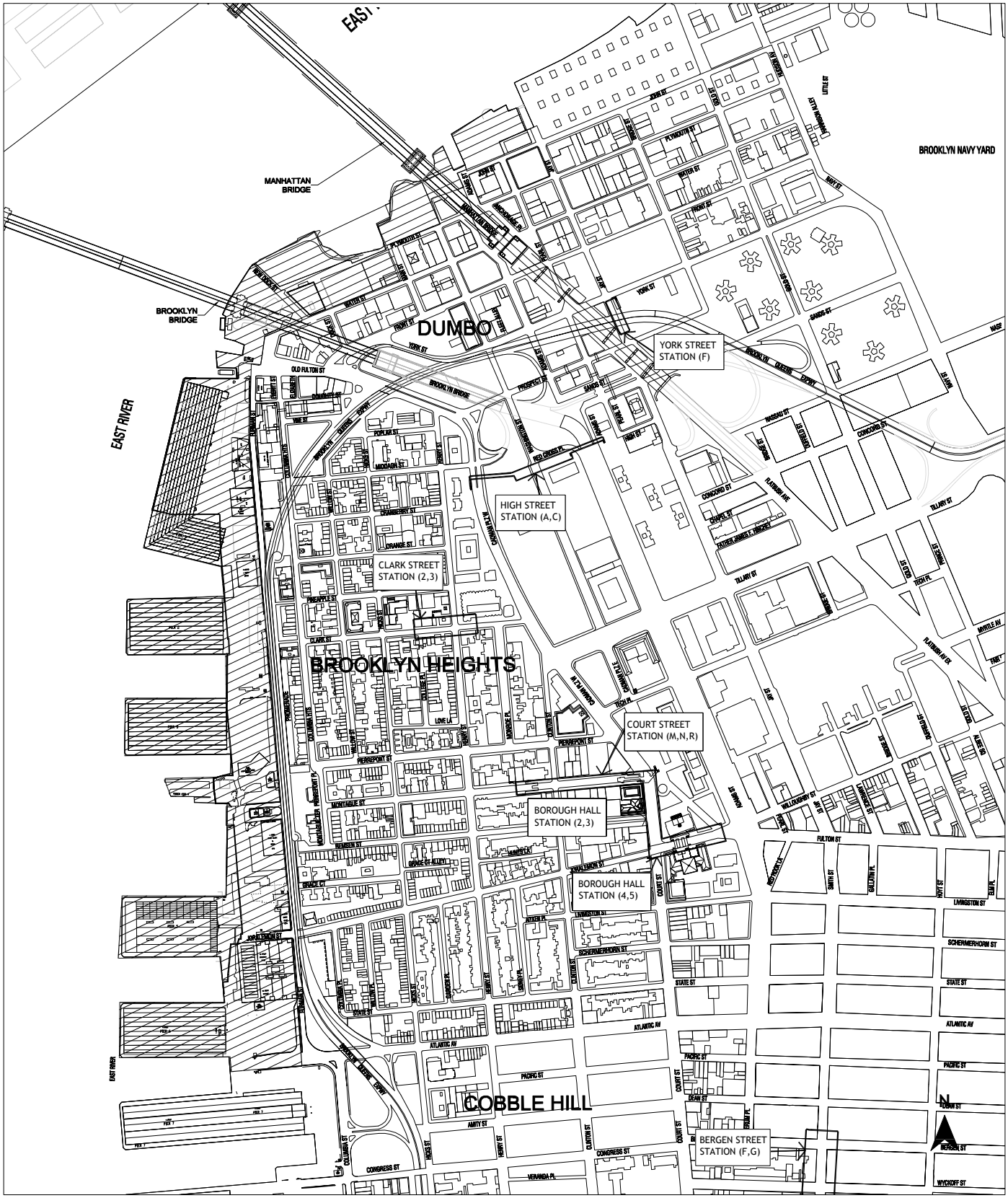
A. INTRODUCTION

This chapter of the environmental impact statement (EIS) describes the transit and pedestrian conditions and potential impacts associated with the proposed Brooklyn Bridge Park. The project site is located along the Brooklyn waterfront at the edges of the Cobble Hill, Brooklyn Heights and D.U.M.B.O. neighborhoods, and is bounded by Atlantic Avenue, Furman Street, Water Street and portions of Plymouth Street and John Street (see Figure 15-1). The transit analyses include those subway stations located in the vicinity of the project and New York City Transit (NYCT) local bus lines that currently serve the Brooklyn waterfront area. The pedestrian analysis includes the sidewalks and a stairway at the Brooklyn Bridge that will likely be most used by concentrations of pedestrians generated by the proposed project.

As described in detail in Chapter 1, "Project Description," the proposed project would result in the development of an 85-acre park, which would provide public recreational space along with residential, hotel and a variety of commercial uses. The transportation analyses in this EIS address a fully developed program that could reasonably be constructed by 2012. The transit and pedestrian analyses in this chapter consider subway, bus, and water taxi trips in the area as well as walk-only trips. The specific development program analyzed in this chapter assumes development of an 85-acre park with public recreation space, a 185-boat slip marina, a residential component with 1,210 dwelling units, a 225-room hotel, and a mix of restaurant, retail, office and educational uses. In addition, as part of the proposed project, and if approved by the City of New York, the transportation analyses consider that Joralemon Street would be closed to vehicular traffic at Furman Street but would remain open to pedestrians and bicyclists.

In this chapter, the existing conditions at the transit and pedestrian facilities expected to be used by the majority of new demand from projected development sites are described in detail. Future 2012 Without the Proposed Project (No Build) conditions are then evaluated, including additional transit and pedestrian demand and any changes in transit facilities by 2012. Increases in travel demand resulting from the proposed action were added to the base No-Build condition to develop the Future 2012 With the Proposed Project (Build) condition. Any significant adverse impacts from the proposed action are then identified.

The proposed project is expected to generate its heaviest travel demand during the weekday 12-1 PM (midday), 5-6 PM and Sunday 2-3 PM (midday) peak hours. The analyses of pedestrian conditions therefore focuses on these periods. Some demand would also be generated during the weekday 8-9 AM commuter peak hour, primarily from the project's commercial and residential components. However, the new demand in the AM peak hour would total less than half the new demand generated in any of the peak hours selected for analysis. As presented in Table 14-7, the proposed project would generate a net total of 3,132 person trips in the weekday AM peak hour, compared to 8,040, 7,175, and 9,189 new trips during the weekday midday, PM and Sunday midday peak hours, respectively. Therefore, there would likely be no new significant pedestrian



Project Area

Not to Scale

Area Subway Stations
Figure 15-1

BROOKLYN BRIDGE PARK

impacts in the AM peak hour not already disclosed for the other peak hours when project-generated demand would be substantially greater.

For the subway analysis, existing subway stations within ½ mile of the proposed project area were studied. A threshold of 200 new peak hour trips entering or exiting a subway station has been established under *CEQR Technical Manual* criteria to determine whether new subway demand from a proposed action warrants a detailed analysis at a particular station. Based on the travel demand forecast, the proposed action would generate a total of approximately 989 subway trips during the weekday midday peak hour, 1,558 trips during the 5-6 PM peak hour and 1,375 trips during the Sunday 2-3 PM peak hour. The subway analysis focuses on the weekday PM and Sunday midday peak hours. The weekday PM peak hour was selected as it is during this period that peak demand generated by the project's commercial, residential and park elements would all coincide with a peak commuter period on the overall subway system. Although overall subway demand is typically lower in the Sunday midday than during the weekday peak hours, this period was also included for analysis as the second highest number of hourly project-generated trips would occur during this period. The potential for subway impacts in the weekday AM and midday periods over and above those identified in the PM and Sunday midday is considered unlikely given the overall lower levels of weekday midday ridership on the system, and, as discussed above, the substantially lower project demand during the AM peak hour.

Based on the assignment of new subway trips presented later in this chapter, it is expected that four of the area's subway stations or station complexes would experience a peak hour demand in excess of 200 persons per hour in either the PM or Sunday peak hours, or both. These stations are York Street (served by F trains), High Street (A and C trains), Clark Street (2 and 3 trains), and the Borough Hall/Court Street station complex (2, 3, 4, 5, M and R trains). Therefore, conditions at key elements at these stations are analyzed in detail.

Based on the travel demand forecast, the proposed action would generate a total of approximately 719 bus trips during the weekday midday peak hour, 658 bus trips during the PM peak hour and 906 bus trips during the Sunday midday peak hour. All of these trips would be distributed among bus routes serving the proposed action site. During the weekday midday and weekend periods, the transit systems usually operate to meet minimum service (headway) standards and therefore sufficient capacity to service demand is typically provided. Further, demand during these periods is generally balanced between inbound and outbound trips. Therefore, the quantitative analysis of local bus conditions focuses on the weekday PM peak hour when the potential for project impacts is greatest. A qualitative discussion of local bus operations on Sundays is also provided.

The analyses of pedestrian conditions focus on the key sidewalks where new pedestrian demand is expected to be most concentrated. These facilities are located primarily along corridors providing access to and from area subway stations. Facilities that would be utilized by pedestrians en route to and from the park are also analyzed. As part of the proposed action, improvements to the existing pedestrian facilities are expected, and (if approved by the City of New York) Joralemon Street would be limited to pedestrians and bicyclists from Columbia Place to Furman Street.

While the project would not result in significant adverse impacts to pedestrian service levels or subway conditions, increased ridership on three bus routes would be considered a significant impact; as discussed in Chapter 20, "Alternatives," the impact could be mitigated with increased bus service.

B. DATA COLLECTION

Transit and pedestrian data was collected at key subway station elements and pedestrian facilities during three peak periods: the weekday midday (12-1 PM), the weekday PM (5-6 PM) and the Sunday midday (2-3 PM). The weekday PM peak period is analyzed to consider the demand generated by the park's commercial and residential elements (plus the park demand) during weekday conditions. The Sunday midday peak period analysis considers the peak demand generated by the park during weekend conditions. NYCT provided data on weekday peak hour ridership at the maximum load points on each of the bus routes serving the project area.

C. EXISTING CONDITIONS

SUBWAY SERVICE

The adjacent Brooklyn Heights and Downtown Brooklyn neighborhoods have a number of subway stations that are expected to serve the proposed development. These include York Street (F), High Street (A,C), Clark Street (2,3), Borough Hall/Court Street (2,3,4,5,M,R), and Bergen Street (F,G). These stations are shown in Figure 15-1. As discussed in more detail later in this chapter, subway demand generated by the proposed action is expected to exceed the CEQR threshold of 200 subway trips per hour at the York Street, High Street and Clark Street stations, and Borough Hall/Court Street station complex.

Table 15-1 shows the average weekday entering turnstile counts at existing subway stations serving the proposed action area for the years 2001 through 2003, as well as the 2003 ranking of each station based on average weekday ridership relative to all 424 stations system-wide. As shown in Table 15-1, the Borough Hall/Court Street station complex, served by six subway lines, ranks 20 out of the 424 stations in the subway system based on an average of 34,437 persons entering on a typical weekday in 2003.

Table 15-1
Average Weekday Entering Turnstile Counts

Station	2003 Rank	2001	2002	2003	Percent Change 2001-2003	Percent Change 2002-2003
York Avenue (F)	308	3,537	3,698	3,555	0.5%	-3.9%
High Street (A,C)	247	5,137	5,428	4,934	-4.0%	-9.1%
Clark Street (2,3)	274	4,020	3,928	4,213	4.8%	7.3%
Court Street/Borough Hall (2,3,4,5,M,R)	20	35,250	34,805	34,437	-2.3%	-1.1%
Bergen Street (F,G)	140	8,403	9,018	8,918	6.1%	-1.1%
TOTALS		**56,347**	**56,877**	**56,057**	**-0.5%**	**-1.4%**

Note: * Rank out of 424 stations system-wide in 2003.
Source: New York City Transit 2003 Subway and Bus Ridership Report.

Demand at this station decreased by 2.3 percent between 2001 and 2003. The York Street Station, served by the F train, experiences the lowest level of weekday demand of the area's subway stations, with 3,555 persons entering on a typical weekday in 2003. The High Street and Clark Street stations rank 247 and 274, respectively. Demand at the High Street station decreased by four percent from 2001 to 2003, while demand at Clark Street station increased by 4.8 percent during the same period. Overall, between 2001 and 2003, the data indicate that

aggregate demand at subway stations serving the project site remained relatively stable at between 56,000 and 57,000 entering riders on a typical weekday.

In evaluating the data in Table 15-1, it is important to note that the 2001 through 2003 period saw numerous and extended service changes to subway lines serving the project area as a result of the events of September 11, 2001, and reconstruction of the Manhattan Bridge and the Stillwell Avenue terminal in Coney Island. The data in Table 15-1 therefore reflect conditions during a period of flux and may not accurately reflect general trends in subway ridership in the project area.

The following briefly describes each of the analyzed subway stations serving the project site.

YORK STREET STATION

The York Street station, served by F trains, is located at Jay and York Streets in D.U.M.B.O. (Down Under the Manhattan Bridge Overpass). Access to this station is via a single street stair (S-7) at the southeast corner of Jay and York Streets. The station's fare control area, consisting of a token booth (N-530), three turnstiles and a service gate, is located on a mezzanine level above a single island platform. This station would serve the demand generated by the northern end of the project area.

HIGH STREET STATION

As shown in Figure 15-1, the High Street station, served by A and C trains, is located between Adams Street and Cadman Plaza West in the vicinity of Middagh and High Streets between the Brooklyn Heights and D.U.M.B.O. neighborhoods. It is expected that the majority of subway riders en route between the project site and the High Street station would utilize street stair S-4 at Middagh Street and Cadman Plaza West. This single stair entrance leads to a mezzanine with a fare control area comprised of a token booth (N-100), three turnstiles and a service gate. A single island platform serves both Manhattan- and Brooklyn-bound trains.

CLARK STREET STATION

The Clark Street station, served by Nos. 2 and 3 trains, is located at the intersection of Clark and Henry Streets in Brooklyn Heights. At-grade entrances on Clark and on Henry Streets provide access to a fare array consisting of a token booth (R-600), four entry/exit turnstiles and a service gate. Access to the single island platform below is via three elevators, all of which operate during peak periods. Two are typically in operation during off-peak hours.

BOROUGH HALL/COURT STREET STATION COMPLEX

The Borough Hall/Court Street station complex consists of three distinct but interconnected stations. The Borough Hall station served by Nos. 2 and 3 trains contains a single mezzanine located beneath Court Street and two side platforms stacked one above the other. A passageway connects the south end of the upper platform to the Borough Hall station served by Nos. 4 and 5 trains. This station, located beneath Joralemon Street, has two side platforms and two mezzanines, one on the north (Manhattan-bound) side of the station, and one on the south (Brooklyn-bound) side adjacent to the Municipal Building. The south mezzanine contains a token booth (R-602) and a fare array with five turnstiles. Access to this mezzanine from the street is provided by two stairways (O1 and O5) located in the portico of the Municipal Building. Neither of these stairs is maintained by NYCT. The north mezzanine is controlled by two high

turnstiles and two high revolving exit gates, with access from the street provided by two stairways (S2 and S3). The two mezzanines operate as a combined system as they are connected by a series of three bridges, one which connects the free zones and two connecting the paid zones. A third mezzanine, open from 6:10 AM to 9:05 PM on weekdays, is located at Court Street at the west end of the station and contains a token booth (R-604), six turnstiles and a service gate. Two stairs on the northwest and southwest corners of the intersection of Court and Joralemon Streets (S5 and S4, respectively) provide access from street level.

The Court Street station, served by M and R trains, is located below Montague Street west of Court Street. It consists of a single island platform and two mezzanines located at the east and west ends of the station. The east mezzanine is shared with the Borough Hall 2, 3 station. The west mezzanine, closest to the project site, contains a token booth (C-7), three turnstiles and two high-revolving turnstiles. Three stairs provide access from street level, stairs S-4 and S-5 near the northwest and southwest corners of the intersection of Clinton and Montague Streets, and stair S-6 midblock on the north side of Montague Street between Clinton and Henry Streets. This mezzanine is open 7 AM to 8 PM on weekdays and 10:10 AM to 8 PM on weekends and holidays.

On weekdays, subway riders en route between the project site and the Borough Hall 4, 5 station are expected to utilize stairs S4 and S5 and fare array R-604 at Court Street. On weekends when this mezzanine is closed, these riders are expected to utilize fare array R-602 and west-facing stairs S3 and O1 on the north and south sides of Joralemon Street, respectively. The analysis of conditions at the Borough Hall 4, 5 station therefore focuses on these station elements.

Subway riders en route to and from M and R trains at Court Street are expected to utilize fare array C-7 and stairs S-4 and S-5, which are closest to the project site. As the Clark Street station provides more convenient access to the project site than the Borough Hall station, subway riders using 2 and 3 trains are assumed to arrive and depart via Clark Street and are not assigned to station elements at the Borough Hall 2, 3 station.

Analyses of subway station conditions focus on the elements with the potential to be affected in the future with the proposed action (i.e., street stairways and fare arrays). These analyses were prepared using the design capacities for stairs, turnstiles, and high-wheel exits specified in the *CEQR Technical Manual*, *NYCT Authority Station Planning and Design Guidelines* and procedures found in *Pedestrian Planning and Design*, by John J. Fruin. Peak 15-minute conditions during the weekday PM and Sunday midday peak hours are reflected. Stairway analyses were conducted using the Fruin pedestrian level of service (LOS) methodology, which equates pedestrian flow per minute per foot of stairway width with qualitative measures of pedestrian comfort. Fruin defines six levels of service based on the calculated values of pedestrian volumes per foot width of stairway per minute, as shown in Table 15-2. Level of service (LOS) A represents free flow conditions without pedestrian conflicts, and LOS F indicates significant capacity limitations and inconvenience.

Practical capacities were calculated for each analyzed stairway by multiplying service volumes at LOS C/D (10 persons per foot-width per minute, or PFM) by the effective stair width and an adjustment factor to account for two-directional friction, where applicable. Peak 15-minute volumes were compared with these capacities to obtain a volume-to-capacity (v/c) ratio for each peak hour. Using this methodology, LOS A, B and C correspond to volume-to-capacity ratios of less than 1.0, while LOS D, E and F indicate demand that exceeds capacity, and therefore the v/c ratios are greater than 1.0. Levels of service for turnstiles and high revolving exit gates are also

Table 15-2
Stairway Level of Service Definitions

Level of Service	Pedestrians/Foot/ Minute (PFM)	Comments
A	≤ 5	Free flow conditions.
B	5 - 7	Minor reverse flow will cause minor conflicts.
C	7 - 10	Slight restrictions in speed and difficulties in reverse flows.
D	10 - 13	Significant restrictions in speed and difficulties in reverse flows.
E	13 - 17	Reductions in speeds, serious reverse traffic conflicts, and intermittent stoppages.
F	≥ 17	Complete breakdown in traffic flow.

described in terms of volume-to-capacity ratios, where LOS A is less than 0.2, LOS B is between 0.2 and 0.4, LOS C is between 0.4 and 0.6, LOS D is between 0.6 and 0.8, LOS E is between 0.8 and 1.0 and LOS F is greater than 1.0. A v/c ratio greater than 1.0 indicates volumes beyond capacity and extended queues.

Tables 15-3 to 15-6 show the results of the analyses of 2005 existing weekday PM and Sunday midday peak hour conditions at analyzed station elements at the four subway stations/complexes analyzed. As shown in the tables, all analyzed stairways and fare arrays currently operate at LOS B or better in the weekday PM peak period and the Sunday midday peak period. These levels of service are indicative of the relatively low existing usage at the York Street, High Street and Clark Street stations, and the fact that the more heavily used Borough Hall/Court Street Station complex has numerous access points which distributes ridership in an effective manner.

BUS SERVICE

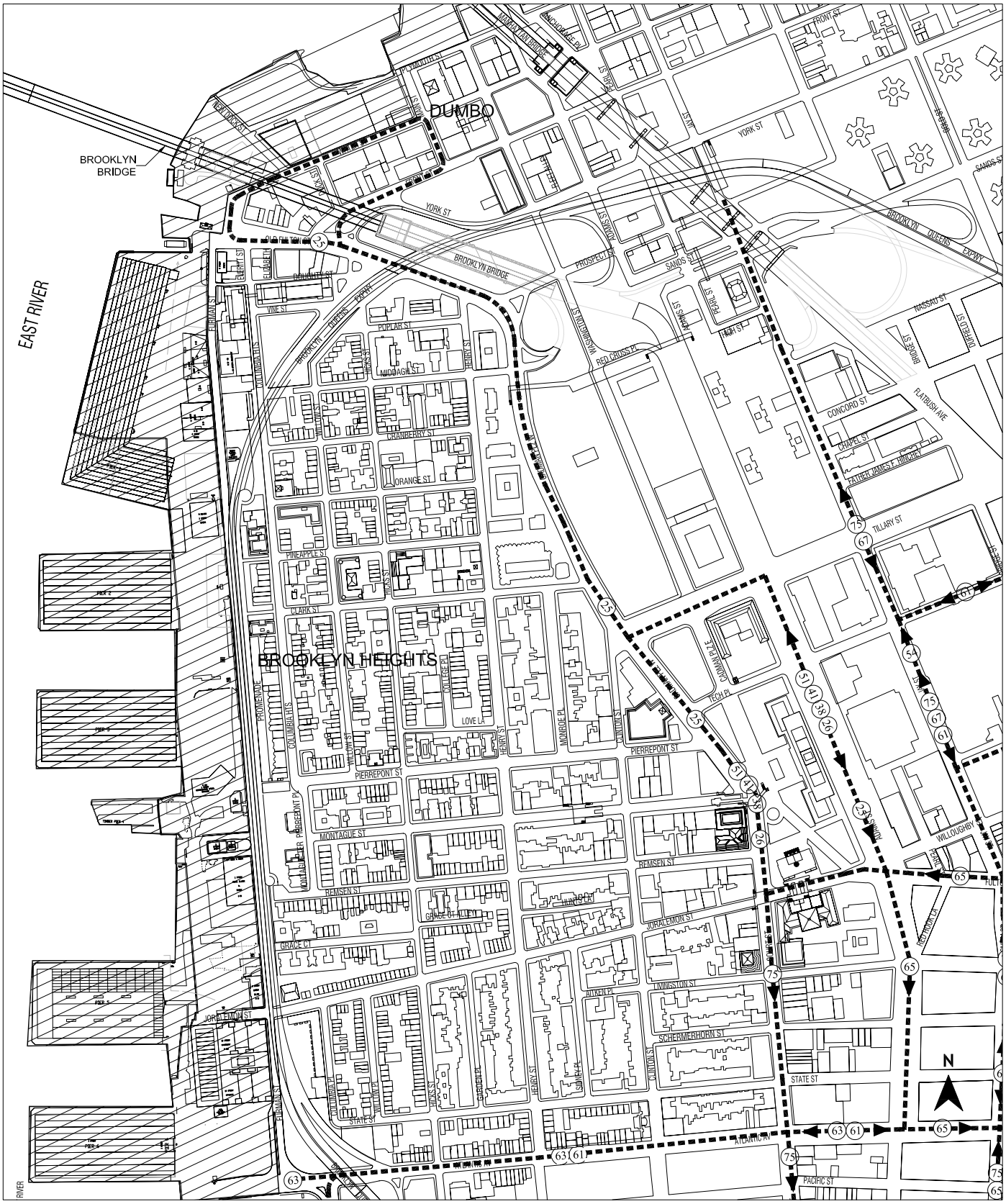
The project site is served directly by NYCT's B25, B61 and B63 local bus routes. These routes are shown in Figure 15-2. Table 15-7 presents a summary of peak hour, peak direction ridership at the maximum load point of each NYCT bus route serving the proposed action area. Brief overviews of each route are provided below.

B25

The B25 operates between East New York and Fulton Landing via Fulton Street and Cadman Plaza West. This route services the business and shopping districts of Downtown Brooklyn, Fort Greene and Bedford-Stuyvesant. During the PM peak hour, the maximum load point in the peak eastbound direction occurs at Fulton Street/Greene Avenue, with an average of 50 passengers per bus. Access to the project site from the B25 is available at the route terminus at Fulton Landing. The PM peak hour headway on the B25 is approximately eight minutes.

B61

B61 service operates between Richards Street/Van Dyke Street in Red Hook and Jackson Avenue/Queens Plaza South in Long Island City, Queens. Within the vicinity of the project site, B61 buses travel along Columbia Street and Atlantic Avenue. During the PM peak hour, the maximum load point in the peak northbound direction occurs at York and Gold Streets with an average of 45 passengers per bus. The weekday PM headway on the B61 is approximately 10 minutes.



This figure has been revised for the FEIS

Local Bus Routes

Figure 15-2

BROOKLYN BRIDGE PARK

Table 15-3
2005 Existing Subway Station Analysis
York Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S7	Stairway @ SE Corner	PM	5.74	861	217	2.52	0.25	A
	Jay Street/York Street	SMD	5.74	861	76	0.88	0.09	A

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
N-530	Jay Street/York Ave					
	3 entry/exit turnstiles	PM	1,440	217	0.15	A
		SMD	1,440	76	0.05	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm.

(2) Effective width measured as stairwell width less 1.5 feet to account for wall and center handrails.
Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Source: PHA 2003 field counts expanded to 2005.

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-4
2005 Existing Subway Station Analysis
High Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S4	Stairway @ Cadman Plaza West	PM	3.20	480	168	3.50	0.35	A
		SMD	3.20	480	95	1.98	0.20	A

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
N-100	Cadman Plaza West Fare Array					
	3 entry/exit turnstiles	PM	1,440	168	0.12	A
		SMD	1,440	95	0.07	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for handrails. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Source: PHA 2003 field counts expanded to 2005

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-5
2005 Existing Subway Station Analysis
Clark Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
(Not applicable - all station entrances located at-grade)								

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
R-600	Clark Street Fare Array					
	4 entry/exit turnstiles	PM	1,920	302	0.16	A
		SMD	1,920	155	0.08	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for handrails. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Source: PHA 2003 field counts expanded to 2005

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-6
2005 Existing Subway Station Analysis
Borough Hall/Court Street Station Complex

COURT STREET STATION (M,R)

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S5	Stairway near SW Corner	PM	2.93	440	66	1.50	0.15	A
	Clinton Street/Montague Street	SMD	2.93	440	15	0.34	0.03	A
S6	Montague Street Stairway Northside	PM	3.60	540	82	1.52	0.15	A
	Midblock Btwn Clinton/Henry Streets	SMD	3.60	540	42	0.78	0.08	A

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
C-7	West Fare Array					
	Clinton Street/Montague Street					
	3 entry/exit turnstiles	PM	2,040	213	0.10	A
	2 high entry/exit turnstiles	SMD	2,040	73	0.04	A

BOROUGH HALL STATION (4,5)

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S3	West Facing Stairway @	PM	6.93	1,040	101	0.97	0.10	A
	Joralemon Street/Borough Hall	SMD	6.93	1,040	64	0.62	0.06	A
O1	West Facing Stairway @	PM	7.07	1,061	209	1.97	0.20	A
	Joralemon Street/Municipal Building	SMD	7.07	1,061	98	0.92	0.09	A
S4	Stairway @ SW Corner	PM	2.73	410	241	5.89	0.59	B
	Joralemon Street/Court Street	SMD	CLOSED					
S5	Stairway @ NW Corner	PM	3.47	521	215	4.13	0.41	A
	Joralemon Street/Court Street	SMD	CLOSED					

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
R-602	Municipal Bldg. Fare Array					
	5 entry/exit turnstiles	PM	3,900	1,075	0.28	B
	2 high entry/exit turnstiles	SMD	3,900	246	0.06	A
	2 high revolving exit gates					
R-604	Court Street Fare Array					
	6 entry/exit turnstiles	PM	2880	456	0.16	A
		SMD	CLOSED			

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for side handrails and 6" for a middle handrail. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Source: PHA 2003 field counts expanded to 2005

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-7
Existing Local Bus Conditions

Route	Peak Hour[1]	Peak Direction	Maximum Load Point	Peak Hour Buses[2]	Peak Hour Capacity[3]	Peak Hour Riders[2]	Average Riders per Bus	Available Capacity
B25	PM	EB	Fulton Street/Greene Avenue	8	520	397	50	123
B61	PM	NB	York Street/Gold Street	6	390	268	45	122
B63	PM	SB	Fifth Avenue/50th Street	6	390	282	47	108

Notes:
[1] Peak hour: weekday 5-6 PM.
[2] Based on most currently available NYC Transit ridership summaries.
[3] Available capacity based on MTA NYCT loading guidelines of 65 riders per standard 40' bus.

B63

The B63 operates between its southern terminal at Shore Road/Fourth Avenue in Bay Ridge and its northern terminal at Atlantic Avenue/Columbia Street in Cobble Hill, traveling primarily via Fifth and Atlantic Avenues. This route serves the business districts of Bay Ridge, Sunset Park, Park Slope and Downtown Brooklyn. During the PM peak hour, the maximum load point in the peak southbound direction occurs at Fifth Avenue/50th Street, with an average of 47 passengers per bus. Access to the project site from the B63 is available at its terminus at Atlantic Avenue and Columbia Street. The weekday PM headway on the B63 is approximately 10 minutes.

A number of additional bus routes serve the Downtown Brooklyn area, including the B26, B38, B41, B51 and B52 routes. These buses all provide service to Cadman Plaza West at Tillary Street. In addition, the B67, B69 and B75 routes all terminate near Jay and Sands Streets. Due to the proximity of the B69 stop to the northern end of the project, it is also expected that some project-generated bus trips would use this route.

WATER TAXIS

Water taxi service is currently available at Fulton Ferry Landing on the north edge of the pier. This service runs between Manhattan and Fulton Ferry Landing along two separate routes. The "Lower Manhattan Commuter Service" route provides service to Lower Manhattan and is available from 7-10 AM and from 3:45-7:00 PM Monday through Friday. The headway between taxis on this route is approximately 40 minutes. The "Midday/Weekend Service" route provides service to Lower Manhattan and to piers along the Hudson River to West 44th Street. This service operates from 9:30 AM-4 PM Monday through Friday, and from 11 AM-7 PM on weekends. The headway between taxis on this route is approximately 45 minutes.

Demand for the ferry service averaged approximately 25 to 30 boardings at Fulton Landing on a typical weekday in March 2003. Commuters using this service are typically residents of the nearby Brooklyn Heights and D.U.M.B.O. neighborhoods with workplaces in Manhattan.

PEDESTRIANS

The analysis of pedestrian conditions focuses on sidewalks where substantial numbers of new trips would be generated by the proposed project (see Figure 15-3). Also included in the analysis is a stairway providing access to the pedestrian and bicycle paths on the Brooklyn Bridge. New pedestrian demand is expected to be well distributed due to the dispersed locations of the projected development sites and the considerable length of the park, extending from Atlantic Avenue on the south to Jay Street on the north. The greatest concentrations of pedestrian demand would occur on sidewalks located along those corridors that serve subway stations as well as the main entrances to the park. These are Old Fulton Street, Joralemon Street and Atlantic Avenue. As shown in Figure 15-4, the analysis of pedestrian conditions focuses on the sidewalks along the Cranberry Street, Clark Street, Court Street and Joralemon Street corridors between the project site and the High Street, Clark Street, Court Street and Borough Hall subway stations. Representative sidewalks along Atlantic Avenue are also analyzed as well as sidewalks near the entrances to the park including along Old Fulton Street, Furman Street and Columbia Street. Sidewalks near the largest development sites are analyzed, including the Furman Street sidewalks near the 360 Furman Street site, and the Water Street and Washington Street sidewalks near the Empire Stores site. The stairway near the intersection of Prospect and Washington Streets providing pedestrian access to the Brooklyn Bridge is also analyzed.

Due to the active recreational characteristics of the proposed park, it is expected that a substantial number of park trips would be pedestrian oriented. Based on studies of the Hudson River Park, pedestrian trips generated by the park (including bicycle trips) are expected to increase as proximity to the park increases. Pedestrian data for key intersections in proximity to the proposed park were analyzed during three peak periods: the weekday midday (12-1 PM) and PM (5-6 PM) peak periods and the Sunday midday (2-3 PM) peak period. Figure 15-4 shows existing pedestrian flows in each period. As shown in Figure 15-4, existing pedestrian activity in the immediate vicinity of the project site is generally low due to the relative remoteness of the site as well as to the residential characteristics of the surrounding neighborhoods. This is especially true for the southern portion of the project site which is relatively isolated and does not currently provide waterfront access, and consequently sees minimal pedestrian activity. For example, peak 15-minute pedestrian volumes on the west sidewalk along Furman Street north of Atlantic Avenue were found to number fewer than ten in any peak hour. Pedestrian activity is more evident at the northern portion of the project site, due to residential and commercial activity in the D.U.M.B.O. neighborhood and existing pedestrian activity at the Empire-Fulton Ferry State Park. Peak 15-minute pedestrian volumes on sidewalks along Old Fulton Street between Water and Front Streets, for example, were found to range from 17 to 64. Higher pedestrian volumes are generally found to the east of the project site approaching the core of Downtown Brooklyn, especially along corridors providing access to subway stations. Along Clark Street, peak 15-minute volumes on the sidewalks between Hicks and Henry Streets range from 74 to 128, while along Montague Street, peak 15-minute volumes were found to range from 18 to 259 on sidewalks between Henry and Clinton Streets.

Sidewalk widths in the pedestrian study area vary considerably, with wider sidewalks typically provided along the major streets and avenues such as Old Fulton Street and Atlantic Avenue. Sidewalks along Old Fulton Street are 12 to 17 feet in width, while the north sidewalk on Atlantic Avenue is 19 feet in width, larger than on the south side, which is 11 feet wide. Sidewalks along the residential streets in proximity to the project site, including Cranberry Street, Clark Street, Montague Street and Joralemon Street, are typically eight to ten feet in width. The sidewalk width available to pedestrians along these residential streets (the effective

Analyzed Sidewalks

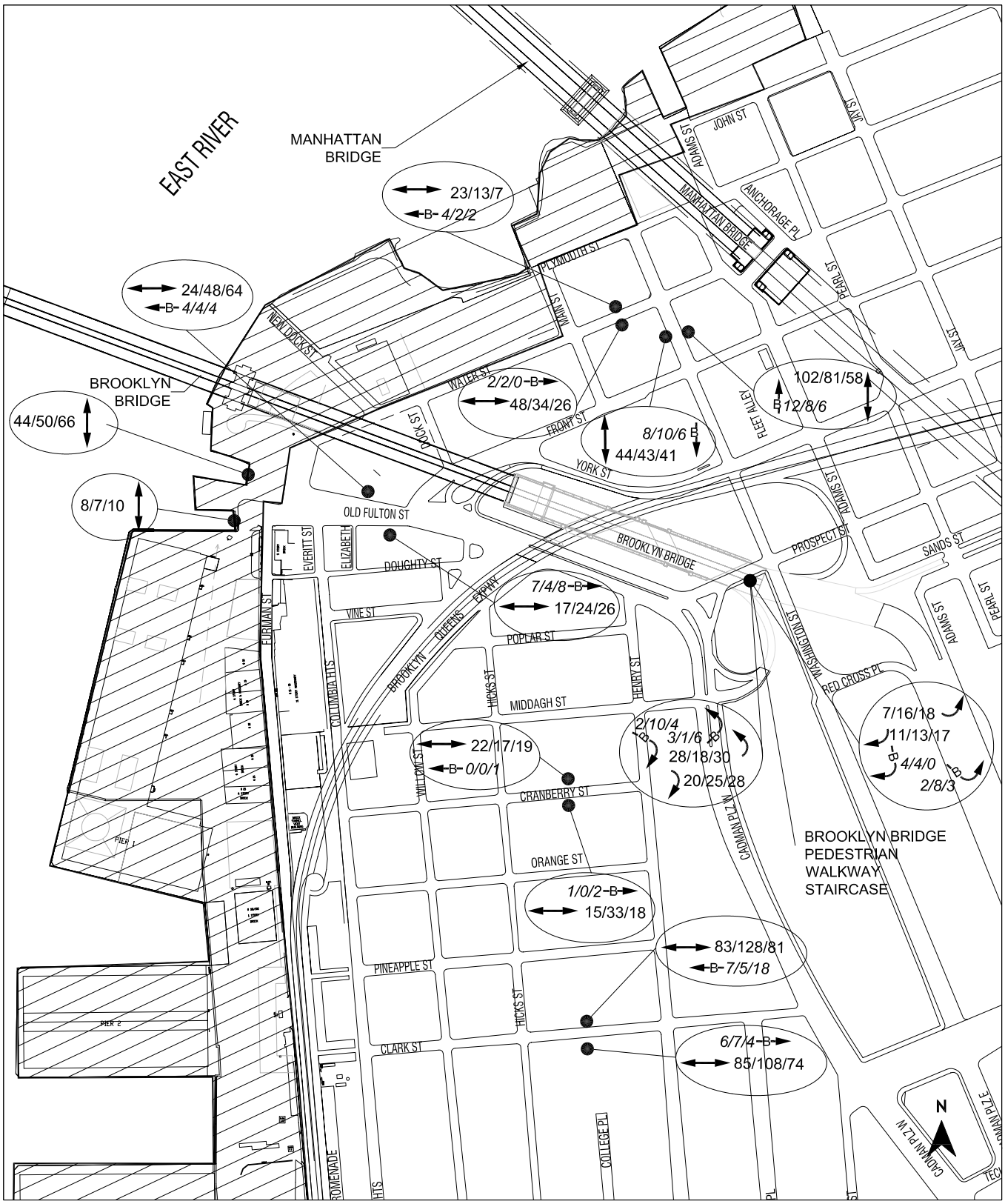
Project Site

Not to Scale

This figure has been revised for the FEIS

Analyzed Sidewalks
Figure 15-3

BROOKLYN BRIDGE PARK



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

-B- - Bicycle Volumes

Project Site

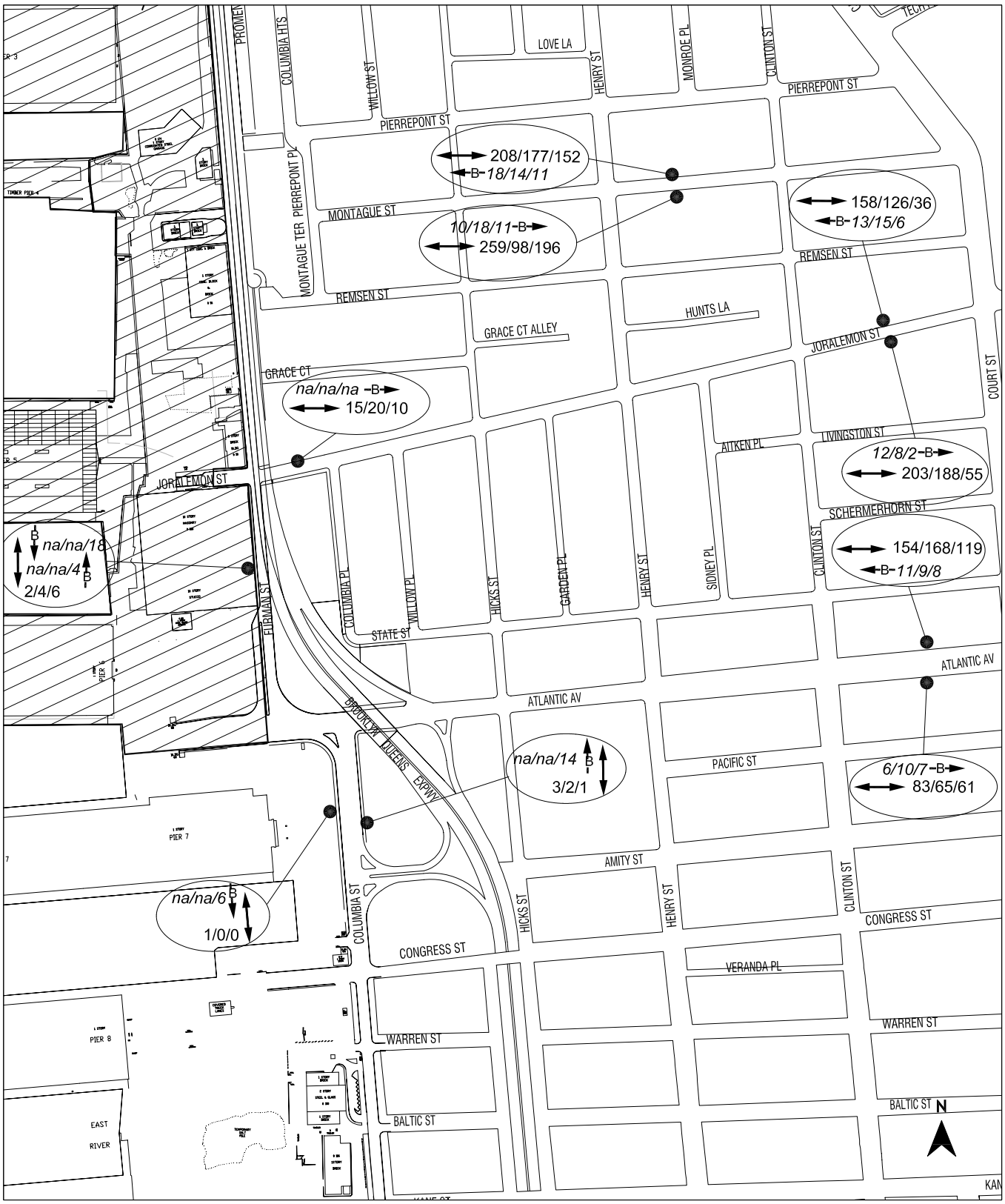
Not to Scale

This figure has been revised for the FEIS

2005 Existing Pedestrian Volumes

Figure 15-4

BROOKLYN BRIDGE PARK



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Not to Scale

-B- - Bicycle Volumes

Project Site

This figure has been revised for the FEIS

2005 Existing Pedestrian Volumes
Figure 15-4 (cont)

BROOKLYN BRIDGE PARK

width) is often reduced due to the presence of street trees, stoops, and various types of street furniture.

Existing peak 15-minute pedestrian flow conditions during the weekday midday (12-1 PM), weekday PM (5-6 PM) and Sunday midday (2-3 PM) peak hours were analyzed using the *Highway Capacity Manual* methodology. This methodology determines the congestion level of pedestrian facilities by considering pedestrian volumes, measuring the sidewalk or crosswalk width, determining the available pedestrian capacity and developing a ratio of existing volume flow to capacity. This ratio is then compared to level of service standards for pedestrian flow which define a qualitative relationship at a given pedestrian traffic concentration level.

Level of service standards are based on the average area available per pedestrian during the analysis period, which is typically 15 minutes. Level of service (LOS) grades from A to F are assigned, with LOS A representing free flow conditions without pedestrian conflicts, and LOS F representing significant capacity limitations and inconvenience. Table 15-8 defines the LOS criteria for pedestrian crosswalk/corner area and sidewalk conditions, according to the *Highway Capacity Manual*. 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 15-8

Pedestrian Crosswalk/Corner Area and Sidewalk Levels of Service Descriptions*

Level of Service		Crosswalk/Corner Area Criteria (sq. ft./ped.)	Sidewalk Criteria (ped./min./ft.)
A	(Unrestricted)	≥ 60	≤ 5
B	(Slightly Restricted)	≥ 40	≤ 7
C	(Restricted but fluid)	≥ 24	≤ 10
D	(Restricted, necessary to continuously alter walking stride and direction)	≥ 15	≤ 15
E	(Severely restricted)	≥ 8	≤ 23
F	(Forward progress only by shuffling; no reverse movement possible)	< 8	> 23

Notes:

* Based on average conditions for 15 minutes.
(sq. ft./ped.) - square feet per pedestrian.
(ped./min./ft.) - pedestrians per minute per foot-width.

Sources: *Highway Capacity Manual.*

Table 15-9 shows the results of the analyses of existing sidewalk conditions for the weekday midday, PM and Sunday midday peak hours. As shown in Table 15-9, all analyzed sidewalks currently operate at LOS B or better under platoon conditions in all peak periods with the exception of the south sidewalk on Joralemon Street between Clinton and Court Streets. This sidewalk operates at LOS C in the weekday midday peak hour reflecting the relative narrowness of the sidewalk and the proximity of this location to the Downtown core where existing pedestrian volumes are typically higher than in the immediate vicinity of the proposed project. Overall, the acceptable LOS C or better peak hour conditions at pedestrian facilities in the vicinity of the proposed project site reflect the existing low pedestrian densities, as well as the adequacy of sidewalk widths on most of the streets and avenues in the area.

TABLE 15-9
2005 EXISTING PEDESTRIAN CONDITIONS

MID-BLOCK ANALYSIS

Map No.	Blockface	Side of Street	Effective Sidewalk Width (feet)	Peak 15 Min. Volumes			Average Walkway						Platoon Walkway		
							Persons per Foot per Min. (PFM)			Level of Service			Level of Service		
				MD	PM	SMD	MD	PM	SMD	MD	PM	SMD	MD	PM	SMD
1	**Cranberry Street** Hicks Street to Henry Street	South	5.4	15	33	18	0.2	0.4	0.2	A	A	A	A	A	A
2	**Cranberry Street** Hicks Street to Henry Street	North	3.3	22	17	19	0.4	0.3	0.4	A	A	A	A	A	A
3	**Old Fulton Street** Elizabeth Street to Front Street	South	13.3	17	24	26	0.1	0.1	0.1	A	A	A	A	A	A
4	**Old Fulton Street** Water Street to Front Street	North	8.0	24	48	64	0.2	0.4	0.5	A	A	A	A	A	A
5	**Washington Street** Water Street to Front Street	East	6.6	102	81	58	1.0	0.8	0.6	A	A	A	B	A	A
6	**Washington Street** Water Street to Front Street	West	10.2	44	43	41	0.3	0.3	0.3	A	A	A	A	A	A
7	**Water Street** Main Street to Washington Street	South	6.0	48	34	26	0.5	0.4	0.3	A	A	A	A	A	A
8	**Water Street** Main Street to Washington Street	North	6.0	23	13	7	0.3	0.1	0.1	A	A	A	A	A	A
9	**Atlantic Avenue** Clinton Street to Court Street	South	5.0	83	65	61	1.1	0.9	0.8	A	A	A	B	A	A
10	**Atlantic Avenue** Clinton Street to Court Street	North	13.1	154	168	119	0.8	0.9	0.6	A	A	A	A	A	A
11	**Joralemon Street** Clinton Street to Court Street	South	4.4	203	188	55	3.1	2.8	0.8	A	A	A	C	B	A
12	**Joralemon Street** Clinton Street to Court Street	North	6.2	158	126	36	1.7	1.4	0.4	A	A	A	B	B	A
13	**Montague Street** Henry Street to Clinton Street	South	7.3	259	98	196	2.4	0.9	1.8	A	A	A	B	A	B
14	**Montague Street** Henry Street to Clinton Street	North	16.8	208	177	152	0.8	0.7	0.6	A	A	A	A	A	A
15	**Clark Street** Hicks Street to Henry Street	South	7.3	85	108	74	0.8	1.0	0.7	A	A	A	A	A	A
16	**Clark Street** Hicks Street to Henry Street	North	8.0	83	128	81	0.7	1.1	0.7	B	B	A	A	B	A
17	**Fulton Ferry Landing** at Old Fulton Street	North West	14.5	44	50	66	0.2	0.2	0.3	A	A	A	A	A	A
18	**Fulton Ferry Landing** at Old Fulton Street	South West	7.1	8	7	10	0.1	0.1	0.1	A	A	A	A	A	A
19	**Furman Street** Joralemon Street to Atlantic Street	West	5.3	2	4	6	0.0	0.1	0.1	A	A	A	A	A	A
20	**Columbia Street** Atlantic Street to Congress Street	East	7.0	3	2	1	0.0	0.0	0.0	A	A	A	A	A	A
21	**Columbia Street** Atlantic Street to Congress Street	West	5.3	1	0	0	0.0	0.0	0.0	A	A	A	B	B	B
22	**Joralemon Street** Columbia Place to Furman Street	North	3.5	15	20	10	0.3	0.4	0.2	A	A	A	A	A	A
23	**Brooklyn Bridge** Stair at Washington and Prospect Sts.	N/A	4.4	66	72	93	1.0	1.1	1.4	A	A	A	N/A	N/A	N/A

PEDESTRIAN SAFETY

A number of heavily trafficked corridors in the vicinity of the project site currently have problems with respect to pedestrian safety and comfort. This is particularly evident on Atlantic Avenue, west of Hicks Street; on Columbia Street; north of Congress Street and on Old Fulton Street near Hicks Street and near the Brooklyn Bridge exit ramp. Several of these corridors will be used for pedestrian access to the proposed project. Old Fulton Street at Hicks Street, the Brooklyn-Queens Expressway exit ramp and the Brooklyn Bridge exit ramp all present areas of high pedestrian/vehicle conflict (see photos in Figure 15-5a, b, c and g). Both the Brooklyn-Queens Expressway entry ramp and exit ramp on Old Fulton Street are unsignalized and can be difficult for pedestrians to cross safely. The relatively wide (approximately 85 feet) width of Old Fulton Street at the Brooklyn-Queens Expressway entry ramp and the absence of pedestrian signals make this a problem location for pedestrians to cross. Farther west on Old Fulton Street, near Elizabeth and Front Streets, the absence of pedestrian signals, crosswalks and medians is also a safety issue for pedestrians, and bus transit riders using the B25 bus via the stop at Old Fulton and Elizabeth Streets. The Old Fulton Street and Front/York Streets intersection has an unsignalized right turn from Old Fulton Street onto Front/York that is also hard for pedestrians to cross safely (see Figure 15-5 d). The Old Fulton Street and Furman Street intersection, near the Fulton Ferry Landing has a left turn that is unsignalized (See Figure 15-5 e and f). Some vehicles make the left turn from Old Fulton Street onto Furman Street at high speeds, and the unsafe conditions are exacerbated by the absence of a pedestrian signal and poor pedestrian sight lines.

Furman Street, at the edge of the proposed park, provides an alternative route to the Brooklyn-Queens Expressway westbound. Vehicles on Furman Street travel at high speeds in their uninterrupted path between Old Fulton Street and Joralemon Street. Currently, there is no pedestrian signal or crosswalk at the intersection of Furman and Joralemon Streets, and pedestrian sightlines are poor as pedestrians crossing Furman Street from Joralemon Street to the park cannot see oncoming vehicles due to the Brooklyn-Queens Expressway bridge abutments extending far into the sidewalk (see Figure 15-5 i). Both Atlantic Avenue and Columbia Street, at the southern end of the proposed park are wide streets with high traffic volumes (see Figure 15-5 j, k and l). The potential for pedestrian/vehicle conflicts is an issue along both of these corridors as the proposed park would introduce new pedestrians in areas where there are very low existing pedestrian volumes. Like the Old Fulton Street corridor, both the Atlantic Avenue and Columbia Street corridors lack sidewalk continuity and do not have clear pedestrian paths.

HIGH PEDESTRIAN ACCIDENT LOCATIONS

Accident data for key locations in the vicinity of the project site were obtained from the New York State Department of Transportation (NYSDOT) for the three-year period from 1999 through 2001. A summary of these data is presented in Figure 14-5 in Chapter 14, "Traffic and Parking." As shown in Figure 14-5, accidents involving pedestrians were relatively low in number during the three year period, likely due in part to the relatively low pedestrian volumes prevalent in the vicinity of the proposed park. The two locations with the highest number of accidents involving pedestrians from 1999 through 2001 were both found to be located along Atlantic Avenue. A total of six accidents occurred at the intersection of Atlantic Avenue and Clinton Street, and four accidents occurred at the intersection of Atlantic Avenue and Hicks Street. The next highest accident location was found to be the intersection of Front and Washington Streets where a total of three accidents involving pedestrians occurred between 1999 and 2001. All other locations examined experienced fewer than three accidents involving pedestrians.

a. Old Fulton Street at the BQE exit ramp.

b. Old Fulton Street at the BQE entry ramp.

c. Old Fulton Street at the BQE entry/exit ramps.

Figure 15-5 (cont)

d. Old Fulton Street at Front/York Streets—Unsignalized right turn.

e. Old Fulton Street left turn onto Furman Street—First in sequence.

f. Old Fulton Street left turn onto Furman Street—Second in sequence.

Figure 15-5 (cont)

g. Brooklyn Bridge exit ramp onto Cadman Plaza West.

h. Joralemon Street between Columbia Place and Furman Street— to be converted to pedestrian only use under the BQE.

i. Poor sightlines for pedestrians at the Joralemon St. and Furman St. intersection due to BQE bridge abutment

Figure 15-5 (cont)

j. Atlantic Avenue between Hicks Street and the BQE ramp. Entry ramp at the right of the photo is heavily used by traffic, has no marked crosswalk and hard for pedestrians to traverse.

k. Atlantic Avenue looking east at Furman Street – wide, with heavy traffic volumes and no medians.

l. Columbia Street looking north at Congress Street—wide, with heavy turning traffic volumes to/from the BQE.

BICYCLES

As shown in Figure 15-6, existing bicycle facilities in the vicinity of the project site include on-street bicycle lanes located along Clinton Street, Henry Street (from Clark to Amity Streets), Adams Street, Jay Street (between Sands and Tillary Streets), Sands Street, Navy Street, Bergen Street, Dean Street and the southern section of Boerum Place. Dedicated bicycle and pedestrian paths are provided along a promenade at the center of the Brooklyn Bridge with access from Tillary Street or via a stairway near Prospect and Washington Streets. A bicycle only facility is also provided along the north side of the Manhattan Bridge with access via a stairway at Jay and Sands Streets. In addition to these facilities, a number of streets in the vicinity of the project site are recommended for use by bicyclists under the New York City's Bicycle Network Development program. Recommended routes include Columbia, Furman, Front, York and Joralemon Streets, and portions of Washington, Clark, Tillary, Smith and Jay Streets, Boerum Place, and Cadman Plaza East.

Existing bicycle volumes during the weekday 12-1 PM, 5-6 PM and Sunday 2-3 PM peak hours along key corridors providing access to the proposed park site are shown in Figure 15-4. As shown in Figure 15-4, some of the highest volumes were found along Montague Street with upwards of 18 bicyclists per hour in each direction. Upwards of 15 bicyclists per hour per direction were observed along Joralemon Street, and upwards of 11 per hour along Atlantic Avenue. Peak hour bicycle volumes along Clark Street ranged from four to 18 in each direction, while along Washington Street at the north end of the project site, bicycle volumes were found to range from six to 12 per direction in each peak hour. Other corridors typically experienced fewer than ten bicycles per hour per direction.

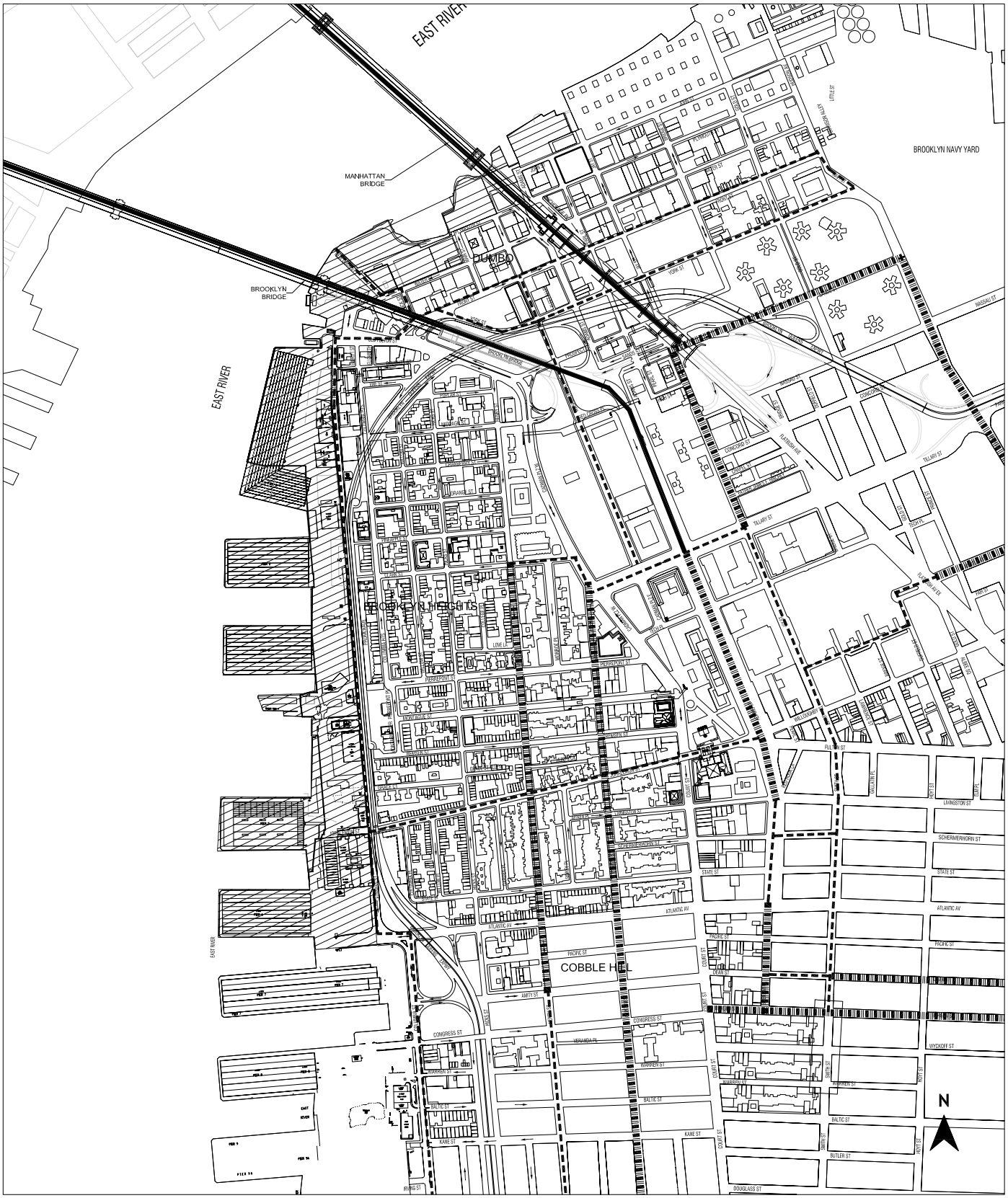
D. THE FUTURE WITHOUT THE PROPOSED PROJECT

Between 2005 and 2012, it is expected that demand at area transit and pedestrian facilities would increase due to long-term background growth as well as the development of a substantial amount of commercial, residential and retail space, and a new arena. In order to forecast those future demands without the proposed action (the No Build condition), the principal development projects were considered, in addition to an annual background growth rate of 0.5 percent per year applied to existing transit and pedestrian demand for the 2005 through 2012 period. This background growth rate, recommended in the *CEQR Technical Manual* for projects in Brooklyn, is applied to account for smaller projects and general increases in travel demand not attributable to specific development projects.

Chapter 2, "Land Use, Zoning, and Public Policy," identifies and describes the No Build developments in the area. No substantive changes to existing analyzed transit or pedestrian facilities are assumed to occur during the 2005 through 2012 period, although as discussed below in the discussion of pedestrian conditions, several initiatives for providing improved pedestrian facilities in the vicinity of the project site are currently under evaluation. The following sections describe how new developments, and the growth in travel demand in this area of Brooklyn, are expected to affect transit and pedestrian facilities in the future without the proposed action.

SUBWAY SERVICE

Under 2012 No Build conditions, subway demand at the York Street, High Street and Clark Street stations and the Borough Hall/Court Street station complex would grow as a result of



Project Area

Recommended Route

Bike Lane (on-street)

Walkway/Bikeway

Not to Scale

This figure has been revised for the FEIS

BROOKLYN BRIDGE PARK

Bicycle Lanes
Figure 15-6

background growth (assumed at 0.5 percent per year) and development projects. No physical or operational changes are anticipated at any of these facilities. Tables 15-10 through 15-13 show the results of the analyses of 2012 No Build weekday PM and Sunday midday peak hour conditions for the analyzed station elements at York Street, High Street, Clark Street, and Borough Hall/Court Street. As shown in Tables 15-10 through 15-13, in the future without the proposed project, all analyzed stairways and fare arrays will continue to operate at LOS B or better in both the weekday PM and Sunday midday peak hours.

BUS SERVICE

During the 2005 through 2012 period, demand on NYCT local bus routes serving the area of the proposed Brooklyn Bridge Park is expected to increase as a result of new developments and general background growth. In addition to demand from discrete development projects, a background growth rate of 0.5 percent per year was applied to account for general demand increases in the area.

Table 15-14 shows the estimated peak hour, peak direction ridership at the maximum load point of each of the three NYCT local bus routes serving the project area in the 2012 future without the proposed action. As shown in Table 15-14, analyzed local bus routes are expected to operate with available Borough Hall/Court Street capacity in the peak direction at their maximum load points in the weekday PM peak period in the future without the proposed action, with the exception of the B25 route. Based on current service levels, the B25 route would experience a capacity shortfall of 105 in the peak eastbound direction in the PM peak hour. As standard practice, NYCT routinely conducts periodic ridership counts and increases service where operationally warranted and fiscally feasible. It is therefore anticipated that under 2012 No Build conditions, NYCT would increase frequency on the B25 route to address this capacity shortfall. As shown in Table 15-14, the addition of one eastbound bus in the PM peak hour would fully address the capacity shortfall on the B25 in the 2012 No Build condition.

PEDESTRIANS

Under 2012 No Build conditions, pedestrian volumes are expected to grow due to background growth (assumed at 0.5 percent per year) and additional developments in the vicinity of the proposed Brooklyn Bridge Park. During this period it is also anticipated that improvements to pedestrian facilities in the vicinity of the proposed project may result from three initiatives currently under evaluation or planning. First, the New York City Department of Transportation plans to implement traffic calming measures developed as part of the Downtown Brooklyn Traffic Calming Project (DBTCP). Under this project, which was initiated by the New York City Department of Transportation (NYCDOT) in 1997, a comprehensive area-wide strategy of physical and operational traffic calming measures was developed for Downtown Brooklyn on a corridor-by-corridor basis. A number of the corridors examined would provide access to the proposed project site, including Atlantic Avenue, Furman, Old Fulton, Columbia, Montague, and Joralemon Streets. Among the project's objectives are to improve pedestrian safety and access, including safer crossings at problem locations, reduce vehicular speeds, and enhance mobility between neighborhoods. In 2001 a pilot program was implemented to evaluate various

Table 15-10
2012 No-Build Subway Station Analysis
York Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S7	Stairway @ SE Corner	PM	5.74	861	576	6.69	0.67	B
	Jay Street/York Street	SMD	5.74	861	268	3.11	0.31	A

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
N-530	Jay Street/York Ave					
	3 entry/exit turnstiles	PM	1,440	576	0.40	B
		SMD	1,440	268	0.19	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for side handrails and 6" for a middle handrail. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Assumed 0.5 percent per year background growth for 2005 through 2012 period.

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-11
2012 No-Build Subway Station Analysis
High Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S4	Stairway @ Cadman Plaza West	PM	3.20	480	186	3.88	0.39	A
		SMD	3.20	480	107	2.23	0.22	A

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
N-100	Cadman Plaza West Fare Array					
	3 entry/exit turnstiles	PM	1,440	186	0.13	A
		SMD	1,440	107	0.07	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for side handrails and 6" for a middle handrail. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Assumed 0.5 percent per year background growth for 2005 through 2012 period.

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-12
2012 No-Build Subway Station Analysis
Clark Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
(Not applicable - all station entrances located at-grade)								

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
R-600	Clark Street Fare Array					
4	entry/exit turnstiles	PM	1,920	313	0.16	A
		SMD	1,920	161	0.08	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for side handrails and 6" for a middle handrail. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Assumed 0.5 percent per year background growth for 2005 through 2012 period.

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-13
2012 No-Build Subway Station Analysis
Borough Hall/Court Street Station Complex

COURT STREET STATION (M,R)

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S5	Stairway near SW Corner	PM	2.93	440	68	1.56	0.16	A
	Clinton Street/Montague Street	SMD	2.93	440	16	0.35	0.04	A
S6	Montague Street Stairway Northside	PM	3.60	540	85	1.57	0.16	A
	Midblock Btwn Clinton/Henry Streets	SMD	3.60	540	43	0.81	0.08	A

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
C-7	West Fare Array					
	Clinton Street/Montague Street					
	3 entry/exit turnstiles	PM	2,040	221	0.11	A
	2 high entry/exit turnstiles	SMD	2,040	76	0.04	A

BOROUGH HALL STATION (4,5)

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	Peak 15 Minute Volume (4)	PFM (5)	Volume to Capacity Ratio	LOS
S3	West Facing Stairway @	PM	6.93	1,040	105	1.01	0.10	A
	Joralemon Street/Borough Hall	SMD	6.93	1,040	66	0.64	0.06	A
O1	West Facing Stairway @	PM	7.07	1,061	216	4.92	0.20	A
	Joralemon Street/Municipal Building	SMD	7.07	1,061	101	0.96	0.10	A
S4	Stairway @ SW Corner	PM	2.73	410	250	5.68	0.61	B
	Joralemon Street/Court Street	SMD	CLOSED					
S5	Stairway @ NW Corner	PM	3.47	521	223	5.07	0.43	B
	Joralemon Street/Court Street	SMD	CLOSED					

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	Peak 15 Min. Volume (4)	Volume to Capacity Ratio	LOS
R-602	Municipal Bldg. Fare Array					
	5 entry/exit turnstiles	PM	3,900	1,361	0.35	B
	2 high entry/exit turnstiles	SMD	3,900	280	0.07	A
	2 high revolving exit gates					
R-604	Court Street Fare Array					
	6 entry/exit turnstiles	PM	2,880	472	0.16	A
		SMD	CLOSED			

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for side handrails and 6" for a middle handrail. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Assumed 0.5 percent per year background growth for 2005 through 2012 period.

(5) Persons per foot width of stairway per minute.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-14
2012 No Build Local Bus Conditions

Route	Peak Hour[1]	Peak Direction	Maximum Load Point	No Build Peak Hour Riders	No Build Conditions with Current Service Levels			No Build Conditions with Potential Service Adjustments		
					Peak Hour Buses	Average Riders Per Bus	Available Capacity[2]	Peak Hour Buses	Average Riders Per Bus	Available Capacity[2]
B25	PM	EB	Fulton Street/ Greene Avenue	625	8	78	-105	10	63	25
B61	PM	NB	York Street/ Gold Street	357	6	60	33	6	60	33
B63	PM	SB	Fifth Avenue/50th Street	354	6	59	36	6	59	36

Notes:
(1) Peak hours: weekday 5-6 PM.
(2) Based on most currently available NYCT ridership summaries.
(3) Available capacity based on NYCT loading guidelines of 65 riders per standard bus.

candidate traffic calming measures. Measures implemented included the widening of the median refuges on Tillary Street at Adams Street to reduce north-south crosswalk distance; and the introduction of a pedestrian refuge (subsequently removed in late summer 2002), new left-turn lane and changes to parking regulations on Atlantic Avenue at Bond Street, along with curb extensions on Bond Street at Atlantic Avenue. After evaluating the effectiveness of the pilot program treatments, an action plan was developed with recommendations for implementing an area-wide traffic calming strategy. With the exception of the November 2003 conversion of Smith Street from two-way to one-way northbound operation from Atlantic Avenue to Schermerhorn Street, no specific measures in the DBTCP have been identified for implementation in the vicinity of the proposed Brooklyn Bridge Park at this time. However, all measures remain candidates for implementation. NYCDOT is working with the Community Boards on prioritizing these measures. NYCDOT intends to implement measures based upon further detailed review, analysis of impacts, and community approval.

Under another initiative, currently being planned by the New York City Department of Design and Construction (DDC), Columbia Street would be reconstructed from Atlantic Avenue to Hamilton Avenue. This reconstruction would include a new walkway/bikeway, sidewalks, curbs, traffic signals, pedestrian ramps, street lighting, water mains, sewers, etc. It is anticipated that some pedestrian enhancements such as neck-downs, new crosswalks and pedestrian indicators for traffic signals would be incorporated as part of this project. Also included in this reconstruction project are portions of De Graw, Van Brunt, Carroll and Woodhull Streets.

Lastly, planning continues for a Brooklyn Waterfront Greenway, a continuous landscaped off-street route for pedestrians and bicyclists that would span 14 miles of Brooklyn waterfront from Sunset Park to Newtown Creek in Greenpoint. This Greenway was identified as a priority route in the Department of City Planning's 1993 Greenway Plan for New York City, which outlined a vision for a 350-mile network of greenways. The proposed Brooklyn Bridge Park would be a key component of the Brooklyn Waterfront Greenway, and Greenway bike and pedestrian paths have been included in the Columbia Street Reconstruction project.

Given that planning for these initiatives is still a continuing process with many details yet to be defined, the analysis of future pedestrian conditions conservatively assumes that no improvements are implemented at analyzed sidewalks, except along the west side of Columbia Street where a re-construction project has already commenced.

Figure 15-7 shows the No Build pedestrian volumes. Table 15-15 shows the results of the analyses of weekday midday, PM and Sunday midday peak hour sidewalk conditions in the 2012 future without the proposed project. As shown in Table 15-15, in the future without the proposed project, all analyzed sidewalks would experience increased flow, but are expected to operate at an acceptable LOS A, B or C under platoon conditions in all analyzed peak hours. The stairs to the Brooklyn Bridge bicycle/pedestrian path at Washington and Prospect Streets are expected to operate at LOS A in all peak hours.

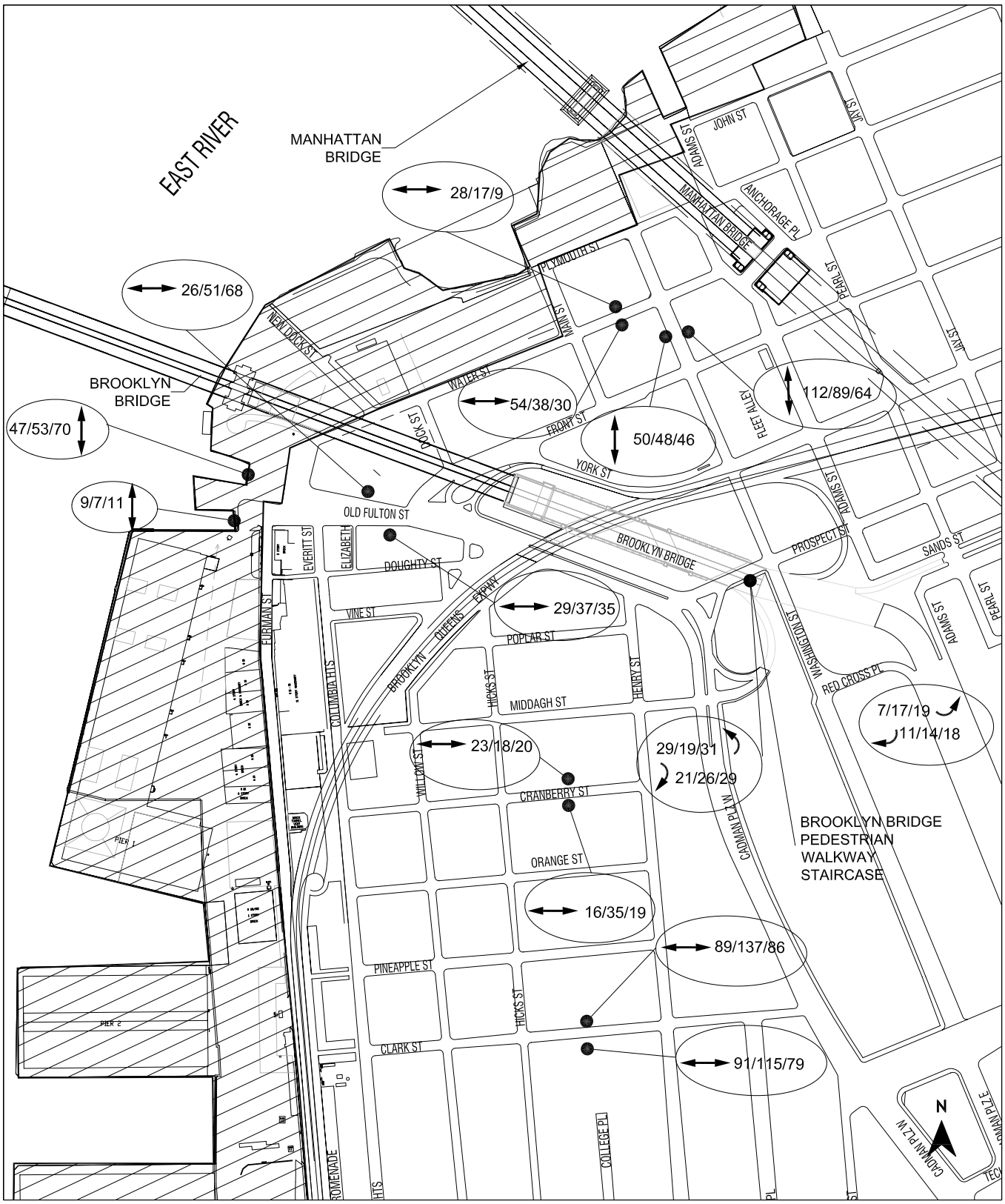
E. THE FUTURE WITH THE PROPOSED PROJECT

This section provides an analysis of transit and pedestrian conditions in the future with the proposed project. As discussed in Chapter 1, "Project Description," the proposed project would result in an 85-acre park development, with public recreation space, a 185-slip marina, a residential component with 1,210 dwelling units, a 225-room hotel, and a mix of restaurant, retail, office and educational uses. Approximately 1,183 new parking spaces would also be created in 5 new parking facilities. The proposed project would displace limited existing activity both on the waterfront and in the upland and therefore, conservatively, no transportation credit is taken for any displacement. It should also be noted that, if approved by the New York City Department of Transportation, Joralemon Street would be closed to vehicle traffic between Furman Street and Columbia Place (but remain open for pedestrians, and bicyclists.

Table 14-6 in Chapter 14, "Traffic and Parking," presents the transportation planning assumptions utilized in the travel-demand analysis, and Table 14-7 shows the weekday peak hour person-trip and vehicle-trip forecasts for the proposed action. As shown in Table 14-7, a total net increment of 1,558 and 1,375 persons trips by subway would be generated by the proposed action in the weekday PM and Sunday MD peak hours, respectively. Net new person-trips by local bus would total 658 in the weekday PM peak hour while walk/other trips would total 4,301, 3,198, and 4,535 in the weekday midday, PM and Sunday midday peak hours, respectively. For the purposes of the transit and pedestrian analyses, commuter rail trips have been included in the totals for subway trips. The high number of walk-only trips in the Sunday midday reflects the high pedestrian activity that would be attracted by the park.

SUBWAY SERVICE

The subway demand forecast and trip assignment estimates were based on the proximity of projected development sites to each individual station. Table 15-16 summarizes the assignment of peak hour project-generated subway trips to the area's subway stations in the 2012 analysis year. A threshold of 200 peak hour trips entering and exiting a station has been established under CEQR criteria to determine whether new subway demand from a proposed action warrants a detailed analysis at a particular station. As shown in Table 15-16, new demand from the proposed action would exceed this threshold at the York Street, High Street and Clark Street stations, and at the combined Borough Hall/Court Street station complex. Demand at the Bergen Street station would, however, remain below the CEQR analysis threshold of 200 peak hour trips



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Project Site

2012 No-Build Pedestrian Volumes
Figure 15-7

BROOKLYN BRIDGE PARK

XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Not to Scale

Project Site

This figure has been revised for the FEIS

2012 No-Build Pedestrian Volumes

Figure 15-7 (cont)

BROOKLYN BRIDGE PARK

TABLE 15-15

2012 NO BUILD PEDESTRIAN CONDITIONS

MID-BLOCK ANALYSIS

Map No.	Blockface	Side of Street	Effective Sidewalk Width (feet)	Peak 15 Min. Volumes			Average Walkway						Platoon Walkway		
							Persons per Foot per Min. (PFM)			Level of Service			Level of Service		
				MD	PM	SMD	MD	PM	SMD	MD	PM	SMD	MD	PM	SMD
1	**Cranberry Street** Hicks Street to Henry Street	South	5.4	16	35	19	0.2	0.4	0.2	A	A	A	A	A	A
2	**Cranberry Street** Hicks Street to Henry Street	North	3.3	23	18	20	0.5	0.4	0.4	A	A	A	A	A	A
3	**Old Fulton Street** Elizabeth Street to Front Street	South	13.3	29	37	35	0.1	0.2	0.2	A	A	A	A	A	A
4	**Old Fulton Street** Water Street to Front Street	North	8.0	26	51	68	0.2	0.4	0.6	A	A	A	A	A	A
5	**Washington Street** Water Street to Front Street	East	6.6	112	89	64	1.1	0.9	0.6	A	A	A	B	A	A
6	**Washington Street** Water Street to Front Street	West	10.2	50	48	46	0.3	0.3	0.3	A	A	A	A	A	A
7	**Water Street** Main Street to Washington Street	South	6.0	54	38	30	0.6	0.4	0.3	A	A	A	A	A	A
8	**Water Street** Main Street to Washington Street	North	6.0	28	17	9	0.3	0.2	0.1	A	A	A	A	A	A
9	**Atlantic Avenue** Clinton Street to Court Street	South	5.0	89	69	65	1.2	0.9	0.9	A	A	A	B	A	A
10	**Atlantic Avenue** Clinton Street to Court Street	North	13.1	164	179	127	0.8	0.9	0.6	A	A	A	A	A	A
11	**Joralemon Street** Clinton Street to Court Street	South	4.4	217	201	59	3.3	3.0	0.9	A	A	A	C	C	A
12	**Joralemon Street** Clinton Street to Court Street	North	6.2	169	134	38	1.8	1.4	0.4	A	A	A	B	B	A
13	**Montague Street** Henry Street to Clinton Street	South	7.3	276	105	209	2.5	1.0	1.9	A	A	A	B	A	B
14	**Montague Street** Henry Street to Clinton Street	North	16.8	222	189	162	0.9	0.7	0.6	A	A	A	A	A	A
15	**Clark Street** Hicks Street to Henry Street	South	7.3	91	115	79	0.8	1.1	0.7	A	A	A	A	B	A
16	**Clark Street** Hicks Street to Henry Street	North	8.0	89	137	86	0.7	1.1	0.7	A	A	A	A	B	A
17	**Fulton Ferry Landing** at Old Fulton Street	North West	14.5	47	53	70	0.2	0.2	0.3	A	A	A	A	A	A
18	**Fulton Ferry Landing** at Old Fulton Street	South West	7.1	9	7	11	0.1	0.1	0.1	A	A	A	A	A	A
19	**Furman Street** Joralemon Street to Atlantic Street	West	4.7	2	4	6	0.0	0.1	0.1	A	A	A	A	A	A
20	**Columbia Street** Atlantic Street to Congress Street	East	5.1	3	2	1	0.0	0.0	0.0	A	A	A	A	A	A
21	**Columbia Street** Atlantic Street to Congress Street	West	8.0	11	10	30	0.1	0.1	0.3	A	A	A	A	A	A
22	**Joralemon Street** Columbia Place to Furman Street	North	3.5	16	21	10	0.3	0.4	0.2	A	A	A	A	A	A
23	**Brooklyn Bridge** Stair at Washington and Prospect Sts.	N/A	4.4	68	76	97	1.0	1.2	1.5	A	A	A	N/A	N/A	N/A

Table 15-16
Projected Generated Subway Trip Distribution
This table has been revised for the FEIS

Subway Station	Peak Period	Number of Trips
York Street	PM	298
F	SUN	244
High Street	PM	296
A, C	SUN	238
Clark Street	PM	213
2,3	SUN	150
Court Street	PM	346
M,R	SUN	328
Borough Hall	PM	349
2,3,4,5	SUN	339
Bergen Street	PM	56
F,G	SUN	76
TOTALS	**PM**	**1,558**
	SUN	**1,375**

in both analyzed peak periods. As also shown in Table 15-16, new subway trips would be well distributed among the other four nearby stations or station complexes, with the heaviest demand in the weekday PM peak hour. The Borough Hall/Court Street station complex (2, 3, 4, 5, M, R) is expected to attract a total of 695 PM peak hour trips, while York Street (F) and High Street (A, C) would experience 298 and 296 new trips, respectively.

The *CEQR Technical Manual* identifies a significant adverse impact for stairways in terms of the width increment threshold (WIT) needed to restore conditions to their No Build state based on the location of the stair within the station. Stairways that are substantially degraded in level of service or which experience the formation of extensive queues are classified as significantly impacted. Significant stairway impacts are typically considered to have occurred once the following thresholds are reached: for a Future Build LOS D condition, a WIT of six inches or more is considered significant; for a Future Build LOS E condition, three to six inches is considered significant; and for Future Build LOS F, a WIT of one- to three-inches is considered significant. For stairways operating at LOS A, B or C in the No Build condition, the determination of whether a significant adverse impact has occurred is based on the WIT needed to bring the stairway to an acceptable level of service (a v/c ratio of less than 1.00), not to the LOS projected for the No Build condition. For turnstiles, escalators and high-wheel exit gates, the *CEQR Technical Manual* defines a significant adverse impact as an increase from a No Build 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 also is considered significant.

Tables 15-17 to 15-20 show the effect of project-generated trips on the various station elements at the four analyzed subway stations or station complexes, and the results of the level of service analyses for the 2012 future with the proposed project. Applying impact criteria, the tables show that no significant adverse impacts would occur at any analyzed stairway or fare array due to the proposed project, and that all analyzed station elements would operate at LOS C or better in the future with the proposed project.

Table 15-17
2012 Build Subway Station Analysis
York Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	No Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build PFM (4)	2012 No-Build V/C	2012 No-Build LOS	2012 Build PFM (4)	2012 Build V/C	2012 Build LOS	Width Increment Threshold in Inches (5)
S7	Stairway @ SE Corner	PM	5.74	861	576	93	669	6.69	0.67	B	7.77	0.78	C	
	Jay Street/York Street	SMD	5.74	861	268	76	344	3.11	0.31	A	4.00	0.40	A	

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	No Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build V/C Ratio	2012 No-Build LOS	2012 Build V/C Ratio	2012 Build LOS
N-530	Jay Street/York Ave									
	3 entry/exit turnstiles	PM	1,440	576	93	669	0.40	B	0.46	C
		SMD	1,440	268	76	344	0.19	A	0.24	B

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for handrails. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Persons per foot width of stairway per minute.

(5) Width increment threshold needed to restore stairway to future No-Build condition.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-18
2012 Build Subway Station Analysis
High Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	No-Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build PFM (4)	2012 No-Build V/C	2012 No-Build LOS	2012 Build PFM (4)	2012 Build V/C	2012 Build LOS	Width Increment Threshold in Inches (5)
S4	Stairway @ Cadman Plaza West	PM	3.20	480	186	75	261	3.88	0.39	A	5.44	0.54	B	
		SMD	3.20	480	107	62	169	2.23	0.22	A	3.52	0.35	A	

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	No-Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build V/C Ratio	2012 No-Build LOS	2012 Build V/C Ratio	2012 Build LOS
N-100	Cadman Plaza West Fare Array									
3	entry/exit turnstiles	PM	1,440	186	75	261	0.13	A	0.18	A
		SMD	1,440	107	62	169	0.07	A	0.12	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for handrails. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Persons per foot width of stairway per minute.

(5) Width increment threshold needed to restore stairway to future No-Build condition.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-19
2012 Build Subway Station Analysis
Clark Street Station

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	No-Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build PFM (4)	2012 No-Build V/C	2012 No-Build LOS	2012 Build PFM (4)	2012 Build V/C	2012 Build LOS	Width Increment Threshold in Inches (5)
(Not applicable - all station entrances located at-grade)														

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	No-Build Pk 15 Min. Volume (4)	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build V/C Ratio	2012 No-Build LOS	2012 Build V/C Ratio	2012 Build LOS
R-600	Clark Street Fare Array									
4	entry/exit turnstiles	PM	1,920	313	67	380	0.16	A	0.20	A
		SMD	1,920	161	47	208	0.08	A	0.11	A

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for handrails. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Persons per foot width of stairway per minute.

(5) Width increment threshold needed to restore stairway to future No-Build condition.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

Table 15-20
2012 Build Subway Station Analysis
Borough Hall/Court Street Station Complex

COURT STREET STATION (M,R)

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	No-Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build PFM (4)	2012 No-Build V/C	2012 No-Build LOS	2012 Build PFM (4)	2012 Build V/C	2012 Build LOS	Width Increment Threshold in Inches (5)
S5	Stairway near SW Corner	PM	2.93	440	68	100	168	1.56	0.16	A	3.83	0.38	A	
	Clinton Street/Montague Street	SMD	2.93	440	16	88	104	0.35	0.04	A	2.36	0.24	A	
S6	Montague Street Stairway Northside	PM	3.60	540	85	8	93	1.57	0.16	A	1.72	0.17	A	
	Midblock Btwn Clinton/Henry Streets	SMD	3.60	540	43	15	58	0.81	0.08	A	1.08	0.11	A	

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	No-Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build V/C Ratio	2012 No-Build LOS	2012 Build V/C Ratio	2012 Build LOS
C-7	West Fare Array									
	Clinton Street/Montague Street									
	3 entry/exit turnstiles	PM	2,040	221	108	329	0.11	A	0.16	A
	2 high entry/exit turnstiles	SMD	2,040	76	103	179	0.04	A	0.09	A

BOROUGH HALL STATION (4,5)

STAIRWAYS

No.	Station Element/Location	Peak Period (1)	Effective Width in Feet (2)	Maximum 15 Minute Capacity (3)	No-Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No-Build PFM (4)	2012 No-Build V/C	2012 No-Build LOS	2012 Build PFM (4)	2012 Build V/C	2012 Build LOS	Width Increment Threshold in Inches (5)
S3	West Facing Stairway @	PM	6.93	1,040	105	0	105	1.01	0.10	A	1.01	0.10	A	
	Joralemon Street/Borough Hall	SMD	6.93	1,040	66	42	108	0.64	0.06	A	1.04	0.10	A	
O1	West Facing Stairway @	PM	7.07	1,061	216	0	216	4.92	0.20	A	2.04	0.20	A	
	Joralemon Street/Municipal Building	SMD	7.07	1,061	101	65	166	0.96	0.10	A	1.57	0.16	A	
S4	Stairway @ SW Corner	PM	2.73	410	250	36	286	5.68	0.61	B	6.97	0.70	B	
	Joralemon Street/Court Street	SMD	CLOSED											
S5	Stairway @ NW Corner	PM	3.47	521	223	36	259	5.07	0.43	B	4.97	0.50	A	
	Joralemon Street/Court Street	SMD	CLOSED											

FARE ARRAYS AND EXIT GATES

No.	Station Element/Location	Peak Period (1)	Maximum 15 Minute Capacity (6)	No Build Pk 15 Min Volume	Pk 15 Min Project Increment	Build Pk 15 Min Volume	2012 No Build V/C Ratio	2012 No Build LOS	2012 Build V/C Ratio	2012 Build LOS
R-602	Municipal Bldg. Fare Array									
	5 entry/exit turnstiles	PM	3,900	1,361	0	1,361	0.35	B	0.35	B
	2 high entry/exit turnstiles	SMD	3,900	280	107	387	0.07	A	0.10	A
	2 high revolving exit gates									
R-604	Court Street Fare Array									
	6 entry/exit turnstiles	PM	2,880	472	72	544	0.16	A	0.19	A
		SMD	CLOSED							

Notes:

(1) Peak Hours: weekday 5-6 pm and Sunday 2-3 pm

(2) Effective width measured as stairwell width less one foot to account for handrails. Effective width is further reduced by 20 percent to account for friction where there are two-way flows.

(3) Stair capacity in persons per 15 minutes based on NYC Transit guidelines of 10 PFM (see Note 5).

(4) Persons per foot width of stairway per minute.

(5) Width increment threshold needed to restore stairway to future No-Build condition.

(6) Fare array capacity based on 32 ppm for turnstiles, 20 ppm for high entry/exit turnstiles, and 30 ppm for high revolving exit gates as per NYCT guidelines.

BUS SERVICE

As shown in Table 14-6, the proposed project is expected to generate a total of approximately 658 trips during the weekday PM peak hour. All of these trips were distributed among the three analyzed bus routes serving the proposed park site. The assignment of project generated bus trips to individual routes was based on the proximity of each route to the development sites. As previously discussed, the bus impact analysis focuses on weekday PM peak hour conditions at the maximum load point on each route in the peak direction. The expected net incremental increase in peak direction bus demand at the maximum load point on each route is shown in Table 15-21. As shown in Table 15-21, the route with the greatest number of new peak direction bus trips through its maximum load point would be the B25 with 127 new eastbound trips in the PM peak hour. The numbers of new peak direction trips on the B61 and B63 routes would total 76 and 77, respectively.

Table 15-21
2012 Future with the Proposed Project: Local Bus Conditions

Route	Peak Hour [1]	Peak Direction	Maximum Load Point	Peak Hour Buses[2]	No-Build Peak Hour Demand	Project Increment	Build Peak Hour Riders	Build Average Riders per Bus	Build Available Capacity[2,3]
B25	PM	EB	Fulton Street/ Greene Avenue	10	625	127	752	75	-102
B61	PM	NB	York Street/Gold Street	6	357	76	433	72	-43
B63	PM	SB	5th Avenue/50th Street	6	354	77	431	72	-41

Notes:
[1] Peak hour: weekday 5-6 PM.
[2] Assumes service levels adjusted to address capacity shortfalls in the No-Build condition.
[3] Available capacity based on NYCT loading guidelines of 65 riders per standard bus.

According to current NYCT guidelines, increases in bus load levels to above their capacities at any load point is defined as a significant adverse impact, necessitating the addition of more bus service along the route. As shown in Table 15-21, in the 2012 future with the proposed project, all three analyzed bus routes would experience PM peak direction load levels at their maximum load points exceeding their capacities. Eastbound B25 buses would experience a deficit of 102 spaces, followed by B61 buses with a deficit of 43 spaces and B63 buses with a deficit of 41 spaces. These capacity shortfalls would require the addition of three eastbound B25 buses, one northbound B61 bus and one southbound B63 bus in the PM peak hour.

Based on the project's travel demand forecast, the project would generate 719 bus trips in the weekday midday (12-1 PM) peak hour, and 906 bus trips in the Sunday midday (2-3 PM) peak hour. NYC Transit operates the three analyzed bus routes in the off-peak periods to maintain minimum service frequency, as bus utilization in this area is light. Given that bus demand in these off-peak periods is typically balanced inbound versus outbound, no significant adverse impacts to off-peak bus operations are expected in the weekday midday or Sunday midday peak hours.

As standard practice, NYCT monitors bus ridership and increases service where operationally warranted and fiscally feasible. As such, the capacity shortfalls on the B25, B61 and B63 routes would be addressed by NYCT over the build-out period for the project, and no project-initiated mitigation would be required.

PEDESTRIANS

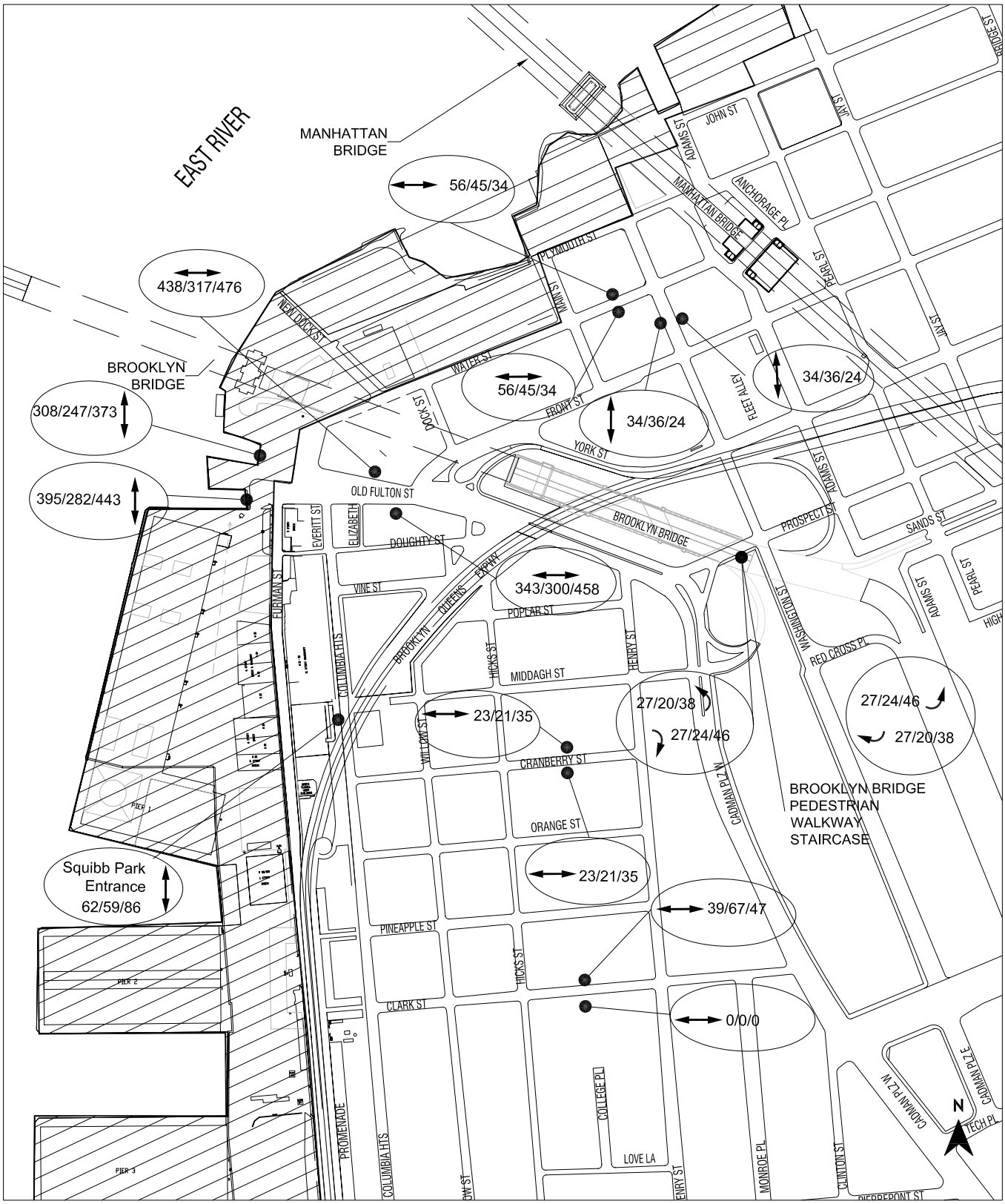
The proposed project would generate new pedestrian demand on sidewalks throughout the study area. This new demand would be comprised of trips made solely by walking, as well as pedestrian trips en route to and from subway station entrances and bus stops. Demand generated by the proposed 85-acre park is expected to be comprised primarily of local walk trips. As shown in Table 14-7, Chapter 14: "Traffic and Parking," the proposed project is expected to generate a total of 4,301 walk-other trips in the weekday midday, 3,198 in the PM and 4,535 in the Sunday midday peak hour. It should be noted that a portion of the walk-other trips would occur totally within the boundaries of the project site, representing, as an example, trips between the park and the restaurants. Trips en route to and from area subway stations and bus stops would account for an additional 1,708, 2,216 and 2,281 trips during these peak hours, respectively.

Although pedestrian trips generated by the proposed project are expected to be well distributed, the greatest concentrations are likely to occur in the vicinity of park entrance locations along Old Fulton Street, Atlantic Avenue, Joralemon Street and Columbia Street. As part of the proposed project, a pedestrian bridge will be built between Squibb Park, located on the corner of Middagh Street and Columbia Heights, and the proposed park. Also as part of the proposed project, the southwest sidewalk at the Old Fulton Street Ferry Landing is expected to be widened, and if approved by the City of New York, Joralemon Street would be closed to vehicular traffic at Furman Street, but it would remain open for pedestrians and bicyclists (see Figure 15-5 h). All other analyzed pedestrian facilities were assumed to remain unchanged from No Build conditions.

The pedestrian bridge proposed to be built between Squibb Park and the proposed park would be about 15 feet wide and would be fully compliant with the Americans with Disabilities Act. The pedestrian bridge would lead from inside Squibb Park to the top of the Pier 1 mound, which is at the same elevation as Squibb Park. Pedestrians entering the proposed park via the pedestrian bridge at Squibb Park would use primarily the west sidewalk of Columbia Heights between Cranberry and Middagh Streets. Approximately 62, 59, and 86 pedestrians in the midday, PM and Sunday peak 15-minute periods would enter the park via the proposed pedestrian bridge.

Figure 15-8 shows the increment pedestrian volumes generated by the proposed project at the analyzed pedestrian facilities and at the Squibb Park entrance. As shown in the figure, as an example, the sidewalk at the north side of Joralemon Street between Columbia Place and Furman Street would be used by approximately 188, 222, and 239 persons in the midday, PM and Sunday peak 15-minute periods, respectively.

Figure 15-9 shows the Build pedestrian volumes. Table 15-22 shows the results of the pedestrian flow analysis on analyzed sidewalks and stairways in the vicinity of the proposed park site in the 2012 future with the proposed project. According to the CEQR Technical Manual, for midblock sidewalk locations, a significant adverse impact occurs when the pedestrian flow rate increases by two or more pedestrians per foot per minute (PFM) over No-Build conditions with flow rates over 15 PFM or more (the threshold of LOS D and E). Platoon flow rates are used for assessing



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Not to Scale

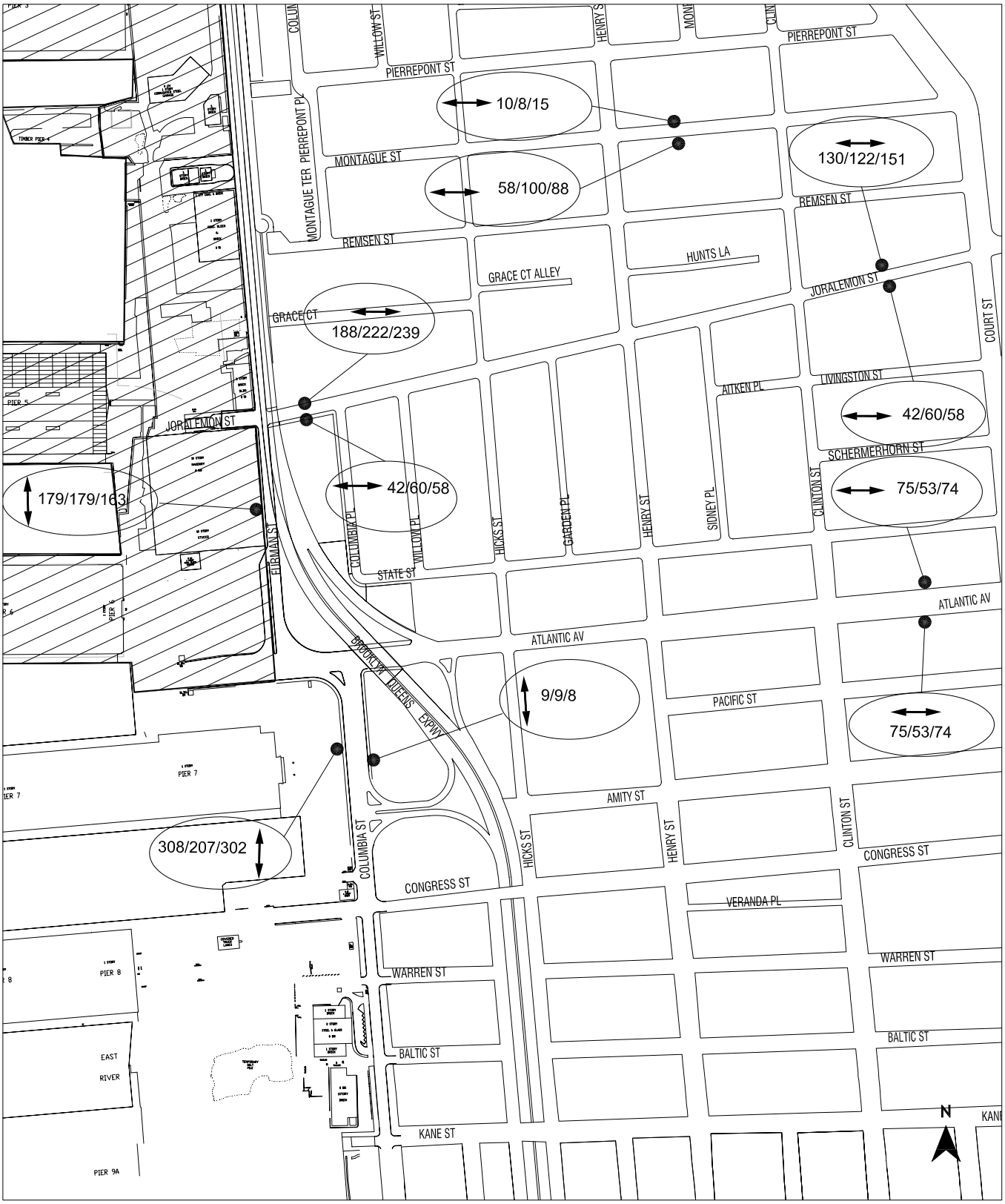
Project Site

This figure has been created for the FEIS

2012 Increment Pedestrian Volumes

Figure 15-8

BROOKLYN BRIDGE PARK



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Not to Scale

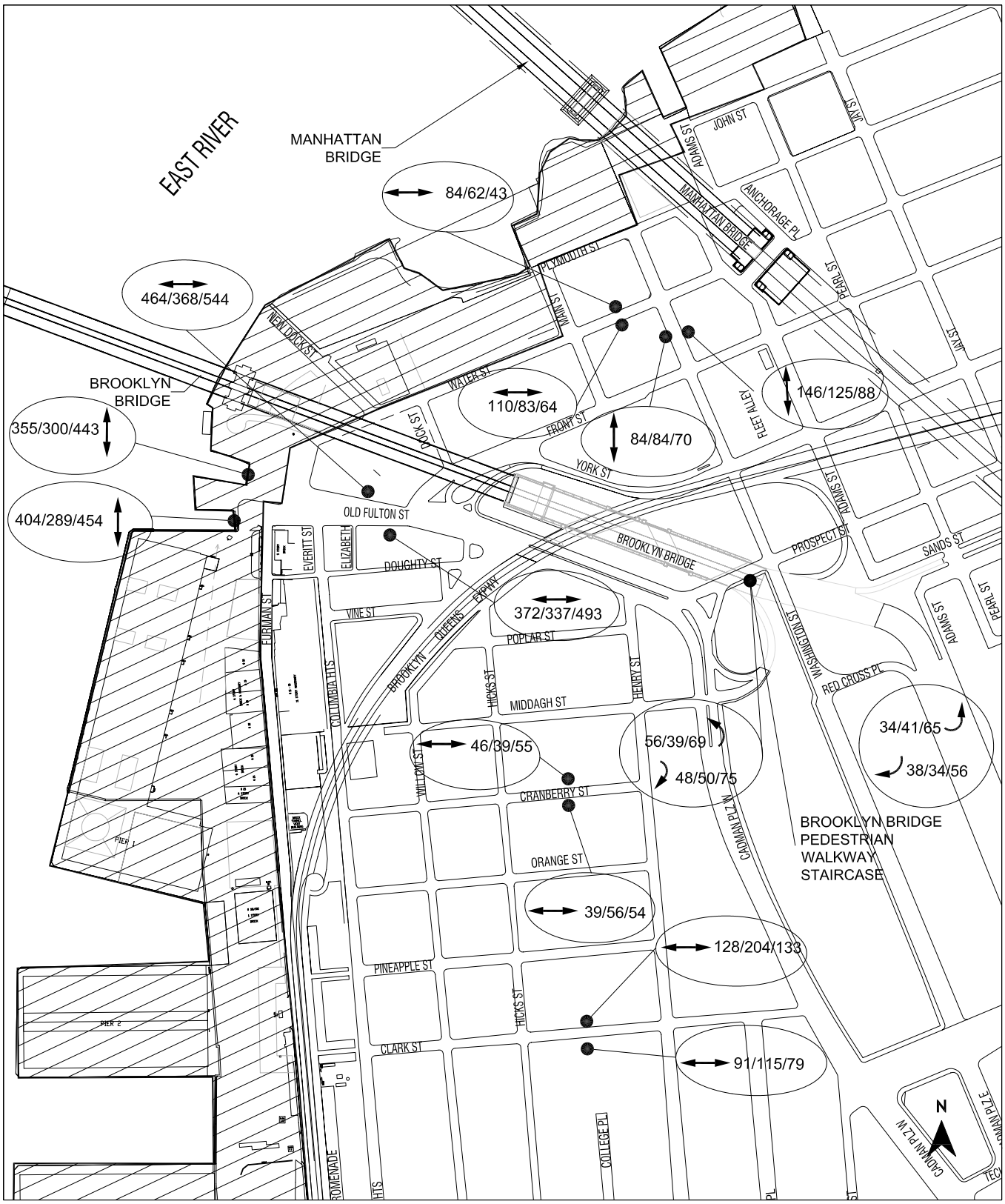
Project Site

This figure has been created for the FEIS

2012 Increment Pedestrian Volumes

Figure 15-8 (cont)

BROOKLYN BRIDGE PARK



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Not to Scale

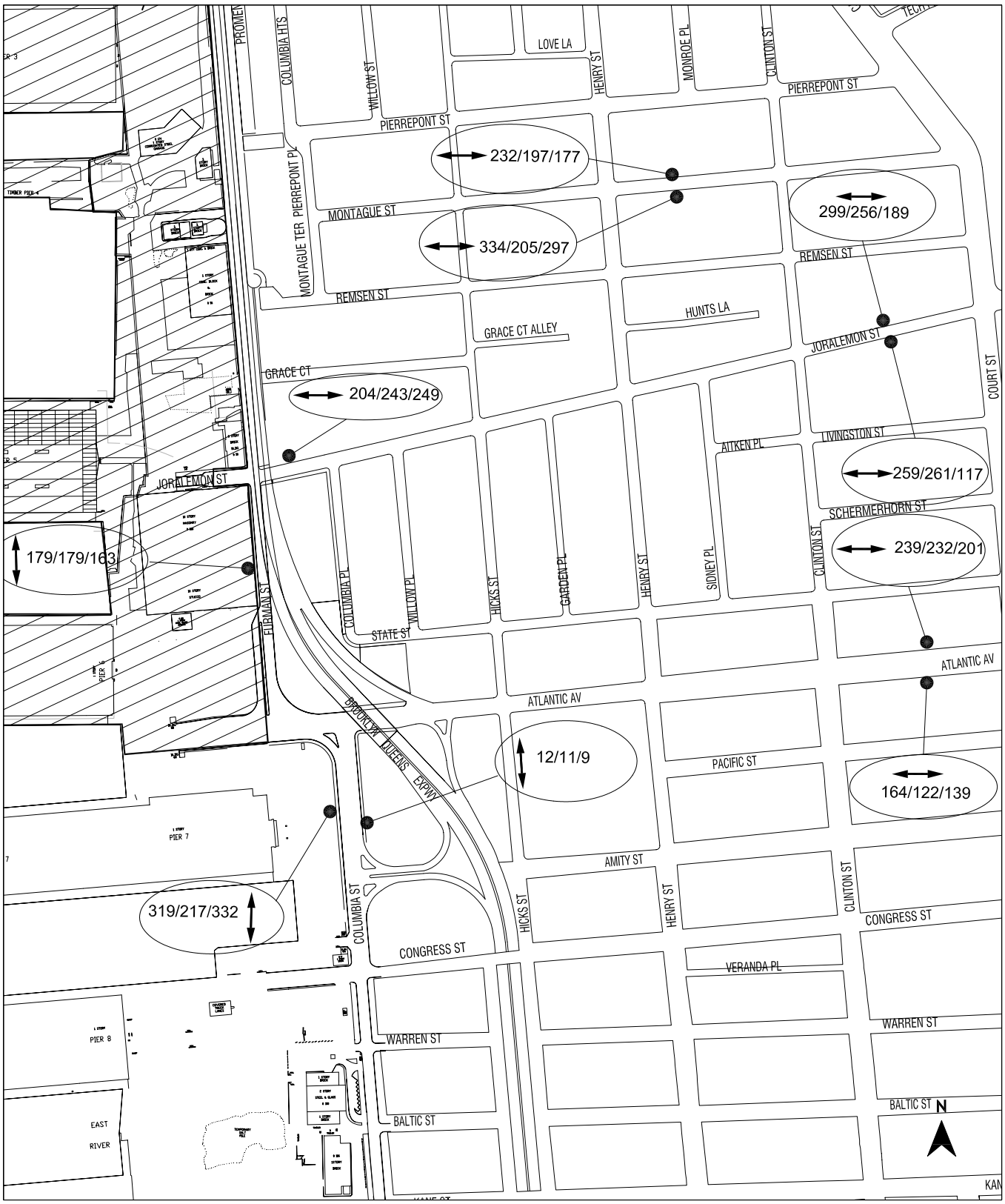
Project Site

This figure has been created for the FEIS

2012 Build Pedestrian Volumes

Figure 15-9

BROOKLYN BRIDGE PARK



XX/XX/XX - MD/PM/SMD Peak 15-min Volumes

Not to Scale

Project Site

This figure has been created for the FEIS

2012 Build Pedestrian Volumes

Figure 15-9 (cont)

BROOKLYN BRIDGE PARK

TABLE 15-22

2012 BUILD PEDESTRIAN CONDITIONS

MID-BLOCK ANALYSIS **This table has been revised for the FEIS**

Map No.	Blockface	Side of Street	Effective Sidewalk Width (feet)	Peak 15 Min. Volumes			Average Walkway						Platoon Walkway		
							Persons per Foot per Min. (PFM)			Level of Service			Level of Service		
				MD	PM	SMD	MD	PM	SMD	MD	PM	SMD	MD	PM	SMD
1	**Cranberry Street** Hicks Street to Henry Street	South	5.4	39	56	54	0.5	0.7	0.7	A	A	A	A	A	A
2	**Cranberry Street** Hicks Street to Henry Street	North	3.3	46	39	55	0.9	0.8	1.1	A	A	A	A	A	B
3	**Old Fulton Street** Elizabeth Street to Front Street	South	13.3	372	337	493	1.9	1.7	2.5	A	A	A	B	B	B
4	**Old Fulton Street** Water Street to Front Street	North	8.0	464	368	544	3.9	3.1	4.5	A	A	A	C	C	C
5	**Washington Street** Water Street to Front Street	East	6.6	146	125	88	1.5	1.3	0.9	A	A	A	B	B	A
6	**Washington Street** Water Street to Front Street	West	10.2	84	84	70	0.5	0.5	0.5	A	A	A	A	A	A
7	Water Street **Main Street to** Washington Street	South	6.0	110	83	64	1.2	0.9	0.7	A	A	A	B	A	A
8	**Water Street** Main Street to Washington Street	North	6.0	84	62	43	0.9	0.7	0.5	A	A	A	A	A	A
9	**Atlantic Avenue** Clinton Street to Court Street	South	5.0	164	122	139	2.2	1.6	1.9	A	A	A	B	B	B
10	**Atlantic Avenue** Clinton Street to Court Street	North	13.1	239	232	201	1.2	1.2	1.0	A	A	A	B	B	B
11	**Joralemon Street** Clinton Street to Court Street	South	4.4	259	261	117	3.9	3.9	1.8	A	A	A	C	C	B
12	**Joralemon Street** Clinton Street to Court Street	North	6.2	299	256	189	3.2	2.8	2.0	A	A	A	B	B	B
13	**Montague Street Henry Street to** Clinton Street	South	7.3	334	205	297	3.1	1.9	2.7	A	A	A	C	B	B
14	**Montague Street** Henry Street to Clinton Street	North	16.8	232	197	177	0.9	0.8	0.7	A	A	A	A	A	A
15	**Clark Street** Hicks Street to Henry Street	South	7.3	91	115	79	0.8	1.1	0.7	A	A	A	A	B	A
16	**Clark Street** Hicks Street to Henry Street	North	8.0	128	204	133	1.1	1.7	1.1	A	A	A	B	B	B
17	**Fulton Ferry** Landing at Old Fulton Street	North West	14.5	355	300	443	1.6	1.4	2.0	A	A	A	B	B	B
18	**Fulton Ferry** Landing at Old Fulton Street	South West	65.6	404	289	454	0.4	0.3	0.5	A	A	A	A	A	A
19	**Furman Street** Joralemon Street to Atlantic Street	West	4.7	179	179	163	2.6	2.6	2.3	A	A	A	B	B	B
20	**Columbia Street** Atlantic Street to Congress Street	East	5.1	12	11	9	0.2	0.1	0.1	A	A	A	A	A	A
21	**Columbia Street** Atlantic Street to Congress Street	West	8.0	319	217	332	2.7	1.8	2.8	A	A	A	B	B	B
22	**Joralemon Street** Columbia Place to Furman Street	North	3.5	204	243	249	3.9	4.6	4.7	A	A	A	C	C	C
23	**Brooklyn Bridge** Stair at Washington and Prospect Sts.	N/A	4.4	176	164	265	2.7	2.5	4.0	A	A	A	N/A	N/A	N/A

impacts. As shown in Table 15-22, all analyzed sidewalks would operate at an acceptable LOS C or better under platoon conditions in all peak periods in the future with the proposed project. The stair to the Brooklyn Bridge Promenade at Washington and Prospect Streets would operate at LOS A. Therefore, as a result of the very low pedestrian flows in the area under No-Build conditions, the proposed project would not result in significant adverse sidewalk impacts in any peak hour.

PEDESTRIAN SAFETY

As noted above, pedestrians generated by the proposed project would enter and exit the proposed park primarily through Old Fulton Street, Joralemon Street, Atlantic Avenue and Columbia Street. The following discusses each of these corridors from the pedestrian safety viewpoint.

The Old Fulton Street corridor would serve as the major pedestrian corridor in the northern end of the project site. Under existing conditions, pedestrians experience long crossing distances and conflicts with traffic exiting the Brooklyn Bridge and the Brooklyn Queens Expressway access/egress ramps (see Figure 15-5a, b, and c). Pedestrian flows, which would be consistently over one thousand persons per hour on each side of Old Fulton Street, will accentuate the pedestrian limitations of the corridor. On the south side of Old Fulton Street at the Brooklyn-Queens Expressway, there is a stop sign-controlled northbound highway exit (right-turn only) with limited sight lines for pedestrians (see Figure 15-5a). The nearby on-ramp is configured to facilitate a major left-turn movement to the highway along with a relatively high-speed right-turn movement (see Figure 15-5b). One mitigating factor is the short crossing distance along the south sidewalk; however, this intersection has little queuing area for pedestrians and would likely be the most difficult location for pedestrians on the corridor.

Along Joralemon Street, which connects to the Downtown Brooklyn hub, sidewalks on both sides are very pedestrian friendly. At the foot of the street, the intersection with Furman Street would be modified to eliminate traffic on the east approach, thereby expanding the pedestrian space. Still, as shown previously on Figure 15-5i, vehicle-pedestrian sight-lines would still be limited at this signalized intersection. Enhanced signage and pavement markings would be helpful along this narrow section of Furman Street.

The Atlantic Avenue corridor is also pedestrian friendly except in the immediate vicinity and to the west of the Brooklyn-Queens Expressway. On the south side, a substantial number of new pedestrian trips would use this sidewalk, and the main point of conflict would be at the northbound on-ramp to the Brooklyn-Queens Expressway (see Figure 15-5j), where high-speed right-turn maneuvers occur. In addition, left-turns from eastbound Atlantic Avenue would create additional conflicts. Improvement options include enhanced pedestrian markings and pedestrian signalization, along with improved signage. As shown in Figure 15-5k, west of the Brooklyn-Queens Expressway the path to the waterfront and Furman Street on the north side of Atlantic Avenue exhibits wide crossings and limited pedestrian refuge areas. There are similar conditions on the south side, however the heavily trafficked intersection with Columbia Street is already accident prone, as discussed in Chapter 14, and the introduction of east-west pedestrian flows at this location would be better accommodated with improved crossing times, better signage and markings.

Pedestrians traveling to and from the park would utilize existing pathways in the study area, primarily the key corridors of Old Fulton Street and Atlantic Avenue; these locations could benefit from improvements to facilitate pedestrian circulation and reduce conflicts. Such improvements are within the scope of several initiatives, including the Downtown Brooklyn

Traffic Calming Project (DBTCP), the Columbia Street reconstruction being undertaken by the City of New York, as well as a federally-sponsored transportation planning study being undertaken by the local development corporation. As project planning advances, a set of coordinated steps will be undertaken to ensure safe pedestrian pathways for park visitors. Specifically, BBPDC would coordinate with the various initiatives described above to ensure that the park's design and user needs are addressed through the implementation of any off-site improvements or other measures that may be determined to be necessary. In addition, pedestrian safety concerns would be addressed as part of NYCDOT's plans for the redesign of Furman Street. Once the park is constructed, park staff would be specifically responsible for monitoring pedestrian safety within the park and the surrounding area, and would coordinate with NYCDOT and relevant initiatives to address any safety concerns that may emerge.

As previously discussed, the DBTCP initiated by the New York City Department of Transportation has proposed pedestrian safety improvements along several of the project site's access corridors. At Old Fulton Street, the DBTCP proposes the creation of substantial new pedestrian space from Front Street to Furman Street, as well as the addition of medians and the signalization of the Brooklyn-Queens Expressway exit ramp onto Old Fulton Street shown in Figure 15-5a. At Furman Street, the DBTCP proposes increased pedestrian signal timing at the Furman Street/Atlantic Avenue intersection. At Joralemon Street, the DBTCP proposes adding neckdowns at the intersection of Joralemon and Hicks Streets to decrease pedestrian crossing times, as well as installing raised crosswalks.

As previously noted, no specific measures in the DBTCP have been identified for implementation in the vicinity of the proposed Brooklyn Bridge Park at this time. However, all measures proposed in the DBTCP remain candidates for implementation. NYCDOT is working with the community boards on prioritizing these measures. NYCDOT intends to implement measures based upon further detailed review, analysis of impacts, and community approval.

As presented earlier, there is a major upgrade to the pedestrian environments incorporated into the city's current reconstruction effort on Columbia Street. The provision of these new facilities on the conflict-free west side of the street would enhance the pedestrian access environment along this southern corridor.

BICYCLES

As described in Chapter 1, "Project Description," as part of the proposed project, a designated bikeway, coordinated with the Greenway Initiative effort, would be integrated into the park from Pier 1 to Pier 6. This bikeway would be approximately 15 feet in width with asphalt paving. Entry for cyclists to the park would primarily be at Old Fulton Street and at Atlantic Avenue. At Fulton Ferry Landing, the bicycle route would connect to the proposed Greenway route along Water Street; the street closing would be subject to New York City approval. The proposed project also considers the closure of Joralemon Street to vehicular traffic at Furman Street, but—if the street closure is approved by the City of New York—this street segment would remain open to bicyclists and pedestrians. Few other physical changes to the study area street system are proposed, and none that would directly affect access to any existing on-street bicycle facility or recommended bicycle route.

The projected commercial developments would likely generate some new peak period commuter trips by bicycle, while the projected residential developments are also likely to generate some new commuter trips by bicycle in the peak periods, as well as recreational bicycle trips in off-peak periods and on weekends. In addition to the designated bikeway within the proposed park,

some of this new demand would likely utilize the on-street bike lanes and recommended bicycle routes on the surrounding street system, as well as the bikeway along the Brooklyn Bridge Promenade.

Although new vehicular traffic generated by the proposed project may increase congestion along some segments of the street network utilized by bicyclists, the project would introduce a new dedicated bicycle path along the waterfront and would not directly affect access to any existing on-street bicycle facility or recommended bicycle route. The proposed project is therefore expected to measurably enhance bicycle access along the waterfront and would not result in significant adverse impacts to study area bicycle facilities.

F. CONCLUSION

This chapter analyzes the effects of added travel demand from projected development sites and the Brooklyn Bridge Park on subway stations, local bus services and pedestrian facilities in the vicinity of the proposed project area. The results of the analyses show that this new demand would not result in significant adverse impacts to analyzed stairways or fare arrays at the York Avenue, High Street and Clark Street stations, and the Borough Hall/Court Street station complex. Significant adverse pedestrian impacts are also not expected to occur at sidewalks along the principal pedestrian access corridors serving the proposed project area. However, in the 2012 future with the proposed project, the B25, B61 and B63 local bus routes would all be significantly adversely impacted in their peak directions in the weekday PM peak hour. As standard practice, NYCT monitors bus ridership and increases service where operationally warranted and fiscally feasible. As such, the capacity shortfall on these routes would be addressed by NYCT, and no project-initiated mitigation is required for the proposed project.

Current pedestrian corridors providing access to the project area present deficiencies in terms of pedestrian conflicts and pedestrian safety. Old Fulton Street would receive the most new demand and is also the location of greatest sensitivity with respect to accommodating this demand. The Atlantic Avenue corridor would also carry substantial numbers of new pedestrian trips generated by the project, and the western end of this avenue, already exhibiting high accident rates, would benefit from improvements to safely accommodate new pedestrians. ✷