposed action. Based on criteria specified in the *CEQR Technical Manual*, it was determined that a quantified assessment of subway station elements and pedestrian circulation would be required. Since the estimated trips generated by the proposed action would not exceed impact thresholds for subway line-haul or bus line-haul during any time period, these elements were not analyzed.

SUBWAY SERVICE

To assess subway stairway operations, the user volume is compared to the element's design capacity, resulting in a volume-to-capacity (v/c) ratio. For stairways, the design capacity considers the effective width of a tread, which accounts for railings or other obstructions, the friction between upward and downward patrons, and the average area required for circulation. For control area elements, capacity is measured by the number of an element and the New York City Transit (NYCT) optimum capacity per element. For both stairways and control area elements, volumes and capacities are presented for 15-minute intervals.

The estimated v/c ratio is compared to NYCT criteria to determine a level of service (LOS) for the operation of an element. This v/c ratio is also commonly referred to as V/SVCD, where SVCD is the service volume at LOS C/D. Table 16-1 shows the LOS and corresponding v/c ratios for subway station elements.

Table 16-1
Level of Service Criteria for Subway Station Elements

LOS	V/C Ratio	
	Stairways	Turnstiles/Gates
A	0.00 to 0.45	0.00 to 0.20
B	0.45 to 0.70	0.20 to 0.40
C	0.70 to 1.00	0.40 to 0.60
D	1.00 to 1.33	0.60 to 0.80
E	1.33 to 1.67	0.80 to 1.00
F	1.67 or Greater	Greater than 1.00

Source: New York City Mayor's Office of Environmental Coordination, *CEQR Technical Manual* (December 2001).

For stairways, at LOS A and B, there is sufficient area to allow pedestrians to freely select their walking speed and bypass slower pedestrians. When cross and reverse flow movement exists, only minor conflicts may occur. At LOS C, movement is fluid although somewhat restricted. While there is sufficient room for standing without personal contact, circulation through queuing areas may require adjustments to walking speed. At LOS D, walking speed is restricted and reduced. Reverse and cross flow movement is severely restricted because of congestion and the difficult passage of slower moving pedestrians. At LOS E and F, walking speed is restricted. There is also insufficient area to bypass others, and opposing movement is difficult. Often, forward progress is achievable only through shuffling, with queues forming.

The determination of significant impacts for station elements varies based on their type and use. For stairways, impacts are considered significant based on the minimum amount of additional capacity, which would mitigate the location to its No Build or LOS C/D operating conditions. For a location with a Build LOS D, a widening of six inches or more needed to restore future No Build or LOS C/D conditions is considered significant; for a Build LOS E condition, a widening of three inches or more is considered significant; and for a Build LOS F condition, a widening of 1 inch or more is considered significant. For turnstiles, service gates, and escalators, an increase in volume that results in a v/c ratio of greater than 1.00 may be considered significant, since a value of 1.00 represents the design capacity of the element.

PEDESTRIAN OPERATIONS

The adequacy of the study area's sidewalks, crosswalks, and corner reservoir capacities in relation to the demand imposed on them was assessed using the methodologies presented in the 2000 *Highway Capacity Manual* (HCM 2000). Sidewalks were analyzed in terms of pedestrian flow. The calculation of the average pedestrians per foot per minute (PFM) of effective walkway width is the basis for Level of Service (LOS) analysis. However, due to the tendency of pedestrians to move in congregated groups, a platoon factor (+4 PFM) is applied in the calculation of pedestrian flow to more accurately estimate the dynamics of walking. This procedure generally results in a LOS one level poorer than the average flow.

Crosswalks and street corners are not easily measured in terms of free pedestrian flow, as they are influenced by the effects of traffic signals. Street corners must be able to provide sufficient

space for a mix of standing pedestrians (queued to cross a street) and circulating pedestrians (crossing the street or moving around the corner). The HCM methodologies apply a measure of time and space availability based on the area of the corner, the timing of the intersection signal, and the estimated space used by circulating pedestrians.

The total "time-space" available for these activities is the net area of the corner (in square feet) multiplied by the cycle length, which is expressed in square feet per minute. The analysis then determines the total circulation time for all pedestrian movements at the corner (expressed as pedestrians per minute). The ratio of net time-space divided by pedestrian circulation time provides the LOS measurement of square feet per pedestrian (SFP).

Crosswalk LOS is also a function of time and space. Similar to the street corner analysis, crosswalk conditions are first expressed as a measurement of the available area (the crosswalk width multiplied by the width of the street) and the permitted crossing time. This measure is expressed in square feet per minute. The average time required for a pedestrian to cross the street is calculated based on the width of the street and an assumed walking speed. The ratio of time-space available in the crosswalk to the average crossing time is the LOS measurement of available square feet per pedestrian. The LOS analysis also accounts for vehicular turning movements that traverse the crosswalk.

Table 16-2 shows the LOS standards for sidewalks, corner reservoirs, and crosswalks.

Table 16-2
Level of Service Criteria for Pedestrian Elements

LOS	Sidewalks	Corner Reservoirs and Crosswalks
A	5 PFM or less	60 SFP or More
B	5 to 7 PFM	40 to 60 SFP
C	7 to 10 PFM	24 to 40 SFP
D	10 to 15 PFM	15 to 24 SFP
E	15 to 23 PFM	8 to 15 SFP
F	More than 23 PFM	Less than 8 SFP

Notes:
PFM = pedestrians per foot per minute.
SFP = square feet per pedestrian.
Source: New York City Mayor's Office of Environmental Coordination, *CEQR Technical Manual* (December 2001).

The *CEQR Technical Manual* specifies that a LOS D condition or better is considered reasonable for sidewalks, corner reservoirs, and crosswalks within the Manhattan Central Business District (CBD), which is in the project study area. For crosswalks and corner reservoirs, a LOS D condition requires a minimum of 15 SFP, while for sidewalks, a LOS D condition requires a maximum of 15 PFM.

For areas similar to the study area, project-related sidewalk impacts are considered significant and require examination of mitigation if there is an increase of 2 PFM over No Build conditions that are characterized by flow rates greater than 15 PFM (LOS D). For corners and crosswalks, a decrease of 1 SFP under the Build condition when the No Build condition has an average occupancy of less than 15 SFP (LOS D) is considered significant. However, if there is less than a 200-person increase at a location within the peak hour, any impact is not considered significant, since such increases would not typically be perceptible.

C. EXISTING CONDITIONS

Facilities determined for analysis reflect the likely points of access to the project site for transit riders and pedestrians. A detailed transit analysis was conducted for two NYCT subway stations and for three peak periods—weekday AM, PM, and pre-theater. The assessment of pedestrian circulation considers three intersections and eight midblock sidewalks. This assessment was prepared for four peak periods—weekday AM, midday, PM, and pre-theater. These respective analysis time periods were selected based on travel characteristics of Fordham University users and background conditions in the study area. Existing transit and pedestrian levels are based on volumes collected during field surveys conducted on November 15 and 21, 2006.

TRANSIT SERVICE IN STUDY AREA

The Fordham University project site is located in the Lincoln Square neighborhood in Manhattan and is served by numerous NYCT subway and bus routes. A description of each of these transit modes and how they would be affected by trips associated with the proposed action is provided below. The Metropolitan Transportation Authority (MTA) has recently approved a plan to reduce its projected budget deficit. This plan may result in fare increases and service reductions or eliminations that could impact subway and bus routes within the transit study area. These service cuts, however, would affect primarily off-peak service and routes that are considered redundant or low performing. Potential actions by the state legislature could affect the actual implementation of these announced fare increases and service cuts.

SUBWAY SERVICE

The transit study area includes the 59th Street-Columbus Circle Station (A/B/C/D/1) and the 66th Street-Lincoln Center Station (No.1 line), as shown in Figure 16-1.

A/C/B/D Subway Lines

- The A and C trains operate primarily along Central Park West and Eighth Avenue in Manhattan, with the A train serving only express stops. Both trains operate between Upper Manhattan and northeastern Brooklyn or southeastern Queens, with the C train terminating at Euclid Avenue in Brooklyn and the A train extending to the Rockaways in Queens. The B and D trains operate primarily along Sixth Avenue and Central Park West in Manhattan. The D train provides express service at all times between the Bronx and Coney Island. The B train operates on weekdays only between the Bronx and Brighton Beach during peak hours, but terminates at West 145th Street in Manhattan during off-peak hours.

No. 1 Subway Line

- The No. 1 line, which serves stations primarily along Broadway and Seventh Avenue in Manhattan, operates between Van Cortlandt Park in the Bronx and South Ferry in Manhattan.

BUS SERVICE

The local bus routes that provide regular service to the study area are shown in Figure 16-2. The M5, M7, M11, M20, M57, M66, M72, and M104 use standard buses with a guideline capacity of 54 passengers per bus. The M31 uses articulated buses with a guideline capacity of 93

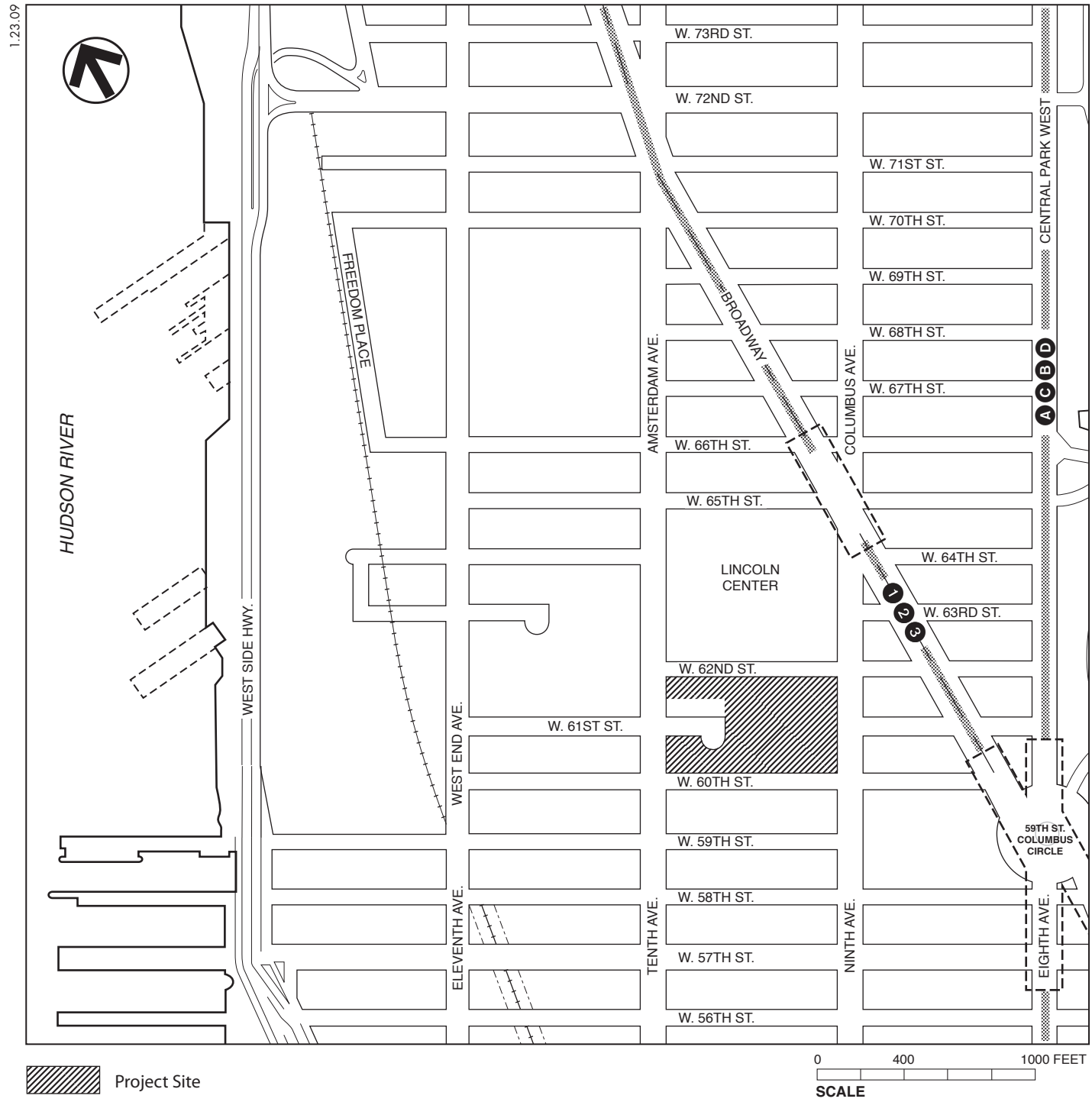

Figure 16-1
Study Area Subway Facilities

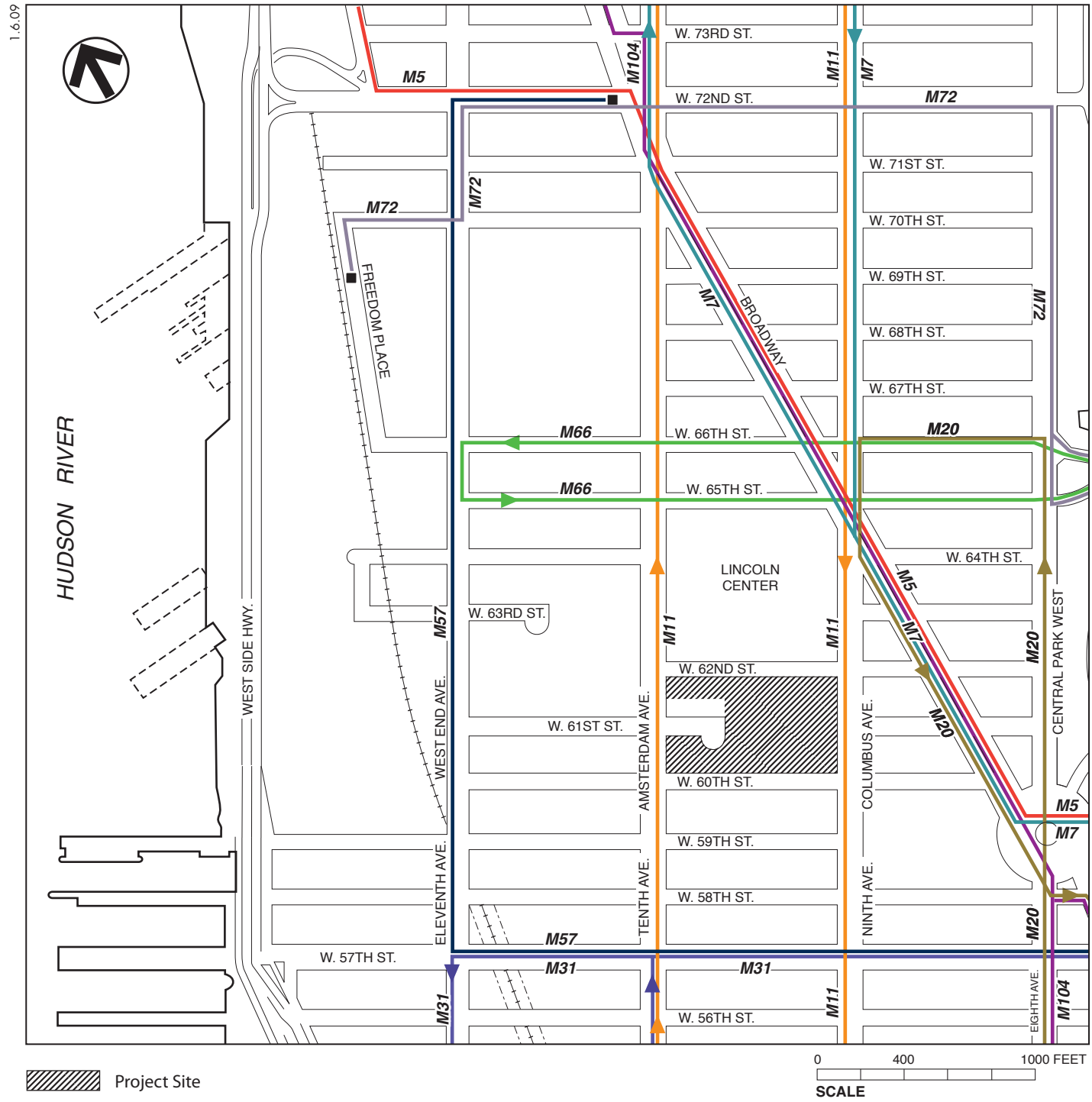

Figure 16-2
Study Area Bus Routes

passengers per bus. Table 16-3 provides a summary of the NYCT local bus routes and their weekday frequencies of operation.

Table 16-3
NYCT Local Bus Routes Serving The Study Area

Bus Route	Start Point	End Point	Routing	Frequency of Bus Service (Headway in Minutes)			
				AM	Midday	PM	Evening
M5	Washington Heights	Greenwich Village	Via Broadway, Riverside Dr, and 5th Avenue	10	10	10	12
M7	Harlem	Union Square	Columbus Ave & Broadway	10	8	8	12
M11	Bethune/ Hudson St	W. 145th St/ Riverside Dr	Via Amsterdam & Columbus Ave	10	7	9	10
M20	Lincoln Center	Battery Park City	Broadway	20	12	12	15
M31	Yorkville	Clinton	Via York Avenue/57th Street	5	8	8	9
M57	Upper West Side	East Midtown	Via 57th Street	9	10	9	9
M66	Upper East side	Upper West side	Via 65th to 68th Streets	6	8	6	9
M72	Upper East side	Upper West side	Via 72nd Street	10	10	10	10
M104	Harlem	Murray Hill*	Broadway & 42nd Street	7	6	6	10

Source: NYCT, Manhattan Bus Timetable (2007/2008).
Notes: Under the recently approved MTA plan, the end point of the M104 bus route (*) could be changed from Murray Hill to Times Square. Furthermore, operating hours of the M11 and M20 routes could reduce and overnight service on the M66 and M104 routes could be eliminated.

SUBWAY STATION OPERATIONS

An analysis of stairway and control area operations was conducted for the 59th Street-Columbus Circle Station and the 66th Street-Lincoln Center Station. Since these stations have multiple entrances and control areas, quantified analyses were limited to the elements that would be most heavily used by trips to and from the project site. At the 59th Street-Columbus Circle Station, the S3 stairway located at the south center median along Broadway at West 60th Street, the M16-B stairway located on the southeast corner of Broadway and West 60th Street, and the N49 control area, to which the M16-B stairway connects, were analyzed. The N49 control area includes two high exit gates, a service gate, and five two-way turnstiles. At the 66th Street-Lincoln Center Station, the West 64th Street stairway and the R160AK control area were analyzed. The R160AK control area includes two high entry/exit gates and five two-way turnstiles.

Table 16-4 summarizes the existing AM, PM, and pre-theater peak hour operating levels for the various vertical circulation elements, while Table 16-5 shows the existing operation of turnstiles and high entry/exit gates at the corresponding station control areas. Service levels for the station elements identified are based on peak 15-minute volumes developed from the manual counts. The results show that all stairways and control areas currently operate at acceptable LOS C or better during the AM, PM, and pre-theater peak periods, except for the M16-B stairway, which operates at LOS D during the AM peak period, and the S3 stairway, which operates at LOS D during the PM peak period.

Table 16-4
2007 Existing Conditions: Subway Station Vertical Circulation Analysis

Stairways	Width (feet)	Effective Width (feet)	15-Minute Pedestrian Volumes Up	15-Minute Pedestrian Volumes Down	Friction Factor	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	147	41	0.80	600	0.31	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B Columbus Circle- 60th St and Broadway	8.3	6.3	676	97	0.80	756	1.02	D
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	237	154	0.90	540	0.72	C
PM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	86	64	0.90	675	0.22	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B Columbus Circle- 60th St and Broadway	8.3	6.3	292	498	0.90	851	0.93	C
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	81	423	0.80	480	1.05	D
Pre-Theater Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	74	57	0.90	675	0.19	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B Columbus Circle- 60th St and Broadway	8.3	6.3	456	336	0.90	851	0.93	C
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	141	283	0.90	540	0.79	C

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001) in accordance with the *CEQR Technical Manual.*

Table 16-5
2007 Existing Conditions: Subway Station Control Area Analysis

Station Elements	Quantity	15-Minute Pedestrian Volumes In	15-Minute Pedestrian Volumes Out	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	17	40	600	0.10	A
Two-Way Turnstiles	5	44	238	2400	0.12	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Metro-Card Gate (HEET) Exit only	2	0	250	600	0.42	C
Service Gate	1	6	3	750	0.01	A
Two-Way Turnstiles	5	157	366	2400	0.22	B
PM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	27	51	600	0.13	A
Two-Way Turnstiles	5	125	112	2400	0.10	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Metro-Card Gate (HEET) Exit only	2	0	215	600	0.36	B
Service Gate	1	9	9	750	0.02	A
Two-Way Turnstiles	5	517	193	2400	0.30	B
Pre-Theater Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	1	171	600	0.29	B
Two-Way Turnstiles	5	76	142	2400	0.09	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Metro-Card Gate (HEET) Exit only	2	0	332	600	0.55	C
Service Gate	1	25	8	750	0.04	A
Two-Way Turnstiles	5	460	310	2400	0.32	B

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001), in accordance with the *CEQR Technical Manual*.

PEDESTRIAN CIRCULATION

The pedestrian study area considers the sidewalks, corner reservoirs, and crosswalks that would be most affected by new trips generated by the proposed action. Since the majority of Fordham University trips are made via subway, the pedestrian study area includes primarily elements along logical routes to the two nearby subways stations. The resultant study area includes three intersections along Broadway and Columbus Avenue between West 60th and West 62nd Street, along with these intersections' adjoining sidewalks.

The study area sidewalks, corner reservoirs, and crosswalks were assessed for the AM, midday, PM, and pre-theater peak periods. As shown in Tables 16-6 through 16-8, all analysis locations operate at acceptable LOS D or better during all analysis time periods.

Table 16-6
2007 Existing Conditions: Pedestrian LOS Analysis for Sidewalks

Location	Sidewalk	Effective Width (feet)	15-Minute Two-Way Volume	Average		Platoon	
				PFM	LOS	PFM	LOS
AM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	68	0.5	A	4.5	A
Columbus Avenue between 61st Street and 60th Street	East	8	54	0.5	A	4.5	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	56	0.4	A	4.4	A
	South	4	420	7.0	C	11.0	D
60th Street between Columbus Avenue and Broadway	North	7	82	0.8	A	4.8	A
	South	9.5	557	3.9	A	7.9	C
Columbus Avenue between 60th Street and 59th Street	West	11	159	1.0	A	5.0	A
	East	12	169	0.9	A	4.9	A
Midday Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	119	0.9	A	4.9	A
Columbus Avenue between 61st Street and 60th Street	East	8	110	0.9	A	4.9	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	48	0.4	A	4.4	A
	South	4	117	2.0	A	6.0	B
60th Street between Columbus Avenue and Broadway	North	7	121	1.2	A	5.2	B
	South	9.5	518	3.6	A	7.6	C
Columbus Avenue between 60th Street and 59th Street	West	11	312	1.9	A	5.9	B
	East	12	263	1.5	A	5.5	B
PM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	190	1.4	A	5.4	B
Columbus Avenue between 61st Street and 60th Street	East	8	156	1.3	A	5.3	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	55	0.4	A	4.4	A
	South	4	158	2.6	A	6.6	B
60th Street between Columbus Avenue and Broadway	North	7	201	1.9	A	5.9	B
	South	9.5	446	3.1	A	7.1	C
Columbus Avenue between 60th Street and 59th Street	West	11	296	1.8	A	5.8	B
	East	12	304	1.7	A	5.7	B
Pre-Theater Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	277	2.1	A	6.1	B
Columbus Avenue between 61st Street and 60th Street	East	8	123	1.0	A	5.0	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	56	0.4	A	4.4	A
	South	4	258	4.3	A	8.3	C
60th Street between Columbus Avenue and Broadway	North	7	151	1.4	A	5.4	B
	South	9.5	604	4.2	A	8.2	C
Columbus Avenue between 60th Street and 59th Street	West	11	301	1.8	A	5.8	B
	East	12	288	1.6	A	5.6	B

Note: PFM = pedestrians per foot per minute

Table 16-7
2007 Existing Conditions: Pedestrian LOS Analysis for Corner Reservoirs

Locations	Corner	AM		Midday		PM		Pre-Theater	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	Northeast	485.5	A	454.8	A	279.6	A	257.2	A
	Southeast	1303.3	A	1085.2	A	850.7	A	857.9	A
	Southwest	301.8	A	206.0	A	170.1	A	219.2	A
	Northwest	709.8	A	489.4	A	349.0	A	354.5	A
Columbus Avenue and W.60th Street	Northeast	203.9	A	82.9	A	71.5	A	78.5	A
	Southeast	113.6	A	153.7	A	117.1	A	121.8	A
	Southwest	53.6	B	51.1	B	42.0	B	31.4	C
	Northwest	401.9	A	146.9	A	131.9	A	97.1	A
Broadway and W.60th Street	Southwest	79.3	A	72.7	A	49.5	B	58.7	B
	Northwest	114.0	A	114.1	A	80.1	A	93.0	A

Note: SFP = square feet per pedestrian

Table 16-8
2007 Existing Conditions: Pedestrian LOS Analysis for Crosswalks

Location	Crosswalk	Street Width (feet)	Crosswalk Width (feet)	Conditions with Conflicting Vehicles							
				AM		Midday		PM		Pre-Theater	
				SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	North	64.0	14.0	261.0	A	217.2	A	109.0	A	110.0	A
	East	39.0	16.0	315.3	A	304.6	A	203.6	A	179.9	A
	South	70.0	14.0	176.0	A	138.2	A	106.9	A	159.4	A
	West	55.0	16.0	227.8	A	138.4	A	114.6	A	122.6	A
Columbus Avenue and W.60th Street	North	67.0	15.0	132.1	A	57.5	B	51.0	B	55.8	B
	East	49.0	19.5	235.7	A	93.6	A	88.4	A	86.6	A
	South	60.5	12.0	12.8	E	26.7	C	19.3	D	19.5	D
	West	51.5	13.0	141.9	A	45.4	B	41.3	B	23.2	D
Broadway and W.60th Street	North	102.0	40.0	56.1	B	185.8	A	79.4	A	56.1	B
	Southeast	39.5	40.0	31.2	C	35.5	C	26.9	C	25.4	C
	Southwest	40.5	40.0	19.9	D	23.5	D	16.5	D	16.6	D
	West	49.0	14.0	44.4	B	29.2	C	23.1	D	31.5	C

Note: SFP = square feet per pedestrian

D. THE FUTURE WITHOUT THE PROPOSED ACTION—2014

Transit and pedestrian conditions in the 2014 future without the proposed action were assessed to establish a baseline, or the 2014 No Build condition, against which the potential project impacts were evaluated. This analysis incorporates general background growth and the effects of nearby developments (as described in Chapter 15, "Traffic and Parking") that may affect transit service and pedestrian movements in the study area.

CHANGES IN THE TRANSIT ENVIRONMENT

59TH STREET-COLUMBUS CIRCLE STATION REHABILITATION

- Two new subway entrances (stairways S6 and S7) at the northwest corner of Broadway and West 60th Street for the southbound number 1 subway line will be completed by 2014. These new stairways would result in a reassignment of some subway riders away from the median stairway and dispersion of pedestrian flow at the intersection's south and west crosswalks and southwest corner. This redistribution of pedestrian trips and the new southern S6 stairway, as well as the connecting control area, were incorporated into the No Build analysis.

- In addition, the station rehabilitation would widen the M-16 stairway at the southeast corner of Broadway and West 60th Street from 6.3 to 14.8 feet. The new stairway would be renamed as M-17. Connecting to this street-level subway access, the N49 control area will also be reconfigured with increased capacity.

TRANSIT AND PEDESTRIAN VOLUME PROJECTIONS

Future No Build peak hour transit and pedestrian levels were estimated by first applying a background growth of 0.5 percent per year (as recommended by the *CEQR Technical Manual*), for a total of 3.5 percent by 2014. A number of nearby projects, as detailed in Chapter 15, "Traffic and Parking," would also be completed and generate new transit and pedestrian trips in the study area. Depending on the specific locations of these "No Build" projects, the relevant trips were assigned to the study area transit and pedestrian analysis locations.

SUBWAY STATION OPERATIONS

Future No Build peak 15-minute volumes were computed by adding the discrete trips associated with the nearby No Build projects, as well as general background growth to the existing subway station volumes, and by redistributing some of the existing S3 stairway volumes to the new S6 stairway. Tables 16-9 and 16-10 summarize the 2014 No Build peak period operating levels for the station elements at the 59th Street-Columbus Circle Station and the 66th Street-Lincoln Center Station. With the station improvements described above, all analyzed stairways and control areas would operate at acceptable levels.

Table 16-9
2014 No Build Condition: Subway Station Vertical Circulation Analysis

Stairways	Width (feet)	Effective Width (feet)	15-Minute Pedestrian Volumes Up	15-Minute Pedestrian Volumes Down	Friction Factor	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	196	50	0.80	600	0.41	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17)[1] Columbus Circle- 60th St and Broadway	18.3	14.8	758	129	0.80	1770	0.50	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	82	47	0.90	540	0.24	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	371	242	0.90	945	0.65	B
PM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	107	108	0.90	675	0.32	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17) Columbus Circle- 60th St and Broadway	18.3	14.8	368	657	0.90	1991	0.51	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	29	126	0.80	480	0.32	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	90	388	0.80	840	0.57	B
Pre-Theater Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	84	97	0.90	675	0.27	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17) Columbus Circle- 60th St and Broadway	18.3	14.8	518	448	0.90	1991	0.49	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	42	85	0.90	540	0.24	A
S6 Columbus Circle- 60th St and Broadway NW	7.0	6.0	127	264	0.80	840	0.47	B

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001) in accordance with the *CEQR Technical Manual*.
[1] M-17 replaces M16-B in No Build condition.

Table 16-10
2014 No Build Condition: Subway Station Control Area Analysis

Station Elements	Quantity	15-Minute Pedestrian Volumes In	15-Minute Pedestrian Volumes Out	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	20	48	600	0.11	A
Two-Way Turnstiles	5	51	284	2400	0.14	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	7	3	750	0.01	A
Two-Way Turnstiles	10	190	696	4800	0.18	A
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	242	371	900	0.68	D
PM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	36	58	600	0.16	A
Two-Way Turnstiles	5	164	128	2400	0.12	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	12	10	750	0.03	A
Two-Way Turnstiles	10	674	487	4800	0.24	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	388	90	900	0.53	C
Pre-Theater Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	1	181	600	0.30	B
Two-Way Turnstiles	5	116	150	2400	0.11	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	31	9	750	0.05	A
Two-Way Turnstiles	10	571	710	4800	0.27	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	264	127	900	0.43	C

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001), in accordance with the *CEQR Technical Manual*.

PEDESTRIAN CIRCULATION

Trips associated with general background growth and new developments in the study area were overlaid onto the existing pedestrian networks. In addition, pedestrian trips were redistributed to account for the new S6 and S7 stairways to generate No Build peak period volumes for analysis. As shown in Tables 16-11, 16-12, and 16-13, all study area sidewalks, corners, and crosswalks would continue to operate at acceptable LOS D or better in the 2014 No Build condition, with the exception of the north and south crosswalks at Columbus Avenue and West 60th Street. The north crosswalk would deteriorate to E during the AM, PM, and pre-theater peak periods, with average pedestrian space of 14.1, 12.3, and 13.2 SFP, respectively. The south crosswalk would deteriorate to LOS F, with an average pedestrian space of 5.6 SFP during the AM peak period and to LOS E, with average pedestrian space of 13.6, 10.8, and 11.1 SFP during the midday, PM, and pre-theater peak periods, respectively.

Table 16-11
2014 No Build Condition: Pedestrian LOS Analysis for Sidewalks

Location	Sidewalk	Effective Width (feet)	15-Minute Two-Way Volume	Average		Platoon	
				PFM	LOS	PFM	LOS
AM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	74	0.5	A	4.5	A
Columbus Avenue between 61st Street and 60th Street	East	8	56	0.5	A	4.5	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	478	3.5	A	7.5	C
	South	4	576	9.6	C	13.6	D
60th Street between Columbus Avenue and Broadway	North	7	568	5.4	B	9.4	C
	South	9.5	557	3.9	A	7.9	C
Columbus Avenue between 60th Street and 59th Street	West	11	168	1.0	A	5.0	B
	East	12	181	1.0	A	5.0	B
Midday Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	125	0.9	A	4.9	A
Columbus Avenue between 61st Street and 60th Street	East	8	113	0.9	A	4.9	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	267	2.0	A	6.0	B
	South	4	202	3.4	A	7.4	C
60th Street between Columbus Avenue and Broadway	North	7	430	4.1	A	8.1	C
	South	9.5	501	3.5	A	7.5	C
Columbus Avenue between 60th Street and 59th Street	West	11	324	2.0	A	6.0	B
	East	12	274	1.5	A	5.5	B
PM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	200	1.5	A	5.5	B
Columbus Avenue between 61st Street and 60th Street	East	8	161	1.3	A	5.3	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	441	3.3	A	7.3	C
	South	4	237	4.0	A	8.0	C
60th Street between Columbus Avenue and Broadway	North	7	753	7.2	C	11.2	D
	South	9.5	354	2.5	A	6.5	B
Columbus Avenue between 60th Street and 59th Street	West	11	310	1.9	A	5.9	B
	East	12	320	1.8	A	5.8	B
Pre-Theater Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	292	2.2	A	6.2	B
Columbus Avenue between 61st Street and 60th Street	East	8	127	1.1	A	5.1	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	420	3.1	A	7.1	C
	South	4	354	5.9	B	9.9	C
60th Street between Columbus Avenue and Broadway	North	7	667	6.4	B	10.4	D
	South	9.5	526	3.7	A	7.7	C
Columbus Avenue between 60th Street and 59th Street	West	11	316	1.9	A	5.9	B
	East	12	306	1.7	A	5.7	B

Note: PFM = pedestrians per foot per minute

Table 16-12
2014 No Build Condition: Pedestrian LOS Analysis for Corner Reservoirs

Locations	Corner	AM		Midday		PM		Pre-Theater	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	Northeast	409.9	A	426.2	A	250.7	A	231.0	A
	Southeast	1100.7	A	1011.8	A	758.9	A	752.0	A
	Southwest	202.7	A	174.7	A	129.4	A	150.5	A
	Northwest	448.8	A	403.6	A	259.4	A	253.5	A
Columbus Avenue and W.60th Street	Northeast	41.3	B	40.4	B	25.3	C	27.4	C
	Southeast	88.2	A	130.3	A	100.8	A	102.2	A
	Southwest	37.3	C	43.3	B	39.3	C	27.9	C
	Northwest	80.6	A	82.3	A	63.7	A	54.3	B
Broadway and W.60th Street	Southwest	89.0	A	91.7	A	67.4	A	72.5	A
	Northwest	59.7	B	80.4	A	50.4	B	53.4	B

Note: SFP = square feet per pedestrian

Table 16-13
2014 No Build Condition: Pedestrian LOS Analysis for Crosswalks

Location	Crosswalk	Street Width (feet)	Crosswalk Width (feet)	Conditions with Conflicting Vehicles							
				AM		Midday		PM		Pre-theater	
				SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	North	64	14	207.0	A	200.7	A	96.8	A	97.8	A
	East	39	16	266.8	A	284.7	A	182.1	A	161.4	A
	South	70	14	137.1	A	124.3	A	89.4	A	125.9	A
	West	55	16	129.0	A	109.9	A	77.3	A	76.8	A
Columbus Avenue and W.60th Street	North	67	15	14.1	E	17.9	D	12.3	E	13.2	E
	East	49	19.5	224.1	A	109.1	A	88.7	A	88.0	A
	South	60.5	12	5.6	F	13.6	E	10.8	E	11.1	E
	West	51.5	13	103.1	A	57.8	B	59.5	B	32.2	C
Broadway and W.60th Street	North	102	40	36.4	C	92.6	A	26.8	C	24.5	C
	Southeast	39.5	40	29.1	C	33.3	C	25.1	C	23.7	D
	Southwest	40.5	40	23.1	D	28.8	C	20.7	D	19.6	D
	West	49	14	47.8	B	36.3	C	29.5	C	35.8	C

Note: SFP = square feet per pedestrian

E. PROBABLE IMPACTS OF THE PROPOSED ACTION—2014

The future 2014 condition with the proposed action ("Build Condition") would exhibit an increase in transit and pedestrian trips attributed to development of Phase I of Fordham University's proposed Master Plan and the projected increases in faculty, administrative staff, and student populations on the Fordham Lincoln Center campus. This section describes the projected travel patterns of these trips and assesses their potential impacts on nearby transit and pedestrian facilities.

TRIP GENERATION AND ASSIGNMENT

The Build transit and pedestrian networks incorporate trips from the project increment and those established for the future No Build condition. As summarized in Chapter 15, "Traffic and Parking," the 2014 Phase I campus expansion would result in 91, 149, and 92 new subway trips during the AM, PM, and pre-theater peak hours, respectively. These trips and those associated with other travel modes that would be using the study area's pedestrian elements were estimated to total 303, 580, 553, and 332 pedestrians during the AM, midday, PM, and pre-theater peak hours, respectively.

SUBWAY STATION OPERATIONS

Peak 15-minute volumes were computed by adding the estimated increments from the proposed action onto the No Build volumes. Tables 16-14 and 16-15 summarize the weekday AM, PM, and pre-theater peak period operating levels for the analyzed subway stairways and control areas, respectively, under the 2014 Build condition. As shown, all analysis elements would continue to operate at acceptable levels; therefore, the proposed action in 2014 would not result in any significant adverse impacts on subway station operations.

Table 16-14
2014 Build Condition: Subway Station Vertical Circulation Analysis

Stairways	Width (feet)	Effective Width (feet)	15-Minute Pedestrian Volumes Up	15-Minute Pedestrian Volumes Down	Friction Factor	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	199	57	0.80	600	0.43	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17) [1] Columbus Circle- 60th St and Broadway	18.3	14.8	762	138	0.80	1770	0.51	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	82	47	0.90	540	0.24	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	372	244	0.90	945	0.65	B
PM Peak Period								
64th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	113	112	0.90	675	0.33	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17) [1] Columbus Circle- 60th St and Broadway	18.3	14.8	375	662	0.90	1991	0.52	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	29	126	0.80	480	0.32	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	91	389	0.80	840	0.57	B
Pre-Theater Peak Period								
64th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	90	101	0.90	675	0.28	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17) [1] Columbus Circle- 60th St and Broadway	18.3	14.8	525	453	0.90	1991	0.49	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	42	85	0.90	540	0.24	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	128	265	0.80	840	0.47	B

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001) in accordance with the *CEQR Technical Manual*.
[1] M-17 replaces M16-B in Build condition.

Table 16-15
2014 Build Condition: Subway Station Control Area Analysis

Station Elements	Quantity	15-Minute Pedestrian Volumes In	15-Minute Pedestrian Volumes Out	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	22	48	600	0.12	A
Two-Way Turnstiles	5	56	287	2400	0.14	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	7	3	750	0.01	A
Two-Way Turnstiles	10	199	700	4800	0.19	A
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	244	372	900	0.68	D
PM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	37	60	600	0.16	A
Two-Way Turnstiles	5	167	132	2400	0.12	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	12	10	750	0.03	A
Two-Way Turnstiles	10	679	494	4800	0.24	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	389	91	900	0.53	C
Pre-Theater Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	1	184	600	0.31	B
Two-Way Turnstiles	5	120	153	2400	0.11	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	31	9	750	0.05	A
Two-Way Turnstiles	10	576	717	4800	0.27	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	265	128	900	0.44	C

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001), in accordance with the *CEQR Technical Manual*.

PEDESTRIAN CIRCULATION

The proposed action would result in an increase in pedestrian activities within the study area. Most of these trips, with the exception of those entering or exiting from the campus parking garage and those traveling directly between the dormitory buildings and campus facilities, would appear on the street network and be overlaid onto the No Build pedestrian volumes. Tables 16-16, 16-17, and 16-18 present the Build analysis results for the study area's sidewalks, corners, and crosswalks, respectively. As with the No Build analysis, all study area sidewalks and corners would continue to operate at acceptable LOS D or better in the 2014 Build condition. However, the north and south crosswalks at Columbus Avenue and West 60th Street would continue to operate at congested levels. The average pedestrian space at the north crosswalk would decrease from 14.1 to 13.7 SFP, 12.3 to 11.8 SFP, and 13.2 to 12.8 SFP during the AM, PM, and pre-theater peak periods, respectively. The average pedestrian space at the south crosswalk would remain at comparable levels as the No Build condition during all analysis peak periods. Because the above reductions in pedestrian space are within the CEQR impact threshold of 1 SFP, the proposed action in 2014 would not result in any significant adverse pedestrian impacts.

Table 16-16
2014 Build Condition: Pedestrian LOS Analysis for Sidewalks

Location	Sidewalk	Effective Width (feet)	15-Minute Two-Way Volume	Average		Platoon	
				PFM	LOS	PFM	LOS
AM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	99	0.7	A	4.7	A
Columbus Avenue between 61st Street and 60th Street	East	8	56	0.5	A	4.5	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	469	3.5	A	7.5	C
	South	4	577	9.6	C	13.6	D
60th Street between Columbus Avenue and Broadway	North	7	583	5.6	B	9.6	C
	South	9.5	548	3.8	A	7.8	C
Columbus Avenue between 60th Street and 59th Street	West	11	172	1.0	A	5.0	B
	East	12	183	1.0	A	5.0	B
Midday Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	171	1.3	A	5.3	B
Columbus Avenue between 61st Street and 60th Street	East	8	113	0.9	A	4.9	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	265	2.0	A	6.0	B
	South	4	204	3.4	A	7.4	C
60th Street between Columbus Avenue and Broadway	North	7	460	4.4	A	8.4	C
	South	9.5	499	3.5	A	7.5	C
Columbus Avenue between 60th Street and 59th Street	West	11	331	2.0	A	6.0	B
	East	12	278	1.5	A	5.5	B
PM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	242	1.8	A	5.8	B
Columbus Avenue between 61st Street and 60th Street	East	8	161	1.3	A	5.3	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	433	3.2	A	7.2	C
	South	4	239	4.0	A	8.0	C
60th Street between Columbus Avenue and Broadway	North	7	777	7.4	C	11.4	D
	South	9.5	346	2.4	A	6.4	B
Columbus Avenue between 60th Street and 59th Street	West	11	317	1.9	A	5.9	B
	East	12	324	1.8	A	5.8	B
Pre-Theater Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	331	2.5	A	6.5	B
Columbus Avenue between 61st Street and 60th Street	East	8	127	1.1	A	5.1	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	410	3.0	A	7.0	C
	South	4	356	5.9	B	9.9	C
60th Street between Columbus Avenue and Broadway	North	7	689	6.6	B	10.6	D
	South	9.5	516	3.6	A	7.6	C
Columbus Avenue between 60th Street and 59th Street	West	11	323	2.0	A	6.0	B
	East	12	310	1.7	A	5.7	B

Note: PFM = pedestrians per foot per minute

Table 16-17
2014 Build Condition: Pedestrian LOS Analysis for Corner Reservoirs

Locations	Corner	AM		Midday		PM		Pre-Theater	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	Northeast	396.1	A	404.2	A	242.8	A	225.3	A
	Southeast	1065.8	A	968.1	A	742.1	A	735.5	A
	Southwest	190.1	A	157.8	A	121.5	A	140.9	A
	Northwest	416.4	A	357.0	A	241.1	A	238.2	A
Columbus Avenue and W.60th Street	Northeast	40.4	B	38.3	C	24.6	C	26.7	C
	Southeast	89.0	A	129.8	A	101.5	A	103.1	A
	Southwest	37.4	C	42.2	B	38.9	C	27.8	C
	Northwest	78.7	A	77.5	A	61.2	A	52.6	B
Broadway and W.60th Street	Southwest	89.0	A	91.5	A	67.3	A	72.4	A
	Northwest	58.7	B	77.0	A	49.1	B	52.0	B

Note: SFP = square feet per pedestrian

Table 16-18
2014 Build Condition: Pedestrian LOS Analysis for Crosswalks

Location	Crosswalk	Street Width (feet)	Crosswalk Width (feet)	Conditions with Conflicting Vehicles							
				AM		Midday		PM		Pre-Theater	
				SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	North	64	14	196.8	A	186.6	A	92.2	A	94.3	A
	East	39	16	258.9	A	271.5	A	178.3	A	158.4	A
	South	70	14	129.7	A	116.1	A	84.5	A	119.4	A
	West	55	16	117.4	A	94.5	A	70.6	A	71.0	A
Columbus Avenue and W.60th Street	North	67	15	13.7	E	16.7	D	11.8	E	12.8	E
	East	49	19.5	233.9	A	109.1	A	89.5	A	89.2	A
	South	60.5	12	5.7	F	13.5	E	10.9	E	11.1	E
	West	51.5	13	101.4	A	55.2	B	57.4	B	31.6	C
Broadway and W.60th Street	North	102	40	34.9	C	76.3	A	25.4	C	23.4	D
	Southeast	39.5	40	29.1	C	33.1	C	25.0	C	23.6	D
	Southwest	40.5	40	23.1	D	28.7	C	20.6	D	19.5	D
	West	49	14	47.8	B	36.3	C	29.5	C	35.9	C

Note: SFP = square feet per pedestrian

F. THE FUTURE WITHOUT THE PROPOSED ACTION—2032

As discussed previously, transit and pedestrian conditions in the future without the proposed action were assessed to establish a baseline, or the 2032 No Build condition, against which to evaluate the potential project impacts. The 2032 No Build peak hour transit and pedestrian levels were estimated by first applying a background growth of 0.50 percent per year (as recommended by the *CEQR Technical Manual*), for a total of 12.5 percent by 2032. Trips associated with "No Build" projects were also incorporated and assigned to the study area transit and pedestrian elements.

SUBWAY STATION OPERATIONS

Future No Build peak 15-minute volumes were computed by adding the discrete trips associated with the nearby No Build projects, as well as general background growth to the existing subway station elements, and by redistributing some of the existing S3 stairway volumes to the new S6 and S7 stairways. Tables 16-19 and 16-20 summarize the 2032 No Build peak period operating levels for the station elements at the 59th Street-Columbus Circle Station and the 66th Street-Lincoln Center Station. With the station improvements described above, all analyzed stairways and control areas would operate at acceptable levels.

PEDESTRIAN CIRCULATION

Trips associated with general background growth and new developments in the study area were overlaid onto the existing pedestrian networks. In addition, pedestrian trips were redistributed to account for the new S6 and S7 stairways to generate No Build peak period volumes for analysis. As shown in Tables 16-21, 16-22, and 16-23, all study area sidewalks, corners, and crosswalks would continue to operate at acceptable LOS D or better in the 2032 No Build condition, except for the north and south crosswalks of Columbus Avenue and West 60th Street. The north crosswalk at this intersection would deteriorate to LOS E with average pedestrian space of 13.7, 11.8, and 12.7 SFP during the AM, PM, and pre-theater peak periods, respectively while the south crosswalk would deteriorate to LOS F with average pedestrian space of 4.7 SFP during the AM peak period, and to LOS E with an average pedestrian space of 11.9, 9.5, and 9.8 SFP during the midday, PM, and pre-theater peak periods, respectively.

Table 16-19
2032 No Build Condition: Subway Station Vertical Circulation Analysis

Stairways	Width (feet)	Effective Width (feet)	15-Minute Pedestrian Volumes Up	15-Minute Pedestrian Volumes Down	Friction Factor	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	209	54	0.80	600	0.44	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17)[1] Columbus Circle- 60th St and Broadway	18.3	14.8	807	123	0.80	1770	0.53	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	88	50	0.90	540	0.26	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	324	171	0.90	945	0.52	B
PM Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	115	114	0.90	675	0.34	A
59th Street- Columbus Circle Station (A/B/C/D/1)								
M16-B (M-17)[1] Columbus Circle- 60th St and Broadway	18.3	14.8	395	702	0.90	1991	0.55	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	31	136	0.80	480	0.35	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	96	417	0.80	840	0.61	B
Pre-Theater Peak Period								
66th Street- Lincoln Center Station (1)								
Lincoln Center- 64th Street	6.0	5.0	90	102	0.90	675	0.28	A
59th Street- Columbus Circle Station(A/B/C/D/1)								
M16-B (M-17)[1] Columbus Circle- 60th St and Broadway	18.3	14.8	559	478	0.90	1991	0.52	B
S3 Columbus Circle- 60th St and Broadway Median	5.0	4.0	46	92	0.90	540	0.26	A
S6 Columbus Circle- 60th St and Broadway NW	8.0	7.0	137	283	0.80	840	0.50	B

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001) in accordance with the *CEQR Technical Manual*.

[1] M-17 replaces M16-B in No Build condition.

Table 16-20
2032 No Build Condition: Subway Station Control Area Analysis

Station Elements	Quantity	15-Minute Pedestrian Volumes In	15-Minute Pedestrian Volumes Out	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	21	51	600	0.12	A
Two-Way Turnstiles	5	55	306	2400	0.15	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	8	3	750	0.01	A
Two-Way Turnstiles	10	190	739	4800	0.19	A
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	171	324	900	0.55	C
PM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	38	63	600	0.17	A
Two-Way Turnstiles	5	175	138	2400	0.13	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	13	11	750	0.03	A
Two-Way Turnstiles	10	721	524	4800	0.26	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	417	96	900	0.57	C
Pre-Theater Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	2	196	600	0.33	B
Two-Way Turnstiles	5	123	163	2400	0.12	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	33	9	750	0.06	A
Two-Way Turnstiles	10	613	768	4800	0.29	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	283	137	900	0.47	C

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001), in accordance with the *CEQR Technical Manual*.

Table 16-21
2032 No Build Condition: Pedestrian LOS Analysis for Sidewalks

Location	Sidewalk	Effective Width (feet)	15-Minute Two-Way Volume	Average		Platoon	
				PFM	LOS	PFM	LOS
AM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	81	0.6	A	4.6	A
Columbus Avenue between 61st Street and 60th Street	East	8	61	0.5	A	4.5	A
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	487	3.6	A	7.6	C
	South	4	620	10.3	D	14.3	D
60th Street between Columbus Avenue and Broadway	North	7	586	5.6	B	9.6	C
	South	9.5	601	4.2	A	8.2	C
Columbus Avenue between 60th Street and 59th Street	West	11	182	1.1	A	5.1	B
	East	12	196	1.1	A	5.1	B
Midday Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	136	1.0	A	5.0	B
Columbus Avenue between 61st Street and 60th Street	East	8	124	1.0	A	5.0	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	273	2.0	A	6.0	B
	South	4	215	3.6	A	7.6	C
60th Street between Columbus Avenue and Broadway	North	7	450	4.3	A	8.3	C
	South	9.5	542	3.8	A	7.8	C
Columbus Avenue between 60th Street and 59th Street	West	11	353	2.1	A	6.1	B
	East	12	298	1.7	A	5.7	B
PM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	218	1.6	A	5.6	B
Columbus Avenue between 61st Street and 60th Street	East	8	175	1.5	A	5.5	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	446	3.3	A	7.3	B
	South	4	252	4.2	A	8.2	C
60th Street between Columbus Avenue and Broadway	North	7	785	7.5	C	11.5	D
	South	9.5	381	2.7	A	6.7	B
Columbus Avenue between 60th Street and 59th Street	West	11	338	2.0	A	6.0	B
	East	12	348	1.9	A	5.9	B
Pre-Theater Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	317	2.3	A	6.3	B
Columbus Avenue between 61st Street and 60th Street	East	8	139	1.2	A	5.2	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	426	3.2	A	7.2	C
	South	4	379	6.3	B	10.3	D
60th Street between Columbus Avenue and Broadway	North	7	695	6.6	A	10.6	D
	South	9.5	568	4.0	A	8.0	C
Columbus Avenue between 60th Street and 59th Street	West	11	343	2.1	A	6.1	B
	East	12	331	1.8	A	5.8	B

Note: PFM = pedestrians per foot per minute

Table 16-22
2032 No Build Condition: Pedestrian LOS Analysis for Corner Reservoirs

Locations	Corner	AM		Midday		PM		Pre-Theater	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	Northeast	380.3	A	391.2	A	230.9	A	210.7	A
	Southeast	1025.1	A	941.0	A	695.7	A	693.7	A
	Southwest	191.0	A	162.0	A	120.5	A	141.8	A
	Northwest	425.3	A	373.4	A	243.2	A	237.4	A
Columbus Avenue and W.60th Street	Northeast	39.6	C	37.8	C	23.8	D	25.8	C
	Southeast	81.2	A	120.5	A	93.3	A	94.4	A
	Southwest	34.5	C	39.5	C	36.1	C	25.5	C
	Northwest	77.7	A	77.3	A	60.4	A	51.1	B
Broadway and W.60th Street	Southwest	81.7	A	83.6	A	61.4	A	66.2	A
	Northwest	56.4	B	75.5	A	47.4	B	50.2	B

Note: SFP = square feet per pedestrian

Table 16-23
2032 No Build Condition: Pedestrian LOS Analysis for Crosswalks

Location	Crosswalk	Street Width (feet)	Crosswalk Width (feet)	Conditions with Conflicting Vehicles							
				AM		Midday		PM		Pre-Theater	
				SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	North	64	14	196.8	A	182.2	A	90.0	A	90.0	A
	East	39	16	247.7	A	263.2	A	167.7	A	147.3	A
	South	70	14	127.4	A	114.2	A	80.8	A	116.0	A
	West	55	16	122.4	A	102.1	A	72.4	A	72.4	A
Columbus Avenue and W.60th Street	North	67	15	13.7	E	17.0	D	11.8	E	12.7	E
	East	49	19.5	212.8	A	100.5	A	82.1	A	81.8	A
	South	60.5	12	4.7	F	11.9	E	9.5	E	9.8	E
	West	51.5	13	95.9	A	52.9	B	54.7	B	29.5	C
Broadway and W.60th Street	North	102	40	34.4	C	88.8	A	25.9	C	23.5	D
	Southeast	39.5	40	26.8	C	30.4	C	22.9	D	21.7	D
	Southwest	40.5	40	21.1	D	26.4	C	19.0	D	17.9	D
	West	49	14	42.9	B	32.5	C	26.6	C	32.3	C

Note: SFP = square feet per pedestrian

G. PROBABLE IMPACTS OF THE PROPOSED ACTION—2032

The future 2032 condition with the proposed action would exhibit an increase in transit and pedestrian trips attributed to the full development of Fordham University's proposed Master Plan and the projected increases in faculty, administrative staff, and student populations on the Fordham Lincoln Center campus. This section describes the projected travel patterns of these trips and assesses their potential impacts on nearby transit and pedestrian facilities.

TRIP GENERATION AND ASSIGNMENT

The Build transit and pedestrian networks incorporate trips from the project increment and those established for the future No Build condition. As summarized in Chapter 15, "Traffic and Parking," the 2032 final build-out of the campus expansion would result in 94, 366, and 245 new subway trips during the AM, PM, and pre-theater peak hours, respectively. These trips and those associated with other travel modes that would be using the study area's pedestrian elements were estimated to total 427, 800, 1,143, and 717 pedestrians during the AM, midday, PM, and pre-theater peak hours, respectively.

SUBWAY STATION OPERATIONS

Peak 15-minute volumes were computed by adding the estimated increments from the proposed action onto the No Build volumes. Tables 16-24 and 16-25 summarize the weekday AM, PM, and pre-theater peak period operating levels for the analyzed subway stairways and control areas, respectively, under the 2032 Build condition. As shown, all analysis elements would continue to operate at acceptable levels; and therefore, the proposed action in 2032 would not result in any significant adverse impacts on subway station operations.

Table 16-24
2032 Build Condition: Subway Station Vertical Circulation Analysis

Stairways		Width (feet)	Effective Width (feet)	15-Minute Pedestrian Volumes Up	15-Minute Pedestrian Volumes Down	Friction Factor	15-Minute SVCD Capacity	15-Minute V/SVCD Ratio	15-Minute LOS
AM Peak Period									
66th Street- Lincoln Center Station (1)									
	Lincoln Center- 64th Street	6.0	5.0	213	60	0.80	600	0.46	B
59th Street- Columbus Circle Station (A/B/C/D/1)									
M16-B (M-17) [1]	Columbus Circle- 60th St and Broadway	18.3	14.8	812	131	0.80	1770	0.53	B
S3	Columbus Circle- 60th St and Broadway Median	5.0	4.0	88	50	0.90	540	0.26	A
S6	Columbus Circle- 60th St and Broadway NW	8.0	7.0	325	173	0.90	945	0.53	B
PM Peak Period									
66th Street- Lincoln Center Station (1)									
	Lincoln Center- 64th Street	6.0	5.0	128	140	0.90	675	0.40	A
59th Street- Columbus Circle Station (A/B/C/D/1)									
M16-B (M-17) [1]	Columbus Circle- 60th St and Broadway	18.3	14.8	412	735	0.90	1991	0.58	B
S3	Columbus Circle- 60th St and Broadway Median	5.0	4.0	31	136	0.80	480	0.35	A
S6	Columbus Circle- 60th St and Broadway NW	8.0	7.0	99	424	0.80	840	0.62	B
Pre-Theater Peak Period									
66th Street- Lincoln Center Station (1)									
	Lincoln Center- 64th Street	6.0	5.0	104	114	0.90	675	0.32	A
59th Street- Columbus Circle Station (A/B/C/D/1)									
M16-B (M-17) [1]	Columbus Circle- 60th St and Broadway	18.3	14.8	576	494	0.90	1991	0.54	B
S3	Columbus Circle- 60th St and Broadway Median	5.0	4.0	46	92	0.90	540	0.26	A
S6	Columbus Circle- 60th St and Broadway NW	8.0	7.0	140	286	0.80	840	0.51	B

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001) in accordance with the *CEQR Technical Manual*.
[1] M-17 replaces M16-B in Build condition.

Table 16-25
2032 Build Condition: Subway Station Control Area Analysis

Station Elements	Quantity	15-Minute Pedestrian Volumes In	Out	15-Minute SVCD Capacity	V/SVCD Ratio	LOS
AM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	23	52	600	0.13	A
Two-Way Turnstiles	5	59	309	2400	0.15	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	8	3	750	0.01	A
Two-Way Turnstiles	10	198	744	4800	0.20	A
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	173	325	900	0.55	C
PM Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	43	67	600	0.18	A
Two-Way Turnstiles	5	196	147	2400	0.14	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	14	11	750	0.03	A
Two-Way Turnstiles	10	753	541	4800	0.27	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	424	99	900	0.58	C
Pre-Theater Peak Period						
66th Street- Lincoln Center Station (1) R160AK Control Area (at Lincoln Center and 64th Street)						
Metro-Card Gate (HEET)	2	2	204	600	0.34	B
Two-Way Turnstiles	5	135	169	2400	0.13	A
59th Street- Columbus Circle Station (A/B/C/D/1) N49 Control Area						
Service Gate	1	34	9	750	0.06	A
Two-Way Turnstiles	10	628	785	4800	0.29	B
59th Street- Columbus Circle Station (1)						
Metro-Card Gate (HEET)	3	286	140	900	0.47	C

Note: Capacities were calculated based on rates presented in the NYCT, *Station Planning and Design Guidelines* (January 2001), in accordance with the *CEQR Technical Manual*.

PEDESTRIAN CIRCULATION

The proposed action would result in an increase in pedestrian activities within the study area. Most of these trips, with the exception of those entering or exiting from the campus parking garage and those traveling directly between the dormitory buildings and campus facilities, would appear on the street network and be overlaid onto the No Build pedestrian volumes. Tables 16-26, 16-27, and 16-28 present the Build analysis results for the study area's sidewalks, corners, and crosswalks, respectively.

As described in section B, "Methodology," project-related sidewalk impacts are considered significant if there is an increase of 2 PFM or more over the No Build condition beyond LOS D (15 PFM). For corner reservoirs and crosswalks, impacts resulting in a decrease of 1 SFP or more over the No Build condition beyond LOS D (15 SFP) is considered significant. As shown in Tables 16-26 through 16-28, significant adverse pedestrian impacts were identified for the north crosswalk of the Columbus Avenue and West 60th Street intersection during the PM and pre-theater peak periods, as detailed below.

Table 16-26
2032 Build Condition: Pedestrian LOS Analysis for Sidewalks

Location	Sidewalk	Effective Width (feet)	15-Minute Two-Way Volume	Average		Platoon	
				PFM	LOS	PFM	LOS
AM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	108	0.8	A	4.8	A
Columbus Avenue between 61st Street and 60th Street	East	8	61	0.5	A	4.5	A
60th Street between Columbus Avenue and tenth Avenue	North	9	478	3.5	A	7.5	C
	South	4	622	10.4	D	14.4	D
60th Street between Columbus Avenue and Broadway	North	7	602	5.7	B	9.7	C
	South	9.5	592	4.2	A	8.2	C
Columbus Avenue between 60th Street and 59th Street	West	11	186	1.1	A	5.1	B
	East	12	198	1.1	A	5.1	B
Midday Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	182	1.3	A	5.3	B
Columbus Avenue between 61st Street and 60th Street	East	8	124	1.0	A	5.0	B
60th Street between Columbus Avenue and tenth Avenue	North	9	271	2.0	A	6.0	B
	South	4	217	3.6	A	7.6	C
60th Street between Columbus Avenue and Broadway	North	7	478	4.6	A	8.6	C
	South	9.5	540	3.8	A	7.8	C
Columbus Avenue between 60th Street and 59th Street	West	11	361	2.2	A	6.2	B
	East	12	302	1.7	A	5.7	B
PM Peak Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	313	2.3	A	6.3	B
Columbus Avenue between 61st Street and 60th Street	East	8	175	1.5	A	5.5	B
60th Street between Columbus Avenue and tenth Avenue	North	9	439	3.3	A	7.3	C
	South	4	255	4.3	A	8.3	C
60th Street between Columbus Avenue and Broadway	North	7	845	8.0	C	12.0	D
	South	9.5	374	2.6	A	6.6	B
Columbus Avenue between 60th Street and 59th Street	West	11	353	2.1	A	6.1	B
	East	12	356	2.0	A	6.0	B
Pre-Theater Period							
Columbus Avenue between 62nd Street and 60th Street	West	9	410	3.0	A	7.0	C
Columbus Avenue between 61st Street and 60th Street	East	8	139	1.2	A	5.2	B
60th Street between Columbus Avenue and Amsterdam Avenue	North	9	416	3.1	A	7.1	C
	South	4	383	6.4	B	10.4	D
60th Street between Columbus Avenue and Broadway	North	7	754	7.2	C	11.2	D
	South	9.5	558	3.9	A	7.9	C
Columbus Avenue between 60th Street and 59th Street	West	11	357	2.2	A	6.2	B
	East	12	339	1.9	A	5.9	B

Note: PFM = pedestrians per foot per minute

Table 16-27
2032 Build Condition: Pedestrian LOS Analysis for Corner Reservoirs

Locations	Corner	AM		Midday		PM		Pre-Theater	
		SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	Northeast	368.3	A	372.6	A	216.5	A	199.5	A
	Southeast	994.8	A	915.4	A	654.7	A	653.1	A
	Southwest	179.7	A	148.3	A	105.2	A	121.1	A
	Northwest	396.1	A	333.0	A	209.2	A	206.3	A
Columbus Avenue and W.60th Street	Northeast	38.8	C	36.0	C	21.7	D	23.8	D
	Southeast	81.9	A	120.0	A	93.2	A	94.6	A
	Southwest	34.6	C	38.5	C	34.6	C	24.6	C
	Northwest	75.7	A	72.8	A	54.8	B	46.7	B
Broadway and W.60th Street	Southwest	81.7	A	83.4	A	61.3	A	66.1	A
	Northwest	55.5	B	72.5	A	44.9	B	47.2	B

Note: SFP = square feet per pedestrian

Table 16-28
2032 Build Condition: Pedestrian LOS Analysis for Crosswalks

Location	Crosswalk	Street Width (feet)	Crosswalk Width (feet)	Conditions with Conflicting Vehicles							
				AM		Midday		PM		Pre-Theater	
				SFP	LOS	SFP	LOS	SFP	LOS	SFP	LOS
Columbus Avenue and W.62nd Street	North	64	14	187.5	A	166.9	A	83.3	A	84.2	A
	East	39	16	240.8	A	255.4	A	158.4	A	140.0	A
	South	70	14	120.3	A	107.9	A	71.7	A	102.8	A
	West	55	16	111.5	A	88.6	A	59.7	B	60.2	A
Columbus Avenue and W.60th Street	North	67	15	13.4	E	16.0	D	10.7	E+	11.5	E+
	East	49	19.5	221.6	A	100.5	A	82.4	A	82.8	A
	South	60.5	12	4.8	F	11.8	E	9.4	E	9.7	E
	West	51.5	13	93.7	A	50.5	B	50.0	B	27.6	C
Broadway and W.60th Street	North	102	40	33.0	C	74.2	A	23.1	D	21.1	D
	Southeast	39.5	40	26.8	C	30.3	C	22.8	D	21.6	D
	Southwest	40.5	40	21.1	D	26.3	C	18.9	D	17.9	D
	West	49	14	42.9	B	32.6	C	26.6	C	32.3	C

Note: SFP = square feet per pedestrian; + = significant adverse impact

PM PEAK PERIOD

Crosswalk

- The north crosswalk at Columbus Avenue and West 60th Street would deteriorate within LOS E with a reduction in average pedestrian space from 11.8 SFP to 10.7 SFP.

PRE-THEATER PEAK PERIOD

Crosswalk

- The north crosswalk at Columbus Avenue and West 60th Street would deteriorate within LOS E with a reduction in average pedestrian space from 12.7 SFP to 11.5 SFP.

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