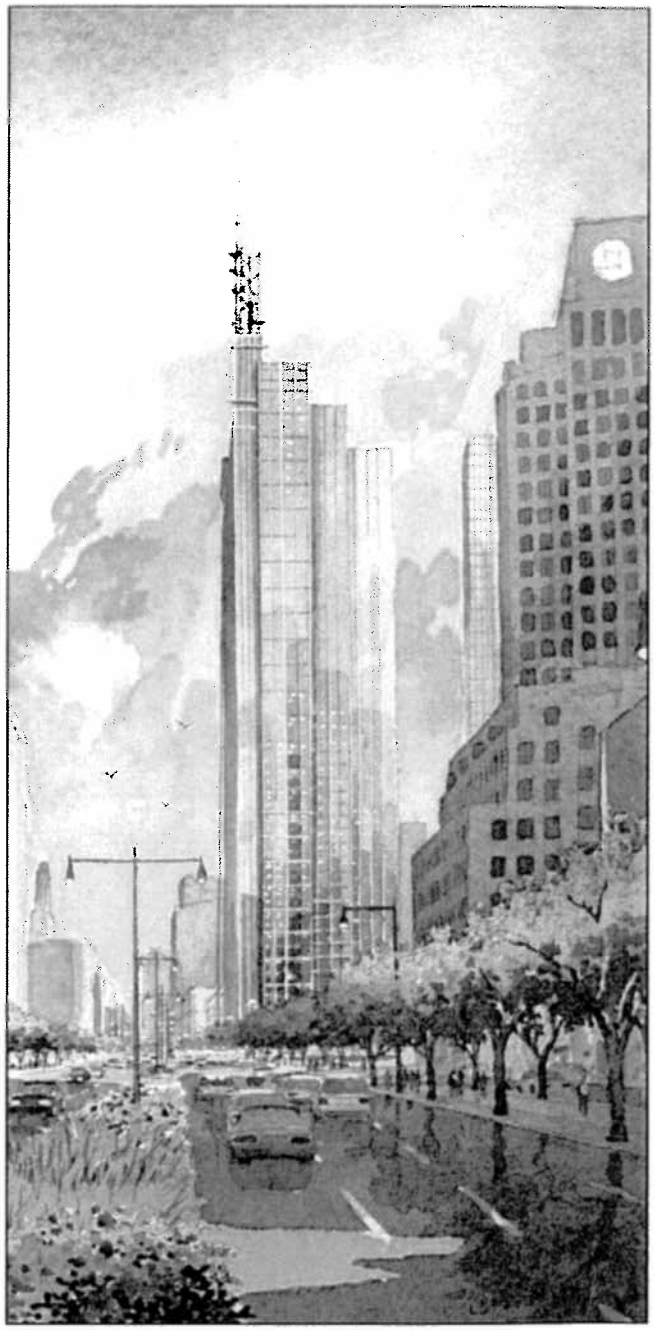
# DOWNTOWN **BROOKLYN** DEVELOPMENT

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## FINAL ENVIRONMENTAL IMPACT STATEMENT

**(INCORPORATING FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT)**

**CEQR#: 03DME016K**

**APRIL 2004**

# DOWNTOWN BROOKLYN DEVELOPMENT

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# (INCORPORATING FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT)

**April 2004**

**CEQR No.:** 03DME016K

**ULURP Nos.:**

| | | |
|---|---|---|
| C040171 ZMK | N040176 HGK | C040181 ZSK |
| C030514 MMK | C040173 HUK | C040182 ZSK |
| C030515 MMK | C040174 HUK | C040183 ZSK |
| C030516 MMK | C040175 HUK | C040184 ZSK |
| C030517 MMK | C040180 PPK | C040185 PSK |
| M930481(E) ZSK | C040177 HDK | C040172 ZRK |
| M000592(A) ZSK | C040178 HDK | |
| M860689(B) ZSK | | |

**Project Location:** Brooklyn, New York

Area bounded generally by Tillary Street to the north, Flatbush Avenue to the east, Schermerhorn Street to the south and Adams Street/Boerum Place to the west

**Lead Agency:** Office of the Deputy Mayor for
Economic Development and Rebuilding

**Lead Agency Contact:** Robert R. Kulikowski, Ph.D.
Assistant to the Mayor
100 Gold St., 2nd Floor
New York, NY 10038

Phone: (212) 788-2937

**Prepared by:** AKRF, Inc.

Philip Habib & Associates, LLC

Historical Perspectives, Inc.

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# Foreword*

This Final Environmental Impact Statement—which incorporates the Final Supplemental Environmental Impact Statement and will be referenced throughout the document as the "FEIS"—for the Downtown Brooklyn Development project responds to all substantive comments made on the Draft Environmental Impact Statement (DEIS) and Draft Supplemental Environmental Impact Statement (DSEIS) that was accepted as complete by the Office of the Deputy Mayor for Economic Development and Rebuilding, as lead agency under the City Environmental Quality Review (CEQR) process. A DEIS was prepared for the proposed actions, and a notice of completion for the DEIS was issued on November 28, 2003. Subsequent to the issuance of the DEIS, an announcement was made regarding the potential development of a large, mixed-use arena project with commercial, residential and retail uses along Atlantic Avenue just east of the project area. The size of the proposed Atlantic Yards project and its proximity to the Downtown Brooklyn Development project area necessitated revisions to the future baseline conditions analyzed in the Downtown Brooklyn Development DEIS.

Although the Downtown Brooklyn Development project is not linked to the approval of the Arena project or any of its components, the purpose of the Downtown Brooklyn Development DSEIS was to incorporate the overall Arena project in the future baseline condition in the same way that other unbuilt projects had already been accounted for in the Downtown Brooklyn Development DEIS. A positive declaration and notice of intent to prepare a Draft Supplemental Environmental Impact Statement (DSEIS) was issued on January 22, 2004, and a public scoping meeting was held on February 23, 2004. Additional comments were accepted during a 10-day period that followed, until Thursday, March 4, 2004. A final supplemental scope was issued and served as the framework for the DSEIS. A Notice of Completion was issued and the DSEIS was published on March 8, 2004.

This foreword summarizes the substantive changes made between the DSEIS and FEIS. The principal changes are as follows:

- A public hearing on the DEIS/DSEIS was held on March 24, 2004 at Klitgord Auditorium at the New York City College of Technology to accept oral comments. The public hearing on the DEIS was held concurrently with the hearing on the project's Uniform Land Use Review Procedure (ULURP) applications. Comments were accepted at the hearing and throughout the public comment period, which was held open through April 7, 2004. Relevant comments were considered in the preparation of this FEIS. Chapter 23, "Comments and Responses," has been prepared to address comments made at the public hearing and written comments provided at the public hearing and during the public comment period;
- The privately-owned portion of site K (Block 2060, Lots 1, 4) has been removed from the proposed development plan. The lots are occupied by small commercial and institutional (i.e., Institute of Design and Construction) uses. Its removal from the plan is in response to

* The Foreword is new to the EIS.

comments in support of the existing school, based on its importance to area. All corresponding land use actions related to that portion of the site—including rezoning, changes to allowable use, acquisition/disposition of those lots, and modifications to ground-floor retail requirements, streetwall continuity and curb cut restrictions—have been removed from the EIS and ULURP applications;

- All land use actions proposed for Block 1118—aka Site 6A under the Atlantic Terminal Urban Renewal Plan (ATURP)—as part of the Downtown Brooklyn Development project have been removed. The site, located at the southeast corner of Atlantic and Flatbush Avenues, was neither a projected nor potential development site under the plan; however, a number of land use actions were being proposed for the site including rezoning, modification of allowable use, and acquisition/disposition of that property under the ATURP. These proposed actions affecting this block have been removed from the EIS and ULURP applications in response to concerns raised during the public review that these actions could facilitate the development of Atlantic Yards Arena and Redevelopment Project;

- Revisions to the Brooklyn Center Urban Renewal Plan (BCURP) for (1) the continued designation of Site 3A as an urban renewal site, with the expiration date maintained; (2) the de-designation of Sites 3B and 3C, and Block 160, Lots 1 and 36; (3) the addition of supplementary controls related to the development of site M (aka BCURP sites 14, 14A, 15, 15A and 15B) for a Post-Graduate Educational Center; and (4) the addition of a requirement for each redeveloper to perform all mitigation measure identified in the EIS for this plan prior to the issuance of a certificate of occupancy;

- Since issuance of the DSEIS, the New York City Landmarks Preservation Commission (LPC) amended their determinations of eligibility for three architectural resources, and identified five additional buildings as potential architectural resources. The impact of the proposed actions on these resources has been assessed in the FEIS. The measures required to mitigate the adverse impacts on historic resources located on those lots which are currently City-owned or would be acquired by the City would be enforced under the revised BCURP, and are described in the FEIS. Public comments on the potential significance of three buildings in the project area as possible underground railroad sites were considered; research into the history of the buildings was conducted; and the potential impacts of the proposed actions on those possible sites was assessed.

- The EIS has been revised to clarify that for City-owned sites or sites that are proposed for City ownership, E-designations for hazardous materials will not be placed on those development lots. Instead, since development of these sites would occur through disposition to a private entity, a mechanism to ensure that further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during construction would be required under the City's contract of sale with the private entity selected to develop the site.

- The No Build and Build subway line haul analyses have been revised to reflect conditions at the peak load points within Downtown Brooklyn on each of the routes serving the study area. The forecast of 2013 future baseline conditions also incorporates updated New York City Transit schedule and peak load point ridership data reflecting the February 2004 changes in service across the Manhattan Bridge and the reopening of the Stillwell Avenue terminus in late 2004. A qualitative discussion of commuter van services in Downtown

Brooklyn has been incorporated, and the discussion of bicycle facilities has been expanded to include additional information on bicycle routes within Downtown Brooklyn.

- Since issuance of the DEIS/DSEIS, an E-designation has been placed on projected development site BB (Block 165, Lot 29), to avoid any potential significant air quality impacts related to $PM_{2.5}$ emissions. The E-designation stipulates that any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilating, and air conditioning stack(s) is located at least 115 feet from the lot line facing Hoyt Street and parallel with Schermerhorn Street.

Where appropriate, the FEIS text was revised in response to comments or changes in the project. These revisions and changes are indicated by double underlines. ✷

# A. PROJECT IDENTIFICATION

The Downtown Brooklyn Development project is a public planning effort to create opportunities for stimulating and integrating commercial, academic, cultural, and residential development in the Downtown Brooklyn area (see Figure S-1). It is part of the City's long-range strategy to create a vibrant, multi-use urban environment that serves the residents, businesses, and academic institutions of Downtown Brooklyn and its surrounding communities. The project seeks to reinforce Downtown Brooklyn's role as a regional central business district; to provide viable development sites for future market cycles; to capture regional employment growth and strengthen New York City's economic base by attracting new businesses and retaining businesses considering relocation outside Manhattan; to increase opportunities for commercial, residential, and academic growth in Downtown Brooklyn; to promote connections between the area's commercial core and surrounding academic, cultural, and residential neighborhoods; and to reinforce the positive character of surrounding neighborhoods.

The project seeks to integrate the various land uses found in the project area (i.e., commercial, retail, institutional, academic, residential, and public space) and introduce a unifying urban design vision for Downtown Brooklyn. In implementing this planning effort, the following objectives have been established:

- Focus on comprehensive planning to encourage a mix of uses that complement the central commercial core and nearby residential communities;
- Capture future economic growth and new jobs by creating opportunities for new office development, by allowing for the creation of buildings with large floorplates and square footages required of modern offices by corporate tenants;
- Strengthen New York City's economic base by attracting new businesses, and retaining businesses considering relocation outside of the City;
- Foster connections between the commercial and retail cores of MetroTech and Fulton Mall to the north, the Boerum Hill residential neighborhood to the south, and the Fort Greene neighborhood to the east;
- Encourage opportunities for residential growth and enhance vitality through the development of higher-density, mixed-income apartment houses within Downtown Brooklyn;
- Foster new and varied retail opportunities to meet the needs of workers, residents and visitors and make Downtown Brooklyn an entertainment/leisure destination;
- Accommodate the parking demand associated with new development;
- Establish a strong cultural district and foster the growth of the area's education centers;

- Create appropriate massing and design guidelines to respond to the context of the surrounding buildings and uses, to create an attractive area that is an appealing place to live, work, and visit that transitions easily into neighboring residential areas;
- Enhance the public environment, ground-floor uses, and streetscapes in the project area through proposed improvements such as renovated subway entrances, new public spaces, and the creation of criteria and incentives for quality ground-floor uses; and
- Integrate new development, vehicular and pedestrian circulation planning, and streetscaping along Flatbush Avenue Extension, Willoughby Street, and adjacent side streets.

The project entails a number of public approvals, which are presented briefly below (see Figures S-2 and S-3):

- Zoning map amendment to increase the floor area ratio (FAR) of portions of the Special Downtown Brooklyn District (SDBD); to allow for greater commercial and residential density in the downtown area; to allow commercial use where such use is not currently allowed; to permit residential use on sites where such use is not currently allowed; and to expand the SDBD (ULURP No. C040171 ZMK);
- Zoning text changes to the SDBD to provide special height and setback regulations and other massing controls for higher-density commercial districts, and new requirements for sidewalk widenings, security-gate transparency, indoor bicycle parking, signage controls, and subway stair relocation (ULURP No. N040172 ZRK);
- Zoning text changes to the SDBD to add or remove requirements for ground-floor retail continuity, ground-floor glazing, street wall continuity, curb cut prohibition, and street tree planting on selected streets (ULURP No. N040172 ZRK);
- Zoning text changes to the SDBD to extend the Schermerhorn Street Height Limitation Area "B" of 140 feet and establish a new Height Limitation Area "C" of 250 feet on the blocks bounded by Smith, Nevins, Livingston, and Schermerhorn Streets and establish a height limit of 160 feet on the south side of Myrtle Avenue between Fleet Place and Ashland Place (ULURP No. N040172 ZRK);
- Mapping actions that would demap the following existing streets: Red Hook Lane, between Fulton Street and Boerum Place (ULURP No. C030515 MMK); Pearl Street, between Fulton Street and Willoughby Street (ULURP No. C030514 MMK); Prince Street, between Flatbush Avenue Extension and Myrtle Avenue; and Fair Street between Fleet Place and Prince Street (ULURP No. C030517 MMK);
- Mapping actions that would widen the south side of Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension (ULURP No. C030516 MMK); widen Fleet Place from Willoughby Street to Fair Street and extend Fleet Place north from Fair Street to Myrtle Avenue; and widen the south side of Myrtle Avenue between Flatbush Avenue Extension and Fleet Place (ULURP No. C030517 MMK);
- Amendment to the Brooklyn Center Urban Renewal Plan (BCURP) to extend the expiration date of the plan from 2010 to 2044; to extend the Urban Renewal project boundary by 9 blocks; to designate 57 lots within five proposed development sites; to remove certain previously designated urban renewal sites; to modify the definition of Commercial land use to permit residential and community facility uses; to modify the definition of Public Space land use to permit below-grade parking and accessory uses; to delete Industrial and Related

use and Institutional/Commercial uses as land use categories; to eliminate Q parcels from the text and maps; and to revise the plan text to reflect the standard format for urban renewal plans (ULURP Nos. C040173 HUK and N040176 HGK);

- Amendments to the MetroTech Urban Renewal Plan to change the land use for Block 2060, Lot 8, from street widening to open space; to eliminate Q parcels from the text and maps; and to revise the plan text to reflect the standard format for urban renewal plans (ULURP Nos. C040174 HUK and C040178 HDK);
- Modification of the MetroTech General Large-Scale Development Special Permit to reallocate existing floor area, to allocate newly created floor area generated from the proposed rezoning of Block 142, Lot 1, and to clarify that Commercial and Community Facility uses are allowed at this projected development site (ULURP Nos. M930481(E) ZSK, M000592(A) ZSK, and M860689(B) ZSK);
- Amendment to the Atlantic Terminal Urban Renewal Plan (ATURP) to extend the expiration date of the plan from 2008 to 2044; to modify the definition of Commercial land use within the plan to permit community facilities and below-grade parking; to change the land use and eliminate restrictions on maximum floor area ratios and maximum commercial floor area for certain sites; to eliminate Q parcels from the text and maps; and to revise the plan text to reflect the standard format for urban renewal plans (ULURP No. C040175 HUK);
- Disposition of the City-owned property pursuant to Urban Renewal as well as Block 140, Lot 111 and Block 2107, Lot 36 (ULURP Nos. C040180 PPK and C040177 HDK);
- Site selection for a visual and performing arts public library on Block 2110, Lot 3 (ULURP No. C040185 PSK); and
- Special permits for four proposed parking facilities: 1) a 694-space below-grade public parking facility at Willoughby Street between Albee Square West/Gold Street and Duffield Street; 2) a 457-space partially below-grade parking facility on the south side of Myrtle Avenue and east side of Flatbush Avenue Extension; 3) a 466-space below-grade parking facility on Block 2110; and 4) a 465-space below-grade parking facility on Block 2107 (ULURP Nos. C040181 ZSK, C040182 ZSK, C040183 ZSK, and C040184 ZSK).

## B. PROJECT AREA

Downtown Brooklyn is the economic center of what would be America's fourth largest city, and what is New York City's third largest central business district after Midtown and Downtown Manhattan. It occupies a valuable and unique position as a competitive, back-office space alternative to New Jersey, due to its proximity to Wall Street and local and regional mass transit access. The Downtown Brooklyn Development project area comprises a variety of land uses and building types, including commercial office buildings, courthouses and government buildings, educational facilities/major academic and cultural institutions, residential buildings, and highly active retail stores (see Figure S-1). MetroTech Center, a 16-acre corporate and academic complex that was built as part of an urban renewal effort by the City, is one of the major components of Downtown Brooklyn. Roughly bounded by Jay and Willoughby Streets, Flatbush Avenue Extension and Johnson Street/Tech Plaza, MetroTech is home to Polytechnic University, several government and municipal agencies including the New York City Fire Department and 911 headquarters, and major commercial tenants such as Bear Stearns, KeySpan, J.P. Morgan Chase, and Verizon. Located near MetroTech Center are several large

buildings housing a 376-room Renaissance Marriott hotel, the offices of New York City Transit, and parts of the New York State Supreme Court. Amidst these modern buildings are many smaller-scale civic and commercial structures that date back to the 19th century.

Commercial retail activity is concentrated in the southern portion of the project area, within the Fulton Street Mall corridor. This area contains three- to five-story commercial structures housing ground-floor retail uses. Macy's department store is the area's major anchor tenant. Farther to the east along Fulton Mall is The Gallery at Fulton Street, another large-scale commercial retail use.

To the north and west of the project area is the core of Brooklyn's Civic Center. The Civic Center area houses a number of City, State, and Federal institutions, including Brooklyn's Borough Hall and Municipal Building, Brooklyn Criminal Court, Kings County Family Court, the General Post Office, the New York State Supreme Court (Civil Term and Criminal Term), the New York City Housing Court, and the U.S. Federal Courthouse at Cadman Plaza East (currently being expanded).

The project area is also home to a number of educational institutions. These include Polytechnic University, Long Island University, New York City College of Technology, Brooklyn Law School, George Westinghouse High School, Brooklyn Technical High School, Pacific High School, the Institute of Design and Construction, Career Educational Consultants, and the Brooklyn Friends School. The Department of Education also occupies two prominent buildings on the southwestern edge of the project area: 110 and 131 Livingston Street. However, 110 Livingston Street being vacated by the department and the site is to be redeveloped.

At the southeast corner of the project area is the Brooklyn Academy of Music (BAM). BAM has been in Brooklyn since 1861, and its facility on Lafayette Avenue and Ashland Place was constructed in 1906. The BAM Local Development Corporation (BAM LDC) in mid-1999 began working to create a vibrant mixed-use multicultural arts district in the area surrounding BAM.

The project area also contains some residential development and is surrounded by a number of residential neighborhoods. To the west of the project area is Brooklyn Heights, to the south is the Boerum Hill neighborhood, to the east is Fort Greene, and to the north is Concord Village.

## C. DESCRIPTION OF THE PROPOSED ACTIONS

The development project calls for the rezoning of an area in Downtown Brooklyn roughly bounded by Tillary Street to the north, Schermerhorn Street to the south, Adams Street to the west, and Ashland Place to the east (see Figure S-1). The rezoning would provide for the development of sites for a mix of office, academic, cultural, residential, and retail uses.

The proposed actions are projected to stimulate approximately 6.7 million square feet of new development, including 4.6 million square feet of office space, 979,000 square feet of residential use (approximately 979 units), 844,000 square feet of retail, and 260,000 square feet of community facility and cultural space. The proposed project would also include provisions for approximately 1,617 public parking spaces.

The bulk of the development activity, which would include property acquisition, new public space, parking facilities, and infrastructure improvements, is expected to take place along Willoughby Street near Flatbush Avenue Extension. Additional development is expected to take place along Livingston Street, Myrtle Avenue, Flatbush Avenue Extension, in the vicinity of Jay

Street and Fulton Mall, and within the BAM cultural district. The project would also include provisions for new public space and the public parking facilities.

The project proposes the expansion of the commercial core into the area generally bounded by Adams and Willoughby Streets, Flatbush Avenue and Fulton Street through the rezoning of blocks within this area to a higher density FAR. The demapping of Red Hook Lane (between Boerum Place and Fulton Street) and Pearl Street (between Fulton and Willoughby Streets) and the development of the adjacent four blocks will help to create a new focal point and entrance to the Fulton Mall area from the Civic Center and Brooklyn Heights neighborhoods to the west.

The properties at the northwest side of MetroTech, which are occupied by New York City College of Technology and Polytechnic University, would also be rezoned as part of the project to allow for mixed-use commercial/community facility development. Larger development on these sites would be intended to be consistent with other developments currently under construction in this area, such as the 330 Jay Street building (which includes office space) and the new Federal courthouse on the north side of Tillary Street.

The creation of a connection between the commercial and retail cores of MetroTech and Fulton Mall to the south and the Boerum Hill residential neighborhood to the south is one of the objectives of the project. The development sites bounded by Livingston and Schermerhorn Streets, Smith Street and Third Avenue are expected to be developed with residential buildings to replace current uses—primarily public parking lots and underutilized buildings—that pose an uninviting barrier between these two areas. The proposed height limits along these blocks will be reduced in order to create a transition to the nearby low-scale, residential neighborhood.

## URBAN DESIGN VISION

Enhancing the uses and streetscapes of Flatbush Avenue Extension is a central goal of the Downtown Brooklyn Development project. Flatbush Avenue is envisaged as becoming an inviting entrance to Downtown Brooklyn, linking the commercial, retail, and academic uses to the west with Fort Greene. A number of the blocks facing the avenue between Tillary Street and Atlantic Avenue would be rezoned to allow for larger-scale development with active ground-floor uses on these sites. In addition, various streetscape enhancements would also be installed to enhance the pedestrian experience, including a wider landscaped center median along the avenue, similar to Adams Street; continuous sidewalks that are wider at street crossings; and signalized and delineated pedestrian crossings (see Figure S-4).

As Flatbush Avenue is seen as the eastern entrance to Downtown Brooklyn, Willoughby Street is envisaged as a "front door" to the corporate buildings that would surround this street, particularly between Adams Street and Flatbush Avenue. This "front door" on Willoughby Street would have a public space as a focal point around which the entrances to the commercial buildings would be located. The streetscape of Willoughby Street would also be improved, like the improvements proposed for Flatbush Avenue, with widened sidewalks and improved subway entrances that are included in new buildings and/or plazas. MetroTech has standard streetscape elements that could be extended throughout the area; other elements could replicate the models used for the Grand Central and 34th Street areas.

## PUBLIC SPACE

Urban renewal changes for the project would provided for the creation of public space at the south side of Willoughby Street between Duffield Street and Albee Square West/Gold Street

(Willoughby Square). The urban renewal changes would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets. Figure S-5 presents the areas proposed for streetscape improvements and public space enhancements.

The Willoughby Square public space would be similar to the MetroTech Commons in size (approximately 1.15 acres) and is intended to be a focal point for new commercial investment in the surrounding blocks (see Figure S-6). The public space could incorporate a variety of amenities. The public space is proposed to include a below-grade, 694-space public parking facility with entrances/exits at its southern end (see Figure S-7). In addition, Myrtle Avenue between Flatbush Avenue Extension and the proposed extension of Fleet Place, and Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension, would be widened to include planted medians. The Jay Street Plaza public space would include a new subway entrance/exit to the Jay Street subway station and would create a focal point at the southwestern corner of the project area.

## D. PROPOSED PROJECT ACTIONS

### REZONING

Table S-1 presents a list of the lots within the proposed actions' development sites affected by the proposed rezoning actions. Figure S-3 shows the existing zoning of the project area and Figure S-8 illustrates the project area's proposed zoning.

The sites in the northwest portion of the project area would be rezoned from C6-1 and C6-1A to C6-4 to allow for increased FAR for commercial and community facility (academic) uses. The rezoning of the east side of Flatbush Avenue Extension to C6-4 would allow for sites along this major corridor, currently zoned as residential or manufacturing, to be developed with increased FAR for mixed-use commercial/residential. The areas in the center of the project area would be rezoned from C5-4 and C6-1 to C6-4.5, which would allow for commercial development to an FAR of 12.0, extending the possibility for office development south of the existing MetroTech area. The southern portion of the project area, currently zoned C6-1, would be rezoned to C6-4 to create the potential for increased FAR for residential use. In addition to the large rezoning areas, there are three small rezoning sites at the southern and eastern borders of the project area. The area south of Myrtle Avenue between Fleet Street and Ashland Place would be rezoned from R6 to R7-1 with a commercial overlay of C2-4, to create the possibility for increased FAR for residential use and ground-floor retail along this street. One block in the southern portion of the project area would be rezoned from C6-1 to C6-2; although this would not affect the allowable FAR for commercial uses (3.44 to 6.02) for this block, it would allow for increased residential density to be established on the block.

### TEXT CHANGES TO THE SPECIAL DOWNTOWN BROOKLYN DISTRICT

The actions also propose changes to the recently created SDBD. The changes mainly relate to height limits in the project area, which are designed to establish contextual buffers in the area bounded by Smith, Nevins, Livingston, and Schermerhorn Streets, between the large-scale commercial buildings in Downtown Brooklyn and surrounding low-scale residential buildings in the surrounding neighborhoods. The proposed changes are:

- Extend the SDBD along Myrtle Avenue to Ashland Place, with the extension of the former Fair Street forming the district's southern boundary;

**Table S-1**
**Projected/Potential Development Site Lots Affected by Proposed Rezoning**

| Rezoning | Blocks: Lots | Existing Permitted FAR | Proposed FAR |
|---|---|---|---|
| C6-1, C6-1A to C6-4 | B 128: 1, 26<br>B 131: 1<br>B 142: 1[1]<br>B 160: 18, 29<br>B 161: 1, 3, 18, 27, 30, 33, 47, 50, 52-64<br>B 164: 1, 13, 29, 31, 42-44<br>B 165: 17-19, 29, 58<br>B 167: 15, 16, 26-28, 36, 42<br>B 2093: 1 | Commercial: 6.0<br>Residential: 3.44<br>Com. Fac. : 6.5 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| C5-4 to C6-4.5 | B 144: 1<br>B 150: 1, 6, 10, 11, 19<br>B 153: 3, 14, 15<br>B 154: 1, 5, 11, 12, 36-40 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 | Commercial: 12<br>Residential: 10<br>Comm. Fac.: 12 |
| C6-1 to C6-4.5 | B 145: 8, 10, 13-16, 18-22, 26, 32<br>B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52<br>B 149: 1, 14, 15, 17, 19, 22-26, 28, 30-34, 49, 50<br>B 152: 37 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 | Commercial: 12<br>Residential: 10<br>Comm. Fac.: 12 |
| C6-1 (Use) | B 2110: 3 | 0.2[3] | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 |
| C6-1 to C6-2 | B 174: 9, 13, 18, 23, 24 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 | Commercial: 6.0<br>Residential: 6.02<br>Comm. Fac.: 6.5 |
| M1-1 to C6-4 | B 133: 1, 5, 13, 15<br>B 134: 1, 5, 30, 38, 41<br>B 2049: 8 | Commercial: 1.0<br>Residential: 0<br>Comm. Fac.: 2.4 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| R6/C1-3, C8-2 to C6-4 | B 2049: 2[2]<br>B 2060: 22-27, 32, 122<br>B 2061: 1 (part)<br>B 2062: 1, 5, 6, 17-19, 21, 23, 24, 103 | Commercial: 2.0<br>Residential: 2.43<br>Comm. Fac.: 4.8 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| R6 to R7-1/C2-4 | B 2061: 1 (part), 40 (part), 60 (part), 80 (part), 100 (part) | Commercial: 0<br>Residential: 2.43<br>Comm. Fac.: 4.8 | Commercial: 2.0<br>Residential: 4.0<br>Comm. Fac.: 4.8 |

**Notes: FAR = Floor Area Ratio**
1 The existing zoning of this lot is C6-1A.
2 The existing permitted FAR of Block 2049, Lot 2 is 2.43/1. No part of this lot is zoned C8-2.
3 As per ATURP restriction.

- Establish a flexible height and setback envelope for commercial and community facility buildings in the C6-4.5 zoning district, similar to Lower Manhattan (see Table S-2). The tower option would have a maximum base height of 85 feet, and a setback of 20 feet for commercial and community facility buildings on lots larger than 15,000 square feet. For commercial and community facility buildings on lots smaller than 15,000 square feet , the tower option would have a maximum base height of 85 feet, a setback of 15 feet on narrow streets, and a setback of 10 feet on wide streets. For all buildings containing commercial and community facility uses, tower lot coverage above 150 feet would be limited to 65 percent up to 300 feet and limited to 50 percent coverage above 300 feet. The standard building

option would have a minimum base height of 60 feet where street walls are required, and a maximum base height of 125 feet on narrow streets (150 feet on wide streets), and a maximum building height of 250 feet. The standard building option would also require setbacks of 15 feet on narrow streets and 10 feet on wide streets.

- Change the tower height and setback envelope for the tower option in C6-1, C5-4, and C6-4 zoning districts to match that of the C6-4.5 zoning district (see Table S-2);
- Establish a flexible height and setback envelope for the R7-1 zoning district, with a minimum base height of 40 feet, a maximum base height of 85 feet, and a maximum building height of 160 feet (see Table S-2);

**Table S-2**
**Building Envelope Options in SDBD**

| Building Options | Building Elements | R7-1 (4.0 FAR) | | C6-1 (6.0 FAR) | | C5-4, C6-4 (10.0 FAR) | | C6-4.5 (12.0 FAR) |
|---|---|---|---|---|---|---|---|---|
| | | Existing | Proposed | Existing | Proposed | Existing | Proposed | Proposed |
| Standard | Min. Base (Street wall) | 40' | 40' | 60'/60' | no change | 125'/60' | 60'/60' | 60'/60' |
| | Max. Base | 65' | 85' | 150'/125'*† | no change | 150'/125'*† | no change | 150'/125'*† |
| | Setback | 10' | 10' | 10'/15'* | no change | 10'/15'* | no change | 10'/15'* |
| | Max. Height | 80' | 160' | 210'/185'* | no change | 210'/185'* | no change | 250' |
| Tower** | Max. Base | | | 85'† | no change | 85'† | no change | 85'† |
| | Setback | | | 10'/15' @ 85'* 40'/50' @ 150'* | 20' @ 85'* | 10'/15' @ 85'* 40'/50' @ 150'* | 20' @ 85'* | 20' @ 85'* |
| | Lot Coverage | | | 40% @ 150' | 65% @ 150 50% @ 300' | 40% @ 150' | 65% @ 150 50% @ 300' | 65% @ 150 50% @ 300' |
| | Max. Height | | | 495' | 495' | None | None | None |

Notes: FAR = Floor Area Ratio
*Wide Street (>75') / Narrow Street
†Minimum base height of 60' where street wall is required.
**For buildings containing commercial and community facility uses.

- Allow the development of property on the south side of Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension to a distance of 250 feet, to rise from the streetline without setback on Flatbush Avenue Extension and Willoughby Street, and mandate a setback at 85 feet on Albee Square West/Gold Street;
- Extend the Schermerhorn Street Height Limitation Area "B" of 140 feet and establish a new Height Limitation Area "C" of 250 feet on the blocks bounded by Smith, Nevins, Livingston, and Schermerhorn Streets. Area "B" would extend 100 feet into the blocks from the north-south streets and 85.92 feet north from the property line of Schermerhorn Street. The remainder of the blocks would be mapped as Area C;
- For properties within Schermerhorn Street Height Limitation Areas "B" and "C" that are zoned C6-4 and located within the Special Downtown Brooklyn District, permit a rear yard equivalent with a minimum depth of 60 feet. The center line of the rear yard would be permitted to be located within ten feet of midway between street lines;

- Add an indoor bicycle parking requirement for new development sites;
- Modify retail requirement to govern ground-floor uses to a depth of 50 feet from the property line, and to require 50 percent glazing and 75 percent transparency of security gates within the SDBD. Along both sides of Willoughby Street from Boerum Place to Flatbush Avenue Extension, and facing the proposed public space, 70 percent glazing would be required;
- Modify retail requirements to allow public libraries and museums, and non-commercial art galleries as ground-floor retail;
- Reduce streetwall requirements from 100 percent to 70 percent;
- Allow loading docks and berths of up to 60 linear feet of continuous facade where ground-floor retail is required and curb cuts are permitted;
- Add a subway stair relocation requirement for development sites of more than 5,000 square feet at subway entrances to the following stations: Jay Street-Borough Hall, Lawrence Street, Hoyt-Schermerhorn Street, DeKalb Avenue, Hoyt Street, Nevins Street, Court Street, Pacific Street, and Atlantic Avenue;
- Add street wall continuity requirements to:
  - the east side of Flatbush Avenue Extension, the area currently occupied by Prince Street;
  - the north side of Willoughby Street between Flatbush Avenue Extension and Fleet Place;
  - the south side of Myrtle Avenue between Flatbush Avenue Extension and Ashland Place;
  - the west side of Duffield Street, 200 feet south of its intersection with Willoughby Street; and
  - the east side of Albee Square West/Gold Street, 200 feet south of its intersection with Willoughby Street.
- Add ground-floor retail use requirement to: 1) the south side of Myrtle Avenue between Flatbush Avenue Extension and Ashland Place; 2) the east side of Flatbush Avenue Extension between Myrtle Avenue and Willoughby Street; 3) both sides of Duffield Street between Willoughby and Fulton Streets, except for the area of the proposed Willoughby Square public space; and 4) both sides of Albee Square West/Gold Street between Willoughby and Fulton Streets; except for the area of the proposed Willoughby Square public space.
- Add fenestration and security-gate transparency requirements where there is a ground-floor retail use requirement;
- Add curb cut restrictions to the east side of Flatbush Avenue Extension between Myrtle Avenue and Willoughby Street;
- Remove curb cut restrictions from the south side of Willoughby Street between Adams and Jay Streets and Duffield Street and Albee Square West/Gold Street;
- Add street tree requirements to the south side of Myrtle Avenue between Flatbush Avenue Extension and Ashland Place.

- Add a 5-foot sidewalk extension requirement to the south side of Willoughby Street between Adams and Flatbush Avenue Extension, except between Duffield Street and Albee Square West/Gold Street.
- Add signage controls;
- Clarify text regarding minimum base height of street walls (60 feet) in C5-4 and C6-4 zoning districts; and
- Clarify language regarding New York City Department of Parks and Recreation (DPR) jurisdiction over street tree planting standards.

## MAPPING ACTIONS

In order to merge blocks to create larger, more viable development sites, the proposed actions would include the demapping of the following low-traffic-volume streets: 1) Red Hook Lane, between Fulton Street and Boerum Place; 2) Fair Street, between Prince Street and Fleet Place; 3) Pearl Street, between Fulton Street and Willoughby Street; and 4) Prince Street, between Flatbush Avenue Extension and Myrtle Avenue.

The development rights generated from the demapping of these streets would be utilized in the projected development of the associated blocks and lots.

In order to provide for more rational site development on the project sites east of Flatbush Avenue Extension, the proposed actions would include mapping of the extension of Fleet Place north, from Fair Street to Myrtle Avenue, at a width of 60 feet. The existing Fleet Place roadway between Fair and Willoughby Streets would be widened to 60 feet.

The proposed mapping actions would also widen the following streets in order to improve circulation in the Downtown Brooklyn area and to provide more efficient access to projected development sites: 1) Willoughby Street, south side between Albee Square West/Gold Street and Flatbush Avenue Extension (the segment between Albee Square West/Gold Street and Duffield Street would be converted to one-way westbound operation), would be widened from 60 to 95 feet; and 2) Myrtle Avenue, south side, between Flatbush Avenue Extension and the extension of Fleet Place, would be tapered from 100 feet at Flatbush Avenue Extension to the existing 75-foot width at Fleet Place.

Figure S-9 shows the streets affected by the proposed mapping actions.

## URBAN RENEWAL PLAN MODIFICATIONS

The Downtown Brooklyn Development project would include several modifications to existing urban renewal plans for designated sites that have not yet been acquired and/or disposed and new urban renewal sites proposed for development. As described below, the modifications affect the Brooklyn Center Urban Renewal Plan, the Atlantic Terminal Urban Renewal Plan and the MetroTech Urban Renewal Plan.

*BROOKLYN CENTER URBAN RENEWAL PLAN*

- Extend the urban renewal project boundary to include 9 blocks: Blocks 144, 145, 146, 150, 151, 152, 153, 154 (part), and 2061 (part);
- Designate 57 lots within the project boundary, comprising five proposed development sites and were not previously designated but are now included in the Urban Renewal Plan and Area, and are identified as sites I, L, M, O, and P in Figure S-10;
- Extend the duration of the plan to remain in effect for a period of 40 years from the date of the approval of this plan amendment, except for any property conveyed by the City prior to June 30, 2003, where the controls of the plan will remain in effect until September 12, 2010, the current expiration date of the plan;
- Modify the definition of Commercial land use within the plan to permit residential and community facilities uses;
- Modify the definition of Public Space land use within the plan to permit below-grade parking and accessory uses;
- Modify design objectives in the plan to require that on sites O and P, as shown on Figure S-10, the streetwall shall rise to a height minimum of 80 feet and maximum of 85 feet, and then set back a minimum of 15 feet for facades facing the public space;
- Modify design objectives in the plan for the site P facade facing the public space to require retail use pursuant to the SDBD retail requirements, which call for 70 percent glazing and 75 percent transparency of security gates along Willoughby Street;
- Modify the land use for part of site I (Block 2060, Lots 22-27, 32, 122; and Block 2062, Lots 1, 5, 6, 17-19, 21, 23, 24, 103) in Figure S-10 from Institutional/Commercial use to Commercial use;
- Delete Industrial and Related use, and Institutional/Commercial uses as a land use category;
- De-designate Block 2095, Lots 9, 10, 25-29, 38-40, 42, 43, 45, 53, 57, 59 (known as Site 6 in the plan); Block 161, Lots 1, 3, and 52-64 (known as Site 3B in the plan); Block 161, Lots 27, 30, and 33 (known as Site 3C in the plan); and Block 160, Lots 1 and 36;
- Establish land uses for the proposed designated sites;
- Provide for disposition approval for the proposed newly designated blocks and lots, including the proposed demapped streetbeds, and previously designated blocks and lots that would be extended as part of the plan amendment;
- The plan will reflect the following changes to the City Map:
  - Demapping of: 1) Red Hook Lane, between Fulton Street and Boerum Place; 2) Fair Street, between Prince Street and Fleet Place; 3) Pearl Street, between Fulton Street and Willoughby Street; and 4) Prince Street, between Flatbush Avenue Extension and Myrtle Avenue.
  - Mapping action to: 1) Map Fleet Place north, from Fair Street to Myrtle Avenue, at a width of 60 feet. The existing Fleet Place streetbed between Fair and Willoughby Streets would also be widened to 60 feet; 2) Widen Willoughby Street, south side, between Albee Square West/Gold Street and Flatbush Avenue Extension from 60 feet to 95 feet;

3) Taper Myrtle Avenue, south side, between Flatbush Avenue Extension and the extension of Fleet Place from 100 feet at Flatbush Avenue Extension to the existing 75-foot width at the extension of Fleet Place; and 4) Eliminate Q parcels (properties not to be acquired under the plan) from the text and maps and revise the plan text to reflect the standard format for urban renewal plans.

- Supplementary Controls: site M (BCURP Sites 14, 14A, 15, 15A and 15B) shall be developed as a single entity and shall include at least 100,000 square feet of floor area for a Post-Graduate Educational Center classified under the Zoning Resolution as Use Group 3, "Community Facility: College or university use, including professional schools but excluding business colleges or trade schools."
- Requirement for each redeveloper to perform all mitigation measures identified in the EIS for this plan prior to the issuance of a certificate of occupancy.

*ATLANTIC TERMINAL URBAN RENEWAL PLAN*

- Extend the duration of the plan to remain in effect for a period of 40 years from the date of the approval of this plan amendment, except for any property conveyed by the City prior to June 30, 2003 where the controls of the plan will remain in effect until July 25, 2008, the current expiration date of the plan;
- Modify the definition of Commercial land use within the plan to permit other uses permitted by the Zoning Resolution, including, but not limited to, community facilities and accessory uses;
- Eliminate restrictions on maximum floor area and maximum commercial floor area for site EE (Block 2110);
- Provide disposition approval for City-owned site EE (Block 2110); and
- Eliminate Q parcels from the text and maps and revise the plan text to reflect the standard format for urban renewal plans.

*METROTECH URBAN RENEWAL PLAN*

- Change the land use for City-owned Block 2060, Lot 8 from street widening to open space use;
- Provide disposition approval for City-owned Block 2060, Lot 8; and
- Eliminate Q parcels from the text and maps and revise the plan text to reflect the standard format for urban renewal plans.

The Schermerhorn-Pacific Urban Renewal Area is also located in the project area. No modifications to this plan are proposed as part of the project. Site Z is located within the boundaries of this urban renewal area; however, site Z is not identified as a designated site.

## DISPOSITION OF CITY-OWNED PROPERTY

The actions would potentially facilitate the disposition to EDC of the City's interest in real property for the following sites: Block 140, Lot 111; Block 2107, Lot 36, and other existing City-owned property or property that will become City-owned that is located within the

boundaries of the proposed amended Brooklyn Center Urban Renewal Plan, as identified in *Urban Renewal Plan Modifications.*

### OTHER ACTIONS

Special permits would be required for four parking facilities proposed as part of the project. The 694-space below-grade public parking facility at Willoughby Street between Albee Square West/Gold Street and Duffield Street, and a 457-space partially below-grade parking facility on the south side of Myrtle Avenue east of Flatbush Avenue Extension, are proposed to accommodate parking demand associated with new development. A 465-space public parking facility on Block 2107 and a 466-space below-grade public parking facility on Block 2110 (site EE) are also proposed to accommodate parking demand associated with the BAM cultural district. The public parking facility on Block 2107 is not part of the projected or potential development scenarios.

The MetroTech General Large-Scale Development Special Permit would be modified to reallocate existing floor area, allocate newly created floor area generated from the proposed rezoning of Block 142, Lot 1 [site C], waive height and setback requirements, and to clarify that commercial and community facility uses are allowed at this projected development site.

Approval for site selection for a visual and performing arts public library on Block 2110, Lot 3 would also be sought. As described above, BAM LDC is working to create a mixed-use multicultural arts district in the area surrounding the Brooklyn Academy of Music. An anchor component of the envisioned district is the proposed visual and performing arts library on City-owned site EE, which would be a facility of the Brooklyn Public Library. The proposal calls for a 140,000-square-foot facility on six levels housing reading rooms, archives, galleries, media labs, an auditorium, performance space, and a multimedia lounge.

The New York State Urban Development Corporation, Empire State Development Corporation (ESDC) is the State Environmental Quality Review Act (SEQRA) lead agency on behalf of the Empire State Local Development Corporation (ESLDC), a local development corporation created by the New York Job Development Authority. It is anticipated that ESLDC will authorize funding through the Port Authority Transportation, Economic Development & Infrastructure Renewal (TEDIR) Program in support of the development of the proposed visual and performing arts library, below-grade parking facility and outdoor public area on Block 2110.

## E. ENVIRONMENTAL REVIEW AND PROJECT STATUS

The proposed zoning map and text changes, mapping actions, urban renewal amendments, disposition of City's interest in real property, and special permits are subject to the City's land use approval process under the Uniform Land Use Review Procedure (ULURP) and environmental review under the City Environmental Quality Review (CEQR). The City's ULURP is specifically designed to allow public review of proposed actions at four levels: Community Board, Borough President, City Planning Commission, and City Council. The procedure sets time limits for review at each stage to ensure a maximum total review period of approximately seven months. Environmental review under CEQR runs concurrently with ULURP. For this project, it began when the lead agency determined that the project might have a significant adverse effect on the environment and issued a Positive Declaration requiring that an EIS be prepared. A public scoping session on the scope of the EIS was held on May 20, 2003.

A DEIS was prepared for the proposed actions, and a notice of completion for the DEIS was issued on November 28, 2003.

Subsequent to issuance of the notice of completion for the DEIS, it was determined that a Draft Supplemental Environmental Impact Statement (DSEIS) should be prepared to account for a potential major mixed-use development in the Atlantic Terminal neighborhood of Brooklyn—referred to as the Atlantic Yards Arena and Redevelopment project. Although the Downtown Brooklyn Development project is not linked to the approval of the Arena project or any of its components, the purpose of the DSEIS was to incorporate the overall Arena project in the future baseline condition in the same way that other unbuilt projects had already been accounted for in the DEIS. A positive declaration and notice of intent to prepare a Draft Supplemental Environmental Impact Statement (DSEIS) was issued on January 22, 2004, and a public scoping meeting was held on February 23, 2004. Additional comments were accepted during a 10-day period that followed, until Thursday, March 4, 2004. A final supplemental scope was issued and served as the framework for the DSEIS. A Notice of Completion was issued and the DSEIS was published on March 8, 2004. A public hearing on the DEIS/DSEIS and the was held on March 24, 2004 at Klitgord Auditorium at the New York City College of Technology to accept oral comments. The public hearing on the DEIS was held concurrently with the hearing on the project's Uniform Land Use Review Procedure (ULURP) applications. Comments were accepted at the hearing and throughout the public comment period, which was held open through April 7, 2004. Relevant comments were considered in the preparation of this Final Environmental Impact Statement, which incorporates the Final Supplemental Environmental Impact Statement, and will be referenced throughout the document as the "FEIS."

## DEVELOPMENT FRAMEWORK FOR EIS ANALYSIS

In considering the potential environmental impacts of the proposal to alter use, floor area, and other regulations within the project's study area, it is necessary to examine reasonable development consequences of these land use and zoning changes. Without a reasonable but conservative future development scenario, it would not be possible to assess the range of effects (e.g., traffic, air quality, neighborhood character) that might occur as a result of the proposed actions.

## ANALYSIS YEAR

CEQR assessments of large area-wide zoning proposals not associated with specific development projects are based upon a 10-year time frame, or "Build" period. This is the time frame that can be reasonably predicted without engaging in highly speculative projections. Thus, the EIS will address a development program that could reasonably be constructed by 2013. Although the proposed actions affect the entire project area as previously defined, the analysis of changes to allowable use and bulk and other land use provisions are focused on those sites that are reasonably likely to undergo development within the foreseeable 10-year timeframe; these would be known as "projected sites." Sites that are unlikely to be developed within the 10-year timeframe would be discussed qualitatively and are considered to be "potential sites."

## PROJECTED AND POTENTIAL SITE PROGRAMS

To determine the size and location of future development, as well as the likelihood of that development's timeframe as either a projected or potential site, each of the parcels affected by the proposed actions was assessed using a screening procedure. The remainder of the parcels

within the proposed project area are considered to be neither projected nor potential sites since they would not likely undergo major redevelopment as a result of the proposed actions.

Table S-3 presents the projected development parcels with their existing and proposed uses and FARs. Table S-4 presents the potential development parcels with their existing and proposed uses and FARs.

**Table S-3**
**Projected Sites: Lot Area, Uses, and ZFA***

| Site Ref.[1] | Blocks: Lots | Total Lot Area[2] | Existing Uses | Existing Built Floor Area | Existing Maximum ZFA[2] | Proposed Uses | Proposed Maximum ZFA[2] |
|---|---|---|---|---|---|---|---|
| C | B 142: 1 | Large Scale Plan | Com. Fac. (Polytech) | 72,000 | 310,000 | Com. Fac. Office | 800,000 |
| G | B 2049: 8 | 10,000 | Industrial Residential | 60,000 | 10,000 | Residential Retail | 81,000 |
| I(A) | B 2060: 22-27, 32 (part), 122; B 2061: 1 (part); B 2062: 6 (part) | 64,000 | Retail Com. Fac. | 41,000 | 156,000 | Retail Residential Pub. Parking | 420,000 |
| J | B 2061: 1 (part) | 86,000 | Retail | 38,000 | 209,000 | Residential Retail | 345,000 |
| M | B 153: 3, 14, 15; B 154: 1, 5, 11, 12, 36-40; | 71,000 | Residential Retail Office | 235,000 | 707,000 | Retail Office | 848,000 |
| O | B 145: 8,10, 13-16, 18-22, 26, 32 | 49,000 | Residential Retail Parking | 85,000 | 297,000 | Retail Office | 594,000 |
| P | B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52 | 87,000 | Residential Retail Parking | 158,000 | 524,000 | Retail Office Public Space Pub. Parking | 1,047,000 |
| Q | B 149: 1, 49 | 137,000 | Retail Parking | 373,000 | 824,000 | Retail Office | 1,648,000 |
| S | B 2093: 1 | 51,000 | Office Retail | 376,000 | 304,000 | Office Retail | ±12,000[3] |
| AA | B 165: 17-19, 58 | 18,000 | Parking | 1,000 | 109,000 | Residential Retail | 181,000 |
| BB | B 165: 29 | 21,000 | Retail Office | 25,000 | 124,000 | Residential Retail | 207,000 |
| EE | B 2110: 3 | 58,000 | Parking | 2,000 | 12,000 | Com. Fac. Cultural Retail | 376,000 |
| **Total Floor Area/ZFA:** | | **673,000** | | **1,502,000** | **3,710,000** | | **6,559,000** |

**Notes:** * ZFA = Zoning Floor Area

Since the issuance of the DEIS/DSEIS, site K has been removed from the proposed development plan.

[1] Site reference corresponds to Figure S-1.

[2] Based on preliminary estimate of lot size and calculated ZFA.

[3] Infill of arcade only.

## Table S-4
## Potential Sites: Lot Area, Uses, and ZFA*

| Site Ref.[1] | Blocks: Lots | Total Lot Area[2] | Existing Uses | Existing Built Floor Area | Existing Maximum ZFA[2] | Proposed Uses | Proposed Maximum ZFA[2] |
|---|---|---|---|---|---|---|---|
| A | B 128: 1, 26 | 111,000 | Com. Fac. (NYC Tech) | 636,000 | 723,000 | Com. Fac. Retail Office | 1,112,000 |
| B | B 131: 1 (part) | 160,000 | Com. Fac. (NYC Tech) | 451,000 | 1,037,000 | Com. Fac. Retail Office | 1,595,000 |
| D | B 133: 1, 5, 13, 15 | 42,000 | Retail Com. Fac. | 109,000 | 42,000 | Residential Retail | 416,000 |
| E | B 134: 1, 5, 38, 41 | 10,000 | Residential Retail | 10,000 | 10,000 | Residential Retail | 97,000 |
| F | B 134: 30 | 6,000 | Warehouse | 27,000 | 6,000 | Residential Retail | 39,000 |
| H | B 2049: 2 | 26,000 | Parking Auto Repair | 13,000 | 62,000 | Residential Retail | 255,000 |
| I (B) | B 2060: 32 (part); B 2062: 1, 5, 6 (part), 17-19, 21, 23, 24, 103 | 45,000 | Retail Community Facility | 38,000 | 109,000 | Retail Office | 670,000 |
| L | B 144: 1 B 150: 1, 6, 10, 11, 19 | 41,000 | Retail Office | 89,000 | 405,000 | Retail Hotel | 486,000 |
| N | B 152: 37 | 13,000 | Retail | 27,000 | 81,000 | Residential Retail | 161,000 |
| R | B 149: 14, 15, 17, 19, 22-26, 28, 30-34, 50 | 47,000 | Retail Office | 131,000 | 285,000 | Retail Office | 569,000 |
| T | B 160: 18 | 13,000 | Retail | 58,000 | 79,000 | Residential Retail | 131,000 |
| U | B 161: 27, 30, 33 | 19,000 | Retail | 68,000 | 112,000 | Residential Retail | 186,000 |
| V | B 161: 18 | 15,000 | Retail | 30,000 | 90,000 | Residential Retail | 150,000 |
| W | B 160: 29 | 12,000 | Retail | 48,000 | 72,000 | Residential Retail | 120,000 |
| Y | B 164: 1, 13 | 34,000 | Retail Office Parking | 72,000 | 203,000 | Residential Retail | 339,000 |
| Z | B 164: 29, 31, 42-44 | 21,000 | Retail Parking | 10,000 | 128,000 | Residential Retail | 213,000 |
| CC | B 167: 15, 16, 26-28, 36, 42 | 49,000 | Residential Retail Parking | 70,000 | 292,000 | Residential Retail | 487,000 |
| DD | B 174: 9, 13, 18, 23, 24 | 40,000 | Residential Retail | 93,000 | 238,000 | Residential Retail | 238,000 |
| **Total Floor Area/ZFA:** | | 704,000 | | 1,980,000 | 3,974,000 | | 7,264,000 |

**Notes:** ZFA = Zoning Floor Area

* Since issuance of the DEIS/DSEIS, site X has been removed from the proposed development plan.

[1] Site reference corresponds to Figure S-1.

[2] Based on preliminary estimate of lot size and calculated ZFA.

## REASONABLE WORST-CASE DEVELOPMENT SCENARIO

*OFFICE DEVELOPMENT*

With the proposed actions, several large sites would accommodate commercial development up to 12.0 FAR, which represents a substantial increase in FAR from the FAR permitted today, which ranges from 1.0 to 10.0. The new office tenants would most likely be drawn from traditional Manhattan tenants with back-office operations who would consider relocating to less expensive but convenient space in Downtown Brooklyn. The proposed actions would also help to attract new business to the area.

Together, the projected and potential development sites could total approximately 6.7 million square feet of office development. However, the appeal of these sites is primarily for back-office operations, particularly for those that require larger floorplates. This segment of the market is more limited. Therefore, although it is theoretically possible to develop 6.7 million square feet within the project area by 2013, this is not considered likely. Actual development will depend heavily on competition from suburban locations and marketing efforts.

Screening criteria for commercial development, which were developed in consultation with DCP, were considered for each of the parcels affected by the proposed actions in order to determine the site's attractiveness for commercial use, its bulk, and its development timeframe. Based on the screening criteria, it is reasonable to assume that approximately 4.6 million square feet of office development would occur in the next 10 years on sites identified by the City, as shown in Table S-5. Thus, the sites identified for projected office development would be analyzed in detail as part of the reasonable worst-case scenario. Table S-6 presents the development assumed for the potential sites by use.

*RESIDENTIAL DEVELOPMENT*

Many of the same reasons that attract corporate tenants to Downtown Brooklyn also attract residents to the area, such as proximity to an extensive mass transit system and the presence of cultural/academic institutions. Over the past decade, the City, particularly in the boroughs of Manhattan and Brooklyn, has experienced a very robust housing market. As a result, a significant number of housing units have been built in and around Downtown Brooklyn. It can be expected that demand for additional housing would continue as part of the City-wide trend as well as a direct result of the proposed actions. Thus, as part of the impact analysis, it is necessary to make reasonable estimates of likely residential development for the projected sites.

Screening criteria for residential development, which were developed in consultation with DCP, considered each of the parcels affected by the proposed actions in order to determine the site's attractiveness for residential use, its bulk, and its development timeframe.

Based on discussions with site owners, evaluation of housing market trends, and application of the screening criteria, it is reasonable to assume that approximately 979,000 square feet of residential development (or approximately 979 units based on average size of 1,000 square feet per unit) could be completed and occupied by 2013 and would be analyzed in detail as part of the reasonable worst-case scenario.

## Table S-5
## Projected Sites: Proposed Program by Use *

| Site Ref.** | Proposed Floor Area by Use (in ZSF) | | | | |
|---|---|---|---|---|---|
| | Office | Retail | Residential | Community Facility | Other |
| C | 720,000 | | | 80,000 | |
| G | | 10,000 | 71,000 | | |
| I (A) | | 60,000 | 300,000 | | 457-space Public Parking Facility |
| J | | 86,000 | 259,000 | | |
| M | 778,000 | 70,000 | | | |
| O | 544,000 | 50,000 | | | |
| P | 999,000 | 48,000 | | | 1.15-acre Public Space (Willoughby Square), 694-space Public Parking Facility |
| Q | 1,233,000 | 415,000*** | | | |
| S | 337,000 | 51,000 | | | |
| AA | | 18,000 | 163,000 | | |
| BB | | 21,000 | 186,000 | | |
| EE | | 15,000 | | 140,000 (Visual and Performing Arts Library) | 40,000 Cultural (Theater) 466-space Public Parking Facility |
| **Total Floor Area** | **4,611,000** | **844,000** | **979,000 (approx. 979 dwelling units)** | **220,000** | **1,617 spaces Public Parking, 1.63 acres Public Space, 40,000 sf Cultural** |

Notes: * Since the issuance of the DEIS/DSEIS, site K has been removed from the proposed development plan.
** Site reference corresponds to Figure S-1.
*** The majority of retail use on this site is the existing Gallery at Fulton Street, which would remain.
SF = Square Feet, ZSF = Zoning Square Feet

## Table S-6
## Potential Sites: Assumed Program by Use*

| Site Ref.* | Proposed Floor Area by Use (in ZSF) | | | | |
|---|---|---|---|---|---|
| | Office | Retail | Residential | Community Facility | Other |
| A | 450,000 | 50,000 | | 599,000 | |
| B | 450,000 | 50,000 | | 739,000 | |
| D | | 42,000 | 374,000 | | |
| E | | 10,000 | 88,000 | | |
| F | | 6,000 | 33,000 | | |
| H | | 26,000 | 230,000 | | |
| I (B) | 625,000 | 45,000 | | | |
| L | | 41,000 | | | 445,000-sf Hotel |
| N | | 13,000 | 148,000 | | |
| R | 522,000 | 47,000 | | | |
| T | | 13,000 | 118,000 | | |
| U | | 19,000 | 168,000 | | |
| V | | 15,000 | 135,000 | | |
| W | | 12,000 | 108,000 | | |
| X | | 51,000 | 459,000 | | |
| Y | | 34,000 | 305,000 | | |
| Z | | 21,000 | 191,000 | | |
| CC | | 49,000 | 438,000 | | |
| DD | | 40,000 | 199,000 | | |
| **Total Floor Area** | **2,047,000** | **533,000** | **2,535,000 (approx. 2,535 dwelling units)** | **1,338,000** | **445,000-sf Hotel** |

Notes: *Since issuance of the DEIS/DSEIS, site X has been removed from the proposed development plan.
** Site reference corresponds to Figure S-1
SF = Square Feet, ZSF = Zoning Square Feet

*RETAIL AND INSTITUTIONAL USES*

The project also assumes that approximately 844,000 square feet of retail could be developed by 2013. Of this retail use, approximately 415,000 square feet would be associated with a large mixed-use commercial/retail development proposed on site Q, a projected site. The balance of the retail space would mostly comprise ground-floor retail use at the other commercial sites and certain residential development sites. These ground-floor retail uses would predominantly serve proposed commercial and residential uses.

Retail was also assumed for the ground-floor uses on the potential development sites. Based on evaluations of lot size, this retail use could total approximately 533,000 sf. This is a reasonable assumption given that some of the goals of the project are to foster new and varied retail opportunities and to enhance and enliven street frontages.

### ILLUSTRATIVE BULK CONFIGURATIONS

To assess the visual and contextual impacts of the proposed actions, bulk configurations all of which conform to the proposed zoning were formulated by DCP to illustrate the development that could be created on the project sites that have been identified as part of the worst-case development scenario (see Figures S-11 through S-13). Actual development on any of the development scenario sites may differ from what is shown on the bulk configurations.

### FUTURE BASELINE CONDITION

The baseline or No Build condition ("The Future without the Proposed Actions") assumes that none of the discretionary actions proposed as part of the Downtown Brooklyn Development project are adopted. Development in the baseline condition would be limited to those projects that would be developed independently of the proposed project or project parcels that would likely be developed under the current zoning regulations and land use policies.

## F. THE FUTURE WITH THE PROPOSED ACTIONS

### LAND USE, ZONING, AND PUBLIC POLICY

The proposed zoning and related actions would change the scale and density of land use within the project area, while maintaining the current mix of predominantly commercial, residential, and community facility uses. The development projected to result from the proposed actions would be compatible with the existing uses in the project area and would continue ongoing trends of intensifying development, while protecting the character of the nearby neighborhoods by providing transitional zones between areas. These changes would be expected to have a positive impact on both the immediate area and the City as a whole. Furthermore, the actions would support the CBD-type development sought for the Downtown Brooklyn area. No significant adverse impacts on land use, zoning, or public policy would result from the proposed actions.

### SOCIOECONOMIC CONDITIONS

Overall, the proposed actions would not result in significant adverse impacts due to residential or business displacement. To the contrary, the project would reinforce existing trends towards residential and economic development in Downtown Brooklyn and offer significant benefits to the area's business and residential communities. Construction and ongoing operation of the development program would create or retain a significant number of jobs in New York City and

State, with operation of the completed development program for the projected sites generating approximately 40,430 permanent jobs (both direct and indirect) in New York City and 8,530 permanent jobs in New York State. Annual tax revenue generated by the development of the projected sites would also be significant, with program-related City, State, and MTA taxes estimated at $86.4 million, $149.5 million and $5.0 million, respectively.

The proposed actions would not result in significant adverse impacts due to direct or indirect residential displacement. There are approximately 130 residential units currently located on the projected development sites, and residents living in these units would be directly displaced by the proposed actions. In total, residents living in the 130 units represent less than one percent of the study area population, and the profile of the majority of the displaced residents is not markedly different from that of the overall study area, indicating that their displacement would not alter neighborhood character or lead to indirect displacement of remaining residents. The City provides relocation assistance to residents living on sites subject to City acquisition, and it is likely that displaced residents could relocate within Downtown Brooklyn. In addition, the No Build scenario includes four developments with a combined 2,721 residential units available for low and moderate income households.

Residential development under the proposed actions would result in a net increase of approximately 849 new residential units and 1,670 residents. The introduction of these new units and population is not expected to exert indirect displacement pressures on existing residents for several reasons. First, although the study area does contain a substantial number of residential units in buildings not subject to rent control or rent stabilization (approximately 874 project area residents and 11,765 study area residents live in buildings that contain five or fewer units) the high median incomes and housing costs in the area indicate that a large proportion of unregulated units are already renting or selling at, or close to, market rate. This makes the potential for indirect displacement in the study area substantially lower compared to other areas with below-average income levels and housing costs. Second, new units constructed under the proposed actions would represent only a small proportion (4.2 percent) of total housing units in the study area, making it unlikely that they would change neighborhood character. Finally, incentives offered through housing subsidy programs (such as the 80/20 program) make it likely that a percentage of units built under the proposed actions would be rented to low- and moderate-income tenants, thereby retaining the mixed-income character of the housing stock.

By 2013, the proposed actions would introduce approximately 4.6 million square feet of commercial office space and about 844,000 square feet of retail space, resulting in approximately 19,124 net new jobs to Downtown Brooklyn. Like the residential community, the business community of Downtown Brooklyn would not experience any significant adverse impacts due to the proposed actions.

The development of the projected sites would directly displace approximately 100 non-residential uses such as retail shops, food establishments, parking lots, an academic facility, small light industries, and municipal offices. Approximately 11 of those uses are located on previously designated Brooklyn Center Urban Renewal Area sites, and thus could be displaced in the absence of the proposed actions. In total, approximately 1,701 jobs (approximately 2 percent of 2002 study area employment) would be directly displaced by the proposed actions. Other existing employment on projected development sites would relocate in the absence of the proposed actions (for example, the municipal jobs associated with the Department of Education) or be restored by 2013 under the proposed actions. Businesses that would be directly displaced do not meet the criteria for significant displacement, as outlined in the *CEQR Technical Manual;*

they do not have substantial economic value to the City, they do not define neighborhood character, nor do they belong to a special category of business that is protected by special regulations or publicly adopted plans. Furthermore, as part of the City's site acquisition process, commercial tenants would be offered a relocation package, which would include financial coverage for certain moving costs, re-establishment fees, and use of brokerage services to find alternative locations.

The proposed actions are expected to beneficially impact existing businesses by increasing residential and worker populations (by approximately 1,670 and 19,124 respectively), creating a substantial new customer base. The proposed actions are not expected to exert indirect displacement pressures on businesses in the project area or study area; the proposed actions would not alter existing economic patterns, directly displace anchor establishments or uses that form a customer base, or introduce a use that would lower property values.

## COMMUNITY FACILITIES

Community facilities and services in and around the study area are sufficient to meet any increased demand that would result from the development of the projected sites by 2013. Public elementary and intermediate schools are expected to have ample capacity to accommodate the increase in students that would result from the development of the projected sites. This increase in population would not create a significant impact on public libraries or publicly funded day care centers in their respective study areas. Based on discussions and correspondence with representatives of the New York City Police Department and New York City Fire Department, each department will continue to evaluate the need for personnel and equipment and make any necessary adjustments to adequately serve the areas affected by the proposed actions.

## OPEN SPACE

As a result of the future population introduced by the proposed actions, there would be a shortage of passive open space in the ¼-mile study area for the combined worker and resident population. However, this shortage would not result in a significant adverse impact. The open space ratios in existing and No Build conditions also indicate a shortfall in the amount of open space located within the ½-mile study area. The future population introduced to the area as a result of the proposed actions would exacerbate this shortage. The future with the proposed actions would continue to have an inadequacy of open space that is below the open space ratio guideline set by the New York City Department of City Planning (DCP) of 2.0 acres of active open space per 1,000 residents, and below the recommended weighted average ratios of passive open space per 1,000 residents and workers. However, it is recognized that these goals are not feasible for many areas of the City, and they are not considered impact thresholds. The proposed actions would not result in a significant adverse open space impact because the proposed actions would not displace any existing open space resource and would create approximately 1.15 acres of passive public space to offset the increased shortfalls in the two study areas.

## SHADOWS

The shadows analysis concluded that the proposed office towers on sites O, P, and Q would substantially block the sunlight on Willoughby Square, a public space created by the proposed actions and located on the south side of Willoughby Street between Duffield Street and Albee Square West/Gold Street, in all seasons of the year. Development anticipated as a result of the proposed actions on sites O, P, and Q would surround Willoughby Square on its west, south,

and east sides. It is expected that the landscaping of the Square would consist largely of shade-tolerant plants, thereby reducing or avoiding impacts to vegetation; however, the attractiveness and utility of Willoughby Square, particularly in cooler months, would be compromised by the duration and coverage of shadows from buildings likely to be created as a result of the proposed actions. Nevertheless, as this new public space would not exist without the tall buildings to be constructed adjacent to it, this condition would not constitute a significant adverse impact on the Willoughby Square public space.

Shadows from the buildings generated by the proposed actions would also fall on the RV Ingersoll Housing open space, Columbus Park/Borough Hall Park, 111 Livingston Street public plaza, and Long Island University (LIU) Plaza; however, incremental shadows from the buildings projected with the proposed actions are not expected to have significant adverse impacts on these open spaces. The majority of the RV Ingersoll Housing Project open space would be unaffected by project-generated shadow, and the new shadows on Columbus Park/Borough Hall Park would be of short duration and would affect this open space during the early morning, when the park is less likely to be used. LIU Plaza would receive project-generated shadows in the late afternoon, when workers and students are less likely to use this passive open space. Although the shadows at 111 Livingston Street would be of long duration and large coverage, they would not be expected to create an adverse impact, based on the usage and condition of the sitting area. Overall, shadows from the proposed actions would not have a significant adverse impact on any public open space.

## HISTORIC RESOURCES

The analysis of archaeological resources determined that 21 lots on four projected development sites and 10 lots on five potential development sites are considered to be potentially sensitive for 19th century archaeological resources (see Table S-7 below). Individual Stage 1A Archaeological Assessments will be prepared for those lots that are currently City-owned or are acquired by the City, as directed by LPC, before development of these sites would commence. If determined necessary by LPC, as a result of the Stage 1A Archaeological Assessment, Stage 1B field testing—for which a protocol would be submitted to and approved by LPC—and further testing, if needed, will be undertaken prior to development of these sites. In the event that Stage 1B field testing confirms that there are significant archaeological resources on the lots which cannot be recovered during the testing phase, full archaeological excavation will occur or the development will be redesigned to leave the resources protected in place. All archaeological work will be completed under LPC review and will adhere to the standards set forth in the 2001 *CEQR Technical Manual* and the Archaeological Guidelines for work in New York City. Under the revised BCURP, each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not have any significant adverse impacts on the potential archaeological resources of these lots. For the lots which are not now and would not become City-owned (Block 165, Lot 58 and Block 164, Lots 1 and 29), a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources on these lots pursuant to their development is considered a potential unmitigated, significant adverse impact.

**Table S-7**
**Lots with Potential Archaeological Significance**

| Development Site | Block | Lot(s) | Nearest Cross Streets |
|---|---|---|---|
| **Projected Development Sites** | | | |
| I(A) | 2061 | 1 | Myrtle Avenue between Prince and Fleet Streets |
| O | 145 | 13, 14, 15, 18, 19, 20 | Willoughby and Bridge Streets |
| P | 146 | 12, 13, 14, 15, 29, 37, 41, 42, 43, 46, 47, 48, 49 | Willoughby Street and Albee Square West/Gold Street |
| AA | 165 | 58 | Livingston Street between Hoyt and Bond Streets |
| **Potential Development Sites** | | | |
| D | 133 | 5 | Flatbush Avenue and Johnson Street |
| H | 2049 | 2 (329-333 Gold Street and 104-112 Prince Street only) | Flatbush Avenue and Gold Street |
| I(B) | 2062 | 1, 17, 18, 19, 21, 24 | Willoughby and Fleet Streets |
| J | 2061 | 1 | Myrtle Avenue between Fleet Street and Ashland Place |
| Y | 164 | 1 | Livingston and Smith Streets |
| Z | 164 | 29 | Livingston Street between Smith and Hoyt Streets |

There would be no direct impacts to known architectural resources with the proposed actions, as none are located on the projected and potential development sites. However, three potential architectural resources are located on projected development sites: the Joseph J. Jacobs Building, on site C, which LPC deems eligible for listing on the State and National Registers of Historic Places (S/NR listing); the Board of Education Building at 131 Livingston Street, on site M, which LPC deems eligible for designation as a New York City Landmark and S/NR listing; and 233 Duffield Street, on site P, which LPC deems eligible for designation as a New York City Landmark and S/NR listing. In addition, two potential architectural resources are located on potential development sites: 565-571 Fulton Street, on site R, which LPC deems eligible for New York City Landmark designation and S/NR listing; and 423 Fulton Street, on site L, which LPC deems eligible for S/NR listing. The removal of the buildings for these developments would constitute a significant adverse impact on architectural resources. Measures to mitigate this impact have been developed in consultation with LPC. In addition to these direct effects, several of the known and potential architectural resources are located within 90 feet of projected and potential development sites, and, therefore, could be potentially physically affected by ground-borne construction-period vibrations or other potential construction-related issues. It is expected that construction protection plans would be instituted for these developments in order to avoid potential physical impacts on these architectural resources.

The new, modern development on the projected and potential development sites that could occur as a result of the proposed actions would be expected to alter the context of the surrounding architectural resources, changing it from a mixed context of low, medium, and high-rise structures on lots of varied size to one with a greater concentration of high-rise structures on large sites. However, the bulk of the larger development would be located on the boundaries of the MetroTech area, which already contains a mix of tall office buildings and low-rise historic structures, and views to surrounding resources would not be blocked. New residential

development along Livingston Street also would increase the visibility of resources on that block by increasing activity on the street. Therefore, this change in context would not constitute a significant adverse impact on architectural resources.

A thorough documentation study has not uncovered an association of the 227 Duffield Street, 233 Duffield Street, and 436 Gold Street buildings with the Underground Railroad, and there is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad.

The owner of 233 Duffield Street has asserted that that there were shafts in the 227 and 233 Duffield Street buildings, as well as other buildings on Duffield Street, that linked the buildings' sub-basements to the surface and to tunnels under the street buildings, but he has also reported that the sub-basements and shafts have been filled and lost. However, the potential existence of these tunnels, without corroborating artifacts, would not necessarily demonstrate a connection to the Underground Railroad.

The existence of tunnels under the street buildings and any potential corroborating artifacts cannot be ascertained without further testing. Therefore, additional work, first in the form of a visual inspection of the interiors of the buildings after condemnation to ascertain the existence of other artifacts and, second, in the form of new continuous soil borings, would need to be undertaken at the sites. Soil borings will be conducted to determine subsurface conditions, such as fill layers, with the locations of borings to be approved by an archaeologist prior to their execution. This testing would be impracticable prior to demolition of these structures and while they are still occupied, and would therefore have to be conducted at the time of site redevelopment. If the soil borings indicate a potential for archeologically sensitive areas, Stage 1B testing will be undertaken in the potentially sensitive areas. The testing phase will first include the preparation of a testing protocol by a professional archaeologist, to be reviewed and approved by LPC prior to implementation. Testing will be conducted by a professional archaeologist, and appropriate research issues will be formulated in the event of a discovery.

Should the Stage 1B testing establish an association of one or all of these buildings with the Underground Railroad, and the National Park Service criteria for eligibility of Underground Railroad properties for National Historic Landmark designation or for listing in the National Register of Historic Places are met, the redevelopment of these sites pursuant to the proposed actions would constitute a significant adverse impact to archaeological resources. As required under the revised BCURP, measures to partially mitigate the elimination of these resources will, if required, be developed in consultation with LPC and performed prior to issuance of a certificate of occupancy to the redeveloper. For a further description of potential mitigation options, see "Mitigation," below.

## URBAN DESIGN AND VISUAL RESOURCES

The development that would potentially result from the proposed actions would trigger substantial changes in urban design and visual resources. Building bulk and height would be noticeably altered. Street pattern and block forms would change somewhat, but this would not be a significant adverse impact. New public spaces, proposed mandatory sidewalk widenings, and ground-floor retail use and glazing would enliven the street-level environment in the project area. Overall, changes would be significant but not adverse. In general, the proposed actions are expected to transform the appearance of the project area, through streetscape enhancements that would unify the urban design of the area and bridge gaps in the urban fabric, and through the

creation of new developments that would enhance the vitality of the area and foster connections between MetroTech and Fulton Mall and the Boerum Hill and Fort Greene neighborhoods to the south and east.

## NEIGHBORHOOD CHARACTER

The neighborhood character impact analysis focused on changes to neighborhood character resulting from potential impacts in the following technical areas: Land Use, Urban Design and Visual Resources, Historic Resources, Socioeconomic Conditions, Traffic and Pedestrians, and Noise. The analysis concluded that neighborhood character would change with new land uses and building types, increases in employees and residents, and increases in traffic and pedestrian activity, but that the change would not result in a significant adverse impact in neighborhood character.

## HAZARDOUS MATERIALS

The potential for the presence of hazardous materials in soil and/or groundwater and resulting impacts associated with the redevelopment of potential and projected development lots within the Downtown Brooklyn Development area was evaluated using a combination of topographical, geological, and hydrogeological data; historical map review; regulatory records; and limited street-level site inspections. Neighboring lots were evaluated if no potential for impacts was identified on a given lot that was part of a potential/projected development site.

Hazardous materials are substances that pose a threat to human health and/or the environment. However, their presence only threatens human health or the environment when exposure to those materials can occur. When manufacturing districts (where past or current industrial and commercial activities that may have resulted in releases of hazardous materials) are rezoned to allow for commercial, residential or institutional use, as in the case of the proposed actions, uncontrolled demolition and excavation activities associated with the development of lots could increase pathways by exposing existing sub-surface contaminated materials. The most likely routes of human exposure are breathing of volatile and semi-volatile compounds or particulate-laden air released during soil disturbing activities and dermal contact.

Potential contaminants were identified at or close to all of the projected and potential development lots. Specifically, potential hazardous materials impacts were identified for all projected and potential development lots that comprise the Downtown Brooklyn Development sites.

Given the above, procedures to reduce the potential for unnecessary and unacceptable exposure to these contaminants were developed. Prior to construction, further investigation will be performed on each development site to determine the presence and nature of contaminants of concern and the proper remedial and/or health and safety measures that would be employed during redevelopment.

For lots that are not City-owned nor intended for City ownership, an E-designation will be used to ensure that the further investigation (and, where necessary, remediation) will be performed. The E-designation requires that the fee owner of an E-designated lot conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City Department of Environmental Protection (DEP) before issuance of a building permit by the Department of Buildings (pursuant to Section 11-15 of the Zoning Resolution—Environmental Requirements). The E-designation also includes mandatory construction-related health and safety plans, which must also be approved by DEP. Table S-8 lists those development sites that are neither

**Table S-8**

**Sites to Receive E-designation for Hazardous Materials**

| Letter Reference | Block | Lot |
|---|---|---|
| A | 128 | 1 |
| A | 128 | 26 |
| B | 131 | 1 part |
| C | 142 | 1 |
| D | 133 | 1 |
| D | 133 | 5 |
| D | 133 | 13 |
| D | 133 | 15 |
| E | 134 | 1 |
| E | 134 | 5 |
| E | 134 | 38 |
| E | 134 | 41 |
| F | 134 | 30 |
| G | 2049 | 8 |
| H | 2049 | 2 |
| J | 2061 | 1 part |
| N | 152 | 37 |
| Q | 149 | 1 |
| Q | 149 | 49 |
| S | 2093 | 1 |
| T | 160 | 18 |
| V | 161 | 18 |
| W | 160 | 29 |
| Y | 164 | 1 |
| Y | 164 | 13 |
| Z | 164 | 29 |
| Z | 164 | 31 |
| Z | 164 | 42 |
| Z | 164 | 43 |
| Z | 164 | 44 |
| AA | 165 | 17 |
| AA | 165 | 18 |
| AA | 165 | 19 |
| AA | 165 | 58 |
| BB | 165 | 29 |
| DD | 174 | 9 |
| DD | 174 | 13 |
| DD | 174 | 18 |
| DD | 174 | 23 |
| DD | 174 | 24 |

City-owned nor intended for City ownership, and will receive an E-designation for hazardous materials. For City-owned sites or sites that are proposed for City ownership, E-designations will not be placed on development lots. Instead, since development of these sites would occur through disposition to a private entity, a similar mechanism to ensure that further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during

construction will be required under the City's contract of sale with the private entity selected to develop the site. Table S-9 lists development sites that are either City-owned or intended for City ownership. This mechanism and the E-designation mechanism will reduce or avoid the potential that significant adverse impacts would result from the proposed actions on all development sites.

**Table S-9***
**City-Owned Sites and Sites Intended for City Ownership**

| Letter Reference | Block | Lot |
|---|---|---|
| I(A) | 2060 | 22 |
| I(A) | 2060 | 23 |
| I(A) | 2060 | 24 |
| I(A) | 2060 | 25 |
| I(A) | 2060 | 26 |
| I(A) | 2060 | 27 |
| I(A) | 2060 | 122 |
| I(A) | 2060 | p/o 32 |
| I(A) | 2061 | p/o1 |
| I(B) | 2060 | p/o 32 |
| I(B) | 2062 | 1 |
| I(B) | 2062 | 5 |
| I(B) | 2062 | 6 |
| I(B) | 2062 | 17 |
| I(B) | 2062 | 18 |
| I(B) | 2062 | 19 |
| I(B) | 2062 | 21 |
| I(B) | 2062 | 23 |
| I(B) | 2062 | 24 |
| I(B) | 2062 | 103 |
| L | 144 | 1 |
| L | 150 | 1 |
| L | 150 | 6 |
| L | 150 | 10 |
| L | 150 | 11 |
| L | 150 | 19 |
| M | 153 | 3 |
| M | 153 | 14 |
| M | 153 | 15 |
| M | 154 | 1 |
| M | 154 | 5 |
| M | 154 | 11 |
| M | 154 | 12 |
| M | 154 | 36 |
| M | 154 | 37 |
| M | 154 | 38 |
| M | 154 | 39 |
| M | 154 | 40 |
| O | 145 | 8 |
| O | 145 | 10 |
| O | 145 | 13 |

**Table S-9* (cont'd)**
**City-Owned Sites and Sites Intended for City Ownership**

| Letter Reference | Block | Lot |
|---|---|---|
| O | 145 | 14 |
| O | 145 | 15 |
| O | 145 | 16 |
| O | 145 | 18 |
| O | 145 | 19 |
| O | 145 | 20 |
| O | 145 | 21 |
| O | 145 | 22 |
| O | 145 | 26 |
| O | 145 | 32 |
| P | 146 | 2 |
| P | 146 | 7 |
| P | 146 | 11 |
| P | 146 | 12 |
| P | 146 | 13 |
| P | 146 | 14 |
| P | 146 | 15 |
| P | 146 | 16 |
| P | 146 | 17 |
| P | 146 | 23 |
| P | 146 | 29 |
| P | 146 | 34 |
| P | 146 | 35 |
| P | 146 | 36 |
| P | 146 | 41 |
| P | 146 | 42 |
| P | 146 | 43 |
| P | 146 | 46 |
| P | 146 | 47 |
| P | 146 | 48 |
| P | 146 | 50 |
| P | 146 | 51 |
| P | 146 | 52 |
| P | 146 | p/o18 |
| P | 146 | p/o18 |
| P | 146 | p/o37 |
| P | 146 | p/o37 |
| R | 149 | 14 |
| R | 149 | 15 |
| R | 149 | 17 |
| R | 149 | 19 |
| R | 149 | 22 |
| R | 149 | 23 |
| R | 149 | 24 |
| R | 149 | 25 |
| R | 149 | 26 |

**Table S-9* (cont'd)**
**City-Owned Sites and Sites Intended for City Ownership**

| Letter Reference | Block | Lot |
|---|---|---|
| R | 149 | 28 |
| R | 149 | 30 |
| R | 149 | 31 |
| R | 149 | 32 |
| R | 149 | 33 |
| R | 149 | 34 |
| R | 149 | 50 |
| U | 161 | 27 |
| U | 161 | 30 |
| U | 161 | 33 |
| CC | 167 | 15 |
| CC | 167 | 16 |
| CC | 167 | 26 |
| CC | 167 | 27 |
| CC | 167 | 28 |
| CC | 167 | 36 |
| EE | 2110 | 3 |
| N/A | 2060 | 8 |
| N/A | 2106 | 4 |
| N/A | 2106 | 5 |
| N/A | 2106 | 6 |
| N/A | 2106 | 7 |
| N/A | 2106 | 9 |
| N/A | 2106 | 16 |
| N/A | 2106 | 19 |
| N/A | 2106 | 24 |
| N/A | 2106 | 26 |
| N/A | 2106 | 29 |
| N/A | 2106 | 35 |
| N/A | 2106 | 40 |
| N/A | 2107 | 2 |
| N/A | 2107 | 15 |
| N/A | 2107 | 24 |
| N/A | 2107 | 30 |
| N/A | 2107 | 36 |
| N/A | 2107 | 40 |
| N/A | 2107 | 41 |
| N/A | 2108 | 1 |

**Notes:** * Since the issuance of the DEIS/DSEIS, Block 2060, Lots 1 and 4 (part of site K) and site X have been removed from the proposed development plan.

Closed Street Beds:

Red Hook Lane, between Fulton Street and Boerum Place
Fair Street, between Prince Street and Fleet Place
Pearl Street, between Fulton Street and Willoughby Street
Prince Street, between Flatbush Avenue extension and Myrtle Avenue

Without the proposed actions, a number of construction projects involving conversion or additions to existing buildings, or construction of new buildings may occur. Without the mechanisms associated with the proposed actions, these activities could result in the exposure of construction workers and nearby residents to hazardous materials.

## INFRASTRUCTURE

By the Build year of 2013, the proposed actions are expected to generate net new water usage of about 1.2 millions of gallons per day (mgd) and net new wastewater flows of 605,000 gallons per day (gpd) at the projected development sites. Although the projected development that would likely result from the proposed actions would create new demand for water and treatment of sewage, the municipal services have adequate capacity to meet the increases in demand. Therefore, no significant adverse impacts are expected to result to these services.

## SOLID WASTE

The proposed actions would place a new demand on solid waste and sanitation services. They are expected to result in a net increase over existing conditions of about 31,601 pounds per week (or 15.8 tons per week) of solid waste that New York City Department of Sanitation (DSNY) would collect, transport and dispose of. Private carters would handle a net increase of about 366,128 pounds per week (or about 183 tons per week). Although the development of the projected sites would create new demand for the disposal of solid waste, municipal and private solid waste services have adequate capacity to meet the increases in demand. Therefore, no significant adverse impacts are expected on these services from the proposed actions.

## ENERGY

Development resulting from the proposed actions would place an increased demand on energy services. Currently, uses at the projected development sites create some demand for energy. Although the development of the projected sites would create new demands on energy, the additional demand would not be large enough to have significant adverse impacts on energy services.

## TRAFFIC AND PARKING

The proposed actions would affect traffic by facilitating street system changes and by increasing traffic volumes. Proposed changes to the study area street network include the closure of several minor streets (Red Hook Lane and portions of Pearl, Prince and Fair Streets), the widening of portions of Fleet Place, Willoughby Street, and Myrtle Avenue, and the extension of Fleet Place to a new intersection with Myrtle Avenue. A new street connection between Duffield Street and Albee Square West would be created midblock between Willoughby and Fulton Streets, and portions of Duffield and Elm Streets would be converted from one-way northbound to one-way southbound operation. Projected developments would result in a net increase of 865 inbound and 242 outbound vehicle trips in the AM peak hour (auto, taxi and truck), 402 inbound and 416 outbound vehicle trips in the midday, and 278 inbound and 1,016 outbound vehicle trips in the PM peak hour. This new demand, and the effects of street system changes related to the proposed actions, would combine to result in significant traffic impacts at 29 signalized

intersections in one or more peak periods. As shown in Table S-10, the PM peak hour would have the highest number of impacted intersections with 28, followed by the AM and the midday, with 23 and 20 impacted intersections, respectively. See "Mitigation" below for proposed mitigation measures.

**Table S-10**
**Summary of Impacted Intersections**

| Intersections | | AM | MD | PM |
|---|---|---|---|---|
| Atlantic Avenue @ | Flatbush Avenue | X | X | X |
| | Fourth Avenue | X | X | X |
| | Bond Street | X | X | |
| | Hoyt Street | X | X | X |
| | Smith Street | X | | X |
| | Boerum Place | X | | X |
| Flatbush Avenue @ | Tillary Street | X | X | X |
| | Myrtle Avenue | X | X | X |
| | Willoughby Street | X | X | X |
| | DeKalb Avenue | X | | X |
| | Fulton Street | X | X | X |
| | Livingston Street | X | | X |
| | Schermerhorn Street/Lafayette | X | X | X |
| | Fourth Avenue/Hanson Place | | | X |
| Jay Street @ | Tech Place | | | X |
| Livingston Street @ | Bond Street | X | X | X |
| | Hoyt Street | | X | X |
| | Smith Street | | X | X |
| | Boerum Place | X | X | X |
| Myrtle Avenue @ | Prince Street | X | X | X |
| | Ashland Place | X | X | X |
| Schermerhorn Street @ | Bond Street | X | | X |
| | Hoyt Street | | | X |
| | Smith Street | X | X | X |
| Tillary Street @ | Adams Street | X | X | X |
| | Jay Street | X | X | X |
| Willoughby Street @ | Gold Street/Albee Square West | | | X |
| | Bridge Street | X | X | X |
| | Jay Street | X | X | X |

X = impacts to one or more movements in the peak hour.

The proposed actions would facilitate the development of three new public parking facilities with a total of approximately 1,617 parking spaces. With this additional capacity, which would be sufficient to accommodate all of the anticipated public parking demand from projected development sites, the surplus of off-street public parking spaces in the AM would increase to 2,581 from 2,029 in the No Build condition. In the midday, there would be a deficit of 998 spaces within the study area, compared to a deficit of 1,179 in the No Build condition. As the proposed actions would increase the surplus of study area parking spaces in the AM by 552, and would reduce the No Build midday parking deficit by 181 spaces, no significant adverse impacts to off-street parking conditions would result from the proposed actions.

## TRANSIT AND PEDESTRIANS

The proposed actions would generate a net total of 6,013 inbound and 691 outbound trips by subway in the AM peak hour, and 1,163 inbound and 7,408 outbound in the PM peak hour. Trips by local bus would total 546 inbound and 83 outbound in the AM peak hour and 211 inbound and 782 outbound in the PM. Trips by walking only, bicycle or other non-vehicular modes would total 1,360 inbound and 623 outbound in the AM peak hour, and 1,780 inbound and 2,753 outbound in the PM. The additional subway demand would significantly impact two street stairs at the Jay Street-Borough Hall subway station in one or both peak periods. Bus trips generated by projected development would result in a significant PM peak hour impact to NYC Transit's B25 bus route in the peak eastbound direction. Pedestrian trips en route to and from projected development sites would impact one crosswalk on Jay Street at Willoughby Street and one crosswalk on Albee Square West/Gold Street at Willoughby Street. See "Mitigation" below for proposed mitigation measures.

## AIR QUALITY

The analysis showed that the maximum predicted carbon monoxide (CO) and particulate matter ($PM_{10}$ and $PM_{25}$) concentrations from mobile sources would be lower than the corresponding ambient air standards, with the development of the projected development sites under the proposed actions. The cumulative parking garage analysis also determined that the project's public parking facilities would not result in any significant adverse air quality impacts. Thus, the proposed actions would not have significant adverse air quality impacts from mobile source emissions. A stationary source screening analysis and subsequent detailed dispersion modeling determined that there would be no potential significant adverse air quality impacts from emission of nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$) and $PM_{10}$, from the proposed HVAC systems of the projected development sites. With respect to $PM_{2.5}$,an E-designation has been placed on projected development site BB (Block 165, Lot 29), which stipulates that any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilation, and air conditioning stack(s) is located at least 115 feet from the lot line facing Hoyt Street and parallel with Schermerhorn Street to avoid any potential significant air quality impacts. In addition, there would be no significant adverse air quality impacts from industrial facilities on the proposed developments sites.

## NOISE

Noise monitoring at 16 receptor locations (identified as areas where project-generated traffic would have the potential to cause significant increases in noise levels or noise impacts) was performed in year 2003 in May and June. With the exception of Site 2 (Duffield Street between Willoughby and Fulton Streets), future noise levels with the proposed actions at all of the analysis sites would increase by less than 3 dBA during all of the analysis periods compared to future noise levels without the proposed actions. (Noise levels at Sites 1, 4 through 8, and 10 through 16 would increase by less than 2 dBA, an imperceptible and insignificant increase. Noise levels at Sites 3 and 9 would increase by less than 3 dBA, a barely perceptible and insignificant increase.) Consequently, with the exception of Site 2, the development of the projected development sites would not result in any significant increases in noise levels.

Increases at Site 2 would be perceptible and, based upon CEQR noise impact criteria, would constitute a significant noise impact. There is no feasible mitigation to eliminate this impact at this site during the AM period, and thus it constitutes an unmitigated project impact.

In addition, as part of the development that would occur with the proposed actions, a 1.15-acre public space, Willoughby Square, is proposed to be built over the below-grade public parking facility at Site 2. Based upon the analysis results, noise levels of approximately 69 to 73 dBA would be expected at this new public space. These noise levels would be higher than those generally recommended for outdoor activities, but would be comparable to levels in existing parks in New York City which are adjacent to moderately to heavily trafficked streets and roadways. There are no feasible mitigation measures to reduce noise levels within an urban public space such as this to within recommended levels for this type of use.

*NOISE ATTENUATION*

Noise attenuation values for buildings are recommended in the 2001 *CEQR Technical Manual* and are designed to maintain interior noise levels of 45 dBA or lower, and are determined based on exterior $L_{10}(1)$ noise levels.

In general, 20 to 25 dBA of building attenuation can be achieved with double glazed windows and alternative means of ventilation, such as window-sleeve air conditioning units. Noise attenuation of up to 40 dBA can be achieved with double glazed windows with good sealing properties and alternative means of ventilation such as central air conditioning. Based upon the $L_{10(1)}$ values measured at the analysis sites, a maximum of 40 dBA of building attenuation would be required. The provision for providing sufficient building attenuation would be mandated by placing an E-designation on the projected and potential development sites (see Table S-11 for a list of the affected blocks and lots). In addition, mechanical equipment such as heating, ventilation, and air conditioning (HVAC), and elevator motors would utilize sufficient noise reduction devices to comply with applicable noise regulations and standards. Overall, with the specified attenuation measures, the proposed actions would not have any significant interior noise impacts, and would comply with all CEQR requirements.

## CONSTRUCTION IMPACTS

Construction of the projected development sites would be phased, and it is assumed that all construction would be completed by 2013.

The assessment focused on the construction activities expected at sites O, P, and Q. These clustered sites, located along Willoughby Street west of Flatbush Avenue Extension, contain a substantial amount of the total projected development program and would be constructed within an overlapping timeframe. As proposed, these sites would include approximately 2.8 million square feet of commercial office space, over 500,000 square feet of retail, an underground public parking facility, and one public space: the 1.15-acre Willoughby Square. Sites C, M, and S would also entail the construction of commercial office and retail space; however, these sites are not clustered and the building programs for sites C and S are smaller.

Construction of the mixed-use residential developments proposed on sites G, I(A), J, AA, and BB are likely to proceed in a fashion similar to the office buildings, but would be smaller and thus would have fewer impacts. Site EE, located at the southern end of the rezoning area at Flatbush and DeKalb Avenues, would be developed with a visual and performing arts public library and theater, and would also include public parking and a nominal amount of retail use. In addition to the construction of buildings, the development of this site would entail the construction of streetscape improvements.

**Table S-11**

**Minimum Building Attenuation to Comply With CEQR Requirements***

| Site | Location | Time | $L_{10}$ (dBA) | Building Attenuation (dBA) | Affected Blocks and Lots |
|---|---|---|---|---|---|
| 1 | Bridge Street between Willoughby and Fulton Streets | MD | 71.2 | 30 | B 152, L 37; B 145, L 8, 10, 13-15 |
| 2 | Duffield Street between Willoughby and Fulton Streets | MD | 73.7 | 30 | B 145, L 26, 32; B 146, L 2, 7, 11-18 |
| 3 | Albee Square West/Gold Street between Willoughby Street and DeKalb Avenue | PM | 71.3 | 30 | B 146, L 23, 29, 34-37, 41-43, 46-52 |
| 4 | Gallatin Place between Fulton and Livingston Streets | MD | 80.2 | 40 | B 164, L 1, 13, 29, 31, 42-44 |
| 5 | Fulton Street between Hanover Place and Bond Street | PM | 76.4 | 35 | B 160, L 18, 29; B 149, L 14, 15, 17, 19, 22, 26, 28, 30-34, 50; B 161, L 27, 30, 33, B 2093, L1 |
| 6 | Fleet Street between DeKalb Avenue and Flatbush Avenue Extension | MD | 68.7 | 25 | B 149, L 1, 49 |
| 7 | Intersection of Flatbush Avenue Extension and Prince Street | MD | 77.1 | 35 | B 2060, L 22-27, 32, 122; B 2062; L 1, 5, 6, 17-19, 21, 23, 24, 103 |
| 8 | Livingston Street between Bond and Hoyt Streets | AM | 76.0 | 35 | B 165, L 17-19, 29, 58 |
| 9 | Willoughby Street between Bridge and Duffield Streets | MD | 73.8 | 30 | B 145, L 16, 18-22 |
| 10 | Flatbush Avenue between Lafayette Avenue and Hanson Place | MD | 77.0 | 35 | B 174, L 9, 13, 18, 23, 24; B 2110, L 3; B 167, L 15, 16, 26, 28, 36, 42 |
| 11 | Southwest corner of Ashland Place and Myrtle Avenue | PM | 73.1 | 30 | B 2061, L1 |
| 12 | Myrtle Avenue between Prince Street and Ashland Place | PM | 71.7 | 30 | B2061, L1 |
| 13 | Gold Street between Johnson Street and Flatbush Avenue Extension | AM | 71.3 | 30 | B 2049, L 2, 8; B 133, L 1, 5, 13, 15; B 134, L 1, 5, 30, 38, 41 |
| 14 | Tillary Street between Jay and Bridge Streets | MD | 77.2 | 35 | B 131, L 1; B 142, L 1 |
| 15 | Adams Street between Tillary and Johnson Streets | MD | 74.2 | 30 | B 128, L 1, 26 |
| 16 | Fulton Street between Adams and Jay Streets | PM | 79.4 | 35 | B 144, L 1; B 150, L 1, 6, 10, 11, 19; B 153, L 3, 14, 15; B 154, L 1, 5, 11, 12, 36-40 |

**Note:** *The provision for providing sufficient building attenuation to comply with CEQR requirements will be mandated by placing an E-designation on these lots.

The assessment concludes that, for the most part, construction impacts of the development associated with the proposed actions would be temporary and similar to those experienced elsewhere in the City's business districts. Impacts specific to conditions in the study area would relate mainly to the potential physical effects to historic resources and potential effects on traffic conditions, particularly on Flatbush Avenue and Adams Street where currently congestion exists.

## PUBLIC HEALTH

Based on 2001 *CEQR Technical Manual* guidelines, it was determined that a full assessment of the proposed actions' potential impacts on public health is not necessary and that no significant adverse impacts are expected as a result of the proposed actions.

## MITIGATION

### *HISTORIC RESOURCES*

#### *Architectural Resources*

Three potential architectural resources would be directly affected by the development of projected development sites pursuant to the proposed actions. These are the Joseph J. Jacobs Building of Polytechnic University (site C), located at 305-315 Jay Street, which LPC deems eligible for listing on the State and National Registers of Historic Places (S/NR listing); the Board of Education Building at 131 Livingston Street (site M), which LPC deems eligible for designation as a New York City Landmark and S/NR listing; and 233 Duffield Street (site P), which LPC deems eligible for designation as a New York City Landmark and S/NR listing. In addition, two other potential architectural resources would be directly affected by the development of potential development sites: 565-571 Fulton Street (site R), which LPC deems eligible for New York City Landmark designation and S/NR listing; and 423 Fulton Street (site L), which LPC deems eligible for S/NR listing. The removal of the buildings for these developments would constitute a significant adverse impact on architectural resources.

Measures to mitigate the impact on these buildings have been developed in consultation with the New York City Landmarks Preservation Commission (LPC). Per the guidelines of the 2001 *CEQR Technical Manual*, possible mitigation measures for significant adverse effects on architectural resources include redesign (i.e. relocating the action or contextual redesign), adaptive reuse, construction protection plan, data recovery, or relocation. LPC has indicated that data recovery (i.e., recordation to the standards of the Historic American Building Survey [HABS]) will be sufficient mitigation for the Joseph J. Jacobs Building and the 423 Fulton Street building. The scopes of work for all HABS-level documentation will be provided to LPC for review and approval prior to the start of demolition of these buildings. Under the revised Brooklyn Center Urban Renewal Plan, each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as HABS-level documentation, prior to issuance of a certificate of occupancy. HABS-level documentation will be provided for the 565-571 Fulton Street, Board of Education (131 Livingston Street), and 233 Duffield Street buildings; however, these buildings are considered to be rarer resources, and therefore further consideration was given of possible measures to mitigate this impact. For the Joseph J. Jacobs Building, which is not located within the revised BCURP, Polytechnic University, the property owner, will execute a restrictive declaration requiring that HABS-level documentation will be prepared prior to demolition of the building.

It is unlikely that the projected development of sites M and P and the potential development of site R could be relocated to other sites within the project area. The screening criteria for commercial development, which were developed in consultation with DCP, were considered for all of the parcels affected by the proposed actions in order to determine a site's attractiveness for commercial use, its bulk, and its development timeframe. Sites M, P, and R met all of the criteria for commercial development, where other blocks and lots within the project area did not.

Therefore, it is reasonable to assume that the development projected to occur on these sites could not occur on other sites within the project area. Further, it is not considered feasible to include the 131 Livingston Street, 233 Duffield Street, and 565-571 Fulton Street buildings within the developments projected for sites M, P, and R. Site R was previously designated as an urban renewal site in 1970 as part of the BCURP. The proposed actions would not alter the status of the site in the BCURP. It is possible that the façades of the 575-571 Fulton Street and 131 Livingston Street buildings could be preserved in place and incorporated into the façade of a modern office building; however, this would affect the structure and character of the resources.

Commitment for mitigation beyond the HABS-standard recordation of the buildings is not possible given that neither the development program nor the project developers are known. However, for 131 Livingston Street and 575-571 Fulton Street, it is possible that once a developer has been identified, there may be the potential to preserve architectural elements of the buildings' façades as part of the proposed developments. As described above, LPC deems 131 Livingston Street, 233 Duffield Street, and 565-571 Fulton Street eligible for designation as New York City Landmarks and for listing on the State and National Registers. Should the future development of these sites involve city, state, or federal discretionary actions, environmental review that takes into consideration these architectural resources may be required, according to the applicable statutory requirements. In addition, if the buildings are calendared for designation or designated as NYCLs, application to the LPC Preservation Department will be required prior to the start of any construction work involving these buildings.

*Archaeological Resources*

LPC has determined that there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that are considered to be potentially sensitive for 19th century archaeological resources. Individual Stage 1A Archaeological Assessments will be prepared for those lots which are currently City-owned or would be acquired by the City, as directed by LPC, before development of these sites would commence. If determined necessary by LPC, as a result of the Stage 1A Archaeological Assessment, Stage 1B field testing—for which a protocol will be submitted to and approved by LPC—and further testing, if needed, will be undertaken prior to development of these sites. In the event that Stage 1B field testing confirms that there are significant archaeological resources on the lots which cannot be recovered during the testing phase, full archaeological excavation will occur, or the development will be redesigned to leave the resources protected in place. All archaeological work will be completed under LPC review and adhere to the standards set forth in the 2001 *CEQR Technical Manual* and the Archaeological Guidelines for work in New York City. Under the revised BCURP, each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not result in any significant adverse impacts on archaeological resources on these lots.

For the lots which are not now and would not become City-owned (Block 165, Lot 58 and Block 164, Lots 1 and 29), a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, archaeological field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources on these lots pursuant to their development is considered a potential unmitigated, significant adverse impact.

*Underground Railroad*

During the public comment period for the DEIS/DSEIS, several property owners came forward to claim that their buildings were utilized for Underground Railroad activities. Specifically, the three buildings are 227 Duffield Street (Block 146, Lot 15); 233 Duffield Street (Block 146, Lot 12); and 436 Gold Street, aka 436 Albee Square West (Block 146, Lot 51). A thorough documentation study has not uncovered an association with the Underground Railroad for the buildings, and there is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad. The owner of 233 Duffield Street has asserted that that there were shafts in the 227 and 233 Duffield Street buildings, as well as other buildings on Duffield Street, that linked the buildings' sub-basements to the surface and to tunnels under the street buildings, but he has also reported that the sub-basements and shafts have been filled and lost. However, the potential existence of these tunnels, without corroborating artifacts, would not necessarily demonstrate a connection to the Underground Railroad.

The existence of tunnels under the street buildings and any potential corroborating artifacts cannot be ascertained without further testing. Therefore, additional work, first in the form of a visual inspection of the interiors of the buildings after condemnation to ascertain the existence of other artifacts and, second, in the form of new continuous soil borings, would need to be undertaken at the sites. Soil borings will be conducted to determine subsurface conditions, such as fill layers, with the locations of borings to be approved by an archaeologist prior to their execution. This testing would be impracticable prior to demolition of these structures and while they are still occupied, and would therefore have to be conducted at the time of site redevelopment. If the soil borings indicate a potential for archeologically sensitive areas, Stage 1B testing will be undertaken in the potentially sensitive areas. The testing phase will first include the preparation of a testing protocol by a professional archaeologist, to be reviewed and approved by LPC prior to implementation. Testing will be conducted by a professional archaeologist, and appropriate research issues will be formulated in the event of a discovery.

Should the Stage 1B testing establish an association of one or all of these buildings with the Underground Railroad, and the National Park Service criteria for eligibility of Underground Railroad properties for National Historic Landmark designation or for listing in the National Register of Historic Places are met, the redevelopment of these sites pursuant to the proposed actions would constitute a significant adverse impact to archaeological resources. As required under the revised BCURP, measures to partially mitigate the elimination of these resources will, if required, be developed in consultation with LPC and performed prior to issuance of a certificate of occupancy to the redeveloper. Partial mitigation measures would involve HABS-level documentation and/or an exhibit in an appropriate location. As described above under "Architectural Resources," 233 Duffield Street also has been identified by LPC as a potential architectural resource, and therefore HABS-level documentation will be provided to mitigate its loss.

*TRAFFIC AND PARKING*

Demand from projected development sites and the effects of street system changes related to the proposed actions would combine to result in significant traffic impacts at 29 signalized intersections in one or more peak periods. To address these impacts, a mitigation plan for the Downtown Brooklyn street network was developed incorporating measures that were previously identified in several earlier studies but were not implemented as well as new concepts developed

based on the findings of this EIS and discussions with NYCDOT and other agencies. The development of the mitigation plan followed a two-tier approach. First to be evaluated were physical and operational changes to the street network to improve traffic flow. Some of these measures would potentially benefit multiple intersections or entire corridors. Where further mitigation was found to be needed, a second tier of more traditional site-specific measures were evaluated, including modifications to intersection signalization and channelization, and curbside parking regulations.

As shown in Table S-12, the proposed traffic mitigation plan would fully address all impacts at 17 intersections in the AM peak hour, 17 in the midday and 21 in the PM peak hour. Eighteen out of 29 intersections impacted by the proposed actions would no longer be impacted with implementation of the proposed mitigation plan. However, unmitigable impacts would remain in one or more peak periods at a total of eleven intersections. The intersection of Adams Street and Tillary Street would have four unmitigated impacts in the AM peak period and two each in the midday and PM peak periods. The intersection of Atlantic Avenue and Bond Street would have one unmitigated impact in the midday peak period, while the intersection of Atlantic and Flatbush Avenues would have one unmitigated impact in the PM. The intersection of Atlantic and Fourth Avenues would have one unmitigated impact in the AM peak period, as would the intersection of Atlantic Avenue and Smith Street.

The intersection of Flatbush Avenue and Fulton Street would have two unmitigated impacts in the PM, as would the intersection of Flatbush Avenue/Hanson Place/Fourth Avenue. The Flatbush Avenue and Livingston Street intersection would have one unmitigated impact in the AM, and the intersection of Flatbush and Myrtle Avenues would have four unmitigated impacts in the AM and two in the PM. The intersection of Flatbush Avenue and Tillary Street would have one unmitigated impact in the AM, two in the midday and three in the PM peak hour. Lastly, the intersection of Flatbush Avenue with Schermerhorn Street and Lafayette Avenue would have three unmitigated impacts in the PM peak period.

Additional measures will be explored in coordination with NYCDOT to reduce or eliminate these unmitigated significant adverse impacts. The City recognizes the historic and on-going traffic issues in the Downtown Brooklyn area, whose congested conditions would continue to exist regardless of the proposed actions. The City is committed to seeking remedies to these significant congested conditions.

*TRANSIT AND PEDESTRIANS*

*Subway Service*

Transit demand from projected development sites would significantly impact two street stairs at the Jay Street-Borough Hall subway station in one or both peak periods. At Stair S3, at the northwest corner of Jay and Fulton Streets, a one-foot widening would restore this stair to LOS C in the PM peak hour, comparable the No Build condition and below NYC Transit's minimum standard of 10 persons per foot-width per minute (PFM). However, while such mitigation is feasible, it would not be practical to undertake for this moderate level of impact. (Stair S3 would

**Table S-12**
**Summary of Mitigated Traffic Impacts**

| Intersections | | AM | MD | PM |
|---|---|---|---|---|
| Atlantic Avenue and | Flatbush Avenue | X | X | U |
| | Fourth Avenue | U | X | X |
| | Bond Street | X | U | |
| | Hoyt Street | X | X | X |
| | Smith Street | U | | X |
| | Boerum Place | X | | X |
| Flatbush Avenue and | Tillary Street | U | U | U |
| | Myrtle Avenue | U | X | U |
| | Willoughby Street | X | X | X |
| | DeKalb Avenue | X | | X |
| | Fulton Street | X | X | U |
| | Livingston Street | U | | X |
| | Schermerhorn Street/Lafayette | X | X | U |
| | Fourth Avenue/Hanson Place | | | U |
| Jay Street and | Tech Place | | | X |
| Livingston Street and | Bond Street | X | X | X |
| | Hoyt Street | | X | X |
| | Smith Street | | X | X |
| | Boerum Place | X | X | X |
| Myrtle Avenue and | Prince Street | X | X | X |
| | Ashland Place | X | X | X |
| Schermerhorn Street and | Bond Street | X | | X |
| | Hoyt Street | | | X |
| | Smith Street | X | X | X |
| Tillary Street and | Adams Street | U | U | U |
| | Jay Street | X | X | X |
| Willoughby Street and | Albee Square West/Gold Street | | | X |
| | Bridge Street | X | X | X |
| | Jay Street | X | X | X |

**Notes:**
**X:** All impacts fully mitigated.
**U:** One or more unmitigated impacts in the peak period.

operate at a functional LOS D in the PM). In addition, urban renewal changes for the project would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets that would potentially include a new subway entrance/exit to the Jay Street-Borough Hall station. A new subway entrance/exit located within this plaza would fully address the PM peak hour impact to Stair S3. Therefore, pending the implementation of a new transit plaza, the proposed actions' impact to Stair S3 would remain unmitigated.

To mitigate the AM and PM peak hour impacts to Stair S4 on the northeast corner of Jay and Willoughby Streets, it is proposed to double the width of this stair from its current five feet to ten feet in width. To accommodate this widened stairway and provide sufficient sidewalk space

for pedestrians, an eight-foot-wide sidewalk extension or "neckdown" would be installed within the curb lane along the east sidewalk on Jay Street adjacent to the stair. The proposed neckdown, along with a similar installation along the east sidewalk on Jay Street south of Willoughby Street (to channel traffic), would not adversely impact traffic flow conditions.

With the proposed widening, Stair S4 would operate at LOS C (8.26 PFM) in the AM peak period, comparable to the No Build condition and below NYC Transit's minimum standard of 10 PFM. In the PM peak period, this stair would also operate at an acceptable LOS C (9.01 PFM). The proposed five-foot widening would therefore return this stair to a functional level of operation in both peak periods, fully mitigating the project's impacts.

If, after further detailed engineering, widening of Stair S4 proves to be impractical due to the presence of utilities or other physical constraints, an alternative mitigation scheme would be explored. Under this alternative, a second 5-foot-wide stair would be constructed adjacent to the building line immediately to the north of Stair S4. This stair would face northward and share a common landing with Stair S4 in a "T"-shaped configuration. The two 5-foot-wide stairs would function as a combined system with a capacity similar to that achieved by widening Stair S4 to 10 feet. Consequently, this alternative mitigation measure would similarly address the project's AM and PM peak hour impacts to Stair S4. Construction of this new stair would likely not require extension of the adjacent sidewalk, but such an extension (or neckdown) may still be considered for implementation for the purposes of enhancing pedestrian safety at this intersection.

*Local Bus Service*

Project demand would significantly impact eastbound B25 service in the PM peak hour. As standard practice, New York City Transit routinely conducts ridership counts and adjusts bus service frequency to meet its service criteria, within fiscal and operating constraints. Therefore, no mitigation is proposed for the impact to eastbound B25 service.

*Pedestrians*

Project demand would significantly impact the north crosswalk on Jay Street at Willoughby Street in the PM peak hour and the south crosswalk on Albee Square West at Willoughby Street in both the AM and PM peak hours. These crosswalk impacts would all be fully mitigated by widening each crosswalk by 0.5 to four feet.

*AIR QUALITY*

Chapter 16, "Air Quality," showed that under the 2013 build condition, with the development of the projected sites, impacts on carbon monoxide (CO) would be well below ambient air quality standards and the City's de minimis criteria. The proposed traffic mitigation measures, which include new roadway configurations and volume diversions, were evaluated to determine the potential effects on air quality in the study area. Because the proposed mitigation measures seek to avoid or reduce the levels of congestion and delays at an intersection, an overall improvement in traffic conditions is expected for the study area as compared to the Build condition. Based on the traffic mitigation analysis presented above, the proposed changes in volume, levels of service, and delays through the network would result in similar, if not lower, predicted CO concentrations under the build with mitigation condition. Similarly, the build with mitigation scenario would not alter the conclusions of no significant impact on inhalable particulate ($PM_{10}$ and $PM_{2.5}$) levels.

The proposed traffic mitigation measures would not affect the stationary or industrial source analyses provided in Chapter 16, which determined that there would be no significant air quality impacts resulting from the proposed actions.

*NOISE*

At the Site 2 noise receptor, located at Duffield Street between Willoughby and Fulton Streets, future noise levels with the proposed actions would increase by up to 3.4 dBA compared to future noise levels without the proposed actions during the AM peak period. Increases of this magnitude would be perceptible and, based upon CEQR noise impact criteria, would constitute a significant noise impact. This impact would occur because of the relatively low volumes at this location without the proposed actions, and the number of vehicles (particularly trucks) generated by the development expected on this street and in the surrounding area. While no residences would be impacted with the proposed actions, the increase in noise levels at Site 2, during the AM peak period would exceed the CEQR impact criteria and thus, the project would have a significant noise impacts at this location. There is no feasible mitigation to eliminate this impact at this site during this time period, and thus it would constitute a significant adverse project impact.

## ALTERNATIVES

The purpose of the alternatives analysis is to examine reasonable and practicable options that avoid or reduce project-related, significant adverse impacts and may still allow for the achievement of the stated goals and objectives of the proposed actions. Four alternatives were analyzed: No Action Alternative, No Unmitigated Impacts Alternative, Modified Brooklyn Center Urban Renewal Plan (BCURP) alternative, and the BQE Ramp Alternative.

*NO ACTION ALTERNATIVE*

The No Action Alternative assumes that the proposed zoning changes and other land use actions would not be implemented, and compares conditions under the No Action Alternative with conditions with the proposed actions. The No Action condition assumes no amendments to the zoning map and zoning text for the Special Downtown Brooklyn District; no amendments to the Brooklyn Center Urban Renewal Plan, MetroTech Urban Renewal Plan, and Atlantic Terminal Urban Renewal Plan; no modification of the MetroTech General Large-Scale Development Special Permit; no disposition of the City's interest in real property; no site selection for a visual and performing arts public library on Block 2110, Lot 3; and no special permits for the proposed parking facilities. The No Action Alternative would require no discretionary actions.

*Land Use, Zoning, and Public Policy*

With the No Action Alternative, the rezoning area would continue to contain a mix of civic, office, residential, community facility, and retail uses; the developments associated with the proposed actions would not take place. This alternative would not require acquisition of sites by the City or potential direct displacement of uses currently occupying the proposed new designated properties. The mapping or demapping of certain streets in the project area would not occur, and the development of large floorplates to encourage downtown expansion would be precluded.

In this No Action Alternative, zoning changes and new development would be expected to occur on a site-by-site basis as a continuation of the existing redevelopment trends in the area. Unlike

the proposed actions, this alternative would not provide the zoning and map changes and text amendments necessary to support a comprehensive planning effort. However, similar to the proposed actions, no adverse effects to land use, zoning, or public policy would result from the No Action Alternative.

*Socioeconomic Conditions*

It is generally anticipated that existing economic activities on the projected development sites will remain. Absent the proposed actions, the only anticipated development on the projected development sites is the conversion of the existing building on site G at Tech Place and Gold Street for 60 new residential units.

Unlike the proposed actions, the No Action Alternative would not result in the direct displacement of approximately 130 residential units and 100 non-residential uses in the projected development sites. It would not result in the significant benefits to the area's business and residential communities that the proposed actions are expected to generate. With the No Action Alternative, Downtown Brooklyn would not see the same increase in residential and worker populations, and hence, customer base, during both construction and the ongoing operation of the projected development sites. In addition, the No Action Alternative would not further the City's goals of reinforcing Downtown Brooklyn's role as a regional central business district attracting new businesses and retain businesses considering relocation outside of the City.

*Community Facilities*

Like the proposed actions, no significant impacts to community facilities would result from the No Action Alternative.

*Open Space and Recreational Facilities*

Under the No Action Alternative, the ½-mile study area would continue to experience a deficiency of passive open space resources, with the weighted average ratio for passive open space remaining at 0.26 acres per 1,000 workers and residents. The study area also would continue to experience a deficiency in active open space; the active open space ratio would decrease from 0.49 to 0.48 acres per 1,000 residents. The No Action Alternative would not add the approximately 1.15 acres of passive open space and streetscape improvements that would be created as part of the proposed actions.

*Shadows*

The shadows that would fall on new public spaces and existing open spaces under the proposed actions, while not considered to be a significant adverse impact, would not occur with this alternative. Similar to the proposed actions, there would be no potential for shadow impacts under the No Action Alternative.

*Historic Resources*

*Architectural Resources*. Unlike with the proposed actions, under the No Action Alternative, the Joseph J. Jacobs Building of Polytechnic University (site C), located at 305-315 Jay Street, the Board of Education Building at 131 Livingston Street (site M), 233 Duffield Street (site P), and 423 Fulton Street (site L), all of which LPC deems eligible designation as New York City Landmarks and/or listing on the State and National Registers of Historic Places (S\NR), would

not be demolished and thus no significant adverse impacts would occur on these four potential architectural resources.

The cast-iron buildings at 565-571 Fulton Street (site R) have also been identified as potential architectural resources, the demolition of which would be considered to be a significant adverse impact. However, this site was previously approved for acquisition and redevelopment in 1970 as part of the Brooklyn Center Urban Renewal Plan (BCURP), and thus the demolition of these buildings would be considered a significant adverse impact under both the proposed actions and the No Action Alternative.

*Archeological Resources*. LPC has determined that there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that are considered to be potentially sensitive for 19th century archaeological resources. Under the No Action Alternative, no development would take place on these lots, and thus no subsurface disturbance would occur on these sites. Therefore, there would be no impacts to any potential archaeological resources that might be present on the projected or potential development sites.

*Urban Design and Visual Resources*

Under the No Action Alternative, the urban design and existing view corridors and views to visual resources in the project area will not substantially change. The No Action Alternative would not provide for new public spaces, sidewalk widenings, or ground-floor retail use and glazing requirements for new construction, all of which would enliven the street-level environment in the project area and would be expected in the proposed actions scenario. This alternative would not meet the proposed actions' goals to transform the appearance of the project area through streetscape enhancements, new public plazas and the creation of new developments that would enhance the vitality of the area and foster connections between neighborhoods. Like the proposed actions, the No Action Alternative would not result in significant adverse impacts on urban design and visual resources.

*Neighborhood Character*

Under the No Action Alternative, the uses currently on the projected development sites would remain, with the exception of site G, which would be redeveloped for residential use independent of the proposed actions Overall, the more cohesive Downtown Brooklyn neighborhood expected to result from the proposed actions would not occur with the No Action Alternative; however, neither the proposed actions nor the No Action Alternative is expected to result in significant adverse impacts on neighborhood character.

*Hazardous Materials*

Generally, developments that may occur within the project area under the No Action Alternative could result in the exposure of construction workers and nearby residents to hazardous materials, if development were to occur on any lot in the project area that has the potential for hazardous material contamination. However, all construction and required removal or handling of hazardous materials would be conducted in accordance with applicable City, State and Federal requirements, thereby minimizing the potential for exposure. Under the No Action Alternative, regular maintenance of existing buildings on the project sites would minimize potential adverse effects associated with the presence of hazardous materials. The presence of these materials would not present a significant exposure risk if the buildings are properly maintained. Therefore, with the use of appropriate measures to minimize the potential for exposure to hazardous materials, this alternative is not expected to result in significant adverse impacts.

*Infrastructure and Energy*

As with the proposed actions, no significant adverse infrastructure and energy impacts would occur under the No Action Alternative.

*Traffic and Parking*

In the No Action Alternative, traffic and parking levels in the study area would increase as a result of general background growth and future developments in the area. A smaller surplus of off-street public parking spaces would exist in the AM peak period as compared to existing conditions; during the midday peak period, a shortage would occur. On-street parking demand would continue to exceed supply throughout much of the day in this alternative. No significant adverse impacts to on- or off-street parking conditions would result from the proposed actions.

*Transit and Pedestrians*

Under the No Action Alternative, transit and pedestrian facilities in the project area would experience an increase in demand as a result of background growth and future developments anticipated throughout the project area. However, levels of service (LOS) at stairways and fare arrays at subway stations, local bus routes, sidewalks, corner areas, and crosswalks would remain largely the same compared with existing conditions.

*Air Quality*

No violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur either under the No Action Alternative or with the proposed actions, and both scenarios would be consistent with the New York State Implementation Plan (SIP).

*Noise*

Noise levels under the No Action Alternative would not be expected to be significantly higher than existing levels, and no significant adverse noise impacts would occur at the 16 noise receptor locations in the project area. Unlike the proposed actions, the No Action Alternative would not result in an unmitigated significant adverse impact at the Site 2 receptor located at Duffield Street between Willoughby and Fulton Streets.

*Construction Impacts*

The No Action Alternative would not generate the temporary construction impacts attributable to the proposed actions. The No Action Alternative would avoid the increase in truck traffic and construction-related noise projected to occur with the proposed actions, but would not provide the economic benefits associated with the construction of the projected development sites.

*Conclusion*

Overall, the No Action Alternative would not result in any of the significant adverse impacts associated with the development of the projected sites under the proposed actions, with the exception of the significant impact from the potential demolition of the three cast iron buildings at 565-571 Fulton Street. However, the No Action Alternative would fall far short of the objectives of the proposed actions in facilitating opportunities for new commercial developments with the size and large floorplates required of modern corporate tenants; attracting new businesses and retain businesses considering relocation outside of the City; encouraging new residential, cultural and retail opportunities to meet the needs of workers, residents and visitors; fostering connections between the commercial and retail cores of MetroTech and Fulton Mall,

and the Boerum Hill and Fort Greene residential neighborhoods; and enhancing the public environment, ground-floor uses, and streetscapes to make the project area an appealing place to live, work, and visit.

*NO UNMITIGATED IMPACTS ALTERNATIVE*

This No Unmitigated Impacts Alternative assesses a change in density or program design in order to avoid the potential unmitigated impacts associated with the projected development sites. The development of the projected development sites under the proposed actions would result in significant unmitigated adverse impacts to one or more movements at 11 intersections during one or more peak periods. To avoid the potential unmitigated impacts, this alternative would require that the overall program size for the projected development sites be reduced by approximately 95 percent. Unlike the approximately 6.7 million-square-foot development potential assumed on the projected development sites under the proposed actions, this alternative would limit development on the projected sites to approximately 335,000 square feet. This would represent less than 10 percent of the floor area currently allowed "as-of-right" under the existing allowable zoning and land use regulations.

Additionally, the No Unmitigated Impacts Alternative program would need to avoid the potential unmitigated impacts on historic resources and noise quality. With a 95 percent reduction in the size of the project program, most of the projected development sites would not be developed. Therefore, it is assumed that under this alternative, projected development site AA would not be developed and the potential archaeological resources on a portion of that site (i.e. Block 165, Lot 58) would not be disturbed. However, an unmitigated impact could remain for the other lots which have the potential to contain archaeological resources and are not now and would not become City-owned (Block 164, Lots 1 and 29), as these lots are located on a potential development site and this alternative does not consider a reduction in the scale of development assumed to occur post-2013. The reduction in the size of the project program would avoid the unmitigated noise impact at the Site 2 receptor (Duffield Street between Willoughby and Fulton Streets), as no large-scale commercial development would occur on adjacent projected development sites O and P, and no public space or public parking facility would be created that could result in elevated traffic volumes on this street.

The No Unmitigated Impacts Alternative, by significantly reducing the number of sites to be developed, would fail to meet the objectives of the Downtown Brooklyn Development project.

*MODIFIED BCURP ALTERNATIVE*

The Modified BCURP Alternative considers that the amendments to the BCURP omit the proposed extension of the Urban Renewal area boundary by 9 blocks and the designation of 57 lots within the five proposed development sites: sites I(A), L, M, O, and P. This alternative would preclude the ability to form viable development sites on these blocks that are sufficiently large to accommodate the large floorplates and square footages required of modern corporate offices. In addition, without the ability to form viable development sites, none of the proposed mapping actions would be required; the project area's block pattern would remain as it is in current conditions, hindering the accessibility of existing and new development. None of the proposed actions' public spaces would be created under this alternative since these spaces would occupy parcels that would not be newly designated.

Projected development sites not affected by the omissions from the BCURP and other sites previously designated under the BCURP could still be developed; however, unlike the

approximately 6.7 million-square-foot development potential assumed on the projected development sites under the proposed actions, this alternative would reduce the overall development potential by 43 percent, to approximately 3.8 million square feet. The viability of the projected commercial development on site Q would be considerably lessened in the absence of the projected commercial developments on sites O and P and the new Willoughby Square public space; if this site could not be developed, the development potential under this alternative would be reduced to 2.2 million square feet, a decrease of 67 percent from the development potential with the proposed actions. In addition, the development under this alternative would primarily increase the institutional and residential presence in Downtown Brooklyn, rather than extend and reinforce the downtown commercial office core.

With respect to this alternative's effects on potential architectural resources, it would be unlikely that sites L, M, or P would be redeveloped under a single development program. However, it is possible that under this alternative the City could dispose of the Board of Education Building at 131 Livingston Street for redevelopment. Similar to the proposed actions, any plans that include the demolition of 131 Livingston Street, 233 Duffield Street, or 423 Fulton Street would constitute a significant adverse impact on this potential architectural resource. The cast-iron buildings at 565-571 Fulton Street, which are located on a site that was previously designated and approved for acquisition and redevelopment in 1970 as part of the BCURP, could still be removed under this alternative.

Without new developments on sites Q and I(A) bridging the area around Flatbush and Myrtle Avenues, the proposed streetscape improvements on these streets would be less beneficial than with the proposed actions. In addition, there would be fewer changes to the density of the project area or to its view corridors with this alternative. It is possible that new development on a site-by-site basis could occur on sites I(A) or M, as a continuation of existing redevelopment trends in the area; however, such new development is not expected to be of a size to warrant the demapping of Red Hook Lane or Prince Street.

Under this alternative, traffic and parking demands in the study area would be less than under the proposed actions, particularly along Willoughby Street and adjacent streets, since there would be considerably less commercial office and retail development (1.3 to 2.9 million square feet, versus 5.5 million square feet with the proposed actions). However, there would still be significant traffic impacts with this alternative, as the traffic demand would be above the level sufficient to eliminate unavoidable significant traffic impacts. On-street parking demand would continue to exceed supply throughout much of the day. Similarly, although transit and pedestrian facilities in the project area would experience less demand than with the proposed actions, it is expected that significant adverse impacts on pedestrian conditions and subway stair levels of service would still occur. Without the development of the commercial office towers and public parking facility on projected development sites O and P, the predicted unmitigated significant noise impacts resulting from the proposed actions would not occur.

Overall, the Modified BCURP Alternative would create less new development and would not allow for the creation of new public spaces. By significantly reducing the ability to provide viable development sites in the Downtown Brooklyn area, this alternative would fail to meet the objectives of the Downtown Brooklyn Development project.

*BQE RAMP ALTERNATIVE*

Under the BQE Ramp Alternative, a new exit ramp from the westbound Brooklyn-Queens Expressway (BQE) to the BQE service road between North Elliott Place and Navy

Street/Ashland Place would be constructed. The existing substandard loop-ramp to Navy Street would be eliminated. The program for the projected development sites under this BQE Ramp Alternative would be identical to the development program under the proposed actions and would require the same discretionary actions.

With this improvement measure, first recommended in NYCDOT's *1987 Downtown Brooklyn Master Planning Improvements Study,* vehicles en route from the westbound BQE to destinations in the Downtown Brooklyn core such as MetroTech, Atlantic Center and the projected commercial developments along Willoughby Street, would have the option of utilizing the new ramp to reach southbound Ashland Place. From Ashland Place, this traffic would then enter the Downtown Brooklyn core via westbound Myrtle Avenue, Willoughby Street and DeKalb Avenue. By allowing Ashland Place to function as a southbound distributor roadway for traffic from the westbound BQE, this alternative would reduce southbound demand along the congested Flatbush Avenue corridor. Approximately 407 vehicles per hour would be diverted to southbound Ashland Place from Flatbush Avenue Extension in the AM peak period, 226 in the midday and 347 in the PM peak period. As the Brooklyn-Queens Expressway is under the jurisdiction of the New York State Department of Transportation (NYSDOT), planning and implementation of a new off-ramp would require close consultation with NYSDOT.

In addition to a proposed new BQE off-ramp, the street network modifications recommended as part of the project's traffic mitigation plan would also be implemented under this alternative. As traffic flows within the study area would be altered by the proposed new off-ramp, especially along the Flatbush Avenue and Ashland Place corridors, some site specific mitigation measures (e.g., modifications to signalization, lane configurations and parking regulations) under this alternative would be different than those proposed as part of the project's traffic mitigation plan. These intersections include seven along the Flatbush Avenue corridor (Tillary, Willoughby, Fulton, and Livingston Streets; Myrtle and DeKalb Avenues; and Schermerhorn Street/Lafayette Avenue) along with the intersection of Myrtle Avenue with Ashland Place. At all other impacted intersections, the improvement measures recommended under the BQE Ramp Alternative would be the same as for the proposed actions. Traffic conditions at these locations with these measures would also be the same as for the proposed actions.

Overall, a total of nine intersections would have unmitigated significant adverse impacts in one or more peak hours under this alternative, compared to eleven intersections with the proposed actions. There would be eight movements with unmitigated impacts in the AM peak hour, three in the midday and six in the PM with this alternative. This compares to 12 movements with unmitigated impacts in the AM peak hour, five in the midday and 15 in the PM with the proposed project's traffic mitigation plan.

The conclusions in other technical areas under this alternative would not differ from those disclosed under the proposed actions.

## UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS

Unavoidable significant adverse impacts are defined as those that meet the following two criteria: 1) no reasonably practicable mitigation measures to eliminate the impacts; and 2) no reasonable alternatives to the proposed project that would meet the purpose and need of the action, eliminate the impact, and not cause other or similar significant adverse impacts.

For the Downtown Brooklyn Development analysis, unavoidable significant adverse impacts were identified for archaeological resources, traffic, transit, and noise.

*ARCHAEOLOGICAL RESOURCES*

The New York City Landmarks Preservation Commission (LPC) has determined that there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that are considered to be potentially sensitive for 19th century archaeological resources. Individual Stage 1A Archaeological Assessments will be prepared, and archaeological field testing will be undertaken if needed, as directed by LPC, for those lots that are currently City-owned or would be acquired by the City, before development of these sites would commence. Under the revised Brooklyn Center Urban Renewal Plan, each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not result in any significant adverse impacts on archaeological resources on these City-owned or would be acquired lots.

However, for lots which are not now and would not become City-owned (Block 165, Lot 58 and Block 164, Lots 1 and 29), a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, archaeological field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources on these lots pursuant to their development would be considered a potential unmitigated, significant adverse impact.

*TRAFFIC*

The development of the projected sites under the proposed actions would result in significant adverse traffic impacts at 29 signalized intersections in one or more peak periods. Eighteen out of the 29 intersections impacted by the development of the projected sites would no longer be impacted with the implementation of proposed traffic mitigation plan. However, as shown in Table S-13, one or more movements at eleven intersections would remain impacted in one or more peak periods. No feasible mitigation measures have been identified; additional mitigation measures will be considered in coordination with NYCDOT to reduce or eliminate the impacts at these intersections.

**Table S-13**
**Intersections With Unmitigable Impacts**

| Intersections | Number of Unmitigated Impacts | | |
|---|---|---|---|
| | AM | Midday | PM |
| Adams Street @ Tillary Street | 4 | 2 | 2 |
| Atlantic Avenue @ Bond Street | 0 | 1 | 0 |
| Atlantic Avenue @ Flatbush Avenue | 0 | 0 | 1 |
| Atlantic Avenue @ Fourth Avenue | 1 | 0 | 0 |
| Atlantic Avenue @ Smith Street | 1 | 0 | 0 |
| Flatbush Avenue @ Fulton Street | 0 | 0 | 2 |
| Flatbush Avenue @ Hanson Place/Fourth Avenue | 0 | 0 | 2 |
| Flatbush Avenue @ Livingston Street | 1 | 0 | 0 |
| Flatbush Avenue @ Myrtle Avenue | 4 | 0 | 2 |
| Flatbush Avenue @ Schermerhorn Street/Lafayette Avenue | 0 | 0 | 3 |
| Flatbush Avenue @ Tillary Street | 1 | 2 | 3 |

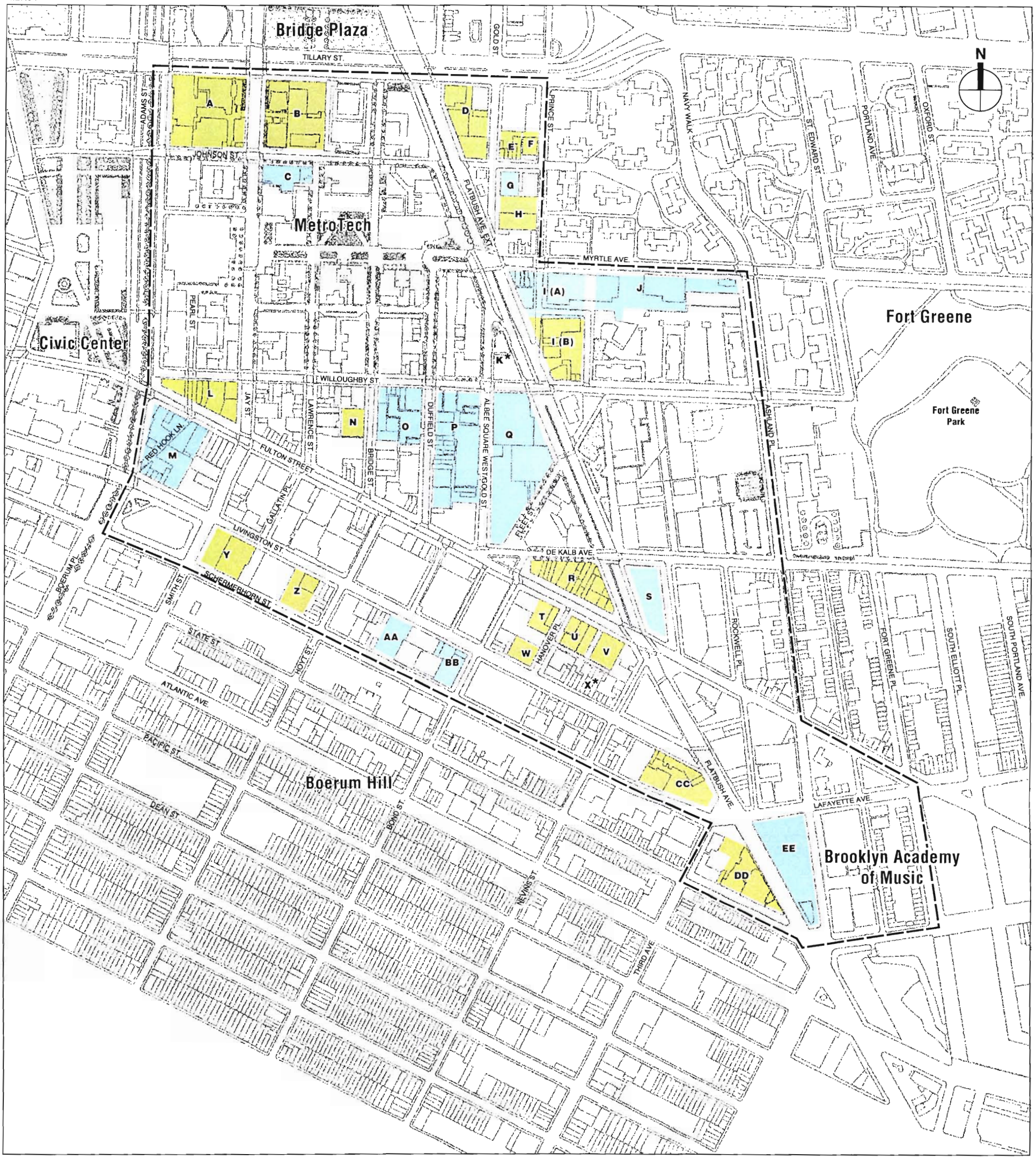
*TRANSIT*

Mitigation measures to address subway station stairway impacts typically involve physically widening an affected stairway in order to increase its capacity, or implementing measures that would decrease demand, typically by providing new and/or more convenient access points. At Stair S3, at the northwest corner of Jay and Fulton Streets, a one-foot widening would restore this stair to the No Build condition in the PM peak period. However, while such mitigation is feasible, it would not be practical to undertake for this moderate level of impact. (Stair S3 would operate at a functional LOS D in the PM peak period). In addition, urban renewal changes proposed as part of this project would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets. This public space—Jay Street Plaza—would potentially include a new subway entrance/exit to the Jay Street-Borough Hall station. A new subway entrance/exit located within this plaza would fully address the PM peak period impact to Stair S3. Therefore, pending the implementation of a new transit plaza, the proposed actions' impact to Stair S3 would remain unmitigated.

*NOISE*

At the Site 2 noise receptor, located at Duffield Street between Willoughby and Fulton Streets, future noise levels with the proposed actions would increase by up to 3.4 dBA compared to future noise levels without the proposed actions during the AM peak period. Increases of this magnitude would be perceptible and, based upon CEQR noise impact criteria, would constitute a significant noise impact. This impact would occur because of the relatively low volumes at this location without the proposed actions, and the number of vehicles (particularly trucks) generated by the development expected on this street and in the surrounding area. While no residences would be impacted with the proposed actions, the increase in noise levels at Site 2, during the AM peak period would exceed the CEQR impact criteria and thus, the project would have a significant noise impacts at this location. There is no feasible mitigation to eliminate this impact at this site during this time period, and thus it would constitute an unmitigated project impact. ✷

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— — — Project Area Boundary

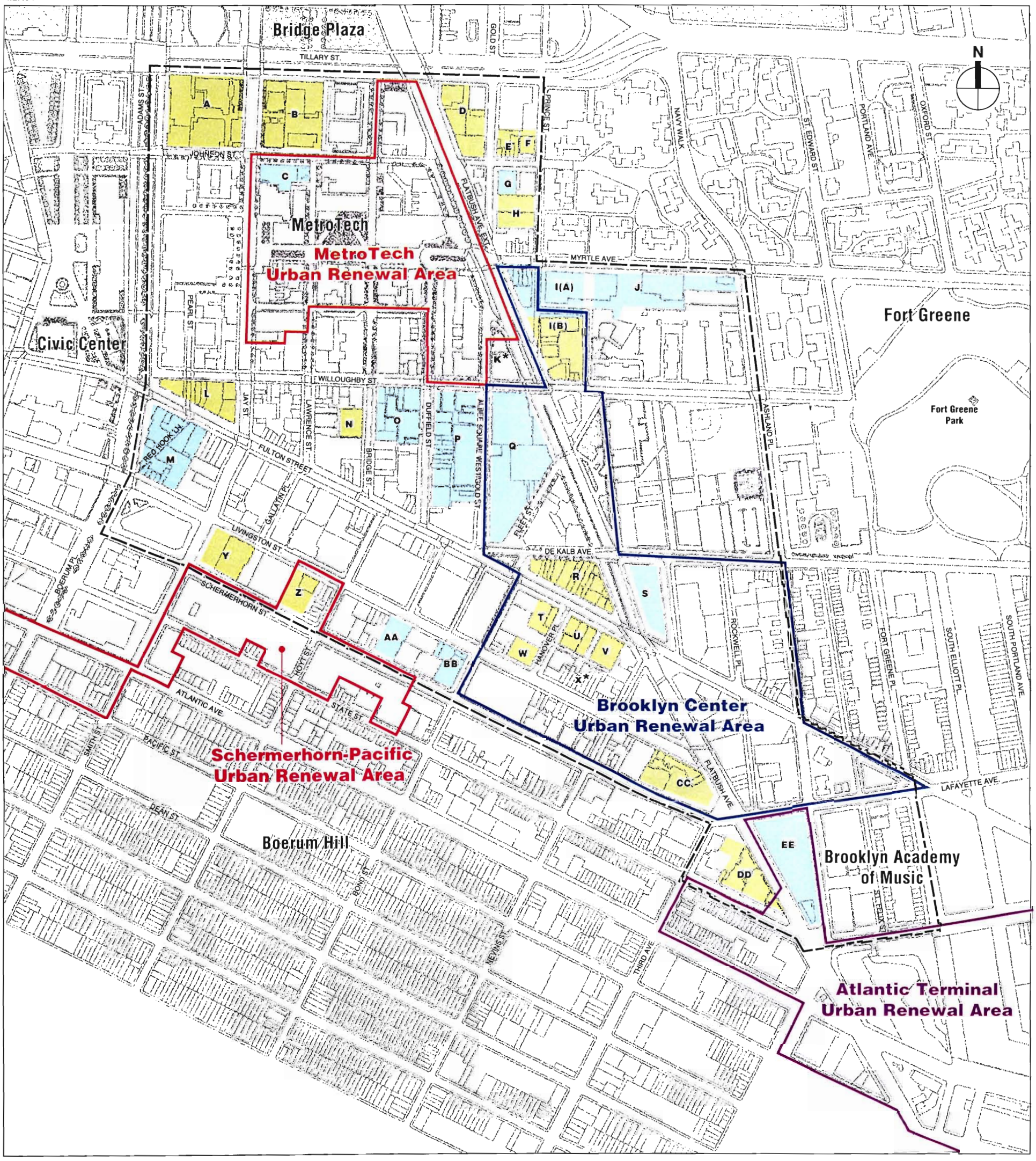
Projected Development Site

Potential Development Site

* Since the issuance of the DEIS/DSEIS, Sites K and X have been removed from the proposed development plan



**Project Area**
Figure S-1




- Project Area Boundary
- Projected Development Site
- Potential Development Site
- Atlantic Terminal Urban Renewal Area Boundary
- Brooklyn Center Urban Renewal Plan Boundary
- MetroTech Urban Renewal Area Boundary
- Schermerhorn-Pacific Urban Renewal Area Boundary

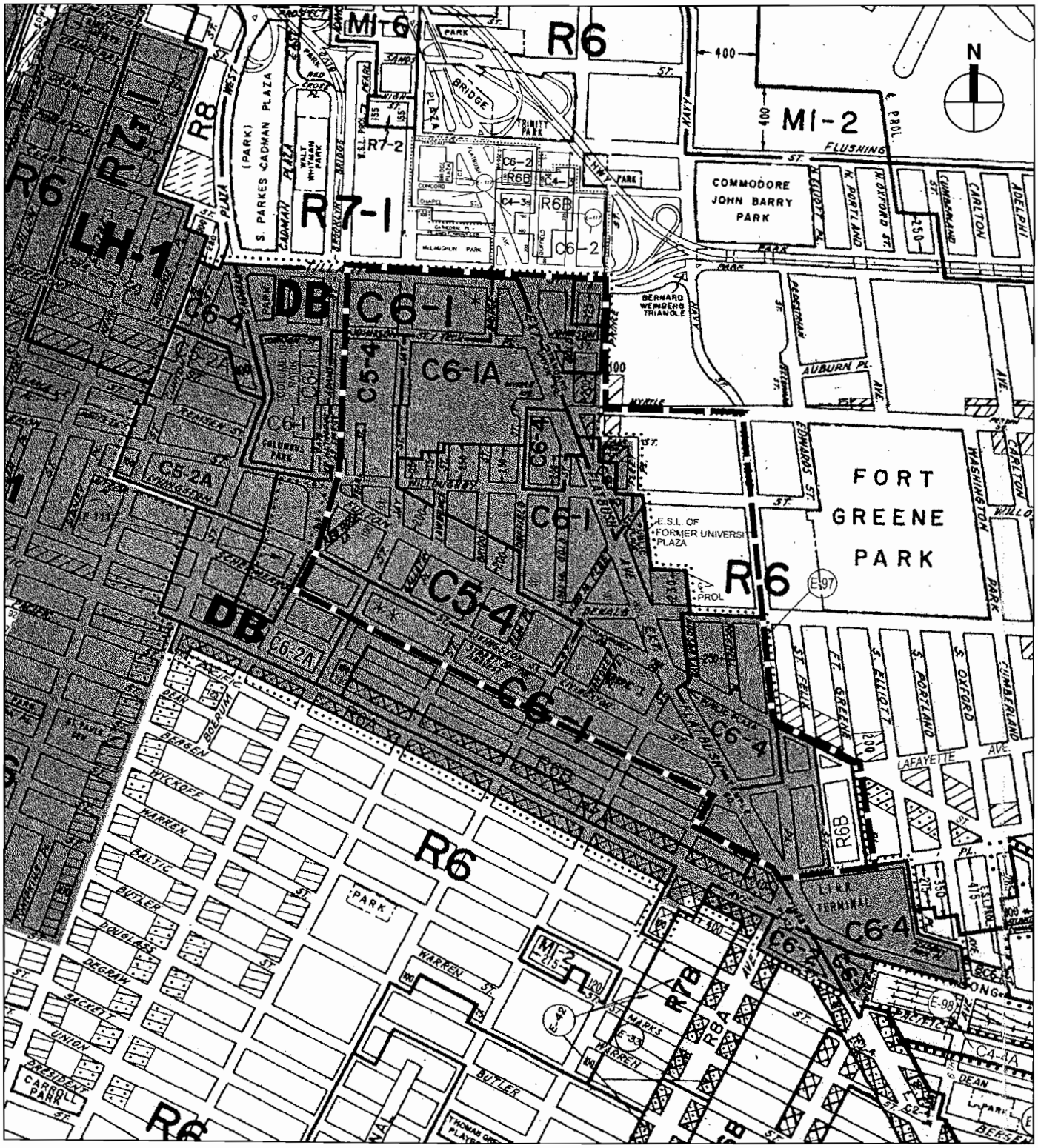
* Since the issuance of the DEIS/DSEIS, Sites K and X have been removed from the proposed development plan

0 500 FEET
SCALE

DOWNTOWN**BROOKLYN**DEVELOPMENT

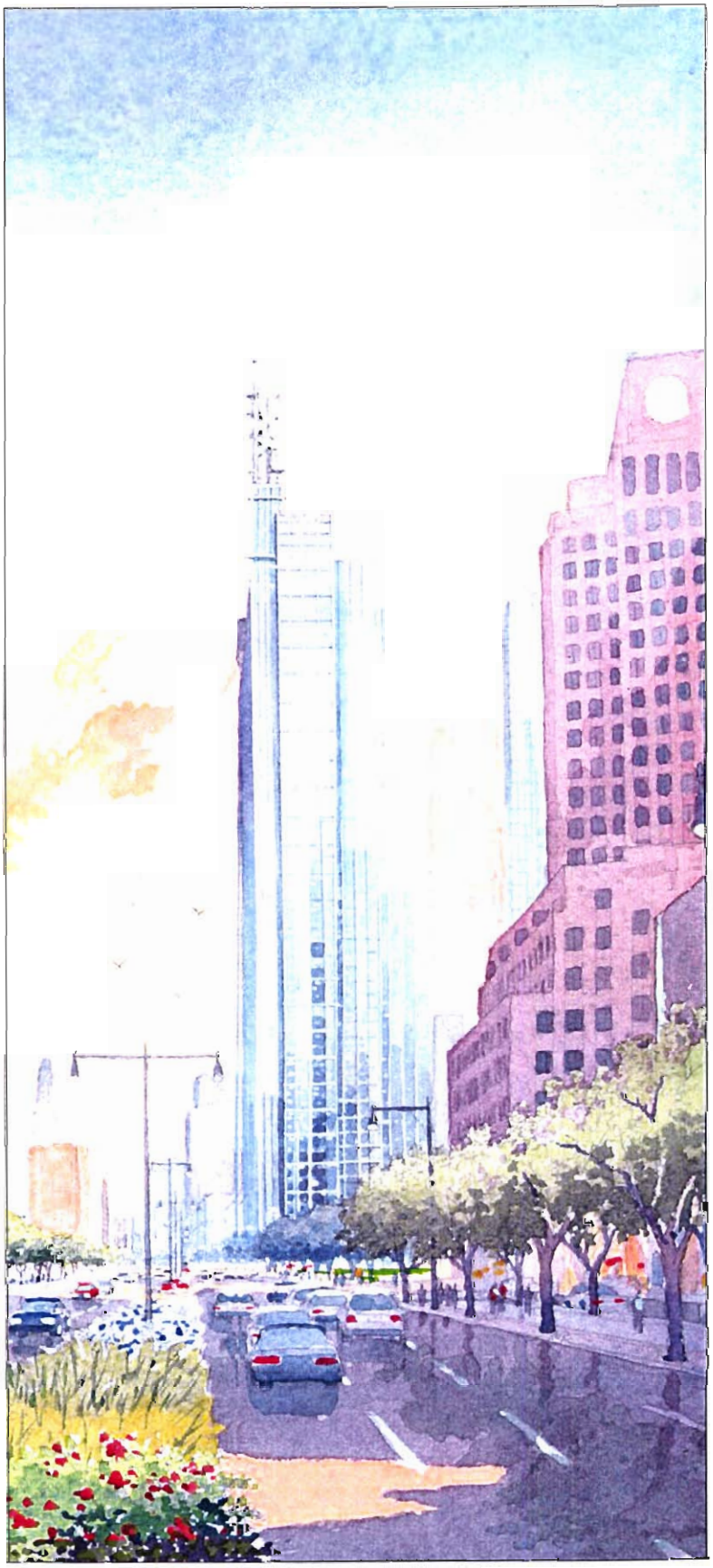
**Existing Urban Renewal Plan Boundaries**
Figure S-2

4.22.04

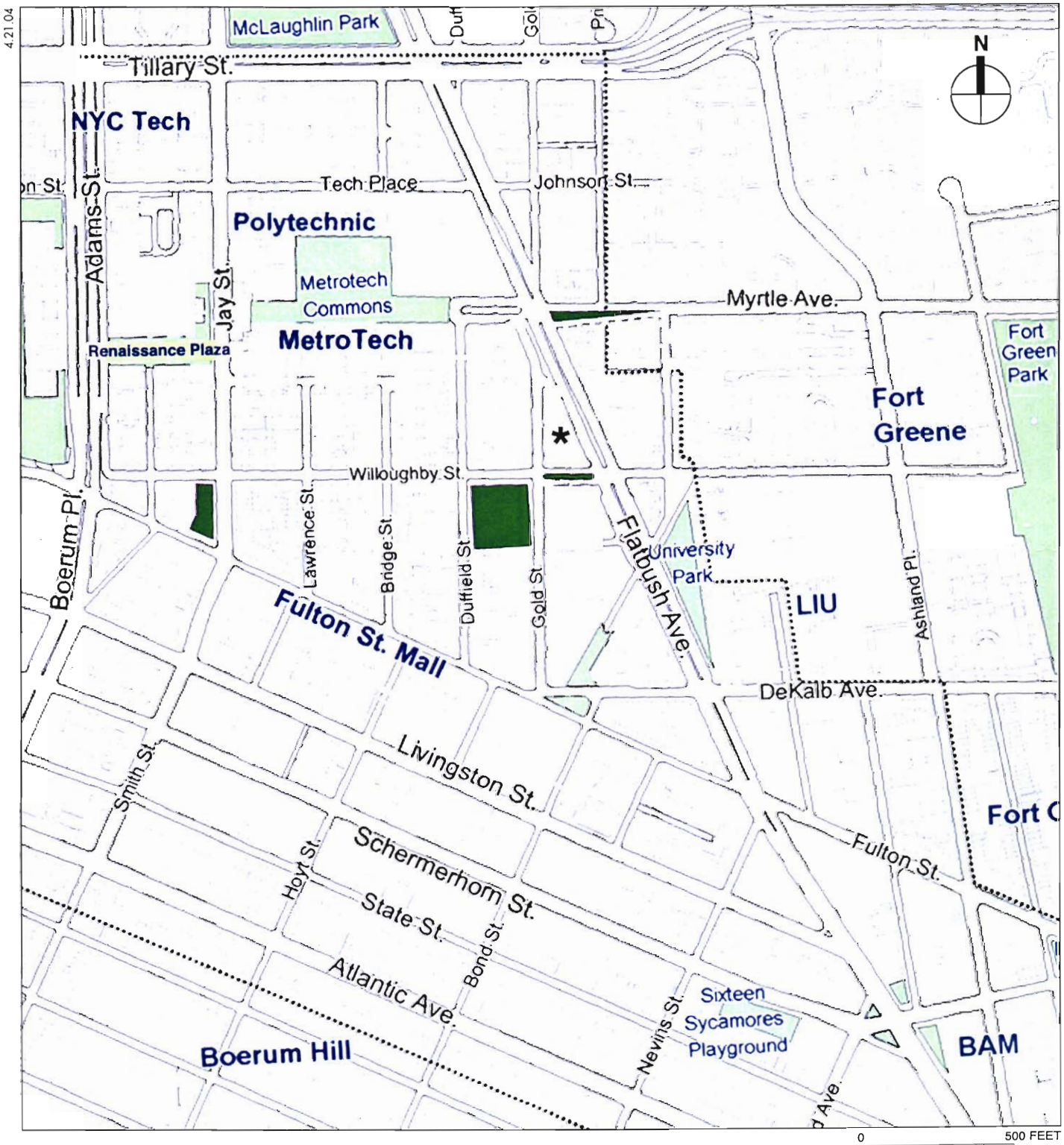



**Current Zoning**
Figure S-3

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**Illustrative Rendering of Flatbush Avenue**
Figure S-4




Existing Public Spaces

Proposed Public Spaces

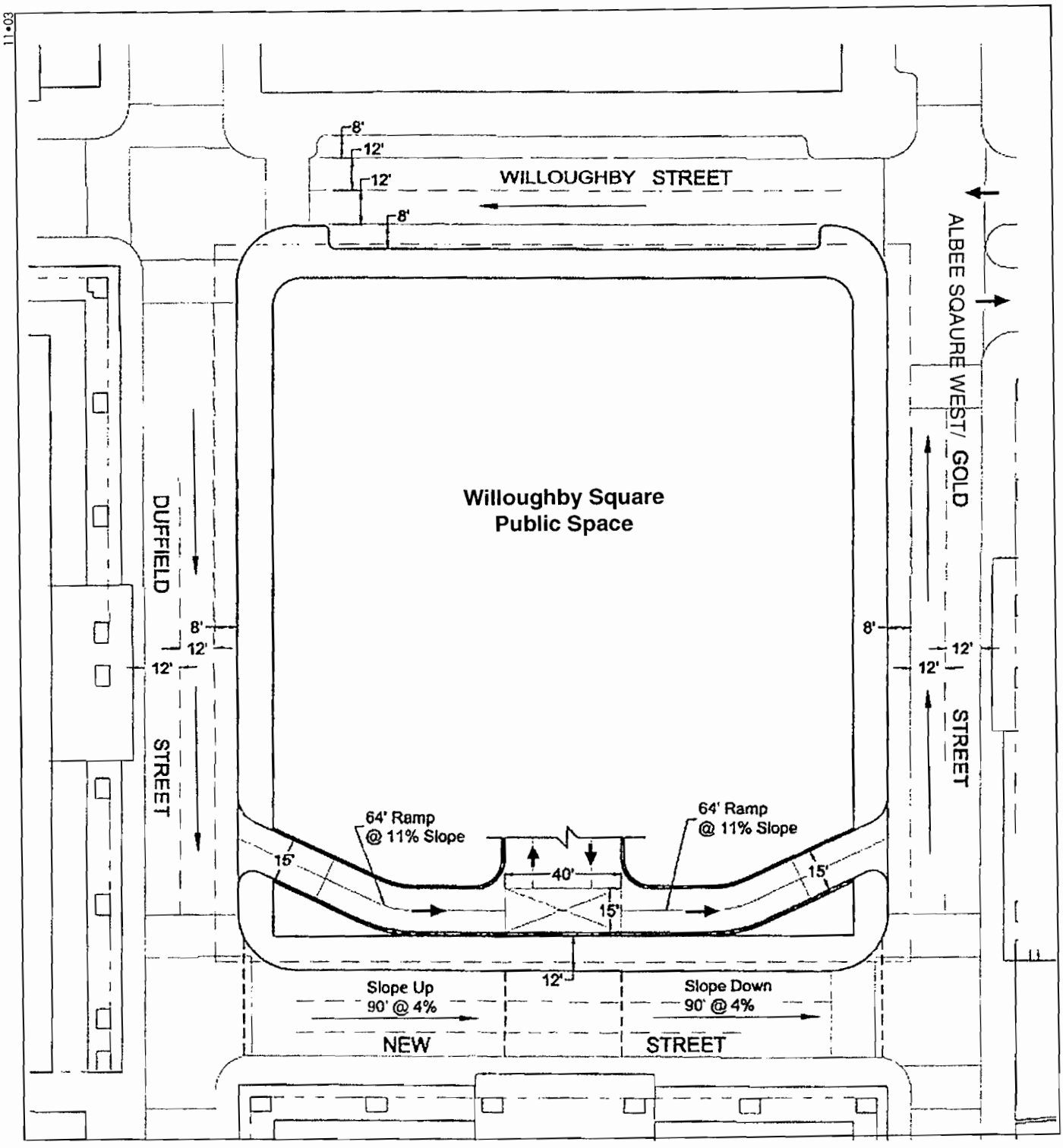
* Since the issuance of the DEIS/DSEIS, the proposed Flatbush Triangle public space has been removed from the proposed development plan

**Proposed Public Spaces**

Figure S-5




**Illustrative Rendering of Willoughby Square**
Figure S-6



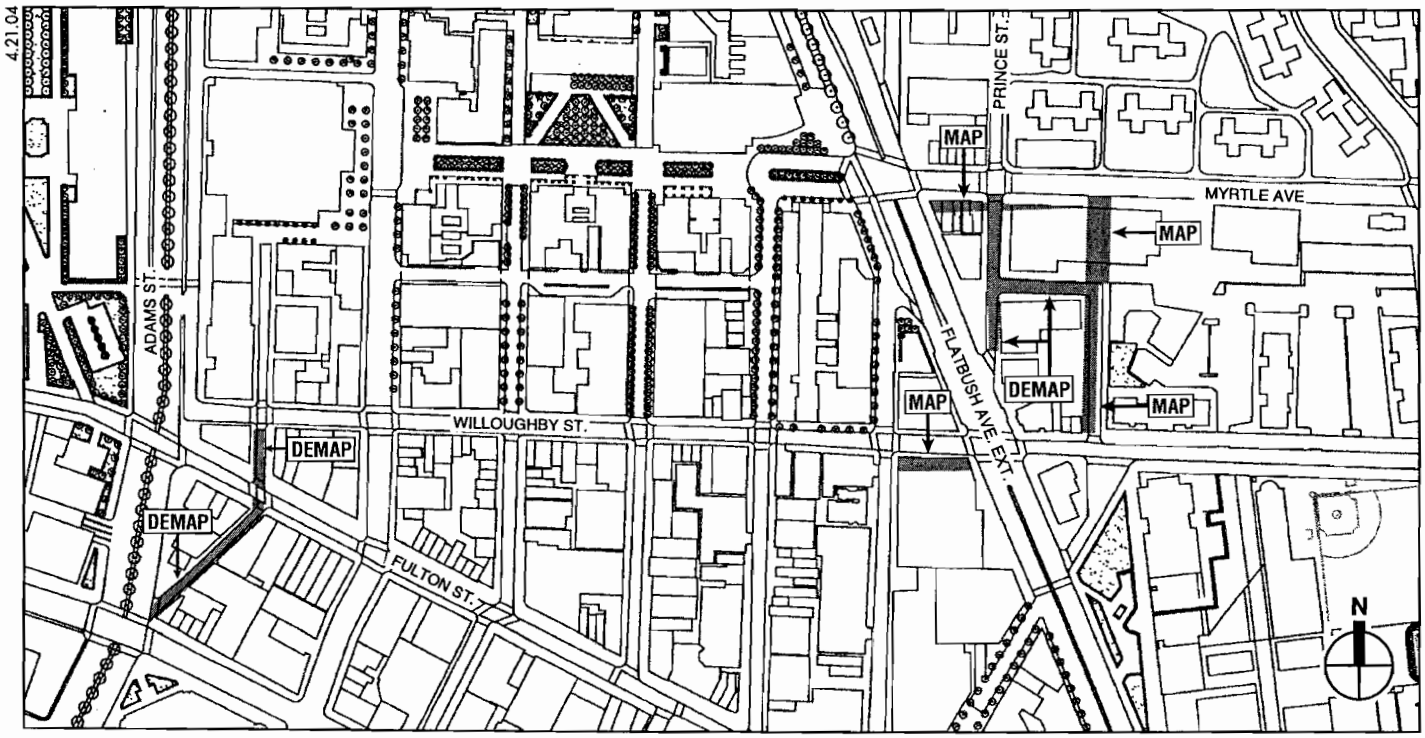

**NOTE:** FOR ILLUSTRATIVE PURPOSES

**Proposed Parking Facility Below Willoughby Square**

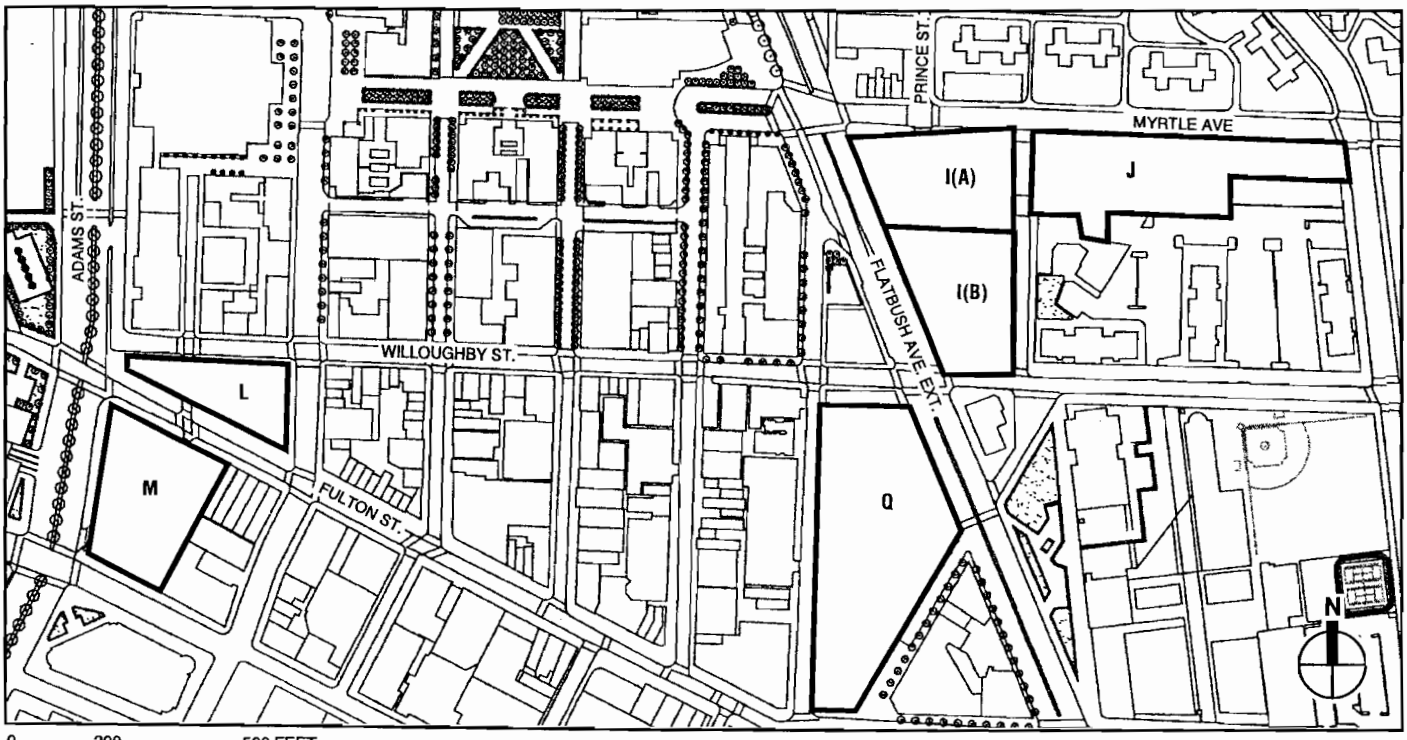
Figure S-7

4.29.04


C6-4
C6-4
C6-4
R7-1(C2-4)
C6-4.5
C6-4
C6-2
C6-4
C6-4
C6-4

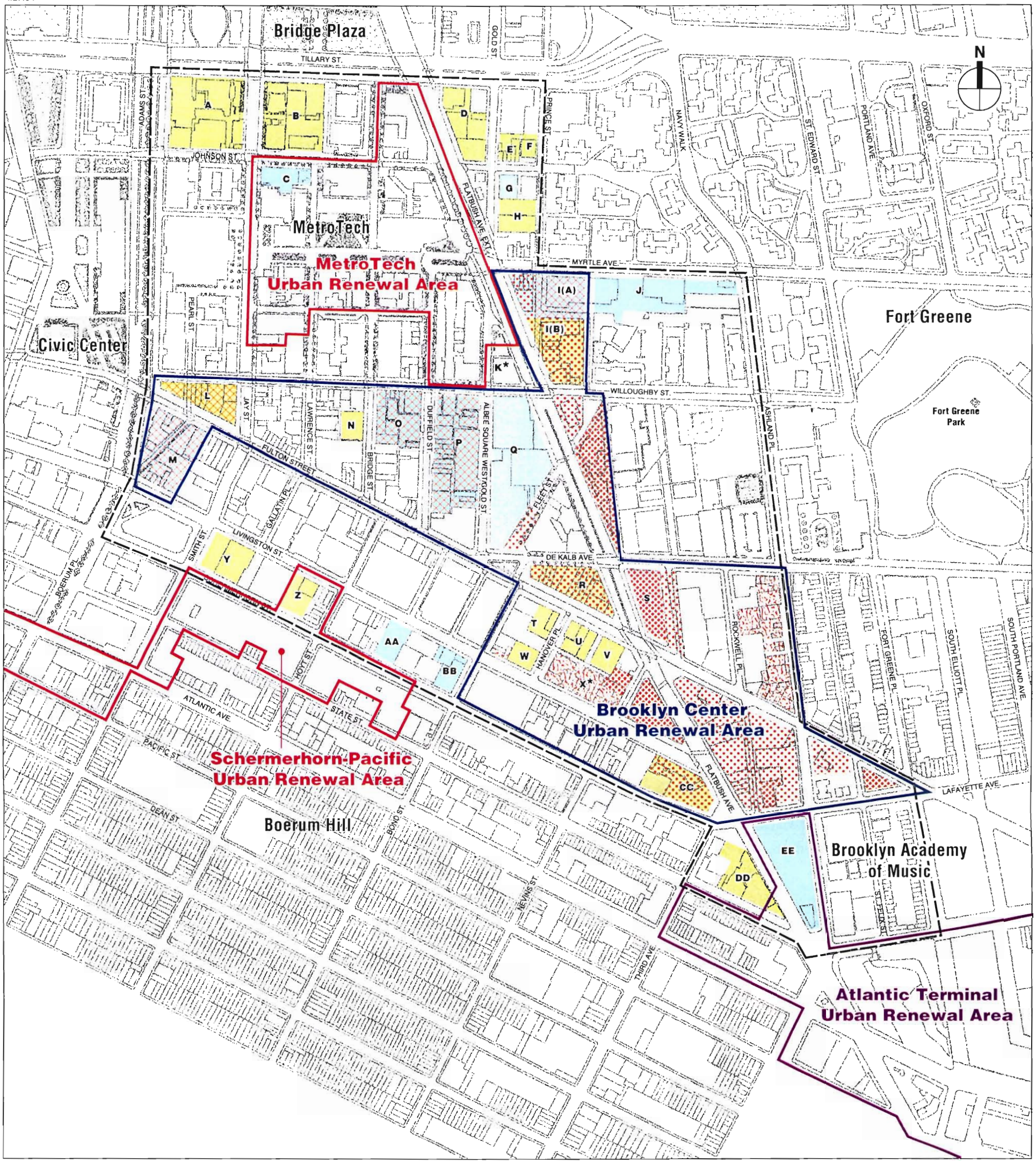



Streets mapping/demapping actions




Project area with mapping/demapping actions in place

## Street Mapping/Demapping Actions– Existing and Proposed Conditions

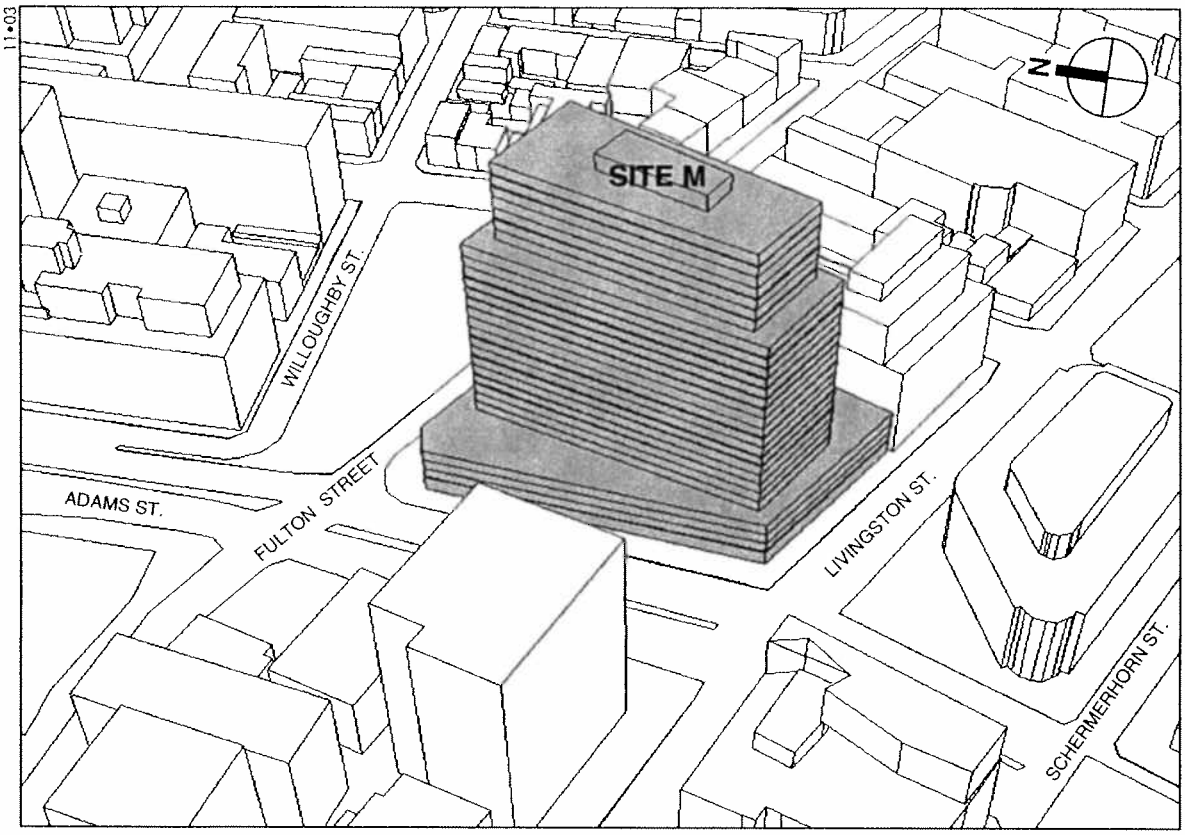


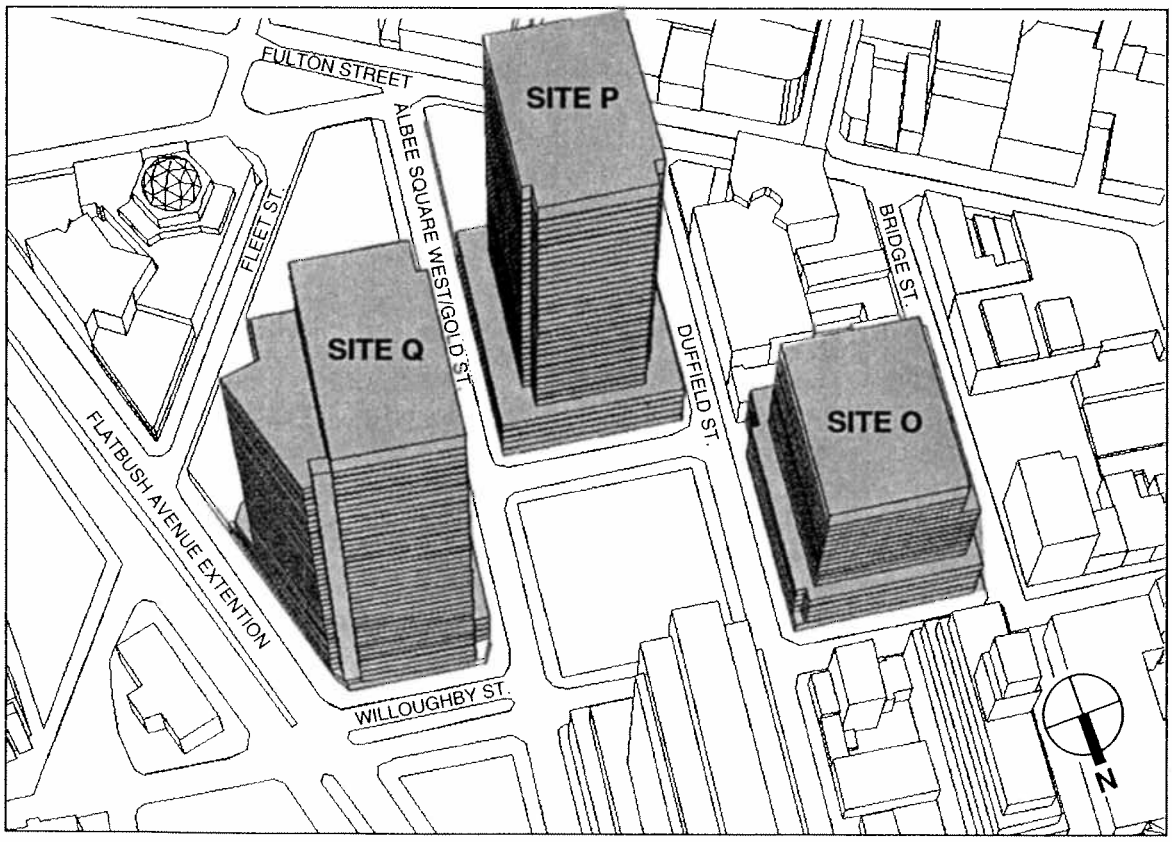

- Project Area Boundary
- Projected Development Site
- Potential Development Site
- Atlantic Terminal Urban Renewal Area Boundary
- Proposed Brooklyn Center Urban Renewal Area Boundary
- MetroTech Urban Renewal Area Boundary
- Schermerhorn-Pacific Urban Renewal Area Boundary
- Blocks/Lots to be Designated
- BCURP Expiration Date Extended
- BCURP Expiration Date Maintained
- Blocks/Lots to be De-designated

* Since the issuance of the DEIS/DSEIS, Sites K and X have been removed from the proposed development plan

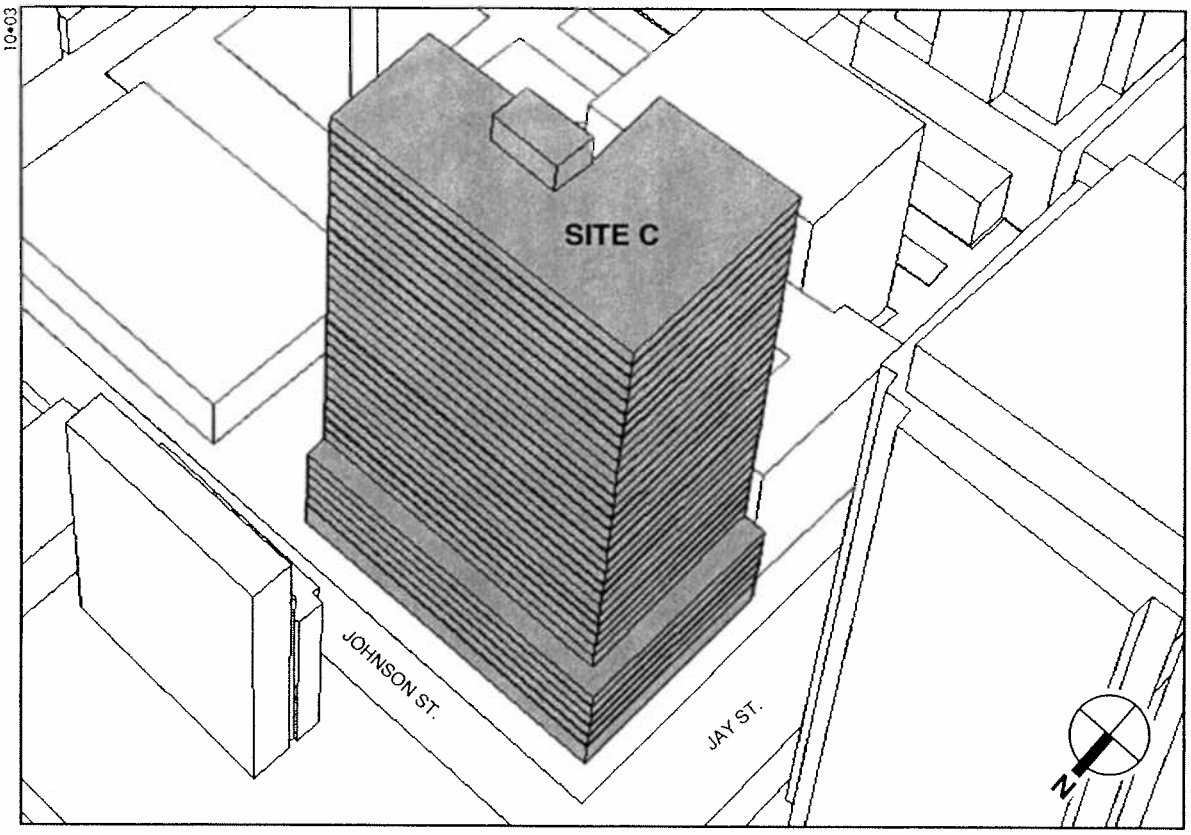


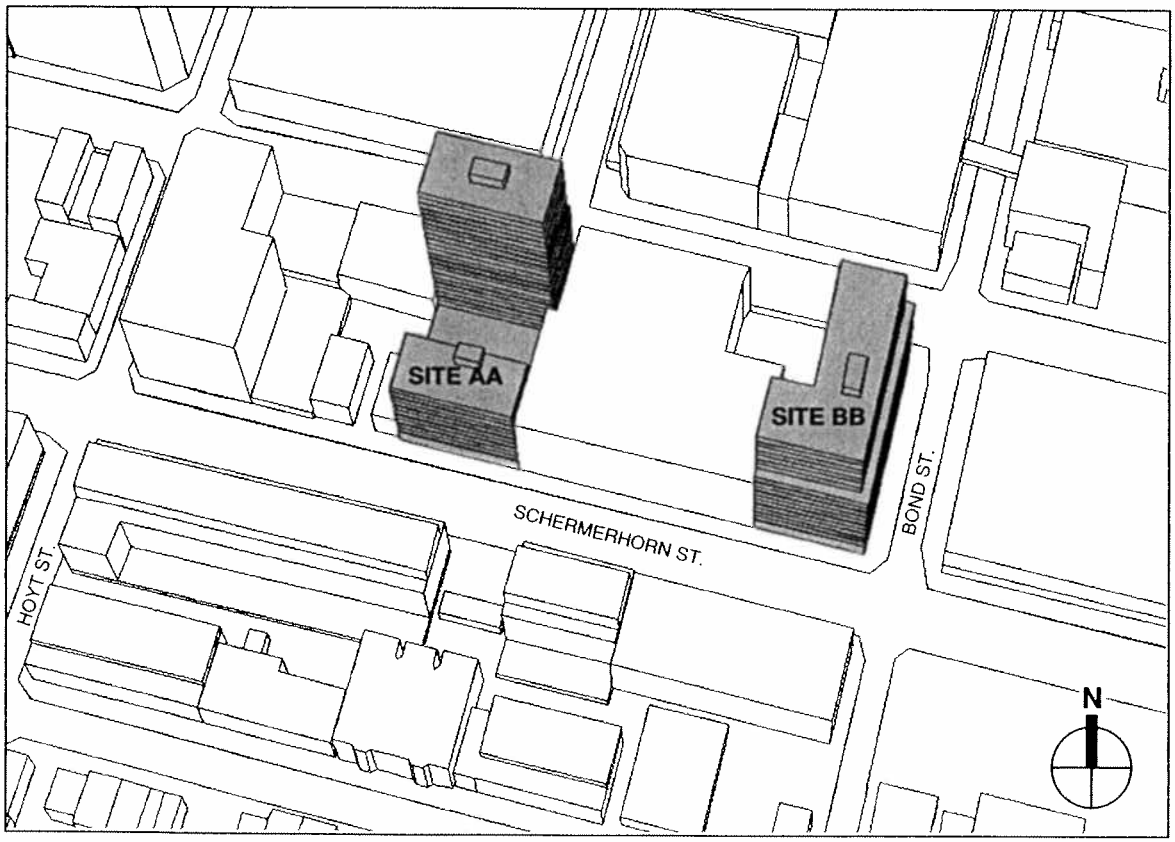
**Proposed Urban Renewal Plan Changes**
Figure S-10



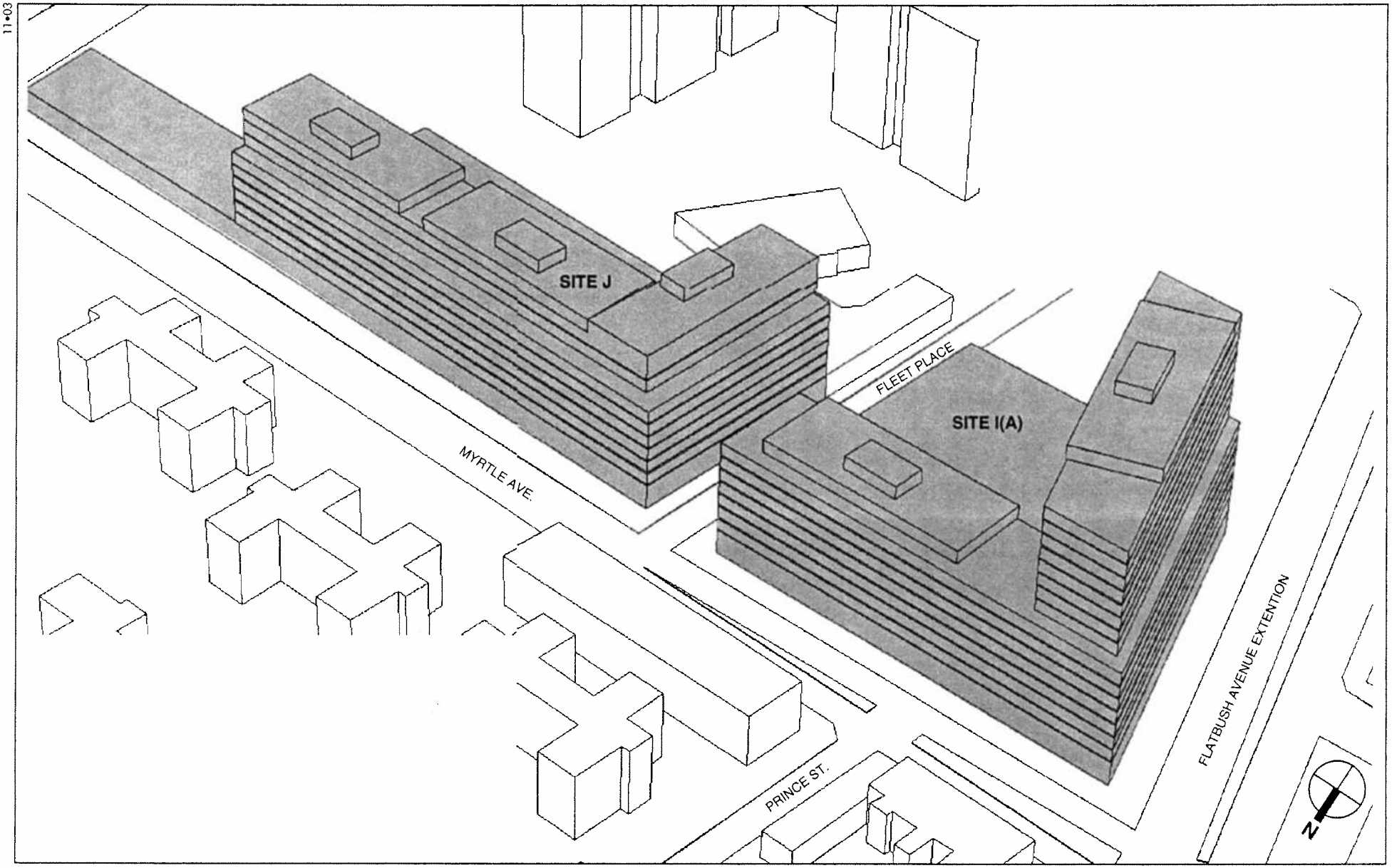




**Illustrative Bulk Configurations-**
**Projected Development Sites with C6-4.5 Rezoning**

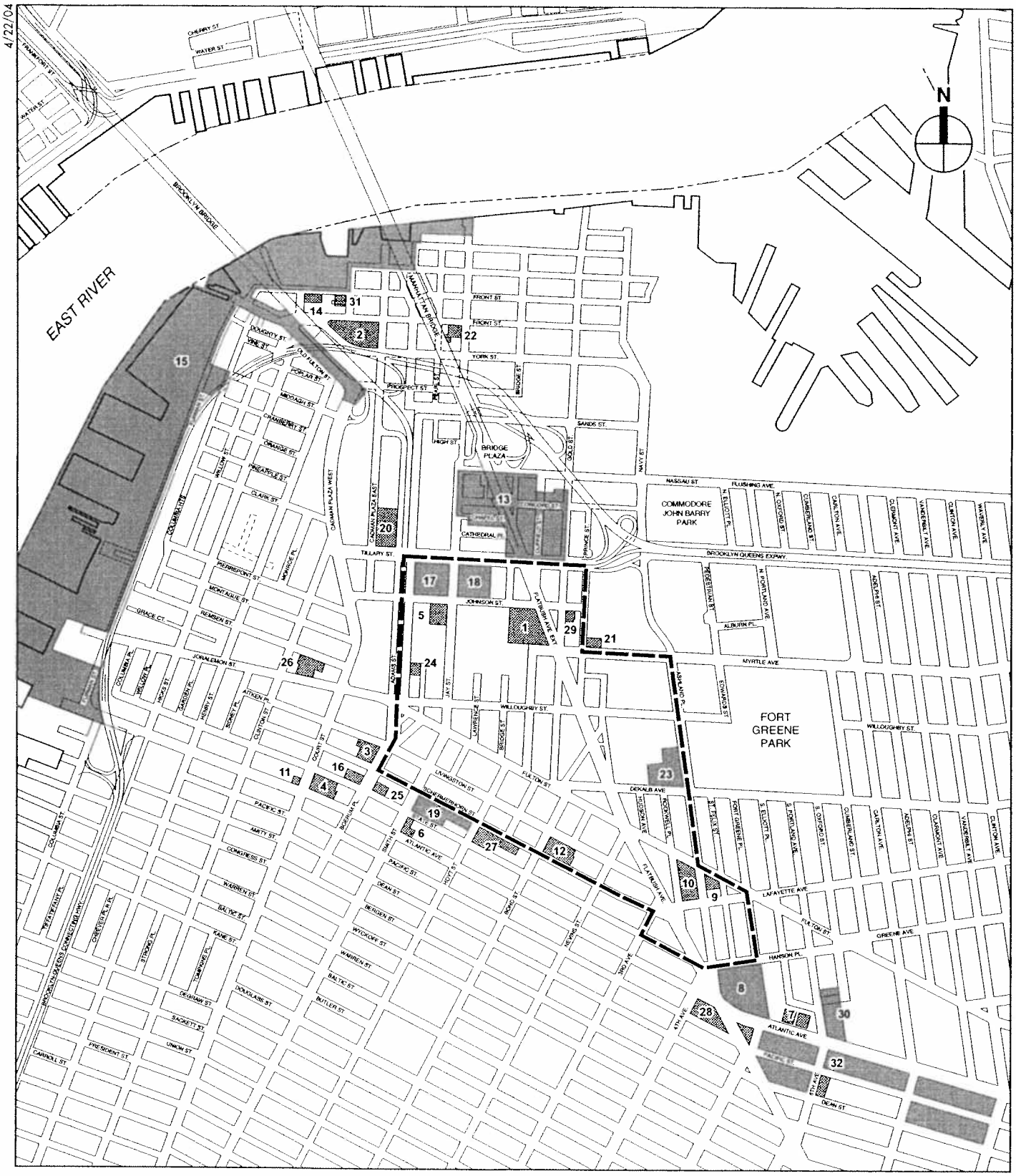



**Illustrative Bulk Configurations-**
**Projected Development Sites with C6-4 Rezoning**




**Illustrative Bulk Configurations-**
**Projected Development Sites with C6-4 and R7-1/C2-4 Zoning**
Figure 1-13




**No Build Project Location**

Figure 1-14

## A. INTRODUCTION

This chapter examines the proposed actions' effects on existing land use and development trends, compatibility with surrounding land use, and consistency with public land use and zoning policies. The following land use, zoning, and public policy analysis discusses existing conditions in the rezoning area and a surrounding ¼-mile study area, as well as future conditions with and without the proposed rezoning and related actions.

As discussed in Chapter 1, "Project Description," the proposed actions would rezone certain blocks in Downtown Brooklyn, modify the Special Downtown Brooklyn District, modify and extend existing Urban Renewal Plans, and map and demap streets in order to create a stronger downtown commercial district. The rezoning would increase allowable commercial, residential, and community facility Floor Area Ratios (FARs) in the downtown core and along its edges.[1] In addition, the proposed mapping and demapping of streets would alter the size of blocks to make them more viable development sites for continued downtown expansion while mappings and demappings of streets would increase the accessibility of the new and existing developments. The proposed zoning and map changes and text amendments would change permissible land uses and building bulk, including height limits, which would support transition areas between the commercial and residential elements of the downtown area.

As described in greater detail below, the analysis concludes that the proposed zoning and related actions would change the scale and density of land use within the project area, while maintaining the current mix of predominantly commercial, residential, and community facility uses. These changes would be expected to have a positive impact on both the immediate area and the City as a whole. No significant adverse impacts on land use, zoning, or public policy would result from the proposed actions.

## B. PROJECT AREA

The area of proposed zoning changes and other actions encompasses Downtown Brooklyn, located just across the East River from lower Manhattan. Downtown Brooklyn is the economic center of what would constitute America's fourth largest city and what is New York City's third largest central business district (CBD) after Midtown and Downtown Manhattan. It occupies a valuable and unique position as a competitive, back-office space alternative to New Jersey, due to its proximity to Wall Street and local and regional mass transit access, among other assets.

For the purposes of assessing existing and future land use, zoning, and public policy, the area has been divided into ten subareas that represent distinct neighborhoods or land use concentrations. These include the MetroTech Center Area (and Jay Street Academic Subarea),

[1] The FAR is the ratio of permitted floor area to building lot area. For example, a building with an FAR of 2.0 has a floor area twice its lot area.

Metro Tech Expansion Area, Fulton Street Mall Area, Schermerhorn-Livingston Streets Area, Fulton Street/Flatbush Avenue Triangle Area, State Street Triangle Area, Flatbush Avenue Extension Area, Myrtle Avenue Area, and Long Island University/University Towers Area (see Figure 2-1). This division facilitates a discussion of the impacts of the proposed actions on both individual buildings and small neighborhood subareas.

## C. DEVELOPMENT HISTORY

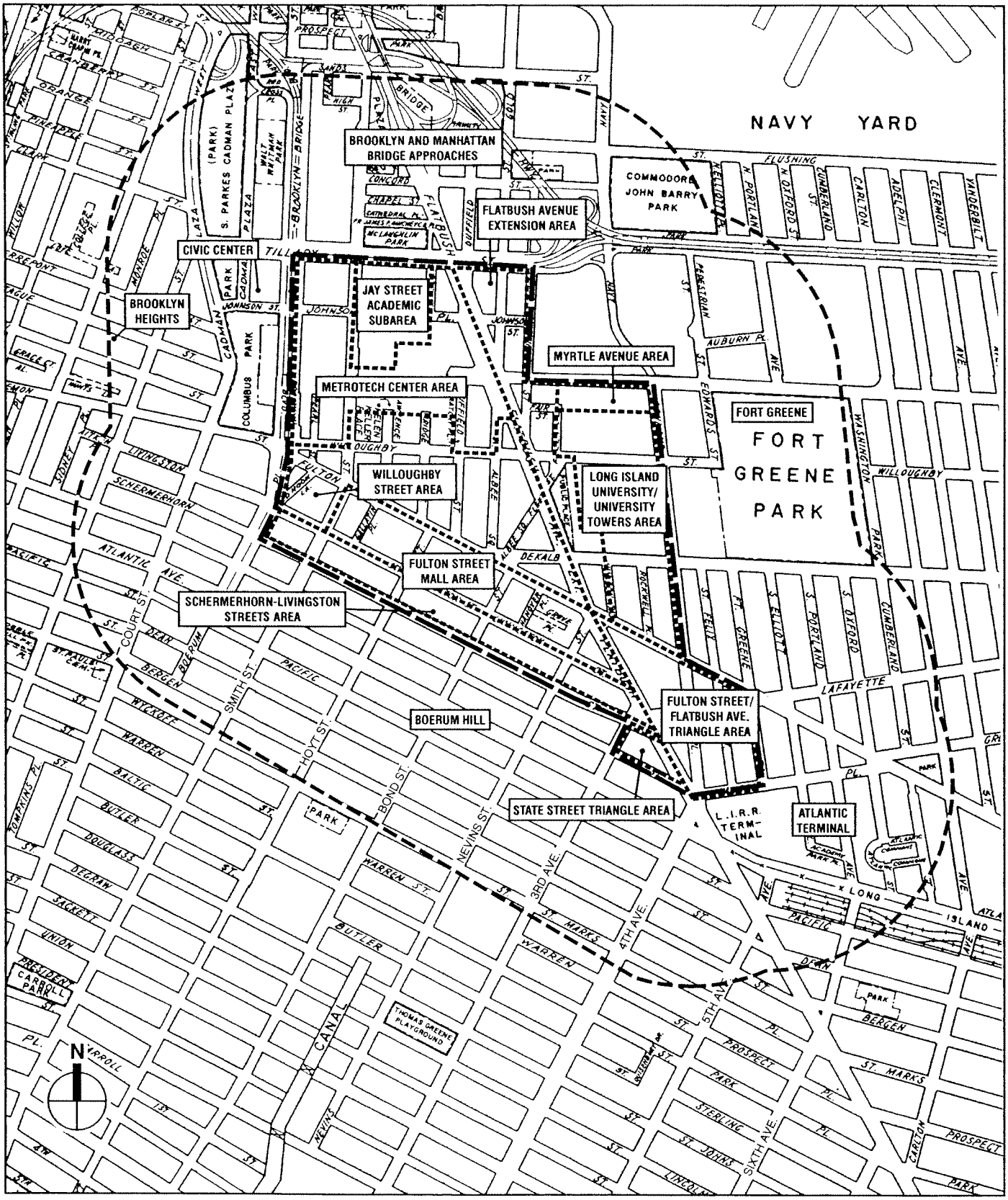
Downtown Brooklyn's urban development began in the early 19th century, when the area was divided into lots and developed with residential uses. The project area was part of a larger residential community, although few of the original brick and frame buildings built in the area at that time remain. In 1865, President Lincoln signed legislation creating a new United States District Court to deal with admiralty litigation in the Port of New York. Deemed the Eastern District of New York, its first session was held in Brooklyn Borough Hall, which was completed in 1851. This Federal court activity triggered the shift in land use that ultimately established Downtown Brooklyn as the borough's center of municipal, State, and Federal government activity, both in the administrative and judicial branches. The opening of the Brooklyn Bridge in 1883 subsequently spurred significant growth in Downtown Brooklyn, including the construction of ornately decorated public buildings and complementary commercial establishments. When Brooklyn was consolidated into greater New York City in 1898, it represented the third largest city in the United States. The 19th century also witnessed rapid growth in the Brooklyn Heights neighborhood, which was spurred initially by the inauguration in 1814 of ferry service between Fulton Street in Manhattan and Fulton Street in Brooklyn. A variety of retail and downtown commercial uses developed along Montague Street, amidst an affluent neighborhood of brownstone buildings.

In the period between 1950 and 1969, Downtown Brooklyn experienced a significant amount of government-related, as well as private development. During this time, the City of New York built 700,000 square feet of court and municipal office space in the downtown area, and the State and Federal governments added almost 550,000 additional square feet, strengthening the area's role as a government center. Some of the area's educational and cultural institutions also expanded during these two decades, including the Westinghouse Vocational and Technical High School, Brooklyn Law School, and New York Technical College.

During this period, in addition to the Civic Center's growth, the Fulton Street retail corridor was thriving and growing faster than any major downtown in the country. Fulton Street had become the City's second most important regional shopping center, after Herald Square. The office market added three major new buildings in the 1960s and three in the early 1970s, but the remainder of the 1970s and early 1980s were marked by less activity and some notable signs of decline. Some of the area's movie palaces closed, and the retail core around Fulton Street experienced declines in sales and in the quality of its stores. A major new retail development, Albee Square Mall, was built in 1979 on the site of the former Albee Theater, but experienced financial difficulty. Deterioration in levels of subway service as well as the condition of several surrounding neighborhoods also contributed to the decline of Downtown Brooklyn.

By the mid-1980s, Downtown Brooklyn began to reverse this trend as revitalization efforts were undertaken. In 1983, the Regional Plan Association (RPA) produced a report on the potential for economic revival in Downtown Brooklyn. This report was based on its earlier Second Regional Plan of 1969, which encouraged the redevelopment of regional sub-centers in order to ensure efficient use of existing infrastructure, retain jobs, and preserve undeveloped land on the City's

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Project Area Boundary

Project Area Subareas

1/4 Mile Study Area Boundary

## Project Area and 1/4 Mile Study Area Subareas

outskirts. During this decade, Borough Hall was renovated, and large office buildings were erected at One Pierrepont Plaza and Livingston Plaza.

Perhaps the most significant office development of this period was MetroTech Center, which was constructed as part of an urban renewal effort sponsored by the City. In 1986, the New York City Department of Housing Preservation and Development (HPD) proposed development of the MetroTech area through the MetroTech Urban Renewal Plan (MetroTech URP), which encompassed the area roughly between Willoughby, Jay, and Tillary Streets and the Flatbush Avenue Extension. The plan obtained City approval in 1987, and became occupied by some of Manhattan's major employers, including Chase Manhattan Bank (now JP Morgan/Chase) and City agencies.

In addition, initial planning for Renaissance Plaza proceeded during the 1980s. This large office and hotel complex, completed in 1999, offered Brooklyn its first new major hotel since the 1920s. Meanwhile, rising rents in Manhattan bolstered demand for both residential and commercial space in other boroughs, including Brooklyn. This accelerated the City and State's efforts to move some of their agencies from Manhattan's Civic Center to the outer boroughs, including Downtown Brooklyn. As can be seen today, a number of City agencies operate from Downtown Brooklyn.

## D. EXISTING CONDITIONS

### LAND USE

*PROJECT AREA*

The Downtown Brooklyn Development project area comprises a variety of land uses and building types, including commercial office buildings, courthouses and government buildings, major academic and cultural institutions, residential buildings, and highly active retail stores (see Figure 2-2).

*MetroTech Center Area and Jay Street Academic Subarea*

MetroTech Center, a 16-acre corporate and academic complex with over 5 million square feet of commercial and municipal office space, is located in the northwest corner of the project area. As described above, the Center was built as part of an urban renewal effort by the City. It is one of the major components of Downtown Brooklyn. Roughly bounded by Jay and Willoughby Streets, Flatbush Avenue Extension, and Johnson Street/Tech Plaza, MetroTech is home to Polytechnic University; several government and municipal agencies, including the New York City Fire Department and 911 Emergency Response headquarters; and major commercial tenants such as Bear Stearns, KeySpan, JP Morgan Chase, and Verizon. MetroTech Center's public plaza (known as The MetroTech Commons) also provides 3.3 acres of passive recreational open space.

Polytechnic University on Lawrence Street, the country's second oldest technological university, is MetroTech's major educational occupant. The University has been operating from Downtown Brooklyn since 1854, around the time Brooklyn Borough Hall was constructed. Two other educational institutions are located near the Polytechnic campus, just north of MetroTech Center. New York City Technical College is located at the corner of Tillary and Adams Streets. East of this is the George Westinghouse Vocational and Technical High School on Tech Place.

The blocks bounded by Tillary Street, Jay Street, Myrtle Avenue and Bridge Street, within the MetroTech Area, comprise the Jay Street Academic Subarea.

Jay Street marks the western edge of the MetroTech complex. The street is lined with academic and office buildings that range from one to 23 stories in height. Located just west of MetroTech Center between Jay and Adams Streets is the aforementioned Renaissance Plaza development. This 32-story tower combines commercial office space with a Marriott Hotel on the lower floors. To the south of Renaissance Plaza is the eastern edge of the Brooklyn Civic Center, with New York City Transit (NYCT) offices and parts of the New York State Supreme Court. Just north of the Marriott Hotel is the Brooklyn Family Courthouse. The Brooklyn Friends School is located south of the NYCT offices.

*Willoughby Street Area*

In the wedge of blocks between Fulton and Willoughby Streets east of Jay Street, buildings are typically 2- to 5-story commercial structures on small lots. Neighborhood-serving retail uses such as delis, hair salons and dry cleaners are found on the ground floors of many of these structures. Several larger buildings are located east of Gold Street north of DeKalb Avenue. These include a 3-story Toys R Us and a 5-story Computer Center. The blocks bounded by Boerum Place and Livingston, Smith and Fulton Streets, contain several low-rise commercial buildings with ground-floor retail uses, such as a bank, clothing stores and shoe stores. Brooklyn Law School and the New York City Department of Education (DOE) have facilities on these blocks. The Institute of Design and Construction and the Career Educational Institute are located at Willoughby Street and Flatbush Avenue.

*Fulton Street Mall Area*

Commercial retail activity is largely concentrated in the southern portion of the project area, within the Fulton Street Mall corridor. This area contains predominantly 3- to 5-story commercial structures housing ground-floor retail uses. Macy's department store is the area's major anchor tenant. Farther to the east along Fulton Street Mall is The Gallery at Fulton Street, another large-scale commercial retail use comprising a number of tenants. Typical ground-floor retail uses on Fulton Street include shoe stores, clothing stores, bedroom and bathroom accessory stores, furniture stores, vitamin stores, and music stores. While the ground-floor uses on Fulton Street are very active, the upper floors of these buildings have less activity.

*Schermerhorn-Livingston Streets Area*

The south side of Livingston Street and the north side of Schermerhorn Street are lined with several 6- to 9-story loft buildings. NYCT occupies a mid-rise office building at Livingston Street and Boerum Place. Several parking facilities and surface parking lots are located on this block; smaller 2- to 4-story commercial buildings also line the block. Ground-floor retail uses along Livingston Street include both neighborhood-serving stores such as banks, delis, clothing stores, and restaurants, as well as specialty stores.

*Fulton Street/Flatbush Avenue Triangle*

The roughly triangular area located between Fulton Street, Flatbush Avenue, Ft. Greene Place, and Atlantic Avenue at the southeastern portion of the project area contains a mix of land uses on oddly shaped blocks formed by the intersecting diagonal streets. The Brooklyn Academy of Music (BAM) is located at Lafayette Avenue and Ashland Place. BAM, which is the major land use in this area, has been in Brooklyn since 1861. BAM brings international performing arts,

*Fort Greene*

This residential neighborhood is largely defined by 19th-century brick and brownstone rowhouses and other assorted 2-to 4-story residential buildings. Several new low-rise residential complexes have been recently completed just north of Atlantic Avenue along South Portland Avenue and S. Oxford, Cumberland, and Carleton Streets. In the northern section of Fort Greene, north of Myrtle Avenue, are several New York City Housing Authority (NYCHA) developments. These include Ingersoll Houses and Walt Whitman Houses. Several institutional uses, including a public school, a branch of the Brooklyn Public Library, and a New York Police Department (NYPD) recruitment center, are located between these two housing complexes. Brooklyn Hospital operates its dental center at the corner of Ashland Place and De Kalb Avenue.

A defining land use within the Fort Greene neighborhood is Fort Greene Park, an approximately 30-acre park bounded by DeKalb Avenue and St. Edwards, Myrtle, and Cumberland Streets. The park contains tennis and basketball courts and playgrounds. It also the site of a Revolutionary War fort and a monument to war prisoners. Commodore Barry Park, another large park, with ballfields, baseball courts, and handball courts, is located at the northern edge of Fort Greene.

Atlantic Center Mall on Atlantic Avenue at Ft. Greene Place is the major commercial use in the neighborhood. Among other stores, the mall contains an Old Navy clothing store and a Pathmark, as well as an office for the New York State Department of Motor Vehicles.

*Brooklyn and Manhattan Bridge Approaches*

The northern portion of the study area is crossed by several approach roads to the Brooklyn and Manhattan Bridges, such as Flatbush Avenue Extension and Adams Street. A major land use in this area is Concord Village. The development, built between 1950 and 1956, is a complex of seven 15-story residential cooperative buildings, containing a total of 1,020 units on a site bordered by Tillary, Adams, Jay, and Nassau Streets. Concord Village occupies an area roughly 8 acres in size, with on-site parking and open space provided between the buildings. East of Concord Village is McLaughlin Park, an approximately 2-acre park fronting Tillary Street with active recreational features such as basketball courts and a paved playing field. The remaining land uses in the area are a mix of open spaces and industrial, commercial, and residential uses. Residential uses in this area are typically low-rise buildings on small lots. Industrial uses include parking lots, storage facilities, and gas stations. There are also several institutional uses in this area such as a Boys and Girls Club, religious institutions, and several schools. The New York City Technical College also has a building in this area.

## ZONING

*PROJECT AREA*

The project area is mapped largely with C5 and C6 commercial districts (see Figure 2-3). The MetroTech Center area is mapped with C6-1A and C6-1 commercial zones. These commercial districts provide for a wide range of high bulk commercial uses that require a central location, such as corporate headquarters, large hotels, entertainment facilities, and retail stores. The C6-1 district is a general commercial district that has a commercial FAR of 6.0, with a bonus to 7.2, and a maximum residential FAR of 3.44. The institutional uses north of MetroTech Center are also zoned with the C6-1 designation. The C6-1A district is a non-contextual district mapped in regional centers, such as Downtown Brooklyn. It differs from the C6-1 district in that it imposes parking requirements appropriate for commercial areas outside Manhattan. A small portion of

modern buildings, including Clark Cadman Tower and Whitman Close Townhouses are located on the west side of Cadman Plaza West north of Tillary Street.

Several institutional uses are located within the residential neighborhood. St. Francis College, St. Ann's School, and Packer Collegiate Institute can be found on the edge of Brooklyn Heights, west of Court Street. Two court facilities—the Appellate Division of the State Supreme Court and the U.S. Bankruptcy Court—are also located in Brooklyn Heights. The Brooklyn Historical Society is located at the southwest corner of Clinton and Pierrepont Streets and the Brooklyn Business Library is located at the corner of Tillary Street and Cadman Plaza West. There are also several religious institutions in the neighborhood.

Within Brooklyn Heights the major commercial uses are located between Clinton Street and Cadman Plaza West/Court Street. These include One Pierrepont Plaza, a 19-story commercial office building along Cadman Plaza West, which was built in 1988. Major retail streets in the neighborhood include Montague Street, which is lined with restaurants and shops, and Court Street, which contains a large movie theater on the block between Schermerhorn and State Streets. Other typical retail uses on Court Street include restaurants, liquor stores, pharmacies, photo stores, and music stores. Brooklyn Heights is bounded to the south by Atlantic Avenue, a major east-west thoroughfare running through Brooklyn into Queens from the East River.

*Boerum Hill*

The Boerum Hill residential neighborhood is located southeast of Brooklyn Heights, largely south of State Street. The area is characterized by 3-story row houses. While largely residential, Boerum Hill also contains a mix of industrial, commercial, and institutional uses as well. Atlantic Avenue in this area has 3- to 4-story buildings with ground floor retail uses, such as taverns, antique stores, thrift stores, furniture stores, restaurants, and delis. Surface parking lots and gas stations are located throughout the area, particularly along Schermerhorn Street. Another major retail thoroughfare in the neighborhood is Fourth Avenue, which is lined with uses such as barber shops, liquor stores, and law offices. Boerum Place, which runs through the neighborhood, is a major roadway that turns into Adams Street north of Joralemon Street. Some major institutional uses in the neighborhood include the Brooklyn House of Detention (which has been recently vacated) and Saint Vincent's Services, a social service agency for children and families, both at Boerum Place and State Street, and the Center for Geriatric Care on Hoyt and Dean Streets. The New York Transit Museum, which is currently under renovation, is located in a former subway station at the corner of Boerum Place and Schermerhorn Street. There are several schools in the area including the Brooklyn High School of the Arts, as well as numerous religious institutions.

*Atlantic Terminal*

The area southeast of BAM near the existing Atlantic Avenue Long Island Railroad (LIRR) station is a mix of industrial, residential, and commercial uses. East of Fifth Avenue, the LIRR submerged tracks run between Atlantic and Pacific Avenues, separating the area from the Fort Greene residential neighborhood to the north. Warehouse uses are located along the railroad tracks. Residential uses are located along Dean Street and to the south. These residences are largely 3- to 4-story buildings interspersed with vacant lots and surface parking lots. Beginning in the late 1990s several industrial sites in the area, particularly along Dean and Pacific Streets, have been converted to residential use. The 1.3-acre Dean Playground is located on Dean Street east of Sixth Avenue. Flatbush Avenue is the major retail strip in the area with stores such as furniture stores, optical stores, and bicycle shops.

*Civic Center*

The area north and west of the project area is the core of Brooklyn's Civic Center. The Civic Center area houses a number of City, State, and Federal institutions, including Brooklyn Borough Hall and Municipal Building, Brooklyn Criminal Court, Brooklyn Family Court, the General Post Office building, the New York State Supreme Court (Civil Term and Criminal Term), the New York City Housing Court, and the U.S. Federal Courthouse at Cadman Plaza East (currently being expanded).

The New York State Supreme Court and Borough Hall are located within the superblock bounded by Johnson Street/Tech Plaza, Cadman Plaza West/Court Street, Adams Street, and Joralemon Street. The area surrounding the two buildings is the 4.1-acre Columbus Park, a small portion of which is used for parking. South of this superblock, on the south side of Joralemon Street, are the Brooklyn Law School and the Municipal Building. Brooklyn Law School (BLS), which has been situated just south of Borough Hall since the late 1960s, significantly benefits from this proximity to courts, legal agencies, and law offices through its extensive clinical program. In 1985, the school purchased a 3-story building at One Boerum Place, which houses its clinical program and other uses. In 1994 a new 11-story $28 million addition was added to the 250 Joralemon Street building, further expanding BLS's presence in Downtown Brooklyn. BLS is also in the process of building a new dormitory at the northwest corner of State Street and Boerum Place. The DOE occupies 131 Livingston Street. 110 Livingston Street, the former DOE headquarters, is currently being vacated. A Request for Proposals was issued for its reuse and the designated developer plans to convert the building for residential and theater use.

The General Post Office building located on the block north of the Supreme Court is being converted to offices for the U.S. District Attorney and other court-related facilities as part of the U.S. Brooklyn Courthouse Project described later in the chapter. The block north of the post office houses the Eastern District Court Building, surrounded by the 2.9-acre Walt Whitman Park. A portion of the park is currently being used for parking by Federal government employees while the new U.S. Brooklyn Courthouse is under construction. The offices of the American Red Cross are located north of the park.

The block to the west of Walt Whitman Park contains another heavily-used public park, S. Parkes Cadman Plaza—which totals approximately 10.4 acres. The Brooklyn War Memorial is located within the park. The park is framed by two major north-south roadways that are primary access routes to Downtown Brooklyn. Connecting to the Brooklyn Bridge off-ramp is Cadman Plaza West, a roadway that frames the west side of S. Parkes Cadman Plaza Park. Cadman Plaza East delineates the east side of this park. The next road to the east is Adams Street, a busy five-lane roadway that connects Downtown Brooklyn to downtown Manhattan and its own Civic Center. Adams Street carries automobile traffic both inbound and outbound, to and from Downtown Brooklyn via the Brooklyn Bridge. It also has a very active bikeway/walkway along its median that allows pedestrians and bikers to walk and ride across the Brooklyn Bridge.

*Brooklyn Heights*

To the west of the civic center is Brooklyn Heights, which is primarily characterized by 19th century rowhouses (with some taller residential buildings) fronting tree-lined streets. Most of the Brooklyn Heights community was developed as a suburb of Manhattan in the early half of the 19th century and is part of the landmarked Brooklyn Heights Historic District. Several more

media, and film to Brooklyn. Its current facility was constructed in 1906. The BAM Local Development Corporation (LDC), established in 1999, is working to help create a mixed-use cultural district in the area. The Mark Morris Dance Company is also located in the area.

The block to the east of BAM contains a garden store on a triangular shaped block. The block to the south of BAM contains the shell of a building currently under construction. This is the future site of the rehabilitated Atlantic Terminal, which will be discussed later in the chapter. Other uses in the area include parking lots near the BAM facility. Several low-rise commercial buildings with ground-floor retail uses are located near the Flatbush Avenue/Fulton Street intersection. Retail uses range from neighborhood-serving facilities, such as bars and food stores, to car audio and beeper stores. The western edge of the Fort Greene residential neighborhood is located just east of the BAM facility. The area is characterized by 3-story rowhouses. An elementary school, community garden, and church are located in this area as well.

*State Street Triangle*

The block bounded by Schermerhorn Street, Flatbush Avenue, and State Street contains several low-rise buildings with a mix of commercial and institutional uses, including a U.S. Marine Corps recruiting center and a DOE facility.

*Flatbush Avenue Extension*

The area east of Flatbush Avenue Extension, north of Fulton Street, and west of Prince/Hudson Streets within the project area is characterized by a mix of institutional uses and small-scale commercial and industrial uses. Small auto-related uses are located along Flatbush Avenue in this area, such as a car wash, garages, and a gas station. An industrial building at the corner of Gold and Tillary Streets was recently converted into a residential building. Engine Company 207 and Ladder Company 110 are located at Tillary Street and Flatbush Avenue. The block bounded by DeKalb Avenue, Flatbush Avenue, Fulton Street and Hudson Street has a number of chain stores and restaurants, such as Applebees, Hallmark and McDonalds.

*Myrtle Avenue Area*

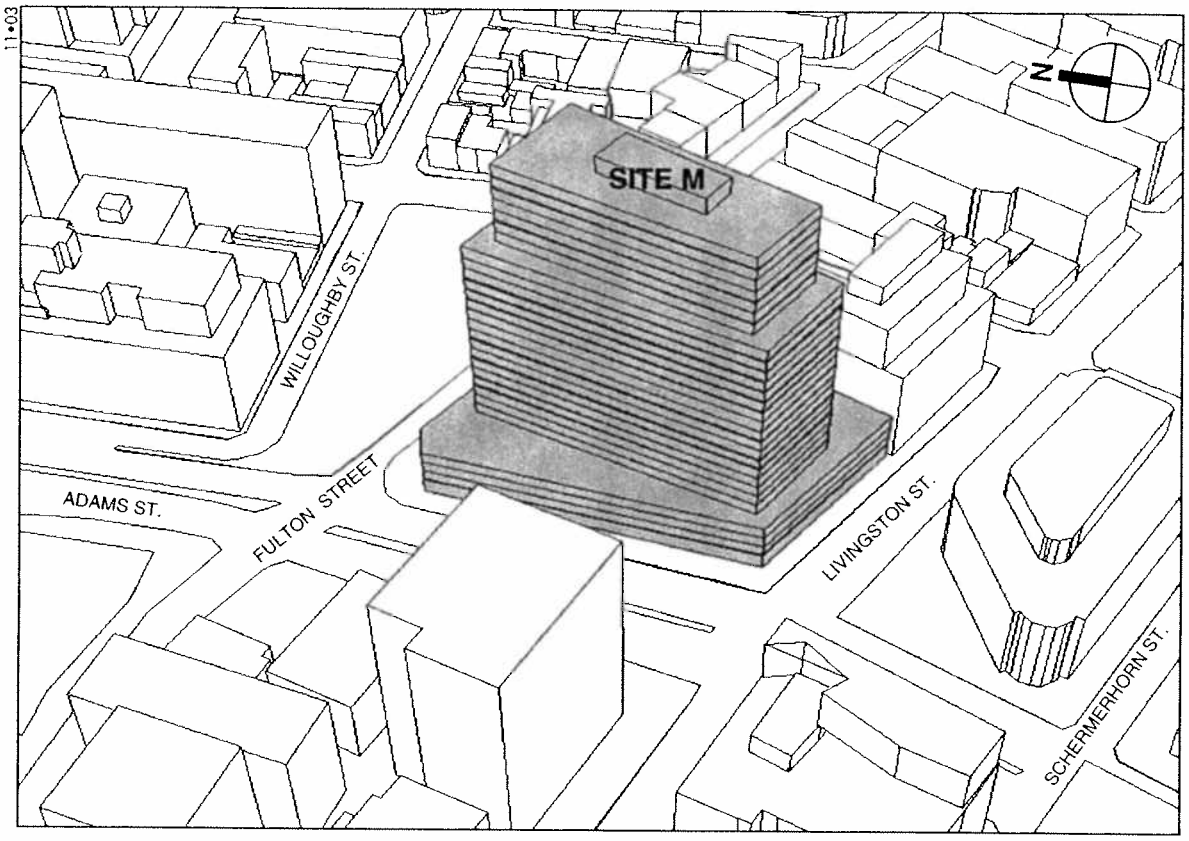
Myrtle Avenue east of Flatbush Avenue Extension is a commercial street lined with neighborhood-serving retail uses such as a pharmacy, supermarket, restaurants, liquor stores, and clothing stores.

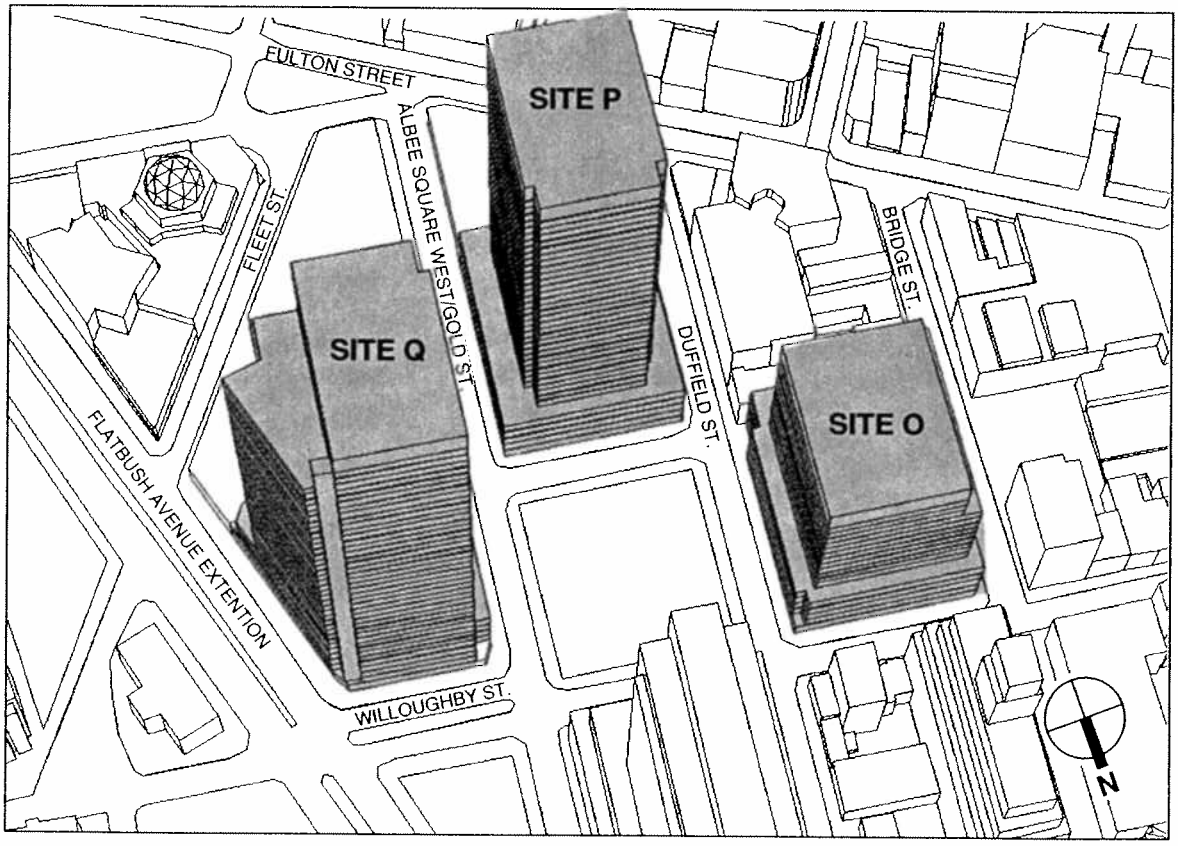
*Long Island University/University Towers Area*

University Towers, a cooperative complex comprising three 16-story residential buildings on 5.5 acres is located on the block bounded by Myrtle Avenue, Ashland Place, Willoughby Street, and Fleet Street. Long Island University's Brooklyn campus is located between Willoughby Avenue, DeKalb Avenue, Ashland Place, and Debevoise Place. The University's tennis courts and athletic fields are also located on this superblock (see Figure 2-2).

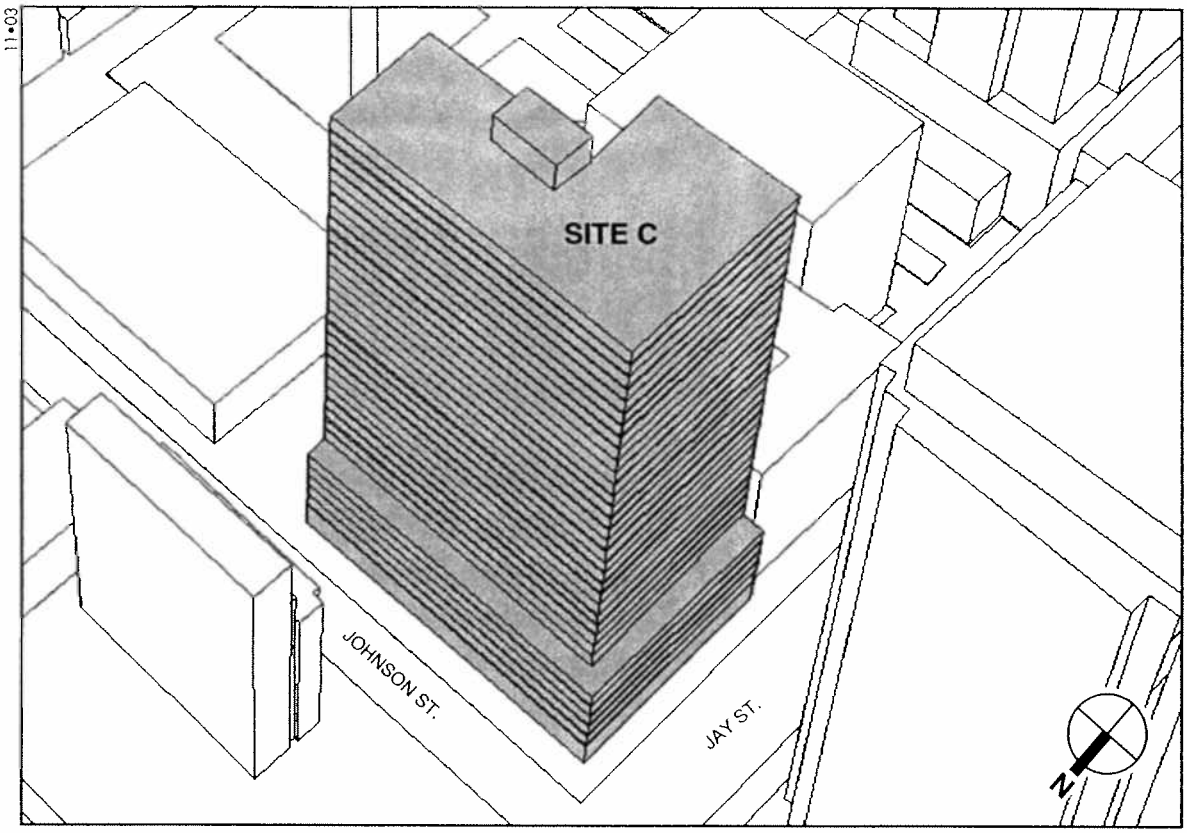
*¼-MILE STUDY AREA*

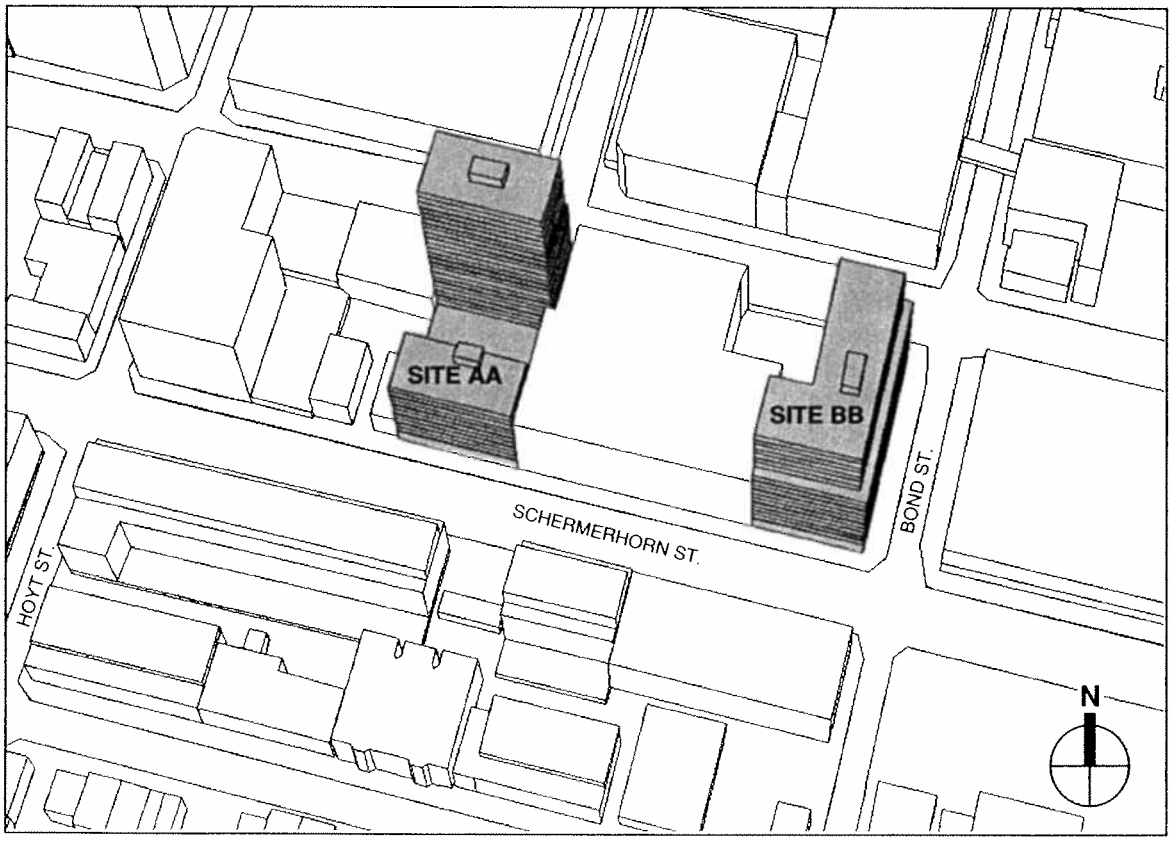
Like the project area, the ¼-mile study area has also been divided into subareas to facilitate the land use analysis. These include the Civic Center, Brooklyn Heights, Boerum Hill, Atlantic Terminal, Fort Greene, and the Brooklyn and Manhattan Bridge Approaches.



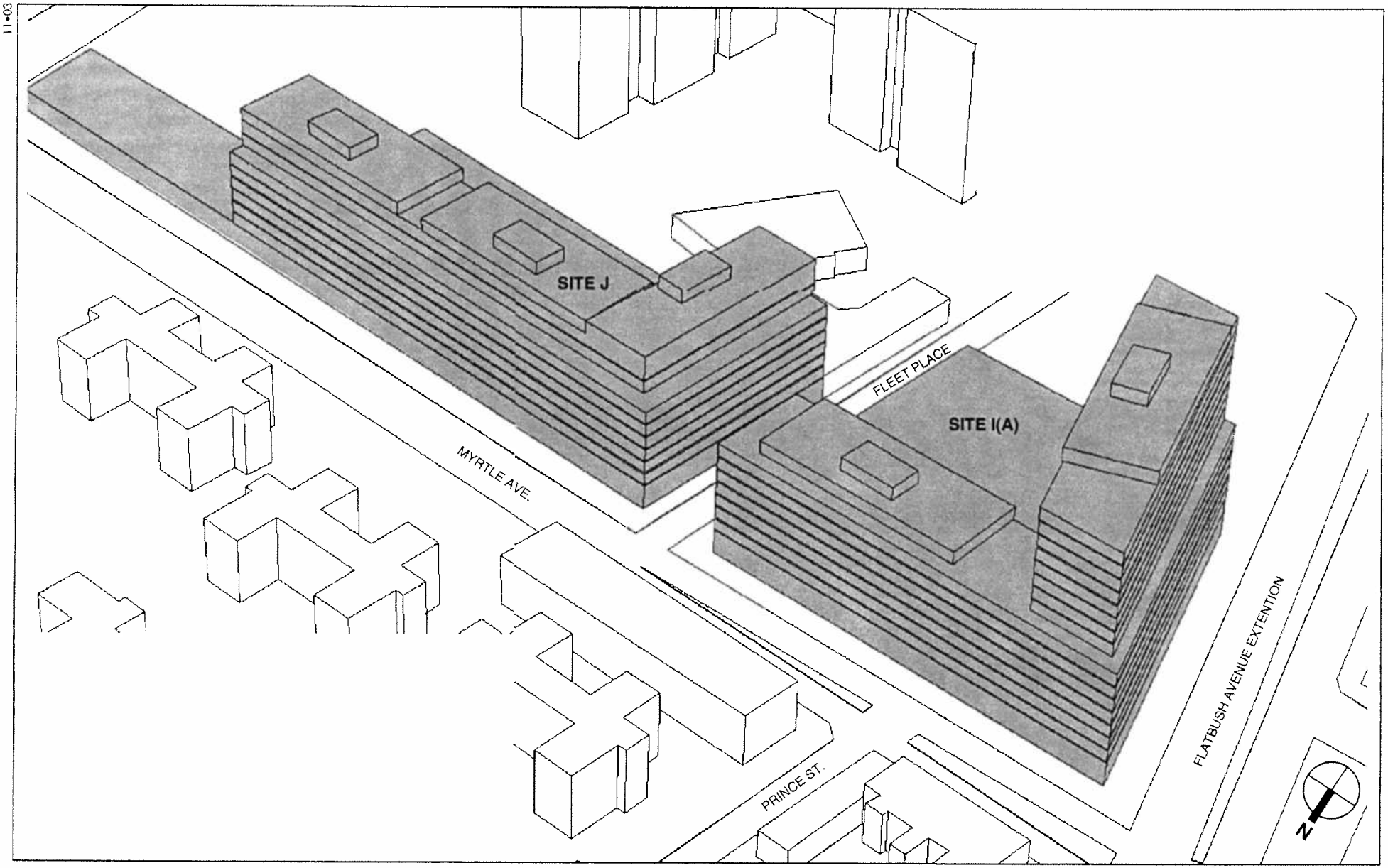




**Illustrative Bulk Configurations-**
**Projected Development Sites with C6-4.5 Rezoning**




**Illustrative Bulk Configurations-**
**Projected Development Sites with C6-4 Rezoning**




**Illustrative Bulk Configurations-**
**Projected Development Sites with C6-4 and R7-1/C2-4 Zoning**
Figure S-13

## A. PROJECT IDENTIFICATION

The Downtown Brooklyn Development project is a public planning effort to create opportunities for stimulating and integrating commercial, academic, cultural, and residential development in the Downtown Brooklyn area (see Figure 1-1). The project seeks to reinforce Downtown Brooklyn's role as a regional central business district; to provide viable development sites for future market cycles; to capture regional employment growth and strengthen New York City's economic base by attracting new businesses and retaining businesses considering relocation outside Manhattan; to increase opportunities for commercial, residential, and academic growth in Downtown Brooklyn; to promote connections between the area's commercial core and surrounding academic, cultural, and residential neighborhoods; and to reinforce the positive character of surrounding neighborhoods.

The project entails a number of public approvals, which are presented briefly below and further detailed in later sections:

- Zoning map amendment to increase the floor area ratio (FAR) of portions of the Special Downtown Brooklyn District (SDBD); to allow for greater commercial and residential density in the downtown area; to allow commercial use where such use is not currently allowed; to permit residential use on sites where such use is not currently allowed; and to expand the SDBD (ULURP No. C040171 ZMK);
- Zoning text changes to the SDBD to provide special height and setback regulations and other massing controls for higher-density commercial districts, and new requirements for sidewalk widenings, security-gate transparency, indoor bicycle parking, signage controls, and subway stair relocation (ULURP No. N040172 ZRK);
- Zoning text changes to the SDBD to add or remove requirements for ground-floor retail continuity, ground-floor glazing, street wall continuity, curb cut prohibition, and street tree planting on selected streets (ULURP No. N040172 ZRK);
- Zoning text changes to the SDBD to extend the Schermerhorn Street Height Limitation Area "B" of 140 feet and establish a new Height Limitation Area "C" of 250 feet on the blocks bounded by Smith, Nevins, Livingston, and Schermerhorn Streets and establish a height limit of 160 feet on the south side of Myrtle Avenue between Fleet Place and Ashland Place (ULURP No. N040172 ZRK);
- Mapping actions that would demap the following existing streets: Red Hook Lane, between Fulton Street and Boerum Place (ULURP No. C030515 MMK); Pearl Street, between Fulton Street and Willoughby Street (ULURP No. C030514 MMK); Prince Street, between Flatbush Avenue Extension and Myrtle Avenue; and Fair Street between Fleet Place and Prince Street (ULURP No. C030517 MMK).

- Mapping actions that would and widen the south side of Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension (ULURP No. C030516 MMK); widen Fleet Place from Willoughby Street to Fair Street and extend Fleet Place north from Fair Street to Myrtle Avenue; and widen the south side of Myrtle Avenue between Flatbush Avenue Extension and Fleet Place (ULURP No. C030517 MMK);
- Amendment to the Brooklyn Center Urban Renewal Plan (BCURP) to extend the expiration date of the plan from 2010 to 2044; to extend the Urban Renewal project boundary by 9 blocks; to designate 57 lots within five proposed development sites; to remove certain previously designated urban renewal sites; to modify the definition of Commercial land use to permit residential and community facility uses; to modify the definition of Public Space land use to permit below-grade parking and accessory uses; to delete Industrial and Related use and Institutional/Commercial uses as land use categories; to eliminate Q parcels from the text and maps; and to revise the plan text to reflect the standard format for urban renewal plans (ULURP Nos. C040173 HUK and N040176 HGK);
- Amendments to the MetroTech Urban Renewal Plan to change the land use for Block 2060, Lot 8, from street widening to open space; to eliminate Q parcels from the text and maps; and to revise the plan text to reflect the standard format for urban renewal plans (ULURP Nos. C040174 HUK and C040178 HDK);
- Modification of the MetroTech General Large-Scale Development Special Permit to reallocate existing floor area, to allocate newly created floor area generated from the proposed rezoning of Block 142, Lot 1, and to clarify that Commercial and Community Facility uses are allowed at this projected development site (ULURP Nos. M930481(E) ZSK, M000592(A) ZSK, and M860689(B) ZSK);
- Amendment to the Atlantic Terminal Urban Renewal Area Plan (ATURP) to extend the expiration date of the plan from 2008 to 2044; to modify the definition of Commercial land use within the plan to permit community facilities and below-grade parking; to change the land use and eliminate restrictions on maximum floor area ratios and maximum commercial floor area for certain sites; to eliminate Q parcels from the text and maps; and to revise the plan text to reflect the standard format for urban renewal plans (ULURP No. C040175 HUK);
- Disposition of the City-owned property pursuant to Urban Renewal as well as Block 140, Lot 111 and Block 2107, Lot 36 (ULURP Nos. C040180 PPK and C040177 HDK);
- Site selection for a visual and performing arts public library on Block 2110, Lot 3 (ULURP No. C040185 PSK); and
- Special permits for four proposed parking facilities: 1) a 694-space below-grade public parking facility at Willoughby Street between Albee Square West/Gold Street and Duffield Street; 2) a 457-space partially below-grade parking facility on the south side of Myrtle Avenue and east side of Flatbush Avenue Extension; 3) a 466-space below-grade parking facility on Block 2110; and 4) a 465-space below-grade parking facility on Block 2107 (ULURP Nos. C040181 ZSK, C040182 ZSK, C040183 ZSK, and C040184 ZSK).

## B. PROJECT AREA

Downtown Brooklyn is the economic center of what would be America's fourth largest city and what is New York City's third largest central business district after Midtown and Downtown

Manhattan. It occupies a valuable and unique position as a competitive, back-office space alternative to New Jersey, due to its proximity to Wall Street and local and regional mass transit access. The Downtown Brooklyn Development project area comprises a variety of land uses and building types, including commercial office buildings, courthouses and government buildings, educational facilities/major academic and cultural institutions, residential buildings, and highly active retail stores (see Figure 1-1). MetroTech Center, a 16-acre corporate and academic complex that was built as part of an urban renewal effort by the City, is one of the major components of Downtown Brooklyn. Roughly bounded by Jay and Willoughby Streets, Flatbush Avenue Extension and Johnson Street/Tech Plaza, MetroTech is home to Polytechnic University, several government and municipal agencies including the New York City Fire Department and 911 headquarters, and major commercial tenants such as Bear Stearns, Key-Span, J.P. Morgan Chase, and Verizon. Located near MetroTech Center are several large buildings housing a 376-room Renaissance Marriott hotel, the offices of New York City Transit, and parts of the New York State Supreme Court. Amidst these modern buildings are many smaller-scale civic and commercial structures that date back to the 19th century.

Commercial retail activity is concentrated in the southern portion of the project area, within the Fulton Street Mall corridor. This area contains three- to five-story commercial structures housing ground-floor retail uses. Macy's department store is the area's major anchor tenant. Farther to the east along Fulton Mall is The Gallery at Fulton Street, another large-scale commercial retail use.

To the north and west of the project area is the core of Brooklyn's Civic Center. The Civic Center area houses a number of City, State, and Federal institutions, including Brooklyn's Borough Hall and Municipal Building, Brooklyn Criminal Court, Kings County Family Court, the General Post Office, the New York State Supreme Court (Civil Term and Criminal Term), the New York City Housing Court, and the U.S. Federal Courthouse at Cadman Plaza East (currently being expanded).

The project area is also home to a number of educational institutions. These include Polytechnic University, Long Island University, New York City College of Technology, Brooklyn Law School, George Westinghouse High School, Brooklyn Technical High School, Pacific High School, the Institute of Design and Construction, Career Educational Consultants, and the Brooklyn Friends School. The Department of Education also occupies two prominent buildings on the southwestern edge of the project area: 110 and 131 Livingston Street. However, 110 Livingston Street is in the process of being vacated by the department and the site is to be redeveloped.

At the southeast corner of the project area is the Brooklyn Academy of Music (BAM). BAM has been in Brooklyn since 1861, and its facility on Lafayette Avenue and Ashland Place was constructed in 1906. The BAM Local Development Corporation (BAM LDC) in mid-1999 began working to create a vibrant mixed-use multicultural arts district in the area surrounding BAM.

The project area also contains some residential development and is surrounded by a number of residential neighborhoods. To the west of the project area is Brooklyn Heights, to the south is the Boerum Hill neighborhood, to the east is Fort Greene, and to the north is Concord Village.

## C. BACKGROUND HISTORY

Beginning in the second half of the 20th century, Downtown Brooklyn has been the subject of numerous studies and development/revitalization plans. Between 1950 and 1969, New York City built approximately 700,000 square feet of court and municipal office space in Downtown Brooklyn, and the State and Federal governments added almost 550,000 additional square feet, strengthening the area's role as a government center. Some of the area's educational and cultural institutions also expanded during these two decades, including the George Westinghouse High School, the Brooklyn Law School, and New York City College of Technology.

Zoning enacted in 1961 did not foresee extensive change to the existing business district, as it was then defined by Court Street, the Civic Center, and Fulton Street's department store corridor. Since that time most commercial redevelopment has required publicly sponsored zoning changes and other government actions, such as urban renewal and direct investment, to facilitate enlargement of the office core on sites that were dominated by lofts, small buildings, and parking lots. In the late 1960s, two urban renewal plans for Downtown Brooklyn were established, in hopes of revitalizing the area: the ATURP and the BCURP. See Figure 1-2 for the URP boundaries. ATURP was established in 1968, and was intended to encourage development and employment opportunities in the area; create new housing of high quality and/or rehabilitated housing of up-graded quality; and provide community facilities, parks, retail shopping, and parking. Similarly, the BCURP was established in 1970 and was intended to strengthen and expand the commercial and retail core and the residential base of Brooklyn Center; to provide new areas for expansion of office, educational, cultural, manufacturing, and open space uses; and to improve traffic safety and rationalize the circulation system in the area by providing for the separation of major pedestrian and traffic flows. The regulations of ATURP and BCURP were to be in effect for 40 years and are scheduled to expire in 2008 and 2010, respectively.

In 1983, the Regional Plan Association (RPA) produced a report on the potential for economic revival in Downtown Brooklyn. This report was based on RPA's earlier Second Regional Plan of 1969, which encouraged the development of regional sub-centers in order to ensure efficient use of existing infrastructure, retain jobs, and preserve undeveloped land on the City's outskirts. During the 1980s, Borough Hall was renovated, and large office buildings were erected with significant public subsidies at One Pierrepont Plaza and Livingston Plaza, on the western and southern edges of the project area, respectively. Perhaps the most significant office development in Brooklyn at that time was MetroTech Center, which was constructed as part of an urban renewal effort sponsored by the City. In 1986, HPD proposed development of the MetroTech area through the MetroTech URP, which encompassed the area roughly between Willoughby, Jay, and Tillary Streets and Flatbush Avenue Extension. The MetroTech URP established land use and economic development goals for Downtown Brooklyn that included strengthening the commercial office and retail core of Downtown Brooklyn and enhancing the City's corporate retention programs by supporting commercial and institutional development; developing job-intensive office, research, scientific, and educational activities; and improving the area's traffic circulation system.

The MetroTech URP led to MetroTech Center, a complex of commercial office, retail, governmental, and educational spaces. Like the other urban renewal plans, MetroTech's regulations will be in effect for 40 years, until 2026. As MetroTech Center began its initial development efforts during the mid-1980s, the City provided substantial subsidies to the commercial tenants and transferred significant City functions to the Center, which now houses the Fire Department

(MetroTech building 9) and 911 Emergency Response (MetroTech building 11) headquarters. MetroTech quickly became an attractive destination for some of Manhattan's major employers, including J.P. Morgan Chase, Security Industry Automation Corporation (SIAC), Bear Stearns, KeySpan, Empire Blue Cross Blue Shield, and City agencies. To date, MetroTech Center has been developed with over 5 million square feet of commercial and municipal office space.

Another major planning effort for the Downtown Brooklyn area was initiated in 2001 with the establishment of the Special Downtown Brooklyn District (see Figure 1-3). As with the URP/URAs, the Special Downtown Brooklyn District was designed to foster development and strengthen the business core of Downtown Brooklyn; to preserve the historic architectural character of development and the pedestrian orientation of ground-floor uses along certain corridors; and to provide new public amenities and enhance the visual character of the area by establishing special sign regulations. The new special district establishes height limits and other bulk controls designed to permit large commercial buildings appropriate for a downtown business district to be developed as-of-right, and establishes a transitional contextual buffer along Schermerhorn Street between Smith Street and Third Avenue, and on Smith Street between Schermerhorn Street and Atlantic Avenue. This effort has resulted in the construction or planning of at least two apartment buildings. Currently planned and in the works are an expansion of the Marriott Hotel, a large dorm for Brooklyn Law School, the BAM cultural district and new housing and retail stores on sites that had been vacant for over 60 years.

The Downtown Brooklyn roadway network provides access to the Brooklyn-Queens Expressway and the Brooklyn and Manhattan Bridges (via Adams Street and Flatbush Avenue, respectively). The existing street network contains a number of major north-south and east-west roadways carrying heavy volumes of through traffic, as well as minor roadways serving local downtown traffic. To help alleviate traffic congestion and associated air quality problems in Downtown Brooklyn, the New York City Economic Development Corporation (EDC) and the New York City Department of Transportation (NYCDOT) studied various roadway improvement measures. EDC's *1987 Downtown Brooklyn Master Planning Improvements Study* (DBMP) recommended a number of improvements ranging from operational changes to major physical improvements in order to address the area's nonattainment of the carbon monoxide (CO) air quality standards. Most of the operational measures have been fully implemented. More recently, NYCDOT prepared the *1999 Downtown Brooklyn Traffic Improvements Study* (DBTIS), which incorporates the elements from the 1987 DBMP that have been completed and recommends alternative roadway improvements given changes in existing and projected traffic conditions. The study also determined that the large physical roadway improvements proposed in the DBMP were no longer necessary to relieve traffic congestion and to attain air quality compliance; in the years subsequent to the DBMP, air quality monitoring data showed that Downtown Brooklyn was in compliance with the CO standards.

A current NYCDOT effort is its ongoing Downtown Brooklyn Traffic Calming Project, which is developing strategies for alleviating traffic bottlenecks while improving the street environment for pedestrians, bicyclists, businesses, and residents. A number of these strategies were implemented in Downtown Brooklyn as part of a pilot program in late 2001.

# D. DESCRIPTION OF THE PROPOSED ACTIONS

## PROJECT OBJECTIVES

The proposed Downtown Brooklyn Development project is part of the City's long-range strategy to create a vibrant, multi-use urban environment that serves the residents, businesses, and academic institutions of Downtown Brooklyn and its surrounding communities. This effort seeks to take full advantage of the area's proximity to Manhattan and its excellent mass transit network and to build on the commercial core already established by the development of MetroTech Center. The proposed actions would reinforce Downtown Brooklyn's role as a regional central business district, build on the success of previous development efforts that have retained and attracted companies in New York, strengthen the linkages between the area's commercial core and surrounding residential neighborhoods, create a strong and diverse retail market, expand residential communities and existing academic and cultural facilities, create public amenities, and significantly add to New York City's economic base.

The project seeks to integrate the various land uses found in the project area (i.e., commercial, retail, institutional, academic, residential, and public space) and introduce a unifying urban design vision for Downtown Brooklyn. In implementing this planning effort, the following objectives have been established:

- Focus on comprehensive planning to encourage a mix of uses that complement the central commercial core and nearby residential communities;
- Capture future economic growth and new jobs by creating opportunities for new office development, by allowing for the creation of buildings with large floorplates and square footages required of modern offices by corporate tenants;
- Strengthen New York City's economic base by attracting new businesses, and retaining businesses considering relocation outside of the City;
- Foster connections between the commercial and retail cores of MetroTech and Fulton Mall to the north, the Boerum Hill residential neighborhood to the south, and the Fort Greene neighborhood to the east;
- Encourage opportunities for residential growth and enhance vitality through the development of higher-density, mixed-income apartment houses within Downtown Brooklyn;
- Foster new and varied retail opportunities to meet the needs of workers, residents and visitors and make Downtown Brooklyn an entertainment/leisure destination;
- Accommodate the parking demand associated with new development;
- Establish a strong cultural district and foster the growth of the area's education centers;
- Create appropriate massing and design guidelines to respond to the context of the surrounding buildings and uses, to create an attractive area that is an appealing place to live, work, and visit that transitions easily into neighboring residential areas;
- Enhance the public environment, ground-floor uses, and streetscapes in the project area through proposed improvements such as renovated subway entrances, new public spaces, and the creation of criteria and incentives for quality ground-floor uses; and

- Integrate new development, vehicular and pedestrian circulation planning, and streetscaping along Flatbush Avenue Extension, Willoughby Street, and adjacent side streets.

## DESCRIPTION OF THE PROPOSED PROJECT

The development project calls for the rezoning of an area in Downtown Brooklyn roughly bounded by Tillary Street to the north, Schermerhorn Street to the south, Adams Street to the west, and Ashland Place to the east (see Figure 1-1). The rezoning would provide for the development of sites for a mix of office, academic, cultural, residential, and retail uses.

The proposed actions are projected to stimulate approximately 6.7 million square feet of new development, including 4.6 million square feet of office space, 979,000 square feet of residential use (approximately 979 units), 844,000 square feet of retail, and 260,000 square feet of community facility and cultural space. The proposed project would also include provisions for approximately 1,617 public parking spaces.

The bulk of the development activity, which would include property acquisition, new public space, parking facilities, and infrastructure improvements, is expected to take place along Willoughby Street near Flatbush Avenue Extension. Additional development is expected to take place along Livingston Street, Myrtle Avenue, Flatbush Avenue Extension, in the vicinity of Jay Street and Fulton Mall, and within the BAM cultural district. The project would also include provisions for new public space and the public parking facilities.

The project proposes the expansion of the commercial core into the area generally bounded by Adams and Willoughby Streets, Flatbush Avenue and Fulton Street through the rezoning of blocks within this area to a higher density FAR. The demapping of Red Hook Lane (between Boerum Place and Fulton Street) and Pearl Street (between Fulton and Willoughby Streets) and the development of the adjacent four blocks will help to create a new focal point and entrance to the Fulton Mall area from the Civic Center and Brooklyn Heights neighborhoods to the west.

The properties at the northwest side of MetroTech, which are occupied by New York City College of Technology and Polytechnic University, would also be rezoned as part of the project to allow for mixed-use commercial/community facility development. Larger development on these sites would be intended to be consistent with other developments currently under construction in this area, such as the 330 Jay Street building (which includes office space) and the new Federal courthouse on the north side of Tillary Street.

The creation of a connection between the commercial and retail cores of MetroTech and Fulton Mall to the south and the Boerum Hill residential neighborhood to the south is one of the objectives of the project. The development sites bounded by Livingston and Schermerhorn Streets, Smith Street, and Third Avenue are expected to be developed with residential buildings to replace current uses—primarily public parking lots and underutilized buildings—that pose an uninviting barrier between these two areas. The proposed height limits along these blocks will be reduced in order to create a transition to the nearby low-scale, residential neighborhood.

### *URBAN DESIGN VISION*

Enhancing the uses and streetscapes of Flatbush Avenue Extension is a central goal of the Downtown Brooklyn Development project. Flatbush Avenue is envisaged as becoming an inviting entrance to Downtown Brooklyn, linking the commercial, retail, and academic uses to the west with Fort Greene. A number of the blocks facing the avenue between Tillary Street and Atlantic Avenue would be rezoned to allow for larger-scale development with active

ground-floor uses on these sites. In addition, various streetscape enhancements would also be installed to enhance the pedestrian experience, including a wider, landscaped center median along the avenue, similar to Adams Street; continuous sidewalks that are wider at street crossings; and signalized and delineated pedestrian crossings (see Figure 1-4).

As Flatbush Avenue is seen as the eastern entrance to Downtown Brooklyn, Willoughby Street is envisaged as a "front door" to the corporate buildings that would surround this street, particularly between Adams Street and Flatbush Avenue. This "front door" on Willoughby Street would have a public space as a focal point around which the entrances to the commercial buildings would be located. The streetscape of Willoughby Street would also be improved, like the improvements proposed for Flatbush Avenue, with widened sidewalks and improved subway entrances that are included in new buildings and/or plazas. MetroTech has standard streetscape elements that could be extended throughout the area; other elements could replicate the models used for the Grand Central and 34th Street areas.

*PUBLIC SPACE*

Urban renewal changes for the project would provide for the creation of public space at the south side of Willoughby Street between Duffield Street and Albee Square West/Gold Street (Willoughby Square). The urban renewal changes would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets. Figure 1-5 presents the areas proposed for streetscape improvements and public space enhancements.

The Willoughby Square public space would be similar to the MetroTech Commons in size (approximately 1.15 acres) and is intended to be a focal point for new commercial investment in the surrounding blocks (see Figure 1-6). The public space could incorporate a variety of amenities. The public space is proposed to include a below-grade, 694-space public parking facility with entrances/exits at its southern end (see Figure 1-7). In addition, Myrtle Avenue between Flatbush Avenue Extension and the proposed extension of Fleet Place, and Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension, would be widened to include planted medians. The Jay Street Plaza public space would include a new subway entrance/exit to the Jay Street subway station and would create a focal point at the southwestern corner of the project area.

## E. PROPOSED PROJECT ACTIONS

### REZONING

Figure 1-3 shows the existing zoning of the project area and Figure 1-8 illustrates the project area's proposed zoning. Table 1-1 presents a list of the lots within the projected and potential development sites affected by the proposed rezoning actions.

The sites in the northwest portion of the project area would be rezoned from C6-1 and C6-1A to C6-4 to allow for increased FAR for commercial and community facility (academic) uses. The rezoning of the east side of Flatbush Avenue Extension to C6-4 would allow for sites along this major corridor, currently zoned as residential or manufacturing, to be developed with increased FAR for mixed-use commercial/residential. The areas in the center of the project area would be rezoned from C5-4 and C6-1 to C6-4.5, which would allow for commercial development to an FAR of 12.0, extending the possibility for office development south of the existing MetroTech

**Table 1-1**
**Projected/Potential Development Site Lots Affected by Proposed Rezoning**

| Rezoning | Blocks: Lots | Existing Permitted FAR | Proposed FAR |
|---|---|---|---|
| C6-1, C6-1A to C6-4 | B 128: 1, 26<br>B 131: 1<br>B 142: 1[1]<br>B 160: 18, 29<br>B 161: 1, 3, 18, 27, 30, 33, 47, 50, 52-64<br>B 164: 1, 13, 29, 31, 42-44<br>B 165: 17-19, 29, 58<br>B 167: 15, 16, 26-28, 36, 42<br>B 2093: 1 | Commercial: 6.0<br>Residential: 3.44<br>Com. Fac. : 6.5 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| C5-4 to C6-4.5 | B 144: 1<br>B 150: 1, 6, 10, 11, 19<br>B 153: 3, 14, 15<br>B 154: 1, 5, 11, 12, 36-40 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 | Commercial: 12<br>Residential: 10<br>Comm. Fac.: 12 |
| C6-1 to C6-4.5 | B 145: 8, 10, 13-16, 18-22, 26, 32<br>B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52<br>B 149: 1, 14, 15, 17, 19, 22-26, 28, 30-34, 49, 50<br>B 152: 37 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 | Commercial: 12<br>Residential: 10<br>Comm. Fac.: 12 |
| C6-1 (Use) | B 2110: 3 | 0.2[3] | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 |
| C6-1 to C6-2 | B 174: 9, 13, 18, 23, 24 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 | Commercial: 6.0<br>Residential: 6.02<br>Comm. Fac.: 6.5 |
| M1-1 to C6-4 | B 133: 1, 5, 13, 15<br>B 134: 1, 5, 30, 38, 41<br>B 2049: 8 | Commercial: 1.0<br>Residential: 0<br>Comm. Fac.: 2.4 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| R6/C1-3, C8-2 to C6-4 | B 2049: 2[2]<br>B 2060: 22-27, 32, 122<br>B 2061: 1 (part)<br>B 2062: 1, 5, 6, 17-19, 21, 23, 24, 103 | Commercial: 2.0<br>Residential: 2.43<br>Comm. Fac.: 4.8 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| R6 to R7-1/C2-4 | B 2061: 1 (part), 40 (part), 60 (part), 80 (part), 100 (part) | Commercial: 0<br>Residential: 2.43<br>Comm. Fac.: 4.8 | Commercial: 2.0<br>Residential: 4.0<br>Comm. Fac.: 4.8 |

**Notes: FAR = Floor Area Ratio**
1 The existing zoning of this lot is C6-1A.
2 The existing permitted FAR of Block 2049, Lot 2 is 2.43/1. No part of this lot is zoned C8-2.
3 As per ATURP restriction.

area. The southern portion of the project area, currently zoned C6-1, would be rezoned to C6-4 to create the potential for increased FAR for residential use. In addition to the large rezoning areas, there are three small rezoning sites at the southern and eastern borders of the project area. The area south of Myrtle Avenue between Fleet Street and Ashland Place would be rezoned from R6 to R7-1 with a commercial overlay of C2-4, to create the possibility for increased FAR for residential use and ground-floor retail along this street. One block in the southern portion of the project area would be rezoned from C6-1 to C6-2; although this would not affect the allowable FAR for commercial uses (3.44 to 6.02) for this block, it would allow for increased residential density to be established on the block.

## TEXT CHANGES TO THE SPECIAL DOWNTOWN BROOKLYN DISTRICT

The actions also propose changes to the recently created Special Downtown Brooklyn District (SDBD). The changes mainly relate to height limits in the project area, which are designed to establish contextual buffers in the area bounded by Smith, Nevins, Livingston, and Schermerhorn Streets, between the large-scale commercial buildings in Downtown Brooklyn and surrounding low-scale residential buildings in the surrounding neighborhoods. The proposed changes are:

- Extend the SDBD along Myrtle Avenue to Ashland Place, with the extension of the former Fair Street forming the district's southern boundary;
- Establish a flexible height and setback envelope for commercial and community facility buildings in the C6-4.5 zoning district, similar to Lower Manhattan (see Table 1-2). The tower option would have a maximum base height of 85 feet, and a setback of 20 feet for commercial and community facility buildings on lots larger than 15,000 square feet. For commercial and community facility buildings on lots smaller than 15,000 square feet, the tower option would have a maximum base height of 85 feet, a setback of 15 feet on narrow streets, and a setback of 10 feet on wide streets. For all buildings containing commercial and community facility uses, tower lot coverage above 150 feet would be limited to 65 percent up to 300 feet and limited to 50 percent coverage above 300 feet. The standard building option would have a minimum base height of 60 feet where street walls are required, and a maximum base height of 125 feet on narrow streets (150 feet on wide streets), and a maximum building height of 250 feet. The standard building option would also require setbacks of 15 feet on narrow streets and 10 feet on wide streets.

**Table 1-2**
**Building Envelope Options in SDBD**

| Building Options* | Building Elements | R7-1 (4.0 FAR) | | C6-1 (6.0 FAR) | | C5-4, C6-4 (10.0 FAR) | | C6-4.5 (12.0 FAR) |
|---|---|---|---|---|---|---|---|---|
| | | Existing | Proposed | Existing | Proposed | Existing | Proposed | Proposed |
| Standard | Min. Base (Street wall) | 40' | 40' | 60'/60' | no change | 125'/60' | 60'/60' | 60'/60' |
| | Max. Base | 65' | 85' | 150'/125'*† | no change | 150'/125'*† | No change | 150'/125'*† |
| | Setback | 10' | 10' | 10'/15'* | no change | 10'/15'* | No change | 10'/15'* |
| | Max. Height | 80' | 160' | 210'/185'* | no change | 210'/185'* | No change | 250' |
| Tower‡ | Max. Base | | | 85'† | no change | 85'† | No change | 85'† |
| | Setback | | | 10'/15' @ 85'* 40'/50' @ 150'* | 20' @ 85'* | 10'/15' @ 85'* 40'/50' @ 150'* | 20' @ 85'* | 20' @ 85'* |
| | Lot Coverage | | | 40% @ 150' | 65% @ 150' 50% @ 300' | 40% @ 150' | 65% @ 150' 50% @ 300' | 65% @ 150' 50% @ 300' |
| | Max. Height | | | 495' | 495' | None | None | None |

Notes: FAR = Floor Area Ratio
*Wide Street (>75') / Narrow Street
†Minimum base height of 60' where street wall is required.
‡For buildings containing commercial and community facility uses.

- Change the tower height and setback envelope for the tower option in C6-1, C5-4, and C6-4 zoning districts to match that of the C6-4.5 zoning district (see Table 1-2);

- Establish a flexible height and setback envelope for the R7-1 zoning district, with a minimum base height of 40 feet, a maximum base height of 85 feet, and a maximum building height of 160 feet (see Table 1-2);
- Allow the development of property on the south side of Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension to a distance of 250 feet, to rise from the streetline without setback on Flatbush Avenue Extension and Willoughby Street, and mandate a setback at 85 feet on Albee Square West/Gold Street;
- Extend the Schermerhorn Street Height Limitation Area "B" of 140 feet and establish a new Height Limitation Area "C" of 250 feet on the blocks bounded by Smith, Nevins, Livingston, and Schermerhorn Streets. Area "B" would extend 100 feet into the blocks from the north-south streets and 85.92 feet north from the property line of Schermerhorn Street. The remainder of the blocks would be mapped as Area C;
- For properties within Schermerhorn Street Height Limitation Areas "B" and "C" that are zoned C6-4 and located within the Special Downtown Brooklyn District, permit a rear yard equivalent with a minimum depth of 60 feet. The center line of the rear yard would be permitted to be located within 10 feet of midway between street lines;
- Add an indoor bicycle parking requirement for new development sites;
- Modify retail requirement to govern ground-floor uses to a depth of 50 feet from the property line, and to require 50 percent glazing and 75 percent transparency of security gates within the SDBD. Along both sides of Willoughby Street from Boerum Place to Flatbush Avenue Extension, and facing the proposed public space, 70 percent glazing would be required;
- Modify retail requirements to allow public libraries and museums, and non-commercial art galleries as ground-floor retail;
- Reduce streetwall requirements from 100 percent to 70 percent;
- Allow loading docks and berths of up to 60 linear feet of continuous facade where ground-floor retail is required and curb cuts are permitted;
- Add a subway stair relocation requirement for development sites of more than 5,000 square feet at subway entrances to the following stations: Jay Street-Borough Hall, Lawrence Street, Hoyt-Schermerhorn Street, DeKalb Avenue, Hoyt Street, Nevins Street, Court Street, Pacific Street, and Atlantic Avenue;
- Add street wall continuity requirements to:
  - the east side of Flatbush Avenue Extension, the area currently occupied by Prince Street;
  - the north side of Willoughby Street between Flatbush Avenue Extension and Fleet Place;
  - the south side of Myrtle Avenue between Flatbush Avenue Extension and Ashland Place;
  - the west side of Duffield Street, 200 feet south of its intersection with Willoughby Street; and

  - the east side of Albee Square West\Gold Street, 200 feet south of its intersection with Willoughby Street.

- Add ground-floor retail use requirement to:
  - the south side of Myrtle Avenue between Flatbush Avenue Extension and Ashland Place;
  - the east side of Flatbush Avenue Extension between Myrtle Avenue and Willoughby Street;
  - both sides of Duffield Street between Willoughby and Fulton Streets, except for the area of the proposed Willoughby Square public space; and
  - both sides of Albee Square West/Gold Street between Willoughby and Fulton Streets; except for the area of the proposed Willoughby Square public space.
- Add fenestration and security gate transparency requirements where there is a ground-floor retail use requirement;
- Add curb cut restrictions to the east side of Flatbush Avenue Extension between Myrtle Avenue and Willoughby Street;
- Remove curb cut restrictions from the south side of Willoughby Street between Adams and Jay Streets and Duffield Street and Albee Square West/Gold Street;
- Add street tree requirements to the south side of Myrtle Avenue between Flatbush Avenue Extension and Ashland Place;
- Add a 5-foot sidewalk extension requirement to the south side of Willoughby Street between Adams and Flatbush Avenue Extension, except between Duffield Street and Albee Square West/Gold Street;
- Add signage controls;
- Clarify text regarding minimum base height of street walls (60 feet) in C5-4 and C6-4 zoning districts; and
- Clarify language regarding New York City Department of Parks and Recreation (DPR) jurisdiction over street tree planting standards.

## MAPPING ACTIONS

In order to merge blocks to create larger, more viable development sites, the proposed actions would include the demapping of the following low-traffic-volume streets:

- Red Hook Lane, between Fulton Street and Boerum Place;
- Fair Street, between Prince Street and Fleet Place;
- Pearl Street, between Fulton Street and Willoughby Street; and
- Prince Street, between Flatbush Avenue Extension and Myrtle Avenue.

The development rights generated from the demapping of these streets would be utilized in the projected development of the associated blocks and lots.

In order to provide for more rational site development on the project sites east of Flatbush Avenue Extension, the proposed actions would include the mapping of the following street:

- Extension of Fleet Place north, from Fair Street to Myrtle Avenue, at a width of 60 feet. The existing Fleet Place roadway between Fair and Willoughby Streets would be widened to 60 feet.

The proposed mapping actions would also widen the following streets in order to improve circulation in the Downtown Brooklyn area and to provide more efficient access to projected development sites:

- Willoughby Street, south side between Albee Square West/Gold Street and Flatbush Avenue Extension (the segment between Albee Square West/Gold Street and Duffield Street would be converted to one-way westbound operation), would be widened from 60 feet to 95 feet; and
- Myrtle Avenue, south side, between Flatbush Avenue Extension and the extension of Fleet Place, would be tapered from 100 feet at Flatbush Avenue Extension to the existing 75-foot width at Fleet Place.

Figure 1-9 shows the streets affected by the proposed mapping actions.

## URBAN RENEWAL PLAN MODIFICATIONS

The Downtown Brooklyn Development project would include several modifications to existing urban renewal plans for designated sites that have not yet been acquired and/or disposed and new urban renewal sites proposed for development. As described below, the modifications affect the Brooklyn Center Urban Renewal Plan, the Atlantic Terminal Urban Renewal Area/Plan and the MetroTech Urban Renewal Plan.

*BROOKLYN CENTER URBAN RENEWAL PLAN*

- Extend the urban renewal project boundary to include 9 blocks: Blocks 144, 145, 146, 150, 151, 152, 153, 154 (part), and 2061 (part);
- Designate 57 lots within the project boundary, comprising five proposed development sites that were not previously designated but are now included in the Urban Renewal Plan and Area, and are identified as sites I, L, M, O, and P in Figure 1-10:
  - I (part) Block 2061, part of Lot 1, and including the proposed demapped portions of the Prince Street and Fair Street streetbeds;
  - L Block 144, Lot 1; Block 150, Lots 1, 6, 10, 11, 19, and including the proposed demapped portions of the Pearl Street streetbed;
  - M Block 153, Lots 3, 14, 15; Block 154, Lots 1, 5, 11, 12, 36-40, and including the proposed demapped portions of the Red Hook Lane streetbed;
  - O Block 145, Lots 8, 10, 13-16, 18-22, 26, 32; and
  - P Block 146, Lots 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-48, and 50-52.
- Extend the duration of the plan to remain in effect for a period of 40 years from the date of the approval of this plan amendment, except for any property conveyed by the City prior to June 30, 2003, where the controls of the plan will remain in effect until September 12, 2010, the current expiration date of the plan. The following previously designated blocks and lots would be affected:

- I (part) Block 2060, Lots 22-27, 32, 122;
- I (part) Block 2062, Lots 1, 5, 6, 17-19, 21, 23, 24, 103;
- R Block 149, Lots 14, 15, 17, 19, 22-26, 28, 30-34, 50;
- CC (part) Block 167, Lots 15, 16, 26-28, 36;
- Block 2079, Lot 21;
- Block 2106, Lots 1, 4-7, 9, 16, 19, 24, 26, 29, 35, 40;
- Block 2107, Lots 2, 15, 24, 30, 36, 40, 41, and including the demapped Rockwell Place streetbed;
- Block 2108, Lot 1;
- Demapped Fleet Street streetbed, southern half between Flatbush Avenue Extension and DeKalb Avenue; and
- Hudson Street between DeKalb Avenue and Fulton Street.

- Modify the definition of Commercial land use within the plan to permit residential and community facilities uses;
- Modify the definition of Public Space land use within the plan to permit below-grade parking and accessory uses;
- Modify design objectives in the plan to require that on sites O and P, as shown on Figure 1-10, the streetwall shall rise to a height minimum of 80 feet and maximum of 85 feet, and then set back a minimum of 15 feet for facades facing the public space;
- Modify design objectives in the plan for the site P facade facing the public space to require retail use pursuant to the SDBD retail requirements, which call for 70 percent glazing and 75 percent transparency of security gates along Willoughby Street;
- Modify the land use for part of site I (Block 2060, Lots 22-27, 32, 122; and Block 2062, Lots 1, 5, 6, 17-19, 21, 23, 24, 103) in Figure 1-10 from Institutional/Commercial use to Commercial use;
- Delete Industrial and Related use, and Institutional/Commercial uses as a land use category;
- De-designate Block 2095, Lots 9, 10, 25-29, 38-40, 42, 43, 45, 53, 57, 59 (known as Site 6 in the plan); Block 161, Lots 1, 3 and 52-64 (known as Site 3B in the plan); Block 161, Lots 27, 30, and 33 (known as Site 3C in the plan); and Block 160, Lots 1 and 36;
- Establish land uses for the proposed designated sites:

| ***Sites (per Figure 1-10)*** | ***Proposed Land Use*** |
|---|---|
| I (part: Block 2061, part Lot 1) | Commercial |
| L | Commercial |
| M | Commercial |
| O | Commercial |
| P (part: Block 146, Lots 23, 29, 34-36, part 18 and 37) | Public |
| P (part: Block 146, Lots 2, 7, 11-17, 41-43, 46-52, part 18 and 37) | Commercial |

- Provide for disposition approval for the following proposed newly designated and previously designated blocks and lots that would be extended as part of the plan amendment:
  - I — Block 2060, Lots 22-27, 122, part 32; Block 2061, part Lot 1; Block 2062, Lots 1, 5, 6, 17-19, 21, 23, 24, 103; and including the proposed demapped portions of the Prince Street and Fair Street streetbeds;
  - L — Block 144, Lot 1; Block 150, Lots 1, 6, 10, 11, 19, and including the proposed demapped portions of the Pearl Street streetbed;
  - M — Block 153, Lots 3, 14, 15; Block 154, Lots 1, 5, 11, 12, 36-40, and including the proposed demapped Red Hook Lane streetbed;
  - O — Block 145, Lots 8, 10, 13-16, 18-22, 26, 32;
  - P — Block 146, Lots 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-48, 50-52;
  - R — Block 149, Lots 14, 15, 17, 19, 22-26, 28, 30-34, 50;
  - CC — Block 167, Lots 15, 16, 26-28, 36;
  - Block 2106, Lots 4-7, 9, 16, 19, 24, 26, 29, 35, 40;
  - Block 2107, Lots 2, 15, 24, 30, 36, 40, 41, and including the demapped Rockwell Place streetbed; and
  - Block 2108, Lot 1.
- The plan will reflect the following changes to the City Map (as described in greater detail above, under *Mapping Actions*):
  - Demapping:
    - Red Hook Lane, between Fulton Street and Boerum Place;
    - Fair Street, between Prince Street and Fleet Place;
    - Pearl Street, between Fulton Street and Willoughby Street; and
    - Prince Street, between Flatbush Avenue Extension and Myrtle Avenue.
  - Mapping:
    - Map Fleet Place north, from Fair Street to Myrtle Avenue, at a width of 60 feet. The existing Fleet Place streetbed between Fair and Willoughby Streets would also be widened to 60 feet;
    - Widen Willoughby Street, south side, between Albee Square West/Gold Street and Flatbush Avenue Extension from 60 feet to 95 feet;
    - Taper Myrtle Avenue, south side, between Flatbush Avenue Extension and the extension of Fleet Place from 100 feet at Flatbush Avenue Extension to the existing 75-foot width at the extension of Fleet Place; and
    - Eliminate Q parcels (properties not to be acquired under the plan) from the text and maps and revise the plan text to reflect the standard format for urban renewal plans.
- Supplementary Controls: site M (BCURP Sites 14, 14A, 15, 15A and 15B) shall be developed as a single entity and shall include at least 100,000 square feet of floor area for a

Post-Graduate Educational Center classified under the Zoning Resolution as Use Group 3, "Community Facility: College or university use, including professional schools but excluding business colleges or trade schools."

- Requirement for each redeveloper to perform all mitigation measures identified in the EIS for this plan prior to the issuance of a certificate of occupancy.

*ATLANTIC TERMINAL URBAN RENEWAL AREA/PLAN*

- Extend the duration of the plan to remain in effect for a period of 40 years from the date of the approval of this plan amendment, except for any property conveyed by the City prior to June 30, 2003 where the controls of the plan will remain in effect until July 25, 2008, the current expiration date of the plan;
- Modify the definition of Commercial land use within the plan to permit other uses permitted by the Zoning Resolution, including, but not limited to, community facilities and accessory uses;
- Eliminate restrictions on maximum floor area and maximum commercial floor area for site EE (Block 2110);
- Provide disposition approval for City-owned site EE (Block 2110); and
- Eliminate Q parcels from the text and maps and revise the plan text to reflect the standard format for urban renewal plans.

*METROTECH URBAN RENEWAL PLAN*

- Change the land use for City-owned Block 2060, Lot 8 from street widening to open space use;
- Provide disposition approval for City-owned Block 2060, Lot 8; and
- Eliminate Q parcels from the text and maps and revise the plan text to reflect the standard format for urban renewal plans.

The Schermerhorn-Pacific Urban Renewal Area is also located in the project area. No modifications to this plan are proposed as part of the project. Site Z is located within the boundaries of this urban renewal area; however, site Z is not identified as a designated site.

## DISPOSITION OF CITY-OWNED PROPERTY

The actions would potentially facilitate the disposition to EDC of the City's interest in real property for the following sites: Block 140, Lot 111; Block 2107, Lot 36, and other existing City-owned property or property that will become City-owned that is located within the boundaries of the proposed amended BCURP, as identified in *Urban Renewal Plan Modifications.*

## OTHER ACTIONS

Special permits would be required for four parking facilities proposed as part of the project. The 694-space below-grade public parking facility at Willoughby Street between Albee Square West/Gold Street and Duffield Street, and a 457-space partially below-grade parking facility on the south side of Myrtle Avenue east of Flatbush Avenue Extension, are proposed to accom-

modate parking demand associated with new development. A 465-space public parking facility on Block 2107 and a 466-space below-grade public parking facility on site EE are also proposed to accommodate parking demand associated with the BAM cultural district. The public parking facility on Block 2107 is not part of the projected or potential development scenarios.

The MetroTech General Large-Scale Development Special Permit would be modified to reallocate existing floor area, allocate newly created floor area generated from the proposed rezoning of Block 142, Lot 1 [site C], waive height and setback requirements, and to clarify that commercial and community facility uses are allowed at this projected development site.

Approval for site selection for a visual and performing arts public library on Block 2110, Lot 3 would also be sought. As described above, BAM LDC is working to create a mixed-use multicultural arts district in the area surrounding the Brooklyn Academy of Music. An anchor component of the envisioned district is the proposed visual and performing arts library on City-owned site EE, which would be a facility of the Brooklyn Public Library. The proposal calls for a 140,000-square-foot facility on six levels housing reading rooms, archives, galleries, media labs, an auditorium, performance space, and a multimedia lounge.

The New York State Urban Development Corporation, Empire State Development Corporation (ESDC) is the State Environmental Quality Review Act (SEQRA) lead agency on behalf of the Empire State Local Development Corporation (ESLCD), a local development corporation created by the New York Job Development Authority. It is anticipated that ESLDC will authorize funding through the Port Authority Transportation, Economic Development & Infrastructure Renewal (TEDIR) Program in support of the development of the proposed visual and performing arts library, below-grade parking facility and outdoor public area on Block 2110.

## F. ENVIRONMENTAL REVIEW AND PROJECT STATUS

The proposed zoning map and text changes, mapping actions, urban renewal amendments, disposition of the City's interest in real property, and special permits are subject to the City's land use approval process and environmental review, as described below.

### UNIFORM LAND USE REVIEW PROCEDURE (ULURP)

The City's ULURP, mandated by Sections 197-c and 197-d of the City Charter, is a process specifically designed to allow public review of the proposed actions at four levels: Community Board, Borough President, New York City Planning Commission (CPC), and City Council. The procedure sets time limits for review at each stage to ensure a maximum total review period of approximately seven months. The process begins with certification by CPC that the ULURP application is complete.

The application is then referred to Brooklyn Community Board 2, which has up to 60 days to review and discuss the proposal, hold a public hearing, and adopt a resolution regarding the proposed project. Once this is complete, the Brooklyn Borough President has up to 30 days to review the project if he chooses. CPC then has up to 60 days for review of the application, during which time a public hearing is held. Following the hearing, CPC may approve or disapprove the application. The required public hearing (see below) for the DEIS may be held jointly with the CPC ULURP hearing. Comments made at the DEIS public hearing are incorporated into a Final Environmental Impact Statement (FEIS); the FEIS must be completed at least 10 days before the CPC action.

CPC forwards the application to the City Council, which has 50 days in which to consider the proposed project. Following the Council's vote, the Mayor may approve or veto the proposed actions. The City Council may override the mayoral veto.

## ENVIRONMENTAL REVIEW

Responding to the State Environmental Quality Review Act (SEQRA) and its implementing regulations, New York City has established rules for its environmental review process, (City Environmental Quality Review, or CEQR). The environmental review provides a means for decision-makers to systematically consider environmental effects along with other aspects of project planning and design; to evaluate reasonable alternatives; and to identify, and mitigate when practicable, any significant adverse environmental effects. Most recently revised in 1991, CEQR rules guide environmental review through the following steps:

- *Establishing a Lead Agency.* Under CEQR, the "lead agency" is the public entity responsible for conducting environmental review. Often, the lead agency is also the entity responsible for the proposed actions. The Office of the Deputy Mayor for Economic Development and Rebuilding is the CEQR lead agency for these actions. This planning effort also involves the following City and State agencies: the Empire State Development Corporation (ESDC), the New York City Department of City Planning (DCP), the New York City Department of Housing and Preservation and Development (HPD), and the New York City Department of Citywide Administrative Services (DCAS) for dispositions of City-owned property. These agencies must make a discretionary decision on one or more of the proposed actions and will act as "involved" agencies. In addition, the New York City Housing Development Corporation (HDC) has been included as an interested agency in order to facilitate their potential funding of a mixed-income housing program for the project sites.

- *Determination of Significance.* The lead agency's first charge is to determine whether the proposed actions may have a significant impact on the environment. To do so, it must prepare an Environmental Assessment Statement (EAS). The proposed Downtown Brooklyn Development Project was the subject of an EAS that was issued on April 15, 2003. This document included a screening analysis to determine the actions' potential to have significant impacts in the different technical areas set forth in the *CEQR Technical Manual.* The lead agency determined that the actions may have a significant adverse effect on the environment in other technical areas, requiring that an environmental impact statement (EIS) be prepared, and issued a Positive Declaration.

- *Scoping.* Once the lead agency issues a Positive Declaration, it must then issue a draft scope of work for the ensuing EIS. "Scoping" is the process of focusing the environmental impact analyses on the key issues. CEQR requires a public scoping meeting as part of the process. Such a meeting was held for the proposed rezoning actions, Special Permits and other land use actions on May 20, 2003, and additional comments were accepted during a 10-day period that followed. Comments were received and the draft scope was revised to reflect those comments. A final scope was issued and served as the framework for the DEIS analyses.

- *Draft Environmental Impact Statement (DEIS).* In accordance with the final scope of work, a DEIS is prepared. The lead agency and other involved City agencies will review all aspects of the document, calling on other City agencies to help, as deemed appropriate. Once the

lead agency is satisfied that the DEIS is complete, it issues a Notice of Completion and circulates the DEIS for public review. The DEIS must be deemed complete before the ULURP application can also be found complete. A DEIS was prepared for the proposed actions, and a notice of completion for the DEIS was issued on November 28, 2003.

- *Draft Supplemental Environmental Impact Statement (DSEIS).* Subsequent to the issuance of the DEIS, an announcement was made regarding the potential development of a large, mixed-use arena project with commercial, residential and retail uses along Atlantic Avenue just east of the project area. The size of the proposed Arena project and its proximity to the Downtown Brooklyn Development project area necessitated revisions to the future baseline conditions analyzed in the DEIS. A positive declaration and notice of intent to prepare a Draft Supplemental Environmental Impact Statement (DSEIS) was issued on January 22, 2004, and a public scoping meeting was held on February 23, 2004. Additional comments were accepted during a 10-day period that followed, until Thursday, March 4, 2004. Comments were received, and the draft scope of analyses for the DSEIS was revised to reflect those comments. A final supplemental scope was issued and served as the framework for the DSEIS.

  The Arena project will undergo its own separate environmental review, which has not been started, in accordance with the State Environmental Quality Review Act. It is anticipated that the Empire State Development Corporation will serve as the lead agency for environmental review of that project. Although the DSEIS is not linked to the approval of the Arena project or any of its components, the purpose of the DSEIS was to incorporate the overall Arena project in the future baseline condition in the same way that other unbuilt projects had already been accounted for in the DEIS. A Notice of Completion was issued and the DSEIS was published on March 8, 2004.

- *Public Review.* The public review period, which must extend for a minimum of 30 days, allows the public to review and to comment on the DEIS/DSEIS either in writing or at a public hearing convened for the purpose of receiving such comments. As noted above, where the CEQR process is coordinated with another City process that requires a public hearing, such as ULURP, the hearings may be held jointly. In any event, the lead agency must publish a notice of the hearing at least 14 days before it takes place and must accept written comments for at least 10 days following the close of the hearing. All substantive comments received at the hearing or during the comment period become part of the CEQR record and must be summarized and responded to in an FEIS. Public review of the DEIS/DSEIS began on March 8, 2004 with the issuance of the Notice of Completion and publication of the DSEIS. A public hearing was held on March 24, 2004 at Klitgord Auditorium at the New York City College of Technology to accept oral comments. The oral comments and written submissions on the DEIS/DSEIS received through April 7, 2004, the close of the public comment period, were considered in the preparation of the Final Environmental Impact Statement (FEIS).

- *Final Environmental Impact Statement (FEIS).* The FEIS responds to all substantive comments made on the DEIS/DSEIS, either in a separate chapter or in changes to the body of the text, graphics, and charts. The lead agency has determined that the FEIS is complete and has issued a Notice of Completion.

- *CEQR Findings.* The lead agency and any other involved agency making a discretionary decision on one or more of the proposed actions must each adopt a formal set of written

findings based on the FEIS and reflecting its conclusions about the significant adverse environmental impacts of the proposed project, potential alternatives, and potential mitigation measures. The findings may not be adopted until 10 days after the Notice of Completion has been issued for the FEIS. Once findings are adopted, the lead and involved agencies may take their actions. This means that in the ULURP process, CPC and the City Council must wait at least 10 days after the FEIS is complete to take any action on a given application.

The lead agency is required to take a "hard look" at the environmental effects of a proposed project and, to the maximum extent practicable, avoid or mitigate adverse impacts on the environment, as consistent with social, economic, and other essential considerations. The EIS identifies and analyzes the significant environmental impacts of the proposed development and how those impacts could be avoided or minimized, providing a means for agencies to consider environmental factors and choose among alternatives in their decision-making processes. The discussion below presents the various assumptions used in the DEIS in its analysis of project effects. A description of a reasonable worst-case development scenario, which assumes development that is likely to occur within the analysis period, is present below as the proposed framework for the DSEIS analysis.

## G. DEVELOPMENT FRAMEWORK FOR EIS ANALYSIS

In considering the potential environmental impacts of the proposal to alter use, floor area, and other regulations within the project's study area, it is necessary to examine reasonable development consequences of these land use and zoning changes. Without a reasonable but conservative future development scenario, it would not be possible to assess the range of effects (e.g., traffic, air quality, neighborhood character) that might occur as a result of the proposed actions.

### ANALYSIS YEAR

CEQR assessments of large area-wide zoning proposals not associated with specific development projects are based upon a 10-year build period. This is the time frame that can be reasonably predicted without engaging in highly speculative projections. Thus, the EIS will address a development program that could reasonably be constructed by 2013. Although the proposed actions affect the entire project area as previously defined, the analysis of changes to allowable use and bulk and other land use provisions are focused on those sites that are reasonably likely to undergo development within the foreseeable 10-year timeframe; these would be known as "projected sites." Sites that are unlikely to be developed within the 10-year timeframe would be discussed qualitatively and are considered to be "potential sites."

### PROJECTED AND POTENTIAL SITE PROGRAMS

To determine the size and location of future development, as well as the likelihood of that development's timeframe as either a projected or potential site, each of the parcels affected by the proposed actions was assessed using a screening procedure, which is detailed below. The remainder of the parcels within the proposed project area are considered to be neither projected nor potential sites since they would not likely undergo major redevelopment as a result of the proposed actions.

The following criteria were used to determine projected sites that are likely to be developed within the 2013 timeframe:

- Commercial and retail sites located nearest the existing Downtown Brooklyn commercial core would likely be developed first;
- Commercial sites should have direct connection, be adjacent to, or in close proximity to mass transit;
- Sites that would not require any subsequent discretionary actions (except the public review of business terms of the land disposition pursuant to Section 384(b)(4) of the City Charter) prior to development, should the proposed actions be approved and implemented; and
- Anticipated public acquisition of private property to facilitate the creation of viable development sites.

Table 1-3 presents the projected development parcels with their existing and proposed uses and FARs.

Potential sites considered unlikely to be developed within the 2013 timeframe include:

- Publicly owned or publicly controlled development sites, where subsequent actions (other than the public review of business terms of the land disposition pursuant to Section 384(b)(4) of the City Charter) are required for development; and
- Sites located farther from the commercial core or residential neighborhoods.

Table 1-4 presents the potential development parcels with their existing and proposed uses and FARs.

## REASONABLE WORST-CASE DEVELOPMENT SCENARIO

The discussion below details the methodology and criteria established for identifying projected and potential development sites and the development of a reasonable worst-case scenario for impact analysis in the EIS.

### *OFFICE DEVELOPMENT*

With the proposed actions, several large sites would accommodate commercial development up to 12.0 FAR, which represents a substantial increase in FAR from the FAR permitted today, which ranges from 1.0 to 10.0. The new office tenants would most likely be drawn from traditional Manhattan tenants with back-office operations who would consider relocating to less expensive but convenient space in Downtown Brooklyn. The proposed actions would also help to attract new business to the area.

**Table 1-3**
**Projected Sites: Lot Area, Uses, and ZFA***

| Site Ref.[1] | Blocks: Lots | Total Lot Area[2] | Existing Uses | Existing Built Floor Area | Existing Maximum ZFA[2] | Proposed Uses | Proposed Maximum ZFA[2] |
|---|---|---|---|---|---|---|---|
| C | B 142: 1 | Large Scale Plan | Com. Fac. (Polytech) | 72,000 | 310,000 | Com. Fac. Office | 800,000 |
| G | B 2049: 8 | 10,000 | Industrial Residential | 60,000 | 10,000 | Residential Retail | 81,000 |
| I(A) | B 2060: 22-27, 32 (part), 122; B 2061: 1 (part); B 2062: 6 (part) | 64,000 | Retail Com. Fac. | 41,000 | 156,000 | Retail Residential Pub. Parking | 420,000 |
| J | B 2061: 1 (part) | 86,000 | Retail | 38,000 | 209,000 | Residential Retail | 345,000 |
| M | B 153: 3, 14, 15; B 154: 1, 5, 11, 12, 36-40; | 71,000 | Residential Retail Office | 235,000 | 707,000 | Retail Office | 848,000 |
| O | B 145: 8,10, 13-16, 18-22, 26, 32 | 49,000 | Residential Retail Parking | 85,000 | 297,000 | Retail Office | 594,000 |
| P | B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52 | 87,000 | Residential Retail Parking | 158,000 | 524,000 | Retail Office Public Space Pub. Parking | 1,047,000 |
| Q | B 149: 1, 49 | 137,000 | Retail Parking | 373,000 | 824,000 | Retail Office | 1,648,000 |
| S | B 2093: 1 | 51,000 | Office Retail | 376,000 | 304,000 | Office Retail | ±12,000[3] |
| AA | B 165: 17-19, 58 | 18,000 | Parking | 1,000 | 109,000 | Residential Retail | 181,000 |
| BB | B 165: 29 | 21,000 | Retail Office | 25,000 | 124,000 | Residential Retail | 207,000 |
| EE | B 2110: 3 | 58,000 | Parking | 2,000 | 12,000 | Com. Fac. Cultural Retail | 376,000 |
| **Total Floor Area/ZFA:** | | **652,000** | | **1,466,000** | **3,586,000** | | **6,559,000** |

**Notes:** ZFA = Zoning Floor Area
* Since issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.
[1] Site reference corresponds to Figure 1-1.
[2] Based on preliminary estimate of lot size and calculated ZFA.
[3] Infill of arcade only.

The history of office development in New York City since World War II is that demand continually increases in Manhattan over the long term due to the growth in office-type jobs, the requirements of technology and efficiency in providing office space, and the changing character and occupancy rate of the space. In the past 30 years, it has been clear that demand for modern Class A office space actually exceeds supply in Manhattan's two Central Business Districts (CBDs). In a search for affordable space, companies have relocated to developments in the nearby suburbs, particularly New Jersey, and to sites out of the region in times of particular high demand and high rents. The likely out-of-City relocation areas are the New Jersey "Gold Coast";

**Table 1-4**
**Potential Sites: Lot Area, Uses, and ZFA***

| Site Ref.[1] | Blocks: Lots | Total Lot Area[2] | Existing Uses | Existing Built Floor Area | Existing Maximum ZFA[2] | Proposed Uses | Proposed Maximum ZFA[2] |
|---|---|---|---|---|---|---|---|
| A | B 128: 1, 26 | 111,000 | Com. Fac. (NYC Tech) | 636,000 | 723,000 | Com. Fac. Retail Office | 1,112,000 |
| B | B 131: 1 (part) | 160,000 | Com. Fac. (NYC Tech) | 451,000 | 1,037,000 | Com. Fac. Retail Office | 1,595,000 |
| D | B 133: 1, 5, 13, 15 | 42,000 | Retail Com. Fac. | 109,000 | 42,000 | Residential Retail | 416,000 |
| E | B 134: 1, 5, 38, 41 | 10,000 | Residential Retail | 10,000 | 10,000 | Residential Retail | 97,000 |
| F | B 134: 30 | 6,000 | Warehouse | 27,000 | 6,000 | Residential Retail | 39,000 |
| H | B 2049: 2 | 26,000 | Parking Auto Repair | 13,000 | 62,000 | Residential Retail | 255,000 |
| I (B) | B 2060: 32 (part); B 2062: 1, 5, 6 (part), 17-19, 21, 23, 24, 103 | 45,000 | Retail Community Facilty | 38,000 | 109,000 | Retail Office | 670,000 |
| L | B 144: 1 B 150: 1, 6, 10, 11, 19 | 41,000 | Retail Office | 89,000 | 405,000 | Retail Hotel | 486,000 |
| N | B 152: 37 | 13,000 | Retail | 27,000 | 81,000 | Residential Retail | 161,000 |
| R | B 149: 14, 15, 17, 19, 22-26, 28, 30-34, 50 | 47,000 | Retail Office | 131,000 | 285,000 | Retail Office | 569,000 |
| T | B 160: 18 | 13,000 | Retail | 58,000 | 79,000 | Residential Retail | 131,000 |
| U | B 161: 27, 30, 33 | 19,000 | Retail | 68,000 | 112,000 | Residential Retail | 186,000 |
| V | B 161: 18 | 15,000 | Retail | 30,000 | 90,000 | Residential Retail | 150,000 |
| W | B 160: 29 | 12,000 | Retail | 48,000 | 72,000 | Residential Retail | 120,000 |
| Y | B 164: 1, 13 | 34,000 | Retail Office Parking | 72,000 | 203,000 | Residential Retail | 339,000 |
| Z | B 164: 29, 31, 42-44 | 21,000 | Retail Parking | 10,000 | 128,000 | Residential Retail | 213,000 |
| CC | B 167: 15, 16, 26-28, 36, 42 | 49,000 | Residential Retail Parking | 70,000 | 292,000 | Residential Retail | 487,000 |
| DD | B 174: 9, 13, 18, 23, 24 | 40,000 | Residential Retail | 93,000 | 238,000 | Residential Retail | 238,000 |
| **Total Floor Area/ZFA:** | | **704,000** | | **1,980,000** | **3,974,000** | | **7,264,000** |

**Notes:** *Since issuance of the DEIS/DSEIS, site X has been removed from the proposed development plan.
ZFA = Zoning Floor Area
[1] Site reference corresponds to Figure 1-1.
[2] Based on preliminary estimate of lot size and calculated ZFA.

Princeton and Morristown in New Jersey; Stamford, Connecticut; and Westchester County, New York. Some of the demand for CBD-type space may be met by relocation to the suburbs, but more recently, relocation to boroughs outside of Manhattan has been an option, as well.

Together, the projected and potential development sites could total approximately 6.7 million square feet of office development. However, the appeal of these sites is primarily for back-office operations, particularly for those that require larger floorplates. This segment of the market is more limited. Therefore, although it is theoretically possible to develop 6.7 million square feet within the project area by 2013, this is not considered likely. Actual development will depend heavily on competition from suburban locations and marketing efforts.

The following screening criteria for commercial development, which were developed in consultation with DCP, were considered for each of the parcels affected by the proposed actions in order to determine the site's attractiveness for commercial use, its bulk, and its development timeframe:

- The site should have a 30,000-square-foot minimum lot area to allow for the design of large floorplates required by modern commercial office developments;
- The proposed parcels subject to a rezoning action must comprise more than 50 percent of the site in order to optimize the development potential resulting from the increase in FAR;
- The existing structures on a site should not be built to more than 50 percent of the proposed zoning; an underbuilt site under the allowable zoning would be a more likely candidate for redevelopment; and
- The lots comprising the commercial development site should not have more than three owners; multiple ownerships make it difficult to assemble the parcels into a large contiguous footprint for development in a timely manner.

Based on the above screening criteria, it is reasonable to assume that approximately 4.6 million square feet of office development would occur in the next 10 years on sites identified by the City, as shown in Table 1-5. Thus, the sites identified for projected office development would be analyzed in detail as part of the reasonable worst-case scenario. Table 1-6 presents the development assumed for the potential sites by use.

*RESIDENTIAL DEVELOPMENT*

Many of the same reasons that attract corporate tenants to Downtown Brooklyn also attract residents to the area, such as proximity to an extensive mass transit system and the presence of cultural/academic institutions. Over the past decade, the City, particularly in the boroughs of Manhattan and Brooklyn, has experienced a very robust housing market. As a result, a significant number of housing units have been built in and around Downtown Brooklyn. It can be expected that demand for additional housing would continue as part of the Citywide trend as well as a direct result of the proposed actions. Thus, as part of the impact analysis, it is necessary to make reasonable estimates of likely residential development for the projected sites.

## Table 1-5
## Projected Sites: Proposed Program by Use*

| Site Ref.** | Proposed Floor Area by Use (in ZSF) | | | | |
|---|---|---|---|---|---|
| | Office | Retail | Residential | Community Facility | Other |
| C | 720,000 | | | 80,000 | |
| G | | 10,000 | 71,000 | | |
| I (A) | | 60,000 | 300,000 | | 457-space Public Parking Facility |
| J | | 86,000 | 259,000 | | |
| M | 778,000 | 70,000 | | | |
| O | 544,000 | 50,000 | | | |
| P | 999,000 | 48,000 | | | 1.15-acre Public Space (Willoughby Square), 694-space Public Parking Facility |
| Q | 1,233,000 | 415,000*** | | | |
| S | 337,000 | 51,000 | | | |
| AA | | 18,000 | 163,000 | | |
| BB | | 21,000 | 186,000 | | |
| EE | | 15,000 | | 140,000 (Visual and Performing Arts Library) | 40,000 Cultural (Theater) 466-space Public Parking Facility |
| **Total Floor Area** | **4,611,000** | **844,000** | **979,000 (approx. 979 dwelling units)** | **220,000** | **1,617 spaces Public Parking, 1.15 acres Public Space, 40,000 sf Cultural** |

**Notes:** * Since issuance of the DEIS/DSEIS, site K has been removed from the proposed development plan.
** Site reference corresponds to Figure 1-1.
*** The majority of retail use on this site is the existing Gallery at Fulton Street, which would remain.
SF = Square Feet, ZSF = Zoning Square Feet

## Table 1-6
## Potential Sites: Assumed Program by Use*

| Site Ref.** | Proposed Floor Area by Use (in ZSF) | | | | |
|---|---|---|---|---|---|
| | Office | Retail | Residential | Community Facility | Other |
| A | 450,000 | 50,000 | | 599,000 | |
| B | 450,000 | 50,000 | | 739,000 | |
| D | | 42,000 | 374,000 | | |
| E | | 10,000 | 88,000 | | |
| F | | 6,000 | 33,000 | | |
| H | | 26,000 | 230,000 | | |
| I (B) | 625,000 | 45,000 | | | |
| L | | 41,000 | | | 445,000-sf Hotel |
| N | | 13,000 | 148,000 | | |
| R | 522,000 | 47,000 | | | |
| T | | 13,000 | 118,000 | | |
| U | | 19,000 | 168,000 | | |
| V | | 15,000 | 135,000 | | |
| W | | 12,000 | 108,000 | | |
| Y | | 34,000 | 305,000 | | |
| Z | | 21,000 | 191,000 | | |
| CC | | 49,000 | 438,000 | | |
| DD | | 40,000 | 199,000 | | |
| **Total Floor Area** | **2,047,000** | **533,000** | **2,535,000 (approx. 2,535 dwelling units)** | **1,338,000** | **445,000-sf Hotel** |

**Notes:** * Since issuance of the DEIS/DSEIS, site X has been removed from the proposed development plan.
** Site reference corresponds to Figure 1-1
SF = Square Feet, ZSF = Zoning Square Feet

The following screening criteria for residential development, which were developed in consultation with DCP, considered each of the parcels affected by the proposed actions in order to determine the site's attractiveness for residential use, its bulk, and its development timeframe:

- The site should have a 10,000-square-foot minimum lot area to allow for the rational design of residential floorplates at an FAR of 10, and to take full advantage of additional FAR;
- Like the office criteria, the proposed parcels subject to a rezoning action must comprise more than 50 percent of the site in order to optimize the development potential resulting from the increase in FAR;
- Like the office criteria, the existing structures on a site should not be built to more than 50 percent of the proposed zoning. An underbuilt site under the allowable zoning would be a more likely candidate for redevelopment;
- As with the office criteria, the lots comprising the residential development site should not have more than three owners. Multiple ownerships make it difficult to assemble the parcels into a large contiguous footprint for development in a timely manner; and
- Currently underbuilt manufacturing buildings of three or more stories located in areas where the proposed zoning would permit new residential use could be converted to residential units with the construction of two additional floors.

Based on discussions with site owners, evaluation of housing market trends, and application of the above criteria, it is reasonable to assume that approximately 979,000 square feet of residential development (or approximately 979 units based on average size of 1,000 square feet per unit) could be completed and occupied by 2013 and would be analyzed in detail as part of the reasonable worst-case scenario.

The potential sites would be discussed qualitatively with respect to their potential effects on the EIS's environmental impact analysis areas. This would include a discussion of the transfer of unbuilt development rights. With the proposed increase in residential FAR, there could be a greater incentive for owners and developers to make use of zoning lot mergers. In consultation with DCP, the project examined adjacent lots that could benefit from zoning lot mergers, which would allow for additional residential development. The analysis indicates that approximately 208,000 square feet of additional floor area may be available for residential development (or approximately 208 units based on average size of 1,000 square feet per unit).

*RETAIL AND INSTITUTIONAL USES*

The project also assumes that approximately 844,000 square feet of retail could be developed by 2013. Of this retail use, approximately 415,000 square feet would be associated with a large mixed-use commercial/retail development proposed on site Q, a projected site. The balance of the retail space would mostly comprise ground-floor retail use at the other commercial sites and certain residential development sites. These ground-floor retail uses would predominantly serve proposed commercial and residential uses.

Retail was also assumed for the ground-floor uses on the potential development sites. Based on evaluations of lot size, this retail use could total approximately 533,000 square feet. This is a reasonable assumption given that some of the goals of the project are to foster new and varied retail opportunities and to enhance and enliven street frontages.

## ILLUSTRATIVE BULK CONFIGURATIONS

To assess the visual and contextual impacts of the proposed actions, bulk configurations all of which conform to the proposed zoning were formulated by DCP to illustrate the development that could be created on the project sites that have been identified as part of the worst-case development scenario (see Figures 1-11 through 1-13). Actual development on any of the development scenario sites may differ from what is shown on the bulk configurations.

## FUTURE BASELINE CONDITION

The baseline or No Build condition ("The Future Without the Proposed Actions") assumes that none of the discretionary actions proposed as part of the Downtown Brooklyn Development project are adopted. Development in the baseline condition would be limited to those projects that would be developed independently of the proposed project or project parcels that would likely be developed under the current zoning regulations and land use policies (see Table 1-7 and Figure 1-14).

The list of No Build projects has been updated as new information has become available between issuance of the Draft and Final Scope of Analyses and subsequent to issuance/certification of the DEIS. These updates include refinements to a site program's uses and size, and also includes new development projects not previously disclosed. The additions include the projected development of two sites within the Atlantic Terminal Urban Renewal Area (noted in Table 1-7 as Atlantic Center and Shops at Atlantic Center, Site 5). Although these developments were proposed last year, discussions with the City did not reach the level that would require incorporating the potential projects into the No Build condition. A potential developer of these sites has since made a firmer proposal, and the sites are now included in the baseline condition in order to be as conservative as possible, while remaining focused on realistic development. The programs listed in Table 1-7 represent the maximum build-out possible under current zoning and the ATURP; there are no detailed design plans for the sites at this time.

The future baseline condition also includes the proposed Atlantic Yards Arena and Redevelopment project. The Arena project is proposed for an approximately 24-acre site bounded by Flatbush, Atlantic, and Vanderbilt Avenues and Dean Street at the southeastern edge of Downtown Brooklyn. The principal components of the project are listed below in Table 1-7. This project will undergo a separate environmental review in accordance with SEQRA. It is anticipated that the Empire State Development Corporation (ESDC) will serve as the lead agency. Several actions are expected to be sought by the Arena project under the SEQR process, including overrides of local zoning regulations related to density, allowable uses, height and setback waivers, street closures and widenings, and transfer of floor area across zoning districts. As noted above, although the Downtown Brooklyn Development project is not linked to the approval of the Arena project or any of its components, the DSEIS was prepared to incorporate the overall Arena project in the future baseline condition in the same way that other unbuilt projects had already been accounted for in the DEIS.

The technical analyses in Chapters 2 through 19 assess impacts in 2013 without and with the proposed actions. Chapter 20 assesses mitigation for identified significant adverse impacts; and Chapter 21 considers alternatives to the implementation of all or certain aspects of the project's proposed actions.

**Table 1-7**
**Development Projects Proposed for Study Area by 2013**

| No. | Name/Address | Build Year | Residential Use | Office/ Commercial Use | Other Uses |
|---|---|---|---|---|---|
| 1 | 9 MetroTech (NW corner Flatbush Avenue Extension and Myrtle Avenue) | 2003 | | 670,000 square feet (sf) for Empire Blue Cross-Blue Shield, NYC Human Resources Administration | 272-space parking facility (includes 133 public spaces), 6,000 sf retail |
| 2 | 60-82 Washington Street | 2005 | 254 units | | |
| 3 | 110 Livingston Street | | 245 units | | 6,000 sf theater, 225 below-grade parking spaces |
| 4 | Atlantic and Court (NE corner of Court Street) | 2004 | 320 units | | 20,000 sf retail, 40,000 sf YMCA, 700 car public parking facility |
| 5 | 330 Jay Street | 2005 | | 170,000 sf | 780,000 sf court space, 150-space accessory car parking facility |
| 6 | Atlantic Avenue and Smith Street (Block 176) | 2004 | 50 units | 31,500 sf | 15,000 sf ground-floor retail + 8,500 sf community facility, 130 space parking facility |
| 7 | Atlantic Center | (2008) | 711 units | 875,000 sf | 395,000 sf ground-floor retail (same as in existing conditions) |
| 8 | Atlantic Terminal | 2004 | | 470,000 sf | 470,000 sf retail, rehabilitated LIRR station |
| 9 | BAM LDC East (Block 2108 bounded by Ashland Place, Fulton, Lafayette and St. Felix Streets) | 2004 | 100,000 sf | | 60,000 sf cultural uses |
| 10 | BAM LDC North (Block 2107 bounded by Ashland and Rockwell Places and Lafayette and Fulton Streets) | | 570,000 sf | | 10,000 sf retail, 7,000 sf open space, 43,000 sf dance center, 160,000 sf museum/gallery, 50,000 sf theater, and 465-space parking facility |
| 11 | Atlantic Avenue at NW corner of Court Street | 2003 | | | 10,900 sf pharmacy |
| 12 | Bond Street Garage | 2004 | | | 18,185 sf retail |
| 13 | Bridge Plaza Rezoning (area bounded by Tillary, Prince, Nassau and Jay Streets) | 2004 | 295 anticipated | | Rezoning from M1-1 to R6B, C6-2 and C4-3 |
| 14 | Bridgefront Condominiums (42 Main Street) | 2003 | 21 units | | |

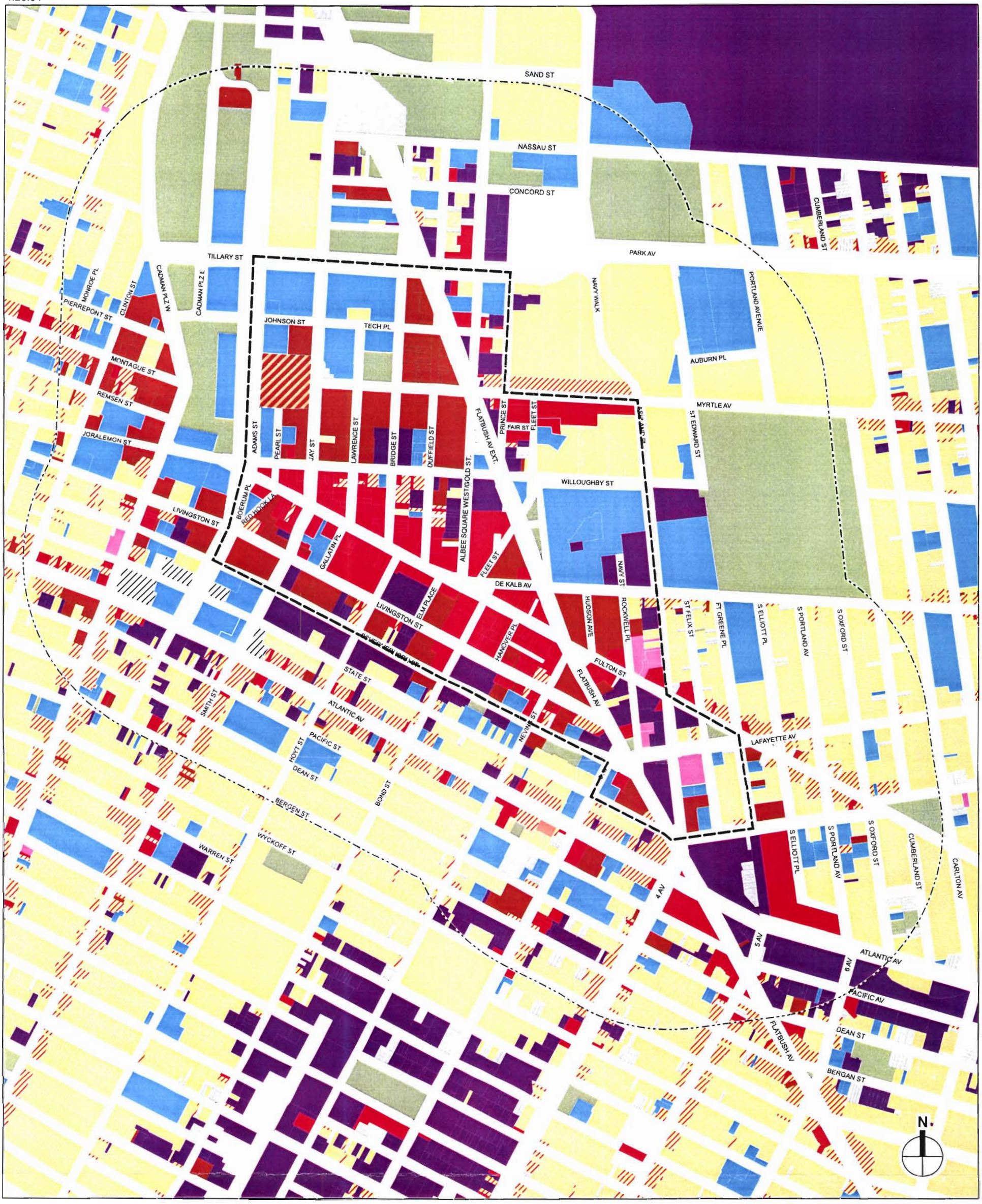
**Table 1-7 (cont'd)**
**Development Projects Proposed for Study Area by 2013**

| No. | Name/Address | Build Year | Residential Use | Office/ Commercial Use | Other Uses |
|---|---|---|---|---|---|
| 15 | Brooklyn Bridge Park | | | | 70-acre park on East River shoreline, including open spaces, cultural facilities, hotel, marketplaces, restaurants, indoor recreation centers, education center, marina for a total of 1.5 million sf built space; 150,000 sf recreation center on Pier 5, hotel and conference center on upland portion of Pier 1 |
| 16 | Brooklyn Law School dormitory (NW corner State Street and Boerum Place) | 2004 | | | 371-bed dormitory, 212-space public parking facility |
| 17 | City University (site A) | | | | 590,777 sf additional academic/community facility use per University master plan |
| 18 | City University (site B) | | | | 258,938 sf additional academic/community facility use per University master plan |
| 19 | ESDC/HS (Block 170, S side Schermerhorn between Hoyt and Smith; E side Smith b/ Schermerhorn and State Streets) | 2004 | 440 housing units (including 200 affordable housing units) | | 40,000 sf community facility, commercial or hotel<br>65,000 sf retail |
| 20 | Federal Courthouse (NW corner Adams and Tillary Streets) | 2004 | | | 700,000 sf for courtrooms and judges' chambers for U.S. Eastern District of New York, operations for U.S. District Court, U.S. Bankruptcy Court, as well as other court-related agencies. |
| 21 | Ingersoll Community Center | | | | New 18,250 sf community center to replace former 9,000 sf center |
| 22 | Light Bridges (100 Jay Street) | 2005 | 153 dwelling units | 88,000 sf | 33,000 sf retail, 280 parking spaces |
| 23 | LIU Recreation and Wellness Center (site of present Goldner Building and LIU tennis courts) | 2004 | | 10,000 sf for Brooklyn Hospital Center/athletic staff | 117,000 sf wellness/recreation center with natatorium, tennis courts, track, 3,500 seating for athletic events |

**Table 1-7 (cont'd)**
**Development Projects Proposed for Study Area by 2013**

| No. | Name/Address | Build Year | Residential Use | Office/ Commercial Use | Other Uses |
|---|---|---|---|---|---|
| 24 | New York Marriott Brooklyn Expansion (Adams Street N of Willoughby Street) | 2005 | | | 280-room hotel annex, 8,500 sf retail |
| 25 | 53 Boerum Place | 2003 | 99 dwelling units | | 85 parking spaces |
| 26 | Saint Francis College - Anthony J. Genovesi Center | April 2003 | | 4,000 sf | 8,350 sf athletic facility |
| 27 | Schermerhorn between Hoyt and Bond Streets (Block 171) | 2004 | 135 units, 14 townhouses | | 14,700 sf ground-floor retail and 50 parking spaces |
| 28 | Shops at Atlantic Center, Site 5 (Block 927) | | 308 units | | 16,980 sf ground-floor retail (same as in existing conditions) |
| 29 | Site G | | 60 units | | |
| 30 | South Portland Avenue at Atlantic Avenue (Block 2004) | | 32 3-family houses | | |
| 31 | Sweeney Building Conversion | 2003 | 87 units | | |
| 32 | Atlantic Yards Arena and Redevelopment Project | 2013 | 5,500 mixed income residential units | 1.8 million sf, 400,000 sf retail | 18,000 to 20,000-seat arena, with 52,000 sf publicly accessible roof top recreational space, 3,500 parking spaces, 6 acres of public open space |

**Note:** * See Figure 1-14 for reference.
**Sources:** Downtown Brooklyn Council, New York City Economic Development Corporation, New York City Department of City Planning, New York City Department of Housing Preservation and Development, AKRF.




- Project Area Boundary
- Land Use Study Area Boundary (1/4-Mile Perimeter)
- Residential
- Residential (with Ground Floor Retail)
- Hotels
- Commercial
- Office
- Office/Hotel
- Institutional
- Entertainment
- Open Space
- Industrial, Utilities, Transportation, Public Parking
- Vacant
- Under Construction



**Land Use**
Figure 2-2




Project Area Boundary

1/4 Mile Study Area Boundary

C1-3

C1-4

C2-3

C2-4

C1-5

Special Purpose District

**DB** Special Downtown Brooklyn District

DOWNTOWN**BROOKLYN**DEVELOPMENT

**Existing Zoning**
Figure 2-3

the MetroTech Center area is mapped with a C6-4 commercial district. This district is designed to provide for medium bulk office uses and has a maximum commercial FAR of 10.0 (with a bonus to 12.0) and a maximum residential FAR of 10.0 (with a bonus to 12.0). The area in the Fulton Flatbush Triangle is mapped with this designation as well.

The blocks to the west of MetroTech Center that house the Renaissance Plaza development are mapped with a C5-4 district. Like the C6-4 district this is a medium bulk commercial district, with the same allowable FARs. The district is a restricted central commercial district intended primarily for retail and office uses that serve the metropolitan region and for areas where continuous retail frontage is desired. C5-4 and C6-4 districts are mapped along the Fulton Street Mall area.

The area along Flatbush Avenue Extension, occupied by the University Towers Cooperative and the Long Island University campus, is zoned R6. This residential district is designed for medium density housing with typical developments ranging from 3- to 12-stories. It has a maximum allowable FAR of 2.43.

Much of the project area is located in the Special Downtown Brooklyn District. The portion of Atlantic Avenue between Court Street and Fourth Avenue is located in the Atlantic Avenue Subdistrict of the Special Downtown Brooklyn District. These districts are described in further detail below under "Public Policy."

*¼-MILE STUDY AREA*

*Civic Center*

The Civic Center area is mapped with C6-1 districts. As described above, this is a general commercial district with a commercial FAR of 6.0, with a bonus to 7.2.

*Brooklyn Heights*

Brooklyn Heights has several residential districts, with decreasing maximum allowable FARs as one moves westward from the Downtown Brooklyn core. An R8 district with a maximum allowable FAR of 6.02 is mapped near Cadman Plaza West. Further west into Brooklyn Heights, R7-1 districts with a maximum allowable FAR of 4.0 and R6 districts with a maximum allowable FAR of 2.43 predominate. The R6 district is intended for medium density housing, ranging between 3- and 12-stories. The R7 district typically produces 6- to 8-story apartment houses. The area bordering on MetroTech Center along Clinton Street is zoned with two medium bulk commercial/office districts—C6-4 and C5-2A. A limited height district is mapped in much of Brooklyn Heights. This overlay district limits the heights of buildings in certain areas designated as historic districts by the Landmarks Preservation Commission. In the Brooklyn Heights LH-1 district buildings are limited to 50 feet in height.

*Boerum Hill*

The Boerum Hill residential area is largely zoned with R6 and R6B residential districts. R6B districts differ from the R6 districts described above in that they encourage greater lot coverage and have a smaller maximum allowable FAR—2.0. Typical residences produced in this contextual district are 4-story row houses. The major commercial streets in the area are zoned with commercial overlays: C2-4 along Atlantic Avenue, C1-3 and C2-3 along Smith Street, C2-4 along Fourth Avenue, and C1-4 along Fifth Avenue. These overlays permit a maximum commercial FAR of 2.0. The C1 overlays accommodate the retail and personal service shops

needed in residential neighborhoods, while the C2 overlays permit a wider range of local service establishments, which are intended to serve a wider neighborhood.

*Atlantic Terminal*

In the Atlantic Terminal area there is a mix of medium density commercial and residential districts as well as areas mapped with manufacturing districts. An M1-1 manufacturing district is mapped along the south side of Atlantic Avenue in this area. This district, with a maximum FAR of 1.0, serves as an industrial front yard or buffer to adjacent residential or commercial districts. R6B and R7-2 residential districts are located adjacent to this M1-1 district, as is a C6-4 commercial district.

*Fort Greene*

The Fort Greene area is zoned primarily with the R6 medium density housing district described above. C1-3 and C2-3 overlays are mapped along Fulton Street.

*Brooklyn and Manhattan Bridge Approaches*

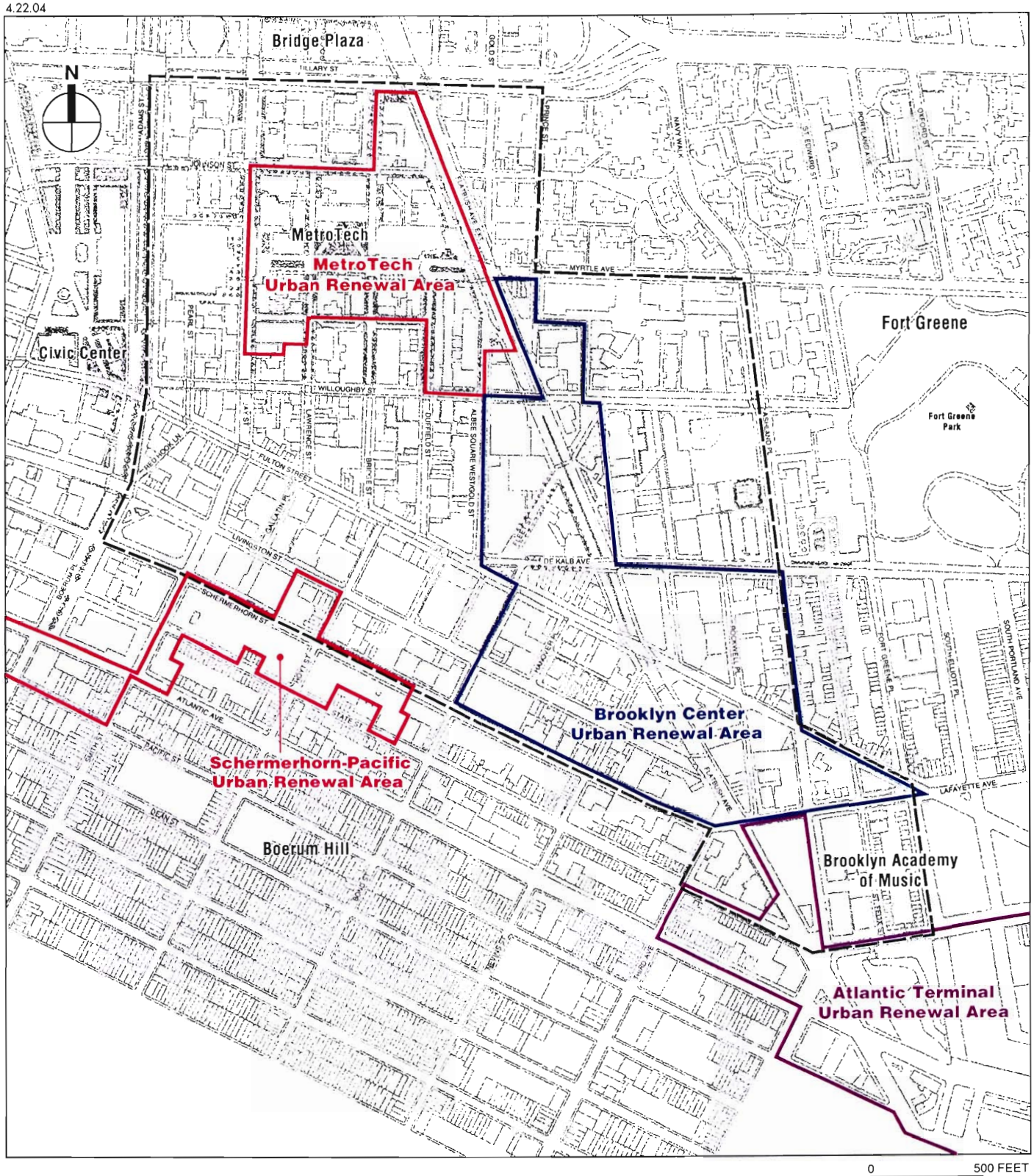
As in other portions of the ¼-mile study area, R6 and R7-1 residential districts predominate in this section of the study area. The Bridge Plaza rezoning project, which was recently approved, rezoned a portion of this area from an M1-1 zoning district to R6-B, C4-3, and C6-2 districts. There is also an M1-6 district in the area, which allows a maximum FAR of 10.0.

## PUBLIC POLICY

Downtown Brooklyn has been the subject of numerous studies and development/revitalization plans since the second half of the 20th century. Zoning enacted in 1961 did not foresee extensive changes to the existing business district, as it was then defined by Court Street, the Civic Center, and Fulton Street's retail corridor. Since that time most commercial redevelopment has required publicly sponsored zoning changes and other government actions, such as urban renewal and direct investment, to facilitate enlargement of the office core on sites that were dominated by lofts, small buildings, and parking lots.

In the late 1960s, two urban renewal plans for Downtown Brooklyn were established, in hopes of revitalizing the area: the Atlantic Terminal Urban Renewal Plan (ATURP) and the Brooklyn Center Urban Renewal Plan (BCURP). See Figure 2-4 for the ATURP/BCURP boundaries. The ATURP was established in 1968, and was intended to encourage development and employment opportunities in the area; create new housing of high quality and/or rehabilitated housing of up-graded quality; and provide community facilities, parks, retail shopping, and parking. Similarly, the BCURP was established in 1970 and was intended to strengthen and expand the commercial and retail core and the residential base of Brooklyn Center; to provide new areas for expansion of office, educational, cultural, manufacturing, and open space uses; and to improve traffic safety and rationalize the circulation system in the area by providing for the separation of major pedestrian and traffic flows. The regulations of ATURP and BCURP were to be in effect for 40 years and are still in effect, although scheduled to expire in 2008 and 2010, respectively.

The aforementioned MetroTech URP, created in 1986, established land use and economic development goals for Downtown Brooklyn that included strengthening the commercial office and retail core of Downtown Brooklyn and enhancing the City's corporate retention programs by supporting commercial and institutional development; developing job-intensive office, research, scientific, and educational activities; and improving the area's traffic circulation system. The




Project Area Boundary

Atlantic Terminal Urban Renewal Area Boundary

Brooklyn Center Urban Renewal Plan Boundary

MetroTech Urban Renewal Area Boundary

Schermerhorn-Pacific Urban Renewal Area Boundary

## Existing Urban Renewal Plan Boundaries

MetroTech URP led to the development of MetroTech Center complex of commercial office, retail, governmental, and educational spaces. As MetroTech Center began its initial development efforts during the mid-1980s, the City provided substantial subsidies to the commercial tenants and transferred significant City functions to the Center. Like the other urban renewal plans, MetroTech's regulations are in effect for 40 years, until 2026.

The Schermerhorn-Pacific Urban Renewal Area is also located within the rezoning area along Schermerhorn Street roughly between Smith and Bond Streets. The URA was formed when New York State purchased three parcels of vacant land in 1974 but development did not commence. The sites have been used for parking since 1977. In 1998 a Hoyt-Schermerhorn Task Force was formed to recommend plans for reuse of the area. The Empire State Development Corporation (ESDC) currently has plans for redevelopment within the URA.

Another major planning effort for the Downtown Brooklyn area was initiated in 2001 with the establishment of the Special Downtown Brooklyn District (see Figure 2-3). As with the URP/URAs, the Special Downtown Brooklyn District was designed to foster development and strengthen the business core of Downtown Brooklyn; to preserve the historic architectural character of development and the pedestrian orientation of ground-floor uses along certain corridors; and to provide new public amenities. The special district established height limits and other bulk controls designed to permit large commercial buildings appropriate for a downtown business district to be developed as-of-right, and established a transitional contextual buffer between the downtown commercial core and the lower-scale residential community of Boerum Hill.

The portion of Atlantic Avenue between Court Street and Fourth Avenue is located within the Special Atlantic Avenue District, a subdistrict of the Special Downtown Brooklyn District. The purpose of the subdistrict is to preserve the scale and form of Atlantic Avenue development, which is characterized by 3- to 4-story attached buildings with shops built in the 19th century. It also aims to preserve the multi-use nature of the area, with its mix of commercial and residential uses, as well as maintain certain architectural features of the buildings through design guidelines. The district provides flexibility in arranging building bulk and mandates street level commercial uses, among other urban design controls.

## E. THE FUTURE WITHOUT THE PROPOSED ACTIONS

### LAND USE

As demand for modern office space continues to exceed supply in Manhattan's two CBDs, companies will continue to search for affordable space elsewhere, such as in Downtown Brooklyn, and the need for commercial development to accommodate that demand will continue. The proximity to an extensive mass transit system and the presence of cultural/academic institutions will also continue to attract residential development to Downtown Brooklyn. Over the past decade, Brooklyn has experienced a very robust housing market, resulting in a significant number of housing units being built in and around Downtown Brooklyn. It can be expected that demand for additional housing would continue as part of the City-wide trend, with additional residential development in Brooklyn.

In addition to market-based trends, the Special Downtown Brooklyn District continues to encourage the construction or planning of development projects in the project area. Growth trends in Downtown Brooklyn are expected to reflect the growth trends that have characterized

the area since the 1980s. The Downtown Brooklyn area is expected to continue to have a major presence of commercial office, retail, government, and educational uses. Residential uses are expected to remain concentrated at the outskirts of the downtown core, in such neighborhoods as Brooklyn Heights, Boerum Hill, Bridge Plaza, and Fort Greene. Educational, government, and commercial office uses would likely continue in the areas surrounding the Civic Center. Currently planned and under development are numerous residential, commercial, and institutional projects proposed to be developed within the study area prior to the 2013 analysis year (see Table 2-1 and Figure 2-5). Some of the larger projects are described in more detail below.

**Table 2-1**
**Development Projects Proposed for Study Area by 2013**

| No. | Name/Address | Build Year | Residential Use | Office/ Commercial Use | Other Uses |
|---|---|---|---|---|---|
| 1 | 9 MetroTech (NW corner Flatbush Avenue Extension and Myrtle Avenue) | 2003 | | 670,000 square feet (sf) for Empire Blue Cross-Blue Shield, NYC Human Resources Administration | 272-space parking facility (includes 133 public spaces), 6,000 sf retail |
| 2 | 60-82 Washington Street | 2005 | 254 units | | |
| 3 | 110 Livingston Street | | 245 units | | 6,000 sf theater, 225 below-grade parking spaces |
| 4 | Atlantic and Court (NE corner of Court Street) | 2004 | 320 units | | 20,000 sf retail, 40,000 sf YMCA, 700 car public parking facility |
| 5 | 330 Jay Street | 2005 | | 170,000 sf | 780,000 sf court space, 150-space accessory car parking facility |
| 6 | Atlantic Avenue and Smith Street (Block 176) | 2004 | 50 units | 31,500 sf | 15,000 sf ground-floor retail + 8,500 sf community facility, 130 space parking facility |
| 7 | Atlantic Center | (2008) | 711 units | 875,000 sf | 395,000 sf ground-floor retail (same as in existing conditions) |
| 8 | Atlantic Terminal | 2004 | | 470,000 sf | 470,000 sf retail, rehabilitated LIRR station |
| 9 | BAM LDC East (Block 2108 bounded by Ashland Place, Fulton, Lafayette and St. Felix Streets) | 2004 | 100,000 sf | | 60,000 sf cultural uses |
| 10 | BAM LDC North (Block 2107 bounded by Ashland and Rockwell Places and Lafayette and Fulton Streets) | | 570,000 sf | | 10,000 sf retail, 7,000 sf open space, 43,000 sf dance center, 160,000 sf museum/gallery, 50,000 sf theater, and 465-space parking facility |
| 11 | Atlantic Avenue at NW corner of Court Street | 2003 | | | 10,900 sf pharmacy |
| 12 | Bond Street Garage | 2004 | | | 18,185 sf retail |

* See Figure 2-5 for reference

**Sources:** Downtown Brooklyn Council, New York City Economic Development Corporation, New York City Department of City Planning, New York City Department of Housing Preservation and Development, AKRF.

**Table 2-1 (cont'd)**
**Development Projects Proposed for Study Area by 2013**

| No. | Name/Address | Build Year | Residential Use | Office/ Commercial Use | Other Uses |
|---|---|---|---|---|---|
| 13 | Bridge Plaza Rezoning (area bounded by Tillary, Prince, Nassau and Jay Streets) | 2004 | 295 anticipated | | Rezoning from M1-1 to R6B, C6-2 and C4-3 |
| 14 | Bridgefront Condominiums (42 Main Street) | 2003 | 21 units | | |
| 15 | Brooklyn Bridge Park | | | | 70-acre park on East River shoreline, including open spaces, cultural facilities, hotel, marketplaces, restaurants, indoor recreation centers, education center, marina for a total of 1.5 million sf built space; 150,000 sf recreation center on Pier 5, hotel and conference center on upland portion of Pier 1 |
| 16 | Brooklyn Law School dormitory (NW corner State Street and Boerum Place) | 2004 | | | 371-bed dormitory, 212-space public parking facility |
| 17 | City University (site A) | | | | 590,777 sf additional academic/community facility use per University master plan |
| 18 | City University (site B) | | | | 258,938 sf additional academic/community facility use per University master plan |
| 19 | ESDC/HS (Block 170, S side Schermerhorn between Hoyt and Smith; E side Smith b/ Schermerhorn and State Streets) | 2004 | 440 housing units (including 200 affordable housing units) | | 40,000 sf community facility, commercial or hotel<br>65,000 sf retail |
| 20 | Federal Courthouse (NW corner Adams and Tillary Streets) | 2004 | | | 700,000 sf for courtrooms and judges' chambers for U.S. Eastern District of New York, operations for U.S. District Court, U.S. Bankruptcy Court, as well as other court-related agencies. |
| 21 | Ingersoll Community Center | | | | New 18,250 sf community center to replace former 9,000 sf center |
| 22 | Light Bridges (100 Jay Street) | 2005 | 153 dwelling units | 88,000 sf | 33,000 sf retail, 280 parking spaces |

* See Figure 2-5 for reference

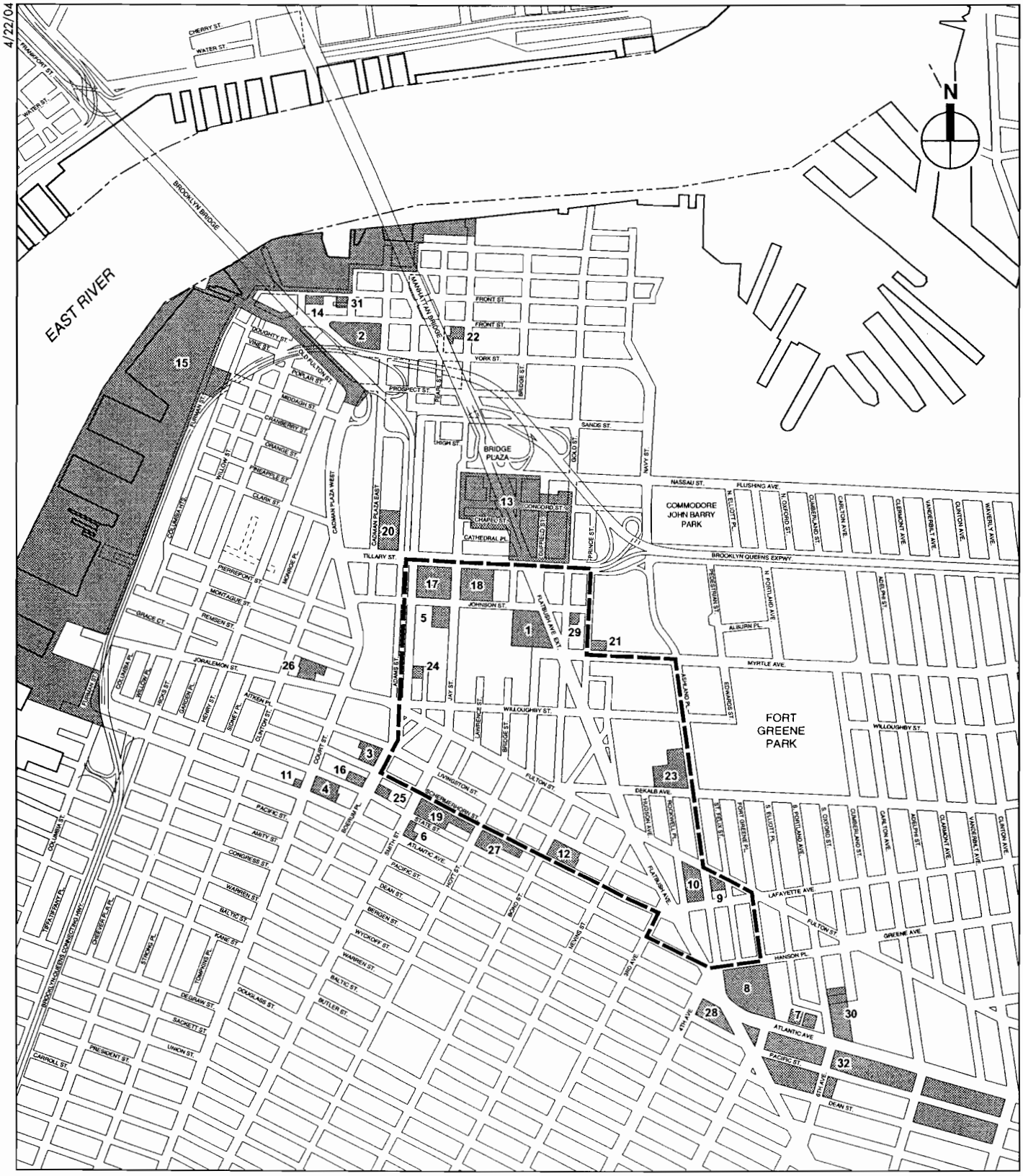
**Sources:** Downtown Brooklyn Council, New York City Economic Development Corporation, New York City Department of City Planning, New York City Department of Housing Preservation and Development, AKRF.

**Table 2-1 (cont'd)**
**Development Projects Proposed for Study Area by 2013**

| No. | Name/Address | Build Year | Residential Use | Office/ Commercial Use | Other Uses |
|---|---|---|---|---|---|
| 23 | LIU Recreation and Wellness Center (site of present Goldner Building and LIU tennis courts) | 2004 | | 10,000 sf for Brooklyn Hospital Center/athletic staff | 117,000 sf wellness/recreation center with natatorium, tennis courts, track, 3,500 seating for athletic events |
| 24 | New York Marriott Brooklyn Expansion (Adams Street N of Willoughby Street) | 2005 | | | 280-room hotel annex, 8,500 sf retail |
| 25 | 53 Boerum Place | 2003 | 99 dwelling units | | 85 parking spaces |
| 26 | Saint Francis College - Anthony J. Genovesi Center | April 2003 | | 4,000 sf | 8,350 sf athletic facility |
| 27 | Schermerhorn between Hoyt and Bond Streets (Block 171) | 2004 | 135 units, 14 townhouses | | 14,700 sf ground-floor retail and 50 parking spaces |
| 28 | Shops at Atlantic Center, Site 5 (Block 927) | | 308 units | | 16,980 sf ground-floor retail (same as in existing conditions) |
| 29 | Site G | | 60 units | | |
| 30 | South Portland Avenue at Atlantic Avenue (Block 2004) | | 32 3-family houses | | |
| 31 | Sweeney Building Conversion | 2003 | 87 units | | |
| 32 | Atlantic Yards Arena and Redevelopment Project | 2013 | 5,500 mixed income residential units | 1.8 million sf, 400,000 sf retail | 18,000 to 20,000-seat arena, with 52,000 sf publicly accessible roof top recreational space, 3,500 parking spaces, 6 acres of public open space |

* See Figure 2-5 for reference
**Sources:** Downtown Brooklyn Council, New York City Economic Development Corporation, New York City Department of City Planning, New York City Department of Housing Preservation and Development, AKRF.

The major project planned for a portion of the study area in the future without the proposed actions is the Atlantic Yards Arena and Redevelopment project, which is proposed for an approximately 24-acre site bounded by Flatbush, Atlantic, and Vanderbilt Avenues and Dean Street at the southeastern edge of Downtown Brooklyn. The principal components of the project include an arena with an approximate capacity of 18,000 to 20,000 seats. The arena would be used by a major league sports franchise, and would incorporate approximately 52,000 square feet (sf) of publicly accessible recreational space on the arena rooftop. In addition, the project would include a parking facility with the capacity for approximately 3,500 vehicles, 1.8 million sf




## No Build Project Location

Figure 2-5

of Class A commercial office space, approximately 5,500 mixed-income residential units, approximately 400,000 sf of retail space, and 6 acres of public space. This project will undergo a separate environmental review in accordance with the State Environmental Quality Review Act. It is anticipated that the Empire State Development Corporation (ESDC) will serve as the lead agency. Several actions are expected to be sought by the Arena project under the SEQR process, including overrides of local zoning regulations related to density, allowable uses, height and setback waivers, street closures and widenings, and transfer of floor area across zoning districts.

Another large project underway in the study area is the new Federal Courthouse at Adams and Tillary Streets, which is currently under construction. The 17-story building will house facilities for the U.S. Bankruptcy Courts, the U.S. Eastern District of New York, and the U.S. District Court, as well as other court-related agencies. As part of this project, the General Post Office Building will be renovated and reused as office space for the U.S. District Attorney and the U.S. Bankruptcy Court. Another large courthouse project is a 473-foot-tall building with court facilities and commercial space that is currently being built at 330 Jay Street. The building will house the New York State Supreme Court and the City's Family Court. The City's Housing Court will then move into the Family Court building.

There are several other major institutional projects being planned for the study area. The Metropolitan Transportation Authority (MTA) is undertaking a renovation of its Atlantic Avenue Terminal. The rehabilitated station will improve passenger circulation and access for subway and train customers and provide retail for passengers and area residents. As described above, another large project under construction in the vicinity is a 22-story dormitory for Brooklyn Law School on the site of a surface parking lot at the northwest corner of State Street and Boerum Place.

In addition to these large institutional projects, a major commercial project is underway. Site 9S in MetroTech is being developed. This commercial office project is proposed to contain 670,000 square feet (sf) of commercial space. Plans are also underway to expand the existing Marriott Hotel at Renaissance Plaza by 280 rooms. Two sites within the ATURP are also expected to be developed. While there are not yet any design plans, it is anticipated that Atlantic Center and the Shops at Atlantic Center will be developed to the maximum extent allowable under current zoning and the ATURP.

Numerous residential projects are also being planned that range from approximately 21 units to 250 units. The largest of these projects are planned by the BAM Local Development Corporation. Combined, its two proposed projects would introduce more than 670,000 sf of housing along with over 300,000 sf of cultural space.

## ZONING AND PUBLIC POLICY

The future without the proposed actions is likely to see the continuation of City and State policies that support the growth of Downtown Brooklyn as a City and regional center. Mixed use developments containing commercial, residential, and community facility uses are being planned by the State. Several of the projects shown in Table 2-1 above are publicly sponsored. ESDC is planning two developments in the Boerum Hill area. In addition, the New York City Economic Development Corporation (EDC) issued a Request for Proposal for the reuse of 110 Livingston Street and has designated a developer who plans to convert the building to a residential use with theater space.

These projects demonstrate the City and State's ongoing interest in actively promoting new development in Downtown Brooklyn, as a major center for the region and the City as a whole. It is expected that zoning changes will continue to occur on a locational basis to facilitate support of such projects. As described above, one such rezoning recently completed by the Department of City Planning (DCP) amended the zoning map to change an eight-block area of Bridge Plaza from M1-1 to C6-2, C4-3, and R6B. As a result of the Bridge Plaza rezoning, it is anticipated that approximately 295 dwelling units could be developed on about 21 projected and potential development sites within the rezoning area over a ten-year period. The existing trend of redevelopment in the area would continue in the future without the proposed actions. However, growth in the bulk of Downtown Brooklyn will likely be far short of the development potential for the area.

Federal and local interest in encouraging new development in Downtown Brooklyn was demonstrated in a 2001 report released by a group of 35 business and community leaders appointed by Senator Charles Schumer. The report, which was entitled "Preparing for the Future: A Commercial Development Strategy for New York City," recommended establishing a new Central Business District in Downtown Brooklyn to create 12 million additional square feet of commercial space. Despite this recommendation, the study area in the future without the proposed actions would not have the assemblage of sites necessary to facilitate this amount of development.

## F. THE FUTURE WITH THE PROPOSED ACTIONS

The proposed actions are significant public policy actions that, by definition, will result in changes in permitted uses and bulk regulations in the project area. As described in Chapter 1, "Project Description," the proposed actions include zoning changes; text changes to the Special Downtown Brooklyn District; mapping actions; modifications to the Brooklyn Center Urban Renewal Plan, Atlantic Terminal Urban Renewal Area Plan, and MetroTech Urban Renewal Plan; disposition of city-owned property; special permits for public parking facilities; and modifications to the MetroTech General Large-Scale Development Special Permit. In considering the potential land use and zoning impacts—as well as public policy implications—of these actions, it is necessary to examine a reasonable development scenario that may ensue. Without a reasonable but conservative "worst-case" future development scenario, it would be impossible to assess the range of effects that might occur as a result of the project. This development scenario is detailed in Chapter 1.

### LAND USE

*REZONING AREA*

Potential land use changes in the project area would accompany the development projected to result from the proposed actions. This development is outlined in section of Chapter 1, "Project Description." While the rezoning could potentially result in new residential, office, or retail buildings on any of the blocks in the project area, land use changes in the study area are effectively limited by market demand and other factors.

The proposed actions would result in changes to the area's land use patterns. While the area would continue to be defined by a mix of office, retail, and residential uses, the density of these uses would increase. The proposed actions would result in a much more intensely developed downtown commercial core area with transitional zones to neighboring residential areas. The

land in the project area would be developed at a higher density than it is currently and than it would be absent the proposed actions.

The amount of office space in the project area would increase dramatically as a result of the proposed actions, with an additional 4.6 million zoning square feet of office development anticipated by 2013. The development expected to result from the proposed actions would continue trends of creating commercial office buildings with inexpensive floor plates large enough to accommodate businesses looking for ready to go space for consolidation of office uses or back office space. As this demand for office space cannot be met within Manhattan's CBDs, the provision in Brooklyn would alleviate a deficiency of the existing land uses. Approximately 979 residential units are also expected to be built in the project area as part of the reasonable worst-case development scenario. These would be developed along the outer edges of the commercial core, to function as transition areas to the lower-scale neighboring residential neighborhoods.

The following sections discuss the impacts of anticipated land use changes in each of the land use subareas:

*MetroTech Center Area and Jay Street Academic Subarea*

The properties at the northwest side of MetroTech Center, which are occupied by New York City College of Technology and Polytechnic University, would be rezoned as part of the proposed actions to allow for mixed-use commercial/community facility development. The rezoning would allow the construction of a high-density community facility/commercial building at the southeast corner of Jay Street and Tech Place and further solidify the MetroTech area as an office center in Downtown Brooklyn. A new, large-scale commercial/community facility development would not substantially alter existing land use patterns in the subarea, as these are already the predominant land uses found at MetroTech Center. Rather, it would redevelop the site currently occupied by Polytechnic University, allowing the institution to have a greater presence in the area. Furthermore, the established high-density office node in Downtown Brooklyn would expand. Larger development on this site would be consistent with other developments currently under construction in this area, such as the 330 Jay Street building and the new Federal courthouse on the north side of Tillary Street. In addition, the expected development would further strengthen the academic base of Downtown Brooklyn, and facilitate further interaction between the commercial and academic realms.

The Jay Street Plaza public space that would be expected to be developed as a result of the proposed actions would include a new subway entrance/exit to the Jay Street subway station. This would enhance transit access in the area, further supporting commercial uses while creating a community focal point at the southwestern corner of the project area.

*Willoughby Street Area*

The anticipated office development would be concentrated at the southern end of the MetroTech Center area along Adams Street and in several buildings north of Fulton Street between Bridge and Fleet Streets. This development would extend the commercial center to the south into the area generally bounded by Adams and Willoughby Streets, Flatbush Avenue, and Fulton Street, through the rezoning of blocks within this area to a higher density FAR. The anticipated development would result in office towers on blocks currently occupied by low-rise commercial uses, such as small professional offices, parking lots, and neighborhood-oriented retail stores. The demapping of Red Hook Lane (between Livingston and Fulton Streets) and Pearl Street (between Fulton and Willoughby Streets) and the development of the adjacent four blocks will

help to create a gateway to the adjacent Fulton Mall area from the Civic Center and Brooklyn Heights neighborhoods to the west.

The 3.3 million zoning square feet of commercial development along Willoughby Street projected with the reasonable worst case development scenario would shift the area's land use composition towards the high-density office end of the spectrum from low-rise commercial uses. While the scale of development would change, types of uses would not—commercial use on the sites would continue to dominate. The commercial uses would be compatible with the office towers to the north as well as the lower-scale commercial uses along Fulton Street. The transition between the high-rise commercial towers and low-rise commercial buildings would shift south by one block, from Willoughby Street to Fulton Street. The creation of a 1.15-acre public space at Willoughby Square would be a focus for new commercial investment in the surrounding blocks and would be compatible with the surrounding commercial uses.

*Fulton Street Mall Area*

No major land use changes are expected in the Fulton Street Mall Area as a result of the proposed actions. With the higher density commercial development permissible in the Willoughby Street Area to the north, the Fulton Street Mall would serve as the transition area to the lower density commercial development to the south.

*Schermerhorn-Livingston Streets Area*

The development sites bounded by Livingston, Schermerhorn, and Smith Streets, and Third Avenue are expected to be developed with apartment buildings to replace current uses—primarily public parking lots and underutilized and low-rise commercial/retail buildings that pose an uninviting barrier between the residential area to the south and commercial core to the north. Height limits proposed for Schermerhorn Street, which abuts the low-rise residences to the south, would provide for a transition to the nearby low-scale, residential neighborhood. The area between Livingston and Schermerhorn Streets would serve as a transitional zone and connector between the higher-density commercial core to the north and the lower-rise Boerum Hill neighborhood to the south, thereby unifying the area. This residential development would continue trends presently occurring in the area, such as the ESDC-sponsored developments along Schermerhorn Street.

*Fulton Street/Flatbush Avenue Triangle Area*

Additional community facility development is expected near BAM on the site of the garden supply store, further enhancing this area as a center for public use. Expected uses as part of the Downtown Brooklyn Development Plan include a new library of visual and performing arts on Flatbush Avenue and a new theater on Lafayette Avenue. Such institutional uses would be compatible with the nearby entertainment facilities and neighboring residential neighborhood. Other commercial and residential development in the area would help integrate this area with the remainder of Downtown.

*State Street Triangle Area*

This block would be rezoned to support increased residential density. Any new development that could occur on this block with the proposed actions would support development around the LIRR terminal and would be compatible with the medium-density residential uses in the area. It would also serve as a transition to the lower-density residential uses to the south. Although no specific development has been identified for this parcel as part of the proposed actions, the

actions affecting the site would facilitate the development of appropriate and compatible uses in the future.

*Flatbush Avenue Extension Area*

Residential development is expected to take place at the southeast corner of Myrtle Avenue and Flatbush Avenue Extension. This would be compatible with the residential uses to the southeast at University Towers. Another building is expected to be converted for residential use at the corner of Gold and Johnson Streets. This would be adjacent to a building that has been converted to residential use and would be continuing an existing trend in the area. It would also be compatible with the adjacent NYCHA RV Ingersoll Houses.

*Myrtle Avenue Area*

Residential development is expected to take place along Myrtle Avenue east of Fleet Place, on the site of low-rise retail structures. This residential development would be compatible with the nearby NYCHA developments and the University Towers complex and would continue to provide retail stores to the neighborhood at the ground-floor level.

*Long Island University/University Towers Area*

As these areas are already fully developed with well established land uses, no development is anticipated in this area. However, the existing land uses would be compatible with the changes anticipated in the surrounding area.

*¼-MILE STUDY AREA*

The development anticipated to result from the proposed actions is not likely to trigger additional significant development in most of the study area outside the project area. Brooklyn Heights and Boerum Hill are firmly established residential neighborhoods and are not likely to support much additional development; nor are the areas occupied by NYCHA developments, such as Ingersoll and Walt Whitman Houses. Protections in place for the Brooklyn Heights, Boerum Hill, and Fort Greene historic districts would deter alteration of these brownstone communities. Any change in land use at NYCHA developments would require numerous city actions and would require displacement of thousands of residents and would thus be unlikely to occur.

The expansion of the downtown core could result in additional development at the edges on sites where additional development is permissible under existing zoning. Any development permissible by existing zoning would be expected to be compatible with the neighboring commercial and residential uses, as well as future anticipated residential and commercial uses.

The trend of new low-rise residential development on vacant parcels in Fort Greene and conversion of industrial lofts along the Flatbush Avenue Extension and Dean and Pacific Streets to residential use may be enhanced by the strengthening of the downtown core. Another likely location for additional development would be the transition area between Downtown Brooklyn and Brooklyn Heights, between Adams Street and Court Street. This area contains a mix of land uses, including several auto-related uses and low-rise commercial buildings. However, height limits in place in this area restrict the extent to which high-rise development would continue westward. Another area in which development in the downtown core could spur increased development to maximize zoning potential is the area north of Tillary Street near the bridge approaches—an area characterized by a mix of land uses without any unifying land use scheme.

The rezoning would continue a trend that is likely to occur as a result of the recently approved Bridge Plaza rezoning.

In addition, the proposed development is likely to spur some upgrading/refurbishing of space—especially retail space—in immediately surrounding areas. This would most likely take the form of retail space upgraded to cater to the office market along streets just outside the project area, yet close to new offices. Significant retail upgrading is unlikely to occur beyond streets that immediately surround large-scale office construction.

*CONCLUSION*

The zoning and related actions would change allowable bulk on most blocks in the area that would be rezoned. Overall, the project area would remain a mix of retail, office, and residential uses, but these uses would be developed at a higher density than existing uses, with densities decreasing with distance from the commercial core. The development projected to result from the proposed actions would be compatible with the existing uses in the project area and would continue ongoing trends of intensifying development, while protecting the character of the nearby neighborhoods and providing transitional zones between areas.

Along most streets in the project area, the anticipated change in land uses would lead to changes in socioeconomic conditions and neighborhood character, as detailed in those chapters of this EIS. If buildings are acquired by the City to facilitate the anticipated development, existing residents, businesses, or educational facilities would be relocated in compliance with the procedures of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as codified in Title 42, Section 4601 of the Unites States Code and the applicable implementing regulations set forth in Title 49, Part 2 of the Code of Federal Regulations (collectively, the "Uniform Act"), as well as with New York State Eminent Domain Procedure law. The transformation of the edges of Downtown Brooklyn from a low-scale, mixed institutional/office/residential area, to a more dense, CBD-type office center with surrounding high-density residential development, would be substantial and, when viewed in light of related changes to the area's character and role in the economy of New York City, would have a positive impact on both the immediate vicinity and the city as a whole. For more information see Chapter 3, "Socioeconomic Conditions" and Chapter 9, "Neighborhood Character."

While the proposed actions would substantially change land uses on the development sites themselves, they would not be in conflict with nearby uses. A balance of office, residential, retail, and institutional uses in the area would be maintained. Furthermore, the actions would support the CBD-type development sought for Downtown Brooklyn. Therefore, significant adverse impacts on land use would not result from the proposed actions.

## ZONING

The provisions of the zoning map and text changes, and related actions are discussed in detail in Chapter 1, "Project Description," and summarized below. While bulk regulations would vary within the project area, in most cases the rezoning would permit greater maximum FARs than are currently permitted. These zoning changes would enable development that would create linkages between the various subareas within the study area, thereby unifying Downtown Brooklyn. Zoning changes are described for each subarea below.

Table 2-2 presents a list of the projected and potential development site lots affected by the proposed rezoning actions. Figure 2-6 illustrates the project area's proposed zoning.

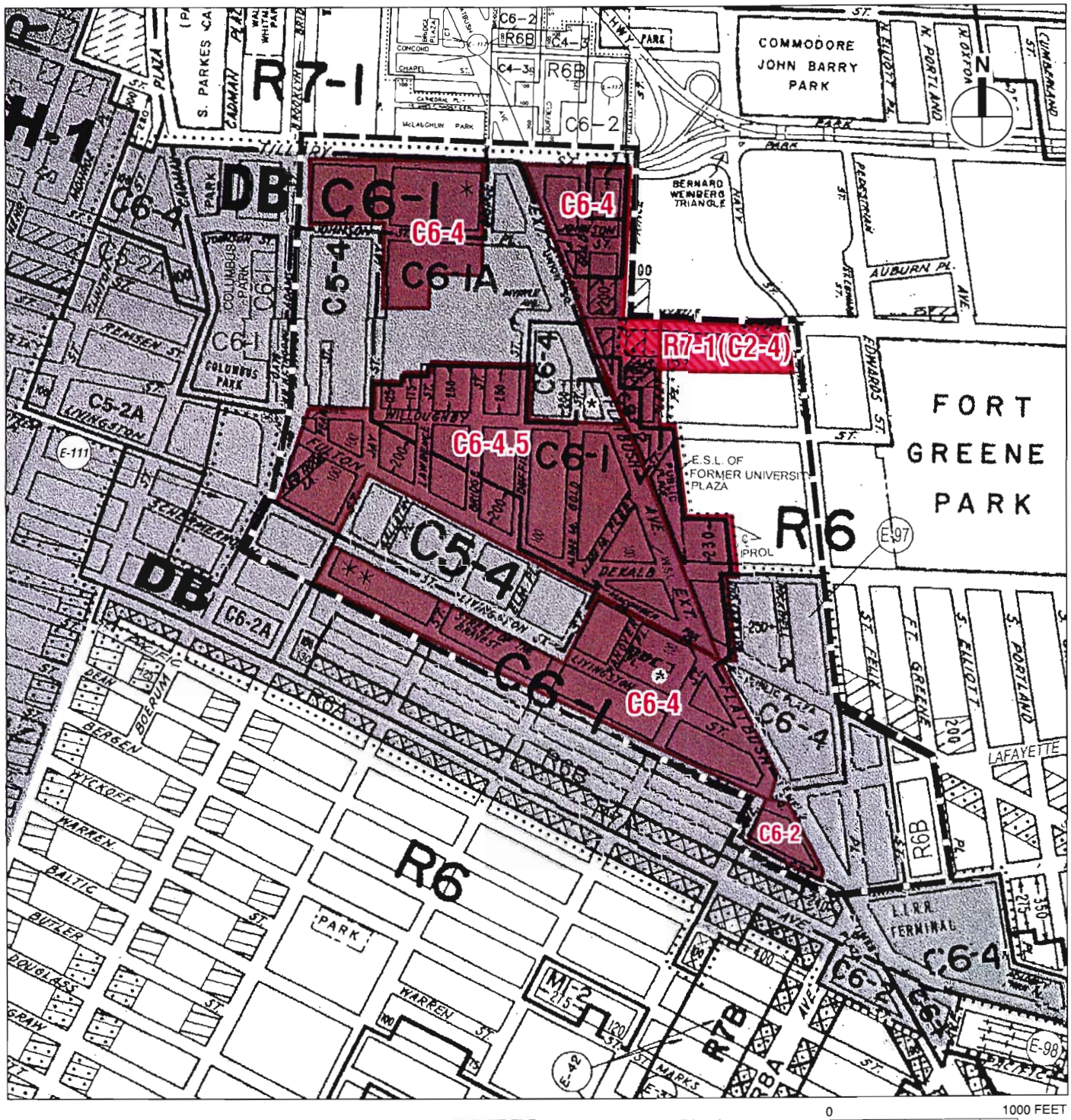

4.29.04
C6-1
C6-4
C6-1A
C6-4
R7-1(C2-4)
C6-4.5
C6-1
C5-4
C6-4
C6-2
R6
R6B
R7-1
R7B
DB
C5-4
C6-2A
C6-4
C6-1
C5-2A
C5-4
C6-2A
C6-4
C6-4
C6-4

**Table 2-2**
**Comparison of Existing and Proposed Zoning**
**of Projected and Potential Development Site Lots**

| Rezoning | Blocks: Lots | Existing Permitted FAR | Proposed FAR |
|---|---|---|---|
| C6-1, C6-1A to C6-4 | B 128: 1, 26<br>B 131: 1<br>B 142: 1[1]<br>B 160: 18, 29<br>B 161: 1, 3, 18, 27, 30, 33, 47, 50, 52-64<br>B 164: 1, 13, 29, 31, 42-44<br>B 165: 17-19, 29, 58<br>B 167: 15, 16, 26-28, 36, 42<br>B 2093: 1 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac. : 6.5 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| C5-4 to C6-4.5 | B 144: 1<br>B 150: 1, 6, 10, 11, 19<br>B 153: 3, 14, 15<br>B 154: 1, 5, 11, 12, 36-40 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 | Commercial: 12<br>Residential: 10<br>Comm. Fac.: 12 |
| C6-1 to C6-4.5 | B 145: 8, 10, 13-16, 18-22, 26, 32<br>B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52<br>B 149: 1, 14, 15, 17, 19, 22-26, 28, 30-34, 49, 50<br>B 152: 37 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 | Commercial: 12<br>Residential: 10<br>Comm. Fac.: 12 |
| C6-1 (Use) | B 2110: 3 | 0.2[3] | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 |
| C6-1 to C6-2 | B 174: 9, 13, 18, 23, 24 | Commercial: 6.0<br>Residential: 3.44<br>Comm. Fac.: 6.5 | Commercial: 6.0<br>Residential: 6.02<br>Comm. Fac.: 6.5 |
| M1-1 to C6-4 | B 133: 1, 5, 13, 15<br>B 134: 1, 5, 30, 38, 41<br>B 2049: 8 | Commercial: 1.0<br>Residential: 0<br>Comm. Fac.: 2.4 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| R6/C1-3, C8-2 to C6-4 | B 2049: 2[2]<br>B 2060: 22-27, 32, 122<br>B 2061: 1 (part)<br>B 2062: 1, 5, 6, 17-19, 21, 23, 24, 103 | Commercial: 2.0<br>Residential: 2.43<br>Comm. Fac.: 4.8 | Commercial: 10<br>Residential: 10<br>Comm. Fac.: 10 |
| R6 to R7-1/C2-4 | B 2061: 1 (part), 40 (part), 60 (part), 80 (part), 100 (part) | Commercial: 0<br>Residential: 2.43<br>Comm. Fac.: 4.8 | Commercial: 2.0<br>Residential: 4.0<br>Comm. Fac.: 4.8 |

**Notes: FAR = Floor Area Ratio**

1 The existing zoning of this lot is C6-1A.

2 The existing permitted FAR of Block 2049, Lot 2 is 2.43/1. No part of this lot is zoned C8-2.

3 As per ATURP restriction.

*PROJECT AREA*

*MetroTech Center Area and Jay Street Academic Subarea*

As a result of the proposed actions the sites in the northwest portion of the project area currently occupied by NYC Technical College, Polytechnic Institute, and Westinghouse High School would be rezoned from C6-1 and C6-1A to C6-4 to allow for increased FAR for commercial and community facility uses. The rezoning would allow for maximum FARs of 10.0 rather than the existing 6.0 for commercial uses and 6.5 for community facility uses. No change in uses permitted by zoning would occur. This would permit higher density commercial, community facility, or residential uses on the site. It would facilitate the creation of larger mixed-use commercial/institutional facilities that could bolster the role of academic institutions in the Downtown Brooklyn core and encourage further interaction between the commercial and scholastic elements of the downtown area.

*Willoughby Street Area*

The triangle between Willoughby and Fulton Streets and the blocks bounded by Boerum Place, Livingston Street, Smith Street, and Fulton Street would be rezoned from C5-4 and C6-1 to C6-4.5. This would permit FARs of 12.0 for commercial and community facility uses and 10.0 for residential uses, compared to 10.0 FARs for each use with the C5-4 district and 3.44 residential FAR, 6.0 commercial FAR, and 6.5 community facility FAR with the C6-1 district. The area north of Willoughby Street between Jay and Duffield Streets would also be rezoned from C6-1 to C6-4.5. This rezoning would encourage the development of higher density uses and extend the possibility for office development at the southern end of the existing commercial core, extending the commercial center south to Fulton Street. Such uses would replace the small underdeveloped commercial and residential buildings in the area around Fulton Street.

*Fulton Street Mall Area*

The blocks bounded by Livingston, Bond, and Fulton Streets and Flatbush Avenue, would be rezoned from C6-1 to C6-4 to create the potential for increased FAR for residential use and mixed-use residential/commercial use. The zoning change would more accurately reflect the built FAR of buildings already in the area.

*Schermerhorn-Livingston Streets Area*

The block between Schermerhorn and Livingston Streets would be rezoned from C6-1 to C6-4 to create the potential for increased FAR for residential use and mixed-use residential/commercial use. This change would permit higher density uses in a transition zone between the newly enlarged downtown core and the Boerum Hill neighborhood. Height limits of 140 feet would be in place for the buildings fronting Schermerhorn Street, and 250 feet for buildings fronting Livingston Street. This would further facilitate the transition between the higher-density commercial and lower-density residential uses.

*Fulton Street/Flatbush Avenue Triangle Area*

No zoning changes are proposed for this area.

*State Street Triangle Area*

There is one small rezoning site at the southern and eastern borders of the project area, near Atlantic Center; this triangle would be rezoned from C6-1 to C6-2. Although this would not

affect the allowable FAR for commercial uses (6.0) for this block, it would allow for increased residential density (3.44 FAR to 6.02 FAR) and support development around the LIRR terminal).

*Flatbush Avenue Extension Area*

The rezoning of the east side of Flatbush Avenue Extension from M1-1, M1-4, R6, C6-1, C6-1A, and C8-2 to C6-4 would allow for sites along this major corridor, currently zoned for residential and manufacturing uses, to be developed with increased FAR for mixed-use commercial/residential. This rezoning would enable these low-rise commercial, residential, and industrial buildings containing auto-related uses, small stores, and residential buildings to be developed with higher-density residential and commercial buildings with maximum FARs of 10.0, thereby extending the commercial core eastward and uniting this area with the commercial uses to the west and the residential uses to the east. New light manufacturing uses would no longer be permitted in the area. This area would function as a gateway to Downtown Brooklyn. As existing small lot sizes on these parcels could not likely accommodate buildings with the higher FAR, this zoning change, along with the demapping of small streets, would encourage the assemblage of lots for future development and extension of the commercial core.

*Myrtle Avenue Area*

The area south of Myrtle Avenue between Fleet Place and Ashland Place would be rezoned from R6 to R7-1 with a commercial overlay of C2-4, to allow increased FAR for residential use and ground-floor retail along this street. The Special Downtown Brooklyn District would be extended to include this area, and new zoning regulations for R7-1 would be added. The rezoning would permit commercial FARs of 2.0 (whereas no commercial uses are permitted under existing zoning) and would increase allowable residential FAR from 2.43 to 4.0. It would also limit building heights to 160 feet to ensure compatibility with other nearby buildings. This would permit mixed use residential/retail development that would serve as a transition to the largely residential Fort Greene area to the east.

*Long Island University/University Towers Area*

No rezoning would occur in this area.

*¼- MILE STUDY AREA*

Zoning designations in the larger study area would not change as a result of the proposed rezoning actions. Surrounding areas such as Brooklyn Heights, Boerum Hill, and Fort Greene would all remain as residential and commercial zones. Therefore, the proposed actions would have no direct zoning impacts in the ¼-mile study area outside the project area.

*CONCLUSION*

The proposed actions would significantly alter the zoning within the project area, by increasing allowable FARs. However, this rezoning would support the development of a unified downtown and a further strengthened CBD. Overall, there would be no significant adverse impacts to zoning from the proposed actions.

## PUBLIC POLICY

*PROJECT AREA*

The zoning map and text changes, mapping actions, and urban renewal plan modifications (described in detail in Chapter 1, "Project Description") would facilitate commercial development within an expanded CBD and permit and encourage higher density residential development at the edge of the CBD to serve as a transition zone to neighboring residential areas. The proposed actions would be in keeping with established public policy, having been developed around the principles of a strengthened urban core, unified downtown and neighboring areas, transitions between the CBD and low-scale residential neighborhoods, and active ground-floor uses to enliven the streetscape and enhance the pedestrian experience. The proposed actions would support these goals as follows:

- *Strengthened Urban Core*: The Downtown Brooklyn commercial center would be expanded. The demapping of certain streets would create larger, more viable development sites, enabling the expansion of the commercial core to the south and west.
- *Unified Downtown*: The proposed mapping actions would improve circulation within the downtown area, easing travel between neighborhoods. The provision of new open spaces would serve both the residential and commercial populations, and would provide a gathering point for the various communities.
- *Transition Zones*: Changes in the Special Downtown Brooklyn District would allow for contextual buffers between large-scale commercial buildings in the downtown and low-scale buildings in surrounding neighborhoods. This would be achieved through extensions of the district, added flexibility in height and setback envelopes, additional height limits, and changes to permit residential and community facility uses.
- *Active Ground Floors:* A lively, pedestrian-oriented environment would be created by mandating glazing and transparency of security gates within the Special Downtown Brooklyn District, increasing allowable uses on ground-floors, and altering ground-floor retail requirements on several streets.

*¼- MILE STUDY AREA*

No changes in public policy are proposed for areas outside the project area but within the ¼-mile study area. The proposed actions would continue public policies that are in place within neighboring areas and would not be in conflict with other public policies for the area.

*CONCLUSION*

The proposed actions would reflect the intentions of the public policies that are already in place, while making modifications to facilitate and further the goals of expanding and redeveloping Downtown Brooklyn as a commercial center and maintaining the character of the area's residential neighborhoods. The proposed actions would allow and encourage an expansion of the downtown commercial core, provide new opportunities for residential and mixed-use development, create new open spaces, improve access to and from the CBD and adjoining areas, and foster an enlivened pedestrian atmosphere. Overall, these changes are expected to have a beneficial effect, and no significant adverse impacts to public policy would result from the proposed actions. ✷

# A. INTRODUCTION

## BACKGROUND

The Downtown Brooklyn Development project is a public planning effort to create opportunities for stimulating and integrating commercial, academic, cultural, and residential development in the Downtown Brooklyn area. This chapter describes the socioeconomic effects of the proposed development of the project, particularly if the "reasonable worst-case scenario" occurs, with the projected development sites being developed by 2013 as described in Chapter 1, "Project Description."

The socioeconomic study area used for this analysis is the area within one-quarter mile from the borders of the proposed project area, roughly bounded by Sands Street to the north, Wyckoff Street to the south, Henry Street to the west, and Cumberland Street to the east (see Figure 3-1). This chapter describes the potential for socioeconomic changes in the one-quarter mile study area, and describes the economic and fiscal benefits arising from the development of the properties in terms of employment and tax benefits realized by the City and State.

## CONCLUSIONS

Overall, the proposed actions would not result in significant adverse impacts due to residential or business displacement. To the contrary, the project would reinforce existing trends towards residential and economic development in Downtown Brooklyn and offer significant benefits to the area's business and residential communities. Construction and ongoing operation of the development program would create or retain a significant number of jobs in New York City and State, with operation of the completed development program for the projected sites generating approximately 40,430 permanent jobs (both direct and indirect) in New York City and 8,530 permanent jobs in New York State. Annual tax revenue generated by the development of the projected sites would also be significant, with program-related City, State, and MTA taxes estimated at $86.4 million, $149.5 million and $5.0 million, respectively.

The proposed actions would not result in significant adverse impacts due to direct or indirect residential displacement, as defined in the 2001 *CEQR Technical Manual*. There are approximately 130 residential units currently located on projected development sites, and residents living in these units would be directly displaced by the development of the projected sites. In total, residents living in the 130 units represent less than one percent of the study area population and have profiles that are not markedly different from that of the overall study area, indicating that their displacement would not alter neighborhood character or lead to indirect displacement of remaining residents. The City provides relocation assistance to residents living on sites subject to City acquisition, and it is likely that displaced residents could relocate within Downtown Brooklyn.

Residential development under the proposed actions would result in a net increase of approximately 849 new residential units and 1,670 residents. The introduction of these new units and population is not expected to exert indirect displacement pressures on existing residents for several reasons. First, although the study area does contain a substantial number of residential units in buildings not subject to rent control or rent stabilization (approximately 874 project area residents and 11,765 study area residents live in buildings that contain five or fewer units) the high median incomes and housing costs in the area indicate that a large proportion of unregulated units are already renting or selling at, or close to, market rate. This makes the potential for indirect displacement in the study area substantially lower compared to other areas with below-average income levels and housing costs. Second, new units constructed under the proposed actions would represent only a small proportion (4.2 percent) of total housing units in the study area, making it unlikely that they would change neighborhood character. Finally, incentives offered through housing subsidy programs (such as the 80/20 program) make it likely that a percentage of units built under the proposed actions would be rented to low- and moderate-income tenants, thereby retaining the mixed-income character of the housing stock.

By 2013, the proposed actions would introduce approximately 4.6 million square feet of commercial office space and about 844,000 square feet of retail space, resulting in approximately 19,124 net new jobs to Downtown Brooklyn. Like the residential community, the business community of Downtown Brooklyn would not experience any significant adverse impacts due to the proposed actions.

The development of the projected sites would directly displace approximately 100 non-residential uses such as retail shops, food establishments, parking lots, an academic facility, small light industries, and municipal offices. Approximately 11 of those uses are located on previously designated Brooklyn Center Urban Renewal Area sites, and thus could be displaced in the absence of the proposed actions. In total, approximately 1,701 jobs (approximately 2 percent of 2002 study area employment) would be directly displaced by the proposed actions. Other existing employment on projected development sites would relocate in the absence of the proposed actions (for example, the municipal jobs associated with the Department of Education) or be restored by 2013 under the proposed actions. Businesses that would be directly displaced do not meet the criteria for significant displacement, as outlined in the 2001 *CEQR Technical Manual;* they do not have substantial economic value to the City, they do not define neighborhood character, nor do they belong to a special category of business that is protected by special regulations or publicly adopted plans. Furthermore, as part of the City's site acquisition process, commercial tenants would be offered a relocation package, which would include financial coverage for certain moving costs, re-establishment fees, and use of brokerage services to find alternative locations.

The proposed actions are expected to beneficially impact existing businesses by increasing residential and worker populations (by approximately 1,670 and 19,124, respectively), creating a substantial new customer base. The proposed actions are not expected to exert indirect displacement pressures on businesses in the project area or study area; the proposed actions would not alter existing economic patterns, directly displace anchor establishments or uses that form a customer base, or introduce a use that would lower property values.

Analyses performed using the guidelines provided in the 2001 *CEQR Technical Manual* indicate that the proposed actions would not result in any significant adverse impacts on neighborhood character due to potential changes in socioeconomic conditions.

# B. METHODOLOGY

## ORGANIZATION OF THE ANALYSIS

The socioeconomic analysis contained herein is based on the 2001 *City Environmental Quality Review (CEQR) Technical Manual* methodology. The analysis begins by describing the existing socioeconomic conditions in the socioeconomic study area, including demographic characteristics, the local housing market, business activity, and land use trends. Development expected in the future without the proposed actions is then discussed, which establishes the future conditions of the study area, should the proposed actions not take place. The analysis then describes the projected development that would result from the proposed actions. A preliminary analysis, and, where necessary, further detailed analysis is conducted based on the principle issues of concern with respect to socioeconomic change according to the 2001 *CEQR Technical Manual.*

- Direct (or primary) residential displacement;
- Direct (or primary) business and institutional displacement;
- Indirect (or secondary) residential displacement;
- Indirect (or secondary) business and institutional displacement; and
- Effects on specific industries.

These issue areas are considered for the 2013 analysis year, which represents the ten-year time frame considered for the CEQR assessments of large area-wide zoning proposals. For purposes of this analysis, it is assumed that by 2013 all of the projected development sites would be redeveloped. While the 2013 date is not as significant under the No Build condition, it is helpful to maintain these dates as benchmarks throughout the analysis in order to establish appropriate comparisons between the conditions with and without the proposed actions.

Following the analysis of potential adverse socioeconomic changes is a brief discussion on the potential economic and fiscal benefits that would be generated by the projected development in terms of employment and tax benefits realized by the City and State. In the absence of a specific project, the estimation of fiscal impacts can vary within a considerable range. Therefore, this chapter provides a simplified presentation of the relative benefits of the projected development.

## SOCIOECONOMIC STUDY AREA AND DATA SOURCES

Following 2001 *CEQR Technical Manual* guidelines, the socioeconomic study area is the same as the primary land use study area; it encompasses the project area and adjacent area within approximately one-quarter mile of its borders. The study area is roughly bounded by Sands Street to the north, Wyckoff Street to the south, Henry Street to the west, and Cumberland Street to the east. The census tracts for which demographic and housing data is readily available do not exactly coincide with the boundary of the ¼-mile study area (see Figure 3-1). Following 2001 *CEQR Technical Manual* guidelines, data from the 19 census tracts that fall at least 50 percent within the one-quarter mile radius (tracts 9, 11, 13, 25, 27, 29.01, 29.02, 31, 33, 35, 37, 39, 41, 43, 129.01, 129.02, 161, 179 and 181) were included in the analysis. The study area comprises an area of approximately 1.2 square miles or 768 acres. It covers all of the Downtown Brooklyn, including MetroTech and Civic Center, portions of Brooklyn Heights and Fort Greene, as well as small portions of Bridge Plaza, Boerum Hill, and Park Slope. The area directly affected by the proposed actions is the project area, which consists of all or portions of five census tracts in the Downtown Brooklyn core (tracts 11, 27, 31, 35, and 37). The project area covers an area of approximately 190 acres.

Various sources have been used to prepare this chapter, including field surveys and City land use maps; the New York City Department of City Planning (DCP); U.S. Census data; New York City Department of Finance's Real Property Assessment Data (RPAD); DCP's MISLAND database; real estate brokers; and articles from newspapers and other publications. Following guidelines set forth in the 2001 *CEQR Technical Manual*, the latest census data available (2000) was used to characterize the existing demographic and housing characteristics.

## C. EXISTING CONDITIONS

This section presents an overview of economic trends and existing conditions for the area potentially affected by the projected development. This overview establishes the economic baseline for the region, describing characteristics of the current residential and workforce populations and identifying key economic indicators within the study area. Demographic characteristics of the residential population are described, including population changes and income distribution over time. The section then describes housing demographics and the current housing market in the area. The section concludes with a discussion of the existing economic activity in the project area and in the surrounding socioeconomic study area.

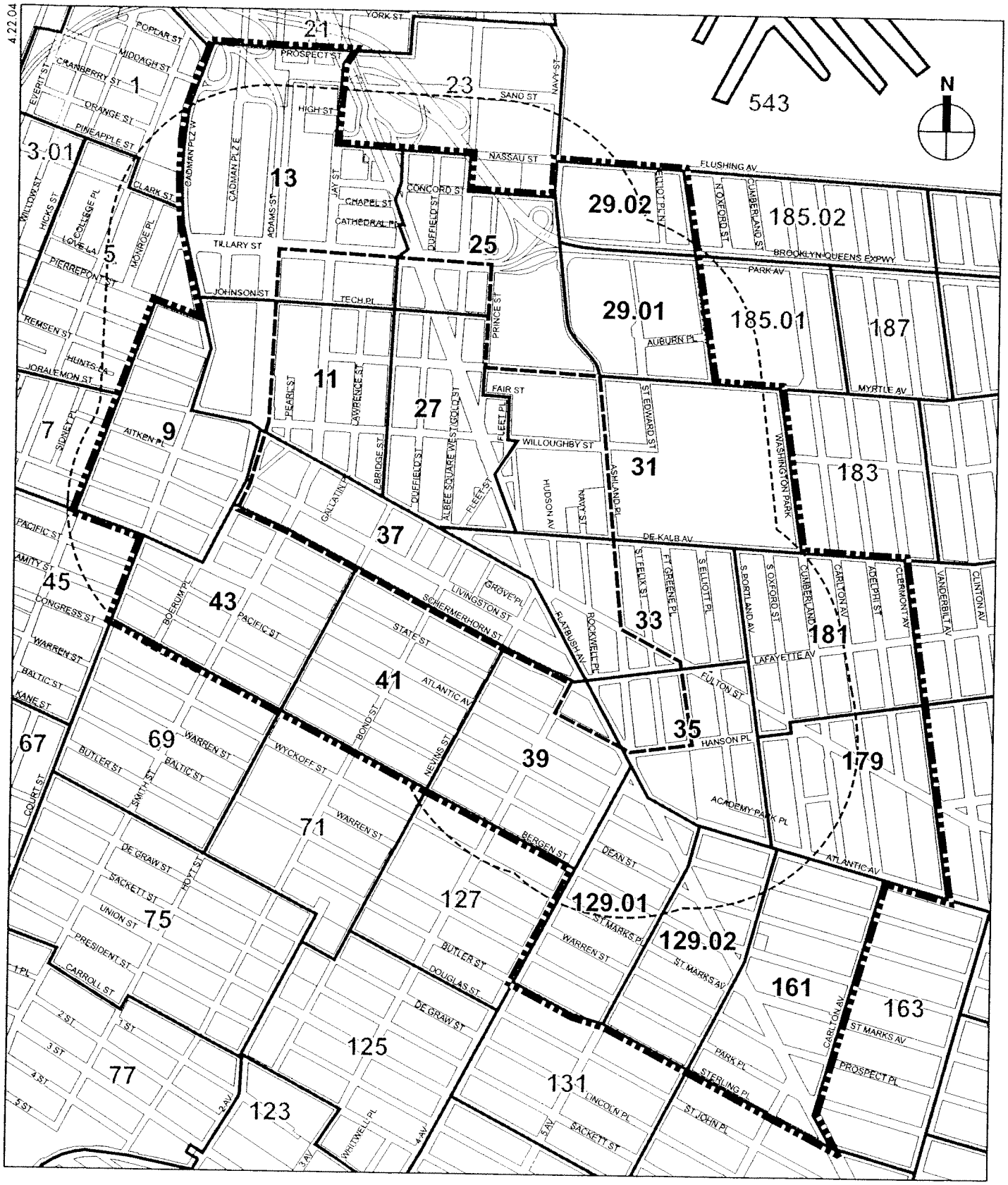
### POPULATION CHARACTERISTICS

#### *TOTAL POPULATION*

According to U.S. Census Bureau data, the 19 census tracts that make up the socioeconomic study area were home to 42,077 residents in 2000, including approximately 3,269 in the smaller project area (see Table 3-1). The project area's population decreased by 106 people (3.1 percent), from 3,375 in 1990 to 3,269 in 2000. During the same period, population in the study area increased by 1,747 residents, or approximately 4.3 percent, compared to the 7.2 percent increase in the Borough of Brooklyn as a whole. The overall change in population was not evenly distributed, however, as Table 3-1 illustrates, most of the growth took place in census tracts 9, 13, 25, 33 and 179, including portions of Civic Center, Bridge Plaza, and Brooklyn Academy of Music (BAM) neighborhoods. Tracts 29.01, 29.02, 31, 35, 39 and 161 lost population, predominantly in the Fort Greene neighborhood. The residential population in tracts 41, 43, 129.01, 129.02 and 181, predominantly covering Boerum Hill, essentially stayed the same. The largest increase took place in Tract 13, which added 871 units.

#### *HOUSEHOLDS AND HOUSEHOLD SIZE*

As shown in Table 3-2, the project area contained about 1,225 households in 2000, a decrease of 109 from 1990 (-8.2 percent). This substantial percentage loss is counter to household trends in the study area and borough-wide. During the same period, households in the study area increased by 1,217 (7.4 percent), from 16,418 in 1990 to 17,635 households in 2000, consistent with the overall increase in households in the Borough of Brooklyn (6.4 percent). The average household size in the project area as well as the study area was 2.1 compared to 2.8 in Brooklyn.




Project Area Boundary

1/4-Mile Study Area Boundary

Census Tracts Study Area Boundary

Census Tract Boundary

DOWNTOWN**BROOKLYN**DEVELOPMENT

**Socioeconomic Study Area**

Figure 3-1

**Table 3-1**
**Population Change in Census Tracts: 1990-2000**

| Census Tract | Residents | | Change,1990-2000 | |
|---|---|---|---|---|
| | 1990 | 2000 | Number | Percent |
| 9 | 1,823 | 2,178 | 355 | 19.5% |
| 11* | 73 | 117 | 44 | 60.3% |
| 13 | 1,662 | 2,533 | 871 | 52.4% |
| 25 | 1,505 | 2,105 | 600 | 39.9% |
| 27* | 577 | 621 | 44 | 7.6% |
| 29.01 | 4,636 | 4,300 | -336 | -7.3% |
| 29.02 | 956 | 653 | -303 | -31.7% |
| 31* | 3,297 | 2,870 | -427 | -13.0% |
| 33 | 1,798 | 2,348 | 550 | 30.6% |
| 35* | 1,610 | 1,477 | -133 | -8.3% |
| 37* | 271 | 357 | 86 | 31.7% |
| 39 | 2,267 | 2,119 | -148 | -6.5% |
| 41 | 3,221 | 3,251 | 30 | 0.9% |
| 43 | 2,959 | 2,942 | -17 | -0.6% |
| 129.01 | 2,155 | 2,239 | 84 | 3.9% |
| 129.02 | 2,030 | 2,125 | 95 | 4.7% |
| 161 | 2,789 | 2,568 | -221 | -7.9% |
| 179 | 2,857 | 3,379 | 522 | 18.3% |
| 181 | 3,844 | 3895 | 51 | 1.3% |
| Project Area | 3,375 | 3,269 | -106 | -3.1% |
| Study Area | 40,330 | 42,077 | 1,747 | 4.3% |
| Brooklyn | 2,300,664 | 2,465,326 | 164,662 | 7.2% |

**Notes:** *Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Source:** 1990 and 2000 U.S. Census data.

*AGE DISTRIBUTION*

As shown in Table 3-3, the project area's population had a median age of almost 35 years in 2000, 1.7 years older than in both the study area and the overall borough (both the study area and Brooklyn had a median age of 33.1 years). While most tracts in the project area have witnessed an aging of the population since 1990, the median age of Census Tract 11 (MetroTech area) dropped by over 10 years of age, going from 41.3 in 1990 to 30.1 in 2000. In the larger study area, the median age in most tracts stayed about the same or increased somewhat. The only two tracts to experience a drop in median age, other than number 11, were tracts 9 and 179, which include portions of the Civic Center and BAM, respectively.

## Table 3-2
## Households and Household Size

| Census Tract | 1990 | | 2000 | | Change, 1990-2000 | |
|---|---|---|---|---|---|---|
| | Number | Persons Per Household | Number | Persons Per Household | Number | Percent |
| 9 | 1,016 | 1.8 | 1,136 | 1.8 | 120 | 11.8% |
| 11* | 36 | 2 | 53 | 2.2 | 17 | 47.2% |
| 13 | 986 | 1.7 | 1,118 | 1.6 | 132 | 13.4% |
| 25 | 426 | 3.5 | 789 | 2.6 | 363 | 85.2% |
| 27* | 299 | 1.9 | 179 | 3.0 | -120 | -40.1% |
| 29.01 | 1,316 | 3.5 | 1,293 | 2.6 | -23 | -1.7% |
| 29.02 | 318 | 3 | 234 | 2.8 | -84 | -26.4% |
| 31* | 1,025 | 3.2 | 949 | 2.0 | -76 | -7.4% |
| 33 | 773 | 2.3 | 905 | 2.1 | 132 | 17.1% |
| 35* | 656 | 2.5 | 703 | 1.9 | 47 | 7.2% |
| 37* | 158 | 1.7 | 167 | 1.8 | 9 | 5.7% |
| 39 | 1,047 | 2.2 | 984 | 2.0 | -63 | -6.0% |
| 41 | 1,376 | 2.3 | 1,415 | 2.0 | 39 | 2.8% |
| 43 | 1,059 | 2.8 | 1,064 | 2.1 | 5 | 0.5% |
| 129.01 | 888 | 2.4 | 978 | 2.3 | 90 | 10.1% |
| 129.02 | 868 | 2.3 | 989 | 2.1 | 121 | 13.9% |
| 161 | 1,150 | 2.4 | 1,214 | 2.1 | 64 | 5.6% |
| 179 | 969 | 2.9 | 1,256 | 2.4 | 287 | 29.6% |
| 181 | 2,052 | 1.9 | 2,209 | 1.8 | 157 | 7.7% |
| **Project Area** | 1,334 | 2.5 | 1,225 | 2.1 | -109 | -8.2% |
| **Study Area** | 16,418 | 2.5 | 17,635 | 2.1 | 1,217 | 7.4% |
| **Brooklyn** | 827,679 | 2.8 | 880,727 | 2.8 | 53,048 | 6.4% |

**Notes:** *Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.

**Source:** 1990 and 2000 U.S. Census.

**Table 3-3**
**Age Distribution, 1990 and 2000**

| Census Tract | Total Population | Under 15 | | Over 65 | | Median Age |
|---|---|---|---|---|---|---|
| | | Population | Percent | Population | Percent | |
| **1990** | | | | | | |
| 9 | 1,823 | 186 | 10.2% | 182 | 10.0% | 36.5 |
| 11* | 73 | 0 | 0.0% | 22 | 30.1% | 41.3 |
| 13 | 1,662 | 123 | 7.4% | 192 | 11.6% | 41.1 |
| 25 | 1,505 | 501 | 33.3% | 98 | 6.5% | 26 |
| 27* | 577 | 32 | 5.5% | 86 | 14.9% | 26.7 |
| 29.01 | 4,636 | 1411 | 30.4% | 302 | 6.5% | 23.8 |
| 29.02 | 956 | 242 | 25.3% | 93 | 9.7% | 28 |
| 31* | 3,297 | 612 | 18.6% | 570 | 17.3% | 35.6 |
| 33 | 1,798 | 177 | 9.8% | 65 | 3.6% | 30.8 |
| 35* | 1,610 | 225 | 14.0% | 32 | 2.0% | 33.2 |
| 37* | 271 | 5 | 1.8% | 15 | 5.5% | 33.3 |
| 39 | 2,267 | 300 | 13.2% | 106 | 4.7% | 33.2 |
| 41 | 3,221 | 410 | 12.7% | 217 | 6.7% | 34.4 |
| 43 | 2,959 | 271 | 9.2% | 168 | 5.7% | 30.8 |
| 129.01 | 2,155 | 362 | 16.8% | 180 | 8.4% | 32.1 |
| 129.02 | 2,030 | 364 | 17.9% | 98 | 4.8% | 30.9 |
| 161 | 2,789 | 487 | 17.5% | 122 | 4.4% | 31 |
| 179 | 2,857 | 441 | 15.4% | 509 | 17.8% | 39.1 |
| 181 | 3,844 | 465 | 12.1% | 299 | 7.8% | 32.6 |
| **Project Area** | 3,375 | 456 | 13.5% | 424 | 12.6% | 33.4 |
| **Study Area** | 40,330 | 6,614 | 16.4% | 3,356 | 8.3% | 32.2 |
| **Brooklyn** | 2,300,664 | 508,241 | 22.1% | 286,911 | 12.5% | 32.3 |
| **2000** | | | | | | |
| 9 | 2,178 | 193 | 8.9% | 199 | 9.1% | 34.6 |
| 11* | 117 | 12 | 10.3% | 2 | 1.7% | 30.1 |
| 13 | 2,533 | 156 | 6.2% | 252 | 9.9% | 39.2 |
| 25 | 2,105 | 573 | 27.2% | 165 | 7.8% | 29.2 |
| 27* | 621 | 113 | 18.2% | 19 | 3.1% | 29.2 |
| 29.01 | 4,300 | 1,392 | 32.4% | 324 | 7.5% | 23.9 |
| 29.02 | 653 | 160 | 24.5% | 56 | 8.6% | 32.8 |
| 31* | 2,870 | 305 | 10.6% | 633 | 22.1% | 37.7 |
| 33 | 2,348 | 481 | 20.5% | 130 | 5.5% | 30.6 |
| 35* | 1,477 | 213 | 14.4% | 100 | 6.8% | 35.5 |
| 37* | 357 | 18 | 5.0% | 30 | 8.4% | 38.4 |
| 39 | 2,119 | 239 | 11.3% | 122 | 5.8% | 34.1 |
| 41 | 3,251 | 316 | 9.7% | 465 | 14.3% | 37.3 |
| 43 | 2,942 | 298 | 10.1% | 168 | 5.7% | 32.4 |
| 129.01 | 2,239 | 334 | 14.9% | 148 | 6.6% | 32.3 |
| 129.02 | 2,125 | 262 | 12.3% | 143 | 6.7% | 32.7 |
| 161 | 2,568 | 301 | 11.7% | 170 | 6.6% | 33.2 |

**Table 3-3 (cont'd)**
**Age Distribution, 1990 and 2000**

| Census Tract | Total Population | Under 15 | | Over 65 | | Median Age |
|---|---|---|---|---|---|---|
| | | Population | Percent | Population | Percent | |
| **2000 (cont'd)** | | | | | | |
| 179 | 3,379 | 634 | 18.8% | 453 | 13.4% | 34.6 |
| 181 | 3895 | 390 | 10.0% | 311 | 8.0% | 33.3 |
| **Project Area** | 3269 | 403 | 12.3% | 418 | 12.8% | 34.8 |
| **Study Area** | 42,077 | 6,390 | 15.2% | 3,890 | 9.2% | 31.3 |
| **Brooklyn** | 2,465,326 | 555,142 | 22.5% | 282,658 | 11.5% | 33.1 |

**Notes:** * Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Source:** 1990 and 2000 U.S. Census

Children and seniors are the population groups potentially most vulnerable to residential displacement because of limited and/or fixed incomes and limited control over their housing choices. In terms of children as a percentage of population, 12.3 percent of the project area's population was under 15 years of age, less than the 15.2 percent in the study area and 22.5 percent in Brooklyn. Conversely, 12.8 percent of the project area's population was 65 years or older, which is higher than the 9.2 percent in the study area and 11.5 percent in Brooklyn.

*INCOME*

*Median Income*

As shown in Table 3-4, median household income in 1999 in the project area was 23 percent higher than the borough wide median ($39,450 versus $32,135), even though household incomes in the project area decreased by about $1,000 between 1989 and 1999. At the same time, the median household incomes in project area tracts 11 and 27 (MetroTech area) increased significantly, by 186 percent and 115 percent, respectively. Median incomes for census tracts within or partially within the project area ranged from $29,732 to $45,213. In the study area, median household income in 1999 dollars increased by about 12 percent, going from $40,723 in 1989 to $45,594 in 1999, 15.6 percent higher than the project area, and 41.9 percent higher than Brooklyn. Median incomes varied throughout the study area in 1999, ranging from $16,680 to $79,201. In addition, four out of the five census tracts in the study area that had a lower median income in 1999, as compared to 1989, were in the eastern portion of the study area (i.e., the Fort Greene neighborhood). In the Borough of Brooklyn, median income decreased by 6.9 percent over the decade, going from $34,508 in 1989 to $32,135 in 1999.

**Table 3-4**
**Median Household Income, 1989 and 1999**

| Census Tract | 1989 Median Household Income | 1989 Income in 1999 Dollars | 1999 Median Household Income | Real Dollar Change 1989-1999 | |
|---|---|---|---|---|---|
| | | | | Dollars | Percent |
| 9 | $54,690 | $73,479 | $79,201 | $5,722 | 7.8% |
| 11* | $7,743 | $10,403 | $29,732 | $19,329 | 185.8 |
| 13 | $46,957 | $63,089 | $58,828 | -$4,261 | -6.8 |
| 25 | $9,617 | $12,921 | $16,680 | $3,759 | 29.1 |
| 27* | $11,902 | $15,991 | $34,375 | $18,384 | 115.0 |
| 29.01 | $10,267 | $13,794 | $11,641 | -$2,153 | -15.6 |
| 29.02 | $18,068 | $24,275 | $27,159 | $2,884 | 11.9 |
| 31* | $36,569 | $49,132 | $40,641 | -$8,491 | -17.3 |
| 33 | $34,323 | $46,115 | $45,213 | -$902 | -2.0 |
| 35* | $34,773 | $46,719 | $44,306 | -$2,413 | -5.2 |
| 37* | $22,000 | $29,558 | $36,667 | $7,109 | 24.0 |
| 39 | $23,697 | $31,838 | $38,686 | $6,848 | 21.5 |
| 41 | $44,944 | $60,384 | $61,486 | $1,102 | 1.8 |
| 43 | $32,348 | $43,461 | $56,429 | $12,968 | 30.0 |
| 129.01 | $27,377 | $36,782 | $48,024 | $11,242 | 30.6 |
| 129.02 | $36,552 | $49,109 | $55,625 | $6,516 | 13.3 |
| 161 | $32,778 | $44,039 | $65,192 | $21,153 | 48.0 |
| 179 | $26,602 | $35,741 | $38,750 | $3,009 | 8.4 |
| 181 | $30,919 | $41,541 | $48,731 | $7,190 | 17.3 |
| **Project Area** | $30,125 | $40,474 | $39,450 | -$1,024 | -2.5 |
| **Study Area** | 30,310 | $40,723 | $45,594 | $4,871 | 11.9 |
| **Brooklyn** | 25,684 | $34,508 | 32,135 | -$2,373 | -6.9% |

**Notes:** * Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Source:** 1990 and 2000 U.S. Census

*Poverty*

In the project area, the percentage of people living below the poverty level decreased from 24.9 percent in 1989 to 20.1 percent in 1999 (see Table 3-5). In the study area, the percentage of people living in poverty also decreased slightly, from 22.7 to 21.7 percent over the decade. In contrast, the percentage of people living in poverty increased in Brooklyn from 22.7 in 1989 to 25.1 in 1999. The poverty rates in the study area census tracts varied widely, from 0 percent in Tract 11 at the western edge of the project area to 61 percent in Tract 29.01 in the Fort Greene neighborhood. The low-income levels in this tract reflect the presence of large-scale public housing projects, which set maximum income limitations. Of all census tracts in the study area, Tract 13 experienced the largest increase in poverty rate between 1989 and 1999, with the

**Table 3-5**
**Persons with Incomes Below the Poverty Level**

| Census Tract | 1989 | | 1999 | | Change: 1989-1999 | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| 9 | 119 | 6.5 | 289 | 13.4 | 170 | 142.9 |
| 11* | 61 | 83.6 | 0 | 0.0 | -61 | -100.0 |
| 13 | 86 | 5.2 | 783 | 30.8 | 697 | 810.5 |
| 25 | 894 | 59.6 | 733 | 38.3 | -161 | -18.0 |
| 27* | 87 | 15.1 | 149 | 24.7 | 62 | 71.3 |
| 29.01 | 2101 | 45.7 | 2441 | 60.9 | 340 | 16.2 |
| 29.02 | 364 | 38.1 | 157 | 25.2 | -207 | -56.9 |
| 31* | 223 | 89.6 | 303 | 17.1 | 80 | 35.9 |
| 33 | 303 | 17.0 | 406 | 19.9 | 103 | 34.0 |
| 35* | 290 | 18.2 | 274 | 18.6 | -16 | -5.5 |
| 37* | 54 | 19.9 | 109 | 28.4 | 55 | 101.9 |
| 39 | 581 | 25.8 | 454 | 21.6 | -127 | -21.9 |
| 41 | 259 | 8.4 | 186 | 6.1 | -73 | -28.2 |
| 43 | 390 | 17.8 | 300 | 13.6 | -90 | -23.1 |
| 129.01 | 536 | 24.9 | 260 | 11.4 | -276 | -51.5 |
| 129.02 | 315 | 15.6 | 179 | 8.5 | -136 | -43.2 |
| 161 | 454 | 16.3 | 255 | 10.0 | -199 | -43.8 |
| 179 | 552 | 22.3 | 667 | 21.9 | 115 | 20.8 |
| 181 | 496 | 12.9 | 479 | 12.1 | -17 | -3.4 |
| **Project Area** | 458.5 | 24.9 | 546.5 | 20.1 | 88 | 19.2 |
| **Study Area** | 8,165 | 22.7 | 8,424 | 21.7 | 259 | 3.2 |
| **Brooklyn** | 514,163 | 22.7 | 610,476 | 25.1 | 96,313 | 18.7 |

**Notes:** * Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Source:** 1990 and 2000 U.S. Census

number of persons below poverty level jumping from 86 in 1989 to 783 in 1999. This increase can be partially attributed to a 502-unit residential building built in 1992 and occupied by members of the Watchtower (a Jehovah's Witnesses organization) who are unpaid volunteers. Overall, one in five persons in the project area has incomes below the poverty level, compared to one in four in Brooklyn.

## HOUSING CHARACTERISTICS

### *TOTAL HOUSING UNITS*

In the 1990s, the project area experienced a small gain in housing units, growing from 1,302 units in 1990 to 1,345 in 2000, an increase of 3.3 percent (see Table 3-6). Over the same time period, the housing stock in the overall study area increased by 696 or 3.9 percent. The rise in housing units in both the project area and the study area fell short of the increase in Brooklyn, which added 57,195 units or 6.5 percent. Throughout the project area, the change in the number

**Table 3-6**
**Total Housing Units**

| Census Tracts | 1990 | 2000 | Change 1990-2000 | |
|---|---|---|---|---|
| | | | Number | Percent |
| 9 | 1,137 | 1,199 | 62 | 5.5 |
| 11* | 16 | 83 | 67 | 418.8 |
| 13 | 1,097 | 1,135 | 38 | 3.5 |
| 25 | 481 | 740 | 259 | 53.8 |
| 27* | 201 | 178 | -23 | -11.4 |
| 29.01 | 1,353 | 1,343 | -10 | -0.7 |
| 29.02 | 342 | 235 | -107 | -31.3 |
| 31* | 1,114 | 1,002 | -112 | -10.1 |
| 33 | 851 | 1,030 | 179 | 21.0 |
| 35* | 766 | 738 | -28 | -3.7 |
| 37* | 145 | 214 | 69 | 47.6 |
| 39 | 1,170 | 1,063 | -107 | -9.1 |
| 41 | 1,548 | 1,556 | 8 | 0.5 |
| 43 | 1,204 | 1,127 | -77 | -6.4 |
| 129.01 | 990 | 1,056 | 66 | 6.7 |
| 129.02 | 955 | 1,084 | 129 | 13.5 |
| 161 | 1,277 | 1,259 | -18 | -1.4 |
| 179 | 1,021 | 1,305 | 284 | 27.8 |
| 181 | 2,251 | 2,268 | 17 | 0.8 |
| **Project Area** | 1,302 | 1,345 | 43 | 3.3 |
| **Study Area** | 17,919 | 18,615 | 696 | 3.9 |
| **Brooklyn** | 873,671 | 880,727 | 57,195 | 6.5 |

**Notes:** * Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Sources:** 1990 and 2000 U.S. Census

of units varied by census tract. Tracts 11 and 37 increased by 67 and 69 units, respectively, while tracts 27, 31, and 35 all lost units (23, 112, and 28, respectively). In the larger study area, the greatest increase in units was 284 in tract 179 (BAM area), closely followed by 259 in tract 25 (Bridge Plaza area). The northeastern portion of the study area lost the most units over the period, with tracts 29.01 and 31 each losing over 100 units during the 1990s. Overall, 8 of the 19 census tracts in the study area lost housing units. Although the project area accounts for about 25 percent of the land area of the total study area, only about seven percent, or 1,345 units of the 18,615 total study area units, are within the project area. This small proportion reflects the project area's lower population density and its primary role as a downtown district.

*OCCUPIED UNITS AND OWNER-OCCUPIED UNITS*

In 2000, the project area, socioeconomic study area and Borough of Brooklyn all had low vacancy rates for housing units, 6.3, 5.1 and 5.4 percent, respectively (see Table 3-7). The vacancy rates in the project area and Borough have remained relatively constant since 1990, while the rate in the study area has decreased by 3.5 percent. The only census tract in the study area with a vacancy rate of over 10 percent was number 37, which had a rate of 15.4 percent.

**Table 3-7**
**Occupied and Owner-Occupied Housing Units**

| Census Tract | Total Units | | Occupied Units | | | | Owner-Occupied Units | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | | % of Total Units | | Total | | % of Total Units | |
| | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 |
| 9 | 1,137 | 1,199 | 1,001 | 1,152 | 88.0 | 96.1 | 352 | 413 | 31.0 | 34.4 |
| 11* | 16 | 83 | 16 | 83 | 100.0 | 100.0 | 0 | 0 | 0.0 | 0.0 |
| 13 | 1,097 | 1,135 | 1,047 | 1,072 | 95.4 | 94.4 | 803 | 804 | 73.2 | 70.8 |
| 25 | 481 | 740 | 466 | 740 | 96.9 | 100.0 | 17 | 39 | 3.5 | 5.3 |
| 27* | 201 | 178 | 194 | 165 | 96.5 | 92.7 | 9 | 0 | 4.5 | 0.0 |
| 29.01 | 1,353 | 1,343 | 1,353 | 1,292 | 100.0 | 96.2 | 10 | 19 | 0.7 | 1.4 |
| 29.02 | 342 | 235 | 328 | 235 | 95.9 | 100.0 | 16 | 53 | 4.7 | 22.6 |
| 31* | 1,114 | 1,002 | 1,052 | 954 | 94.4 | 95.2 | 278 | 485 | 25.0 | 48.4 |
| 33 | 851 | 1,030 | 749 | 969 | 88.0 | 94.1 | 138 | 194 | 16.2 | 18.8 |
| 35* | 766 | 738 | 668 | 707 | 87.2 | 95.8 | 57 | 110 | 7.4 | 14.9 |
| 37* | 145 | 214 | 145 | 181 | 100.0 | 84.6 | 7 | 0 | 4.8 | 0.0 |
| 39 | 1,170 | 1,063 | 1,039 | 1,020 | 88.8 | 96.0 | 131 | 154 | 11.2 | 14.5 |
| 41 | 1,548 | 1,556 | 1,452 | 1,463 | 93.8 | 94.0 | 419 | 487 | 27.1 | 31.3 |
| 43 | 1,204 | 1,127 | 1,009 | 1,064 | 83.8 | 94.4 | 129 | 241 | 10.7 | 21.4 |
| 129.01 | 990 | 1,056 | 902 | 990 | 91.1 | 93.8 | 186 | 253 | 18.8 | 24.0 |
| 129.02 | 955 | 1,084 | 855 | 994 | 89.5 | 91.7 | 222 | 204 | 23.2 | 18.8 |
| 161 | 1,277 | 1,259 | 1,158 | 1,185 | 90.7 | 94.1 | 275 | 334 | 21.5 | 26.5 |
| 179 | 1,021 | 1,305 | 976 | 1,265 | 95.6 | 96.9 | 167 | 292 | 16.4 | 22.4 |
| 181 | 2,251 | 2,268 | 1,974 | 2,135 | 87.7 | 94.1 | 437 | 488 | 19.4 | 21.5 |
| **Project Area** | 1,302 | 1,345 | 1,215 | 1,260 | 93.3 | 93.7 | 184 | 298 | 14.1 | 22.2 |
| **Study Area** | 17,919 | 18,615 | 16,384 | 17,666 | 91.4 | 94.9 | 3,653 | 4,570 | 24.6 | 24.6 |
| **Brooklyn** | 873,671 | 880,727 | 828,199 | 930,866 | 94.8 | 94.6 | 215,843 | 238,290 | 24.7 | 25.6 |

**Notes:** * Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Sources:** 1990 and 2000 U.S. Census

The inventory of owner-occupied housing units in both the study area and overall borough remained relatively constant at about 25 percent from 1990 to 2000. However, in the project area, owner-occupancy increased from 14 to 22 percent in the 1990s. Three of the project area tracts had no owner-occupied units, and the other two had rates of 15 and 49 percent, respectively. In total, the project area had 1,047 renter-occupied units in 2000. The percentage of owner-occupied units varies among the study area census tracts. The owner-occupancy rate ranged from 0 percent (tracts 11, 27, 37) to 71 percent (tract 13, the location of a large cooperative housing development on Cadman Plaza) for tracts in the study area. Only 3 of the 19 tracts had owner-occupancy percentages of over 30 percent (9, 13, and 31).

*UNITS NOT PROTECTED BY RENT REGULATION*

The number of units in a residential structure in New York City is important because it affects the type of rent protection afforded to occupants. Rent control can apply to buildings with more than three units built before 1947, and rent stabilization can apply to structures with six units or

more built before 1974. Table 3-8 shows that in 2000, 231, or 24.0 percent of the rental units in the project area, and 31.6 percent of units in the study area, were in structures containing fewer than five units, both smaller proportions than the 35.4 percent for the entire borough.

**Table 3-8**
**Units in Structure, Renter-Occupied, 2000**

| Census Tracts | 1 to 4 Units | | 5 to 9 Units | | 10 or More Units and Other | | Total Units |
|---|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent | Number |
| 9 | 160 | 21.7 | 168 | 22.7 | 411 | 55.6 | 739 |
| 11* | 0 | 0 | 0 | 0 | 83 | 100 | 83 |
| 13 | 7 | 2.6 | 7 | 2.6 | 254 | 94.8 | 268 |
| 25 | 66 | 9.4 | 31 | 4.4 | 604 | 86.2 | 701 |
| 27* | 86 | 52.1 | 12 | 7.3 | 67 | 40.6 | 165 |
| 29.01 | 9 | 0.7 | 91 | 7.1 | 1,173 | 92.1 | 1,273 |
| 29.02 | 18 | 9.9 | 9 | 4.9 | 155 | 85.2 | 182 |
| 31* | 8 | 1.7 | 10 | 2.1 | 451 | 96.2 | 469 |
| 33 | 407 | 52.5 | 157 | 20.3 | 211 | 27.2 | 775 |
| 35* | 146 | 24.5 | 167 | 28 | 284 | 47.6 | 597 |
| 37* | 68 | 37.6 | 54 | 29.8 | 59 | 32.6 | 181 |
| 39 | 316 | 36.5 | 151 | 17.4 | 399 | 46.1 | 866 |
| 41 | 485 | 49.7 | 215 | 22 | 276 | 28.3 | 976 |
| 43 | 320 | 38.9 | 204 | 24.8 | 299 | 36.3 | 823 |
| 129.01 | 405 | 55 | 216 | 29.3 | 116 | 15.7 | 737 |
| 129.02 | 464 | 58.7 | 241 | 30.5 | 85 | 10.8 | 790 |
| 161 | 366 | 43 | 366 | 43 | 119 | 14 | 851 |
| 179 | 365 | 37.5 | 28 | 2.9 | 580 | 59.6 | 973 |
| 181 | 446 | 27.1 | 325 | 19.7 | 876 | 53.2 | 1,647 |
| **Project Area** | 231 | 24.0 | 155 | 16.1 | 577 | 59.9 | 962 |
| **Study Area** | 4,142 | 31.6 | 2,452 | 18.7 | 6,502 | 49.6 | 13,096 |
| **Brooklyn** | 227,437 | 35.4 | 88,502 | 13.8 | 326,498 | 50.8 | 642,437 |

**Notes:** * Census tracts that lie completely within, or that have significant residential areas within, the proposed project area.
**Sources:** 1990 and 2000 U.S. Census

Using the City's RPAD files (2002 data), which identified a total of 21 five-unit buildings in the project area and 152 five-unit buildings in the study area, and conservatively assuming that all were rental buildings, an additional 105 units in the project area (11 percent of the project area rental units) and 760 units in the study area (6 percent of the study area rental units) were not likely to be covered by rent protection. This brings the total number of unprotected rental units to approximately 335 in the project area (about one-third of the project area total rental units) and 4,900 in the study area (37 percent of study area rental units). These buildings contain an estimated 874 persons in the project area (27 percent of the year 2000 project area population) and 11,765 persons in the study area (28 percent of the year 2000 study area population).

Although buildings containing fewer than six units are not subject to rent control or rent stabilization, it is likely that most of the one- to five-unit buildings in the project area and study area are currently renting at or close to market rate, making their residents less susceptible to displacement. As indicated in Table 3-9, the median housing value in the study area is more than twice the median housing value for the Borough of Brooklyn. In addition, the study area's median contract rent is approximately 15 percent higher than Brooklyn's median contract rent, even when the area's public housing units (which account for a large proportion of the 4,137 units renting for under $500 per month) are factored into the analysis.

**Table 3-9**

**2000 Housing Value and Rent Data**

| | Project Area | | Study Area | | Brooklyn | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| **Owner occupied** | | | | | | |
| Value under $100,000 | N/A | N/A | 6 | 0.9 | 4,130 | 4.6 |
| $100,000 to $199,999 | N/A | N/A | 67 | 10.8 | 31,484 | 35.4 |
| $200,000 to $299,999 | N/A | N/A | 65 | 10.5 | 30,968 | 34.8 |
| $300,000 to $399,000 | N/A | N/A | 85 | 13.7 | 10,625 | 11.9 |
| $400,000 or more | N /A | N/A | 398 | 64.1 | 11,837 | 13.3 |
| **Total** | N/A | N/A | 621 | 100.0 | 89,044 | 100.0 |
| *Median housing value* | *N/A* | | *$482,389* | | *$224,100* | |
| **Renter Occupied** | | | | | | |
| Rent under $500 | 213 | 22.5 | 4,137 | 32.0 | 192,408 | 30.5 |
| $500 to $749 | 403 | 42.6 | 2,785 | 21.5 | 262,223 | 41.6 |
| 750 to $999 | 215 | 22.7 | 2,575 | 19.9 | 128,516 | 20.4 |
| $1,000 to $1,499 | 97 | 10.2 | 2,312 | 17.9 | 37,077 | 5.9 |
| $1,500 or more | 19 | 2.0 | 1,126 | 8.7 | 9,836 | 1.6 |
| **Total** | 947 | 100.0 | 12,935 | 100.0 | 630,060 | 100.0 |
| *Median contract rent* | *$699* | *100.0* | *$713* | *100.0* | *$621* | *100.0* |

**Source:** 2000 Census of Population and Housing

The remaining 65.1 percent of project area rental units and 62.6 percent of study area units are in structures containing six or more housing units, and so are potentially afforded protection under either rent control or stabilization (i.e., units in structures containing six or more housing units and that were built prior to 1974).

## RENTS AND HOUSING VALUE

The 2000 Census data indicates a somewhat higher cost of housing in the study area compared to the overall Borough of Brooklyn. The median contract rent for apartments in the study area was $713, 15 percent higher than Brooklyn's median contract rent of $621 (see Table 3-9). There are a substantially larger percentage of high priced rentals in the study area compared to Brooklyn as a whole. Of the renter-occupied housing units in the study area, 32 percent of the units rented for less than $500 per month, while 27 percent rented for over $1,000 per month. In Brooklyn overall, just over 30 percent of rental units rented for less than $500 a month, while only 7.5 percent rented for over $1,000 per month.

According to local real estate brokers, the residential real estate market in the study area has gone through some significant changes over the past 15 years. Until about 1993, most neighborhoods in the study area (with the exception of Brooklyn Heights) had low housing costs, few amenities, and low desirability compared to Manhattan and Brooklyn Heights. Around 1993, the market began to change as the economy surged, housing demand increased, and more of the city's population began to appreciate the area's historic brownstones and its convenience to Manhattan. Rents and buying prices escalated, reaching peaks in 2000 and 2001.

Coinciding with the economic downturn that began in 2001, rents began to slide, while home prices remained constant or continued to increase. According to local real estate brokers, average rental rates decreased by 15 to 25 percent since 2001, and many apartments are on the market for over two weeks before renting—a marked contrast to 2000 and 2001, when demand was extraordinarily high and apartments rented immediately. The market for townhouses, condominiums, and cooperatives, on the other hand, has remained strong and prices in many neighborhoods have continued to increase.[1] According to the Corcoran Group, one of New York City's largest private real estate companies. Brooklyn residential real estate prices surged in 2002, with cooperatives up 18 percent, condominiums up 64 percent, single-family townhouses up 2 percent and multi-family townhouses up 26 percent from 2001.

*APARTMENTS*

Across Brooklyn, the average monthly rent in 2002 was approximately $1,250 for a studio, $1,700 for a one-bedroom, $2,200 for a two-bedroom, and $2,850 for a three-bedroom. Brooklyn Heights was the most expensive neighborhood in Brooklyn for each apartment category, including an average monthly rent of $1,250 for a studio, $1,900 for a one-bedroom, $2,650 for a two-bedroom, and $3,850 for a three-bedroom apartment. The Fort Greene/Clinton Hill area is in general the most reasonable neighborhood to rent, with the average monthly rental rate ranging from $1,200-$1,400 for a one-bedroom, $1,500-$1,900 for a two-bedroom, and $2,300 to $2,600 for a three-bedroom apartment.[2]

It should be noted that the majority of rental properties on the market are renting for a substantially higher rate than the median rental data reported above by the 2000 Census of Population and Housing. This discrepancy is primarily due to the very low turnover of rent-regulated apartments as well as the presence of publicly subsidized and public housing units.

*COOPERATIVES*

The overall average price for a cooperative in Brooklyn was $349,000 in 2002, with average sale prices of $145,000 for studio units, $259,000 for one-bedroom units, $421,000 for two-bedroom units, and $734,000 for units with three or more bedrooms. The most expensive neighborhood in the borough in which to purchase shares in each cooperative category was Brooklyn Heights, which had an average price of $152,000 for a studio, $300,000 for a one-bedroom, $505,000 for a two-bedroom, and $928,000 for a unit with three or more bedrooms. Within the study area, the least expensive neighborhood to purchase cooperative shares for a studio or three-plus bedroom unit was the Cobble Hill/Carroll Gardens neighborhood with an average price of $115,000 and

[1] Telephone interviews with Renaissance Properties and Eva M. Daniels Realty, Inc. November 2003.

[2] Housing rental rates and prices were obtained from the Corcoran Group, Renaissance Properties, and Eva M. Daniels Realty, Inc.

$549,000 respectively. The Fort Greene/Clinton Hill neighborhood was the most reasonable area in the study area for one-bedroom or two-bedroom units with average prices of $171,000 and $322,000, respectively.

*CONDOMINIUMS*

The average sales price for a condominium in Brooklyn was $416,000. Boerum Hill was the most expensive study area neighborhood in which to purchase a condominium, with an average sale price of $454,000. The Park Slope area was the least expensive, with an average price of $298,000. The condominium market in the Fort Greene/Clinton Hill area is also strong, with several one-bedroom condominiums selling for approximately $450,000 in recent months.

*TOWNHOUSES*

In 2002, single-family townhouses in Brooklyn sold for $827,000 and multiple-family units sold for $711,000, on average. The most expensive area in Brooklyn to purchase a townhouse was in Brooklyn Heights, where the average single-family unit sold for $1.9 million and the average multi-family unit sold for $1.7 million. The most affordable neighborhood to purchase a townhouse was Fort Greene/Clinton Hill, where the average single-family unit sold for $555,000 and the average price for a multi-family unit was $489,000.

## ECONOMIC CONDITIONS

*REGIONAL ECONOMIC CONTEXT*

Over the past several decades, New York City's share of total regional employment has been diminishing. In 1958, there were 3.1 million employees in New York City, which accounted for 80 percent of the region's employment. By 2000, the number of employees in the City stood at 3.2 million, but its share of regional employment had dipped to 65 percent.

In total, the New York City metropolitan area contains some 432 million square feet of office space (all classes) in a total of nearly 1,400 buildings. In the 1990s, Manhattan's office inventory increased by 4.7 million square feet, or 2 percent. During this same period, demand for space by expanding companies created a very tight Class A office space market in Manhattan. As a result of the increased demand, rents for Class A office space doubled between 1990 and 2000. The market for Class A space in Manhattan was very tight, with a vacancy rate of only 4.5 percent, a decrease over the period of 72 percent.

In response to the market demand, MetroTech Center added nearly 3 million square feet of Class A office space to the Brooklyn inventory between 1990 and 2000. However, this modest expansion of the office supply within New York City was overshadowed by office development along the New Jersey Hudson River Waterfront where approximately 12 million square feet of relatively inexpensive Class A office space was built between 1990 and 2000. This space supplies room for 50,000 employees and represents about $150 million in 2003 tax dollars. Due to the overall lack of reasonably priced Class A office space in Manhattan, several firms left the New York City for the New Jersey Hudson River area for available lower-cost, large floor-plate buildings. In 2000 alone, 32 firms, totaling about 9,000 employees, relocated from New York City to New Jersey.

In response to these trends, New York has formed a strategy for the redevelopment of its Lower Manhattan, Hudson Yards, Long Island City and Downtown Brooklyn business districts. Down-

town Brooklyn's role in this strategy is to provide available and competitively-priced space that meets the building and locational attributes sought by corporate tenants that will offer a viable alternative for businesses to relocate to or remain in New York City. This includes the back office functions of firms seeking to disperse operations from central locations. Downtown Brooklyn is easily accessible to Manhattan and offers Class A office space at more reasonable rates. Brooklyn office market data for 2002 are presented in Tables 3-10 and 3-11, below.

**Table 3-10**
**Brooklyn, New York Office Market, 2003**

| | Type of Space | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Class A | | Class B | | Class C | | Overall | |
| | 1st Quarter | 2nd Quarter | 1st Quarter | 2nd Quarter | 1st Quarter | 2nd Quarter | 1st Quarter | 2nd Quarter |
| Total Number of Buildings | 10 | 10 | 45 | 45 | 24 | 24 | 79 | 79 |
| Total Inventory (sf) | 5,495,462 | 5,495,462 | 6,158,719 | 6,158,719 | 3,249,308 | 3,249,308 | 14,903,489 | 14,903,489 |
| Total Available Space (sf) | 31,150 | 31,150 | 1,100,283 | 1,100,283 | 506,005 | 488,385 | 1,637,438 | 1,624,545 |
| Total Vacancy Rate | 0.6% | 0.6% | 17.9% | 17.9% | 15.6% | 15.0% | 11.0% | 10.9% |
| Monthly Rental psf | $31.11 | $31.11 | $24.71 | $24.45 | $19.97 | $20.37 | $23.36 | $23.35 |

**Source:** Cushman & Wakefield Research Services

**Table 3-11**
**Brooklyn, New York Office Market, 2003**

| Type of Building | No. of Buildings | Total Inventory (sf) | Total Available Space (sf) | Total Vacancy Rate | Monthly Rental (psf) |
|---|---|---|---|---|---|
| Class A | 10 | 5,495,462 | 31,150 | 0.6% | $31.11 |
| Class B | 45 | 6,158,719 | 1,100,283 | 17.9% | $24.45 |
| Class C | 24 | 3,249,308 | 488,385 | 15.0% | $20.37 |
| **Total** | **79** | **14,903,489** | **1,624,545** | **10.9%** | **$23.35** |

**Source:** Cushman & Wakefield Research Services

Currently, there are approximately 70,000 workers in Downtown Brooklyn, many at the myriad of borough and citywide public agencies in the Civic Center area and at the operation centers of major financial centers. Seven academic institutions are located in Downtown Brooklyn, which include 32,000 students. In addition, Downtown Brooklyn boasts notable cultural attractions, including BAM, which draws hundreds of thousands of visitors annually.

Downtown Brooklyn includes 11 million square feet of commercial office space, including 6 million square feet of modern, high-quality Class A office space. The nearly nonexistent Downtown Brooklyn vacancy rate (0.2 percent) is a strong indicator of substantial unmet demand for additional Class A space in the area.

*COMMERCIAL DISTRICT SUB-AREAS*

*Project Area*

*MetroTech Center Area*. Located in the northwestern portion of the project area (see Figure 3-2, MetroTech Center is a 16-acre corporate and academic complex with over 5 million square feet of commercial and municipal office space and an estimated 20,000 employees. Major employers in the area include Bear Stearns, KeySpan, JP Morgan Chase, and Verizon. Located just to the west of MetroTech is the Renaissance Plaza development, which combines commercial office space with a Marriott Hotel on the lower floors.

The MetroTech Business Improvement District (BID) provides public safety, sanitation, economic development, marketing and promotional services throughout the 25-block area. The BID comprises over 220 businesses, retailers and services.

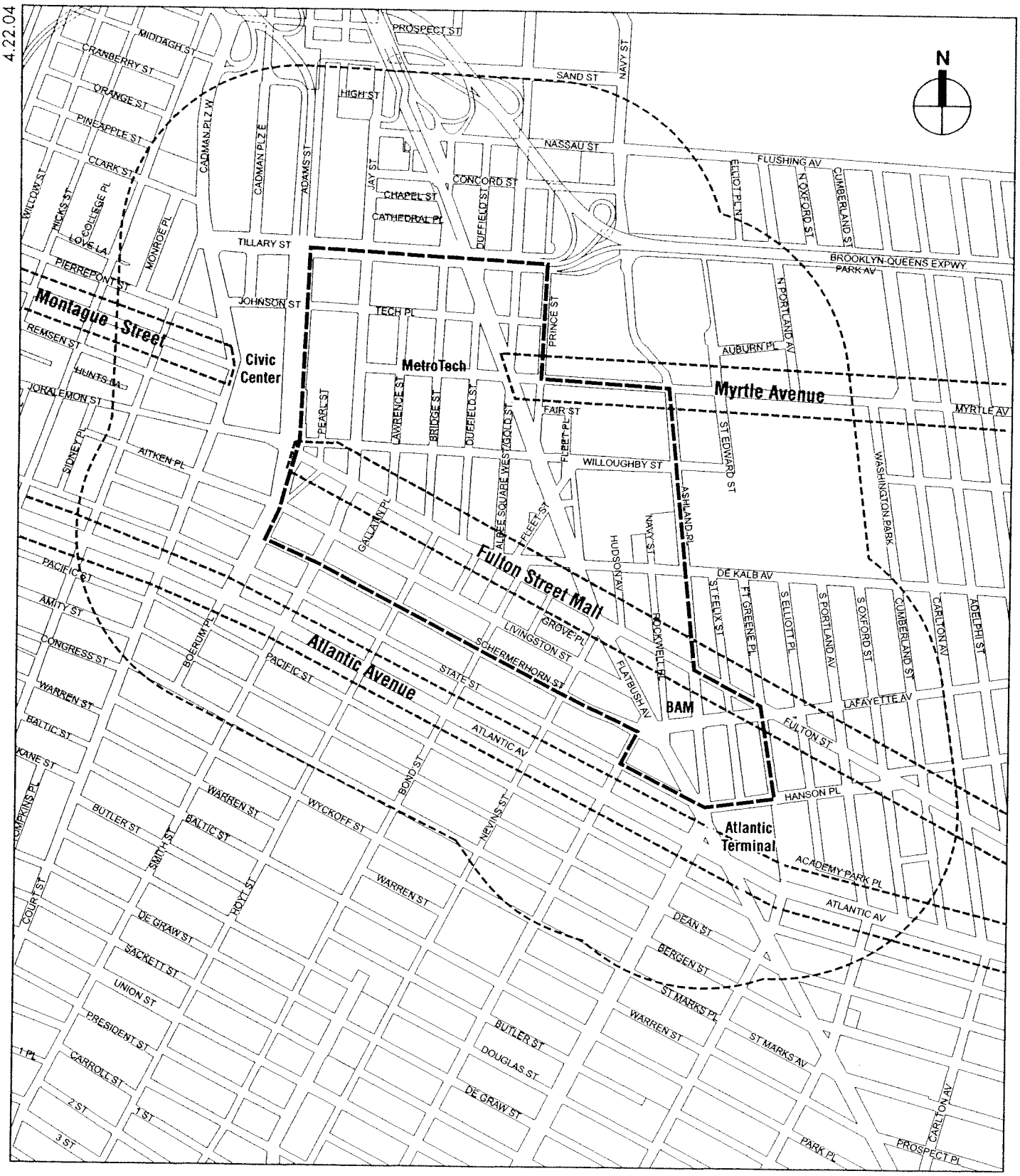
*Fulton Street Mall*. The Fulton Street Mall is a vital commercial corridor, centered on Fulton Street north of Borough Hall. The area serves as a shopping district for office workers, residents of Fort Greene and other nearby neighborhoods, and those transferring between the various forms of public transit that converge there. Macy's Department store, occupying the former Abraham and Strauss building, is the corridor's primary retail anchor and one of the top-performing stores of the chain. Other retail businesses include comparison goods retailers such as shoe stores, clothing stores, accessory stores, furniture stores, toy stores, and music stores. The wedge-shaped area between Jay Street, Willoughby Street and Fulton Street, includes several small neighborhood convenience stores and service businesses such as delis, banks, restaurants, hair salons and dry cleaners. National retailers include Toys-R-Us and Computer Center. Retail rents along Fulton Street are the highest of all retail locations in New York City outside of Manhattan.

The Fulton Mall Improvement Association is the area's BID. Fulton FIRST (Fleet Initiative for Retail Services and Trade) is a 3-year planning and marketing effort aimed at revitalizing the Fulton Street commercial corridor. The program offers businesses financial and technical assistance and has also funded the Fulton Street Retail Redevelopment Plan, a master plan aimed at attracting investment to the corridor.

*Brooklyn Academy of Music (BAM) Area*. This roughly triangular area is located between Fulton Street, Flatbush Avenue and Fort Greene Place, at the southeastern portion of the project area. There are several cultural and institutional uses located in this area including BAM, the Mark Morris Dance Company, the Institute of Design and Construction, and the Career Educational Institute. The BAM Local Development Corporation is working on further developing the mixed-use cultural district that is growing in the area. The rehabilitated Atlantic Terminal is under construction one block south of BAM.

Aside from the cultural organizations, economic activities in the area include scattered and small-scale retail and service businesses and a few transportation-related industrial activities. A small triangular block south of the Atlantic Terminal contains the Long Island Railroad (LIRR) supply yard and a car stereo repair shop. Other economic activities in the area include commercial parking lots near the BAM facility and low-rise office buildings with ground-floor retail near the Flatbush Avenue/Fulton Street intersection. The area's small retail storefronts include neighborhood convenience food stores. The area also contains a number of bars and car audio and beeper stores.

4.22.04




Project Area Boundary

1/4-Mile Study Area Boundary

Economic Sub-Area Corridor

**Economic Sub-Areas**

Figure 3-2

DOWNTOWN**BROOKLYN**DEVELOPMENT

*Myrtle Avenue*. Myrtle Avenue is a commercial corridor that runs through the Clinton Hill and Fort Greene neighborhoods as well as the northern section of the study area. Retail businesses on Myrtle Avenue east of Flatbush Avenue include a pharmacy, a supermarket, restaurants, and clothing stores. Small auto-related uses such as a carwash, garages, and a gas station, are also located in this area. The area west of Flatbush Avenue and north of DeKalb Avenue is characterized by a mix of institutional and small-scale commercial and industrial uses.

The Myrtle Avenue Commercial Revitalization and Development Project (MARP) Local Development Corporation is working toward restoring Myrtle Avenue as an economically vital neighborhood commercial corridor. In order to enhance the corridor, MARP and businesses along Myrtle Avenue are currently considering the establishment of a BID.

*Study Area*

*Brooklyn Civic Center*. The Civic Center area is a major governmental employment hub because it contains a number of City, State, and Federal institutions, including Brooklyn Borough Hall and Municipal Building, Brooklyn Criminal Court, Brooklyn Family Court, the General Post Office building, the New York State Supreme Court (Civil Term and Criminal Term), the New York City Housing Court, and the U.S. Federal Courthouse at Cadman Plaza East. The area also supports a substantial number of employees in court-related agencies and law offices.

*Montague Street*. Montague Street is the retail shopping district for the affluent Brooklyn Heights community. The street, which links the Civic Center with the Brooklyn Heights Promenade, is lined with largely upscale restaurants and shops. In recent years, a number of national fast food and other chains have opened along Montague Street, replacing locally owned businesses. These retailers cater primarily to the lunch-time and after-work office worker market.

Court Street, which contains a large movie theater on the block between Schermerhorn and State Streets, includes retail and service businesses such as restaurants, liquor stores, pharmacies, photo stores, and music stores. There are also a number of small neighborhood shops and restaurants at the northern end of Henry Street.

*Atlantic Avenue*. Atlantic Avenue is the most prominent retail corridor in the Boerum Hill neighborhood and contains a number of ground-floor retail uses including food and gift stores, taverns, antique stores, thrift stores, furniture stores, restaurants and delis. It serves the Boerum Hill, Cobble Hill, and Brooklyn Heights neighborhoods and attracts antique and used furniture shoppers from throughout the City. The Atlantic Street Corridor is also home to a number of Middle Eastern businesses including several restaurants, specialty food shops, delis, and clothing stores. The corridor includes several identifiable sections that have developed market niches for specific types of goods and services:

- The stretch between Flatbush Avenue and Nevins Street includes several religious goods and service establishments;
- A number of antique and art shops are found between Nevins Street and Smith Street;
- Large institutional uses form a gap in the Atlantic Avenue retail corridor between Smith Street and Court Street; and
- Middle Eastern and other ethnic specialty shops and food-related businesses including grocers and restaurants are located predominantly west of Court Street.

In addition, Fourth Avenue, a shorter commercial corridor that intersects Atlantic in the southeastern portion of the study area, is lined with neighborhood-based businesses such as barber shops, liquor stores, and law offices.

*Atlantic Terminal Area*. The Atlantic Terminal area is southeast of BAM, near the existing Atlantic Avenue Long Island Railroad (LIRR). Adjacent to the Terminal, on the eastern side of Fort Greene Place, is the Atlantic Center Shopping Complex. The Atlantic Center includes about 400,000 square feet of retail space that is anchored by Macy's department store and a Pathmark grocery store. In addition, transportation-related businesses such as a U-Haul rental facility and a commercial surface parking lot are located along the railroad tracks. The Brooklyn Brewery is located to the south, along Pacific Street. Flatbush Avenue is the major retail district of the area and includes establishments such as furniture stores, opticians, and bicycle shops.

## *EMPLOYMENT*

### *Project Area*

As described above, the MetroTech development is a major office employment center in the project area, providing office jobs to an estimated 20,000 employees. The Fulton Street Mall retail corridor from Boerum Place to Flatbush Avenue provides the bulk of the area's approximately 7,200 retail jobs. Public sector employment is centered in agency buildings along Livingston Street, along Jay Street, and near Borough Hall.

*Projected Development Sites*. The projected development sites occupy an aggregate area of about 784,000 square feet (approximately 18 acres) with over 1.5 million square feet of built space, some of which is currently unoccupied. Uses on these projected development sites include offices, retailers, community organizations and services, municipal offices, parking garages and lots, and small light industries, and collectively employ an estimated 3,250 people. Existing uses and estimated employment for each projected development site are provided in Table 3-12. As illustrated in Table 3-12, and later under "Future With the Proposed Actions," existing employment would remain on certain projected sites in the future with the proposed actions. Existing built floor area was estimated using data from the city's RPAD files (2002), and occupancy rates were estimated based on field surveys performed in August 2003. Employment estimates were generated using standard industry employment ratios of: 300 sf per retail employee; 250 sf per office employee; 143 sf per restaurant employee; and 100 sf per fast food employee.

### *Study Area*

Data in Table 3-13 indicate that there were an estimated 71,392 employees in the study area in 2002. The largest employment sector in Downtown Brooklyn is Public Administration. With almost 23,000 workers, the public sector accounts for more than one-third of total employment in the study area, reflecting Downtown Brooklyn's role as a center for both borough and citywide agencies. In addition, the retail and F.I.R.E. (Finance, Insurance and Real Estate) sectors are major employers in the area representing approximately 7,200 and 5,900 workers, respectively (or about 10 and 8 percent of the area's employment base). The retail sector employees provides about 7,200 jobs in the Downtown Brooklyn study area, and is characterized by small retail businesses with an average of 8 employees per establishment. The headquarters of a number of large public utilities such as Keyspan Energy Systems bring about 2,400 public utility sector jobs to the study area. Manufacturing is less prominent, employing less than 1,200

**Table 3-12**
**Existing Uses and Estimated Employment on Projected Development Sites***

| Site Ref. | Blocks: Lots | Estimated Occupied Floor Area | Existing Uses (Estimated Number of Establishments) | Estimated Number of Jobs |
|---|---|---|---|---|
| C | B 142: 1 | 72,000 | Polytechnic Institute | 72** |
| G | B 2049: 8 | 60,000 | The Clocktower Building (multiple businesses) | 120 |
| I(A) | B 2060: 22-27, 32 (part); B 2061: 1 (part); B 2062: 6 (part) | 41,000 | Services (3); Eating and Drinking (5); Auto-related (3); Educational (1); Convenience Goods (4); Residential (3 units) | 139 |
| J | B 2061: 1 (part) | 38,000 | Services (3); Eating & Drinking (3); GAFO (1); Auto-related (1); Convenience Goods (1); Religious (1); | 103 |
| M | B 153: 3, 14, 15; B 154: 1, 5, 11, 12, 36-40 | 235,000 | Services (3); Eating & Drinking (3); GAFO (2); Convenience Goods (1); Educational (1); Institutional (1); Office (1); Residential (30 units) | 557 |
| O | B 145: 8,10,13-16, 18-22, 26, 32 | 85,000 | Services (8); GAFO (8); Eating & Drinking (9); Convenience Goods (3); Auto-related (1); Residential (47 units) | 183 |
| P | B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52 | 158,000 | Services (2); Eating & Drinking (4); Convenience Goods (1); GAFO (2); Auto-related (5); Office (5); Residential (51 units) | 560 |
| Q | B 149: 1 | 373,000 | The Gallery at Fulton Street (variety of GAFO, Services, Eating & Drinking, Convenience Goods, and Vacant Stores) and adjacent parking lot | 731** |
| S | B 2093: 1 | 376,000 | Service (2); Office (2); Eating & Drinking (2); GAFO (1); Convenience Goods (1); Transportation (1) | 744** |
| AA | B 165: 17-19, 58 | 1,000 | Auto-related (parking lot) (1) | 6 |
| BB | B 165: 29 | 25,000 | GAFO (3); Convenience Goods (1) | 25 |
| EE | B 2110: 3 | 2,000 | Auto-related (parking lot) (1) | 8 |
| **Total** | | **1, 466,000** | | **3,248** |

**Notes:**

* Since the issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.

** Existing employment would not be affected by the proposed actions. Businesses on sites S and Q would not be displaced by the proposed actions. Employment on site C would return to the site after construction or relocate to another building within the project area.

Existing use categories are loosely based on the North American Industry Classification System (NAICS) codes commonly used to classify retail and other commercial uses. GAFO includes general merchandise stores, apparel and accessories stores, furniture and home furnishings stores, and office supply stores; Eating and Drinking includes restaurants, fast food establishments, and bars; Services include neighborhood services such as dry cleaners, beauty salons, and shoe repair shops; Convenience Goods includes food stores such as delis, grocery stores, and bakeries, and non-food stores such as newsstands and drug stores. Auto-related includes auto supply shops, gas stations, and parking lots.

**Source:** AKRF, Inc.

people, predominantly in the printing and garment industries, and representing less than 2 percent of the study area total. Table 3-13 provides 2002 employment information for all industries in the area (by 2-digit Standard Industrial Classification (SIC) codes).

**Table 3-13**
**Study Area Employment by Industry, 2002**

| SIC Code | Business Description | Estimated | | Percent of Study Area Total | |
|---|---|---|---|---|---|
| | | Total Estab. | Total Employees | Firms | Employees |
| **Agriculture Forestry and Fisheries** | | | | | |
| | *Total* | *4* | *16* | *0.1%* | *0.0%* |
| **Mineral Industries** | | | | | |
| | *Total* | *1* | *7* | *0.0%* | *0.0%* |
| **Construction Industries** | | | | | |
| 15 | Building Construction-Gen. Contractors | 23 | 105 | 0.6% | 0.1% |
| 17 | Construction-Special Trade Contract | 24 | 163 | 0.6% | 0.2% |
| | *Total* | *47* | *268* | *1.2%* | *0.4%* |
| **Manufacturing** | | | | | |
| 20 | Food And Kindred Products | 5 | 24 | 0.1% | 0.0% |
| 22 | Textile Mill Products | 5 | 247 | 0.1% | 0.3% |
| 23 | Apparel & Other Fabric Products | 10 | 109 | 0.2% | 0.2% |
| 24 | Lumber & Wood Products, Ex. Furniture | 2 | 24 | 0.0% | 0.0% |
| 26 | Paper And Allied Products | 3 | 77 | 0.1% | 0.1% |
| 27 | Printing, Publishing, & Allied Ind. | 38 | 491 | 0.9% | 0.7% |
| 29 | Petroleum Refining & Related Indus. | 1 | 6 | 0.0% | 0.0% |
| 30 | Rubber And Misc. Plastics Products | 2 | 34 | 0.0% | 0.0% |
| 31 | Leather And Leather Products | 1 | 1 | 0.0% | 0.0% |
| 32 | Stone, Clay, Glass, & Concrete Prod | 2 | 28 | 0.0% | 0.0% |
| 34 | Fabricated Metal Products | 4 | 18 | 0.1% | 0.0% |
| 35 | Ind. & Comm. Machinery & Computers | 2 | 8 | 0.0% | 0.0% |
| 36 | Electrical/Electronic Equip.(Ex. Comp.) | 1 | 2 | 0.0% | 0.0% |
| 38 | Instruments And Related Products | 5 | 28 | 0.1% | 0.0% |
| 39 | Misc. Manufacturing Industries | 10 | 69 | 0.2% | 0.1% |
| | *Total* | *91* | *1,166* | *2.2%* | *1.6%* |
| **Transportation, Communications, and Utilities** | | | | | |
| 41 | Local, Suburban, & Interurban Trans | 15 | 2,723 | 0.4% | 3.8% |
| 42 | Motor Freight Transport. & Warehouse | 17 | 409 | 0.4% | 0.6% |
| 43 | U.S. Postal Service | 4 | 68 | 0.1% | 0.1% |
| 45 | Transportation By Air | 1 | 3 | 0.0% | 0.0% |
| 47 | Transportation Services | 6 | 23 | 0.1% | 0.0% |
| 48 | Communication | 26 | 207 | 0.6% | 0.3% |
| 49 | Electric, Gas, & Sanitary Services | 5 | 2,404 | 0.1% | 3.4% |
| | *Total* | *74* | *5,837* | *1.8%* | *8.2%* |

**Table 3-13 (cont'd)**
**Study Area Employment by Industry, 2002**

| SIC Code | Business Description | Estimated | | Percent of Study Area Total | |
|---|---|---|---|---|---|
| | | Total Estab. | Total Employees | Firms | Employees |
| **Wholesale Trade** | | | | | |
| 50 | Wholesale Trade-Durable Goods | 43 | 297 | 1.1% | 0.4% |
| 51 | Wholesale Trade-Nondurable Goods | 52 | 413 | 1.3% | 0.6% |
| | *Total* | *95* | *710* | *2.3%* | *1.0%* |
| **Retail Trade** | | | | | |
| 52 | Bldg Material/Garden Sup./Mobile Homes | 16 | 165 | 0.4% | 0.2% |
| 53 | General Merchandise Stores | 32 | 1,258 | 0.8% | 1.8% |
| 54 | Food Stores | 90 | 443 | 2.2% | 0.6% |
| 55 | Auto. Dealers & Gas. Service Stations | 11 | 54 | 0.3% | 0.1% |
| 56 | Apparel And Accessory Stores | 143 | 940 | 3.5% | 1.3% |
| 57 | Home Furniture/Furnishings/Equip. | 91 | 589 | 2.2% | 0.8% |
| 58 | Eating And Drinking Places | 242 | 2,265 | 6.0% | 3.2% |
| 59 | Miscellaneous Retail | 288 | 1,529 | 7.1% | 2.1% |
| | *Total* | *913* | *7243* | *22.4%* | *10.1%* |
| **Finance, Insurance, and Real Estate** | | | | | |
| 60 | Depository Institutions | 36 | 2,135 | 0.9% | 3.0% |
| 61 | Non depository Credit Institutions | 15 | 118 | 0.4% | 0.2% |
| 62 | Security/Commodity Brokers & Service | 12 | 80 | 0.3% | 0.1% |
| 63 | Insurance Carriers | 7 | 168 | 0.2% | 0.2% |
| 64 | Insurance Agents, Brokers & Service | 39 | 1,108 | 1.0% | 1.6% |
| 65 | Real Estate | 149 | 1,668 | 3.7% | 2.3% |
| 67 | Holding & Other Investment Offices | 2 | 615 | 0.0% | 0.9% |
| | *Total* | *260* | *5892* | *6.4%* | *8.3%* |
| **Service Industries** | | | | | |
| 70 | Hotels And Other Lodging Place | 5 | 36 | 0.1% | 0.1% |
| 72 | Personal Services | 212 | 839 | 5.2% | 1.2% |
| 73 | Business Services | 180 | 1,917 | 4.4% | 2.7% |
| 75 | Auto. Repair, Services, And Parking | 54 | 333 | 1.3% | 0.5% |
| 76 | Misc. Repair Services | 21 | 54 | 0.5% | 0.1% |
| 78 | Motion Pictures | 9 | 94 | 0.2% | 0.1% |
| 79 | Amuse. & Recreation Service (Ex. Movies) | 47 | 449 | 1.2% | 0.6% |
| 80 | Health Services | 322 | 6,182 | 7.9% | 8.7% |
| 81 | Legal Services | 626 | 2,780 | 15.4% | 3.9% |
| 82 | Educational Services | 94 | 8,069 | 2.3% | 11.3% |
| 83 | Social Services | 158 | 4,604 | 3.9% | 6.4% |
| 84 | Museums, Art Galleries, Zoos, Etc. | 6 | 45 | 0.1% | 0.1% |

**Table 3-13 (cont'd)**
**Study Area Employment by Industry, 2002**

| SIC Code | Business Description | Estimated | | Percent of Study Area Total | |
|---|---|---|---|---|---|
| | | Total Estab. | Total Employees | Firms | Employees |
| **Service Industries (cont'd)** | | | | | |
| 86 | Membership Organizations | 111 | 1,057 | 2.7% | 1.5% |
| 87 | Engineering/Acctg./Managerial/Related Services | 123 | 762 | 3.0% | 1.1% |
| 89 | Miscellaneous Services | 11 | 132 | 0.3% | 0.2% |
| | *Total* | *1,979* | *27,353* | *48.7%* | *38.3%* |
| **Public Administration** | | | | | |
| 90 | Public Administration (SIC 90-97) | 175 | 19,395 | 4.3% | 27.2% |
| 99 | No classifiable Establishments | 428 | 3,505 | 10.5% | 4.9% |
| | *Total* | *603* | *22,900* | *14.8%* | *32.1%* |
| **Overall Total** | | | | | |
| | ***Total All Industries*** | ***4,067*** | ***71,392*** | ***100.0%*** | ***100.0%*** |

**Sources:** Claritas, Inc., based on New York State Department of Labor data.

## D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

This section describes the socioeconomic conditions that would be expected in the project and study areas in the future without the proposed actions. It also describes changes in population and economic activity that are anticipated on the projected development sites should the proposed actions not be implemented. For analysis purposes, the "No Build" year is assumed to be 2013.

### EXTENT OF EXPECTED DEVELOPMENT

*PROJECT AREA*

In the future without the proposed actions, 11 projects unrelated to the proposed actions are expected to take place within the project area by 2013 (see Table 3-14). These projects will amount to approximately 4.6 million square feet of space, including approximately:

- 730 residential units;
- 1.3 million square feet of cultural and community facility space;
- 780,000 square feet of space for city courts;
- 1.3 million square feet of office/commercial space;
- 512,685 square feet of retail; and
- 887 public parking spaces.

**Table 3-14**
**Development Projects Expected to Be Completed in the Study Area by 2013**

| Name/Address | Build Year | Residential Units | Office (sq ft) | Retail (sq ft) | Other |
|---|---|---|---|---|---|
| **Project Area Sites** | | | | | |
| 9 MetroTech | 2003 | 0 | 670,000 | 6,000 | 272 parking spaces |
| 330 Jay St | 2005 | 0 | 170,000 | 0 | 780,000 sf court, 150 parking spaces |
| Atlantic Terminal | 2004 | 0 | 470,000 | 470,000 | rehabilitated LIRR station |
| BAM LDC East (Block 2108) | 2004 | 100 | 0 | 0 | 60,000 sf cultural uses |
| BAM LDC North (Block 2107) | NA | 570 | 0 | 10,000 | 43,000 sf dance center, 160,000 sf museum/gallery, 50,000 sf theater, 7,000 sf open space and 466-space parking facility |
| Bond Street Garage | 2004 | 0 | 0 | 18,185 | |
| City University (site A) | NA | 0 | 0 | 0 | 590,777 sf academic/community facility |
| City University (site B) | NA | 0 | 0 | 0 | 258,938 sf academic/community facility |
| LIU Recreation and Wellness Center | 2004 | 0 | 10,000 | 0 | 117,000 sf wellness/recreation center, with 3,500 seats for events |
| New York Marriott Brooklyn Expansion | 2005 | 0 | 0 | 8,500 | 280-room hotel annex |
| Site G | NA | 60[1] | 0 | 0 | |
| **Study Area Sites** | | | | | |
| Atlantic Yards Arena and Redevelopment Project | 2013 | 5,500 | 1,800,000 | 400,000 | 800,000 sf arena, 3,500 sf parking spaces |
| 110 Livingston St | NA | 245 | 0 | 0 | 6,000 theater, 225 parking spaces |
| 223 Atlantic Avenue (NE corner of Court St) | 2004 | 320 | 0 | 20,000 | 40,000 sf YMCA, 700 parking spaces |
| Atlantic Ave and Smith St (Block 176) | 2004 | 50 | 31,500 | 15,000 | 8,500 sf community facility, 130 parking spaces |
| Atlantic Center (Block 2002) | 2008 | 711 | 875,000 | 395,000[1] | |
| Atlantic Avenue at NW corner of Court Street | 2003 | 0 | 0 | 10,900 | |
| Bridge Plaza | 2004 | 295 | 0 | 0 | |
| Brooklyn Law School | 2004 | 0 | 0 | 0 | 371-bed dormitory, 212 parking spaces |
| ESDC/HS (Block 170)[3] | 2004 | 440 | 0 | 65,000 | 40,000 sf community facility, commercial or hotel |
| Federal Courthouse | 2004 | 0 | 0 | 0 | 700,000 sf for courts |
| Ingersoll Community Center | NA | 0 | 0 | 0 | New 18,250 sf community center to replace former 9,000 sf center |
| 53 Boerum Place | 2003 | 99 | 0 | 0 | 85 parking spaces |
| Saint Francis College—Anthony J. Genovesi Center | 2003 | 0 | 4,000 | 0 | 8,350 sf athletic facility |
| Schermerhorn between Hoyt and Bond Streets (Block 171) | 2004 | 149 | 0 | 14,700 | 50 parking spaces |
| Shops at Atlantic Center, Site 5 (Block 927) | 2008 | 308 | 0 | 16,980[1] | |
| South Portland Avenue at Atlantic Avenue (Block 2004) | NA | 96 | 0 | 0 | |
| **Net New Space[3]** | | **8,883** | **4,030,500** | **1,038,285** | |
| **Total Space** | | **8,943** | **4,030,500** | **1,450,265** | |

**Notes:**
[1] Renovation of existing space.
[2] Includes 200 affordable units.
[3] Net New Space is the difference between the total space minus any renovation of existing space (Site G).
**Sources:** AKRF, Downtown Brooklyn Council, New York City Economic Development Corporation, New York City Department of City Planning, New York City Department of Housing Preservation and Development.

*PROJECTED DEVELOPMENT SITES*

In the future without the proposed actions, it is generally anticipated that existing economic activities on the projected development sites will remain. Absent the proposed actions, the only anticipated development on the projected sites is 60 new residential units that are planned for site G at Tech Place and Gold Street. These new residential units will displace a 60,000-square-foot existing industry that employs an estimated 120 workers. In the future without the proposed actions, it is estimated that there will be a total of 399 residents and 4,046 employees located on the projected sites.

*STUDY AREA*

In the future without the proposed actions, 27 projects unrelated to the proposed rezoning are expected to take place in the socioeconomic study area by 2013 (including those within the project area; see Table 3-14). These projects in total will amount to approximately 18 million square feet of space, including:

- 8,943 residential units (equivalent to approximately 8.94 million square feet of space);
- 1.4 million square feet of cultural and community facility space;
- 800,000 square foot arena;
- 1,480,000 square feet of space for courts;
- Approximately 4.0 million square feet of office/commercial space;
- 1.54 million square feet of retail space (including 412,000 square feet of redeveloped space, for a net addition of 1,038,265 square feet); and
- Nearly 5,790 public parking spaces.

Once all development is complete, an additional 18,780 residents will be living and 24,911 employees will be working within the socioeconomic study area, an increase of 45 percent and 35 percent, respectively. In 2013, without the proposed actions, the residential population in the study area is expected to grow to 60,857 and the worker population is projected to 96,843 (see Table 3-15).

**Table 3-15**

**Project Study Area Growth in the Future Without the Proposed Actions (Current-2013)**

| Study Area | Current Estimate | 2013 | % Change, Current-2013 |
|---|---|---|---|
| Population | 42,077 | 60,857 | 44.6% |
| Employment | 71,932 | 96,843 | 34.6% |

**Sources:** Population from the 2000 U.S. Census data; Employment data is a 2002 estimate from Claritas, Inc. July 2003.

Ongoing efforts to revitalize and enhance existing retail districts in and around Downtown Brooklyn—including the Fulton Street, Atlantic Avenue, and Myrtle Avenue shopping districts—are expected to continue in the future without the proposed actions.

## POPULATION AND HOUSING CHARACTERISTICS

*PROJECT AREA*

Without the proposed actions, it is estimated that 4,802 persons will reside in the project area in 2013, an increase of 1,533 residents from its current estimated population of 3,269. Approximately 670 of the 730 planned new housing units or an estimated 1,407 residents will be part of BAM and the Atlantic Center developments in the southeastern portion of the project area. Thus, in the future without the proposed actions, the residential population of the project area is expected to increase substantially, or by about 47 percent. This will change the character of the southeastern corner of the area from one of a business district to a mixed-use area. It is likely that the new units would be a combination of market rate and affordable housing, perhaps achieving an 80/20 mix, not too different from the income characteristics found in the BAM neighborhood and in the residential portion of Atlantic Center.

*STUDY AREA*

As described above and shown in Table 3-14, some 8,943 residential units are expected for completion in the study area through 2013. As a result of these projects, which would occur with or without the proposed zoning amendments and other related actions, there will be a substantial increase in the population of the study area (See Table 3-15). Between 2000 and 2013, the total study area residential population is expected to increase by about 45 percent, or from about 42,077 to 60,857 residents. This residential growth will be the result of both new construction and conversions of non-residential to residential space. The residential development projects and associated population growth is spread throughout the study area, with a sizable concentration in the BAM-Atlantic Terminal area. The Atlantic Yards Arena and Redevelopment project development will account for almost 62 percent of all new residential units within the study area (5,500 units). Most of the proposed housing units are expected to be market-rate. The Atlantic Center project will contain some 220 affordable units, similar to the mix of existing units in the immediate area.

*SUMMARY*

Trends over the past decade show that many of the neighborhoods within the study area are attractive for private market-rate residential development. This assessment is supported by the large amount of planned development projects throughout the project and study areas. Therefore, it is likely that whether or not the proposed actions are implemented, additional displacement pressure may be placed on residents of unregulated apartments, which are located throughout the study area.

*PROTECTION OF RESIDENTS*

As noted in "Existing Conditions," strong protection is offered against involuntary displacement of existing residents. This includes various rent regulations, which cover most of the area's stock of rental housing, and additional regulations controlling the conversion of buildings to cooperatives or condominiums, regulations guiding tenant selection and rental or sales price for subsidized housing, and regulations against tenant harassment. In the future without the proposed actions, no substantial changes in these programs are expected that would lessen the protection afforded to residents or change the prospects for the displacement of tenants.

## ECONOMIC CONDITIONS

*PROJECT AREA*

The project area is expected to experience a substantial increase in its economic and employment base in the future without the proposed actions. Planned and proposed projects will add some 3,892,400 square feet of office, retail, court, and community facility space to the project area by 2013, adding some 9,581 jobs to the Downtown Brooklyn area.

The vast majority of the 512,685 square feet of new retail development that is expected to be built in the project area by 2013, 470,000 square feet or about 92 percent, will be constructed as part of the expanded Atlantic Center development. The retail portion of the Atlantic Center project will be anchored by a 200,000-square-foot Target discount department store. New stores at Atlantic Center are likely to include national retailers such as The Gap, Victoria's Secret, and The Children's Place, similar to the existing tenant mix.

The two major office developments that are anticipated to take place in the project area by 2013 are 470,000 square feet of space in the Atlantic Center project and the 670,000-square-foot addition to the office component of the MetroTech development.

The education and arts sector in the Downtown Brooklyn project area is also expected to grow substantially in the future without the proposed actions, most notably with the major expansion of BAM.

*STUDY AREA*

Trends in the economic sectors in and around Downtown Brooklyn through 2013 indicate a substantial strengthening of the historic civic center as a major private sector employment hub for the City. Office and retail uses are projected to sizably increase their presence in the area, with about 4.03 million square feet of office space and 1.454 million square feet of new retail space expected.

The institutional sector, particularly community facilities related to the arts and/or education, will also grow in the area, bringing in new visitors and workers to the area as well. The sizable expansion of office employment in Downtown Brooklyn and the substantial projected increase in the area's residential population will also contribute towards and support Downtown Brooklyn's retail establishments, particularly along Fulton Street and Atlantic Avenue.

The remaining manufacturing and industrial businesses in the area are likely to be under increased pressure. The competition for space with potential office or residential tenants will contribute toward the continued conversion of industrial space to these and other uses, since office rents, for example, are typically at least twice the rents for manufacturing and wholesale space.

# E. THE FUTURE WITH THE PROPOSED ACTIONS

## INTRODUCTION

The extensive loss of Class A office space as a result of the attack on the World Trade Center, need to decentralize, increases in demand, and limited new supply have created a severe shortage of commercial space that threatens New York City's continued economic growth. Without new space and more affordable rents, New York City will lose jobs and economic

activity to locations with readily available, affordable space in the region and elsewhere. As an alternative to Manhattan as an office location, Downtown Brooklyn offers proximity to Downtown Manhattan, excellent transit access, existing corporate presence at MetroTech and One Pierrepont Plaza, and nearby amenities including cultural facilities such as BAM and world-class parks nearby such as the Brooklyn Heights Promenade and Prospect Park. The real and perceived constraints which have limited more extensive commercial development in Downtown Brooklyn include zoning that does not facilitate the built form and density required by corporations seeking Class A office space, difficult site assemblage as a result of small parcels in multiple ownership, and the now-changing perception of the area as a predominantly government center instead of a business center.

## PROJECTED DEVELOPMENT SCENARIO

The analysis of potential socioeconomic impacts in the study area associated with the proposed actions builds upon the level of development anticipated under the No Build condition described in the preceding section. Changes that could result from the proposed action are added to these future projected baseline conditions, i.e., the No Build condition. As with the No Build evaluation, 2013 is used as the analysis year.

### *PROJECTED DEVELOPMENT PROGRAM*

As described in the previous section, the proposed actions involve rezoning and other land use actions for an area in Downtown Brooklyn roughly bounded by Tillary Street to the north, Schermerhorn Street to the south, Adams Street to the west, and Ashland Place to the east. The following section describes the projected development that would reasonably be expected to be completed and occupied by 2013 as a result of the proposed actions.

The anticipated development on projected development sites in the project area, as described in detail in Chapter 2, "Land Use, and Public Policy," represents a reasonable worst-case development scenario that could be constructed under the regulatory changes that would occur with implementation of the proposed actions. As shown in Table 3-16, below, this projected development scenario includes a mixture of residential, office, retail, and community facility uses. Twenty percent of the housing units (approximately 196 apartments) are expected to be developed with the 80/20 New Construction Program described above, which is used to construct multifamily rental housing where 20 percent of the units are rented to low- and moderate-income tenants for periods of at least 10 to 20 years. The remaining units are expected to be market-rate. In total, the following amount of development is reasonably expected to occur by 2013 as a result of the proposed actions:

- 4.61 million square feet of commercial office space;
- 844,000 square feet of retail space;
- 979 residential units;
- 220,000 square feet of community facility space;
- 40,000 square feet of cultural space;
- 1,617 public parking spaces; and
- Over 1.6 acres of public space.

**Table 3-16**
**Proposed Floor Area by Use, Projected Development Sites; Future Build Condition (zsf)**

| Site Ref[1] | Office | Retail | Residential | Community Facility |
|---|---|---|---|---|
| C | 720,000 | 0 | 0 | 80,000 |
| G | 0 | 10,000 | 71,000 | 0 |
| I (A) | 0 | 60,000 | 300,000 | 0 |
| J | 0 | 86,000 | 259,000 | 0 |
| M | 778,000 | 70,000 | 0 | 0 |
| O | 544,000 | 50,000 | 0 | 0 |
| P | 999,000 | 48,000 | 0 | 0 |
| Q | 1,233,000 | 415,000 | 0 | 0 |
| S | 337,000 | 51,000 | 0 | 0 |
| AA | 0 | 18,000 | 163,000 | 0 |
| BB | 0 | 21,000 | 186,000 | 0 |
| EE | 0 | 15,000 | 0 | 140,000 |
| ***Total Floor Area*** | ***4,611,000*** | ***844,000*** | ***979,000*** | ***220,000*** |
| ***Total Housing Units*** | | | ***±979*** | |

**Notes:** zsf = zoning square feet
1,000 zsf = 1 housing unit

*PROJECTED POPULATION AND EMPLOYMENT*

Based on the reasonable worst-case development scenario under the proposed actions shown in Table 3-16, above, the projected development sites would be occupied by 2,056 residents and 20,825 workers by 2013 in the future with the proposed action. As described below, it is conservatively assumed that all of the estimated 386 residents and 1,701 workers expected to be otherwise located on sites directly affected by the proposed actions would be directly displaced. However, projected net increases of approximately 1,670 residents and 19,124 employees are forecast.

## POPULATION AND HOUSING CONDITIONS

*DIRECT RESIDENTIAL DISPLACEMENT*

*Methodology*

The 2001 *CEQR Technical Manual* defines direct residential displacement (sometimes called primary residential displacement) as the involuntary displacement of residents from the site of (or a site directly affected by) a proposed action. Impacts could occur if the numbers and types of people being displaced would be enough to alter neighborhood character and possibly lead to indirect displacement of remaining residents. For the purposes of this analysis, the area directly affected by the proposed actions is the project area, and the specific sites are those that have been identified as projected development sites. In order to get a better understanding of the residents who will potentially be displaced by the proposed project, information on population, housing, and income was collected using block level data from the 2000 US Census Bureau.

*Impact Assessment*

In the future without the proposed actions, the planned conversion of industrial space to residential use at site G on Gold Street would add 60 housing units and a projected 126 new residents to the project area (based on a household size of 2.1 persons per unit ). No housing units would be displaced in the project area as a result of planned projects in the future without the proposed actions. As discussed above, in the future No Build condition, it is conservatively assumed that the approximately 130 residential units currently in buildings on the projected development sites would remain residential and occupied at existing levels through 2013. As a result, new development anticipated in the future without the proposed action would raise the population of the project area from its existing base of 3,269 residents to 3,395 in 2013—an increase of 2.6 percent.

Anticipated development on the projected development sites under the proposed actions would result in the construction of 979 residential units which would be occupied by approximately 2,056 residents. Table 3-17 and Table 3-18 show residential population and unit count in 2000, by block and lot and projected development site, that would be directly displaced by the proposed actions. The proposed actions would directly displace an estimated 386 residents living in approximately 130 housing units that currently exist on projected development sites. As shown in Table 3-17, sites O and P, each with approximately 119 and 222 residents, accounted for roughly 88 percent of the total residents living within the projected development sites in 2000. In addition, there were more households living in site P (55 households) compared to site M (30 households) and site O (38 households). The average household size among the residents in the projected development sites ranged from 1.50 persons per household in site M to a high of 4.04 persons per household in site P.

The 1999 median household income of $48,000 in site O and site P was higher than the median household income in the Study Area, Brooklyn and New York City, $46,000, $32,000 and $38,000 respectively (see Table 3-17). In contrast, the median household income in site M ($17,000) was significantly less in comparison to the Study Area, Brooklyn and New York City. With a low median household income, the poverty level (21 percent) in site M was higher than site O and site P, less than the Study Area and Brooklyn, but similar to New York City. Site I(A) had no residents in 2000. In addition, the poverty level in site O and site P (16 percent) was considerably less compared to the Study Area (22 percent), Brooklyn (25 percent) and New York City (21 percent).

**Table 3-17**
**Demographic Characteristics of Residents Displaced by Proposed Actions**

| Site Ref. | Blocks: Lots | Total Pop. | No. of Households | Avg. HH Size | 1999 Med. HH Income | Poverty Status |
|---|---|---|---|---|---|---|
| I(A)[1] | B 2060: 25 | 0 | 0 | 0 | 0 | 0 |
| M | B 154: 37-40 | 45 | 30 | 1.50 | $17,426 | 20.9% |
| O | B 145: 10, 13-15, 18-20, 22, 32 | 119 | 38 | 1.89 | $47,946 | 16.0% |
| P | B 146: 11-13, 15, 17, 34-36, 51 | 222 | 55 | 4.04 | $47,946 | 16.0% |
| **Total** | | **386** | **123** | | | |
| **Study Area** | | | | | **$45,594** | **21.7%** |
| **Brooklyn** | | | | | **$32,135** | **25.1%** |
| **New York City** | | | | | **$38,293** | **21.2%** |

[1] Site I(A) is a previously designated Brooklyn Center Urban Renewal Area site and could de displaced in the absence of the proposed actions.

Source: U.S. Department of Commerce, Bureau of the Census, 2000 Census, Summary File 1 and Summary File 3.

According to the 2000 Census, of the 128 residential units within the projected development sites, approximately 123 units were occupied and five were vacant (see Table 3-18). The residential buildings in site M and site P were fully occupied in 2000 with no vacancies whereas site O had two vacant units. Although site I(A) only had three units in 2000, they were all vacant units. It should be noted that the three vacant units on site I(A) are located on a previously designated Brooklyn Center Urban Renewal Area site and thus could be displaced in the absence of the proposed actions. Approximately 122 of the 123 occupied units were renter-occupied units with only one owner-occupied unit on site P.

The projected development sites contain a mixture of market- and below-market rate units. Three buildings on site P (lots 34-36, with 40 of the site's 56 units) contain more than six units—making them subject to rent control or stabilization regulations—and are in fair to poor condition. As shown in Table 3-18, the 2000 median contract rent for residents living in site P was approximately $679 per month.

Although, the 2000 median contract rent for residential buildings in site O was similar to site P ($679 per month), the estimated 41 residential units on site O were either recently converted or renovated, and have been reported to be renting closer to market rates.

According to Table 3-18, the 2000 median contract rent for residents in site M was approximately $650 per month. With four residential buildings subject to direct displacement, site M contains two buildings that have at least six units thus making them subject to rent control or stabilization regulations. The remaining two buildings contain residential on the upper floors of mixed-use buildings with ground floor retail; it is assumed that these units are not protected by rent control or stabilization, and thus, are renting at or close to market rates. As shown in Table 3-18, the median contract rent for sites M, O, and P are higher than median contract rents in Brooklyn ($621 per month) and New York City ($646 per month) but less than the median contract rent in the Study Area ($713). Since the year 2000, given the robust economy, it is likely that the median contract rent will have risen.

**Table 3-18**

**Housing Characteristics of Units Directly Displaced by Proposed Actions**

| Site Ref. | Blocks: Lots | Housing Units | Occupancy Status | | Tenure | | Median Contract Rent |
|---|---|---|---|---|---|---|---|
| | | | Occupied | Vacant | Owners | Renters | |
| I(A) | B 2060: 25 | 3 | 0 | 3 | 0 | 0 | $0 |
| M | B 154: 37-40 | 30 | 30 | 0 | 0 | 30 | $650 |
| O | B 145: 10, 13-15, 18-20, 22, 32 | 40 | 38 | 2 | 0 | 38 | $679 |
| P | B 146: 11-13, 15, 17, 34-36, 51 | 55 | 55 | 0 | 1 | 54 | $679 |
| | Total | 128 | 123 | 5 | 1 | 122 | |
| | | | | | | Study Area | $713 |
| | | | | | | Brooklyn | $621 |
| | | | | | | New York City | $646 |

**Source:** U.S. Department of Commerce, Bureau of the Census, 2000 Census, Summary File 1 and Summary File 3.

For those sites subject to City acquisition, the City would participate in the relocation of residents that would be directly displaced by the proposed actions. Residents subject to direct displacement due to city site acquisition and site disposition for redevelopment would be provided with a relocation package, which could include financial assistance for certain moving costs and use of brokerage services to find alternative housing locations. In addition, there are four development projects in the future no build scenario that will provide affordable housing within the study area. The Atlantic Yards Arena and Redevelopment Project development includes 5,500 residential units, of which 41 percent (2,250 units) will be reserved for low to moderate income groups; the Atlantic Center development contains 30 percent, or 220 affordable units; the Atlantic and Court development contains 20 percent, or 51 affordable units; and the ESDC/HS development will have approximately 45 percent of the 440 units (200 units) available for low and moderate income households. Therefore, this direct displacement would not result in significant adverse impacts on neighborhood character.

*INDIRECT RESIDENTIAL DISPLACEMENT ANALYSIS*

*Methodology*

According to the 2001 *CEQR Technical Manual*, in most cases, the issue for indirect displacement of a residential population is that an action would increase property values and thus rents throughout the study area, making it difficult for some existing residents to afford their homes. The characteristics of a development program have a substantial influence on the project's indirect effects on the surrounding residential population. Generally, greater impacts are likely if:

- The program adds substantial new population with different socioeconomic characteristics compared to the size and character of the existing population;
- It directly displaces uses or properties that have had a "blighting" effect on property values in the area;
- It introduces a substantial amount of a more costly type of housing compared to existing housing and housing expected to be built in the study area by the time the program is developed;
- It introduces a "critical mass" of non-residential uses (for example, a large office complex), such that the surrounding area becomes more attractive as a residential neighborhood complex; and
- It introduces a land use that could have a similar indirect effect if it is large enough, prominent enough, or combines with other like uses to create a critical mass large enough to offset positive trends in the study area, to impede efforts to attract investment to the area, or to create a climate for disinvestment.

In addition, attributing an indirect (also referred to as secondary) residential displacement impact to a project depends on several factors related to the characteristics of the neighborhood population and housing conditions and trends:

- First, there must be a population that is particularly vulnerable to displacement.
- Second, the potential impact of a project must be measured in the context of the existing residential market and the projected population and housing conditions that would be anticipated in the future without the proposed actions. This is necessary for determining

whether a project would create new displacement pressures in a neighborhood, accelerate existing displacement pressures, or have no appreciable effect on activities that promote displacement. Of equal importance is the issue of proximity.

- The extent of an action's impacts tends to lessen with distance from the affected project area as the more immediate effects of other planned projects and actions, pre-existing land use and demographic trends, and other factors gain predominance over the effects of an increasingly distant project.

To summarize, key factors that will contribute to both an assessment of future socioeconomic composition and indirect residential displacement are the nature of planned development activity itself, trends in housing market conditions and related demographic characteristics, and changes in the various programs that afford residents protection from displacement.

*Impact Assessment*

As discussed under "The Future Without the Proposed Actions," 8,943 residential units are currently planned and expected to be completed in the study area through 2013 whether or not the proposed actions are implemented. Between 2000 and 2013, the total study area population is expected to increase by about 454 percent, or from about 42,077 to 60,857 residents. The proposed action would add 1,670 net new residents to this forecasted No Build population base, bringing the total to 62,527 study area residents. The following analysis addresses each of the criteria used to assess the potential for the indirect displacement of residents as a result of the proposed action:

*Potentially Vulnerable Population*. As described under existing conditions, it is estimated that about 874 project area residents (27 percent of the total current population) and 11,765 study area residents (28 percent of the total) currently reside in unregulated rental units in buildings with five or fewer units. In addition, the project area and study area both have higher proportions of senior citizens than the Borough of Brooklyn as a whole. Residents in unregulated units, particularly if they are senior citizens (or children), could be vulnerable to displacement pressures. However, as noted in the Existing Conditions section of this chapter, the median income, contract rent, and housing value for residents in both the project area and study area are substantially higher than for Brooklyn residents as a whole. These characteristics make it unlikely that a large proportion of residents in unregulated buildings would be subject to indirect displacement.

*New Population with Different Socioeconomic Characteristics*. The proposed actions would result in a net increase of approximately 849 new housing units and 1,670 persons. This represents a substantial (51 percent) increase in the population of the project area, but only a modest (4 percent) increase in the larger study area. Considering the high median income and housing costs of existing residents, the socioeconomic characteristics of new residents are not expected to differ significantly from the socioeconomic characteristics of the existing population.

*New, More Costly Housing*. Assuming that development on the projected sites in the project area would include 20 percent of the new units for moderate-income households, the proposed actions would generate an estimated 196 affordable housing units for low- and moderate-income tenants and 783 market-rate units with no income restrictions. The introduction of these market rate units is unlikely to exert displacement pressures on existing residents because a) they would represent only a small proportion (4.2 percent) of total housing units in the study area and b) as discussed above, housing costs in the study area are high compared to the Borough of Brooklyn.

*"Critical Mass" of Non-Residential Uses.* The development anticipated under the proposed actions would generate a sizable amount of non-residential space totaling some 5.7 million square feet of office, retail, and community facility space. This would build upon the 9.3 million square feet of non-residential space currently planned in the study area in the future without the proposed actions (comprising office, court, community facility, and retail space). The development under the proposed action condition would be expected to be consistent with the projected No Build trends and enhance the desirability of the study area as a place to live and work.

*Distance from Directly Affected Area.* Any potential indirect residential displacement pressures would be most acute in the immediate project area. However, as discussed above, the majority of the 3,300 residents in the project area are unlikely to be subject to displacement pressures.

*CONCLUSIONS*

The potential influx of 1,670 net additional residents under the proposed actions would continue the existing trend toward new residential construction in the immediate project area anticipated in the future without the proposed actions, i.e., 1,533 new residents in the No Build condition. Effects of this change would be most concentrated in the project area, and diminish with distance from the project area.

As described above, it is assumed that the estimated 386 residents living in housing units on projected development sites would be directly displaced by the development of the projected sites. These residents would represent less than one percent of the 2000 study area population and an even lower proportion of the projected 2013 study area population. Because they represent a small proportion of the area's population and the profile of the majority of the displaced residents is not markedly different from that of the overall study area, and because the proposed actions are being undertaken by a public agency, the displacement of these residents would not be considered a significant impact. In addition, the no build scenario includes four developments with a combined 2,721 residential units available for low and moderate income households. The City would participate in the relocation of all residents currently living on sites subject to City acquisition.

In addition to those who would be directly displaced, there are approximately 874 project area residents and 11,765 study area residents currently living in buildings not subject to rent control or stabilization. However, the high median income and housing costs evident in both the project area and the study area indicate that a large proportion of these unregulated units are likely renting or selling at, or close to, market rate. This makes the likelihood of indirect residential displacement lower than it would be in an area with below-average income levels and housing costs.

*PROTECTION OF CURRENT RESIDENTS*

Whether or not residents are potentially vulnerable to involuntary displacement is largely a consequence of several factors, including market conditions and trends, and public policy decisions. Within the study area, these policy decisions include the presence of a number of subsidized housing developments subject to programs, described below, where the selection of tenants and rents are typically controlled by government regulations. Therefore, these developments would not significantly be affected by outside market forces, or state legislation that regulate the rents paid by tenants and the process by which buildings may be converted to cooperative or condominium use.

*Subsidized Housing*

*Public Housing*

The New York City Housing Authority (NYCHA) has been the predominant provider of low-income housing in the city. Today, public housing may be developed as a conventional, acquisition, or turnkey project. In conventional public housing, the Housing Authority Finances the project with tax-exempt bonds and acts as a developer by acquiring the site and retaining architects and contractors. Under turnkey public housing, the developer is under contract with the NYCHA, which, at the project's completion, purchases the project from the developer. The developer usually gets conventional construction financing for the project rather than using tax-exempt bonds, thus incurring additional costs. However, this development can be less expensive for the city as a result of increased efficiency in construction and administration.

Public housing in the study area includes the Walt Whitman House and Ingersoll House in the Fort Greene neighborhood. Tenant selection and rental rates at all projects are strictly controlled by NYCHA and tenants are not subject to displacement by residential market activity.

*Housing Subsidy Programs*

*80/20 New Construction Programs.* A major source of funding for new housing for low- and moderate-income tenants over the past decade has been the tax-exempt bond financing program sponsored by the New York City Housing Development Corporation (HDC) and the New York State Housing Finance Agency. Under that program, tax exempt bonds are issued for multifamily rental housing where 20 percent of the units are rented to low- and moderate-income tenants for periods of at least 10 to 20 years. The remaining units are typically market-rate. The tax exempt financing allowed pursuant to certain provisions of the Internal Revenue Code and the New York State Private Housing Finance Law lowers the cost of construction and operating a development that enables a developer to set aside units for low- and moderate-income tenants.

*Mixed-Income Program (50/30/20).* HDC is implementing an initiative designed to spur the creation of mixed-income housing within the city. Under the initiative, at least 20 percent of the units in a new or rehabilitated development must be reserved for low-income households earning less than 50 percent of the New York City median income. Approximately 30 percent of the units would be set aside for households earning the lesser of a) 7 or 8 times the HDC established maximum rents for "middle-income" families or b) 250 percent of the New York City median income. The remaining 50 percent of the units would be set at market rates. In addition to providing a tax-exempt financing to fund the first mortgages of projects financed under the initiative, HDC would provide from $30,000 to $45,000/unit of subsidies for the low and middle-income units in the development (up to a maximum of $5,000,000 to $7,500,000/ project). The exact amount of HDC's subsidy would largely depend upon the size of the affordable units.[1]

[1] Program description obtained from the New York City Housing Development Corporation web site: http://www.nychdc.com/developers/potdev/mixedincome.htm. Site last accessed on 11/6/03.

## ECONOMIC CONDITIONS

### *DIRECT ECONOMIC DISPLACEMENT*

#### *Methodology*

The 2001 *CEQR Technical Manual* defines direct, or primary business displacement as the involuntary displacement of businesses from the site of (or a site directly affected by) a proposed action. A significant direct displacement impact may exist if, for example, the businesses in question have substantial economic value to the City or region or substantially contribute to a defining element of the neighborhood character.

#### *Impact Assessment*

In total, the projected development would directly displace approximately 100 non-residential uses. Of those, approximately 11 are located on previously designated Brooklyn Center Urban Renewal Area sites, and thus could be displaced in the absence of the proposed actions. The displaced businesses would include a variety of uses such as: retail shops selling goods such as clothing, shoes, liquor, and cell phones; fast food and dine-in restaurants; service businesses such as beauty salons and shoe repair shops; and auto-related and light industrial operations. The majority of the displaced economic activity consists of small retail businesses, with gross floor areas ranging from approximately 1,000 to 10,000 square feet. Table 3-19 provides a summary of existing uses and employment estimates for projected development sites.

As shown in Table 3-19, it is estimated that the projected development would directly displace approximately 1,701 workers.[1] It is important to note, however, that this displacement estimate includes some employment that would be relocated whether or not the proposed actions are implemented. For example, portions of sites M and P are currently occupied by City agencies, which plan to relocate. The 72 Polytechnic University jobs currently located on site C were not factored into the displacement estimate because those jobs would either be moved to other buildings within the project area or return to the site after construction under the proposed actions has been completed.

Businesses that would be displaced by the proposed actions do not meet the criteria for significant displacement. They are not of substantial economic value to the City or region; they are not subject to regulations or publicly adopted plans to preserve, enhance, or protect them, and they do not contribute substantially to a defining element of the Downtown Brooklyn neighborhood character. Furthermore, any business located on a projected development site would receive relocation assistance from New York City. As part of the City's site acquisition process, commercial tenants would be offered a relocation package, including financial coverage for certain moving costs and fixtures, re-establishment fees, and use of brokerage services to find alternative locations.

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[1] This approximation includes estimated employment on all sites listed in Table 3-12, with the exception of the 744 employees on site S, the 731 employees on site Q, and the 72 employees on site C. Under the proposed actions, no employment displacement (temporary or permanent) would occur on sites S or Q; employment on site C would either return to the site after construction under the proposed actions has been completed, or relocate to another building within the project area.

**Table 3-19**
**Uses Subject to Direct Displacement Under the Proposed Actions* and Estimated Employment**

| Site Reference | Blocks: Lots | Existing Uses (Estimated Number of Establishments) | Estimated Number of Jobs |
|---|---|---|---|
| **Previously Designated Sites** | | | |
| I(A)[1] | B 2060: 22-27, 32 (part) | Services (2); Convenience Goods (2); Eating and Drinking (5); Auto-related (2) | 62 |
| **Proposed Newly Designated Sites** | | | |
| G | B 2049: 8 | The Clocktower Building (multiple businesses) | 120 |
| I(A) | B 2061: 1 (part); B 2062: 6 (part) | Services (1); Auto-related (1); Convenience Goods (2); Educational (1) | 77 |
| J | B 2061: 1 (part) | Services (3); Eating & Drinking (3); GAFO (1); Auto-related (1); Convenience Goods (1); Religious (1); | 103 |
| M | B 152: 3, 14, 15; B 154: 1, 5, 11, 12, 36-40 | Services (2); Eating & Drinking (3); GAFO (4); Convenience Goods (1); Educational (1); Institutional (1); Office (1) | 557 |
| O | B 145: 8, 10, 13-16, 18-22, 26, 32 | Services (8); GAFO (8); Eating & Drinking (9); Convenience Goods (3); Auto-related (1) | 183 |
| P | B 146: 2, 7, 11-18, 23, 29, 34-37, 41-43, 46-52 | Services (2); Eating & Drinking (4); Convenience Goods (1); GAFO (2); Auto-related (5); Office (5) | 560 |
| AA | B 165: 17-19, 58 | Auto-related (parking lot) (1) | 6 |
| BB | B 165: 29 | GAFO (3); Convenience Goods (1); | 25 |
| EE | B 2110: 3 | Auto-related (parking lot) (1) | 8 |
| | | **TOTAL** | **1,701** |

**Notes:**

[1] Site I(A) is a previously designated Brooklyn Center Urban Renewal Area site and could de displaced in the absence of the proposed actions.

*Since the issuance of the DEIS/DSEIS, site K has been removed from the proposed development plan.

Existing use categories are loosely based on the North American Industry Classification System (NAICS) codes commonly used to classify retail and other commercial uses. GAFO includes general merchandise stores, apparel and accessories stores, furniture and home furnishings stores, and office supply stores; Eating and Drinking includes restaurants, fast food establishments, and bars; Services include neighborhood services such as dry cleaner, beauty salons, and shoe repair shops; Convenience Goods includes food stores such as delis, grocery stores, and bakeries, and non-food stores such as newsstands and drug stores. Auto-related includes auto supply shops, gas stations, and parking lots.

Employment estimates were generated using standard employment ratios, as described in the Economic Conditions subsection of the Existing Conditions section of this report.

**Source:** AKRF, Inc.

*INDIRECT ECONOMIC DISPLACEMENT*

*Methodology*

As with residential displacement, the issue for indirect displacement of businesses or institutions is that an action would increase property values and thus rents throughout the study area, making it difficult for some categories of businesses to remain in that area. According to the 2001 *CEQR Technical Manual*, an action can lead to such changes if:

- It introduces enough of a new economic activity to alter existing economic patterns;
- It adds to the concentration of a particular sector of the local economy enough to alter or accelerate an ongoing trend to alter existing economic patterns;
- It directly displaces uses or properties that have had a "blighting" effect on commercial property values in the area, leading to rises in commercial rents;
- It directly displaces uses of any type that directly support businesses in the area or bring people to the area that form a customer base for local businesses;
- It directly or indirectly displaces residents, workers, or visitors who form the customer base of existing businesses in the area; or
- It introduces a land use that could have a similar indirect effect, through the lowering of property values if it is large enough or prominent enough or combines with other like uses to create a critical mass large enough to offset positive trends in the study area, to impede efforts to attract investment to the area, or to create a climate for disinvestment.

*Impact Assessment*

To assess whether or not the proposed actions would be expected to generate secondary (or indirect) displacement pressures on area businesses, the following section addresses each of these criteria.

*Potential for New Economic Activity to Alter Existing Economic Patterns*

The project would not introduce a new type of economic activity to the area. Commercial, public, and non-profit activities are all uses that currently operating in the study area and projected to increase substantially in the future without the proposed actions. The proposed actions seek to reinforce and strengthen these existing and projected future No Build activities.

*Sector Concentration Large Enough to Influence Economic Trends*

The purpose and need for the proposed actions is to position Downtown Brooklyn as a resource of competitively priced Class A commercial office space to help facilitate retention of existing corporations in the City of New York and the attraction of new ones. The proposed actions seek to address the severe shortage of such space in Manhattan and by enabling the construction of alternative office space counter the out-migration of firms looking to relocate or expand in the region.

By influencing economic trends in the City of New York in a positive way and attracting approximately 1,670 new residents and 19,124 net new jobs to Downtown Brooklyn, the proposed actions would play a major role in an overall public policy geared to retaining and attracting new employers to the City. Local economic patterns would be affected, as the

Downtown Brooklyn study area continues to shift from a center of government employment to one of private sector investment as well.

Effects on the office market in Downtown Brooklyn would be positive. The low Class A vacancy rates in Downtown Brooklyn and throughout the City indicate that the project-related development would not hurt the market for existing Class A space. The relatively high Class B and C vacancy rates (also throughout the City) have not changed in years, and reflects in large part the problem of an inventory of outdated space whose characteristics do not meet the needs of the majority of Class A corporate tenants. For example, an examination of the retail rents for Class B and C space before and after the opening of the similar mixed-use MetroTech development reveals no change in the rent levels for this space.

*Displaces Anchor or Other Critical Establishment*

The proposed actions would not displace Macy's Department Store, the major retail anchor on Fulton Street, the retail shopping district in the heart of the project area. However, the project would be likely to displace a number of businesses who together serve a market niche of stores, boutiques, and services that cater to customers from surrounding residential neighborhoods and nearby government and private offices. The other retail shopping districts in the area are not expected to experience any indirect displacement of retail establishments as a result of the proposed actions. In addition, the expenditure potential of the additional residents and workers would increase the potential customer base in terms of both number and spending per capita. As a result, the proposed actions would be expected to have a positive effect on the viability of the Myrtle Avenue and Atlantic Avenue retail districts.

*Directly Displaces Uses that Form a Customer Base*

The proposed actions would not directly displace the customer base of the shops along Fulton Street, Atlantic Avenue, Myrtle Avenue, or any other retail shopping districts in the study area. The customer base, as discussed above, for the Fulton Street Mall consists of daytime office and other workers in Downtown Brooklyn as well as residents of Fort Greene, other nearby residential neighborhoods, and the larger Brooklyn trade area. In addition, the Civic Center in the vicinity of Fulton Street would continue to attract customers who form a portion of the existing shopping base. Although roughly 386 residents in the project area would be directly displaced, it is assumed that they will find alternative housing with the assistance of the City of New York, possibly within the study area. For this analysis, it is assumed that the reasonable build-out for the proposed actions would bring thousands of additional housing units (1,670 net new residents) and jobs (approximately 19,124 net new workers) to the project area and study area, creating additional spending potential within the study area.

*Introduces a Land Use that Lowers Property Values*

The proposed actions would not introduce a land use that lowers property values. As discussed above, the influx of workers and residents into the project and study areas as a result of the proposed actions and its projected development scenario would be expected to increase property values for commercial, particularly retail space. Foot traffic both during office hours and in the evenings and weekends would increase substantially as a result of the proposed actions.

*CONCLUSIONS*

The proposed actions would directly displace approximately 100 non-residential uses and 1,701 employees currently located on projected development sites. As stated above, some of these

employees are expected to relocate in the absence of the proposed actions, and other jobs would be displaced during construction, but replaced upon project completion. As part of the City's site acquisition process, commercial tenants being directly displaced by the proposed actions would be offered a relocation package.

The proposed actions would not indirectly displace businesses in the project area or study area. To the contrary, the proposed actions are expected to beneficially impact existing businesses by increasing residential and worker populations.

New residents and workers drawn to the project area as a result of the proposed actions would help to support the nearly one million square feet of new retail space that would be built. Building on the population and employment growth anticipated in the future without the proposed actions, the development anticipated with the rezoning would be expected to support the Atlantic Avenue, Myrtle Avenue, Montague Street, and BAM/Atlantic Terminal area shopping districts.

As documented above, the existing residential and employment base is expected to remain largely intact, with additional residents and workers added by new development facilitated by the proposed actions. Fulton Street will continue to be a convenient place to shop for residents of the greater Fort Greene/Clinton Hill neighborhood and beyond. As a result, the existing customer base for stores with goods and servicing catering to the local population are expected to remain and potentially grow.

At the same time, the addition of new office workers and tenants is likely to expand the demand for more typical national retailers. So while the direct displacement identified above would take place with the proposed actions, it is expected that the independently-owned stores would exist side by side with the national retailers, both jointly sharing an expanded customer base.

## F. CONSTRUCTION PERIOD ECONOMIC BENEFITS

The principal model used to estimate the effect of constructing the projected development program on the City's economy is the Regional Input-Output Modeling System (RIMS II), developed by the U.S. Department of Commerce, Bureau of Economic Analysis. The model contains data for New York City on 490 economic sectors, showing how each sector affects every other sector as a result of a change in the quantity of its product or service. A similar RIMS II model for New York State, also developed by the U.S. Department of Commerce, has been used to trace the effects on the State economy. The models have been adjusted to reflect the most recent changes in the New York metropolitan area price level. Using these models and the specific characteristics of the project, the total effect has been projected for New York City and State.

### VALUE OF THE CONSTRUCTION

The development of the projected development program would be undertaken by the private investment of funds into the area in conjunction with the City's investment in infrastructure and public improvements. Based on preliminary estimates of costs per square foot, the investment for construction of the projected development program in Downtown Brooklyn is estimated for the purpose of this analysis to equal about $1.59 billion ($1,589 million) in 2003 dollars. This amount includes about $1.09 billion for office development, about $200 million for residential development, about $146 million for retail development, about $38 million for community facilities development, and about $116 million for parking, infrastructure, and other public de-

velopment. This amount does not include the amount for the cultural facility (theater), which would be additional. In each of the above figures, the amount includes site preparation and hard costs (actual construction), and design, legal, and related costs. The total estimated amount of $1.59 billion reflects the cost of physical improvements to the site, and therefore excludes other values (such as financing, the value of the land, marketing, etc.) not directly a part of the expenditures for construction. The total cost—including financing, the value of the land, real estate payments, management, initial marketing expenditures, and similar expenditures—would be substantially more.

## ECONOMIC AND FISCAL ANALYSIS

An analysis of the economic and fiscal impacts associated with the construction expenditures for each of the uses in the projected development program has been conducted using the RIMS II models for New York City and New York State. The projected employment and fiscal benefits from construction of the office development is presented in Table 3-20; residential, retail, and community facilities development in Table 3-21; and parking, infrastructure, and other public development in Table 3-22. The employment and fiscal benefits from construction of the entire projected development program (excluding the cultural facility/theater) is summarized in Table 3-23.

### *EMPLOYMENT*

The $1.59 billion represents the direct expenditures during the construction period. As a result of the direct expenditures, the direct employment for constructing the entire development program is estimated at about 10,042 person-years of employment. (A person-year is the equivalent of one employee working full-time for 1 year.) In addition to direct employment, total employment resulting from construction expenditures would include jobs in business establishments providing goods and services to the contractors and resulting indirect and generated employment. Based on the model's economic multipliers for New York City industrial sectors, the construction of the entire development program would generate an additional 5,359 person-years of employment within New York City, bringing the total direct and generated jobs from the construction of the program to 15,401 person-years (see Table 3-23). In the larger New York State economy, the model estimates that the projected development would generate 9,010 person-years of indirect employment, bringing the total direct and generated jobs from construction of the projected development to 19,052 person-years of employment.

The direct wages and salaries during the assumed 10-year construction period are estimated at $585.33 million, in 2003 dollars (see Table 3-23). Total direct and generated wages and salaries resulting in New York City from construction of the entire development program are estimated at $871.72 million. In the broader New York State economy, total direct and generated wages and salaries from construction of the entire development program are estimated at $1,060.11 million.

**Table 3-20**
**Employment and Fiscal Benefits from Construction of the Office Development**

| | Portion in New York City | Total New York City and State |
|---|---|---|
| **Employment (Person-years)*** | | |
| Direct (Construction) | 6,993 | 6,993 |
| Indirect (Secondary and Induced) | 3,756 | 6,291 |
| *Total* | *10,749* | *13,284* |
| **Wages and Salaries (millions of 2003 dollars)** | | |
| Direct (Construction) | $411.37 | $411.37 |
| Indirect (Secondary and Induced) | $202.89 | $335.06 |
| *Total* | *$614.26* | *$746.43* |
| **Total Economic Output of Demand** (millions of 2003 dollars)** | | |
| Direct (Construction) | $1,090.0 | $1,090.0 |
| Indirect (Secondary and Induced) | $508.2 | $1,000.2 |
| *Total* | *$1,598.2* | *$2,090.3* |
| **Tax Revenues, Exclusive of Real Estate*** (Constant 2003 dollars)** | | |
| New York City Taxes | $45,354,000 | |
| MTA Taxes | $2,740,600 | |
| New York State Taxes | $76,049,200 | |
| *Total* | *$124,143,800* | |

**Notes:**

* A person-year is the equivalent of one person working full-time for a year.

** The economic output or total effect on the local economy derived from the direct construction spending.

*** Includes sales tax, personal income taxes, corporate and business taxes, and numerous other taxes on construction and secondary expenditures.

**Source:** The characteristics and construction cost of the office development; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

**Table 3-21**

**Employment and Fiscal Benefits from Construction of the Residential, Retail, and Community Facilities Development**

| | Portion in New York City | Total New York City and State |
|---|---|---|
| **Employment (Person-years)*** | | |
| Direct (Construction) | 2,450 | 2,450 |
| Indirect (Secondary and Induced) | 1,274 | 2,183 |
| *Total* | *3,724* | *4,633* |
| **Wages and Salaries (millions of 2003 dollars)** | | |
| Direct (Construction) | $136.37 | $136.37 |
| Indirect (Secondary and Induced) | $64.89 | $109.98 |
| *Total* | *$201.26* | *$246.35* |
| **Total Economic Output of Demand** (millions of 2003 dollars)** | | |
| Direct (Construction) | $383.6 | $383.6 |
| Indirect (Secondary and Induced) | $167.8 | $338.9 |
| *Total* | *$551.4* | *$722.5* |
| **Tax Revenues, Exclusive of Real Estate*** (Constant 2003 dollars)** | | |
| New York City Taxes | $15,504,800 | |
| MTA Taxes | $948,300 | |
| New York State Taxes | $25,532,100 | |
| *Total* | *$41,985,200* | |

**Notes:**

* A person-year is the equivalent of one person working full-time for a year.

** The economic output or total effect on the local economy derived from the direct construction spending.

*** Includes sales tax, personal income taxes, corporate and business taxes, and numerous other taxes on construction and secondary expenditures.

**Source:** The characteristics and construction cost of the proposed residential, retail, and community facility development; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

**Table 3-22**
**Employment and Fiscal Benefits from Construction of the Parking, Infrastructure, and Other Public Development**

| | Portion in New York City | Total New York City and State |
|---|---|---|
| **Employment (Person-years)*** | | |
| Direct (Construction) | 599 | 599 |
| Indirect (Secondary and Induced) | 329 | 536 |
| *Total* | *928* | *1,135* |
| **Wages and Salaries (millions of 2003 dollars)** | | |
| Direct (Construction) | $37.59 | $37.59 |
| Indirect (Secondary and Induced) | $18.61 | $29.74 |
| *Total* | *$56.20* | *$67.33* |
| **Total Economic Output of Demand** (millions of 2003 dollars)** | | |
| Direct (Construction) | $115.5 | $115.5 |
| Indirect (Secondary and Induced) | $54.4 | $104.1 |
| *Total* | *$169.9* | *$219.6* |
| **Tax Revenues, Exclusive of Real Estate*** (Constant 2003 dollars)** | | |
| New York City Taxes | $2,641,300 | |
| MTA Taxes | $168,400 | |
| New York State Taxes | $5,500,700 | |
| *Total* | *$8,310,400* | |

**Notes:**

* A person-year is the equivalent of one person working full-time for a year.

** The economic output or total effect on the local economy derived from the direct construction spending.

*** Includes sales tax, personal income taxes, corporate and business taxes, and numerous other taxes on construction and secondary expenditures.

**Source:** The characteristics and construction cost of the proposed parking, infrastructure, and other development; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

**Table 3-23**
**Employment and Fiscal Benefits from Construction of the Entire Projected Development Program (10-Year Period)**

| | Portion in New York City | Total New York City and State |
|---|---|---|
| **Employment (Person-years)*** | | |
| Direct (Construction) | 10,042 | 10,042 |
| Indirect (Secondary and Induced) | 5,359 | 9,010 |
| *Total* | *15,401* | *19,052* |
| **Wages and Salaries (millions of 2003 dollars)** | | |
| Direct (Construction) | $585.33 | $585.33 |
| Indirect (Secondary and Induced) | $286.39 | $474.78 |
| *Total* | *$871.72* | *$1,060.11* |
| **Total Economic Output of Demand** (millions of 2003 dollars)** | | |
| Direct (Construction) | $1,589.1 | $1,589.1 |
| Indirect (Secondary and Induced) | $730.4 | $1,443.2 |
| *Total* | *$2,319.5* | *$3,032.3* |
| **Tax Revenues, Exclusive of Real Estate*** (Constant 2003 dollars)** | | |
| New York City Taxes | $63,500,100 | |
| MTA Taxes | $3,857,300 | |
| New York State Taxes | $107,082,000 | |
| *Total* | *$174,439,400* | |

**Notes:**

* A person-year is the equivalent of one person working full-time for a year.

** The economic output or total effect on the local economy derived from the direct construction spending.

*** Includes sales tax, personal income taxes, corporate and business taxes, and numerous other taxes on construction and secondary expenditures.

**Source:** The characteristics and construction cost of the projected development program; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

*FISCAL IMPACTS*

The construction activity would also generate tax revenues. As indicated above, the total cost for constructing the entire development program (excluding financing and similar costs) is estimated at approximately $1.59 billion. Based on the U.S. Bureau of Economic Analysis' RIMS II model for New York City and State, the total economic activity, including indirect expenditures (those generated by the direct expenditures), that would result from construction of the entire projected development program is estimated at $3.03 billion ($3,032.3 million) in New York State, of which $2.32 billion ($2,319.5 million) would occur in New York City (see Table 3-23).

The construction activity would have associated with it tax revenues for New York City, the Metropolitan Transportation Authority (MTA), and New York State. Based on aggregate data on economic activity and tax receipts for the New York City and State economies from development projects, it is estimated that City tax revenues resulting from construction of a development program such as this would equal approximately 2.74 percent of the development program's total economic activity in New York City. New York State and the MTA (which collects a 0.25 percent sales tax and tax surcharges on business and utilities taxes within the City and the MTA 12-county region) would receive revenues equal to about 3.66 percent of the development's total economic activity in the State. In total, the construction of the entire projected development is estimated to generate approximately $174.44 million in tax revenues for New York City, MTA, and New York State, in 2003 dollars (see Table 3-22). Of these tax revenues, the largest portion would come from sales tax, personal income taxes, and corporate, business, and related taxes on direct and induced economic activity. New York State and the MTA would receive about $110.94 million (63.6 percent) of the tax revenues generated by construction of the development program, and New York City would receive about $63.50 million (36.4 percent) of these tax revenues.

In addition, to the extent that the development is mortgaged, New York City would receive mortgage recording fees; the City would also receive real property-related revenues, i.e., real estate tax payments, during the construction period.

## ANNUAL OPERATING BENEFITS

### *EMPLOYMENT*

Based on typical amounts per square foot, the direct employment in the completed development program is estimated at approximately 20,871 permanent jobs, including approximately 18,444 jobs in the office space, 2,110 retail jobs, 260 community facility and cultural facility jobs, and 57 parking, residential maintenance, and other jobs. Not all of this employment would necessarily be new to New York City; some of this employment might represent jobs that simply relocate to Downtown Brooklyn from elsewhere in the City. However, this employment would represent jobs either new or retained in New York City, which might have gone outside the City if Downtown Brooklyn were not redeveloped.

In addition to direct employment, total employment resulting from the annual operation of completed development program would include jobs in business establishments off-site providing goods and services to the occupants of the buildings and resulting in indirect and generated employment. Based on the RIMS II model's economic multipliers for New York City industrial sectors, the completed development program would generate an additional 19,555 permanent jobs within New York City, bringing the total direct and generated jobs from the annual operation of the completed development program to 40,426 jobs within New York City (see Table 3-24). In the larger New York State economy, the model estimates that the completed development program would generate 28,087 jobs of indirect employment, bringing the total direct and generated jobs from the annual operation of the completed development to 48,958 jobs in New York State.

**Table 3-24**
**Employment and Fiscal Benefits from the Annual Operation of the Completed Development Program**

| | Portion in New York City | Total New York City and State |
|---|---|---|
| **Employment (Permanent Jobs)** | | |
| Direct (On-site) | 20,871 | 20,871 |
| Indirect (Secondary and Induced) | 19,555 | 28,087 |
| *Total* | *40,426* | *48,958* |
| **Wages and Salaries (Millions of constant 2003 dollars)** | | |
| Direct (On-Site) | $1,024.62 | $1,024.62 |
| Indirect (Secondary and Induced) | $591.01 | $819.53 |
| *Total* | *$1,615.62* | *$1,844.14* |
| **Total Economic Output or Demand* (Millions of constant 2003 dollars)** | | |
| Direct (On-Site) | $3,050.12 | $3,050.12 |
| Indirect (Secondary and Induced) | $2,064.34 | $2,935.78 |
| *Total* | *$5,114.46* | *$5,985.90* |
| **Typical Tax Revenues, Exclusive of Real Estate** (Constant 2003 dollars)** | | |
| New York City Taxes | $86,354,500 | |
| MTA Taxes | $5,002,300 | |
| New York State Taxes | $149,528,900 | |
| *Total* | *$240,885,700* | |

**Notes:** *The economic output or total effect on the local economy derived from the direct spending during operation.

**Includes sales tax, personal income taxes, corporate and business taxes, and numerous other taxes on direct and secondary expenditures.

**Sources:** The economic characteristics of the completed development program; the Regional Input-Output Modeling System (RIMS II), U.S. Department of Commerce, Bureau of Economic Analysis; and the tax rates by applicable jurisdiction.

Based on average salaries by economic sector in Brooklyn from the New York State Department of Labor, the direct wages and salaries from the annual operation of the completed development program are estimated at $1.02 billion ($1,024.62 million in 2003 dollars, see Table 3-24). Total direct and generated wages and salaries resulting in New York City from the annual operation of the completed development are estimated at $1.62 billion ($1,615.62 million). In the broader New York State economy, total direct and generated wages and salaries from the annual operation of the completed development are estimated at $1.84 billion ($1,844.14 million). All figures are in 2003 dollars.

The direct effect on the local economy from the completed development program, measured as economic output or demand, is estimated at approximately $3.05 billion ($3,050.1 million), annually. Based on the U.S. Bureau of Economic Analysis' RIMS II model for New York City and State, the total economic activity, including indirect expenditures (those generated by the direct expenditures), that would result from annual operation of the development is estimated at $5.99 billion ($5,985.9 million) in New York State, of which $5.11 billion ($5,114.5 million) would occur in New York City (see Table 3-24).

*FISCAL IMPACTS*

The annual operation of the completed development would have associated with it tax revenues for New York City, MTA, and New York State. These tax revenues would include property tax-related revenues and non-property tax revenues. In total, the operation of the completed development program is estimated to generate approximately $240.89 million annually (in 2003 dollars) in non-property related tax revenues for New York City, MTA, and New York State. Of these tax revenues, the largest portion would come from personal income taxes, sales tax, corporate and business taxes, and similar taxes on the direct and generated economic activity from the completed development. New York State and the MTA would receive about $154.53 million of the tax revenues generated by the operation of the completed development, and New York City would receive about $86.35 million of these tax revenues. As is the case with the employment from the development, not all of these tax revenues would necessarily be new to New York City; some of these revenues might represent amounts that would accrue from the Downtown Brooklyn development that currently occur elsewhere in the City. However, this revenue would represent amounts either new or retained in New York City, which might have gone outside the City if Downtown Brooklyn were not redeveloped.

The City would also receive annual property tax revenues. These revenues would be expected to be initially based on the assessed value of the land, with the assessed value of improvements to the land phased-in according to one of the applicable real estate tax programs, such as, for commercial development, the City's Industrial and Commercial Incentive Program, and for residential development, Section 421-a of the New York State Real Property Tax Law. Taxes would be changing from year-to-year, and in any year would be based on the taxable assessed value and the applicable tax rate. Over time, the value of the land and improvements would be totally taxable. All of the incremental property taxes from the new development in Downtown Brooklyn would be new to New York City. ✷

## A. INTRODUCTION

The proposed Downtown Brooklyn rezoning and related actions would introduce new people—employees of new office and retail space, residents, shoppers, and students—to the study area. The daytime and evening populations may increase demand on the area's community facilities and services, including the police and fire departments, public schools, libraries, and public day care. This chapter considers the potential effects of the development of the projected sites by 2013 under the proposed actions, as described in Chapter 1, "Project Description," on the capacity and performance of these community services. Following the methodology of the 2001 *City Environmental Quality Review (CEQR) Technical Manual*, this analysis focuses on public community facilities. Private facilities and services, such as private schools, are not assessed. Potential impacts on public open space and recreational facilities are analyzed separately in Chapter 5, "Open Space and Recreational Facilities."

The Atlantic Yards Arena and Redevelopment project will add a substantial residential and worker population to the No Build Condition, increasing demand on community facilities and services. In addition, the project includes a large affordable housing component. Therefore, the quantified public schools analysis has been revised to consider this additional No Build population. The analysis approach for public schools also has been adjusted to reflect the latest methodology used by the New York City Department of City Planning (DCP) for large-scale development projects. Future baseline changes in public school enrollment are calculated by adding the number of students generated by the No Build projects to the projected enrollment from the New York City Department of Education (DOE) or DCP. In addition, more recent school enrollment, capacity, and utilization data have become available from DOE, and updated school enrollment projections from DOE and DCP have become available subsequent to issuance of the DEIS.

As discussed below, this analysis concludes that community facilities and services in and around the study area are sufficient to meet any increased demand that would result from the development of the projected sites by 2013. Public elementary and intermediate schools are expected to have ample capacity to accommodate the increase in students that would result from this development. This increase in population would not create a significant impact on public libraries or publicly funded day care centers in their respective study areas, as described below. Based on discussions and correspondence with representatives of the New York City Police Department (NYPD) and New York City Fire Department (FDNY), each department will continue to evaluate the need for personnel and equipment and make any necessary adjustments to adequately serve the areas affected by the proposed actions.

## B. SCREENING LEVEL ASSESSMENT

This chapter uses the reasonable worst-case development scenario, as discussed in Chapter 1, "Project Description," as the basis for assessing the impacts of the proposed actions on community facilities. CEQR methodology calls for detailed assessments in areas where a project may have an impact on the provision of public or publicly funded services available to the community. The 2001 *CEQR Technical Manual* provides guidelines or thresholds that can be used to make an initial determination of whether a detailed study is necessary to determine potential impacts. In the areas of public schools, libraries, and day care centers, development of the projected sites by 2013 under the proposed actions would result in populations above the 2001 *CEQR Technical Manual* thresholds, and a detailed analysis follows. As described below, the proposed actions do not require a detailed assessment for police, fire, or health care services. However, police and fire protection are discussed qualitatively for informational purposes.

The reasonable worst-case development scenario does not specify the types of residential units in terms of income that would be developed under the proposed actions. To ensure that the analyses performed in this chapter are reasonably conservative for estimating the potential number of children that could be introduced to the public school systems and publicly funded day care centers in the study area, an 80/20 component is assumed for all new residential development under the reasonable worst-case scenario. That is, 20 percent of all residential units would be developed as subsidized housing for low- to moderate-income households, and 80 percent would be market rate.* Under this assumption, the proposed actions would yield approximately 196 low- to moderate-income units and 783 market rate units. The proposed actions would not generate the 600 low- to moderate-income residential units required to perform an analysis of area health care facilities.

In terms of police and fire protection services, the 2001 *CEQR Technical Manual* suggests that a detailed assessment of service delivery be conducted if a proposed action would affect the physical operations of, or access to and from, a fire station or police precinct house. While the development projected in the reasonable worst-case development scenario would not result in such direct effects, for the purpose of providing a more comprehensive analysis of the proposed actions' effects on community services, this chapter addresses police and fire protection services.

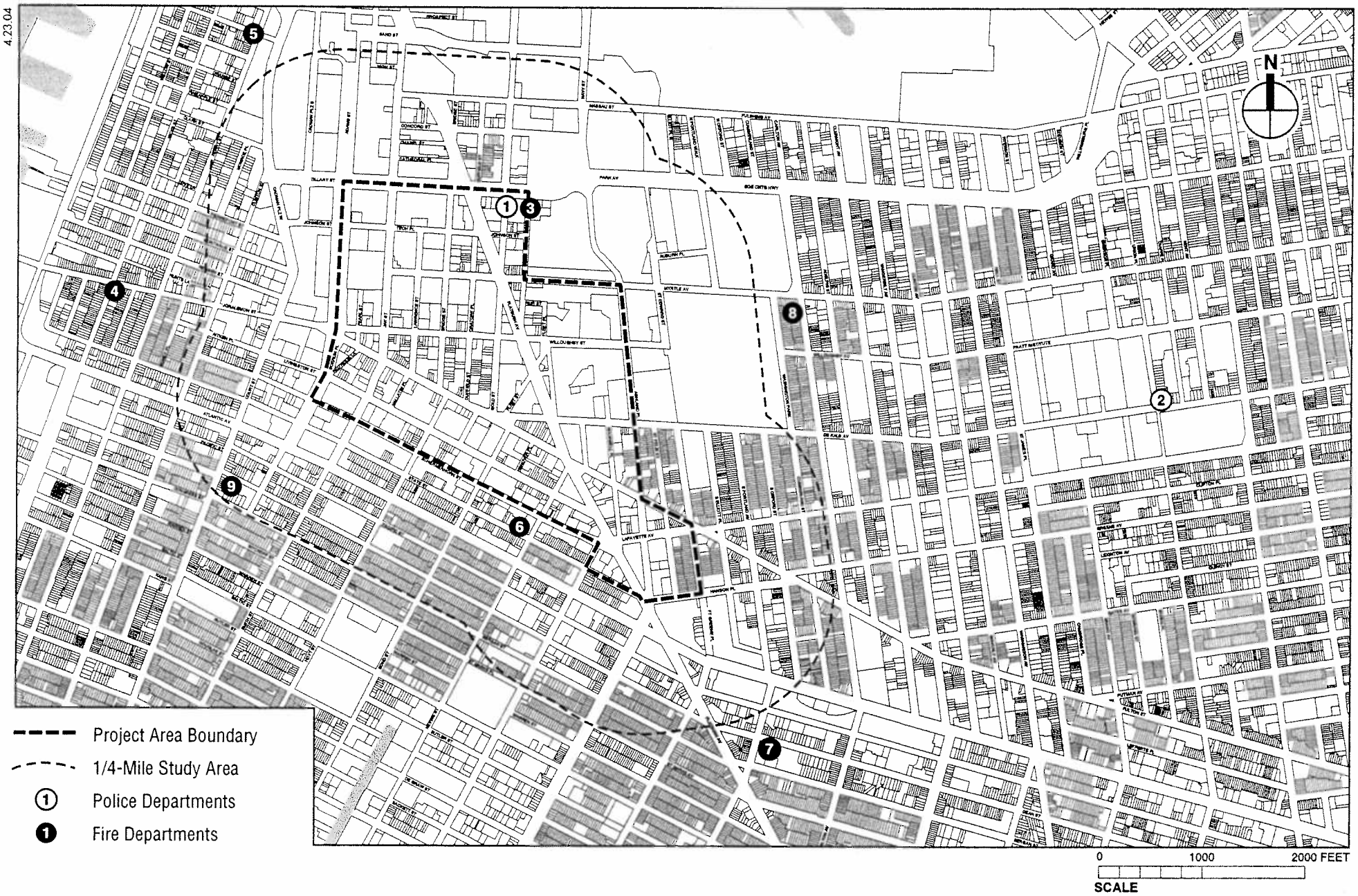
## C. EXISTING CONDITIONS

### POLICE SERVICES

The project area and surrounding neighborhoods are served primarily by the 84th Precinct as well as the 88th Precinct of the New York City Police Department (See Table 4-1 and Figure 4-1). With headquarters located at 301 Gold Street in Downtown Brooklyn, the 84th Precinct serves an area of 1.07 square miles bounded by Atlantic Avenue and Wyckoff Street to the south, Flatbush Avenue and Prince Street to the east, and the East River to the north and west.

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* According to the 2001 *CEQR Technical Manual,* income levels are based on Annual Section 8 Median Family Income (MFI) per family of four, which is used to establish eligibility for many government-assisted housing programs. Families falling under the "low-moderate" classification are earning 80 percent or less of MFI.




**Police and Fire Departments**

Figure 4-1

**Table 4-1**
**Police Services**

| Map No. | Police Department | Address | Facility Type | Uniformed Staff |
|---|---|---|---|---|
| 1 | 84th Precinct | 301 Gold Street | NYC Police Station | 218 |
| 2 | 88th Precinct | 298 Classon Avenue | NYC Police Station | 135 |

The precinct serves the heart of Downtown Brooklyn, including Metrotech Center, the Fulton Street Mall, Borough Hall, the New York City Fire Department Headquarters, the New York City Transit Authority Headquarters, the New York City Transit Museum, and several courthouses, as well as the residential neighborhoods of Brooklyn Heights, Boerum Hill, Vinegar Hill, and the Farragut Residences. Approximately 218 officers are assigned to the 84th Precinct. Currently, staffing levels are sufficient to meet the needs of the community.*

The 88th Precinct is located at 298 Classon Street in the Clinton Hill/Fort Greene section of Brooklyn. The precinct serves an area of 1.42 square miles bounded by Atlantic Avenue to the south, Classon Avenue to the east, Flatbush Avenue and Prince Street to the west, and the East River to the north. The area is primarily residential, with some industrial activity located at the Brooklyn Navy Yard. In addition, the precinct serves the Brooklyn Academy of Music and the Atlantic Center Shopping Complex. The eastern portion of the project area between Flatbush Avenue and Ashland Place falls within the service area of this precinct. With approximately 135 uniformed staff members assigned to the 88th Precinct, staffing levels are sufficient to meet the current needs of the community.**

## FIRE PROTECTION

The six New York City Fire Department (FDNY) fire stations that serve the project area are located along Tillary and Middagh Street to the north, State and Dean Streets to the south, Carlton Avenue to the east, and Hicks Street to the west of the project area (see Figure 4-1 and Table 4-2). The fire station located at 172 Tillary Street, which houses Engine Company 207 and Ladder Company 110, is the only fire station located within the project area itself.

Units responding to a fire are not limited to those closest to it. Normally, a total of three engine companies and two ladder companies respond to each call. Engine companies carry hoses, while ladder companies provide search, rescue, and building ventilation functions. In addition, rescue companies are called for fires or emergencies in high-rise buildings. The Fire Department can call on units in other parts of the City as needed.

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* Telephone conversation on July 31, 2003 with Officer Kopeck, 84th Precinct Community Affairs Officer.

** Telephone conversation on June 16, 2003 with Officer Caputo, 88th Precinct Community Affairs Officer.

**Table 4-2**
**Fire Protection Services**

| Map No. | Fire Department | Address |
|---|---|---|
| 3 | Engine Co. 207, Ladder Co. 110 | 172 Tillary Street |
| 4 | Engine Co. 224 | 274 Hicks Street |
| 5 | Engine Co. 205, Ladder Co.118 | 74 Middagh Street |
| 6 | Engine Co. 226, Ladder Co. 146 | 409 State Street |
| 7 | Engine Co. 219, Ladder Co. 105 | 494 Dean Street |
| 8 | Engine Co. 210 | 160 Carlton Avenue |
| 9 | Fire Patrol 3 | 12 Dean Street |

**Source:** Letter dated July 31, 2003 from FDNY Chief of Operations Salvatore Cassano to AKRF, Inc.; Telephone conversation on September 9, 2003 with FDNY Captain Paul Canlon; FDNY website (www.nyc.gov/html/fdny/html/home2.shtml).

## PUBLIC SCHOOLS

As per Table 3C-1 of the 2001 *CEQR Technical Manual,* a detailed analysis of public schools is required if the proposed actions would generate more than 50 elementary/middle school students. Since the residential component of the proposed actions would generate elementary and intermediate school students that exceed this threshold, this analysis focuses on elementary and junior high schools. DOE assigns students to specific schools at these levels based on geographic proximity to the home. High school students are given a choice of New York City public schools to attend. An assessment of area high schools is not required for the proposed actions since they would generate only 65 high school students, fewer than CEQR threshold of 150 that would require further analysis.

The project area falls within the boundaries of Brooklyn Community School District (CSD) 13 and CSD 15. CSD 13 extends roughly from the East River, north of Fulton and Union Streets, to Garvey Avenue, and includes much of Downtown Brooklyn as well as Brooklyn Heights, Cobble Hill, Fort Greene, Prospect Heights, and Clinton Hill. CSD 15 includes the neighborhoods west of Prospect Park between Fulton Street to the north and 53rd Street to the south. Boerum Hill, Carroll Gardens, Park Slope, Red Hook, Gowanus, Greenwood Heights, Windsor Terrace, and Sunset Park are all included in CSD 15, along with those portions of the project area south of Fulton Street. Under the DOE's 2003 reorganization, New York City's 32 CSDs have been grouped into 10 Instructional Divisions. CSD 13 and 15 have been placed into Instructional Division 8, along with CSDs 14 and 16.

According to the 2001 *CEQR Technical Manual,* the study area for an analysis of educational facilities generally coincides with the region within the CSD serving the site of the proposed action. The project area crosses through three separate regions within the two school districts described above—Regions 1 and 2 in CSD 13 and Region 3 in CSD 15. Therefore, this analysis assesses the potential effects of the reasonable worst-case development scenario on schools located in these three regions, with a particular focus on schools located within approximately ½-mile of the project area. Children residing within the project area would most likely attend the elementary and intermediate schools within these regions. This chapter also examines effects on schools throughout all of CSDs 13 and 15, since students may also attend schools within their district but outside their immediate vicinity. As population shifts within a school district change

over time, DOE can adjust attendance zones within districts to improve the affected school or schools' composition and utilization.

It should be noted that in 1993, DOE (then the Board of Education) adopted a proposal to broaden public school choice by allowing elementary and junior high school students to attend schools outside their districts as long as space was available. This option, however, is not exercised by many parents, and most students attend elementary and intermediate school within their home district.

*ELEMENTARY SCHOOLS*

Thirteen elementary schools are located within approximately ½-mile of the project area in the three CSD regions described above (see Figure 4-2 and Table 4-3). There are no elementary schools within the project area itself. In CSD 13, the two closest schools are P.S. 287 (Dr. Baily K. Ashford School) at 50 Navy Street and P.S. 67 (Charles A. Dorsey School) at 51 St. Edwards Street, to the northeast of the project area. P.S. 261 (Philip Livingston School) at 314 Pacific Street and P.S. 38 (Pacific Community School) at 450 Pacific Street, located southwest of the project area, are the closest schools in CSD 15. According to the most recent enrollment and capacity figures available from DOE, which are for the 2002-2003 school year, these schools are operating at an average of capacity of 72 percent, with a total of 884 available seats.

The thirteen elementary schools located within the ½-mile study area have a total of 2,530 available seats, with a 75 percent utilization rate. None of the elementary schools in the study area are operating at or above capacity. Collectively, the elementary schools located in Regions 1 and 2 in CSD 13 and Region 3 in District 15 are operating at 75 percent of capacity, with 10,328 enrolled students and 3,419 available seats. Enrollment at elementary schools throughout all of CSD 13 is 10,485 or 73 percent of capacity, with a surplus of 3,879 seats. Overall elementary enrollment in CSD 15 is 15,312, or 85 percent of capacity, leaving 2,719 seats available.

*INTERMEDIATE SCHOOLS*

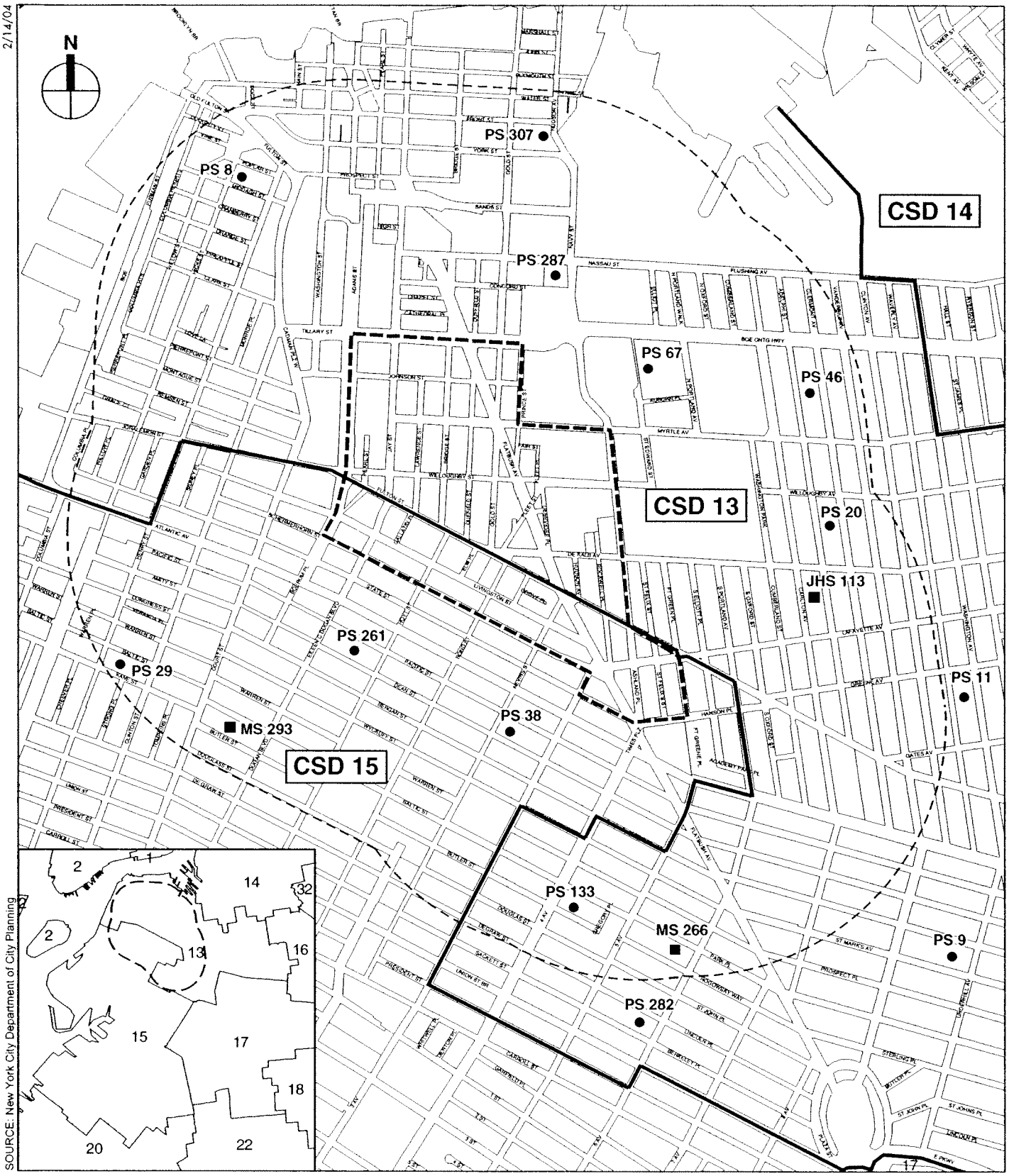
Four intermediate schools are located within a ½-mile radius of the project area. J.H.S. 113 (Edmond Learning Center) at 300 Adelphi Street and M.S. 266 (Park Place Community Middle School) at 62 Park Place are each located in CSD 13. 773 students are enrolled at J.H.S. 113 which operates at 58 percent capacity, with 559 available seats. M.S. 266 operates just above its capacity of 180, with an enrollment of 183 students. In CSD 15, J.H.S. 293, which houses the Brooklyn School for Global Studies and the Brooklyn School for International Studies, is located at 284 Baltic Street. These schools combined operate at 77 percent capacity with 355 available seats. Overall, the intermediate schools in the vicinity of the project area have an enrollment of 2,165 students and are operating at 70 percent capacity, with 914 seats available. Intermediate schools throughout Regions 1 and 2 in CSD 13 and Region 3 in District 15, which includes one additional school (M.S. 142) outside of the ½-mile study area, operate at 66 percent of capacity. Current enrollment stands at 2,457 students, with 1,192 seats available. Intermediate school enrollment for all of CSD 13 is 3,739, or 72 percent of capacity, with 1,490 seats available. CSD 15 intermediate schools currently have 4,413 students enrolled, operating at 67 percent of capacity, with 2,166 seats available.

## Table 4-3
## Public School Utilization, Capacity, and Enrollment Figures
## 2002-2003 School Year

| School | Enrollment in Program | Program Capacity | Available Seats in Program | Program Utilization (Percent) |
|---|---|---|---|---|
| **Elementary Schools** | | | | |
| **District 13** | | | | |
| P.S. 8, Robert Fulton School | 262 | 382 | 120 | 69% |
| P.S. 9, Teunis G. Bergen School | 734 | 995 | 261 | 74% |
| P.S. 11, Purvis J. Behan School | 597 | 830 | 233 | 72% |
| P.S. 20, Clinton Hill School | 762 | 990 | 228 | 77% |
| P.S. 46, Edward C. Blum School | 545 | 813 | 268 | 67% |
| P.S. 67, Charles A. Dorsey School | 743 | 982 | 239 | 76% |
| P.S. 133, James A. Butler School | 369 | 403 | 34 | 92% |
| P.S. 282, Park Slope Elementary School | 659 | 898 | 239 | 73% |
| P.S. 287, Dr. Baily K. Ashford School | 337 | 648 | 311 | 52% |
| P.S. 307, D.H. Williams School | 592 | 895 | 303 | 66% |
| **Total, Elementary Schools in District 13** | **10,485** | **14,364** | **3,879** | **73%** |
| **District 15** | | | | |
| P.S. 29, John M. Harrigan School | 800 | 760 | (40) | 105% |
| P.S. 38, Pacific Community School | 506 | 786 | 280 | 64% |
| P.S. 261, Philip Livingston School | 683 | 737 | 54 | 93% |
| **Total, Elementary Schools in District 15** | **15,312** | **18,031** | **2,719** | **85%** |
| **Total, Elementary Schools in ½ Mile Study Area** | **7,589** | **10,119** | **2,530** | **75%** |
| **Total, Elementary Schools in Regions 1 and 2 in District 13 and Region 3 in District 15** | **10,328** | **13,747** | **3,419** | **75%** |
| **Total, Elementary Schools in Districts 13 and 15 Combined** | **25,797** | **32,395** | **6,598** | **80%** |
| **Intermediate Schools** | | | | |
| **District 13** | | | | |
| M.S. 266, Park Place Community Middle School | 183 | 180 | (3) | 102% |
| J.H.S. 113, Edmond Learning Center | 773 | 1,332 | 559 | 58% |
| **Total, Intermediate Schools in District 13** | **3,739** | **5,229** | **1,490** | **72%** |
| **District 15** | | | | |
| M.S. 293, Nathan Hale Middle School* | 1,212 | 1,567 | 355 | 77% |
| **Total, Intermediate Schools in District 15**** | **4,413** | **6,579** | **2,166** | **67%** |
| **Total, Intermediate Schools in ½ Mile Study Area** | **2,168** | **3,079** | **911** | **70%** |
| **Total, Intermediate Schools in Regions 1 and 2 in District 13 and Region 3 in District 15** | **2,460** | **3,749** | **1,189** | **66%** |
| **Total, Intermediate Schools in Districts 13 and 15 Combined** | **8,152** | **11,808** | **3,656** | **69%** |

**Notes:** * Includes J.H.S. 429 and 496, Brooklyn School for Global Studies and Brooklyn School for International Studies.
** Includes M.S. 136 in Administrative District 85.

**Sources:** Enrollment and capacity for individual schools: New York City Department of Education, *Utilization Profiles: Enrollment/Capacity/Utilization, 2002-2003*. These figures include Pre-K enrollment in these buildings. Totals for Community School Districts 13 and 15 enrollment: New York City Department of Education and New York City Department of City Planning, Enrollment Projections for Community School Districts (Actual 2002, Projected 2003 to 2012). DCP's actual enrollment does not include Pre-K enrollment. Capacity numbers for CSD 13 and 15: New York City Department of Education, *Utilization Profiles: Enrollment/Capacity/Utilization, 2002-2003*.




**Area Schools**

Figure 4-2

*HIGH SCHOOLS*

New York City public high school students have the option of attending a high school anywhere in the City. However, the tendency is to attend a school within a closer distance to the home. Two public high schools are located within the project area—Pacific High School at 112 Schermerhorn Street and George Westinghouse Vocational High School at 105 Tech Place. In addition, two public high schools are located just outside the project area. Brooklyn Technical High School is located at DeKalb Avenue and South Elliott Place and the Brooklyn High School of Performing Arts, located at 345 Dean Street just south of the project area.

## LIBRARIES

The proposed actions would add 979 new residential units, more then the 2001 *CEQR Technical Manual* Table 3C-3 threshold of 734 units. Therefore, a detailed public library analysis is warranted. According to the 2001 *CEQR Technical Manual*, residents will typically travel as much as three-quarters of a mile to use library facilities. Thus, the library service area for this analysis is defined as the ¾-mile radius around the project area. All libraries located within this radius are included in the assessment. To determine the population of the library service area, 2000 U.S. Census data were assembled for all census tracts that fell primarily within the library service area. There are no public libraries within the project area itself.

The Brooklyn Public Library (BPL) system serves all of Brooklyn and contains two central libraries and 58 neighborhood branches throughout the borough. The total number of volumes in BPL is approximately 2,155,427. Seven libraries are located within approximately three-quarters of a mile of the project area (see Table 4-4 and Figure 4-3) including the two main libraries—the Brooklyn Central Library at Grand Army Plaza and the Business Library on Cadman Plaza West. The Brooklyn Central Library houses the largest of all circulating and general reference collections in BPL. The Business Library is dedicated exclusively to business and finance and provides free access to business and investment resources. In addition, each of the five neighborhood library branches in the study area also offers special programs and services to residents including public education, health information services, job information centers, and internet workshops.

**Table 4-4**
**Library Services**

| Map # | Library | Location | Volumes | Circulation[1] |
|---|---|---|---|---|
| 1 | Central Library | Grand Army Plaza | 733,767 | 1,330,936 |
| 2 | Business Library | 280 Cadman Plaza West | 38,097 | 21,928 |
| 3 | Brooklyn Heights Branch | 280 Cadman Plaza West | 63,374 | 271,923 |
| 4 | Carroll Gardens Branch | 396 Clinton Street | 74,950 | 56,975 |
| 5 | Clinton Hill Branch | 380 Washington Avenue | 50,151 | 50,332 |
| 6 | Pacific Branch | 25 Fourth Avenue | 62,095 | 43,705 |
| 7 | Walt Whitman Branch | 93 Saint Edwards Street | 44,407 | 28,815 |
| | **Library Service Area[2]** | | 1,066,841 | 1,804,614 |
| | **Total BPL System[3]** | | 2,155,427 | 10,278,195 |

**Notes:**
[1] Includes checkouts and renewals.
[2] ¾-mile radius around the project area.
[3] BPL System consists of the Brooklyn Central Library, Business Library, and 58 neighborhood branches in Brooklyn.
**Source:** The Brooklyn Public Library, Brooklyn Public Library website (www.brooklynpubliclibrary.org).

The seven libraries in the ¾-mile service area have a combined total of 1,066,841 volumes. With a residential population of 151,433 according to 2000 U.S. Census data, the service area has a volumes-to-resident ratio of 7.0 to 1. The total population of the borough of Brooklyn is 2,465,326. In total, the BPL system has a collection of approximately 2,155,427 volumes or a volumes-to-resident ratio of 0.87 to 1. The volumes-to-resident ratio of the ¾-mile service area is significantly greater than the ratio of the entire BPL system. This can be attributed to the fact that the largest library in Brooklyn (Central Library) is located within the library service area. It should be noted that residents can go to any BPL branch and order books from any of the other library branches.

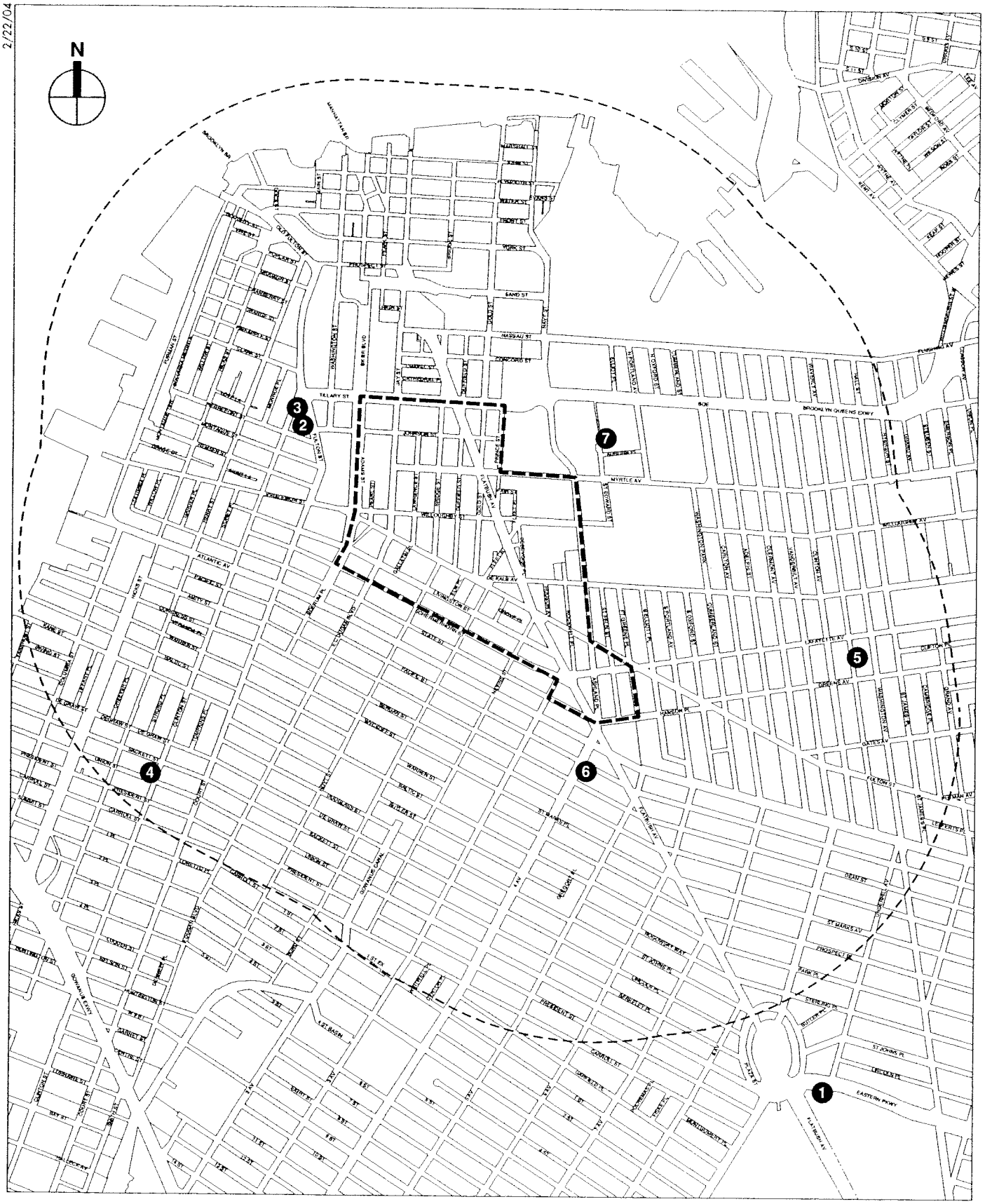
## DAY CARE

Publicly funded day care for the children of income-eligible households in New York City is sponsored and financially supported by the Agency for Child Development (ACD) within the City's Administration for Children's Services (ACS), and Head Start, federally funded early childhood education and family support programs. The City of New York formerly operated public day care facilities, but now neither ACD nor the City operates day care programs. Most children are served through ACD contracts with hundreds of private, non-profit organizations that operate child care programs in communities across the City that are licensed by the New York City Department of Health (DOH). ACD also issues vouchers to eligible families to provide financial assistance in purchasing care from any legal day care provider in the City. ACD facilitates day care services for children between the ages of 2 months and 12 years, and publicly financed day care is used predominantly by children 5 years old and under. (Children over 5 often start kindergarten within elementary schools.) Head Start programs administered by ACS throughout New York City serve over 17,000 preschool-age children (ages 3 to 5) from low-income families.

To receive subsidized child care services, a family must meet specific financial and social eligibility criteria that are determined by Federal, State, and local regulations. Eligibility is determined by a family's gross income, with consideration of family size. To meet the social eligibility for publicly-funded day care, a family must also have an approved "reason for care," such as involvement in a child welfare case or participation in a "welfare-to-work" program. Parents must appear at an eligibility interview at an ACD borough office to be considered.

According to the 2001 *CEQR Technical Manual,* publicly funded group day care centers within a 1-mile study area should be identified for residential developments. Given that there are no location requirements for enrollment in day care centers, some parent/guardians may choose a day care center closer to a location of employment rather than their place of residence. Parent/guardians have the option of using ACD vouchers to purchase day care from public and private providers both within and outside the 1-mile study area, potentially in neighborhoods close to parents' workplaces. The portability of ACD vouchers indicates that services beyond a 1-mile study area can and are used by eligible parents. However, as discussed in the 2001 *CEQR Technical Manual,* the centers closest to the project area are more likely to be subject to increased demand. ACD has provided information only for those facilities located closest to the project area. There are 16 public day care centers located within or in close proximity to the project area, with a total capacity of approximately 1,465 slots (see Table 4-5). These facilities are well-utilized with a current enrollment of 1,154, with 314 available slots.

2/22/04




**Library Locations**

Figure 4-3

**Table 4-5**
**Publicly Funded Day Care Centers in or near the Project Area**

| Name | Address | Capacity | Enrollment | Available Slots |
|---|---|---|---|---|
| Alonzo Austin Daughtry Day Care | 30 Third Avenue | 30 | 26 | 4 |
| BBCS Child Care Center* | 105 N. Portland Avenue | 135 | 116 | 19 |
| BBCS Duffield Children Center | 101 Fleet Place | 160 | 123 | 37 |
| BBCS FDC Careers Program | 285 Myrtle Avenue | 208 | 144 | 64 |
| BBCS Willoughby Waverly | 143 Waverly Avenue | 175 | 171 | 4 |
| Bethel Baptist Day Care Center | 242 Hoyt Street | 125 | 115 | 10 |
| Farragut Children's Center | 32 Navy Street | 75 | 64 | 11 |
| Farragut Day Care Center | 104 Albee Square West/Gold Street | 110 | 81 | 29 |
| Low Memorial Day Care Center | 176 Johnson Street | 80 | 52 | 28 |
| LYFE Community Preparatory School** | 679-69 Schermerhorn Street | 10 | 13 | 0 |
| LYFE Sarah J. Hale | 345 Dean Street | 8 | 0 | 8 |
| Nat Turner Day Care Center | 460 Atlantic Avenue | 50 | 24 | 26 |
| Nevins Day Care Center | 460 Atlantic Avenue | 155 | 147 | 8 |
| Our Children's Center | 300 Jay Street | 24 | 23 | 1 |
| Victims Assistance Services Brooklyn Criminal Court Children Center | 120 Schermerhorn Street | N/A | N/A | N/A |
| Warren Street Center for Children and Families | 343 Warren Street | 120 | 55 | 65 |
| | **Total:** | **1,465** | **1,154** | **314** |

**Notes:**
* BBCS (Brooklyn Bureau of Community Service)
** LYFE (Leading Youth to Find Empowerment)
**Source:** Administration for Children's Services, 2003.

In addition to attending group day care centers, eligible children may also be cared for in the homes of family child care providers, also registered by DOH. A family child care provider is a professional who provides care for three to seven children in his or her residence. A group family child care provider is a professional who cares for 7 to 12 children, with the help of an assistant, in his or her home. The majority of family and group family child care providers in New York City are registered with a child care network, which provides access to training and support services (see Table 4-6). Currently, there are approximately 2,000 slots throughout Brooklyn administered by 11 network providers. According to ACS, these home-based facilities tend to absorb unmet demand at day care centers, and more host households are added to the system as demand increases.

**Table 4-6**
**Brooklyn Family Child Care Networks**

| Name | Address | Estimated Network Spaces |
|---|---|---|
| Bedford Avenue Family Day Care | 40 Brevoort Place | 95 |
| Brooklyn Bureau Family Day Care | 285 Myrtle Avenue | 228 |
| Brookwood Child Care | 25 Washington Street | 300 |
| Child Development Support Corporation | 1213 Fulton Street | N/A |
| East New York Family Day Care | 477 Vermont Street | N/A |
| Faith, Hope & Charity Family Day Care | 370 New Lots Avenue | N/A |
| Friends of Crown Heights Family Day Care | 671 Prospect Place | 600 |
| Nuestros Ninos Child Development School | 384 South 4th Street | 250 |
| Park Slope Family Day Care | 333 14th Street | N/A |
| Salvation Army/Brownsville Day Care | 280 Riverdale Avenue | 100 |
| Salvation Army/Brownsville Family Day Care | 80 Lorraine Street | 400 |
| | **Total Child Care Spaces** | 1,973 |

**Source:** Child Care Inc., 2003

# D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

## POLICE SERVICES

The NYPD typically adjusts its allocation of personnel as the need arises. Increased allocations are considered when increased demand becomes apparent. It is NYPD policy not to make adjustments in advance of planned development. Each year, the precinct may be assigned new recruits, but there are also losses due to transfers and promotions. As noted above, the 84th and 88th Precincts have a combined force of approximately 353 officers. While no change is expected, further adjustments to the size and deployment of the police force based on budgetary factors or other policy decisions may be made by 2013 in the future without the proposed actions.

## FIRE PROTECTION

Like NYPD, the Fire Department does not allocate personnel based on planned development, but responds to demonstrated need. The Fire Department has no immediate plans to make any changes in stations or equipment in the area. In 2013, the Fire Department will continue to evaluate the need for personnel and equipment and make necessary adjustments to adequately serve the area.

## PUBLIC SCHOOLS

The No Build utilization rate for school facilities is calculated by adding the estimated enrollment from known future proposed residential developments to the projected enrollment from DCP or DOE and then comparing that number to projected capacity.

In the future without the proposed actions, new residential development is anticipated within the rezoning area and throughout the surrounding study area, as described in Chapter 2, "Land Use,

Zoning, and Public Policy" (see Table 2-1). For most of these developments, it is not known whether the project will include affordable housing units. Therefore, for the purposes of this analysis, it conservatively has been assumed that 10 percent of all planned residential units will be developed as subsidized housing for low- to moderate-income households, unless otherwise noted in Table 4-7. Overall, close to 8,000 market rate units and 1,450 affordable housing units are expected to be generated by 2013 independent of the proposed actions. These residential developments are summarized in Table 4-7.

**Table 4-7**
**Expected Residential Development:**
**Future Without the Proposed Actions**

| Project Location | Total Housing Units | Market Rate Units | Low-Moderate Income Units | Low Income Units |
|---|---|---|---|---|
| 60-82 Washington Street | 254 | 229 | 25 | |
| 110 Livingston Street | 245 | 220 | 25 | |
| 223 Atlantic Avenue (NE corner of Court Street) | 254 | 229 | 25 | |
| Atlantic Avenue and Smith Street (Block 176) | 50 | 45 | 5 | |
| Atlantic Center | 711 | 640 | 71 | |
| BAM LDC East (Block 2108 bounded by Ashland Place, Fulton, Lafayette and St. Felix Streets) | 100 | 90 | 10 | |
| BAM LDC North (Block 2107 bounded by Ashland and Rockwell Places and Lafayette and Fulton Streets) | 570 | 513 | 57 | |
| Bridge Plaza Rezoning (area bounded by Tillary, Prince, Nassau and Jay Streets) | 295 | 265 | 30 | |
| Bridgefront Condominiums (42 Main Street) | 21 | 19 | 2 | |
| ESDC/HS (Block 170, S side Schermerhorn between Hoyt and Smith; E side Smith b/t Schermerhorn and State Streets) * | 440 | 240 | 200 | |
| Light Bridges (100 Jay Street) | 153 | 148 | 15 | |
| 53 Boerum Place | 99 | 89 | 10 | |
| Schermerhorn between Hoyt and Bond Streets (Block 171) | 135, 14 townhouses | 134 | 15 | |
| Shops at Atlantic Center, Site 5 (Block 927) | 308 | 277 | 31 | |
| Site G | 60 | 54 | 6 | |
| South Portland Avenue at Atlantic Avenue (Block 2004) | 96 | 86 | 10 | |
| Sweeney Building Conversion | 87 | 78 | 9 | |
| Atlantic Yards Arena and Redevelopment Project ** | 5,500 | 4,600 | | 900 |
| **Total** | **9,392** | **7,956** | **546** | **900** |

**Notes:** * This project will include 200 (45%) affordable housing units.
** This project includes 4,500 units to be developed under the New York City Housing Development Corporation's New Housing Opportunities Program (NewHOP), which requires the following affordability component: 20% (900 units) for low income families, 30% (1,350 units) for middle income families, and 50% (2,250 units) set at market rates. For the purposes of this analysis, middle income families are considered "high income" as per the guidelines set forth in the 2001 *CEQR Technical Manual* (see Table 3C-2, "Projected Public School Pupil Ratios in New Housing Units of All Sizes"). The remaining 1,000 units will be developed as market rate condominiums/cooperatives.

**Sources:** Downtown Brooklyn Council, New York City Economic Development Corporation, New York City Department of City Planning, New York City Department of Housing Preservation and Development, AKRF, Inc.

The 2001 *CEQR Technical Manual*'s Table 3C-2, "Projected Public School Pupil Ratios in New Housing Units of All Sizes," summarizes pupil generation rates, based on the DOE's analysis of income mix and location (by borough) for new residential units. Table 4-8 shows the number of new public elementary and intermediate school students expected to be generated by the new residential development identified in Table 2-1.

**Table 4-8**
**Projected New Housing Units and Estimated Number of Students Generated: Future Without the Proposed Actions**

| | Housing Units* | Elementary School | Intermediate School | High School | Total Students Generated |
|---|---|---|---|---|---|
| Market Rate | 7,956 | 2,145 | 795 | 477 | 3,417 |
| Low-Moderate Income | 546 | 186 | 71 | 49 | 306 |
| Low Income | 900 | 333 | 126 | 81 | 540 |
| **Total** | **9,392** | **2,664** | **992** | **607** | **4,263** |

Note: * Projected new housing units as shown in Table 4-7 and described in Chapter 2, "Land Use, Zoning, and Public Policy."
Sources: Student generation rates are based on the 2001 *CEQR Technical Manual's* Table 3C-2: "Projected Public School Pupil Ratios in New Housing Units of All Sizes."

DCP and the DOE Division of School Facilities predict changes in enrollment by district up to 10 years in the future using cohort survival methodology based on birth rates and grade-retention ratios. Slight differences in methodology account for variations between the DOE and DCP enrollment projections.* The 2001 *CEQR Technical Manual* suggests that both DCP's and DOE's enrollment projects may be considered in evaluating potential impacts, although the more conservative (higher enrollment and lower capacity) projections should be used for calculating numerical impacts. Enrollment projections were obtained from DCP and DOE, and the data were compared to determine which figures are more conservative in projecting future enrollment for CSDs 13 and 15. In this case, both projections are used as the basis for assessing potential impacts, as follows. The DCP enrollment projections are more conservative for both elementary and intermediate students in CSD 13 and intermediate students in CSD 15. DOE enrollment projections are more conservative with respect to elementary students in CSD 15 and are, therefore, applied to elementary schools in this district.

The enrollment projections do not account for discrete new residential developments planned for the area; thus, the additional populations from these new projects are also included in predicting future enrollment and utilization. Since it is not possible to predict exactly how these students will be distributed among area schools, this analysis has assumed that students will be evenly divided between CSD 13 and CSD 15.

In applying these enrollment projections and changes in population, it is important to note that school enrollment and utilization conditions in the City can change substantially over a long time horizon such as 2013. Based on consultation with DCP, it was determined that the percent change in students projected between 2011 and 2012 (the last year for which data is available from DCP and DOE) would be held constant to project elementary and intermediate school enrollments for the 2013 analysis year.

As shown below, none of the elementary or intermediate schools in the study area or associated school district regions are expected to operate at or above capacity in 2013.

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* According to DCP, the major differences in methodology between the DOE and DCP enrollment projects are the following: DOE projects births by race/ethnicity for its projects, while DCP holds the latest actual birth data constant; and DOE includes Long Term Absentees (those students who are registered but are not in attendance at a NYC public school) in its projections, while DCP does not include them.

*ELEMENTARY SCHOOLS*

DCP's CSD 13 projections indicate that the trend in the declining numbers of elementary grade students, evident in recent years, will continue through 2012, with slowing rates of decline between 2009 and 2012. The projections show 1,494 fewer public elementary school students district wide, or an approximately 14 percent net decrease, by 2013. DOE projections for CSD 15 indicate that the number of elementary grade students in this district will decline through 2008 with a gradual increase from 2009 to 2012. Based on this projection, there will be 877 fewer elementary students district wide, or a 5.7 percent net decrease by 2013.

Applying these more conservative projection rates to the thirteen elementary schools in the ½-mile study area results in a projection of 909 fewer public elementary school students by 2013 (see Table 4-9). At the same time, residential development in the area will add 2,664 elementary school students to CSD 13 and 15. If all of these students were to attend the thirteen schools within ½ mile of the project area, the total enrollment in the thirteen schools in 2013 would be 9,344, with a surplus of 775 seats (92 percent utilization).

For the elementary schools within the three school district regions that serve the project area, 1,599 additional students will be enrolled by 2013, taking into consideration both DCP projections and new residential development. This group of schools will be operating at 87 percent of capacity with a total enrollment of 11,927 students. Overall in CSD 13, there will be a total of 162 fewer elementary school students and schools will operate at 72 percent of capacity with 4,041 available seats. CSD 15 elementary schools will operate at 87 percent of capacity with 455 additional students and a surplus of 2,264 seats.

Overall, there is expected to be available capacity at all of study area public elementary schools in 2013.

*INTERMEDIATE SCHOOLS*

Both DCP and DOE projections show a continuing trend of decreasing intermediate school enrollments through 2012. Using DCP's more conservative projections for intermediate schools in CSD 13, it is expected that there will be a net overall decline of 20 percent in intermediate school enrollment, or a decrease of 746 students. In CSD 15, DCP projections are also more conservative, with 312 fewer intermediate students, or a decline of 7 percent.

Based on these projections, the intermediate schools in the ½-mile study area will have a projected enrollment of 2,884 students by the year 2013. These schools will be operating at an average capacity of 94 percent with a surplus of 195 seats. For all intermediate schools in the relevant regions, enrollment will rise to 3,156 students. Utilization will increase to 84 percent, leaving 593 seats available. Throughout CSD 13, there will be a total of 250 fewer students, with intermediate schools operating at 67 percent of capacity with a surplus of 1,740 seats. CSD 15 intermediate schools will operate at 70 percent of capacity, with 184 additional students and 1,982 seats available. Overall, there is expected to be available capacity at all of the study area public intermediate schools in 2013.

*HIGH SCHOOLS*

DCP and DOE do not provide projections of high school students on a local basis. Additional high school students generated by demographic shifts and future development projects in the area, as shown in Table 4-8, would be able to choose from among the City's high schools and are not likely to affect utilization at neighborhood schools.

**Table 4-9**

**Estimated Public Elementary/Intermediate School Enrollment, Capacity, and Utilization: Future Without the Proposed Actions**

| Region/District | Projected Enrollment in 2013* | Students Generated from New Residential Development | Total Future Enrollment in 2013 | Program Capacity | Available Seats in Program | Program Utilization |
|---|---|---|---|---|---|---|
| **Elementary Schools** | | | | | | |
| Totals, Elementary Schools within ½ Mile of Project Area** | 6,680 | 2,664 | 9,344 | 10,119 | 775 | 92% |
| Totals, CSD 13 Regions 1 and 2 and CSD 15 Region 3 | 9,263 | 2,664 | 11,927 | 13,747 | 1,820 | 87% |
| Totals, CSD 13 | 8,991 | 1,332 | 10,323 | 14,364 | 4,041 | 72% |
| Totals, CSD 15 | 14,435 | 1,332 | 15,767 | 18,031 | 2,264 | 87% |
| Totals, CSDs 13 and 15 Combined | 23,426 | 2,664 | 26,090 | 32,395 | 6,305 | 81% |
| **Intermediate Schools** | | | | | | |
| Totals, Intermediate Schools within ½ Mile of Project Area | 1,892 | 992 | 2,884 | 3,079 | 195 | 94% |
| Totals, CSD 13 Regions 1 and 2 and CSD 15 Region 3 | 2,164 | 992 | 3,156 | 3,749 | 593 | 84% |
| Totals, CSD 13 | 2,993 | 496 | 3,489 | 5,229 | 1,740 | 67% |
| Totals, CSD 15*** | 4,101 | 496 | 4,597 | 6,579 | 1,982 | 70% |
| Totals, CSDs 13 and 15 Combined | 7,094 | 992 | 8,086 | 11,808 | 3,722 | 68% |

**Notes:** * The percent change in students projected between 2011 and 2012 (the last year for which data is available from DCP and DOE) is held constant to determine enrollment projections for 2013.
** 2013 estimates for enrollment in schools within the vicinity of the project area were derived proportionally from total enrollment for CSDs 13 and 15.
*** Includes M.S. 136 in Administrative District 85.

**Sources:** Totals for CSDs 13 and 15 projected enrollment: New York City Department of City Planning and New York City Department of Education, Enrollment Projections (Actual 2002, Projected 2003-2012). DCP enrollment projections do not include Pre-K enrollment. Capacity numbers for CSDs 13 and 15: New York City Department of Education, *Utilization Profiles: Enrollment/Capacity/Utilization, 2002-2003.*

## LIBRARIES

This analysis assumes that the number of volumes in the library service area in the future without the proposed actions will remain the same as the number of volumes in the existing condition. However, it is likely that most of the libraries will increase the number of volumes in their collection by 2013. In April 2001, BPL released "Taking Flight," a five-year strategic plan through 2006 outlining specific goals and objectives to position itself as the center of knowledge for the borough of Brooklyn. These include the construction of a new visual and performing arts library near the Brooklyn Academy of Music, in the southeastern section of the project area (which is part of the proposed actions). In addition, BPL seeks to expand and strengthen its collections, educational programs, and research services, increase private and government funding, and improve facility structures, maintenance, and accessibility.

In the future without the proposed actions, the population is expected to increase in the project area by 20,094 residents due to new residential development projects expected to be completed by 2013. To project the residential population of the ¾-mile library service area in 2013, the estimated residential population that would be generated by planned development projects

within a ½-mile radius of the project area was added to the existing population within the ½-mile area. For the remaining area within the ¾-mile library service area, a conservative annual background growth rate of 0.5 percent was assumed and applied to the existing residential population. Using this rate of growth, 22,571 new residents are expected in the ¾-mile library service area, for a total of 174,004 residents.* As a result, the volumes per resident ratio will decrease from 7.0 to 1 in the existing condition to approximately 6.1 to 1 in 2013.

### DAY CARE

New development projects and other background growth will result in an increase of 24,456 in the 1-mile study area residential population from 196,199 to 220,655 by 2013. The 1,456 new low and low-moderate income units in the Future Without the Proposed Actions could generate as many as 518 children between the ages of 2 months and 12 years who could be eligible for publicly-funded day care according to the CEQR methodology. However, the school-age children (pre-K to 6th grade) would be unlikely to utilize the day care slots available in these facilities since they would be enrolled in public school. Any increased demand for slots could be substantially met with the slots currently available at the day care facilities in the study area as well as family day care slots and vouchers for private day care centers.

## E. THE FUTURE WITH THE PROPOSED ACTIONS

### POLICE SERVICES

The project's introduction of office, retail, and residential uses may necessitate the assignment of additional personnel, resources, and equipment to the project area. This decision would be based upon many factors, some of which include composition of the spaces, type of clients, hours of operation, vehicle traffic flow, pedestrian traffic, transient population, and permanent population. Typically, a commitment of resources would be based on demonstrated need and would not be made until a detailed development plan and operational statistics for the proposed projects became available. Overall, the role of the Police Department in providing effective, efficient service is not expected to be adversely affected by the developments that could result from the proposed actions under the reasonable worst-case scenario.

### FIRE PROTECTION

In the future with the proposed actions, FDNY could provide adequate fire protection services to the project area and surrounding neighborhoods.** All development would be constructed in accordance with all applicable fire and safety codes. There would be no direct effects to the physical operations of, or access to, FDNY facilities. Overall, no impact on fire services is expected as a result of the development of the projected sites subsequent to the proposed actions.

### PUBLIC SCHOOLS

DCP and the DOE Division of School Facilities have developed a methodology of determining how many public school students are generated by development. DCP and DOE have created a

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* Existing base population based on 2000 U.S. Census data.

** Letter dated July 21, 2003 to AKRF, Inc. from Salvatore Cassano, Chief of Operations, FDNY.

matrix that estimates the number of elementary, intermediate, and high school students who would attend public schools based on the number of new dwelling units in a proposed action.

As discussed above, the reasonable worst-case development scenario that would be developed under the proposed actions would include 783 market-rate residential units (or 80 percent of all projected residential development), and 196 subsidized units (20 percent) reserved for families with low- to moderate-incomes (see Table 4-10). Based on the methodology described above, households occupying these new developments under the proposed actions would generate an estimated 278 elementary school students (211 from low- to moderate-income and 67 from high income households), and 103 intermediate school students (78 from low- to moderate-income and 25 from high income families). Since it is difficult to predict how these students would be distributed among area schools, for purposes of this analysis it is assumed that students would be evenly divided between CSD 13 and CSD 15. The elementary and intermediate public schools in CSDs 13 and 15 within the three school district regions that would most likely serve residences in the project area would have ample capacity for this number of students (see Table 4-11). Therefore, no significant adverse impacts to schools would occur as a result of the development of the projected sites by 2013.

**Table 4-10**
**Projected New Housing Units and Estimated Number of Students Generated: Future with the Proposed Actions**

| | Housing Units* | Elementary School | Intermediate School | High School | Total Students Generated |
|---|---|---|---|---|---|
| Market Rate | 783 | 211 | 78 | 47 | 336 |
| Low-Moderate Income | 196 | 67 | 25 | 18 | 110 |
| **Total** | **979** | **278** | **103** | **65** | **446** |

Note: * Housing units are based on the reasonable worst-case development scenario as described in Chapter 1, "Project Description."
Sources: Student generation rates are based on the 2001 *CEQR Technical Manual's* Table 3C-2: "Projected Public School Pupil Ratios in New Housing Units of All Sizes."

## LIBRARIES

Under the reasonable worst-case development scenario, it is estimated that 1,930 new residents would be generated by the proposed actions, for a total of 175,934 residents in the ¾-mile study area. The volume per resident ratio would decrease minimally from 6.1 to 1 in the future without the proposed actions to 6.06 to 1. The number of new residents added to the library service area by the projected developments would be a very small percentage of the total annual library users. Therefore, it is not likely that there would be a significant adverse impact on library resources by the development of the projected sites by 2013. In addition, library services within the study area would be enhanced by the proposed creation of a visual and performing arts public library on site EE.

## DAY CARE

By 2013, the proposed actions would result in the introduction of approximately 196 low- to moderate-income units. Following the methodology set forth in the 2001 *CEQR Technical Manual* for estimating the number of children eligible for public day care, the 196 low- to moderate-income units would generate a maximum of approximately 67 children (ages 0 to 12) eligible for publicly financed child care.

**Table 4-11**
**Estimated Public Elementary/Intermediate School Enrollment, Capacity, and Utilization: Future with the Proposed Actions**

| Region/District | Projected Enrollment in 2013 without Proposed Actions* | Students Generated from Proposed Actions | Total Projected Future Enrollment in 2013 | Program Capacity | Available Seats in Program | Program Utilization |
|---|---|---|---|---|---|---|
| **Elementary Schools** | | | | | | |
| Totals, Elementary Schools within ½ Mile of Project Area** | 9,344 | 278 | 9,622 | 10,119 | 497 | 95% |
| Totals, CSD 13 Regions 1 and 2 and CSD 15 Region 3 | 11,927 | 278 | 12,205 | 13,747 | 1,542 | 89% |
| Totals, CSD 13 | 10,323 | 139 | 10,462 | 14,364 | 3,902 | 73% |
| Totals, CSD 15 | 15,767 | 139 | 15,906 | 18,031 | 2,125 | 88% |
| Totals, CSDs 13 and 15 Combined | 26,090 | 278 | 26,368 | 32,395 | 6,027 | 81% |
| **Intermediate Schools** | | | | | | |
| Totals, Intermediate Schools within ½ Mile of Project Area | 2,884 | 103 | 2,987 | 3,079 | 92 | 97% |
| Totals, CSD 13 Regions 1 and 2 and CSD 15 Region 3 | 3,156 | 103 | 3,259 | 3,749 | 490 | 87% |
| Totals, CSD 13 | 3,489 | 52 | 3,541 | 5,229 | 1,688 | 68% |
| Totals, CSD 15*** | 4,597 | 51 | 4,648 | 6,579 | 1,931 | 71% |
| Totals, CSDs 13 and 15 Combined | 8,086 | 103 | 8,189 | 11,808 | 3,619 | 69% |

**Notes:** * Enrollment projections for 2013 are held steady from 2012, the last year for which data is available from DCP and DOE.
** 2013 estimates for enrollment in schools within the vicinity of the project area were derived proportionally from total enrollment for CSDs 13 and 15.
*** Includes M.S. 136 in Administrative District 85.

**Sources:** Totals for CSDs 13 and 15 projected enrollment: New York City Department of City Planning and New York City Department of Education, Enrollment Projections (Actual 2002, Projected 2003-2012). DCP enrollment projections do not include Pre-K enrollment. Capacity numbers for CSDs 13 and 15: New York City Department of Education, *Utilization Profiles: Enrollment/Capacity/Utilization, 2002-2003.*

Several factors would limit the number of eligible children generated by potential developments under the proposed actions that would be likely to utilize public day care facilities in the 1-mile study area. While publicly financed day care is available to children up to age 12, the majority of slots cater to children up to age 5, since children above 5 years old often attend public school. It is expected that some of the 67 children generated by the proposed actions will attend school and therefore, they would be unlikely to utilize the public day care system.

There are also available slots at homes licensed to provide family day care which families of eligible children may elect to use instead of public day care centers and therefore, there may be additional capacity available. In addition, there are private day care centers in the study area at which parents of eligible children may use ACD vouchers. The ACD voucher system facilitates the provision of day care services to eligible children from both public and private providers throughout the City, beyond the 1-mile study area. The voucher system would spur the development of new private day care facilities to meet the need of eligible children that could result from an 80/20 development scenario under the proposed actions. Thus, new demand generated by development of the projected sites by 2013 could be met by new or expanded services in response to market needs.

Given these limiting factors and the relatively small number of children eligible for publicly financed day care that would result from the proposed actions when compared with the capacity of area facilities and family child care networks throughout the borough (see Tables 4-5 and 4-6), the demand for public day care slots would not cause a significant impact on public day care centers. ✷

# Chapter 5: Open Space and Recreational Facilities

## A. INTRODUCTION

The 2001 *New York City Environmental Quality Review (CEQR) Technical Manual* guidelines indicate the need for an open space analysis when an action would result in the physical loss of public open space or the introduction of 200 or more residents or 500 or more workers to an area. The proposed actions would result in an increase in the number of residents and employees in the study area. These increased populations would result in an increase in the number of people using local parks. Therefore, detailed open space analysis was conducted to determine whether the proposed actions would result in any significant direct or indirect significant adverse open space impacts. This chapter assesses existing conditions (both users and resources), conditions in the future without the proposed actions, and potential impacts that would result from the proposed actions.

As a result of the future population introduced by the proposed actions, there would be a shortage of passive open space in the ¼-mile study area for the combined worker and resident population. The open space ratios in existing and No Build conditions also indicate a shortfall in the amount of open space located within the ½-mile study area. The future population introduced to the area as a result of the proposed actions would exacerbate this shortage. The future with the proposed actions would continue to have an inadequacy of open space that is below the open space ratio guideline set by the New York City Department of City Planning (DCP) of 2.0 acres of active open space per 1,000 residents, and below the recommended weighted average ratios of passive open space per 1,000 residents and workers. However, it is recognized that these goals are not feasible for many areas of the City, and they are not considered impact thresholds.

The proposed actions would not result in a significant adverse open space impact because the proposed actions would not displace any existing open space resource and would create approximately 1.15 acres of passive public space to offset the increased shortfalls in the two study areas.

## B. METHODOLOGY

### STUDY AREAS

This analysis of potential open space impacts was conducted based on methodologies contained in the *2001 CEQR Technical Manual*. According to CEQR guidelines, the first step in assessing potential open space impacts is to establish study areas appropriate for the new population(s) to be added as a result of the proposed actions. The study area is based on the distance a person is assumed to walk to reach a neighborhood open space. Workers typically use passive open spaces and are assumed to walk approximately 10 minutes (about a ¼-mile distance) from their places of work. Residents are more likely to travel farther to reach parks and recreational facilities. They are assumed to walk about 20 minutes (about a ½-mile distance) to reach both passive and active neighborhood open spaces. Because the proposed actions have both commercial and

residential components, two study areas are evaluated—a commercial study area based on a ¼-mile distance from the project site, and a residential study area based on a ½-mile distance.

As per the 2001 *CEQR Technical Manual*, the commercial open space study area comprises all census tracts that have 50 percent of their area located within a ¼-mile of the project area. All open spaces, as well as all residents and employees within census tracts with at least 50 percent of their area within the ¼-mile radius, were included in the study areas (see Figure 5-1). The same methodology was applied to the ½-mile residential study area. Open spaces located within ½ mile of the project site, but within a census tract having less than 50 percent of its area located within ½ mile of the project site, are not included quantitatively in the open space assessment but are discussed qualitatively. While residents may also visit certain regional parks (e.g., Prospect Park), such open spaces are not included in the quantitative analysis.

## OPEN SPACE USER POPULATIONS

Demographic data were used to identify potential open space users (residents and workers) within the ¼- and ½-mile study areas. To determine the number of residents currently located within the study areas, data were compiled from the 2000 Census for the tracts in each study area. The age distribution of the residential population was noted, as children and elderly residents are typically more dependent on local open space resources. The number of employees in each of the study areas was determined based on 1990 reverse journey-to-work data compiled by DCP (2000 data on employment are not currently available.)

## INVENTORY OF OPEN SPACE RESOURCES

All publicly accessible open spaces and recreational facilities within the ¼- and ½-mile study areas were inventoried to determine their size, character, and condition. Public spaces that do not offer useable recreational areas, such as spaces where seating is unavailable, were excluded from the survey, as were open spaces that are not easily accessible by the general public. However, some of these (e.g., community gardens) are presented in Table 5-3 and are noted in the qualitative analysis. The information used for this analysis was gathered through field studies conducted in June 2003 on weekdays; from the New York City Department of Parks and Recreation (DPR); and from *Privately Owned Public Space: The New York City Experience* (2000), a collaboration by DCP, Jerold S. Kayden, and the Municipal Art Society. At each open space, active and passive recreational spaces were noted. Active open space facilities are characterized by activities such as jogging, field sports, and children's active play. Such open space features might include basketball courts, baseball fields, or play equipment. Passive open space facilities are characterized by activities such as strolling, reading, sunbathing, and people-watching. Some spaces, such as lawns, public esplanades, and dog runs, can be both active and passive recreation areas. Figure 5-2 and Table 5-3 provide the inventory of useable public open space resources within the two study areas.

## ADEQUACY OF OPEN SPACE RESOURCES

After completing the inventory, the adequacy of open space in the study area was assessed both quantitatively and qualitatively. In the quantitative approach, the ratio of useable open space acreage to the study area population—referred to as the open space ratio—is compared with guidelines established by DCP. To determine the adequacy of open space resources for the working (daytime) population of a given area, DCP has established that 0.15 acres of passive open space per 1,000 workers represents a reasonable amount of open space. For the residential

12.7.06

Primary Study Area Boundary

Secondary Study Area Boundary

1 No Build Development Projects

Jamaica Transportation Center Intermodal Enhancements

0 2000 FEET

SCALE

N

Development Projects in the Future
Without the Proposed Actions

Figure 2-6

**Jamaica Plan**

*Worker Population*

There are 134,305 workers in the ½-mile study area, based on 1990 reverse journey-to-work information (see Table 5-1). Again, although the analysis conservatively assumes that residentsand employees are separate populations, it is possible that some of the residents have chosen to live near their workplace. Therefore, it is possible that there is some double-counting of the daily user population when residential and worker populations overlap.

## AGE OF OPEN SPACE USER POPULATION

*¼-MILE STUDY AREA*

At approximately 70 percent, people between the ages of 20 and 64 make up the vast majority of the population of the study area (see Table 5-2). Children and teenagers (0-19 years old) account for only approximately 20 percent of the entire residential population. Persons 65 and over account for approximately 9 percent of the study area population.

**Table 5-2**
**Age Distribution of ¼- and ½-Mile Study Areas**

| Age | Number of Residents | Percentage of Total Population |
|---|---|---|
| **¼-Mile Study Area** | | |
| Under 5 | 2,280 | 5.4 |
| 5 to 9 | 2,083 | 5.0 |
| 10 to 14 | 2,027 | 4.8 |
| 15 to 19 | 2,198 | 5.2 |
| 20 to 64 | 29,643 | 70.5 |
| 65 and Over | 3,846 | 9.1 |
| **½-Mile Study Area** | | |
| Under 5 | 5,942 | 5.5 |
| 5 to 9 | 5,551 | 5.1 |
| 10 to 14 | 5,270 | 4.9 |
| 15 to 19 | 5,527 | 5.1 |
| 20 to 64 | 75,362 | 69.7 |
| 65 and Over | 10,501 | 9.7 |
| **Sources:** U.S. Census of Population and Housing, 2000. | | |

*½-MILE STUDY AREA*

The residential age-distribution characteristics remain relatively constant between the ¼- and ½-mile study areas. Within the ½-mile study area, adults between the ages of 20 and 64 again represent the highest percentage (approximately 70 percent) of the residential population (see Table 5-2). The 65 and over age group accounts for approximately 10 percent of the ½-mile study area population. Given that the two populations expected to utilize the open spaces the most (children and the elderly) make up the smallest percentage of the residential population, the residential population does not incur a disproportionate burden on open spaces in either the ¼- or the ½- mile study areas.

## INVENTORY OF OPEN SPACE RESOURCES

### *¼-MILE STUDY AREA*

Twenty-five public open space and recreational resources are located within the ¼-mile open space study area. These open spaces include publicly owned open spaces and privately owned spaces that are open to the public. Altogether, the open space resources in the study area total approximately 75.63 acres (see Figure 5-2 and Table 5-3).

**Table 5-3**
**Open Space Resources**

| Ref # | Name | Owner | Amenities | Total Acres | Active | Passive | Condition | Use Level |
|---|---|---|---|---|---|---|---|---|
| ¼-Mile Study Area | | | | | | | | |
| 1 | MetroTech Plaza and Malls | MetroTech Center | Pedestrian mall, walkways, benches | 3.3 | 0.0 | 3.3 | Good | Heavy |
| 2 | New York Technical College | CUNY | Benches, plants | 0.22 | 0.0 | 0.22 | Good | Low |
| 3 | Renaissance Marriott Hotel | Marriott | Benches, walkway, flowers, trees | 0.73 | 0.0 | 0.73 | Good | Heavy |
| 4 | MTA | NYC | Seating, planters, designated smoking area | 0.24 | 0.0 | 0.24 | Average | Low |
| 5 | Macomber Square | NYC | Trees, seating | 0.11 | 0.0 | 0.11 | Average | Moderate |
| 6 | LIU Plaza | DPR | Seating, lawns, flowers, landscaping, sculpture/ monument | 1.16 | 0.0 | 1.16 | Good/ Excellent | Moderate |
| 7 | Temple Square | NA | Benches, trees | 0.07 | 0.0 | 0.07 | Average | Moderate |
| 8 | Sitting Area | NA | Seating, trees, plants | 0.14 | 0.0 | 0.14 | Poor | Moderate |
| 9 | Fort Greene Park | DPR | Rolling lawns, trees, monuments, basketball and tennis courts | 30.17 | 15.08 | 15.09 | Excellent | Heavy |
| 10 | RV Ingersoll Housing Project | NYCHA | Seating, playgrounds, basketball courts | 2.96 | 1.48 | 1.48 | Average | Moderate |
| 11 | Commodore John Barry Park and Playground | DPR | Baseball diamonds, basketball courts, football field, playgrounds, lawns, trees, benches | 10.39 | 5.2 | 5.19 | Average | Moderate |
| 12 | McLaughlin Park | DPR | Ballfield and courts, benches | 1.97 | 1.6 | .37 | Good | Low |
| 13 | Walt Whitman Park | DPR | Lawn area, benches | 2.91 | 1.45 | 1.46 | Average | Low |
| 14 | S. Parkes Cadman Plaza | DPR | Benches, walkways, Brooklyn War Memorial | 10.38 | 2.08 | 8.3 | Average | Moderate to Heavy |
| 15 | Columbus Park | DPR | Benches, walkways | 4.14 | 0.0 | 4.14 | Good | Moderate |
| 16 | Borough Hall Park | DPR | Walkways, benches | 0.87 | 0.0 | 0.87 | Good/ Excellent | Moderate |
| 17 | 111 Livingston St. | | Seating | 0.13 | 0.0 | 0.13 | Poor | Low |




## Existing Open Spaces

1. 111 Livingston Street Sitting Area
2. Borough Hall Park
3. Columbus Park
4. RV Ingersoll Housing Project Open Spaces
5. Long Island University Plaza
6. Fort Greene Park

## Projected Public Spaces

7. Willoughby Square

* Since the issuance of the DEIS/DSEIS, projected site K has been removed from the proposed development plan



**Open/Public Spaces**
Figure 6-1

## Table 5-3 (cont'd)
## Open Space Resources

| Ref # | Name | Owner | Amenities | Total Acres | Active | Passive | Condition | Use Level |
|---|---|---|---|---|---|---|---|---|
| 18 | PS 261 Playground[1] | DOE | School playground, jungle gym, paved play area, baseball diamond | 1.01 | 1.01 | 0.0 | Average | Heavy |
| 19 | Sixteen Sycamores Playground | DPR | Playground, handball court, slide, jungle gym, benches, bathrooms, swings | 0.57 | 0.46 | 0.11 | Average | Moderate |
| 20 | North Pacific Playground and Greenthumb | DPR | Playground, jungle gym, benches | 0.16 | 0.08 | 0.08 | Good | Heavy/ Moderate |
| 21 | DOE Playground | DOE | Paved play area, basketball, playground | 0.38 | 0.34 | 0.04 | Average | Low |
| 22 | Dean Playground | DPR | Playground, basketball court, slides, jungle gyms | 1.30 | 1.04 | 0.26 | Average | Moderate |
| 23 | Atlantic Terminal Open Space | NYCHA | Seating, trees, playground | 0.24 | 0.12 | 0.12 | Average | Moderate |
| 24 | Cuyler Gore | DPR | Lawns, benches, trees, playground, jungle gyms | 1.16 | 0.29 | 0.87 | Good | Low |
| 25 | Edmunds /JHS 294 Playground | DPR | Playground, basketball court, jungle gym, slides, swings, benches, restrooms | 0.92 | 0.64 | 0.28 | Average/ Good | Heavy |
| **½-Mile Study Area** | | | | | | | | |
| 26 | Albert L. Parham Playground | DPR | Playground, pool, swings, benches, tables, basketball court (mostly paved) | 1.25 | 0.88 | 0.37 | Average/ Good | Heavy/ Moderate |
| 27 | Oracle / PS 46 Edward C. Blum Playground | DPR | Playground jungle gyms, swings, basketball, paved play area, benches, trees, bathrooms, | 0.68 | 0.61 | 0.07 | Average/ Good | Moderate |
| 28 | Sacred Heart Parish Basketball Court | Sacred Heart Parish | Basketball court | 0.07 | 0.07 | 0.0 | Poor | Low |
| 29 | Housing Project | NYCHA | Sitting areas, basketball courts, jungle gyms | 1.79 | .90 | 0.89 | Average | Moderate |
| 30 | Oxport / JHS 265 Playground | DPR | Basketball, jungle gym, fitness area, swings, gaming tables | 1.03 | 0.82 | 0.21 | Average | Moderate |
| 31 | PS 287/Ashford Playground | DPR | Playground, paved play area | 2.11 | 1.90 | 0.21 | Average | Low |
| 32 | Farragut Houses | NYCHA | Basketball, play equipment, benches | 2.22 | 1.11 | 1.11 | Average | Moderate |

**Table 5-3 (cont'd)**
**Open Space Resources**

| Ref # | Name | Owner | Amenities | Total Acres | Active | Passive | Condition | Use Level |
|---|---|---|---|---|---|---|---|---|
| 33 | Trinity Park[2] | DPR | Sitting area | 1.05 | 0.0 | 1.05 | Average | Low |
| 34 | Bridge Park[3,4] | DPR | Playground, basketball courts, seating areas | 2.91 | 2.42 | 0.49 | Good | Low/ Moderate |
| 35 | Brooklyn Bridge Park, Main Street Playground | NYSOPR HP | Beach area, grassy fields, small playground | 5.00 | 2.5 | 2.5 | Excellent | High |
| 36 | Empire-Fulton Ferry State Park | NYSOPR HP | Benches, lawn areas, paths, picnic benches | 5.50 | 1.10 | 4.40 | Good | Moderate |
| 37 | Fulton Ferry Pier | DPR | Seating, garden area, interpretive historic displays | 1.15 | 0.0 | 1.15 | Good/ Excellent | Heavy |
| 38 | Hillside Park | DPR | Grassy area, dog run | 2.06 | 1.75 | 0.31 | Good | Moderate |
| 39 | Chapin Playground | DPR | Playground, swings, slides, benches, gaming tables | 0.3 | 0.27 | 0.03 | Excellent | Moderate/Heavy |
| 40 | Brooklyn Promenade[5] | DPR | Esplanade with vistas, playgrounds, sitting areas, trees, plants | 2.56 | 1.02 | 1.54 | Excellent | Moderate/ Heavy |
| 41 | Palmetto Playground | DPR | Benches, playground equipment, game tables, trees, plantings, sculpture, basketball courts, community garden, fitness area, and dog run | 0.40 | 0. 30 | 0.10 | Excellent | Moderate |
| 42 | LICH open spaces | LICH | Benches, playgrounds | 0.93 | 0.39 | 0.54 | Good/ Excellent | Heavy |
| 43 | Cobble Hill Park | DPR | Playground, jungle gyms, landscaping, trees, benches, tables | 0.59 | 0.13 | 0.46 | Excellent | Moderate/ Heavy |
| 44 | PS 29 Playground[6] | DOE | Mostly paved play area, jungle gym | 0.67 | 0.67 | 0.0 | Average | Heavy |
| 45 | Boerum Park / JHS 6 Playground | DPR | Play equipment, jungle gyms, swings, basketball and tennis courts, benches, trees, sculptures | 0.92 | 0.83 | 0.09 | Excellent | Heavy |
| 46 | Gowanus Houses open space | NYCHA | Benches, lawns, playgrounds, jungle gyms | 1.13 | 0.56 | 0.57 | Average | Low/ Moderate |
| 47 | Nicholas Nequan Heyward Jr Park at Gowanus Houses | DPR | Handball and basketball courts, playground, sculpture, benches, | 1.04 | 0.94 | 0.10 | Average | Low |

**Table 5-3 (cont'd)**
**Open Space Resources**

| Ref # | Name | Owner | Amenities | Total Acres | Active | Passive | Condition | Use Level |
|---|---|---|---|---|---|---|---|---|
| 48 | Wyckoff Gardens Open Space | NYCHA | Benches, lawn, playgrounds, basketball | 0.48 | 0.24 | 0.24 | Average | Low/ Moderate |
| 49 | PAL | PAL | Jungle gym, seating, interactive sculpture | 0.24 | 0.12 | 0.12 | Average | Low |
| 50 | Park Slope / PS 282 Playground | DPR | Basketball, jungle gym, benches, swings, slides, paved play areas | 0.96 | 0.86 | 0.10 | Excellent | Heavy |
| 51 | Greene Park / PS 11 Playground | DPR | Jungle gym, playground, swings, gaming tables, bathrooms, slides, basketball and handball courts, mostly paved | 1.26 | 1.01 | 0.25 | Good/ Average | Moderate/ Heavy |
| 52 | Underwood Park | DPR | Playgrounds, benches, game tables, landscaping, and trees | 1.19 | 0.60 | 0.59 | Good/ Average | Heavy |
| **Open Spaces not included in the ¼-mile quantitative analysis** | | | | | | | | |
| A | Brooklyn Bears Rockwell Place Garden | DPR | Community garden, bench | 0.08 | 0.0 | 0.08 | Good | NA |
| B | Landscaped Area at Fulton and Lafayette Av. | TPL | Lawn, landscaping, trees, benches, and a pagoda | 0.16 | 0.00 | 0.16 | Good | NA |
| C | Warren St Marks Community Garden | NA | Garden | 0.05 | 0.00 | 0.05 | Good | NA |
| **Open Spaces not included in the ½-mile quantitative analysis** | | | | | | | | |
| D | Van Vorhees Park | DPR | Tennis, handball, and basketball courts, asphalt play area, play equipment, swings, comfort station, spray showers, sculpture, benches, flowers and trees | 5.25 | 2.63 | 2.63 | Good | Moderate |
| E | Thomas Greene Playground | DPR | Playground, basketball and handball courts, trees, benches, and picnic tables | 2.53 | 1.27 | 1.26 | Good | Moderate |
| F | Gardens of Union | DPR | Garden | 0.20 | 0.00 | 0.20 | Good | NA |
| G | Lincoln Berkeley Community Garden | NA | Garden | 0.05 | 0.00 | 0.05 | Good | NA |
| H | Community Garden at St Marks Av. | NA | Garden | 0.08 | 0.00 | 0.08 | Good | NA |
| I | Hollenbach Community Garden | NA | Garden | 0.16 | 0.00 | 0.16 | Good | NA |

**Table 5-3 (cont'd)**
**Open Space Resources**

**Notes:**
CUNY = City University of New York
DOE = New York City Department of Education
DPR = New York City Department of Parks and Recreation
LICH = Long Island College Hospital
NA = Not Available
NYCHA = New York City Housing Authority
NYSOPRHP = New York State Office of Parks, Recreation, and Historic Preservation
PAL = Police Athletic League
TPL=Trust for Public Land
[1] School playground closes at 6pm.
[2] Total acreage of lot equals 6.30. Acreage of Trinity Park used in this analysis represents usable open space.
[3] Consists of 3 parks: Bridge Parks 1, 2, and 3.
[4] Total acreage of lot equals 4.14. Acreage of Bridge Park used in this analysis represents usable open space.
[5] Includes the promenade, Fruit Sitting Area, and Pierrepont Playground.
[6] Not open to public after sundown.
**Sources:** New York City Department of Parks and Recreation publications and website; AKRF, Inc., fieldwork; Lot info 2002.

Several open spaces are located within the project area. The largest is MetroTech Commons, a public pedestrian plaza located between the buildings of MetroTech Center. The 3.3-acre pedestrian mall was created from former streets, and features crisscrossing pathways, a central plaza, landscaping, trees, seating, lunchtime concerts, and other music programs. West of MetroTech Commons, across Jay Street, is the Renaissance Marriott Hotel urban plaza. This open space consists of an open area with trees and plants, in addition to a 40-foot-wide, concrete-paved courtyard/walkway connecting Adams and Jay Streets lined with trees and benches. This open space is utilized by area workers during lunch and breaks. Several other open spaces in the study area are associated with buildings. New York Technical College has a small open space along Tillary Street that contains benches and plantings/landscaping. The Metropolitan Transit Authority (MTA) building at Adams and Livingston Streets has an urban plaza with landscaped areas, trees, ledge seating, and a clearly marked, designated smoking area. Macomber and Temple Squares were both created by the irregular street grid, and amenities include seating, landscaping and trees. At the intersection of Flatbush and Lafayette Avenues, adjacent to the Brooklyn Academy of Music parking lot, is a sitting area with ledge seating and trees. Long Island University (LIU) Plaza is a public space located along Flatbush Avenue between Fleet Street and DeKalb Avenue. The plaza is designed with tiered areas and contains landscaping, flowers, trees, benches, walkways, and a large pagoda-like sculpture. The open spaces in the rezoning area are all used for passive recreation.

Thirteen City parks, under the jurisdiction of the DPR, are located within the ¼-mile study area and contain both active and passive uses. With more than 30 acres, the largest City park in the area is Fort Greene Park, which occupies approximately eight City blocks between Myrtle and DeKalb Avenues, Washington Park and St Edwards Street. Fort Greene Park is devoted to both active and passive uses with walkways, benches, trees, open grassy areas, monuments, basketball and tennis courts, and playgrounds. Commodore John Barry Park and Playground is located on a superblock between Nassau Street, Elliot Place, Park Avenue, and Navy Street. This park contains baseball diamonds, football fields, basketball courts, playgrounds, and play areas, as well as a large area with walkways, benches, and trees. McLaughlin Park occupies a full block just north of the project area, between Cathedral Place, Flatbush Avenue, Tillary and Jay Streets, close to the entrance to the Manhattan Bridge. This park combines seating areas, with a larger paved area containing ball courts, playground equipment, and a ballfield.

A large area of open space consisting of various parks is located a few blocks to the west of McLaughlin Park. The open spaces extend from Prospect to Joralemon Streets, between Cadman Plaza West and Adams Street, and include Walt Whitman Park, S. Parkes Cadman Park, Columbus Park, and Borough Hall Park. These open space resources lie between the residential neighborhood of Brooklyn Heights and Brooklyn's commercial and Civic Center.

As a result, the users of these parks encompass a broad range of groups, including business people and municipal employees, families and children, and other residents. The 2.91-acre Walt Whitman Park features benches along its perimeter, mature trees, and a small central lawn area. The 10.38-acre S. Parkes Cadman Plaza does not feature active recreational equipment, but its large open field is often used for such sports as frisbee, touch football, and soccer. At the center of the park is the Brooklyn War Memorial, which extends almost the entire width of the park and provides seating along its south side. Columbus Park, approximately four acres in size, is located in front of the State Supreme Court Building. Johnson Street splits this park into two sections. Both sections of the park, which contain benches, walkways and trees, are heavily used during the daytime. The southern portion of Columbus Park extends without interruption into Borough Hall Park, located in front of Brooklyn Borough Hall. Several days a week this area is the site of one of the City's Greenmarkets.

North of Fort Greene Park are the RV Ingersoll Houses, a housing project of the New York City Housing Authority (NYCHA). This development has a tower-in-the-park configuration, which typically consists of a superblock with residential towers surrounded by lawns, trees, walkways, benches, playgrounds, basketball and handball courts, and sometimes parking and community centers. Although the open space associated with these developments is primarily meant for the residents, they are publicly accessible and therefore included in this analysis. The acreage of the open space for this type of development has been adjusted to reflect that some of the open areas between the residential buildings are fenced off and therefore not accessible. Atlantic Terminal is another tower-in-the-park housing project located within the ¼-mile study area at Atlantic and Carlton Avenues that contains publicly accessible open space. Features are consistent with other NYCHA developments and include benches, walkways, trees, and playgrounds.

A few of the remaining open spaces in the ¼-mile study area are associated with schools. While the Philip Livingston School, PS 261 and the Pacific School, PS 38 playgrounds are under the jurisdiction of the DOE and primarily for the use of the children attending the schools, these open spaces are open to the public after school hours*. Both of these playgrounds have few amenities, consisting primarily of large paved play areas with markings for several sports, including baseball and basketball, basketball hoops, and jungle gyms. Edmunds Playground is adjacent to and associated with JHS 294, but it is under the jurisdiction of the DPR and is therefore a City park. As a City park, it has more features, including a basketball court, playground, jungle gym, slides, swings, benches, trees, and rest rooms.

*½-MILE STUDY AREA*

Within the ½-mile study area, 52 public open spaces and recreational facilities serve the surrounding residential and commercial populations. Public open spaces with no useable public amenities were not included in the study area inventory. Including all of the public parks and

* School playgrounds locked after school hours or with signage indicating that the grounds were for school use only were not included in analysis.

open spaces listed in the ¼-mile study area, the ½-mile study area contains a total of approximately 115.12 acres of public open spaces (see Figure 5-2 and Table 5-3).

Continuing the pattern found in the ¼-mile study area, many of the open spaces in the ½-mile study area are associated with schools or housing projects. Most of these school open spaces are under the jurisdiction of DPR and are publicly accessible. These spaces have a variety of features, including playgrounds, basketball and handball courts, jungle gyms, swings, slides, benches, tables, game tables, lawns, trees, paved play areas, and rest rooms. Several of these open spaces have special features. The Albert L. Parham Playground adjacent to the Clinton Hill Elementary School, PS 20, between Willoughby, Clermont, and DeKalb Avenues and Adelphi Street also contains a small outdoor pool. The Oxport/JHS 265 Playground along Flushing Avenue between N. Portland and N. Oxford Streets has a fitness area with several pieces of fitness equipment and signage explaining how to use them. Boerum Park/JHS 6 Playground contains a tennis court. In addition, the Sacred Heart Parish School is a private parochial school with a small paved play area with basketball hoops that is located along Clermont Avenue.

Several housing projects are located within the ½-mile study area, including the Farragut Houses, Gowanus Houses, and Wyckoff Gardens Houses. As mentioned earlier, while these are primarily meant for use by residents, they are accessible to the public. Amenities can include lawns, benches, trees, walkways, playgrounds, jungle gyms, and basketball and handball courts. The Nicholas Nequan Heyward Jr. Park, under the jurisdiction of the DPR, is located on the grounds of the Gowanus Houses. This park contains handball and basketball courts, play areas, jungle gyms, and benches. A Police Athletic League (PAL) playground is located along Baltic Street between Third and Fourth Avenues adjacent to a residential building. The small playground contains jungle gyms, and seating located along the perimeter.

In the northern and northeastern portions of the study area, Bridge Park comprises a series of smaller open spaces and playgrounds that generally follow the alignment of the Brooklyn-Queens Expressway (BQE) in the vicinity of Sands, Prospect, and York Streets. The park features a concrete playing field, playground equipment including slides and swings, basketball and handball courts, benches and sitting areas, and game tables for chess and checkers. Trinity Park is a sitting area located to the south of the Bridge Parks between the BQE and ramps to the Manhattan Bridge. DPR has jurisdiction over these open spaces and much of the right of way around the Brooklyn and Manhattan Bridges and the BQE. Although DPR lists the acreages of these areas, for the purposes of this analysis, acreages were adjusted to reflect only the useable space.

Main Street Playground is a new playground and open space at the north end of Main Street. The children's play area includes play equipment with a nautical theme and a sandbox. The open area includes a beach area, grassy fields, and an esplanade with seating and viewing areas.

Empire-Fulton Ferry State Park is located on the waterfront between the Brooklyn and Manhattan Bridges. Facilities in the park include an esplanade at the water's edge with panoramic views of the two bridges and the Manhattan skyline, lawn and picnic areas, and the historic warehouses of the Empire Stores. Although the park totals about nine acres, including the warehouses, the land and water area devoted to park uses is 5.5 acres.

Brooklyn Bridge Park (BBP), a large park proposed for full development by 2010, would incorporate and encompass the already existing Main Street Playground and Empire-Fulton State Park. A description of BBP is provided below under Section D, "The Future Without the Proposed Actions."

To the west is another waterfront open space that contains a range of recreational uses. Fulton Ferry Park, a pier at the foot of Old Fulton Street along the East River, features a nautical and historical theme. The railings surrounding the pier were designed to resemble the cable webbing of the Brooklyn Bridge, and the benches mimic nautical cleats. A small building that formerly housed a marine fireboat station and later a museum devoted to the Fulton Ferry is also contained in the park. In the northwestern portion of the study area are several DPR facilities: Hillside Park, Chapin Playground, Brooklyn Heights Promenade, and Palmetto Playground. Hillside Park is a sloping, grassy area adjacent to the BQE primarily used as a dog run. Chapin Playground is a small but well-utilized playground at the corner of Middagh Street and Columbia Heights. The Brooklyn Heights Promenade is known for its excellent views of Manhattan, the East River, and Upper New York Harbor. It consists of an esplanade with landscaped gardens. Located within the Promenade are the Fruit Sitting Area located between Orange and Cranberry Streets and Pierrepont Playground located at Pierrepont Street. The Palmetto Playground is located at Atlantic Avenue to the side of the ramp to the BQE. In addition to the regular playground amenities, this park also contains a fitness area with fitness equipment and how-to signage, a community garden, and a dog run.

Long Island College Hospital (LICH) is located across Atlantic Avenue and maintains four small, public open space areas. Altogether these open spaces total almost one acre in size, and are almost equally divided between playground use and landscaped seating areas. Southeast of LICH, the Cobble Hill Playground is located near Clinton and Congress Streets in the neighborhood of Cobble Hill. This park is a little more than ½ acre in size, and contains seating areas, a community garden and a tot-lot.

## ANALYSIS OF THE ADEQUACY OF OPEN SPACE RESOURCES

### *¼-MILE STUDY AREA*

*Quantitative Analysis*

As described above, the analysis of the ¼-mile study area focuses on passive open spaces that may be used by workers in the area. To assess the adequacy of the open spaces in the area, the ratio of workers to acres of open space is compared to DCP's planning guideline of 0.15 acres of passive space per 1,000 workers. In addition, the passive open space ratio for both workers and residents in the area is compared to the recommended weighted average ratio.

The ¼-mile study area includes a total of approximately 75.63 acres of open space, of which approximately 44.76 acres are passive space. A total of 42,077 residents live within this vicinity, and 104,849 people work within the ¼-mile study area boundary. The combined residential and worker population is 146,926.

Based on DCP guidelines, the area has a passive open space ratio of 0.43 acres of passive open space per 1,000 workers; this is higher than the City's guideline of 0.15 acres (see Table 5-4). The combined passive open space ratio is 0.31 acres per 1,000 residents and workers, which is higher than the recommended weighted average ratio of 0.25 acres per 1,000 residents and workers. Thus, there is sufficient passive open space to serve the combined worker and resident populations.

*Qualitative Analysis*

Several community gardens are located in the ¼-mile study area. Given that access is limited to members (a phone number for membership information was listed at the sites) and the few hours when the gardens are open, these gardens were not included in the quantitative analysis. However, these gardens are an invaluable open space resource to the community. Another private open space located in the ¼-mile study area is bounded by Fulton Street, Lafayette Avenue, and St. Felix Street and was created out of the irregular street pattern. The space contains rolling landscape, a pagoda, flowers, pathways, and seating. Since the space was locked and not accessible, it was not included in the quantitative analysis but it does contribute to the aesthetic appeal of the area.

*½-MILE STUDY AREA*

*Quantitative Analysis*

With a total of approximately 115.12 acres of open space, of which 52.87 are for active use and 62.25 are for passive use, and a total residential population of 108,153, the ½-mile study area has an overall open space ratio of approximately 1.06 acres per 1,000 residents. This is less than the Citywide median of 1.5 acres per 1,000 residents and the City's optimal planning goal of 2.5 acres of combined active and passive open space ratio per 1,000 residents. The area currently has a shortage of open space typical of a number of neighborhoods in New York City.

The shortage in active open space is more pronounced, as the ½-mile study area's residential active open space ratio is only 0.49 (see Table 5-4), substantially less than the planning goal of 2.0 acres per 1,000 residents. The area's residential passive open space ratio is approximately 0.58 acres per 1,000 residents—just above the City's planning goal of 0.5 acres per 1,000 residents.

When the employees who work within the ½-mile study area are added to the population, the passive open space ratio is much lower. As described earlier, workers typically use passive open spaces during the workday, so the passive open space ratio is the relevant ratio for consideration. With a worker and residential population of 242,458, the combined passive open space ratio in the ½-mile study area is 0.26, lower than the recommended weighted average ratio of 0.31 acres per 1,000 residents and workers.

*Qualitative Analysis*

Several open spaces were not included in the quantitative analysis but were located within ½-mile of the project area. These open spaces include several community gardens, Van Vorhees Park, and Thomas Greene Playground. Van Vorhees Park consists of 4.32 acres and Thomas Greene Park consists of 2.53 acres of active and passive uses. In addition, Prospect Park, which is approximately 526 acres in size, is approximately 5 blocks south of the ½-mile study area. Prospect Park contains an abundance of features including rolling hills, a forest, a 60-acre lake, the Prospect Park Zoo, and several facilities for cultural activities, including a band shell for live music. These destination parks would be used by residents and workers within the study area and would substantially improve the active and passive open space ratios for the study area.

**Table 5-4:**
**Analysis of Adequacy of Public Open Space Resources in the 1/4-Mile and 1/2-Mile Study Area**

| ¼-Mile Study Area | | | |
|---|---|---|---|
| | **Existing Conditions** | **No Build Conditions** | **With the Project** |
| **Study Area Population** | | | |
| Residents | 42,077* | 53,740 | 55,796 |
| Workers | 104,849** | 127,362 | 148,076 |
| **Total** | 146,926 | 181,102 | 203,872 |
| **Open Space Acreage** | | | |
| Passive | 44.76 | 46.36 | 47.51 |
| **Open Space Ratios** | | | |
| Recommended Weighted Average Ratio for Passive | 0.25/1,000 residents and workers | 0.25/1,000 residents and workers | 0.25/1,000 residents and workers |
| Combined Passive | 0.31/1,000 residents and workers | 0.26/1,000 residents and workers | 0.23/1,000 residents and workers |
| Passive | 0.43/1,000 workers | 0.36/1,000 workers | 0.32/1,000 workers |
| **Percent Change** | | **Existing to No Build** | **No Build to Project** |
| Combined Passive | | -15.97% | -8.97% |
| Passive | | -14.73% | -11.86% |
| **½-Mile Study Area** | | | |
| | **Existing Conditions** | **No Build Conditions** | **With the Project** |
| **Study Area Population** | | | |
| Residents | 108,153* | 128,248 | 130,304 |
| Workers | 134,305** | 157,954 | 178,668 |
| **Total** | 242,458 | 286,202 | 308,972 |
| **Open Space Acreage** | | | |
| Total | 115.12 | 137.56 | 138.71 |
| Active | 52.87 | 61.79 | 61.79 |
| Passive | 62.25 | 75.77 | 76.92 |
| **Open Space Ratios** | | | |
| Active | 0.49/1,000 residents | 0.48/1,000 residents | 0.47/1,000 residents |
| Recommended Weighted Average Ratio for Passive | 0.31/1,000 residents and workers | 0.31/1,000 residents and workers | 0.30/1,000 residents and workers |
| Combined Passive | 0.26/1,000 residents and workers | 0.26/1,000 residents and workers | 0.25/1,000 residents and workers |
| **Percent Change** | | **Existing to No Build** | **No Build to Project** |
| Active | | -1.44% | -1.58% |
| Combined Passive | | 3.11% | -5.96% |

**Sources:** *2000 U.S. Census
**1990 U.S. Census

# D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

## OPEN SPACE STUDY AREA POPULATION

*¼-MILE STUDY AREA*

As described in Chapter 2, "Land Use, Zoning, and Public Policy," 32 projects are expected to be completed in the ¼-mile study area by 2013 in the future without the proposed actions. These projects consist of residential, commercial, and mixed-use developments that will bring

additional residents and workers to the study area. Some of the larger projects include: a portion of the Atlantic Yards Arena and Redevelopment project, at the southeast corner of Flatbush and Atlantic Avenues; Atlantic Center, located at Atlantic Avenue and Fort Greene Place; Brooklyn Academy of Music Local Development Corporation (BAM LDC) East and North, two projects located on adjacent blocks bounded by Fulton and St. Felix Streets, Lafayette Avenue, and Rockwell Place; the new Federal courthouse at Adams and Tillary Streets; and two City University projects located on adjacent blocks on Tillary between Adams and Bridge Streets. In addition to the other No Build projects, these projects would bring the residential population to 53,740 and the worker population to 127,362. The 2013 combined residential and worker population in the ¼-mile study area is projected at 181,102 persons.

*½-MILE STUDY AREA*

Residential and worker populations within the ½-mile study area are also expected to increase by 2013. Significant new projects within the ½-mile study area (but outside the ¼-mile study area) include a residential project at 60-82 Washington Street; a segment of the Brooklyn Bridge Park, which will add workers to the area; and the remainder of the Atlantic Yards Arena and Redevelopment project. The ½-mile residential population (including the residential growth from the ¼-mile study area) is estimated to be 128,248. The total worker population within the ½-mile radius (including the new workers within the ¼-mile radius) is expected to increase to 157,954. By 2013, the total population of the ½-mile study area, including workers and residents, is estimated to be 285,202 persons.

## OPEN SPACE RESOURCES

*¼-MILE STUDY AREA*

Within the ¼-mile study area, two new projects are expected to be completed by 2013, both of which are mixed-use developments that are expected to incorporate open space in their design plans. The Arena project is expected to include a total of 6.0 acres of open space to the study area. Given that only a portion of the project is located within the ¼-mile study area, the acreage has been adjusted accordingly. Within the ¼-mile study area, the Arena project will add a total of 2.0 acres of public open space, of which 1.8 acres will be passive and 0.2 acres will be active space. The BAM LDC North project is a mixed-use development that will add approximately 0.16 acres of passive open space to the study area.

A sitting area, consisting of approximately 0.14 acres, is located next to the BAM parking lot at the southeast corner of Flatbush and Lafayette Avenues. Although the block is also development site EE of the proposed action, it is likely this site would be developed to some extent in the future without the proposed actions, and as a result, this sitting area would be removed. In addition, as a result of the proposed City University (site A) development at Tillary and Adams Street, it is possible that the existing passive open space, consisting of approximately 0.22 acres, would be removed.

With a net gain of 1.60 acres of passive open space, the passive open space in the ¼-mile study area would increase to 46.36 acres. The active open space acreage is expected to increase slightly (by 0.20 acres), to 31.07 acres. The total amount of open space would decrease slightly to 77.43 acres.

*½-MILE STUDY AREA*

With the addition of Brooklyn Bridge Park, a significant new destination open space will be created within the ½-mile study area. The 70-acre BBP is expected to stretch along 1.3 miles of the East River from the foot of Atlantic Avenue to Jay Street, north of the Manhattan Bridge, and generally includes the waterfront area and piers, along with some upland property. The park would provide neighboring residents from the surrounding communities with an opportunity to experience their waterfront directly, while also serving future park users from all five boroughs, New York State, and all over the world. The proposed park would offer a range of landscapes, passive and active recreational activities, and other opportunities for a wide variety of park experiences. Walkway, bikeway, and waterborne transportation features would provide access into and through BBP. Several potential commercial development parcels are also identified for the proposed park and include an indoor athletic facility for year-round swimming, ice skating, and other activities; a new hotel and restaurants; sites for more casual dining opportunities; and arts, education, and cultural facilities. Although the total park will consist of approximately 70 acres, the acreage has been adjusted to reflect that only a portion (approximately one-third) of the park will be located within the study area. In addition, given that the Main Street Playground and Empire-Fulton Ferry State Park are existing open spaces, these parks are not included in the acreage for Brooklyn Bridge Park for the purposes of this analysis. It should be noted that the Empire-Fulton Ferry State Park is expected to be renovated as part of the BBP project. In addition, the balance of the new public open space associated with the Arena project (4.0 acres, including 3.6 acres of passive open space and 0.4 acres of active open space) would be introduced to the study area.

In addition to the changes in open space noted in the ¼-mile study area, the total open space in the ½-mile study area will increase to 137.56 acres by 2013. Passive and active open space will increase to 75.77 and 61.79 acres, respectively.

## ANALYSIS OF THE ADEQUACY OF OPEN SPACES

*¼-MILE STUDY AREA*

In 2013, in the future without the proposed actions, the passive open space ratio would decrease by approximately 16 percent from existing conditions, from 0.31 to 0.26 per 1,000 residents and workers (see Table 5-4). This is slightly above the recommended weighted average ratio of 0.25 acres per 1,000 workers and residents.

It should be noted that the ¼-mile study area has more than twice as many workers as residents; therefore, it is likely that these open spaces would be used predominantly by the worker population. For the worker population alone, the passive open space ratio would fall from 0.43 to 0.36 acres per 1,000 workers, which remains significantly higher than the DCP guideline of 0.15 acres per 1,000 workers.

*½-MILE STUDY AREA*

Both open space and population in the study area are expected to increase in the ½-mile study area in the future without the proposed actions. New open space, including the addition of a segment of the Brooklyn Bridge Park and open space to be created with the Arena project, is expected to offset somewhat the additional worker and residential population in the study area. Therefore, the active open space ratio is expected to decrease slightly by approximately 1.44 percent, from 0.49 to 0.48 acres per 1,000 residents, and thus would continue to be lower than

DCP's recommended guidelines. The passive open space ratio for the combined population would remain at 0.26 acres per 1,000 workers and residents, representing an increase in the ratio of approximately 3 percent. Although the passive open space ratio would increase, it would continue to be lower than the recommended weighted average ratio of 0.31 acres per 1,000 residents and workers.

*QUALITATIVE ANALYSIS*

As mentioned above, two-thirds of Brooklyn Bridge Park was not included in the quantitative analysis because the majority of the park would not be located within the ½-mile study area boundary. However, since it would be just outside the study area and contiguous to the section of the park that is located within the study area, it is likely that residents and workers would take advantage of the remaining 47 acres that this regional resource will have to offer.

# E. THE FUTURE WITH THE PROPOSED ACTIONS

## STUDY AREA POPULATION

*¼-MILE STUDY AREA*

As described in Chapter 1, "Project Description," the proposed actions in Downtown Brooklyn would result in significant increases to the residential and worker populations. The 12 projected development sites identified in the reasonable worst-case development scenario would likely add a total of 2,056 residents and 20,714 workers to the area. These increases would result in a residential population of 55,796 and a worker population of 148,076 in the ¼-mile open space study area, for a total population of 203,872 persons.

*½-MILE STUDY AREA*

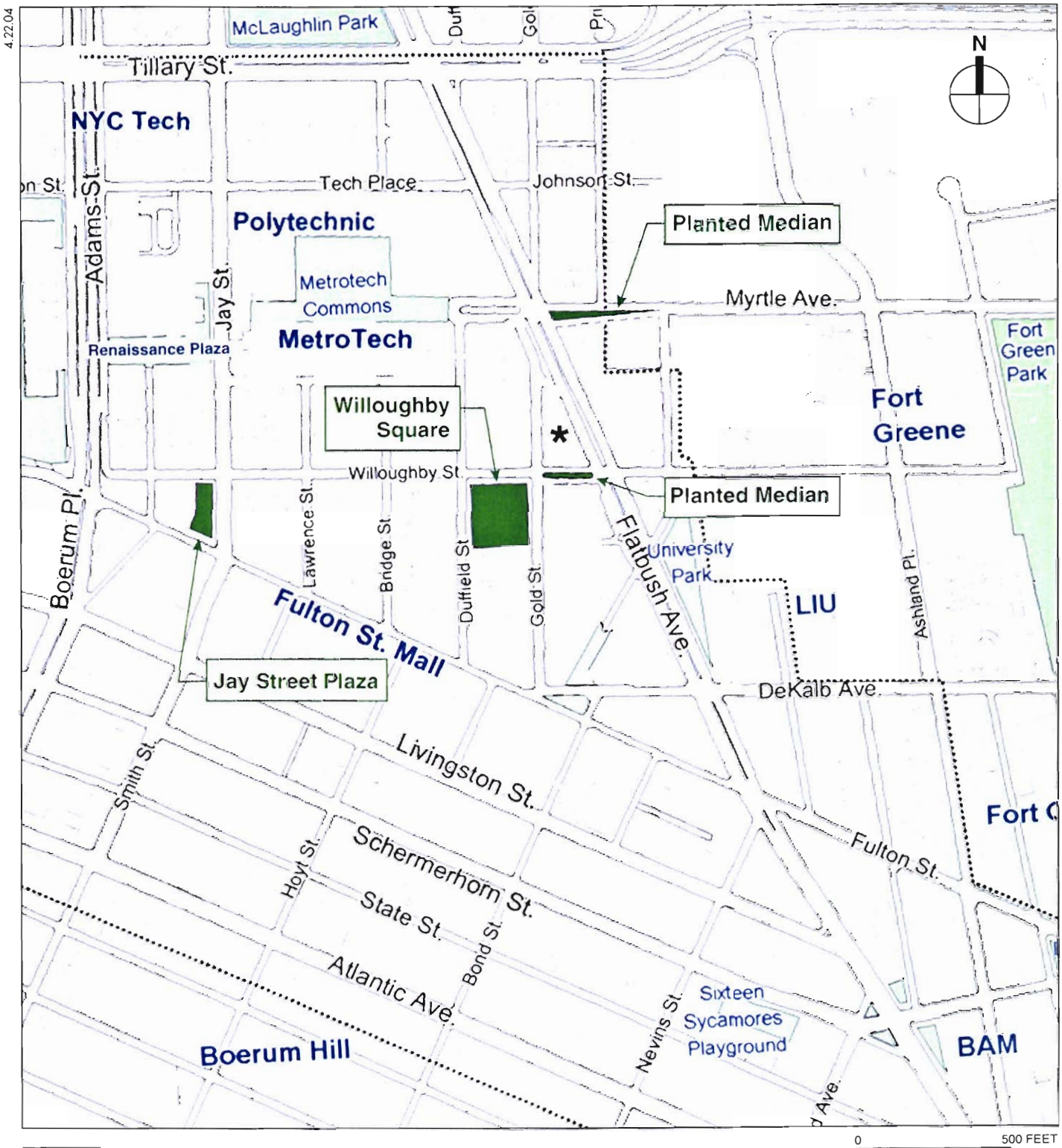
With the proposed actions, the residential and worker populations in the ½-mile study area would increase to 130,304 and 179,668, respectively. The combined population would be 308,972 persons.

## OPEN SPACE RESOURCES

*¼-MILE STUDY AREA*

As mentioned in Chapter 1, "Project Description," the proposed actions would create changes to the urban renewal areas that would provide for the creation of a new public space (see Figure 5-3): Willoughby Square, to be located at the south side of Willoughby Street between Duffield Street and Albee Square West/Gold Street. Willoughby Square would be approximately 1.15 acres in size and could incorporate a variety of amenities. The public space is proposed to include a below-grade public parking facility with entrances/exits at its southern end. Willoughby Square is intended to be a focal point for new commercial investment in the surrounding blocks. Since the issuance of the DEIS/DSEIS, Site K, the site of the proposed Flatbush Triangle public space, has been removed from the project development plan (see Figure 5-4).

The cumulative changes to public spaces would result in an increase of 1.15 acres of passive recreational space in the ¼-mile study area. As a result of the proposed actions, the passive open space in the ¼-mile study area would increase to 47.51 acres. Since no changes in active open




Existing Public Spaces

Proposed Public Spaces

* Since the issuance of the DEIS/DSEIS, the proposed Flatbush Triangle public space has been removed from the proposed development plan

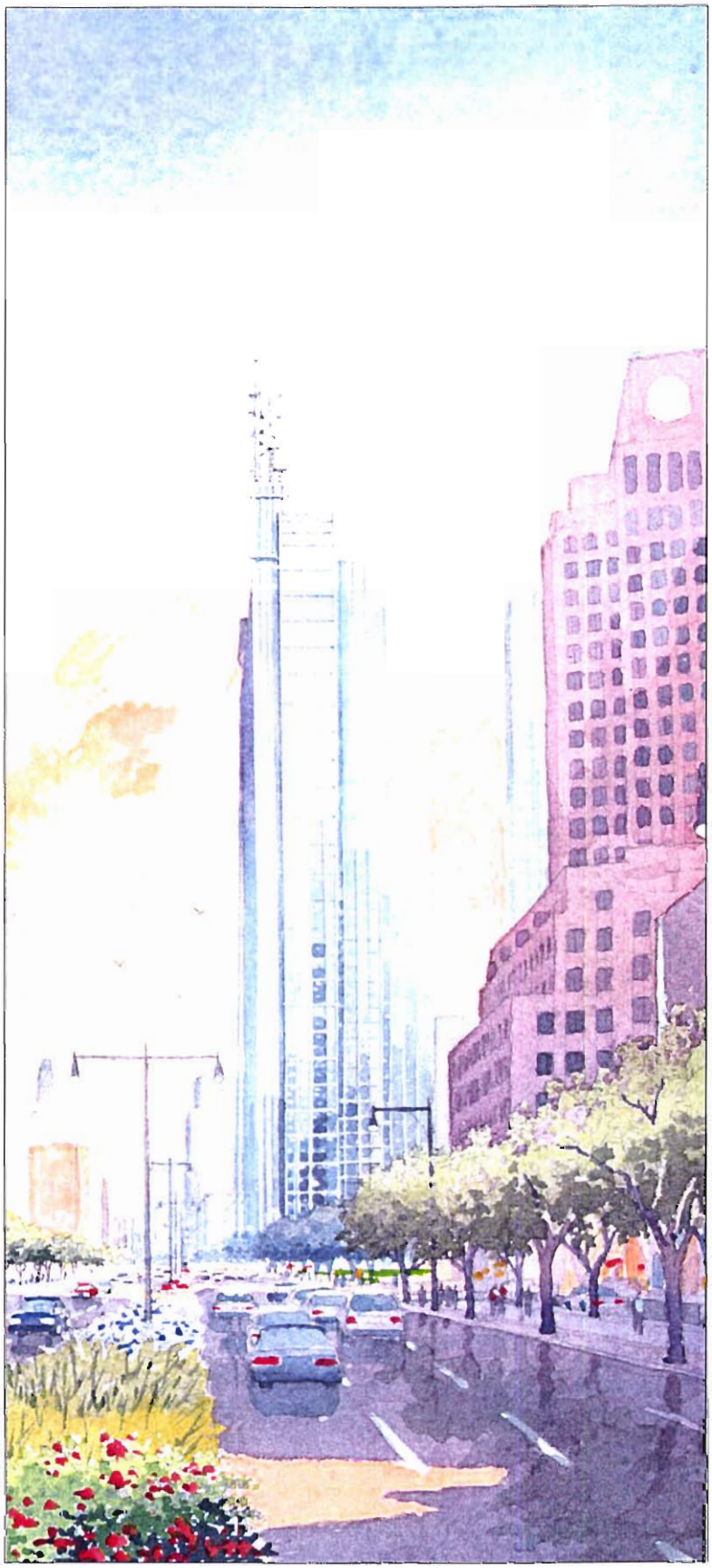
**Proposed Public Spaces**

Figure 5-3




**Illustrative Rendering of Willoughby Square**
Figure 5-4

4.23.04



**Illustrative Rendering of Flatbush Avenue**

Figure 5-5

space are expected to occur, that acreage would remain unchanged at 31.07 acres. The total amount of open space would increase to 78.58 acres.

*½-MILE STUDY AREA*

With the changes to public spaces mentioned above, the total open space in the ½-mile study area would increase to 138.71 acres. Passive recreational space would increase to 76.92 acres. Active recreational space would remain the same as in the future conditions without the proposed actions, at 61.79 acres.

## ANALYSIS OF THE ADEQUACY OF OPEN SPACES

*¼-MILE STUDY AREA*

The combined passive open space ratio would decrease from the future conditions without the proposed actions of 0.26 acres per 1,000 workers and residents, to 0.23 acres with the proposed actions. The ratio would fall slightly below the recommended weighted average ratio of 0.25 acres per 1,000 workers and residents. In addition, this change represents just under an 9 percent decrease in the open space ratio. According to the 2001 *CEQR Technical Manual,* a 5 percent decrease in the open space ratio is generally considered to be a substantial change. Thus, although the proposed actions would result in the creation of new public space, the large number of workers and residents projected to be generated by the proposed actions would continue to result in an inadequacy of open space.

It should be noted that the study area has more than 2.5 times the number of workers as residents; therefore, it is likely that the open spaces in this area would be used predominantly by the worker population. Considering only the worker population, the passive open space ratio would fall from 0.36 to 0.32 acres per 1,000 workers, which remains significantly higher than the 0.15 acres per 1,000 workers suggested by DCP.

*½-MILE STUDY AREA*

As a result of the proposed actions, the active open space ratio within the ½-mile study area would decrease slightly to 0.47 acres per 1,000 residents. This represents a decrease from the No Build condition of approximately 1.58 percent. The passive open space ratio for the combined population would decrease by approximately 5.96 percent, from 0.26 to 0.25 acres per 1,000 residents and workers. Although the active and passive open space ratios would continue to be below the levels recommended by DCP, it is recognized that these goals are not feasible for many areas of the City, and they are not considered impact thresholds. As mentioned above, according to the 2001 *CEQR Technical Manual*, a 5 percent decrease in open space ratios is considered a substantial change. Given that the active open space ratio would only decrease by 1.58 percent, the proposed actions would not result in a significant adverse impact on active open spaces in the study area. The combined passive open space ratio would decrease by 5.96 percent, which is slightly higher than the threshold guidelines recommended by DCP. Therefore, as mentioned above, although new public spaces would be created, there would continue to be a shortage of open space in the future with the proposed actions.

*QUALITATIVE ANALYSIS*

There are a number of important factors not accounted for in the quantitative analysis of open space ratios. These include the presence of several open spaces that are within or just outside of

½-mile of the project site that were not included in the open space calculations, and the conservative assumptions used for this analysis.

As mentioned above, although located within the study area, community gardens were not included in the quantitative analysis, since membership (albeit free and open to everyone) and/or restricted hours of access may limit public accessibility. In addition, several open spaces are located just outside the boundary of the study area, including Van Vorhees Park and Thomas Greene Playground. These parks are located within ½-mile of the proposed rezoning area, but within a census tract having less than 50 percent of its area located within ½-mile of the proposed project area. Therefore, they are not included in the quantitative open space assessment.

One public space that would be provided for in the proposed actions is not included in the quantitative analysis. A transit plaza at Jay Street between Willoughby and Fulton Streets is proposed that would improve the streetscape and enhance public space. The Jay Street Plaza public space would include a new subway entrance/exit to the Jay Street subway station. The design for this public space has not been finalized. Since the transit plaza would be located on a potential development site and is therefore unlikely to be developed by 2013, the primary function of the space would be as a transit plaza, and the amenities are not yet known, this space was not included in the quantitative analysis. In addition, several streets would be widened with the proposed actions to include planted medians, including Myrtle Avenue between Flatbush Avenue Extension and the proposed extension of Fleet Place, and Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension (see Figure 5-5). In addition, there would be new street tree requirements along Myrtle Avenue between Flatbush Avenue Extension and Ashland Place, which would serve to increase the amount of green, landscaped space in the area. While these public spaces were not considered quantitatively, they would enhance the visual quality of the area. The potential for project-generated shadows to fall on the proposed public spaces is discussed in Chapter 6, "Shadows."

Another factor in relieving the open space shortfall in the ½-mile study area would be the proximity of the development to Brooklyn Bridge Park. As mentioned above, two-thirds of BBP was not included in the quantitative analysis because the majority of the park would not be located within the ½-mile study area boundary. However, since it would be just outside the study area and contiguous to the section of the park that would be located within the study area, it is likely that residents would take advantage of the remaining 47 acres that this regional resource will have to offer.

All of these resources provide recreational opportunities and either add to the quality of the area or are expected to be used by the new populations generated by the proposed actions.

## CONCLUSIONS

As a result of the future population introduced by the proposed actions, there would be a shortage of passive open space in the ¼-mile study area for the combined worker and resident population. However, this shortage would not result in a significant adverse impact. The open space ratios in existing and No Build conditions also indicate a shortfall in the amount of open space located within the ½-mile study area. The future with the proposed actions would continue to have an inadequacy of open space that is below the open space ratio guideline set by DCP of 2.0 acres of active open space per 1,000 residents, and below the recommended weighted average ratios of passive open space per 1,000 residents and workers. However, it is recognized that these goals are not feasible for many areas of the City, and they are not considered impact thresholds.

The proposed actions would not result in a significant adverse open space impact because the proposed actions would not displace any existing open space resource and would create approximately 1.15 acres of passive public space to offset the increased shortfalls in the two study areas. ✷

## A. INTRODUCTION

The proposed actions include the rezoning of a large portion of Downtown Brooklyn. It is expected that a number of new buildings would be developed in the project area as a result of the proposed actions, with most of the projected development sites located along Willoughby Street and Myrtle Avenue. The proposed actions would also create two new public spaces—Willoughby Square and Jay Street Plaza—to enhance the urban design of the area and offset its shortfall of passive open space. There are over 30 existing public open spaces in and adjacent to the project area; in addition, Downtown Brooklyn is home to a number of historic resources, several of which have significant features that are sunlight-dependent. Overall, there are a number of open spaces and historic resources that could be affected by shadows created by the development induced by the proposed actions.

Bulk configurations—all of which conform to the proposed zoning—were formulated by the New York City Department of City Planning (DCP) to illustrate the development that could be created on the project sites that have been identified as part of the worst-case development scenario. Using those bulk configurations, this chapter analyzes the potential shadow impacts of the proposed actions.

The analysis concluded that the projected buildings would substantially block the sunlight on Willoughby Square, a public space created by the proposed actions and located on the south side of Willoughby Street between Duffield Street and Albee Square West/Gold Street, in all seasons of the year. Development anticipated as a result of the proposed actions on sites O, P, and Q would surround Willoughby Square on its west, south, and east sides. It is expected that the landscaping of the Square would consist largely of shade-tolerant plants, thereby reducing or avoiding impacts to vegetation; however, the attractiveness and utility of Willoughby Square, particularly in cooler months, would be compromised by the duration and coverage of shadows from buildings likely to be created as a result of the proposed actions. Nevertheless, as this new public space would not exist without the tall buildings to be constructed adjacent to it, this condition would not constitute a significant adverse impact on the Willoughby Square public space.

Shadows from the buildings generated by the proposed actions would also fall on the RV Ingersoll Housing open space, Columbus Park/Borough Hall Park, 111 Livingston Street public plaza, and LIU Plaza; however, incremental shadows from the buildings projected with the proposed actions are not expected to have significant adverse impacts on these open spaces. The majority of the RV Ingersoll Housing Project open space would be unaffected by project-generated shadow, and the new shadows on Columbus Park/Borough Hall Park would be of short duration and would affect this open space during the early morning, when the park is less likely to be used. LIU Plaza would receive project-generated shadows in the late afternoon, when workers and students are less likely to use this passive open space. Although the shadows at 111 Livingston Street would be of long duration and large coverage, they would not be expected to create an

adverse impact, based on the usage and condition of the sitting area. Overall, shadows from the proposed actions would not have a significant adverse impact on any public open space.

## B. METHODOLOGY

Following the guidelines of the 2001 *New York City Environmental Quality Review (CEQR) Technical Manual,* this analysis considers shadows on four representative days of the year: March 21st/September 21st, the equinoxes; May 6th, the midpoint between the summer solstice and the equinox (and equivalent to August 6th); June 21st, the summer solstice and the longest day of the year; and December 21st, the winter solstice and shortest day of the year. In identifying potential effects, CEQR focuses on uses and users of the open space, landscaping and vegetation, and, if there are historic resources, features or details that are both sunlight-dependent and make such resources significant. It should also be noted that since CEQR methodology does not consider shadows and incremental increases in shadows within 1½ hours of sunrise or sunset significant, the analysis period is between 1½ hours after sunrise and 1½ hours before sunset.

The 2001 *CEQR Technical Manual* identifies the following as situations when a significant shadow impact may occur:

- Substantial reduction in sunlight where a sensitive use is already subject to substandard sunlight (i.e., less than the minimum time necessary for survival);
- Reduction in sunlight available to a sensitive use from more to less than the minimum time necessary for its survival;
- Substantial reduction in sunlight to a sun-sensitive use or feature; and
- Substantial reduction in the usability of the open space.

## C. SHADOW SCREENING

Because of the large number of open spaces in the project area, a shadow screening analysis was performed to identify those open spaces or historic resources that could be affected by shadows from the buildings projected to be built in the reasonable worst-case development scenario. Following the guidelines provided in the 2001 *CEQR Technical Manual*, a list of all sun-sensitive historic resources and open spaces was created within the area of the potential shadow sweep of the buildings on the projected development sites.

As described above, bulk configurations were formulated by DCP to illustrate the projected development. To maximize building height, the screening assumes most sites would rise with the minimum required base height and the smallest marketable floor-plates for tower floors. To identify resources of concern, the potential shadow length is first considered. Based on the 2001 *CEQR Technical Manual*, a building has a shadow length factor equal to 4.3 times its height. For example, the bulk configuration developed for site Q is 615 feet in height, and would, therefore, have a maximum shadow length of approximately 2,645 feet.

### OPEN SPACES

Open spaces that would be out of shadow range of the project-generated buildings, that would not be affected by project shadows due to intervening buildings, or that are in the area south of the projected development sites (where no project shadow would fall) were eliminated from further analysis. Table 6-1 lists all of the existing open spaces that fall within the maximum shadow length of the buildings on the projected development sites and indicated which were eliminated from analysis.

**Table 6-1**
**Shadows Screening: Open Spaces Within Maximum Shadow Length**

| Open Spaces Within Shadow Length Buffer | Outside Reach of Potential Shadows? | Fully Shaded by Intervening Buildings? |
|---|---|---|
| **Existing Open Spaces Included in Analysis** | | |
| Columbus Park/Borough Hall Park | NO | NO |
| LIU Plaza | NO | NO |
| 111 Livingston St. | NO | NO |
| RV Ingersoll Housing Project | NO | NO |
| **Existing Open Spaces Screened Out of Analysis** | | |
| Boerum Park/JHS 6 Playground | YES | — |
| Brooklyn Bears Rockwell Place Garden | YES | — |
| Brooklyn Bridge Park | YES | — |
| Commodore John Barry Park and Playground | YES | — |
| DOE Playground | YES | — |
| Farragut Houses | YES | — |
| Fort Greene Park | NO | YES |
| Gowanus Houses open space | YES | — |
| Macomber Square | YES | — |
| McLaughlin Park | NO | YES |
| MetroTech Plaza and Malls | NO | YES |
| MTA | YES | — |
| New York City College of Technology | NO | YES |
| Nicholas Nequan Heyward Jr Park at Gowanus Houses | YES | — |
| North Pacific Playground and Greenthumb | YES | — |
| Oxport/JHS 265 Playground | YES | — |
| PAL | YES | — |
| PS 261Playground | YES | — |
| PS 287/Ashford Playground | YES | — |
| Renaissance Marriott Hotel | NO | YES |
| S. Parkes Cadman Plaza | NO | YES |
| Sixteen Sycamores Playground | YES | — |
| Temple Square | YES | — |
| Trinity Park | YES | — |
| Walt Whitman Park | NO | YES |
| Wyckoff Gardens Open Space | YES | — |

**Notes:** DOE = New York City Department of Education
MTA = Metropolitan Transit Authority
PAL = Police Athletic League

## HISTORIC RESOURCES

Historic resources that fall within the maximum shadow length of the buildings on the projected development sites also were identified. Based on the 2001 *CEQR Technical Manual*, historic resources with sunlight-dependent features (such as stained-glass windows or historic landscapes) should be considered in shadow analyses.

As detailed in Chapter 7, "Historic Resources," there are a number of historic resources within the project area and the surrounding blockfronts (see Table 7-2 for the list of resources in this area). With the exception of the buildings or sites identified, none of these buildings are considered to have sun-sensitive features which contribute to their significance as a historic resource. St. Boniface Church, located on the west side of Duffield Street between Willoughby Street and Myrtle Avenue, has stained-glass windows on its east façade (see Figure 7-1 and Photograph 27

of Figure 7-15). However, as the approximately 394-foot-tall J.P. Morgan Chase building is located only 60 feet east of the church across Duffield Street, it is expected that shadows from this building already cover the resource. The United States Post Office and Court House, Brooklyn Central Office at 271-301 Cadman Plaza East, has a deeply carved stone façade that has been considered in previous analyses to be a sun-sensitive feature. No shadow is expected to be cast on this resource from the projected development, as the building is already surrounded by large-scale development, including the nearly-completed, 473-foot-tall 330 Jay Street building at the opposite corner of Adams and Johnson Streets. Fort Greene Park, which is an open space included within the boundaries of the Fort Greene Historic District, would not be affected by shadows from site J because this resource is already covered by shadows from existing buildings in the area. Baptist Temple, which has stained-glass windows on its north and east façades, is, like the adjacent Temple Square open space, outside of the reach of project-generated shadows.

The maximum shadow sweep of the proposed actions extends farther than the historic resources study area, potentially as far as Henry Street to the west, Nassau Street to the north, Carlton Avenue to the east, and Atlantic Avenue/Hanson Place to the south. This extended area contains a number of other historic resources, including Brooklyn Borough Hall and the Borough Hall IRT subway station, at Cadman Plaza West and Joralemon Street; the Brooklyn Heights Historic District (which includes individual historic resources such as the First Unitarian Church of Brooklyn, Holy Trinity Church, Church of the Pilgrims, and Saint Ann's Church); a very small, northern portion of the Cobble Hill Historic District; the Brooklyn Trust Company at 177-179 Montague Street; and the State Street Houses, at 291-299 and 290-324 State Street. Although some of the historic resources in this wider area are expected to have sun-sensitive features, these resources are already covered in whole or in part by shadows from intervening buildings, and it is expected that any project-generated shadows reaching to this wider area would be small and dispersed, and, therefore, not significant. Therefore, the following assessment of shadow impacts focuses only on open spaces and proposed public spaces.

## D. RESOURCES OF CONCERN FOR FURTHER ANALYSIS

### OPEN/PUBLIC SPACES

Shadows due to development resulting from the proposed actions would fall on four existing public open spaces, in addition to the two proposed public spaces. The existing open spaces are 111 Livingston Street, Columbus Park/Borough Hall Park, RV Ingersoll Housing Project, and the Long Island University (LIU) Plaza.

111 Livingston Street, which is located on the northwest corner of Livingston Street and Boerum Place, contains a small sitting area. This open space is located directly west of projected development site M.

Columbus Park is located to the west of the project site, on a superblock bounded by Court, Adams, Joralemon, and Johnson/Tillary Streets. Borough Hall and the State Supreme Court, as well as parking lots for the buildings, are also located on the block. This open space features wide walkways, numerous benches, and fenced areas (inaccessible to pedestrians) with grass and large trees. There is an enclosed flower garden and a fountain in front of Borough Hall, and a fenced-in area with a statue of Christopher Columbus by Emma Stebbins in front of the main entrance to the State Supreme Court. During the summer, a farmers market is set up on the walkway between Borough Hall and the flower garden. The main entrance to Borough Hall faces the park (rather than Joralemon Street). This façade has a substantial portico supported by

six fluted Ionic columns and surrounded by a flight of broad steps. At the center of the roof is a domed cupola. A cast-iron kiosk for the Borough Hall IRT subway station is also located within the park's boundaries.

The RV Ingersoll Housing Project is located on the superblock bounded by Prince Street, Myrtle Avenue, St. Edward Street, and the Brooklyn Queens Expressway. The open space area on this site is located directly north of projected development sites I(A) and J, across Myrtle Avenue. The open space is just under three acres in size and contains grassy areas, seating, playgrounds, and basketball courts.

Long Island University (LIU) Plaza is located on Flatbush Avenue Extension just south of Willoughby Street and east of projected development site Q (see Figure 6-1). LIU Plaza is 1.16 acres in size and is entirely passive open space. The plaza is designed with tiered areas and contains landscaping, flowers, trees, benches, walkways, and a large pagoda-like sculpture.

Shadows from the projected developments would fall on both proposed public spaces. The Willoughby Square public space would be located on the south side of Willoughby Street between Duffield and Albee Square West/Gold Streets, would be similar to the MetroTech Commons in size, and is intended to be a focal point for new commercial investment in the surrounding blocks (see Figure 6-1). Exact plans for this public space has yet to be determined. The second public space, the Jay Street Plaza, would be located on the block bounded by Fulton, Livingston, and Smith Streets and Boerum Place; however, it would mainly feature a new subway entrance/exit to the Jay Street subway station and is not expected to have seating or other amenities for passive or active recreation. In addition, this proposed public space is located on a potential development site and is unlikely to be developed by 2013. Therefore, the Jay Street Plaza is not considered in this analysis.

## E. THE FUTURE WITHOUT THE PROPOSED ACTIONS

The major project planned for a portion of the study area in the future without the proposed actions is the Atlantic Yards Arena and Redevelopment project, which is proposed for an approximately 24-acre site bounded by Flatbush, Atlantic, and Vanderbilt Avenues and Dean Street at the southeastern edge of Downtown Brooklyn. A principal component of the project is an arena with an approximate capacity of 18,000 to 20,000 seats, along with a commercial office development. This chapter was revised to consider the potential for this development to have shadow impacts on the open spaces and public spaces considered in this analysis. The following existing open spaces and proposed public spaces are outside the potential shadow sweep of the development: 111 Livingston Street, Columbus Park/Borough Hall Park, RV Ingersoll Housing Project, and Willoughby Square. The Long Island University (LIU) Plaza, although located more than half a mile away from the arena site, is the only open space considered in this analysis that is possibly within the potential shadow sweep of the development. LIU Plaza could possibly be within the project's potential shadow sweep in the December analysis period, when shadows are generally the longest they are all year. However, on that analysis day, LIU Plaza would be entirely covered by shadows from existing buildings.

## F. ASSESSMENT OF SHADOW IMPACTS

The sun rises in the east and casts its earliest (and longest) shadows towards the west. Later in the morning, the sun rises higher in the sky, casting shorter shadows towards the northwest. At noon, the sun is at its highest point in the sky and casts the shortest shadows of the day directly

north. (During Daylight Savings Time, this occurs at 1:00 PM rather than at noon.) In the afternoon, the sun continues to move west and begins to descend, casting longer shadows toward the northeast and east. At the end of the day, just before the sun sets in the west, shadows are slightly shorter than just after sunrise.

In its yearly cycle, the height of the sun in the sky and the time and directional location at which it rises and sets varies by season. In the winter, the sun travels in a low arc across the southern sky, rising late in the southeast and setting early in the southwest. Because it is so low in the sky, it casts longer shadows. In the spring and fall, the sun arcs through the sky at a somewhat higher angle, rises earlier in the east, and sets later in the west. In these seasons, shadows are of moderate length. In the summer, the sun arcs through the sky at its highest angle, rising almost directly overhead at noon. For this reason, summer shadows are shortest. However, in the summer, the sun rises earliest and sets latest; it also travels farther, from the northeast to the northwest. Thus, the summer sun casts shadows in more directions than those seen in other seasons and its late sunset and early sunrise creates shadows earlier in the morning and later in the evening than in other seasons.

The extent and duration of the proposed actions' shadows are summarized in Table 6-2 and illustrated in Figures 6-2 through 6-34. The shadows diagrams illustrate those open and public spaces that would experience project-generated shadows for the longest period of time covering the largest portion of the resource.

**Table 6-2**
**Project Shadow Durations**

| Open/Public Space | March 21<br>7:36 AM-4:29 PM<br>EST | May 6<br>7:27 AM-6:18 PM<br>DST | June 21<br>6:57 AM-7:01 PM<br>DST | December 21<br>8:51 AM-2:53 PM<br>EST |
|---|---|---|---|---|
| 111 Livingston Street | 7:36–10:15 AM | 7:27–11:30 AM | 6:57–11:30 AM | 8:51–9:30 AM |
| | 2h 39m | 4h 3m | 4h 27m | 39m |
| Columbus Park/Borough Hall Park | 9:30–11:00 AM | — | — | 8:51–11:30 AM |
| | 1h 30m | — | — | 2h 39m |
| Willoughby Square* | 7:36AM–4:29 PM | 7:27 AM–6:18 PM | 6:57 AM–7:01 PM | 8:51 AM–2:53 PM |
| | 8h 53m | 10h 51m | 12h 4m | 6h 2m |
| RV Ingersoll Housing Project | — | — | — | 8:51 AM–2:53 PM |
| | — | — | — | 6h 2m |
| LIU Plaza | 3:00–4:29 PM | 3:30–6:18 PM | 3:15–7:01 PM | — |
| | 1h 29m | 2h 48m | 3h 46 min | — |

**Notes:** *Public space to be created with the proposed actions. Since the issuance of the DEIS/DSEIS, the proposed Flatbush Triangle public space has been removed from the project's development plan.

EST—Eastern Standard Time
DST—Daylight Saving Time
September 21 is the equivalent of March 21, but one hour later.
August 6 is the equivalent of May 6, but EST.

## MARCH 21/SEPTEMBER 21 ANALYSIS PERIOD: 7:36 AM TO 4:29 PM EASTERN STANDARD TIME (EST)

On the equinoxes (March 21 and September 21), the shadow of the building on projected development site M would fall on the sitting area at 111 Livingston Street at the beginning of the analysis period (7:36 AM) and last until 10:15 AM. For a large part of the morning, the entire area would be covered by shadows from the projected development. However, from 10:15 AM until around noon, when more people are likely to be out, the sitting area would receive full sun. More people are likely to be out in this passive open space later in the day.

Columbus Park/Borough Hall Park would receive its first shadow from site M at 9:30 AM (see Figure 6-4). At that time, shadows would fall on the walkway between the parking lot and Borough Hall. By 10:15 AM, most of the shadows would be off the walkway and covering the parking lot, and by 11:00 AM, all project-generated shadow would be off the open space (see Figure 6-5).

No new shadows from the projected development sites would be cast onto the RV Ingersoll Housing Project during the March/September analysis period.

Figures 6-2, 6-3, and 6-6 through 6-10 depict the shadow path throughout the day for the March/September analysis period in relation to LIU Plaza and Willoughby Square.

Willoughby Square would be covered by shadows from the buildings on projected development sites O, P, and Q for the entire analysis day. Beginning at 7:36 AM, shadows would be cast from site Q in a westerly direction (see Figures 6-2 and 6-3). By 10:15 AM, the public space would be half covered by shadows from sites P and Q, but the central area of the park would receive sunlight angled in a northeasterly direction (see Figure 6-6). By 11:45 AM, about three-quarters of the public space would be covered by shadows from the building on site P (see Figure 6-7). At 1:15 PM, the public space would receive shadow from sites O and P, but would again receive sunlight on about half of the public space, this time in a northeast swath (see Figures 6-8 and 6-9). By the end of the analysis day (4:29 PM), the public space would almost be entirely in shadow, most of which would be from the buildings on sites O and P (see Figure 6-10). The worst shadow on Willoughby Square would be at the beginning and end of the analysis period, as well as the noon hour, when shadows would stretch across the Square, covering more than three-quarters of the public space.

LIU Plaza would begin to receive shadows from sites P and Q at 3:00 PM. By the end of the analysis period, shadows from these sites would cover about one-third of the park, adding to shadows being cast from existing surrounding buildings (see Figure 6-10). The Plaza would have over three hours of complete sunlight from 11:30 AM until 3:00 PM, when the shadows from the project-generated buildings would begin to fall on the open space.

## MAY 6/AUGUST 6 ANALYSIS PERIOD: 7:27 AM TO 6:18 PM DAYLIGHT SAVINGS TIME (DST)

Between the equinoxes and the summer solstice, May 6 or August 6, shadows would generally be shorter than in March and September, except during the very beginning and end of the analysis period. From 7:27 to 11:30 AM during this analysis period, shadows from site M would be cast onto the 111 Livingston Street sitting area. From the start of the analysis period to around 10:00 AM, the area would be cast completely into shadow. The sitting area would receive full sun from 11:30 AM until 2:00 PM, at which time the 111 Livingston Street building would begin to cast shadows on its sitting area.

Shadows from the building on site M would never reach Columbus Square/Borough Hall Park during the May/August analysis period.

No new shadows from project-generated buildings would be cast onto the RV Ingersoll Housing Project during the May/August analysis period.

Figures 6-11 through 6-17 depict the shadow path throughout the day for the May/August analysis period.

Willoughby Square would receive shadows from the buildings on projected development sites O, P, and Q for the entire analysis day. At the start of the analysis period, shadows would fall from site Q in a westerly direction, covering the southern two-thirds of the public space (see Figure 6-11). By 9:00 AM, shadows from site Q would cover almost the entire public space, giving the Square some of the most extensive shadow coverage it would see all day (see Figure 6-12). By 10:45 AM, as site P begins to cast a shadow on the area, just over half of Willoughby Square would be covered by shadow (see Figure 6-13). At 12:30 PM, more sun would begin to fall on the public space, and by 2:15 PM, more than half of the Square would have sunlight (see Figures 6-14 and 6-15). By 4:00 PM, site O would cast a large shadow on Willoughby Square, covering three-quarters of the public space (see Figure 6-16). By 6:00 PM, the entire public space would be in shadow, but by the end of the analysis period (6:18 PM) some sunlight would begin to fall on the northern portion of the public space, along Willoughby Street (see Figure 6-17). The most extensive shadows would occur at 9:00 AM and 6:00 PM, when shadow from sites Q and O, respectively, would cover the entire public space.

From the beginning of the analysis period until around 12:30 PM, most of LIU Plaza would be covered by shadows from the University's adjacent gym, cafeteria, and other buildings. Starting at 12:30 PM and lasting for about three hours, LIU Plaza would receive full sun. The first shadows from sites P and Q would begin to fall at 3:30 PM, and by 4:00 PM, the northeastern portion of the Plaza would be covered in shadow (see Figure 6-16). The shadows would move southeast, casting shadows on about half of the Plaza by the end of the analysis period (see Figure 6-17).

### JUNE 21 ANALYSIS PERIOD: 6:57 AM TO 7:01 PM DST

On the summer solstice, the longest day of the year, the sun is most directly overhead and shadows are shortest for most of the day. During the very beginning and end of the analysis period, shadows stretch farther than in the May/August analysis period. 111 Livingston Street's sitting area would be cast into shadow from site M from 6:57 to 11:30 AM. The entire area would be covered by shadow until around 11:00 AM, when the project-generated shadow would begin to move off the open space. The open space would receive full sun from 11:30 AM until 1:45 PM, when the 111 Livingston Street building would start to cast shadows on its sitting area.

Shadows from project-generated buildings would never reach Columbus Park/Borough Hall Park during the June analysis period.

No new shadows from project-generated buildings would be cast onto the RV Ingersoll Housing Project during the June analysis period.

Figures 6-18 through 6-25 depict the shadow path throughout the summer solstice.

Willoughby Square would begin to receive shadow from site Q at the beginning of the June analysis period. At that time, the southern half of the Square would be cast into shadow (see Figure 6-18). As the sun moves across the southern portion of the sky, site Q would continue to

cast a shadow on the public space, and would almost completely cover the area in shadow from 9:45 to 10:15 AM (see Figure 6-20). By 12:00 PM, half of the Square would have direct sunlight, and half of the Square would be covered by shadow from sites P and Q (see Figure 6-21). From 12:00 to 3:30 PM, the Square would continue to have shadows from sites O, P, and Q, but the shadows would cover less than half the public space (see Figures 6-21 through 6-23). After 3:30 PM, the shadow from site O would continue to increase, and by approximately 5:00 PM the shadow from this site would cover the entire public space (see Figure 6-24). By the end of the analysis period, the shadow would cover three-quarters of the public space (see Figure 6-25).

From 3:15 PM to the end of the analysis period, sites P and Q would cast shadows on LIU Plaza. The first shadows would be created from site Q (see Figure 6-23). At 5:15 PM, sites P and Q would cast separate shadows on the Plaza (see Figure 6-24). At the end of the analysis period, shadow from these sites would fully cover the Plaza (see Figure 6-25).

**DECEMBER 21—ANALYSIS PERIOD: 8:51 AM TO 2:53 PM EST**

On the shortest day of the year, the winter solstice, shadows are generally the longest they are all year. The projected development on site M would cast shadows on the sitting area at 111 Livingston Street from 8:51 to 9:30 AM during this analysis period. The shadows would cover less than half the sitting area at the start of the analysis period, and would quickly move off the open space. However, at that time, the remainder of the sitting area would be almost entirely covered by shadows from existing buildings. For about two hours, starting at 10:30 AM, the sitting area would receive full sun.

The project-generated building on site M would begin to cast shadows on Columbus Park/ Borough Hall Park at the beginning of the analysis period (see Figure 6-26). The shadows would stretch across the parking lot, the walkway between Borough Hall and the parking lot, Borough Hall, and the flower garden and fountain just north of Borough Hall. The most extensive shadow would occur around 10:00 AM, when a large portion of the Park that currently receives sun would be cast into shadow (see Figure 6-29). The shadow would be cast in a northwest direction, covering the parking lot, the eastern section of Borough Hall, and much of the central area of Columbus Park just west of the State Supreme Court building. By 10:45 AM, most of the shadow would be off Columbus Park; only the parking lot and the benches outside the Supreme Court building would be in shadow (see Figure 6-30). By 11:30 AM, the remaining shadow from site M would move off the Park.

Shadow would be cast on the RV Ingersoll Housing Project for the entire December analysis period. The shadows would be cast from the project-generated buildings on sites I(A) and J, and would mainly cover the grassy area south of the apartment buildings. After 12:00 PM, some shadow would be cast on the area north of the apartment buildings, which includes a play and seating area. The shadow would stay on this area until the end of the analysis period.

Willoughby Square would receive shadows throughout the analysis period, from 8:51 AM until 2:53 PM. At the start of the analysis period, sites P and Q would cast shadow on just over two-thirds of the public space (see Figure 6-27). From 11:00 AM to 1:00 PM, only the projected building on site P would cast a shadow on the Square (see Figures 6-31 to 6-32). At 1:30 PM, shadows from site O would begin to fall on Willoughby Square (see Figure 6-33). By the end of the analysis period, shadows from sites O and P would cover roughly three-quarters of the public space; the remainder of the open space would be covered by shadows from existing buildings (see Figure 6-34). No shadows would be cast on LIU Plaza during the December analysis period.

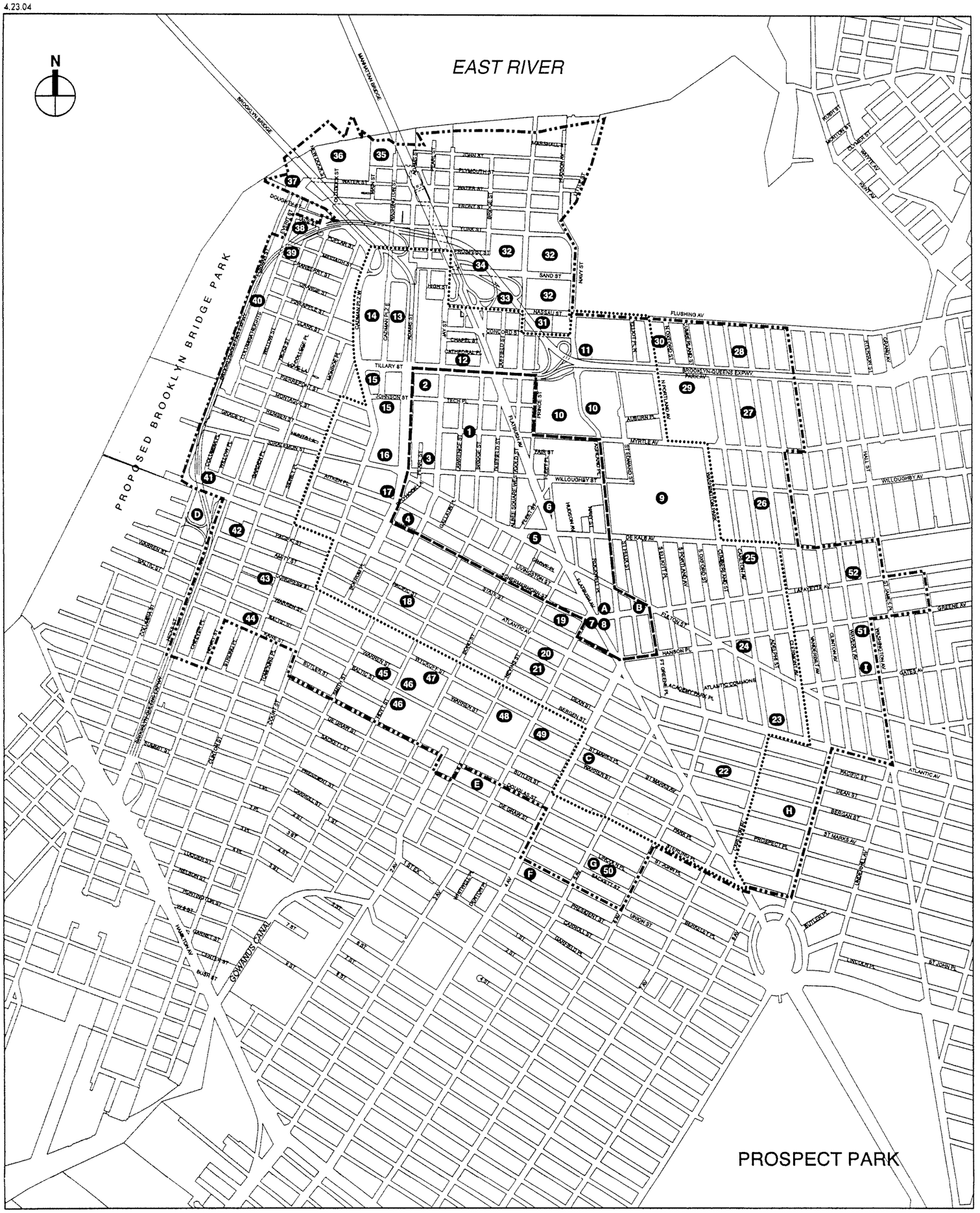
## CONCLUSIONS

Willoughby Square, a public space to be created by the proposed actions, would be located on the south side of Willoughby Street between Duffield Street and Albee Square West/Gold Street. Development anticipated as a result of the proposed actions on sites O, P, and Q would surround Willoughby Square on its west, south, and east sides. The projected buildings would substantially block the sunlight on Willoughby Square in all seasons of the year. It is expected that the landscaping of the Square would consist largely of shade-tolerant plants, thereby reducing or avoiding impacts to vegetation; however, the attractiveness and usability of Willoughby Square, particularly in cooler months, would be compromised by the duration and coverage of shadows from buildings likely to be created as a result of the proposed actions. Nevertheless, this new public space would not exist without the tall projected buildings to be constructed adjacent to it. Therefore, this condition would not constitute a significant adverse impact on the Willoughby Square public space.

A portion of the RV Ingersoll Housing Project open space would receive project-generated shadow for the entire December analysis period. However, for the majority of the analysis period, this shadow would only cover a grassy area south of the apartment buildings, which is unlikely to be used for passive recreation during the winter months. The majority of the open space would be unaffected by project-generated shadow. The project's shadows would not have a significant impact on this open space.

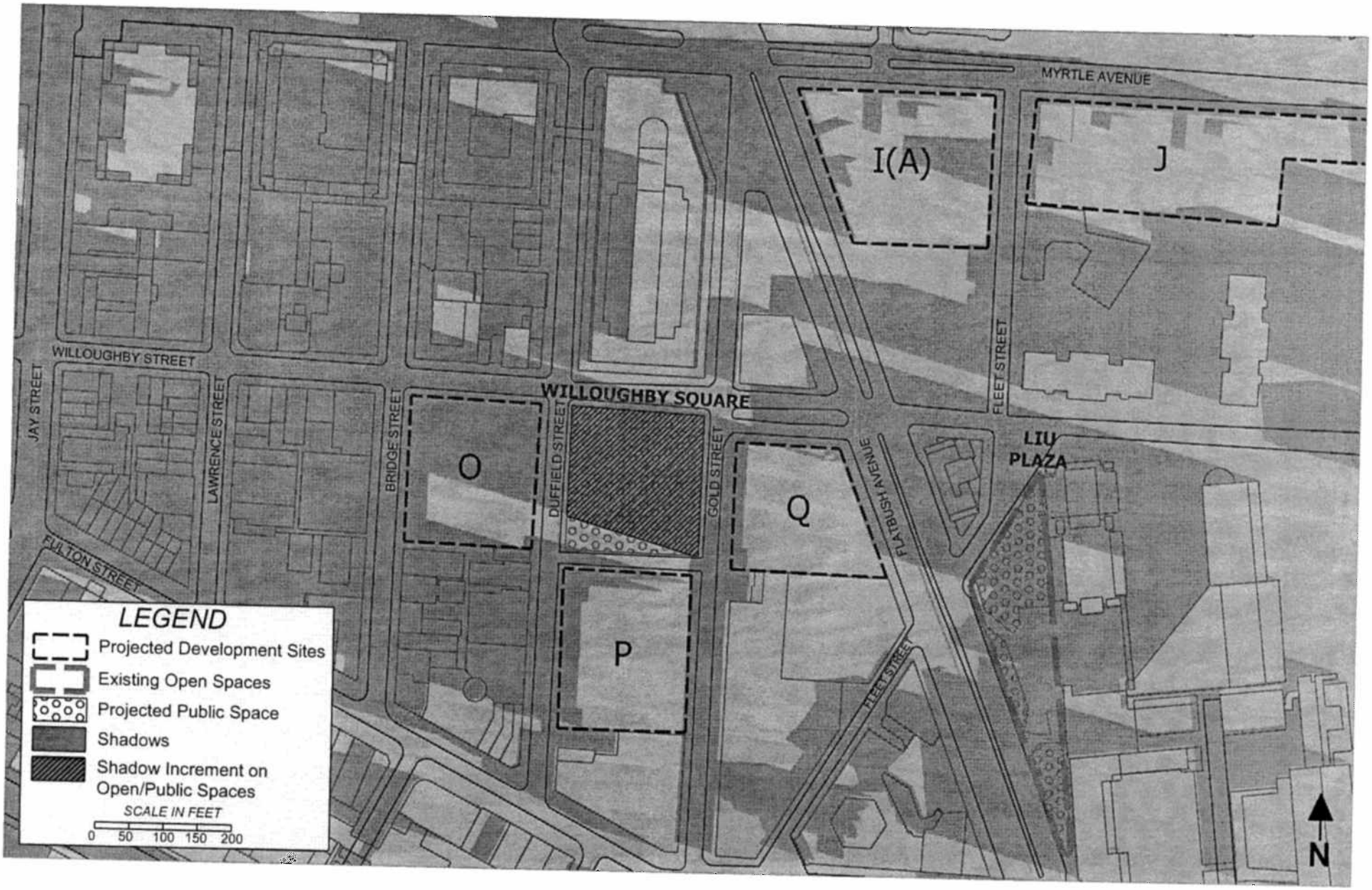
The new shadows on Columbus Park/Borough Hall Park in March and December would be of short duration, and would affect this open space during the early morning, when the park is less likely to be used. The public plaza at 111 Livingston Street would receive new shadows from project-generated buildings in the morning hours throughout the year. Although the shadows at 111 Livingston Street would be of long duration and large coverage, they would not be expected to create an adverse impact, based on the usage and condition of the sitting area. Finally, LIU Plaza would receive project-generated shadows in the late afternoon during the March, May, and June analysis periods. These two open spaces would receive full sun for varying periods of time during the mid-morning and early afternoon, when workers and students are most likely to use these areas. Therefore, the project is not considered to have a significant shadow impact on these resources. ✷

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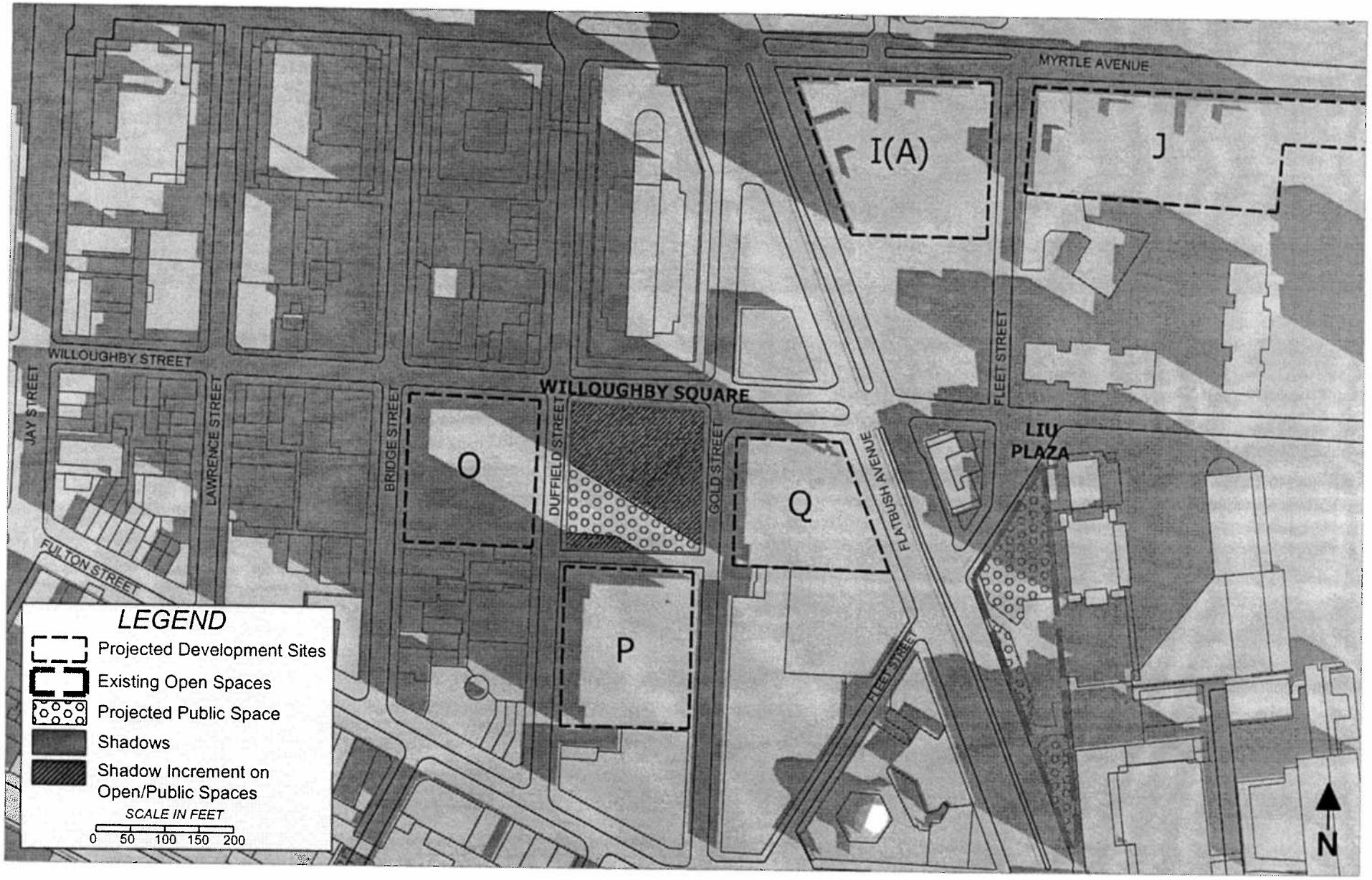



- Project Area Boundary
- 1/4-Mile Study Area Boundary
- 1/2-Mile Study Area Boundary
- ❶ Open Space Resource (see Table 5-3 for reference)
- Ⓐ Open Space Resource Not Included in Quantitative Analysis (see Table 5-3 for reference)

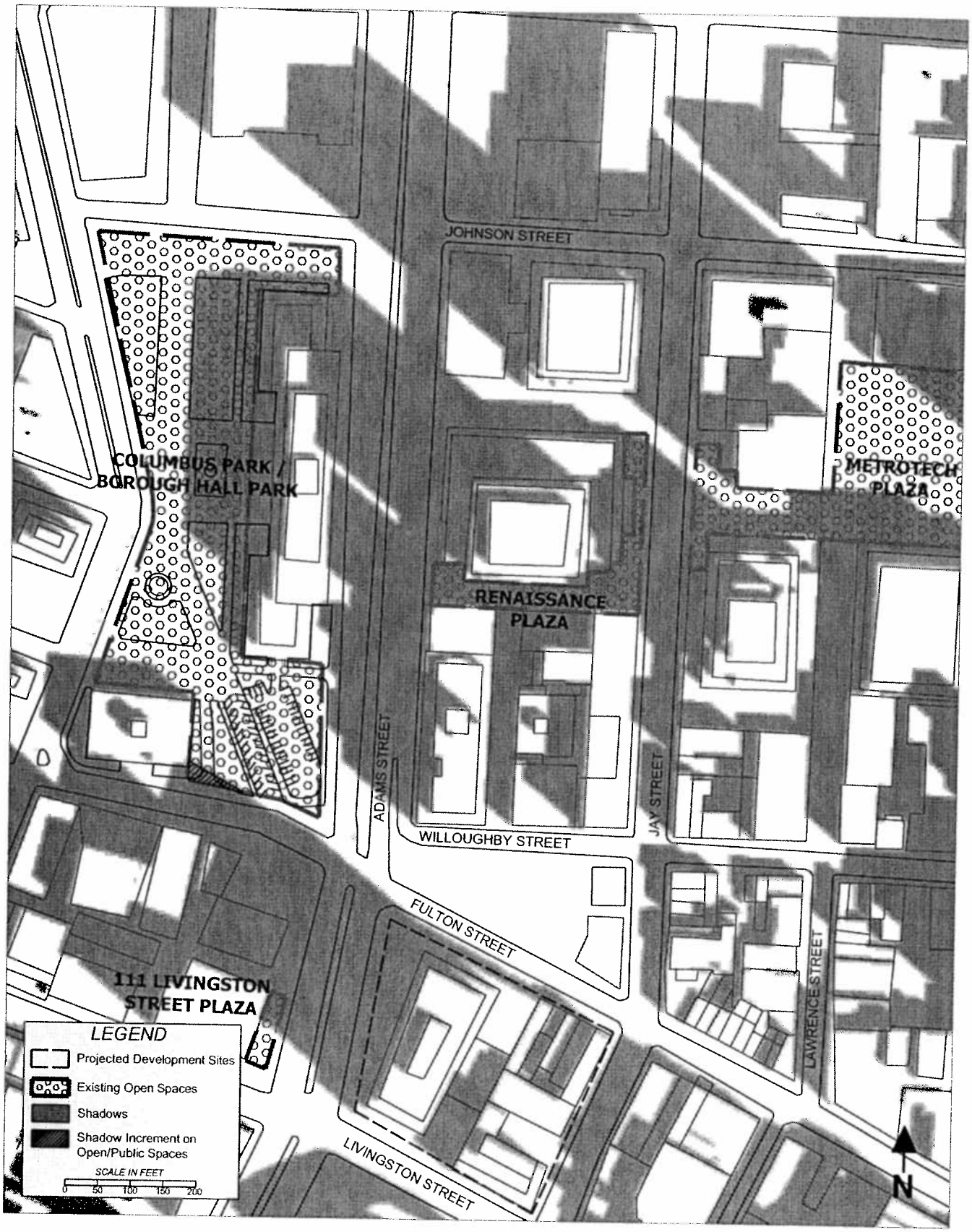
**Open Space Resources**
Figure 5-2



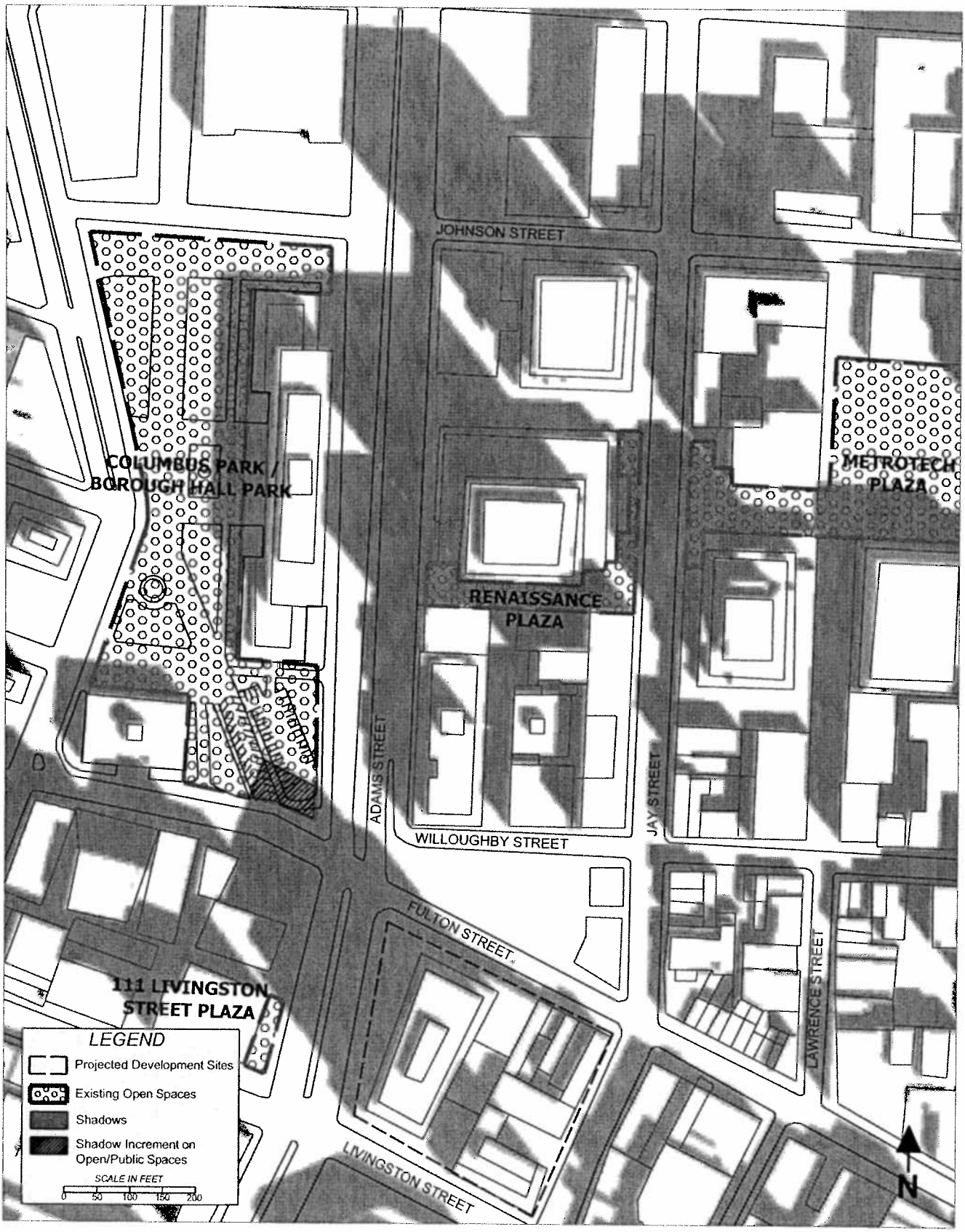

Shadow Diagrams
March 21 - 7:36 AM EST
*Figure 6 - 2*



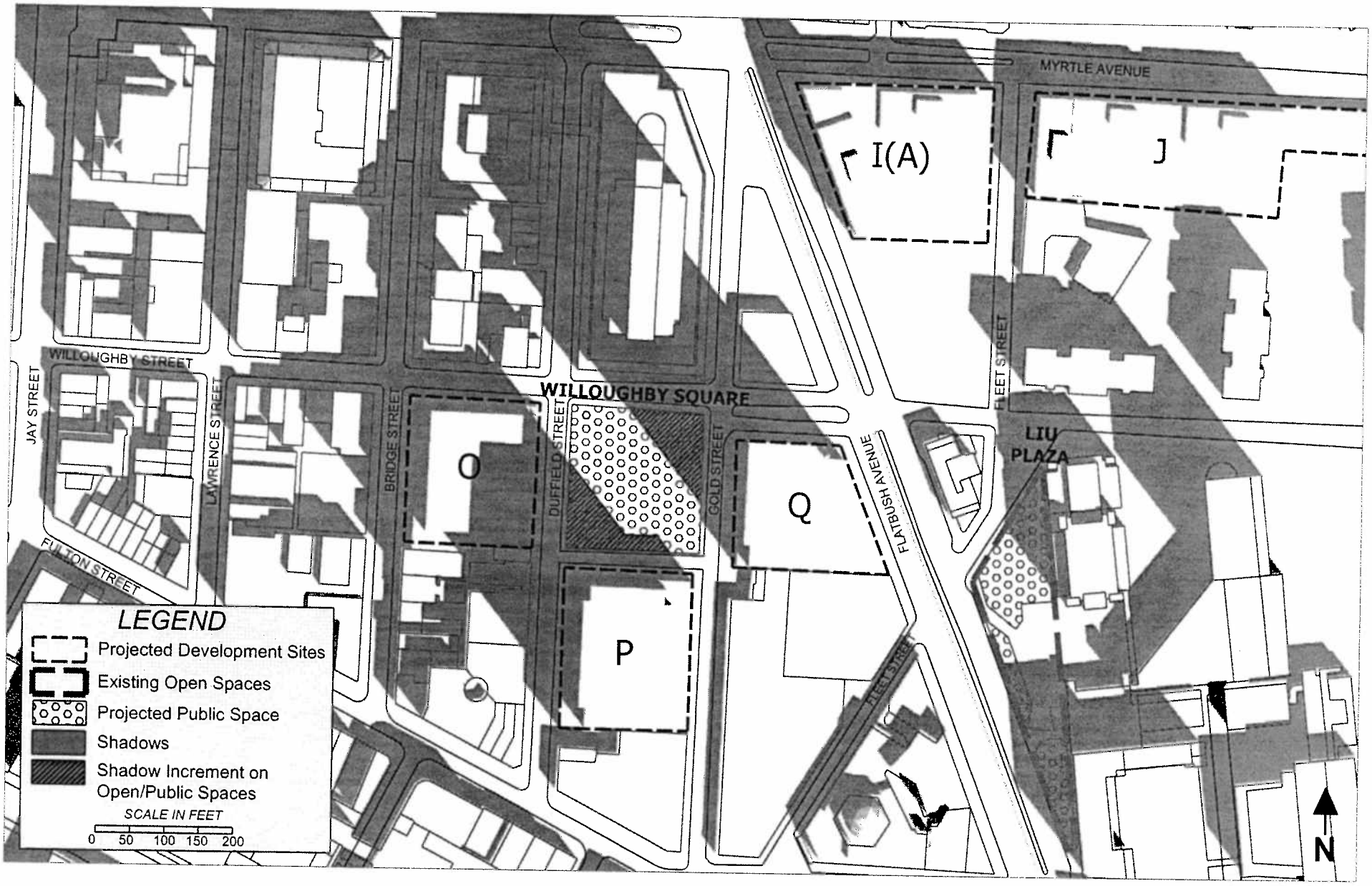

Shadow Diagrams
March 21 - 8:45 AM EST
*Figure 6 - 3*



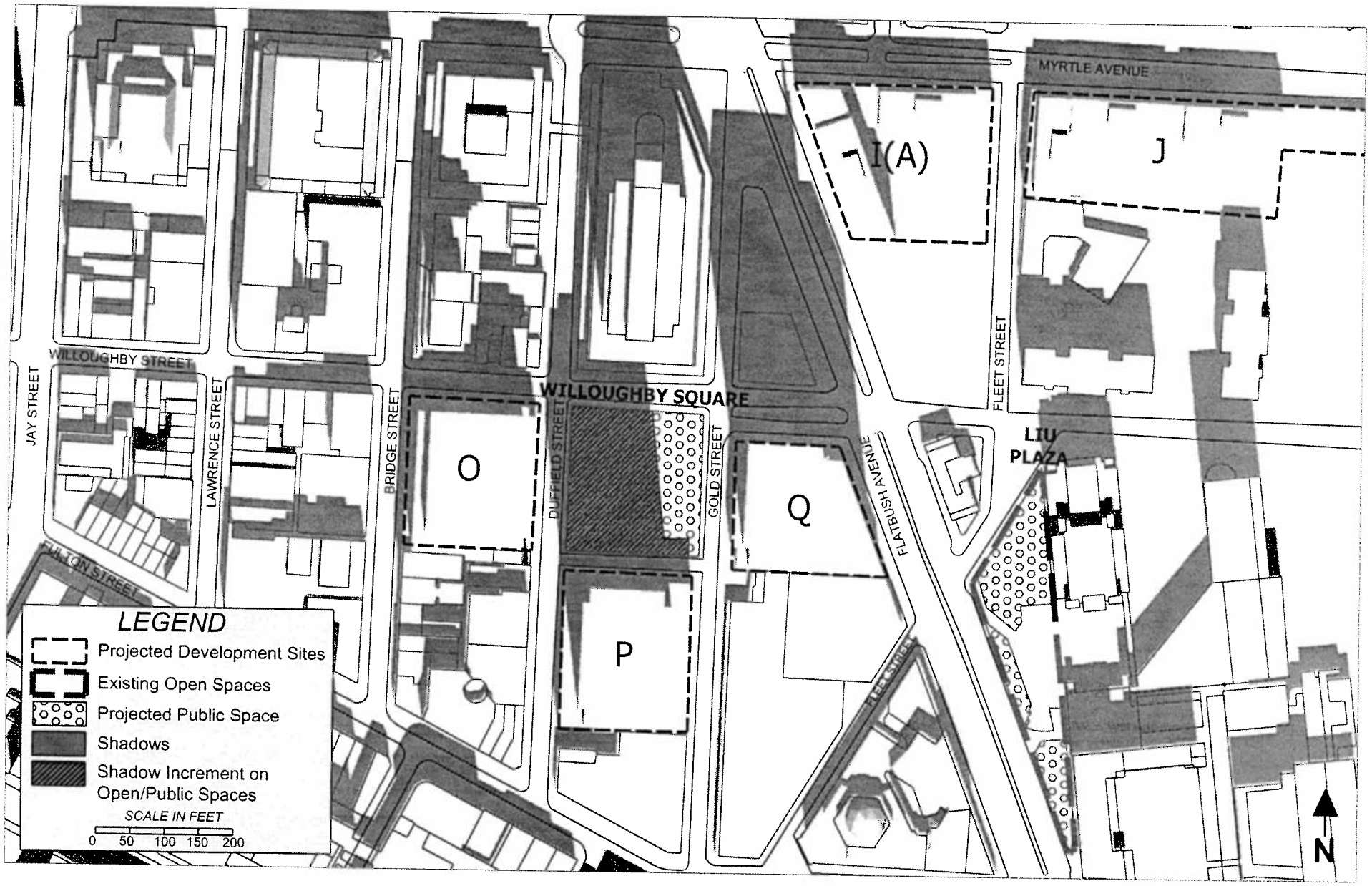

Shadow Diagrams
March 21 - 9:30 AM EST
*Figure 6 - 4*



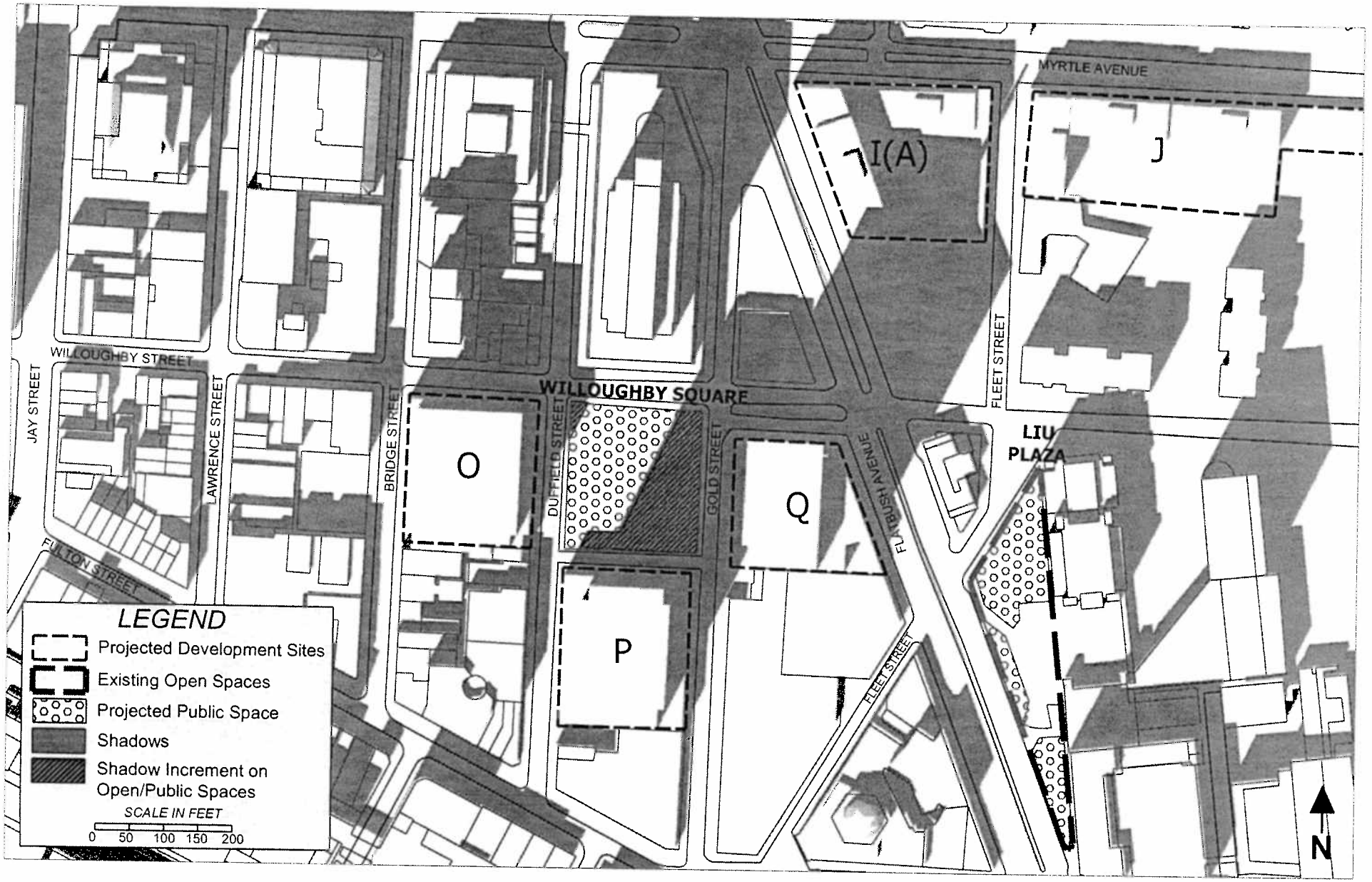

Shadow Diagrams
March 21 - 10:15 AM EST



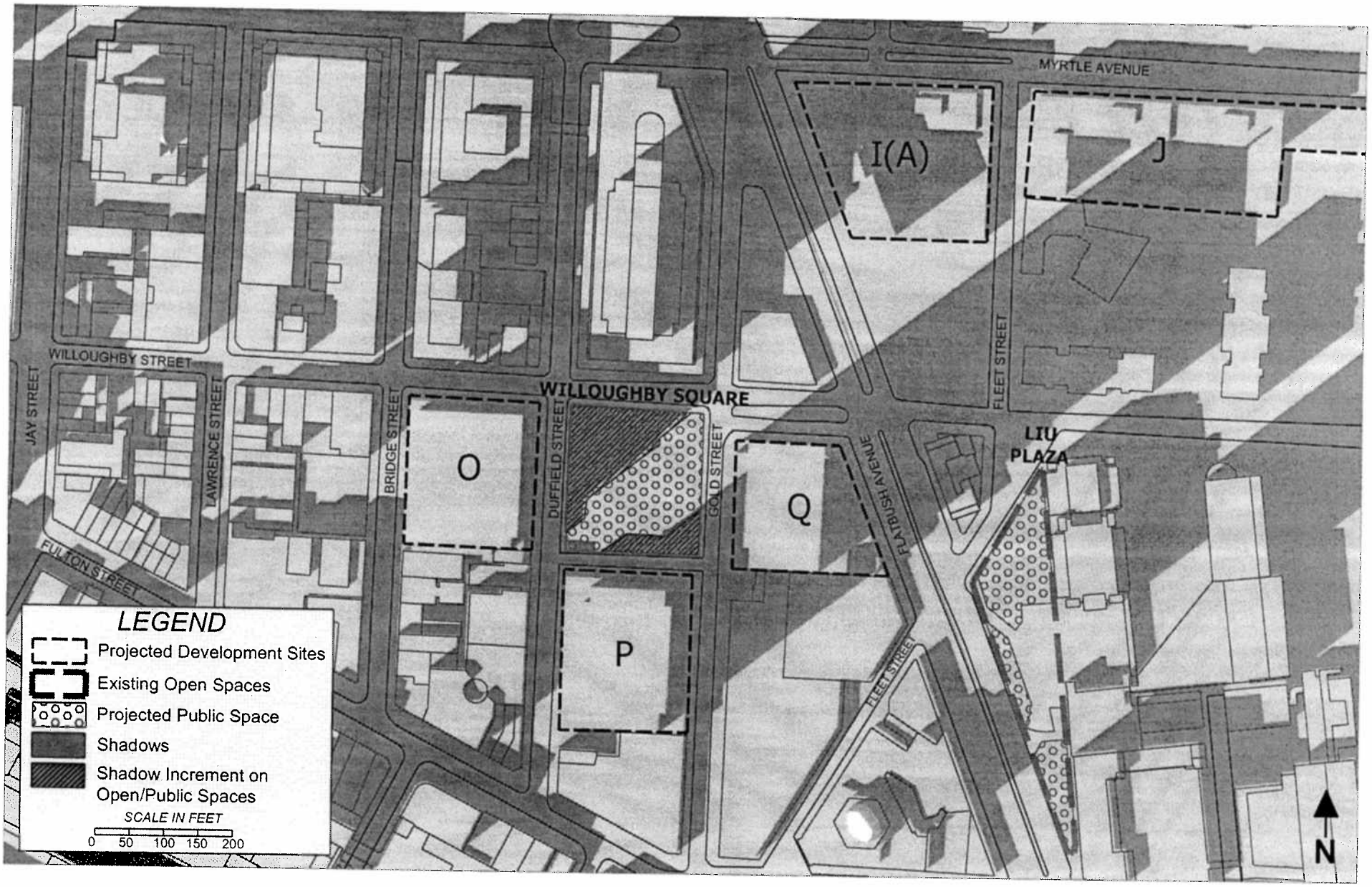

Shadow Diagrams
March 21 - 10:15 AM EST
*Figure 6 - 6*



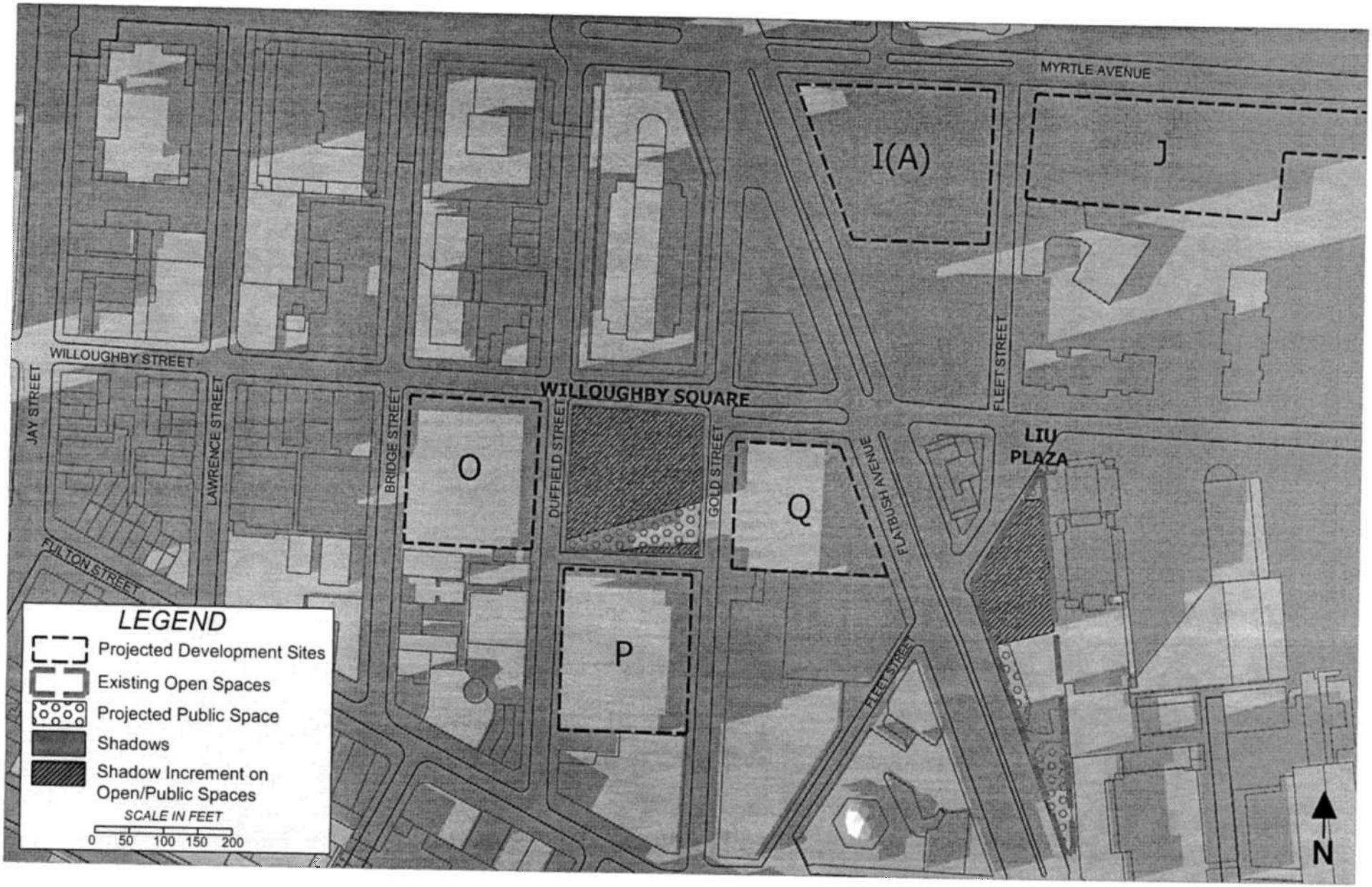

Shadow Diagrams
March 21 - 11:45 AM EST
*Figure 6 - 7*



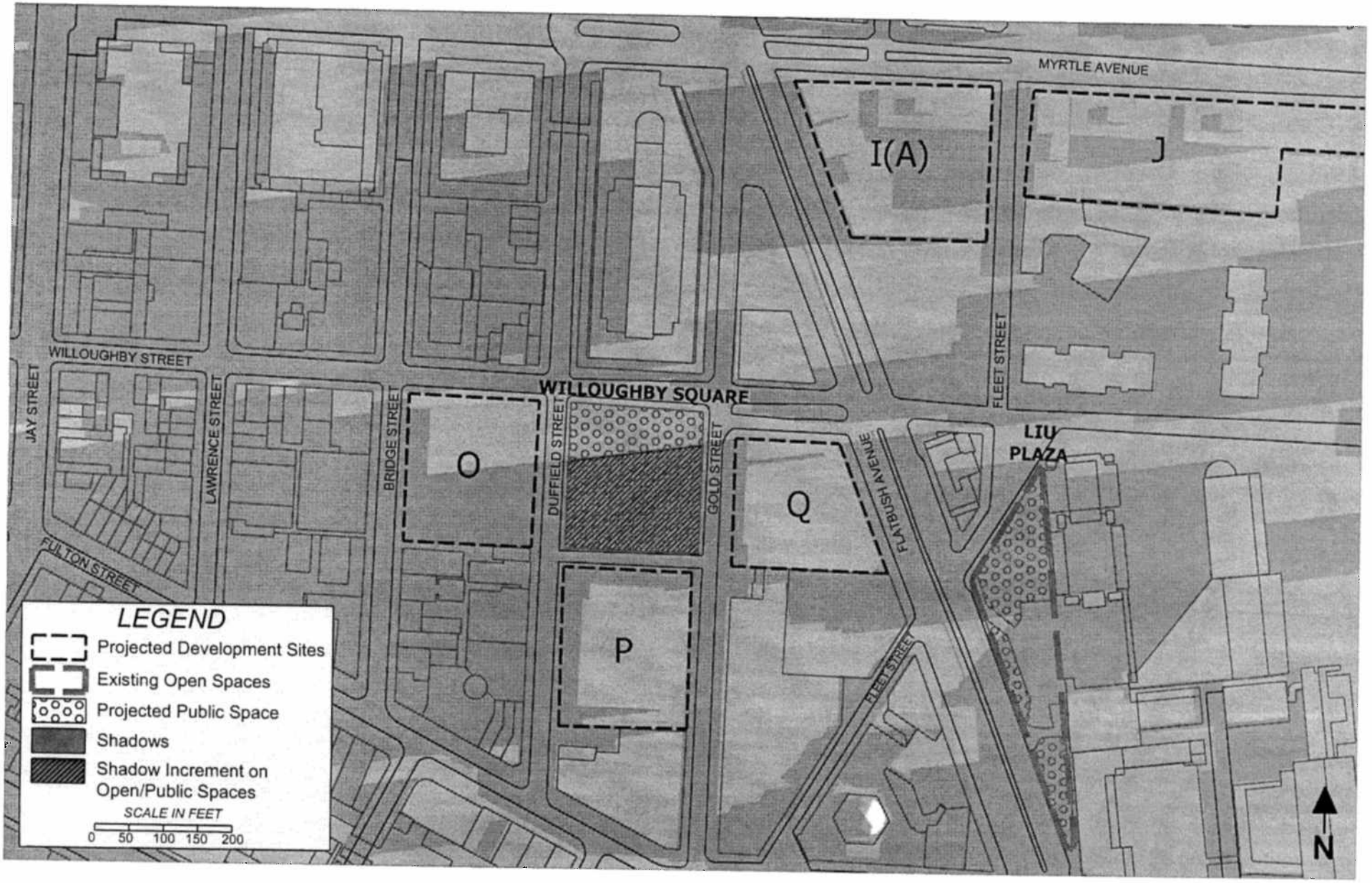

Shadow Diagrams
March 21 - 1:15 PM EST
*Figure 6 - 8*



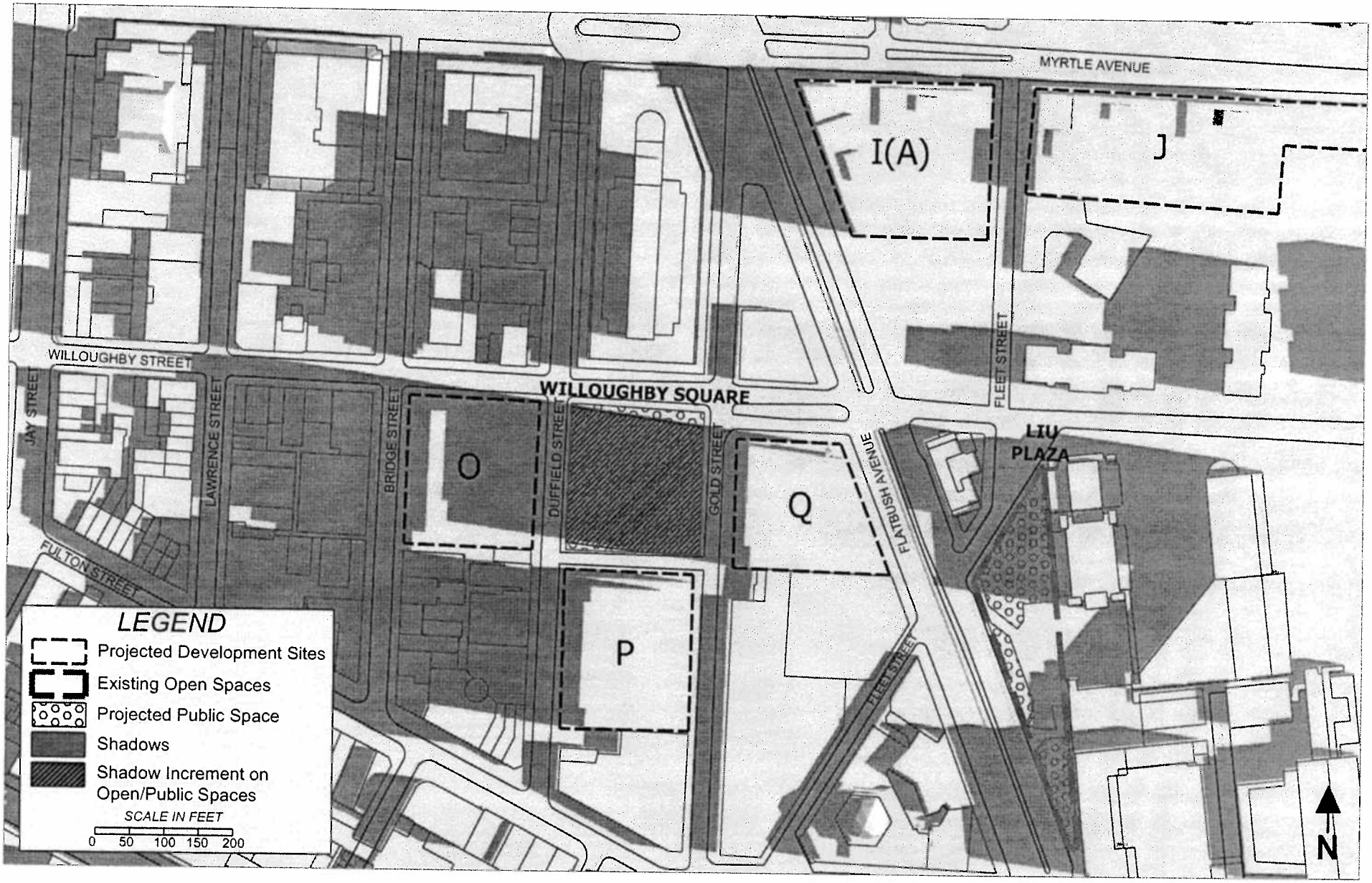

Shadow Diagrams
March 21 - 2:45 PM EST
*Figure 6 - 9*



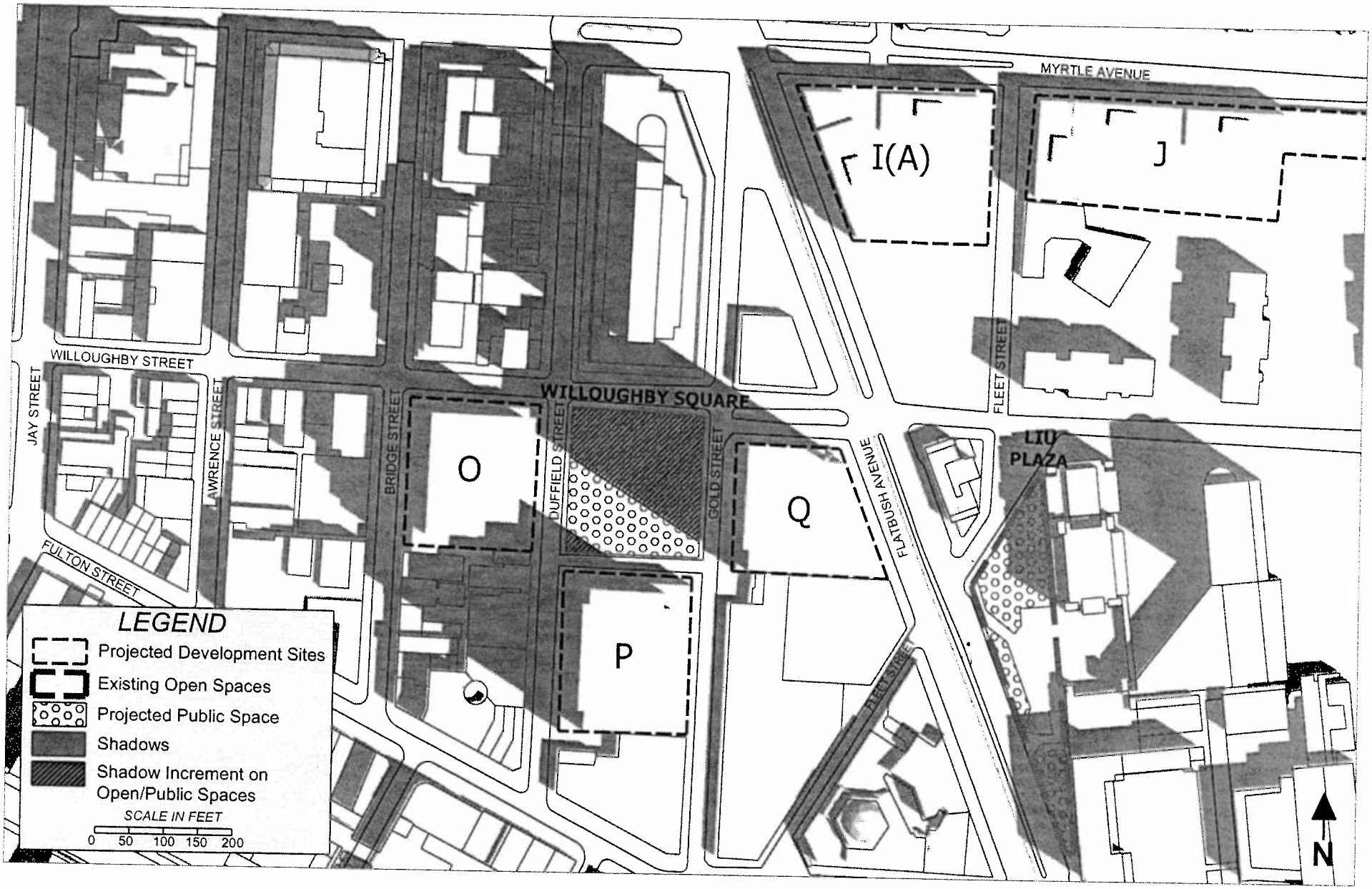

Shadow Diagrams
March 21 - 4:29 PM EST
*Figure 6 - 10*



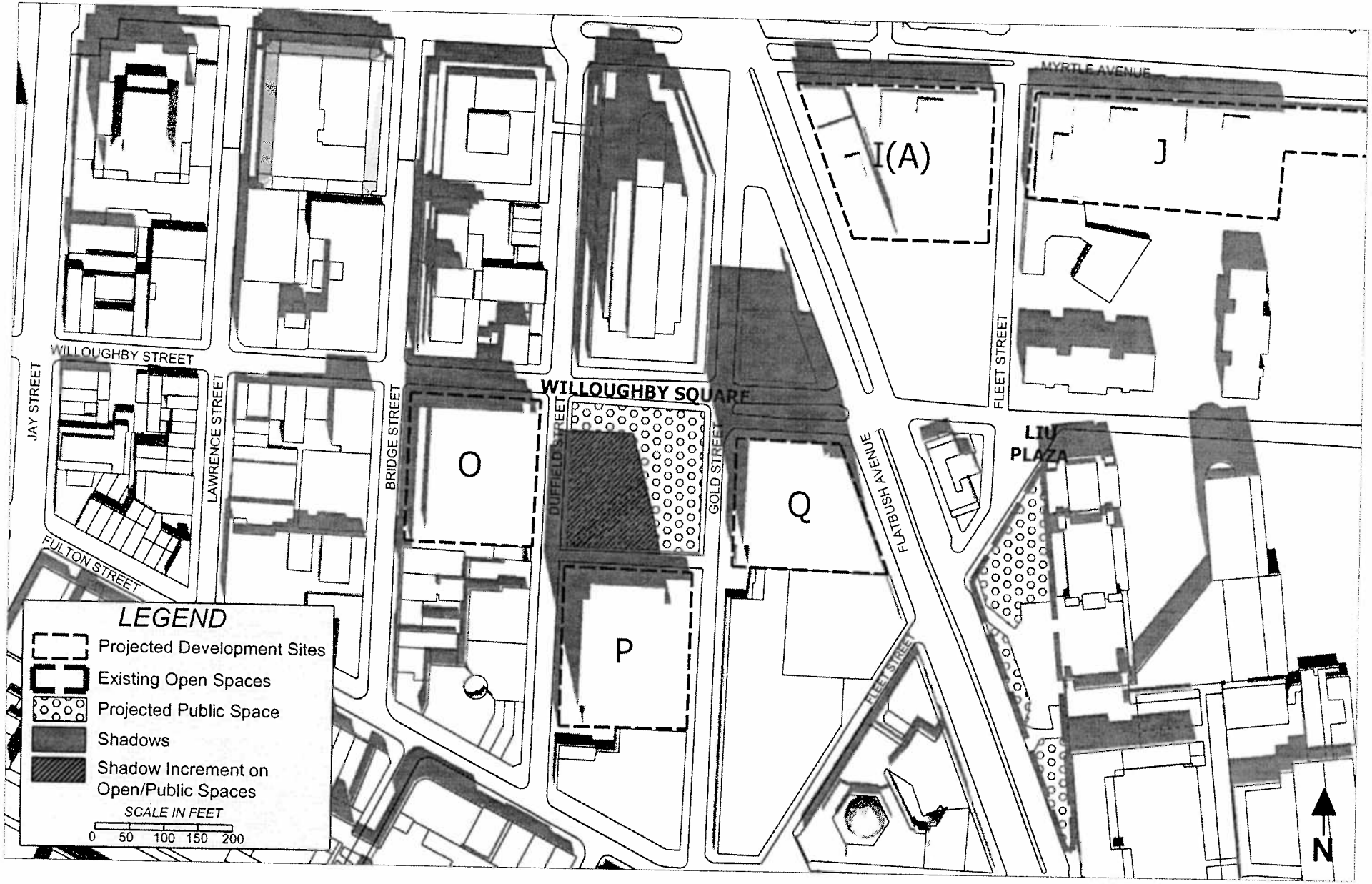

Shadow Diagrams
May 6 - 7:27 AM DST
*Figure 6 - 11*



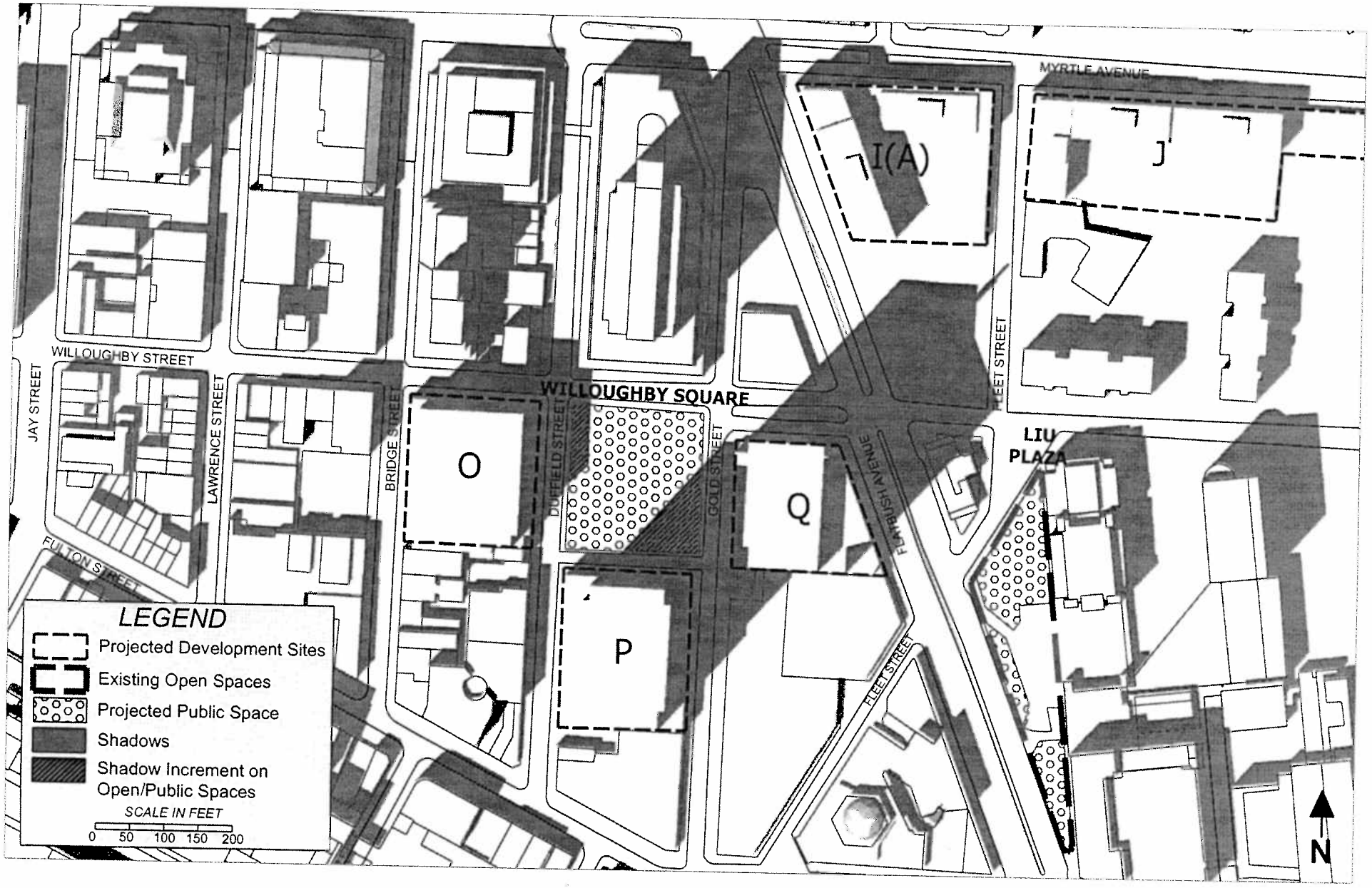

Shadow Diagrams
May 6 - 9:00 AM DST
*Figure 6 - 12*



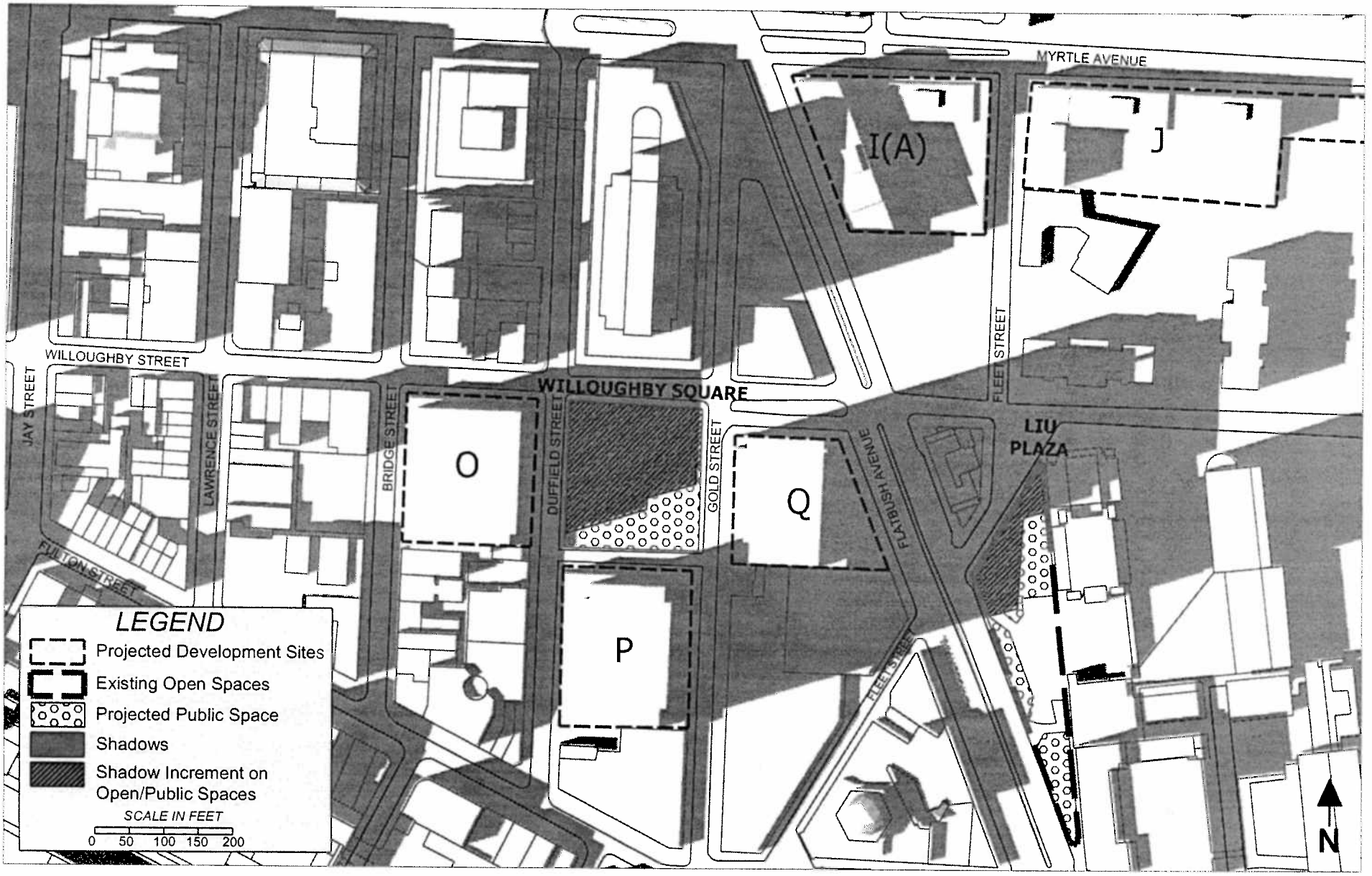

Shadow Diagrams
May 6 - 10:45 AM DST
*Figure 6 - 13*



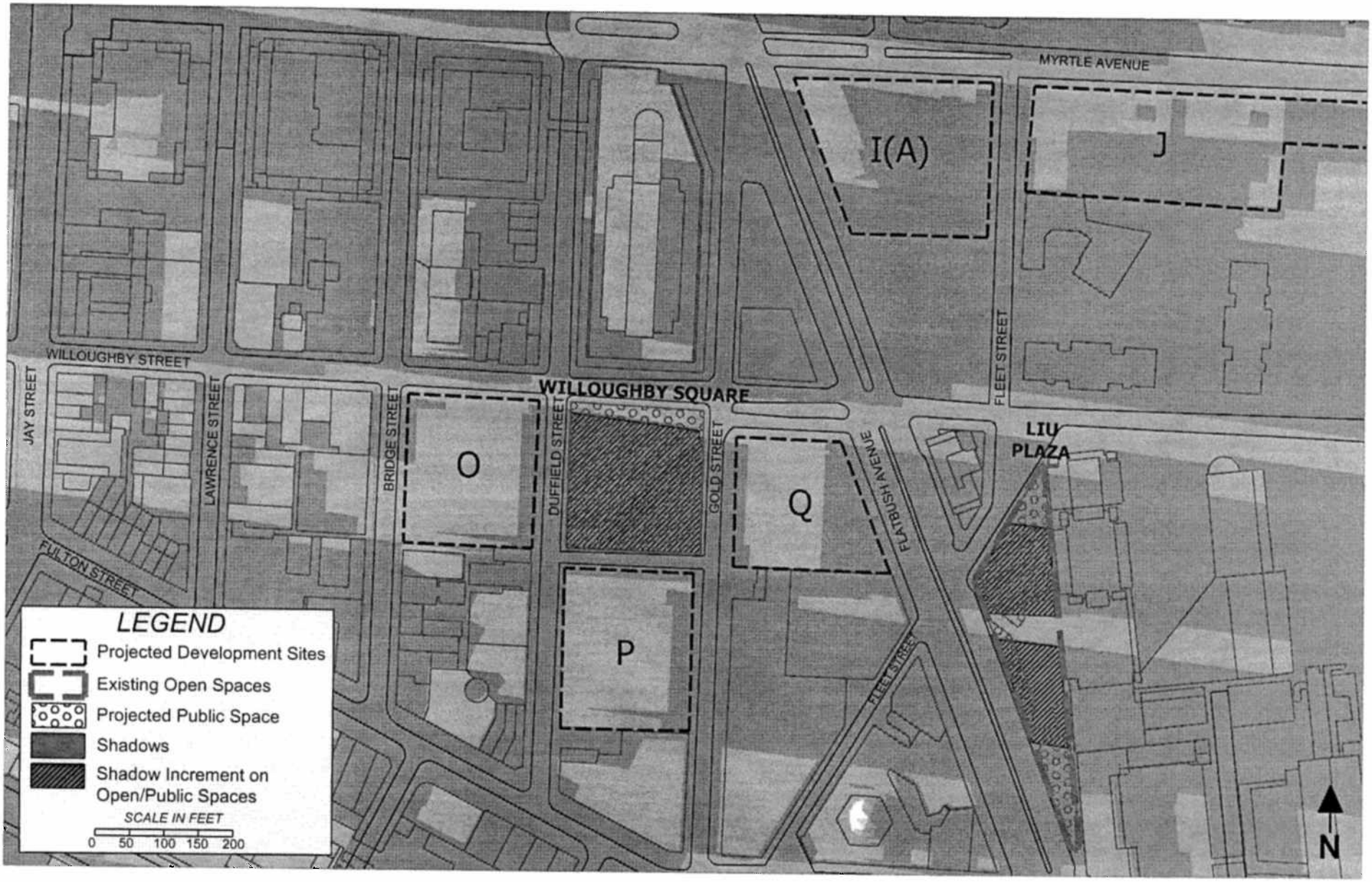

Shadow Diagrams
May 6 - 12:30 PM DST
*Figure 6 - 14*



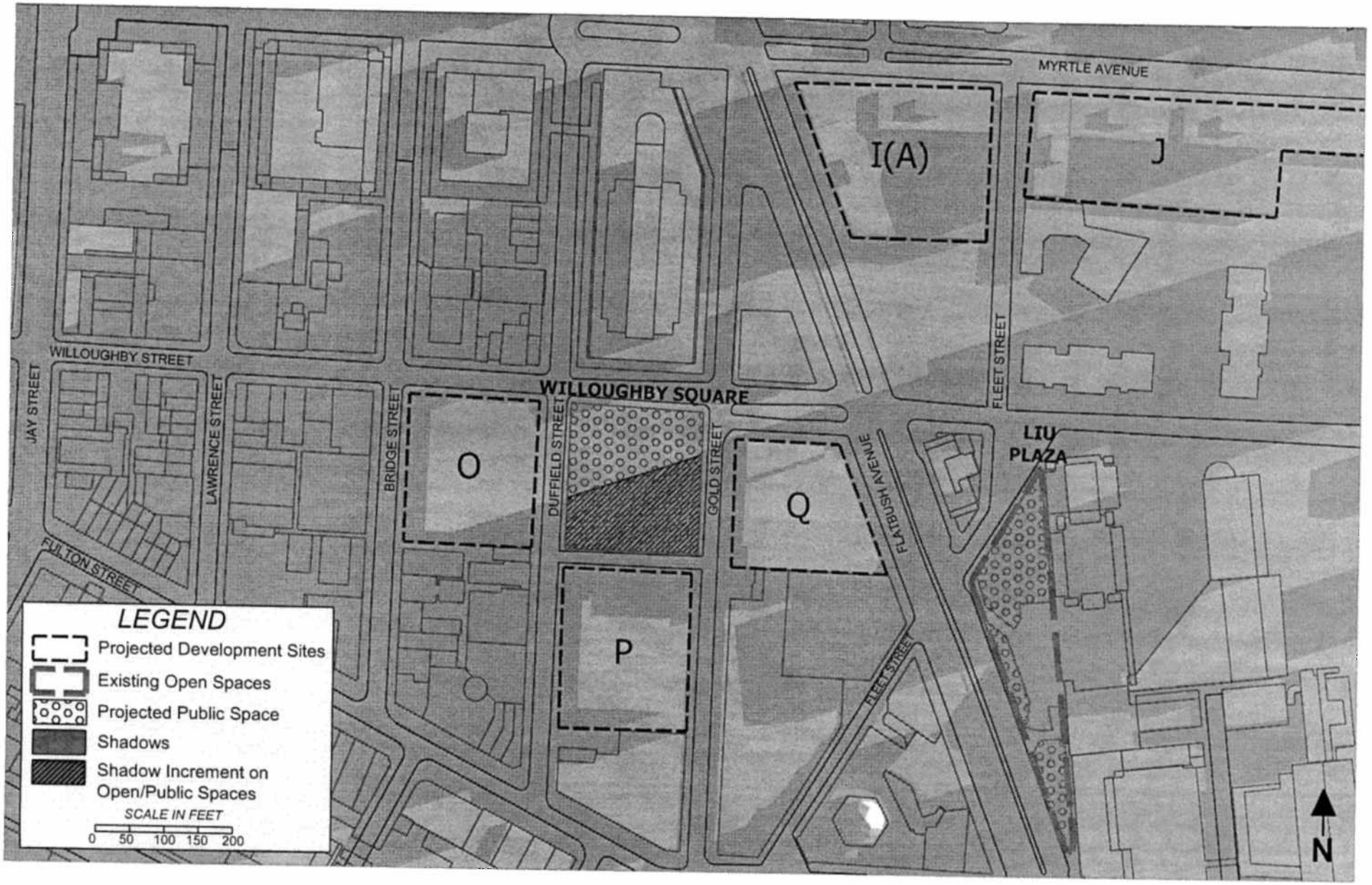

Shadow Diagrams
May 6 - 2:15 PM DST
*Figure 6 - 15*



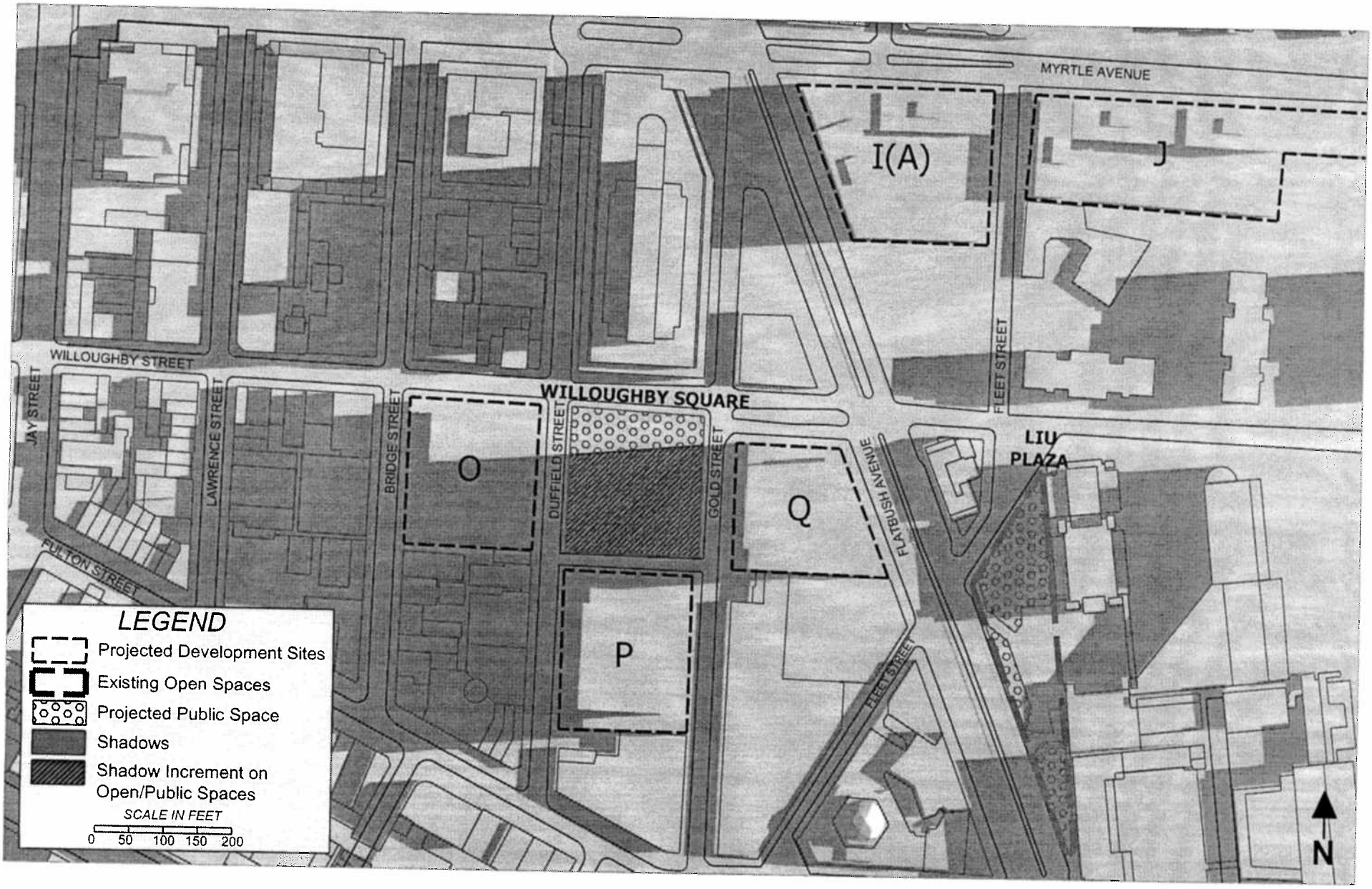

Shadow Diagrams
May 6 - 4:00 PM DST
*Figure 6 - 16*



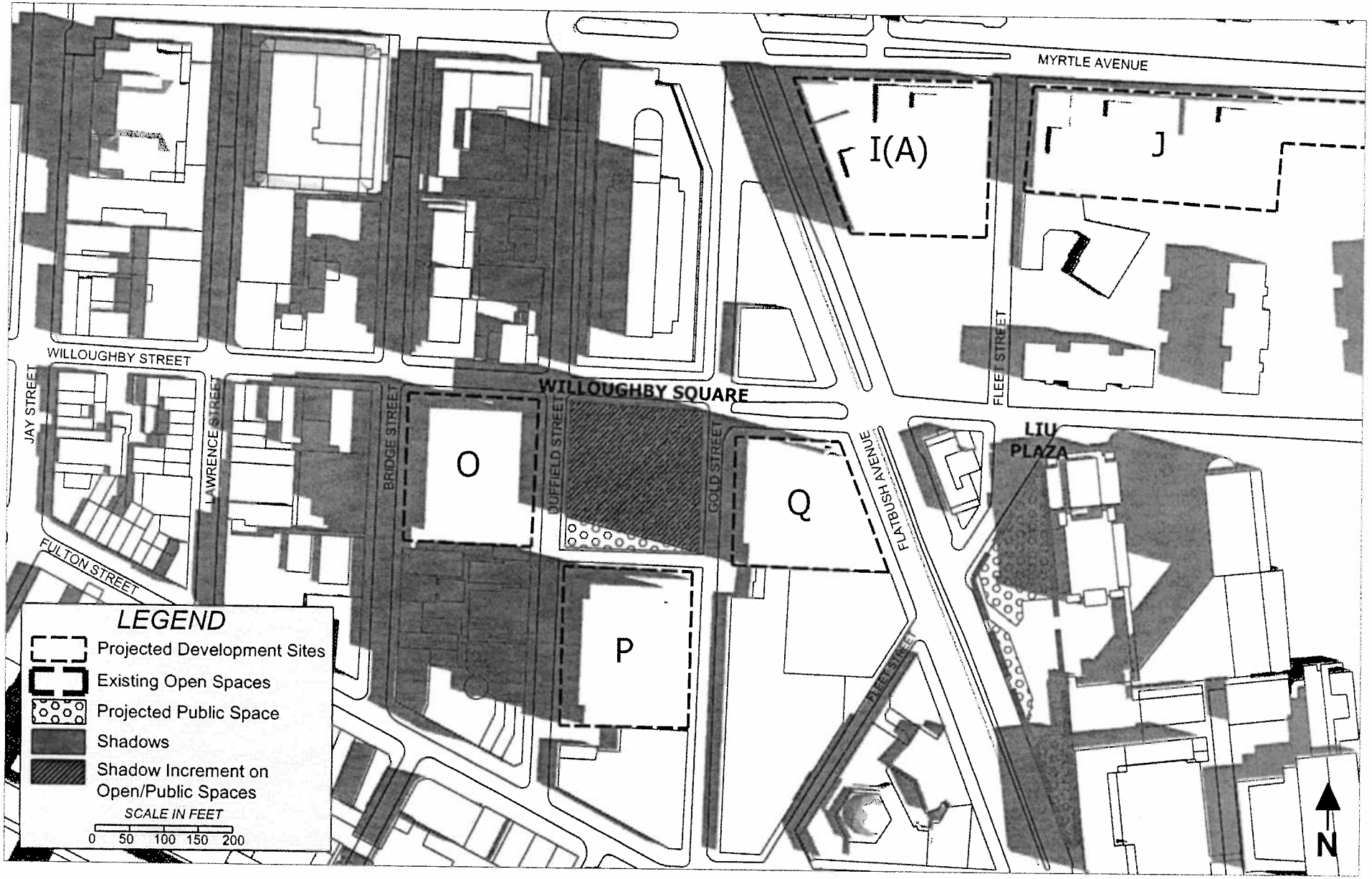

Shadow Diagrams
May 6 - 6:18 PM DST
*Figure 6 - 17*



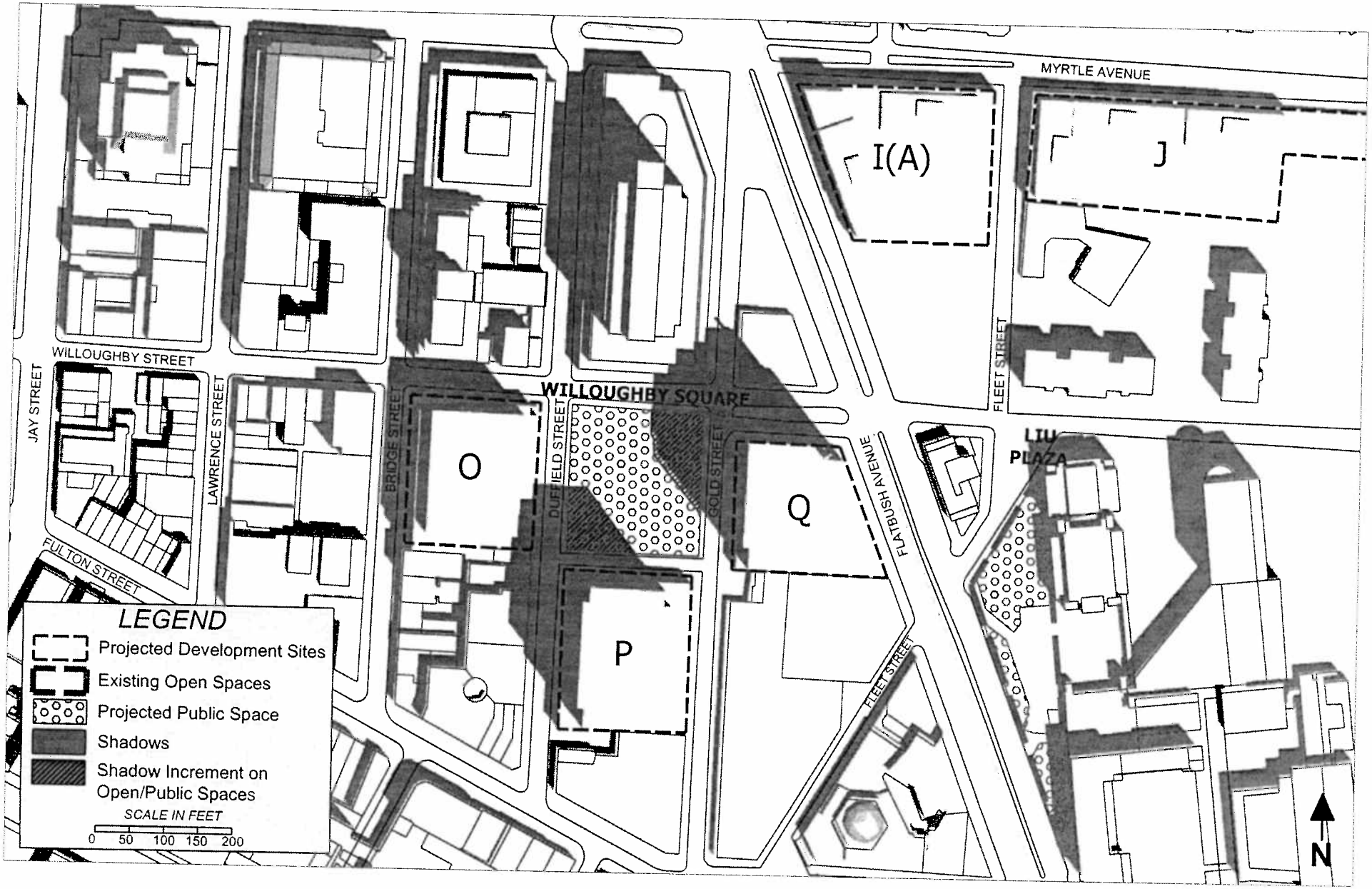

Shadow Diagrams
June 21 - 6:57 AM DST
*Figure 6 - 18*



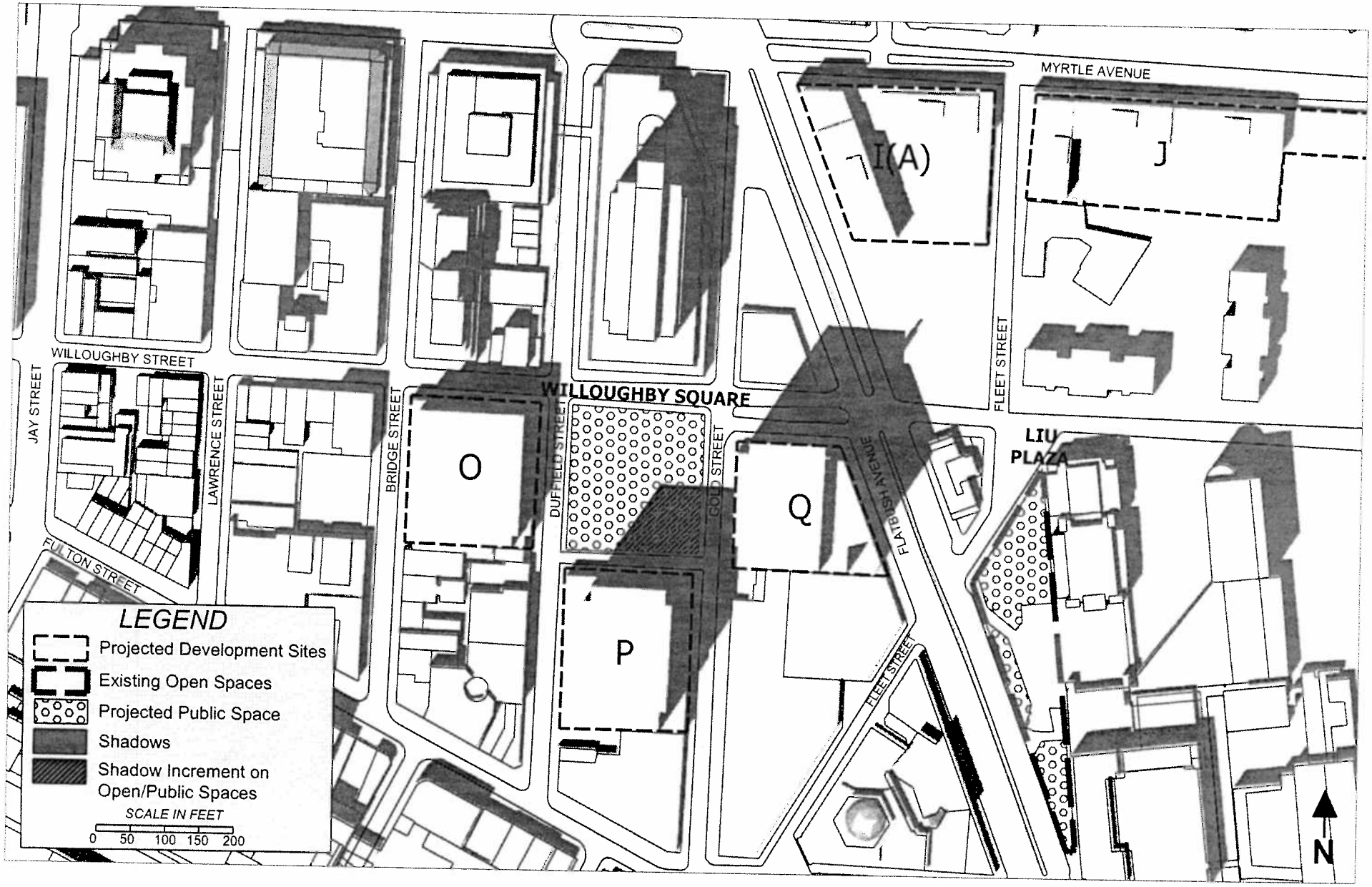

Shadow Diagrams
June 21 - 8:30 AM DST
*Figure 6 - 19*



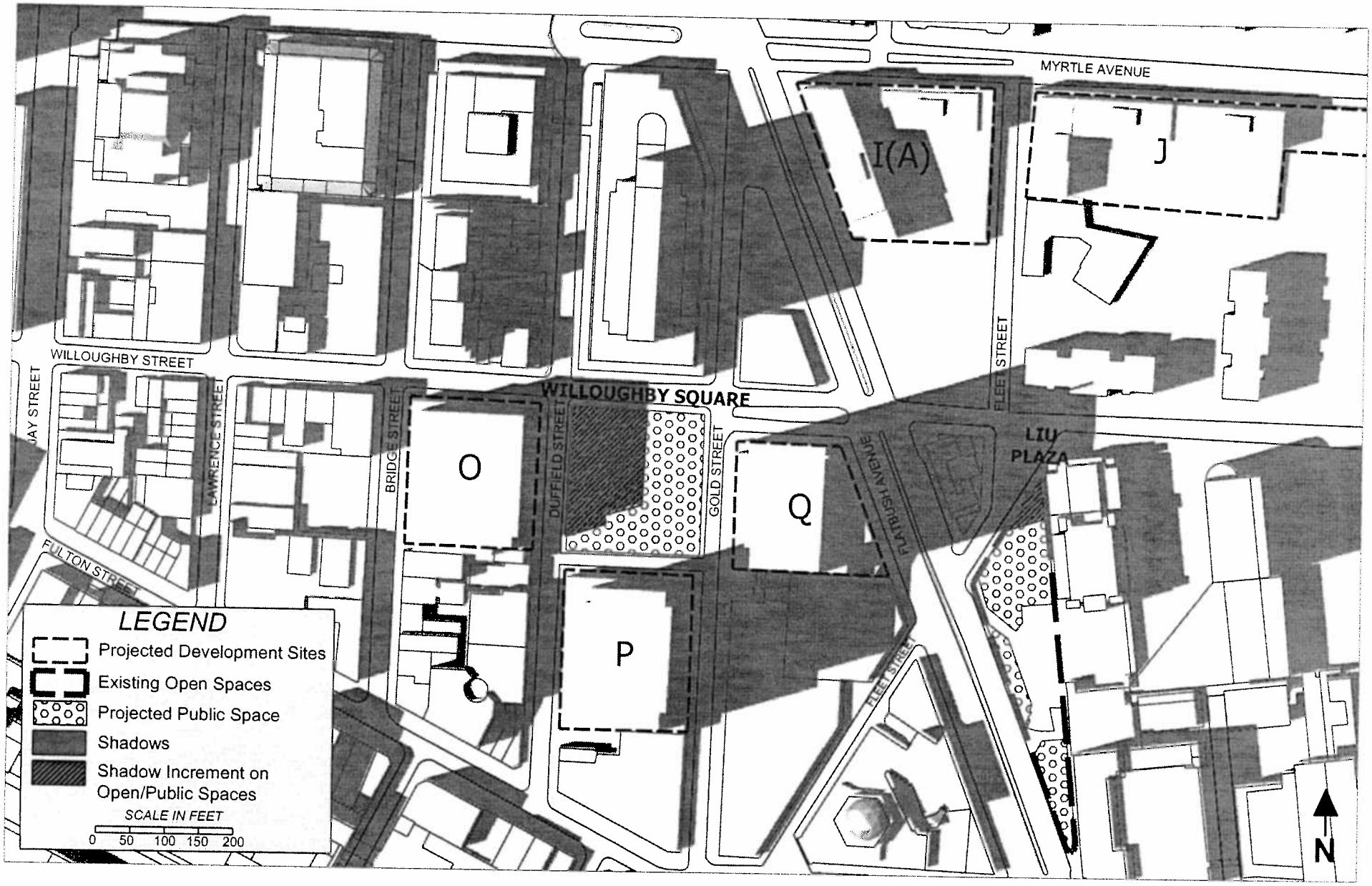

Shadow Diagrams
June 21 - 10:15 AM DST
*Figure 6 - 20*



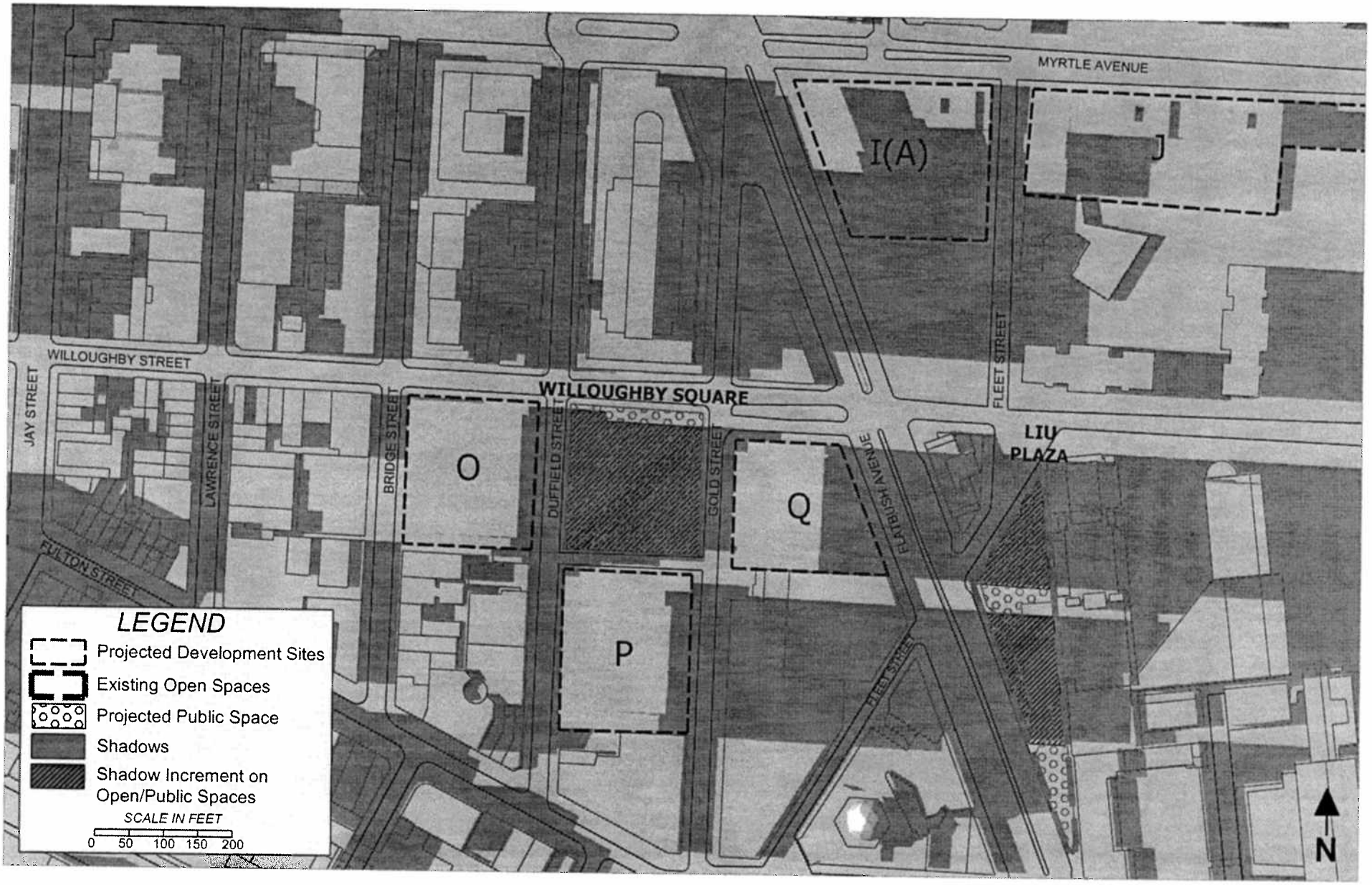

Shadow Diagrams
June 21 - 12:00 PM DST
*Figure 6 - 21*



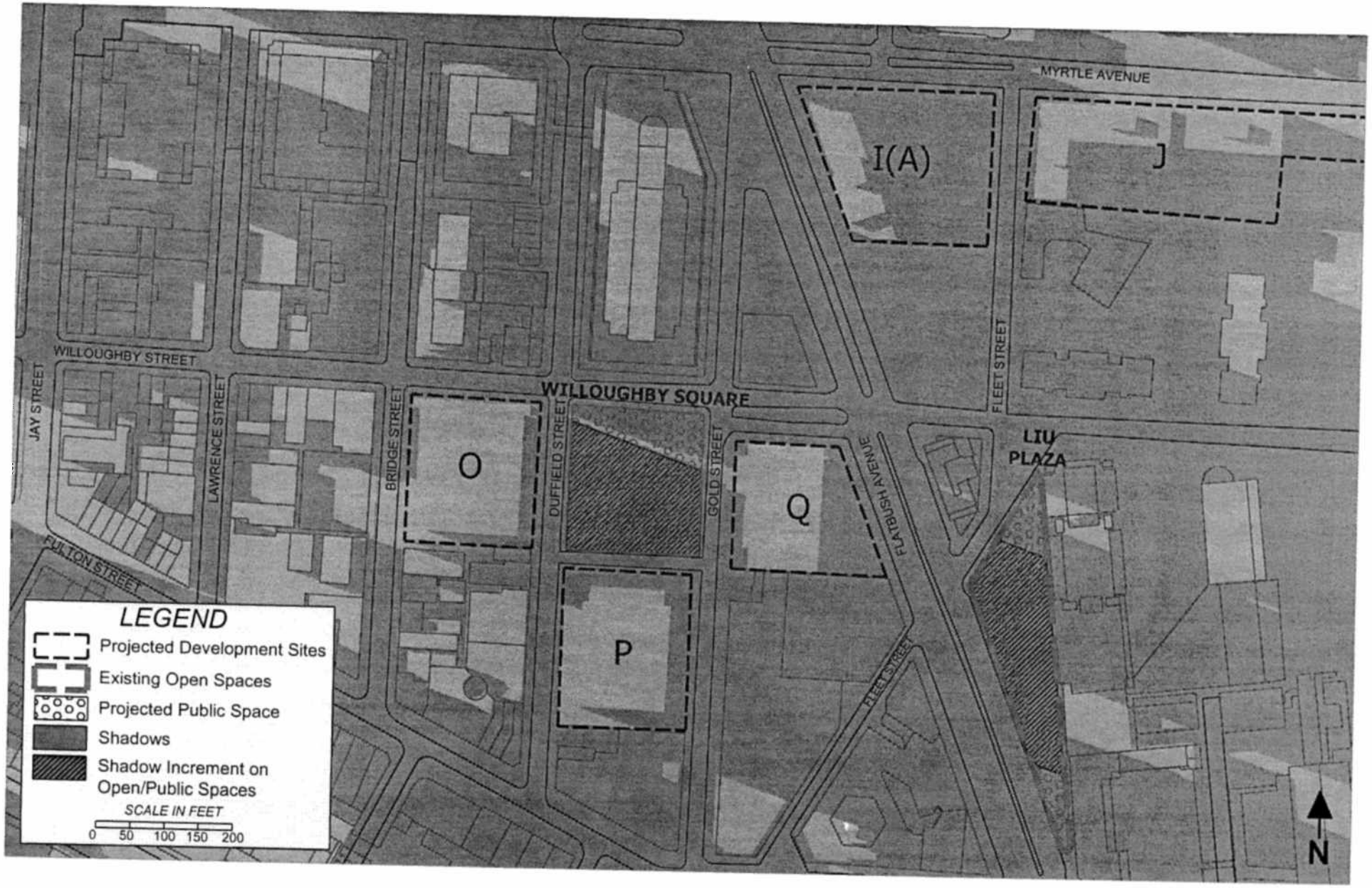

Shadow Diagrams
June 21 - 1:45 PM DST
*Figure 6 - 22*



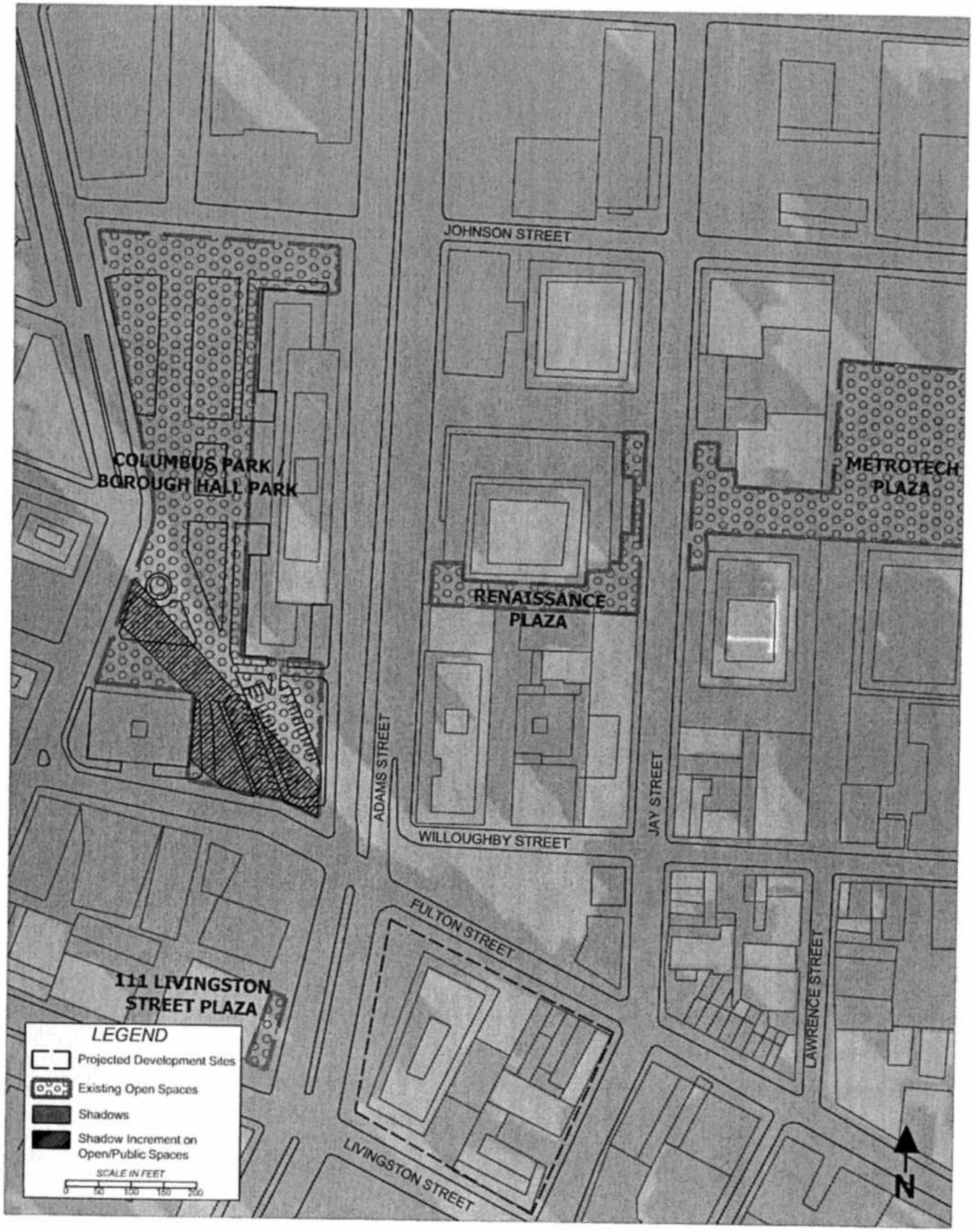

Shadow Diagrams
June 21 - 3:30 PM DST
*Figure 6 - 23*



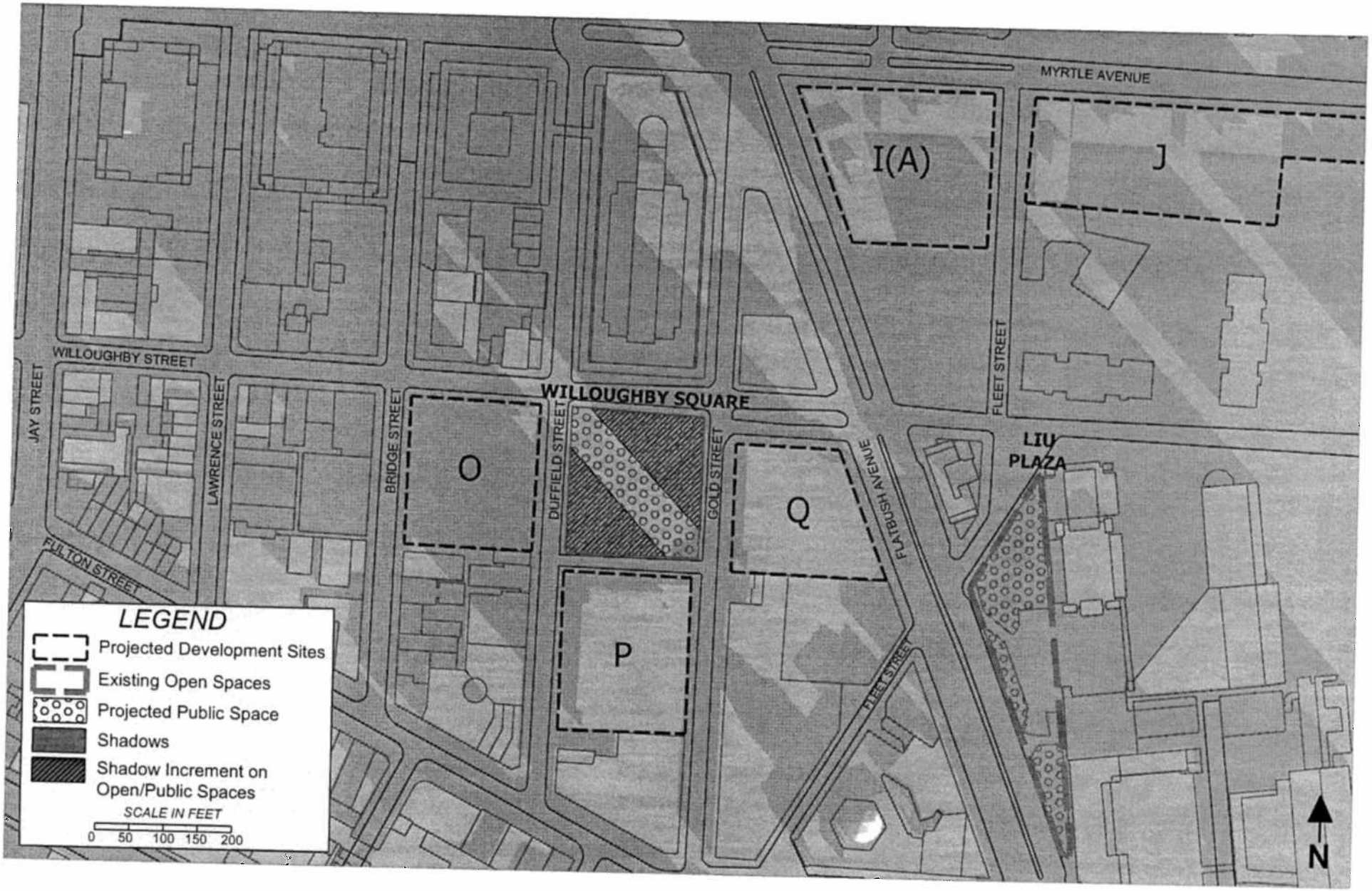

Shadow Diagrams
June 21 - 5:15 PM DST
*Figure 6 - 24*



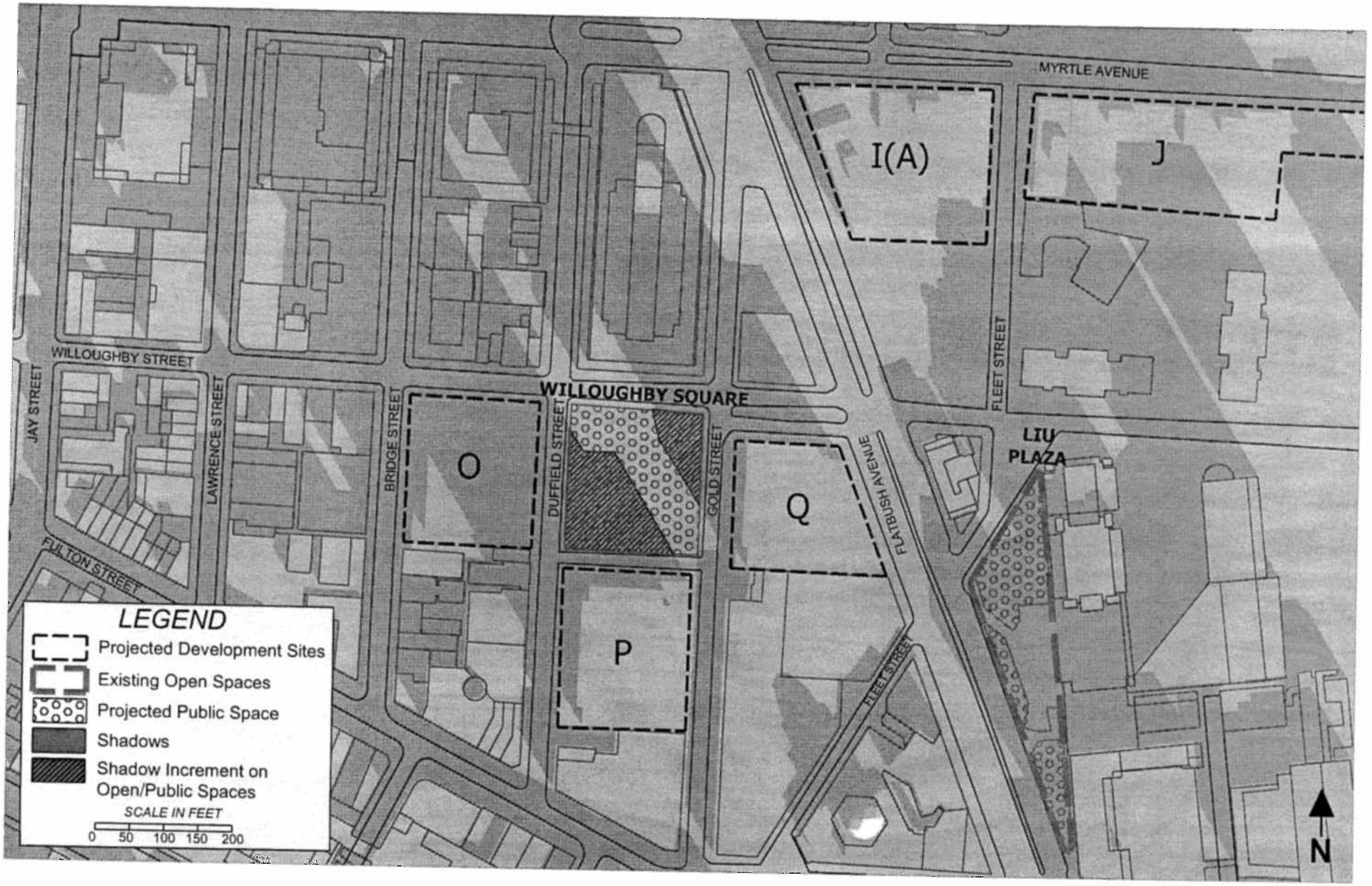

Shadow Diagrams
June 21 - 7:01 PM DST
*Figure 6 - 25*



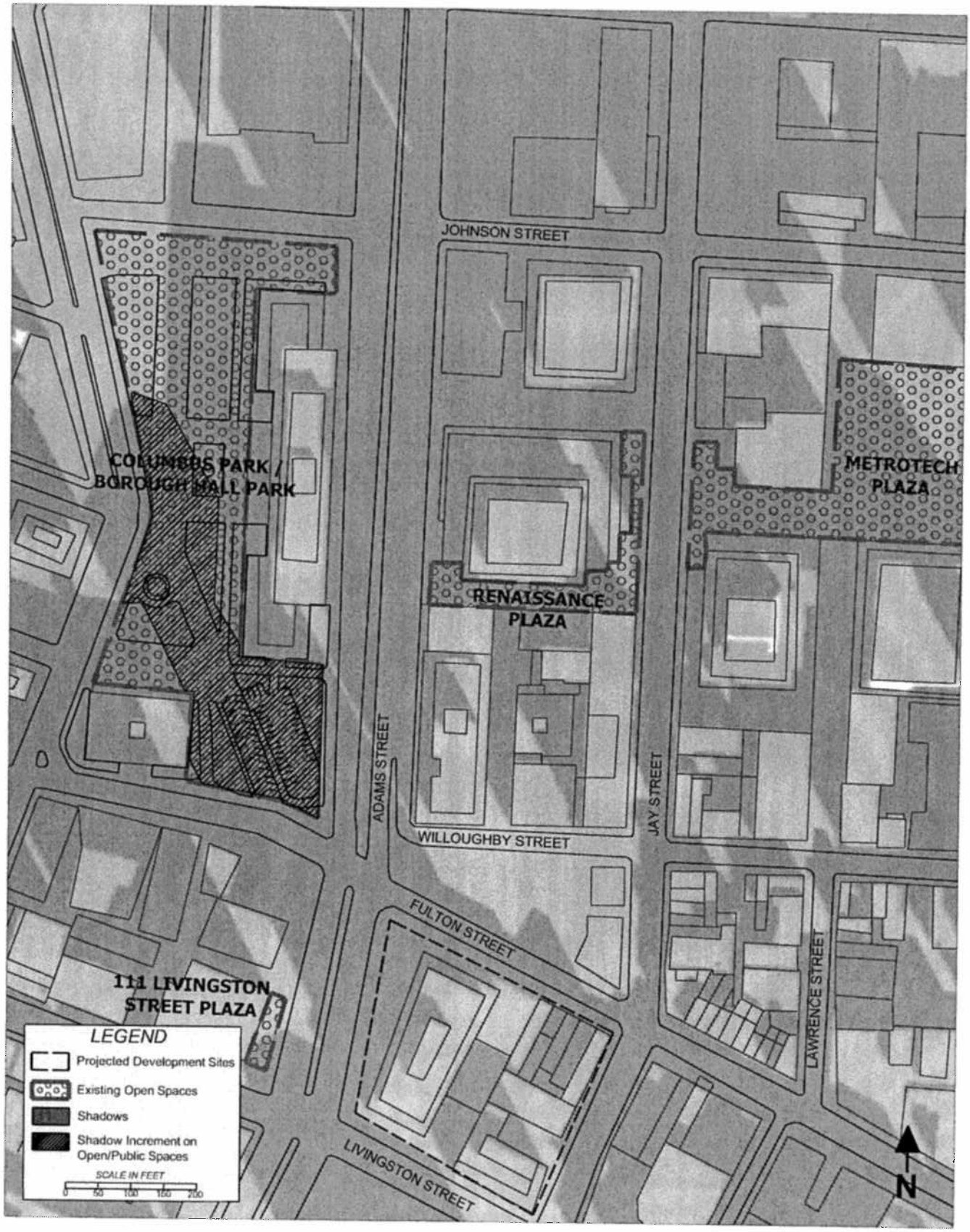

Shadow Diagrams
December 21 - 8:51 AM EST
*Figure 6 - 26*



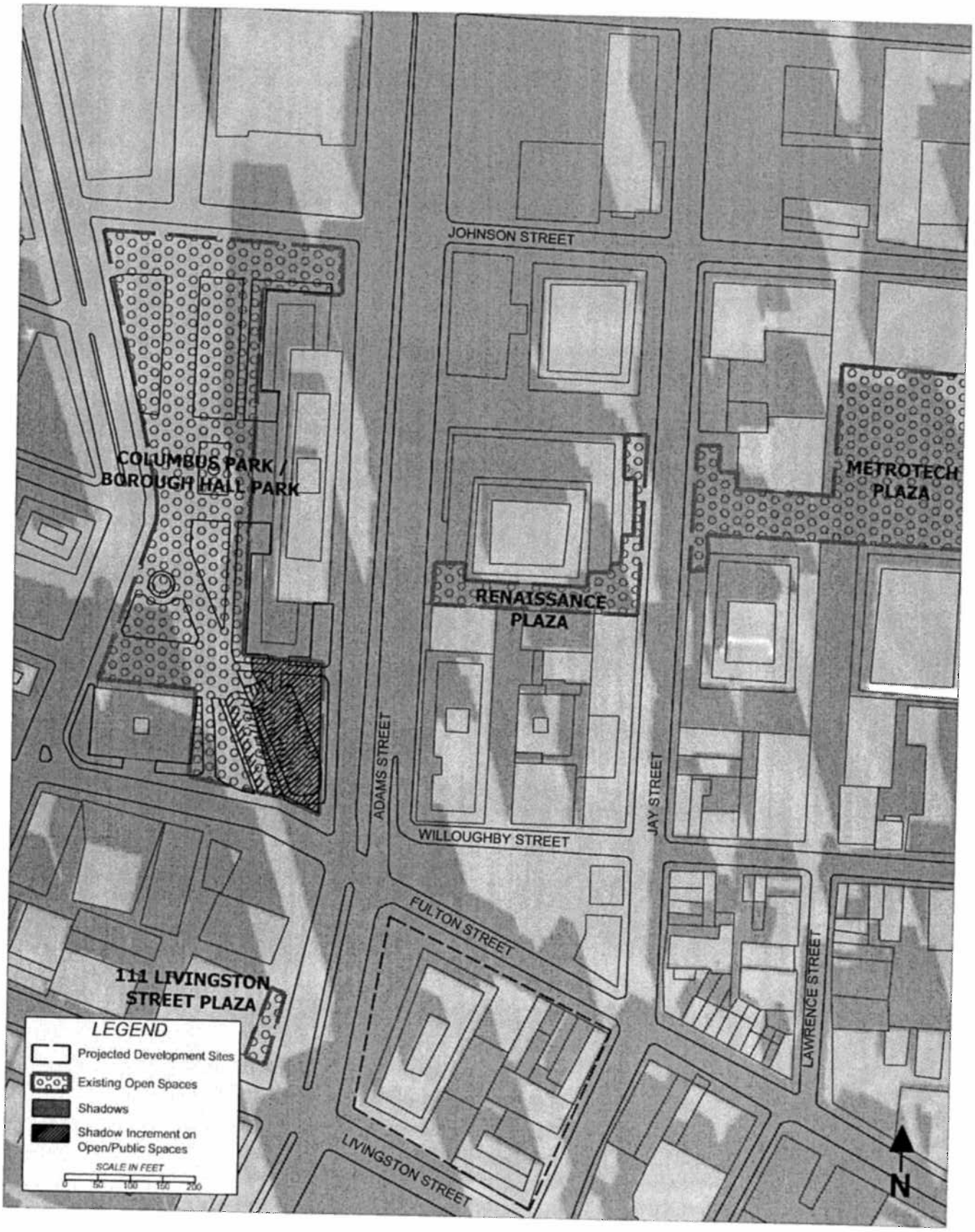

Shadow Diagrams
December 21 - 8:51 AM EST
*Figure 6 - 27*



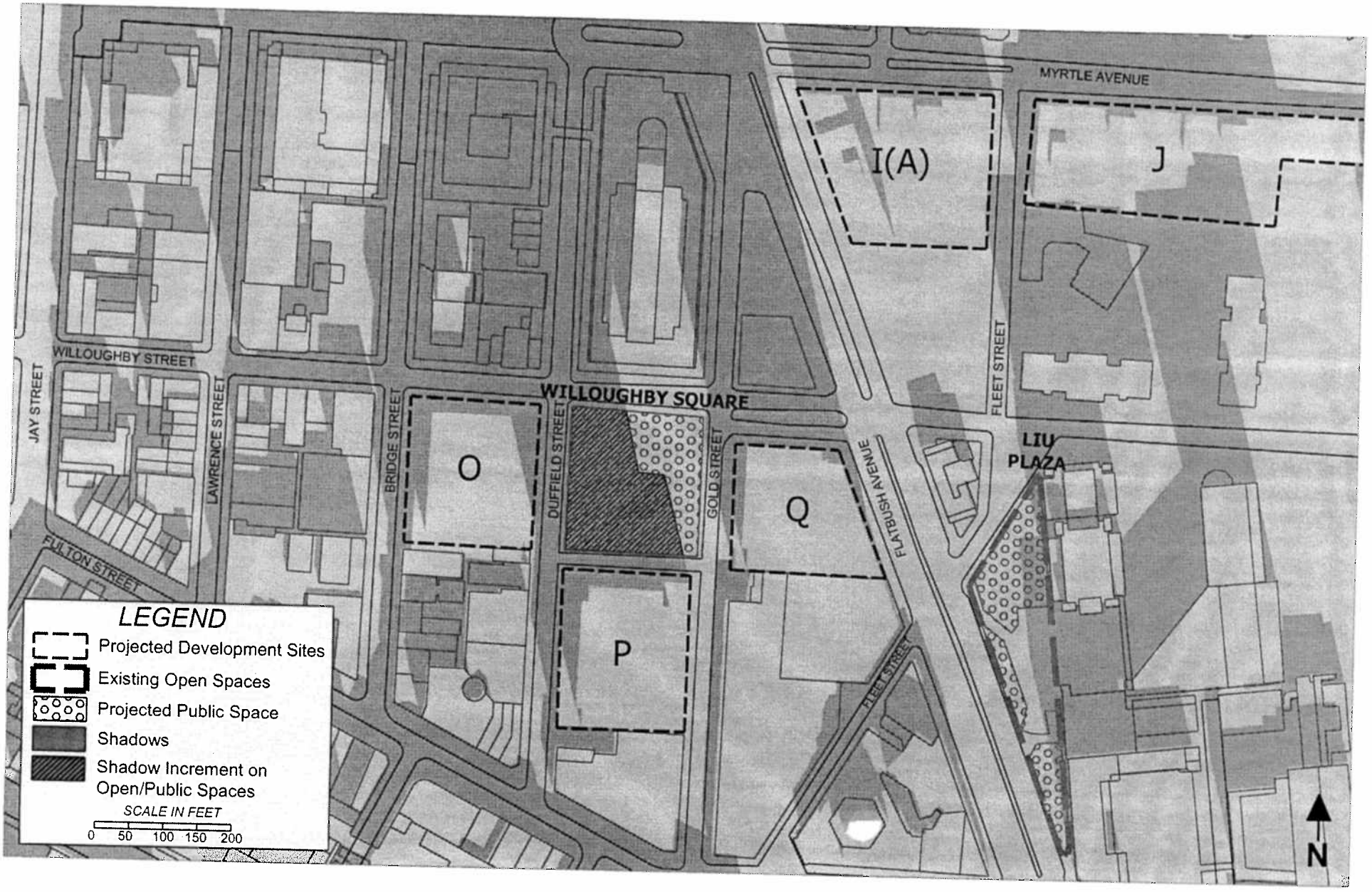

Shadow Diagrams
December 21 - 9:45 AM EST
*Figure 6 - 28*



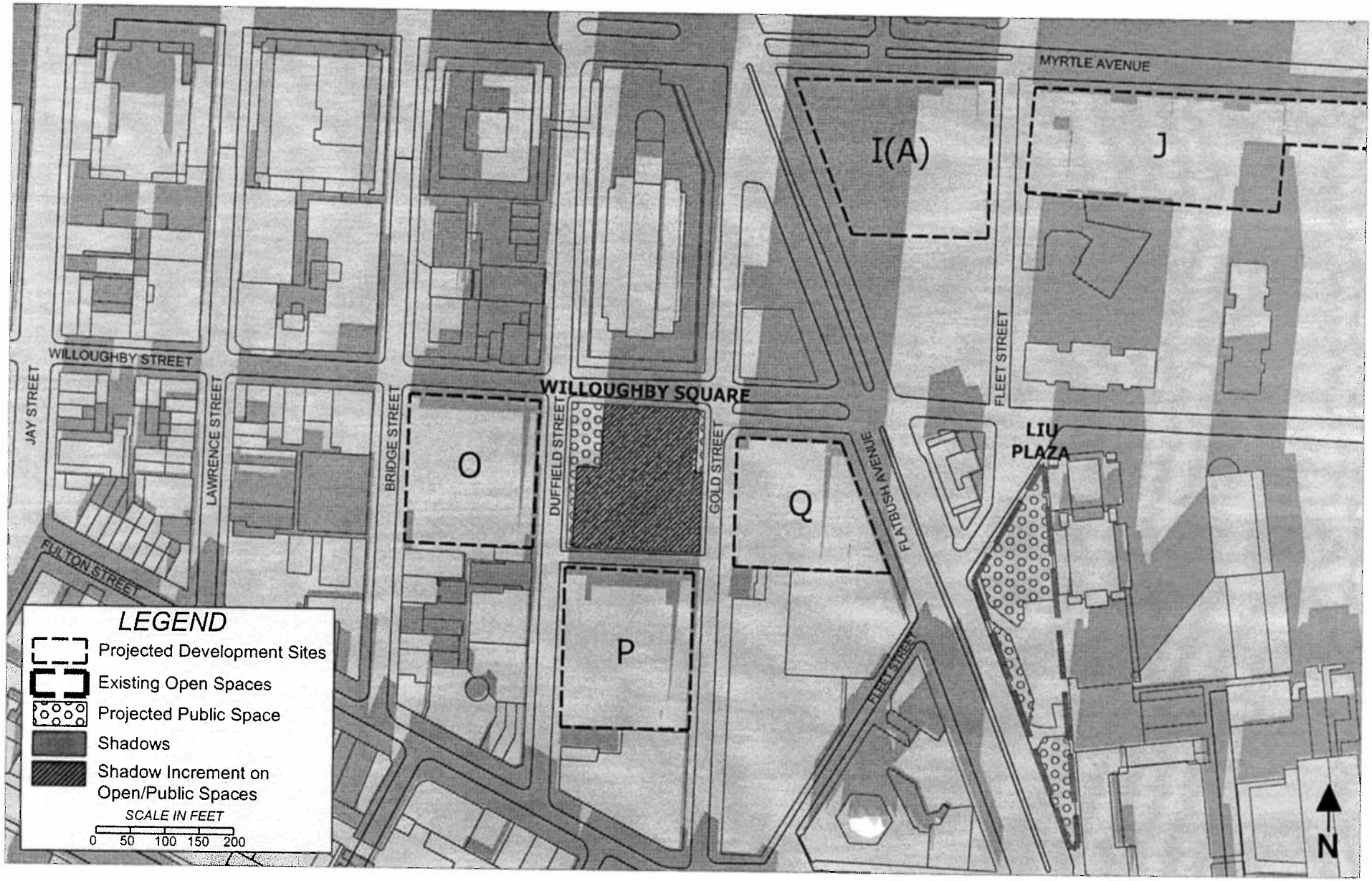

Shadow Diagrams
December 21 - 10:00 AM EST
*Figure 6 - 29*



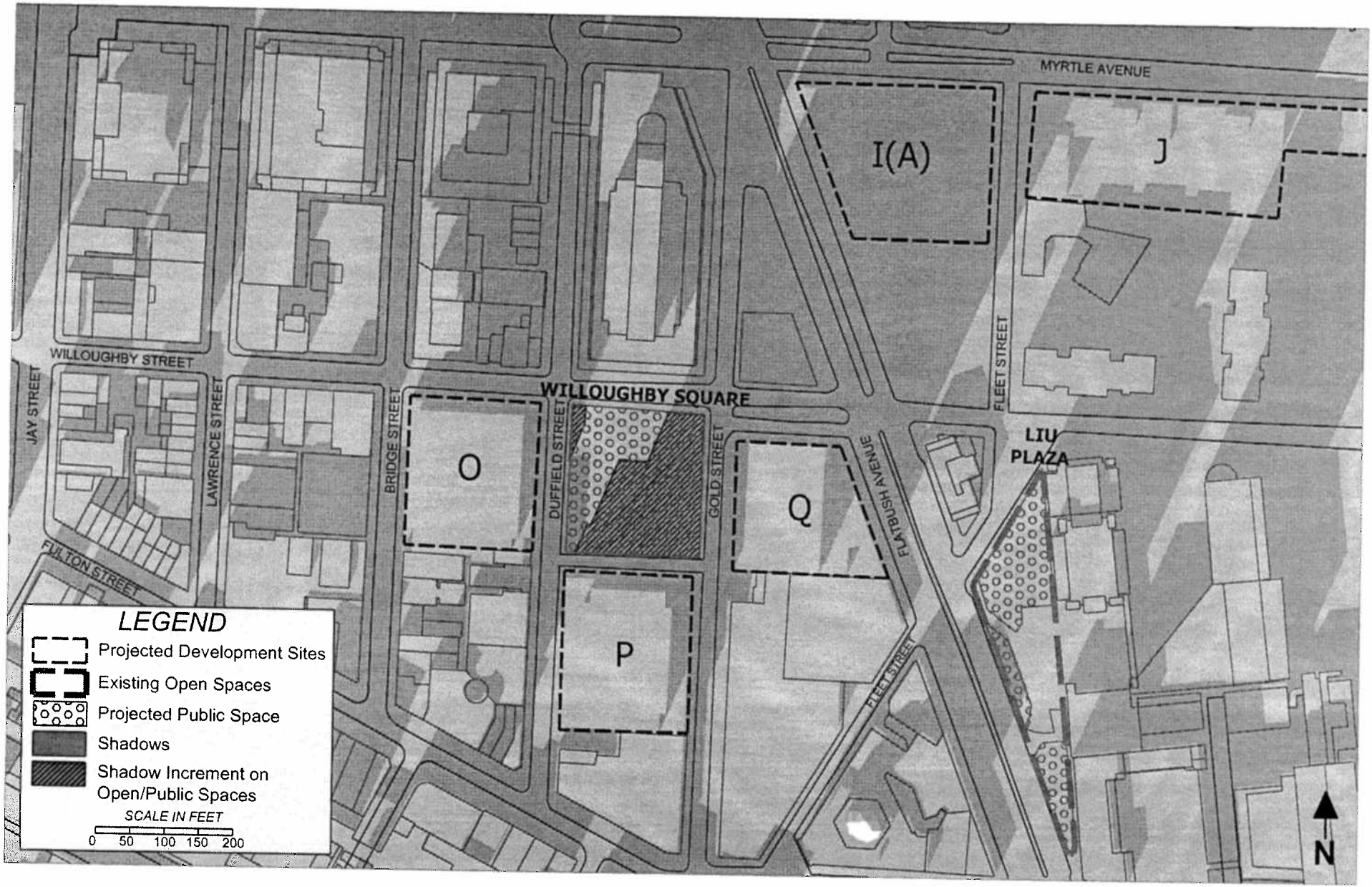

Shadow Diagrams
December 21 - 10:45 AM EST
*Figure 6 - 30*



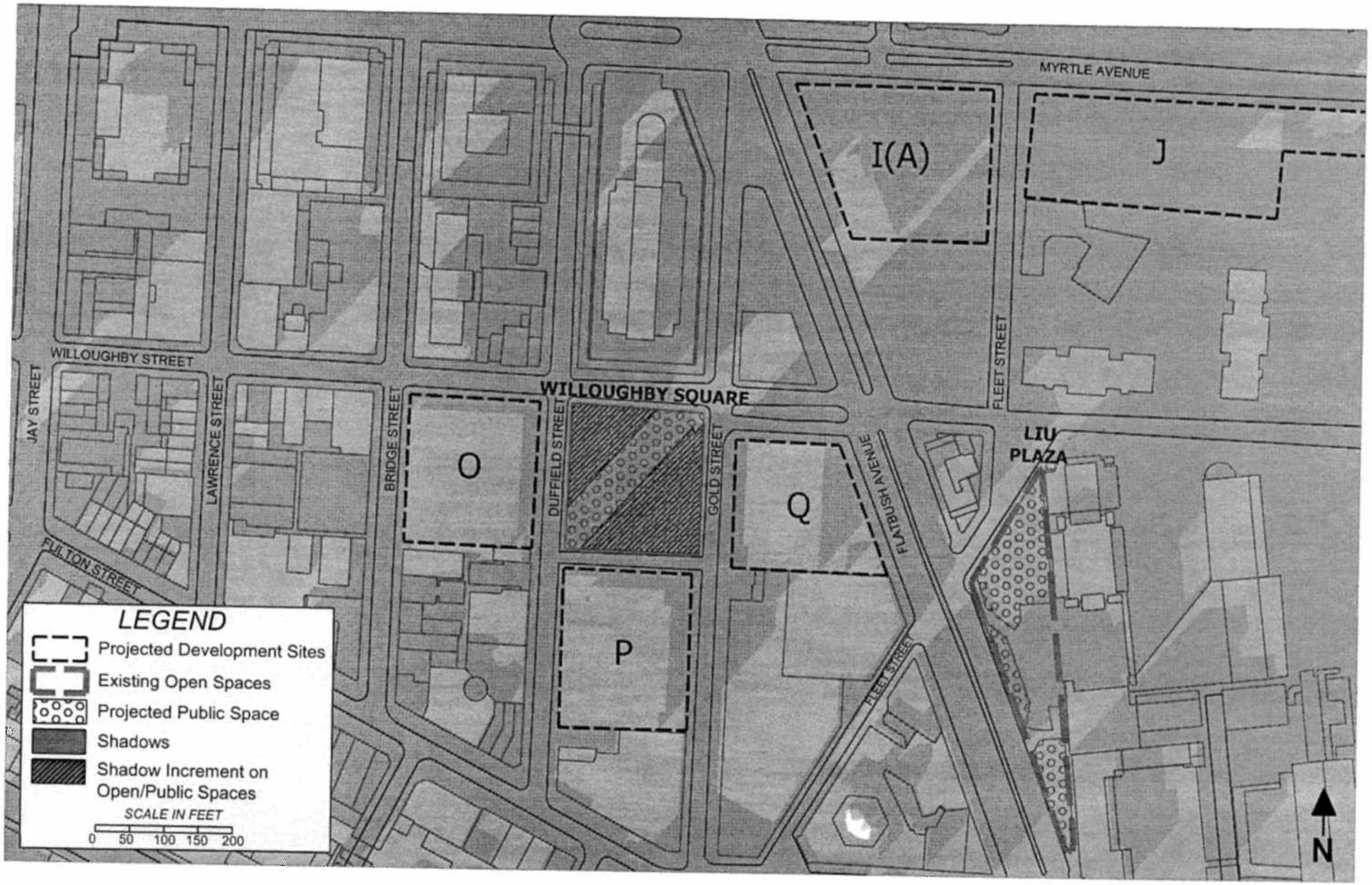

Shadow Diagrams
December 21 - 11:00 AM EST
*Figure 6 - 31*




Shadow Diagrams
December 21 - 12:15 PM EST
*Figure 6 - 32*




Shadow Diagrams
December 21 - 1:30 PM EST
*Figure 6 - 33*




Shadow Diagrams
December 21 - 2:53 PM EST
*Figure 6 - 34*

# A. INTRODUCTION

This chapter considers the potential of the proposed actions to affect architectural and archaeological resources within and around the project area. The rezoning area is roughly bounded by Tillary Street to the north, Ashland Place to the east, Schermerhorn Street to the south, and Adams Street to the west. Within this area, projected and potential development sites have been identified where new residential, commercial, retail, and institutional development is anticipated.

## ISSUES

The proposed actions would affect 59 blocks of the Downtown Brooklyn area, which contains numerous architectural resources (as described below) that relate to multiple periods of Brooklyn's development. A number of these resources are located adjacent to or within 90 feet of the identified projected and potential development sites; in addition, several architectural resources are located directly on development sites. This analysis focuses first on the resources located nearest the projected and potential development sites, and then includes a discussion of the resources that are located further away, which may experience contextual impacts. Since the development of sites pursuant to the proposed actions could involve subsurface disturbance, archaeological resources were also considered in this analysis.

## METHODOLOGY

The analysis of potential archaeological resources focuses on the projected and potential development sites, since these are the areas where any archaeological resources that might be present would most likely be disturbed as a result of the proposed actions. To evaluate the possibility that archaeological resources may exist on the development sites, the New York City Landmarks Preservation Commission (LPC) conducted a preliminary archaeological assessment of the sites.

Based on potential effects that could result where proposed construction activities might physically alter or damage an historic structure, where construction may be close enough to an historic structure to potentially cause structural damage, and also to account for visual or contextual impacts, the study area for architectural resources was defined as the project area, plus all structures on lots facing the project area boundary (see Figure 7-1). Within the study area, historic resources considered comprise officially recognized (known) historic resources—properties listed on the State or National Registers of Historic Places (S/NR) or determined eligible for such listing, National Historic Landmarks (NHL), and New York City Landmarks and Historic Districts (NYCL). Potential architectural resources that appear to meet eligibility criteria for listing on the S/NR or NYCL designation were also identified.

## CONCLUSIONS

The analysis of archaeological resources determined that 21 lots on four projected development sites and 10 lots on five potential development sites are considered to be potentially sensitive for 19th century archaeological resources. Individual Stage 1A Archaeological Assessments would be prepared for those lots which are currently City-owned or would be acquired by the City, as directed by LPC, before development of these sites would commence. If determined necessary by LPC, as a result of the Stage 1A Archaeological Assessment, Stage 1B field testing—for which a protocol would be submitted to and approved by LPC—and further testing, if needed, would be undertaken prior to development of these sites. In the event that Stage 1B field testing confirms that there are significant archaeological resources on the lots that cannot be recovered during the testing phase, full archaeological excavation would occur, or the development would be redesigned to leave the resources protected in place. Under the revised Brooklyn Center Urban Renewal Plan, each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not have any significant adverse impacts on the potential archaeological resources of these lots. For the lots which are not now and would not become City-owned, a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources in these lots pursuant to their development would be considered a potential unmitigatable, significant adverse impact.

There would be no direct impacts to known architectural resources with the proposed actions, as none are located on the projected and potential development sites. However, three potential architectural resources are located on projected development sites: the Joseph J. Jacobs Building, on site C, which LPC deems eligible for listing on the State and National Registers of Historic Places (S/NR listing); the Board of Education Building at 131 Livingston Street, on site M, which LPC deems eligible for designation as a New York City Landmark and S/NR listing; and 233 Duffield Street, on site P, which LPC deems eligible for designation as a New York City Landmark and S/NR listing. In addition, two potential architectural resources are located on potential development sites: 565-571 Fulton Street, on site R, which LPC deems eligible for New York City Landmark designation and S/NR listing; and 423 Fulton Street, on site L, which LPC deems eligible for S/NR listing. The removal of the buildings for these developments would constitute a significant adverse impact on architectural resources. Measures to mitigate this impact have been developed in consultation with LPC. In addition to these direct effects, several of the known and potential architectural resources are located within 90 feet of projected and potential development sites, and, therefore, could be potentially physically affected by ground-borne construction-period vibrations or other potential construction-related issues. It is expected that construction protection plans would be instituted for these developments in order to avoid potential physical impacts on these architectural resources.

The new, modern development on the projected and potential development sites that could occur as a result of the proposed actions would be expected to alter the context of the surrounding architectural resources, changing it from a mixed context of low-, medium-, and high-rise structures on lots of varied size to one with a greater concentration of high-rise structures on large sites. However, the bulk of the larger development would be located on the boundaries of the MetroTech area, which already contains a mix of tall office buildings and low-rise historic structures, and views to surrounding resources would not be blocked. New residential development along Livingston Street also would increase the visibility of resources on that block by

increasing activity on the street. Therefore, this change in context would not constitute a significant adverse impact on architectural resources.

A thorough documentation study has not uncovered a documentable association of the 227 Duffield Street, 233 Duffield Street, and 436 Gold Street buildings with the Underground Railroad, and there is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad. The potential existence of tunnels under the street buildings and any corroborating artifacts cannot be ascertained without further testing. Therefore, additional work, first in the form of a visual inspection of the interiors of the buildings after condemnation to ascertain the existence of other artifacts and, second, in the form of new continuous soil borings, would need to be undertaken at the sites. Soil borings will be conducted to determine subsurface conditions, such as fill layers, with the locations of borings to be approved by an archaeologist prior to their execution. This testing would be impracticable prior to demolition of these structures and while they are still occupied, and would therefore have to be conducted at the time of site redevelopment. If the soil borings indicate a potential for archeologically sensitive areas, Stage 1B testing will be undertaken in the potentially sensitive areas. The testing phase will first include the preparation of a testing protocol by a professional archaeologist, to be reviewed and approved by LPC prior to implementation. Testing will be conducted by a professional archaeologist, and appropriate research issues will be formulated in the event of a discovery.

Should the Stage 1B testing establish an association of one or all of these buildings with the Underground Railroad, and the National Park Service criteria for eligibility of Underground Railroad properties for National Historic Landmark designation or for listing on the National Register of Historic Places are met, the redevelopment of these sites pursuant to the proposed actions would constitute a significant adverse impact to archaeological resources. As required under the revised BCURP, measures to partially mitigate the elimination of these resources will, if required, be developed in consultation with LPC and performed prior to issuance of a certificate of occupancy to the redeveloper. See Chapter 20, "Mitigation," for further description of potential mitigation options.

## B. BACKGROUND HISTORY

Downtown Brooklyn was the center of the old Dutch town of Breukelen, which was founded in 1657. The area's initial growth was due to its proximity to the waterfront, where a ferry slip was located near the foot of today's Cadman Plaza West. In 1704, a road to the ferry was constructed. Initially called Ferry Road, this was the borough's earliest thoroughfare. Downtown Brooklyn's urban development began in the early 19th century, when the area was divided into lots and developed with residential uses. In 1811, Robert Fulton and Robert R. Livingston secured the exclusive rights to operate steamboats in New York State. By the following year, they had established scheduled ferry service between Fulton Street in Brooklyn and Fulton Street in Manhattan. The ferry service made it possible to live on one side of the river and work on the other. A variety of retail and downtown commercial uses developed along Montague Street, amidst an affluent neighborhood of brownstone buildings. In 1814, Ferry Road—then called Ferry Street—was renamed Fulton Street in honor of Robert Fulton. As a result of activity induced by the steamboat, commercial and residential activity in Brooklyn flourished in the 1820s and 1830s. Growth of the area was also stimulated by the opening of the Brooklyn Navy Yard on Wallabout Bay in 1801.

In 1834, Brooklyn was granted a city charter by the State legislature. The period from the mid-19th century to the turn of the 20th century was the peak of development for Downtown Brooklyn. Major improvements in the transportation networks occurred at this time and many outstanding examples of commercial and civic architecture were constructed. Ferry service also expanded during the mid-19th century, and a horse-drawn coach railway, the Brooklyn City Railroad Company, was incorporated in 1853. These early routes, which extended down Fulton Street and Myrtle Avenue, two of the main commercial arteries of Brooklyn, were later replaced by elevated transit lines. In 1883, the Brooklyn Bridge opened and created a vital new link to Manhattan. In 1865, the United States—Eastern District Court of New York was created, and its first session was held in Brooklyn Borough Hall. This Federal court activity triggered the shift in land use that ultimately established Downtown Brooklyn as the borough's center of municipal, State, and Federal government activity, both in the administrative and judicial branches. By the end of the 19th century, Brooklyn had developed into a thriving metropolis concentrated around City Hall (now Borough Hall) and Fulton Street. Downtown Brooklyn consisted of a mélange of ornately decorated public buildings and leading commercial and shopping facilities. In 1898, the City of Brooklyn was incorporated into Greater New York; at this time, it represented the third largest city in the United States.

In 1908, both the Borough Hall Interborough Rapid Transit (IRT) subway station and the Manhattan Bridge opened. By 1924, ferry service was terminated, supplanted by both the subway and the bridges. In the 1920s and 1930s, Borough Hall continued as the centerpiece of Downtown Brooklyn, and was surrounded by variety of governmental, commercial, educational, and other institutional buildings. Following World War II, Downtown Brooklyn underwent numerous changes; the "el" structures were demolished (including the removal of the Fulton Street elevated subway in 1941) and major streets were widened. Between 1950 and 1969, approximately 1.25 million square feet of city, state, and federal court and office space was added to Downtown Brooklyn, strengthening the area's role as a government center. Some of the area's educational and cultural institutions also expanded during these two decades, and the Fulton Street retail corridor was thriving and growing faster than any major downtown in the country. Fulton Street had become the City's second most important regional shopping center, after Herald Square.

The office market added three major new buildings in the 1960s and three in the early 1970s, but the remainder of the 1970s and early 1980s were marked by less activity and some notable signs of decline. Some of the area's movie palaces closed, and the retail core around Fulton Street experienced declines in sales and in the quality of its stores. A major new retail development, Albee Square Mall, was built in 1979 on the site of the former Albee Theater, but experienced financial difficulty. Deterioration in levels of subway service as well as the condition of several surrounding neighborhoods also contributed to the decline of Downtown Brooklyn. The intersection of Fulton Street and Atlantic Avenue—which had developed as the location of Brooklyn's most intense transportation hub and of its tallest building, the Williamsburg Savings Bank—also declined during this era. In the 1960s urban renewal plans were developed for this area. By the mid-1980s, Downtown Brooklyn began to reverse this trend as revitalization efforts were undertaken. During this decade, Borough Hall was renovated, and large office buildings were erected at One Pierrepont Plaza and Livingston Plaza. Perhaps the most significant office development of this period was MetroTech Center, which was constructed as part of an urban renewal effort sponsored by the City and is now occupied by some of Manhattan's major employers, including Chase Manhattan Bank (now JP Morgan/Chase) and City agencies.

# C. EXISTING CONDITIONS

## ARCHAEOLOGICAL RESOURCES

The New York City Landmarks Preservation Commission (LPC) conducted a preliminary archaeological assessment of the projected and potential development sites, as the development of these sites pursuant to the proposed actions would potentially require subsurface disturbance. LPC determined that the majority of the development sites had no archaeological significance. However, 21 lots on four projected development sites and 10 lots on six potential development sites were considered to be potentially sensitive for 19th century archaeological resources (see Table 7-1 and Figure 7-1 for the locations of lots).

**Table 7-1**
**Lots with Potential Archaeological Significance**

| Development Site | Block | Lot(s) | Nearest Cross Streets |
|---|---|---|---|
| **Projected Development Sites** | | | |
| I(A) | 2061 | 1 | Myrtle Avenue between Prince and Fleet Streets |
| O | 145 | 13, 14, 15, 18, 19, 20 | Willoughby and Bridge Streets |
| P | 146 | 12, 13, 14, 15, 29, 37, 41, 42, 43, 46, 47, 48, 49 | Willoughby Street and Albee Square West/Gold Street |
| AA | 165 | 58 | Livingston Street between Hoyt and Bond Streets |
| **Potential Development Sites** | | | |
| D | 133 | 5 | Flatbush Avenue and Johnson Street |
| H | 2049 | 2 (329-333 Gold Street and 104-112 Prince Street only) | Flatbush Avenue and Gold Street |
| I(B) | 2062 | 1, 17, 18, 19, 21, 24 | Willoughby and Fleet Streets |
| J | 2061 | 1 | Myrtle Avenue between Fleet Street and Ashland Place |
| Y | 164 | 1 | Livingston and Smith Streets |
| Z | 164 | 29 | Livingston Street between Smith and Hoyt Streets |

## ARCHITECTURAL RESOURCES

*PROJECT AREA*

*Known Resources*

There are 11 known architectural resources (properties listed on the State or National Registers of Historic Places (S/NR) or determined eligible for such listing; National Historic Landmarks (NHL); and New York City Landmarks and Historic Districts (NYCL)) within the project area's boundaries. These are described below, listed on Table 7-2, and mapped on Figure 7-1.

The **Atlantic Avenue Control House (IRT)** (S/NR-listed), a kiosk, was designed by Heins & LaFarge and built in 1908 (see Photograph 1 of Figure 7-2). One story tall and constructed of buff-colored brick with limestone and terra-cotta trim, it served as an entrance to the subway station until 1971. The control house was dismantled in 2000 as part of the Atlantic Avenue Long Island Rail Road (LIRR) terminal and subway station renovation. It recently has been reconstructed and will serve as an underground entrance to the renovated station.

## Table 7-2
## Architectural Resources within the Project and Study Areas

| Ref. No.† | Property Name/ Current Use | Address | Block/ Lot | NYCL | NYCL Eligible* | S/NR-Listed | S/NR-Eligible* |
|---|---|---|---|---|---|---|---|
| **PROJECT AREA** | | | | | | | |
| **Known Resources** | | | | | | | |
| 1 | Atlantic Avenue Control House (IRT) | Atlantic Avenue and Flatbush Avenue | | | | X | |
| 2 | Atlantic Avenue Subway Station (Eastern Parkway Line, 4/5) | Atlantic Avenue and Flatbush Avenue | N/A | | | | X** |
| 3 | Brooklyn Fire Headquarters (former) | 365-367 Jay Street | 147/2 | X | | X | |
| 4 | Dime Savings Bank | 9 DeKalb Avenue | 149/75 | X♦ | | | |
| 5 | Duffield Street Houses (4 buildings total) | 182, 184, 186, 188 Duffield Street (were 100, 106, 108 and 110 Johnson Street) | 2058/40 | X | | | X** (186 Duffield Street only) |
| 6 | First Free Congregational Church (now Polytechnic University) | 311 Bridge Street | 2047/7 | X | | | X** |
| 7 | Gage & Tollner Restaurant | 372 Fulton Street | 154/17 | X♦ | | X | |
| 8 | New York & New Jersey Telephone Company Building | 81 Willoughby Street | 148/39 | | X | | X** |
| 9 | New York Telephone Company, Long Island Headquarters | 101 Willoughby Street | 2058/1 | | X | | X** |
| 10 | Pioneer Warehouses | 37-53 and 74-92 Rockwell Place | 2109/9 | | X (by LPC previously) | | X** |
| 11 | Public School 5 (former) | 122 Tillary Street | 131/1 | | X• | | X** |
| **Potential Resources** | | | | | | | |
| A | | 345 Adams Street (aka 11-17 Willoughby Street) | 140/123 | | X | | X |
| B | | 376 Fulton Street | 154/18 | | X | | X♦ |
| C | | 446 Fulton Street | 156/26 | | | | X |
| D | (3 buildings total) | 565-571 Fulton Street | 149/25 | | X | | |
| E | | 308-310 Livingston Street | 166/25 | | X• | | X |
| F | A.I. Namm & Son Department Store Building (former) | 450 Fulton Street | 157/9 | | X | | X |
| G | America Fore Building (former) | 141 Livingston Street | 154/28 | | X | | X♦ |
| H | Board of Education Building | 131 Livingston Street | 154/1 | | X• | | X |
| I | Brooklyn Friends School | 375 Pearl Street | 140/106 | | | | X |
| J | Joseph J. Jacobs Building, Polytechnic University | 305-315 Jay Street | 142/1 | | | | X |
| K | Macy's (former Abraham & Strauss Buildings) | 418-430 Fulton Street and 15-29 Gallatin Place | 156/1,13 | | X | | X |
| L | Offerman Building/ Wechsler Brothers Block (former) | 248 Duffield Street/ 505 Fulton Street | 145/35 | | X | | X |
| M | Public School 15 (former) | 372 Schermerhorn Street | 174/1 | | | | X |
| N | St. Boniface Church | 111 Willoughby Street | 2058/38 | | | | X |
| Q | | 233 Duffield Street | 146/12 | | X• | | X• |
| R | Loesser's Department Store (former) | 25 Elm Place/ 229 Livingston Street | 158/1 | | | | X• |
| S | | 495 Fulton Street | 152/1 | | | | X• |

**Table 7-2 (cont'd)**
**Architectural Resources within the Project and Study Areas**

| Ref. No.† | Property Name/ Current Use | Address | Block/ Lot | NYCL | NYCL Eligible* | S/NR-Listed | S/NR-Eligible* |
|---|---|---|---|---|---|---|---|
| **Potential Resources (cont'd)** | | | | | | | |
| T | | 386-388 Fulton Street | 155/10 | | X* | | |
| U | | 423 Fulton Street | 150/11 | | | | X* |
| **STUDY AREA** | | | | | | | |
| **Known Resources** | | | | | | | |
| 12 | Baptist Temple | 360 Schermerhorn Street | 173/23 | | | X | |
| 13 | Brooklyn Academy of Music Historic District | Bounded by Lafayette Avenue, Fulton Street, Ashland Place, and State Street | N/A | X | | | X** |
| 14 | Brooklyn Central Courthouse | 120 Schermerhorn Street | 169/17 | | X | | X** |
| 15 | Fort Greene Historic District and Expansion (S/NR district includes NYCL BAM district) | Bounded by Myrtle and Vanderbilt Avenues, Fulton Street, and Ft. Greene Place; expansion extends to DeKalb Avenue, S. Oxford Street, and Hanson and Ashland Places | N/A | X (Historic District only, not Expansion ) | | X | |
| 16 | Friends Meeting House | 110 Schermerhorn Street | 169/9 | X | | X | |
| 17 | United States Post Office and Court House, Brooklyn Central Office | 271-301 Cadman Plaza East | 127/1 | X | | X | |
| 18 | Williamsburg Savings Bank Building | 1 Hanson Place | 2111/1 | X♦ | | X | |
| **Potential Resources** | | | | | | | |
| O | (15 buildings total) | 522-550 State Street | 180/7,9-22 | | | | X |
| P | Board of Education Headquarters (former) | 110 Livingston Street | 269/1 | | X | | X |

**Notes:**
† Reference numbers/letters correspond to Figure 7-1.
* Unless otherwise noted, determinations of eligibility made by LPC in comment letter dated July 26, 2002.
** Determinations of eligibility made previously, by OPRHP.
NYCL interior and exterior.
♦ Determinations of eligibility made by LPC in comment letter dated November 13, 2003.
▪ Determinations of eligibility made by LPC in comment letter dated April 19, 2004.

The **Atlantic Avenue Subway Station (IRT)** (S/NR-eligible) at Flatbush Avenue, also designed by Heins & LaFarge, opened in 1908. Its decorative elements include mosaic and faience plaques of the initial A, surrounded by Dutch tulips (see Photograph 2 of Figure 7-2). At the western end of the Long Island Railroad Terminal are the remains of a spur which connected the subways with the LIRR. The spur was designed by August Belmont, the German-Jewish banker who was the president of the Interborough Rapid Transit (IRT) company and the subway's principal financier.

The former **Brooklyn Fire Headquarters** (NYCL, S/NR-listed) is located at 365-367 Jay Street (see Photograph 3 of Figure 7-3). The building was designed by Frank Freeman in the Roman-esque Revival style and built in 1892. It is faced in rock-faced granite, red sandstone, and gold Roman brick, and trimmed with terra cotta. The former firehouse consists of two sections: a 5-story section with an arched fire engine garage, and an adjacent 6-story watchtower. Both

sections are capped by pyramidal roofs covered with red tile. The building was converted into low-income housing in 1987.

**Dime Savings Bank** (NYCL, interior and exterior) is located at 9 DeKalb Avenue (see Photograph 4 of Figure 7-3). It was designed in the Classical Revival style by Mowbray & Uffinger in 1906-08, and substantially enlarged by Halsey, McCormack & Helmer in 1931-32. The building is faced with marble; it has a temple front and is capped by a dome. The focus of the interior of the building, which is also a NYCL, is a rotunda supported by 12 red German marble columns with gilded capitals displaying Mercury dimes.

**Duffield Street Houses** (NYCL, S/NR-eligible [186 Duffield Street only]). 182, 184, 186, and 188 Duffield Street—formerly 100, 106, 108, and 110 Johnson Street—are Greek Revival row houses that were built between 1835 and 1847 (see Photograph 5 of Figure 7-4). The houses feature Queen Anne, Second Empire, British Aesthetic, Gothic Revival, and Greek Revival elements. 186 Duffield Street (the only S/NR-eligible property of the group) has a free-standing Greek revival portico, and 184 Duffield Street retains its second story enclosed tea-room porch. Three of the four houses were built by Reverend Samuel Roosevelt Johnson on what was his grandfather's colonial-era farm; 186 Duffield Street may have been a Johnson family residence. Instead of being demolished for the MetroTech project, the houses were moved from Johnson Street to their current location in 1990, and a covenant which required a small front yard was honored in the move.

**First Free Congregational Church** (NYCL, S/NR-eligible), later the Bridge Street African Wesleyan Methodist Episcopal Church, and now Wunsch Hall of Polytechnic University, is located at 311 Bridge Street (see Photograph 6 of Figure 7-4). The Greek Revival-style building was constructed in 1846-47 and first served as a Congregational church. Seven years after its completion, it was sold to Brooklyn's oldest African-American congregation, the African Wesleyan Methodist Episcopal Church. This congregation, which became known as the Bridge Street A.W.M.E. Church, occupied the building for 84 years before moving to Bedford-Stuyvesant. The church is also reported to have been a stop on the Underground Railroad. It later became a factory and was acquired by Polytechnic Institute (now Polytechnic University) in 1968. The university now uses the building as a student center.

The **Gage & Tollner Restaurant** (NYCL, interior and exterior, S/NR-listed) building, at 372 Fulton Street, dates from ca. 1875; the restaurant interior dates from 1892 (see Photograph 7 of Figure 7-5). Gage & Tollner was founded by Charles M. Gage at a nearby location in 1879. The restaurant moved to its current building in 1892; at that time, a new wooden shop front was added and the interior was redesigned. The dining room, a NYCL, has cherry wood trim, original furnishings and mirrors, Lincrusta wall covering, and gaslight fixtures.

**New York & New Jersey Telephone Company Building** (NYCL-eligible, S/NR-eligible), located at 81 Willoughby Street, was Brooklyn's first telephone headquarters (see Photograph 8 of Figure 7-5). The 7-story, tan brick and stone building was constructed in 1898 and designed by R.L. Daus in the Beaux Arts-Renaissance Revival style. Symbolic ornament on the buildings' façade includes intertwined TC (for telephone company) initials over the door and bells, earpieces, and wall telephones.

**New York Telephone Company, Long Island Headquarters** (NYCL-eligible, S/NR-eligible), 101 Willoughby Street, was designed by Voorhees, Gmelin & Walker and built in 1931 (see Photograph 9 of Figure 7-6). The 27-story building is faced with brick with a graded palette. The ground-floor windows have Art Deco style grillages.

The **Pioneer Warehouses** (NYCL-eligible, S/NR-eligible), 37-53 Flatbush Avenue and 74-92 Rockwell Place, were originally designed by J. Graham Glover in 1896. The original warehouses consisted of a 2-story building at 41-43 Flatbush Avenue and a 7-story building at 78-84 Rockwell Place. Major additions to these structures took place in 1902, 1910, and 1914. The existing 10-story building probably dates from sometime after 1914 (see Photograph 10 of Figure 7-6). The warehouses have a classically-inspired front façade of buff brick, concrete, and terra-cotta, with ornamental ironwork. The design incorporates prows of ships that project from the face of the building, and lions' heads that ornament its base. A red brick extension building at 74 Rockwell Place was designed by Walter H. Volckening and dates from 1931.

Former **Public School 5** (NYCL-eligible, S/NR-eligible), now the George Westinghouse Information Technology High School, is a 4-story building located at 114 Tillary Street (see Photograph 11 of Figure 7-7). The school was designed in the Collegiate Gothic style by C.B.J. Snyder, the Superintendent for Buildings for the New York City Board of Education, and constructed in 1908. The brick and limestone building is distinguished at the street level by a Gothic arcade and at the roofline by steep gabled parapets, crenellation, and tracery. A 1960 addition to the south of the original building is constructed of red brick.

*Potential Resources*

There are 19 potential architectural resources within the project area's boundaries. These are described below, listed on Table 7-2, and mapped on Figure 7-1. As noted on Table 7-2, determinations of NYCL and S/NR eligibility of potential architectural resources were made by LPC. No NYCL designations, or determinations of S/NR-eligibility by the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP), have been made.

**345 Adams Street** (NYCL-eligible, S/NR-eligible), also known as 11-17 Willoughby Street, is a 12-story building that was constructed as offices for the Brooklyn Edison Company (see Photograph 12 of Figure 7-7). The first phase of the building was built in 1924; the second phase of construction, in 1926, expanded the building to the north to connect to 368 Pearl Street, a 3-story red brick building which was also owned by Brooklyn Edison. The original entrance to the building is on Pearl Street; however, in 1960, after Adams Street was widened, the building's main entrance and façade were shifted to Adams Street. The building was designed by McKenzie, Voorhees, & Gmelin in a Renaissance palazzo style. It is faced in white brick with a light-colored, 2-story stone base and light-colored terra cotta detail. The top two floors are set back behind a metal railing and are topped with a red tile, hipped roof. There are ornate metal lamps on the Willoughby Street façade. The building underwent an extensive renovation ca. 1994-2001, conducted by Robert Silman Associates.

**376 Fulton Street** (NYCL-eligible), a 5-story building that dates from ca. 1874 (see Photograph 13 of Figure 7-8). The fifth story is a mansard roof that could potentially be a later addition to the building. The second, third, and fourth floors have segmental arched windows separated by attached columns. It was occupied by the firm of Balch, Price & Co.—a hat and fur house—from 1874 until 1918.

**446 Fulton Street** (S/NR-eligible), also known as the Liebmann Brothers Building, is a 4-story, red brick building with Romanesque details (see Photograph 14 of Figure 7-8). The building dates at least from 1893, and possibly as early as the 1880s. The northeast corner of the building (at the southwest corner of Fulton and Hoyt Streets) is topped by a metal-faced tower, and there are two metal-faced bays at the second and third stories on the Hoyt Street façade. The Hoyt and Fulton Street corner of the building is faced with metal at the second and third stories, with large

plate-glass windows; this portion of the building, while possibly an alteration, appears to date from at least the late 1930s. The first floor of the building has been heavily altered. In 1897, the Liebmann Brothers sold their stock to the Joseph H. Bauland Company, a Chicago dry goods merchant company, which intended to remodel the store into an arcade building.

**565, 569, and 571 Fulton Street** (NYCL-eligible), three 4-story cast iron buildings, appear to have been constructed sometime between 1869 and 1880; they first appear on the 1880 Bromley map as part of the Hanover Building, which stretches from 559-571 Fulton Street and appears to be made up of six separate but attached buildings (see Photograph 15 of Figure 7-9). In the late 19th century the buildings appear to have been occupied by carpet, clothing, haberdashery, and piano stores. The buildings were occupied by the Hudson Canadian company circa 1977. They are currently occupied by retail stores on the ground floor. The buildings have large, segmental arched window openings at the second and third stories, and arched window openings at the fourth story. The window openings are divided by small pilasters, and each story is capped by a thin cornice. The building façades are painted in a variety of colors, and the first floors of the buildings have been heavily altered; however, otherwise the buildings appear to be in stable structural condition (based on a visual assessment of the exterior of the Fulton Street façades of Nos. 565 and 571).

**308-310 Livingston Street** (NYCL-eligible, S/NR-eligible) is a 3-story, brown brick building with metal-framed bay windows at the second and third stories and polychrome terra-cotta detailing at the roofline (see Photograph 16 of Figure 7-9). There are two sculptural elements at the roofline that include figures of pages who appear to be carrying crests. The building appears to have been built sometime between 1904 and 1915 for commercial use. Originally a central corridor ran through the center of the building, but this was removed sometime between 1938 and 1950.

The former **A.I. Namm & Son Department Store Building** (NYCL-eligible, S/NR-eligible), is located at 450 Fulton Street, the southeast corner of Fulton and Hoyt Streets (see Photograph 17 of Figure 7-10). The department store was founded by Adolph I. Namm, who established a dry goods store in Manhattan in 1876 and moved to Brooklyn, into a 25-foot shop, in 1886. Namm's moved to its present site in 1891. By 1904, the store occupied 10-12 Elm Place, 452 Fulton Street, and 9-15 Hoyt Street; by 1938, the store had taken over the entire block, excepting 460-472 Fulton Street. In 1924, the former Fulton Street façade of the complex was torn down and replaced by an 8-story structure designed by Kohn & Butler, with a high archway flanked by Corinthian columns. An 8-story annex to the store, also designed by Kohn & Butler, went up at the southeast corner of Fulton and Hoyt Streets in 1928-29. This annex building is built of light-colored stone, with long, linear columns of windows separated by heavily detailed metal panels, now patinated. The top story of the building is set back slightly behind a metal railing.

Namm bought the name and trademarks of its neighboring department store, Loeser's, when Loeser's closed in 1952, and the store was thereafter known as Namm-Loeser's. The store was sold to Abraham & Straus in 1956 and closed in 1957. By 1969, all but the annex building at the corner of Fulton and Hoyt Streets had been demolished and replaced by an Abraham & Straus annex. At the corner of Fulton and Hoyt Streets, the building has been divided up into small stores at the first and second floor levels.

The former **America Fore Building** (NYCL-eligible), also known as the former Manufacturers Hanover Building and now the New York City Civil Court, is located at 141 Livingston Street (see Photograph 18 of Figure 7-10). The 16-story building was constructed in 1959 and designed by the firm of Morris Lapidus and Associates in the Modernist style. It sets back above the 10th

story. Long horizontal bands of windows divided by very thin metal columns set at regular intervals. The northern portion of the building does not have the same fenestration pattern, and appears to function as a utility area.

The **Board of Education Building** (NYCL-eligible, S/NR-eligible), at 131 Livingston Street, was built in 1907. It is an L-shaped building with frontages on Livingston Street and Red Hook Lane; Livingston Street is the building's main façade (see Photograph 19 of Figure 7-11). The building is six stories in height and constructed of red brick with limestone detailing in a Beaux Arts design. Previous Board of Education buildings had been located within the same block since at least 1885, when a wood building located in the interior of the block is indicated in the Robinson map. The Brooklyn Board of Education was formed in 1845, and the Consolidated New York City Board of Education was formed in 1892.

The **Brooklyn Friends School** (S/NR-eligible), 375 Pearl Street, was built in 1927 for the Brooklyn Law School (see Photograph 20 of Figure 7-11). The red brick and limestone, 8-story building was the first to be designed particularly for the law school, which remained in the building until 1968. The Brooklyn Friends School has occupied the building since 1972. It was designed by the firm of Thompson, Holmes & Converse, and has both Romanesque Revival and Art Moderne details. The building's main façade is distinguished by a loggia at the 8th floor, which is composed of delicate columns and round arches.

**Joseph J. Jacobs Building, Polytechnic University** (S/NR-eligible), 305-315 Jay Street, was built between 1904 and 1915 (see Photograph 21 of Figure 7-12). It was the administration building of the American Safety Razor Corporation's complex on the block from at least 1927 through 1954, when the company moved to Virginia and Polytech Institute (now Polytechnic University) purchased the building. The building is 5 stories tall and is constructed of brick separated by stripes of sandstone. The segmental arched windows are deeply set. A red brick parapet with a nameplate that says "Joseph J. Jacobs Building" is set atop the fifth floor.

The **former Abraham & Strauss Buildings** (NYCL-eligible, S/NR-eligible), now the Macy's complex, incorporate eight interconnected buildings on the block bounded by Fulton, Hoyt, and Livingston Streets and Gallatin Place. The Art Deco, 9-story main building on Fulton Street is L-shaped around the Liebmann Brothers Building at the southwest corner of Fulton and Hoyt Streets; it was designed by Starrett & Van Vleck and built in 1929 (see Photograph 22 of Figure 7-12). This building has vertically banded columns of brick rising the full height of the building. The 7-story secondary building, located at the northeast corner of Gallatin Place and Livingston Street, was built in 1885 (other sources date the building to 1895 or 1898); it is a Romanesque Revival style structure faced in Roman brick and brownstone with terra-cotta decoration (see Photograph 23 of Figure 7-13). The complex also incorporates 420 and 422 Fulton Street, two cast-iron buildings from the 1870s. 420 Fulton Street is narrow and designed in a Flemish Renaissance style; 422 Fulton Street is wide and designed in the French Second Empire style.

The store originated in 1865 in Brooklyn as a small dry-goods shop called Wechsler & Abraham. When the Brooklyn Bridge was completed in 1883, Abraham and Wechsler foresaw that a new shopping district would emerge at its eastern terminus, and they moved their business to a 5-story building at 422 Fulton Street. By 1889, Wechsler & Abraham was the largest dry-goods store in New York State. In 1893, Abraham joined with Isidor and Nathan Straus to buy out Wechsler's share of the business and the store became Abraham & Straus.

The former **Offerman Building** (NYCL-eligible, S/NR-eligible), also known as the former **Wechsler Brothers Block**, is located at 248 Duffield Street, with additional frontage on Fulton

Street (see Photographs 24 and 25 of Figures 7-13 and 7-14). The 7-story brown brick and limestone building was constructed in 1890-91 and designed by Lauritzen & Voss for Henry Offerman. The Romanesque Revival style of the building includes the use of massive round arches, a variety of masonry textures, and decorative details, such as shields with lion's heads, panels with Henry Offerman's initials, and rows of grimacing heads above the sixth floor.

The Joseph H. Bauland Company occupied the building prior to 1903; from 1903 until 1907, the building was occupied by the Chapman & Co. department store, which succeeded the Joseph H. Bauland Company. Around 1907, the Darlington Company department store remodeled and decorated the store in anticipation of moving in; however, the company went bankrupt. From 1914 through at least 1924, the building housed City government offices. Martin's department Store purchased the building in 1925 and renovated it to accommodate their growing business; Martin's remained in the building until at least 1982. As of 1932, the City still leased some space in the building for municipal court offices. It is currently occupied by the Conway department store.

Former **Public School 15** (S/NR-eligible), located at 372 Schermerhorn Street (aka 475 State Street), was designed by Samuel B. Leonard, Superintendent of Buildings and Repairs for the Board of Education (see Photograph 26 of Figure 7-14). The 2- and 3-story school was built in 1860 and designed in the Rundbogenstil, a style related to the Romanesque Revival as expressed in contemporary German architecture. The style emphasized economy of material and workmanship and ample fenestration. Two NYCL Brooklyn school buildings designed in this style are P.S. 34 and P.S. 111. The building is faced in brick, currently painted a light purple color, with minimal stone detailing; the narrow windows have segmental arches at the first and second stories. The building is finished above the third story with a band of corbelled brick.

**St. Boniface Church** (S/NR-eligible), located at 111 Willoughby Street (aka 190-194 Duffield Street), was founded in 1854 for German immigrants and the building was constructed and dedicated in 1872. The church is faced in red brick with brownstone detailing in a very restrained Gothic Revival design (see Photograph 27 of Figure 7-15). The gable-front, central portion of the church is flanked by two towers topped with metal-clad short steeples.

**233 Duffield Street** (NYCL-eligible, S/NR-eligible), is a 3-story residential building faced with brown wood clapboarding (see Photograph 28 of Figure 7-16). It appears to date from between 1848 and 1850. The building has small decorative lintels above its windows and is capped by a cornice, painted brown. All of the building's windows, and the metal stoop leading to the main entrance appear to be replacements. The main entrance has been altered, and is recessed behind the building's front façade. The door enframement remains in place, but the door is now located several feet deeper within the building, creating a small, open vestibule. The building has a visible half-basement; this level of the building is painted a dark green, and has two openings covered by rolling metal grates. The owner of this building has reported that it was used as part of the Underground Railroad (see discussion below).

The former **Loesser's Department Store** building (S/NR-eligible), which is located at the northeast corner of Elm Place and Livingston Street, was designed by Francis Kimball and built in 1899-1900. Kimball was also the architect of the Montauk Club and Emanuel Baptist Church in Brooklyn. The building is six stories in height, and is faced with light-colored stone, brick, and terra cotta (see Photographs 29 and 30 of Figures 7-16 and 7-17). The bays of the first two stories are capped by segmental arches and separated by rusticated stone. The central portions of both the Elm Place and Livingston Street facades are tied from the third through the sixth floors by bays of windows, which culminate in large arches at the sixth floor. On the Elm Place façade,

these bays are interrupted by panels of decorative terra cotta. The first floor of the Elm Place façade has been substantially altered by an addition at the first floor which projects into the otherwise wide sidewalk of the street. This addition is faced in light brown brick and is of a simple, utilitarian design. The corner of the building at Livingston Street and Elm Place is chamfered, and one of the building's entrances is located at this corner.

**495 Fulton Street** (S/NR-eligible) is located at the northwest corner of Fulton and Bridge Streets (see Photograph 31 of Figure 7-17). The lower two floors of the building are faced with light-colored stone, and have been substantially altered on the Fulton Street façade, as well as a portion of the Bridge Street façade, for a modern storefront. In addition, a large loading dock has been cut into the Bridge Street façade at the first story. Above the second story, the building is faced in light-colored brown brick. The third and fourth stories have long columns of windows, culminating in arches and separated by decorative stone panels. There is a narrow stone stringcourse above the fourth story, and a large copper cornice above the fifth story. The building was constructed ca. 1906 by the Leonard Moody Real Estate Company as a business structure. In 1934, it was leased to the Herson Stores Corporation for a ladies' and children's specialty shop.

**386-388 Fulton Street** (NYCL-eligible) is located at the southeast corner of Fulton and Smith Streets. It is three stories tall, with a mezzanine above the first story (see Photograph 32 of Figure 7-18). The building is faced with light-colored stone and is faintly Gothic in style, particularly in the treatment of the stone arches at the central bay and entrance to the building on Smith Street. The first story of the building has been substantially altered on its Fulton Street façade and the northern portion of its Smith Street façade for a modern storefront. In 1925, this property was leased by the Frank G. Shattuck Company, which operated the chain of Schrafft's stores, and the company erected a building on this site for a Schrafft's restaurant, tea room, and candy shop. This was the first restaurant established by Schrafft's in Brooklyn. A portion of the ground floor and the mezzanine and the entire second floor were used by John David, a clothier. The ground floor and mezzanine was used for furnishings and hats, and the upper floor was used for a clothing department. In 1940, the building hosted the headquarters of the Associated Willkie Club. The Schrafft's establishment was maintained in the building through at least 1972, and the original storefront can still be seen on Smith Street (minus the signage).

**423 Fulton Street** (S/NR-eligible) is located on the east side of Pearl Street between Fulton and Willoughby Streets (see Photograph 33 of Figure 7-18). It is four stories in height and is faced with light-colored red-brown brick. The building has large, loft-like windows, and is capped with terra-cotta, Art Deco ornament; there is also terra-cotta, Art Deco ornament around the main entrance to the building on Pearl Street. According to the 1938 Sanborn map, the building was constructed in 1931. In 1934, the Empire State Motion Picture Operators Union had its headquarters in the building; and in 1939, the Monroe Loan Society of New York and the Long Island Outfitting Company had their headquarters in the building.

**Red Hook Lane**, a narrow street which runs between Fulton Street and Boerum Place within the project area, is the remaining segment of a roadway that was originally laid out in 1760 but also may have existed before that date. The Lane was the route used by farmers in South Brooklyn to transport their goods to Fulton Ferry and the New York market. It has also been reported that at one time the Lane linked Brooklyn with Dutch farms in Red Hook, and that it played a role in the American Revolution.[1] It was mostly eliminated by the implementation of the street grid

[1] "Is it End of the Road for a Historic Lane?" New York Daily News, February 24, 2004.

plan of 1834. Red Hook Lane has not been identified as a NYCL- or S/NR-eligible historic resource by LPC.

*STUDY AREA*

*Known Resources*

As described above, the study area for architectural resources was defined as the project area, plus all structures on lots facing the project area boundary. There are seven known architectural resources within the study area boundaries. These are described below, listed on Table 7-2, and mapped on Figure 7-1.

**Baptist Temple** (S/NR-listed), 360 Schermerhorn Street, began in 1823 as the First Baptist Church (see Photograph 34 of Figure 7-19). In 1893, the temple moved to its current location and the existing building was constructed; this location came to be known as Temple or Brimstone Square. The red brick, Romanesque Revival style building has frontages on Schermerhorn Street and Third Avenue, deeply arched entrances on Third Avenue, and a tower at the corner of Third Avenue and Schermerhorn Streets. Each façade has a gable front and stained glass windows. The interior contains seats rather than pews.

The **Brooklyn Academy of Music Historic District** (NYCL, S/NR-eligible) is roughly bounded by Lafayette Avenue, Fulton Street, Ashland Place, and State Street. The majority of the buildings in the district are rowhouses dating from 1855 to 1859 (see Photograph 35 of Figure 7-19). Most of the rowhouses are three or four stories in height, faced in brick or brownstone, and have Italianate features—high stoops, arched doorways, windows with bracketed lintels, and projecting bracketed cornices. Notable non-residential buildings within the historic district are the Brooklyn Academy of Music, the Williamsburgh Savings Bank, the Salvation Army building, and the Hanson Place Methodist Church (see Photographs 36 and 37 of Figure 7-20).

**Brooklyn Central Courthouse** (NYCL-eligible, S/NR-eligible), 120 Schermerhorn Street, was designed by Collins & Collins and built in 1930-1932 (see Photograph 38 of Figure 7-21). The 10-story, Renaissance Revival style building is similar in bulk to the nearby 110 Livingston Street building. It features limestone-clad upper walls on a granite basement. The Schermerhorn Street façade has a deep entrance porch articulated by three 3-story neo-Renaissance arches set in a 4-story rusticated base. A balustrade separates this element of the façade from the arched upper-floor windows.

The **Fort Green Historic District** (NYCL, S/NR-listed) is bounded roughly by Myrtle Avenue on the north, Vanderbilt Avenue on the east, Fulton Street on the south, and Ft. Greene Place on the west. The S/NR-listed district expansion extends roughly to DeKalb Avenue on the north, S. Oxford Street on the east, Hanson Place on the south, and Ashland Place on the east, and includes the Brooklyn Academy of Music Historic District (NYCL, S/NR-eligible). The historic district includes Fort Greene Park, but otherwise is virtually entirely composed of residential buildings. The rowhouses in the district are primarily 3- to 5-story, brownstone and brick buildings designed in the Italianate, Second Empire, Anglo-Italianate, and neo-Grec styles (see Photographs 39 and 40 of Figures 7-21 and 7-22). By far the most predominant style is the Italianate; building details include high stoops, arched doorways, floor-length parlor windows, and carved brackets supporting windows and cornices. Fort Greene Park moved to its present site in 1845, and was re-landscaped in 1868 by Frederick Law Olmsted and Calvert Vaux. Within the park is a 200-foot-tall Doric column; this is the Prison Ship Martyrs Monument, which marks the site of a vault containing the remains of hundreds of Revolutionary War

soldiers (see Photograph 41 of Figure 7-22). The memorial was designed in 1908 by McKim, Mead and White.

**Friends Meeting House** (NYCL, S/NR-listed), 110 Schermerhorn Street, was designed by Charles T. Bunting in 1857 (see Photograph 42 of Figure 7-23). The meeting house is a modest red brick structure designed to reflect the simplicity of the Quaker beliefs. The only grand gesture in this simple building is the tall multi-paned windows on the four sides of the building that allow light to flood the second-floor meeting room.

**United States Post Office and Court House, Brooklyn Central Office** (NYCL, S/NR-listed) is located at 271-301 Cadman Plaza East (see Photograph 43 of Figure 7-23). The Supervising Architect of the U.S. Treasury was responsible for the design of many Romanesque Revival post offices in the United States; however, the Brooklyn Central Office is one of the few such buildings still standing and in use. Construction began in 1885 under Mifflin E. Bell, whose design was later transformed into a boldly-scaled Romanesque Revival work. The later extension (1930-31) was designed during James Wetmore's tenure as acting Supervising Architect. The building is composed of rough and polished granite; its other features include a steep slate roof with dormers, a 6-story tower, and projecting half-round turrets with conical roofs. It was recently renovated for office and courtroom use, and it also maintains its historic post office function.

**Williamsburg Savings Bank Building** (NYCL, interior and exterior, S/NR-listed), located at 1 Hanson Place, is, at 512 feet tall, the most prominent feature of the Brooklyn skyline (see Photograph 44 of Figure 7-24). The building was constructed in 1927, when the bank's trustees found it necessary to expand beyond their location in Williamsburg. Designed by the architectural firm of Halsey, McCormick & Helmer, the bank is Byzantine-styled with a striking series of setbacks rising to a 4-faced illuminated clock and gilded copper dome. The base of the building is constructed of Indiana limestone and polished rainbow granite from Minnesota. The 63-foot-high main banking room, also an NYCL, is visually expressed on the exterior of the building. The setback portion of the building is introduced by another series of arched windows and is constructed of buff-colored brick with terra-cotta detailing. The various setbacks are accentuated by contrasting limestone trim, with the 13th and 26th floors set off by the use of round arches and a continuous terra-cotta band.

*Potential Resources*

There are two potential architectural resources within the study area boundaries. These are described below, listed on Table 7-2, and mapped on Figure 7-1. As described above, determinations of NYCL and S/NR eligibility of potential architectural resources were made by LPC in a comment letter dated July 26, 2002. OPRHP has not made any determinations of S/NR eligibility.

**522-550 State Street** (S/NR-eligible), 15 buildings located on the south side of State Street between Third and Fourth Avenues, appear to have been built sometime before 1885. These 2½- and 3-story rowhouses are faced in red brick (with stone details) and brownstone; a few have decorative pediments over the doorframe. The buildings were designed in the Italianate style, similar to those in the nearby BAM and Fort Greene Historic Districts. Most retain their cornices and stoops (see Photographs 45 and 46 of Figures 7-24 and 7-25).

**Board of Education Headquarters (former)** (NYCL-eligible, S/NR-eligible), 110 Livingston Street, was built in 1925 by McKim, Mead and White (see Photograph 47 of Figure 7-25). The building originally housed the Benevolent and Protective Order of Elks, but was taken over by

the New York City Board of Education in 1939. It is 14 stories tall and crowned by a red tile, hipped roof. The first two floors are faced in rusticated limestone, with arched window openings; the next three stories are divided into nine bays on the Boerum Place façade, separated by Corinthian pilasters. The remainder of the building is simple masonry with a regular fenestration pattern. The Board of Education (now Department of Education) is in the process of vacating the building, which is currently proposed for redevelopment for residential and theater use.

## UNDERGROUND RAILROAD

During the public comment period for the DEIS/DSEIS, several property owners came forward to claim that their buildings were utilized for Underground Railroad activities. Specifically, the three buildings are 227 Duffield Street (Block 146, Lot 15); 233 Duffield Street (Block 146, Lot 12); and 436 Gold Street, aka 436 Albee Square West (Block 146, Lot 51). The discussion below provides a short history of the Underground Railroad, a history of the buildings during the 19th century, and assesses the potential for the buildings to have been used for such activities and their potential significance as cultural resources.

The Underground Railroad refers to the effort of enslaved African Americans to gain their freedom by escaping bondage. The Underground Railroad was neither underground nor a railroad, but a network of safe houses and individuals who helped slaves escape to freedom. It was a clandestine operation that began during the colonial period, later became part of organized abolitionist activity in the 19th century, and reached its peak in the period 1830-1865. It is estimated that approximately 100,000 persons in North America successfully escaped slavery between 1790 and 1860.

Homes and businesses where fugitive slaves could rest and eat were called "stations" and were run by "stationmasters"; those who contributed money or goods to the cause were "stockholders"; and the "conductor" moved fugitive slaves from one station to the next. Fugitive slaves were known as "packages" or "freight." Several churches in the Downtown Brooklyn and surrounding area were reported to have acted as stations on the Underground Railroad, including the Plymouth Church of the Pilgrims, in Brooklyn Heights; Lafayette Avenue Presbyterian Church, in Fort Greene; the Bridge Street African Wesleyan Methodist Church in Downtown Brooklyn, which was the first African American congregation in Brooklyn; and the Concord Baptist Church, which is no longer extant at its original location in Downtown Brooklyn.

The 227 Duffield Street property was known as 141 Duffield Street through ca. 1855, and as 185 Duffield Street from ca. 1856 through the early 1870s, when it received its current address. In the early 19th century, the current lot straddled the dividing line of the John Duffield and Samuel Fleet estates. The lot was bought by Susan Lawrence by 1829, and was sold at public auction in 1847 to Daniel Lord. The lot was sold in 1848 by Daniel Lord to John J. Studwell, and later that year Studwell sold the lot to Caleb Baldwin, a local mason. It appears that no development occurred on the property before this time. It appears that Caleb Baldwin may have constructed the building currently existing on the property in 1849, before selling the property that year to Robert Bonnel (another local mason), based on the purchase price. Caleb Baldwin may have lived on the property briefly in 1848-49. In 1850, Robert Bonnel sold the property to Harriet Truesdell; further improvements may have been made to the property during this year, based on the purchase price. From 1851 through ca. 1863, Thomas Truesdell, a cotton broker, his wife Harriet, and their family lived in the building. The Truesdell family could no longer be found

living on the property after 1863; however, Thomas Truesdell continued to be listed as the owner of the property in tax records through the remainder of the 19th century.

The 233 Duffield Street property was known as 147 Duffield Street through ca. 1855, and as 191 Duffield Street from ca. 1856 through the early 1870s, when it received its current address. Like the 227 Duffield Street property to the north, this current lot straddled the dividing line of the John Duffield and Samuel Fleet estates in the early 19th century. The lot was bought by Susan Lawrence by 1829, and was sold at public auction in 1847 to Daniel Lord. In 1848, Daniel Lord sold the lot to Thomas Edwards, a Brooklyn builder. It appears that Mr. Edwards constructed row houses on this lot and two others purchased from Daniel Lord, sometime between 1848 and 1850. Although Mr. Edwards never lived on any of these three lots, and was forced to sell part of his interest in 233 Duffield Street in 1855 to cover debts incurred from a court case, he was able to retain at least partial ownership of the property, and his descendants were listed as owners of the property during the later 19th century. Names of renters of the property during the 19th century could not be located. A Thomas Edwards, possibly the same person, was admitted to the Plymouth Church of the Pilgrims in 1859 and was a member in good standing through at least 1867.

The 436 Gold Street property was known as 310 Gold Street during the 1860s, and it received its current address in the early 1870s. This current lot was part of the Samuel Fleet estate in the early 19th century, and was located directly north of the Fleet mansion (which burned down in 1857). No development of the property is shown on the 1855 Perris map. After Samuel Fleet's death in 1864, his heirs began selling off parts of the estate lands, including the land that became the 436 Gold Street property. In 1865, the property was acquired by Emeline Sackett, at a price that suggests that the lot was already developed. Therefore, it appears likely that a structure was erected on the property sometime between 1855 and 1865. At some time between 1867 and 1898, it appears that the building on the lot was raised from 2½ stories with a basement to 3 stories with a basement; possibly the current bay on the front of the building was installed at the same time. It appears that Emeline Sackett never lived on the property during the time she owned it, and it is unknown who rented the structure during the 19th century.

In summary, it appears that the three buildings were constructed in ca. 1848, 1848-1850, and 1855-1865, respectively. No information regarding the residents of the buildings before the end of the Civil War could be found for 233 Duffield Street and 436 Gold Street. A link between the Truesdell family, which occupied 227 Duffield Street from ca. 1851 to 1863, and documented Underground Railroad events could not be established. Neither could the family be linked to churches in the area reported to be active in the Underground Railroad, specifically the churches listed above. As described above, a Thomas Edwards, possibly the same person as the builder of 233 Duffield Street, was a member of the Plymouth Church of the Pilgrims from 1859 through at least 1867; however, there is no record that Mr. Edwards ever occupied his property on Duffield Street, and a link between Mr. Edwards and any documented Underground Railroad events could not be established. Therefore, the three buildings have no documentable association with the Underground Railroad.

The owner of 233 Duffield Street has asserted that there were shafts in the 227 and 233 Duffield Street buildings, as well as other buildings on Duffield Street, that linked the buildings' sub-basements to the surface, and to tunnels under the street's buildings, but he has also reported that the sub-basements and shafts have been filled and lost. However, the potential existence of these tunnels, without corroborating artifacts, would not necessarily demonstrate a connection to the underground railroad. No information to document these property features has been received

from the three property owners or could be identified through independent research. Similarly, no documentation of an association of the three buildings with the Underground Railroad has been received from the three property owners or (as described above) could be identified through independent research.

The Underground Railroad Resources in the United States Theme Study, prepared by the National Park Service, was used to evaluate the three properties for their eligibility to be listed on the National Register of Historic Places. Properties considered for eligibility under this theme study are ones associated with some aspect of the Underground Railroad between the American Revolution and the Civil War, with an emphasis on the period between the formal organization of the abolitionist movement in 1820 and the end of the Civil War. They include the following property types:

- 'Stations' on the Underground Railroad. These are buildings, structures, or sites where fugitives were harbored and their use as such has been documented;
- Properties associated with prominent persons;
- Slave rebellion sites;
- Properties associated with legal challenges to slavery;
- Properties associated with documented slave escapes;
- Properties associated with documented fugitive rescues;
- Churches associated with congregations active in the Underground Railroad;
- Maroon communities;
- Archeological sites; and
- Others.

In order to be eligible as National Historic Landmarks, the Duffield Street and Gold Street properties would need to retain high integrity from the period of significance (between the American Revolution and the end of the Civil War) and (1) be connected with a nationally-significant event, such as a slave rescue, court case, or slave insurrection; (2) vividly represent, through a combination of extant resources possessing high integrity and solid documentation, the contribution of a particular social, political, or ideological group to the functioning of the Underground Railroad; or (3) have a significant association with a national figure of the Underground Railroad and his or her Underground Railroad activity.

In order to be eligible for listing on the National Register of Historic Places, the Duffield Street and Gold Street properties would need to retain integrity from the period of significance (between the American Revolution and the end of the Civil War) and meet one or more of the National Register Criteria, as discussed below:

- Be associated with some event, or represent some broad aspect of the working of the Underground Railroad locally, statewide, or regionally. The properties must possess a documentable association with the Underground Railroad (Criterion A);
- Be associated with local 'conductors' who assisted fugitive slaves, such as leaders of local abolition societies, ministers, and free blacks (Criterion B); or
- Have yielded or may be likely to yield, information important in history or prehistory, in terms of a specific archaeological research design (Criterion D).

As described above, the 227 Duffield Street, 233 Duffield Street, and 436 Gold Street buildings have no documentable association with the Underground Railroad. Therefore, there is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad.

## D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

### ARCHAEOLOGICAL RESOURCES

Without the proposed actions, it is assumed that there will be no subsurface disturbance of any of the projected development sites. Potential development sites A and B could be developed pursuant to City University's master plan in the future without the proposed actions; however, since LPC has determined that these sites are not sensitive for prehistoric or historic-period resources, there would be no impacts in any case.

### ARCHITECTURAL RESOURCES

As described in detail in Chapter 2, "Land Use, Zoning, and Public Policy," a number of projects are planned for construction within the architectural resources study area by the year 2013. Several of these projects would take place within 90 feet of known and/or potential architectural resources; these are described briefly below. In addition, one project—the redevelopment of 110 Livingston Street for residential use—would renovate a potential architectural resource.

Construction of the 9 MetroTech office tower, which is nearing completion, is taking place directly adjacent to the First Free Congregational Church. The development of site B pursuant to City University's master plan would occur directly adjacent to former Public School 5. Development of the 53 Boerum Place site for residential use will be adjacent to the Friends Meeting House. The BAM LDC North development of Block 2107 will take place across a narrow (50-foot) street from the Pioneer Warehouses. Pursuant to the New York City Department of Buildings' (DOB) Technical Policy and Procedure Notice (PPN) #10/88, concerning procedures for avoidance of damage to historic structures from adjacent construction, it is expected that construction protection plans have been developed for projects within 90 feet of architectural resources to avoid potential physical impacts.

The proposed expansion of the Brooklyn Marriott Hotel on Adams Street will be adjacent to 345 Adams Street and across a narrow street from the Brooklyn Friends School. A construction protection plan has been developed for this project to protect these two buildings during construction activities.

The Atlantic Avenue/Smith Street and ESDC/HS multiple-use projects will be located across Smith Street from the Brooklyn Central Courthouse. However, Smith Street is approximately 80 feet wide, and therefore this resource is not expected to be physically affected by the projects' construction. Similarly, the Atlantic Terminal, LIU Recreation and Wellness Center, and BAM LDC East projects will be located in close proximity to the Brooklyn Academy of Music and Fort Greene Historic Districts, respectively, but none of the resources are close enough to be physically affected by potential construction-related issues. The Atlantic Center-Site 5 residential project will be located directly south of the Atlantic Avenue Control House. However, Atlantic Avenue is approximately 100 feet wide, and, therefore, this recently reconstructed resource is not expected to be physically affected by the projects' construction. It

is expected that the Atlantic Avenue LIRR renovation project includes a plan to retain the significant elements of the S/NR-eligible Atlantic Avenue subway station.

The Atlantic Yards Arena and Redevelopment project, which would be built on an approximately 24-acre site at the intersection of Flatbush and Atlantic Avenues, would be located directly adjacent to the Prospect Heights Historic District (S/NR-listed) and within 90 feet (across Vanderbilt Avenue) from St. Luke's Episcopal Church, at 520 Clinton Avenue (NYCL, S/NR-listed). Within the area surrounding the Arena project site are a number of other architectural resources, including the Hanson Place Baptist Church, at 88 Hanson Place (NYCL, S/NR-listed); the Royal Castle Apartments, at 20-30 Gates Avenue (NYCL); the Park Slope Historic District (NYCL, S/NR-listed); and the Park Slope Historic District Extension (which LPC deems eligible for NYCL designation and S/NR listing, according to a comment letter dated March 4, 2004). This proposal is still in a preliminary stage; however, if it moves forward, it will be subject to its own environmental review process, which would consider the project's potential effect on historic resources. It is anticipated that the analysis of historic resources for that project would recommend that construction protection plans be developed for architectural resources within 90 feet of the project site, in order to avoid potential physical impacts.

In general, the context of the architectural resources will change with the addition of new, modern buildings to the area. In addition, it is possible that one or more of the potential architectural resources within the project and study areas identified above may be found eligible for listing on the Registers or designation as a New York City Landmark and may be listed or designated in the future.

Architectural resources that are listed on the National Register or that have been found eligible for listing are given a measure of protection from the effects of federally sponsored or assisted projects under Section 106 of the National Historic Preservation Act. Although preservation is not mandated, federal agencies must attempt to avoid adverse impacts on such resources through a notice, review and construction process. Properties listed on the State Register are similarly protected against impacts resulting from State-sponsored or State-assisted projects under the State Historic Preservation Act. Private property owners using private funds can, however, alter or demolish their properties without such a review process. Privately-owned sites that are NYCLs, within New York City Historic Districts, or pending designation, are protected under the New York City Landmarks Law, which requires New York City Landmarks Preservation Commission review and approval before any alteration or demolition can occur. Should future redevelopment of the area involve federal, state, or city discretionary actions, measures to maintain the significance of the buildings listed above may be required, pursuant to the appropriate statutory requirements. In addition, if one of the buildings listed above is calendared for designation as a New York City Landmark or is designated as a New York City Landmark, application to LPC's Preservation Department for a permit would be required prior to the start of any work. As described above, DOB's Technical PPN #10/88 protects architectural resources within 90 feet of proposed projects from potential construction-related damage.

# E. THE FUTURE WITH THE PROPOSED ACTIONS

## ARCHAEOLOGICAL RESOURCES

As LPC has determined that the majority of the development sites have no archaeological significance, the development of these sites pursuant to the proposed actions would not have a

significant impact on archaeological resources. As described above and listed in Table 7-1, there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that were considered to be potentially sensitive for 19th century archaeological resources. Individual Stage 1A Archaeological Assessments will be prepared for those lots that are currently City-owned or are acquired by the City, as directed by LPC, before development of these sites commences. The Stage 1A Archaeological Assessment would establish the archaeological sensitivity of the site to host archaeological resources, by providing a historical contextual overview, a development history of the site, an assessment of past disturbance, and the identification of any potential resource types that may be present on the site. If determined necessary by LPC, as a result of the Stage 1A Archaeological Assessment, Stage 1B field testing—for which a protocol would be submitted to and approved by LPC— and further testing, if needed, will be undertaken prior to development of these sites. In the event that Stage 1B field testing confirms that there are significant archaeological resources on the lots which cannot be recovered during the testing phase, full archaeological excavation will occur or the development will be redesigned to leave the resources protected in place. All archaeological work will be completed under LPC review and will adhere to the standards set forth in the 2001 *CEQR Technical Manual* and the Archaeological Guidelines for work in New York City. Under the revised Brooklyn Center Urban Renewal Plan (BCURP), each redeveloper would be required to perform all mitigation measures identified in the EIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not have any adverse impacts on potential archaeological resources on these lots. For the lots which are not now and would not become City-owned (Block 165, Lot 58 and Block 164, Lots 1 and 29), a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, archaeological field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources on these lots pursuant to their development is considered a potential unmitigated, significant adverse impact.

## ARCHITECTURAL RESOURCES

There would be no direct impacts to known architectural resources with the proposed actions, as none are located on the projected and potential development sites.

Three potential architectural resources would be directly affected by the development of projected development sites pursuant to the proposed actions. These are the Joseph J. Jacobs Building of Polytechnic University, located at 305-315 Jay Street, which LPC deems eligible for S/NR listing; the Board of Education Building at 131 Livingston Street, which LPC deems eligible for designation as a New York City Landmark and S/NR listing; and 233 Duffield Street, on site P, which LPC deems eligible for designation as a New York City Landmark and S/NR listing. In addition, two other potential architectural resources would be directly affected by the development of potential development sites: 565-571 Fulton Street, which LPC deems eligible for New York City Landmark designation and S/NR listing; and 423 Fulton Street, which LPC deems eligible for S/NR listing. The removal of the buildings for these developments would constitute a significant adverse impact on architectural resources. Measures to mitigate this impact have been developed in consultation with LPC (see Chapter 20, "Mitigation").

In addition to these direct effects, several of the projected and potential development sites are located less than 90 feet from known and potential architectural resources, and therefore these resources could be potentially physically affected by ground-borne vibrations or other potential construction-related issues. These resources are listed below in Table 7-3. It is expected that

construction protection plans would be instituted for these developments in order to avoid potential physical impacts on these architectural resources (see Chapter 18, "Construction Impacts").

The new, modern development on the projected and potential development sites that could occur as a result of the proposed actions would be expected to alter the context of the surrounding architectural resources, changing it from a mixed context of low-, medium-, and high-rise structures on lots of varied size to one with a greater concentration of high-rise structures on large sites. However, the bulk of the larger development would be located on the boundaries of the MetroTech area, which already contains a mix of tall office buildings and low-rise historic structures. The prominence of some architectural resources in surrounding views—such as views of 345 Adams Street from points west of Adams Street, views of the Dime Savings Bank from Fulton Street, and views of the America Fore Building from points south on Smith Street—would be somewhat diminished by the construction of new, tall buildings in close proximity to these resources. However, views to these resources would not be blocked (see Chapter 8, "Urban Design and Visual Resources"). New residential development along Livingston Street also would increase the visibility of resources on that block by increasing activity on the street. Therefore, this change in context would not constitute a significant adverse impact on architectural resources. The remaining portion of Red Hook Lane between Fulton Street and Boerum Place would be eliminated with the demapping of this street and the development of Site M. However, the street has not been identified as a NYCL- or S/NR-eligible resource by LPC, and it is possible that the street could be recognized in some way within the development of site M.

## Table 7-3
## Architectural Resources Potentially Affected by Proposed Actions

| Resource | Status* | Block | Lot | Development Site(s) | Approx. Distance from Site |
|---|---|---|---|---|---|
| **Resources on Projected/Potential Development Sites** | | | | | |
| Board of Education Building (131 Livingston Street) | NYCL-eligible†, S/NR-eligible | 154 | 1 | M | On site |
| Joseph J. Jacobs Building, Polytechnic University | S/NR-eligible | 142 | 1 | C | On site |
| 233 Duffield Street | NYCL-eligible†, S/NR-eligible† | 146 | 12 | P | On site |
| 423 Fulton Street | S/NR-eligible† | 150 | 11 | L | On site |
| 565-571 Fulton Street | NYCL-eligible | 149 | 25 | R | On site |
| **Resources Within 90 Feet of Projected Development Sites** | | | | | |
| America Fore Building (former) | NYCL-eligible | 154 | 28 | M | Adjacent |
| Offerman Building/Wechsler Brothers Block (former) | NYCL-eligible, S/NR-eligible | 145 | 35 | O | Adjacent |
| Gage & Tollner Restaurant | NYCL (interior and exterior), S/NR-listed | 154 | 17 | M | 48 feet |
| | | | | L | 80 feet |
| Dime Savings Bank | NYCL (interior and exterior) | 149 | 75 | Q | 50 feet |
| | | | | R | 70 feet |
| New York Telephone Company, Long Island Headquarters | NYCL-eligible, S/NR-eligible** | 2058 | 1 | O | 60 feet |
| Brooklyn Academy of Music (part of BAM Historic District) | NYCL, S/NR-eligible** | 2111 | 15 | EE | 70 feet |
| Salvation Army Building (part of BAM Historic District) | NYCL, S/NR-eligible** | 2111 | 11 | EE | 70 feet |
| Williamsburg Savings Bank | NYCL (interior and exterior), S/NR-listed | 2111 | 1 | EE | 70 feet |
| 376 Fulton Street | NYCL-eligible | 154 | 18 | M | 74 feet |
| | | | | L | 80 feet |
| **Resources Within 90 Feet of Potential Development Sites** | | | | | |
| Public School 5 (former) | S/NR-eligible** | 131 | 1 | B | Adjacent |
| Public School 15 (former) | S/NR-eligible | 174 | 1 | DD | Adjacent |
| 345 Adams Street | NYCL-eligible, S/NR-eligible | 140 | 123 | L | 60 feet |
| 522-550 State Street | S/NR-eligible | 180 | 7, 9-22 | DD | 60 feet |
| 565-571 Fulton Street | NYCL-eligible | 149 | 25 | T | 80 feet |
| | | | | U | 80 feet |
| Baptist Temple | S/NR-listed | 173 | 23 | CC | 80 feet |
| Macy's (former Abraham & Strauss Buildings) | NYCL-eligible, S/NR-eligible | 156 | 1 | Z | 80 feet |

**Notes:**

* Unless otherwise noted, determinations of NYCL and S/NR eligibility made by LPC in a comment letter dated July 26, 2002.

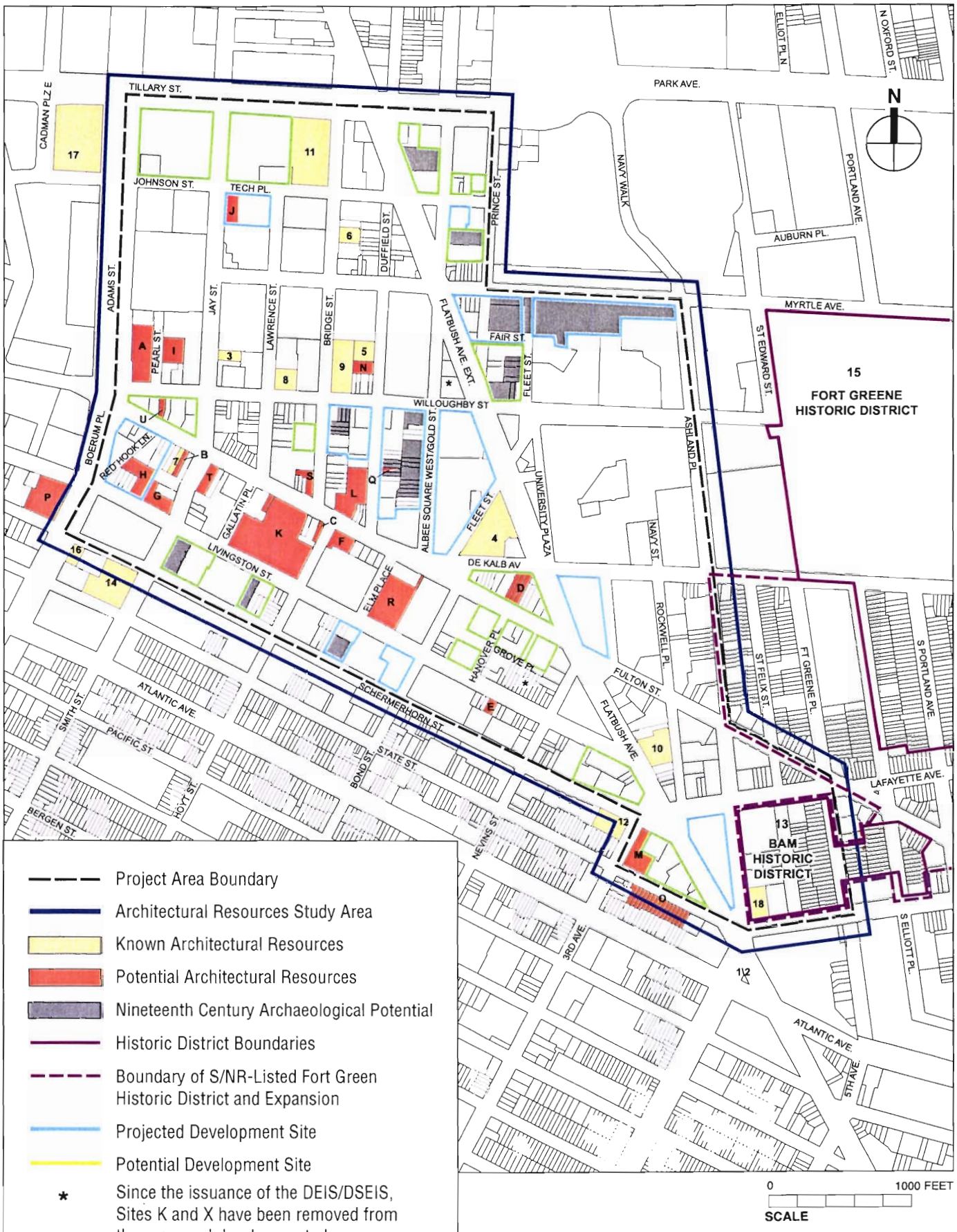
** Determinations of S/NR eligibility made previously, by OPRHP.

† Determinations of eligibility made by LPC in a comment letter dated April 19, 2004.

## UNDERGROUND RAILROAD

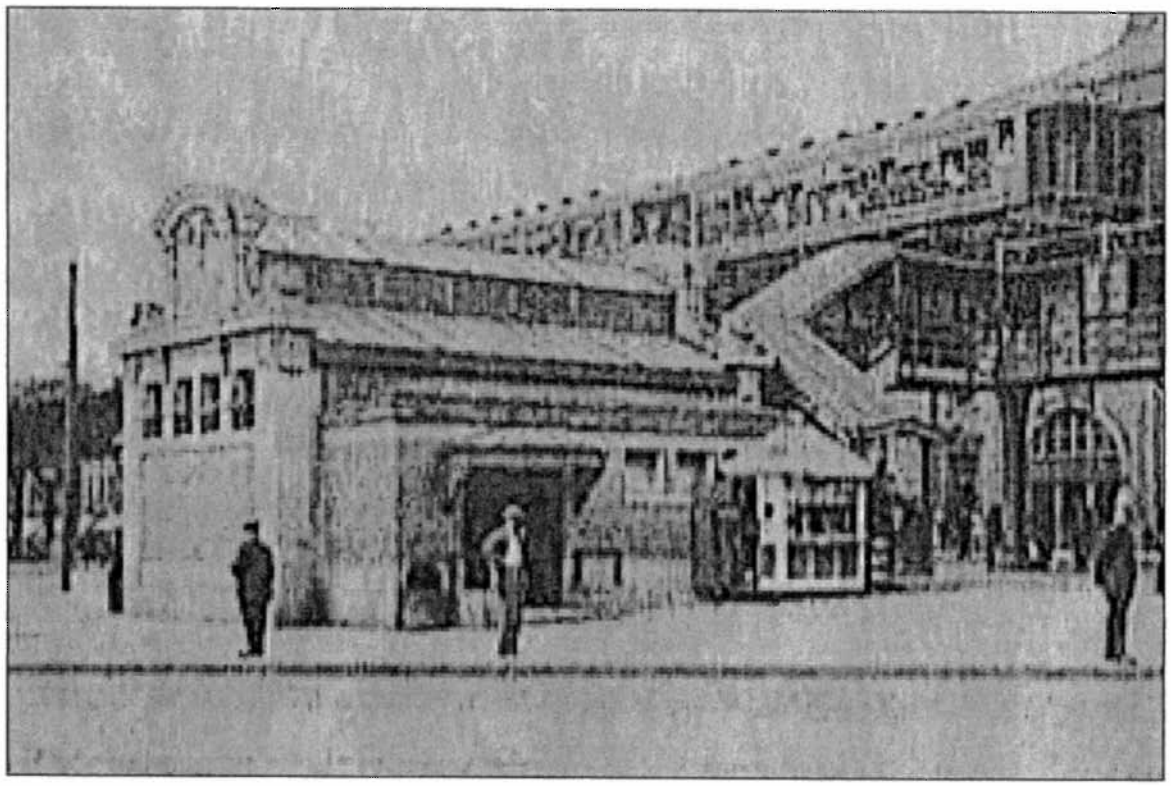
As described above, a thorough documentation study has not uncovered a documentable association of the 227 Duffield Street, 233 Duffield Street, and 436 Gold Street buildings with the Underground Railroad, and there is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad. The potential existence of tunnels under the street buildings and any corroborating artifacts cannot be ascertained without further testing. Therefore, additional work, first in the form of a visual inspection of the interiors of the buildings after condemnation to ascertain the existence of other artifacts and, second, in the form of new continuous soil borings, would need to be undertaken at the sites. Soil borings will be conducted to determine subsurface conditions, such as fill layers, with the locations of borings to be approved by an archaeologist prior to their execution. This testing would be impracticable prior to demolition of these structures and while they are still occupied, and would therefore have to be conducted at the time of site redevelopment. If the soil borings indicate a potential for archeologically sensitive areas, Stage 1B testing will be undertaken in the potentially sensitive areas. The testing phase will first include the preparation of a testing protocol by a professional archaeologist, to be reviewed and approved by LPC prior to implementation. Testing will be conducted by a professional archaeologist, and appropriate research issues will be formulated in the event of a discovery.

Should the Stage 1B testing establish an association of one or all of these buildings with the Underground Railroad, and the National Park Service criteria for eligibility of Underground Railroad properties for National Historic Landmark designation or for listing on the National Register of Historic Places are met, the redevelopment of these sites pursuant to the proposed actions would constitute a significant adverse impact to archaeological resources. As required under the revised BCURP, measures to partially mitigate the elimination of these resources will, if required, be developed in consultation with LPC and performed prior to issuance of a certificate of occupancy to the redeveloper. See Chapter 20, "Mitigation," for further description of potential mitigation options. ✶



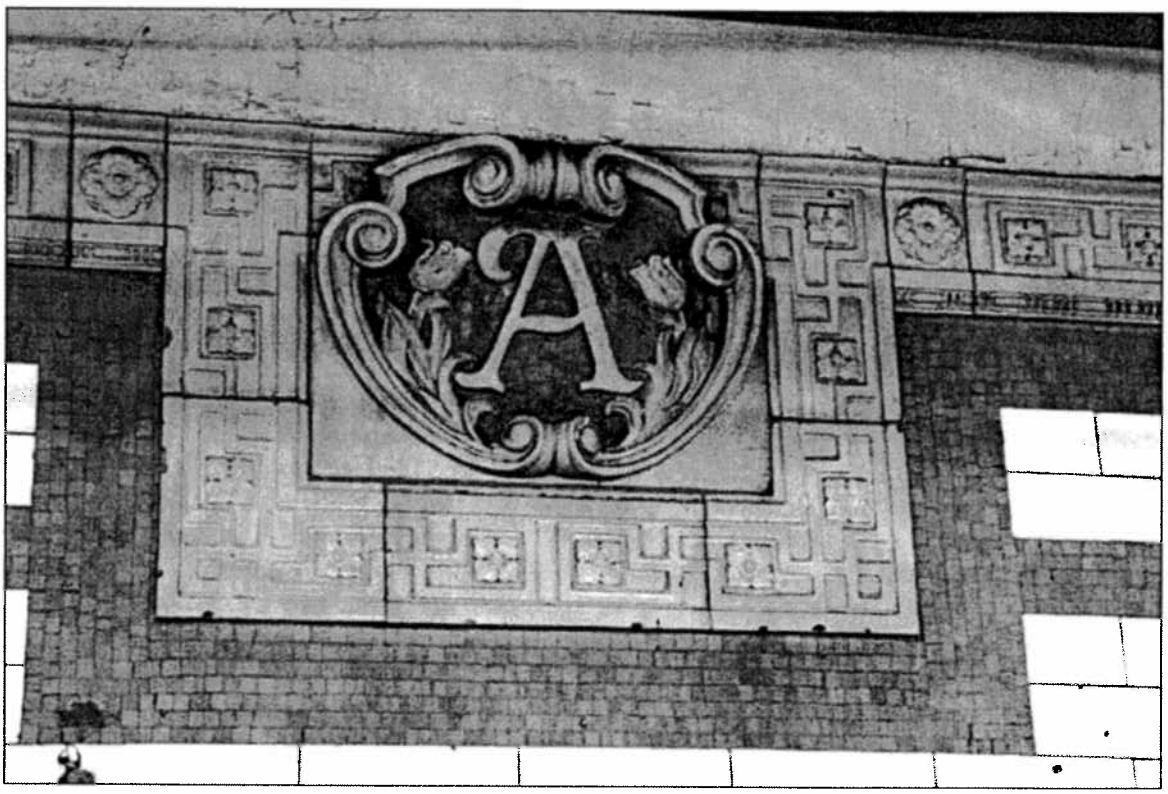

## Historic Resources

Figure 7-1



Credits: Library of Congress, Prints and Photographs Division, Detroit Publishing Company Collection, LC - D4-772144

Atlantic Avenue Control House (IRT), ca. 1910-1920 **1**

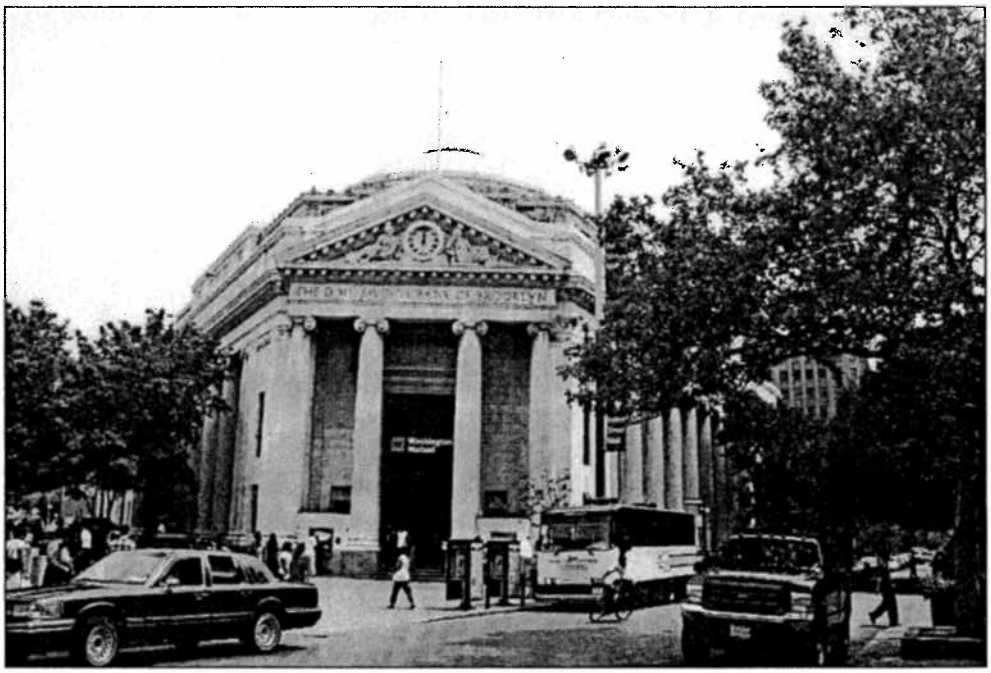



Atlantic Avenue Subway Station (Eastern Parkway Line, 4/5) **2**

## Known Architectural Resources in Project Area
### View 1 and 2
Figure 7-2




Brooklyn Fire Headquarters (former) **3**

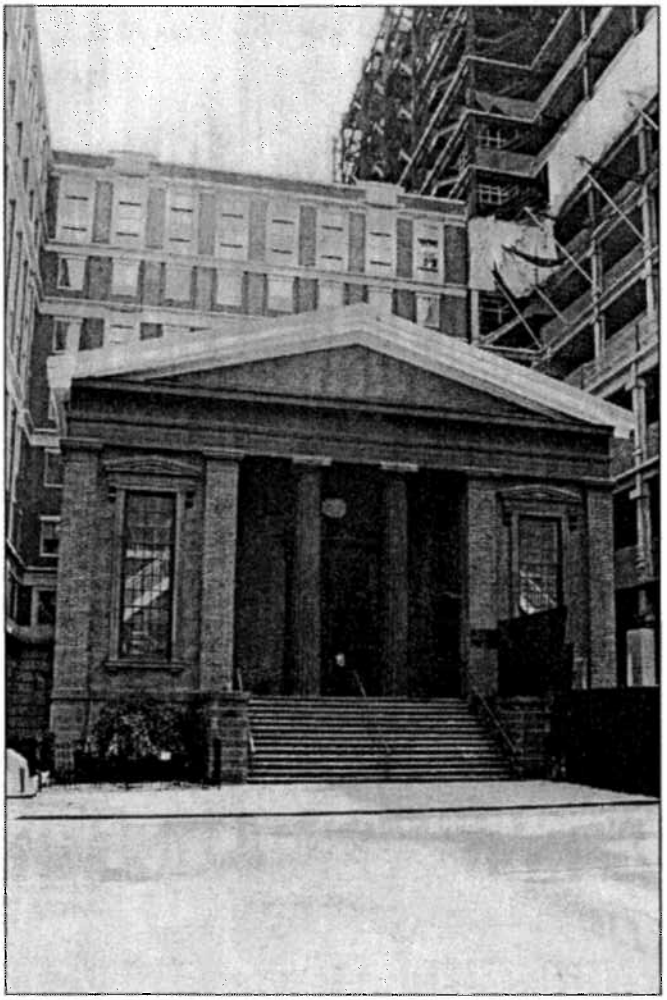


Dime Savings Bank **4**

## Known Architectural Resources in Project Area
### View 3 and 4
Figure 7-3



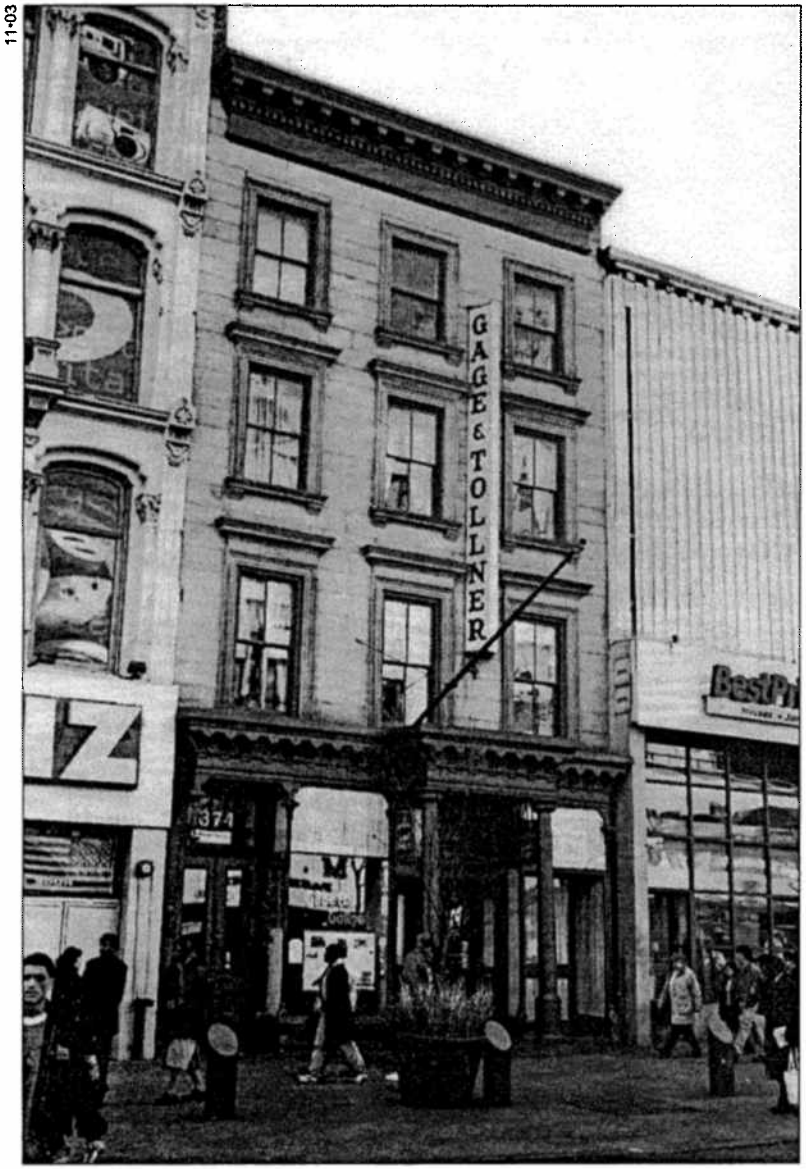
Duffield Street Houses **5**



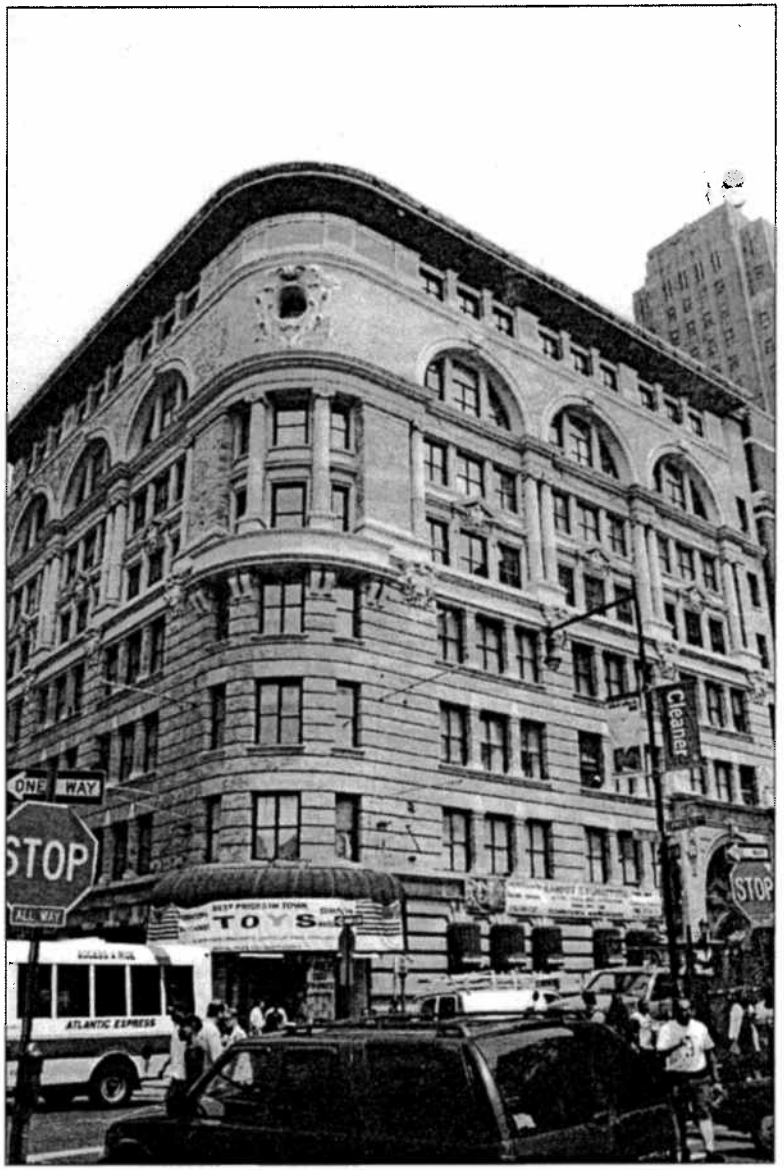
First Free Congregational Church **6**

## Known Architectural Resources in Project Area
### View 5 and 6
Figure 7-4

11-03




Gage & Tollner Restaurant 7




New York & New Jersey Telephone Company Building 8

## Known Architectural Resources in Project Area
### View 7 and 8
Figure 7-5



New York Telephone Company, Long Island Headquarters **9**



Pioneer Warehouses **10**

## Known Architectural Resources in Project Area
## View 9 and 10

11-03



Public School 5 (former) **11**

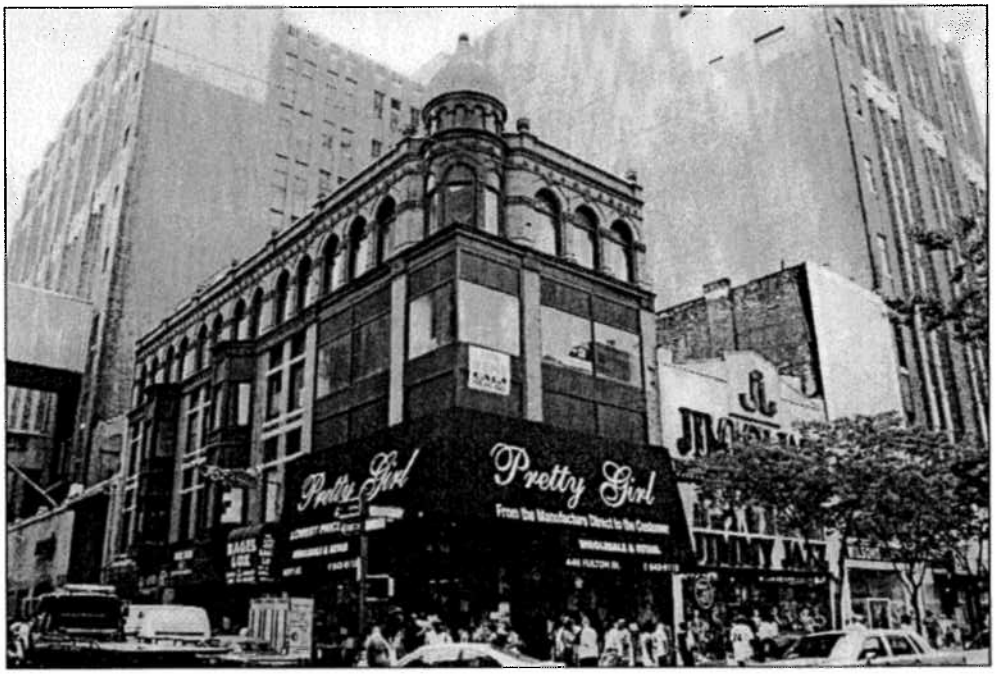


345 Adams Street **12**

## Known and Potential Architectural Resources in Project Area
## View 11 and 12




376 Fulton Street **13**




446 Fulton Street **14**

## Potential Architectural Resources in Project Area
## View 13 and 14
Figure 7-8



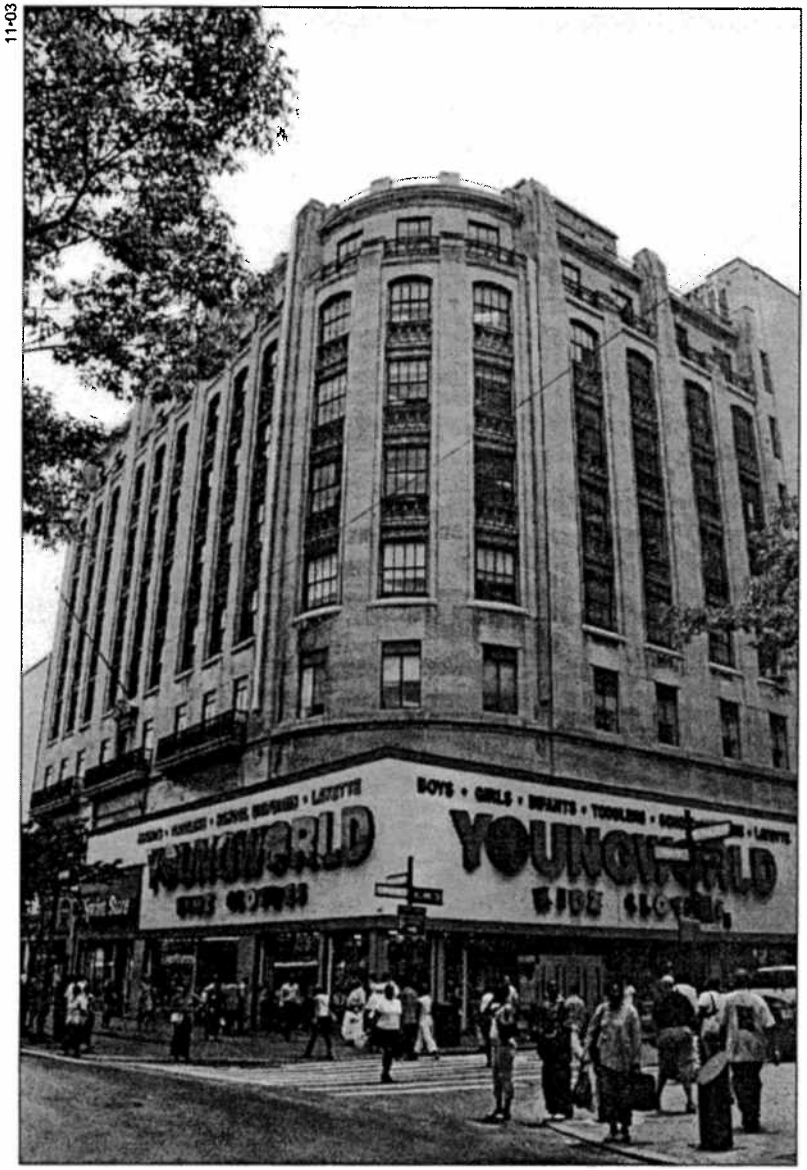

565-571 Fulton Street **15**



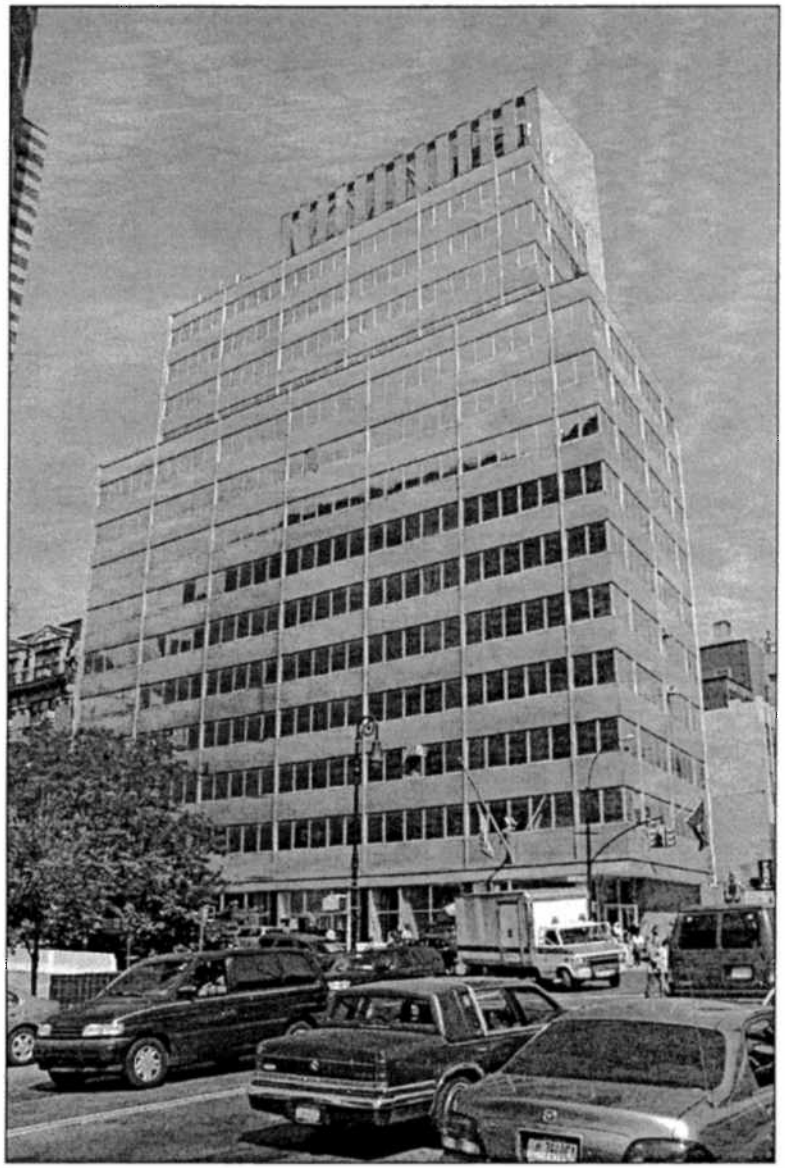

308-310 Livingston Street **16**

## Potential Architectural Resources in Project Area
### View 15 and 16
Figure 7-9

11-03



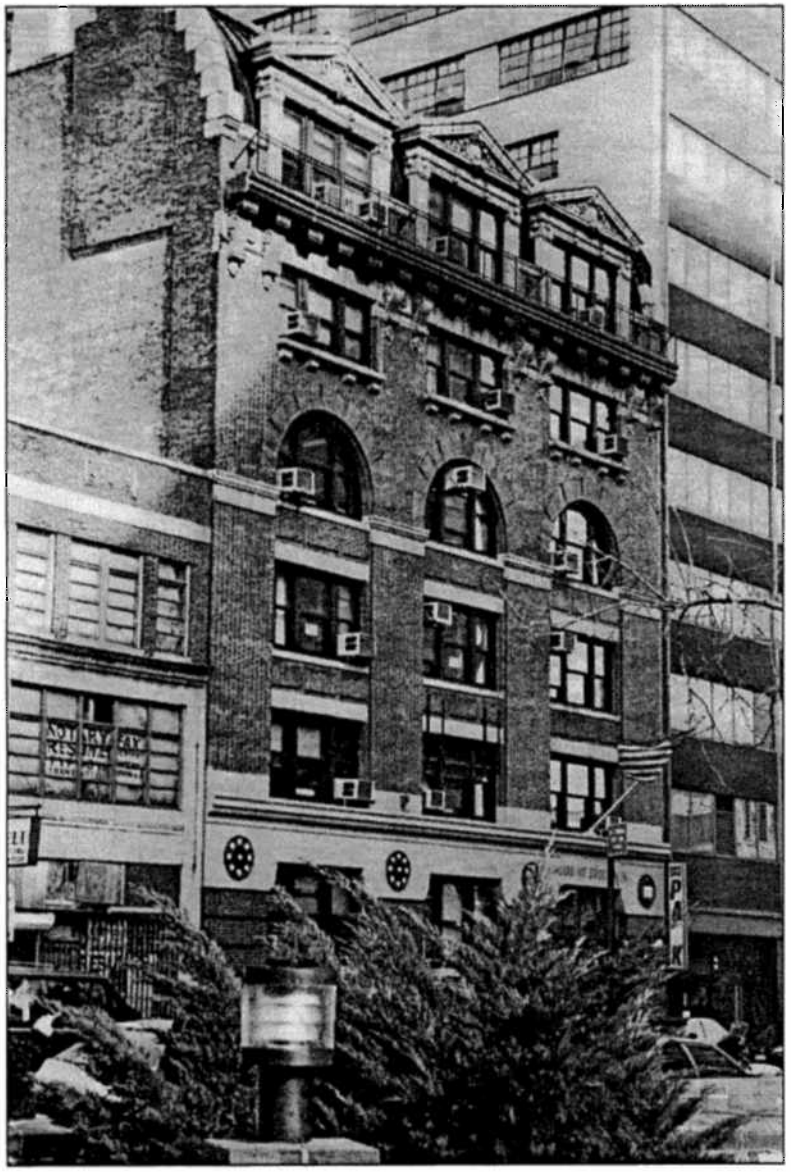

A.I. Namm & Son Department Store Building (former) **17**



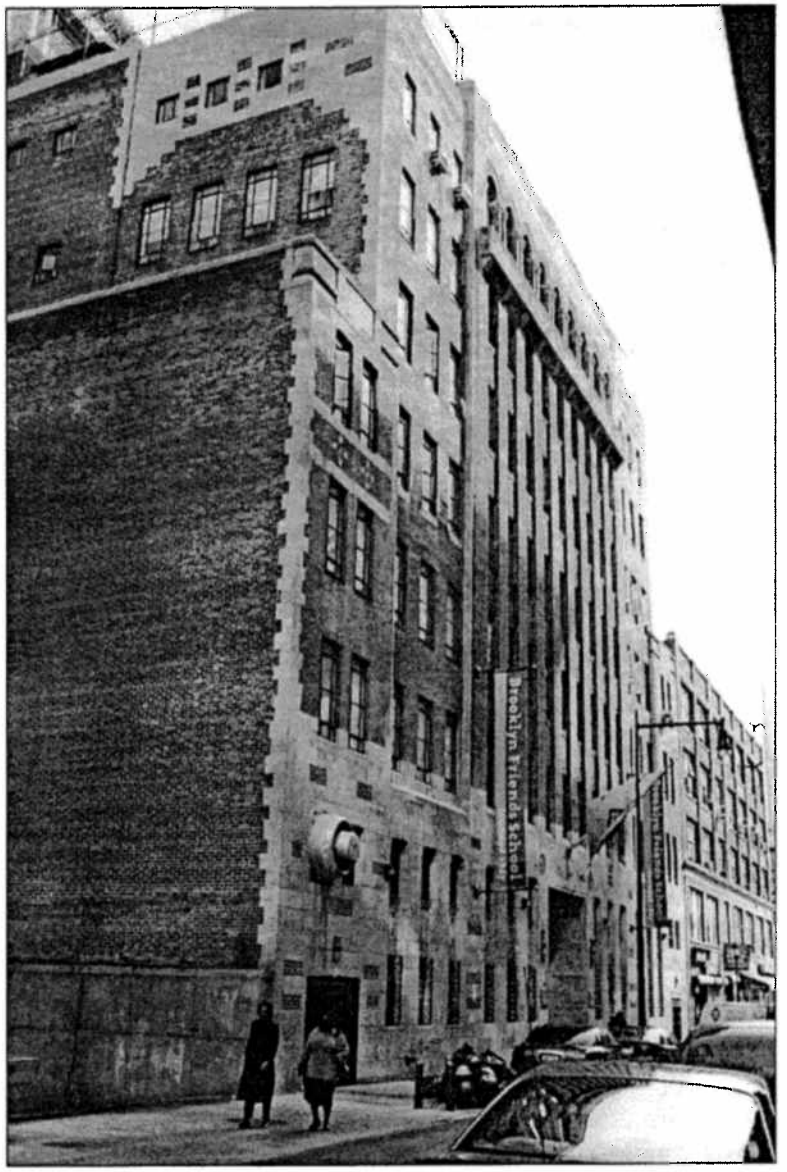
America Fore Building **18**

## Potential Architectural Resources in Project Area
### View 17 and 18
Figure 7-10

11-03



Board of Education Building, 131 Livingston Street 19

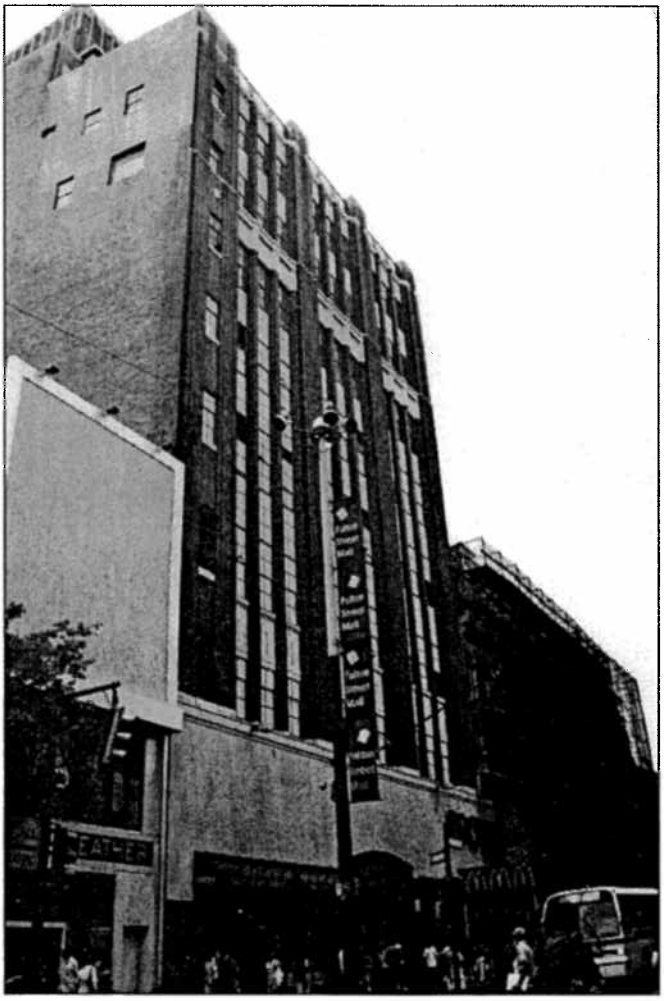



Brooklyn Friends School 20

## Potential Architectural Resources in Project Area
### View 19 and 20
Figure 7-11



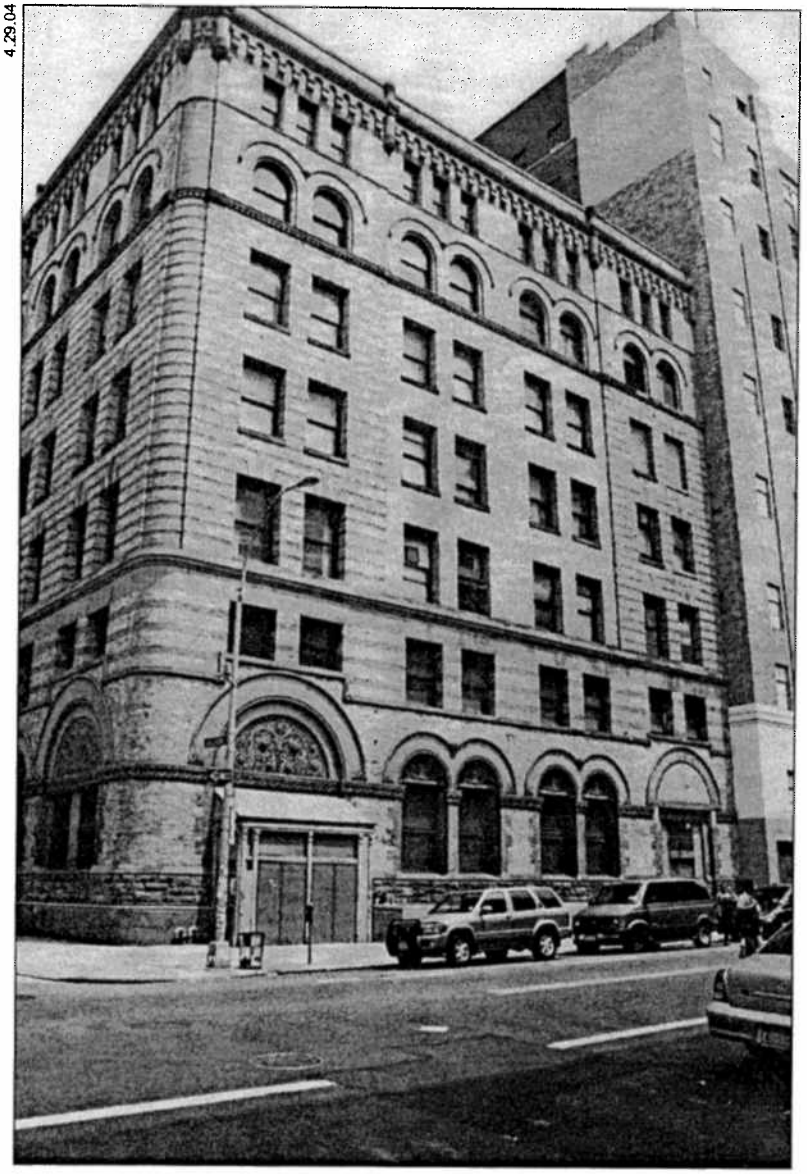

Joseph J. Jacobs Building **21**



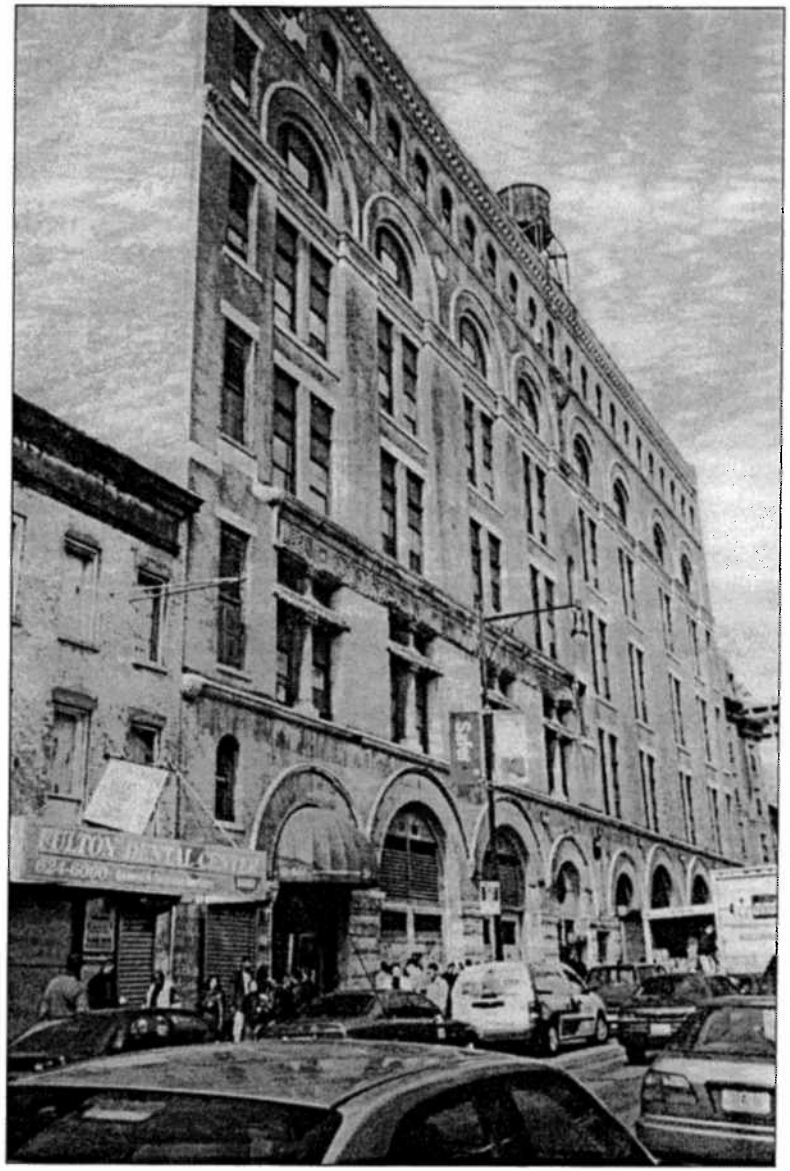
Macy's - Fulton Street facade **22**

## Potential Architectural Resources in Project Area
## View 21 and 22

4.29.04



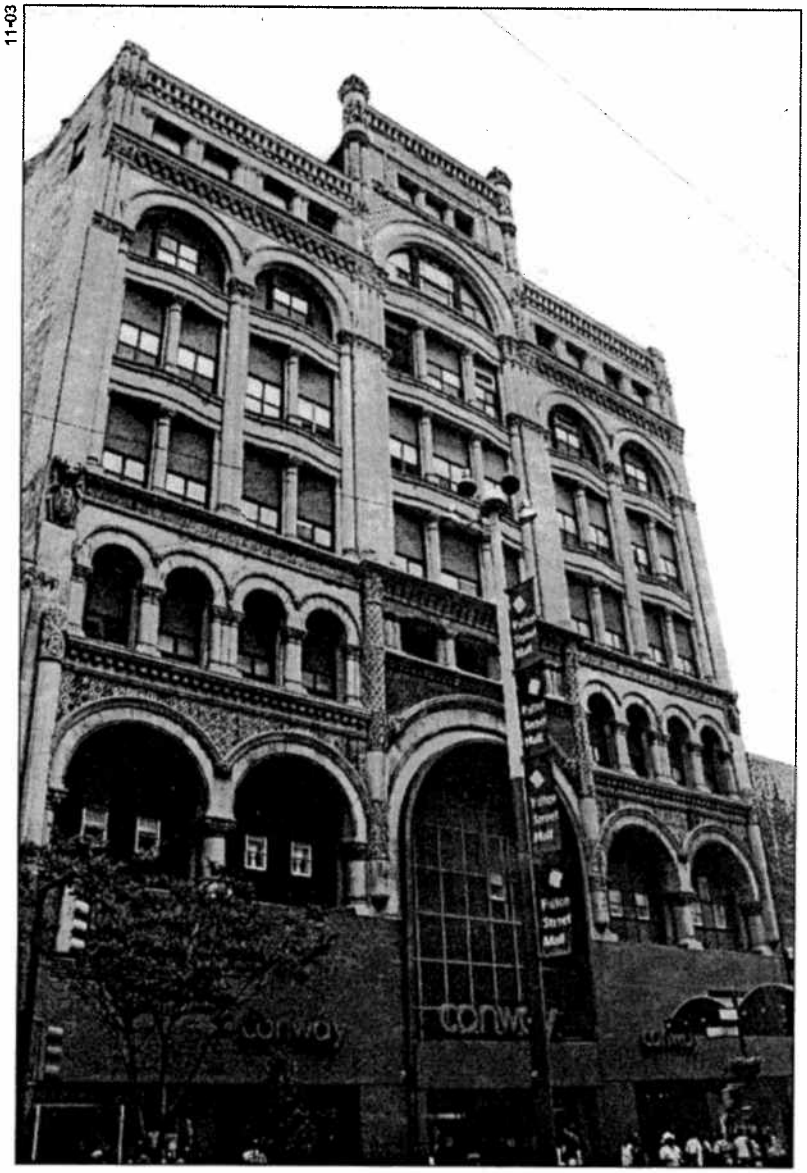
Macy's-Livingston Street facade **23**



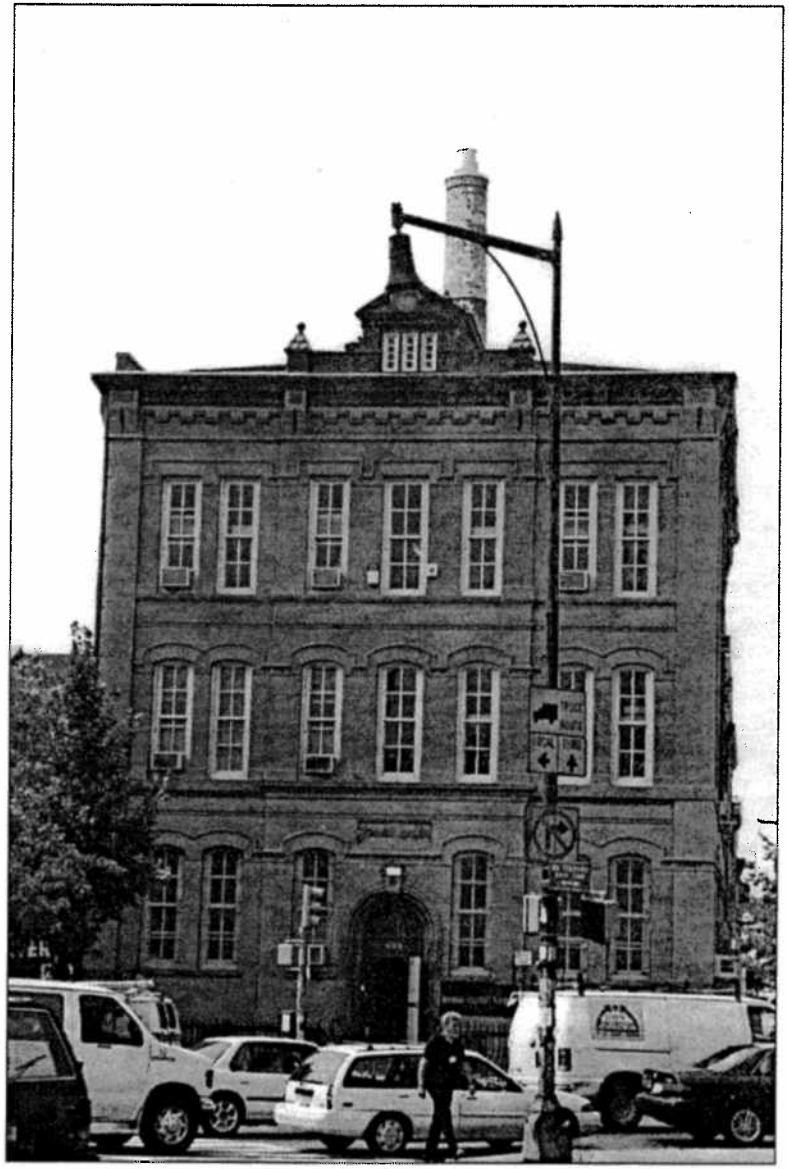
Offerman Building/Wechsler Brothers Block (former) - Duffield Street Facade **24**

## Potential Architectural Resources in Project Area
### View 23 and 24
Figure 7-13

11-03



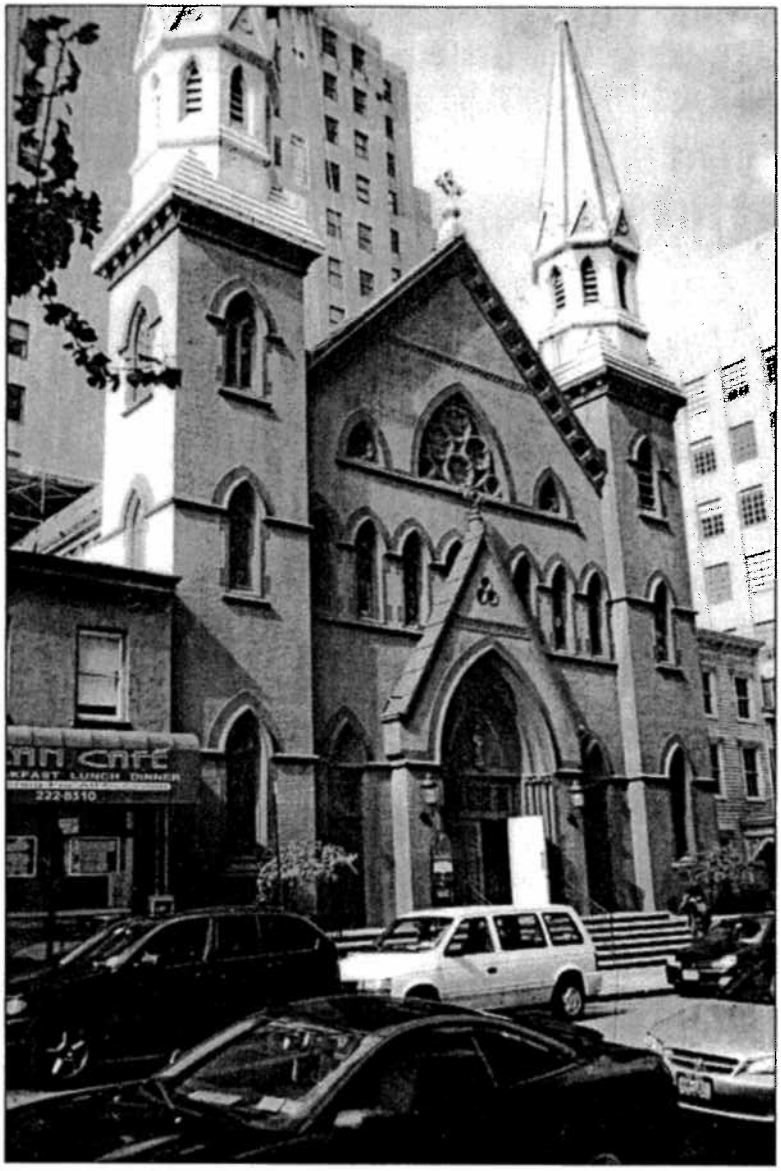
Offerman Building/Wechsler Brothers Block (former) - Fulton Street facade **25**



Public School 15 (former) **26**

## Potential Architectural Resources in Project Area
### View 25 and 26
Figure 7-14

11-03




St. Boniface Church **27**

## Potential Architectural Resources in Project Area
### View 27




233 Duffield Street **28**

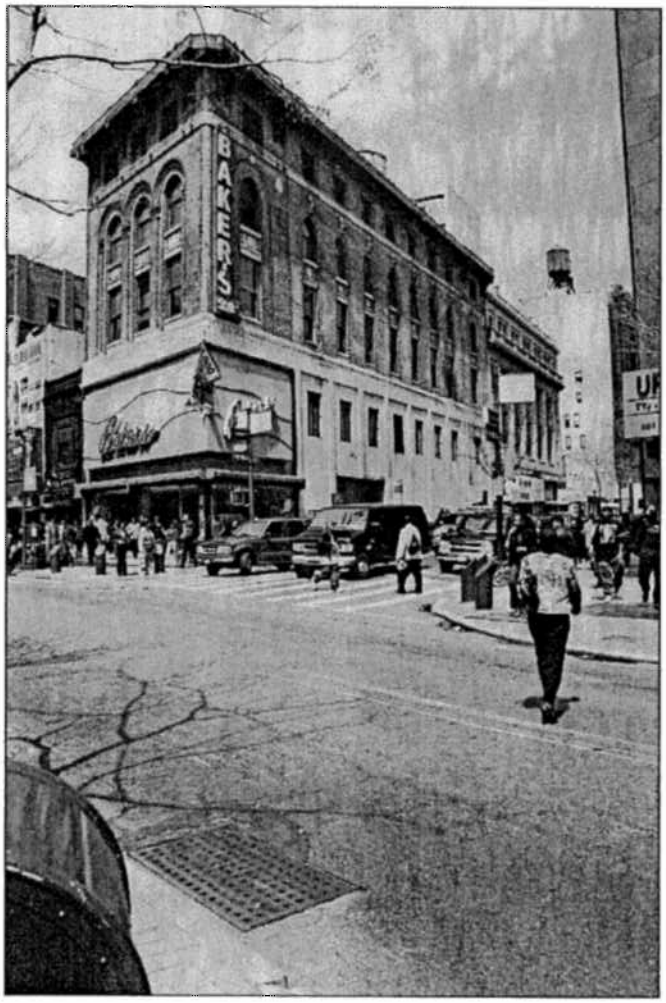



Loesser's Department Store (former) **29**

## Potential Architectural Resources in Project Area
### View 28 and 29




Loesser's Department Store (former) **30**



495 Fulton Street **31**

## Potential Architectural Resources in Project Area
### View 30 and 31
Figure 7-17

4.28.04



386-388 Fulton Street **32**




423 Fulton Street **33**

## Potential Architectural Resources in Project Area
### View 32 and 33
Figure 7-18

4.28.04

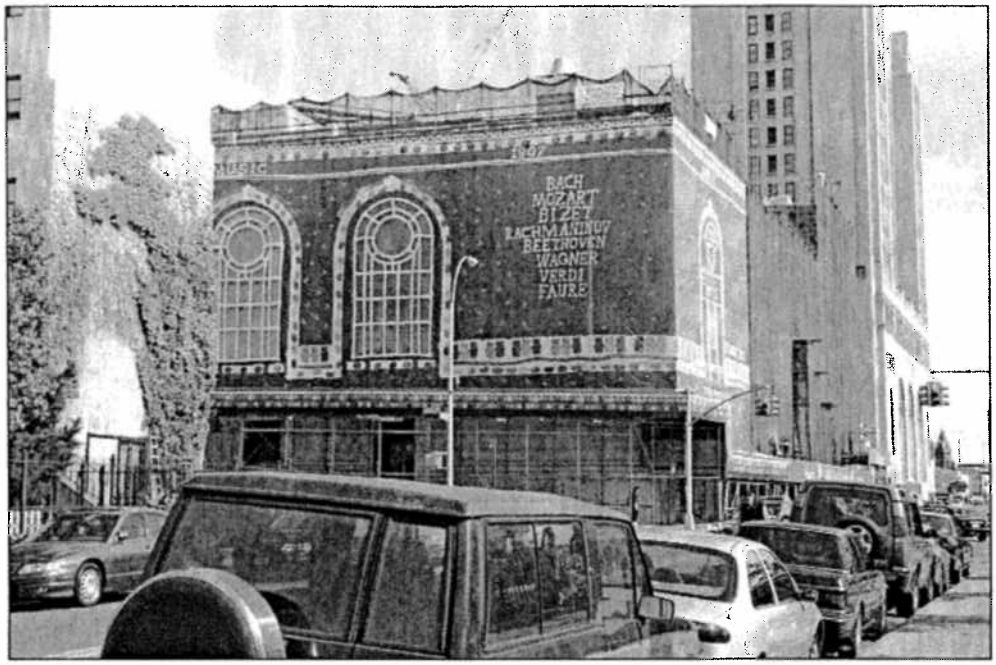


Baptist Temple **34**

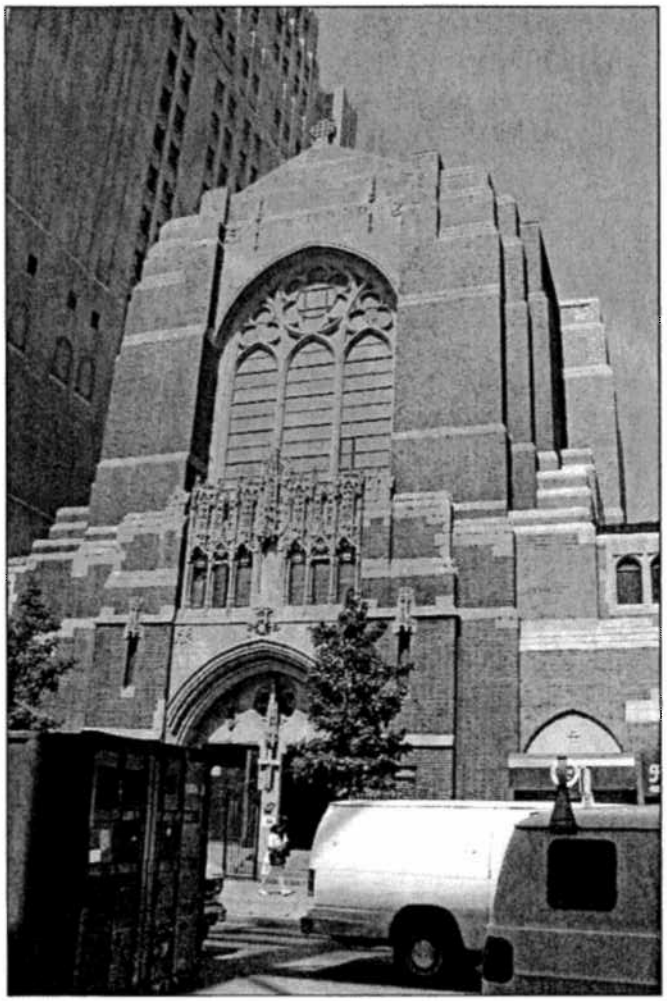


Brooklyn Academy of Music Historic District - Rowhouses on St. Felix Street **35**

## Known Architectural Resources in Project Area
## View 34 and 35
Figure 7-19

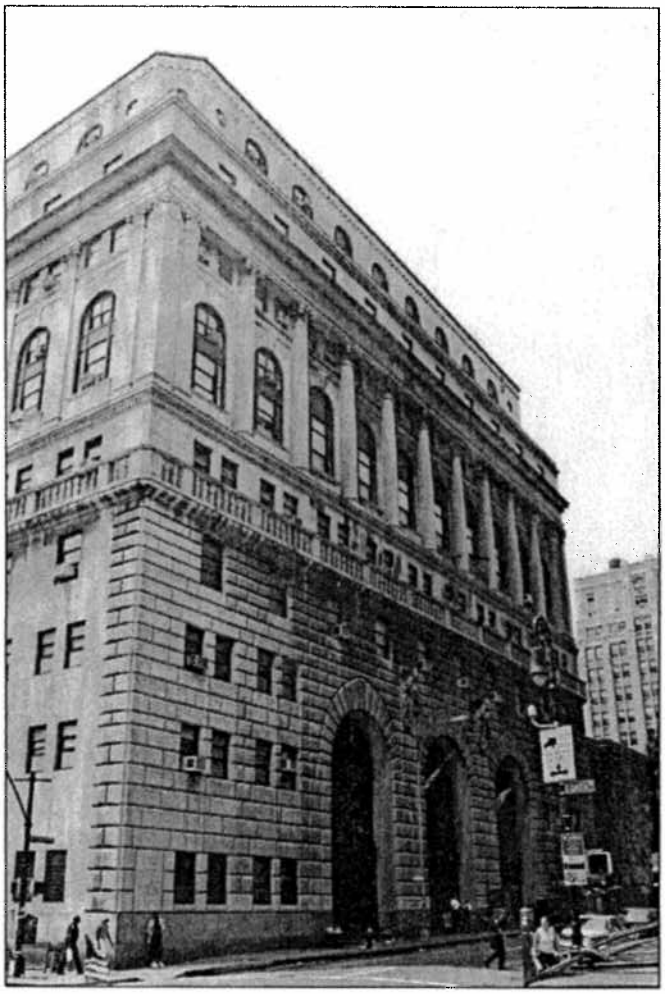



Brooklyn Academy of Music Historic District - Brooklyn Academy of Music **36**
(currently undergoing restoration)



Brooklyn Academy of Music Historic District - **37**
Hanson Place Methodist Church

## Known Architectural Resources in Project Area
### View 36 and 37
Figure 7-20



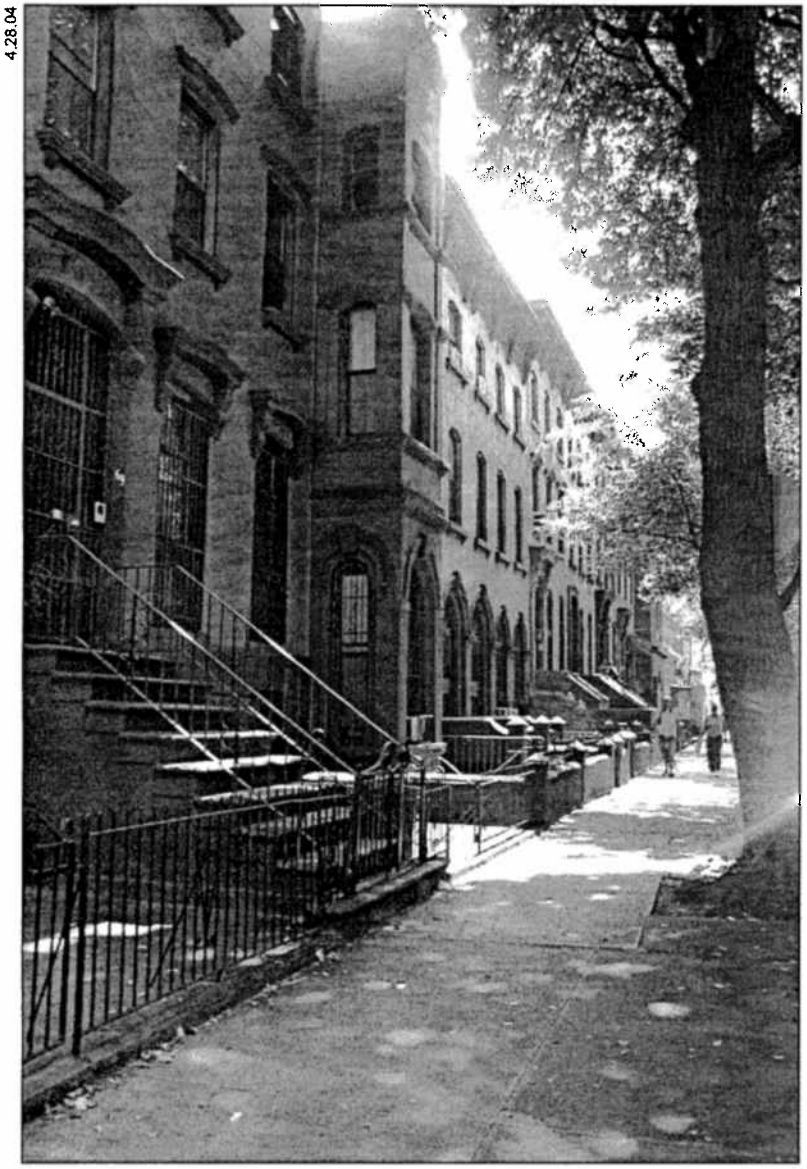
Brooklyn Central Courthouse **38**



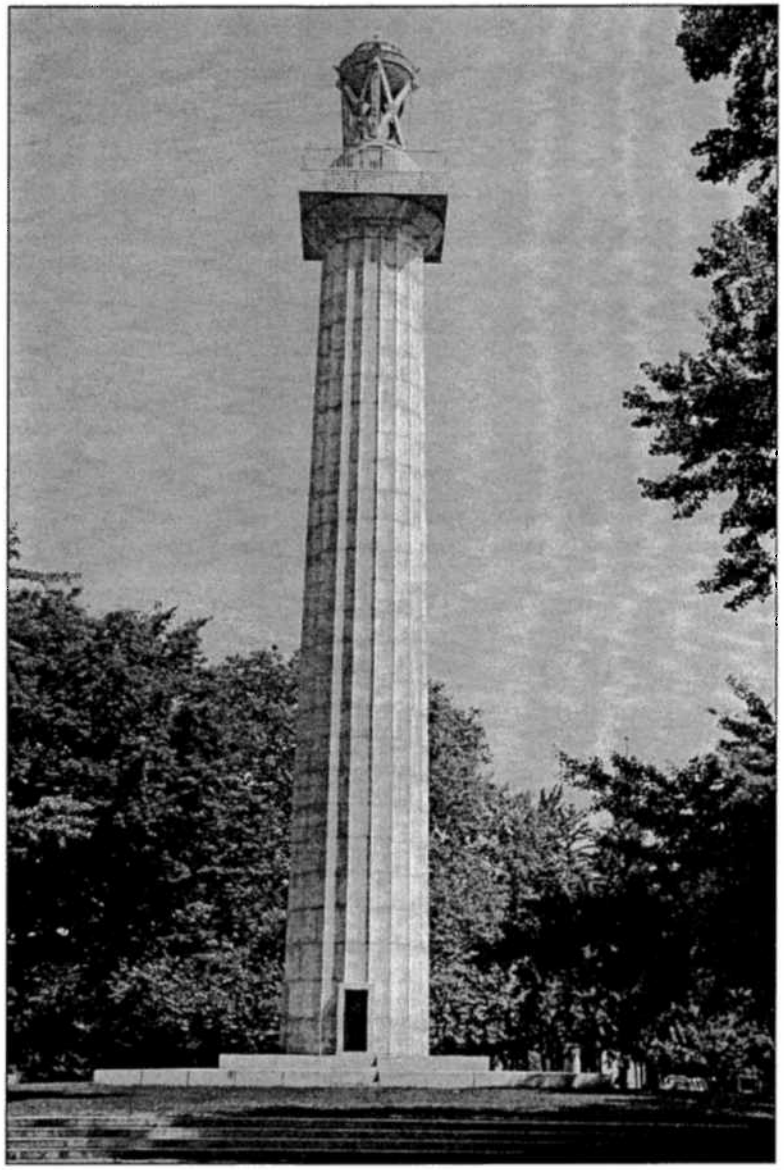

Fort Greene Historic District - rowhouses on Fort Greene Place **39**

## Known Architectural Resources in Project Area
### View 38 and 39
Figure 7-21

4.28.04



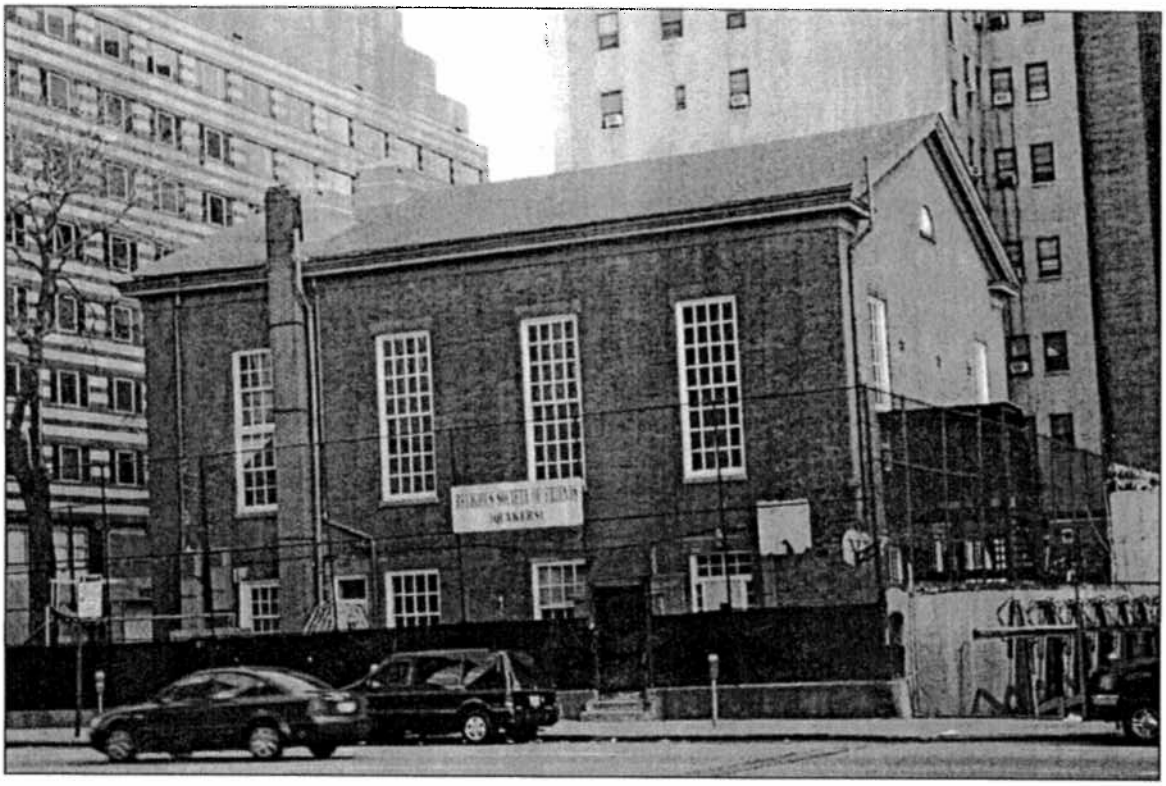
Fort Greene Historic District - rowhouses on Fort Greene Place **40**



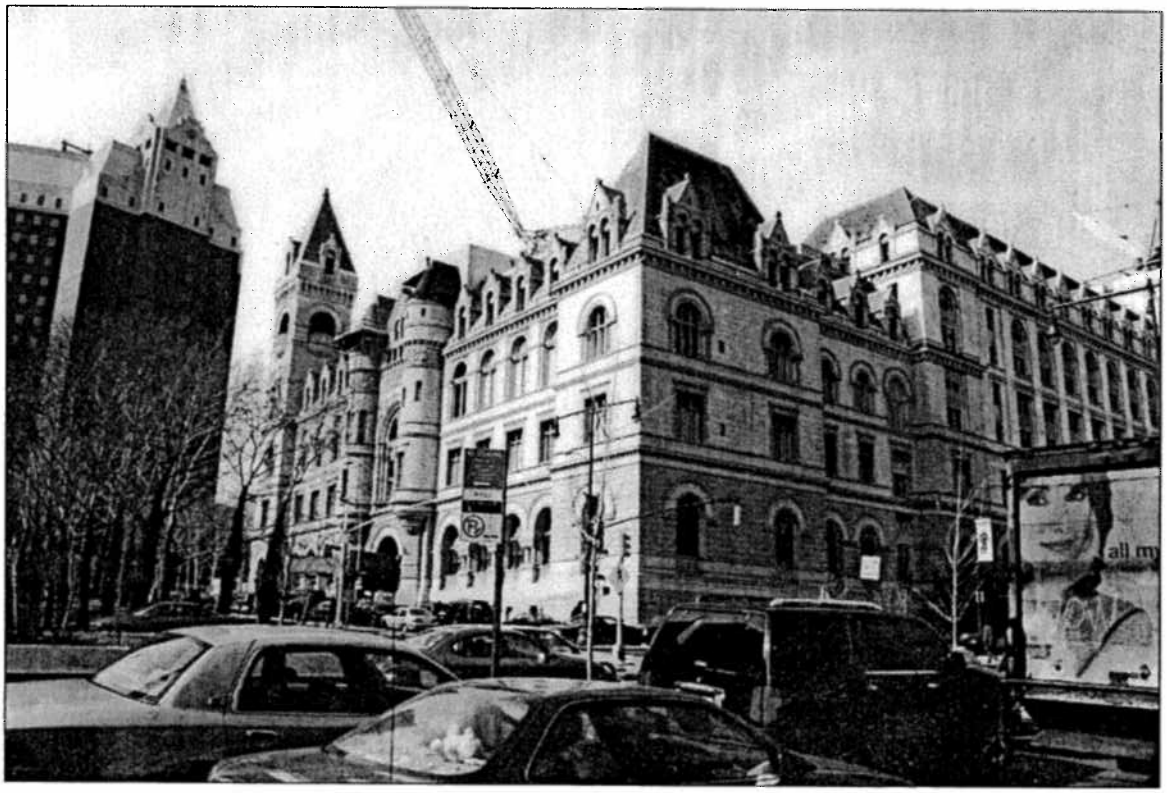
Prison Ship Martyrs Monument, Fort Greene Park **41**

## Known Resources in Study Area
### View 40 and 41
Figure 7-22

4.28.04



Friends Meeting House **42**



U.S. Post Office and Court House, Brooklyn Central Office **43**

## Known Architectural Resources in Study Area
### View 42 and 43
Figure 7-23

4.28.04



Williamsburg Saving Bank Building **44**



522-550 State Street **45**

## Known and Potential Resources in Study Area
### View 44 and 45
Figure 7-24

4.28.04



522-550 State Street **46**




Board of Education Headquarters (former), 110 Livingston Street **47**

## Potential Architectural Resources in Project Area
### View 46 and 47
Figure 7-25

## A. INTRODUCTION

This chapter considers the effects of the proposed actions on the urban design and visual resources in the project area and, as appropriate, surrounding areas. As discussed in Chapter 1, "Project Description," and shown in Figure 8-1, the project area comprises approximately 60 blocks bounded to the north by Tillary Street; to the east by Prince Street, Ashland Place, and Ft. Greene Place; to the south by Pacific, State, and Schermerhorn Streets; and to the west by Adams Street/Boerum Place. As described in Chapter 1, the proposed actions are expected to result in a sizable amount of new development over the next 10 years.

As defined in the 2001 *CEQR Technical Manual*, urban design components and visual resources determine the "look" of a neighborhood—its physical appearance, including the size and shape of buildings, their arrangement on blocks, the street pattern, and noteworthy views that may give an area a distinctive character. The following analysis addresses each of these characteristics for existing conditions and the future without and with the proposed actions for the year 2013, by which time the development of the projected development sites is expected to be complete. Although changes in the character of the area will begin sooner, the full build-out of the projected development sites is considered in this analysis as the reasonable worst-case scenario. The analysis also briefly describes the full build-out of the projected and potential development sites.

The development that would potentially result from the proposed actions would trigger substantial changes in urban design and visual resources. Building bulk and height would be noticeably altered. Street pattern and block forms would change somewhat, but this would not be a significant adverse impact. New public spaces, proposed mandatory sidewalk widenings, and ground-floor retail use and glazing would enliven the street-level environment in the project area. Overall, changes would be significant but not adverse. In general, the proposed actions are expected to transform the appearance of the project area, through streetscape enhancements that would unify the urban design of the area and bridge gaps in the urban fabric, and through the creation of new developments that would enhance the vitality of the area and foster connections between MetroTech and Fulton Mall and the Boerum Hill and Fort Greene neighborhoods to the south and east.

## B. EXISTING CONDITIONS

The discussion below focuses first on the area's urban design—its basic layout and structures—and then identifies its visual resources. The section also addresses conditions on the sites considered most likely for development.

## PROJECT AREA

### *URBAN DESIGN*

The components that most determine the built form and look of the project area are its street patterns, which create the shape of its blocks; its uses, and the sizes and shapes of its buildings; and its streetscapes, as discussed below.

#### *Natural Features, Street Patterns, and Block Shapes*

The topography of the area is relatively flat, with a slight slope downward to the south. The project area is laid out in a skewed grid pattern (see Figure 8-1, above). The streets south of Tillary Street and east of Adams Street are set in a north-south oriented grid. This grid is interrupted by Flatbush Avenue and Fulton Street, which cut through the area on diagonals from the northwest to the southeast, creating some irregularly shaped blocks. South of Fulton Street, streets are laid out in a grid pattern diagonal to the north-south grid above. East of Flatbush Avenue, the grid pattern is reoriented yet again south of Lafayette Street, and there are few streets and larger blocks in the area between DeKalb Avenue and Tillary Street. There are no natural features within the project area.

There are a number of superblocks in the area, such as the one formed by Long Island University's campus, which is bounded by Willoughby Street, Ashland Place, Dekalb Avenue, and Flatbush Avenue Extension. Another is the MetroTech area at the core of Downtown Brooklyn, which is bounded by Johnson Street/Tech Plaza, Duffield Street/Oratory Place, Willoughby Street, and Jay Street. Within this area, Myrtle Avenue and the majority of the north-south streets are for pedestrian use only, leading to the MetroTech Commons in the center of the block. The Renaissance Marriott Hotel block is another superblock, bounded by Johnson Street/Tech Plaza and Adams, Jay, and Willoughby Streets. Pearl Street terminates in the middle of this block at an urban plaza, and is so narrow as to effectively function as a pedestrian-only street for the majority of the time. The R.V. Ingersoll Houses north of Myrtle Avenue, the University Towers complex north of Long Island University, and the Borough Hall complex west of Adams Street, are also on superblock sites.

Several open spaces are located within the project area. The largest is MetroTech Commons, a public pedestrian plaza located between the buildings of MetroTech Center. The open space features pedestrian paths, a central plaza, landscaping, trees, and seating (see Photograph 1 of Figure 8-2). West of MetroTech Commons, across Jay Street, is the Renaissance Marriott Hotel urban plaza (mentioned above). This open space consists of planted areas with trees, as well as a 40-foot-wide, concrete-paved courtyard/walkway connecting Adams and Jay Streets lined with trees and benches. Macomber Square (at DeKalb Avenue and Fulton Street) and Temple Square (at Schermerhorn Street and Flatbush Avenue), which were created by the irregular street grid, include seating, landscaping and trees. At the intersection of Flatbush and Lafayette Avenues, adjacent to the Brooklyn Academy of Music parking lot, is a sitting area with ledge seating and trees. Long Island University (LIU) Plaza is a public space located along the east side of Flatbush Avenue between Fleet Street and DeKalb Avenue. The plaza is designed with tiered areas and contains landscaping, flowers, trees, benches, walkways, and a large pagoda-like sculpture (see Photograph 2 of Figure 8-2).

Although they are not open to the general public, Long Island University's athletic fields and tennis courts, along Ashland Place between Willoughby Street and DeKalb Avenue, also add green space to the project area. There are also small open spaces at York Technical College on

Tillary Street and at the Metropolitan Transit Authority (MTA) building at Boerum Place and Livingston Street. On the boundaries of the project area are Columbus Park/Borough Hall Park, McLaughlin Park, and Fort Greene Park.

*Streetscape*

The project area is urban in character, with streets flanked by concrete sidewalks that are wider along the major thoroughfares and Fulton Street. There are high volumes of vehicular traffic on Flatbush Avenue, Jay Street, Adams Street, Tillary Street, Fulton Street and, just south of the project area, Atlantic Avenue. Adams Street serves as Downtown Brooklyn's primary approach to the Brooklyn Bridge, and there is a local service road on each side of the street, which increases its width and physical presence as a divider (see Photograph 3 of Figure 8-3). Similarly, Flatbush Avenue, the primary approach to the Manhattan Bridge, is a wide thoroughfare with few pedestrian crossings. Adams and Tillary Streets and Flatbush Avenue, in particular, mark the boundaries of neighborhoods and create wide divisions in the urban fabric. Only limited vehicular traffic is allowed on Fulton Mall, but the street experiences a high level of pedestrian traffic. The remaining streets in the area are mainly one-way. Circulation is easier on the east-west streets than the north-south streets, as the north-south streets are interrupted or are discontinuous north and south of Fulton Street. Red Hook Lane, Gallatin Place, Pearl Street, and Fair Street are some of the narrowest streets in the area; these do not receive a lot of vehicular traffic.

In general, the area is busy when shops and offices are open, and much less so at night. Street furniture found within the project area includes phone booths, newsstands, and lampposts in a variety of styles, including bishop's crook, Central Park, cobrahead, and one based on historical models with teardrop lights (see Photograph 4 of Figure 8-3). Along Fulton Street, there are also covered bus stops, kiosks, benches, street trees, banners hanging from lampposts, and some large planters and directional signage (see Photograph 5 of Figure 8-4). In general, there is a lot of signage along the faces of buildings on Willoughby and Fulton Streets in particular, obscuring the details of the lower floors of buildings on these streets. The MetroTech area has standardized trash cans, benches, bollards, signage, and pedestrian lighting, all executed in a modern style in dark green, but the streetscape elements in the remainder of the project area are a mix of types, styles, and conditions (see Photograph 6 of Figure 8-4). There are sidewalk bridges over Hoyt and Bond Streets between Fulton and Livingston connecting Macy's properties, and another above Duffield Street north of Willoughby Street connecting two portions of the J.P. Morgan Chase complex.

Other than within the area's open spaces, there are a few scattered groups of street trees within the project area, particularly along Fleet Street between DeKalb and Flatbush Avenues and State Street west of Third Avenue. A portion of the MetroTech Commons links to Jay Street and provides visual relief from the densely developed street. The median of Adams Street has some plantings, which do not provide much relief from this wide street. Flatbush Avenue also has a median, only portions of which are planted, and these plantings are much smaller than those along Adams Street (see Photograph 7 of Figure 8-5).

*Building Uses, Shapes and Forms*

As discussed in Chapter 2, "Land Use, Zoning, and Public Policy," the Downtown Brooklyn area contains a variety of uses, including residences, offices, retail, and institutions. The shapes and forms of the area's buildings result from the underlying street pattern, which creates odd block configurations. The look of the area's built form also depends on the location within the

project area. In general, buildings within the project area are built to the streetline. Therefore, with some exceptions where parking areas or vacant lots exist, there are strong streetwalls throughout the project area.

This discussion focuses on the nine subareas presented in Chapter 2: MetroTech Center Area (and Jay Street Academic Subarea), Willoughby Street Area, Fulton Street Mall Area, Schermerhorn-Livingston Streets Area, Fulton Street/Flatbush Avenue Triangle Area, State Street Triangle Area, Flatbush Avenue Extension Area, Myrtle Avenue Area, and Long Island University/University Towers Area.

*MetroTech Center Area*. The MetroTech Center area is dominated by commercial, educational, and governmental uses. This area comprises the portion of the project area with the most new development (i.e. buildings built within the past 20 years). The majority of this new development is clustered around the MetroTech Commons open space, discussed above, which occupies the former streetbed of Myrtle Avenue between Jay Street and Flatbush Avenue Extension. The new development is typically greater than 20 stories in height, created for commercial and governmental use, of modern design, and faced mainly in masonry, glass, and steel (see Photographs 8 and 9 of Figures 8-5 and 8-6). Buildings are typically built to the streetwall. There are two notable exceptions to this pattern: the First Free Congregational Church, a small building now used by Polytech University and hemmed in by the 9 MetroTech development; and the unoccupied houses at 182-188 Duffield Street, each of which has a small front yard. These Greek Revival 3-story rowhouses date from 1835–1847 and were moved from their original location on Johnson Street during the development of MetroTech. The MetroTech Center area also includes a portion of the New York City College of Technology at Tillary and Adams Streets. There is one potential development site in this area (site A).

*Jay Street Academic Subarea*. This small subarea at the northern boundary of the project area includes the buildings of three educational institutions: the New York City College of Technology, Polytech University, and the George Westinghouse Information Technology High School, a 4-story building with a Collegiate Gothic main building and a modern, red brick extension (see Photograph 10 of Figure 8-6). These institutional buildings with functional designs were mainly built in the late 19th and early 20th centuries, and they occupy large lots although their height is limited. A recently completed Polytech University dormitory building is larger—18 stories in height—but, like the majority of this area, is faced in light-colored masonry. One of the Polytech buildings east of Bridge Street is constructed of red brick and has a utilitarian design. There is one projected development site and one potential development site in this subarea (sites B, and C, respectively).

*Willoughby Street Area*. To the south of the MetroTech core, along Willoughby Street, the buildings are typically three to four stories in height, faced in red brick and light-colored masonry, and were constructed in the late 19th and early 20th centuries. The buildings along this street are mainly commercial, although a few have residential uses above the ground floor. As discussed above, there is a large amount of signage along the street, including banners on buildings and lampposts as well as awnings and signs on buildings (see Photograph 11 of Figure 8-7). The buildings are built to the building line, which creates a strong streetwall. They are also stylistically diverse, and include two visually distinctive New York/New Jersey Telephone Company buildings, one of which, at 27 stories, is prominent in the surrounding area.

Between Willoughby and Fulton Streets in the area between Adams Street and Flatbush Avenue, there is a greater number of buildings, most of which are small scale (less than six stories in height) and on small lots. As with the buildings along Willoughby Street, the buildings along the

midblocks south of Willoughby to Fulton Street are mainly commercial and typically date from the late 19th century to early 20th century. This area includes three-story wood frame and brick buildings (some of which are residential, or residential above the ground floor); small one- and two-story buildings with masonry façades and art deco details; and a few larger-scale buildings, including the former Offerman Building/Wechsler Brothers Brock, which heavy masonry façades on both Duffield and Fulton Streets, and the Gallery at Fulton Street, which occupies most of the block bounded by Albee Square West/Gold Street, Willoughby Street, Fleet Street, and Flatbush Avenue Extension (see Photographs 12 and 13 of Figures 8-7 and 8-8). The Dime Savings Bank, a domed, marble-faced Classical Revival building, occupies the majority of the block bounded by Fleet Street, DeKalb Avenue, and Flatbush Avenue Extension. This area contains the majority of the projected development sites (sites M, O, P, and Q) as well as several potential development sites (sites L, N, and R). Therefore, it potentially would have the greatest possibility to change in the future with the proposed actions.

*Fulton Street Mall Area*. Fulton Street, a major retail corridor, contains a variety of typically one- to six-story buildings affixed with advertising signs, particularly on the upper stories. The majority of the buildings along the street were built in the first half of the 20th century, are on small lots, are built to the lot line, and create a strong streetwall. There are a few cast-iron buildings, and a few with ornamented façades (see Photographs 14 and 15 of Figures 8-8 and 8-9). There are two developments with larger footprints: the Macy's complex, which encompasses eight interconnected buildings on the block bounded by Gallatin Place and Hoyt, Fulton, and Livingston Streets. The principal building in this complex is nine stories in height and is faced with dark brown brick with Art Deco details. Macy's also occupies a large secondary building on the block just to the east. On the block bounded by Hanover Place and Fulton, Nevins, and Livingston Streets, there is a small interior alley, and the scale of the buildings and their lots is typically much smaller than on the rest of Fulton Street (see Photograph 16 of Figure 8-9). This area includes four potential development sites (sites T, U, V and W). There is also one former theater, the Loew's Metropolitan, which is being converted into a worship center for the Brooklyn Tabernacle; this five-story, red brick building has frontages on Fulton, Smith, and Livingston Streets.

*Schermerhorn-Livingston Streets Area*. This area is composed of the blocks bounded by Boerum Place, Flatbush Avenue, and Schermerhorn and Livingston Streets. A large, open concrete garage on Bond Street, which was constructed in 1974, is the most recent development on this block; most of the other buildings were developed in the early 20th century (see Photographs 17 and 18 of Figure 8-10). Most of the buildings on these blocks are used for commercial and office uses, some with retail at the ground-floor level; however, compared to the buildings along Fulton Street just to the north, there is much less signage on the buildings, and much less streetlife. The largest buildings are between six and 11 stories in height; the remainder are mostly less than three stories tall. At the far west corner of the area is a Metropolitan Transit Authority building, a modern, 12-story dark-colored masonry and glass building with a public plaza facing Livingston Street and Boerum Place. A number of parking lots break up the street walls of Livingston and Schermerhorn Streets. There are two projected development sites (sites AA and BB) and three potential development sites (sites Y, Z, and CC) within this area.

*Fulton Street/Flatbush Avenue Triangle Area*. This area includes the Brooklyn Academy of Music complex and portions of the Fort Greene and BAM Historic Districts. The historic districts are primarily composed of three- to five-story rowhouses faced in brick and/or brownstone (see Photograph 19 of Figure 8-11). The Brooklyn Academy of Music complex includes the historic academy building on Lafayette Avenue, which is currently being renovated;

a new Mark Morris Dance Center on Lafayette Avenue; and a theater on Fulton Street. There also are a number of parking lots located within these blocks. The Williamsburg Savings Bank, which at 512 feet is currently the most prominent feature of the Brooklyn skyline, is located at the northwest corner of Hanson and Ashland Places (see Photograph 20 of Figure 8-11).

*State Street Triangle Area*. This very small area is composed of the block bounded by Third, Lafayette, and Flatbush Avenues This block includes a two- and three-story historic former public school, currently painted a light purple color, and a series of one- to five-story commercial buildings built in the early 20th century (see Photograph 21 of Figure 8-12).

*Flatbush Avenue Extension Area*. This area comprises the east side of Flatbush Avenue Extension between Tillary and Fulton Streets and includes a variety of land uses, such as commercial, residential, educational, institutional, and industrial. As described above, Flatbush Avenue creates a strong visual divide between the core Downtown Brooklyn area and the neighborhoods east of Flatbush. The area just south of Tillary Street (which includes projected development site G and potential development sites D, E, F, and H) comprises a number of medium-scale (six to eight story) former manufacturing buildings, scattered vacant and parking lots, and a few rowhouse buildings, particularly along Myrtle Avenue (see Photograph 22 of Figure 8-12). Further east are the R.V. Ingersoll Houses, a complex of over 20 red brick, six-story buildings of utilitarian design surrounded by green space (see Photograph 23 of Figure 8-13). South of this area is the LIU Plaza (described above), and site S, which is a full-block, seven-story, modern steel and glass building.

*Myrtle Avenue Area*. This very small area, also known as projected development site J, comprises the south side of Myrtle Avenue between roughly Fleet Street and Ashland Place. It is currently occupied by one-story buildings with retail uses (see Photograph 24 of Figure 8-13).

*Long Island University/University Towers Area*. The Long Island University/University Towers area is located to the south of the Myrtle Avenue area and to the east of the Flatbush Avenue Extension area. The University Towers complex, located along Willoughby Street, is composed of three 15-story, simple red brick residential buildings built in the 1950s. The buildings are set back somewhat from the streetline. South of Willoughby Street is the Long Island University campus, which is roughly bounded by Willoughby Street, Ashland Place, DeKalb Avenue, and Flatbush Avenue Extension. The main building on the campus facing the LIU Plaza and Flatbush Avenue is 11 stories in height, faced in light brown brick, and constructed ca. 1928; the remaining buildings on the campus are between three and 16 stories in height and are built in a variety of styles and materials. LIU's athletic center, which fronts onto DeKalb Avenue, has no windows and presents a blank masonry wall to the street (see Photograph 25 of Figure 8-14).

*VISUAL RESOURCES*

An area's visual resources may consist of public view corridors, vistas, or natural or built features. Within the project area, historic buildings, parks, and diverse vistas constitute the area's visual resources, as discussed below. Views to visual resources and vistas within the study area are typically short, not extending completely across the project area, due to the skewed street pattern. Visual resources are discussed in the nine subareas from which they are visible or from where the views originate.

*MetroTech Center Area*

Adams Street, which forms the western border of this subarea and the project area, has an expansive width which allows for extended views along the street. Views south are of a mix of

tall and short, modern and older buildings; past Livingston Street, the road angles to the southwest and less can be seen. The Renaissance Marriott Hotel and 345 Adams Street are prominent in views north. The U.S. Post Office is prominent in views north of the Renaissance Marriott Hotel, and the spire of the Empire State Building can be seen in the far distance (see Photograph 26 of Figure 8-14).

Views west from Adams Street and western portions of Willoughby and Fulton Streets include Borough Hall. The open space surrounding Borough Hall sets it apart and enhances its prominence, despite its relatively small stature. Western views from this location also include several historic brick tower buildings west of Borough Hall on Court Street: the 35-story Montague-Court Building, the 28-story red brick 32 Court Street building, and the 29-story red brick Italianate Brooklyn Chamber of Commerce building (see Photograph 27 of Figure 8-15). The Renaissance Marriott Hotel is the focal point of the narrow view corridor north on Pearl Street. Views south on Pearl Street end at Fulton Street, where the road angles to the southwest.

*Jay Street Academic Subarea*. Views north along Jay Street are of the approach to the Brooklyn Bridge in the far distance, and of McLaughlin Park in the foreground. Views east along Johnson Street are unremarkable; views west are of the U.S. Post Office. Along Tillary Street west, the new federal courthouse, the green open space of Walt Whitman Park/S. Parks Cadman Plaza, and a tall apartment building in Brooklyn Heights can be seen (see Photograph 28 of Figure 8-15).

*Willoughby Street Area*

Views east along Willoughby are of the Prison Ship Martyrs Monument in Fort Greene Park, a 148-foot-tall obelisk designed by McKim, Mead & White (see Photograph 29 of Figure 8-16). Views east and west along Willoughby Street also include several historic resources, but these are difficult to see due to the street's narrow width. The former Brooklyn Fire Headquarters building is prominent in views north along Jay Street because of its dramatic coloration and sharply-pitched roof. Far in the distance along Jay Street, the approach to the Brooklyn Bridge can be seen. Views north along Lawrence, Bridge, and Duffield Streets end with the MetroTech Commons and the new 9 MetroTech office development; views south along these streets end at Fulton Street, where the street grid angles.

*Fulton Street Mall Area*

Except where noted above, views along the Fulton Street Mall are generally constrained by the large degree of signage on the street, which serves to obscure the underlying buildings. In addition, the Fulton Street Mall signs and electric signboards spanning the street at its intersections with Adams Street/Boerum Place and Flatbush Avenue tend to limit surrounding views (see Photograph 30 of Figure 8-16). The visual impact and prominence of the historic resources along the street are also somewhat diminished by the high level of signage. One exception is the Dime Savings Bank, which is visually prominent in views east from Macomber Square, as the street opens up at this location (see Photograph 31 of Figure 8-17).

*Schermerhorn-Livingston Streets Area*

Views north generally end with the buildings along Fulton Street, due to the angled street grid. On Hoyt Street and Hanover Place, these views are of visually interesting buildings such as the cast-iron buildings at 565-571 Fulton Street and the Offerman Brothers/Wechsler Brothers Block building, which has a carved masonry façade (see Photograph 32 of Figure 8-17). Views west on Livingston Street include several historic and visually interesting buildings, such as the Roman-

esque Revival-style Macy's complex building on Gallatin Place, the red brick, Beaux Arts 131 Livingston Street building, and, across Boerum Place, the former Board of Education building at 110 Livingston Street. The last two resources are most prominent in views from the intersection of Livingston Street and Boerum Place. Views east along Livingston Street end with the large, buff-brick bulk of the Pioneer Warehouses (see Photograph 33 of Figure 8-18). The most visually prominent building in views west on Schermerhorn Street is the Brooklyn Central Courthouse, which has a heavy masonry, Renaissance Revival-style façade (see Photograph 34 of Figure 8-18). Views east along Schermerhorn Street include the Williamsburg Savings Bank, the red brick Baptist Temple and the former Public School 15. Temple Square, the open space located at the intersection of Schermerhorn Street and Flatbush Avenue, opens up views to the two latter buildings and enhances their prominence.

*Fulton Street/Flatbush Avenue Triangle Area*

Within this area, views south on Ashland Place, and St. Felix Street are of the commercial/office development under construction on the Atlantic Terminal superblock and the Williamsburg Savings Bank. Views north along Hudson Avenue and Rockwell Place are of the Long Island University campus. Views west on Fulton Street are generally limited by the Fulton Street Mall sign and electric signboard spanning the street at its intersection with Flatbush Avenue. Views along Hanson Place are mainly of the construction on the Atlantic Terminal superblock and the small open space at Fulton and South Oxford Streets.

*State Street Triangle Area*

This area has views to the Williamsburg Savings Bank, the Pioneer Warehouses, and the Baptist Temple, all of which are visually prominent from this location (see Photograph 35 of Figure 8-19).

*Flatbush Avenue Extension Area*

Along Flatbush Avenue, views north are of the tall new development on the west side of the street (including 9 MetroTech and the J.P. Morgan Chase complex) and of the Manhattan Bridge in the far distance (see Photograph 36 of Figure 8-19). The visually busy streetscape is somewhat relieved by the green open space of the LIU Plaza on the east side of the street; however, in general, Flatbush Avenue does not provide a visual corridor of significant interest.

*Myrtle Avenue Area*

Views east from this subarea are unremarkable, but are generally wide due to the open space surrounding the R.V. Ingersoll Houses and the low scale of the buildings on the south side of the street. Views west are of busy Flatbush Avenue and, in the distance, the tall modern buildings of MetroTech.

*Long Island University/University Towers Area*

Views within this area are limited because of the superblocks north and south of Willoughby Street; in addition, the eastern portion of Long Island University's campus is slightly raised. Therefore, views are mainly along Willoughby Street and DeKalb Avenue. Views west along Willoughby Street are of the MetroTech area; views east are of Fort Greene Park and the Prison Ship Martyrs Monument (see above). Views along DeKalb Avenue are generally unremarkable. Views north on Rockwell Place end at the LIU campus.

# C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

## URBAN DESIGN

There are a number of projects under construction or being planned for the Downtown Brooklyn area. These include several new residential developments along Schermerhorn Street; the development of the BAM cultural district east of Flatbush Avenue, the new courthouse and commercial office expansion in the MetroTech area and, at the project area's southern boundary, the completion of the large-scale Atlantic Terminal commercial/retail development. In addition, the Bridge Plaza Rezoning project would allow for more residential development north of Tillary Street at the project area's northern boundary. All of these projects are being developed within the boundaries of existing blocks, and therefore are not expected to change any natural features, street patterns, or block shapes. The density of the area will continue to increase with these projects, and the projects are expected to be in keeping with the general trend toward large-scale construction. The use of the buildings will be consistent with existing uses. The form of the buildings is expected to be, in general, taller and more modern than what currently exists. Some of the projects, in particular the residential developments along Schermerhorn Street, are replacing vacant lots, and, therefore, are expected to enhance the visual quality and liveliness of these blocks.

At the project area's southeastern boundary, the large-scale, mixed-use Atlantic Yards Arena and Redevelopment project is proposed for an approximately 24-acre site. This project is not expected to change any natural features of the study area. However, it would be expected to alter street patterns and block shapes by the closing and widening of certain streets. In addition, it would substantially change the density of development at this edge of the Downtown Brooklyn area, as a large portion of the project would be built over what is now a below-grade open rail yard on the south side of Atlantic Avenue. One of the projected uses of the site, the arena to be used by a major-league sports franchise, would be unique within this area.

Absent the proposed actions, it is anticipated that little change will occur in the urban design of the project area. Without the impetus of the increase in FAR and the change in permitted uses that would result from the proposed actions, new construction is unlikely to occur on the projected and potential development sites. Under the existing master plan for the City University's campus/buildings, new buildings with additional square footage for academic use potentially could be constructed on these blocks. Aside from this potential development, no other new development is expected to occur that would involve changes to the project area's urban design. Minor changes in the project area's urban design could result from the upgrading and/or reuse of existing buildings in the area. While the urban design of the area could improve with improvements in the exterior façades of surrounding buildings by owners looking to attract new tenants, the overall urban design of the area, in terms of the type and bulk of buildings, would most likely be maintained to a great extent.

## VISUAL RESOURCES

Absent the proposed actions, it is anticipated that existing view corridors and views to visual resources will not substantially change in the project area. Without the impetus of the increase in FAR and the change in permitted uses that would result from the proposed actions, substantial new construction is unlikely to occur in the project area. The Atlantic Terminal and Atlantic Yards Arena and Redevelopment projects are expected to alter views of the Williamsburg Savings Bank from the south. However, as this is currently the tallest building in Brooklyn, and

can be viewed from long distances away and from multiple vantage points, this change is not expected to be significantly adverse. The Atlantic Yards Arena and Redevelopment project also is expected to change the visual nature beyond the southeast boundary of the study area. In particular, it is expected to substantially alter the existing view corridors of Atlantic Avenue and Flatbush Avenue. It may also alter views to surrounding visual resources, including resources that lie outside of the project area. The potential impacts of this proposed project will be analyzed in its own environmental review process. The new federal courthouse, 330 Jay Street building, and Atlantic Terminal building will form new visual landmarks in the area.

## D. FUTURE WITH THE PROPOSED ACTIONS

### URBAN DESIGN

*NATURAL FEATURES, STREET PATTERNS, AND BLOCK SHAPES*

The proposed actions would result in several changes to block shapes and street patterns in the project area. Specifically, the blocks on either side of Pearl Street and Red Hook Lane between Boerum Place and Jay Street would be combined to form two larger blocks, and Pearl Street and Red Hook Lane would be eliminated in these locations. The elimination of Prince Street between Flatbush Avenue Extension and Myrtle Avenue and Fair Street between Prince Street and Fleet Place, and the extension of Fleet Place north from Fair Street to Myrtle Avenue, would create one large block where currently there are two blocks and part of a third. The creation of the Willoughby Square public space with a new street directly to the south would break up the bulk of the block bounded by Willoughby, Duffield, Fulton, and Albee Square West/Gold Streets. As discussed above, the streets to be removed carry very little pedestrian or vehicular traffic, and their elimination is not expected to create a significant adverse impact. The block shapes to be created by the proposed actions are expected to encourage new development with larger floorplates, which would be consistent with the size of new development in the project area.

*STREETSCAPE*

The proposed actions would create improvements to the project area's streetscape by providing for two public spaces—Willoughby Square and Jay Street Plaza—and creating new street-level pedestrian amenities along Flatbush Avenue/Flatbush Avenue Extension and Willoughby Street (see Figure 8-20). These include mandatory sidewalk widenings along the south side of Willoughby Street between Adams and Flatbush Avenue Extension (except at the proposed Willoughby Square); new street tree requirements along Myrtle Avenue between Flatbush Avenue Extension and Ashland Place; and signage controls. Various streetscape enhancements also would be installed along Flatbush Avenue/Flatbush Avenue Extension, to enhance the pedestrian experience of this street and bridge its disconnect in the urban fabric. The proposed enhancements include a wider landscaped center median along the avenue, similar to Adams Street; continuous sidewalks that are wider at street crossings; and signalized and delineated pedestrian crossings (see Figure 8-21).

Both Willoughby Street and Flatbush Avenue would be provided with improved subway entrances to be included in new buildings and/or plazas, to provide for a less cluttered and more pedestrian-friendly environment. Myrtle Avenue between Flatbush Avenue Extension and the proposed extension of Fleet Place, and Willoughby Street between Albee Square West/Gold Street and Flatbush Avenue Extension, would be widened to include planted medians.

Fenestration/glazing, security gate transparency, and retail uses also would be required on the ground floors of most new developments in the project area, which would serve to visually enhance the pedestrian environment on surrounding streets. The Jay Street Plaza public space would include a new subway entrance/exit to the Jay Street subway station; however, this public space is located on a potential development site, and, thus, the public space and new subway entrance/exit are unlikely to be developed by 2013.

*BUILDING USES, SHAPES, AND FORMS*

It is anticipated that the proposed rezoning and other related actions would allow for the development of new, modern structures that would be much taller and would have larger floorplates than most buildings currently located within the project area. Based on the illustrative bulk diagrams prepared by DCP, the proposed actions could lead to the construction of buildings ranging from approximately 6 to 46 stories (or up to approximately 615 feet) in height. At this height, and with the larger expected floorplates, the projected buildings at sites M, O, P, and Q would be most comparable to the existing MetroTech development, and would serve to expand its urban design and form into the surrounding area. Based on the proposed 12.0 FAR in the C6-4.5 zoning district, the projected buildings within this area could be of a similar height as those found in downtown Manhattan, depending on the size of the base and tower floorplates. In addition, the new buildings could be designed in a modern style, such as with metal and glass curtain wall façades. The new setback, ground-floor transparency, ground-floor retail, fenestration, and other requirement for new developments are expected to improve the design of the proposed buildings, particularly from the street-level perspective.

The development sites bounded by Third Avenue and Livingston, Schermerhorn, and Smith Streets (sites AA and BB) and on the east side of Flatbush Avenue Extension between Tillary and Willoughby Streets (sites I(A) and J), are expected to be developed mainly with residential buildings that would replace existing public parking lots and underutilized buildings that pose an uninviting barrier between the Boerum Hill and Fort Greene neighborhoods and the Downtown Brooklyn core. The proposed height limitation areas for the blocks bounded by Smith, Livingston, Nevins, and Schermerhorn Streets would allow this development to be moderately taller than what currently exists within the Area C (250-foot height limit) boundaries and slightly higher than existing buildings within the Area B (140-foot height limit) boundaries. However, as there would be no height limit in the areas zoned C6-4 and C6-4.5 to the north, these height limitation areas are expected to create a contextual buffer between the extended MetroTech area and the Boerum Hill area to the south. Similarly, the height limitation on the south side of Myrtle Avenue between Fleet and Ashland Places is expected to act as a contextual buffer between the Fort Greene neighborhood and the MetroTech area, although it would allow for much taller development than what currently exists. It is anticipated that any new structures built on these sites would be of a modern appearance and, therefore, would differ in visual appearance from those structures currently located on the sites.

It is expected that these sites would be individually developed over a 10-year period, and, therefore, not all at one time. Therefore, the development of potential new buildings, while expected to constitute new presences in the rezoning area as they are constructed, would constitute a gradual development that would lead to an incremental change in visual character along area streets. The additional development on the potential development sites after 2013 would further this change, and would be particularly noticeable along Fulton Street at its intersections with Adams Street and Flatbush Avenue. The development of potential development sites R, T, U, V and W, after 2013 for residential, office, and retail uses are expected to improve the quality of

these underutilized blocks. Therefore, the proposed actions would not be anticipated to have a significant adverse effect on the urban design of the project area.

As described above, the proposed actions would provide for two public spaces on sites L and P: Willoughby Square and Jay Street Plaza. These public spaces would increase the amount of green open space in the rezoning area and change the land use of these blocks to improve the surrounding visual and pedestrian atmosphere.

## VISUAL RESOURCES

*MetroTech Center Area*

Views from Adams and Joralemon Streets east along Fulton and Livingston Streets would change considerably with the addition of a tall, modern building at this intersection on site M. From this viewpoint, the new development would appear to be an extension of the MetroTech area. Borough Hall and the brick tower buildings along Court Street would be somewhat diminished in views west along Fulton Street by this new development. With the development of Site L after 2013, views south on Pearl Street would end at the new development, rather than at Fulton Street one block to the south, and the tall views noted above would further change.

*Jay Street Academic Subarea*. Views east along Johnson Street would be somewhat altered by the new developments on sites C and G. However, these views are generally unremarkable, and this change is not considered to be significant. After 2013, views along Tillary Street would be somewhat altered by the potential development of sites A, B, and D; views west along Johnson near Adams Street would still include the U.S. Post Office, although the context of these views would be altered by the new development on site A.

*Willoughby Street Area*

Views east along Willoughby to the Prison Ship Martyrs Monument in Fort Greene Park would not be obstructed by the proposed new development along this street. Portions of views along this street would be opened up by the creation of the Willoughby Square open space, and views along the street would be enhanced by the proposed improvements to streetscape elements and the removal of buildings obscured by excess signage. Views to the former Brooklyn Fire Headquarters building would not be obstructed or diminished with the proposed actions. Views along Bridge, Duffield, and Albee Square West/Gold Streets would change with the addition of a public space and several new commercial office buildings along these streets; however, these views are generally unremarkable, and this change is not considered to be significant.

*Fulton Street Mall Area*

Views along Fulton Street would be altered by the development on sites M, Q, and S, particularly near the street's intersection with Adams Street. After 2013, views near Fulton Street would be further altered by the clustered potential development of sites R, T, U, V, and W; however, this change is not considered to be significant, as these views are generally constrained by the large degree of signage on the street, which serves to obscure the underlying buildings and historic resources. The context of views to the Dime Savings Bank from Macomber Square would be considerably altered, due to the greater density and different appearance of the new development on adjacent site Q (and, post 2013, on site R).

*Schermerhorn-Livingston Streets Area*

Views along Schermerhorn and Livingston Streets would be altered by the development of sites AA and BB, which have frontages on both streets; in addition, the development of site M would remove one of the visually interesting buildings along Livingston Street (the Beaux Arts Board of Education building at 131 Livingston Street).

After 2013, the context of views to the Brooklyn Central Courthouse on Schermerhorn Street would change with the potential development of site Y, but these views would not be obstructed. Views north on Hanover Place would be substantially altered by the potential development of sites T, U, and W, along the street, as well as the potential development on site R, which would replace the cast-iron buildings at 565-571 Fulton Street. The potential development of sites CC and DD would alter views of the adjacent Baptist Temple and former Public School 15; however, the scale of development permitted under the proposed zoning would not be expected to overwhelm these resources.

*Fulton Street/Flatbush Avenue Triangle Area*

Within this area, views south on Ashland Place and St. Felix Street would include the commercial/office development currently under construction on the Atlantic Terminal superblock (expected to be complete by 2013) and the Williamsburg Savings Bank. Views along Hanson Place would be altered by the creation of the visual and performing arts public library on site EE and the completed Atlantic Terminal development, which would be considerably taller and more dense than what currently exists on those sites. After 2013, views west on Fulton Street would be altered by the potential development of sites R, T, U, V, and W near Flatbush Avenue.

*State Street Triangle Area*

Views to the Williamsburg Savings Bank and the Pioneer Warehouses would be altered by the development of site EE, but these views would already be changed by the completed Atlantic Terminal development and the proposed Atlantic Yards Arena and Redevelopment project. As described above, the potential development of site DD after 2013 would alter views of the Baptist Temple and the former Public School 15, but the scale of development permitted on this site under the proposed zoning would not be expected to overwhelm these resources.

*Flatbush Avenue Extension Area*

Views along Flatbush Avenue are expected to improve with the proposed actions. Specifically, the proposed enhancements to the streetscape—including a wider, landscaped median similar to Adams Street, continuous sidewalks that are wider at street crossings, signalized and delineated pedestrian crossings, and a new, green public space at Willoughby Square—would enhance surrounding views and the pedestrian experience of the street, and help to bridge its disconnect in the urban fabric. Views along Flatbush Avenue also would be altered by the addition of new development along both sides of the street, particularly after 2013; however, in general, this development would be an improvement over existing conditions, as the street currently includes a number of visually undistinguished buildings.

*Myrtle Avenue Area*

Views east along Myrtle Avenue would change with the development of sites I(A) and J on the south side of the street. However, as Myrtle Avenue currently does not provide a visual corridor of significant interest, these changes are not expected to be adverse. In addition, the proposed

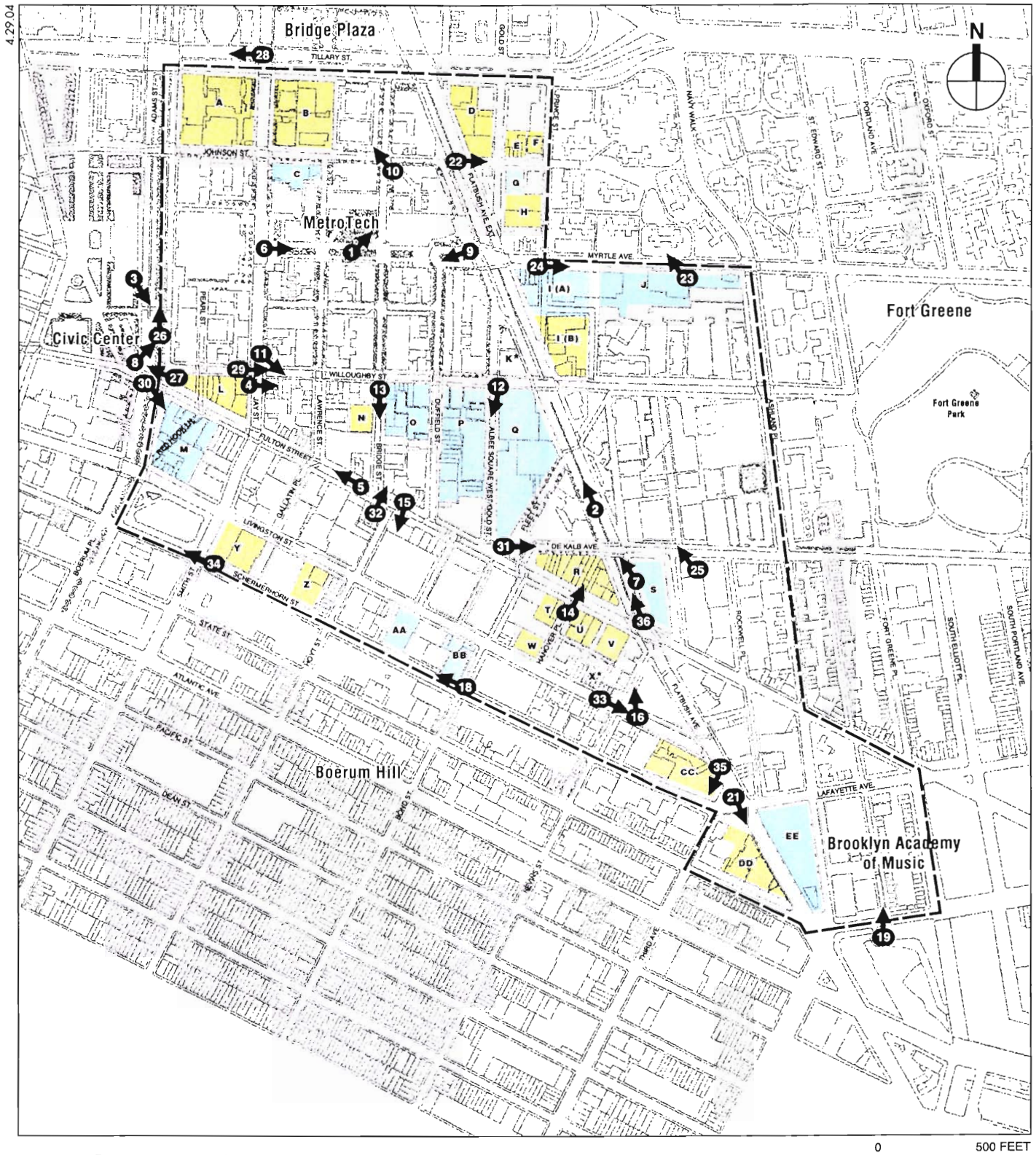
enhancements to the streetscape—including a landscaped median between Flatbush Avenue Extension and Fleet Street—would improve surrounding views and the pedestrian experience of the street.

*Long Island University/University Towers Area*

Views west along Willoughby Street are expected to improve with the proposed enhancements to the streetscape elements of Willoughby Street and Flatbush Avenue. Other views within this area are not expected to change considerably with the proposed actions.

## E. CONCLUSIONS

With the development anticipated to occur by 2013 in the project area, changes in urban design and visual resources would be considerable, but not adverse. Building bulk and height are the elements of urban design that would be most substantially altered by the proposed actions. Commercial office towers would be created along the south side of Willoughby Street, extending the high-density office uses currently found in the MetroTech Center area. There would be several changes to street patterns and block forms in the project area, but these changes are not anticipated to have any adverse effects on urban design. Mandatory sidewalk widenings, subway stair relocations, landscaped medians, pedestrian crossings, and street tree plantings would help improve the project area's streetscape, which currently has a jumble of styles and types of streetscape elements. Ground-floor glazing, security gate transparency, and retail uses, which would be mandatory on the ground floor of most developments, would contribute to a lively, pedestrian-oriented environment. While the proposed development would not block any significant views or vistas, it would remove some visually interesting buildings in surrounding views and would considerably alter views of and within the rezoning area. Views along Willoughby Street and Flatbush Avenue Extension would be enhanced by the proposed improvements to streetscape elements on these streets. In general, the proposed actions are expected to transform the appearance of the project area, through streetscape enhancements that would unify the urban design of the area and bridge gaps in the urban fabric, and through the creation of new developments that would enhance the vitality of the area and foster connections between MetroTech and Fulton Mall and the Boerum Hill and Fort Greene neighborhoods to the south and east. ✷




Project Area Boundary

Projected Development Site

Potential Development Site

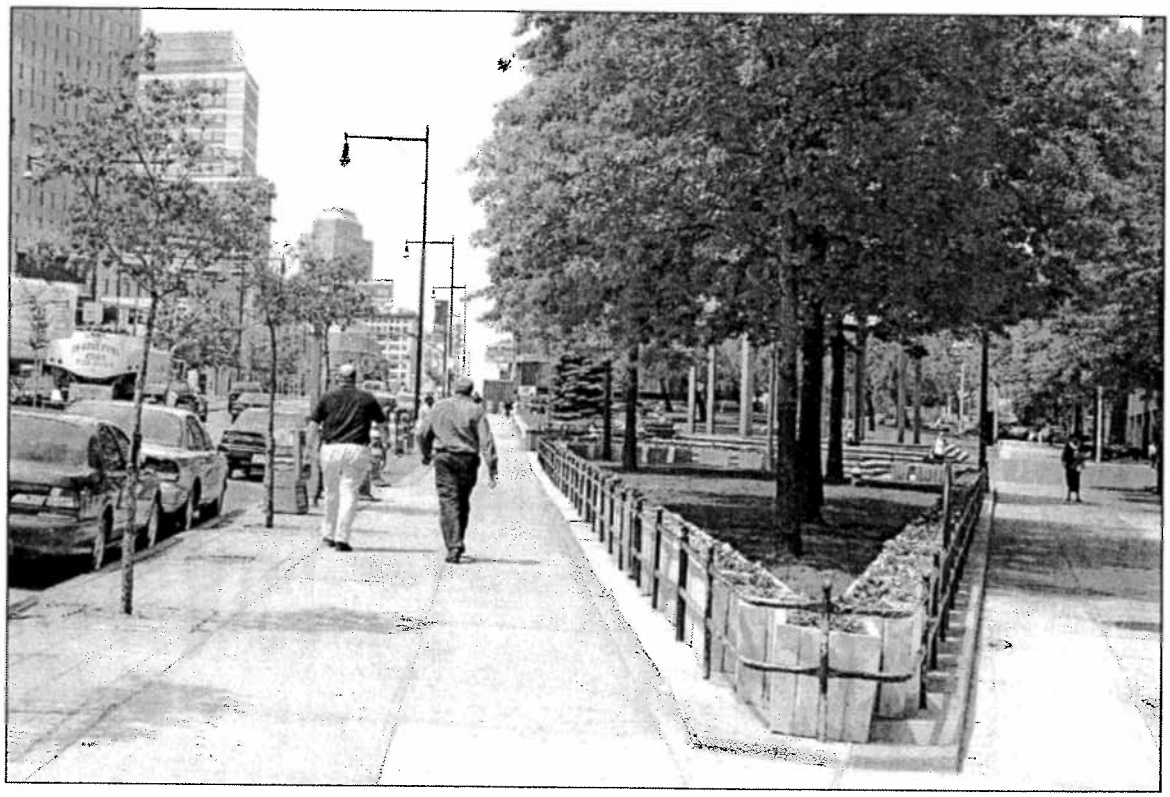
Photo Reference Numbers and View Directions

* Since the issuance of the DEIS/DSEIS, Sites K and X have been removed from the proposed development plan

**Project Area**
Figure 8-1

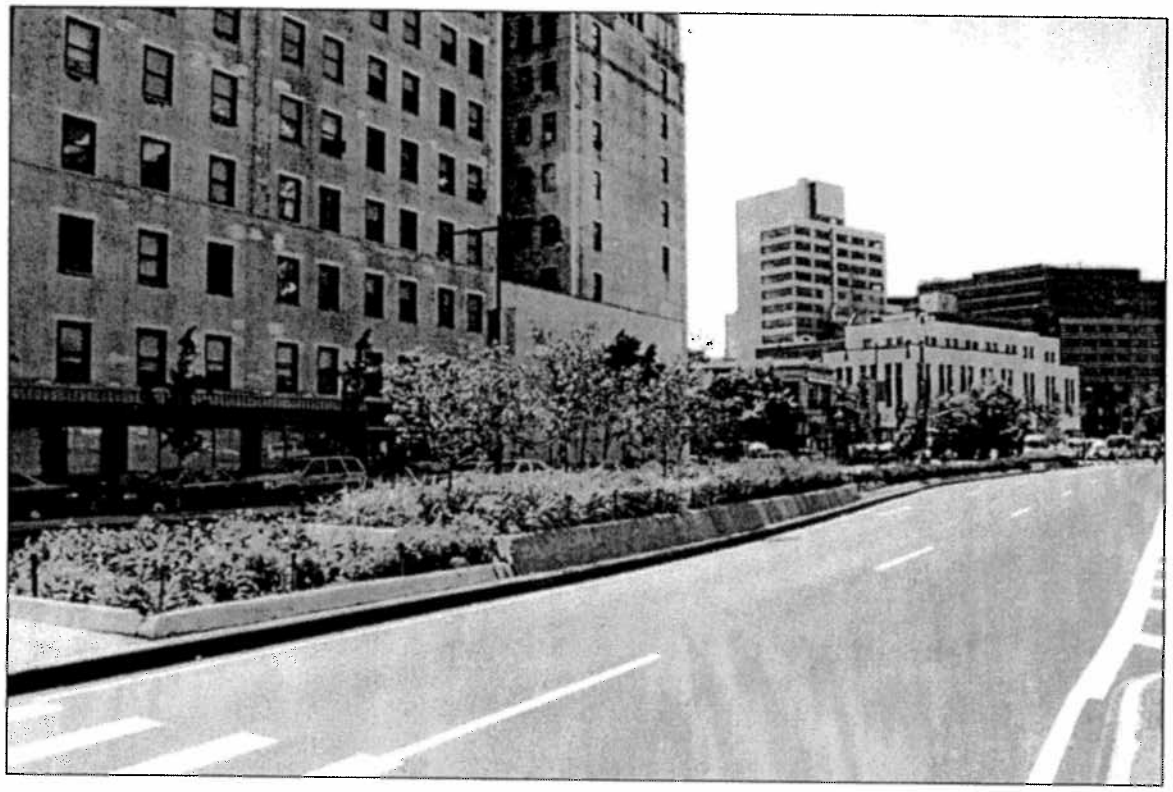


MetroTech Commons 1



Long Island University Plaza, view north 2

## Open Spaces in Project Area
### View 1 and 2
Figure 8-2

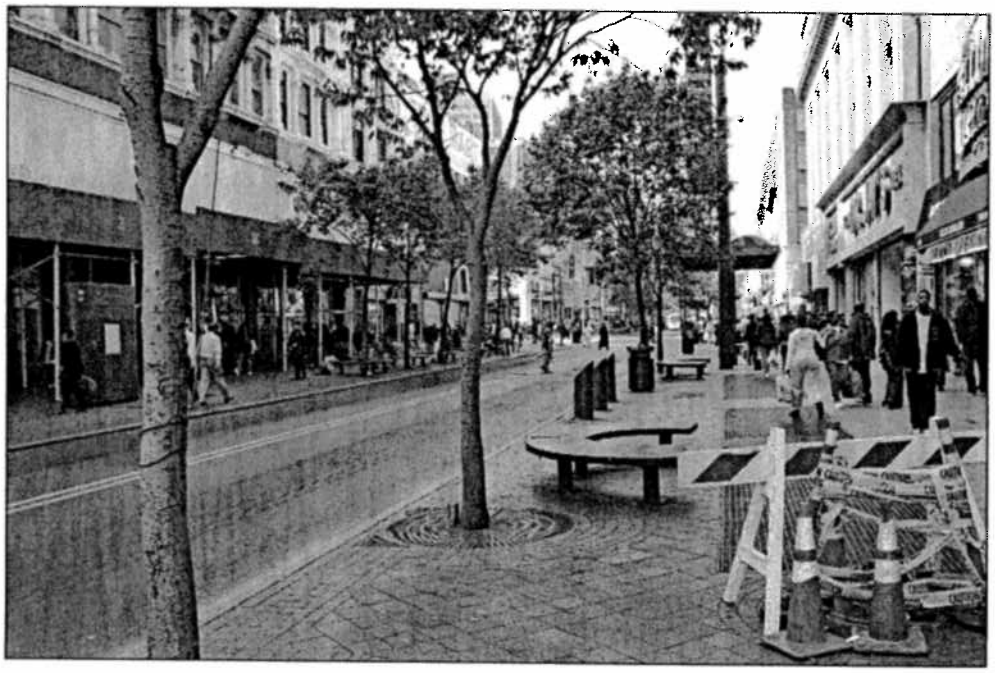


Adams Street, looking south at planted median 3




Willoughby Street, view east from Jay Street 4

## Streetscape of Project Area
### View 3 and 4
Figure 8-3

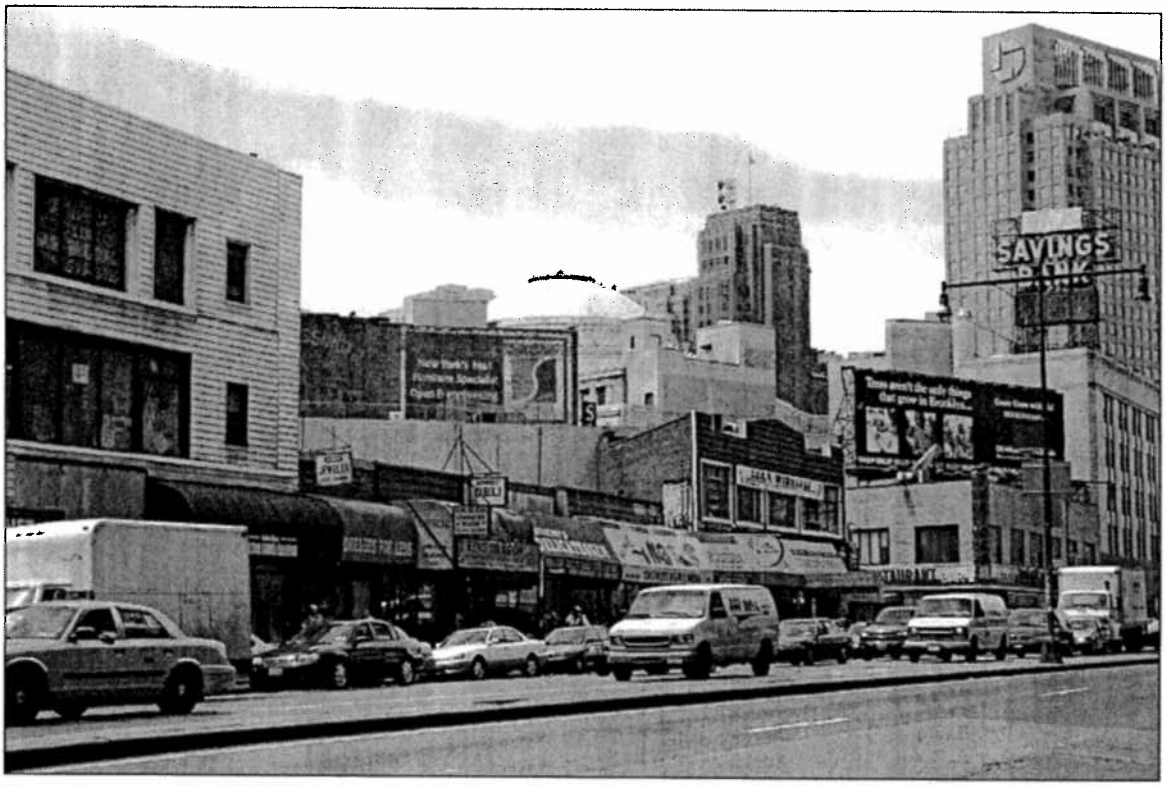


Fulton Street Mall, view of standard streetscape elements **5**



MetroTech Commons, view of standard lamppost and bench designs **6**

## Streetscape of Project Area
### View 5 and 6
Figure 8-4




Flatbush Avenue Extension, view northwest from Fulton Street **7**



Adams Street, view northeast from Willoughby Street **8**

## Streetscape and Buildings of Project Area
### View 7 and 8
Figure 8-5



Myrtle Avenue, view west from Duffield Street **9**



George Westinghouse Information Technology High School **10**

## Buildings in Project Area
### View 9 and 10
Figure 8-6

11-03




Willoughby Street, south side between Jay and Lawrence Streets **11**




Albee Square West/Gold Street, west side south of Willoughby Street **12**

**Buildings in Project Area**
**View 11 and 12**
Figure 8-7

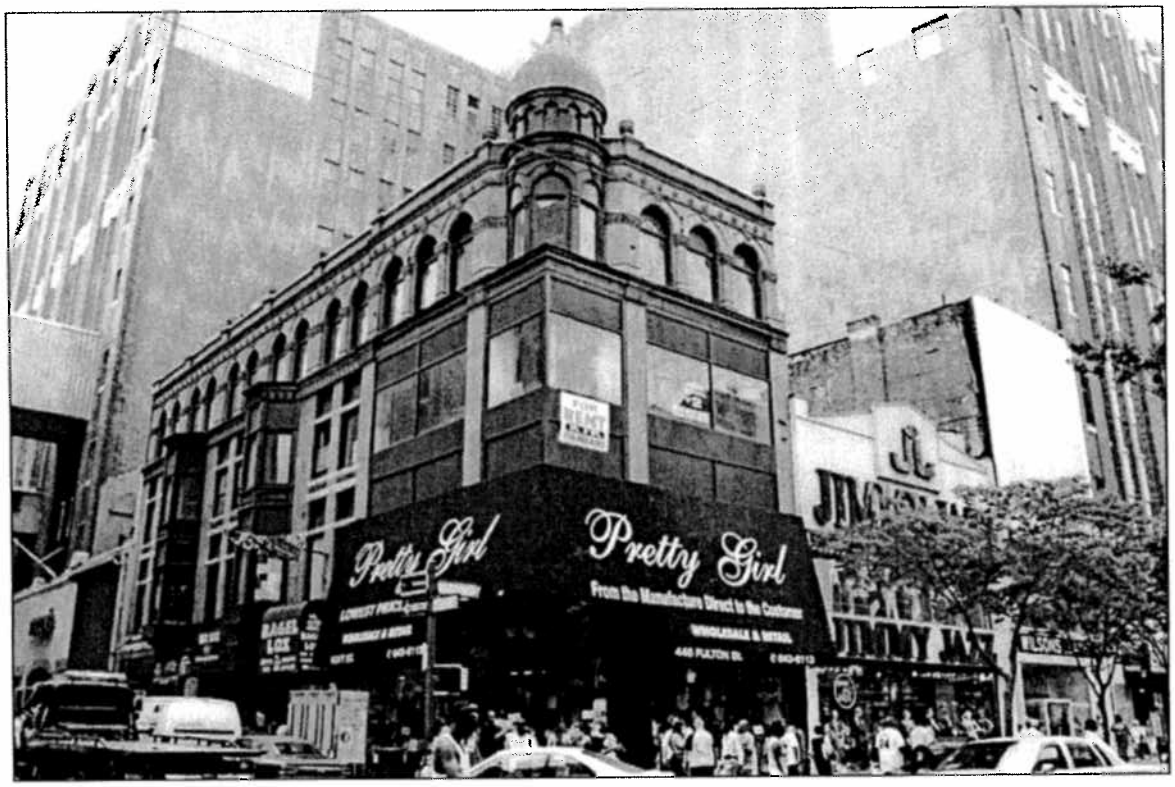


Bridge Street, view south from Willoughby Street **13**




North side of Fulton Street at Hanover Place **14**

## Buildings in Project Area
## View 13 and 14
Figure 8-8

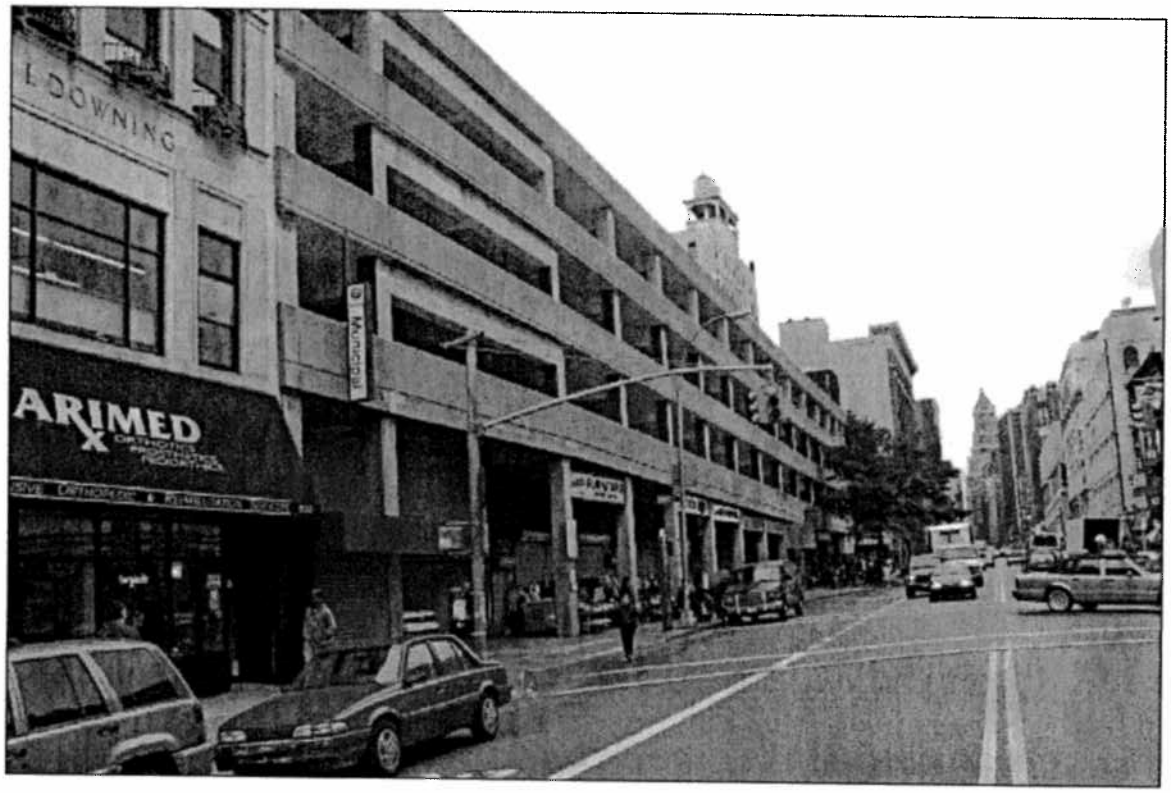



South side of Fulton Street, view southwest from Hoyt Street **15**

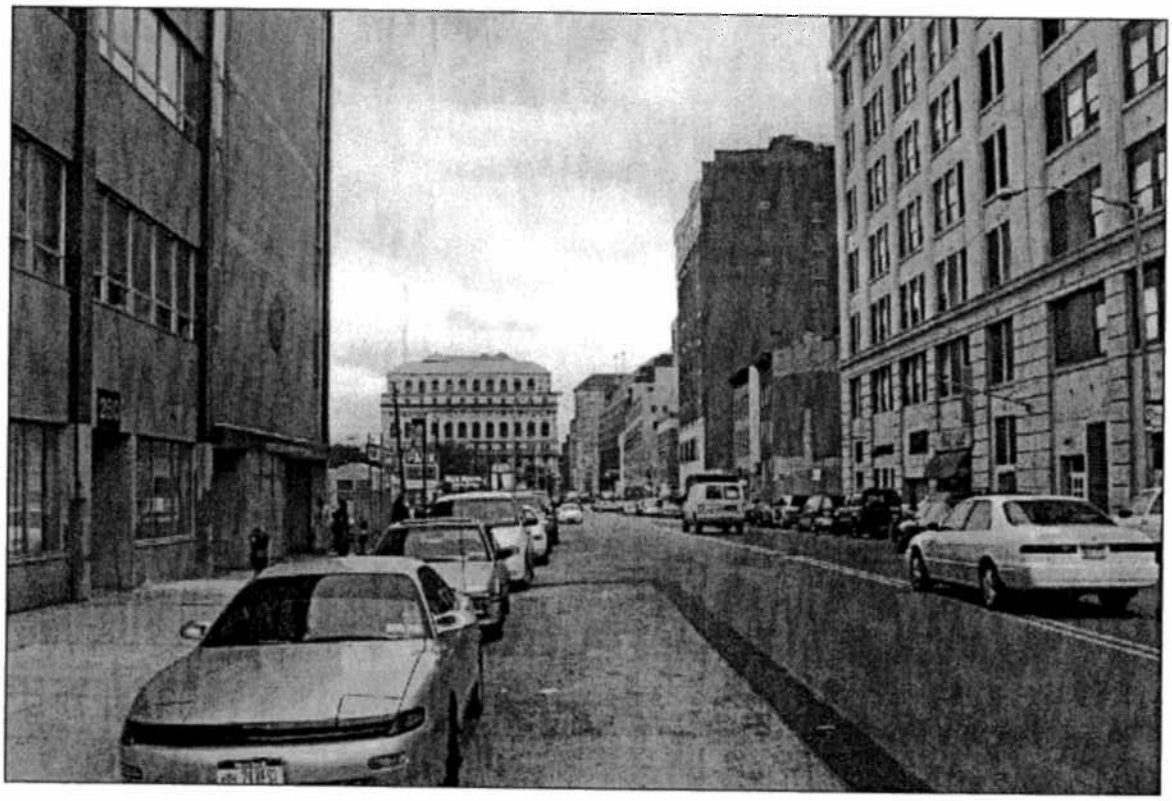



View north on Nevins Street from Livingston Street **16**

**Buildings in Project Area**
**View 15 and 16**
Figure 8-9




South side of Livingston Street, view west from Hanover Place **17**



View west on Schermerhorn Street from Bond Street **18**

**Buildings in Project Area**
**View 17 and 18**
Figure 8-10

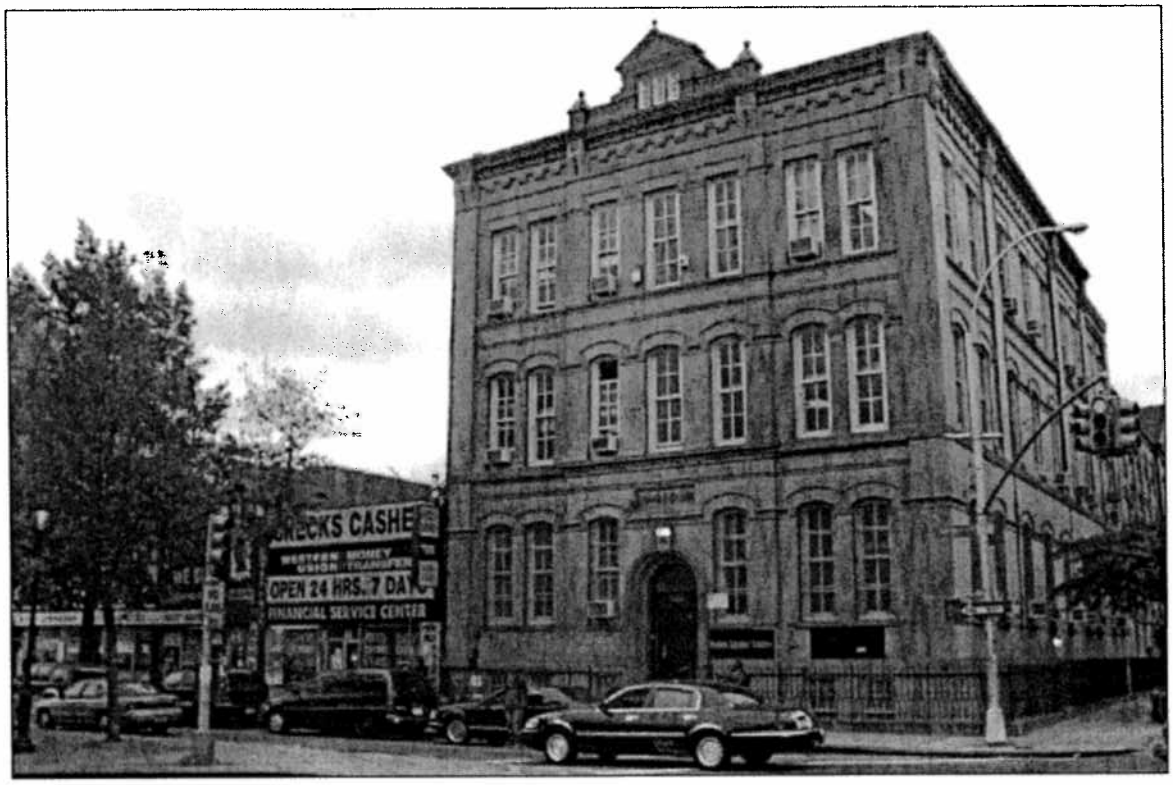


St. Felix Street, view north from Hanson Place **19**

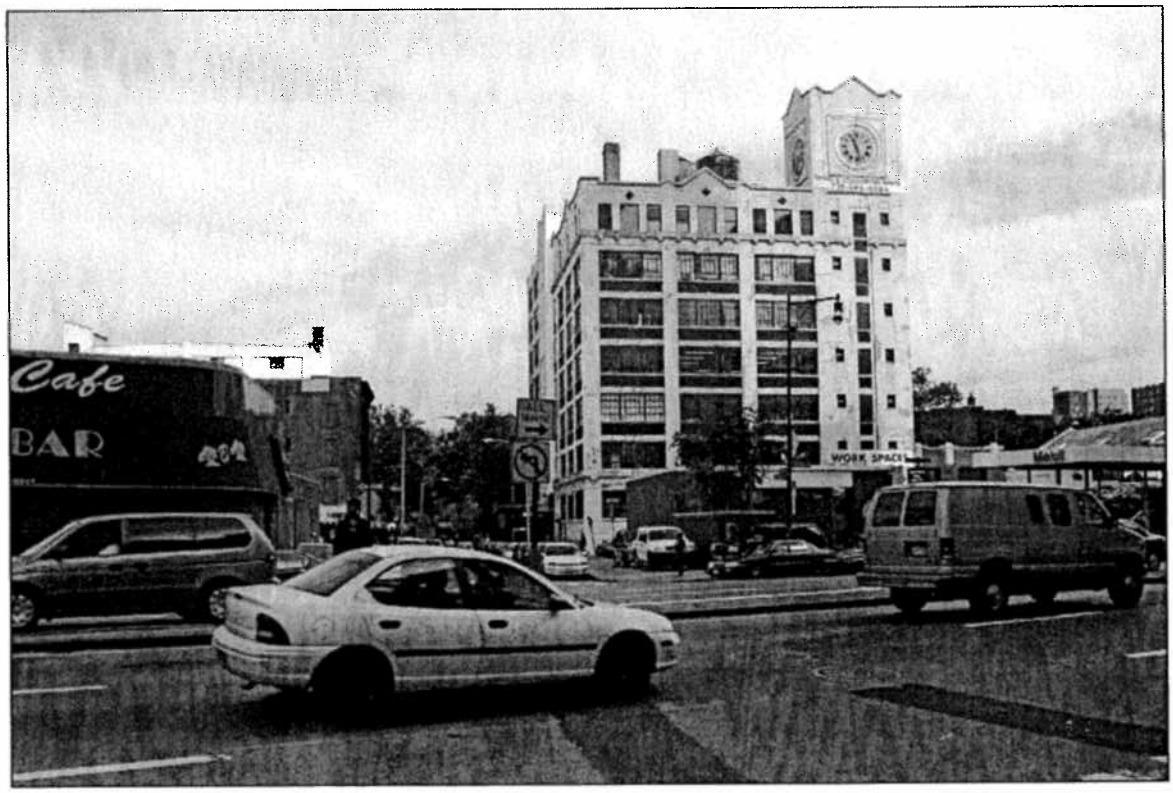


Williamsburg Savings Bank, view north from Atlantic Avenue **20**

**Buildings in Project Area**
**View 19 and 20**
Figure 8-11




Schermerhorn Street, south side east of Third Avenue **21**

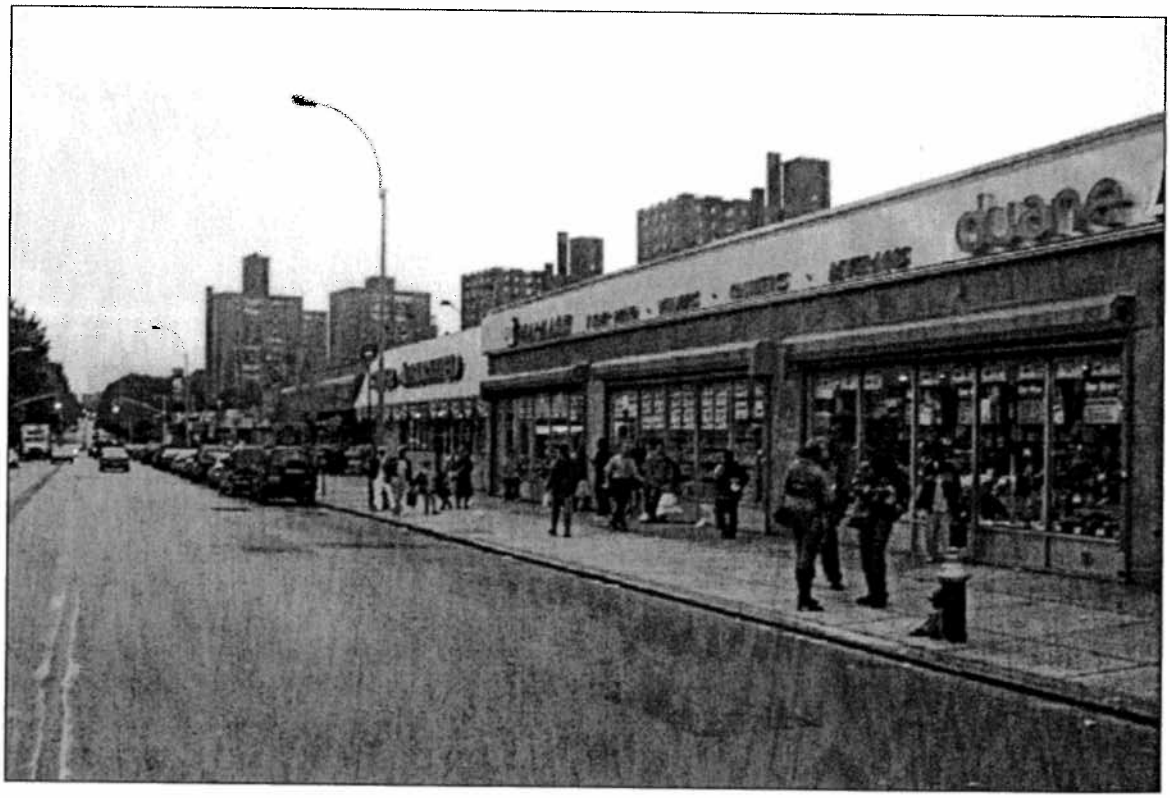



Johnson Street, view east from Flatbush Avenue Extension **22**

**Buildings in Project Area**
**View 21 and 22**
Figure 8-12

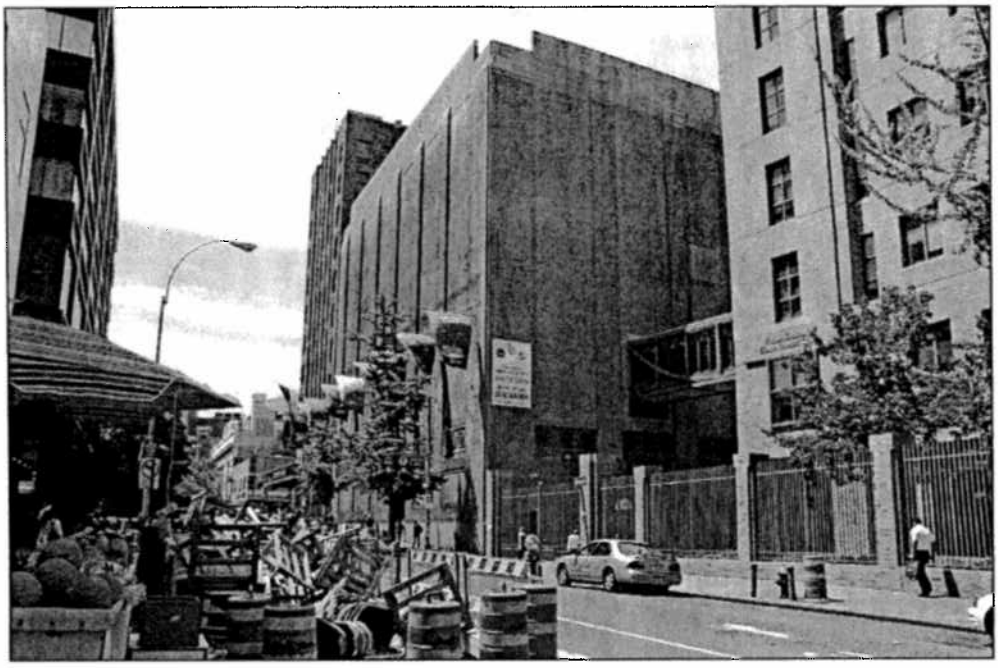


RV Ingersoll Houses, view north from Myrtle Avenue **23**




Myrtle Avenue, south side east of Flatbush Avenue Extension **24**

**Buildings in Project Area**
**View 23 and 24**
Figure 8-13



Long Island University, north side of DeKalb Avenue **25**

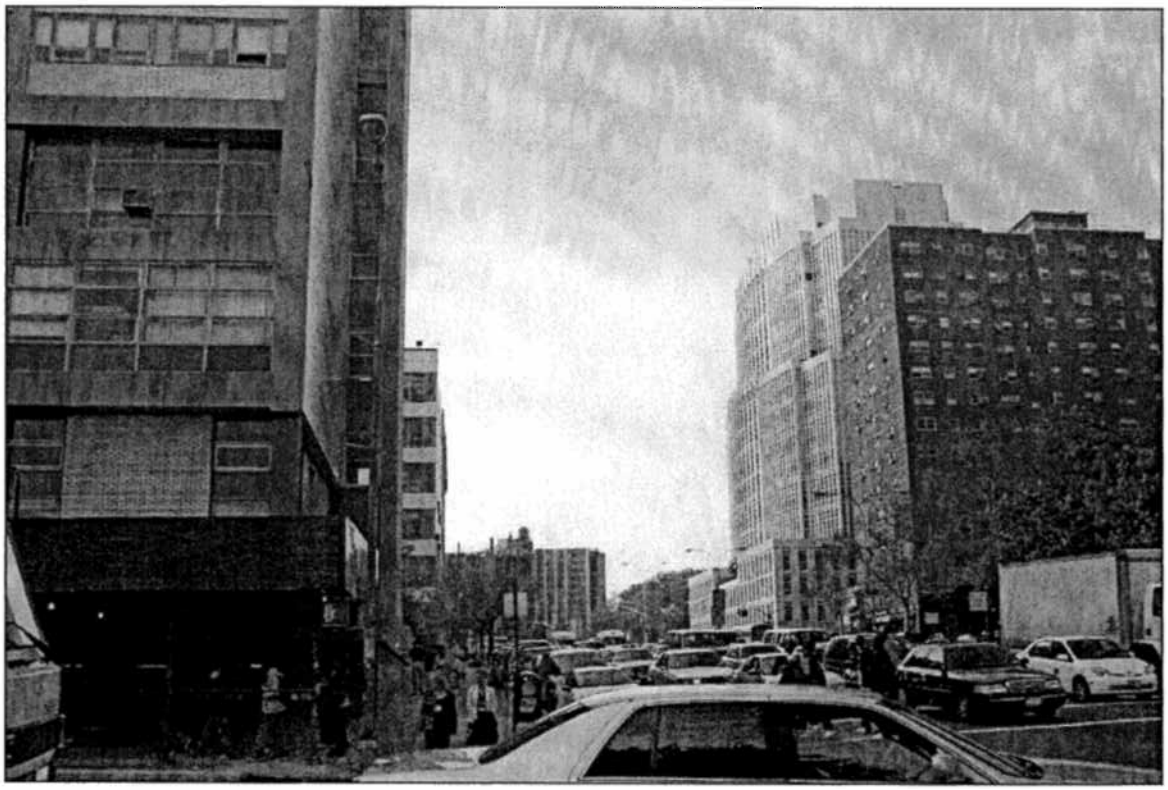



Adams Street, view north from Willoughby Street **26**

## Buildings in Project Area
## View 25 and 26
Figure 8-14



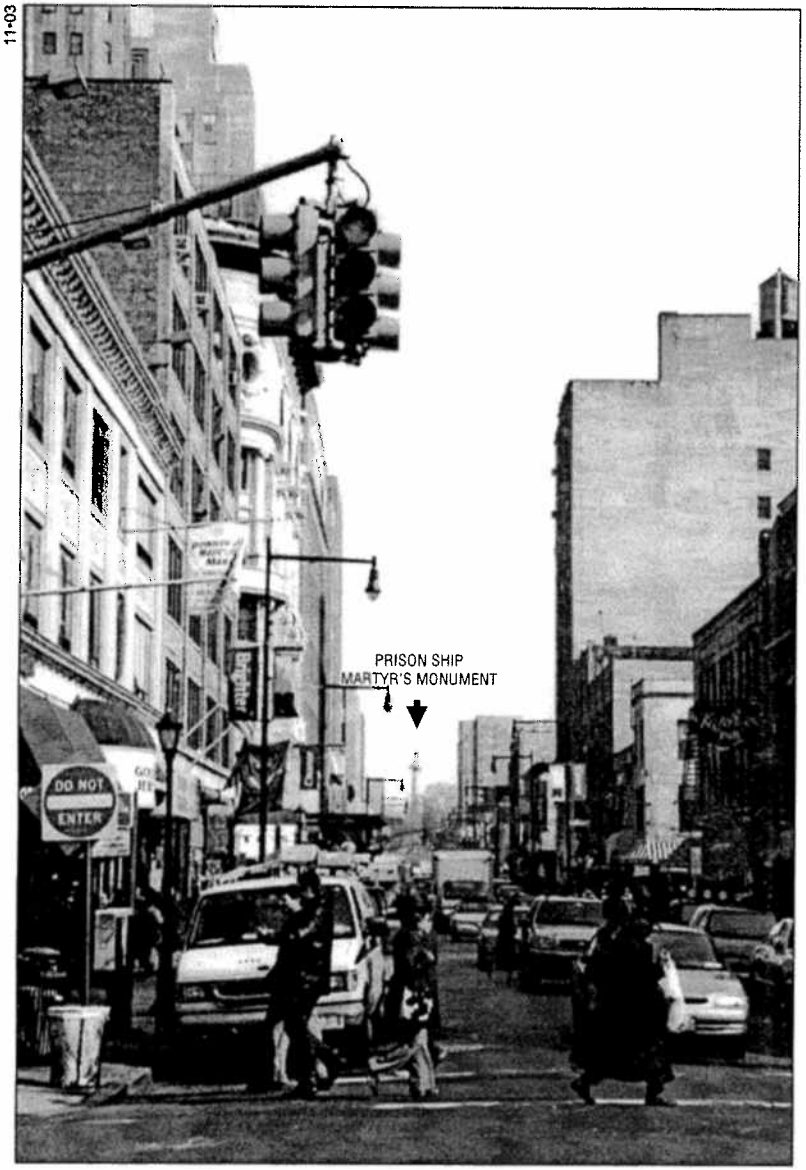
View northwest from Fulton and Adams Streets **27**



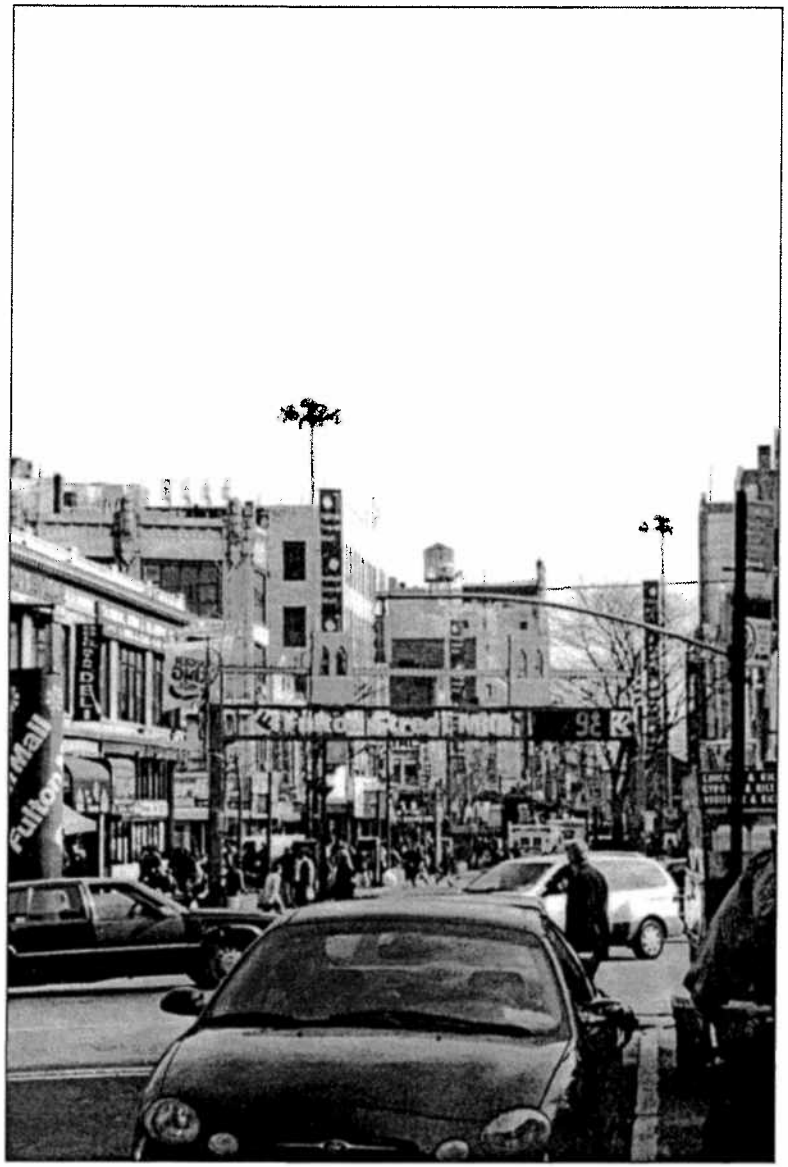
Tillary Street, view west from Jay Street **28**

**Views in Project Area**
**View 27 and 28**
Figure 8-15

11-03



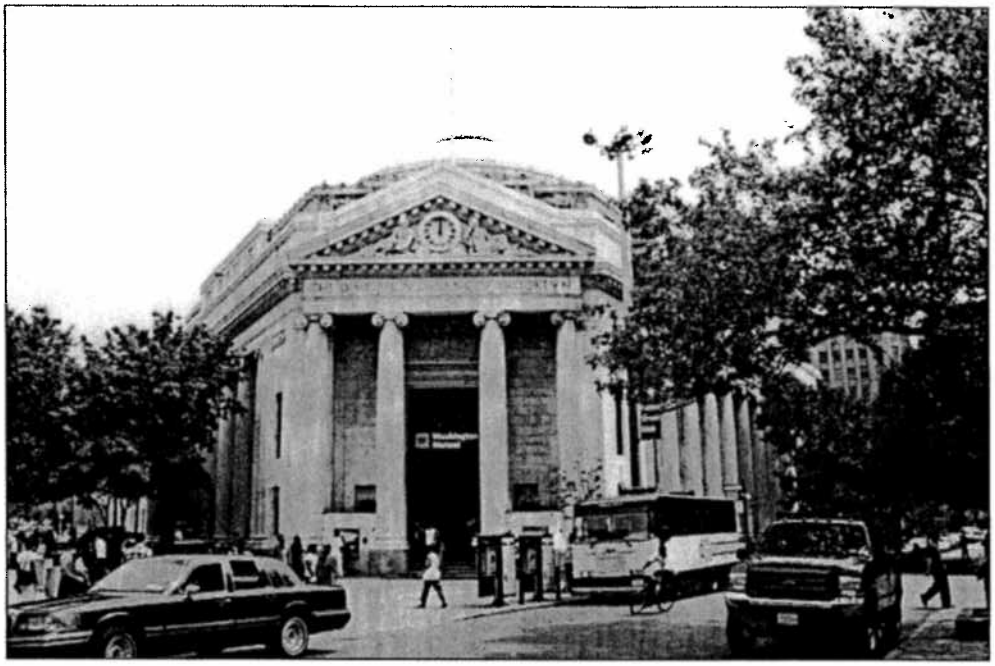

View east on Willoughby Street from Jay Street **29**



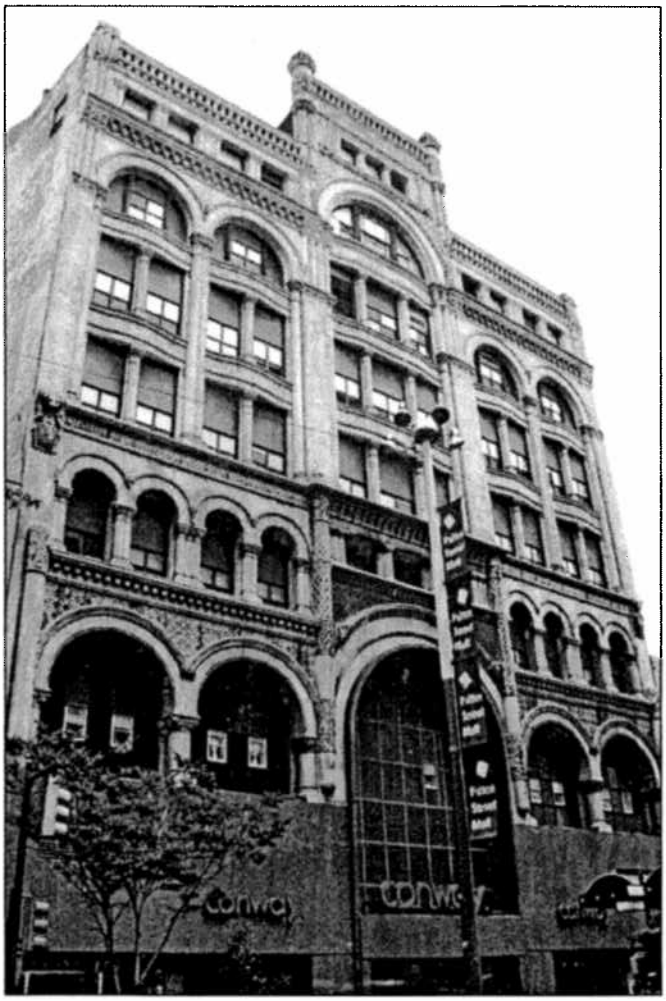

View east on Fulton Street from Adams Street **30**

DOWNTOWN**BROOKLYN**DEVELOPMENT

## Views in Project Area
### View 29 and 30
Figure 8-16



Dime Savings Bank, view from Macomber Square **31**



North side of Fulton Street, view north from Hoyt Street **32**

## Buildings in Project Area
## View 31 and 32
Figure 8-17

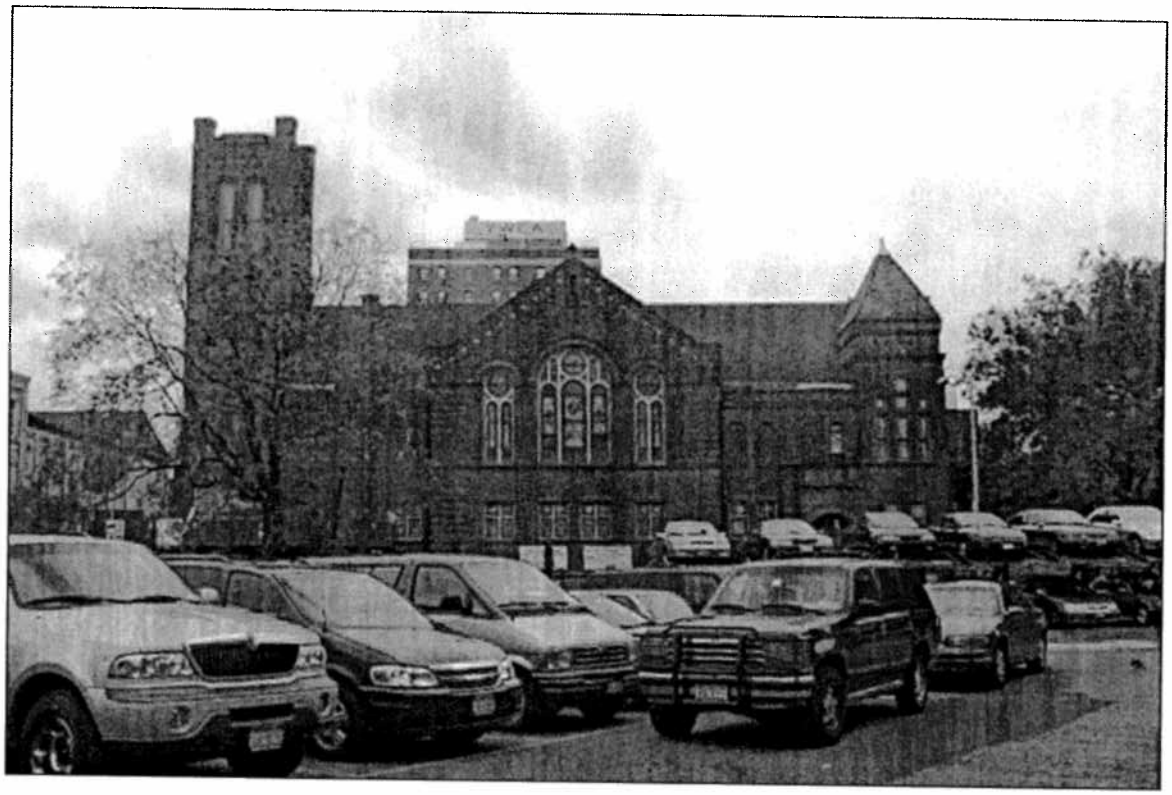


View east on Livingston Street from Hanover Place **33**



View to Brooklyn Central Courthouse, on Schermerhorn Street from Smith Street **34**

**Buildings in Project Area**
**View 33 and 34**
Figure 8-18



View south to Baptist Temple from Livingston Street and Flatbush Avenue **35**



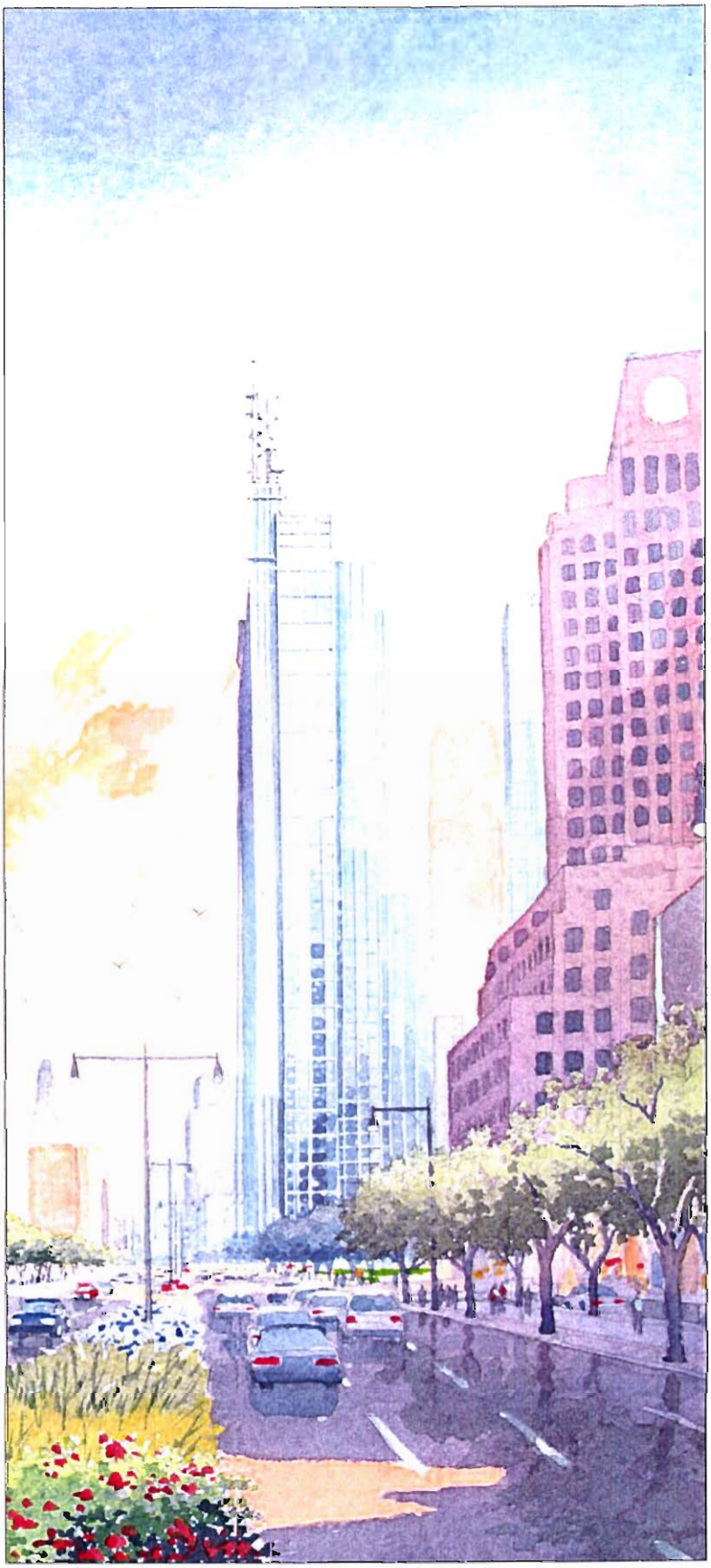
View northwest from Flatbush Avenue and Fulton Street **36**

**Views in Project Area**
**View 35 and 36**
Figure 8-19




**Illustrative Rendering of Willoughby Square**
Figure 8-20

4.23.04



**Illustrative Rendering of Flatbush Avenue**

Figure 8-21

## A. INTRODUCTION

As defined in the 2001 *CEQR Technical Manual*, neighborhood character is considered to be an amalgam of the various elements that give a neighborhood its distinct personality. These elements can include land use, urban design, visual resources, historic resources, socioeconomics, traffic, and noise, as well as any other physical or social characteristics that help to distinguish the community in question from another.

According to the 2001 *CEQR Technical Manual*, an assessment of neighborhood character is generally needed when the action would exceed preliminary thresholds in any one of the following areas of technical analysis: land use, urban design and visual resources, historic resources, socioeconomic conditions, traffic and pedestrians, or noise. An assessment is also appropriate when the action would have moderate effects on several of the aforementioned areas. Potential effects on neighborhood character may include:

- *Land Use.* Development resulting from proposed actions could alter neighborhood character if it introduces new land uses, conflicts with land use policy or other public plans for the area, changes land use character, or generates significant land use impacts.
- *Urban Design and Visual Resources.* In developed areas, urban design changes have the potential to affect neighborhood character by introducing substantially different building bulk, form, size, scale, or arrangement. Urban design changes may also affect block forms, street patterns, or street hierarchies, as well as streetscape elements such as streetwalls, landscaping, curbcuts, and loading docks. Visual resource changes could affect neighborhood character if they directly alter key visual features such as unique and important public view corridors and vistas, or block public visual access to such features.
- *Historic Resources.* When an action would result in substantial direct changes to a historic resource or substantial changes to public views of a resource, or when a historic resources analysis identifies a significant impact in this category, there is a potential to affect neighborhood character.
- *Socioeconomic Conditions.* Changes in socioeconomic conditions have the potential to affect neighborhood character when they result in substantial direct or indirect displacement or addition of population, employment, or businesses; or substantial differences in population or employment density.
- *Traffic and Pedestrians.* Changes in traffic and pedestrian conditions can affect neighborhood character in a number of ways. For traffic to have an effect on neighborhood character, it must be a contributing element to the character of the neighborhood (either by its absence or its presence), and it must change substantially as a result of the action. According to the 2001 *CEQR Technical Manual,* such substantial traffic changes can include: changes in level of service (LOS) to C or below; change in traffic patterns; change

in roadway classifications; change in vehicle mixes; substantial increases in traffic volumes on residential streets; or significant traffic impacts, as identified in the technical traffic analysis. Regarding pedestrians, when a proposed action would result in substantially different pedestrian activity and circulation, it has the potential to affect neighborhood character.

- *Noise.* According to the 2001 *CEQR Technical Manual*, for an action to affect neighborhood character with respect to noise, it would need to result in a significant adverse noise impact and a change in acceptability category.

This chapter of the EIS examines neighborhood character on the blocks to be rezoned and their surrounding blocks, and the proposed actions' effects on that character. The chapter's impact analysis focuses on changes to neighborhood character resulting from changes in the technical areas discussed above, since changes in these technical areas are most relevant to potential changes in neighborhood character. The analysis concludes that neighborhood character would change with new land uses and building types, increases in employees and residents, and increases in traffic and pedestrian activity, but the change would not be adverse, as discussed below.

## B. EXISTING CONDITIONS

### PROJECT AREA

The project area comprises Downtown Brooklyn, the economic center of what would constitute America's fourth largest city and what is New York City's third largest central business district (CBD) after Midtown and Downtown Manhattan. It occupies a valuable and unique position as a competitive, back-office space alternative to New Jersey, due to its proximity to Manhattan, local and regional mass transit access, and affordable Class A office space. Currently, there are approximately 70,000 workers in Downtown Brooklyn, many at the operation centers of major financial institutions. The project area is also home to a number of educational institutions accommodating a significant student population of approximately 32,000. In general, the area is active when shops and offices are open, and much less so at night.

Overall, the area can be characterized as a bustling mixed-use district with a variety of land uses and building types, including commercial office buildings, courthouses and government buildings, major academic and cultural institutions, residential buildings, and active retail stores. Modern buildings such as the Renaissance Marriott Hotel and MetroTech exist in juxtaposition with older and historically significant buildings, such as the New York Telephone Company building, the Dime Savings Bank, and the Williamsburg Savings Bank, the most recognizable building in the Brooklyn skyline.

The high concentration of educational institutions in and around the project area on superblock sites helps to create a campus-like environment, particularly in the north and east portions of the study area. These institutions include: Polytechnic University, Long Island University, New York City College of Technology, Brooklyn Law School, George Westinghouse High School, Brooklyn Technical High School, Pacific High School, the Institute of Design and Construction, Career Educational Consultants, and the Brooklyn Friends School.

The irregular street patterns throughout the project area create a variety of block sizes and shapes. The highest volumes of vehicular traffic can be found on Flatbush Avenue, Adams Street, Tillary Street, Jay Street, and Atlantic Avenue at the very base of the study area. Noise

levels are relatively high and reflect the heavy traffic volumes. Circulation is easier on the east-west streets than the north-south streets, as the north-south streets are interrupted or are discontinuous north and south of Fulton Street. Adams and Tillary Streets and Flatbush Avenue mark the boundaries of neighborhoods and create divisions in the urban fabric.

The area is served by one of the densest concentrations of mass transit in the United States. With fifteen subway lines running through the project area, Downtown Brooklyn is easily accessible to Lower Manhattan, Midtown Manhattan, and neighborhoods throughout Brooklyn and Queens. Downtown Brooklyn is also served by commuter rail, with the Long Island Rail Road (LIRR) operating out of a terminal at Flatbush and Atlantic Avenues that is connected to the Atlantic Avenue/Pacific Street subway station complex. From here, trains operate to Jamaica and points east, with connections available to all LIRR branches with the exception of the Port Washington Branch. Flatbush Avenue and Adams Street also provide fast and direct connections to Manhattan via the Brooklyn and Manhattan Bridges to the northwest of the project area.

For the purposes of assessing existing and future neighborhood character, the project area has been divided into nine areas that represent distinct neighborhoods or land use concentrations. These include the MetroTech Center Area and Jay Street Academic Subarea, Willoughby Street Area, Fulton Street Mall Area, Schermerhorn-Livingston Streets Area, Fulton Street/Flatbush Avenue Triangle Area, State Street Triangle Area, Flatbush Avenue Extension Area, Myrtle Avenue Area, and Long Island University/University Towers Area. The boundaries of these areas are defined in Chapter 2, "Land Use, Zoning, and Public Policy."

*METROTECH CENTER AREA AND JAY STREET ACADEMIC SUBAREA*

Commercial office activity in Downtown Brooklyn is concentrated in MetroTech, a 16-acre corporate and academic complex with over 5 million square feet of commercial and municipal office space that serves as one of the major components of the Downtown Brooklyn CBD. It is home to several major commercial tenants, government and municipal agencies, and educational institutions. Located near MetroTech are several large buildings: the 32-story Brooklyn Renaissance Plaza; 345 Adams Street (14 stories); and parts of the New York State Supreme Court (11 stories). Amidst these modern buildings are many smaller-scale civic and commercial structures that date back to the 19th century.

Polytechnic University, the country's second oldest technological university, is MetroTech's major educational occupant. The University is an integral part of Downtown Brooklyn, anchoring the area as a center of higher education since its founding in 1854. Two other educational institutions are located near the Polytechnic campus, just north of MetroTech Center—New York City Technical College and George Westinghouse Vocational and Technical High School. Jay Street, the western edge of the MetroTech complex, is lined with academic and office buildings that range from one to 23 stories in height, giving the area its mixed-use character.

The area is busiest during the workday due to the high concentration and court-related of commercial activity, but remains moderately active in the evening and weekend hours as a result of the large student population. The streets passing through the center of the MetroTech complex are blocked to vehicular traffic, open only to pedestrians and emergency vehicles. MetroTech Commons, located within this central area between the MetroTech buildings, is a public pedestrian plaza which features a central plaza, pedestrian paths, landscaping, and seating, helping to create a campus-like environment.

*WILLOUGHBY STREET AREA*

The wedge-shaped area between Jay, Fulton, and Willoughby Streets to the south and east of MetroTech typically includes two- to six-story commercial buildings constructed in the late 19th and early 20th centuries which contain a concentration of neighborhood-serving retail uses as well as larger retail stores, including Toys 'R Us and Computer Center. This area has a steady flow of pedestrians throughout the day, with higher volumes to the west due to mass transit connections. While primarily characterized as an active commercial district, the area also contains a number of small residential and mixed-use buildings.

*FULTON STREET MALL AREA*

The Fulton Street Mall is a vital commercial retail corridor characterized by a high concentration of retail businesses in predominantly three- to five-story commercial structures, with the upper floors relatively underutilized or vacant. The area serves as a shopping district for office workers, residents of nearby neighborhoods, and travelers transferring between the various forms of public transit that converge there. Large numbers of shoppers and pedestrians fill the mall throughout the day and evening, with vehicular traffic limited to buses and emergency vehicles during peak hours. Two large signs frame Fulton Street at either end of the Fulton Street Mall, one at Boerum Place and the other near Flatbush Avenue. More generally, visually prominent signage tends to dominate the character of the streetscape. Macy's department store is the corridor's primary retail anchor, with The Gallery at Fulton Street, another large-scale commercial retail center, located farther to the east. This area contains mainly older structures more typical of Downtown Brooklyn prior to the surge in development of Class A office space in the 1980s and 1990s. A number of these have been identified as potentially significant historic resources, including the Macy's complex, the former A.I. Namm & Son Department Store building, the former Offerman Building/Wechsler Brothers Block, and three cast-iron buildings at 565-571 Fulton Street.

*SCHERMERHORN-LIVINGSTON STREETS AREA*

This area, which is characterized primarily by a mix of commercial, institutional, and parking uses, has is noticeably less activity than the Fulton Street Mall to the north. The area is somewhat of a transition zone between the commercial business center of Downtown Brooklyn to the north and the residential and mixed-use buildings of the Boerum Hill neighborhood to the south. The south side of Livingston Street and the north side of Schermerhorn Street are lined with several 6- to 9-story loft buildings containing a mix of commercial and industrial uses; office buildings between 6 and 11 stories in height; and several smaller residential buildings. A number of parking lots break up the streetwalls, particularly along the south side of Schermerhorn Street. Ground-floor retail uses along Livingston Street include neighborhood-serving stores such as banks, delis, clothing stores, and restaurants, as well as specialty stores.

*FULTON STREET/FLATBUSH AVENUE TRIANGLE AREA*

This area is characterized by a mix of uses and activities on oddly shaped blocks formed by the intersecting diagonal streets. The historic Williamsburg Savings Bank is the most prominent feature in the Brooklyn skyline and marks the edge of Downtown Brooklyn, with the residential neighborhoods of Fort Greene, Boerum Hill, and Park Slope beginning to the south and east. The Brooklyn Academy of Music (BAM) just north of the Williamsburg Savings Bank forms the core of the emerging BAM cultural district. BAM, in Brooklyn since 1861 and occupying its

current facility since 1906, draws hundreds of thousands of visitors annually as host to international performing arts, media, and film. The area is particularly crowded for BAM events with a large influx of patrons at specific hours. The blocks containing the Williamsburg Savings Bank and BAM also act as a transition zone between the busy commercial activity to the west and the quieter Fort Greene residential neighborhood to the east.

A major transportation hub is located in this area, with the LIRR's Atlantic Avenue terminal, which provides commuter service to and from Queens and Long Island, and connections to numerous subway lines at the Atlantic Avenue/Pacific Street station. During rush hour the immediate area is one of the busiest in Downtown Brooklyn. The Atlantic Avenue/Pacific Street station complex, including the LIRR terminal, is presently undergoing a major reconstruction.

The character of the northern portion of this area is less defined. This area is noticeably less active than the character of the commercial business district to the northwest, with scattered and small-scale retail and service businesses and a few transportation-related industrial activities, including several commercial parking lots.

*STATE STREET TRIANGLE AREA*

The State Street Triangle contains several low-rise buildings with a mix of commercial and institutional uses that match activity levels in the eastern portion of the Schermerhorn-Livingston Street Area.

*FLATBUSH AVENUE EXTENSION AREA*

A mix of institutional, residential, and small-scale commercial and industrial businesses characterize this area to the east of Flatbush Avenue. Flatbush Avenue creates a strong physical and visual divide between MetroTech and the core Downtown Brooklyn area to the west and the neighborhoods east of Flatbush Avenue. As one travels east from the heavy traffic along Flatbush Avenue, streetlife quickly dissipates, especially along the midblocks of Fleet, Prince, and Fair Streets.

*MYRTLE AVENUE AREA*

Myrtle Avenue east of Flatbush Avenue within the project area is a rather underutilized commercial strip lined with one-story, neighborhood-serving retail buildings such as a pharmacy, supermarket, restaurants, liquor stores, and clothing stores. A number of these buildings are vacant. The area primarily serves the immediate surrounding residential community to the north and east.

*LONG ISLAND UNIVERSITY/UNIVERSITY TOWERS AREA*

The superblock in the northern part of this area is characterized by Long Island University's Brooklyn campus, which includes University Towers, a cooperative complex comprising three 16-story residential buildings, several university buildings, a public plaza, tennis courts, and athletic fields. As with many educational institutions in urban areas, the campus is slightly removed from the center of CBD activity, located between the high-density commercial activity to the west and the quieter residential neighborhoods to the east. The southern part of the area contains a greater mix of businesses including commercial, entertainment, residential, and light industrial.

## STUDY AREA

To assess the effects of the proposed actions on neighborhood character in the areas surrounding the project area, the ¼-mile study area is used. As in Chapter 2, "Land Use, Zoning, and Public Policy," six subareas were defined: Civic Center, Brooklyn Heights, Boerum Hill, Atlantic Terminal, Fort Greene, and the Brooklyn Bridge and Manhattan Bridge approaches. Each of these areas is described below.

### *CIVIC CENTER*

To the north and west of the project area is the core of Brooklyn's Civic Center, primarily a mix of institutional and open space uses containing two major roadways. The Civic Center is a major government employment center, providing primarily office jobs in a number of city, state, and federal institutions, including Brooklyn's Borough Hall and Municipal Building, the General Post Office, and several courthouses. The area is very active during the workday, with substantially less activity during evenings and on weekends. Adams Street, which forms the western boundary of the project area, and Cadman Plaza West are primary access routes for Downtown Brooklyn. These streets connect to the ramps of the Brooklyn Bridge, bringing large volumes of traffic through the area. Adams Street also contains a very active median that is heavily used by cyclists and pedestrians to ride or walk across the Brooklyn Bridge. The area also contains a number of large open space amenities, which are heavily used by both workers and visitors.

### *BROOKLYN HEIGHTS*

The Brooklyn Heights neighborhood, located to the west of the Civic Center area, is primarily characterized by 19th century rowhouses fronting tree-lined streets, with some taller residential buildings in between. Most of the Brooklyn Heights community was developed as a suburb of Manhattan in the early half of the 19th century and is part of the landmarked Brooklyn Heights Historic District. The eastern portion of the area acts as an extension of Downtown Brooklyn with numerous institutions, modern office buildings, and commercial establishments. Buildings along Court Street range from 14 to 31 stories in height. The neighborhood becomes quieter and largely residential to the west, with the most luxurious residences located along Joralemon Street and fronting the Brooklyn Heights Promenade outside the study area.

Montague Street links the Civic Center with the Brooklyn Heights Promenade to the west and is characterized by upscale shops and restaurants primarily catering to the affluent local community. Interspersed within these establishments are a number of national fast food and other chains which recently replaced locally-owned businesses and attract business district office workers into the area during the lunch-time and after work hours. Court Street also contains numerous shops and restaurants but feels more like a traditional commercial strip rather than the quaint, more appealing environment along Montague Street.

### *BOERUM HILL*

The Boerum Hill community is characterized largely by three- to five-story brownstones and apartment houses. While largely residential, however, the area is also defined by a mix of uses throughout most of the area. The northernmost blocks of Boerum Hill between State and Schermerhorn Streets contain light industrial, institutional, and office uses as well as residences. Atlantic Avenue is the most prominent retail corridor in the Boerum Hill neighborhood and contains antique shops, specialty food and clothing stores, taverns, and restaurants, along with

basic neighborhood services. It is a destination spot for antique and used furniture shoppers from across the city and is a hub of Middle Eastern businesses. Another major retail thoroughfare in the neighborhood is Fourth Avenue, which is characterized by its small storefronts with residences above. Boerum Place is a major roadway that runs through the neighborhood and becomes Adams Street north of Joralemon Street. South of Atlantic Avenue between Smith and Nevins Streets, the area grows noticeably quieter as one travels into the heart of the residential district.

*ATLANTIC TERMINAL*

Atlantic Center Mall on Atlantic Avenue at Fort Greene Place is the major commercial use in the neighborhood. Located adjacent to the LIRR terminal and Atlantic Avenue/Pacific Street subway station, these uses combine to create a node where shoppers, commuters, workers, and residents come together at different times throughout the day and evening. The activity quickly subsides further south due to the presence of the LIRR submerged tracks running between Atlantic Avenue and Pacific Street east of Fort Greene Place. Surrounded by a number of light industrial and transportation-related uses, the visually dominant tracks have the effect of eliminating any sense of community in the immediate area. The tracks act as a physical and visual border between the Prospect Heights residential neighborhood to the south and the Fort Greene mixed-use neighborhood to the north and east. Residential uses appear just to the south along Dean Street, however, largely consisting of three- to four-story buildings interspersed with vacant property and surface parking lots. Several industrial sites along Dean and Pacific Streets have recently been converted to residential use. These residential uses intensify as one travels further south outside of the study area, while commercial retail uses continue to characterize the Flatbush Avenue thoroughfare.

*FORT GREENE*

Fort Greene is largely defined by 19th century brick and brownstone rowhouses and other assorted two- to four-story residential buildings. The northern section, however, is home to several New York City Housing Authority (NYCHA) developments, including the RV Ingersoll Houses and Walt Whitman Houses, which are characterized by large residential towers surrounded by open plazas. The area is home to many artists, musicians, and writers, and due to its proximity to the Brooklyn Academy of Music, a vibrant entertainment and night life district is developing.

Within the Fort Greene area, Fulton Street is home to shops, restaurants, and galleries, and restaurants and cafes have recently opened along DeKalb Avenue. Myrtle Avenue functions as a more traditional neighborhood shopping strip with banks, delis, and hardware and grocery stores. The area immediately surrounding the 30-acre Fort Greene Park is characterized by quiet tree lined streets fronting beautiful 19th century brownstones. Fort Greene Park is host to summer concerts, and offers passive and active recreational amenities.

*BROOKLYN BRIDGE AND MANHATTAN BRIDGE APPROACHES*

The blocks north of the project area can be thought of as having several distinct characters: the busy roadways, the residential community of Concord Village, and the mixed-use Bridge Plaza area. The northernmost portion of the study area is characterized by several approach roads to the Brooklyn and Manhattan Bridges, particularly Flatbush Avenue Extension and Adams Street. Unlike much of the study area, there is little retail and pedestrian activity on these blocks due to the proximity of the bridges and approaches. These roadways carry substantial traffic volumes

and tend to become congested, especially during rush hours. The heavy traffic contributes to high existing noise levels in the area.

Between these major roadways lies Concord Village, a complex of seven 15-story residential cooperative buildings with over 1,000 units. Concord Village in itself characterizes the area, occupying approximately 8 acres of land, with on-site parking and open space provided between the buildings. McLaughlin Park provides additional open space across Jay Street. The Bridge Plaza area east of Flatbush Avenue Extension is less defined, with a greater mix of uses, including industrial, institutional, commercial, residential, and open space. Residential uses in this area are typically low-rise buildings on small lots. Industrial uses include parking lots, storage facilities, and gas stations which exist among a number of institutional uses. All of these combined create an area that is relatively inactive, with little pedestrian activity. Although these blocks are physically close to the heart of the CBD to the south, there is a feeling of isolation due to the large roadways in between these two areas.

## C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

### PROJECT AREA

Several projects, independent of the proposed actions, are being planned or constructed within the project area in the future. While these developments may result in some changes to neighborhood character in the immediate vicinity of the proposed development sites, most of the project area is expected to retain its most prominent characteristics, and overall neighborhood character would be minimally affected.

Generally, Downtown Brooklyn is expected to continue to have a major presence of commercial office, retail, government, and educational uses, with an increase in residential use concentrated at the outlying areas of the downtown core. More specifically, eleven developments are anticipated for completion within the project area by 2013, as described in Chapter 2, "Land Use, Zoning, and Public Policy." These include office, residential, institutional, and retail projects located primarily within the MetroTech Center and Fulton Street/Flatbush Avenue Triangle areas and concentrated near the edges of the project area. In large part these projects would be consistent with the character of their immediate surrounding area and would not have a significant effect on neighborhood character. The use of the new buildings would be consistent with existing uses. The projects are being developed within the boundaries of existing blocks and would not result in the removal of any of the architecturally distinguished buildings that make up the area. While an increase in density would result from the new construction, the overall neighborhood character of the project area is not likely to change significantly.

For example, a new commercial office building is currently under construction at 9 MetroTech South. While this would cause an increase in the worker population, thereby increasing pedestrian activity and traffic, the use and scale of the building would be compatible with existing MetroTech buildings. The project would not substantially change MetroTech's character; rather, it would reinforce the area as a densely-developed CBD.

Similarly, the expansions planned for New York City College of Technology and Long Island University would strengthen Downtown Brooklyn's role as a major educational hub. These developments may result in some additional pedestrian and vehicular traffic in the area, and may spur some additional economic activity (e.g. additional retail uses), but are not likely to affect

the overall neighborhood character of the MetroTech Center, Jay Street Academic, and Willoughby Street areas.

The most significant change to neighborhood character is most likely to occur in the Fulton Street/Flatbush Avenue Triangle area. The residential population of the project area is expected to increase, largely as a result of the BAM Local Development Corporation's residential development projects in and around the southeast corner of the project area. With this development, in conjunction with the large-scale commercial development at Atlantic Terminal, the character of the immediate area is likely to change from a primarily commercial district to a mixed-use area with a substantial residential presence and an overall increase in street life during business and non-business hours.

Additional employees and residents would be expected to increase demand for retail and other services in the area. At the same time, ongoing efforts to revitalize and enhance existing retail districts in and around Downtown Brooklyn—including the Fulton Street, Atlantic Avenue, and Myrtle Avenue shopping districts—are expected to continue in the future without the proposed actions. As a result, the character of these retail districts would improve.

With additional employees and residents resulting from development in the project area, pedestrian activity would increase along with vehicular traffic. However, since heavy volumes of traffic are already present throughout the area, this increase is not likely to have a significant effect on neighborhood character. More generally, the project area as a whole currently contains a tremendous amount of economic activity. Therefore, the increase in worker and residential populations are not likely to result in significant changes to the character of neighborhoods beyond the area immediately surrounding the specific developments. Any additional economic activity brought by these developments is likely to be most pronounced in the immediate vicinity of the project locations rather than in surrounding neighborhoods.

In addition, consistent with the existing trend toward private market-rate residential development experienced by many of the neighborhoods within the study area, displacement pressure may be placed on residents of unregulated apartments, which are located throughout the project area and surrounding study area.

All of these developments are likely to result in changes to the character of the areas immediately surrounding the project locations, but are not likely to result in changes to the character of the neighborhoods beyond those immediate areas.

## STUDY AREA

### *BROOKLYN HEIGHTS*

While little development is expected in the portion of Brooklyn Heights that falls within the ¼-mile study area, the construction of Brooklyn Bridge Park along the East River shoreline may have a significant effect on the Brooklyn Heights neighborhood overall. The project will create a 70-acre park containing active and passive open spaces, cultural facilities, marketplaces, restaurants, indoor recreation and education centers, a hotel and conference center, and a marina. The park is likely to improve the appeal of the already desirable Brooklyn Heights neighborhood, adding a substantial amount of recreational and economic activity to the area and drawing thousands of visitors. As a result, pedestrian and vehicular traffic are likely to increase along some of the east-west streets which connect the Downtown Brooklyn CBD with the waterfront. Therefore, while the architecture and overall urban design of the area would not

change, the presence of Brooklyn Bridge Park could have an effect on neighborhood character in Brooklyn Heights.

*BOERUM HILL*

Several residential buildings are planned for the northernmost blocks of Boerum Hill, in the area bounded by Schermerhorn Street, Bond Street, Atlantic Avenue, and Boerum Place. Many of these developments will replace existing surface parking lots and underutilized industrial sites. This is likely to result in a change to the character of the immediate neighborhood, from a transitional area between the commercial corridors of Livingston and Fulton Streets to the north and the residential neighborhood to the south, to a more vibrant residential community that is more compatible with adjacent institutional and residential uses. The Boerum Hill neighborhood would be extended to the north. In addition, a continuous streetwall would be created along Schermerhorn and State Streets, enhancing the visual quality of these blocks. While these developments would affect the areas immediately surrounding the project locations, the overall character of the Boerum Hill neighborhood would not change significantly and would remain substantially the same as it is today.

*ATLANTIC TERMINAL*

A major project planned for this portion of the study area in the future without the proposed actions is the Atlantic Yards Arena and Redevelopment project, which is proposed for an approximately 24-acre site bounded by Flatbush, Atlantic, and Vanderbilt Avenues and Dean Street at the southeastern edge of Downtown Brooklyn. The development of this project, in addition to the completion of the large-scale Atlantic Terminal commercial/retail development, the adjacent Atlantic Center residential mixed-use project, and other large residential developments in the immediate area, is likely to substantially change the neighborhood character of the Atlantic Terminal area with considerable increases in residential, commercial, and other economic activity. These developments could also spur additional economic activity, and help foster connections between the northern parts of Boerum Hill and Prospect Park and Fort Greene.

*BROOKLYN AND MANHATTAN BRIDGE APPROACHES*

The recently approved Bridge Plaza rezoning could create a slight shift in the character of the northern portion of the study area. The rezoning could result in the redevelopment of several blocks containing primarily industrial and transportation-related uses as well as several vacant lots with a number of residential projects. These developments may help to connect the residential blocks north of Nassau Street with the Fort Greene residential neighborhood to the east and the Concord Village area to the west, resulting in an increase in street activity in the immediate area and a more physically cohesive community. The additional residential population could increase demand for retail and other services which may spark additional retail development in the immediate area. While the rezoning may result in such beneficial effects on neighborhood character in the immediate area, the character of the rest of the area is expected to remain substantially the same as it is today.

The character of the Civic Center and Fort Greene neighborhoods is unlikely to change significantly by 2013.

## D. THE FUTURE WITH THE PROPOSED ACTIONS

This section discusses potential changes in the character of the project area and the surrounding ¼-mile study area by 2013. This section focuses on potential changes to neighborhood character resulting from changes in the technical areas of Land Use, Socioeconomic Conditions, Historic Resources, Urban Design and Visual Resources, Traffic and Pedestrians, and Noise, since changes in these technical areas are most likely to result in changes to neighborhood character as follows:

- *Land Use*. The Land Use, Zoning, and Public Policy analysis (see Chapter 2) indicates that the proposed actions would change the scale and density of land use within the project area while maintaining the current mix of predominantly commercial, residential, retail, and community facility uses. These changes would bring about related changes to urban design, visual resources, socioeconomics, traffic, and pedestrians, which would affect neighborhood character.

- *Socioeconomic Conditions*. The Socioeconomic Conditions analysis (see Chapter 3) indicates that by 2013, the proposed actions could result in the direct displacement of approximately 130 dwelling units and an estimated 100 businesses. However, development of the project sites would offset this potential direct displacement through the creation of approximately 979 new dwelling units, 4.6 million square feet of office, and 844,000 square feet of retail use with their associated workforce.

- *Historic Resources*. The analysis in Chapter 7, "Historic Resources," found that the proposed actions would not have any direct adverse impacts on any known architectural resources. While three potential architectural resources would be directly affected by the development of projected development sites, and two potential architectural resources would be directly affected by the development of potential development sites under the proposed actions, no significant impacts to neighborhood character are expected to result from these effects.

- *Urban Design and Visual Resources*. The Urban Design and Visual Resources analysis (see Chapter 8) indicates that the proposed actions would result in considerable changes to the urban design and visual quality of the area. These would include substantial changes to building bulk, form, size, and scale, as well as enhancements to streetscape elements. While the proposed development would not block any significant views or vistas, it would remove a few visually interesting buildings in surrounding views and would considerably alter views of and within the project area.

- *Traffic and Pedestrians*. The Traffic and Parking analysis (see Chapter 14) indicates that the proposed actions would result in substantial traffic impacts in a number of locations in the project area. The analysis also notes that most traffic impacts would be fully or partially mitigated (see Chapter 20, "Mitigation"). In terms of parking, the analysis indicates that the proposed actions would include sufficient new off-street parking capacity to fully accommodate all displaced parking capacity and new parking demand generated by the projected developments, and that no significant adverse impacts to on- or off-street parking conditions would result from the proposed actions. The Transit and Pedestrians analysis (see Chapter 15) indicates that the action would result in significant pedestrian impacts at some area crosswalks, NYCT's B25 bus route in one peak period in one direction, and some impacts at subway stair entrances, as well as increases in pedestrian activity throughout the area.

- *Noise.* Noise increases as a result of additional traffic that would accompany the proposed actions are expected to be imperceptible in the vast majority of locations throughout the rezoning area. With respect to New York City CEPO-CEQR standards, the increase in noise levels would result in a change in acceptability category at just two locations in the Willoughby Street Area, and the only significant increase in noise levels due to the proposed actions would occur along Duffield Street. These noise impacts are not expected to result in a significant adverse impact to neighborhood character. In addition, buildings constructed in the area would be required to attenuate noise to achieve acceptable interior noise levels.

## PROJECTED DEVELOPMENT SITES

The potential impacts of the proposed actions have been assessed via a worst-case development scenario, as discussed in Chapter 1, "Project Description." The development scenario projects that the proposed actions could result in the development of approximately 4.6 million square feet of commercial office development, 979 residential dwelling units, 220,000 square feet of community facility space, 40,000 square feet of cultural facilities, 844,000 square feet of retail development, approximately 1,617 public parking spaces, and approximately 1.15 acres of public space.

## LAND USE IMPACTS ON NEIGHBORHOOD CHARACTER

The land use in the project area is the strongest factor in determining the character of the area because it would cause related changes in the look and feel of the area, and the levels of activity in the area. Land use changes would spur changes to neighborhood character in the area of visual resources, urban design, socioeconomic conditions, and vehicular and pedestrian traffic.

The proposed actions would spur changes in the area's land use patterns, with new, large-scale developments on a number of sites in the project area. The proposed actions would result in a more intensely developed commercial core area with transitional zones to neighboring residential areas, resulting in a more cohesive CBD overall with positive effects on neighborhood character. The proposed actions would serve to create a more cohesive Downtown Brooklyn neighborhood. The entire neighborhood would take on the character of one cohesive area rather than the more disjointed sections that exists today, with pockets of intense activity in close proximity to areas with almost no activity at all. In addition, developments under the proposed actions would help create the critical mass of commercial, institutional, and residential uses which is often necessary to help create a more vibrant community that is active for a greater portion of the day and night.

### *METROTECH CENTER AREA AND JAY STREET ACADEMIC SUBAREA*

The character of the MetroTech Center Area and Jay Street Academic Subarea, which is projected for development of a high-density community facility/commercial building located at Jay Street and Tech Place and a public space along Jay Street, would not be adversely affected by the proposed actions. These developments would serve to strengthen the area's identity as a high-density, mixed-use district at the core of the Downtown Brooklyn CBD.

### *WILLOUGHBY STREET AREA*

The proposed office developments along Adams Street and north of Fulton Street between Bridge and Fleet Streets would bring more intense activity to the area, creating a larger, central node of commercial activity in the core of Downtown Brooklyn. Willoughby Street would also

be affected, with land use composition changing from primarily low-rise commercial uses to high-density office uses. As a result, what is currently a transitional area would become part of the Downtown Brooklyn core, and the transition between the high-rise commercial towers and low-rise commercial buildings would shift south by one block to Fulton Street. No significant adverse impacts to neighborhood character would result.

*FULTON STREET MALL AREA*

As no new development is expected in this area by 2013, the neighborhood character is not expected to change, and no significant adverse impacts to neighborhood character would result from the proposed actions.

*SCHERMERHORN-LIVINGSTON STREETS AREA*

New development and changes in land use along Schermerhorn and Livingston Streets would result in changes to the character of the area. The uninviting streetscapes which currently exist in this area due to surface parking lots and underutilized and low-rise commercial buildings would be replaced by residential buildings. This would improve the character of the area, creating an attractive transitional zone between the higher-density commercial core to the north and the lower-rise Boerum Hill neighborhood to the south. The height limits proposed along Schermerhorn Street would ensure that the scale of the Boerum Hill neighborhood would not be overwhelmed by the new developments, and would serve to unify the area. As a result, there would be no significant adverse impacts to neighborhood character in this area.

*FULTON STREET/FLATBUSH AVENUE TRIANGLE AREA*

Neighborhood character in this area is not likely to change significantly as a result of the proposed actions. Although several cultural developments are proposed for the southeast corner of the project area, these new uses would be in keeping with existing land uses. Furthermore, these developments would enhance the area's identity as a center of arts and entertainment, and provide for a smoother transition between the residential neighborhoods to the east and south and the commercial activity to the north. No significant adverse impacts to neighborhood character of this area would result.

*STATE STREET TRIANGLE AREA*

A small portion of the proposed Arena project is expected to be constructed south of this area in the future without the proposed actions. The development of the Arena project is likely to substantially change the neighborhood character of this area. In addition, given that this area will be rezoned to allow for increased residential density, any residential development that might occur could change the area's character from a mix of commercial, institutional, and industrial uses to more residential.

*FLATBUSH AVENUE EXTENSION AREA*

The projected developments under the proposed actions would bring new residential buildings to the area, helping to enliven these underutilized blocks. The character of the area would likely improve as a result, and no significant adverse impacts to neighborhood character are expected.

*MYRTLE AVENUE AREA*

New residential development along Myrtle Avenue east of Fleet Place would help to enliven this small area by increasing density while continuing to provide retail uses along the street to ensure street level activity. A larger building in this area to replace the existing one-story retail structures would serve as a connection between the residential buildings to the north and south. Therefore, no significant adverse impacts to neighborhood character of the area would result.

*LONG ISLAND UNIVERSITY/UNIVERSITY TOWERS AREA*

With no new development expected to occur in this area by 2013, no significant adverse impacts to neighborhood character are expected to result.

## URBAN DESIGN AND VISUAL IMPACTS ON NEIGHBORHOOD CHARACTER

Neighborhood character would be affected by changes in urban design and visual character due to new office buildings constructed primarily in the Willoughby Street Area, between Willoughby and Fulton Streets, and at Boerum Place between Fulton and Livingston Streets; new residential and mixed-use buildings in the eastern and southern portions of the project area; and the creation of new public spaces. To a lesser extent, proposed changes to block shapes and street patterns would also affect the character of the area, allowing for new developments with larger floorplates on larger blocks. In short, the area would look and feel very different as a result of the proposed actions, and this would change the character of the area.

The proposed actions would encourage the development of buildings that would be significantly different in terms of bulk, form, size, and scale from the buildings that would exist in absence of the proposed actions. The three large office towers to be developed along Willoughby Street would be considerably different in design and visual character than existing buildings on the site (which would likely remain in absence of the proposed actions), and would be more in keeping with buildings to the north of Willoughby Street. Along Schermerhorn Street, the replacement of surface parking lots with new residential buildings would change the design and improve the visual character of these blocks. New residential developments in the Flatbush Avenue Extension and Myrtle Avenue Areas would replace existing public parking lots and underutilized buildings. These new, larger buildings would help to create a contextual buffer that would better connect the residential neighborhoods of Boerum Hill and Fort Greene with the heart of Downtown Brooklyn, improving the character of the area.

Throughout the project area, new buildings would be more visually engaging at the street level as the result of fenestration, ground-floor transparency, street-level retail use, and other requirements for new developments under the proposed actions. In addition, various streetscape enhancements, such as landscaped center medians along Flatbush Avenue, Willoughby Street, and Myrtle Avenue, continuous sidewalks that are wider at street crossings, signalized and delineated pedestrian crossings, and improved subway entrances would result in a less cluttered, more pedestrian-friendly environment and would serve to improve the overall neighborhood character of the project area.

The proposed developments would not block any significant views or vistas, but would alter the views of the project area, and would transform the overall appearance of Downtown Brooklyn. However, no significant adverse impacts to neighborhood character are expected to result from these changes to urban design and visual resources.

## SOCIOECONOMIC IMPACTS ON NEIGHBORHOOD CHARACTER

The proposed changes in land use and building bulks would result in changes to the socioeconomic makeup of the area which, in turn, would influence the character of the neighborhood as a whole. The approximately 1,670 new residents and 19,124 new employees expected to result from the projected developments would likely be similar in socioeconomic characteristics to residents and employees that would populate the area in the future without the proposed actions. The proposed actions also are expected to result in the direct displacement of approximately 130 dwelling units and 100 businesses.

As a result of the construction of several office towers in the Willoughby Street Area, the additional workers and visitors in the area would be expected to increase demand for retail and other services in the area. Moreover, the new businesses on these sites would also increase demand for business services from companies in the existing buildings. This activity is likely to spur an upgrading in the types of retail and office establishments in the area, which could have a moderate effect on neighborhood character.

As discussed in Chapter 3, "Socioeconomic Conditions," some direct displacement of retail businesses would take place with the proposed actions. However, it is expected that independently-owned stores such as these would continue to exist side by side with the national retailers, jointly sharing an expanded customer base. As a result, while the retail mix will change to some extent, no significant adverse impacts to neighborhood character are expected to result from these displacements.

Furthermore, while the displacement of residents and jobs as a result of the proposed actions would be an adverse impact, this impact would be offset by the creation of hundreds of new residences and thousands of new jobs. In addition, the City, as part of its site acquisition process, will provide assistance aimed at relocating these tenants and businesses within the same area. Overall, the creation of new housing and jobs would result in beneficial impacts to the socioeconomic character of the area, and no significant adverse impacts are expected.

## TRAFFIC AND PEDESTRIAN IMPACTS ON NEIGHBORHOOD CHARACTER

Increases in traffic, transit, and pedestrian levels in the study area as a result of the proposed actions would also affect neighborhood character. Traffic would increase over future No Build levels as a result of the new office, residential, retail, and institutional developments in the project area. These increases would result in significant traffic impacts throughout the traffic study area and particularly along Flatbush and Atlantic Avenues, the primary corridors for traffic to and from the projected developments, as well as Adams and Tillary Streets. Additionally, bus and subway ridership demand would increase as a result of the proposed actions.

The effects of traffic on neighborhood character would be most apparent outside of the major thoroughfares discussed above, since traffic levels along these routes would continue to be very high with or without the proposed actions. Other streets in the project area, which would remain relatively underutilized in the future No Build condition, would become noticeably more congested with the projected developments. For example, Willoughby and Duffield Streets would function as the primary access corridor for much of the commercial development that would occur with the proposed actions. Willoughby and Livingston Streets would experience a significant degradation in traffic levels of service (LOS) and would become noticeably more congested. As discussed in Chapter 20, "Mitigation," the majority of these traffic impacts would be mitigated. Even with the implementation of mitigation measures, however, unmitigated

adverse traffic impacts would remain. These are all signs of a shift toward a more intense, high density CBD.

This increased traffic activity would be accompanied by increases in street-level pedestrian activity throughout the area—most noticeably on the streets surrounding the projected new office towers. While significant adverse pedestrian impacts would only be experienced in the Willoughby Street Area, the increased pedestrian activity resulting from the proposed actions would be noticeable on most streets in the project area. Overall, the streets would be more active during most times of the day and night as a result of the increase in office, residential, retail, and institutional uses. While sidewalk congestion is likely to result, the proposed actions provide for sidewalk widening and other street improvements that would help alleviate pedestrian congestion.

In addition, the increased pedestrian activity could also have a beneficial effect on neighborhood character. An increase in foot traffic could help create a safer urban environment and improve economic activity by increasing the customer base for area retail stores. Moreover, street life in the Downtown Brooklyn core would be enlivened such that the neighborhood would feel more like a typical bustling, urban CBD rather than a disjointed commercial district with scattered pockets of activity.

Although a number of traffic, subway stair, and pedestrian crosswalk impacts were identified in the analysis, the majority of the impacted locations—particularly those along the major corridors through the project area—would already be congested in the future without the proposed actions. At these locations, project-generated increases in vehicular or pedestrian traffic, which could result in significant adverse impacts, may not be readily perceptible. Therefore, it is expected that the projected transportation-related impacts would not noticeably alter the character of the Downtown Brooklyn neighborhood. In addition, measures are proposed to mitigate most of the identified impacts (see Chapter 20, "Mitigation").

## HISTORIC RESOURCE IMPACTS ON NEIGHBORHOOD CHARACTER

The analysis in Chapter 7, "Historic Resources," found that there would be no direct impacts to known architectural resources as a result of the proposed actions. However, three potential architectural resources are located on projected development sites—the Joseph J. Jacobs Building, on site C, and the Board of Education Building at 131 Livingston Street, on site M, and 233 Duffield Street, on site P—and two potential architectural resources are located on potential development site—565-571 Fulton Street on site R, and 423 Fulton Street, on site L. The removal of the buildings for these developments would constitute a significant adverse impact on architectural resources. Measures to mitigate this impact have been developed in consultation with LPC. Overall, these impacts are not expected to have a significant adverse impact on neighborhood character. In general, potential effects on archaeological resources are not the type to affect neighborhood character. Therefore, no significant adverse impacts to neighborhood character can be expected in relation to historic resources.

## NOISE IMPACTS ON NEIGHBORHOOD CHARACTER

Noise increases as a result of the additional traffic that would accompany the proposed actions are expected to be imperceptible at all locations except along Duffield Street between Willoughby and Fulton Streets. This impact is the result of low existing traffic volumes on Duffield Street which are expected to increase with the proposed developments. While this

impact would not affect any residences, it would have an adverse effect on the proposed public space at Willoughby Square. Although these noise levels would be higher than those generally recommended for outdoor activities, they would be comparable to levels in existing parks in New York City which are adjacent to moderately and heavily trafficked roadways. In general, while there would be some additional localized noise due to additional vehicles on streets that are currently lightly traveled, the character of these streets is not defined by traffic levels and additional traffic would not, in and of itself, redefine its character. Therefore, no significant adverse impacts to neighborhood character as a result of noise can be expected.

### STUDY AREA

The impact of the proposed actions on communities in the study area beyond the project area would be likely to stem from the socioeconomic effects of the proposed actions on these areas. To the extent that the proposed actions would spur development outside the borders of the project area, changes in neighborhood character could occur.

As discussed in Chapter 3, "Socioeconomic Conditions," the proposed actions would not be expected to create substantial development pressures or other economic activity in the area beyond the project area. Subject to future market conditions, existing trends would be likely to continue with or without the proposed actions, and Downtown Brooklyn would be expected to remain a mixed-use, economic center of commercial, government, cultural, and educational activity as well as residential development. As such, the surrounding study area would not be likely to experience significant changes in character. While, as a result of the proposed actions, some additional retail and service-type establishments may develop outside the borders of the project area due to an increase in workers and residents, these new businesses should not cause significant changes in the character of these neighborhoods. Therefore, no significant adverse impacts to neighborhood character are expected to result from the proposed actions on the blocks surrounding the project area.

## E. CONCLUSIONS

Undoubtedly, the proposed actions would result in a change in the character of Downtown Brooklyn in general, and specifically in the blocks and portions of communities that make up the project area. Were the proposed actions not to change the character of the area, they would fail to achieve the project's goals.

A number of the project area's blocks do not currently exhibit a strongly defined character, especially when compared to the blocks outside of the project area (in neighborhoods such as Brooklyn Heights). Nonetheless, the proposed actions would likely change the area's character in a number of ways:

- *Land Use.* The area would continue as a mixed-use area, but office, institutional, and residential uses would increase substantially and light industrial uses would decline. These land use changes would lead to changes in other analysis areas, which would also affect neighborhood character, as summarized below. Land use changes would result in significant beneficial changes to neighborhood character.
- *Urban Design and Visual Resources.* The proposed actions would result in considerable changes to the bulk, form, size, and scale of buildings in the area. Furthermore, the proposed actions would substantially change the area's visual character through the construction of new office towers, residential buildings, and cultural and other institutional facilities. These

new buildings would considerably change the built form of the area in the Willoughby Street, Flatbush Avenue Extension, and Schermerhorn-Livingston Streets areas. Though substantial, these urban design and visual changes would not result in significant adverse impacts to neighborhood character.

- *Historic Resources*. The proposed actions would not affect historic resources so as to affect neighborhood character.
- *Socioeconomic Conditions*. Changes in land use and the scale of development would result in significant changes to socioeconomic conditions in the area. The number of workers and residents in the area would increase. Some jobs would be displaced, but the overall number of jobs would increase substantially as a result of the proposed actions. Retail uses would change and intensify to meet the demands of new workers. Similarly, while some residents would be displaced, a large number of new residential units would be constructed. Overall, changes to socioeconomic conditions would result in beneficial changes to neighborhood character, and no significant adverse impacts would result from changes in socioeconomic conditions.
- *Traffic and Pedestrians*. Traffic and pedestrian congestion would increase throughout the project area. However, the streets along the edges of the project area, such as Flatbush Avenue and Adams and Tillary Streets, are already burdened with high levels of traffic, and mitigation would be able to relieve much of that congestion. The increased level of traffic on formerly less-traveled streets and the unmitigated traffic impacts of the project are expected to change neighborhood character, but not at a level that would constitute a significant adverse impact. The increases in street-level pedestrian activity throughout the project area would also change neighborhood character, but would not constitute a significant adverse impact.
- *Noise*. As the noise increases resulting from the additional traffic that would accompany the proposed actions are expected to be largely imperceptible, neighborhood character would not be affected by noise and no significant impacts would result.

A close examination of the future No Build condition, compared with the analyses of conditions as projected in 2013 resulting from the proposed actions, indicates that the actions would result in an overall change in the character of the project area with respect to land use, urban design and visual resources, and street-level pedestrian activity. While a number of significant adverse traffic and pedestrian impacts were identified, the majority of these impacts occur in locations that would already be congested in 2013 in the absence of the proposed actions. It is expected that these transportation-related impacts would not significantly alter neighborhood character. Therefore, significant adverse impacts to overall neighborhood character are not expected to result from the proposed actions. ✷

## A. INTRODUCTION

This chapter assesses the potential for the presence of hazardous materials in soil and/or groundwater and for impacts associated with the redevelopment of potential and projected development lots within the Downtown Brooklyn Development area.

Generally, hazardous materials are defined as those substances that pose a threat to human health and/or the environment. These substances include, but are not limited to, volatile organic compounds (VOCs) often associated with gasoline filling stations and dry cleaning establishments; semi-volatile organic compounds (SVOCs) often associated with fuel oil, coal and ash; polychlorinated biphenyls (PCBs) often associated with utilities and transformers; pesticides and herbicides often associated with vegetated land; and heavy metals often associated with manufacturing processes. The presence of hazardous materials threatens human health or the environment only when exposure to those materials can occur. The most likely routes of human exposure are breathing of volatile and semi-volatile compounds or particulate-laden air released during soil disturbing activities and dermal contact. The potential adverse health effects from the anticipated contaminants are diverse. This chapter includes procedures to reduce the potential for unnecessary and unacceptable exposure to these contaminants.

Hazardous materials are of concern when manufacturing districts are rezoned to allow for commercial, residential or institutional use, as in the case of the proposed actions. Potential contaminants of concern were identified for all of the projected and potential development lots. Although the proposed actions would be unlikely to introduce new activities and/or processes using hazardous materials, uncontrolled demolition and excavation activities associated with the development of lots could increase pathways by exposing existing sub-surface contaminated materials.

The hazardous materials studies completed for this analysis have not ruled out the potential presence of hazardous materials on (or proximate to) any of the projected or potential development lots. A complete list of the development sites and the nature of the environmental condition that may have impacted each lot is provided later in this chapter. Prior to construction, further investigation will be performed on each development site to determine the presence and nature of contaminants of concern and the proper remedial and/or health and safety measures that would be employed during redevelopment. Mechanisms to ensure that these actions occur include the placement of an E-designation on lots that are neither City-owned nor intended for future City-ownership.

The E-designation will require that, prior to redevelopment, the property owner of an E-designated lot conduct a Phase I Environmental Site Assessment (ESA) in accordance with the American Society of Testing Materials (ASTM) E1527-00. If confirmation of potential hazardous materials impacts is identified, the owner must prepare and implement a testing and sampling protocol, and remediation where appropriate, to the satisfaction of the New York City

Department of Environmental Protection (DEP) before issuance of a building permit by the Department of Buildings (pursuant to Section 11-15 of the Zoning Resolution – Environmental Requirements). The E-designation also requires mandatory construction-related health and safety plans, which must also be approved by DEP.

For City-owned sites or sites that are proposed for City ownership, E-designations will not be placed on development lots. Instead, since development of these sites will occur through disposition to a private entity, a similar mechanism to ensure that further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during construction will be required under the City's contract of sale with the private entity selected to develop the site. This mechanism and the E-designation will reduce or avoid the potential that significant adverse impacts would result from the proposed actions on all development sites.

## B. METHODOLOGY

A review of historic maps, a survey of regulatory records, and limited street-level site inspections were conducted to assess the potential for hazardous materials to be present in the soil and/or groundwater because of past and/or present uses of projected and potential development lots (or properties adjacent to these lots). Specifically, this chapter cites lots that contain facilities, activities, or conditions requiring assessments as listed in Chapter 24 of Title 15 of the Rules of the City of New York. Vacant land and parking lots are not specifically cited in Chapter 24 of Title 15 of the Rules of the City of New York as conditions requiring further assessment, although petroleum and hazardous materials are often dumped on vacant land. For lots where the only potential environmental conditions identified were vacant land or use as a parking lot, additional assessment was performed on adjacent lots and/or on lots within 400 feet of the development lot. Additionally, for lots where the only potential environmental conditions identified were sidewalk transformer vaults, additional assessment was performed on adjacent lots and/or on lots within 400 feet of the development lot.

The scope of work for the hazardous materials assessment was two-fold. First, an area-wide summary was prepared of topographical, geological and hydrogeological conditions, from City and U.S. Geological Survey sources. Second, individual development lots (and where appropriate, their surrounding properties) were studied to determine whether current or historical potential hazardous materials conditions may have affected the development sites. Factors that were considered when making this determination included the severity and probability of the potential hazardous materials condition to the project site, as well as geological or hydrogeological conditions that may have affected the migration of the hazardous material.

For each development lot, the following research was conducted:

- A visual inspection of the property (from sidewalks and public rights of way) to identify uses and assess existing conditions, such as the presence of fill pipes, vent caps, transformer vaults, dumping and abandoned drums, or other evidence of petroleum usage or hazardous materials.
- An evaluation of the land use history using available historical fire insurance maps going back to approximately 1900.
- A review of U.S. Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) databases regarding hazardous materials. These

records assisted in identifying the use, generation, storage, treatment, disposal, or release of hazardous materials.

If it was determined during the research that the potential existed for a hazardous materials condition on site to have impacted the development lot, then no further research was performed on adjacent lots. However, if no such potential was identified during the on-site research, the same scope of research was conducted on adjacent properties. If, based on the research of adjacent properties, it was determined that an off-site source may have impacted the development lot, then no further research was performed on properties within 400 feet of the development lot. However, if, based on the research of adjacent properties, it was not determined that an off-site source may have impacted a development lot, then the same scope of research was expanded to properties within 400 feet of the development lot to determine whether the potential exists for hazardous materials conditions to have impacted the development lot. The classes of contaminants typically encountered in urban areas are described briefly below:

- *Volatile organic compounds (VOCs).* These include aromatic compounds—such as benzene, toluene, ethylbenzene, xylene (BTEX), and methyl tertiary butyl ether (MTBE), which are found in petroleum products (especially gasoline)—and chlorinated compounds, such as tetrachloroethene (also known as perchloroethylene or "perc"), and tricholoroethene, which are common ingredients in solvents, degreasers, and cleansers. VOCs represent the greatest potential for contamination issues since, in addition to soil and groundwater contamination, they can generate organic vapors. Former or current dry cleaners, particularly plants where large-scale processing occurs, and gasoline stations are the most likely sources for substantial VOC contamination. Auto repair and large gasoline spills can also lead to similar concerns (although there are now established procedures for the proper storage, handling, use, and disposal of these materials).

- *Semivolatile organic compounds (SVOCs).* The most common SVOCs encountered are polycyclic aromatic hydrocarbons (PAHs), which are constituents of partially combusted coal or petroleum-derived products, such as coal ash, and asphalt. These are common in New York City fill.

- *Polychlorinated biphenyls (PCBs).* Commonly used as a dielectric fluid in transformers, underground high-voltage electric pipelines, and hydraulically-operated machinery, PCBs are of special concern at electrical transformer locations where leakage into soil under or surrounding the transformers may have occurred. PCBs and/or PCB-containing materials were once widely used in manufacturing and industrial applications (i.e., hydraulic lifts, transformers, and plastic manufacturing, etc.). PCBs tend to travel only short distances in soil, except in unusual circumstances (e.g., large spills of PCB-containing oils over many years).

- *Pesticides, herbicides, and rodenticides.* These are commonly used to control rodents and/or insects, and vegetation in vacant structures or in vegetated lots.

- *Metals (including lead, arsenic, cadmium, chromium, and mercury).* Metals are often used in smelters, foundries, and metal works and are found as components in paint, ink, petroleum products, and coal ash. These metals tend not to travel in soil, therefore, they would be of greatest concern at the site where they were generated. Metals could be an issue if substantial subsurface construction is required on a development lot. Metals, at levels above natural background levels, are frequently present in fill material throughout the New York metropolitan area.

Table 10-1 lists the current or historical land use or database listing and indicates which classes of chemicals may have impacted soil and/or groundwater conditions. In parking lots or vacant lots, where illegal dumping of hazardous materials may have occurred, all of the classes of chemicals may have impacted soil and/or groundwater conditions.

**Table 10-1**

**Recognized Environmental Conditions and Associated Classes of Chemicals**

| Recognized Environmental Condition | Associated Classes of Chemicals |
|---|---|
| Dry Cleaners | V, S, M |
| Filling Stations | V, S, M |
| Gasoline Tanks | V, S, M |
| MOSF Listing | V, S, M |
| Gasoline Vent Pipe/Fill Cap | V, S, M |
| Monitoring Wells | V, S,M |
| Oil Change Shops | V, S,M |
| Substations | S, PCB,V,M |
| Utilities | V, S, PCB, M |
| Active Spill Listing | V, S, PCB,M |
| RCRA Generator | V, S, PCB, P, M |
| Fuel Oil Tanks (PBS Listing) | V, S,M |
| Auto Repair | V, S, PCB, M |
| Fuel Oil Vent Pipe / Fill Cap | V, S,M |
| Drug Manufacturing Laboratories | V, S, PCB, P, M |
| Printing Facility | V, S, M,PCB |
| Machine Shop | V, S, PCB, M |
| Hydraulic Lifts | V, S, PCB,M |
| Stored Drums | V, S, PCB, P, M |
| Detail Shop | V, S, PCB, M |
| Auto Sales | V, S, PCB, M |
| Car Wash | V, S,M |
| General Factory | V, S, PCB, P, M |
| General Manufacturing | V, S, PCB, P, M |
| Upholstering | V,S,M |
| Furniture Making | V,S,M |
| Paint Stores | V,S,M |
| Historic Drug Stores | V, S, P,M |
| Medical Laboratory | V, S, M |
| Institutional Laboratory | V, S, M |
| Photo Developer | V, S,M |
| Lumber Yard | V, S, P, M |
| Closed Spill Listing | V, S, PCB,M |
| Furrier | V, M,S |
| Parking Lot | V, S, PCB, P, M |
| Vacant Lot | V, S, PCB, P, M |
| Transformer | V,S,M, PCB, |

**Notes:** V = VOCs, S = SVOCs, PCB = PCBs, P = pesticides, M = metals

## C. EXISTING CONDITIONS

Downtown Brooklyn's urban development began in the early 19th century, when the area was divided into lots and developed with residential uses. The rezoning area was part of a larger residential community, although few of the original brick and frame buildings built in the area at that time remain. The opening of the Brooklyn Bridge in 1883 subsequently spurred significant growth in Downtown Brooklyn, including the construction of ornately decorated public buildings and complementary commercial establishments. When Brooklyn was consolidated into greater New York City in 1898, it represented the third largest city in the United States.

At the start of the 20th century, Downtown Brooklyn remained primarily residential, with commercial development beginning to appear along Fulton Street. In the 1920s and 1930s, many of the residential structures converted to commercial and industrial (factory and manufacturing facility) use. This conversion was centered mainly around Flatbush Avenue and Fulton Street.

In the period between 1950 and 1970, Downtown Brooklyn experienced a significant amount of government-related, as well as private development. During this period, in addition to the Civic Center's growth, the Fulton Street retail corridor was thriving and growing faster than any major downtown in the country. Fulton Street had become the City's second most important regional shopping center, after Herald Square. Many of the residential, commercial and industrial structures were either converted to parking garages or demolished to allow for parking lots. Additionally, many institutional structures were constructed around this time in the northwestern portion of the rezoning area, along Johnson Street and Jay Street.

The office market added three major new buildings in the 1960s and three in the early 1970s, but the remainder of the 1970s and early 1980s were marked by less activity and some notable signs of decline. During this period, many of the buildings with industrial uses converted to commercial use. By the mid-1980s, Downtown Brooklyn began to reverse this trend as revitalization efforts were undertaken.

The topography in the rezoning area slopes downward in northeasterly or easterly directions towards the East River. Based on reports compiled by the U.S. Geological Survey, the rezoning area lies at an elevation ranging from approximately 30 to 40 feet above the National Geodetic Vertical Datum of 1929 (an approximation of mean sea level). Groundwater is most likely situated between approximately 20 and 35 feet below the surface and bedrock is most likely situated between approximately 100 and 150 feet below the surface. Groundwater most likely flows in a northeasterly direction toward the East River. However, actual groundwater flow at the development sites can be affected by many factors, including past filling activities, underground utilities, and other subsurface openings or obstructions such as basements, underground parking garages and subway lines, bedrock geology, and other factors beyond the scope of this study. Groundwater in Brooklyn is not used as a source of potable water.

Please see Tables 1-3 and 1-5 in Chapter 1, "Project Description," for a listing of the projected and potential development sites that includes an itemization of the lots that comprise each development site. Please see Figure 1-1 in Chapter 1, "Project Description," for a map showing the projected and potential development sites, and see Figure 10-1 for a map showing the blocks and lots in the rezoning area.

Following are detailed site histories for the projected and potential development lots, and/or for adjacent lots, and/or for lots within 400 feet that have the potential to affect soil and/or groundwater conditions on the development lot. Site histories are organized first by Site Letter

and second by Tax Block and Lot. At the end of each history, a summary of the potential environmental condition(s) and the potential classes of chemicals that may have affected the development lot are given.

## PROJECTED DEVELOPMENT SITES

*SITE C*

*Block 142*

**Lot 1**, located at 80-96 Johnson Street, 305-317 Jay Street and 54-66 Lawrence Street (Helen Keller Place), contains a five-story school. One vent pipe and five fill ports were noted outside the buildings during the site inspection. The Lot was shown to contain three one- and one five-story Polytechnic University buildings and a parking lot since ca. 1969.

Ca. 1904, Lot 1 was depicted as primarily two- and three-story row houses and stores and a two-story building labeled "compound." Ca. 1915 the "compound" was labeled a factory and a one- and two-story church was shown. The remainder of the lot was largely unchanged. Multiple "American Safety Razor Corp." manufacturing buildings were shown to cover much of the lot, though some residences, stores and the church remained ca. 1938 and 1950.

Lot 1 was listed twice in a review of regulatory databases. An active spill listing for the Polytechnic University on February 6, 2001 stated that contaminated soil was found during excavation. A historic utility site was listed for Lot 1. The database listed an electric substation on the site in the 1920s.

The site's historical use as an electrical substation may have contributed to on-site contamination by hazardous materials. The five fill ports observed on Lot 1 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Historic manufacturing facilities may have utilized hazardous materials in their operations. Due to these factors, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE G*

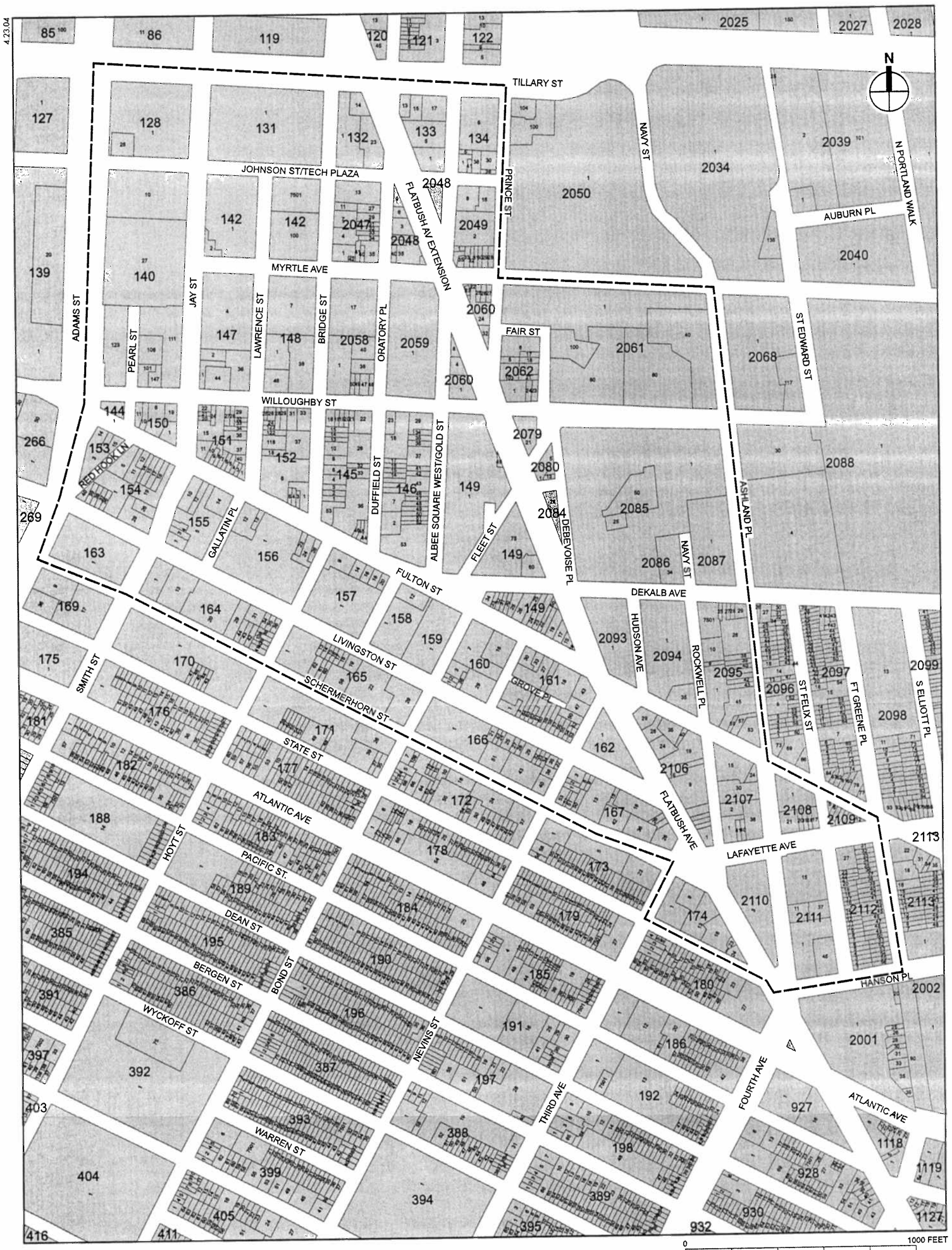
*Block 2049*

**Lot 8**, located at 319-327 Albee Square West/Gold Street and 166-174 Johnson Street (Tech Place), currently contains seven-story and two-story commercial structures and a one-story private parking garage.

Historical maps show that ca. 1904 and ca. 1915 Lot 8 contained two- and three-story residences and vacant land (1915 map only). From ca. 1938 to ca. 1995 Lot 8 was shown to contain a one-story building labeled "office" and "printing" and a one-story commercial building labeled "garage" and in the 1938 map. A one-story building labeled "radio" and "storage" was shown in the 1950-1995 maps.

Lot 30 was not listed in any of the regulatory databases searched.

Due to the historical presence of a printing facility on the lot, which may have utilized hazardous material in its operations, there is a potential for VOCs, SVOCs, PCB, and metals to exist on Lot 8.




Project Area Boundary

205 Block Numbers

25 Lot Numbers

**Blocks and Lots in Project Area**
Figure 10-1

*SITE I(A)*

*Block 2060*

**Lot 22**, located at 156 Myrtle Avenue, is currently occupied by a one-story restaurant. Lot 22 was historically occupied by a four-story commercial structure in 1904 and by a subway station from ca. 1915 to ca. 1995.

Lot 22 was not listed in any of the regulatory databases searched.

Due to the historical presence of a subway station at Lot 22, there is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 23**, located at 227 Flatbush Avenue Extension, is currently vacant.

Historical land use maps indicate that Lot 23 was occupied by a four-story commercial structure in 1904, and by a subway station from ca. 1915 to ca. 1995.

Lot 23 was not listed in any of the regulatory databases searched.

Due to the historical presence of a subway station at Lot 23 there is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 24**, located at 245 Flatbush Avenue Extension, is currently (with Lot 32) part of a two-story car wash and detail facility. During the site visit, 10-gallon and 55-gallon plastic drums of soap and wax were noted on-site.

Historic maps showed Lot 24 was occupied by two-story residences ca. 1904 and ca. 1915. Maps from 1938 and 1950 showed the site occupied by a "moving pictures" facility. From ca. 1969 to ca. 1995 the site was shown as occupied by a new and used auto sales shop and a two-story store.

Lot 24 was not listed in any of the regulatory databases searched.

The historical presence of auto-related facilities at Lot 24 may have resulted in petroleum and/or hazardous materials contamination on the site. Current use of the site as a car wash and detail facility may also have resulted in contamination with petroleum products or solvents. There is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 25**, located at 160 Myrtle Avenue, currently contains a four-story residential structure with a retail space on the first floor. Although the first floor was vacant at the time of site inspection, signage indicated that the property was recently occupied by a dry cleaning facility.

Historical maps from 1904 to 1995 showed Lot 25 was occupied by a four-story commercial structure labeled as a store.

Lot 25 was not listed in any of the regulatory databases searched.

Due to the recent use of the building on Lot 25 as a dry cleaning facility there is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 26**, located at 162 Myrtle Avenue, currently contains a one-story commercial building, occupied by a pizza restaurant and a shoe repair facility. Lot 26 historically contained a four-story commercial structure labeled as a store ca. 1904, ca. 1915, and ca. 1938; and by a one-story commercial structure from ca. 1950 to 1995, labeled as a store from 1960 through 1995.

Lot 26 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

Lots 24, 25, and 27 are located adjacent to Lot 26 on Block 2060. Reviews of these lots are summarized in this chapter. Lot 24 historically contained an auto sales store and currently contains a car wash and detail facility. Lots 25 and 27 historically contained dry cleaning facilities. There is a potential that VOCs, SVOCs, PCBs, and metals on these adjacent lots may have impacted Lot 26.

**Lot 27**, located at 164 Myrtle Avenue, currently contains a one-story commercial building occupied by a variety store and a Chinese restaurant. Lot 27 historically contained a three-story commercial structure labeled as a store ca. 1904, 1915, and 1938. A historic map from 1950 showed Lot 27 to contain a dry cleaning facility. From ca. 1969 to 1995 Lot 2 contained a one-story commercial building labeled on historic maps as a store.

Lot 27 was not listed in any of the regulatory databases searched.

Due to historical use of the building on Lot 27 as a dry cleaning facility there is a potential for VOCs, SVOCs, and metals to exist on the site.

**Part of Lot 32**, located at 152 Prince Street, (with Lot 24) is part of a two-story car wash and detail shop. Lot 32 is a paved area used as the entrance and exit to the car wash.

Lot 32 is depicted in historical maps from 1904 and 1915 as containing residential buildings. Maps from 1938, 1950, 1969, and 1977 showed Lot 38 to contain a "filling station" with four buried tanks. The site was shown as vacant in maps from 1982 and 1995.

Lot 32 was not listed in any of the regulatory databases searched.

Historical use of Lot 32 as a filling station with on-site gasoline tanks may have resulted in presence of petroleum and/or hazardous materials on the site. It is also possible that hazardous materials were dumped on the property when it was vacant. There is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

*Block 2061*

**Part of Lot 1**, located at 95 Fleet Street, 180-236 Myrtle Avenue, and 90-96 Ashland Place, currently contains a one-story commercial building occupied by a drug store, grocery store, restaurant, nail salon, and liquor store.

Historically, Lot 1 contained multiple three-story residences, some with stores on the ground floors, ca. 1904 and ca. 1915; and six three-story residences, multiple one-story commercial buildings labeled as "stores" and vacant land ca. 1938 and ca. 1950. A map from 1969 showed the site to contain parking lots, multiple one-story commercial buildings labeled as "stores," and a one-story commercial building labeled "dry cleaner." Ca. 1977, 1982 and 1995, Lot 1 contained a parking lot and multiple one-story commercial buildings, some labeled "store;" ca. 1977, Lot 1 also contained a public building.

Lot 1 was not listed in any of the regulatory databases searched.

Historical use of Lot 1 as a dry cleaning facility may have resulted in presence of hazardous materials on the site. There is a potential for VOCs, SVOCs, and metals to exist on the site.

*Block 2062*

**Part of Lot 6**, located at 147-153 Prince Street, 96-100 Fleet Place and 2-20 Fair Street, currently contains a two-story building occupied on the first floor by a pre-school and on the second floor by a multimedia center.

Lot 6 was historically occupied by two- and three-story residences and commercial structures ca. 1904 and 1915. A historical map from 1938 showed Lot 6 to contain a lumber yard and a two-story commercial building labeled as a store. A historical map from 1950 showed the site contained a two-story manufacturing facility; this building was shown as vacant on a map from 1969. A map from 1977 showed a two-story building on-site but labeling was illegible. Ca. 1982 and ca. 1995, Lot 6 contained a two-story warehouse.

Lot 6 was listed once in a search of regulatory databases. 147 Prince Street was listed as a Petroleum Bulk Storage Site. This facility was listed as containing a 2,500-gallon fuel oil underground storage tank (UST), which was closed in place in 2001.

The on-site fuel oil underground storage tank may have contributed to on-site petroleum contamination. Historic manufacturing facilities may have utilized hazardous materials in their operations. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE J*

*Block 2061*

**Part of Lot 1**, located at 95 Fleet Street, 180-236 Myrtle Avenue and 90-96 Ashland Place, contains a one-story building comprising a drug story, grocery store, restaurant, nail salon, and liquor store. One fill cap was observed on the sidewalk outside the site during inspection.

The lot historically contained multiple three-story residences, some containing first floor stores, ca. 1904 through ca. 1915. Ca. 1938 through ca. 1950 the site was depicted as having multiple one-story commercial buildings labeled "store," six three-story residences and vacant land. Ca. 1969 the site contained parking lots, multiple one-story stores, and a 1-story commercial building labeled "dry cleaner." From ca. 1977 through ca. 1995, the site was shown to contain a parking lot and multiple one-story commercial buildings.

The subject part of Lot 1 was not listed in any of the regulatory databases searched.

Due to the site's historical use as a dry cleaner, hazardous materials may be present on the site. The fill cap may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Due to these factors, there is a potential for the presence of VOCs and SVOCs, and metals on this site.

*SITE K*

Since the issuance of the DEIS/DSEIS Site K has been removed from the proposed development plan.

*SITE M*

*Block 153*

**Lot 3**, located at 1-13 Court Square (Brooklyn Bridge Boulevard), 342-346 Fulton Street and 414-434 Red Hook Lane (Pearl Street), contains a three-story bank. The lot was shown to contain bank building(s) with a vacant area for drive in service since ca. 1969.

From ca. 1904 through ca. 1950 Lot 3 was depicted as two-, three-, and four-story commercial structures. One structure was labeled "Kings County Trust Co." in maps from 1904 through 1950. Another structure was labeled "Jefferson Building" in maps from 1904 through 1938. A third structure was labeled "furniture" in a 1950 map.

Lot 3 was not listed in any of the regulatory databases searched.

The manufacturing of furniture may have occurred in the structure labeled "furniture" in a 1950 historical map. Historical manufacturing facilities may have utilized hazardous materials. Therefore, there is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 14**, located at 348 Fulton Street, contains a one-story commercial building with a shoe store. The lot was shown to contain a one-story store since ca. 1904.

Lot 14 was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 14 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 3 and 15 are located adjacent to Lot 14 on Block 153. Reviews of these lots are summarized in this chapter. Lot 3 historically contained a factory where hazardous materials may have been used. Lot 15 contains a vent pipe and a fill cap, likely associated with a petroleum storage tank. Leaking storage tanks may contribute to petroleum contamination. There is a potential that VOCs, SVOCs, PCBs, and metals on these adjacent lots may have impacted Lot 14.

**Lot 15**, located at 350-354 Fulton Street and 402-412 Red Hook Lane (Pearl Street), contains a two-story commercial building with a deli, hair salons, and nail salons. A vent pipe and fill cap were observed on the site during a site inspection. The lot was shown to be one two-story store since ca. 1938.

From ca. 1904 through ca. 1915 the subject lot contained one structure labeled "National City Bank."

The subject lot was not listed in any of the regulatory databases searched.

The vent pipe and fill cap observed on Lot 15 may indicate the presence of on-site storage tanks. Leaking storage tanks may have contributed to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs and SVOCs, and metals to exist on the site.

*Block 154*

**Lot 1**, located at 131-135 Livingston Street and 417-423 Red Hook Lane (Pearl Street), contains a six-story New York City Department of Education (DOE) building and a six-story parking garage. A monitoring well, two vent pipes, and two fill caps were observed on the site during a site inspection. The lot was shown to contain one six-story building labeled "Board of Education," "offices," "supply department," "loading" and "garage" in historical maps from ca. 1950 through ca. 1995.

Ca. 1904, Lot 1 was depicted as a three- and four-story DOE Building, two three-story stores, two three-story buildings labeled "Manual Training High School Annex" and "Repair Shop" and a vacant area. Ca. 1915 and 1938, Lot 1 was occupied by a DOE building with offices and a supply department.

The site was listed once in the regulatory databases searched. 131 Livingston Street (Headquarters K802) was listed as a Petroleum Bulk Storage Site with a 4,000-gallon fuel oil aboveground storage tank (AST) and a 6,000-gallon fuel oil AST.

The vent pipes and fill caps observed and the listing of two on-site ASTs on Lot 1 indicate the potential presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Additionally, the historical repair shop on Lot 1 may have contributed to the on-site soil and groundwater contamination. There is a potential for VOCs and SVOCs, PCBs, and metals to exist on Lot 1.

**Lot 5**, located at 356-358 Fulton Street and 401-415 Red Hook Lane (Pearl Street), currently contains a two-story bank building. The site was shown to contain a two-story bank building and one-, two-, and three-story buildings (unlabeled) on historical maps from 1969 through 1995. Ca. 1904 through ca. 1950, the lot was shown to contain a two-story bank building and either vacant land, two-story stores or a five-story building labeled "IEP."

The address 409 Red Hook Lane was listed in the State Spills database for having a closed-status spill for the overfilling of a gasoline tank. The DOE Transportation Garage was also listed in the State Petroleum Bulk Storage database for having closed-in-place in 1994 three 550-gallon gasoline USTs and one 156-gallon gasoline UST. The Transportation Garage was also listed in the State Resource Conservation and Recovery Act (RCRA) database as being a Hazardous Waste Generator/Transporter.

The gasoline tanks closed-in-place on Lot 5 may have historically leaked gasoline onto soil or groundwater. The overfilling of the gasoline tank may also have contributed to this type of contamination. It is unknown what type or quantity of hazardous material may have been generated or transported on Lot 5; therefore, hazardous materials contamination may have also occurred on Lot 5. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 5.

**Lot 11**, located at 360 Fulton Street, (combined with Lot 12) currently contains a one- and two-story sporting goods store. The Lot was shown to contain a one-story commercial building since ca. 1938. Ca. 1904 and 1915, the site was shown to contain a three-story store, labeled "Imperial Café" in the 1915 map.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 11 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 1, 5, and 12 are located adjacent to Lot 11 on Block 154. Reviews of these lots are summarized in this chapter. Lot 1 contains potential petroleum storage tanks. Lot 5 contains potential gasoline tanks and was listed in State databases for a petroleum spill and for generating hazardous materials. No potential for petroleum or hazardous materials contamination was noted for Lot 12 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lots 1 and 5, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 11.

**Lot 12**, located at 362-364 Fulton Street, (combined with Lot 11) currently contains a one- and two-story sporting goods store. The lot historically contained a one-story commercial building since 1969. Historical maps from 1904 and 1915 show Lot 12 to contain one three-story store and maps from 1938 and 1950 show the lot to contain two one-story stores.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 12 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 11 and 14 are located adjacent to Lot 12 on Block 154. The review of Lot 11 is summarized in this chapter. No potential for petroleum or hazardous materials contamination was noted for Lot 11 during the site visit, a review of historical maps, and a review of regulatory databases. Lot 14, located at 366 Fulton Street, is currently a four-story commercial building with an electronics store on the ground level. Lot 14 historically contained a four-story store ca. 1904 through ca. 1995. Lot 14 was not listed in any of the regulatory databases searched. No potential for petroleum or hazardous materials contamination was noted for Lot 14 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 1, 5, and 36-40 are located on the same block as and within 400 feet of Lot 12. These lots are summarized in this chapter. Lots 1 and 38 contain potential petroleum storage tanks. Lot 5 contains potential gasoline tanks and was listed in State databases for a petroleum spill and for generating hazardous materials. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. No potential for petroleum or hazardous materials contamination was noted for Lots 36, 37, 39 or 40 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lots 1, 5, and 38 there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 12.

**Lot 36**, located at 129 Livingston Street, currently contains a three-story commercial building (vacant at the time of inspection). The lot was shown to contain a three-story residence ca. 1904 through ca. 1915 and a three-story commercial structure ca. 1938 through ca. 1995.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 36 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 1 and 37 are located adjacent to Lot 36 on Block 154. Reviews of these lots are summarized in this chapter. Lot 1 contains potential petroleum storage tanks. No potential for petroleum or hazardous materials contamination was noted for Lot 37 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lot 1, there is a potential that VOCs and SVOCs on this adjacent lot may have impacted Lot 36.

**Lot 37**, located at 127 Livingston Street, currently contains a five-story residential structure with a deli on the ground floor and a law firm on the second floor. The lot was shown to contain a five-story commercial structure since ca. 1938. Ca. 1904 and 1915, Lot 37 was shown to contain three-story residences.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 37 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 1, 36, and 38 are located adjacent to Lot 37 on Block 154. Reviews of these lots are summarized in this chapter. Lots 1 and 38 contain potential petroleum storage tanks. No potential for petroleum or hazardous materials contamination was noted for Lot 36 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lots 1 and 38, there is a potential that VOCs and SVOCs, and metals on these adjacent lots may have impacted Lot 37.

**Lot 38**, located at 125 Livingston Street, contains a five-story residential building with a sandwich shop on the first floor and a law firm on the second floor. A fill cap was observed on-site during a site inspection. The site was shown to contain a five-story building with first and second floor commercial since ca. 1938.

From ca. 1904 through ca. 1915 the site was depicted as a three-and-a-half-story residence.

Lot 38 was not listed in any of the regulatory databases searched.

The fill cap observed during a site inspection may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs and SVOCs, and metals to exist on Lot 38.

**Lot 39**, located at 123 Livingston Street, contains a five-story residential structure with a trophy store and a cellular phone store on the ground floor and a cellular phone store on the second floor. The lot historically contained a five-story commercial store since ca. 1938. Historical maps from ca. 1904 and 1915 depicted Lot 39 to contain three-story residences.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 39 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 1, 38 and 40 are located adjacent to Lot 39 on Block 154. Reviews of these lots are summarized in this chapter. Lots 1 and 38 contain potential petroleum storage tanks. No potential for petroleum or hazardous materials contamination was noted for Lot 40 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lots 1 and 38, there is a potential that VOCs, SVOCs, and metals on these adjacent lots may have impacted Lot 39.

**Lot 40**, located at 119-121 Livingston Street and 429-433 Red Hook Lane (Pearl Street), currently contains a four-story residential structure with a deli and a restaurant on the ground floor. The Lot historically contained one-, three-, and four-story stores since ca. 1938. Ca. 1904 and 1915, Lot 40 was shown to contain multi-level residential structures.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 40 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 1 and 39 are located adjacent to Lot 40 on Block 154. Reviews of these lots are summarized in this chapter. Lot 1 contains potential petroleum storage tank(s). No potential for petroleum or hazardous materials contamination was noted for Lot 39 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lot 1, there is a potential that VOCs, SVOCs, and metals on this adjacent lot may have impacted Lot 40.

*SITE O*

*Block 145*

**Lot 8**, located at 393-395 Bridge Street, currently contains a one-story commercial building with a restaurant and an art gallery. Lot 8 historically contained a one-story structure divided into two stores since ca. 1950. Ca. 1938, Lot 8 was shown to contain two four-story stores. Ca. 1915, the lot was depicted as having two three-story stores and ca. 1904, two three-story residences.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 8 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 6, 10, 26, and 32 are located adjacent to Lot 8 on Block 145. Reviews of Lots 10, 26, and 32 are summarized in this chapter. Lots 10 and 32 historically contained manufacturing facilities where petroleum and/or hazardous materials may have been used. Lot 26 historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on vacant land. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 8.

**Lot 10**, located at 387-391 Bridge Street, currently contains (joined with Lots 13, 14, and 15) a three-story residential structure with retail space on the ground floor. Lot 10 was historically shown to contain several three-story residences or stores since ca. 1904. One of the buildings was labeled "furniture" in maps from ca. 1969 through 1995.

The subject lot was not listed in any of the regulatory databases searched.

The manufacturing of furniture and the associated use of hazardous materials may have occurred in the structure labeled "furniture" in historical maps. Therefore, there is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 13**, located at 385 Bridge Street, currently contains (joined with Lots 10, 14, and 15) a three-story residential structure with retail space on the ground floor. Lot 13 was historically shown to contain a three-story residence or store since ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 13 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 10, 14, and 26 are located adjacent to Lot 13 on Block 145. Reviews of these lots are summarized in this chapter. Lot 10 may have historically contained a manufacturing facility where petroleum and/or hazardous materials may have been used. Lot 26 historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 14 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lots 10 and 26, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 13.

**Lot 14**, located at 383 Bridge Street, currently contains (joined with Lots 10, 13, and 15) a three-story residential structure with retail space on the ground floor. Lot 14 was historically shown to contain a residence or store since ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 14 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 13, 15, 21, and 26 are located adjacent to Lot 14 on Block 145. Reviews of these lots are summarized in this chapter. Lot 15 historically contained a dry cleaner where hazardous materials may have been used. Lot 21 historically contained a manufacturing facility and vacant land. Lot 26 historically contained vacant land. Petroleum and/or hazardous materials may have been utilized in manufacturing processes and/or dumped on vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 13 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lots 15, 21, and 26, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 14.

**Lot 15**, located at 381 Bridge Street, currently contains (joined with Lots 10, 13, and14) a three-story residential structure with retail space, including a dry cleaner, on the ground floor. Lot 15 was historically shown to contain a residence or store since ca. 1904.

Magic Touch Cleaners Corp., listed on Lot 15, was listed in the RCRA database as a Small Quantity Generator for having generated spent halogenated solvents in 2000.

The on-site dry cleaner may have contributed to hazardous materials contamination on Lot 15. There is a potential for VOCs, SVOCs, and metals to exist on Lot 15.

**Lot 16**, located at 88-90 Willoughby Street and 373-379 Bridge Street, currently contains a three-story residential building with commercial space on the ground floor. Current retail tenants include a restaurant, hair salon, deli, clothing store, dentist, bakery, jewelry store, and a grocery store. Lot 16 historically contained a three-story building divided into 4 four stores since ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

The dentist currently occupying the property may contain a laboratory where hazardous materials are utilized.

Lots 15 and 18 are located adjacent to Lot 16 on Block 145. Reviews of these lots are summarized in this chapter. Lot 15 historically contained a dry cleaner where hazardous materials may have been used. No potential for petroleum or hazardous materials contamination was noted for Lot 18 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lot 15, there is a potential that VOCs, SVOCs, and metals on this adjacent lot may have impacted Lot 16.

**Lot 18**, located at 92 Willoughby Street, currently contains (joined with Lots 19 and 20) a three-story residential building with retail space on the ground floor. The current tenant of the retail space in Lot 18 is a shoe store. Lot 18 was historically shown to contain a residence or store since ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 18 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 15, 16, and 19 are located adjacent to Lot 18 on Block 145. Reviews of these lots are summarized in this chapter. Lot 15 currently contains a dry cleaner and was listed in the State RCRA database for having generated spent halogenated solvents. No potential for petroleum or

hazardous materials contamination was noted for Lots 16 or 19 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lot 15, there is a potential that VOCs, SVOCs, and metals on this adjacent lot may have impacted Lot 18.

**Lot 19**, located at 94 Willoughby Street, currently contains (joined with Lots 18 and 20) a three-story residential building with retail space on the ground floor. The retail space in Lot 19 is currently vacant. Lot 19 was historically shown to contain a residence or store since ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 19 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 15, 18, and 20 are located adjacent to Lot 19 on Block 145. Reviews of these lots are summarized in this chapter. Lot 15 currently contains a dry cleaner and was listed in the State RCRA database for having generated spent halogenated solvents. No potential for petroleum or hazardous materials contamination was noted for Lots 18 and 20 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lot 15, there is a potential that VOCs, SVOCs, and metals on this adjacent lot may have impacted Lot 18.

**Lot 20**, located at 96 Willoughby Street, currently contains (joined with Lots 18 and 19) a three-story residential building with retail space on the ground floor. The current tenant of the retail space on Lot 20 is a cellular phone store. Lot 20 was historically shown to contain a residence or store since ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 20 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 15, 19, and 21 are located adjacent to Lot 20 on Block 145. Reviews of these lots are summarized in this chapter. Lot 15 currently contains a dry cleaner and was listed in the State RCRA database for having generated spent halogenated solvents. Lot 21 historically contained a factory where hazardous materials may have been utilized. Petroleum and/or hazardous materials may have been dumped on this lot when it was vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 19 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lots 15 and 21, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 20.

**Lot 21**, located at 98 Willoughby Street, currently contains a one-story commercial structure with a restaurant and check-cashing store. Lot 21 was shown to contain a three-story store in historical maps ca. 1995; a vacant lot labeled "parking" ca. 1969 through ca. 1982; a three-story store with parking ca. 1950; a three-story store ca. 1938; a two-story factory and a two-story store ca. 1915, and two two-story structures (one labeled as a residence) ca. 1904.

The subject lot was not listed in any of the regulatory databases searched.

Illegal dumping may have occurred on the vacant parking lot. It is unknown whether manufacturing involving petroleum and/or hazardous materials occurred in the historical factory indicated on Lot 21. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to be present on Lot 21.

**Lot 22**, located at 206-214 Duffield Street and 100-104 Willoughby Street, currently contains a one-story commercial structure. Current tenants of the building include a photo-developing shop (in-house), a bagel shop, a gift shop, and a restaurant. One vent pipe and one fill cap were observed during site inspection.

Lot 22 was shown to contain multiple four-story commercial structures with one factory from ca. 1938 through ca. 1995. Lot 22 was shown to contain a four-story building labeled "blacksmith and hardware" in a 1904 map and "heavy hardware" in a 1915 map.

Lot 22 was listed twice in historical databases. United Duffield Company, listed at 214 Duffield Street, was listed in the State Spills database for having a closed-status spill for a broken fill pipe in December 1994. Lot 22 was also listed in the State Petroleum Bulk Storage database for having one 3,000-gallon fuel oil underground storage tank.

Leaking storage tanks may contribute to on-site petroleum contamination. It is unknown whether manufacturing involving petroleum and/or hazardous materials occurred in the historical factory indicated on Lot 22. The on-site photo developing facility may utilize hazardous materials in the developing process. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 22.

**Lot 26**, located at 216-226 Duffield Street, currently contains a paved parking lot with an attendant's booth. Lot 26 has historically contained a vacant lot labeled "parking" since ca. 1950. Ca. 1904 through 1938, Lot 26 contained multiple three-story residences. A historical map from 1938 depicted some of the residences as 'vacant' or as having been demolished.

The subject lot was not listed in any of the regulatory databases searched.

It is possible that petroleum and/or hazardous materials were dumped on vacant lots or parking lots. There is a low potential for petroleum and/or hazardous materials contamination on Lot 26.

Lots 8, 10, 13, 14, 21, 22, and 32 are located adjacent to Lot 26 on Block 145. Reviews of these lots are summarized in this chapter. Lots 10, 21, 22, and 32 historically contained factories and/or manufacturing facilities where petroleum and/or hazardous materials may have been used in daily operations. Lots 22 and 32 may contain petroleum storage tanks. Lot 22 currently contains an on-site photo developing facility where hazardous materials may be utilized. Lot 21 historically contained vacant land where petroleum and/or hazardous materials may have been dumped. No potential for petroleum or hazardous materials contamination was noted for Lots 8, 13 and 14 during the site visit, a review of historical maps, and a review of regulatory databases. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 26.

**Lot 32**, located at 228 Duffield Street, currently contains a three-story residential structure with a restaurant on the ground floor. One vent pipe was observed outside the property during site inspection.

Lot 32 has historically contained a three-story structure since ca. 1904. The structure was labeled as a residence ca. 1904 through ca. 1915, as a store ca. 1938 through ca. 1969, as a manufacturing building ca. 1977 through 1982, and as a commercial structure ca. 1995.

The subject lot was not listed in any of the regulatory databases searched.

Lot 32 may contain petroleum storage tank(s), which may have leaked into soil or groundwater. It is unknown whether the historical manufacturing that occurred on Lot 32 involved the use or

generation of petroleum or other hazardous materials. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 32.

*SITE P*

*Block 146*

**Lot 7**, located at 237-243 Duffield Street, currently contains a three-story commercial building occupied by a clothing store.

Lot 7 historically contained a three-story residence from prior to ca. 1904 until ca. 1938, and a three-story store from ca. 1950.

Lot 7 was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 7 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 2, 11, and 46-49 are located adjacent to Lot 7 on Block 146. Reviews of Lots 11 and 46-49 are summarized in this chapter. Lots 46-49 currently contain and historically contained parking lots. Illegal dumping of petroleum and/or hazardous materials may have occurred on these vacant lots. No potential for petroleum or hazardous materials contamination was noted for Lot 11 during the site visit, a review of historical maps, and a review of regulatory databases.

Lot 2, located at 245-253 Duffield Street, currently contains a two-story retail clothing store. Lot 2 historically contained multi-level stores and residences ca. 1904; the two-story "Duffield Street Theater" 1915 through ca. 1938; a two-story movie theater ca. 1950 through 1982; and a two-story commercial store ca. 1995. Lot 2 was not listed in any of the regulatory databases searched. No potential for petroleum or hazardous materials contamination was noted for Lot 2 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 12-18, 23, 29, 34-37, 41-43, and 50-53 are located on the same block as and within 400 feet of Lot 7. All of these lots are summarized in this chapter. Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug wholesaler. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 16, 23, 29, 37, 41, 42, 43, and 52 are currently and/or were historically used for parking or contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 11, 15, 34, 36, 50, or 51 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 7.

**Lot 11**, located at 235 Duffield Street, is currently occupied by a four-story residential building with a restaurant on the first floor and a nail salon on the second floor.

Historically, Lot 11 contained a three-story residence ca. 1904, and contained a three-story store from ca. 1915 to ca. 1995.

Lot 11 was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 11 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 7, 12, 43, and 46 are located adjacent to Lot 11 on Block 146. Reviews of these lots are summarized in this chapter. Lot 12 may contain petroleum storage tank(s), which may have leaked into soil or groundwater. Lots 43 and 46 currently contain and historically contained parking lots. Illegal dumping of petroleum and/or hazardous materials may have occurred on these vacant lots. No potential for petroleum or hazardous materials contamination was noted for Lot 7 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lot 12, there is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 11.

**Lot 12**, located at 233 Duffield Street, currently contains a three-story residential building, with retail space (a tea salon and psychic shop) on the ground floor. One vent pipe and one fill cap were noted outside this building during site inspection.

Historic maps show that Lot 12 contained a three-story residence from prior to ca. 1904 to ca. 1915, and a three-story store from ca. 1915 to ca. 1995.

Lot 12 was not listed in any of the regulatory databases searched.

The vent pipe and fill cap observed on Lot 12 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 13**, located at 231 Duffield Street, currently contains a three-story residential building, with retail space (a tea salon and psychic shop) on the ground floor. One vent pipe was noted outside this building during site inspection.

Historically, Lot 13 contained a two-story residence from prior to ca. 1904 to ca. 1950, and a two-story store from ca. 1950 to prior to ca. 1995.

Lot 13 was not listed in any of the regulatory databases searched.

The vent pipe observed on Lot 13 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 14**, located at 229 Duffield Street, is currently an unpaved vacant lot.

Historic maps indicate that Lot 14 contained a three-story residence from ca. 1904 through ca. 1938, and a three-story store ca. 1950. Lot 14 was unlabeled on land use maps from 1969 through 1995, which could indicate the lot was vacant.

Lot 14 was not listed in any of the regulatory databases searched.

Hazardous materials may have been dumped on the property since it became vacant. There is, therefore, a low potential for hazardous materials to exist on the site.

Lots 13, 15, 42, and 43 are located adjacent to Lot 14 on Block 146. Reviews of these lots are summarized in this chapter. Lot 13 may contain petroleum storage tank(s), which may have leaked into soil or groundwater. Lots 42 and 43 currently contain and historically contained parking lots. Illegal dumping of petroleum and/or hazardous materials may have occurred on these vacant lots. No potential for petroleum or hazardous materials contamination was noted for Lot 15 during the site visit, a review of historical maps, and a review of regulatory databases.

Due to environmental conditions on Lot 13, there is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 14.

**Lot 15**, located at 227 Duffield Street, currently contains a two-story commercial building, which was vacant at the time of site inspection.

Historically, Lot 15 contained a three-story residence from prior to 1904 to ca. 1950, and a three-story store from ca. 1969 to ca. 1995.

Lot 15 was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 15 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 14, 16, 41, and 42 are located adjacent to Lot 15 on Block 146. Reviews of these lots are summarized in this chapter. Lot 14 is currently and was likely historically a vacant lot. Lot 16 historically contained a factory and may currently contain a petroleum storage tank. Leaking storage tanks could contribute to soil and groundwater contamination. Historic factories may have utilized hazardous materials in their manufacturing processes. Lots 41 and 42 currently contain and historically contained parking lots. Illegal dumping of petroleum and/or hazardous materials may have occurred on vacant lots. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 15.

**Lot 16**, located at 225 Duffield Street, currently contains a two-story commercial building, which was vacant at the time of site inspection. One vent pipe was noted outside this building during site inspection.

Historic maps from 1904 and 1915 show Lot 16 to be occupied by a three-story residence. A map from 1938 shows a three-story building on the site, but labeling is illegible. A three-story factory is shown on Lot 16 on maps from 1950 and 1969; maps from 1977 through to 1995 show a three-story building on the site, but labeling for this building is illegible.

Lot 16 was not listed in any of the regulatory databases searched.

Historic factories may have utilized hazardous materials in their operations, and it is possible that hazardous materials have been dumped on the property since it became vacant. The vent pipe observed on Lot 16 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 17**, located at 223 Duffield Street, currently contains a two-story beauty supply store.

Historic land use maps show that ca. 1904, Lot 17 contained a three-story residence. A map from 1915 showed Lot 17 to be occupied by a three-story factory. A map from 1938 showed the site to contain a three-story commercial building labeled "shoe repairing," and maps from 1950, 1969, 1977, 1982, and 1995 showed it to contain a three-story commercial building labeled "printing."

Lot 17 was not listed in any of the regulatory databases searched.

Historic manufacturing, shoe repairing, and printing facilities may have utilized hazardous materials in their operations. There is, therefore, a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 18**, located at 213-221 Duffield Street, and 110-114 Willoughby Street, currently contains seven-story and two-story institutional buildings occupied by the NYC Human Resources Administration - Emergency Assistance Unit.

Lot 18 historically contained a two-story residence ca. 1904 and ca. 1915. Maps from 1938 and 1950 showed Lot 18 to contain a two-story and seven-story warehouse; maps from 1950 through to 1995 showed it to contain a two-story building labeled "NYC Dept. of Social Services" and a seven-story unlabeled building.

Lot 18 appeared twice in the regulatory databases searched. 213 Duffield Street was listed as Petroleum Bulk Storage Site containing a 15,000-gallon fuel oil aboveground storage tank (AST), a 2,500-gallon fuel oil AST (both active) and a 2,500-gallon fuel oil AST that was closed in place in 1998. 221 Duffield Street was also listed as a Petroleum Bulk Storage Site containing one 20,000-gallon fuel oil AST, which was closed in 1993.

The on-site fuel oil tanks, if they leaked, may have contributed to on-site petroleum contamination. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 23**, located at 106 and 108 Willoughby Street and at 201 - 209 Duffield Street, currently contains a partially paved parking lot with an attendant's booth.

Historic maps show that Lot 23 contained two-story residences from prior to 1904 to ca. 1915. A map dated 1938 showed the site to contain a one-story commercial building labeled "Towns and James Whol. Drugs." Maps from 1950 to 1995 labeled Lot 23 as used for parking.

Lot 23 was not listed in any of the regulatory databases searched.

Current and historic use of Lot 23 for parking may have resulted in the presence of petroleum and/or hazardous materials as a result of illegal dumping. Historically, the on-site drug wholesaler may have utilized hazardous materials. There is a potential VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 23.

**Lot 29**, located at 116-124 Willoughby Street, and at 392-400 Albee Square West/Gold Street, currently contains a paved parking lot.

Historically, Lot 29 contained three-story residences from ca. 1904 to ca. 1950 (ca. 1915 these residences also contained stores). Maps from 1969 to 1982 showed the site to be vacant; a map from 1995 indicated that Lot 29 was used for parking.

Lot 29 was not listed in any of the regulatory databases searched.

Current and historic use of Lot 29 for parking may have resulted in the presence of petroleum and/or hazardous materials due to illegal dumping.

Lots 18 and 34 are located adjacent to Lot 29 on Block 146. Reviews of these lots are summarized in this chapter. Lot 18 contained aboveground petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. No potential for petroleum or hazardous materials contamination was noted for Lot 34 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lot 18, there is a potential that VOCs, SVOCs, metals, and pesticides on this adjacent lot may have impacted Lot 29.

**Lot 34**, located at 402 Albee Square West/Gold Street, currently contains (with Lots 35 and 36) a five-story residential building. Lot 34 has historically contained a five-story residential building since at least 1904.

Lot 34 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

No potential for petroleum or hazardous materials contamination was noted for Lot 34 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 18, 29, and 35 are located adjacent to Lot 34 on Block 146. Reviews of these lots are summarized in this chapter. Lots 18 and 35 may contain petroleum storage tanks, which may have leaked into soil or groundwater. Current and historic use of Lot 29 for parking may have resulted in the presence of petroleum and/or hazardous materials due to illegal dumping. There is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 34.

**Lot 35**, located at 404 Albee Square West/Gold Street, currently contains (with Lots 34 and 36) a five-story residential building. One fill cap was noted on the sidewalk outside of Lot 35 during site inspection.

Historical maps indicate that Lot 35 has contained a five-story residential building since prior to 1904.

Lot 35 was not listed in any of the regulatory databases searched.

The vent pipe observed on Lot 35 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 36**, located at 406 Albee Square West/Gold Street, currently contains (with Lots 34 and 35) a five-story residential building. Lot 36 has historically contained a five-story residential building since at least 1904.

Lot 36 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

Lots 18, 35 and 37 are located adjacent to Lot 36 on Block 146. Reviews of these lots are summarized in this chapter. Lots 18 and 35 may contain petroleum storage tanks, which may have leaked into soil or groundwater. Current and historic use of Lot 37 for parking may have resulted in the presence of petroleum and/or hazardous materials due to illegal dumping. There is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 36.

**Lot 37**, located at 408-414 Albee Square West/Gold Street, currently contains (with Lots 41, 42, 43, 46, 47, 48, and 49) a paved parking lot with attendant's booth.

Historical maps show that Lot 37 contained three-story residences from prior to 1904 to ca. 1938 and was vacant ca. 1950. The site has been used for parking since ca. 1969.

Lot 37 was not listed in any of the regulatory databases searched.

Lot 37 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 37.

Lots 16, 17, 18, 36, and 41 are located adjacent to Lot 37 on Block 146. Reviews of these lots are summarized in this chapter. Lots 16 and 17 historically contained factories and/or

manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 18 contains aboveground petroleum storage tanks and Lot 16 may contain tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Lot 16 was historically vacant. No potential for petroleum or hazardous materials contamination was noted for Lots 36 and 41 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lots 16, 17 and 18, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 37.

**Lot 41**, located at 416 Albee Square West/Gold Street, currently contains (with Lots 37, 42, 43, 46, 47, 48, and 49) a paved parking lot with attendant's booth.

Historically, this site contained a three-story residence from ca. 1904 to ca. 1950, and was vacant from ca. 1969 to ca. 1995.

Lot 41 was not listed in any of the regulatory databases searched.

Lot 41 is currently used for parking and historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on Lot 41.

Lots 15, 16, 37, and 42 are located adjacent to Lot 41 on Block 146. Reviews of these lots are summarized in this chapter. Lot 16 may currently contain a petroleum storage tank(s) and historically contained a factory where petroleum and/or hazardous materials may have been used in operations. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. Lot 42 is currently used for parking and historically contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 15 and 37 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lots 16, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 41.

**Lot 42**, located at 418 Albee Square West/Gold Street, currently contains (with Lots 37, 41, 43, 46, 47, 48, and 49) a paved parking lot with attendant's booth.

Historically, this site contained a three-story residence from ca. 1904 to ca. 1982, and was vacant ca. 1995.

Lot 42 was not listed in any of the regulatory databases searched.

Lot 42 is currently used for parking and historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on Lot 42.

Lots 14, 15, 41, and 43 are located adjacent to Lot 42 on Block 146. Reviews of these lots are summarized in this chapter. Lots 14, 41, and 43 are currently and were historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 15 during the site visit, a review of historical maps, and a review of regulatory databases. It is unlikely that any of these uses impacted Lot 42.

Lots 2, 7, 11-13, 16-18, 23, 29, 34-37, and 46-53 are located on the same block as and within 400 feet of Lot 42. All of these lots are summarized in this chapter. Lot 2 is summarized as an adjacent lot to Lot 7 and Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks

could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 23, 29, 37, 42, 46, 47, 48, 49, and 52 are currently and were historically used for parking or contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 2, 11, 34, 36, 50, or 51 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 42.

**Lot 43**, located at 420-424 Albee Square West/Gold Street, currently contains (with Lots 37, 41, 42, 46, 47, 48, and 49) a paved parking lot with attendant's booth.

Historically, this site contained three-story residences from ca. 1904 to ca. 1938, was vacant ca. 1950, and has been used for parking since ca. 1969.

Lot 43 was not listed in any of the regulatory databases searched.

Lot 43 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 43.

Lots 11-14, 42, and 46 are located adjacent to Lot 43 on Block 146. Reviews of these lots are summarized in this chapter. Lots 12 and 13 may contain petroleum storage tanks, as evidenced by vent pipes and/or fill caps observed during site inspection. Leaking storage tanks could contribute to soil and groundwater contamination. Lots 14, 42, and 46 are currently used for parking and historically contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 11 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions on Lots 12 and 13, there is a potential that VOCs, SVOCs, and metals on these adjacent lots may have impacted Lot 43.

**Lot 46**, located at 426 Albee Square West/Gold Street, currently contains (with Lots 37, 41, 42, 43, 47, 48, and 49) a paved parking lot with attendant's booth.

Historically, this site contained a three-story residence from ca. 1904 to ca. 1950, and was vacant from ca. 1969 to ca. 1995.

Lot 46 was not listed in any of the regulatory databases searched.

Lot 46 is currently used for parking and historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on Lot 46. Lots 7, 11, 43 and 47 are located adjacent to Lot 46 on Block 146. Reviews of these lots are summarized in this chapter. Lots 43 and 47 are currently used for parking and historically contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 7 or 11 during the site visit, a review of historical maps, and a review of regulatory databases. It is unlikely that any of these uses impacted Lot 46.

Lots 2, 12-18, 23, 29, 34-37 41, 42, and 48-53 are located on the same block as and within 400 feet of Lot 46. All of these lots are summarized in this chapter. Lot 2 is summarized as an adjacent lot to Lot 7 and Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 23, 29, 37, 41, 42, 46, 48, 49, and 52 are currently and were

historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 2, 15, 34, 36, 50, or 51 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 46.

**Lot 47**, located at 428 Albee Square West/Gold Street, currently contains (with Lots 37, 41, 42, 43, 46, 48 and 49) a paved parking lot with attendant's booth.

Historically, this site contained a three-story residence from ca. 1904 to ca. 1982, and was vacant ca. 1995.

Lot 47 was not listed in any of the regulatory databases searched.

Lot 47 is currently used for parking and historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on Lot 47.

Lots 7, 46, and 48 are located adjacent to Lot 47 on Block 146. Reviews these lots are summarized in this chapter. Lots 46 and 48 are currently used for parking and historically contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 7 during the site visit, a review of historical maps, and a review of regulatory databases. It is unlikely that these adjacent uses have impacted Lot 47.

Lots 2, 11-18, 23, 29, 34-37, 41-43, and 49-53 are located on the same block as and within 400 feet of Lot 47. All of these lots are summarized in this chapter. Lot 2 is summarized as an adjacent lot to Lot 7 and Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 23, 29, 37, 41, 42, 43, 46, 48, 49, and 52 are currently and were historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 2, 11, 15, 34, 36, 50, or 51 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 47.

**Lot 48**, located at 430 Albee Square West/Gold Street, currently contains (with Lots 37, 41, 42, 43, 46, 47, and 49) a paved parking lot with attendant's booth.

Historically, this site contained a three-story residence from ca. 1904 to ca. 1950, and a three-story building labeled "frat. ho." from ca. 1969 to ca. 1982. A map from 1995 showed Lot 48 to be vacant.

Lot 48 was not listed in any of the regulatory databases searched.

Lot 48 is currently used for parking and historically contained vacant land. Petroleum and/or hazardous materials may have been dumped on Lot 48.

Lots 7, 47, and 49 are located adjacent to Lot 48 on Block 146. Reviews these lots are summarized in this chapter. Lots 47 and 49 are currently used for parking and historically contained vacant land. No potential for petroleum or hazardous materials contamination was

noted for Lot 7 during the site visit, a review of historical maps, and a review of regulatory databases. It is unlikely that these adjacent uses have impacted Lot 48.

Lots 2, 11-18, 23, 29, 34-37, 41-43, 46, and 50-53 are located on the same block as and within 400 feet of Lot 48. All of these lots are summarized in this chapter. Lot 2 is summarized as an adjacent lot to Lot 7 and Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 23, 29, 37, 41, 42, 43, 46, and 52 are currently and were historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 2, 11, 15, 34, 36, 50, or 51 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 48.

**Lot 49**, located at 432 Albee Square West/Gold Street, currently contains (with Lots 37, 41, 42, 43, 46, 47, and 48) a paved parking lot with attendant's booth.

Historically, this site contained a three-story residence from ca. 1904 to ca. 1950, and a three-story commercial building ca. 1969 to ca. 1995.

Lot 49 was not listed in any of the regulatory databases searched.

Lot 49 was historically and is currently used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 49.

Lots 7, 48, and 50 are located adjacent to Lot 49 on Block 146. Reviews of these lots are summarized in this chapter. Lot 48 is currently used for parking and historically contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 7 or Lot 50 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 2, 11-18, 23, 29, 34-37, 41-43, 46, 47, and 51-53 are located on the same block as and within 400 feet of Lot 49. All of these lots are summarized in this chapter. Lot 2 is summarized as an adjacent lot to Lot 7 and Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 23, 29, 37, 41-43, 46, 47, and 52 are currently and were historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 2, 11, 15, 34, 36, or 51 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 49.

**Lot 50**, located at 434 Albee Square West/Gold Street, currently contains a three-story commercial building occupied by a dental surgery office.

Historically, Lot 50 contained a three-story residential building from prior to 1904 to ca. 1995. From ca. 1995 to ca. 1997 this building was labeled "transient."

Lot 50 was not listed in any of the regulatory databases searched.

No potential for petroleum or hazardous materials contamination was noted for Lot 50 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 2, 49, and 51 are located adjacent to Lot 50 on Block 146. Reviews of these lots are summarized in this chapter. Lot 49 was historically and is currently used for parking. No potential for petroleum or hazardous materials contamination was noted for Lot 2 or Lot 51 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 7, 11-18, 23, 29, 34-37, 41-43, 46-48, 52, and 53 are located on the same block as and within 400 feet of Lot 50. All of these lots are summarized in this chapter. Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 23, 29, 37, 41, 42, 43, 46, 47, 48, and 52 are currently and/or were historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 7, 11, 15, 34, or 36 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 50.

**Lot 51**, located at 436 Albee Square West/Gold Street, currently contains a four-story residential building.

Historic maps from 1904 and 1915 show Lot 51 as containing a five-story residence, and maps from 1938 through 1969 show a five-story store on the site. Lot 51 was unlabeled on maps from 1977 to 1995.

Lot 51 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 51.

Lots 2, 50, and 52 are located adjacent to Lot 51 on Block 146. These lots are summarized in this chapter. Lot 2 was summarized as an adjacent property to Lot 52. Lot 52 currently contains and historically contained vacant land since ca. 1904. No potential for petroleum or hazardous materials contamination was noted for Lots 2 or 50 during the site visit, a review of historical maps, and a review of regulatory databases.

Lots 7, 11-18, 23, 29, 34-37, 41-43, 46-49, and 53 are located on the same block as and within 400 feet of Lot 51. All of these lots are summarized in this chapter. Lot 53 is summarized as an adjacent lot to Lot 52. Lots 16 and 17 historically contained factories and/or manufacturing and/or printing facilities where petroleum and/or hazardous materials may have been used in operations. Lot 23 historically contained a drug store. It is possible that hazardous materials are or may have been used in these operations. Lots 12, 13, 16, 18, 35, and 53 may contain petroleum storage tanks. Leaking storage tanks could contribute to soil and groundwater contamination. Two spills were reported to New York State for Lot 53. Lots 14, 23, 29, 37, 41,

42, 43, 46, 47, 48, and 49 are currently and/or were historically used for parking and contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lots 7, 11, 15, 34, or 36 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 51.

**Lot 52**, located at 438 Albee Square West/Gold Street, is currently an unpaved vacant lot. Historical land use maps indicate that the site has been vacant since prior to 1904.

Lot 52 was not listed in any of the regulatory databases searched.

Due to the potential for illegal dumping of hazardous materials on the property when vacant, there is a low potential for petroleum and/or hazardous materials to exist on the site.

Lots 2, 51, and 53 are located adjacent to Lot 52 on Block 146. A review of Lot 51 is summarized in this chapter. Lot 51 currently contains and historically contained a parking lot and/or vacant land since ca. 1904. Petroleum and/or hazardous materials may have been dumped on vacant land. Lot 2, located at 245-253 Duffield Street, currently contains a two-story retail clothing store. Lot 2 historically contained multi-level stores and residences ca. 1904; the two-story "Duffield Street Theater" from 1915 through ca. 1938; a two-story movie theater ca. 1950 through 1982; and a two-story commercial store ca. 1995. Lot 2 was not listed in any of the regulatory databases searched. No potential for petroleum or hazardous materials contamination was noted for Lot 2 during the site visit, a review of historical maps, and a review of regulatory databases.

Lot 53, located at 255-261 Duffield Street, 523-545 Fulton Street, and 440-458 Albee Square West/Gold Street, currently contains a four-story residential building. Lot 53 historically contained stores and residences ca. 1904 through ca. 1915. A large four-story structure containing stores was noted on Lot 53 in historical maps ca. 1938 through ca. 1995. 523 Fulton Street was listed twice in the State Spills database for two closed-status spills. In 1995, a 1,500-gallon fuel oil storage tank was overfilled. In 1996, equipment failure caused the spill of 10 gallons of fuel oil. Both spills were reportedly cleaned up with due diligence. The presence and condition of petroleum storage tanks on Lot 53 may have contributed to soil or groundwater contamination.

There is a potential that VOCs, SVOCs, PCBs, and metals on the adjacent Lot 53 may have impacted Lot 52.

*SITE Q*

*Block 149*

**Lot 1** is located at the following addresses: 1-7 De Kalb Avenue; 409-463 Albee Square West/Gold Street; 126-140 Willoughby Street; 290-308 and 318-328 Flatbush Avenue Extension; and 50-90 Fleet Street (Albee Square West/Gold Street). Lot 1 currently contains a multi-story commercial shopping mall (The Gallery at Fulton Street) with an aboveground parking lot. An electrical transformer was noted at the property during site inspection.

Historically, Lot 1 contained two- and three-story residences and stores ca. 1904 and 1915. On maps from 1938 and 1950, Lot 1 contained a parking facility (with 10 gasoline tanks shown in 1938), a vacant lot labeled "used cars," a one-story building labeled "auto laundry," two- and three-story residences, a commercial building labeled "E F. Albee Theatre," stores, and a filling station with a total of 11 gasoline tanks (tanks were shown in the 1938 Map only). Ca. 1969 and

1977 only a parking facility, the commercial building labeled "EF Albee Theatre," and stores remained on the site; the remainder of the site was unlabeled (and assumed to contain vacant land). Maps from 1982 and 1995 showed Lot 1 to be occupied by a commercial building labeled "Albee Square Mall" and a parking area. Albee Square (formerly Prince Street) was shown to run through Block 149 and divide Lot 1 into two parcels in historical maps from 1904 through 1950.

Lot 1 was listed one time in the regulatory databases searched. An unknown active hazardous spill to the air was reported at 1 DeKalb Avenue (Panars Clothing) in November 2002. It is possible that Panars Clothing is a dry cleaning facility.

Due to the historical presence of a filling station with gasoline tanks, a parking lot with gasoline tanks, the current presence of an electrical transformer, use of the property for parking, and an active hazardous materials spill from a potential dry cleaner, there is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 49** is located at 310-316 Flatbush Avenue Extension. Lot 49 currently contains a paved driveway and a stairway to the subway.

Historically, Lot 49 contained a residence ca. 1904 and 1915. On maps from 1938 and 1950, Lot 49 contained a portion of a filling station (with 11 gasoline tanks shown in 1938). Ca. 1969 and 1977, Lot 49 was used as a parking facility. Maps from 1982 and 1995 showed Lot 49 to be vacant land.

Lot 49 was not listed in the regulatory databases searched.

Historical use of Lot 49 as a part of a filling station with on-site gasoline tanks may have resulted in presence of petroleum and/or hazardous materials on the site. It is also possible that hazardous materials were dumped on the property when it was vacant. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE S*

*Block 2093*

**Lot 1** is located at 395-435 Flatbush Avenue Extension; 50-62 De Kalb Avenue; 458-498 Hudson Avenue; and 605-621 Fulton Street. Lot 1 currently contains a six-story institutional building with retail space on the ground floor, including an ice cream shop, a gift shop, a clothing store, an electronics store, and a restaurant. The second through sixth floors are occupied by the New York State Department of Motor Vehicles. The building has a basement parking garage.

A historical map from 1904 showed Lot 1 to contain numerous two- and three-story residential and commercial (stores) buildings, and the Montauk Theatre. A map from 1915 showed commercial buildings labeled "Richard E. Thibaut Peerless Wall Papers;" commercial buildings (stores); a commercial building labeled "Crescent Theatre;" and a commercial structure labeled "Moving Picture Show" on the site. A map from 1938 showed Lot 1 to contain commercial buildings labeled "Richard E. Thibaut Peerless Wall Papers;" auto parking; a commercial building in labeled "Werba's Brooklyn Theatre;" and commercial buildings labeled "offices" and "stores." Ca. 1950 the site contained three- and four-story commercial buildings labeled "upholstering," a parking lot, and several commercial buildings (stores, offices, "dining" and "dancing"). Ca. 1969 the site was vacant except for several three- and four-story commercial buildings (stores) on the northwestern corner of block. On maps from 1977 and 1982, Lot 1 was

labeled as "New York Telephone Co." with a garage in the basement and a vault on the north-adjacent sidewalk. In 1995 the same details were provided but the site was labeled as NYNEX.

Lot 1 appeared three times in the Federal and State databases searched. 395 Flatbush (New York Telephone) was listed as an Air Discharge Facility. An open spill was listed for Hudson Avenue at De Kalb Avenue, in February 1996. 200 gallons of transformer oil were reportedly released from two transformer vaults due to criminal mischief. An open spill was also listed at 415 Flatbush (Brooklyn Public Library); contaminated soil was found during tank removal.

Historical upholstering, wall papering and telephone facilities may have utilized hazardous materials in their operations. Open spills listed for the site indicate that petroleum and/or hazardous materials may have been released and may remain on-site. There is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

*SITE AA*

*Block 165*

**Lot 17**, located at 230 Livingston Street, is currently (with Lots 18, 19, and 58) a paved parking lot.

Historically, Lot 17 contained five-story residential structures from ca. 1904 to ca. 1915, and five-story stores from ca. 1938 to ca. 1977. Lot 17 was shown as vacant land on a map from 1982. A map from 1995 showed Lot 17 joined with Lots 18, 19, and 58 to form a parking lot.

Lot 17 was not listed in any of the regulatory databases searched.

Lot 17 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 17.

Lots 16, 18, and 58 are located adjacent to Lot 17 on Block 165. Reviews of Lots 18 and 58 are summarized in this chapter. Lots 18 and 58 are currently and were historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lots 18 and 58. Lot 18 historically contained a factory, which may have utilized hazardous materials. Due to environmental conditions noted on Lot 18, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on this adjacent lot may have impacted Lot 17.

**Lot 18**, located at 232 Livingston Street, is currently (with Lots 17, 19, and 58) a paved parking lot.

Lot 18 contained a three-story residence ca. 1904 and contained a three-story store ca. 1915. Maps from 1938 and 1950 showed the site to contain a three-story factory with store. The site contained a three-story store from ca. 1969 to ca. 1977, and was shown as vacant land in a map from 1982. A map from 1995 showed Lot 18 joined with Lots 17, 19, and 58 to form a parking lot.

Lot 18 was not listed in any of the regulatory databases searched.

Lot 18 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 18. Lot 18 also historically contained a factory, which may have utilized hazardous materials in its operations. Due to these factors, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals may have impacted Lot 18.

**Lot 19**, located at 234-236 Livingston Street, is currently (with Lots 17, 18, and 58) a paved parking lot.

Historically, Lot 19 contained two two-story residential row houses and one three-story building labeled "Fur Making" ca. 1904. On a map from 1915, the site was shown to contain two-story residential row houses and one three-story building; the labeling on the three-story building was illegible. Ca. 1938 the site contained two two-story stores and one three-story store. A map from 1950 showed two four-story stores, one labeled "factory," present on-site. Lot 19 was vacant from ca. 1969 to ca. 1982. A map from 1995 showed Lot 19 joined with Lots 17, 18, and 58 to form a parking lot.

Lot 19 was not listed in any of the regulatory databases searched.

Current and historical use of the site for auto parking may have resulted in the release of hazardous materials and/or petroleum on-site through dumping. Historical fur-making facilities may have utilized hazardous materials in their operations. There is, therefore, a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 19.

**Lot 58**, located at 219-225 Schermerhorn Street, is currently (with Lots 17, 18, and 19) a paved parking lot.

Historically, Lot 58 contained three-story residential buildings from ca. 1904 to ca. 1915. Ca. 1938 the property was vacant. From ca. 1950 to ca. 1982, the site contained a subway station entrance, vacant land, and a parking lot. A map from 1995 showed Lot 58 joined with Lots 17, 18, and 19 for use as a parking lot.

Lot 58 was not listed in any of the regulatory databases searched.

Current and historical use of the site for auto parking may have resulted in the release of hazardous materials and/or petroleum on-site through dumping.

Lots 17, 18, 19, 22, and 60 are located adjacent to Lot 58 on Block 165. Reviews of Lots 17, 18, and 19 are summarized in this chapter. Lots 17 and 19 are currently and/or were historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lots 17 and 59. Additionally, Lot 19 was historically occupied by a fur maker, which may have utilized hazardous materials in its operations. Lot 18 historically contained a factory, which also may have utilized hazardous materials in its operations. Due to the environmental conditions identified on Lots 17, 18, and 19, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 58.

*SITE BB*

*Block 165*

**Lot 29** is located at 254-272 Livingston Street, 30-36 Bond Street, and 245-253 Schermerhorn Street. Lot 29 currently contains a three-story residential building with a furniture store on the first floor, a one-story commercial building occupied by Goodwill, and a two-story commercial building with a mattress store on the first floor.

From ca. 1904 to ca. 1915, Lot 29 contained vacant land, five three-story stores, four three-story residential row houses, and a three-story building labeled "bakery." Maps from 1938 and 1950 show a one-story building labeled "receiving" and a two-story store on-site. Maps from 1969 to 1995 showed Lot 29 to contain a one-story factory, a store, a two-story building labeled "furniture," a one-story store and a subway station entrance.

Lot 29 was not listed in any of the regulatory databases searched.

Historical presence of a subway station entrance, a furniture manufacturing or storage facility, and a factory on-site may have resulted in the release of hazardous materials and/or petroleum on-site. There is, therefore, a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 29.

*SITE EE*

*Block 2110*

**Lot 3**, located at 75-119 Flatbush Avenue, 286-346 Ashland Place, 2-20 Lafayette Avenue, and 113-121 Rockwell Place, currently contains a paved parking lot and a garden center.

Lot 3 historically contained 23 two- and three-story residences; 20 three-story stores; a three-story commercial building labeled "Hat, Feed and Excelsior" at 103 Flatbush Avenue; a three-story commercial building labeled "paints and oils" at 113 Flatbush Avenue; and a three-story commercial building labeled "upholsterer" at 115 Flatbush Avenue ca. 1904. Ca. 1915, Lot 3 contained 27 two- and three-story residences with ground floor stores; six three-story residences; and 17 vacant lots. Ca. 1933, Lot 3 contained 38 two- and three-story residences with ground floor stores; a four-story commercial building labeled "Lindsay Laboratories Drug Mfg" at 302-308 Ashland Place; one two-story school; and a three-story store labeled "lighting fixtures." Ca. 1950, in addition to numerous residences with ground floor stores and the drug manufacturing company, Lot 3 contained two parking lots, a medical center, a medical laboratory, and an animal hospital. Ca. 1968 Lot 3 no longer contained the drug manufacturing company. From prior to 1977 through the present, Lot 3 has contained a garden center with a one-story green house and a paved parking lot.

Lot 3 was not listed in any of the regulatory databases searched.

Due to its historical use as a drug manufacturing company, a medical center and laboratory, and an animal hospital, there is a potential for the presence of VOCs, SVOCs, PCBs, pesticides, and metals on-site on Lot 3.

## POTENTIAL DEVELOPMENT SITES

*SITE A*

*Block 128*

**Lot 1**, located at 288-316 Jay Street, 60-84 Tillary Street, 253-281 Adams Street, and 55-81 Johnson Street (Tech Place), currently contains (with Lot 26) 5-, 6-, and 12-story institutional structures occupied by the New York City College of Technology. A transformer vault was noted outside the site during the site inspection. The lot was shown to have been occupied by New York City College of Technology structures since ca. 1969. A Consolidated Edison substation was noted to exist beneath college laboratories on Lot 1 in historical maps from 1969, 1977, 1982, and 1995.

Lot 1 historically contained two- and three-story residences and a two-story building ca. 1904 and 1915. The two-story building was labeled "compound" in a 1904 map and "Themes Co. Metal ----[illegible]" in a 1915 map. Ca. 1938 and 1950, Lot 1 contained a one-story institutional structure (labeled "Long Island University" in the 1938 map and "State Institute of Applied Arts and Sciences" in the 1950 map), a substation (labeled "Brooklyn Edison Co." in the 1938 map and "Consolidated Edison" in the 1950 map), three-story residences, two vacant lots labeled

"parking" (1950 map only), and a lot labeled "Auto Laundry and Repair Shop" with three gasoline tanks.

Lot 1 was listed three times in a search of regulatory databases. A petroleum spill was reported to NYSDEC for the New York City College of Technology. The spill was listed as having a closed status. New York City College of Technology was listed in the State RCRA database as a generator of hazardous waste. The site was also listed as having had a historic utility site in the 1920s—an electrical substation.

Due to the site's historical use for auto repair and the potential presence of gasoline underground storage tanks, petroleum or hazardous materials may exist on the site. The site's historical use as an electrical substation may also have contributed to on-site contamination by hazardous materials. It is possible that hazardous materials were dumped on vacant land. Laboratories in current institutional structures may utilize hazardous materials. Additionally, the transformer vault observed during site inspection, if it has leaked, may have contributed to on-site petroleum or hazardous materials contamination. Due to these factors, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 26**, located at 57-63 Johnson Street (Tech Place), currently contains (with Lot 1) 5-, 6- and 12-story institutional structures occupied by the New York City College of Technology. A transformer vault was noted outside the site during a site inspection. The lot was shown to have been occupied by NYC Technical College structures since ca. 1969. Ca. 1904 through ca. 1950, Lot 26 contained two- and three-story residential structures. Lot 26 was listed in regulatory databases as having had a historic utility site in the 1920s—an electrical substation.

The site's historical use as an electrical substation may have contributed to on-site contamination by hazardous materials. Laboratories in current institutional structures may utilize hazardous materials. Due to these factors, there is a potential for VOCs, SVOCs, PCBs, and metals to be present on the site.

*SITE B*

*Block 131*

**Northern half of Lot 1**, located at 85-101 Johnson Street (Tech Place) and 90-112 Tillary Street, currently contains an 18-story residence hall for Polytechnic University and a three-story building for the NYC Community College of Applied Arts and Sciences that contains a gymnasium, auditorium, and television studio. Monitoring wells were observed in the sidewalk outside the building. The lot was shown to have been occupied by NYC Community College structures since ca. 1969.

Lot 1 was split in half by Lawrence Street until ca. 1950 when the street was closed off and built on. The northern half of Lot 1 historically contained two- and three-story residences ca. 1904 and 1915. Ca. 1938 and 1950, the northern half of Lot 1 contained mostly two- and three-story residences, but also included a private garage with a 550-gallon buried gasoline tank and a dental supply store. Lot 1 was not listed in any of the regulatory databases searched.

Due to the site's historical use for a garage and dental supply store, and the potential presence of one gasoline underground storage tank, there is a potential for VOCs, SVOCs, and metals to exist on the site.

*SITE D*

*Block 133*

**Lot 1**, located at 147-157 Flatbush Avenue Extension, 302-310 Albee Square West/Gold Street, and 157-165 Johnson Street, contains a one-story restaurant and a one-story vacant building that most recently housed an auto repair shop. Lot 1 is shown to have been a school from ca. 1904 through ca. 1938. The lot was depicted as one-story auto sales and service building from ca. 1950 through 1969 and the site has contained an unlabeled one-story commercial building and warehouse since ca. 1977. Lot 1 was not listed in any of the regulatory databases searched.

Due to the site's historical use as an auto repair shop, there is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 5**, located at 129-145 Flatbush Avenue Extension and 292-300 Albee Square West/Gold Street, contains a six-story New York Police Department (NYPD) building. Monitoring wells were observed on the sidewalk outside the lot during the site inspection.

Lot 5 was shown to contain multiple four-story residences and a one-story store ca. 1904. Multiple one-story buildings of unknown use and vacant land were depicted ca. 1915. The 1938 map indicated a six-story manufacturing building, a one-story storage building, and vacant land. Ca. 1950 a six-story furnace warehouse and repair shop, a seven-story office building, a one-story storage facility, and vacant land occupied this lot. A six-story warehouse and office, a seven-story structure labeled "New York City Department of Welfare," a one-story storage facility, and vacant land were mapped on Lot 5 ca. 1966. Maps from 1977 through 1995 depicted a six-story building labeled "NYC Transit Authority Police Academy," a one-story auto-related commercial building, and vacant land.

Lot 5 was listed twice in a review of regulatory databases. The lot was listed as a Hazardous Waste Generator of lead in 1991. The subject lot was also listed as a Petroleum Bulk Storage Site with a 2,000-gallon diesel underground storage tank (UST), a 5,000-gallon fuel oil UST, and a 2,500-gallon fuel oil UST that is temporarily out of service.

Due to the site's historical use for auto related and manufacturing uses and the potential presence of three underground storage tanks, petroleum or hazardous materials may exist on the site. Additionally, it is possible that hazardous materials were dumped on vacant land. Due to these factors, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 13**, located at 125 Flatbush Avenue Extension, 87-89 Duffield Street, and 153-154 Tillary Street, contains a one-story commercial building used for auto sales.

Lot 13 contained two two-story buildings of unknown use ca. 1904. Ca. 1915 a one- and two-story building of unknown use, a two-story store, and a two-story storage building were depicted. From ca. 1938 to the present a one-story commercial building labeled "auto sales and service" has been depicted.

Lot 13 was listed as a Petroleum Bulk Storage facility in a review of regulatory databases. Nine USTs were listed as being closed and removed in 1993: six 550-gallon gasoline tanks, one 1,500-gallon lube oil tank, one 550-gallon lube oil tank and one 1,080-gallon tank listed as "other."

Due to the site's historical use for auto service and historic underground storage tanks, there is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 15**, located at 156-158 Tillary Street and 127 Flatbush Avenue Extension, contains a four-story commercial building.

The lot historically contained a four-story furniture storage building and a stable ca. 1904 through ca. 1915. Ca. 1938 the lot contained a commercial building labeled "Manhattan Drug Co." Ca. 1950 through ca. 1995, Lot 15 was depicted as a four-story manufacturing building.

Lot 15 was not listed in any of the regulatory databases searched.

Due to the site's historical manufacturing uses, which may have utilized petroleum and/or hazardous materials in their operations, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE E*

*Block 134*

**Lot 1**, located at 311-315 Albee Square West/Gold Street currently contains (with Lot 41) a four-story residential structure with a restaurant on the first floor. Lot 1 historically contained two-story residences, storage facilities, and commercial structures, four-story commercial structures, and one-story structures of unknown use since ca. 1904. An auto repair facility was noted to exist in a two-story structure on Lot 1 in historical maps from 1977, 1982, and 1995.

Lot 1 was listed once in a search of regulatory databases. "Team Obsolete" was listed as a Small Quantity Generator of hazardous materials.

Due to the site's historical use for auto repair and because of an on-site hazardous materials generator, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 5**, located at Albee Square West/309 Gold Street, currently contains a surface parking lot. A 55-gallon drum was noted on the project site during a site inspection.

Lot 5 was shown to contain residences on historical maps from 1904, 1915, 1938 and 1950, and was shown as vacant land on maps from 1969, 1977, 1982, and 1995.

Lot 5 was not listed in any of the regulatory databases searched.

Due to current use of the site as a parking lot where petroleum and/or hazardous materials may have been dumped and the presence of a 55-gallon drum of unknown contents in the parking lot, there is a low potential for hazardous materials to exist on the site.

Lots 1, 6, and 38 are located adjacent to Lot 5 on Block 134. Reviews of Lots 1 and 38 are summarized in this chapter. Lot 1 historically contained an auto repair facility and was listed in State databases for an on-site hazardous materials generator. Lot 38 historically contained a machine shop. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 5.

**Lot 38**, located at 173-175 Johnson Street, is currently occupied by a four-story residential structure and a two-story commercial structure.

On historical maps from 1904, 1915, and 1938, Lot 38 was shown to contain a four-story residential structure and two two-story structures of unknown use. Ca. 1950, 1969, 1977, 1982, and 1995, Lot 38 was shown to contain a four-story residential structure, a two-story structure of

unknown use, and a two-story structure labeled as a "machine shop." On the historical map from 1977 this two-story structure was labeled as "storage."

Lot 38 was not listed in any of the regulatory databases searched.

Due to the historical presence of a machine shop on Lot 38, there is a potential for VOCs, SVOCs, PCBs, and metals to exist on the site.

**Lot 41**, located at 171 Johnson Street, currently contains (with Lot 1) a four-story residential structure with a restaurant on the first floor. Historical maps show the site was occupied by a four-story residential structure since prior to ca. 1904.

Lot 41 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

Lots 1 and 28 are located adjacent to Lot 41 on Block 134. Reviews of these lots are summarized in this chapter. Lot 1 historically contained an auto repair facility and was listed in State databases for an on-site hazardous materials generator. Lot 38 historically contained a machine shop. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 41.

*SITE F*

*Block 134*

**Lot 30**, located at 78-88 Prince Street, currently contains a five-story commercial building.

Historical maps show that ca. 1904 Lot 30 was occupied by multiple two-story residences. From ca. 1915 to ca. 1995 the site was occupied by a manufacturing facility; on the map from 1938, the manufacturing facility was labeled "furniture."

Lot 30 was listed once in a search of regulatory databases. The site was listed as a Petroleum Bulk Storage site containing a 3,000 gallon fuel oil underground storage tank, which was listed as closed before April 1991.

Due to historical manufacturing facilities on Lot 30, petroleum and/or hazardous materials may exist on the site. Additionally, the fuel oil underground storage tank listed in the Petroleum Bulk Storage Site database, if it leaked, may have contributed to on-site petroleum contamination. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE H*

*Block 2049*

**Lot 2**, located at 329-341 Albee Square West/Gold Street and 104-120 Prince Street, currently contains a one-story parking garage and parking lot. One vent pipe and one fill port were noted during a site inspection.

Historical land use maps showed Lot 2 contained a one-story commercial building and 2-, 3-, and four-story residences in 1904. Ca. 1915, Lot 2 was shown to contain a one-story commercial building labeled "RR car barn" and two- and three-story residences. Historical maps from 1938 and 1950 showed the site as occupied by one-story commercial building labeled "used auto sales" and a one-story commercial building labeled "garage and auto repair" with two gas tanks.

Ca. 1969, Lot 2 contained a one-story commercial building labeled "used auto sales" and a one-story warehouse with 2 gas tanks. Historical maps from 1977, 1982, and 1995 indicated the site contained a one-story commercial building labeled "auto body shop."

Lot 2 was listed once in a search of regulatory databases. Pepper and Potter, Inc., at 329 Albee Square West/Gold Street, was listed as a Petroleum Bulk Storage Site. This site was listed as containing a 5,000-gallon fuel oil aboveground storage tank, a 1,080-gallon "other" underground storage tank, and a 1,500-gallon lube oil underground storage tank. All tanks were listed as closed and removed in 1993.

Due to the historical presence of auto repair, auto body shop, garage and railroad car barn facilities on Lot 2, petroleum and/or hazardous materials may exist on the site. Additionally, the underground and aboveground storage tanks listed in the Petroleum Bulk Storage Site database, potential tanks indicated on historical land use maps, and a potential additional on-site storage tank indicated by the vent pipe and fill port noted during a site inspection, may have contributed to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE I(B)*

*Block 2060*

**Part of Lot 32,** located at 152 Prince Street, is currently part of a two-story car wash and detail shop with Lots 24 and 123. Lot 32 is a paved area used as the entrance and exit to the car wash

Lot 32 is depicted in historical maps from 1904 and 1915 as residential buildings. Maps from 1938, 1950, 1969, and 1977 showed Lot 38 to contain a "filling station" with four buried tanks. The site was shown as vacant in maps from 1982 and 1995.

Lot 32 was not listed in any of the regulatory databases searched.

Historical use of Lot 32 as a filling station with on-site gasoline tanks may have resulted in presence of petroleum and/or hazardous materials on the site. It is also possible that hazardous materials were dumped on the property when it was vacant. There is a potential for VOCs, SVOCs, PCBs, metals, and pesticides to exist on the site.

**Lot 122,** located at 229 Flatbush Avenue Extension, currently contains a one-story commercial building occupied by a variety store. Historically, Lot 122 contained a shed ca. 1904, was vacant ca. 1915, and contained a one-story commercial building from ca. 1938 to ca. 1995.

Lot 122 was not listed in any of the regulatory databases searched.

Petroleum and/or hazardous materials may have been dumped on Lot 122 when it was vacant land ca. 1915. There is a low potential for petroleum and/or hazardous materials to exist on the site.

Lots 23 and 24 are located adjacent to Lot 122 on Block 2060. Reviews of Lots 23 and 24 are summarized in this chapter. Lot 23 historically contained a subway station. Lot 24 currently contains a carwash and auto detail facility and historically contained an auto sales shop. There is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 122.

*Block 2062*

**Lot 1,** located at 275-287 Flatbush Avenue Extension and at 159-163 Willoughby Street, currently contains a one-story commercial building occupied by a car wash and oil change facility. Seven vent pipes and seven fill caps labeled "motor oil" were noted outside the subject building during a site inspection.

Historically, Lot 1 contained four three-story residences (one labeled with a 1st floor store) and vacant land ca. 1904 and 1915. A map from 1938 showed the site to contain a two-story factory labeled "cutlery," a three-story residence with a 1st floor store, and a three-story commercial building with a 1st floor store. Ca. 1950, the site contained a two-story factory labeled "cutlery," a one-story forge, a three-story residence with 1st floor store, and a three-story commercial building with cutlery warehouse. Ca. 1969, Lot 1 contained a two-story factory labeled "cutlery," a one-story forge, a three-story residence and a three-story commercial structure with 2nd floor residences. Lot 1 was shown as a parking lot on maps from 1977, 1982 and 1995.

Lot 1 was not listed in any of the regulatory databases searched.

Current use of Lot 1 as a car wash and oil change facility may have resulted in the presence of petroleum and/or hazardous materials on the site. The seven vent pipes and fill ports observed on Lot 1 may indicate the presence of on-site motor oil or other storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Also, historic manufacturing facilities may have utilized hazardous materials in their operations. It is possible that hazardous materials were dumped on the property when portions of it were was vacant. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 5,** located at 155 Prince Street, currently contains a two-story commercial building. A vent pipe was noted on this building during site inspection.

Lot 5 was historically occupied by three-story residences ca. 1905 and 1915, and by a two-story commercial building labeled "1-neon signs, 2-club" ca. 1938. A map from 1950 showed the site occupied by a two-story commercial building labeled "1-office, 2-store," and a map from 1969 showed it occupied by a two-story commercial building with 1st floor store. Maps dated 1977 and 1982 showed Lot 5 to contain a two-story manufacturing building; in 1982 this building was labeled as having a store on the first floor. In 1995 this building was shown to be vacant.

Lot 5 was not listed in any of the regulatory databases searched.

The vent pipe observed on Lot 5 may indicate the presence of an on-site storage tank. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Historic manufacturing facilities may have utilized hazardous materials in their operations. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Part of Lot 6,** located at 147-153 Prince Street, 96-100 Fleet Place, and 2-20 Fair Street, currently contains a two-story building occupied on the first floor by a pre-school and on the second floor by a multimedia center.

Lot 6 was historically occupied by two- and three-story residences and commercial structures ca. 1904 and 1915. A historical map from 1938 showed Lot 6 to contain a lumber yard and a two-story commercial building labeled as a store. The map from 1950 showed the site contained a two-story manufacturing facility; this building was shown as vacant on a map from 1969. A map from 1977 showed a two-story building on-site but labeling was illegible. Ca. 1982 and ca. 1995, Lot 6 contained a two-story warehouse.

Lot 6 was listed once in a search of regulatory databases. 147 Prince Street was listed as a Petroleum Bulk Storage Site. This facility was listed as containing a 2,500-gallon fuel oil underground storage tank, which was closed in place 2001.

The on-site fuel oil underground storage tank may have contributed to on-site petroleum contamination. Historic manufacturing facilities may have utilized hazardous materials in their operations. It is also possible that hazardous materials were used and/or dumped on the property when it was used as a lumber yard. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 17,** located at 102 Fleet Place, (along with Lots 18, 19, and 21) currently contains a paved parking lot.

Historically, Lot 17 contained a three-story residence ca. 1904, 1915, 1938, 1950, and 1969, with vacant land also present ca. 1938 through 1969. Lot 17 was shown as vacant on maps dated 1977, 1982, and 1995.

Lot 17 was not listed in any of the regulatory databases searched.

Current use of Lot 17 as a parking lot and historical vacant land may have resulted in presence of petroleum and/or hazardous materials on-site. Hazardous materials may have been dumped on the property when it was vacant. There is a low potential for petroleum and/or hazardous materials to exist on the site.

Lots 5, 6, and 18 are located adjacent to Lot 17 on Block 2062. Reviews of these lots are summarized in this chapter. Lot 5 may contain a petroleum storage tank (as evidenced by an observed vent pipe) and historically contained a manufacturing facility, which may have used petroleum and/or hazardous materials in its operations. Lot 6 contains a fuel oil underground storage tank and historically contained a lumber yard and a manufacturing facility. Lot 18 currently contains a parking lot and historically contained vacant land. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 17.

**Lot 18,** located at 104 Fleet Place, (along with Lots 17, 19, and 21) currently contains a paved parking lot.

Historical maps from 1904 and 1915 show Lot 18 to contain a two-story residence. Historical maps from 1938 to 1995 show Lot 18 to be vacant.

Lot 18 was not listed in any of the regulatory databases searched.

Current use of Lot 18 as a parking lot and historical vacant land may have resulted in presence of petroleum and/or hazardous materials on-site. Hazardous materials may have been dumped on the property when it was vacant. There is a low potential for petroleum and/or hazardous materials to exist on the site.

Lots 5, 17, and 19 are located adjacent to Lot 18 on Block 2062. Reviews of these lots are summarized in this chapter. Lot 5 may contain a petroleum storage tank (as evidenced by an observed vent pipe) and historically contained a manufacturing facility, which may have used petroleum and/or hazardous materials in its operations. Lot 17 and 19 currently contain a parking lot and historically contained vacant land. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 18.

**Lot 19,** located at 106-108 Fleet Place, (along with Lots 17, 18, and 21) currently contains an unpaved parking lot.

Historically, Lot 19 contained a four-story residence ca. 1904, 1915, and 1938, with vacant land also present ca. 1938. Lot 19 was shown as vacant on a map dated 1950. Maps dated from 1969 to 1995 indicated that Lot 19 was used as a parking lot.

Lot 19 was not listed in any of the regulatory databases searched.

Current and historical use of Lot 18 as an unpaved parking lot may have resulted in presence of petroleum and/or hazardous materials on-site. Hazardous materials may have been dumped on the property when it was vacant. There is a low potential for petroleum and/or hazardous materials to exist on the site.

Lots 18, 21, and 103 are located adjacent to Lot 19 on Block 2062. Reviews of these lots are summarized in this chapter. Lot 103 currently contains a New York City Transit (NYCT) substation and historically contained vacant land. Lot 18 and 21 currently contain a parking lot and historically contained vacant land. There is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 19.

**Lot 21,** located at 110 Fleet Place, currently contains an unpaved parking lot in conjunction with Lots 17, 18, and 19.

Historically, Lot 21 contained a three-story residence ca. 1904 and ca. 1915. Lot 21 was shown as vacant on maps dated 1938 and 1950. Maps dated from 1969 to 1995 indicated that Lot 21 was used as a parking lot.

Lot 21 was not listed in any of the regulatory databases searched.

Current use of Lot 21 as an unpaved parking lot may have resulted in the presence of petroleum and/or hazardous materials on-site. Hazardous materials may have been dumped on the property when it was vacant. There is a low potential for petroleum and/or hazardous materials to exist on the site.

Lots 1, 19, 23, 24, and 103 are located adjacent to Lot 21 on Block 2062. Reviews of these lots are summarized in this chapter. Lot 1 currently contains a car wash and oil change facility. Seven potential petroleum underground storage tanks may exist on Lot 1. Additionally, Lot 1 historically contained a manufacturing facility, where petroleum and/or hazardous materials may have been used in operations. Lot 19 currently contains a parking lot and historically contained vacant land. Lot 24 may contain a petroleum storage tank (evidenced by a vent pipe observed during site inspection). Lot 103 currently contains the NYCT substation and historically contained vacant land. No potential for petroleum or hazardous materials contamination was noted for Lot 23 during the site visit, a review of historical maps, and a review of regulatory databases. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 21.

**Lot 23,** located at 167 Willoughby Street and at 112-120 Fleet Place, currently contains a four-story boy's home. Historically, Lot 23 contained three- and four-story residential structures (one with a store) ca. 1904. The three- and four-story residential structures were also shown, along with a one-story office building, in maps from ca. 1938 to ca. 1969. A commercial enterprise was located in the basement of a three-story residential structure on maps dated 1977, 1982 and 1995.

Lot 23 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 23.

Lots 21 and 24 are located adjacent to Lot 23 on Block 2062. Reviews of these lots are summarized in this chapter. Lot 21 was historically and is currently a parking lot. Petroleum and/or hazardous materials may have been historically dumped on the parking lot. Lot 24 may contain a petroleum storage tank. Leaking storage tanks may contribute to petroleum contamination. There is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 23.

**Lot 24,** located at 165 Willoughby Street, currently contains a three-story residential building. One vent pipe and one fill cap were noted outside this building during site inspection.

Historical maps from 1904 to 1995 show Lot 24 to contain a three-story residential building. From ca. 1969 to 1995 this building was labeled as having a commercial enterprise (labeled in 1977 as a store) in the basement.

Lot 24 was not listed in any of the regulatory databases searched.

The vent pipe observed on Lot 24 may indicate the presence of an on-site storage tank. Leaking storage tanks may contribute to on-site petroleum contamination. There is a potential for VOCs and SVOCs to exist on the site.

**Lot 103,** located at 157-161 Prince Street, currently contains a two-story institutional building occupied by the NYCT Flatbush Substation, and a parking lot.

Lot 103 historically contained three three-story residences ca. 1904, 1915, and 1938; ca. 1938 one of these building contained a first-floor store. A map from 1950 showed Lot 103 to contain a one-story storage building and vacant land. A map from 1969 showed the site occupied by a two-story factory labeled "cutlery" and a one-story storage building. From ca. 1977 to ca. 1995, Lot 103 contained a one-story building occupied by NYCT.

Lot 103 was not listed in any of the regulatory databases searched.

Current use of Lot 103 as an NYCT substation may have resulted in presence of petroleum and/or hazardous materials (potentially including PCBs) on-site. Also, hazardous materials may have been dumped on the property when it was vacant. There is a potential for VOCs, SVOCs, PCBs, metals, and pesticides to exist on the site.

*SITE L*

*Block 144*

**Lot 1**, located at 80-96 Johnson Street (Tech Place), 305-317 Jay Street and 54-66 Lawrence Street (Helen Keller Place), contains a two-story commercial building with restaurants and stores on the first floor and offices on the second. A vent pipe, a fill cap and a transformer vault were noted outside the subject building during site inspection.

Lot 1 historically contained a parking lot, three one-story and one five-story buildings—all part of the Polytechnic University—ca. 1969 through 1995. Ca. 1950, Lot 1 was shown to contain a one- and two-story building labeled "Mayflower Branch of Plymouth Church," one one-story and one five-story manufacturing building (the five-story building was labeled "American Safety Razor Corp.") and a one-story storage building. Ca. 1938, Lot 1 was shown to contain the Mayflower Branch of Plymouth Church and several structures belonging to the American Safety Razor Corp. Ca. 1915, Lot 1 was shown to contain the Mayflower Branch of Plymouth Church, a five-story building labeled "Superior Construction Factory" and five three-story residential

row houses. Ca. 1915, Lot 1 was shown to contain two- and three-story residential row houses and a two-story building labeled "compound."

Lot 1 was not listed in any of the regulatory databases searched.

Historic manufacturing uses on Lot 1 may have utilized petroleum and/or hazardous materials. The vent pipe and fill cap observed during the site inspection may be indicative of petroleum storage tank(s). These tanks and the transformer also noted during site inspection may have historically leaked and contributed to on-site petroleum and/or hazardous materials contamination. Due to these factors, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 1.

*Block 150*

**Lot 1**, located at 435-443 Fulton Street and 408-420 Jay Street, is a five-story commercial building with clothing and sports stores on the first floor. One fill cap and one vent pipe were noted on the subject lot during the site inspection. The site was shown to contain five-story commercial buildings with stores on the first floor and offices above since ca. 1938.

Four four-story stores, one four-story store and a factory were depicted on the site ca. 1904 through ca. 1915.

Lot 1 was listed once in the regulatory databases. 408 Jay Street was listed as a Petroleum Bulk Storage Site with one 3,000-gallon fuel oil UST.

Historic factories may have utilized hazardous materials in their operations. The fill cap and vent pipe observed at the site and the regulatory listing of a 3,000-gallon fuel oil tank may indicate the presence of on-site contamination. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Due to these factors, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 6**, located at 427-433 Fulton Street and 26-34 Willoughby Street, contains a two-story commercial building with a first floor clothing store. A transformer vault was noted outside the project site during a site inspection.

Lot 6 was shown to contain five four-story stores and four three-story stores ca. 1904 through ca. 1915. Ca. 1938 through ca. 1950 the site comprised eleven two-story commercial buildings. From ca. 1969 through ca. 1995 the lot contained two two-story stores.

The subject lot was listed once in the regulatory databases searched. 427 Fulton Street is listed as a Petroleum Bulk Storage Site with a 7,000-gallon fuel oil AST that was listed as closed and removed.

On-site storage tanks and transformers may have leaked and contributed to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, and PCBs to exist on the site.

**Lot 10**, located at 425 Fulton Street and 24 Willoughby Street, contains a three-story commercial building with a first floor restaurant. One vent pipe and one fill cap was noted outside the subject property during site inspection.

Lot 10 was shown to contain three two-story stores ca. 1904 through ca. 1915. Ca. 1938 through ca. 1995 the site comprised one two-story store with offices on the second floor.

The subject lot was not listed in any of the regulatory databases searched.

The vent pipe and fill cap noted on Lot 10 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 11**, located at 423 Fulton Street, 395-403 Jay Street, and 20-22 Willoughby Street, contains a four-story commercial building with an optician, law office, and sandwich shop on the first floor.

Two stores were depicted ca. 1904 through ca. 1915. Ca. 1938 the site was shown to contain a four-story store. From ca. 1950 through ca. 1995 Lot 11 contained one two-story store with offices above, two four-story stores and two other stores of unknown size.

Lot 11 was not listed in any of the regulatory databases searched.

The optician currently occupying the site may contain a medical laboratory that utilizes hazardous materials.

Lot 10 is located adjacent to Lot 11 on Block 150. A review of this lot is summarized in this chapter. Lot 10 may contain a petroleum storage tank. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential that VOCs, SVOCs, and metals on the adjacent Lot 10 may have impacted Lot 11.

**Lot 19**, located at 34-40 Willoughby Street, contains one-story commercial building including a clothing store, a gift shop, a photo shop with in-house developing, an electronics store, and a restaurant.

The lot was shown to contain three three-story stores and one three-story residence ca. 1904. Five stores were depicted ca. 1915. Ca. 1938 through ca. 1950 two one-story stores and vacant land occupied the site. From ca. 1969 through ca. 1995 the site contained six one-story stores with one labeled "dry cleaners."

Lot 19 was not listed in any of the regulatory databases searched.

Due to the site's historical use as a dry cleaner and the current use as a photo developing shop, there is a potential that VOCs and metals may be present on the site.

*SITE N*

*Block 152*

**Lot 37,** located at 384-394 Bridge Street, currently contains a four-story commercial structure with a clothing store, a fabric store and a vacant retail space on the ground floor. One vent pipe and one fill cap were noted on the sidewalk outside the structure during site inspection.

Lot 37 historically contained a multi-level commercial building since ca. 1950. The structure was noted to contain a furniture store and a dry cleaner in maps from 1950, 1969, 1977, and 1982. A taxi garage with two 550-gallon gasoline USTs was noted in a 1938 map. Residential structures were shown to occupy Lot 37 ca. 1904 and 1915.

The subject lot was not listed in any regulatory databases searched.

The vent pipe observed during a site inspection may indicate the presence of on-site storage tanks. Additionally, two 550-gallon gasoline USTs were shown to exist on the site in a 1950 map. Leaking storage tanks may contribute to on-site petroleum contamination. Additionally, the historical site's use as a dry cleaner and as a taxi garage may have contributed to petroleum and

hazardous materials contamination on site. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 37.

*SITE R*

*Block 149*

**Lot 14**, located at 589-591 Fulton Street and 518-520 Flatbush Avenue Extension, currently contains a one-story commercial building with a restaurant. Historical land use maps indicate Lot 14 to have contained one- and/or one- and two-story stores since ca. 1904.

Lot 14 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 14.

Lot 15 is located adjacent to Lot 14 on Block 149. A review of Lot 15 is summarized in this chapter. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 15.

Lots 17, 19, 21-26, 28, 30-34 and 50 are located on the same block as and within 400 feet of Lot 14. These lots are summarized in this chapter. Lot 17 historically contained a paint store, which may have contributed to soil and groundwater contamination by hazardous materials. Lots 19 and 21 currently contain dentists, which may contain laboratories where hazardous materials are used. Lots 22, 23, 25, 26 and 28 may have historically contained factories or manufacturing facilities, which may have utilized petroleum and/or hazardous materials in their operations. Lots 30 and 34 may contain petroleum storage tanks. A spill was reported to New York State for Lot 30. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. Lot 50 historically contained a subway station. No potential for petroleum or hazardous materials contamination was noted for Lots 24, 31, 32, or 33 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 14.

**Lot 15**, located at 585-587 Fulton Street and at 412-416 Flatbush Avenue Extension, currently contains a three-story commercial building, occupied on the first story by a clothing and jewelry shop, on the second story by a nail salon, and on the third story by a hair salon.

Historically the site contained three- and four-story stores from ca. 1904 to ca. 1950, with lodging also on-site ca. 1904. A three-story commercial building labeled "store" was shown on maps from 1969 to 1995.

Lot 15 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 15.

Lots 14 and 17 are located adjacent to Lot 15 on Block 149. Reviews of these lots are summarized in this chapter. Lot 17 historically contained a paint store, which may have contributed to soil and groundwater contamination by hazardous materials. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 14. There is a potential that VOCs, SVOCs, and metals on the adjacent Lot 17 may have impacted Lot 15.

**Lot 17**, located at 581-583 Fulton Street and at 406-408 Flatbush Avenue Extension, currently contains a one-story commercial building occupied by a gift store, an electronics store, and a shoe store.

Lot 17 historically contained five-story stores from ca. 1904 to ca. 1950. These stores were labeled "paints" on maps dating from 1938 and 1950. Maps from 1969 to 1995 showed Lot 17 to contain one-story stores.

Lot 17 was not listed in any of the regulatory databases searched.

Due to the historical presence of a paint store on Lot 17, there is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 19**, located at 577-579 Fulton Street and at 402-404 Flatbush Avenue Extension, currently contains (with Lot 21) a five-story commercial building occupied by a shoe store, jewelry store, dentist, and hair salon. Historical maps indicate that the site has contained a five-story commercial building since prior to 1904.

Lot 19 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 19.

Lots 17 and 21 are located adjacent to Lot 19 on Block 149. Reviews of these lots are summarized in this chapter. Lot 17 historically contained a paint store, which may have contributed to soil and groundwater contamination by hazardous materials. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 21. There is a potential that VOCs, SVOCs, and metals on the adjacent Lot 17 may have impacted Lot 19.

**Lot 21**, located at 575 Fulton Street, currently contains (with Lot 19) a five-story commercial building occupied by a shoe store, jewelry store, dentist, and hair salon.

Historical maps indicate that Lot 21 has contained a five-story commercial building since prior to 1904. In maps from 1904 and 1915, this building was labeled "pictures."

Lot 21 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 21.

Lots 19, 22, and 50 are located adjacent to Lot 21 on Block 149. Reviews of these lots are summarized in this chapter. Lot 22 historically contained manufacturing facilities, which may have utilized hazardous materials in their operations. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lots 19 or 50. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on the adjacent Lot 22 may have impacted Lot 21.

**Lot 22**, located at 573 Fulton Street, currently contains a five-story commercial building, which is occupied on the first floor by a jewelry store and shoe store.

Historically, Lot 22 contained a five-story store from ca. 1904 to ca. 1977 (labeled as stores with offices above in maps from 1904 and 1915). From ca. 1982 to ca. 1995, Lot 22 contained a four-story store and manufacturing facility.

Lot 22 was not listed in any of the regulatory databases searched.

Historic manufacturing facilities may have utilized hazardous materials in their operations. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 23**, located at 571 Fulton Street and at 30 De Kalb Avenue, currently contains a four-story commercial building, occupied on the first story by jewelry and shoe stores.

A historic land use map from 1904 shows Lot 23 (with Lots 23-26 and 28) occupied by a four-story store called the Hanover Building. Maps from 1915 to 1982 show the site to contain a four-story store. Ca. 1995 the site contained a five-story store and manufacturing facility.

Lot 23 was not listed in any of the regulatory databases searched.

Historic manufacturing facilities may have utilized hazardous materials in their operations. There is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

**Lot 24**, located at 569 Fulton Street and at 24 De Kalb Avenue, currently contains a four-story commercial building with a clothing store on the ground floor.

A historic land use map from 1904 shows Lot 24 (with Lots 23-26 and 28) occupied by a four-story store called the Hanover Building. Maps from 1915 and 1938 show a four-story commercial building on the site labeled as "offices" and "food market." From ca. 1950 to ca. 1995 the site contained a four-story store.

Lot 24 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

Lots 23 and 25 are located adjacent to Lot 24 on Block 149. Reviews of these lots are summarized in this chapter. Lot 23 historically contained a manufacturing facility, which may have utilized hazardous materials in its operations. Lot 25 also may have contained a manufacturing facility. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on the adjacent Lots 23 and 25 may have impacted Lot 24.

**Lot 25**, located at 565 Fulton Street and at 26 De Kalb Avenue, is currently occupied by a four-story vacant building.

A historic land use map from 1904 shows Lot 25 (with Lots 23-26 and 28) occupied by a four-story store called the Hanover Building. Maps from 1915 to 1995 show a four-story store on the site; ca. 1950 this building was labeled with 2nd, 3rd and 4th floor occupied by "furniture," and in maps from 1969 to 1995 the 2nd, 3rd and 4th floors were labeled as commercial.

Lot 25 was not listed in any of the regulatory databases searched.

Lot 25 may have been historically occupied by a furniture manufacturing or repairing facility. These may have utilized hazardous materials in their operations. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 26**, located at 561-563 Fulton Street and at 18-24 De Kalb Avenue, currently contains (with Lot 28) a four-story commercial building occupied by a drugstore.

A historic land use map from 1904 shows Lot 26 (with Lots 23-26 and 28) occupied by a four-story store called the Hanover Building. Maps from 1915 to 1995 show a four-story commercial building on the site labeled "floors 2-4 furniture"; in maps from 1969 and later Lot 26 was combined with Lot 28.

Lot 26 was not listed in any of the regulatory databases searched.

Lot 26 may have been historically occupied by a furniture manufacturing or repairing facility. These may have utilized hazardous materials in their operations. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 28**, located at 559 Fulton Street and at 14 and 16 De Kalb Avenue, currently contains (with Lot 26) a four-story commercial building occupied by a drugstore.

A historic land use map from 1904 shows Lot 28 (with Lots 23-26) occupied by a four-story store called the Hanover Building. Maps from 1915 to 1995 show a four-story commercial building labeled "furniture." In maps from 1969 and later, Lot 28 was combined with Lot 26.

Lot 28 was not listed in any of the regulatory databases searched.

Lot 28 may have been historically occupied by a furniture manufacturing or repairing facility. These may have utilized hazardous materials in their operations. There is a potential for VOCs. SVOCs, and metals to exist on the site.

**Lot 30**, located at 557 Fulton Street and at 12 De Kalb Avenue, currently contains a three-story commercial building, with jewelry and shoe stores on the first floor. One fill cap was noted outside this building during the site inspection.

Historically, Lot 30 contained three-story stores from ca. 1904 to ca. 1995. Ca. 1995 the upper floors of this building were vacant.

Lot 30 was listed once in the regulatory databases searched. 557 Fulton Street was listed for a closed spill from October of 1993. A fill line was disconnected causing the spill.

Due to the presence of a potential on-site storage tank, indicated by the fill cap observed during the site visit and the closed spill listed for the property, there is a potential for VOCs and SVOCs to exist on the site.

**Lot 31**, located at 555 Fulton Street and at 10 De Kalb Avenue, currently contains a three-story commercial building, with jewelry, shoe, and clothing stores on the first floor.

Historically, Lot 31 contained a three-story store from ca. 1904 to ca. 1995. Ca. 1995 the upper floors of this building were vacant.

Lot 31 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 31.

Lots 30 and 32 are located adjacent to Lot 31 on Block 149. Reviews of these lots are summarized in this chapter. Lot 30 potentially contains a petroleum storage tank; one spill was reported to the State for Lot 30. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 32. There is a potential that VOCs, SVOCs, and metals on the adjacent Lot 30 may have impacted Lot 31.

**Lot 32**, located at 553 Fulton Street and at 8 De Kalb Avenue, currently contains a three-story commercial building with a beauty supply shop on the first floor.

Ca. 1904 Lot 32 contained a three-story store. From ca. 1915 to ca. 1995, historical maps show a one-story store on the site.

Lot 32 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

Lots 31 and 33 are located adjacent to Lot 32 on Block 149. Reviews of these lots are summarized in this chapter. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lots 31 and 33.

Lots 14, 15, 17, 19, 21-26, 28, 30, 31, 33, 34, and 50 are located on the same block as and within 400 feet of Lot 32. Reviews of these lots are summarized in this chapter. Lot 17 historically contained a paint store, which may have contributed to soil and groundwater contamination by hazardous materials. Lots 22, 23, 25, 26, and 28 may have historically contained factories or manufacturing facilities, which may have utilized petroleum and/or hazardous materials in their operations. Lots 30 and 34 may contain petroleum storage tanks. A spill was reported to New York State for Lot 30. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. Lot 50 historically contained a subway station. No potential for petroleum or hazardous materials contamination was noted for Lots 14, 15, 19, 21, 24, 31, or 33 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 32.

**Lot 33**, located at 551 Fulton Street and at 6 De Kalb Avenue, currently contains a three-story commercial building with a clothing store on the first floor.

Ca. 1904 Lot 33 contained a three-story store. From ca. 1915 to ca. 1995, historical maps show a one-story store on the site.

Lot 33 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 33.

Lots 32 and 34 are located adjacent to Lot 33 on Block 149. Reviews of these lots are summarized in this chapter. Lot 34 potentially contains a petroleum storage tank, which, if it has historically leaked, may have contributed to petroleum contamination of soil and groundwater. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 32. There is a potential that VOCs, SVOCs, and metals on the adjacent Lot 34 may have impacted Lot 33.

**Lot 34**, located at 547-551 Fulton Street and at 2-6 De Kalb Avenue, currently contains a three-story commercial building with electronics, wigs and clothing stores on the first floor. One vent pipe and one fill cap were noted on the property during site inspection.

According to historic land use maps, the site has been occupied by a three-story store since prior to 1904.

Lot 34 was not listed in any of the regulatory databases searched.

The vent pipe and fill cap observed on Lot 34 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 50**, located at 390-396 Flatbush Avenue Extension, currently contains a three-story commercial building with a jewelry store on the first floor.

Historical maps show the site to be vacant ca. 1904 and occupied by two-story stores from ca. 1915 to ca. 1995. Maps from 1950 and later show a subway entrance also present on the site.

Lot 50 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 50.

Lots 19, 21, 22, and 23 are located adjacent to Lot 50 on Block 149. Reviews of these lots are summarized in this chapter. Lots 22 and 23 historically contained manufacturing facilities that may have utilized petroleum and/or hazardous materials in their operations. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lots 19 and 21. There is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on the adjacent Lots 22 and 23 may have impacted Lot 50.

*SITE T*

*Block 160*

**Lot 18**, located at 508-516 Fulton Street, currently contains (with Lots 7 and 29) one seven-story and one four-story commercial building. A clothing store and a restaurant occupy the first floors of these buildings. One vent pipe and one fill cap were noted outside the on-site buildings during site inspection.

Historical maps from 1904, 1915, and 1938 show numerous four-story stores on Lot 18. From ca. 1950 to ca. 1995 the site contained a four-story store labeled "May's Dept. Store" and "May's Wearing Apparel."

Lot 18 was not listed in any of the regulatory databases searched.

The vent pipe and fill cap observed on Lot 18 may indicate the presence of on-site storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. There is therefore a potential for VOCs and SVOCs to exist on the site.

*SITE U*

*Block 161*

**Lot 27**, located at 526-528 Fulton Street, currently contains a four-story commercial building used for retail sales of children's clothing.

Historically, Lot 27 contained a three-story building ca. 1904. Maps from 1915 and 1938 show the site to contain a three-story store labeled "Kresges 5 and 10 Store." Ca. 1950 to ca. 1977 the site contained a four-story commercial building labeled "C and A Brenninkmeyer." Maps from 1982 and 1995 show the site to contain a four-story commercial building labeled "C Goodwins."

Lot 27 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 27.

Lots 30, 33, and 37 are located adjacent to Lot 27 on Block 161. Reviews of these Lots 30 and 33 are summarized in this chapter. Lot 37, located at 530 Fulton Street, currently contains a four-story commercial structure with a clothing store and a shoe store. Lot 37 historically contained a

four-story store since ca. 1904. Lot 37 was not listed in any of the regulatory databases searched. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lots 30, 33, and 37.

Lots 1, 3, 18, 43, 47, 50, and 52-64 are located on the same block as and within 400 feet of Lot 27. All of the lots, with the exception of Lot 43, are summarized in this chapter. Lots 47 and 50 historically contained a medical laboratory, where hazardous materials were used. Lots 58, 61, and 64 may have historically contained factories or manufacturing facilities, which may have utilized petroleum and/or hazardous materials in their operations. Lots 54, 55, 56, 59, and 63 may contain petroleum storage tanks. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. Lot 47 historically contained vacant land, where petroleum and/or hazardous materials may have been dumped. No potential for petroleum or hazardous materials contamination was noted for Lots 1, 3, 18, 52, 53, 57, 60, and 62 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 27.

**Lot 30**, located at 518-520 Fulton Street, currently contains a two-story commercial building, occupied by a clothing store and shoe store.

Historically, Lot 30 contained a five-story store from ca. 1904 to ca. 1969, and a two-story commercial building from ca. 1977 to ca. 1995.

Lot 30 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the site.

Lots 27 and 33 are located adjacent to Lot 30 on Block 161. Reviews of these lots are summarized in this chapter. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lots 27 or 33.

Lots 1, 3, 18, 37, 43, 47, 50, and 52-64 are located on the same block as and within 400 feet of Lot 30. All of the lots, with the exception of Lot 43, are summarized in this chapter. Lot 37 was summarized as an adjacent property to Lot 27. Lots 47 and 50 historically contained a medical laboratory, where hazardous materials may have been used. Lots 58, 61, and 64 may have historically contained factories or manufacturing facilities, which may have utilized petroleum and/or hazardous materials in their operations. Lots 54, 55, 56, 59, and 63 may contain petroleum storage tanks. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. Lot 47 historically contained vacant land, where petroleum and/or hazardous materials may have been dumped. No potential for petroleum or hazardous materials contamination was noted for Lots 1, 3, 18, 37, 52, 53, 57, 60, and 62 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 30.

**Lot 33**, located at 522-524 Fulton Street, currently contains a four-story commercial building, which is occupied on the first floor by a shoe store, jewelry store, and electronics store.

Historically, Lot 33 was occupied by two four-story stores from ca. 1904 to ca. 1950. Maps from 1969 to 1995 show an unlabeled four-story building on the site.

Lot 33 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the Lot 33.

Lots 27 and 30 are located adjacent to Lot 33 on Block 161. Reviews of these lots are summarized in this chapter. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lots 27 or 30.

Lots 1, 3, 18, 37, 43, 47, 50, and 52-64 are located on the same block as and within 400 feet of Lot 33. All of the lots, with the exception of Lot 43, are summarized in this chapter. Lot 37 was summarized as an adjacent property to Lot 27. Lots 47 and 50 historically contained a medical laboratory, where hazardous materials may have been used. Lots 58, 61, and 64 may have historically contained factories or manufacturing facilities, which may have utilized petroleum and/or hazardous materials in their operations. Lots 54, 55, 56, 59, and 63 may contain petroleum storage tanks. Leaking petroleum tanks could contribute to petroleum contamination of soil and groundwater. Lot 47 historically contained vacant land, where petroleum and/or hazardous materials may have been dumped. No potential for petroleum or hazardous materials contamination was noted for Lots 1, 3, 18, 37, 52, 53, 57, 60, and 62 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on these adjacent lots may have impacted Lot 33.

*SITE V*

*Block 161*

**Lot 18**, located at 532-540 Fulton Street, currently contains a two-story commercial building, occupied on its first floor by a clothing store, shoe store, luggage store, jewelry and sportswear store, and restaurant, and on its second floor by a gym.

A map from 1904 showed three 2-story stores on the site. Ca. 1915 the site contained a two-story store labeled "Woolworth's 5 and 10 Store," and ca. this building was labeled as "Woolworth's 5 and 10 Store," "Tea Room and Dance Hall," and "storage." On a map from 1950 Lot 18 contained multiple two-story stores, with the second floor labeled "bowling." From ca. 1969 to ca. 1995 the site was shown to contain multiple two-story stores, with the second floor labeled "Billiards."

Lot 18 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on the Lot 18.

Lots 37, 43, and 47 are located adjacent to Lot 18 on Block 161. Reviews of Lots 37 and 47 are summarized in this chapter. Lot 37 was summarized as an adjacent property to Lot 27. Lot 47 historically contained a medical laboratory, where hazardous materials may have been used. No potential for petroleum or hazardous materials contamination was noted for Lot 37 during the site visit, a review of historical maps, and a review of regulatory databases. Due to environmental conditions noted on Lot 47, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on this adjacent lot may have impacted Lot 18.

*SITE W*

*Block 160*

**Lot 29**, located at 263-265 Livingston Street, currently contains, with Lots 7 and 18, a seven-story and four-story commercial building, occupied on the first floor by a clothing store. A transformer was noted on-site during site inspection.

Historically, Lot 29 contained two-story residences ca. 1904. Ca. 1915 the site contained a commercial building labeled "New Montauk Theatre," and ca. 1938 it contained a four-story commercial building labeled "Spear and Co Furniture." A four-story commercial building was present on the site form ca. 1938 to ca. 1995.

Lot 29 was not listed in any of the regulatory databases searched.

Historical furniture manufacturing facilities may have utilized hazardous materials in their operations. The transformer on-site may contain hazardous materials. There is, therefore, a potential for VOCs, SVOCs, PCBs, and metals to exist on Lot 29.

*SITE X*

Since the issuance of the DEIS/DSEIS, site X has been removed from the proposed development plan.

*SITE Y*

*Block 164*

**Lot 1**, located at 37-55 Smith Street, 137-145 Schermerhorn Street and 156-164 Livingston Street, is currently a paved parking lot with a portion under excavation.

Ca. 1904, Lot 1 contained three three-story residences, eleven multi-level stores, and vacant land. Ca. 1915 the site contained nine multi-level stores and vacant lots. A map from 1938 showed Lot 1 to be vacant. On maps from ca. 1969 to 1995 Lot 1 was shown as a vacant lot labeled "auto parking."

Lot 1 was not listed in any of the regulatory databases searched.

Lot 1 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 1.

Lot 13 is located adjacent to Lot 1 on Block 161. A review of this lot is summarized in this chapter. Historical uses of Lot 13 include auto parking, upholstering, storage and case storage, manufacturing, and manufacture and/or storage of paints. These conditions may have resulted in the release of hazardous materials and/or petroleum on-site. It is also possible that hazardous materials were dumped on Lot 13 when it was vacant. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, pesticides, and metals on this adjacent lot may have impacted Lot 1.

**Lot 13**, located at 166-176 Livingston Street and at 149-157 Schermerhorn Street, currently contains a four-story commercial building with a bank and school supply store on the first floor.

Historically, Lot 13 contained eight residences, one store, one building labeled "storage," and one building marked "hotel" ca. 1904. Ca. 1915, three three-story residences, one three-story building labeled "upholstering," one building labeled "case storage," one one-story and three

three-story buildings labeled "R.D. Matthews and Sons" and "storage" were shown on the site. Ca. 1938, the site contained a small vacant lot, one factory, one store, one four-story store, and one building labeled "paints." A map from 1950 showed a parking lot with one small four-story building and one larger four-story building on the site; labeling showing the use of these buildings was illegible. From ca. 1977 to ca. 1982, Lot 13 contained a four-story commercial and manufacturing building and one four-story building for which labeling was illegible. A map from 1995 showed the site to contain a parking lot with a small four-story building and a larger four-story building for which labeling was illegible, annotated "Built 1918."

Lot 13 was not listed in any of the regulatory databases searched.

Historical use of the site for auto parking, upholstering, storage and case storage, manufacturing, and manufacture and/or storage of paints, may have resulted in the release of hazardous materials and/or petroleum on-site. It is also possible that hazardous materials were dumped on the property when it was vacant. There is, therefore, a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on Lot 13.

*SITE Z*

*Block 164*

**Lot 29**, located at 179-183 Schermerhorn Street and at 184-196 Livingston Street, is currently a paved parking lot.

Historically, Lot 29 contained two four-story residences, one five-story residence, and two three-story residences ca. 1904; and two four-story residences, one five-story residence, and a vacant lot ca. 1915. From ca. 1938 to ca. 1950, the site contained two five-story residences, one five-story residence, and three stores. On maps from 1977 to 1995, Lot 29 is shown as a vacant lot labeled "parking lot."

Lot 29 was not listed in any of the regulatory databases searched.

Lot 29 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on Lot 29.

Lots 20, 31, and 44 are located adjacent to Lot 29 on Block 164. Reviews of Lots 31 and 44 are summarized in this chapter. Lot 44 currently contains and historical contained an auto parking lot. Hydraulic car lifts were observed on Lot 44. Petroleum and/or hazardous materials may have been dumped on Lot 44. Leaking hydraulic oil storage tank may have contributed to on-site contamination. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 31. Due to environmental conditions noted on Lot 44, there is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on this adjacent lot may have impacted Lot 29.

**Lot 31**, located at 198-202 Livingston Street, currently contains a two-story institutional building, occupied by the New York State Benefit Card Insurance Center.

Lot 31 historically contained three three-story buildings labeled "Abraham and Straus Storage and Work Rooms" ca. 1904. Ca. 1915 the site was occupied by an institutional building labeled "Brooklyn Public Library." From ca. 1938 to ca. 1950 the site contained two-story stores. Ca. 1977, Lot 31 contained an institutional structure labeled "school." A map from 1982 showed two commercial buildings, and a map from 1995 showed one commercial building on Lot 31.

Lot 31 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 31.

Lots 29, 34, 42, 43, and 44 are located adjacent to Lot 31 on Block 164. Reviews of all of these lots, except Lot 34, are summarized in this chapter. Lots 29, 42, 43, and 44 currently contain and historically contained an auto parking lot. Hydraulic car lifts were observed on Lots 42, 43, and 44. Petroleum and/or hazardous materials may have been dumped on vacant parking lots. Leaking hydraulic oil storage tanks associated with car lifts may have contributed to on-site contamination. Additionally, Lot 42 was historically used as a lumber yard. If lumber was treated on-site, hazardous materials may have been used. Due to environmental conditions noted on Lots 42, 43, and 44, there is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 31.

**Lot 42**, located at 189 Schermerhorn Street is currently (with Lots 43 and 44) a paved parking lot. Hydraulic car lifts were noted on-site during the site inspection.

Historically, Lot 42 was vacant from ca. 1904 to ca. 1938. A map from 1950 showed the site as a vacant lot labeled "lumber storage." On maps from 1977 to 1995, Lot 42 was shown as a vacant lot labeled "parking lot."

Lot 42 was not listed in any of the regulatory databases searched.

Current and historical use of the site for auto parking and on-site use of hydraulic car lifts, may have resulted in the release of hazardous materials and/or petroleum on-site. It is also possible that hazardous materials were dumped on the property when it was vacant. Hydraulic oil tanks may have contributed to on-site soil and/or groundwater contamination. Historical lumber operations may have utilized hazardous materials in their processes. There is, therefore, a potential for VOCs, SVOCs, PCBs, metals, and pesticides to exist on Lot 42.

**Lot 43**, located at located at 187 Schermerhorn Street is currently (with Lots 42 and 44) a paved parking lot. Hydraulic car lifts were noted on-site during the site inspection.

Historically, Lot 43 contained a residence from ca. 1904 to ca. 1915, and a five-story store ca. 1938. A map from 1977 showed one building on-site; labeling was illegible. On maps from 1982 to 1995, Lot 42 is shown as a vacant lot labeled "parking lot."

Lot 43 was not listed in any of the regulatory databases searched.

Current and historical use of the site for auto parking, and on-site use of hydraulic car lifts, may have resulted in the release of hazardous materials and/or petroleum on-site. It is possible that hazardous materials were dumped on the property when it was vacant. Hydraulic oil tanks may have contributed to on-site soil and/or groundwater contamination. There is, therefore, a potential for VOCs, SVOCs, PCBs, metals, and pesticides to exist on Lot 43.

**Lot 44**, located at 185 Schermerhorn Street is currently (with Lots 42 and 44) a paved parking lot. Hydraulic car lifts were noted on-site during the site inspection.

Historically, Lot 44 contained residential buildings from prior to 1904 to ca. 1938. On maps from 1977 to 1995, Lot 44 is shown as a vacant lot labeled "parking lot."

Lot 44 was not listed in any of the regulatory databases searched.

Current and historical use of the site for auto parking, and on-site use of hydraulic car lifts, may have resulted in the release of hazardous materials and/or petroleum on-site. It is possible that hazardous materials were dumped on the property when it was vacant. Hydraulic oil tanks may

have contributed to on-site soil and/or groundwater contamination. There is, therefore, a potential for VOCs, SVOCs, PCBs, metals, and pesticides to exist on Lot 44.

*SITE CC*

*Block 167*

**Lot 15**, located at 365 Livingston Street, currently contains a four-story residential building with first floor psychic business and a second floor travel agent business. A vent pipe and fill cap were observed outside of the building.

Lot 15 historically contained a three-story residence from prior to 1904 through at least 1915. Following 1915 through ca. 1982, Lot 15 contained a four-story commercial building. Ca. 1995, Lot 15 contained a New York State Benefit Card Insurance Center.

Lot 15 was not listed in any of the regulatory databases searched.

Due to the presence of a potential on-site storage tank, indicated by the fill cap and vent pipe observed during the site visit, there is a potential for VOCs, SVOCs, and metals to exist on the site.

**Lot 16**, located at 358-376 Livingston Street, currently contains a four-story residential building with ground floor businesses including a furniture store, deli, shoe store, nail salon, dentist, cellular phone store, and a clothing store. A vent pipe was observed during the site visit.

Lot 16 historically contained eight three- and four-story residences with ground floor stores, one two-story commercial building labeled "iron storage," a two-story commercial building and a three-story residential building ca. 1904. From prior to 1915 until the present, Lot 16 has contained nine four- and five-story mixed residential and commercial buildings.

Lot 16, specifically 366 Livingston Street (Livingston Street Realty Association) was reported as a Petroleum Bulk Storage Facility with one 2,500-gallon fuel oil underground storage tank.

Due to the presence of a potential on-site storage tank, indicated by the observed vent pipe and the database listing, there is a potential for VOCs, SVOCs, and metals to exist on Lot 16.

**Lot 26**, located at 60 Flatbush Avenue, currently contains a four-story furniture store.

Lot 26 has maintained its four-story structure for commercial (furniture) use since prior to 1904.

Lot 26 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 26.

Lots 16, 27, and 36 are located adjacent to Lot 26 on Block 167. Reviews of these lots are summarized in this chapter. Lot 16 may contain a petroleum storage tank. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Lots 27 and 36 currently contain a paved parking lot. Lot 36 was historically used for parking. Petroleum and/or hazardous materials may have been dumped on vacant lots. Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, PCBs, metals, and pesticides on these adjacent lots may have impacted Lot 26.

**Lot 27**, located at 62 Flatbush Avenue, currently contains (joined with Lots 28 and 36) a paved parking lot.

Lot 27 historically contained a three-story residence from prior to 1904 through 1915. From prior to 1933 through 1995, Lot 27 was shown to contain an unlabeled one-story structure.

Lot 27 was not listed in any of the regulatory databases searched.

Lot 27 is currently used for parking. Petroleum and/or hazardous materials may have been dumped on this vacant lot.

Lots 26, 28, and 36 are located adjacent to Lot 27 on Block 167. Reviews of these lots are summarized in this chapter. Lots 28 and 36 are currently and were historically used for parking. Petroleum and/or hazardous materials may have been dumped on vacant lots. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 26. It is unlikely that these adjacent uses may have impacted Lot 27.

Lots 1-3, 8, 9, 13-16, 42, and 50-53 are located on the same block and within 400 feet of Lot 27. Reviews of Lots 16 and 42 are summarized in this chapter. Lots 16 and 42 may contain petroleum storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Due to the environmental conditions identified on Lots 16 and 42, there is a potential that VOCs, SVOCs, PCBs, and pesticides on these lots located within 400 feet may have impacted Lot 27.

**Lot 28**, located at 64-70 Flatbush Avenue, 2-10 3rd Avenue, and 357-365 Schermerhorn Street, currently contains (with Lots 27 and 36) a paved parking lot.

Lot 28 historically contained four two-story residences and six one-, two-, and three-story stores ca. 1904. Ca. 1915, Lot 28 contained five two-story stores and one two-story commercial building labeled "bank." Ca. 1933, Lot 28 was shown to be vacant. From prior to 1950 through the present, Lot 28 was shown to be used for parking.

Lot 28 was not listed in any of the regulatory databases searched.

Lot 28 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on this vacant lot.

Lots 27 and 36 are located adjacent to Lot 28 on Block 167. Reviews of these lots are summarized in this chapter. Lots 27 and 36 are currently and/or were historically used for parking. Petroleum and/or hazardous materials may have been dumped on vacant lots. It is unlikely that these adjacent uses may have impacted Lot 28.

Lots 1-3, 8, 9, 13-16, 26, 42, and 50-53 are located on the same block and within 400 feet of Lot 28. Reviews of Lots 16, 26, and 42 are summarized in this chapter. Lots 16 and 42 may contain petroleum storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 26. Due to the environmental conditions identified on Lots 16 and 42, there is a potential that VOCs, SVOCs, PCBs, and pesticides on these lots located within 400 feet may have impacted Lot 28.

**Lot 36**, located at 347-357 Schermerhorn Street, currently contains (with Lots 27 and 28) a paved parking lot.

Lot 36 historically contained a nine-story commercial building that was used as a warehouse ca. 1904. Ca. 1915, an additional 10-story commercial building was shown on Lot 36, with both

buildings labeled "Brooklyn Warehouse and Storage Company." Ca. 1933, Lot 36 was shown to be vacant. From prior to 1950 through the present, Lot 36 was shown to be used for parking.

Lot 36 was not listed in any of the regulatory databases searched.

Lot 36 is currently and was historically used for parking. Petroleum and/or hazardous materials may have been dumped on this vacant lot.

Lots 16, 26, 27, 28, and 42 are located adjacent to Lot 36 on Block 167. Reviews of these lots are summarized in this chapter. Lots 16 and 42 may contain petroleum storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. Lots 27 and 28 are currently and/or were historically used for parking. Petroleum and/or hazardous materials may have been dumped on vacant lots. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 26. Due to the environmental conditions detailed above, there is a potential that VOCs, SVOCs, PCBS, and pesticides on these adjacent lots may have impacted Lot 36.

**Lot 42**, located on 345 Schermerhorn Street, currently contains a paved parking lot. Lot 42 historically was part of the "Brooklyn Warehouse and Storage Company," with 9- and 10-story warehouse buildings located on the site from prior to 1904 through 1915. Ca. 1933, Lot 42 was shown to be vacant. From prior to 1950 through the present, Lot 42 was shown to be used for parking.

Lot 42, specifically 345 Schermerhorn Street, was listed in the regulatory database as a Petroleum Bulk Storage facility, with one 3,500-gallon fuel oil underground storage tank.

Due to current and historical use of Lot 42 for parking, the historical unknown warehouse present on the site ca. 1904 through prior to 1915 and the potential on-site storage tank, there is a potential for VOCs, SVOCs, PCBs, pesticides, and metals to exist on the site.

*SITE DD*

*Block 174*

**Lot 9**, located at 376-382 Schermerhorn Street, currently contains a one-story commercial building with a check cashing store, a music store and a pawn shop.

Lot 9 historically contained a one-story store ca. 1938 through ca. 1995. Ca. 1904 through ca. 1915, Lot 9 contained a one-story building labeled "Young Women's Christian Association."

Lot 9 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 9.

Lots 1 and 13 are located adjacent to Lot 9 on Block 174. A review of Lot 13 is summarized in this chapter. Lot 13 may contain a petroleum storage tank. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination.

Lot 1, located at 473-483 State Street, 7-23 3rd Avenue and 372-374 Schermerhorn Street, currently contains a three-story structure occupied by DOE. Lot 1 has historically contained a three-story structure occupied by DOE and/or a school since ca. 1904. Lot 1 was listed two times in Federal and Sate databases that were reviewed. One listing was for a closed-status spill of approximately one gallon of antifreeze at the intersection of 3rd Avenue and Schermerhorn

Street in October 1998. The second listing was for petroleum bulk storage. 372 Schermerhorn was listed as having one 4,000-gallon fuel oil aboveground storage tank.

Due to environmental conditions noted above, there is a potential that VOCs, SVOCs, and metals on these adjacent lots may have impacted Lot 9.

**Lot 13**, located at 80-88 Flatbush Avenue, 485-495 State Street, and 384 Schermerhorn Street, is currently joined with Lot 18 and contains a five-story commercial building. One vent pipe and one fill cap were noted during the site visit.

Lot 13 historically contained five two-story residences and seven one-story stores from ca. 1904 through ca. 1950. From ca. 1963 through ca. 1995, Lot 13 was shown to be the New York City Department of Social Services Center No. 71.

Lot 13 was not listed in any of the regulatory databases searched.

Due to the probable presence of an on-site storage tank, indicated by the fill pipe and vent cap observed during the site visit, there is the potential for VOCs, SVOCs, and metals to be present on Lot 13.

**Lot 18**, located at 90-98 Flatbush Avenue and 497-503 State Street, is currently joined with Lot 13 and contains a five-story commercial building. A transformer was noted outside the building during the site visit.

Lot 18 historically contained four vacant lots, a one-story bank, six one-story commercial structures, and an open yard labeled "coal pile" ca. 1904. Ca. 1915, Lot 18 was shown to be a casino and theater. From prior to 1933 through 1950, Lot 18 contained three-story stores. From prior to 1968 through 1995, Lot 18 was shown to contain the New York City Department of Social Services Center No. 72.

Lot 18 was not listed in any of the regulatory databases searched.

The transformer vault, if it has leaked petroleum and/or hazardous materials, may have impacted soil and groundwater on the project site.

Lots 13 and 23 are located adjacent to Lot 18 on Block 174. Reviews of these lots are summarized in this chapter. Lot 13 may contain petroleum storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 23. Due to the environmental conditions noted on Lot 13, and the transformer united noted outside Lot 18, there is a potential that VOCs, SVOCs, PCBs, and metals on this adjacent lot may have impacted Lot 18.

**Lot 23**, located at 100 Flatbush Avenue, currently contains a two-story commercial building. Lot 23 historically contained a coal shed ca. 1904. Ca. 1915, Lot 23 contained a two-story store. From prior to 1933 through 1995 the two-story structure has been used as a residence.

Lot 23 was not listed in any of the regulatory databases searched.

No Federal or State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 23.

Lots 18 and 24 are located adjacent to Lot 23 on Block 174. Reviews of these lots are summarized in this chapter. Lot 24 may contain petroleum storage tanks. Leaking storage tanks may contribute to on-site petroleum and/or hazardous materials contamination. No Federal or

State database listings or current or historical land uses were identified that might have resulted in the presence of petroleum and/or hazardous materials on Lot 18. Due to the environmental conditions noted on Lot 24, there is a potential that VOCs, SVOCs, and metals on this adjacent lot may have impacted Lot 23.

**Lot 24**, located at 104-110 Flatbush Avenue and 505-513 State Street, currently contains a five-story commercial building for Army, Navy, and Marines recruitment. One fill pipe and vent cap were observed during the site visit.

Lot 24 historically contained a five-story residential, commercial, and institutional structure ca. 1904 and 1915. From prior to 1933 through 1995, Lot 24 was shown to contain three five-story commercial buildings.

Lot 24 was not listed in any of the regulatory databases searched.

Due to the probable presence of an on-site storage tank, indicated by the fill pipe and vent cap observed during the site visit, there is the potential for VOCs, SVOCs, and metals to be present on Lot 24.

### SUMMARY

Potential hazardous materials impacts were identified for all 71 projected development lots and all 74 potential development lots that comprise the Downtown Brooklyn Development sites. For the 71 projected development lots in the rezoning area, potential hazardous materials impacts were identified on-site for 35 of the lots, on adjacent properties for 27 of the lots, and within 400 feet for 9 of the lots. For the 74 potential development lots, potential hazardous materials impacts were identified on-site for 42 of the lots, on adjacent properties for 25 of the lots, and within 400 feet for 7 of the lots.

Table 10-2 indicates whether environmental conditions were identified on-site, on adjacent sites or on sites within 400 feet of each development lot and also indicates the potential classes of chemicals that may have impacted soil and/or groundwater conditions on the lot.

## D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Without the proposed actions, a number of construction projects involving conversion or additions to existing buildings, construction of new buildings, and improvements to transportation infrastructure may occur within the zoning area before 2013 (see Chapter 1, "Project Description").

If development were to occur on any lot that has the potential for hazardous material contamination, such development could result in the exposure of construction workers and nearby residents to hazardous materials.

**Table 10-2**
**Potential Hazardous Materials Impacts***

| Letter Reference | Projected or Potential Development Site | Block | Lot | Potential Impacts for On-Site, Adjacent Sites or Sites within 400 Feet | Potential Class of Chemical |
|---|---|---|---|---|---|
| C | Projected | 142 | 1 | On-Site | V, S, PCB, P, M |
| G | Projected | 2049 | 8 | On-Site | V, S, PCB,M |
| I(A) | Projected | 2060 | 22 | On-Site | V, S, PCB, M |
| | | 2060 | 23 | On-Site | V, S, PCB, M |
| | | 2060 | 24 | On-Site | V, S, PCB, M |
| | | 2060 | 25 | On-Site | V, S, M |
| | | 2060 | 26 | Adjacent | V, S, PCB, M |
| | | 2060 | 27 | On-Site | V, S, M |
| | | 2060 | Part of 32 | On-Site | V, S, PCB, M |
| | | 2061 | Part of 1 | On-Site | V, S, M |
| | | 2062 | Part of 6 | On-Site | V, S, PCB, P, M |
| J | Projected | 2061 | Part of 1 | On-Site | V, S, M |
| M | Projected | 153 | 3 | On-Site | V, S, M |
| | | 153 | 14 | Adjacent | V, S, PCB, M |
| | | 153 | 15 | On-Site | V, S, M |
| | | 154 | 1 | On-Site | V, S, PCB, M |
| | | 154 | 5 | On-Site | V, S, PCB, P, M |
| | | 154 | 11 | Adjacent | V, S, PCB, P, M |
| | | 154 | 12 | Within 400 ft | V, S, PCB, P, M |
| | | 154 | 36 | Adjacent | V, S, M |
| | | 154 | 37 | Adjacent | V, S, M |
| | | 154 | 38 | On-Site | V, S, M |
| | | 154 | 39 | Adjacent | V, S, M |
| | | 154 | 40 | Adjacent | V, S, M |
| O | Projected | 145 | 8 | Adjacent | V, S, PCB, P, M |
| | | 145 | 10 | On-Site | V |
| | | 145 | 13 | Adjacent | V, S, PCB, P, M |
| | | 145 | 14 | Adjacent | V, S, PCB, P, M |
| | | 145 | 15 | On-Site | V, S, M |
| | | 145 | 16 | Adjacent | V, S, M |
| | | 145 | 18 | Adjacent | V, S, M |
| | | 145 | 19 | Adjacent | V, S, M |
| | | 145 | 20 | Adjacent | V, S, PCB, P, M |
| | | 145 | 21 | On-Site | V, S, PCB, P, M |
| | | 145 | 22 | On-Site | V, S, PCB, P, M |
| | | 145 | 26 | Adjacent | V, S, PCB, P, M |
| | | 145 | 32 | On-Site | V, S, PCB, P, M |
| P | Projected | 146 | 7 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 11 | Adjacent | V, S, PCB, P, M |
| | | 146 | 12 | On-Site | V, S. M |
| | | 146 | 13 | On-Site | V, S, M |
| | | 146 | 14 | Adjacent | V, S, PCB, P, M |
| | | 146 | 15 | Adjacent | V, S, PCB, P, M |

**Table 10-2 (cont'd)**
**Potential Hazardous Materials Impacts***

| Letter Reference | Projected or Potential Development Site | Block | Lot | Potential Impacts for On-Site, Adjacent Sites or Sites within 400 Feet | Potential Class of Chemical |
|---|---|---|---|---|---|
| P (con't) | Projected (con't) | 146 | 16 | On-Site | V, S, PCB, P, M |
| | | 146 | 17 | On-Site | V, S, PCB, P, M |
| | | 146 | 18 | On-Site | V, S, M |
| | | 146 | 23 | On-Site | V, S, PCB, P, M |
| | | 146 | 29 | Adjacent | V, S, M, PCB, P |
| | | 146 | 34 | Adjacent | V, S, PCB, P, M |
| | | 146 | 35 | On-Site | V, S |
| | | 146 | 36 | Adjacent | V, S |
| | | 146 | 37 | Adjacent | V, S, PCB, P, M |
| | | 146 | 41 | Adjacent | V, S, PCB, P, M |
| | | 146 | 42 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 43 | Adjacent | V, S, PCB, P, M |
| | | 146 | 46 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 47 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 48 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 49 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 50 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 51 | Within 400 ft | V, S, PCB, P, M |
| | | 146 | 52 | Adjacent | V, S, PCB, P, M |
| Q | Projected | 149 | 1 | On-Site | V, S, PCB, M |
| | | 149 | 49 | On-Site | V, S, PCB, P, M |
| S | Projected | 2093 | 1 | On-Site | V, S, PCB, M |
| AA | Projected | 165 | 17 | Adjacent | V, S, PCB, P, M |
| | | 165 | 18 | On-Site | V, S, PCB, P, M |
| | | 165 | 19 | On-Site | V, S, PCB,P, M |
| | | 165 | 58 | Adjacent | V, S, PCB, P, M |
| BB | Projected | 165 | 29 | On-Site | V, S, PCB, P, M |
| EE | Projected | 2110 | 3 | On-Site | V, S, PCB, P, M |
| A | Potential | 128 | 1 | On-Site | V, S, PCB, P, M |
| | | 128 | 26 | On-Site | V, S, PCB, M |
| B | Potential | 131 | Part of 1 | On-Site | V, S, M |
| D | Potential | 133 | 1 | On-Site | V, S, PCB, M |
| | | 133 | 5 | On-Site | V, S, PCB, P, M |
| | | 133 | 13 | On-Site | V, S, PCB, M |
| | | 133 | 15 | On-Site | V, S, PCB, P, M |
| E | Potential | 154 | 1 | On-Site | V, S, PCB, P, M |
| | | 154 | 5 | Adjacent | V, S, PCB, P, M |
| | | 154 | 38 | On-Site | V, S, PCB, M |
| | | 154 | 41 | Adjacent | V, S, PCB, P, M |
| F | Potential | 134 | 30 | On-Site | V, S, PCB, P, M |
| H | Potential | 2049 | 2 | On-Site | V, S, PCB, P, M |

**Table 10-2 (cont'd)**
**Potential Hazardous Materials Impacts***

| Letter Reference | Projected or Potential Development Site | Block | Lot | Potential Impacts for On-Site, Adjacent Sites or Sites within 400 Feet | Potential Class of Chemical |
|---|---|---|---|---|---|
| I(B) | Potential | 2060 | Part of 32 | On-Site | V, S, PCB, P, M |
| | | 2060 | 122 | Adjacent | V, S, PCB, P M |
| | | 2062 | 1 | On-Site | V, S, PCB, P, M |
| | | 2062 | 5 | On-Site | V, S, PCB, P, M |
| | | 2062 | Part of 6 | On-Site | V, S, PCB, P, M |
| | | 2062 | 17 | Adjacent | V, S, PCB, P, M |
| | | 2062 | 18 | Adjacent | V, S, PCB, P, M |
| | | 2062 | 19 | Adjacent | V, S, PCB, P, M |
| | | 2062 | 21 | Adjacent | V, S, PCB, P, M |
| | | 2062 | 23 | Adjacent | V, S, PCB, P, M |
| | | 2062 | 24 | On-Site | V, S, M |
| | | 2062 | 103 | On-Site | V, S, PCB, M |
| L | Potential | 144 | 1 | On-Site | V, S, PCB, P, M |
| | | 150 | 1 | On-Site | V, S, PCB, P, M |
| | | 150 | 6 | On-Site | V, S, PCB |
| | | 150 | 10 | On-Site | V, S, M |
| | | 150 | 11 | Adjacent | V, S, M |
| | | 150 | 19 | On-Site | V, S, M |
| N | Potential | 152 | 37 | On-Site | V, S, PCB, P, M |
| R | Potential | 149 | 14 | Within 400 ft | V, S, PCB, P, M |
| | | 149 | 15 | Adjacent | V, S, M |
| | | 149 | 17 | On-Site | V, S, M |
| | | 149 | 19 | Adjacent | V, S, M |
| | | 149 | 21 | Adjacent | V, S, PCB, P, M |
| | | 149 | 22 | On-Site | V, S, PCB, P, M |
| | | 149 | 23 | On-Site | V, S, PCB, P, M |
| | | 149 | 24 | Adjacent | V, S, PCB, P, M |
| | | 149 | 25 | On-Site | V, S, M |
| | | 149 | 26 | On-Site | V, S, M |
| | | 149 | 28 | On-Site | V, S, M |
| | | 149 | 30 | On-Site | V, S |
| | | 149 | 31 | Adjacent | V, S |
| | | 149 | 32 | Within 400 ft | V, S, PCB, P, M |
| | | 149 | 33 | Adjacent | V, S, M |
| | | 149 | 34 | On-Site | V, S, M |
| | | 149 | 50 | Adjacent | V, S, PCB, P, M |
| T | Potential | 160 | 18 | On-Site | V, S, M |
| U | Potential | 161 | 27 | Within 400 ft | V, S, PCB, P, M |
| | | 161 | 30 | Within 400 ft | V, S, PCB, P, M |
| | | 161 | 33 | Within 400 ft | V, S, PCB, P, M |
| V | Potential | 161 | 18 | Adjacent | V, S, PCB, P, M |
| W | Potential | 160 | 29 | On-Site | V, S, PCB, M |

**Table 10-2 (cont'd)**
**Potential Hazardous Materials Impacts***

| Letter Reference | Projected or Potential Development Site | Block | Lot | Potential Impacts for On-Site, Adjacent Sites or Sites within 400 Feet | Potential Class of Chemical |
|---|---|---|---|---|---|
| Y | Potential | 164 | 1 | Adjacent | V, S, PCB, P, M |
| | | 164 | 13 | On-Site | V, S, PCB, P, M |
| Z | Potential | 164 | 29 | Adjacent | V, S, PCB, P, M |
| | | 164 | 31 | Adjacent | V, S, PCB, P, M |
| | | 164 | 42 | On-Site | V, S, PCB, P, M |
| | | 164 | 43 | On-Site | V, S, PCB, P, M |
| | | 164 | 44 | On-Site | V, S, PCB, P, M |
| CC | Potential | 167 | 15 | On-Site | V, S, M |
| | | 167 | 16 | On-Site | V, S, M |
| | | 167 | 26 | Adjacent | V, S, PCB, P, M |
| | | 167 | 27 | Within 400 ft | V, S, PCB, P, M |
| | | 167 | 28 | Within 400 ft | V, S, PCB, P, M |
| | | 167 | 36 | Adjacent | V, S, PCB, P, M |
| | | 167 | 42 | On-Site | V, S, PCB, P, M |
| DD | Potential | 174 | 9 | Adjacent | V, S, M |
| | | 174 | 13 | On-Site | V, S, M |
| | | 174 | 18 | Adjacent | V, S, PCB, M |
| | | 174 | 23 | Adjacent | V, S, M |
| | | 174 | 24 | On-Site | V, S, M |

**Notes:** V = VOCs, S = SVOCs, PCB = PCBs, P = pesticides, M = metals
* Since the issuance of the DEIS/DSEIS, sites K and X have been removed from the proposed development plan.

## E. THE FUTURE WITH THE PROPOSED ACTIONS

The presence of hazardous materials threatens human health or the environment only when exposure to those materials can occur. Even then, the mere presence of or exposure to such materials does not necessarily constitute a risk to human health. Rather, a health risk requires a complete exposure pathway to the contaminants and a sufficient dose to produce adverse health effects. For these reasons, further investigation would be necessary to determine appropriate health and safety and/or remedial measures that would precede or govern soil disturbance activities in known or potentially contaminated areas. Investigative measures would include preliminary assessments to identify potential contaminants of concern likely followed by subsurface testing to confirm the types, levels, and extent of contaminants of concern on development sites. Subsurface testing programs would be governed by site-specific Health and Safety Plans, which would include provisions to protect the health and safety of site workers and the community from potential contaminants of concern during investigative activities. The range of remedial and health and safety measures that would be employed prior to and/or during construction would vary with the types, levels and extent of contamination identified during the testing programs. Site-specific Health and Safety Plans would also govern remedial and construction activities.

For contaminants such as metals (except mercury), PCBs, and SVOCs found in soil or groundwater, volatilization is not anticipated to occur. Therefore, the greatest potential for exposure to these contaminants would be via direct contact with contaminated soil or groundwater or via inhalation of contaminated dust. The focus of health and safety measures on these sites would be to reduce the potential for direct contact with contaminants and reduce the generation of dust during investigative, remedial and/or construction activities. Similarly, post-construction, it is unlikely that special vapor barriers or venting measures would be required for new buildings on a site with these contaminants. However, if these contaminants were to remain in the subsurface post-construction, any areas of sites not occupied by structures would be capped with two-feet of clean fill material to eliminate exposure pathways.

For contaminants such as VOCs (including gasoline and perchloroethylene) and mercury, in addition to the exposure pathways above, inhalation of vapors and movement of vapors through subsurface pathways and the air can also be of concern. Therefore, these types of contaminants require more specialized remedial and health and safety measures to ensure the safety of site workers and the community. The design of a new building at such a site may need to account for the possibility that volatile compounds would remain in the subsurface following construction. As such, the design for a building at such a site might need to incorporate vapor barriers or venting systems, in addition to capping landscaped areas with two-feet of clean fill material.

Contaminated groundwater, which could be encountered during dewatering, is another potential pathway to exposure, particularly for construction workers inside the excavation. Consequently, remedial and/or health and safety measures would include protocols for the proper handling of groundwater.

## DETAILED MEASURES TO AVOID IMPACTS

As described above under existing conditions, each projected and potential development lot has some potential for the presence of hazardous materials. Preventative measures will be undertaken to protect the safety of the public, community residents, and construction workers, as well as the larger environment for areas where redevelopment has the potential to encounter areas of contamination. This will include subsurface investigations to determine the nature and extent of contamination and prescribed construction measures to manage contaminated materials prior to and/or during construction. These measures will be presented in site-specific Sampling and Remedial Work Plans and Health and Safety Plans. Work will be reviewed and approved by DEP, and will be performed in accordance with applicable city, state and federal requirements.

Further investigation at each projected and potential development site will include a preliminary assessment of properties located on, adjacent to, and within 400 feet of a development site, to the extent that such research was not undertaken as part of this assessment. The preliminary assessment will include a site reconnaissance inside all portions of buildings currently on the development site. This assessment will be performed with the objective of determining the need for and/or scope of a subsurface testing program that will be performed on the development lots. When there is known or potential contamination, subsurface testing is necessary to guide health and safety procedures and measures necessary to protect both workers and the community and to indicate whether special handling or disposal of soils or excavated materials is likely to be required during development. A Subsurface Testing Work Plan will be prepared for submission to and approval by the NYCDEP. The Work Plan will specify soil sampling locations and analytical parameters based on both the potential sources of contamination and the proposed construction activities. The Work Plan will also detail any proposed groundwater monitoring

well locations. The parameters that will be analyzed will include, at a minimum, those classes of chemicals that were identified as having the potential to have impacted on-site soil and groundwater conditions, as specified in Table 10-2. If additional potential classes of chemicals are associated with current or past uses on lots located adjacent to or within 400-feet of the development site during the preliminary assessment, these parameters will also be analyzed. Site-specific health and safety procedures to protect the health of site workers and the community during the implementation of the Sampling Work Plan will also be included.

A Subsurface Investigation Report will be prepared following the completion of the sampling program. The report will document field activities, present field and laboratory data, and discuss conclusions and recommendations drawn from the results of the investigation. The report will compare the analytical results to appropriate city, state, and federal standards and guidelines. The report will be submitted to DEP for review and approval. Based on the recommendation provided by DEP, further investigation and/or remediation will occur on the development lots, as necessary, either prior and/or during construction. The protocols for further investigation and/or remediation will be presented in site-specific Sampling and/or Remedial Work Plans, as necessary, which will include Health and Safety Plans.

If contamination is found, prior to site development, a site-specific Construction Health and Safety Plan (CHASP) will be prepared. The CHASP will include health and safety procedures to minimize exposure to workers and the public, including monitoring dust (and, if applicable, VOCs). The CHASP will include provisions for the identification and management of known and/or unexpected buried tanks or contaminated materials that might be encountered during soil disturbance activities anticipated as part of construction.

Excavation and proper off-site disposal is the procedure most commonly used for remediating contaminated soils. However, on sites with VOC contamination, measures such as a vapor barrier and/or a soil vapor extraction system might be used. If groundwater contamination exceeds the sewer use limitations set by the NYC DEP and dewatering were required, the water will be treated by readily available technologies (such as oil-water separators for petroleum-related VOCs and SVOCs; or activated carbon for VOCs). The decision about which treatment procedures to use will depend on the types and levels of contaminants, and the quantity and discharge rate of water requiring treatment.

On development sites where contaminants might remain in soil and/or groundwater after construction, once construction activities are completed, any remaining soils will be "capped" by paved areas and/or two feet of clean fill material. In this manner, potential pathways of exposure will be eliminated with the possible exception of the migration of VOCs. However, if elevated levels of VOCs would remain at a site, the building design will incorporate sufficient measures (e.g., vapor barriers and/or venting systems) to eliminate the potential for exposure. For sites with residual contaminants, a Restrictive Declaration will be placed on the property deed. The Restrictive Declaration will be designed to restrict the manner in which the property may be redeveloped and to ensure that additional testing or remediation measures, if required, will be performed prior to any subsurface excavation or change of use of the property. A draft Restrictive Declaration will be submitted to the DEP's Legal Affairs office for review and approval. Once approved, the Restrictive Declaration will be fully executed to ensure the required measures are implemented and that future redevelopment proceeds in a manner protective of public health.

## MECHANISMS TO ENSURE PREVENTIVE MEASURES WILL BE FOLLOWED

For lots that are not City-owned nor intended for City ownership, an E-designation will be used to ensure that the further investigation (and, where necessary, remediation) described above would be performed. The E-designation requires that the fee owner of an E-designated lot conduct a testing and sampling protocol, and remediation where appropriate, to the satisfaction of DEP before issuance of a building permit by the Department of Buildings (pursuant to Section 11-15 of the Zoning Resolution—Environmental Requirements). The E-designation also includes mandatory construction-related health and safety plans, which must also be approved by DEP. Table 10-3 lists development sites that are neither City-owned nor intended for City ownership.

For City-owned sites or sites that are proposed for City ownership, E-designations will not be placed on development lots. Instead, since development of these sites will occur through disposition to a private entity, further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during construction will be required under the City's contract of sale with the private entity selected to develop the site. This mechanism and the E-designation mechanism will reduce or avoid the potential that significant adverse impacts would result from the proposed actions on all development sites.

Table 10-4 lists development sites that are either City-owned or intended for City ownership.

**Table 10-3**
**Non-City-Owned Sites and**
**Sites Not Intended for City Ownership**

| Letter Reference | Block | Lot |
|---|---|---|
| A | 128 | 1 |
| A | 128 | 26 |
| B | 131 | 1 part |
| C | 142 | 1 |
| D | 133 | 1 |
| D | 133 | 5 |
| D | 133 | 13 |
| D | 133 | 15 |
| E | 134 | 1 |
| E | 134 | 5 |
| E | 134 | 38 |
| E | 134 | 41 |
| F | 134 | 30 |
| G | 2049 | 8 |
| H | 2049 | 2 |
| J | 2061 | 1 part |
| N | 152 | 37 |
| Q | 149 | 1 |
| Q | 149 | 49 |
| S | 2093 | 1 |
| T | 160 | 18 |
| V | 161 | 18 |
| W | 160 | 29 |

**Table 10-3 (cont'd)**
**Non-City-Owned Sites and**
**Sites Not Intended for City Ownership**

| Letter Reference | Block | Lot |
|---|---|---|
| Y | 164 | 1 |
| Y | 164 | 13 |
| Z | 164 | 29 |
| Z | 164 | 31 |
| Z | 164 | 42 |
| Z | 164 | 43 |
| Z | 164 | 44 |
| AA | 165 | 17 |
| AA | 165 | 18 |
| AA | 165 | 19 |
| AA | 165 | 58 |
| BB | 165 | 29 |
| DD | 174 | 9 |
| DD | 174 | 13 |
| DD | 174 | 18 |
| DD | 174 | 23 |
| DD | 174 | 24 |
| I(A) | 2060 | 22 |
| I(A) | 2060 | 23 |
| I(A) | 2060 | 24 |
| I(A) | 2060 | 25 |
| I(A) | 2060 | 26 |
| I(A) | 2060 | 27 |
| I(A) | 2060 | 122 |
| I(A) | 2060 | p/o 32 |
| I(A) | 2061 | p/o1 |
| I(B) | 2060 | p/o 32 |
| I(B) | 2062 | 1 |
| I(B) | 2062 | 5 |
| I(B) | 2062 | 6 |
| I(B) | 2062 | 17 |
| I(B) | 2062 | 18 |
| I(B) | 2062 | 19 |
| I(B) | 2062 | 21 |
| I(B) | 2062 | 23 |
| I(B) | 2062 | 24 |
| I(B) | 2062 | 103 |
| L | 144 | 1 |
| L | 150 | 1 |
| L | 150 | 6 |
| L | 150 | 10 |
| L | 150 | 11 |
| L | 150 | 19 |
| M | 153 | 3 |
| M | 153 | 14 |
| M | 153 | 15 |

**Table 10-3 (cont'd)**
**Non-City-Owned Sites and**
**Sites Not Intended for City Ownership**

| Letter Reference | Block | Lot |
|---|---|---|
| M | 154 | 1 |
| M | 154 | 5 |
| M | 154 | 11 |
| M | 154 | 12 |
| M | 154 | 36 |
| M | 154 | 37 |
| M | 154 | 38 |
| M | 154 | 39 |
| M | 154 | 40 |
| O | 145 | 8 |
| O | 145 | 10 |
| O | 145 | 13 |
| O | 145 | 14 |
| O | 145 | 15 |

**Table 10-4**
**City-Owned Sites and**
**Sites Intended for City Ownership***

| Letter Reference | Block | Lot |
|---|---|---|
| I(A) | 2060 | 22 |
| I(A) | 2060 | 23 |
| I(A) | 2060 | 24 |
| I(A) | 2060 | 25 |
| I(A) | 2060 | 26 |
| I(A) | 2060 | 27 |
| I(A) | 2060 | 122 |
| I(A) | 2060 | p/o 32 |
| I(A) | 2062 | p/o 1 |
| I(B) | 2062 | p/o 32 |
| I(B) | 2062 | 1 |
| I(B) | 2062 | 5 |
| I(B) | 2062 | 6 |
| I(B) | 2062 | 17 |
| I(B) | 2062 | 18 |
| I(B) | 2062 | 19 |
| I(B) | 2062 | 21 |
| I(B) | 2062 | 23 |
| I(B) | 2062 | 24 |
| I(B) | 2062 | 103 |
| L | 144 | 1 |
| L | 150 | 1 |
| L | 150 | 6 |
| L | 150 | 10 |
| L | 150 | 11 |
| L | 144 | 19 |

**Table 10-4 (cont'd)**
**City-Owned Sites and**
**Sites Intended for City Ownership***

| Letter Reference | Block | Lot |
|---|---|---|
| O | 145 | 8 |
| O | 145 | 10 |
| O | 145 | 13 |
| O | 145 | 14 |
| O | 145 | 15 |
| O | 145 | 16 |
| O | 145 | 18 |
| O | 145 | 19 |
| O | 145 | 20 |
| O | 145 | 21 |
| O | 145 | 22 |
| O | 145 | 26 |
| O | 145 | 32 |
| P | 146 | 2 |
| P | 146 | 7 |
| P | 146 | 11 |
| P | 146 | 12 |
| P | 146 | 13 |
| P | 146 | 14 |
| P | 146 | 15 |
| P | 146 | 16 |
| P | 146 | 17 |
| P | 146 | 23 |
| P | 146 | 29 |
| P | 146 | 34 |
| P | 146 | 35 |
| P | 146 | 36 |
| P | 146 | 41 |
| P | 146 | 42 |
| P | 146 | 43 |
| P | 146 | 46 |
| P | 146 | 47 |
| P | 146 | 48 |
| P | 146 | 50 |
| P | 146 | 51 |
| P | 146 | 52 |
| P | 146 | p/o18 |
| P | 146 | p/o18 |
| P | 146 | p/o37 |
| P | 146 | p/o37 |
| R | 149 | 14 |
| R | 149 | 15 |
| R | 149 | 17 |
| R | 149 | 19 |
| R | 149 | 22 |
| R | 149 | 23 |

**Table 10-4 (cont'd)**
**City-Owned Sites and**
**Sites Intended for City Ownership***

| Letter Reference | Block | Lot |
|---|---|---|
| R | 149 | 24 |
| R | 149 | 25 |
| R | 149 | 26 |
| R | 149 | 28 |
| R | 149 | 30 |
| R | 149 | 31 |
| R | 149 | 32 |
| R | 149 | 33 |
| R | 149 | 34 |
| R | 149 | 50 |
| U | 161 | 27 |
| U | 161 | 30 |
| U | 161 | 33 |
| CC | 167 | 15 |
| CC | 167 | 16 |
| CC | 167 | 26 |
| CC | 167 | 27 |
| CC | 167 | 28 |
| CC | 167 | 36 |
| EE | 2110 | 3 |
| N/A | 2060 | 8 |
| N/A | 2106 | 4 |
| N/A | 2106 | 5 |
| N/A | 2106 | 6 |
| N/A | 2106 | 7 |
| N/A | 2106 | 9 |
| N/A | 2106 | 16 |
| N/A | 2106 | 19 |
| N/A | 2106 | 24 |
| N/A | 2106 | 26 |
| N/A | 2106 | 29 |
| N/A | 2106 | 35 |
| N/A | 2106 | 40 |
| N/A | 2107 | 2 |
| N/A | 2107 | 15 |
| N/A | 2107 | 24 |
| N/A | 2107 | 30 |
| N/A | 2107 | 36 |
| N/A | 2107 | 40 |
| N/A | 2107 | 41 |
| N/A | 2108 | 1 |

**Notes:** * Since the issuance of the DEIS/DSEIS, sites K and X have been removed from the proposed development plan.
Closed Street Beds: Red Hook Lane, between Fulton Street and Boerum Place, Fair Street, between Prince Street and Fleet Place, Pearl Street, between Fulton Street and Willoughby Street Prince Street, between Flatbush Avenue extension and Myrtle Avenue.

# A. INTRODUCTION

The workers, students, visitors, and residents expected from the projected development of sites as a result of the proposed actions would create demands for additional water and sewage treatment. The potential effects on those municipal services are discussed in this chapter. Because there are existing buildings on the sites where development is anticipated, this analysis considers the difference between continued use of those buildings in the future without the proposed actions and with the expected development of the projected development sites.

As shown by the following analysis, by 2013 the proposed actions are expected to generate net new water usage of about 1.2 millions of gallons per day (mgd) and net new wastewater flows of 605,000 gallons per day (gpd) at the projected development sites.

Although the projected development that would likely result from the proposed actions would create new demand for water and treatment of sewage, the municipal services have adequate capacity to meet the increases in demand. Therefore, no significant adverse impacts are expected to result to these services.

# B. EXISTING CONDITIONS

## WATER SUPPLY

New York City's water supply system is composed of three watersheds—Croton, Delaware, and Catskill—and extends as far north as the Catskill Mountains, delivering approximately 1.2 billion gallons of water per day to the five boroughs and Westchester County. From these watersheds, water is carried to the City via a conveyance system composed of reservoirs, aqueducts, and tunnels extending as far as 125 miles north of the City. Within the City, a grid of water pipes distributes water to customers. The Croton system supplies an average of 110 mgd, primarily to users in the lower elevation portions of Manhattan and the Bronx. This system does not normally supply water to Brooklyn.

The Delaware and Catskill systems supply all five boroughs and typically deliver about 90 percent of the City's drinking water. The Delaware and Catskills water systems collect water from watershed areas in the Catskill Mountains and deliver it to the Kensico Reservoir in Westchester County. This reservoir acts as the seasonally balancing reservoir. From Kensico Reservoir, water is sent to the Hillview Reservoir in Yonkers, which balances the daily fluctuations in water use. From there, water is delivered to the City through three tunnels, Tunnel Nos. 1, 2, and 3. Tunnel No. 1 carries water through the Bronx and Manhattan to Brooklyn; Tunnel No. 2 travels through the Bronx, Queens, Brooklyn, and then through the Richmond Tunnel to Staten Island; and Tunnel No. 3 goes through the Bronx and Manhattan, terminating in Queens. An extension of Tunnel No. 3 is currently being built in Queens and Brooklyn.

Water consumption in New York City as a whole averages approximately 1.2 billion gallons per day (gpd), but can reach up to 1.5 billion gpd during the summer months.

Tunnel No. 2 services Downtown Brooklyn. Shaft 23 is within the project area at Third Avenue and Schermerhorn Street, and Shaft 16A is just outside of the project area at Nevins and State Streets. These two shafts deliver large volumes of water into the distribution system; and a large number of transmission mains, ranging up to 60 inches in diameter, run under various streets. These large transmission mains feed an interconnected grid of 8- and 12-inch water mains that runs beneath almost all the streets of Downtown Brooklyn. These 8- and 12-inch water mains supply water to individual lots and buildings. Such a grid system equalizes water pressure in an area and allows a section to be cut off for repair and maintenance without affecting users not directly connected to that section. According to the New York City Department of Environmental Protection (NYCDEP), there are currently no problems with the water distribution system's capacity, coverage, or pressure in the area.

As discussed in Chapter 1, "Project Description," the project area is currently occupied by office, retail, residential, and institutional uses. The existing water demand on the projected development sites is estimated to be approximately 491,250 gpd (see Table 11-1). This estimate includes both domestic water use (sinks and toilets) and air conditioning during the summer. Domestic water use enters the sewer system, while water from air conditioning evaporates.

## SANITARY SEWAGE

### *WASTEWATER TREATMENT*

Downtown Brooklyn is almost entirely within the service area of the Red Hook Water Pollution Control Plant (WPCP). A half block bounded by Tillary, Johnson, Gold, and Prince Streets lies within the Newtown Creek WPCP service area. All of the projected development sites are served by the Red Hook WPCP, which discharges treated wastewater flows (or effluent) into the East River. A New York State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation (NYSDEC) regulates the effluent from this WPCP. The Red Hook WPCP is designed to treat a monthly flow of 60 mgd. The average actual monthly flow rate at the plant for the latest 12 months of records available (August 2002 through July 2003) is 32 mgd, which is slightly more than half the treatment capacity of the plant (see Table 11-2). The plant handles greater volumes during storm events due to stormwater inflows to the plant.

Combined sewers that collect stormwater runoff (from roof and street drainage) and sanitary sewage serve Downtown Brooklyn. In dry weather, the sewer lines convey only sanitary sewage and carry it to the Red Hook WPCP, located along the Brooklyn waterfront just north and west of the project area. However, during and immediately after precipitation, such as rain and snow, the sewer lines convey both sanitary sewage and stormwater. When large volumes of stormwater exceed the capacity of the Red Hook WPCP, the combined sewage is permitted to overflow into the East River without treatment at controlled points known as regulators. The projected and potential development sites are mostly built, and therefore almost all of the runoff from impervious cover flows through the combined system and is discharged into the East River.

Based on current wastewater flows, the existing uses on the projected development sites generate approximately 247,580 gpd of sanitary sewage. A detailed breakdown is shown on Table 11-1.

**Table 11-1**
**Existing Water Use on Projected Development Sites***

| Site (See Figure 1-1) | Size (square feet) | Use | Domestic Water Usage (gpd) | Air Conditioning Usage (gpd) | Total Consumption (gpd) |
|---|---|---|---|---|---|
| C | 72,000 | Commercial | 7,200 | 7,200 | 14,400 |
| G | 60,000 | Residential | 14,110 | 10,200 | 24,310 |
| I(A) | 41,000 | Retail | 6,970 | 6,970 | 13,940 |
| J | 38,000 | Retail | 6,460 | 6,460 | 12,920 |
| M | 235,000 | Residential/retail /office | 39,950 | 39,950 | 79,900 |
| O | 85,000 | Residential/retail | 14,450 | 14,450 | 28,900 |
| P | 158,000 | Residential/retail | 26,860 | 26,860 | 53,720 |
| Q | 373,000 | Retail | 63,410 | 63,410 | 126,820 |
| S | 376,000 | Office/retail | 63,920 | 63,920 | 127,840 |
| AA | 1,000 | Parking | 0 | 0 | 0 |
| BB | 25,000 | Retail/office | 4,250 | 4,250 | 8,500 |
| EE | 2,000 | Parking | 0 | 0 | 0 |
| Total | 1,466,000 | NA | 247,580 | 243,670 | 491,250 |

**Notes:** Usage rates from the *City Environmental Quality Review (CEQR) Technical Manual.* Residential units are 1,000 square feet and occupied by 2.1 persons on average.
Each office worker occupies 250 square feet.

* Since the issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.

**Table 11-2**
**Monthly Flows at Red Hook WPCP**

| Year | Month | Flow (mgd) |
|---|---|---|
| 2003 | July | 28 |
| 2003 | June | 35 |
| 2003 | May | 30 |
| 2003 | April | 32 |
| 2003 | March | 28 |
| 2003 | February | 32 |
| 2003 | January | 30 |
| 2002 | December | 33 |
| 2002 | November | 33 |
| 2002 | October | 33 |
| 2002 | September | 36 |
| 2002 | August | 32 |
| 12-Month Average | | 32 |

**Source:** NYCDEP

## C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

It is assumed that some growth and development within the project area would occur in the future without the proposed actions. The expected growth in the area would result in limited development.

### WATER SUPPLY

In the future without the proposed actions, conditions for overall water supply to New York City are not expected to change significantly. The City has initiated a comprehensive water conservation program that seeks to reduce water use by implementing a metering program and requiring that all new fixtures in the City, including those in existing and new structures, be of low-flow design (Local Law No. 29, 1989). Other measures—including leak detection programs, water meters, and locking fire hydrant caps—are aimed at further reducing the City's water needs and will serve to reduce water demand and flows to sewage facilities. NYCDEP projects that over the next decade, the savings from these conservation measures will exceed any increase in water demand from consumers. In addition, Stage 2 of water supply Tunnel No. 3 is now under construction in Queens and Brooklyn. When Tunnel No. 3 is complete, it will enhance and improve the adequacy and dependability of the entire water supply system and improve service and pressure to outlying areas of the City. It will also allow NYCDEP to inspect and repair City Tunnel Nos. 1 and 2 for the first time since they were activated.

The only projected development site expected to be developed by 2013 is Site G, where approximately 60 residential units would be developed absent the approval of the proposed actions. Total water demand on the projected development sites in 2013 is estimated to be about 512,560 gpd.

### SANITARY SEWAGE

Without the development that would result from the proposed actions, little increase in sewage flows from the projected development sites is expected. NYCDEP expects the Red Hook WPCP to remain within its SPDES permit limits with a projected flow of about 40 mgd. This projection subsumes all of the expected No Build developments in Downtown Brooklyn and the rest of the Red Hook WPCP service area.

## D. THE FUTURE WITH THE PROPOSED ACTIONS

Potential demand for water and sewage resulting from the projected development of sites in Downtown Brooklyn is shown on Table 11-3.

### WATER SUPPLY

The anticipated water demand from the projected development sites is estimated at 1,707,640 gpd of water. Subtracting the estimated amount of water consumed if the project does not occur (512,560 gpd), the net increase in demand anticipated with the proposed actions is about 1,195,000 mgd, which is an increase of 0.10 percent to the City's current water demand. This increased demand would not be large enough to significantly impact the New York City water supply system's ability to deliver water reliably, and demand for water is not expected to affect local water pressure.

## SANITARY SEWAGE

By 2013, the projected development sites' sewage generation would be 855,740 gpd, which would be conveyed to the Red Hook WPCP. Subtracting the estimated sewage flows that would be generated by uses on the projected development sites without the proposed actions (247,580 gpd), the net increase in sewage that would be conveyed to the Red Hook WPCP is 608,160 gpd or 1.0 percent of the permitted flow. The additional sanitary sewage expected to result from the proposed actions would not cause the Red Hook WPCP to exceed its design capacity or SPDES permit flow limit. Therefore, sewage generated from the proposed actions would not result in a significant adverse impact to infrastructure systems.

**Table 11-3**
**Expected Water Demand on Projected Development Sites With the Proposed Actions***

| Site | Use | Size (square feet) | Domestic Use (gpd) | Air Conditioning (gpd) | Total Water Demand (gpd) |
|---|---|---|---|---|---|
| C | Office | 720,000 | 72,000 | 72,000 | 144,000 |
| C | Community | 80,000 | 13,600 | 13,600 | 27,200 |
| G | Retail | 10,000 | 1,700 | 1,700 | 3,400 |
| G | Residential | 71,000 | 16,700 | 12,070 | 28,770 |
| I(A) | Retail | 60,000 | 10,240 | 10,240 | 20,480 |
| I(A) | Residential | 300,000 | 70,560 | 51,000 | 121,560 |
| J | Retail | 86,000 | 14,620 | 14,620 | 29,240 |
| J | Residential | 259,000 | 60,920 | 44,030 | 104,950 |
| M | Office | 778,000 | 77,800 | 77,800 | 155,600 |
| M | Retail | 70,000 | 11,900 | 11,900 | 23,800 |
| O | Office | 544,000 | 54,400 | 54,400 | 108,800 |
| O | Retail | 50,000 | 8,500 | 8,500 | 17,000 |
| P | Office | 999,000 | 99,900 | 99,900 | 199,800 |
| P | Retail | 48,000 | 8,160 | 8,160 | 16,320 |
| Q | Office | 1,138,000 | 113,800 | 113,800 | 227,600 |
| Q | Retail | 510,000 | 86,700 | 86,700 | 173,400 |
| S | Office | 337,000 | 33,700 | 33,700 | 67,400 |
| S | Retail | 51,000 | 8,670 | 8,670 | 17,340 |
| AA | Retail | 18,000 | 3,060 | 3,060 | 6,120 |
| AA | Residential | 163,000 | 38,340 | 27,710 | 66,050 |
| BB | Retail | 21,000 | 3,570 | 3,570 | 7,140 |
| BB | Residential | 186,000 | 43,750 | 31,620 | 75,370 |
| EE | Retail | 15,000 | 2,550 | 2,550 | 5,100 |
| EE | Community | 180,000 | 30,600 | 30,600 | 61,200 |
| TOTAL | NA | 6,694,000 | 885,740 | 821,900 | 1,707,640 |

**Notes:** Usage rates from the *City Environmental Quality Review (CEQR) Technical Manual.*
Residential units are 1,000 square feet and occupied by 2.1 persons on average.
Each office worker occupies 250 square feet.
* Since the issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.

## A. INTRODUCTION

The proposed actions would place a new demand on solid waste and sanitation services. As the following analysis shows, the proposed actions are expected to result in a net increase over existing conditions of about 31,601 pounds per week (or 15.8 tons per week) of solid waste that New York City Department of Sanitation (DSNY) would collect, transport and dispose of. Private carters would handle a net increase of about 366,128 pounds per week (or about 183 tons per week). Although the development of the projected sites would create new demand for the disposal of solid waste, municipal and private solid waste services have adequate capacity to meet the increases in demand. Therefore, no significant adverse impacts are expected on these services from the proposed actions.

## B. EXISTING CONDITIONS

In the City of New York, residential and institutional refuse is handled by the DSNY, while solid waste from commercial, retail, and manufacturing uses is collected by private carters. Disposal of residential refuse was handled principally by landfilling at the Fresh Kills Landfill in Staten Island, which stopped accepting solid waste on March 22, 2001. DSNY continues to pick up residential and institutional solid waste and recyclables. These materials are taken to transfer stations for sorting and transfer to larger trucks. From there, private carters take the materials to out-of-city landfills and waste to energy plants. In New York City Fiscal Year 2003 (ended June 30, 2003) DSNY handled about 5,860 tons per day of recyclables and about 12,580 tons per day of solid waste for a total of about 18,440 tons per day.

Commercial carters pick up from businesses, manufacturers and offices and take the waste materials to transfer stations where the recyclable materials are separated from the solid waste. The solid waste is consolidated into larger trucks for transport and disposal in landfills outside of New York City. The recyclable materials are sold and transported to manufacturing facilities. Private carters are believed to handle about 13,000 tons per day of recyclables and solid waste.

Current estimated solid waste generation on the projected development sites is shown on Table 12-1. It is estimated that existing activities on the projected development sites generate a total of 187,486 pounds per week of solid waste and recyclables. Of this total, about 22,058 pounds (or 11 tons) per week is handled by DSNY and about 165,428 pounds (or 82.7 tons) per week is handled by private carters. Using an average truck load of 10 tons, DSNY needs about two truck trips per week, and private carters need about eight truck loads per week, to handle these materials.

**Table 12-1**
**Existing Solid Waste Generation on Projected Development Sites***

| Site (See Figure 1-1) | Use | Size (square feet) | DSNY handled waste (pounds per week) | Privately handled waste (pounds per week) | Total Solid Waste (pounds per week) |
|---|---|---|---|---|---|
| C | Commercial | 72,000 | 0 | 3,744 | 3,744 |
| G | Residential | 60,000 | 2,460 | 0 | 2,460 |
| I(A) | Retail | 41,000 | 0 | 12,956 | 12,956 |
| J | Retail | 38,000 | 0 | 10,008 | 10,008 |
| M | Residential/ retail/office | 235,000 | 9,635 | 0 | 9,635 |
| O | Residential/ retail | 85,000 | 3,485 | 0 | 3,485 |
| P | Residential/ retail | 158,000 | 6,478 | 0 | 6,478 |
| Q | Retail | 373,000 | 0 | 117,868 | 117,868 |
| S | Office/retail | 376,000 | 0 | 19,552 | 19,552 |
| AA | Parking | 1,000 | 0 | 0 | 0 |
| BB | Retail/office | 25,000 | 0 | 1,300 | 1,300 |
| EE | Parking | 2,000 | 0 | 0 | 0 |
| Total | NA | 1,466,000 | 22,058 | 165,428 | 187,486 |

**Notes:** Generation rates from *City Environmental Quality Review (CEQR) Technical Manual*
Residential units are 1,000 square feet and occupied by 2.1 persons on average.
Each office worker occupies 250 square feet.

* Since the issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.

## C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

If the proposed actions are not implemented, it is assumed that the current uses on the projected development sites would continue. There is a project that is currently planned on one of the projected development sites (site G), but its impact on solid waste collection services would be negligible.

New York City adopted a Comprehensive Solid Waste Management Plan (SWMP) in August 1992, and the implementation of the plan was altered slightly in May 1993 to gain approval from New York State Department of Environmental Conservation (NYSDEC). It has since been updated to reflect changing conditions. On March 22, 2001, Fresh Kills Landfill, New York City's only solid waste disposal site, stopped accepting solid waste and on July 4, 2001 it was closed for solid waste disposal as stipulated by New York State and City law. In order to close Fresh Kills, New York City developed interim plans to export all the municipal waste that it collects. A long-term plan was developed, but led to large-scale trucking of municipal solid waste. A new SWMP is being developed with a focus on municipal solid waste. DSNY continues to pick up residential and institutional solid waste and take it to transfer stations for out-of-city disposal until a long-term plan is developed and implemented.

Under the new SWMP, the methods of handling commercial solid waste are not expected to change materially from current methods. On July 31, 2003, DSNY published a final scope of

work for a Commercial Waste Management Study (CWMS). Local Law 74 of 2000 requires this CWMS. The purpose is to: 1) address the siting and operations of private transfer station and waste collection operations; 2) determine future demand for commercial transfer capacity; and 3) facilitate a transition from the current mode of truck-based export to export by barge and/or rail. The CWMS is not expected to be completed until March 2004. However, the basic system of private carters collecting and disposing of waste from commercial facilities is expected to remain unchanged. Overall, no significant changes to solid waste collection systems serving the projected development sites are anticipated. Municipal waste and privately handled waste will continue to be shipped to licensed landfills outside of New York City.

## D. THE FUTURE WITH THE PROPOSED ACTIONS

As shown on Table 12-2, solid waste generated from the projected development sites is estimated to total 585,215 pounds per week (or 41.8 tons per day). This is an increase of about 397,729 pounds per week (or 28.4 tons per day) over existing conditions. A total of less than three truck trips per day would be needed to handle this incremental increase. DSNY-handled solid waste would increase by just under three tons per day. DSNY would need about one new truck trip every three days to handle the additional solid waste and recyclables. This increase is not expected to overburden the City's solid waste handling services, and the proposed actions would not have a significant adverse impact on solid waste and sanitation services.

**Table 12-2**
**Expected Solid Waste Generation on Projected Development Sites With the Proposed Actions***

| Site (See Figure 1-1) | Use | Size (square feet) | DSNY Handled Solid Waste (pounds per week) | Privately Handled Solid Waste (pounds per week) | Total Solid Waste (pounds per week) | Increase Over Existing Conditions (pounds per week) |
|---|---|---|---|---|---|---|
| C | Office | 720,000 | 0 | 37,440 | 37,440 | 37,856 |
| | Community | 80,000 | 4,160 | 0 | 4,160 | |
| G | Retail | 10,000 | 0 | 3,160 | 3,160 | 3,611 |
| | Residential | 71,000 | 2,911 | 0 | 2,911 | |
| I(A) | Retail | 60,000 | 0 | 18,960 | 18,960 | 18,304 |
| | Residential | 300,000 | 12,300 | 0 | 12,300 | |
| J | Retail | 86,000 | 0 | 27,176 | 27,176 | 27,787 |
| | Residential | 259,000 | 10,619 | 0 | 10,619 | |
| M | Office | 778,000 | 0 | 40,456 | 40,456 | 52,941 |
| | Retail | 70,000 | 0 | 22,120 | 22,120 | |
| O | Office | 544,000 | 0 | 28,288 | 28,288 | 40,603 |
| | Retail | 50,000 | 0 | 15,800 | 15,800 | |
| P | Office | 999,000 | 0 | 51,948 | 51,948 | 60,638 |
| | Retail | 48,000 | 0 | 15,168 | 15,168 | |
| Q | Office | 1,138,000 | 0 | 59,176 | 59,176 | 102,468 |
| | Retail | 510,000 | 0 | 161,160 | 161,160 | |
| S | Office | 337,000 | 0 | 17,524 | 17,524 | 14,088 |
| | Retail | 51,000 | 0 | 16,116 | 16,116 | |
| AA | Retail | 18,000 | 0 | 5,688 | 5,688 | 12,371 |
| | Residential | 163,000 | 6,683 | 0 | 6,683 | |
| BB | Retail | 21,000 | 0 | 6,636 | 6,636 | 12,962 |
| | Residential | 186,000 | 7,626 | 0 | 7,626 | |
| EE | Retail | 15,000 | 0 | 4,740 | 4,740 | 14,100 |
| | Community | 180,000 | 9,360 | 0 | 9,360 | |
| Totals | NA | 6,694,000 | 53,659 | 531,556 | 585,215 | 397,729 |

**Notes:** Usage rates from *City Environmental Quality Review (CEQR) Technical Manual* Residential units are 1,000 square feet and occupied by 2.1 persons on average. Each office worker occupies 250 square feet.

* Since the issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.

## A. INTRODUCTION

Development resulting from the proposed actions would place an increased demand on energy services. Currently, uses at the projected development sites create some demand for energy. Although the development of the projected sites would create new demands on energy, the additional demand would not be large enough to have significant adverse impacts on energy services.

## B. EXISTING CONDITIONS

Consolidated Edison (Con Ed) along with other transmission companies delivers electricity to New York City and almost all of Westchester County. The electricity is generated by Con Ed as well as a number of independent power companies, including KeySpan. Annual electric sales total nearly 50 billion kilowatt hours (KWH) of electricity supplied to Con Ed's delivery area (New York City and Westchester County). This is equivalent to about 170.75 trillion British Thermal Units (BTUs) and does not include the energy content in the natural gas and other energy sources used in New York City. In Downtown Brooklyn, Con Ed supplies electricity and steam, while KeySpan delivers natural gas to Downtown Brooklyn. Current energy use on the projected development sites is estimated to be 115.1 billion BTUs for all heating, cooling, and electric power (see Table 13-1).

## C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

A number of power plant construction projects are planned or are currently underway. While not all of the projects will likely be constructed, it is anticipated that sufficient additional generating capacity will be built to meet New York City and Downtown Brooklyn's projected future demand for energy.

In December 2001, New York State Energy Planning Board released the Draft New York State Energy Plan and Draft Environmental Impact Statement. The Final Impact Statement and Energy Plan were issued in June 2002. This plan sets out the New York State policies and objectives for the next five years. The plan is to promote competition in the energy industries, secure reliable and reasonably priced energy supplies, reduce environmental impacts associated with energy generation and consumption, reduce vehicular congestion, and preserve energy-related public benefits programs. These are continuations of the policies developed in the 1998 Energy Plan that are currently in operation. Therefore, no large-scale changes in energy generation and consumption policies are foreseen. It is expected that in the future, Con Ed, KeySpan and another energy provider will continue to deliver energy for Downtown Brooklyn.

**Table 13-1**
**Projected Development Sites:**
**Estimated Annual Energy Consumption***

| Site Ref. | (BTUs) in millions | | |
|---|---|---|---|
| | Existing | No Build 2013 | Build 2013 |
| C | 25,976 | 25,976 | 62,200 |
| G | 6,000 | 8,730 | 10,889 |
| I (A) | 3,044 | 3,044 | 48,642 |
| J | 21,204 | 21,204 | 42,483 |
| M | 19,534 | 19,534 | 64,512 |
| O | 9,587 | 9,587 | 45,168 |
| P | 7,450 | 7,450 | 80,501 |
| Q | 20,813 | 20,813 | 117,108 |
| S | 28,097 | 28,097 | 29,098 |
| AA | 27 | 27 | 24,720 |
| BB | 1,395 | 1,395 | 28,235 |
| EE | 55 | 55 | 12,591 |
| **Total BTUs** | **115,113** | **117,843** | **566,147** |

**Source:** 2001 *New York City Environmental Quality Review CEQR Technical Manual*, AKRF, July 2003.

* Since the issuance of the DEIS/DSEIS, Site K has been removed from the proposed development plan.

Although one project is currently planned for one of the projected development sites, no major changes in energy use at the sites are expected by 2013, should the proposed actions not occur.

## D. THE FUTURE WITH THE PROPOSED ACTIONS

Projected development resulting from the proposed actions would be required to comply with the New York State Conservation Construction Code, which governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope of new buildings. In compliance with the Code, the buildings to be constructed on the projected and potential development sites would incorporate all required energy conservation measures, including meeting the Code's requirements relating to energy efficiency and combined thermal transmittance.

Electricity, gas, and steam, supplied by Con Ed or another power company, would continue to provide heating, cooling, and lighting to Downtown Brooklyn. As shown on Table 13-1, energy consumption from the projected development sites would increase by approximately 438 billion BTUs. This would be only a 0.0026 percent increase and would not be a significant additional load. Thus, the operational energy from the proposed actions would not have significant adverse impacts. ✷

## Transportation Analysis Study Area
## Figure 14-1




Study Area Boundary

Analyzed Intersection (Signalized)

Analyzed Intersection (Unsignalized)

M Projected Development Site

# A. INTRODUCTION

This chapter of the EIS describes the traffic and parking characteristics and potential impacts associated with the proposed rezoning of an approximately 60-block area in Downtown Brooklyn roughly bounded by Tillary Street to the north, Schermerhorn Street/Pacific Street to the south, Adams Street to the west, and Ashland Place to the east (see Figure 1-1 in Chapter 1, "Project Description"). As described in detail in earlier chapters of this EIS, the proposed rezoning would provide for the development of sites for a mixture of commercial office, institutional, residential, and retail uses. Typically, CEQR assessments of large area-wide zoning proposals not associated with specific development projects assume a 10-year build period. This is the time frame that can be reasonably predicted without engaging in highly speculative projections. Thus, the transportation (and other) analyses in this EIS address a development program that could reasonably be constructed by 2013. The traffic and parking analyses consider auto, taxi and truck trips, as well as parking demand and changes in supply related to these "projected" development sites. The locations of these sites and their anticipated uses are shown in Figure 1-1 and listed in Table 1-3 in Chapter 1.

The study area selected for the traffic analysis is shown in Figure 14-1. The study area was selected to encompass the principal roadways most likely to be used by the majority of persons and goods traveling by vehicle to and from the projected development sites. The traffic study area is bounded on the north by Tillary Street, on the south by Atlantic Avenue, on the east by Fort Greene Place, and on the west by Court Street/Cadman Plaza West. Thirty-one intersections are analyzed for vehicular traffic for the weekday 8-9 AM, 12-1 PM (midday) and 5-6 PM peak hours, the periods when demand from these predominantly office and residential development sites would be heaviest.

This chapter describes in detail the existing traffic and parking conditions in the study area. Future conditions in the year 2013 without the proposed actions (the No Build condition) are then determined, including additional transportation-system demand and any changes in the roadways and parking supply expected by the year 2013. The increase in travel demand resulting from the proposed actions is then projected and added to the No Build to develop the 2013 future with the proposed actions. Significant impacts from project generated trips are then identified.

# B. EXISTING CONDITIONS

## DATA COLLECTION

Due to September 11th-related effects on the Downtown Brooklyn traffic system (an AM peak hour single occupancy vehicle [SOV] ban on lower East River crossings, for example), the AM, midday and PM peak hour 2002 base traffic networks for Downtown Brooklyn were developed from existing data sources supplemented by counts at locations (such as along Willoughby

Street) where existing data were not available. The primary data sources were the *330 Jay Street/12 MetroTech FSEIS* (1998 baseline) and data collected in 2000 for the *Brooklyn Bridge O/D Study*. Supplemental data sources included the *Atlantic Center Plaza EIS* (1997), *Atlantic Terminal Office Development SEIS* (2002), and the *Downtown Brooklyn Traffic Improvements Study* (1995). As the data from these various sources indicate that traffic volumes in Downtown Brooklyn have declined in recent years independent of the events of September 11, 2001, year 2000 traffic levels were assumed as a relatively conservative baseline condition for year 2002, and no growth factor was applied. The networks were, however, adjusted to reflect: 1) the closures of Cadman Plaza East, and the MetroTech Service Road at Jay Street; and 2) the reduction of previous through-traffic demand en route to and from the World Trade Center. As the long-term viability of the emergency traffic regulations prohibiting single occupancy vehicles from the lower East River bridges from 6-10 AM has not been established, the AM peak hour network was not adjusted to reflect the lower volumes resulting from this measure.

In September 2002, manual turning movement counts were conducted at 17 locations along DeKalb and Myrtle Avenues, and Livingston, Schermerhorn, State, and Willoughby Streets to document traffic flows where existing data was not available. Supplemental vehicle classification counts and speed surveys were also conducted at that time, as were field surveys of parking regulations, lane configurations and other physical and operational characteristics of the street network. Signal timing plans for signalized intersections within the study area were obtained from the New York City Department of Transportation (NYCDOT).

Figures 14-2 through 14-4 show the 2002 base traffic volumes in the AM, midday, and PM peak hours, respectively.

## VEHICULAR TRAFFIC

### *STUDY AREA STREET NETWORK*

The street system within the project's Downtown Brooklyn study area serves the dual function of providing through-access to and from the Brooklyn and Manhattan Bridges while also accommodating the local traffic demands of the Downtown Brooklyn Central Business District (CBD). There are a number of major north-south and east-west roadways carrying heavy volumes of through traffic, as well as minor roadways serving local downtown traffic. One notable feature of the street system is the Fulton Street Mall, a transit mall along Fulton Street that is restricted to buses and pedestrians along much of its length (some access by service and delivery vehicles is also allowed). The major arterials and streets in Downtown Brooklyn are under computerized signal control. A discussion of the street network within the study area is provided below.

#### *North-South Streets*

The major arterial in the area is **Flatbush Avenue (Flatbush Avenue Extension** north of Fulton Street), which provides direct access to the Manhattan Bridge and serves as a secondary route to the Brooklyn Bridge. Flatbush Avenue runs diagonally in a generally northwest-southeast direction from the Manhattan Bridge through Brooklyn to the Rockaways. Within the study area it is 60 to 70 feet wide and typically operates with three northbound and three southbound through lanes, plus left-turn lanes at key intersections. Within the study area, Flatbush Avenue traverses several complex intersections where three or more streets cross at oblique angles, a pattern characteristic of much of the downtown area. Curbside regulations typically prohibit parking along both sides of Flatbush Avenue, primarily during the peak periods, and left turns

are prohibited at some critical intersections in order to maximize roadway capacity. All analyzed intersections along the Flatbush Avenue corridor within the study area are signalized. Flatbush Avenue typically carries from 2,300 to 3,100 vehicles per hour (vph) in both directions combined at Willoughby Street during peak periods.

Another major north-south arterial in Downtown Brooklyn is formed by the combination of **Adams Street** and **Boerum Place** which connect Atlantic Avenue to the Brooklyn Bridge and Tillary Street. Boerum Place, which runs from Atlantic Avenue to Fulton Street, is an approximately 108-foot-wide arterial with four moving lanes in each direction separated by a raised median. North of Fulton Street, the roadway becomes Adams Street, a limited access arterial with three northbound and three southbound lanes, and adjacent service roads providing access to local streets. Two-way traffic volumes on Adams Street/Boerum Place at Fulton Street typically range from 1,800 to 2,800 vph during peak periods.

In combination, **Jay Street** and **Smith Street** serve as a north-south collector as they traverse the study area. Jay Street runs from Fulton Street north to the waterfront, while Smith Street continues south from Fulton Street. Within the study area, both are typically 52 feet wide and vary from one to two travel lanes in each direction. With the exception of the Flatbush Avenue and Adams Street arterials, Jay Street/Smith Street function as the only continuous north-south roadway within the study area. Between Fulton and Tillary Streets, Jay Street provides a significant land service function with high levels of passenger drop-off/pick-up, loading/unloading, parking, and other curbside activities, including very active bus stops at MetroTech and Renaissance Plaza. Two-way volumes on Jay Street in the vicinity of Willoughby Street typically range from 600 to 1,000 vph during peak periods. South of Atlantic Avenue, Smith Street narrows to 32 feet in width and operates one-way northbound with one to two travel lanes. As discussed later in this chapter, in November 2003, Smith Street was converted from two-way to one-way northbound operation from Atlantic Avenue to Schermerhorn Street.

Other north-south streets within the study area provide primarily local access. Many are discontinuous due to the Fulton Mall and the MetroTech development. Northbound **Lawrence Street** and southbound **Bridge Street** traverse between Fulton Street and the MetroTech Service Road. They are each approximately 30 feet wide and both are currently closed to all but authorized vehicular traffic north of Willoughby Street as a security enhancement for MetroTech. Vehicles can access the unrestricted segment of Lawrence Street from Livingston Street via Gallatin Place. **Hoyt Street**, a 28-foot-wide southbound local street that begins at Fulton Street, functions as the outlet for Bridge Street traffic. As Bridge and Hoyt Streets do not directly intersect, traffic must negotiate an off-set intersection when crossing the Fulton Mall.

**Duffield Street** is a 30-foot-wide street that runs from Fulton Street to Flatbush Court at MetroTech. It operates one-way northbound from Fulton Street to Willoughby Street, one-way southbound from Willoughby Street to the MetroTech Service Road, and two-way from the service road to Flatbush Court. All vehicles en route to Duffield Street from the north are currently screened at Flatbush Court and are prohibited from continuing south of the Service Road to Willoughby Street. These measures were implemented as a security enhancement for MetroTech. From the south, vehicles can reach the unrestricted northbound segment of Duffield Street from Livingston Street via Elm Street. As is the case for most streets intersecting Fulton Street, Duffield and Elm Streets do not directly intersect and traffic must negotiate an off-set intersection when crossing the Fulton Mall.

**Albee Square West** is a 36-foot-wide street connecting DeKalb Avenue and Fulton Street to Willoughby Street. It is one-way northbound except for a short segment at its northern end where it is striped for two-way operation to provide access from the north to parking facilities located along this block, including a 454-space parking garage. Traffic can reach Albee Square West from either westbound DeKalb Avenue (see below) or northbound **Bond Street**, a 24-foot-wide local access street running from the Gowanus Canal to Fulton Street. As Albee Square West and Bond Street do not directly intersect, through-traffic must negotiate a short segment of DeKalb Avenue to travel between the two.

North of Willoughby Street, Albee Square West becomes **Gold Street**, a 36-foot-wide street running from the waterfront to Willoughby Street. Within the study area, it operates southbound from Tillary Street to Tech Place, northbound from Tech Place to Flatbush Avenue Extension, and southbound again from Flatbush Avenue Extension to Willoughby Street. The segment between the southbound Flatbush Avenue Extension Service Road and Willoughby Street functions primarily as an access road for the service entrance for the adjacent 4 MetroTech Center (Chase Manhattan Bank) and for parking facilities south of Willoughby Street. It was until recently used by B54 buses which had been diverted due to the closure of the MetroTech Service Road to general traffic (see below).

*East-West Streets*

The two major east-west routes within the study area are **Tillary Street** to the north and **Atlantic Avenue** to the south. Both provide access to and from the Brooklyn-Queens Expressway (BQE) and collect and distribute traffic between the major north-south roadways and BQE on- and off-ramps. Tillary Street, running along the northern boundary of the study area, connects the BQE to Cadman Plaza West. It typically has four lanes in each direction, including left-turn lanes, and carries from 1,700 to 2,200 vph in the peak periods between Adams and Jay Streets. Atlantic Avenue, along the study area's southern boundary, typically operates with two travel lanes plus a parking lane in each direction west of Flatbush Avenue. In peak periods, curbside parking is restricted at most locations. During peak periods, traffic volumes on Atlantic Avenue typically range from 2,000 to 2,600 vph between Smith Street and Boerum Place.

Four streets parallel Atlantic Avenue to the north, State Street, Schermerhorn Street, Livingston Street and Fulton Street. **State Street** is a 30-foot-wide eastbound street providing local access to adjacent residential land uses. It typically operates with one moving lane plus parking. **Schermerhorn Street** is 50 feet wide and typically operates with one moving lane plus parking in each direction between Flatbush Avenue and Smith Street. At Flatbush Avenue, northbound traffic is prohibited from turning onto Schermerhorn Street. West of Smith Street, Schermerhorn Street narrows to approximately 38 feet in width and operates one-way westbound. Two-way peak period traffic volumes along Schermerhorn Street between Hoyt and Smith Streets typically range from 350 to 700 vph. **Livingston Street** also operates two-way within the study area. It is 50 feet wide and typically operates with one moving lane in each direction. Both curb lanes function as exclusive bus lanes, with the north (westbound) curb lane restricted to buses during the 7 to 10 AM peak period and the south (eastbound) curb lane similarly restricted during the 4 to 7 PM period. Two-way peak period traffic volumes between Smith Street and Boerum Place typically range from 600 to 850 vph.

**Fulton Street**, with numerous adjacent retail uses, was reconstructed in 1985 as a transit and pedestrian mall running from Adams Street to Flatbush Avenue. The street, renamed the **Fulton**

**Street Mall**, was narrowed to a single 12-foot-wide travel lane in each direction to allow for expanded sidewalks on which bus shelter canopies and decorative street furniture have been installed. These sidewalks carry substantial pedestrian flows associated with the mall's retail activity. Through traffic is restricted to NYC transit buses, with nine routes traversing all or part of the mall. Some access by service and delivery vehicles is also permitted. Intersections with principal cross-streets are signalized, including those at Flatbush Avenue, Jay Street, and Adams Street. As most streets intersecting Fulton Street do not directly intersect, north-south traffic must negotiate off-set intersections when crossing the Fulton Mall.

**Willoughby Street**, which runs from St. Edwards Street to Adams Street, would be the principal access route for three of the projected office development sites. It also functions as the only westbound through route between Livingston and Tillary Streets. West of Flatbush Avenue Extension, Willoughby Street is typically 40 feet wide, while to the east of Flatbush Avenue Extension it ranges from is 30 to 50 feet in width. Willoughby Street operates one-way westbound except for the segment between Flatbush Avenue Extension and Duffield Street, and the block between Jay and Pearl Streets, both of which are bi-directional, and the block between Ashland Place and St. Edwards Street which is one-way eastbound. Willoughby Street typically operates with one moving lane per direction plus parking, with peak hour volumes ranging from 300 to 400 vph on the westbound segment between Duffield and Bridge Streets.

Paralleling Willoughby Street to the north is the **MetroTech Service Road** which operates beneath One, Two and Three MetroTech Center between Duffield and Jay Streets. The roadway is bi-directional and provides access to parking and loading facilities in these three buildings. Due to security concerns after September 11, 2001, the MetroTech Service Road was closed to general traffic, and the B54 buses which previously used it for access to Jay Street instead terminated their runs on the Flatbush Avenue Service Road at Flatbush Court. (As discussed in Chapter 15, "Transit and Pedestrians," in September 2003, B54 buses were again extended to Jay Street on a new route via DeKalb Avenue and Fulton Street.)Vehicles en route to the Service Road are screened at a security checkpoint on Flatbush Court. On the east side of Flatbush Avenue Extension opposite Flatbush Court is **Myrtle Avenue**, a 42-foot-wide two-way street that, prior to the development of MetroTech, continued westward as far as Jay Street. Myrtle Avenue typically operates with one moving lane plus parking in each direction. Peak hour two-way volumes west of Navy Street typically range from 600 to 950 vph.

The remaining east-west street within the study area is **Johnson Street/Tech Place** which runs between Cadman Plaza West and Prince Street. This local access street operates one-way eastbound from Adams Street to Jay Street, two-way between Jay and Bridge Streets, and one-way eastbound from Bridge Street to Flatbush Avenue Extension. The segments west of Adams Street and east of Flatbush Avenue Extension are both one-way westbound. The street is approximately 30 feet in width and typically operates with one moving lane in each direction of travel. Due to security concerns related to the Fire Department Headquarters located at 9 MetroTech North, this roadway is presently closed to through-traffic east of Jay Street. Peak hour volumes between Adams and Jay Streets typically range from 80 to 105 vph.

The remaining streets in the study area provide local circulation and access. Most of these local streets are discontinuous within the network.

*Bicycle Facilities*

Within the study area, on-street bicycle lanes are provided along Adams Street from Livingston Street to the Brooklyn Bridge entrance at Tillary Street. A dedicated shared bicycle/pedestrian promenade along the center of the bridge provides access to and from Manhattan. A walkway/bikeway is also provided on the south side of the Manhattan Bridge with access via a stairway at Jay and Sands Streets. To the west of the study area, on-street bike lanes are provided along Clinton Street (northbound) and Henry Street (southbound). In addition to these facilities, a number streets within the study area are recommended for use by bicyclists under the City's *Bicycle Network Development* program. Recommended routes include Ashland Place (between DeKalb and Myrtle Avenues), DeKalb Avenue (east of Ashland Place), Myrtle Avenue, Jay Street (north of Myrtle Avenue), Boerum Place, and Joralemon Street (west of Adams Street).

*INTERSECTION CAPACITY ANALYSES*

The capacity analyses at study area intersections are based on the methodology presented in the *Highway Capacity Manual (HCM) Software 2000 Release 4.1c.* Traffic data required for these analyses include volumes on each approach and various other physical and operational characteristics. Signal timing plans for each signalized intersection were obtained from the New York City Department of Transportation (NYCDOT). Field inventories were conducted to document curbside parking regulations, vehicle classifications, shared lane usage, and other relevant characteristics needed for the analysis.

The HCM methodology provides a volume-to-capacity (v/c) ratio for each signalized intersection approach. The v/c ratio represents the ratio of traffic volumes on an approach to the approach's carrying capacity. A ratio of less than 0.90 is generally considered to be non-congested conditions in dense urban areas; when higher than this value, congestion increases. At a v/c ratio of between 0.95 and 1.0, near-capacity conditions are reached and delays can become substantial. Ratios of greater than 1.0 indicate saturated conditions with queuing.

The HCM methodology also expresses quality of flow in terms of level of service (LOS), which is based on the amount of delay that a driver typically experiences at an intersection. Levels of service range from A, with minimal delay (10 seconds or less per vehicle), to F, which represents long delays (greater than 80 seconds per vehicle).

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

Table 14-1 shows the LOS/delay relationship for signalized and unsignalized intersections using the HCM methodology. Levels of service A, B and C generally represent highly favorable to fair

**Table 14-1**
**Roadway Level of Service Criteria**

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

**Source:** *2000 Highway Capacity Manual*

levels of traffic flow; at LOS D the influence of congestion becomes noticeable; LOS E is considered to be the limit of acceptable delay; and LOS F is considered to be unacceptable to most drivers. In this study, a signalized lane grouping operating at LOS E or F or a v/c ratio of 0.90 or above is identified as congested. For unsignalized intersections, a movement with LOS E or worse is also identified as congested.

Table 14-2 shows the results of the capacity analysis at study area intersections in the three peak hours analyzed. The table highlights those intersection movements that operate at LOS E or F and/or have a high v/c ratio (generally above 0.90 and above). Table 14-2 shows that 20 of the 29 signalized intersections analyzed, and one of the two unsignalized intersections analyzed, have at least one congested movement in one or more peak hours. As shown in the table, 17 analyzed intersections experience congestion during the weekday AM peak hour, 9 during the midday peak hour, and 15 in the PM peak hour.

The following provides more details for each congested intersection by corridor.

*Atlantic Avenue*

Within the study area, the Atlantic Avenue corridor experiences congestion in one or more peak hours at Flatbush and Fourth Avenues, Bond, Hoyt and Smith Streets, and Boerum Place. At Flatbush Avenue, the westbound through-movement is congested in the AM, while the westbound approaches at Bond, Hoyt and Smith Streets and Boerum Place are all congested in the AM peak hour. In the eastbound direction, Atlantic Avenue is congested approaching Fourth Avenue in the midday peak hour and approaching Bond Street in the AM. Congestion is also evident on the eastbound left-turn at Boerum Place in the PM peak hour. Northbound Smith Street is congested in the PM, while the southbound left-turn at Smith Street is congested in all peak periods. The northbound right-turn on Fourth Avenue is congested in the midday and PM while the northbound left-turn is congested in all periods.

**Table 14-2**
**Existing Traffic Conditions**

| SIGNALIZED INTERSECTION | Lane Group | EXISTING | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | | MD Peak Hour | | | | PM Peak Hour | | | |
| | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | |
| Tillary Street (E-W) @ | EB-L | 0.59 | 53.6 | D | | 0.38 | 47.6 | D | | 0.40 | 48.3 | D | |
| Flatbush Avenue (N-S) @ | EB-TR | 0.71 | 40.2 | D | | 0.70 | 40.5 | D | | 0.63 | 45.5 | D | |
| | EB-R | 0.72 | 51.1 | D | | 0.76 | 55.0 | D | | 0.71 | 51.7 | D | |
| | WB-L | 0.99 | 85.6 | F | * | 0.61 | 51.1 | D | | 0.97 | 80.8 | F | * |
| | WB-T | 0.73 | 42.5 | D | | 0.51 | 36.8 | D | | 1.00 | 71.7 | E | * |
| | WB-R | 1.01 | 91.2 | F | * | 0.80 | 57.5 | E | * | 0.56 | 43.4 | D | |
| | NB-L | 0.77 | 47.1 | D | | 0.92 | 63.5 | E | * | 0.69 | 45.8 | D | |
| | NB-T | 0.54 | 23.7 | C | | 0.40 | 21.6 | C | | 0.43 | 22.0 | C | |
| | SB-T | 0.50 | 33.8 | C | | 0.51 | 34.1 | C | | 1.00 | 65.5 | E | * |
| | SB-R | 0.21 | 32.4 | C | | 0.40 | 36.3 | D | | 0.49 | 38.6 | D | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.04 | 127.3 | F | * | 0.66 | 53.8 | D | | 1.02 | 113.8 | F | * |
| Flatbush Avenue (N-S) @ | EB-TR | 0.42 | 39.2 | D | | 0.33 | 37.2 | D | | 0.37 | 37.6 | D | |
| | WB-LTR | 0.80 | 51.1 | D | | 0.54 | 40.7 | D | | 0.57 | 41.6 | D | |
| | NB-L | 0.74 | 54.9 | D | | 0.16 | 17.8 | B | | 0.95 | 112.6 | F | * |
| | NB-TR | 0.96 | 34.8 | C | * | 1.02 | 52.9 | D | * | 0.72 | 19.6 | B | |
| | SB-L | 0.92 | 84.7 | F | * | 0.75 | 56.8 | E | * | 1.01 | 84.9 | F | * |
| | SB-TR | 0.64 | 7.5 | A | | 0.49 | 5.9 | A | | 0.75 | 9.1 | A | |
| Willoughby Street (E-W) @ | EB-L | 1.02 | 121.3 | F | * | 0.87 | 77.1 | E | * | 1.04 | 113.6 | F | * |
| Flatbush Avenue (N-S) @ | EB-R | 0.25 | 27.5 | C | | 0.40 | 28.3 | C | | 0.73 | 45.2 | D | |
| | WB-LT | 0.68 | 50.7 | D | | 0.27 | 36.6 | D | | 0.25 | 37.6 | D | |
| | WB-R | 0.27 | 38.2 | D | | 0.17 | 34.9 | C | | 0.22 | 37.3 | D | |
| | NB-L | 0.73 | 30.9 | C | | 0.47 | 15.2 | B | | 0.77 | 46.5 | D | |
| | NB-T | 0.71 | 14.3 | B | | 0.52 | 5.6 | A | | 0.50 | 4.5 | A | |
| | SB-TR | 0.66 | 21.5 | C | | 0.59 | 16.9 | B | | 0.81 | 19.1 | B | |
| DeKalb Avenue (E-W) @ | WB-L | 0.42 | 37.7 | D | | 0.81 | 58.8 | E | * | 0.77 | 52.5 | D | |
| Flatbush Avenue (N-S) @ | WB-LT | 0.47 | 38.4 | D | | 0.53 | 40.5 | D | | 0.49 | 39.3 | D | |
| | WB-R | 1.01 | 92.6 | F | * | 0.73 | 53.6 | D | | 0.72 | 50.4 | D | |
| | NB-T | 0.87 | 29.0 | C | | 0.63 | 20.7 | C | | 0.63 | 20.5 | C | |
| | SB-TR | 0.69 | 22.0 | C | | 0.64 | 20.8 | C | | 1.01 | 48.5 | D | * |
| Livingston Street (E-W) @ | EB-R | 0.37 | 31.8 | C | | 0.45 | 33.3 | C | | 0.54 | 35.4 | D | |
| Flatbush Avenue (N-S) | NB-L | 0.78 | 29.7 | C | | 0.51 | 8.2 | A | | 0.76 | 39.5 | D | |
| | NB-T | 0.42 | 0.5 | A | | 0.31 | 0.4 | A | | 0.28 | 0.3 | A | |
| | SB-TR | 0.47 | 15.0 | B | | 0.45 | 9.3 | A | | 0.75 | 13.5 | B | |
| Lafayette Avenue/ | EB-LT | 0.49 | 29.1 | C | | 0.39 | 26.0 | C | | 0.71 | 34.5 | C | |
| Schermerhorn Street (E-W) @ | WB-TR | 0.73 | 55.9 | E | * | 0.46 | 47.3 | D | | 0.74 | 55.7 | E | * |
| Flatbush Avenue (N-S) | NB-TR | 1.04 | 65.5 | E | * | 0.96 | 46.6 | D | * | 0.96 | 46.9 | D | * |
| | SB-L | 0.79 | 69.4 | E | * | 0.66 | 58.2 | E | * | 0.97 | 98.3 | F | * |
| | SB-T | 0.51 | 14.3 | B | | 0.51 | 14.3 | B | | 0.79 | 19.8 | B | |
| Fourth Ave/Hanson Pl. (E-W)@ | EB-LT | 0.68 | 40.7 | D | | 0.29 | 30.1 | C | | 0.45 | 35.8 | D | |
| Flatbush Avenue (N-S) | NB-T | 0.51 | 11.8 | B | | 0.61 | 16.5 | B | | 0.54 | 12.1 | B | |
| | NB-R | 0.52 | 14.4 | B | | 0.26 | 13.2 | B | | 0.31 | 10.9 | B | |
| | SB-T | 0.56 | 12.9 | B | | 0.70 | 19.3 | B | | 0.84 | 20.1 | C | |
| | SB-R | 0.45 | 17.9 | B | | 0.52 | 22.6 | C | | 0.96 | 52.1 | D | * |
| Atlantic Avenue (E-W) @ | EB-T | 0.70 | 41.4 | D | | 0.67 | 37.0 | D | | 0.78 | 37.7 | D | |
| Flatbush Avenue (N-S) | EB-R | 0.60 | 45.9 | D | | 0.66 | 43.8 | D | | 0.58 | 36.6 | D | |
| | WB-T | 1.04 | 83.1 | F | * | 0.80 | 43.5 | D | | 0.84 | 42.9 | D | |
| | WB-R | 0.57 | 40.6 | D | | 0.60 | 37.7 | D | | 0.51 | 32.3 | C | |
| | NB-LTR | 0.77 | 23.3 | C | | 0.50 | 19.8 | B | | 0.57 | 18.7 | B | |
| | SB-LTR | 0.42 | 16.0 | B | | 0.52 | 20.1 | C | | 0.70 | 21.5 | C | |

## Table 14-2 (Continued)
### Existing Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | EXISTING AM Peak Hour V/C Ratio | AM Delay (sec.) | AM LOS | | MD Peak Hour V/C Ratio | MD Delay (sec.) | MD LOS | | PM Peak Hour V/C Ratio | PM Delay (sec.) | PM LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jay Street (N-S) @ | EB-L | 0.40 | 31.4 | C | | 0.24 | 24.8 | C | | 0.61 | 54.0 | D | |
| Tillary Street (E-W) | EB-TR | 0.58 | 26.3 | C | | 0.55 | 25.7 | C | | 0.58 | 26.2 | C | |
| | WB-L | 0.73 | 51.0 | D | | 0.51 | 35.8 | D | | 0.80 | 57.6 | E | * |
| | WB-TR | 0.52 | 16.3 | B | | 0.47 | 15.5 | B | | 0.63 | 18.5 | B | |
| | NB-L | 0.15 | 25.7 | C | | 0.18 | 26.1 | C | | 0.17 | 26.0 | C | |
| | NB-TR | 0.69 | 35.6 | D | | 0.42 | 29.3 | C | | 0.59 | 32.7 | C | |
| | SB-L | 0.27 | 30.3 | C | | 0.24 | 27.9 | C | | 0.36 | 32.1 | C | |
| | SB-TR | 0.13 | 25.0 | C | | 0.12 | 24.8 | C | | 0.23 | 26.2 | C | |
| Adams Street (N-S) (Service)@ | EB-L | 1.02 | 108.5 | F | * | 0.73 | 64.4 | E | * | 0.94 | 88.6 | F | * |
| Tillary Street (E-W) | EB-TR | 0.50 | 32.3 | C | | 0.49 | 32.1 | C | | 0.54 | 33.5 | C | |
| | WB-L | 0.92 | 108.4 | F | * | 0.93 | 102.9 | F | * | 1.01 | 118.3 | F | * |
| | WB-T | 0.48 | 46.7 | D | | 0.51 | 47.0 | D | | 0.55 | 48.0 | D | |
| | WB-R | 1.04 | 101.5 | F | * | 0.88 | 67.4 | E | * | 1.01 | 88.5 | F | * |
| | NB-TR | 0.19 | 24.2 | C | | 0.34 | 26.3 | C | | 0.30 | 25.7 | C | |
| | SB-TR | 0.25 | 21.1 | C | | 0.25 | 21.1 | C | | 0.97 | 61.7 | E | * |
| Adams Street (N-S) (Main) | NB-L | 0.22 | 51.3 | D | | 0.30 | 53.2 | D | | 0.35 | 54.6 | D | |
| | NB-T | 0.67 | 32.6 | C | | 0.38 | 26.7 | C | | 0.52 | 29.1 | C | |
| | SB-L | 0.96 | 77.4 | E | * | 0.95 | 76.1 | E | * | 0.97 | 80.3 | F | * |
| | SB-T | 0.98 | 60.1 | E | * | 0.85 | 40.5 | D | | 1.03 | 71.4 | E | * |
| Ashland Place (N-S) @ | EB-LT | 0.33 | 8.1 | A | | 0.22 | 7.1 | A | | 0.42 | 9.0 | A | |
| Myrtle Avenue (E-W) | EB-R | 0.13 | 6.6 | A | | 0.13 | 6.6 | A | | 0.17 | 6.8 | A | |
| | WB-LTR | 0.80 | 20.0 | B | | 0.35 | 8.3 | A | | 0.69 | 16.1 | B | |
| | NB-LTR | 1.00 | 76.5 | E | * | 0.69 | 39.4 | D | | 0.94 | 65.3 | E | * |
| | SB-LTR | 0.88 | 52.4 | D | | 0.70 | 37.6 | D | | 1.02 | 77.3 | E | * |
| Prince Street (NB) @ | EB-LT | 0.61 | 26.8 | C | | 0.42 | 21.1 | C | | 0.89 | 44.7 | D | |
| Myrtle Avenue (E-W) | WB-TR | 0.90 | 46.3 | D | * | 0.59 | 25.5 | C | | 0.64 | 27.3 | C | |
| | NB-LTR | 0.74 | 38.9 | D | | 0.76 | 40.7 | D | | 0.68 | 35.8 | D | |
| Gold St/Albee Square West (N-S) @ | EB-TR | 0.10 | 30.7 | C | | 0.17 | 31.9 | C | | 0.29 | 33.8 | C | |
| Willoughby Street (E-W) | WB-LT | 0.47 | 25.4 | C | | 0.33 | 22.6 | C | | 0.30 | 22.2 | C | |
| | NB-L | 0.18 | 20.7 | C | | 0.27 | 22.2 | C | | 0.20 | 20.9 | C | |
| | NB-R | 0.24 | 21.4 | C | | 0.48 | 26.3 | C | | 0.62 | 30.5 | C | |
| | SB-L | 0.18 | 20.5 | C | | 0.10 | 19.3 | B | | 0.12 | 19.6 | B | |
| | SB-TR | 0.12 | 19.7 | B | | 0.21 | 21.3 | C | | 0.17 | 20.4 | C | |
| Bridge Street (SB) @ Willoughby Street (E-W) | WB-LT | 0.63 | 15.2 | B | | 0.76 | 20.6 | C | | 0.68 | 17.2 | B | |
| Jay Street (N-S) @ | EB-LR | 0.05 | 20.2 | C | | 0.09 | 19.8 | B | | 0.07 | 19.5 | B | |
| Willoughby Street (E-W) | WB-LTR | 0.66 | 34.3 | C | | 1.01 | 81.4 | F | * | 0.69 | 35.5 | D | |
| | NB-LT | 0.49 | 14.3 | B | | 0.24 | 11.4 | B | | 0.34 | 12.3 | B | |
| | SB-TR | 0.30 | 11.9 | B | | 0.28 | 11.7 | B | | 0.37 | 12.6 | B | |
| Bond Street (NB) @ | EB-LT | 0.53 | 11.7 | B | | 0.70 | 14.5 | B | | 0.62 | 10.5 | B | |
| Livingston Street (E-W) | WB-TR | 0.74 | 17.9 | B | | 0.75 | 16.3 | B | | 0.80 | 17.9 | B | |
| | NB-LTR | 0.65 | 23.7 | C | | 0.55 | 21.4 | C | | 0.71 | 26.6 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.67 | 14.3 | B | | 0.69 | 14.1 | B | | 0.62 | 10.5 | B | |
| Livingston Street (E-W) | WB-LT | 0.55 | 12.1 | B | | 0.83 | 21.6 | C | | 0.67 | 12.1 | B | |
| | SB-LTR | 0.21 | 15.3 | B | | 0.33 | 16.8 | B | | 0.51 | 18.9 | B | |

## Table 14-2 (Continued)
### Existing Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | EXISTING AM Peak Hour V/C Ratio | AM Delay (sec.) | AM LOS | | MD Peak Hour V/C Ratio | MD Delay (sec.) | MD LOS | | PM Peak Hour V/C Ratio | PM Delay (sec.) | PM LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Smith Street (N-S) @ | EB-LTR | 0.62 | 16.3 | B | | 0.38 | 13.0 | B | | 0.51 | 14.6 | B | |
| Livingston Street (E-W) | WB-LTR | 0.37 | 12.8 | B | | 0.44 | 13.6 | B | | 0.51 | 14.7 | B | |
| | NB-LTR | 0.62 | 16.0 | B | | 0.28 | 11.9 | B | | 0.57 | 15.4 | B | |
| | SB-LTR | 0.49 | 14.3 | B | | 0.51 | 14.6 | B | | 0.72 | 19.5 | B | |
| Boerum Place (N-S) @ | EB-LT | 0.63 | 43.9 | D | | 0.65 | 47.3 | D | | 0.98 | 89.3 | F | * |
| Livingston Street (E-W) | EB-R | 0.10 | 30.9 | C | | 0.20 | 32.6 | C | | 0.00 | 29.4 | C | |
| | WB-LTR | 0.45 | 36.1 | D | | 0.54 | 38.3 | D | | 0.62 | 41.0 | D | |
| | NB-L | 0.30 | 24.2 | C | | 0.28 | 23.4 | C | | 0.36 | 29.8 | C | |
| | NB-TR | 0.74 | 29.8 | C | | 0.44 | 23.4 | C | | 0.54 | 25.1 | C | |
| | SB-L | 0.86 | 62.3 | E | * | 0.49 | 17.1 | B | | 0.61 | 22.9 | C | |
| | SB-TR | 0.34 | 12.4 | B | | 0.29 | 11.9 | B | | 0.60 | 16.1 | B | |
| Bond Street (NB) @ | EB-LT | 0.20 | 10.2 | B | | 0.34 | 11.6 | B | | 0.63 | 16.0 | B | |
| Schermerhorn Street (E-W) | WB-TR | 0.50 | 13.7 | B | | 0.36 | 11.8 | B | | 0.45 | 13.0 | B | |
| | NB-LTR | 0.90 | 37.7 | D | * | 0.60 | 19.3 | B | | 0.76 | 25.6 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.19 | 7.9 | A | | 0.23 | 8.2 | A | | 0.37 | 9.4 | A | |
| Schermerhorn Street (E-W) | WB-LT | 0.66 | 15.4 | B | | 0.43 | 10.9 | B | | 0.68 | 16.9 | B | |
| | SB-LTR | 0.30 | 16.2 | B | | 0.43 | 17.9 | B | | 0.73 | 25.5 | C | |
| Fourth Ave (N-S) @ | EB-TR | 0.52 | 24.9 | C | | 0.92 | 52.7 | D | * | 0.72 | 30.7 | C | |
| Atlantic Avenue (E-W) | WB-TR | 0.89 | 40.0 | D | | 0.89 | 53.0 | D | | 0.73 | 32.0 | C | |
| | NB-L | 0.96 | 81.5 | F | * | 0.96 | 102.9 | F | * | 0.93 | 90.3 | F | * |
| | NB-T | 0.67 | 39.6 | D | | 0.42 | 42.7 | D | | 0.46 | 38.8 | D | |
| | NB-R | 0.63 | 46.9 | D | | 0.95 | 99.7 | F | * | 1.02 | 105.2 | F | * |
| | SB-T | 0.15 | 17.0 | B | | 0.14 | 9.0 | B | | 0.38 | 18.7 | B | |
| | SB-R | 0.12 | 17.0 | B | | 0.08 | 8.7 | B | | 0.09 | 15.6 | B | |
| Bond Street (NB) @ | EB-LT | 1.04 | 67.1 | E | * | 0.83 | 19.8 | B | | 0.71 | 19.9 | B | |
| Atlantic Avenue (E-W) | WB-TR | 0.93 | 35.7 | D | * | 0.60 | 12.3 | B | | 0.64 | 18.4 | B | |
| | NB-LTR | 0.64 | 35.4 | D | | 0.44 | 28.8 | C | | 0.45 | 33.1 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.65 | 20.7 | C | | 0.67 | 13.6 | B | | 0.68 | 18.9 | B | |
| Atlantic Avenue (E-W) | WB-LT | 1.03 | 57.7 | E | * | 0.62 | 12.7 | B | | 0.69 | 19.8 | B | |
| | SB-LTR | 0.37 | 30.6 | C | | 0.61 | 35.3 | D | | 0.70 | 42.5 | D | |
| Smith Street (N-S) @ | EB-LT | 0.62 | 20.0 | B | | 0.62 | 18.0 | B | | 0.86 | 26.8 | C | |
| Atlantic Avenue (E-W) | WB-TR | 1.02 | 55.9 | E | * | 0.69 | 20.0 | B | | 0.73 | 21.1 | C | |
| | NB-LTR | 0.75 | 38.3 | D | | 0.44 | 32.5 | C | | 0.98 | 73.7 | E | * |
| | SB-L | 0.93 | 98.4 | F | * | 0.88 | 77.5 | E | * | 0.97 | 87.0 | F | * |
| | SB-R | 0.33 | 30.9 | C | | 0.44 | 35.4 | D | | 0.57 | 39.8 | D | |
| Boerum Place (N-S) @ | EB-DfL | 0.76 | 51.9 | D | | 0.61 | 37.5 | D | | 0.91 | 76.5 | E | * |
| Atlantic Avenue (E-W) | EB-TR | 0.39 | 17.5 | B | | 0.55 | 19.8 | B | | 0.56 | 25.2 | C | |
| | WB-LT | 0.99 | 70.1 | E | * | 0.87 | 42.9 | D | | 0.86 | 50.9 | D | |
| | WB-R | 0.33 | 6.4 | A | | 0.28 | 3.2 | A | | 0.26 | 3.5 | A | |
| | SB-L | 0.39 | 27.2 | C | | 0.32 | 16.9 | B | | 0.66 | 27.8 | C | |
| | WB-TR | 0.39 | 27.3 | C | | 0.32 | 16.9 | B | | 0.48 | 24.0 | C | |

## Table 14-2 (Continued)
### Existing Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | EXISTING AM Peak Hour V/C Ratio | AM Delay (sec.) | AM LOS | | MD Peak Hour V/C Ratio | MD Delay (sec.) | MD LOS | PM Peak Hour V/C Ratio | PM Delay (sec.) | PM LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jay Street (N-S) @ | EB-LTR | 0.27 | 23.1 | C | | 0.24 | 23.0 | C | 0.25 | 23.0 | C | |
| Tech Place (E-W) | WB-LR | 0.11 | 21.0 | C | | 0.34 | 24.4 | C | 0.17 | 21.9 | C | |
| | NB-TR | 0.51 | 14.5 | B | | 0.65 | 19.4 | B | 0.73 | 21.3 | C | |
| | SB-LT | 0.31 | 12.1 | B | | 0.48 | 15.5 | B | 0.60 | 17.4 | B | |
| Smith Street (N-S) @ | WB-LTR | 0.4 | 13.5 | B | | 0.38 | 13.4 | B | 0.58 | 16.5 | B | |
| Schermerhorn (E-W) | NB-LTR | 0.69 | 17.6 | B | | 0.72 | 23.1 | C | 0.67 | 17.8 | B | |
| | SB-LTR | 0.74 | 24.6 | C | | 0.68 | 21.5 | C | 0.70 | 19.2 | B | |
| Fulton Street (E-W) @ | EB-LTR | 0.17 | 36.4 | D | | 0.21 | 36.2 | D | 0.18 | 37.3 | D | |
| Flatbush Avenue (N-S) | WB-LT | 0.52 | 46.3 | D | | 0.42 | 41.6 | D | 0.73 | 60.0 | E | * |
| | WB-R | 0.40 | 24.7 | C | | 0.23 | 18.0 | B | 0.32 | 20.7 | C | |
| | NB-TR | 1.02 | 62.4 | E | * | 0.88 | 44.2 | D | 0.80 | 38.2 | D | |
| | SB-L | 0.82 | 61.0 | E | * | 0.67 | 44.2 | D | 0.75 | 39.5 | D | |
| | SB-T | 0.87 | 26.6 | C | | 0.84 | 25.0 | C | 0.79 | 19.9 | B | |

| UNSIGNALIZED INTERSECTION | Lane Group | EXISTING AM (8-9) V/C Ratio | AM Delay (sec.) | AM LOS | | MD (12-1) V/C Ratio | MD Delay (sec.) | MD LOS | PM (5-6) V/C Ratio | PM Delay (sec.) | PM LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Duffield Street (N-S) @ | NB-LR | 0.16 | 16.4 | C | | 0.3 | 19.4 | C | 0.42 | 20.5 | D | |
| Willoughby Street (E-W) | SB-LR | 0.04 | 21.1 | D | | 0.05 | 22.8 | D | 0.08 | 36.3 | E | * |
| (Two-Way Stop Control) | | | | | | | | | | | | |
| Lawrence Street (N-S) @ | WB-TR | - | 8.2 | A | | - | 8.8 | A | - | 8.2 | A | |
| Willoughby Street (E-W) | NB-LR | - | 7.8 | A | | - | 8.2 | A | - | 7.9 | A | |
| (All-Way Stop Control) | | | | | | | | | | | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Congested Intersections ( LOS E or F, or V/C / 0.9)

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

*Flatbush Avenue*

This corridor experiences congestion in one or more peak hours at Tillary Street, Myrtle Avenue, Willoughby Street, DeKalb Avenue, Fulton Street, Schermerhorn Street/Lafayette Avenue and Fourth Avenue/Hanson Place. At Tillary Street, turning movements are problematic, with the northbound left-turn, and westbound left- and right-turns experiencing congestion in one or more peak hours. In the PM peak hour, congestion also occurs on the westbound and southbound through movements. At Myrtle Avenue, the northbound, southbound and eastbound left-turns are congested in one or more peak periods, as is the northbound through-movement. At Willoughby Street, the eastbound left-turn is problematic, with LOS E or F conditions in all peak periods. At DeKalb Avenue, it is the westbound left-turn that is congested (in the midday). The westbound right-turn at this intersection is also congested in the AM, as is the southbound approach in the PM peak hour. One block to the south at Fulton Street, the northbound approach and southbound left-turn are congested in the AM, and the westbound approach is congested in the PM peak period. At Schermerhorn Street/Lafayette Avenue, the northbound Flatbush Avenue approach is congested in all peak hours as is the southbound left-turn. The westbound Schermerhorn Street approach is also congested in the AM and PM peak periods. Lastly, at Fourth Avenue/Hanson Place, the southbound right-turn movement is congested in the PM peak hour.

*Tillary Street*

In addition to the congested movements at Flatbush Avenue Extension discussed above, the intersections of Tillary Street with Jay Street and with Adams Street also experience congested conditions. At Jay Street, the westbound left-turn from Tillary Street onto Jay Street is congested in the PM peak hour. At Adams Street, the eastbound and westbound left-turns and westbound right-turn all operate at LOS E or F in all peak periods. Southbound Adams Street also experiences congestion in all periods, with the southbound service road congested in the PM, the southbound mainline through-movement congested in the AM and PM, and the southbound left-turn congested in all peak periods. In addition, queues at the neckdown leading to the Brooklyn Bridge periodically spill-back onto Adams Street south of Tillary Street, resulting in a low utilization of the available signal green time for that northbound through movement.

*Willoughby Street*

Willoughby Street west of Flatbush Avenue Extension would provide access to much of the commercial office development that would occur with the proposed actions. As described above, the eastbound left-turn movement from Willoughby Street onto Flatbush Avenue Extension experiences congestion in all peak periods. With the exception of the westbound approach to Jay Street which operates at LOS F in the midday, all other movements at signalized intersections along this corridor currently operate at LOS D or better with v/c ratios of less than 0.90 in all peak periods. Both the northbound and westbound approaches at the unsignalized (all-way stop control) intersection of Willoughby Street with Lawrence Street currently operate at LOS A in all periods. However, the approximately ten vehicles per hour using the unsignalized southbound Duffield Street approach to Willoughby Street experience some delay in the PM peak hour (LOS E). Otherwise, both the northbound and southbound stop-controlled approaches at this intersection operate at LOS D or better in all peak hours. Although not reflected in the capacity analysis, field observations suggest that heavy curbside activity,

including double parking, along Willoughby Street west of Albee Square West/Gold Street often constricts flow along the corridor resulting in queuing, especially in the PM peak period.

*Other Corridors*

Other study area intersections experiencing congestion under existing conditions include two along Myrtle Avenue. At Prince Street, westbound Myrtle Avenue is congested in the AM peak hour. At Ashland Place, the southbound approach is congested at Myrtle Avenue in the PM peak hour, while the northbound approach is congested in both the AM and PM. At the intersection of Boerum Place with Livingston Street, the southbound left-turn movement from Boerum Place is congested in the AM peak hour, while the eastbound approach is congested in the PM. Lastly, northbound Bond Street is congested at Schermerhorn Street in the AM peak hour.

Overall, under existing conditions, 17 analyzed intersections experience congestion during the weekday AM peak hour, nine during the midday peak hour, and 15 in the PM peak hour. The number of signalized intersections with one or more movements with a v/c ratio of 1.00 or greater total twelve in the AM peak hour, two in the midday, and seven in the PM.

*ACCIDENT HISTORY*

Annual motor vehicle accidents at nine key study area intersections are shown in Table 14-3. These intersections were identified as experiencing the highest number of accidents over a 3-year period from 2000 through 2002 based on a review of NYCDOT and NYSDOT data. Accidents listed in the table are classified as either non-reportable (involving less than $1,000 in property damage and no injuries or fatalities) or reportable. The numbers of vehicle occupants, bicyclists and pedestrians killed or injured are also shown, as is the average annual number of pedestrians and bicyclists killed or injured over the three year period. As shown in Table 14-3, five of the nine intersections with the highest numbers of accidents are along Flatbush Avenue from Tillary Street to DeKalb Avenue. The intersection with the highest overall number of accidents is Flatbush Avenue Extension and Tillary Street, with a total of 164 accidents in 2000 (reportable and non-reportable, combined), 144 in 2001 and 137 in 2002. This intersection also has the highest number of vehicle occupants killed or injured, with 51 in 2000, 39 in 2001 and 36 in 2002. The intersection of Adams and Tillary Streets has the second highest overall number of accidents, with 115 in 2000, 93 in 2001 and 105 in 2002. Both the Flatbush Avenue Extension/Tillary Street intersection and the Adams Street/Tillary Street intersection function as gateway intersections to East River crossings (the Manhattan Bridge and Brooklyn Bridge, respectively).

The intersection with the highest number of pedestrians and bicyclists killed or injured is Flatbush Avenue Extension and Willoughby Street. At this intersection, which would serve as a gateway to the projected commercial developments along Willoughby Street, an average of seven pedestrians or bicyclists were killed or injured per year from 2000 through 2002. A review of accident data indicates that at this location, typically half of all accidents resulting in injuries or fatalities to pedestrians or bicyclists involved turning vehicles, with failure to yield the right-of-way to pedestrians often cited as a factor. The remaining accidents generally involved vehicles traveling straight ahead along Flatbush Avenue Extension (more often northbound than southbound), with wet road conditions, unsafe speeds and driver inattention often cited as causal factors.

One block to the north, the intersection of Flatbush Avenue Extension with Myrtle Avenue/Flatbush Court averaged six pedestrians or bicyclists killed or injured per year. The

## Table14-3

## Annual Motor Vehicle Accidents at Key Study Area Intersections, 2000-2002

| | Non- Reportable Accidents | | | Reportable Accidents | | | Vehicle Occupants Killed / Injured | | | Bicyclists Killed / Injured | | | Pedestrians Killed / Injured | | | Average Annual Pedestrians/Bicyclists Killed/Injured |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intersection | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 2000 | 2001 | 2002 | 2000-2002 |
| Adams Street/Tillary Street | 92 | 77 | 89 | 23 | 16 | 16 | 35 | 18 | 18 | 2 | 2 | 0 | 0 | 2 | 1 | 2 |
| Flatbush Avenue Ext./Dekalb Avenue | 41 | 29 | 28 | 20 | 9 | 12 | 18 | 15 | 13 | 0 | 1 | 0 | 7 | 2 | 4 | 5 |
| Flatbush Avenue Ext./Gold Street | 4 | 8 | 5 | 3 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| Flatbush Avenue Ext./Myrtle Avenue | 63 | 44 | 44 | 23 | 22 | 16 | 24 | 22 | 16 | 1 | 1 | 2 | 3 | 7 | 3 | 6 |
| Flatbush Avenue Ext./Tillary Street | 131 | 113 | 115 | 33 | 31 | 22 | 51 | 39 | 36 | 3 | 1 | 2 | 3 | 5 | 1 | 5 |
| Flatbush Avenue Ext./Willoughby Street | 32 | 34 | 31 | 20 | 20 | 15 | 22 | 22 | 18 | 0 | 1 | 0 | 5 | 7 | 7 | 7 |
| Fourth Avenue/Atlantic Avenue | 18 | 14 | 6 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jay Street/Willoughby Street | 14 | 23 | 10 | 8 | 9 | 6 | 4 | 2 | 2 | 1 | 0 | 1 | 3 | 8 | 3 | 5 |
| Nevins Street/Schermerhorn Street | 3 | 5 | 2 | 9 | 4 | 3 | 1 | 1 | 1 | 0 | 0 | 0 | 9 | 3 | 2 | 5 |

**Notes**

Reportable accidents are those that involve more than $1,000 in property damage and/or injuries or fatalities.

Source: NYCDOT and NYSDOT data.

pattern of accidents at this intersection is similar to that found at Willoughby Street, with generally half of all accidents resulting in injuries or fatalities to pedestrians or bicyclists involving turning vehicles, and the remaining accidents typically involving vehicles traveling straight ahead along Flatbush Avenue Extension (again more often northbound than southbound).

Four intersections averaged five injuries or fatalities annually including two additional intersections along Flatbush Avenue Extension (at Tillary Street and at DeKalb Avenue), the intersection of Nevins and Schermerhorn Streets, and the intersection of Willoughby and Jay Streets where there are heavy pedestrian flows to and from subway and bus facilities. At this latter location, turning vehicles (especially those turning from Willoughby Street) are again involved in more than half of all accidents involving pedestrians and bicyclists. The block of Willoughby Street to the west of the intersection operates two-way whereas the east leg of the intersection is one-way westbound. This likely contributes to both pedestrian and driver confusion and an increased potential for accidents at this location.

## PARKING

### *OFF-STREET PARKING*

Off-street public parking lots and garages within an approximately ¼-mile radius of the projected development sites were inventoried in September 2002 to assess their capacities and approximate utilization during the weekday AM and midday peak periods. Figure 14-5 shows the locations of these facilities and Table 14-4 shows the map location number, operator, address, licensed capacity, and estimated occupancy for each of the parking facilities under 2002 Existing conditions. As shown in Table 14-4, 57 public parking facilities with a total licensed capacity of approximately 10,800 spaces are located within a ¼-mile radius of the development sites. Overall, these facilities have a combined utilization of approximately 59 percent in the weekday AM and 82 percent in the weekday midday. Approximately 4,447 spaces remain available in the weekday AM, falling to approximately 1,964 by the midday period. It should be noted that a number of the parking garages within MetroTech (e.g., at Chase Manhattan Bank, FDNY, etc.) originally intended as public facilities, have evolved into dedicated accessory garages for their respective buildings.

### *ON-STREET PARKING*

Curbside parking regulations within ¼-mile of the projected development sites were surveyed in September 2002 and again in September 2003, and are listed in Table 14-5 and shown in Figure 14-6. As shown in Figure 14-6, much of the study area is covered by a variety of no parking and no standing regulations typically designed to facilitate AM and PM peak traffic flow on major corridors, provide for curbside access for pick-up/drop-off activity and truck loading and unloading during certain periods of the day, and to facilitate street cleaning. Metered curbside parking spaces are available on some blocks to accommodate the short-term parking needs of adjacent commercial land uses. Much of the metered parking in the study area is concentrated south of Fulton Street, primarily along Livingston Street, Schermerhorn Street, Atlantic Avenue and on intersecting north-south blocks. North of Fulton Street, metered parking is mostly found along Flatbush Avenue and along Jay and Willoughby Streets. The majority of metered parking spaces in Downtown Brooklyn have one-hour limits, although some two-hour metered parking spaces are also available. In addition, there are a small number of four-hour and six-hour metered spaces located in the vicinity of Long Island College Hospital and along

**TABLE 14-4**

## 2002 EXISTING OFF-STREET PARKING FACILITIES AND WEEKDAY UTILIZATION

| No. | Facility Operator | Address | License Number | Licensed Capacity | Weekday AM | | Weekday Midday | | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Estimated Utilization | Available Capacity | Estimated Utilization | Available Capacity | |
| 1 | Edison Hanson, LLC | 625 Atlantic Avenue | 951349 | 650 | 50% | 325 | 50% | 325 | (a) |
| 2 | Prompt Park Services, Inc. | 194-198 Schermerhorn Street | 971583 | 149 | 40% | 89 | 100% | 0 | |
| 3 | 166 Myrtle Parking Corp. | 166 Myrtle Avenue | 0887261 | 200 | 80% | 40 | 100% | 0 | (l) |
| 4 | BHC Car Park, LLC | 97-103 Dekalb Avenue | 1019609 | 155 | 80% | 31 | 100% | 0 | |
| 5 | BHC Car Park, LLC | 240-260 Willoughby Street | 1026761 | 379 | 90% | 37 | 100% | 0 | |
| 6 | Discount Parking, Inc. | 180 Ashland Place | 1009614 | 316 | 90% | 31 | 100% | 0 | |
| 7 | Sharom Park, Inc. | 85 Dekalb Avenue | 898933 | 328 | 60% | 131 | 80% | 65 | |
| 8 | Edison/Willoughby Corp. | 1 Dekalb Avenue | 0978217 | 454 | 50% | 227 | 90% | 45 | |
| 9 | Willoughby Car Park, Inc. | 116-124 Willoughby Street | 975586 | 53 | 75% | 13 | 155% | -30 | (b) |
| 10 | Edison Parking Management | 395 Flatbush Avenue Extension | 0978218 | 140 | 95% | 7 | 60% | 56 | |
| 11 | Speedy Car Park, Inc. | 216 Duffield Street | 1004159 | 125 | 85% | 18 | 100% | 0 | |
| 12 | Angela Vomvolakis | 287-289 Pacific Street | 366315 | 20 | 35% | 13 | 35% | 13 | |
| 13 | Edison Parking Management | 351 Jay Street | 0997699 | 270 | 60% | 108 | 80% | 54 | |
| 14 | Edison Parking Management | 350 Jay Street | 979089 | 888 | 100% | 0 | 80% | 177 | |
| 15 | 20 Smith Parking Corp. | 22 Smith Street | 953487 | 50 | 15% | 42 | 80% | 10 | |
| 16 | Bro Bro/141 Mngmnt. Parking Corp. | 141 Livingston Street | 953482 | 25 | 50% | 12 | 92% | 2 | |
| 17 | Impark 365, LLC | 300 Schermerhorn Street | 1107700 | 50 | 30% | 35 | 95% | 2 | |
| 18 | Edison New York Parking LLC | 160 Livingston Street | 926765 | 100 | 20% | 80 | 100% | 0 | |
| 19 | Central Parking System | 134 Schermerhorn Street | 0976813 | 350 | 20% | 280 | 80% | 70 | |
| 20 | Dormic Parking Corp. | 60 Hoyt Street | 787895 | 150 | 35% | 97 | 100% | 0 | |
| 21 | Dormic Parking Corp. | 200 Schermerhorn Street | 364167 | 275 | 50% | 137 | 95% | 13 | |
| 22 | Rockwell Car Park, LLC | (c) | 1080614 | 140 | 40% | 84 | 80% | 28 | |
| 23 | Impark 365, LLC | 365 Schermerhorn Street | 1107700 | 130 | 80% | 26 | 95% | 6 | (j) |
| 24 | Teddy's Parking System | 71-77 Bond Street | 365142 | 40 | 80% | 8 | 100% | 0 | |
| 25 | Paul's Parking | 252-286 Schermerhorn Street | 1119974 | 100 | 50% | 50 | 95% | 5 | |
| 26 | Edison Parking Management | 1-31 Hoyt Street | 0988463 | 1,000 | 20% | 800 | 40% | 600 | |
| 27 | Livingston & Bond Municipal Garage | 300 Livingston Street | (d) | 606 | 30% | 424 | 80% | 121 | |
| 28 | Central Parking System of NY Inc. | 71-79 Schermerhorn Street | 1108273 | 150 | 65% | 52 | 100% | 0 | |
| 29 | Heights LLC | 199 State Street | 999155 | 150 | 80% | 30 | 85% | 22 | (k) |
| 30 | Automatic Management Corp. | 194-6 Livingston Street | 953488 | 114 | 45% | 62 | 100% | 0 | |
| 31 | Edison Parking Management | 300 Cadman Plaza West | 978157 | 346 | 85% | 51 | 100% | 0 | |
| 32 | Manhattan Parking Boro Corp. | 40 Clinton Street | 368732 | 50 | 50% | 25 | 80% | 10 | |
| 33 | Dormic Parking Corp. | 65 Smith Street | 367731 | 150 | 30% | 105 | 70% | 44 | |
| 34 | J&L Parking | 319 Pacific Street | 0366867 | 50 | 95% | 2 | 95% | 2 | |
| 35 | Garnet Car Park, LLC | 66 Boerum Place | 1079471 | 84 | 50% | 42 | 100% | 0 | |
| 36 | Icon/Livingston Street Parking, LLC | 111 Livingston Street | 1100843 | 150 | 40% | 90 | 65% | 52 | |
| 37 | Kinney of Livingston Street, Inc. | 85 Livingston Street | 0919307 | 160 | 30% | 112 | 90% | 16 | |
| 38 | 212 Holding Corp. | 262-6 Pacific Street | 0366391 | 44 | 30% | 30 | 35% | 28 | |
| 39 | 240 Atlantic Service Station, Inc. | 240 Atlantic Avenue | 1073366 | 100 | 70% | 30 | 95% | 5 | |
| 40 | 207 Pacific Street Corp. | 207 Pacific Street | 0365341 | 16 | 50% | 8 | 75% | 4 | |
| 41 | Pacific Parking Corp. | 262 Atlantic Avenue | 0973586 | 35 | 70% | 10 | 100% | 0 | |
| 42 | Atlantic and Court Municipal Garage | 233 Atlantic Avenue | (d) | 515 | 85% | 77 | 100% | 0 | |
| 43 | Sterling Car Park | 430-432 Albee Square West | 997485 | 23 | 55% | 10 | 191% | -21 | (e) |
| 44 | P.T.A. Parking Corp. | 165-167 Pacific Street | 0366200 | 30 | 55% | 13 | 55% | 13 | |
| 45 | Central Parking System | 187 Pacific Street | 0961964 | 130 | 75% | 32 | 70% | 38 | |
| 46 | Amber Car Park, LLC | 10 Lafayette Ave. | (f) | 110 | 50% | 55 | 85% | 16 | (f),(j) |
| 47 | Amber Car Park, LLC | 258 Ashland Place | (g) | 322 | 65% | 112 | 90% | 32 | (j) |
| 48 | 176-178 Court Parking Associates | 176-178 Court Street | 366728 | 16 | 70% | 4 | 100% | 0 | |
| 49 | Cobble Heights Distributers | 47 Dean Street | 831578 | 26 | 35% | 16 | 100% | 0 | |
| 50 | Vic's Parking Lot | 420 Albee Square West | 367486 | 100 | 30% | 70 | 100% | 0 | |
| 51 | Albee Square Parking | 408 Albee Square West | 365092 | 86 | 50% | 43 | 100% | 0 | |
| 52 | Central Parking System of New York | 100 North Portland Avenue | (h) | 190 | 75% | 47 | 80% | 38 | (h) |
| 53 | Gold Street Parking, LLC | 329-341 Gold Street | 1117272 | 115 | 80% | 23 | 70% | 34 | |
| 54 | Paul's Parking | 330-332 Atlantic Avenue | 366123 | 15 | 40% | 9 | 40% | 9 | |
| 55 | Flatbridge Parking Corp. | 120 Concord Street | 1023980 | 150 | 50% | 75 | 80% | 30 | |
| 56 | Edison NY Parking, LLC | 203 Jay Street | 926767 | 150 | 70% | 44 | 85% | 22 | |
| 57 | 553 Atlantic Garage Corp. | 551-563 Atlantic Avenue | 1030282 | 80 | 70% | 23 | 90% | 8 | (l) |
| | | | **Totals:** | **10,800** | **59%** | **4,447** | **82%** | **1,964** | ------ |

**Notes:**

(a) Source: March 2002 data from Atlantic Terminal Office Development FSEIS.
(b) Observed capacity of approximately 82 spaces with 50% utilization in AM, 100% in midday.
(c) 29-31 Flatbush Avenue/574-578 Fulton Street/62-70 Rockwell Place.
(d) Municipal facility; does not have a license number.
(e) Observed capacity of approximately 50 spaces including 30 spaces in car stackers. 25% AM utilization, 90% midday utilization.
(f) License No. and licensed capacity not posted. Estimated capacity of 110 spaces.
(g) License Nos. 1021918, 10219191, 1021920, 1021922, 986471.
(h) License No. and licensed capacity not posted. Estimated capacity of 190 spaces.
(l) Licensed capacity not posted. Estimated capacity of 200 spaces.
(j) Source for AM utilization: March 2002 data from Atlantic Terminal Office Development FSEIS.
(k) The parking garage at 199 State Street suffered a structural collapse in October 2002 and has since been demolished.
(l) Licensed capacity not posted. Estimated capacity of 80 spaces.

Source: PHA Sept. 2002 field survey, unless otherwise noted.

# Table 14-5
# On-Street Parking Regulations
# (See Figure 6 for Locations)

| Number | Letter | Description |
|---|---|---|
| *1-No Parking* | A | Anytime |
| | B | Midnight-3am Monday Wednesday Friday |
| | C | Midnight-3am Tuesday Thursday Saturday |
| | D | 3am-6am Monday Wednesday Friday |
| | E | 3am-6am Tuesday Thursday Saturday |
| | F | 4am-2pm Tuesday |
| | G | 7am-8am Except Sunday |
| | H | 7am-7pm Monday-Friday |
| | I | 7am-7pm Including Sunday, Loading Zone |
| | J | 7am-7pm Except Sunday |
| | K | 7am-4pm School Days |
| | L | 7am-Midnight |
| | M | 8am-9am Except Sunday |
| | N | 8am-4pm Monday-Friday |
| | O | 8am-4pm Except Sunday |
| | P | 8am-6pm Monday-Friday |
| | Q | 8am-6pm Except Sunday |
| | R | 8am-7pm Monday-Friday |
| | S | 8am-7pm Except Sunday |
| | T | 8am-Midnight Except Sunday |
| | U | 8:30am-10am Monday & Thursday |
| | V | 8:30am-10am Tuesday & Friday |
| | W | 9:30am-11am Monday & Thursday |
| | X | 9:30am-11am Tuesday & Friday |
| | Y | 11am-2pm Monday |
| | Z | 11am-2pm Monday & Thursday |
| | AA | 11am-2pm Tuesday & Friday |
| | AB | 11:30am-1pm Monday & Thursday |
| | AC | 11:30am-1pm Tuesday & Friday |
| | AD | 4pm-7pm Monday Wednesday Friday |
| | AE | 4pm-7pm Tuesday & Thursday |
| | AF | 8am-9am Monday-Friday |
| | AG | 8:30am-10am Wednesday |
| | AH | 8:30-10am Tuesday |
| | AI | 7am-6pm School Days |
| | AJ | 7am-10am Except Sunday |
| | AK | 7am-4pm Except Sunday |
| | AL | 7am-10am Monday-Friday |
| | AM | 8am-6pm Tuesday |
| | AN | 8am-6pm Wednesday |
| | AO | 8am-11am Thursday |
| | AP | 8am-6pm Monday Wednesday Friday |
| | AQ | 11am-2pm Tuesday |
| | AR | 8am-6pm Tuesday & Thursday |
| | AS | 8am-11am Tuesday |
| | AT | 8am-9am Monday & Thursday |
| | AU | 8am-9am Tuesday & Friday |
| | AV | 4pm-7pm Monday-Friday |
| | AW | Loading Zone 15 Minute Parking 7am-12am<br>60 Minute Parking 12am-7am |
| | AX | 8am-8pm Monday-Friday Except Authorized Vehicles |
| | AY | 8am-8pm Except Authorized Vehicles |
| *2-No Standing* | A | Anytime |
| | B | Anytime Except Sunday |
| | C | Anytime Commuter Van Stop |
| | D | Bus Layover Zone |
| | E | Fire Zone |
| | F | Except Authorized Vehicles |
| | G | Except Trucks Loading & Unloading |
| | H | 4am-7pm & No Parking Anytime |
| | I | 6am-6pm Monday-Friday Except Authorized Vehicles |
| *2-No Standing (Continued)* | J | 7am-10am Monday-Friday |
| | K | 7am-10am Except Sunday |
| | L | 7am-4pm Except Authorized Vehicles Except Sunday |
| | M | 7am-4pm Except Trucks Loading & Unloading |
| | N | 7am-7pm Including Sunday |
| | O | 7am-7pm Except Sunday |
| | P | 7am-10am & 4am-7pm Monday-Friday |
| | Q | 7am-7pm Monday-Friday Except Authorized Vehicles |
| | R | 7am-7pm Except Sunday Except Trucks L & U |
| | S | 7am-7pm Except Authorized Vehicles |
| | T | 8am-6pm Monday-Friday Except Authorized Vehicles |
| | U | 8am-6pm Except Sunday |
| | V | 9am-4pm Monday-Friday |
| | W | 9am-4pm Except Sunday Except Authorized Vehicles |
| | X | 10am-7pm Except Trucks Loading & Unloading |
| | Y | 10am-7pm Monday-Friday Except Authorized Vehicles |
| | Z | 4pm-7pm Monday-Friday |
| | AA | 4pm-7pm Except Sunday |
| | AB | 8am-4pm Except Sunday Except Trucks L & U |
| | AC | 7am-4pm Monday-Friday Except Authorized Vehicles |
| | AD | 7am-5pm School Days |
| | AE | 8am-4pm Monday-Friday Except Authorized Vehicles |
| | AF | 7am-4pm School Days |
| *3- (1 Hour) Metered Parking* | A | 8am-7pm Except Sunday |
| | B | 9am-4pm |
| | C | 9am-4pm Except Sunday |
| | D | 9am-7pm Except Sunday |
| | E | 9am-10pm Except Sunday |
| | F | 9am-4pm & 7pm-10pm Except Sunday |
| | G | 10am-7pm Except Sunday |
| | H | 9am-7pm Monday-Friday |
| | I | 9am-7pm Including Sunday |
| | J | 9am-7pm Saturday & Sunday |
| | K | 10am-7pm Monday-Friday |
| | L | 9am-7pm Sunday |
| | M | 10am-7pm Including Sunday |
| | N | 9am-4pm Monday-Friday |
| | O | 10am-4pm Monday-Friday |
| | P | 10am-4pm Except Sunday |
| | Q | 9am-10pm Sunday |
| | R | 8am-7pm Including Sunday |
| *4- (2 Hour) Metered Parking* | A | 8am-7pm Except Sunday |
| | B | 9am-4pm Except Sunday |
| | C | 9am-7pm Except Sunday |
| | D | 9am-7pm Monday-Friday |
| | E | 9am-10pm Except Sunday |
| | F | 10am-7pm Except Sunday |
| | G | 9am-7pm Sunday |
| | H | 9am-7pm Including Sunday |
| | I | 10am-7pm Monday-Friday |
| | J | 9am-7pm Saturday & Sunday |
| | K | 9am-10pm Including Sunday |
| *5- (4 Hour) Metered Parking* | A | 9am-7pm Monday-Friday |
| | B | 9am-7pm Including Sunday |
| *6- (6 Hour) Metered Parking* | A | 9am-10pm Except Sunday |
| | B | 9am-10pm Including Sunday |
| *7- Metered Parking* | A | 6am-Midnight |
| *8- Parking Permitted Only On* | A | 8am-6pm Tuesday |
| | B | 8am-6pm Wednesday |

Tillary Street. Field observations indicate that there is heavy demand for these on-street spaces, with capacity conditions common throughout the study area during weekdays.

Downtown Brooklyn's large concentration of government agencies and court facilities generates a substantial amount of on-street parking by vehicles with official permits. Authorized on-street parking spaces dedicated for use by these vehicles are provided on many streets in Downtown Brooklyn, primarily concentrated in the vicinity of the courts. Agencies issuing official parking permits include the courts, the NYPD and other law enforcement agencies, and the Fire Department. The Board of Education also issues these permits, however, parking demand in Downtown Brooklyn generated by the Board of Education has recently been reduced with the relocation of many of its functions to Lower Manhattan.

In addition to occupying authorized on-street spaces, vehicles with official permits also frequently occupy curbside parking spaces otherwise available to the general public, exacerbating the capacity conditions in the study area. They are also often found in spots where parking would otherwise be illegal, in some cases hindering traffic and pedestrian flow and permitted curbside activity (e.g., truck loading/unloading zones).

## C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Through 2013, it is expected that traffic and parking demands in the study area will increase due to long-term background growth as well as the development of approximately 4.1 million square feet of new office/commercial space, 9,400 dwelling units, 2.9 million square feet of cultural and community facility space, 1.5 million square feet of court facility space, 1.07 million square feet of retail space and a new arena. In order to forecast the future demands without the proposed actions (the No Build condition), the principal development projects listed Table 2-1 and shown in Figure 2-5 in Chapter 2, "Land Use, Zoning and Public Policy," were considered. The largest of these developments is the Atlantic Yards Arena and Redevelopment project (the "Arena project") which is proposed for an approximately 24-acre site bounded by Flatbush, Atlantic, and Vanderbilt Avenues and Dean Street at the southeastern edge of Downtown Brooklyn. The principal components of that project include an arena with an approximate capacity of 18,000 to 20,000 seats and approximately 52,000 square feet (sf) of publicly accessible rooftop recreational space, 1.8 million sf of Class A commercial office space, approximately 5,500 mixed-income residential units, approximately 400,000 sf of retail space, 3,500 parking spaces and six acres of public space. It should be noted that both the development program and the site plan for the Arena project are still being refined. A preliminary travel demand forecast and traffic assignment for the Arena project have therefore been incorporated in the No Build analyses for the Downtown Brooklyn Development project.

In addition to demand from new developments, an annual background growth rate of 0.5 percent per year was applied to existing traffic and parking demand for the 2002 through 2013 period. This background growth rate, recommended in the *CEQR Technical Manual* for projects in Downtown Brooklyn, is applied to account for smaller projects and general increases in travel demand not attributable to specific development projects. Figures 14-7 through 14-9 show the resulting AM, midday and PM peak hour traffic volumes at study area intersections in the 2013 future without the proposed actions.

The 2002 through 2013 period will likely see the implementation of a number of physical and operational changes to the study area street system as a result of new developments such as the Arena project, 330 Jay Street and MetroTech 9 South, as well as NYCDOT's ongoing

Downtown Brooklyn Traffic Calming Project (DBTCP), which is discussed in more detail below. The following such changes have, therefore, been incorporated in the 2013 No Build traffic network.

- The conversion of Johnson Street/Tech Place from one-way eastbound to one-way westbound operation between Flatbush Avenue Extension and Adams Street. (330 Jay Street)
- The construction of a new six-foot-wide mall and changes to intersection markings at the intersection of Atlantic Avenue and Boerum Place to permit conflict-free simultaneous movement of the westbound Atlantic Avenue right-turn and the eastbound Atlantic Avenue exclusive left-turn phase to Boerum Place. (330 Jay Street)
- The creation of an exclusive right-turn-only lane on westbound Atlantic Avenue at its intersection with Smith Street by eliminating some curbside parking. (330 Jay Street)
- The eastward extension of the landscaped median in Flatbush Court to align with the mall located between southbound Flatbush Avenue Extension and the adjacent service road. (MetroTech 9 South)
- The widening of Flatbush Avenue by approximately ten feet between Dean Street and Atlantic Avenue to provide for an additional northbound lane on these two blocks. (Arena project)
- The closure of the segment of Fifth Avenue between Flatbush and Atlantic Avenues, and the segments of Pacific Street between Fifth and Sixth Avenues, and between Carlton and Vanderbilt Avenues. (Arena project)
- The conversion (in November 2003) of Smith Street from two-way to one-way northbound operation from Atlantic Avenue to Schermerhorn Street. (DBTCP)

It should also be noted that NYCDOT periodically evaluates intersections for signalization and installs new traffic signals where warranted. Therefore, during the 2002 through 2013 period it is possible that one or more new traffic signals may be installed within the study area irrespective of No Build developments or the proposed actions. These may include locations where new signal installations may be recommended either as part of the proposed actions, or as mitigation.

The 2002 through 2013 period may also see the implementation of additional measures associated with the New York City Department of Transportation's ongoing Downtown Brooklyn Traffic Calming Project. Under this project, which was initiated by 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. 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. Typical measures proposed for implementation in Downtown Brooklyn include neckdowns (curb extensions at intersections), rationalized lane widths and alignments, and leading pedestrian intervals (a signal phase that holds all vehicles long enough for pedestrians to enter a crosswalk ahead of turning vehicles). In 2001, a pilot program was implemented to evaluate various candidate traffic calming measures. Measures implemented within the study area 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

summer 2002) and a new left-turn lane on Atlantic Avenue at Bond Street, along with curb extensions on Bond Street at Atlantic Avenue. In addition, in November 2003, NYCDOT converted Smith Street from two-way to one-way northbound operation between Atlantic Avenue and Schermerhorn Street. Although no specific measures in the DBTCP with the exception of the Smith Street conversion have been identified for implementation within the study area at this time, all measures remain candidates for implementation. NYCDOT is working with the Community Boards on prioritizing these measures. NYCDOT intends to implement additional measures based upon further detailed review, analysis of impacts, and community approval.

During 2004, the New York State Department of Transportation (NYSDOT) is expected to start construction on a replacement deck for the Brooklyn-Queens Expressway (I-278) from Flushing/Classon Avenues to Sands Street. This section of the expressway, located to the north of the project study area, is comprised of two elevated structures, the Nassau-Concord Viaduct and the Park Avenue Viaduct, both of which suffer from structural problems and deterioration. Construction is expected to take three years with completion in 2007. Under the project's maintenance and protection of traffic plan, the existing six lanes of traffic capacity would be maintained through the construction area at all times, as would access to the on- and off-ramps at Tillary Street, the nearest expressway access points to the study area. Two one-week closures of the on-ramp at Flushing Avenue, approximately one mile east of the study area, would result in the temporary diversion of traffic along Flushing Avenue and Sands Street to the Tillary Street on-ramp. However, as this traffic is not expected to traverse the study area, as the diversions would be of very limited duration, and as there would be no change in the configuration of the expressway or its access points, this project is not expected to affect the study area traffic network during the 2002 through 2013 period. Concurrent with the deck replacement effort, NYSDOT is also undertaking a long range study to identify potential intermediate (15 to 20 years) and long range (20+ years) alternatives for improvements to the Brooklyn-Queens Expressway. Given the long time-frame for any improvements that may result from this effort, no changes to the study area traffic network are expected during the 2002 through 2013 period.

The following sections describe traffic and parking conditions in the future without the proposed actions.

## VEHICULAR TRAFFIC

Table 14-6 shows traffic conditions at analyzed intersections in the future without the proposed actions. As shown in Table 14-6, with continued growth in travel demand, intersections that were congested under existing conditions, will worsen, and there will be additional locations that will become congested in one or more peak hours by 2013. Table 14-6 shows that in the 2013 future without the proposed actions, 21 intersections will experience congestion on one or more approaches in the AM peak hour, 18 in the midday, and 22 in the PM peak hour. This compares with 17, 9, and 15 congested intersections during these respective periods under existing conditions. In 2013, there will be several signalized intersections with one or more movements with a v/c ratio of 1.00 or greater. In the AM peak hour, there will be 19 such intersections versus 12 under existing conditions. There will be 12 such intersections in the midday peak hour (two existing) and 20 during the PM (seven existing).

## Table 14-6
## 2013 Future No Build Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour V/C Ratio | AM Peak Hour Delay (sec.) | AM Peak Hour LOS | | MD Peak Hour V/C Ratio | MD Peak Hour Delay (sec.) | MD Peak Hour LOS | | PM Peak Hour V/C Ratio | PM Peak Hour Delay (sec.) | PM Peak Hour LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tillary Street (E-W) @ | EB-L | 0.66 | 56.9 | E | * | 0.49 | 50.8 | D | | 0.55 | 53.1 | D | |
| Flatbush Avenue (N-S) | EB-TR | 0.88 | 48.5 | D | | 0.91 | 51.8 | D | * | 1.03 | 76.2 | E | * |
| | EB-R | 0.93 | 75.3 | E | * | 0.95 | 80.1 | F | * | 1.05 | 106.5 | F | * |
| | WB-L | 1.32 | >150 | F | * | 0.77 | 57.7 | E | * | 1.24 | >150 | F | * |
| | WB-T | 0.94 | 58.4 | E | * | 0.63 | 39.7 | D | | 1.12 | 109.6 | F | * |
| | WB-R | 1.06 | 106.2 | F | * | 0.84 | 62.0 | E | * | 0.59 | 44.5 | D | |
| | NB-L | 0.84 | 51.6 | D | | 1.00 | 79.7 | E | * | 0.71 | 47.7 | D | |
| | NB-T | 0.60 | 25.0 | C | | 0.45 | 22.3 | C | | 0.48 | 22.8 | C | |
| | SB-T | 0.56 | 34.8 | C | | 0.58 | 35.4 | D | | 1.15 | 115.4 | F | * |
| | SB-R | 0.35 | 35.0 | C | | 0.49 | 38.7 | D | | 0.57 | 41.1 | D | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.30 | >150 | F | * | EB-LTR 0.89 | 63.9 | E | * | 1.19 | >150 | F | * |
| Flatbush Avenue (N-S) | EB-TR | 0.96 | 82.5 | F | * | | | | | 0.94 | 77.9 | E | * |
| | WB-LTR | 1.01 | 83.8 | F | * | 0.71 | 47.5 | D | | 0.77 | 51.0 | D | |
| | NB-L | 1.65 | >150 | F | * | 0.36 | 24.8 | C | | 1.11 | >150 | F | * |
| | NB-TR | 1.10 | 76.7 | E | * | 1.18 | 111.6 | F | * | 0.87 | 25.2 | C | |
| | SB-L | 1.05 | 118.1 | F | * | 1.00 | 105.4 | F | * | 1.15 | 131.3 | F | * |
| | SB-TR | 0.75 | 9.2 | A | | 0.56 | 6.6 | A | | 0.89 | 13.6 | B | |
| Willoughby Street (E-W) @ | EB-L | 1.02 | 119.7 | F | * | 0.90 | 84.1 | F | * | 1.07 | 122.5 | F | * |
| Flatbush Avenue (N-S) | EB-R | 0.26 | 27.8 | C | | 0.43 | 29.1 | C | | 0.78 | 49.7 | D | |
| | WB-LT | 0.73 | 54.0 | D | | 0.30 | 37.0 | D | | 0.27 | 38.1 | D | |
| | WB-R | 0.29 | 38.6 | D | | 0.18 | 35.1 | D | | 0.24 | 37.6 | D | |
| | NB-L | 1.01 | 95.9 | F | * | 0.59 | 21.2 | C | | 0.92 | 84.0 | F | * |
| | NB-T | 0.84 | 18.5 | B | | 0.61 | 6.4 | A | | 0.62 | 5.4 | A | |
| | SB-TR | 0.80 | 25.5 | C | | 0.70 | 19.1 | B | | 1.00 | 37.7 | D | * |
| DeKalb Avenue (E-W) @ | WB-L | 0.45 | 38.3 | D | | 0.87 | 66.2 | E | * | 0.82 | 56.5 | E | * |
| Flatbush Avenue (N-S) | WB-LT | 0.49 | 39.1 | D | | 0.56 | 41.4 | D | | 0.52 | 40.1 | D | |
| | WB-R | 1.11 | 124.8 | F | * | 0.81 | 61.0 | E | * | 0.80 | 56.8 | E | * |
| | NB-T | 1.03 | 55.4 | E | * | 0.74 | 23.5 | C | | 0.78 | 24.7 | C | |
| | SB-TR | 0.82 | 26.4 | C | | 0.75 | 23.6 | C | | 1.20 | 124.2 | F | * |
| Livingston Street (E-W) @ | EB-R | 0.43 | 33.0 | C | | 0.56 | 35.8 | D | | 0.66 | 38.8 | D | |
| Flatbush Avenue (N-S) | NB-L | 0.96 | 59.1 | E | * | 0.58 | 15.7 | B | | 0.84 | 50.7 | D | |
| | NB-T | 0.49 | 0.7 | A | | 0.37 | 0.4 | A | | 0.35 | 0.4 | A | |
| | SB-TR | 0.52 | 15.8 | B | | 0.50 | 9.8 | A | | 0.85 | 16.7 | B | |
| Lafayette Avenue/ | EB-LT | 0.64 | 32.6 | C | | 0.41 | 27.6 | C | | 0.77 | 37.0 | D | |
| Schermerhorn Street (E-W) @ | WB-TR | 0.80 | 61.2 | E | * | 0.62 | 51.3 | D | | 0.90 | 69.9 | E | * |
| Flatbush Avenue (N-S) | NB-TR | 1.23 | 139.9 | F | * | 1.12 | 95.1 | F | * | 1.16 | 111.5 | F | * |
| | SB-L | 0.93 | 93.3 | F | * | 0.77 | 68.1 | E | * | 1.10 | 136.7 | F | * |
| | SB-T | 0.55 | 15.0 | B | | 0.57 | 15.2 | B | | 0.89 | 24.6 | C | |
| Fourth Ave/Hanson Pl. (E-W) | EB-LT | 0.77 | 43.3 | D | | 0.34 | 30.7 | C | | 0.50 | 36.8 | D | |
| Flatbush Avenue (N-S) | NB-T | 0.87 | 19.9 | B | | 0.71 | 18.6 | B | | 0.67 | 14.0 | B | |
| | NB-R | 0.60 | 16.3 | B | | 0.32 | 14.1 | B | | 0.41 | 12.2 | B | |
| | SB-TR | 0.64 | 14.3 | B | | 0.83 | 24.0 | C | | 1.00 | 40.1 | D | |
| | SB-R | 0.53 | 19.8 | B | | 0.63 | 26.2 | C | | 1.13 | 103.4 | F | * |
| Atlantic Avenue (E-W) @ | EB-T | 0.94 | 57.6 | E | * | 0.89 | 46.7 | D | | 1.05 | 73.6 | E | * |
| Flatbush Avenue (N-S) | EB-R | 0.52 | 42.2 | D | | 0.61 | 41.1 | D | | 0.46 | 32.7 | C | |
| | WB-T | 1.31 | >150 | F | * | 1.01 | 72.6 | E | * | 1.10 | 95.4 | F | * |
| | WB-R | 0.75 | 47.7 | D | | 0.75 | 43.5 | D | | 0.68 | 37.4 | D | |
| | NB-LTR | 0.70 | 20.6 | C | | 0.47 | 19.0 | B | | 0.55 | 18.1 | B | |
| | SB-LTR | 0.49 | 17.0 | B | | 0.61 | 21.9 | C | | 0.84 | 26.4 | C | |

**Table 14-6 (Continued)**
**2013 Future No Build Traffic Conditions**

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour V/C Ratio | AM Delay (sec.) | AM LOS | | MD Peak Hour V/C Ratio | MD Delay (sec.) | MD LOS | | PM Peak Hour V/C Ratio | PM Delay (sec.) | PM LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jay Street (N-S) @ | EB-L | 0.61 | 48.0 | D | | 0.36 | 29.8 | C | | 0.99 | 135.7 | F | * |
| Tillary Street (E-W) | EB-TR | 0.84 | 34.6 | C | | 0.76 | 31.0 | C | | 0.80 | 32.6 | C | |
| | WB-L | 1.71 | >150 | F | * | 1.08 | 123.8 | F | * | 1.37 | >150 | F | * |
| | WB-TR | 0.54 | 16.7 | B | | 0.48 | 15.6 | B | | 0.65 | 18.6 | B | |
| | NB-L | 0.20 | 26.4 | C | | 0.27 | 27.7 | C | | 0.32 | 29.1 | C | |
| | NB-TR | 0.83 | 42.4 | D | | 0.59 | 32.9 | C | | 0.78 | 39.7 | D | |
| | SB-L | 0.50 | 43.0 | D | | 0.35 | 31.8 | C | | 0.57 | 45.7 | D | |
| | SB-TR | 0.11 | 24.7 | C | | 0.13 | 24.9 | C | | 0.25 | 26.5 | C | |
| Adams Street (N-S) (Service)@ | EB-L | 1.02 | 106.0 | F | * | 0.75 | 64.8 | E | * | 0.94 | 88.0 | F | * |
| Tillary Street (E-W) | EB-TR | 0.61 | 35.0 | C | | 0.58 | 34.2 | C | | 0.65 | 36.3 | D | |
| | WB-L | 1.16 | >150 | F | * | 1.15 | >150 | F | * | 1.08 | 137.3 | F | * |
| | WB-T | 0.62 | 50.0 | D | | 0.62 | 49.8 | D | | 0.70 | 52.4 | D | |
| | WB-R | 1.12 | 125.6 | F | * | 0.94 | 76.9 | E | * | 1.05 | 99.2 | F | * |
| | NB-TR | 0.41 | 27.5 | C | | 0.59 | 31.2 | C | | 0.59 | 31.3 | C | |
| | SB-TR | 0.28 | 21.7 | C | | 0.32 | 22.3 | C | | 1.21 | 142.2 | F | * |
| Adams Street (N-S) (Main) | NB-L | 0.50 | 59.7 | E | * | 0.42 | 56.8 | E | * | 0.41 | 56.2 | E | * |
| | NB-T | 0.83 | 38.6 | D | | 0.48 | 28.3 | C | | 0.66 | 32.3 | C | |
| | SB-L | 1.21 | >150 | F | * | 1.08 | 110.8 | F | * | 1.08 | 110.2 | F | * |
| | SB-T | 1.13 | 107.2 | F | * | 1.00 | 63.5 | E | * | 1.31 | >150 | F | * |
| Ashland Place (N-S) @ | EB-LT | 0.36 | 8.5 | A | | 0.26 | 7.4 | A | | 0.47 | 9.6 | A | |
| Myrtle Avenue (E-W) | EB-R | 0.14 | 6.7 | A | | 0.14 | 6.6 | A | | 0.18 | 6.9 | A | |
| | WB-LTR | 0.98 | 42.8 | D | * | 0.42 | 9.2 | A | | 0.88 | 29.4 | C | |
| | NB-LTR | 1.14 | 119.8 | F | * | 0.83 | 49.7 | D | | 0.99 | 77.2 | E | * |
| | SB-LTR | 0.99 | 74.4 | E | * | 0.77 | 41.1 | D | | 1.09 | 97.5 | F | * |
| Prince Street (NB) @ | EB-LT | 0.73 | 32.9 | C | | 0.51 | 23.2 | C | | 1.01 | 68.7 | E | * |
| Myrtle Avenue (E-W) | WB-TR | 1.02 | 71.9 | E | * | 0.67 | 28.4 | C | | 0.74 | 31.5 | C | |
| | NB-LTR | 0.75 | 39.7 | D | | 0.78 | 41.9 | D | | 0.70 | 36.6 | D | |
| Gold St/Albee Square West (N-S) @ | EB-TR | 0.10 | 30.8 | C | | 0.17 | 31.9 | C | | 0.30 | 34.1 | C | |
| Willoughby Street (E-W) | WB-LT | 0.52 | 26.6 | C | | 0.35 | 22.9 | C | | 0.33 | 22.6 | C | |
| | NB-L | 0.19 | 20.9 | C | | 0.29 | 22.7 | C | | 0.21 | 21.1 | C | |
| | NB-R | 0.25 | 21.6 | C | | 0.50 | 27.0 | C | | 0.65 | 31.8 | C | |
| | SB-L | 0.17 | 20.4 | C | | 0.09 | 19.2 | B | | 0.11 | 19.5 | B | |
| | SB-TR | 0.13 | 19.9 | B | | 0.24 | 21.7 | C | | 0.19 | 20.9 | C | |
| Bridge Street (SB) @ Willoughby Street (E-W) | WB-LT | 0.70 | 17.5 | B | | 0.82 | 24.8 | C | | 0.75 | 20.6 | C | |
| Jay Street (N-S) @ | EB-LR | 0.05 | 20.2 | C | | 0.09 | 19.9 | B | | 0.07 | 19.6 | B | |
| Willoughby Street (E-W) | WB-LTR | 0.76 | 40.3 | D | | 1.10 | 108.0 | F | * | 0.77 | 40.2 | D | |
| | NB-LT | 0.74 | 19.7 | B | | 0.36 | 12.7 | B | | 0.45 | 13.6 | B | |
| | SB-TR | 0.40 | 13.0 | B | | 0.46 | 13.8 | B | | 0.59 | 15.7 | B | |
| Bond Street (NB) @ | EB-LT | 0.62 | 13.4 | B | | 0.86 | 24.1 | C | | 0.77 | 14.9 | B | |
| Livingston Street (E-W) | WB-TR | 0.89 | 27.8 | C | | 0.82 | 19.9 | B | | 0.87 | 22.5 | C | |
| | NB-LTR | 0.81 | 32.6 | C | | 0.66 | 25.0 | C | | 0.77 | 19.9 | B | |
| Hoyt Street (SB) @ | EB-TR | 0.80 | 19.0 | B | | 0.97 | 40.8 | D | * | 0.88 | 21.9 | C | |
| Livingston Street (E-W) | WB-LT | 0.64 | 14.3 | B | | 0.92 | 32.6 | C | * | 0.77 | 15.8 | B | |
| | SB-LTR | 0.23 | 15.5 | B | | 0.49 | 18.6 | B | | 0.59 | 20.4 | C | |

**Table 14-6 (Continued)**
**2013 Future No Build Traffic Conditions**

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour V/C Ratio | AM Delay (sec.) | AM LOS | | MD Peak Hour V/C Ratio | MD Delay (sec.) | MD LOS | | PM Peak Hour V/C Ratio | PM Delay (sec.) | PM LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Smith Street (N-S) @ | EB-LTR | 0.64 | 22.6 | C | | 0.36 | 25.7 | C | | 0.46 | 28.1 | C | |
| Livingston Street (E-W) | WB-LTR | 0.40 | 18.3 | B | | 0.40 | 26.5 | C | | 0.46 | 28.1 | C | |
| | NB-LTR | 0.82 | 28.5 | C | | 0.45 | 39.5 | D | | 0.77 | 51.9 | D | |
| | SB-DfL | 0.87 | 64.4 | E | * | 1.74 | >150 | F | * | 2.00 | >150 | F | * |
| | SB-LTR | 0.71 | 28.0 | C | | 0.78 | 56.5 | E | * | 1.04 | 102.6 | F | * |
| Boerum Place (N-S) @ | EB-LT | 0.82 | 60.2 | E | * | 0.73 | 80.9 | F | * | 1.10 | >150 | F | * |
| Livingston Street (E-W) | EB-R | 0.16 | 32.9 | C | | 0.21 | 54.3 | D | | 0.01 | 49.0 | D | |
| | WB-LTR | 0.77 | 49.5 | D | | 0.71 | 72.4 | E | * | 0.89 | 92.1 | F | * |
| | NB-L | 0.35 | 24.4 | C | | 0.40 | 52.1 | D | | 0.94 | >150 | F | * |
| | NB-TR | 0.91 | 37.2 | D | * | 0.57 | 51.8 | D | | 0.68 | 56.0 | E | * |
| | SB-L | 1.00 | 100.3 | F | * | 0.58 | 71.0 | E | * | 0.70 | 92.6 | F | * |
| | SB-TR | 0.38 | 11.5 | B | | 0.35 | 25.2 | C | | 0.74 | 36.9 | D | |
| Bond Street (NB) @ | EB-LT | 0.43 | 12.6 | B | | 0.56 | 14.7 | B | | 0.85 | 25.1 | C | |
| Schermerhorn Street (E-W) | WB-TR | 0.53 | 14.2 | B | | 0.46 | 13.2 | B | | 0.54 | 14.5 | B | |
| | NB-LTR | 1.18 | 115.8 | F | * | 0.71 | 23.6 | C | | 0.86 | 33.0 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.51 | 11.3 | B | | 0.61 | 13.3 | B | | 0.86 | 23.8 | C | |
| Schermerhorn Street (E-W) | WB-LT | 0.84 | 25.5 | C | | 0.72 | 19.3 | B | | 1.35 | >150 | F | * |
| | SB-LTR | 0.34 | 16.5 | B | | 0.55 | 19.7 | B | | 0.91 | 38.0 | D | * |
| Fourth Ave (N-S) @ | EB-TR | 0.65 | 27.7 | C | | 1.11 | 103.8 | F | * | 0.90 | 39.1 | D | * |
| Atlantic Avenue (E-W) | WB-TR | 1.08 | 82.5 | F | * | 1.12 | 112.1 | F | * | 0.95 | 48.4 | D | * |
| | NB-L | 1.22 | >150 | F | * | 1.30 | >150 | F | * | 1.33 | >150 | F | * |
| | NB-T | 0.68 | 40.0 | D | | 0.49 | 43.8 | D | | 0.52 | 39.8 | D | |
| | NB-R | 0.66 | 48.8 | D | | 1.15 | >150 | F | * | 1.21 | >150 | F | * |
| | SB-T | 0.18 | 17.3 | B | | 0.17 | 9.3 | A | | 0.45 | 19.7 | B | |
| | SB-R | 0.13 | 17.0 | B | | 0.06 | 8.6 | A | | 0.10 | 15.6 | B | |
| Bond Street (NB) @ | EB-LT | 1.41 | >150 | F | * | 1.05 | 57.6 | E | * | 0.77 | 22.0 | C | |
| Atlantic Avenue (E-W) | WB-TR | 1.18 | 114.0 | F | * | 0.76 | 16.1 | B | | 0.86 | 26.9 | C | |
| | NB-LTR | 0.72 | 38.2 | D | | 0.48 | 29.6 | C | | 0.48 | 33.7 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.72 | 22.6 | C | | 0.68 | 13.9 | B | | 0.69 | 19.2 | B | |
| Atlantic Avenue (E-W) | WB-LT | 1.25 | 144.9 | F | * | 0.78 | 16.6 | B | | 0.91 | 30.8 | C | * |
| | SB-LTR | 0.57 | 35.4 | D | | 1.07 | 97.2 | F | * | 1.21 | >150 | F | * |
| Smith Street (N-S) @ | EB-DfL | 1.44 | >150 | F | * | EB-LT 0.92 | 32.7 | C | * | EB-LT 1.13 | 90.7 | F | * |
| Atlantic Avenue (E-W) | EB-T | 0.73 | 23.2 | C | | | | | | | | | |
| | WB-T | 0.94 | 36.3 | D | * | WB-T 0.79 | 23.2 | C | | WB-T 0.71 | 20.4 | C | |
| | WB-R | 0.46 | 18.2 | B | | WB-R 0.31 | 14.8 | B | | WB-R 0.34 | 14.4 | B | |
| | NB-L | 1.12 | 120.0 | F | * | NB-L 0.60 | 27.6 | C | | NB-L 0.49 | 36.0 | D | |
| | NB-TR | 0.73 | 38.6 | D | | NB-TR 0.35 | 20.5 | C | | NB-TR 0.52 | 34.3 | C | |
| Boerum Place (N-S) @ | EB-DfL | 1.14 | 133.8 | F | * | 0.79 | 47.9 | D | | 1.07 | 114.9 | F | * |
| Atlantic Avenue (E-W) | EB-TR | 0.53 | 19.9 | B | | 0.66 | 22.3 | C | | 0.69 | 28.7 | C | |
| | WB-LT | 1.00 | 74.7 | E | * | 0.83 | 39.7 | D | | 0.84 | 48.8 | D | |
| | WB-R | 0.45 | 1.3 | A | | 0.35 | 0.9 | A | | 0.35 | 0.9 | A | |
| | SB-L | 0.45 | 28.3 | C | | 0.38 | 17.5 | B | | 0.79 | 32.4 | C | |
| | SB-TR | 0.61 | 32.2 | C | | 0.58 | 21.1 | C | | 0.87 | 38.3 | D | |

## Table 14-6 (Continued)
## 2013 Future No Build Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour V/C Ratio | AM Peak Hour Delay (sec.) | AM Peak Hour LOS | | MD Peak Hour V/C Ratio | MD Peak Hour Delay (sec.) | MD Peak Hour LOS | | PM Peak Hour V/C Ratio | PM Peak Hour Delay (sec.) | PM Peak Hour LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jay Street (N-S) @ | WB-LR | 0.12 | 21.0 | C | | WB-LR 0.34 | 24.7 | C | | WB-LR 0.31 | 23.9 | C | |
| Tech Place (E-W) | NB-LT | 0.76 | 20.7 | C | | NB-LT 0.89 | 34.1 | C | | NB-LT 1.00 | 51.4 | D | * |
| | SB-TR | 0.56 | 15.3 | B | | SB-TR 0.87 | 32.7 | C | | SB-TR 0.90 | 33.1 | C | * |
| Smith Street (N-S) @ | WB-T | 0.56 | 29.6 | C | | 0.46 | 48.2 | D | | 0.54 | 50.7 | D | |
| Schermerhorn (E-W) | WB-R | 0.22 | 23.5 | C | | 0.09 | 39.7 | D | | 0.39 | 47.1 | D | |
| | NB-LTR | 1.14 | 104.6 | F | * | 0.70 | 62.0 | E | * | 1.11 | 131.7 | F | * |
| | SB-L | 0.72 | 49.8 | D | | 0.85 | 92.0 | F | * | 1.27 | >150 | F | * |
| | SB-R | 0.52 | 40.8 | D | | 0.51 | 68.9 | E | * | 0.66 | 77.4 | E | * |
| Fulton Street (E-W) @ | EB-LTR | 0.19 | 36.7 | D | | 0.22 | 36.5 | D | | 0.20 | 37.6 | D | |
| Flatbush Avenue (N-S) | WB-LT | 0.54 | 47.2 | D | | 0.44 | 42.3 | D | | 0.77 | 63.3 | E | * |
| | WB-R | 0.54 | 28.5 | C | | 0.29 | 19.0 | B | | 0.41 | 22.6 | C | |
| | NB-TR | 1.19 | 126.2 | F | * | 1.01 | 66.3 | E | * | 0.98 | 57.6 | E | * |
| | SB-L | 1.00 | 92.6 | F | * | 0.76 | 51.6 | D | | 0.96 | 66.9 | E | * |
| | SB-T | 0.98 | 41.7 | D | * | 0.95 | 35.6 | D | * | 0.91 | 26.5 | C | * |

| UNSIGNALIZED INTERSECTION | Lane Group | AM Peak Hour No Action V/C Ratio | AM Peak Hour No Action Delay (sec.) | AM Peak Hour No Action LOS | MD Peak Hour No Action V/C Ratio | MD Peak Hour No Action Delay (sec.) | MD Peak Hour No Action LOS | PM Peak Hour No Action V/C Ratio | PM Peak Hour No Action Delay (sec.) | PM Peak Hour No Action LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Duffield Street (N-S) @ | NB-LR | 0.17 | 17.1 | C | 0.32 | 20.4 | C | 0.46 | 21.8 | C | |
| Willoughby Street (E-W) | SB-LR | 0.05 | 21.6 | C | 0.05 | 22.4 | C | 0.10 | 35.7 | E | * |
| (Two-Way Stop Control) | | | | | | | | | | | |
| Lawrence Street (N-S) @ | WB-TR | - | 8.5 | A | - | 9.0 | A | - | 8.3 | A | |
| Willoughby Street (E-W) | NB-LR | - | 7.9 | A | - | 8.3 | A | - | 8.0 | A | |
| (All-Way Stop Control) | | | | | | | | | | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defacto Left Lane on this approach.
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Congested Intersections ( LOS E or F, or V/C / 0.9)

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

## PARKING

*OFF-STREET PARKING*

In the future without the proposed actions, new developments expected to be completed by 2013 would generate a demand for approximately 2,099 spaces in the AM and 2,684 spaces in the midday at parking facilities in the study area (see Appendix A). Over this same period, approximately 2,061 off-street public parking spaces would be displaced due to new development. This loss in capacity would be more than offset by the addition of approximately 2,100 new public parking spaces. This total includes new spaces planned as part of new developments and the opening (in September 2003) of a new 30-space public parking lot at 209-211 Duffield Street. Among the new developments contributing to these changes in parking supply and demand are 9 MetroTech South which would accommodate its demand of 201 spaces in the AM and 305 spaces in the midday in a new 337-space public garage, 330 Jay Street which would generate a demand of 271 spaces in the AM and 410 spaces in the midday, and office and residential developments at Atlantic Terminal which would generate a total demand of 590 spaces in the AM and 828 in the midday. Residential developments along Schermerhorn Street would displace a total of 1,074 public parking spaces, while the 515-space Atlantic and Court municipal parking garage would be replaced by a new residential and retail development that would generate a demand of 164 AM spaces and 169 midday spaces, but would include a new 700-space public parking garage.

The changes in off-street parking supply and demand discussed above do not include demand that would be generated by the Arena project which would be located immediately to the south of the parking study area. This project is not expected to displace any public off-street parking facility within the study area, however its residential and commercial components are all expected to generate new demand for off-street parking in the weekday AM and midday periods by 2013. The Arena itself will generate demand primarily in the weekday PM and on weekends. It is anticipated that the Arena project's approximately 3,500 on-site parking spaces will be more than sufficient to accommodate all of the new demand generated by that project in the AM and midday peak hours. Given the fact that the Arena project will not displace any existing off-street public parking supply within the study area, and that it will accommodate its new parking demand in on-site garages, this project is not expected to appreciably affect the No Build off-street parking supply or demand within 1/4-mile of any of the projected development sites in the AM and midday. Although the Arena project will likely have a surplus of on-site parking supply during these periods, the analysis of No Build off-street parking conditions does not assume that any of this potential parking capacity will be available to meet parking demand within the study area for the Downtown Brooklyn Development project.

Table 14-7 shows the resulting 2013 No Build off-street parking conditions. As shown in Table 14-7, parking capacity in the study area is expected to total 10,839 spaces, a net increase of 39 spaces compared to existing capacity. Demand is expected to total 8,810 spaces in the AM (versus 6,353 spaces under existing conditions) and 12,018 spaces in the midday (versus 8,836 existing spaces). These totals include a growth factor of 0.5 percent per year applied to existing demand to account for general background growth that would occur through 2013. Overall, as shown in Table 14-7, there would be a surplus of 2,029 public parking spaces in the study area in the AM peak period compared to a surplus of 4,447 in the existing condition. In the midday, however, new demand would eliminate the existing surplus of 1,946 spaces and result in a net deficit of 1,179 spaces in the future without the proposed actions.

**Table 14-7**
**2013 No Build Off-Street Parking Conditions**

| Period | 2002 Existing Conditions | | | 2013 No Build Conditions | | |
|---|---|---|---|---|---|---|
| | Total Capacity | Estimated Demand | Net Spaces Available | Total Capacity (1) | Estimated Demand (2) | Net Spaces Available |
| AM | 10,800 | 6,353 | 4,447 | 10,839 | 8,810 | 2,029 |
| Midday | 10,800 | 8,836 | 1,946 | 10,839 | 12,018 | (1,179) |

**Notes:**
(1) Includes 2,100 new public spaces and 2,061 public spaces displaced by development.
(2) Includes 0.5 percent/year background growth and demand from No Build sites.

*ON-STREET PARKING*

In the future without the proposed actions, it anticipated that demand for on-street parking will increase due to new developments and general background growth. Some existing capacity may be displaced as curbside regulations are adjusted to accommodate new developments, security needs at sensitive locations, and changes in curbside usage. For example, in September 2003 a total of six metered spaces were displaced from the west curb of Flatbush Avenue south of Myrtle Avenue to accommodate the relocation of an existing stop for B54 buses (see Chapter 15, "Transit and Pedestrians"). Overall, it is anticipated that where curbside parking is available, demand will continue to exceed supply throughout much of the day in the future without the proposed actions.

## D. THE FUTURE WITH THE PROPOSED ACTIONS

This section provides an analysis of traffic and parking conditions in the future with the proposed actions. As discussed in Chapter 1, "Project Description," the proposed actions are projected to stimulate approximately 6.7 million square feet of new development, including office, residential, retail, and community facility/cultural space. Approximately 1,617 new public parking spaces would also be created in three new parking garages. These new developments, located on 12 sites within the study area, would displace existing uses on these sites.

It should be noted that, subsequent to the publication of the DSEIS, Site K was eliminated from consideration as a projected development site. The trip generation forecast prepared for the DSEIS did not include any new trips from this site as it was assumed that it would be redeveloped as public open space and therefore would not generate new travel demand. It was also assumed that demand from the existing community facility uses on the Site K would have been relocated within the study area, and therefore, no credit was taken for these trips. Consequently, the elimination of Site K as a projected development site did not result in any change to the project's travel demand forecast.

Also proposed are changes to the study area street network, including the closure of several minor streets (Red Hook Lane and portions of Pearl, Prince and Fair Streets), the widening of portions of Fleet Place, Willoughby Street, and Myrtle Avenue, and the extension of Fleet Place to a new intersection with Myrtle Avenue. A new street connection between Duffield Street and

Albee Square West would be created midblock between Willoughby and Fulton Streets, and portions of Duffield and Elm Streets would be converted from one-way northbound to one-way southbound operation. The analyses in this section examine future traffic and parking conditions in the year 2013 with the full build-out of this projected development scenario.

## CHANGES TO THE STUDY AREA STREET NETWORK

A number of physical and operational changes to the study area street network would be implemented in the future with the proposed actions. These changes are shown in Figure 14-10 and discussed below.

### *STREET CLOSURES (RED HOOK LANE, PEARL STREET, PRINCE STREET, FAIR STREET)*

In order to merge blocks to create larger, more viable development sites, the proposed actions would include the demapping and closure of several minor streets. As shown in Figure 14-10, Red Hook Lane would be closed between Boerum Place and Fulton Street, as would the short segment of Pearl Street between Fulton and Willoughby Streets. Peak hour traffic volumes on these street segments are very low, (typically under 50 vph in the future without the proposed actions), and the majority of this traffic is servicing adjacent land uses which would be displaced by new development. Fair Street between Fleet Place and Prince Street, and Prince Street between Flatbush Avenue Extension and Myrtle Avenue would also be demapped and closed. Much of the traffic on these street segments, which will range from 129 to 174 vph in the future without the proposed actions, would divert to Fleet Place which would be extended to a new intersection with Myrtle Avenue (see below).

### *FLEET PLACE*

In order to provide for more rational site development on the project sites east of Flatbush Avenue Extension, Fleet Place would be widened by ten feet (increasing mapped width from 50 feet to 60 feet) and extended northward to a new signalized intersection with Myrtle Avenue. The street would also be converted from the existing one-way northbound operation to two-way between Willoughby Street and Myrtle Avenue.

### *MYRTLE AVENUE*

In order to improve circulation, Myrtle Avenue would be widened by 25 feet at its intersection with Flatbush Avenue Extension. The mapped street width (including sidewalks) would be tapered from 100 feet in width at Flatbush Avenue Extension to the existing 75 feet at the extension of Fleet Place. A planted median would be installed consistent with the median on the opposing Flatbush Court approach across Flatbush Avenue Extension.

### *GOLD STREET*

Under the proposed actions, Gold Street would be reconfigured between Flatbush Court (Myrtle Avenue) and Willoughby Street. As shown in Figure 14-10, the slip off lane from Gold Street onto southbound Flatbush Avenue Extension would be reconfigured to into a "T" intersection, and the segment of Gold Street north of this intersection would be closed to traffic and made available for pedestrian use. All traffic would access southbound Gold Street via a right turn from southbound Flatbush Avenue Extension.

*WILLOUGHBY STREET*

In order to improve circulation and provide more efficient access to projected development sites, the south side of Willoughby Street would be widened by 35 feet between Albee Square West/Gold Street and Flatbush Avenue Extension. As shown in Figure 14-10, this would provide sufficient right-of-way for 13-foot-wide sidewalks, a 30-foot-wide travelway in each direction, and a planted median. The block of Willoughby Street between Albee Square West/Gold Street and Duffield Street would be converted from two-way to one-way westbound operation.

*NEW PRIVATE DRIVE*

With implementation of the proposed actions, a new private drive would be created connecting Duffield Street to Albee Square West midblock between Willoughby and Fulton Streets. This private drive would operate one-way eastbound and would form the southern boundary of the proposed Willoughby Square public space. Beneath this public space would be constructed a new 694-space public parking garage with an entrance on Duffield Street and an exit on Albee Square West. With Duffield Street operating one-way southbound (see below), traffic en route to and from this garage and the adjacent projected office developments would circulate in a counter-clockwise direction around Willoughby Square. It is anticipated that the intersection of the new private drive with Albee Square West would be stop controlled on both the northbound and eastbound approaches.

*DUFFIELD STREET/ELM STREET*

In order to improve circulation and provide more efficient access to projected development sites, Duffield Street would be converted from one-way northbound to one-way southbound operation between Willoughby and Fulton Streets. Elm Street would also be converted to one-way southbound operation between Fulton and Livingston Streets except for a short segment north of Livingston Street where a single northbound lane would be provided to maintain access to the entrance of an adjacent 1,000-space public parking garage. With the conversion of Elm Street to southbound operation, the intersection of Elm and Livingston Streets would be signalized.

## TRIP GENERATION

The proposed actions are projected to stimulate approximately 6.7 million square feet of new development on 12 sites within the study area, including 4.6 million square feet of office space, 979,000 square feet of residential use (approximately 979 units), 844,000 square feet of retail, and 260,000 square feet of community facility/cultural space. The trip generation rates and mode choice assumptions used to estimate the travel demand that would be generated by this new development were based on accepted CEQR criteria, standard professional references, and studies that have been done for similar uses in Downtown Brooklyn. These sources were supplemented by 1990 and 2000 Census data, Employee Commute Options survey data from firms and governmental/educational institutions in Downtown Brooklyn, as well as recent data for Downtown Brooklyn from other sources. The trip generation rates and modal split assumptions used in forecasting the travel demand from projected development sites are presented in Table 14-8.

As noted above, the developments projected to occur as a result of the proposed actions would displace existing land uses on 12 sites in Downtown Brooklyn. These uses occupy a total of approximately 1.5 million square feet of existing built floor area and include approximately

# Table 14-8
# Transportation Planning Assumptions

| Land Use: | | Office | Residential | Neighborhood Retail | Destination Retail | Community Facility | Visual and Performing Arts Library | Performing Arts Theater | Light Industrial |
|---|---|---|---|---|---|---|---|---|---|
| Trip Generation : (person-trips/1,000 gsf) | | (1) 18.00 | (1) 8.075 | (1) 205 | (see Note 6) | (9) 26.6 | (10) 40.24 | (11) 2.5 (per seat) | (14) 14.67 |
| Temporal Distribution: | AM (8-9) | (1) 11.8% | (1) 9.1% | (1) 3.1% | (7) 2.4% | (9) 7.2% | (10) 0.6% | (11) 0.6% | (14) 13.2% |
| | MD (12-1) | 14.5% | 4.7% | 19.0% | 8.7% | 7.1% | 11.5% | 3.0% | 15.0% |
| | PM (5-6) | 13.7% | 10.7% | 9.6% | 8.9% | 8.3% | 10.3% | 5.0% | 14.1% |
| Modal Split (%) : | | (2) AM/PM / Midday | (4) AM/MD/PM | (5) AM/MD/PM | (8) AM/MD/PM | (2) AM/MD/PM | (11) AM/MD/PM | (13) AM/MD/PM | (2) AM/PM / Midday |
| | Auto | 12% / 2% | 13% | 2% | 20% | 12% | 15% | 20% | 12% / 2% |
| | Taxi | 1% / 1% | 1% | 3% | 2% | 1% | 0% | 5% | 1% / 1% |
| | Subway | 71% / 7% | 65% | 20% | 22% | 71% | 30% | 60% | 77% / 7% |
| | Bus | 6% / 7% | 4% | 5% | 30% | 6% | 15% | 5% | 6% / 7% |
| | Walk/Other | 10% / 83% | 17% | 70% | 26% | 10% | 40% | 10% | 4% / 83% |
| | | 100% / 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% / 100% |
| Vehicle Occupancy: | Auto | (2) 1.42 | (4) 1.19 | (1) 2.00 | (7) 2.00 | (9) 1.50 | (12) 2.70 | (13) 1.42 | (14) 1.30 |
| | Taxi | 1.42 | 1.40 | 2.00 | 2.00 | 1.50 | 2.70 | 1.42 | 1.30 |
| In/Out Distribution (%): | | (1) In / Out | (1) In / Out | (1) In / Out | (8) In / Out | (9) In / Out | (10) In / Out | (13) In / Out | (14) In / Out |
| | AM (8-9) | 96% / 4% | 20% / 80% | 50% / 50% | 61% / 39% | 94% / 6% | 100% / 0% | 72% / 28% | 88% / 12% |
| | MD (12-1) | 39% / 61% | 51% / 49% | 50% / 50% | 55% / 45% | 45% / 55% | 71% / 29% | 51% / 49% | 50% / 50% |
| | PM (5-6) | 5% / 95% | 65% / 35% | 50% / 50% | 47% / 53% | 42% / 58% | 24% / 76% | 48% / 52% | 12% / 88% |
| Truck Trip Generation : (truck trips/1,000 gsf) | | (3) 0.29 | (3) 0.07 | (3) 0.35 | (3) 0.35 | (3) 0.19 | (3) 0.29 | (3) 0.29 | (3) 0.35 |
| Truck Temporal Distribution: | AM (8-9) | (3) 10% | (3) 12% | (3) 8% | (3) 8% | (3) 6% | (3) 10% | (3) 10% | (3) 14% |
| | MD (12-1) | 11% | 9% | 11% | 11% | 11% | 11% | 11% | 9% |
| | PM (5-6) | 2% | 2% | 2% | 2% | 1% | 2% | 2% | 1% |

Notes:

(1) Pushkarev & Zupan, "Urban Space for Pedestrians".
(2) NYCDOT ECO survey data for Downtown Brooklyn. LIRR trips assigned to subway and walk modes.
(3) Curbside Pickup & Delivery Operations & Arterial Traffic Impacts, FHWA , February 1981.
(4) 2000 Census journey-to-work data .
(5) Coliseum Redevelopment SFEIS, July 1997.
(6) Trips per 1,000 gsf based on fitted curve equation Ln(T) = 0.643 LN(X) + 5.866 for Land Use 820, ITE Trip Generation, 6th Edition.
(7) Atlantic Center Plaza FEIS, 1999.
(8) Modified from Atlantic Center Plaza FEIS, 1999.
(9) MetroTech FEIS, 1987.
(10) Based on Brooklyn Public Library data and data from the American Museum of Natural History Planetarium and North Side Project EIS, May 1996.
(11) PHA assumptions.
(12) Lincoln Center data, Oct. 2001.
(13) PHA assumption for daytime pre-theater period.
(14) ITE Trip Generation, 6th Edition, Land Use 110.

622,000 square feet of commercial/office space, 574,000 square feet of retail space, 130 dwelling units, 72,000 square feet of community facility space, 69,000 square feet of miscellaneous industrial space, and approximately 1,181 public parking spaces in eight off-street lots or garages. The trip generation rates and modal split assumptions utilized for forecasting travel demand from projected developments were also utilized in forecasting the demand eliminated due to the displacement of existing uses on each site. The change in travel demand resulting from the proposed actions is the net difference between the eliminated travel demand from existing uses on a site and the travel demand that would be generated by the projected development on that site. The estimated travel demand from existing land uses on each site, and the total travel demand from projected development are shown in Tables 14-9 and 14-10, respectively. Table 14-11 shows the net travel demand in person trips for the AM, midday and PM peak hours for each of the projected development sites. Table 14-12 shows the net numbers of vehicle trips (auto, taxi and truck) in each peak hour. As shown in Table 14-12, the projected developments would result in a net increase of 865 inbound and 242 outbound vehicle trips in the AM peak hour (auto, taxi and truck), 402 inbound and 416 outbound vehicle trips in the midday, and 278 inbound and 1,016 outbound vehicle trips in the PM peak hour.

As shown in Table 14-11, trips by subway would total 6,013 inbound and 691 outbound in the AM peak hour and 1,163 inbound and 7,408 outbound in the PM peak hour. Trips by local bus would total 546 inbound and 83 outbound in the AM peak hour and 211 inbound and 782 outbound in the PM. Trips by walking only, bicycle or other non-vehicular modes would total 1,360 inbound and 623 outbound in the AM peak hour, and 1,780 inbound and 2,753 outbound in the PM. Trips by commuter rail are expected to account for approximately 12 percent of commuter trips during the AM and PM peak periods. However, most if not all of these commuters either walk to and from their place of business from the Long Island Rail Road's Flatbush Avenue Terminal, or complete their journeys via a transfer to and from the subway at the Atlantic Avenue/Pacific Street station complex. These commuter rail trips have therefore been included in the totals for subway and walk trips.

## TRIP ASSIGNMENT

Figures 14-11 through 14-13 show the assignment of project increment traffic (autos, taxis and trucks) to the study area street network during the weekday AM, midday and PM peak hours, respectively. Auto and taxi trips en route to and from projected commercial/office developments were assigned to study area portals based on census origin/destination survey data and data from existing parking lot patrons in Downtown Brooklyn. Auto trips were then assigned to proposed public or accessory parking facilities at or in the vicinity of the individual commercial/office development sites via the most direct routes through the study area street network. Taxi trips were similarly assigned via the most direct routes to and from the entrances to each development site. The assignment pattern for residential auto and taxi trips was based upon employment data for Brooklyn residents from the 2000 Census, while the assignment of retail trips assumed a primarily local distribution from within Brooklyn. The assignment of auto and taxi trips to and from projected community facility developments similarly assumed a primarily local distribution from within Brooklyn. Truck trips were assigned to designated truck routes serving Downtown Brooklyn, and then via the most direct path on the local street network to and from each development site. The project increment traffic assignments shown in Figures 14-11 through 14-13 also reflect the diversion of traffic that would result from changes in the street network associated with the proposed actions (see discussion above).

# Table 14-9
## Estimated Travel Demand From Existing Land Uses on Projected Development Sites (Person Trips)

| | | Site C<br>Community Facility (72,000 sf)<br>(See Note 1) | | Site G<br>Residential (60 D.U.)<br>(See Note 2) | | Site I(A)<br>Residential (3 D.U.)<br>Neighborhood Retail (28,000 sf)<br>Light Industrial (9,000 sf) | | Site J<br>Neighborhood Retail (38,000 sf) | | Site M<br>Residential (30 D.U.)<br>Neighborhood Retail (24,000 sf)<br>Office (185,000 sf) | | Site O<br>Residential (41 D.U.)<br>Neighborhood Retail (31,000 sf) | | Site P<br>Residential (56 D.U.)<br>Neighborhood Retail (16,000 sf)<br>Office (100,000 sf) | | Site Q<br>Destination Retail (373,000 sf)<br>Parking | | Site S<br>Neighborhood Retail (39,000 sf)<br>Office (337,000 sf) | | Site AA<br>Parking<br>(See Note 3) | | Site BB<br>Neighborhood Retail (25,000 sf) | | Site EE<br>Parking<br>(See Note 4) | | Total Travel Demand | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out |
| AM | Auto | 18 | 1 | 1 | 5 | 4 | 2 | 2 | 2 | 48 | 6 | 3 | 5 | 26 | 6 | 98 | 63 | 84 | 5 | 0 | 0 | 2 | 2 | 0 | 0 | 286 | 97 |
| | Taxi | 1 | 0 | 0 | 0 | 3 | 3 | 4 | 4 | 6 | 2 | 3 | 3 | 4 | 2 | 10 | 6 | 11 | 4 | 0 | 0 | 2 | 2 | 0 | 0 | 44 | 26 |
| | Subway | 104 | 4 | 6 | 23 | 30 | 21 | 24 | 24 | 286 | 37 | 24 | 36 | 159 | 37 | 108 | 69 | 513 | 45 | 0 | 0 | 16 | 16 | 0 | 0 | 1,270 | 312 |
| | Local Bus | 9 | 0 | 0 | 1 | 5 | 4 | 6 | 6 | 27 | 6 | 5 | 6 | 15 | 5 | 147 | 94 | 47 | 8 | 0 | 0 | 4 | 4 | 0 | 0 | 265 | 134 |
| | Walk/Other | 15 | 1 | 1 | 6 | 63 | 62 | 85 | 85 | 92 | 58 | 70 | 73 | 57 | 43 | 127 | 81 | 156 | 90 | 0 | 0 | 56 | 56 | 0 | 0 | 722 | 555 |
| | **Total** | **147** | **6** | **8** | **35** | **105** | **92** | **121** | **121** | **459** | **109** | **105** | **123** | **261** | **93** | **490** | **313** | **811** | **152** | **0** | **0** | **80** | **80** | **0** | **0** | **2,587** | **1,124** |
| Midday | Auto | 1 | 2 | 2 | 1 | 11 | 11 | 15 | 15 | 14 | 16 | 13 | 13 | 9 | 10 | 320 | 262 | 22 | 26 | 0 | 0 | 10 | 10 | 0 | 0 | 417 | 366 |
| | Taxi | 1 | 1 | 0 | 0 | 16 | 16 | 22 | 22 | 16 | 17 | 18 | 18 | 10 | 11 | 32 | 26 | 26 | 28 | 0 | 0 | 15 | 15 | 0 | 0 | 156 | 154 |
| | Subway | 5 | 8 | 8 | 7 | 110 | 110 | 148 | 148 | 110 | 118 | 126 | 126 | 76 | 80 | 352 | 288 | 176 | 190 | 0 | 0 | 97 | 97 | 0 | 0 | 1,208 | 1,172 |
| | Local Bus | 5 | 8 | 0 | 0 | 28 | 28 | 37 | 37 | 36 | 44 | 30 | 30 | 23 | 27 | 480 | 393 | 62 | 76 | 0 | 0 | 24 | 24 | 0 | 0 | 725 | 667 |
| | Walk/Other | 61 | 95 | 2 | 2 | 390 | 390 | 518 | 518 | 484 | 573 | 424 | 424 | 304 | 352 | 416 | 341 | 817 | 978 | 0 | 0 | 341 | 341 | 0 | 0 | 3,757 | 4,014 |
| | **Total** | **73** | **114** | 12 | 10 | **555** | **555** | **740** | **740** | **660** | **768** | **611** | **611** | **422** | **480** | **1,600** | **1,310** | **1,103** | **1,298** | **0** | **0** | **487** | **487** | **0** | **0** | **6,263** | **6,373** |
| PM | Auto | 1 | 20 | 4 | 2 | 6 | 8 | 7 | 7 | 10 | 58 | 9 | 8 | 8 | 33 | 278 | 318 | 13 | 103 | 0 | 0 | 5 | 5 | 0 | 0 | 341 | 562 |
| | Taxi | 0 | 2 | 0 | 0 | 8 | 8 | 11 | 11 | 7 | 11 | 9 | 9 | 5 | 7 | 28 | 32 | 12 | 20 | 0 | 0 | 7 | 7 | 0 | 0 | 87 | 107 |
| | Subway | 6 | 120 | 22 | 12 | 58 | 69 | 75 | 75 | 74 | 361 | 76 | 69 | 60 | 209 | 305 | 350 | 107 | 638 | 0 | 0 | 49 | 49 | 0 | 0 | 832 | 1,952 |
| | Local Bus | 1 | 10 | 1 | 1 | 14 | 15 | 19 | 19 | 14 | 38 | 16 | 15 | 10 | 23 | 417 | 477 | 21 | 66 | 0 | 0 | 12 | 12 | 0 | 0 | 525 | 676 |
| | Walk/Other | 1 | 17 | 6 | 3 | 193 | 194 | 262 | 262 | 170 | 210 | 218 | 216 | 116 | 136 | 361 | 413 | 273 | 348 | 0 | 0 | 172 | 172 | 0 | 0 | 1,772 | 1,971 |
| | **Total** | **9** | **169** | 33 | 18 | **279** | **294** | **374** | **374** | **275** | **678** | **328** | **317** | **199** | **408** | **1,389** | **1,590** | **426** | **1,175** | **0** | **0** | **245** | **245** | **0** | **0** | **3,557** | **5,268** |

**Notes:**

(1) Community facility is administrative office space for Polytechnic University. Planning assumptions for office space assumed for this use.

(2) No Build condition assumes conversion from light industrial to 60 dwelling units.

(3) Existing land use on Site AA is an accessory parking lot. No credit assumed for existing demand.

(4) Existing land use on Site EE is a public parking lot. No credit assumed for existing demand.

Commuter rail (LIRR) trips assigned to subway and walk modes.

# Table 14-10
## Total Travel Demand From Projected Development by Site (Person Trips)

| | | Site C<br>Community Facility (80,000 sf)<br>Office (720,000 sf)<br>(See Note 1) | | Site G<br>Residential (71 D.U.)<br>Neighborhood Retail (10,000 sf) | | Site I(A)<br>Residential (300 D.U.)<br>Neighborhood Retail (60,000 sf) | | Site J<br>Residential (259 D.U.)<br>Neighborhood Retail (86,000 sf) | | Site M<br>Neighborhood Retail (70,000 sf)<br>Office (778,000 sf) | | Site O<br>Neighborhood Retail (50,000 sf)<br>Office (544,000 sf) | | Site P<br>Neighborhood Retail (48,000 sf)<br>Office (999,000 sf) | | Site Q<br>Destination Retail (415,000 sf)<br>Office (1,233,000 sf)<br>(See Note 2) | | Site S<br>Neighborhood Retail (51,000 sf)<br>Office (337,000 sf)<br>(See Note 3) | | Site AA<br>Residential (163 D.U.)<br>Neighborhood Retail (18,000 sf) | | Site BB<br>Residential (186 D.U.)<br>Neighborhood Retail (21,000 sf) | | Site EE<br>Performing Arts Library (140,000 sf)<br>Neighborhood Retail (15,000 sf)<br>Cultural Facility (40,000 sf) | | Total Travel Demand | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out |
| AM | Auto | 196 | 8 | 2 | 6 | **10** | **27** | 10 | 25 | 194 | 12 | 136 | 9 | 247 | 13 | 407 | 80 | 85 | 6 | 4 | 13 | 5 | 15 | 7 | 1 | 1,303 | 215 |
| | Taxi | 17 | 1 | 1 | 1 | 6 | 8 | 8 | 10 | 23 | 8 | 16 | 5 | 25 | 6 | 35 | 8 | 12 | 5 | 2 | 3 | 2 | 3 | 1 | 1 | 148 | 59 |
| | Subway | 1,158 | 48 | 13 | 33 | 67 | 153 | 80 | 154 | 1,170 | 91 | 819 | 65 | 1,477 | 91 | 1,900 | 148 | 520 | 52 | 27 | 73 | 31 | 84 | 21 | 11 | 7,283 | 1,003 |
| | Local Bus | 98 | 4 | 2 | 4 | 12 | 17 | 16 | 20 | 106 | 15 | 75 | 11 | 130 | 13 | 308 | 107 | 49 | 10 | 4 | 7 | 4 | 7 | 7 | 2 | 811 | 217 |
| | Walk/Other | 163 | 7 | 24 | 29 | 140 | 163 | 197 | 217 | 315 | 163 | 222 | 116 | 311 | 115 | 387 | 97 | 182 | 116 | 44 | 56 | **52** | **66** | 45 | 33 | 2,082 | 1,178 |
| | **Total** | **1,632** | **68** | **42** | **73** | **235** | **368** | **311** | **426** | **1,808** | **289** | **1,268** | **206** | **2,190** | **238** | **3,037** | **440** | **848** | **189** | **81** | **152** | **94** | **175** | **81** | **48** | **11,627** | **2,672** |
| Midday | Auto | 17 | 26 | 6 | 6 | 31 | 30 | 40 | 39 | 43 | 52 | 30 | 36 | 39 | 51 | 368 | 320 | 27 | 31 | 11 | 11 | **13** | **12** | 77 | 37 | 702 | 651 |
| | Taxi | 8 | 12 | 6 | 6 | 36 | 36 | 51 | 50 | 49 | 53 | 35 | 38 | 38 | 44 | 47 | 48 | 33 | 35 | 11 | 11 | 12 | 12 | 10 | 10 | 336 | 355 |
| | Subway | 57 | 89 | 48 | 48 | 272 | 270 | 368 | 366 | 328 | 360 | 234 | 256 | 258 | 298 | 465 | 446 | 223 | 237 | 91 | 90 | 105 | 104 | 203 | 123 | 2,652 | 2,687 |
| | Local Bus | 57 | 89 | 11 | 11 | 60 | 60 | 86 | 86 | 123 | 155 | 88 | 110 | 118 | 158 | 602 | 558 | 74 | 88 | 19 | 19 | 21 | 21 | 84 | 44 | 1,343 | 1,399 |
| | Walk/Other | 676 | 1,057 | 138 | 138 | 828 | 827 | 1,181 | 1,180 | 1,611 | 1,982 | 1,142 | 1,401 | 1,498 | 1,974 | 1,488 | 1,994 | 980 | 1,141 | 250 | 250 | 292 | 292 | 387 | 281 | 10,471 | 12,517 |
| | **Total** | **815** | **1,273** | **209** | **209** | **1,227** | **1,223** | **1,726** | **1,721** | **2,154** | **2,602** | **1,529** | **1,841** | **1,951** | **2,525** | **2,970** | **3,366** | **1,337** | **1,532** | **382** | **381** | **443** | **441** | **761** | **495** | **15,504** | **17,609** |
| PM | Auto | 12 | 224 | 7 | 5 | 34 | 24 | 36 | 27 | 26 | 233 | 18 | 163 | 24 | 290 | 315 | 687 | 15 | 105 | 16 | 10 | 18 | 11 | 28 | 74 | 549 | 1,853 |
| | Taxi | 1 | 19 | 3 | 3 | 20 | 19 | 26 | 26 | 22 | 39 | 16 | 28 | 15 | 37 | 32 | 63 | 15 | 23 | 6 | 5 | 7 | 7 | 5 | 5 | 168 | 274 |
| | Subway | 70 | 1,331 | 46 | 34 | 228 | 177 | 264 | 220 | 206 | 1,432 | 146 | 1,003 | 181 | 1,756 | 435 | 2,425 | 130 | 661 | 95 | 67 | 109 | 78 | 85 | 176 | 1,995 | 9,360 |
| | Local Bus | 6 | 112 | 7 | 6 | 37 | 34 | 48 | 45 | 40 | 143 | 29 | 101 | 31 | 164 | 455 | 684 | 27 | 72 | 13 | 11 | 14 | 12 | 29 | 74 | 736 | 1,458 |
| | Walk/Other | 10 | 188 | 76 | 73 | 442 | 428 | 617 | 605 | 492 | 664 | 351 | 471 | 343 | 565 | 402 | 732 | 355 | 430 | 140 | 132 | 163 | 155 | 161 | 281 | 3,552 | 4,724 |
| | **Total** | **99** | **1,874** | **139** | **121** | **761** | **682** | **991** | **923** | **786** | **2,511** | **560** | **1,766** | **594** | **2,812** | **1,639** | **4,591** | **542** | **1,291** | **270** | **225** | **311** | **263** | **308** | **610** | **7,000** | **17,669** |

**Notes:**

(1) Community facility assumed to be replacement administrative office space for Polytechnic University. Planning assumptions for office space assumed for this use.

(2) Includes 373,000 sf of existing destination retail that would not be displaced by new development.

(3) In-fill of an existing arcade with neighborhood retail. No change in existing office use on the site.

Commuter rail (LIRR) trips assigned to subway and walk modes.

# Table 14-11
## Net Travel Demand from Projected Development Sites
## (Person Trips)

| | | Site C<br>Office<br>Community Facility | | Site G<br>Residential<br>Neighborhood Retail | | Site I(A)<br>Residential<br>Neighborhood Retail | | Site J<br>Residential<br>Neighborhood Retail | | Site M<br>Office<br>Neighborhood Retail | | Site O<br>Office<br>Neighborhood Retail | | Site P<br>Office<br>Neighborhood Retail | | Site Q<br>Office<br>Destination Retail | | Site S<br>Neighborhood Retail | | Site AA<br>Residential<br>Neighborhood Retail | | Site BB<br>Residential<br>Neighborhood Retail | | Site EE<br>Performing Arts Library<br>Cultural Facility<br>Neighborhood Retail | | Total Travel Demand | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out |
| | Auto | 178 | 7 | 1 | 1 | **6** | **25** | 8 | 23 | 146 | 6 | 133 | 4 | 221 | 7 | 309 | 17 | 1 | 1 | **4** | **13** | **3** | **13** | **7** | **1** | 1,017 | 118 |
| | Taxi | 16 | 1 | 1 | 1 | 3 | 5 | 4 | 6 | 17 | 6 | 13 | 2 | 21 | 4 | 25 | 2 | 1 | 1 | 2 | 3 | 0 | 1 | 1 | 1 | 104 | 33 |
| **AM** | Subway | 1,054 | 44 | 7 | 10 | 37 | 132 | 56 | 130 | 884 | 54 | 795 | 29 | 1,318 | 54 | 1,792 | 79 | 7 | 7 | 27 | 73 | 15 | 68 | 21 | 11 | 6,013 | 691 |
| | Local Bus | 89 | 4 | 2 | 3 | 7 | 13 | 10 | 14 | 79 | 9 | 70 | 5 | 115 | 8 | 161 | 13 | 2 | 2 | 4 | 7 | 0 | 3 | 7 | 2 | 546 | 83 |
| | Walk/Other | 148 | 6 | 23 | 23 | 77 | 101 | 112 | 132 | 223 | 105 | 152 | 43 | 254 | 72 | 260 | 16 | 26 | 26 | 44 | 56 | -4 | 10 | 45 | 33 | 1,360 | 623 |
| | **Total** | **1,485** | **62** | **34** | **38** | **130** | **276** | **190** | **305** | **1,349** | **180** | **1,163** | **83** | **1,929** | **145** | **2,547** | **127** | **37** | **37** | **81** | **152** | **14** | **95** | **81** | **48** | **9,040** | **1,548** |
| | Auto | 16 | 24 | 4 | 5 | 20 | 19 | 25 | 24 | 29 | 36 | 17 | 23 | 30 | 41 | 48 | 58 | 5 | 5 | **11** | **11** | **3** | **2** | **77** | **37** | 285 | 285 |
| | Taxi | 7 | 11 | 6 | 6 | 20 | 20 | 29 | 28 | 33 | 36 | 17 | 20 | 28 | 33 | 15 | 22 | 7 | 7 | 11 | 11 | -3 | -3 | 10 | 10 | 180 | 201 |
| **Midday** | Subway | 52 | 81 | 40 | 41 | 162 | 160 | 220 | 218 | 218 | 242 | 108 | 130 | 182 | 218 | 113 | 158 | 47 | 47 | 91 | 90 | 8 | 7 | 203 | 123 | 1,444 | 1,515 |
| | Local Bus | 52 | 81 | 11 | 11 | 32 | 32 | 49 | 49 | 87 | 111 | 58 | 80 | 95 | 131 | 122 | 165 | 12 | 12 | 19 | 19 | -3 | -3 | 84 | 44 | 618 | 732 |
| | Walk/Other | 615 | 962 | 136 | 136 | 438 | 437 | 663 | 662 | 1,127 | 1,409 | 718 | 977 | 1,194 | 1,622 | 1,072 | 1,653 | 163 | 163 | 250 | 250 | -49 | -49 | 387 | 281 | 6,714 | 8,503 |
| | **Total** | **742** | **1,159** | **197** | **199** | **672** | **668** | **986** | **981** | **1,494** | **1,834** | **918** | **1,230** | **1,529** | **2,045** | **1,370** | **2,056** | **234** | **234** | **382** | **381** | **-44** | **-46** | **761** | **495** | **9,241** | **11,236** |
| | Auto | 11 | 204 | 3 | 3 | 28 | 16 | 29 | 20 | 16 | 175 | 9 | 155 | 16 | 257 | 37 | 369 | 2 | 2 | 16 | 10 | 13 | 6 | 28 | 74 | 208 | 1,291 |
| | Taxi | 1 | 17 | 3 | 3 | 12 | 11 | 15 | 15 | 15 | 28 | 7 | 19 | 10 | 30 | 4 | 31 | 3 | 3 | 6 | 5 | 0 | 0 | 5 | 5 | 81 | 167 |
| **PM** | Subway | 64 | 1,211 | 24 | 22 | 170 | 108 | 189 | 145 | 132 | 1,071 | 70 | 934 | 121 | 1,547 | 130 | 2,075 | 23 | 23 | 95 | 67 | 60 | 29 | 85 | 176 | 1,163 | 7,408 |
| | Local Bus | 5 | 102 | 6 | 5 | 23 | 19 | 29 | 26 | 26 | 105 | 13 | 86 | 21 | 141 | 38 | 207 | 6 | 6 | 13 | 11 | 2 | 0 | 29 | 74 | 211 | 782 |
| | Walk/Other | 9 | 171 | 70 | 70 | 249 | 234 | 355 | 343 | 322 | 454 | 133 | 255 | 227 | 429 | 41 | 319 | 82 | 82 | 140 | 132 | -9 | -17 | 161 | 281 | 1,780 | 2,753 |
| | **Total** | **90** | **1,705** | **106** | **103** | **482** | **388** | **617** | **549** | **511** | **1,833** | **232** | **1,449** | **395** | **2,404** | **250** | **3,001** | **116** | **116** | **270** | **225** | **66** | **18** | **308** | **610** | **3,443** | **12,401** |

**Notes:**

Net travel demand reflects new demand from projected development less displaced demand from existing land uses.

Commuter rail (LIRR) trips assigned to subway and walk modes.

# Table 14-12
## Net Travel Demand from Projected Development Sites
## (Vehicle Trips)

| | | Site C<br>Office<br>Community Facility | | Site G<br>Residential<br>Neighborhood Retail | | Site I(A)<br>Residential<br>Neighborhood Retail | | Site J<br>Residential<br>Neighborhood Retail | | Site M<br>Office<br>Neighborhood Retail | | Site O<br>Office<br>Neighborhood Retail | | Site P<br>Office<br>Neighborhood Retail | | Site Q<br>Office<br>Destination Retail | | Site S<br>Neighborhood Retail | | Site AA<br>Residential<br>Neighborhood Retail | | Site BB<br>Residential<br>Neighborhood Retail | | Site EE<br>Performing Arts Library<br>Cultural Facility<br>Neighborhood Retail | | Total Travel Demand | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out | In | Out |
| AM | Auto | 125 | 5 | 1 | 1 | 4 | 21 | 6 | 19 | 102 | 5 | 94 | 2 | 155 | 4 | 217 | 11 | 1 | 1 | 4 | 11 | 3 | 12 | 4 | 1 | 716 | 93 |
| | Taxi | 11 | 11 | 2 | 2 | 3 | 3 | 4 | 4 | 11 | 11 | 9 | 9 | 15 | 15 | 18 | 18 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 2 | 81 | 81 |
| | Truck | 10 | 10 | 0 | 0 | 2 | 2 | 1 | 1 | 9 | 9 | 9 | 9 | 14 | 14 | 18 | 18 | 0 | 0 | 1 | 1 | 1 | 1 | 3 | 3 | 68 | 68 |
| | **Total** | **146** | **26** | **3** | **3** | **9** | **26** | **11** | **24** | **122** | **25** | **112** | **20** | **184** | **33** | **253** | **47** | **3** | **3** | **8** | **15** | **5** | **14** | **9** | **6** | **865** | **242** |
| Midday | Auto | 11 | 17 | 2 | 3 | 13 | 12 | 15 | 14 | 16 | 22 | 11 | 15 | 19 | 27 | 30 | 37 | 2 | 2 | 7 | 7 | 3 | 2 | 30 | 15 | 159 | 173 |
| | Taxi | 11 | 11 | 5 | 5 | 17 | 17 | 22 | 22 | 30 | 30 | 17 | 17 | 27 | 27 | 20 | 20 | 5 | 5 | 9 | 9 | -2 | -2 | 9 | 9 | 170 | 170 |
| | Truck | 11 | 11 | 0 | 0 | 1 | 1 | 2 | 2 | 10 | 10 | 9 | 9 | 15 | 15 | 21 | 21 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 3 | 73 | 73 |
| | **Total** | **33** | **39** | **7** | **8** | **31** | **30** | **39** | **38** | **56** | **62** | **37** | **41** | **61** | **69** | **71** | **78** | **7** | **7** | **16** | **16** | **2** | **1** | **42** | **27** | **402** | **416** |
| PM | Auto | 8 | 143 | 2 | 2 | 22 | 11 | 21 | 14 | 9 | 120 | 5 | 108 | 10 | 179 | 23 | 255 | 1 | 1 | 12 | 7 | 11 | 5 | 13 | 30 | 137 | 875 |
| | Taxi | 13 | 13 | 3 | 3 | 9 | 9 | 12 | 12 | 21 | 21 | 14 | 14 | 22 | 22 | 22 | 22 | 3 | 3 | 5 | 5 | 0 | 0 | 5 | 5 | 129 | 129 |
| | Truck | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| | **Total** | **23** | **158** | **5** | **5** | **31** | **20** | **33** | **26** | **31** | **142** | **21** | **124** | **35** | **204** | **49** | **281** | **4** | **4** | **17** | **12** | **11** | **5** | **18** | **35** | **278** | **1,016** |

**Notes:**

Net travel demand reflects new demand from projected development less displaced demand from existing land uses.

Taxi trips are balanced.

As shown in Figures 14-11 through 14-13, the primary corridors for traffic en route to and from the projected developments would be Flatbush Avenue Extension and Atlantic Avenue. To the north, Flatbush Avenue Extension would provide access for project trips utilizing the Brooklyn-Queens Expressway (BQE) and most of the 30 to 40 peak hour project trips that would use the Manhattan Bridge. Atlantic Avenue would be used by trips to and from points east, and would also serve as a secondary corridor for access to and from the BQE. Tillary Street and Adams Street would provide access for the 80 to 100 trips per hour that would use the Brooklyn Bridge. Traffic en route to and from the south would be distributed along Flatbush Avenue, as well as along streets within the local grid. Bond Street, for example, would function as an important northbound distributor with 48 to 243 additional trips approaching Livingston Street in each peak hour. Fourth Avenue, Nevins, Hoyt, and Smith/Jay Streets would also serve as local north-south distributors. Both Livingston Street and Schermerhorn Street would function as local east-west distributors.

## VEHICULAR TRAFFIC

Figures 14-14 through 14-16 show the AM, midday and PM peak hour traffic networks in the 2013 future with the proposed actions. The volumes shown are the combination of the incremental traffic generated by the proposed actions and the 2013 No Build traffic network.

### *IMPACT ANALYSIS*

According to *CEQR* criteria, if levels of service deteriorate from LOS A, B or C in the No Build condition to marginally unacceptable mid-LOS D or unacceptable LOS E or F in the Build condition, then a significant traffic impact has occurred. *CEQR* criteria further specify that for a No Build LOS A, B or C which declines to mid-LOS D (45 seconds of delay for signalized intersections and 30 seconds of delay for unsignalized intersections) or worse in the future build condition, mitigation to mid-LOS D is required. For No Build LOS D, an increase of five or more seconds in a lane group in the future build condition should be considered significant if the Build delay exceeds mid-LOS D. For No Build LOS E, an increase in delay of four seconds should be considered significant. For No Build LOS F, three seconds of delay should be considered significant, however, if the No Build LOS F condition already has delays in excess of 120 seconds, an increase of 1.0 second in delay should be considered significant, unless the proposed action would generate fewer than five vehicles through that intersection in the peak hour (signalized intersections) or fewer than five passenger car equivalents (PCE) in the peak hour along the critical approach (unsignalized intersections). In addition, for unsignalized intersections, for the minor street approach to generate a significant impact, 90 PCEs must be identified in the Future Build condition in any peak hour.

Table 14-13 shows the AM, midday and PM peak hour volume-to-capacity ratios, delays and levels of service at analyzed study area intersections in the 2013 future with the proposed actions. The table also identifies those locations that would be impacted based on the criteria discussed above. A summary of impacted intersections is provided in Table 14-14.

As shown in Table 14-13, the PM peak hour would have the highest number of impacted intersections with 28, followed by the AM and the midday, with 23 and 21 impacted intersections, respectively. Intersections with one or more movements operating above capacity (i.e., a v/c ratio of 1.0 or greater) would total 26 in the PM (versus 20 in the future without the proposed actions), 22 in the AM and 17 in the midday (versus 19 and 12 respectively in the No

## Table 14-13
## 2013 Future with the Proposed Actions Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | | MD Peak Hour | | | | | | | PM Peak Hour | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Build | | | Future Action | | | | No Build | | | Future Action | | | | No Build | | | Future Action | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | |
| Tillary Street (E-W) @ | EB-L | 0.66 | 56.9 | E | 0.67 | 57.7 | E | | 0.49 | 50.8 | D | 0.51 | 51.5 | D | | 0.55 | 53.1 | D | 0.58 | 54.1 | D | |
| Flatbush Avenue (N-S) | EB-TR | 0.88 | 48.5 | D | 0.92 | 51.6 | D | | 0.91 | 51.8 | D | 0.95 | 56.2 | E | | 1.03 | 76.2 | E | 1.10 | 100.6 | F | * |
| | EB-R | 0.93 | 75.3 | E | 1.06 | 107.1 | F | * | 0.95 | 80.1 | F | 1.04 | 102.9 | F | * | 1.05 | 106.5 | F | 1.16 | 142.3 | F | * |
| | WB-L | 1.32 | >150 | F | 1.58 | >150 | F | * | 0.77 | 57.7 | E | 0.91 | 70.5 | E | * | 1.24 | >150 | F | 1.35 | >150 | F | * |
| | WB-T | 0.94 | 58.4 | E | 1.01 | 73.7 | F | * | 0.63 | 39.7 | D | 0.66 | 40.5 | D | | 1.12 | 109.6 | F | 1.13 | 116.0 | F | * |
| | WB-R | 1.06 | 106.2 | F | 1.07 | 107.0 | F | | 0.84 | 62.0 | E | 0.85 | 62.6 | E | | 0.59 | 44.5 | D | 0.59 | 44.6 | D | |
| | NB-L | 0.84 | 51.6 | D | 0.84 | 51.4 | D | | 1.00 | 79.7 | E | 1.05 | 93.8 | F | * | 0.71 | 47.7 | D | 0.72 | 47.6 | D | |
| | NB-T | 0.60 | 25.0 | C | 0.61 | 25.1 | C | | 0.45 | 22.3 | C | 0.45 | 22.4 | C | | 0.48 | 22.8 | C | 0.49 | 23.0 | C | |
| | SB-T | 0.56 | 34.8 | C | 0.57 | 35.1 | D | | 0.58 | 35.4 | D | 0.59 | 35.7 | D | | 1.15 | 115.4 | F | 1.15 | 118.3 | F | |
| | SB-R | 0.35 | 35.0 | C | 0.37 | 35.4 | D | | 0.49 | 38.7 | D | 0.55 | 41.3 | D | | 0.57 | 41.1 | D | 0.57 | 41.1 | D | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.30 | >150 | F | 1.45 | >150 | F | ** | EB-LTR 0.89 | 63.9 | E | EB-LTR 0.61 | 54.1 | D | | 1.19 | >150 | F | 1.24 | >150 | F | * |
| Flatbush Avenue (N-S) | EB-TR | 0.96 | 82.5 | F | 0.47 | 40.5 | D | | | | | | | | | 0.94 | 77.9 | E | 0.58 | 43.8 | D | |
| | WB-LTR | 1.01 | 83.8 | F | 1.02 | 86.8 | F | * | 0.71 | 47.5 | D | 0.70 | 46.6 | D | | 0.77 | 51.0 | D | 0.76 | 49.9 | D | |
| | NB-L | 1.65 | >150 | F | 1.65 | >150 | F | | 0.36 | 24.8 | C | 0.41 | 28.1 | C | | 1.11 | >150 | F | 1.11 | >150 | F | |
| | NB-TR | 1.10 | 76.7 | E | 1.15 | 94.9 | F | * | 1.18 | 111.6 | F | 1.29 | >150 | F | * | 0.87 | 25.2 | C | 1.01 | 45.2 | D | * |
| | SB-L | 1.05 | 118.1 | F | 1.10 | 134.2 | F | * | 1.00 | 105.4 | F | 1.13 | 144.8 | F | * | 1.15 | 131.3 | F | 1.24 | >150 | F | * |
| | SB-TR | 0.75 | 9.2 | A | 0.83 | 11.1 | B | | 0.56 | 6.6 | A | 0.59 | 6.8 | A | | 0.89 | 13.6 | B | 0.91 | 14.8 | B | |
| Willoughby Street (E-W) @ | EB-L | 1.02 | 119.7 | F | 1.18 | >150 | F | * | 0.90 | 84.1 | F | 1.39 | >150 | F | * | 1.07 | 122.5 | F | 1.72 | >150 | F | * |
| Flatbush Avenue (N-S) | EB-R | 0.26 | 27.8 | C | 0.20 | 26.1 | C | | 0.43 | 29.1 | C | 0.30 | 25.1 | C | | 0.78 | 49.7 | D | 0.54 | 33.2 | C | |
| | WB-LT | 0.73 | 54.0 | D | 0.75 | 55.4 | E | | 0.30 | 37.0 | D | 0.39 | 38.9 | D | | 0.27 | 38.1 | D | 0.52 | 44.7 | D | |
| | WB-R | 0.29 | 38.6 | D | 0.32 | 39.4 | D | | 0.18 | 35.1 | D | 0.24 | 36.5 | D | | 0.24 | 37.6 | D | 0.26 | 38.3 | D | |
| | NB-L | 1.01 | 95.9 | F | 1.39 | >150 | F | * | 0.59 | 21.2 | C | 0.71 | 29.0 | C | | 0.92 | 84.0 | F | 1.02 | 109.8 | F | * |
| | NB-T | 0.84 | 18.5 | B | 0.79 | 16.6 | B | | 0.61 | 6.4 | A | 0.55 | 5.8 | A | | 0.62 | 5.4 | A | 0.58 | 5.1 | A | |
| | SB-TR | 0.80 | 25.5 | C | 0.88 | 30.0 | C | | 0.70 | 19.1 | B | 0.74 | 20.1 | C | | 1.00 | 37.7 | D | 1.03 | 45.6 | D | * |
| DeKalb Avenue (E-W) @ | WB-L | 0.45 | 38.3 | D | 0.64 | 44.7 | D | | 0.87 | 66.2 | E | 0.88 | 68.6 | E | | 0.82 | 56.5 | E | 0.82 | 57.0 | E | |
| Flatbush Avenue (N-S) | WB-LT | 0.49 | 39.1 | D | 0.34 | 35.7 | D | | 0.56 | 41.4 | D | 0.58 | 42.0 | D | | 0.52 | 40.1 | D | 0.53 | 40.3 | D | |
| | WB-R | 1.11 | 124.8 | F | 1.12 | 127.8 | F | * | 0.81 | 61.0 | E | 0.83 | 63.0 | E | | 0.80 | 56.8 | E | 0.88 | 66.1 | E | * |
| | NB-T | 1.03 | 55.4 | E | 1.06 | 67.1 | E | * | 0.74 | 23.5 | C | 0.77 | 24.5 | C | | 0.78 | 24.7 | C | 0.80 | 25.7 | C | |
| | SB-TR | 0.82 | 26.4 | C | 0.84 | 27.5 | C | | 0.75 | 23.6 | C | 0.79 | 25.0 | C | | 1.20 | 124.2 | F | 1.24 | 140.4 | F | * |
| Livingston Street (E-W) @ | EB-R | 0.43 | 33.0 | C | 0.45 | 33.5 | C | | 0.56 | 35.8 | D | 0.59 | 36.6 | D | | 0.66 | 38.8 | D | 0.83 | 47.1 | D | * |
| Flatbush Avenue (N-S) | NB-L | 0.96 | 59.1 | E | 1.06 | 87.9 | F | * | 0.58 | 15.7 | B | 0.61 | 18.9 | B | | 0.84 | 50.7 | D | 0.86 | 53.5 | D | |
| | NB-T | 0.49 | 0.7 | A | 0.50 | 0.7 | A | | 0.37 | 0.4 | A | 0.61 | 11.2 | B | | 0.35 | 0.4 | A | 0.36 | 0.4 | A | |
| | SB-TR | 0.52 | 15.8 | B | 0.59 | 17.0 | B | | 0.50 | 9.8 | A | 0.53 | 10.1 | B | | 0.85 | 16.7 | B | 0.86 | 16.9 | B | |
| Lafayette Avenue/ | EB-LT | 0.64 | 32.6 | C | 0.67 | 33.5 | C | | 0.41 | 27.6 | C | 0.49 | 29.0 | C | | 0.77 | 37.0 | D | 0.88 | 44.4 | D | |
| Schermerhorn Street (E-W) @ | WB-TR | 0.80 | 61.2 | E | 0.82 | 62.4 | E | | 0.62 | 51.3 | D | 0.68 | 53.3 | D | | 0.90 | 69.9 | E | 0.96 | 79.9 | E | * |
| Flatbush Avenue (N-S) | NB-TR | 1.23 | 139.9 | F | 1.28 | >150 | F | * | 1.12 | 95.1 | F | 1.17 | 113.8 | F | * | 1.16 | 111.5 | F | 1.20 | 127.6 | F | * |
| | SB-L | 0.93 | 93.3 | F | 0.95 | 96.9 | F | * | 0.77 | 68.1 | E | 0.83 | 75.8 | E | * | 1.10 | 136.7 | F | 1.15 | >150 | F | * |
| | SB-T | 0.55 | 15.0 | B | 0.57 | 15.2 | B | | 0.57 | 15.2 | B | 0.60 | 15.7 | B | | 0.89 | 24.6 | C | 0.94 | 28.9 | C | |

## Table 14-13 (Continued)
## 2013 Future with the Proposed Actions Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | MD Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Build | | | Future Action | | | No Build | | | Future Action | | | No Build | | | Future Action | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS |
| Fourth Ave/Hanson Pl. (E-W) | EB-LTR | 0.77 | 43.3 | D | 0.79 | 44.1 | D | 0.34 | 30.7 | C | 0.36 | 31.0 | C | 0.50 | 36.6 | D | 0.52 | 37.1 | D |
| Flatbush Avenue (N-S) | NB-T | 0.87 | 19.9 | B | 0.90 | 21.9 | C | 0.71 | 18.6 | B | 0.74 | 19.1 | B | 0.67 | 14.0 | B | 0.68 | 14.3 | B |
| | NB-R | 0.60 | 16.3 | B | 0.61 | 16.6 | B | 0.32 | 14.1 | B | 0.36 | 14.7 | B | 0.41 | 12.2 | B | 0.44 | 12.7 | B |
| | SB-TR | 0.64 | 14.3 | B | 0.65 | 14.5 | B | 0.83 | 24.0 | C | 0.85 | 25.1 | C | 1.00 | 40.1 | D | 1.04 | 52.1 | D * |
| | SB-R | 0.53 | 19.8 | B | 0.55 | 20.4 | C | 0.63 | 26.2 | C | 0.69 | 28.7 | C | 1.13 | 103.4 | F | 1.20 | 129.1 | F * |
| Atlantic Avenue (E-W) @ | EB-T | 0.94 | 57.6 | E | 0.98 | 64.2 | E * | 0.89 | 46.7 | D | 0.93 | 51.6 | D | 1.05 | 73.6 | E | 1.17 | >150 | F * |
| Flatbush Avenue (N-S) | EB-R | 0.52 | 42.2 | D | 0.53 | 42.5 | D | 0.61 | 41.1 | D | 0.62 | 41.4 | D | 0.46 | 32.7 | C | 0.46 | 32.7 | C |
| | WB-T | 1.31 | >150 | F | 1.47 | >150 | F * | 1.01 | 72.6 | E | 1.07 | 88.8 | F * | 1.10 | 95.4 | F | 1.13 | 107.2 | F * |
| | WB-R | 0.75 | 47.7 | D | 0.78 | 49.7 | D | 0.75 | 43.5 | D | 0.80 | 47.1 | D | 0.68 | 37.4 | D | 0.73 | 39.4 | D |
| | NB-LTR | 0.70 | 20.6 | C | 0.72 | 21.2 | C | 0.47 | 19.0 | B | 0.48 | 19.2 | B | 0.55 | 18.1 | B | 0.56 | 18.3 | B |
| | SB-LTR | 0.49 | 17.0 | B | 0.50 | 17.1 | B | 0.61 | 21.9 | C | 0.62 | 22.2 | C | 0.84 | 26.4 | C | 0.88 | 28.5 | C |
| Jay Street (N-S) @ | EB-L | 0.61 | 48.0 | D | 0.62 | 49.4 | D | 0.36 | 29.8 | C | 0.37 | 30.2 | C | 0.99 | 135.7 | F | 0.99 | 135.7 | F |
| Tillary Street (E-W) | EB-TR | 0.84 | 34.6 | C | 0.90 | 38.7 | D | 0.76 | 31.0 | C | 0.80 | 32.4 | C | 0.80 | 32.6 | C | 0.85 | 34.7 | C |
| | WB-L | 1.71 | >150 | F | 2.02 | >150 | F * | 1.08 | 123.8 | F | 1.20 | >150 | F * | 1.37 | >150 | F | 1.43 | >150 | F * |
| | WB-TR | 0.54 | 16.7 | B | 0.55 | 16.8 | B | 0.48 | 15.6 | B | 0.48 | 15.7 | B | 0.65 | 18.6 | B | 0.65 | 18.7 | B |
| | NB-L | 0.20 | 26.4 | C | 0.21 | 26.6 | C | 0.27 | 27.7 | C | 0.30 | 28.3 | C | 0.32 | 29.1 | C | 0.43 | 31.8 | C |
| | NB-TR | 0.83 | 42.4 | D | 0.84 | 43.0 | D | 0.59 | 32.9 | C | 0.62 | 33.5 | C | 0.78 | 39.7 | D | 0.85 | 44.0 | D |
| | SB-L | 0.50 | 43.0 | D | 0.50 | 43.3 | D | 0.35 | 31.8 | C | 0.36 | 32.4 | C | 0.57 | 45.7 | D | 0.66 | 56.5 | E * |
| | SB-TR | 0.11 | 24.7 | C | 0.11 | 24.7 | C | 0.13 | 24.9 | C | 0.13 | 24.9 | C | 0.25 | 26.5 | C | 0.25 | 26.5 | C |
| Adams Street (N-S) (Service) | EB-L | 1.02 | 106.0 | F | 1.01 | 105.1 | F | 0.75 | 64.8 | E | 0.74 | 64.2 | E | 0.94 | 88.0 | F | 0.94 | 83.9 | F |
| Tillary Street (E-W) | EB-TR | 0.61 | 35.0 | C | 0.65 | 36.1 | D | 0.58 | 34.2 | C | 0.60 | 34.7 | C | 0.65 | 36.3 | D | 0.67 | 36.9 | D |
| | WB-L | 1.16 | >150 | F | 1.20 | >150 | F * | 1.15 | >150 | F | 1.17 | >150 | F * | 1.08 | 137.3 | F | 1.08 | 137.3 | F |
| | WB-T | 0.62 | 50.0 | D | 0.63 | 50.4 | D | 0.62 | 49.8 | D | 0.65 | 50.6 | D | 0.70 | 52.4 | D | 0.77 | 55.5 | E |
| | WB-R | 1.12 | 125.6 | F | 1.13 | 129.4 | F * | 0.94 | 76.9 | E | 0.96 | 80.5 | F | 1.05 | 99.2 | F | 1.05 | 100.2 | F |
| | NB-TR | 0.41 | 27.5 | C | 0.41 | 27.6 | C | 0.59 | 31.2 | C | 0.61 | 31.6 | C | 0.59 | 31.3 | C | 0.63 | 32.4 | C |
| | SB-TR | 0.28 | 21.7 | C | 0.28 | 21.7 | C | 0.32 | 22.3 | C | 0.32 | 22.3 | C | 1.21 | 142.2 | F | 1.21 | 142.2 | F |
| Adams Street (N-S) (Main) | NB-L | 0.50 | 59.7 | E | 0.49 | 59.5 | E | 0.42 | 56.8 | E | 0.44 | 57.7 | E | 0.41 | 56.2 | E | 0.41 | 56.3 | E |
| | NB-T | 0.83 | 38.6 | D | 0.84 | 39.6 | D | 0.48 | 28.3 | C | 0.51 | 28.9 | C | 0.66 | 32.3 | C | 0.71 | 34.0 | C |
| | SB-L | 1.21 | >150 | F | 1.30 | >150 | F * | 1.08 | 110.8 | F | 1.13 | 129.1 | F * | 1.08 | 110.2 | F | 1.12 | 123.4 | F * |
| | SB-T | 1.13 | 107.2 | F | 1.14 | 112.1 | F * | 1.00 | 63.5 | E | 1.01 | 67.0 | E | 1.31 | >150 | F | 1.32 | >150 | F * |
| Ashland Place (N-S) @ | EB-LT | 0.36 | 8.5 | A | 0.38 | 8.6 | A | 0.26 | 7.4 | A | 0.28 | 7.6 | A | 0.47 | 9.6 | A | 0.51 | 10.1 | B |
| Myrtle Avenue (E-W) | EB-R | 0.14 | 6.7 | A | 0.14 | 6.7 | A | 0.14 | 6.6 | A | 0.15 | 6.7 | A | 0.18 | 6.9 | A | 0.19 | 7.1 | A |
| | WB-LTR | 0.98 | 42.8 | D | 1.06 | 64.9 | E * | 0.42 | 9.2 | A | 0.46 | 9.6 | A | 0.88 | 29.4 | C | 0.96 | 43.3 | D |
| | NB-LTR | 1.14 | 119.8 | F | 1.19 | 139.3 | F * | 0.83 | 49.7 | D | 0.97 | 73.1 | E * | 0.99 | 77.2 | E | 1.10 | 109.3 | F * |
| | SB-LTR | 0.99 | 74.4 | E | 1.01 | 78.6 | E * | 0.77 | 41.1 | D | 0.79 | 42.7 | D | 1.09 | 97.5 | F | 1.12 | 109.3 | F * |
| Prince Street (NB) @ | EB-LT | 0.73 | 32.9 | C | EB-LT | 1.28 | >150 | F * | EB-LT | 0.51 | 23.2 | C | EB-LT | 1.09 | 104.5 | F * | EB-LT | 1.01 | 68.7 | E | EB-LT | 1.35 | >150 | F * |
| Myrtle Avenue (E-W) | WB-TR | 1.02 | 71.9 | E | WB-TR | 1.51 | >150 | F * | WB-TR | 0.67 | 28.4 | C | WB-TR | 1.16 | 121.3 | F * | WB-TR | 0.74 | 31.5 | C | WB-TR | 1.19 | 133.2 | F * |
| | NB-LTR | 0.75 | 39.7 | D | | | | | NB-LTR | 0.78 | 41.9 | D | | | | | NB-LTR | 0.70 | 36.6 | D | | | | |

## Table 14-13 (Continued)
## 2013 Future with the Proposed Actions Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | MD Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Build | | | Future Action | | | No Build | | | Future Action | | | No Build | | | Future Action | | |
| | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS |
| Gold St/Albee Square West (N-S) @ | EB-TR | 0.10 | 30.8 | C | | | | 0.17 | 31.9 | C | | | | 0.30 | 34.1 | C | | | |
| Willoughby Street (E-W) | WB-LT | 0.52 | 26.6 | C | WB-T | 0.52 | 36.9 | D | 0.35 | 22.9 | C | 0.33 | 33.5 | C | 0.33 | 22.6 | C | 0.27 | 32.7 | C |
| | NB-L | 0.19 | 20.9 | C | NB-L | 0.50 | 26.2 | C | 0.29 | 22.7 | C | 0.68 | 32.0 | C | 0.21 | 21.1 | C | 0.72 | 33.6 | C |
| | NB-R | 0.25 | 21.6 | C | NB-R | 0.36 | 23.4 | C | 0.50 | 27.0 | C | 0.68 | 32.6 | C | 0.65 | 31.8 | C | 1.09 | 97.0 | F * |
| | SB-L | 0.17 | 20.4 | C | SB-L | 0.16 | 20.0 | B | 0.09 | 19.2 | B | 0.08 | 19.0 | B | 0.11 | 19.5 | B | 0.10 | 19.3 | B |
| | SB-TR | 0.13 | 19.9 | B | SB-R | 0.40 | 24.7 | C | 0.24 | 21.7 | C | 0.29 | 22.3 | C | 0.19 | 20.9 | C | 0.24 | 21.5 | C |
| Bridge Street (SB) @ Willoughby Street (E-W) | WB-LT | 0.70 | 17.5 | B | | 1.48 | >150 | F * | 0.82 | 24.8 | C | 1.31 | >150 | F * | 0.75 | 20.6 | C | 1.40 | >150 | F * |
| Jay Street (N-S) @ | EB-LR | 0.05 | 20.2 | C | | 0.00 | 19.6 | B | 0.09 | 19.9 | B | 0.04 | 19.1 | B | 0.07 | 19.6 | B | 0.00 | 19.6 | B |
| Willoughby Street (E-W) | WB-LTR | 0.76 | 40.3 | D | | 0.91 | 59.1 | E * | 1.10 | 108.0 | F | 1.27 | >150 | F * | 0.77 | 40.2 | D | 1.10 | 105.9 | F * |
| | NB-LT | 0.74 | 19.7 | B | | 0.83 | 23.8 | C | 0.36 | 12.7 | B | 0.39 | 13.0 | B | 0.45 | 13.6 | B | 0.47 | 13.9 | B |
| | SB-TR | 0.40 | 13.0 | B | | 0.44 | 13.5 | B | 0.46 | 13.8 | B | 0.49 | 14.2 | B | 0.59 | 15.7 | B | 0.65 | 16.9 | B |
| Bond Street (NB) @ | EB-LT | 0.62 | 13.4 | B | | 0.97 | 44.4 | D | 0.86 | 24.1 | C | 1.17 | 107.6 | F * | 0.77 | 14.9 | B | 1.04 | 52.3 | D * |
| Livingston Street (E-W) | WB-TR | 0.89 | 27.8 | C | | 1.11 | 81.0 | F * | 0.82 | 19.9 | B | 0.91 | 29.3 | C | 0.87 | 22.5 | C | 0.98 | 40.7 | D |
| | NB-LTR | 0.81 | 32.6 | C | | 1.35 | >150 | F * | 0.66 | 25.0 | C | 0.80 | 31.9 | C | 0.77 | 19.9 | B | 0.86 | 37.2 | D |
| Hoyt Street (SB) @ | EB-TR | 0.80 | 19.0 | B | | 0.87 | 23.6 | C | 0.97 | 40.8 | D | 1.10 | 78.9 | E * | 0.88 | 21.9 | C | 1.04 | 53.2 | D * |
| Livingston Street (E-W) | WB-LT | 0.64 | 14.3 | B | | 0.83 | 23.2 | C | 0.92 | 32.6 | C | 1.04 | 61.0 | E * | 0.77 | 15.8 | B | 1.08 | 71.9 | E * |
| | SB-LTR | 0.23 | 15.5 | B | | 0.30 | 16.1 | B | 0.49 | 18.6 | B | 0.61 | 20.7 | C | 0.59 | 20.4 | C | 0.87 | 31.9 | C |
| Smith Street (N-S) @ | EB-LTR | 0.64 | 22.6 | C | | 0.81 | 30.3 | C | 0.36 | 25.7 | C | 0.42 | 27.1 | C | 0.46 | 28.1 | C | 0.59 | 31.5 | C |
| Livingston Street (E-W) | WB-LTR | 0.40 | 18.3 | B | | 0.50 | 19.9 | B | 0.40 | 26.5 | C | 0.43 | 27.1 | C | 0.46 | 28.1 | C | 0.52 | 29.6 | C |
| | NB-LTR | 0.82 | 28.5 | C | | 0.94 | 39.7 | D | 0.45 | 39.5 | D | 0.54 | 42.4 | D | 0.77 | 51.9 | D | 0.89 | 63.6 | E * |
| | SB-DfL | 0.87 | 64.4 | E | | 0.82 | 56.4 | E | 1.74 | >150 | F | 1.78 | >150 | F * | 2.00 | >150 | F | 2.17 | >150 | F * |
| | SB-TR | 0.71 | 28.0 | C | | 0.86 | 38.8 | D | 0.78 | 56.5 | E | 0.89 | 68.7 | E * | 1.04 | 102.6 | F | 1.30 | >150 | F * |
| Boerum Place (N-S) @ | EB-LT | 0.82 | 60.2 | E | | 0.93 | 76.4 | E * | 0.73 | 80.9 | F | 0.81 | 90.7 | F * | 1.10 | >150 | F | 1.04 | 137.2 | F * |
| Livingston Street (E-W) | EB-R | 0.16 | 32.9 | C | | 0.16 | 32.9 | C | 0.21 | 54.3 | D | 0.21 | 54.3 | D | 0.01 | 49.0 | D | 0.01 | 49.0 | D |
| | WB-LTR | 0.77 | 49.5 | D | | 0.89 | 62.5 | E * | 0.71 | 72.4 | E | 0.82 | 81.3 | F * | 0.89 | 92.1 | F | 1.07 | >150 | F * |
| | NB-L | 0.35 | 24.4 | C | | 0.35 | 24.4 | C | 0.40 | 52.1 | D | 0.40 | 52.1 | D | 0.94 | >150 | F | 1.16 | >150 | F * |
| | NB-TR | 0.91 | 37.2 | D | | 0.93 | 39.3 | D | 0.57 | 51.8 | D | 0.57 | 51.8 | D | 0.68 | 56.0 | E | 0.94 | 56.2 | E |
| | SB-L | 1.00 | 100.3 | F | | 1.05 | 114.8 | F * | 0.58 | 71.0 | E | 0.62 | 74.1 | E | 0.70 | 92.6 | F | 0.74 | 96.9 | F * |
| | SB-TR | 0.38 | 11.5 | B | | 0.38 | 11.5 | B | 0.35 | 25.2 | C | 0.35 | 25.2 | C | 0.74 | 36.9 | D | 0.74 | 36.9 | D |
| Bond Street (NB) @ | EB-LT | 0.43 | 12.6 | B | | 0.48 | 13.3 | B | 0.56 | 14.7 | B | 0.63 | 16.2 | B | 0.85 | 25.1 | C | 0.97 | 40.0 | D |
| Schermerhorn Street (E-W) | WB-TR | 0.53 | 14.2 | B | | 0.54 | 14.3 | B | 0.46 | 13.2 | B | 0.49 | 13.5 | B | 0.54 | 14.5 | B | 0.57 | 14.8 | B |
| | NB-LTR | 1.18 | 115.8 | F | | 1.57 | >150 | F * | 0.71 | 23.6 | C | 0.85 | 32.4 | C | 0.86 | 33.0 | C | 0.95 | 46.4 | D * |

## Table 14-13 (Continued)
## 2013 Future with the Proposed Actions Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | | MD Peak Hour | | | | | | | PM Peak Hour | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Build | | | Future Action | | | | No Build | | | Future Action | | | | No Build | | | Future Action | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | |
| Hoyt Street (SB) @ | EB-TR | 0.51 | 11.3 | B | 0.54 | 11.9 | B | | 0.61 | 13.3 | B | 0.66 | 14.4 | B | | 0.86 | 23.8 | C | 0.94 | 33.4 | C | |
| Schermerhorn Street (E-W) | WB-LT | 0.84 | 25.5 | C | 0.87 | 28.3 | C | | 0.72 | 19.3 | B | 0.81 | 25.7 | C | | 1.35 | >150 | F | 1.53 | >150 | F | * |
| | SB-LTR | 0.34 | 16.5 | B | 0.44 | 17.7 | B | | 0.55 | 19.7 | B | 0.74 | 24.7 | C | | 0.91 | 38.0 | D | 1.31 | >150 | F | * |
| Fourth Ave (N-S) @ | EB-TR | 0.65 | 27.7 | C | 0.68 | 28.5 | C | | 1.11 | 103.8 | F | 1.17 | 128.1 | F | * | 0.90 | 39.1 | D | 1.02 | 59.8 | E | * |
| Atlantic Avenue (E-W) | WB-TR | 1.08 | 82.5 | F | 1.21 | 134.2 | F | * | 1.12 | 112.1 | F | 1.18 | 135.4 | F | * | 0.95 | 48.4 | D | 0.98 | 53.6 | D | * |
| | NB-L | 1.22 | >150 | F | 1.29 | >150 | F | * | 1.30 | >150 | F | 1.34 | >150 | F | * | 1.33 | >150 | F | 1.35 | >150 | F | * |
| | NB-T | 0.68 | 40.0 | D | 0.70 | 40.5 | D | | 0.49 | 43.8 | D | 0.51 | 44.3 | D | | 0.52 | 39.8 | D | 0.54 | 40.2 | D | |
| | NB-R | 0.66 | 48.8 | D | 0.66 | 48.8 | D | | 1.15 | >150 | F | 1.15 | >150 | F | | 1.21 | >150 | F | 1.21 | >150 | F | |
| | SB-T | 0.18 | 17.3 | B | 0.19 | 17.4 | B | | 0.17 | 9.3 | A | 0.19 | 9.4 | A | | 0.45 | 19.7 | B | 0.47 | 20.2 | C | |
| | SB-R | 0.13 | 17.0 | B | 0.13 | 17.0 | B | | 0.06 | 8.6 | A | 0.06 | 8.6 | A | | 0.10 | 15.6 | B | 0.10 | 15.6 | B | |
| Bond Street (NB) @ | EB-LT | 1.41 | >150 | F | EB-LT 1.53 | >150 | F | * | EB-LT 1.05 | 57.6 | E | 1.27 | 149.0 | F | * | 0.77 | 22.0 | C | 0.83 | 24.3 | C | |
| Atlantic Avenue (E-W) | WB-TR | 1.18 | 114.0 | F | 1.32 | >150 | F | * | 0.76 | 16.1 | B | 0.81 | 17.9 | B | | 0.86 | 26.9 | C | 0.89 | 29.5 | C | |
| | NB-LTR | 0.72 | 38.2 | D | 0.73 | 38.7 | D | | 0.48 | 29.6 | C | 0.48 | 29.6 | C | | 0.48 | 33.7 | C | 0.48 | 33.7 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.72 | 22.6 | C | 0.78 | 24.9 | C | | 0.68 | 13.9 | B | 0.71 | 14.6 | B | | 0.69 | 19.2 | B | 0.71 | 19.6 | B | |
| Atlantic Avenue (E-W) | WB-LT | 1.25 | 144.9 | F | 1.28 | >150 | F | * | 0.78 | 16.6 | B | 0.82 | 18.1 | B | | 0.91 | 30.8 | C | 0.92 | 31.8 | C | |
| | SB-LTR | 0.57 | 35.4 | D | 0.72 | 41.8 | D | | 1.07 | 97.2 | F | 1.38 | >150 | F | * | 1.21 | >150 | F | 1.79 | >150 | F | * |
| Smith Street (N-S) @ | EB-DfL | 1.44 | >150 | F | 1.82 | >150 | F | * | EB-LT 0.92 | 32.7 | C | EB-LT 0.88 | 41.0 | D | | EB-LT 1.13 | 90.7 | F | EB-LT 1.20 | 120.5 | F | * |
| Atlantic Avenue (E-W) | EB-T | 0.73 | 23.2 | C | 0.79 | 25.8 | C | | | | | | | | | | | | | | | |
| | WB-T | 0.94 | 36.3 | D | 0.94 | 37.1 | D | | WB-T 0.79 | 23.2 | C | 0.81 | 23.8 | C | | WB-T 0.71 | 20.4 | C | 0.74 | 21.4 | C | |
| | WB-R | 0.46 | 18.2 | B | 0.52 | 19.7 | B | | WB-R 0.31 | 14.8 | B | 0.34 | 15.3 | B | | WB-R 0.34 | 14.4 | B | 0.36 | 14.7 | B | |
| | NB-L | 1.12 | 120.0 | F | 1.12 | 120.0 | F | | NB-L 0.60 | 27.6 | C | 0.60 | 27.6 | C | | NB-L 0.49 | 36.0 | D | 0.49 | 36.0 | D | |
| | NB-TR | 0.73 | 38.6 | D | 0.80 | 42.4 | D | | NB-TR 0.35 | 20.5 | C | 0.40 | 21.2 | C | | NB-TR 0.52 | 34.3 | C | 0.55 | 35.0 | C | |
| Boerum Place (N-S) @ | EB-DfL | 1.14 | 133.8 | F | 1.20 | >150 | F | * | 0.79 | 47.9 | D | 0.83 | 52.6 | D | | 1.07 | 114.9 | F | 1.13 | 135.0 | F | * |
| Atlantic Avenue (E-W) | EB-TR | 0.53 | 19.9 | B | 0.62 | 22.1 | C | | 0.66 | 22.3 | C | 0.72 | 24.0 | C | | 0.69 | 28.7 | C | 0.74 | 30.8 | C | |
| | WB-LT | 1.00 | 74.7 | E | 1.03 | 81.9 | F | * | 0.83 | 39.7 | D | 0.86 | 42.0 | D | | 0.84 | 48.8 | D | 0.90 | 54.9 | D | * |
| | WB-R | 0.45 | 1.3 | A | 0.45 | 1.3 | A | | 0.35 | 0.9 | A | 0.35 | 0.9 | A | | 0.35 | 0.9 | A | 0.35 | 0.9 | A | |
| | SB-L | 0.45 | 28.3 | C | 0.48 | 28.4 | C | | 0.38 | 17.5 | B | 0.38 | 17.0 | B | | 0.79 | 32.4 | C | 0.79 | 32.6 | C | |
| | SB-TR | 0.61 | 32.2 | C | 0.64 | 32.9 | C | | 0.58 | 21.1 | C | 0.62 | 21.9 | C | | 0.87 | 38.3 | D | 0.97 | 51.4 | D | * |
| Jay Street (N-S) @ | WB-LTR | 0.12 | 21.0 | C | WB-LTR 0.12 | 21.0 | C | | WB-LR 0.34 | 24.7 | C | WB-LTR 0.34 | 24.3 | C | | WB-LR 0.31 | 23.9 | C | WB-LTR 0.61 | 30.5 | C | |
| Tech Place (E-W) | NB-LTR | 0.76 | 20.7 | C | NB-LTR 0.86 | 26.7 | C | | NB-LT 0.89 | 34.1 | C | NB-LTR 0.95 | 43.7 | D | | NB-LT 1.00 | 51.4 | D | NB-LTR 1.07 | 73.2 | E | * |
| | SB-LT | 0.56 | 15.3 | B | SB-LT 0.79 | 22.2 | C | | SB-LTR 0.87 | 32.7 | C | SB-LT 0.92 | 38.9 | D | | SB-TR 0.90 | 33.1 | C | SB-LT 0.93 | 37.0 | D | |

## Table 14-13 (Continued)
## 2013 Future with the Proposed Actions Traffic Conditions

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | MD Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Build | | | Future Action | | | No Build | | | Future Action | | | No Build | | | Future Action | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS |
| Smith Street (N-S) @ Schermerhorn Street (E-W) | WB-T | 0.56 | 29.6 | C | 0.56 | 29.8 | C | 0.46 | 48.2 | D | 0.49 | 49.1 | D | 0.54 | 50.7 | D | 0.55 | 51.1 | D |
| | WB-R | 0.22 | 23.5 | C | 0.22 | 23.6 | C | 0.09 | 39.7 | D | 0.09 | 39.7 | D | 0.39 | 47.1 | D | 0.40 | 47.3 | D |
| | NB-LTR | 1.14 | 104.6 | F | 1.27 | >150 | F * | 0.70 | 62.0 | E | 0.79 | 66.7 | E * | 1.11 | 131.7 | F | 1.19 | >150 | F * |
| | SB-L | 0.72 | 49.8 | D | 0.74 | 51.5 | D | 0.85 | 92.0 | F | 0.90 | 99.6 | F * | 1.27 | >150 | F | 1.42 | >150 | F * |
| | SB-R | 0.52 | 40.8 | D | 0.56 | 42.5 | D | 0.51 | 68.9 | E | 0.58 | 72.5 | E | 0.66 | 77.4 | E | 0.89 | 103.6 | F * |
| Fulton Street (E-W) @ Flatbush Avenue (N-S) | EB-LTR | 0.19 | 36.7 | D | 0.19 | 36.7 | D | 0.22 | 36.5 | D | 0.22 | 36.5 | D | 0.20 | 37.6 | D | 0.20 | 37.6 | D |
| | WB-LT | 0.54 | 47.2 | D | 0.54 | 47.2 | D | 0.44 | 42.3 | D | 0.44 | 42.3 | D | 0.77 | 63.3 | E | 0.77 | 63.3 | E |
| | WB-R | 0.54 | 28.5 | C | 0.57 | 29.4 | C | 0.29 | 19.0 | B | 0.31 | 19.3 | B | 0.41 | 22.6 | C | 0.42 | 22.8 | C |
| | NB-TR | 1.19 | 126.2 | F | 1.23 | 143.3 | F * | 1.01 | 66.3 | E | 1.06 | 79.2 | E * | 0.98 | 57.6 | E | 1.02 | 66.0 | E * |
| | SB-L | 1.00 | 92.6 | F | 1.01 | 94.9 | F | 0.76 | 51.6 | D | 0.78 | 52.9 | D | 0.96 | 66.9 | E | 0.98 | 71.4 | E * |
| | SB-T | 0.98 | 41.7 | D | 1.07 | 69.4 | E * | 0.95 | 35.6 | D | 1.00 | 47.6 | D * | 0.91 | 26.5 | C | 0.94 | 29.3 | C |
| Fleet Place (N-S) @ Myrtle Avenue (E-W) | EB-LT | - | - | - | 0.50 | 16.3 | B | - | - | - | 0.45 | 15.4 | B | - | - | - | 0.91 | 37.9 | D |
| | WB-TR | - | - | - | 0.95 | 44.7 | D | - | - | - | 0.67 | 20.9 | C | - | - | - | 0.72 | 23.0 | C |
| | NB-LTR | - | - | - | 0.83 | 42.7 | D | - | - | - | 0.84 | 43.9 | D | - | - | - | 0.82 | 41.8 | D |
| Elm Street (N-S) @ Livingston Street (E-W) | EB-TR | - | - | - | 0.74 | 16.4 | B | - | - | - | 0.63 | 13.3 | B | - | - | - | 0.81 | 19.5 | B |
| | WB-LT | - | - | - | 0.71 | 14.0 | B | - | - | - | 0.36 | 8.9 | A | - | - | - | 0.39 | 9.2 | A |
| | SB-LTR | - | - | - | 0.03 | 13.7 | B | - | - | - | 0.02 | 13.6 | B | - | - | - | 0.02 | 13.6 | B |
| | | | | | 0.08 | 14.2 | B | | | | 0.14 | 14.9 | B | | | | 0.49 | 20.7 | C |

| UNSIGNALIZED INTERSECTION | | AM Peak Hour | | | | | | MD Peak Hour | | | | | | PM Peak Hour | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Build | | | Future Action | | | No Build | | | Future Action | | | No Build | | | Future Action | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS |
| Duffield Street (N-S) @ Willoughby Street (E-W) (Two-Way Stop Control) | NB-LR | 0.16 | 16.4 | C | WB-LTR 0.36 | 9.8 | A | NB-LR 0.30 | 19.4 | C | WB-LTR 0.25 | 9.1 | A | NB-LR 0.42 | 20.5 | D | WB-LTR 0.20 | 8.9 | A |
| | SB-LR | 0.04 | 21.1 | D | SB-TR 0.23 | 103.6 | F | SB-LR 0.05 | 22.8 | D | SB-TR 0.13 | 48.3 | E | SB-LR 0.08 | 36.3 | E | SB-TR 0.19 | 71.2 | F |
| Lawrence Street (N-S) @ Willoughby Street (E-W) (All-Way Stop Control) | WB-TR | - | 8.2 | A | - | 8.9 | A | - | 8.8 | A | - | 9.7 | A | - | 8.2 | A | - | 9.6 | A |
| | NB-LR | - | 7.8 | A | - | 8.0 | A | - | 8.2 | A | - | 8.4 | A | - | 7.9 | A | - | 8.3 | A |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

**Table 14-14**
**Summary of Impacted Intersections**

| | | AM | MD | PM |
|---|---|---|---|---|
| **Atlantic Avenue @** | Flatbush Avenue | X | X | X |
| | Fourth Avenue | X | X | X |
| | Bond Street | X | X | |
| | Hoyt Street | X | X | X |
| | Smith Street | X | | X |
| | Boerum Place | X | | X |
| **Flatbush Avenue @** | Tillary Street | X | X | X |
| | Myrtle Avenue | X | X | X |
| | Willoughby Street | X | X | X |
| | DeKalb Avenue | X | | X |
| | Fulton Street | X | X | X |
| | Livingston Street | X | | X |
| | Schermerhorn Street/Lafayette | X | X | X |
| | Fourth Avenue/Hanson Place | | | X |
| **Jay Street @** | Tech Place | | | X |
| **Livingston Street @** | Bond Street | X | X | X |
| | Hoyt Street | | X | X |
| | Smith Street | | X | X |
| | Boerum Place | X | X | X |
| **Myrtle Avenue @** | Prince Street | X | X | X |
| | Ashland Place | X | X | X |
| **Schermerhorn Street @** | Bond Street | X | | X |
| | Hoyt Street | | | X |
| | Smith Street | X | X | X |
| **Tillary Street @** | Adams Street | X | X | X |
| | Jay Street | X | X | X |
| **Willoughby Street @** | Gold Street/Albee Square West | | | X |
| | Bridge Street | X | X | X |
| | Jay Street | X | X | X |

**X** impacts to one or more movements in the peak hour.

Build condition). The following provides a discussion of the impacted locations by corridor. Measures to mitigate traffic impacts are presented in Chapter 20, "Mitigation."

*Atlantic Avenue*

At the intersection of Flatbush and Atlantic Avenues, the westbound through-movement on Atlantic Avenue would be impacted by project traffic in the AM, midday and PM peak hours, operating at LOS F during these periods, compared to LOS F, E and F, respectively, in the No Build. The eastbound through movement would be impacted in the AM an PM peak hours, operating at LOS E and F, respectively, compared to LOS E during these periods in the No Build.

Eastbound Atlantic Avenue would also be impacted at Fourth Avenue, with LOS F conditions in the midday and LOS E conditions in the PM, versus LOS F and D, respectively in the No Build. Westbound Atlantic Avenue would be impacted in all periods, with LOS F conditions in the AM and midday and LOS D in the PM, unchanged from the No Build. The northbound left-turn at this intersection would be impacted in all periods, operating at LOS F, unchanged from the No Build.

At Bond Street, eastbound Atlantic Avenue would be impacted in the AM and midday, operating at LOS F during these periods, compared to LOS F in the AM and LOS E in the midday in the No Build. Westbound Atlantic Avenue would be impacted in the AM only, also at LOS F, unchanged from the No Build. One block to the east at Hoyt Street, the westbound approach would be impacted in the AM, operating at LOS F during this period, unchanged from the No Build condition. Southbound Hoyt Street would be similarly impacted in the midday and PM periods, operating at LOS F, unchanged from the No Build.

At Smith Street, the eastbound left-turn from Atlantic Avenue would be impacted in the AM and PM peak hours, with LOS F conditions, unchanged from the No Build. At Boerum Place, the eastbound left-turn from Atlantic Avenue would be similarly impacted in the AM and PM peak hours, operating at LOS F, unchanged from the No Build. The westbound left-through movement would be impacted in the AM and PM, with LOS F and D conditions, respectively, compared to LOS E and D, respectively, in the No Build. Although the southbound through-right movement would continue to operate at LOS D in the PM, this movement would also be impacted during this peak hour.

*Flatbush Avenue*

Traffic generated by the proposed actions would result in significant impacts at all analyzed intersections along Flatbush Avenue. At Tillary Street, the eastbound right-turn movement would be impacted in all periods, operating at LOS F, versus LOS E in the AM and LOS F in the midday and PM in the No Build condition. The eastbound through-right movement would be impacted in the PM peak hour only (LOS F versus LOS E in the No Build). The westbound left-turn movement would be impacted in all three peak periods, continuing to operate at LOS F in the AM and PM, and LOS E in the midday. The westbound through movement would be impacted in the AM and PM, with LOS F conditions during both these periods compared to LOS E in the AM and LOS F in the PM in the No Build. Lastly, the northbound left-turn movement would be impacted in the midday, deteriorating to LOS F from LOS E in the No Build.

At Myrtle Avenue, the southbound left-turn movement on Flatbush Avenue would be impacted in all periods, with LOS F conditions, unchanged from the No Build. The northbound through-right movement would also be impacted in all periods, operating at LOS F, F and D in the AM,

midday and PM, respectively, compared to LOS E, F, and C in the No Build. The eastbound left-turn from Myrtle Avenue (Flatbush Court) would be impacted in the AM and PM with LOS F conditions in both periods, unchanged from the No Build. Westbound Myrtle Avenue would be impacted by project traffic in the AM peak hour only, with LOS F conditions, unchanged from the No Build.

As discussed above, Willoughby Street would function as the primary access corridor for much of the commercial development that would occur with the proposed actions. As shown in Table 14-13, traffic generated by the proposed actions would impact the eastbound left-turn movement in all three peak periods, with LOS F conditions, the same as the No Build. The northbound left-turn from Flatbush Avenue to Willoughby Street would also be impacted in the AM and PM, with LOS F conditions in both periods, also unchanged from the No Build. The southbound through-right movement would be impacted in the PM peak hour only, continuing to operate at LOS D.

At DeKalb Avenue, northbound Flatbush Avenue would be impacted in the AM peak hour (LOS E), while southbound Flatbush Avenue would be impacted in the PM (LOS F). The westbound right-turn would be impacted in the AM (LOS F) and PM (LOS E). The levels of service for these impacted movements would be unchanged from the No Build condition.

At Fulton Street, northbound Flatbush Avenue would be impacted in all peak hours, operating at LOS F in the AM and LOS E in the midday and PM, unchanged from the No Build. The southbound left-turn from Flatbush Avenue, would be impacted in the PM peak hour (LOS E, unchanged from the No Build). The southbound through movement would be impacted in the AM and midday, with LOS E and D conditions, respectively, compared to LOS D during these periods in the No Build.

Project traffic using Livingston Street to reach projected development sites would impact the left-turn from northbound Flatbush Avenue in the AM peak hour, when this movement would deteriorate from a No Build LOS E to LOS F. The eastbound right-turn at this intersection would be impacted in the PM, with LOS D conditions, unchanged from the No Build.

The westbound Lafayette Avenue approach to Flatbush Avenue would be impacted in the PM peak hour, with LOS E conditions unchanged from the No Build. The northbound Flatbush Avenue approach would be impacted in all peak hours, continuing to operate at LOS F during these periods. The southbound left-turn movement would be similarly impacted in the AM, midday and PM peak hours, operating at LOS F, E and F, during these periods, unchanged from the No Build.

Lastly, at the Fourth Avenue/Hanson Place intersection, the southbound through-right and right-turn movements would be impacted in the PM peak hour, with LOS D and F conditions, respectively, unchanged from the No Build.

*Livingston Street*

Traffic generated by the proposed actions would impact one or more movements at four intersections along Livingston Street. At Bond Street, the eastbound Livingston Street approach would be impacted in the midday (LOS F versus LOS C in the No Build) and PM peak hours (LOS D versus LOS B in the No Build), and the westbound approach would be impacted in the AM (LOS F versus LOS C in the No Build). The northbound Bond Street approach would also be impacted in the AM peak hour, with the LOS deteriorating from C to F. At Hoyt Street, the westbound Livingston Street approach would be impacted in the midday and PM, with LOS E

conditions during these periods versus LOS C and B in the No Build. The eastbound Livingston Street approach would be similarly impacted in the midday and PM, with LOS E and D conditions during these periods, respectively, versus LOS D and C, respectively, in the No Build.

One block to the west, the southbound through-right movement from Smith Street would be impacted in the midday and PM peak hours, with LOS E and F conditions, respectively, unchanged from the No Build. The southbound left-turn would also be impacted during these hours, operating at LOS F, unchanged from the No Build. The northbound Smith Street approach would be impacted in the PM only, operating at LOS E compared to LOS D in the No Build.

At Boerum Place, the westbound Livingston Street approach would be impacted in all peak hours, with LOS E and F conditions during these periods similar to the No Build. The eastbound left-through movement would be impacted in all periods with LOS E conditions in the AM and LOS F in the midday and PM, unchanged from the No Build. The northbound left-turn on Boerum Place would be impacted in the PM only, (LOS F, unchanged from the No Build), while the southbound left-turn would be impacted in the AM and PM peak hours with continued operation at LOS F.

*Myrtle Avenue*

As discussed previously, at Flatbush Avenue, the eastbound left-turn from Myrtle Avenue (Flatbush Court) would be impacted in the AM and PM with LOS F conditions in both periods, unchanged from the No Build. Westbound Myrtle Avenue would be impacted by project traffic in the AM peak hour only, with LOS F conditions, unchanged from the No Build. To the east at Prince Street, northbound traffic would be diverted to newly extended Fleet Place, and the northbound Prince Street approach eliminated. However, increased volumes on Myrtle Avenue would result in LOS F conditions and impacts on the eastbound and westbound approaches in the AM, midday and PM peak periods. This compares to No Build LOS C, C and E, during these periods, respectively, for the eastbound approach, and LOS E, C and C, respectively for the westbound approach. As shown in Table 14-13, the new intersection along Myrtle Avenue created by the northward extension of Fleet Place would operate with LOS D conditions or better with less than 45 seconds of delay on all approaches in all peak periods.

To the east at Ashland Place, westbound Myrtle Avenue would be impacted in the AM peak hour with LOS E conditions versus LOS D in the No Build. Southbound Ashland Place would be impacted in the AM and PM peak hours (LOS E and F, respectively), while northbound Ashland Place would be impacted in all three peak periods with LOS F conditions in the AM and PM and LOS E in the midday, versus No Build LOS F in the AM, LOS D in the midday, and E in the PM peak hours.

*Schermerhorn Street*

With the exception of the westbound approach to Hoyt Street which would be impacted in the PM with continued LOS F operation, impacts at intersections along Schermerhorn Street are generally to intersecting approaches. For example, the northbound Bond Street approach to Schermerhorn Street would be impacted in the AM and PM peak hours, with LOS F and D conditions, respectively, (LOS F and C in the No Build). The southbound Hoyt Street approach would be impacted in the PM peak hour, deteriorating from LOS C to LOS F. The northbound Smith Street approach to Schermerhorn Street would be impacted in all three peak hours, with

LOS F conditions in the AM and PM, and LOS E in the midday (all unchanged from the No Build). The southbound left-turn would be impacted in the midday and PM with continued operation at LOS F, while the southbound right-turn would be impacted in the PM only, deteriorating from LOS E to LOS F.

*Tillary Street*

In addition to the impacts to the eastbound and westbound Tillary Street approaches at Flatbush Avenue discussed above, the intersections of Tillary Street with Jay Street and with Adams Street would also be impacted in the future with the proposed actions. At Jay Street, the westbound left-turn from Tillary Street onto Jay Street would be impacted in all three peak hours, with LOS F conditions, unchanged from the No Build. As shown in Table 14-13, demand for this movement would be over twice its capacity in the AM. The southbound left-turn from Jay Street onto Tillary Street would be impacted in the PM peak hour, with LOS E conditions versus LOS D in the No Build.

At Adams Street, the westbound left-turn movement from Tillary Street would be impacted in the AM and midday, while the westbound right-turn would be impacted in the AM peak hour only. Both of these movements would operate at LOS F at these times, unchanged from the No Build. The southbound through-movement on the Adams Street mainline would be impacted in the AM and PM, while the southbound left-turn movement would be impacted in all periods. Both of these movements would continue to operate at their No Build LOS F at these times.

*Willoughby Street*

In addition to the impacts to eastbound Willoughby Street at Flatbush Avenue Extension discussed above, the proposed actions would result in impacts at the signalized intersections of Willoughby Street with Gold Street/Albee Square West, Bridge Street and Jay Street. At the Gold Street/Albee Square west intersection, the northbound right-turn movement would be impacted in the PM peak hour, deteriorating from a No Build LOS C to LOS F. At Bridge Street, the westbound Willoughby Street approach would be impacted in all periods, deteriorating to LOS F compared to LOS C or better in all periods in the No Build. At Jay Street, the westbound Willoughby Street approach would be impacted in the AM, midday and PM peak hours, operating at LOS E, F and F during these periods, respectively, versus LOS D, F and D, respectively, in the No Build condition.

At the unsignalized intersection of Willoughby Street with Duffield Street, the southbound Duffield Street approach would operate at LOS F, E and F conditions during the AM, midday and PM peak periods, respectively, versus LOS D, D and E, respectively in the No Build. However, as there would be no more than 13 vehicles on this approach in any peak hour, below the CEQR impact threshold of 90 passenger-car-equivalents, this approach would not be impacted based on CEQR criteria.

*Other Corridors*

In addition to the impacts discussed above, the northbound Jay Street approach to Tech Place would be impacted by project traffic in the PM peak hour. Conditions on this approach would deteriorate from LOS D in the No Build to LOS E.

*ACCIDENTS*

As previously discussed, the two intersections with the highest overall number of accidents in the study area are Flatbush Avenue Extension/Tillary Street and Adams Street/Tillary Street. As shown in Figures 14-11 through 14-13, the proposed actions would add from 222 to 334 vehicles per hour (vph) in the peak hours to the Flatbush Avenue Extension/Tillary Street intersection, and from 131 to 192 vph to the Adams Street/Tillary Street intersection. The proposed actions are not, however, expected to add appreciable numbers of pedestrians to crosswalks at these intersections, as both the projected development sites and the transit facilities that would attract new pedestrian trips are concentrated to the south of these locations.

The intersection of Flatbush Avenue Extension and Willoughby Street, which experienced the highest number of pedestrians or bicyclists killed or injured in the study area during the 2000 through 2002 period (averaging seven per year), would serve as a gateway to the projected commercial developments along Willoughby Street. Pedestrians crossing Flatbush Avenue Extension at this intersection en route to and from projected development sites would be concentrated on the south crosswalk which is expected to see approximately 189 new pedestrian trips in the AM peak hour and 349 in the PM peak hour. (New demand on other crosswalks at this intersection would be substantially smaller). The proposed actions would also increase vehicular traffic through this intersection. The combination of new pedestrian demand on the south crosswalk and new vehicular traffic on the eastbound right-turn movement would likely increase the potential for vehicle/pedestrian conflicts at this critical intersection. Measures to enhance pedestrian safety and access at this intersection are currently being evaluated as part of NYCDOT's Downtown Brooklyn Traffic Calming Project. Chapter 20, "Mitigation," also presents potential changes at this intersection.

To the west, the intersection of Willoughby Street and Jay Street averaged five pedestrians or bicyclists killed or injured annually during the 2000 through 2002 period. New pedestrian demand resulting from the proposed actions would be concentrated on the east crosswalk on Willoughby Street and on the north crosswalk on Jay Street en route between projected development sites and bus stops and subway entrances along Jay Street. New demand on these crosswalks would total approximately 486 AM peak our trips and 634 PM peak hour trips on the east crosswalk, and approximately 86 AM and 170 PM peak hour trips on the north crosswalk. As Willoughby Street is one-way westbound at this intersection, there would be no conflicting vehicular turning movements with pedestrians on the more heavily used east crosswalk. Westbound traffic turning right onto northbound Jay Street does, however, conflict with pedestrians crossing the north crosswalk. The combination of new pedestrian demand on the north crosswalk and new vehicular traffic on the westbound right-turn movement would likely increase the potential for vehicle/pedestrian conflicts at this intersection. Chapter 20, "Mitigation," also presents potential changes at this intersection.

The intersections of Flatbush Avenue Extension with Myrtle Avenue and with DeKalb Avenue averaged six and five pedestrians or bicyclists killed or injured annually from 2000 through 2002, respectively. Pedestrian trips from projected development sites are also expected to occur at these intersections, although they would generally be substantially fewer in number than at intersections along Willoughby Street. The proposed actions would also increase vehicular traffic through these locations. As at the intersection of Flatbush Avenue Extension and Willoughby Street, the combination of new pedestrian demand on crosswalks and new vehicular traffic making turning movements would likely increase the potential for vehicle/pedestrian conflicts. However, it should be noted that the Myrtle Avenue intersection will be substantially

reconfigured in the future, including the extension of the Flatbush Court mall (in the No Build) and closure of vehicular access to the southbound service drive and Gold Street in the future with the proposed actions. These measures would reduce vehicular turning movements, provide additional pedestrian refuges, and shorten pedestrian crossing distances, all of which would enhance pedestrian safety at this intersection. Further measures to enhance pedestrian safety and access at both Myrtle Avenue and at DeKalb Avenue are currently being evaluated as part of NYCDOT's Downtown Brooklyn Traffic Calming Project.

The Nevins Street/Schermerhorn Street intersection was also found to average five pedestrians killed or injured per year. However, the proposed actions are not expected to add appreciable new pedestrian demand at this location.

Although not identified as a high accident location based on 2000 through 2002 data, the signalized intersection of Willoughby Street with Albee Square West/Gold Street is expected to see substantial new pedestrian demand with implementation of the proposed actions. New pedestrian demand en route between projected development sites, the Willoughby Square open space, and area subway station entrances would be primarily concentrated on the south crosswalk on Albee Square West. New demand on this crosswalk would total approximately 960 AM peak hour trips and 1,216 PM peak hour trips. Vehicular traffic would also increase substantially at this intersection, especially turning movements northbound from Albee Square West and southbound from Gold Street. Much of this new traffic would be en route to and from projected development sites and the proposed garage under Willoughby Square. The combination of increased pedestrian and vehicular traffic would likely increase the potential for vehicle/pedestrian conflicts at this intersection. However, as Albee Square West would be converted to one-way northbound operation with the proposed actions, there would be no conflicting vehicular turning movements with pedestrians on the heavily traveled south crosswalk. Chapter 20, "Mitigation," also presents potential changes at this intersection.

*BICYCLE FACILITIES*

The projected commercial developments would likely generate some new peak period commuter trips by bicycle, while the projected residential developments are 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. Some of this new demand would likely utilize the on-street bike lanes along Adams Street and bicycle routes recommended under the City's *Bicycle Network Development* program. To facilitate bicycle commuting to and from Downtown Brooklyn, the proposed zoning text would include a requirement that new commercial developments in C6-1, C6-5, and C6-4 districts provide up to 400 feet of enclosed storage space for bicycles.

The proposed actions include a number of street closures and other physical changes to the study area street system, and would generate new vehicular and pedestrian trips on streets shared with bicycles. These physical changes and increases in vehicular and pedestrian activity are not expected to adversely impact any existing bicycle facility or any bicycle route recommended under the City's *Bicycle Network Development* program.

## PARKING

*OFF-STREET PARKING*

Table 14-15 shows the total estimated hourly parking demand that would be generated by each of the projected developments. As shown in Table 14-15, in the future with the proposed

## Table 14-15
## Hourly Parking Demand From Projected Developments

| | Site C<br>Office<br>Community Facility | Site G<br>Residential<br>Neighborhood Retail | Site I(A)<br>Residential<br>Neighborhood Retail | Site J<br>Residential<br>Neighborhood Retail | Site M<br>Office<br>Neighborhood Retail | Site O<br>Office<br>Neighborhood Retail | Site P<br>Office<br>Neighborhood Retail | Site Q<br>Office<br>Destination Retail | Site AA<br>Residential<br>Neighborhood Retail | Site BB<br>Residential<br>Neighborhood Retail | Site EE<br>Performing Arts Library<br>Cultural Facility<br>Neighborhood Retail | Total Parking Demand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12-1 AM** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 0 | 65 | 74 | 0 | 367 |
| **1-2** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 0 | 65 | 74 | 0 | 367 |
| **2-3** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 0 | 65 | 74 | 0 | 367 |
| **3-4** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 0 | 65 | 74 | 0 | 367 |
| **4-5** | 0 | 4 | 120 | 103 | 0 | 0 | 0 | 0 | 65 | 74 | 0 | 366 |
| **5-6** | 0 | 4 | 118 | 101 | 0 | 0 | 0 | 0 | 64 | 73 | 0 | 360 |
| **6-7** | 10 | 4 | 112 | 96 | 11 | 8 | 14 | 24 | 60 | 68 | 0 | 407 |
| **7-8** | 55 | 3 | 103 | 89 | 58 | 41 | 73 | 117 | 54 | 62 | 0 | 655 |
| **8-9** | 182 | 2 | 89 | 76 | 186 | 131 | 238 | 340 | 47 | 54 | 3 | 1,348 |
| **9-10** | 243 | 2 | 85 | 73 | 248 | 174 | 316 | 493 | 45 | 51 | 8 | 1,738 |
| **10-11** | 248 | 3 | 80 | 69 | 254 | 178 | 322 | 557 | 42 | 48 | 28 | 1,829 |
| **11-12** | 236 | 3 | 76 | 63 | 243 | 170 | 307 | 581 | 41 | 45 | 46 | 1,811 |
| **12-1 PM** | 231 | 3 | 76 | 64 | 236 | 166 | 298 | 603 | 41 | 46 | 61 | 1,825 |
| **1-2** | 241 | 3 | 73 | 62 | 243 | 172 | 313 | 630 | 39 | 45 | 71 | 1,892 |
| **2-3** | 247 | 3 | 75 | 63 | 252 | 177 | 324 | 633 | 41 | 45 | 69 | 1,929 |
| **3-4** | 242 | 3 | 82 | 68 | 251 | 176 | 319 | 611 | 44 | 48 | 67 | 1,911 |
| **4-5** | 173 | 3 | 90 | 75 | 179 | 126 | 222 | 483 | 48 | 52 | 53 | 1,504 |
| **5-6** | 37 | 4 | 96 | 83 | 33 | 24 | 35 | 231 | 53 | 58 | 36 | 690 |
| **6-7** | 14 | 4 | 104 | 90 | 6 | 6 | 6 | 197 | 57 | 64 | 50 | 598 |
| **7-8** | 6 | 5 | 113 | 98 | 1 | 1 | 1 | 220 | 62 | 70 | 58 | 635 |
| **8-9** | 1 | 4 | 119 | 103 | 0 | 1 | 1 | 177 | 66 | 74 | 63 | 609 |
| **9-10** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 70 | 65 | 74 | 45 | 482 |
| **10-11** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 13 | 65 | 74 | 6 | 386 |
| **11-12** | 0 | 4 | 120 | 104 | 0 | 0 | 0 | 0 | 65 | 74 | 0 | 367 |

**Notes:**

Projected Development Site S would be in-fill of an existing arcade with approximately 12,000 SF of neighborhood retail generating negligible parking demand.

actions, projected development would generate a demand for approximately 1,348 parking spaces by the 8-9 AM peak hour. Demand would peak at 1,929 spaces in the midday. In addition, the development of sites I(A), O, P, Q, and EE would displace nine public parking facilities with a total of 1,181 spaces. Therefore, the projected developments would generate a total overall parking demand of 2,529 spaces in the AM and 3,110 in the midday at public parking facilities in the Downtown Brooklyn study area. It is anticipated, however, that the projected residential developments on sites J, AA and EE would include sufficient accessory parking capacity on-site to accommodate all of the residential demand (estimated at 177 spaces in the AM and 149 spaces in the midday). In addition, it is anticipated that the projected office developments on sites C, M, O, P and Q would each incorporate a 225-space accessory parking facility as permitted under zoning. This would provide an additional 1,125 spaces of accessory parking capacity. Some new demand would also be offset by the elimination of demand from existing land uses that would be displaced by projected development. This eliminated demand would total approximately 162 spaces in the AM and 400 spaces in the midday. As shown in Table 14-16, accounting for new demand from projected development sites, displaced demand and capacity from existing land uses, and the new demand that would be accommodated in accessory facilities, the total estimated parking demand at the public parking facilities in the study area in the future with the proposed actions would total 8,694 spaces in the AM and 12,273 in the midday. This compares to 8,810 spaces in the AM and 12,018 spaces in the midday in the future without the proposed actions.

As discussed in Chapter 1, "Project Description," the proposed actions would facilitate the development of three new public parking facilities within the study area. The largest of these would be a 694-space garage to be located on Site P beneath the proposed Willoughby Square public space. Vehicles would enter this facility from Duffield Street and exit onto Albee Square West. A 457-space public garage on Site I(A) (with access from Fleet Place) would replace the 200 spaces presently on the site, and would accommodate the accessory demand from the residential and retail development on this site, as well as some of the demand for public parking generated by projected commercial developments. A 466-space public parking garage on Site EE would accommodate both public parking demand and accessory demand from the performing arts library and cultural facility that would also occupy the site. As shown in Table 14-16, combined these three facilities would add a total of 1,617 spaces to the public parking supply in Downtown Brooklyn. With this additional capacity, the surplus of off-street public parking spaces in the AM in the future with the proposed actions would increase to 2,581 from 2,029 in the No Build condition. In the midday, there would be a deficit of 998 spaces within the study area, compared to a deficit of 1,179 in the No Build condition.

The proposed actions would accommodate all of the anticipated demand generated by projected development sites, would increase the surplus of study area parking spaces in the AM by 552, and would reduce the No Build midday parking deficit by 181 spaces. Therefore, no significant adverse impacts to off-street parking conditions would result from the proposed actions.

*ON-STREET PARKING*

As discussed above, the proposed actions would include sufficient new off-street parking capacity to fully accommodate all displaced parking capacity and new parking demand generated by projected developments. All of the projected commercial developments would also

## Table 14-16
## 2013 Future With the Proposed Actions Off-Street Parking Conditions

| | 2013 No Build Conditions | | | 2013 Future with the Proposed Actions Conditions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Peak Period | Total Capacity (1) | Estimated Public Space Demand (2) | Net Spaces Available | Existing Public Spaces Displaced (3) | New Public Spaces Provided (4) | Total Public Space Capacity | New Project Demand | Existing Demand Eliminated (5) | New Residential Demand Accommodated in On-Site Accessory Facilites (6) | New Office Demand Accommodated in On-Site Accessory Facilites (7) | Total Estimated Public Space Demand | Net Public Spaces Available |
| AM | 10,839 | 8,810 | 2,029 | -1,181 | 1,617 | 11,275 | 1,348 | -162 | -177 | -1,125 | 8,694 | 2,581 |
| Midday | 10,839 | 12,018 | (1,179) | -1,181 | 1,617 | 11,275 | 1,929 | -400 | -149 | -1,125 | 12,273 | (998) |

Notes:

(1) Includes 2,100 new public spaces and 2,061 public spaces displaced by development.

(2) Includes 0.5 percent/year background growth and demand from No Build sites.

(3) Includes 200 spaces on Site I(A), 125 spaces on Site O, 292 spaces on Site P, 454 spaces on Site Q, and 110 spaces on Site EE.

(4) Includes a 457-space public garage on Site I(A), a 694-space public garage at Willoughby Square, a 466-space public garage at Site EE.

(5) Demand generated by existing land uses on projected development sites.

(6) Assumes on-site accessory parking spaces to accommodate demand from projected development sites J, AA and BB.

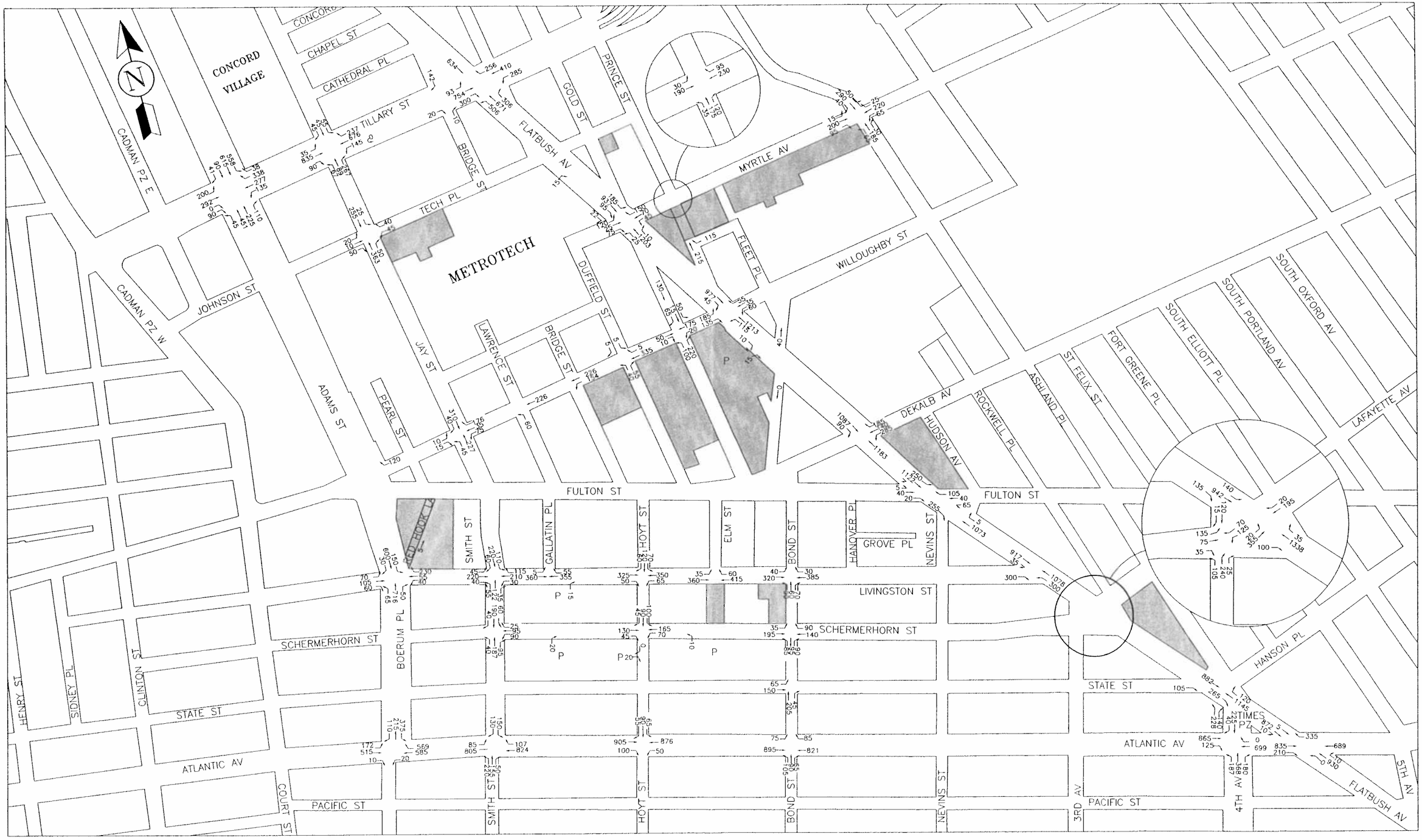
(7) Assumes 225-space accessory parking facilities at projected development sites C, M, O, P and Q.

incorporate sufficient off-street loading facilities to accommodate delivery and service vehicles. Therefore, any new demand for curbside space generated by the proposed actions would consist primarily of pick-up and drop-off activity by autos, taxis and livery vehicles ("black cars"). This activity would be accommodated along curbside lanes in the immediate vicinity of each development site. For example, it is anticipated that pick-up and drop-off activity generated at projected commercial sites O, P and Q would be accommodated along one or both curbs on portions of Willoughby Street as well as Duffield Street, Albee Square West, and the new east-west street connection between them. The proposed actions may result in the elimination of some existing metered parking spaces to accommodate new loading docks or building entrances at projected development sites. They may also, however, result in opportunities for the addition of new curbside spaces due to the displacement of existing loading docks, building entrances, etc. Overall, as sufficient off-street parking capacity would be provided to accommodate all parking demand resulting from the proposed actions, and as delivery and service vehicles would be accommodated in off-street loading facilities, the proposed actions are not expected to adversely effect on-street parking conditions in the study area.

## E. CONCLUSIONS

This chapter analyzes the effects of added traffic and parking demand from projected development sites, and the effects of street system changes related to the proposed actions, on the Downtown Brooklyn transportation system during the weekday AM, midday and PM peak hours. The results of the analyses show that project demand and street system changes would create significant traffic impacts (see Tables 14-13 and 14-14), with the PM peak hour having the most impacts, with 28 impacted intersections, followed by the AM and the midday, with 23 and 20 impacted intersections, respectively. As the proposed actions would increase the No Build surplus of study area parking spaces in the AM by 552, and reduce the No Build midday parking deficit by 181 spaces, no significant adverse impacts to off-street parking conditions would result from the proposed actions. The proposed actions would also generate substantial new pedestrian trips and increase pedestrian-vehicle conflicts at two high-accident locations; Willoughby Street at Flatbush Avenue and Willoughby Street at Jay Street. Chapter 20, "Mitigation," of this EIS provides a description of measures to be developed to mitigate the traffic impacts identified in this chapter. ❖


N
CONCORD VILLAGE
CHAPEL ST
CATHEDRAL PL
TILLARY ST
CADMAN PZ E
CADMAN PZ W
JOHNSON ST
BRIDGE ST
FLATBUSH AV
GOLD ST
PRINCE ST
MYRTLE AV
TECH PL
METROTECH
DUFFIELD ST
FLEET PL
WILLOUGHBY ST
LAWRENCE ST
JAY ST
ADAMS ST
PEARL ST
DEKALB AV
HUDSON AV
ROCKWELL PL
ASHLAND PL
FELIX ST
FORT GREENE PL
SOUTH ELLIOTT PL
SOUTH PORTLAND AV
SOUTH OXFORD AV
LAFAYETTE AV
FULTON ST
OLD FULTON ST
SMITH ST
GALLATIN PL
HOYT ST
ELM ST
BOND ST
HANOVER PL
GROVE PL
NEVINS ST
LIVINGSTON ST
SCHERMERHORN ST
BOERUM PL
HANSON PL
STATE ST
ATLANTIC AV
TIMES PZ
PACIFIC ST
COURT ST
3RD AV
4TH AV
5TH AV
FLATBUSH AV
HENRY ST
SIDNEY PL
CLINTON ST
P
Public Parking Facility
Projected Development Site




P Public Parking Facility

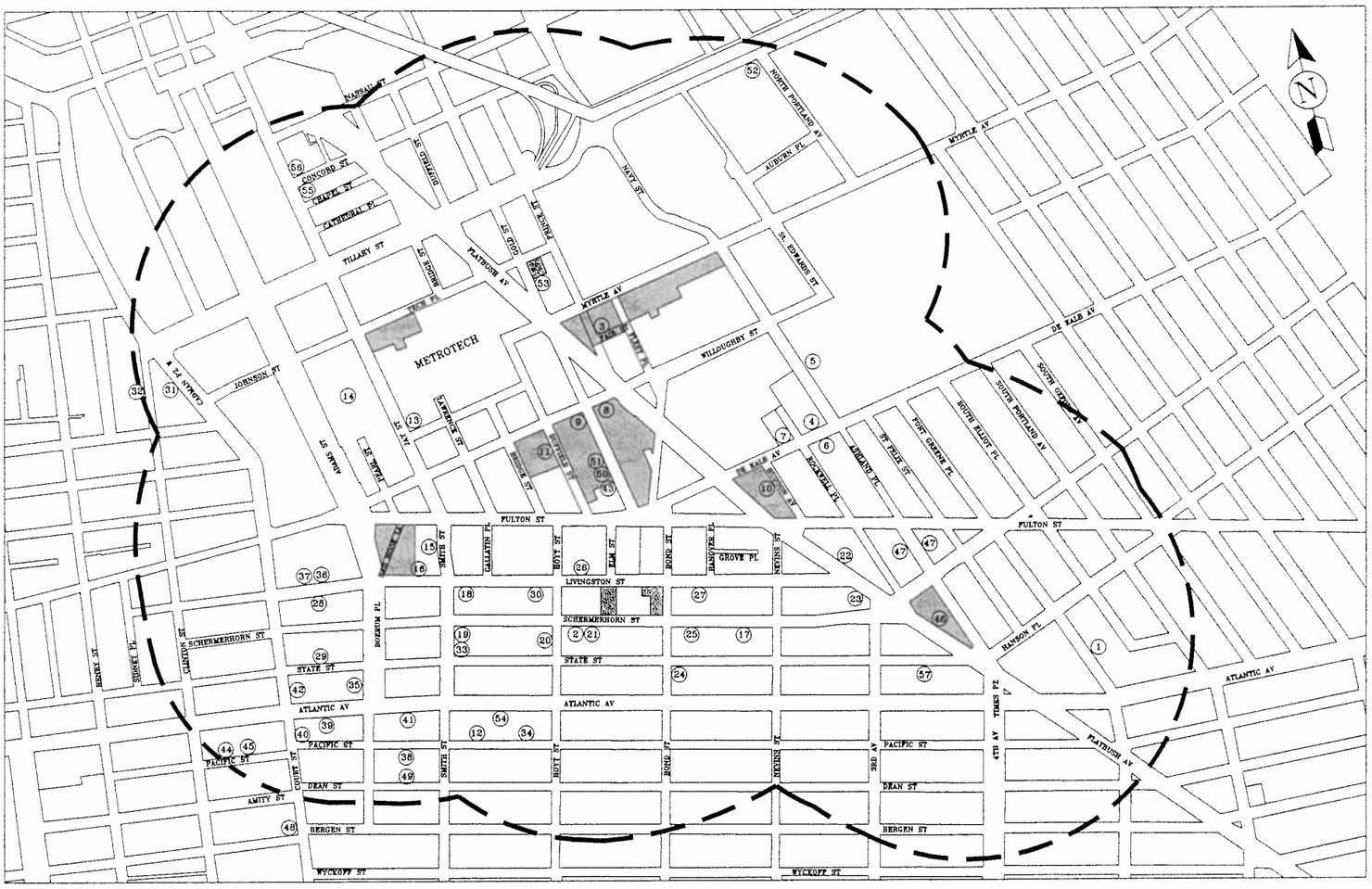
Projected Development Site

# Existing Traffic Volumes- PM Peak Hour
## Figure 14-4




P Public Parking Facility

Projected Development Site




Legend:

Projected Development Site

① Parking Facility

1/4-Mile Radius From Project Sites

# On-Street Parking Regulations

Figure 14-6




Legend:

Projected Development Site

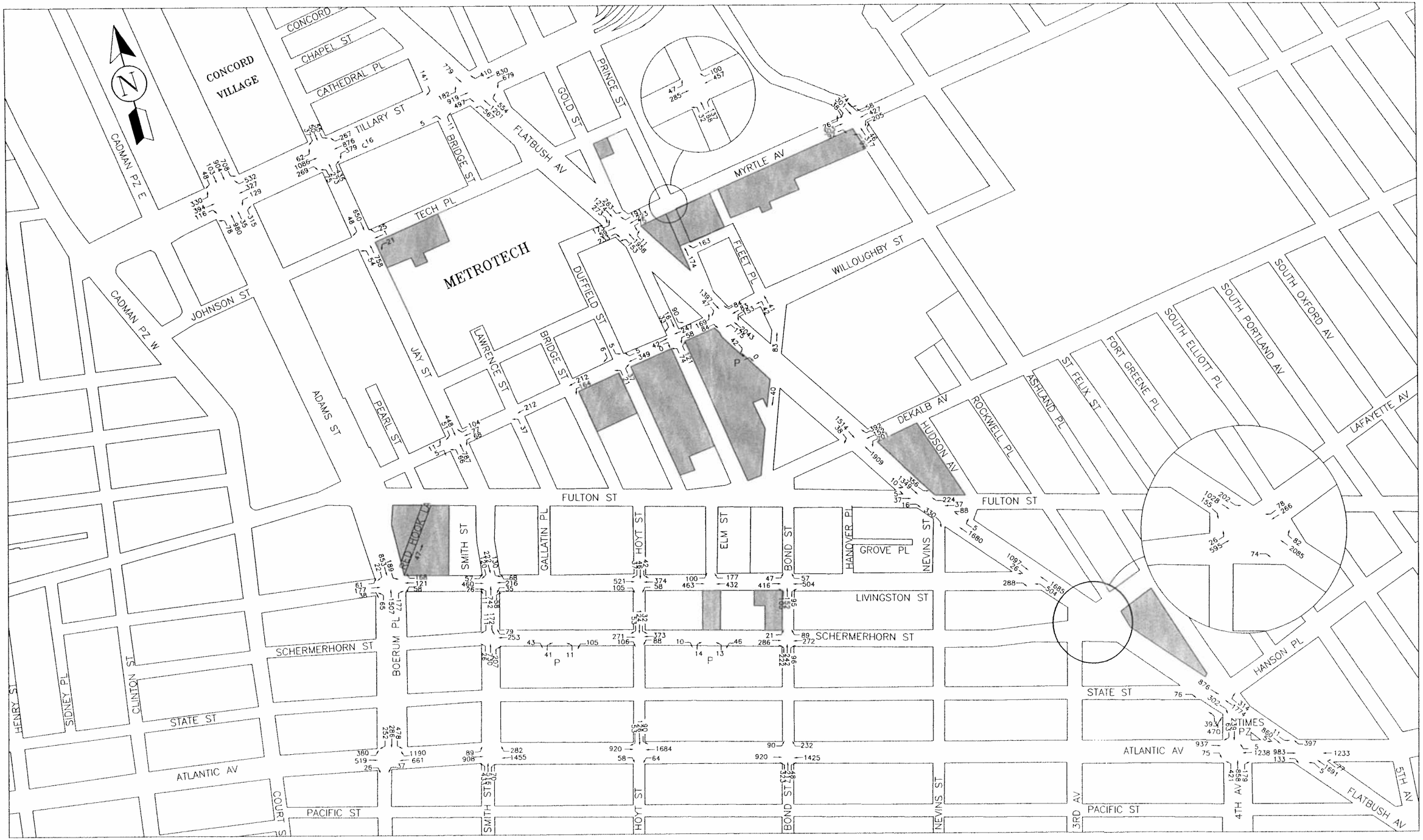
① Parking Regulation

1/4 Mile Radius From Project Sites

TC Temporary Construction Regulation

# 2013 No Build Traffic Volumes- AM Peak Hour

**Figure 14-7**



# 2013 No Build Traffic Volumes- Midday Peak Hour

Figure 14-8

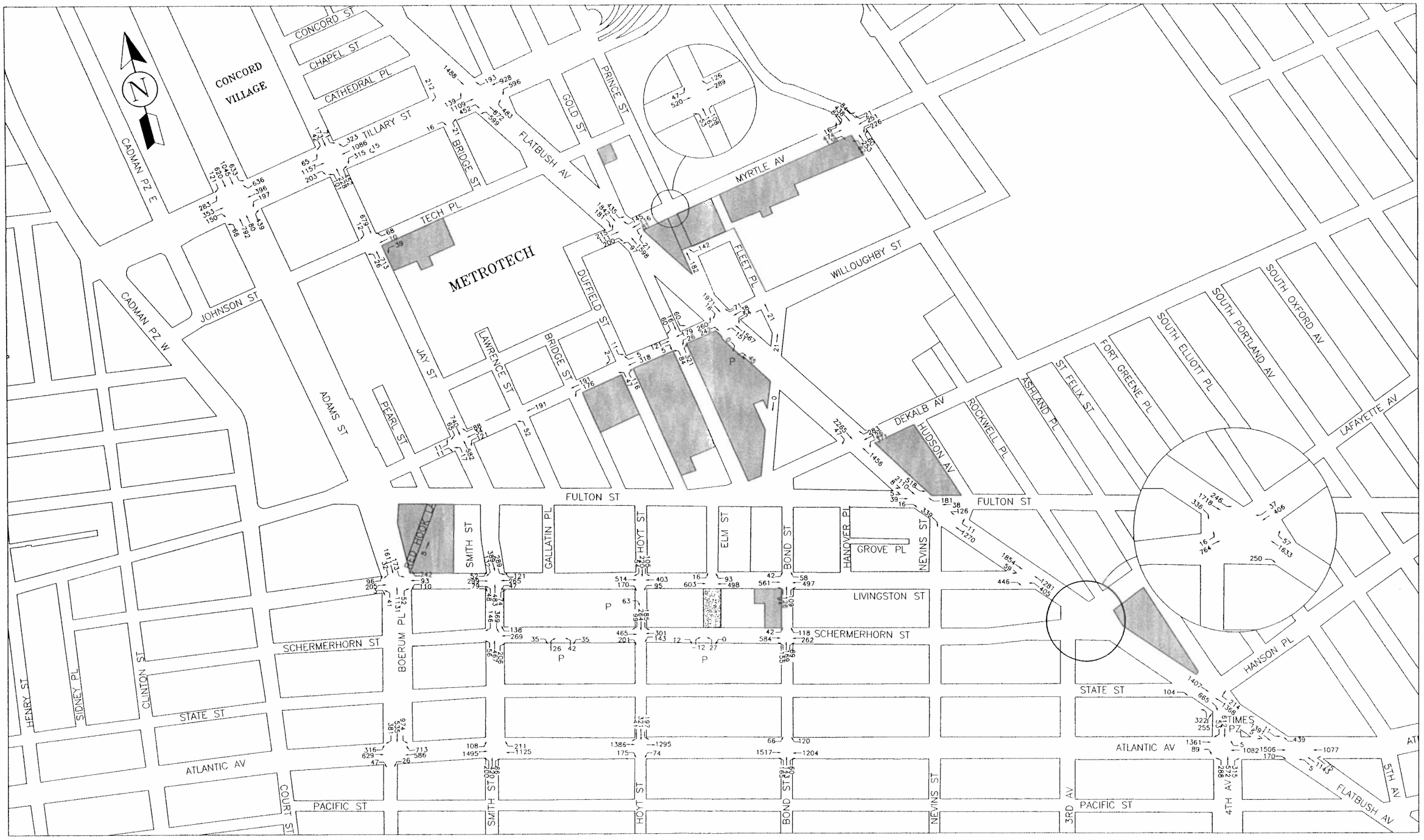



P Public Parking Facility

Projected Development Site

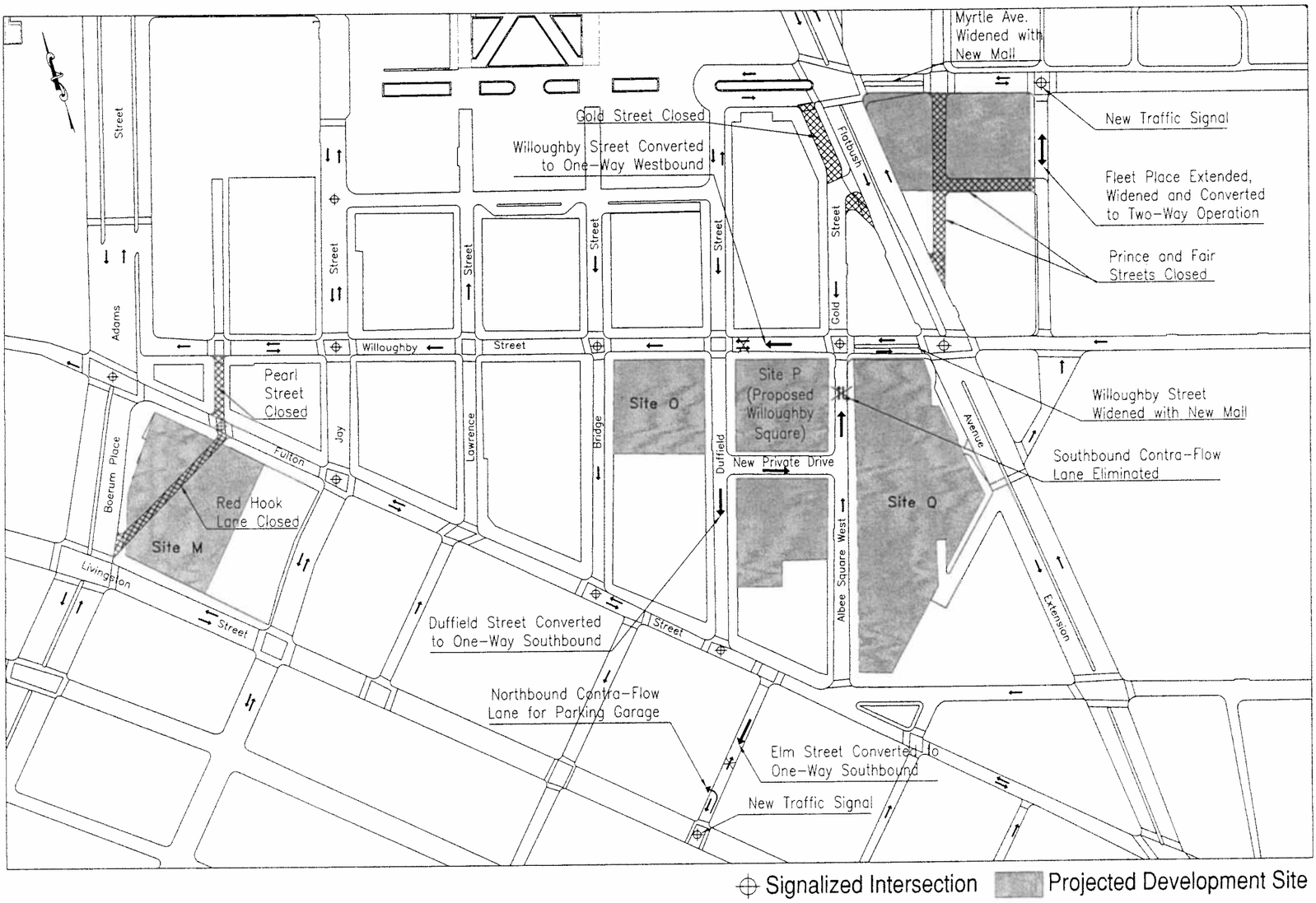
# 2013 No Build Traffic Volumes- PM Peak Hour

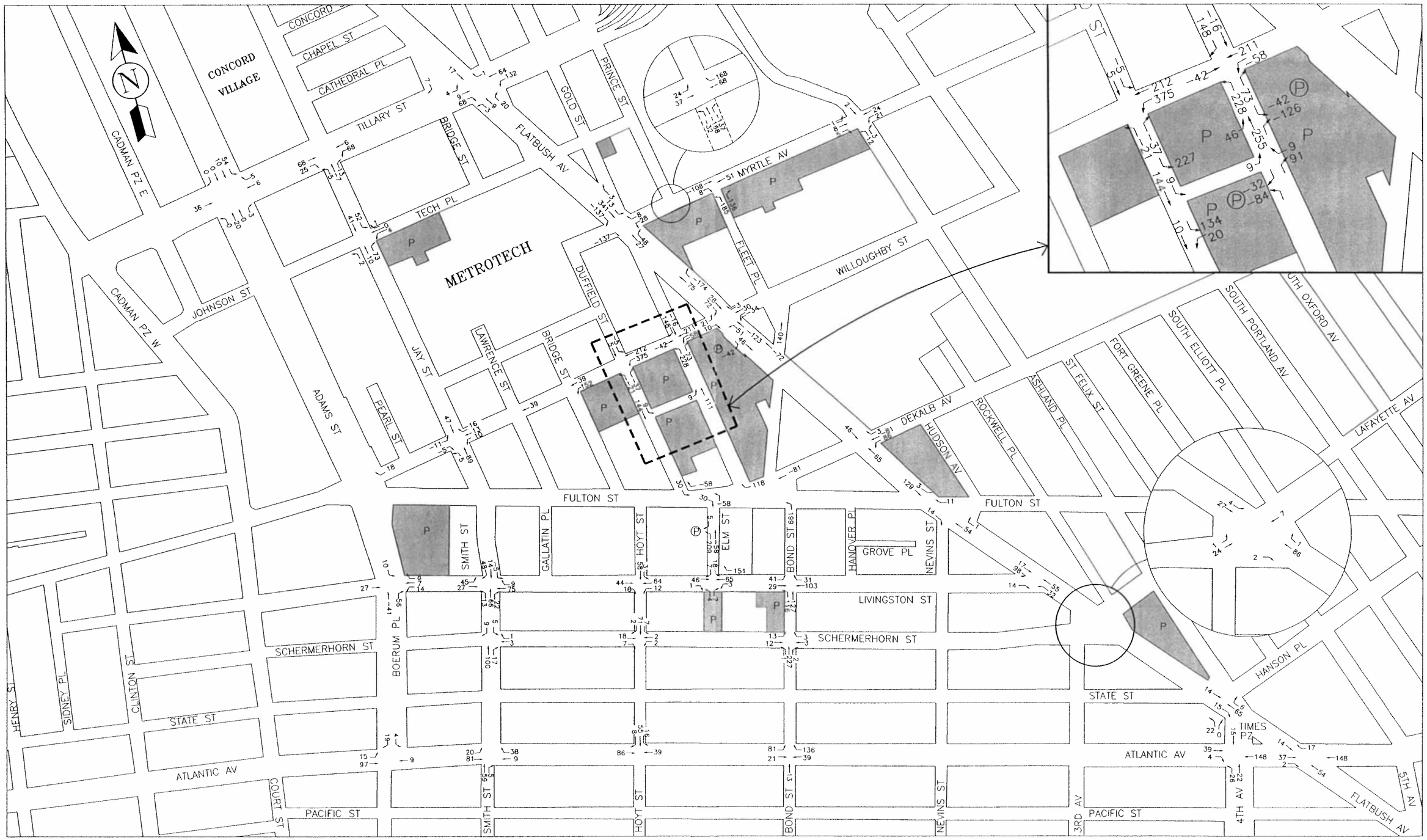
**Figure 14-9**



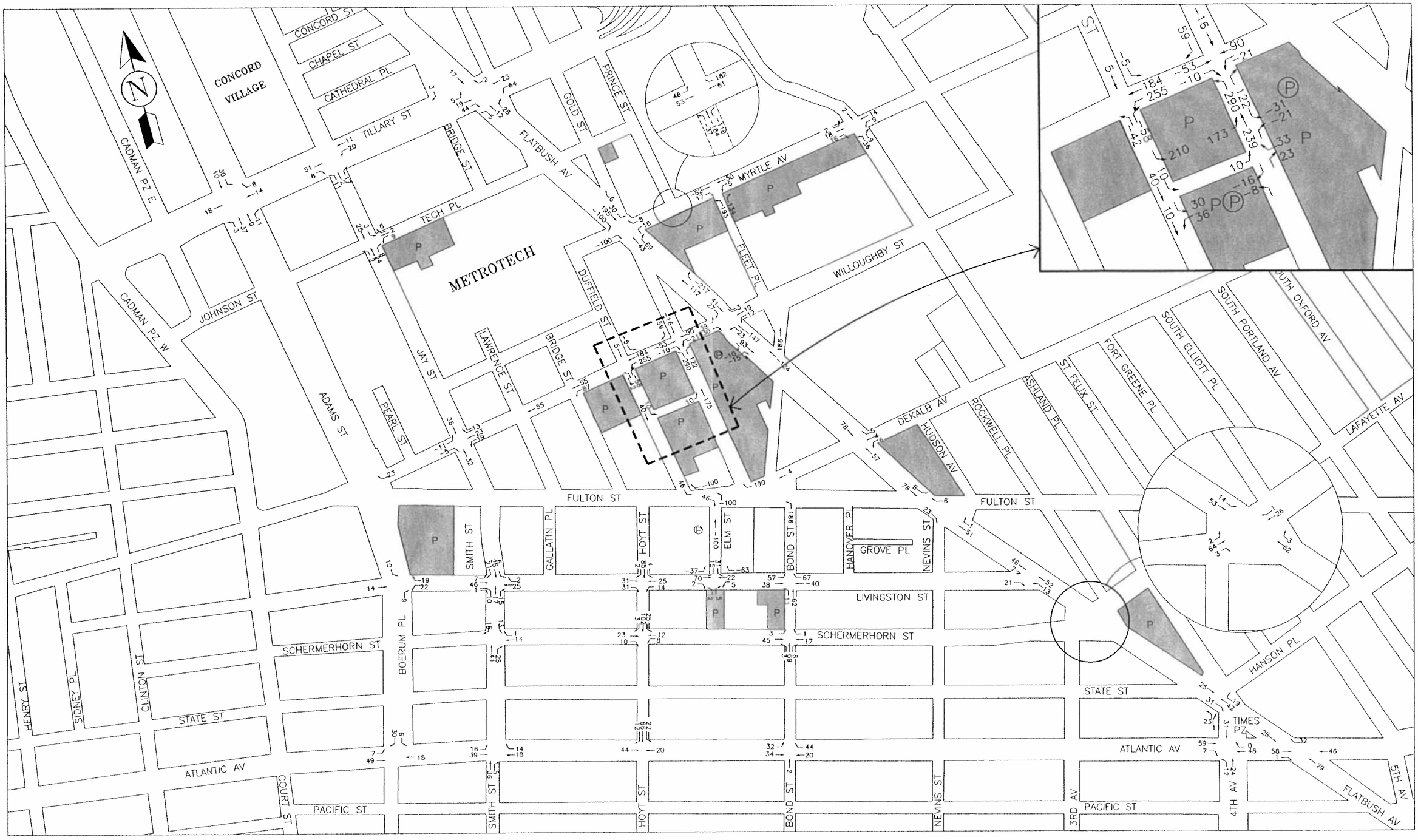

P Public Parking Facility

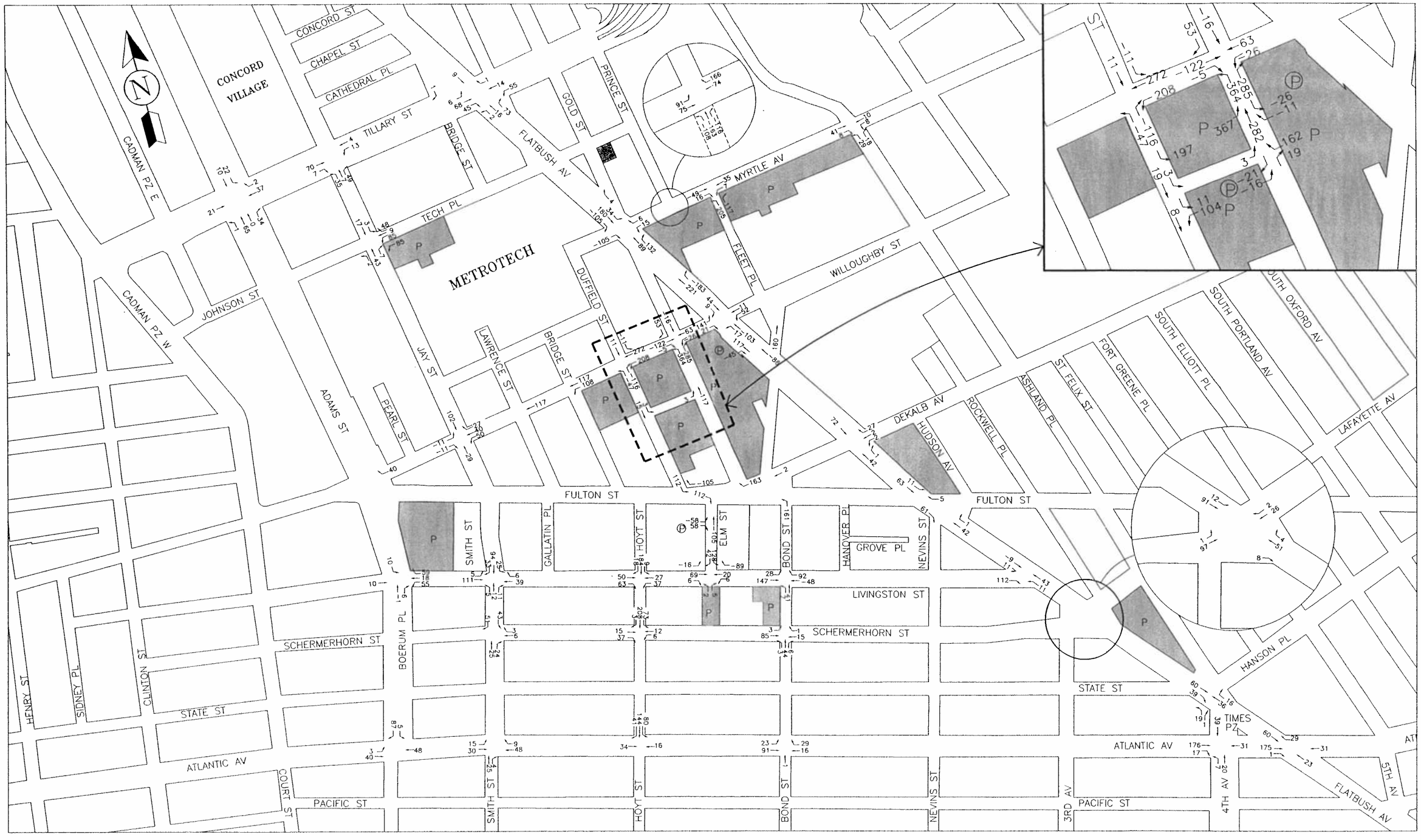
Projected Development Site


Myrtle Ave. Widened with New Mall
New Traffic Signal
Gold Street Closed
Willoughby Street Converted to One-Way Westbound
Fleet Place Extended, Widened and Converted to Two-Way Operation
Prince and Fair Streets Closed
Willoughby Street Widened with New Mall
Southbound Contra-Flow Lane Eliminated
Pearl Street Closed
Red Hook Lane Closed
Site M
Site O
Site P (Proposed Willoughby Square)
New Private Drive
Site Q
Duffield Street Converted to One-Way Southbound
Northbound Contra-Flow Lane for Parking Garage
Elm Street Converted to One-Way Southbound
New Traffic Signal
Adams
Boerum Place
Jay
Lawrence
Bridge
Duffield
Albee Square West
Flatbush Avenue Extension
Fulton
Livingston
Willoughby
Gold
Street
Signalized Intersection
Projected Development Site


CONCORD VILLAGE
CADMAN PZ E
CADMAN PZ W
CONCORD
CHAPEL ST
CATHEDRAL PL
TILLARY ST
BRIDGE ST
FLATBUSH AV
GOLD ST
PRINCE ST
51 MYRTLE AV
TECH PL
METROTECH
FLEET PL
WILLOUGHBY ST
DUFFIELD ST
JOHNSON ST
JAY ST
LAWRENCE ST
BRIDGE ST
ADAMS ST
PEARL ST
DEKALB AV
HUDSON AV
ROCKWELL PL
ASHLAND PL
ST FELIX ST
FORT GREENE PL
SOUTH ELLIOTT PL
SOUTH PORTLAND AV
LAFAYETTE AV
FULTON ST
SMITH ST
GALLATIN PL
HOYT ST
ELM ST
BOND ST
HANOVER PL
GROVE PL
NEVINS ST
LIVINGSTON ST
SCHERMERHORN ST
BOERUM PL
CLINTON ST
HENRY ST
SIDNEY PL
STATE ST
ATLANTIC AV
COURT ST
PACIFIC ST
HANSON PL
TIMES PZ
3RD AV
4TH AV
5TH AV
FLATBUSH AV
P
Future Parking Facility
Existing Parking Facility
Projected Development Site

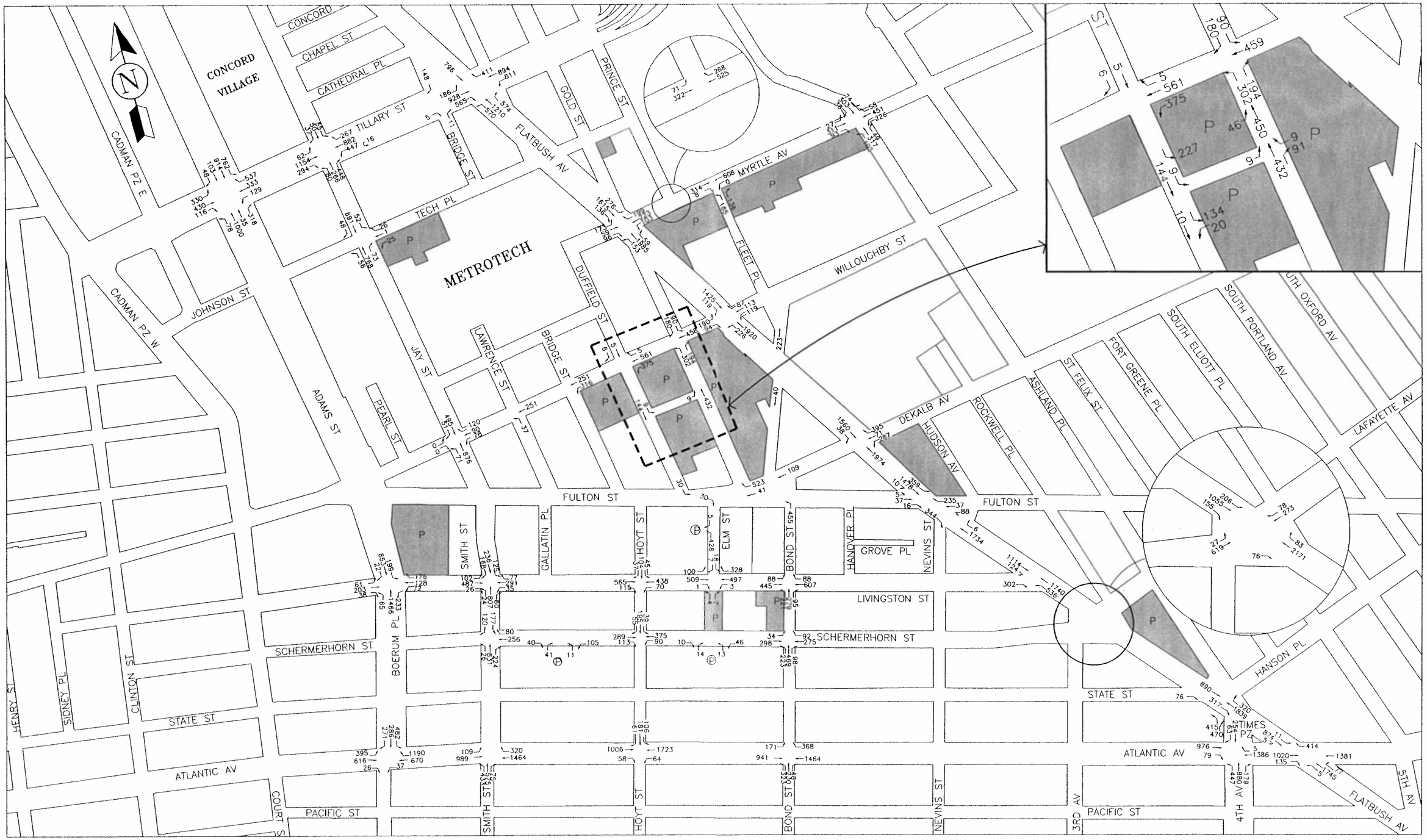
## Project Increment Traffic Assignment- Midday Peak Hour
## Figure 14-12



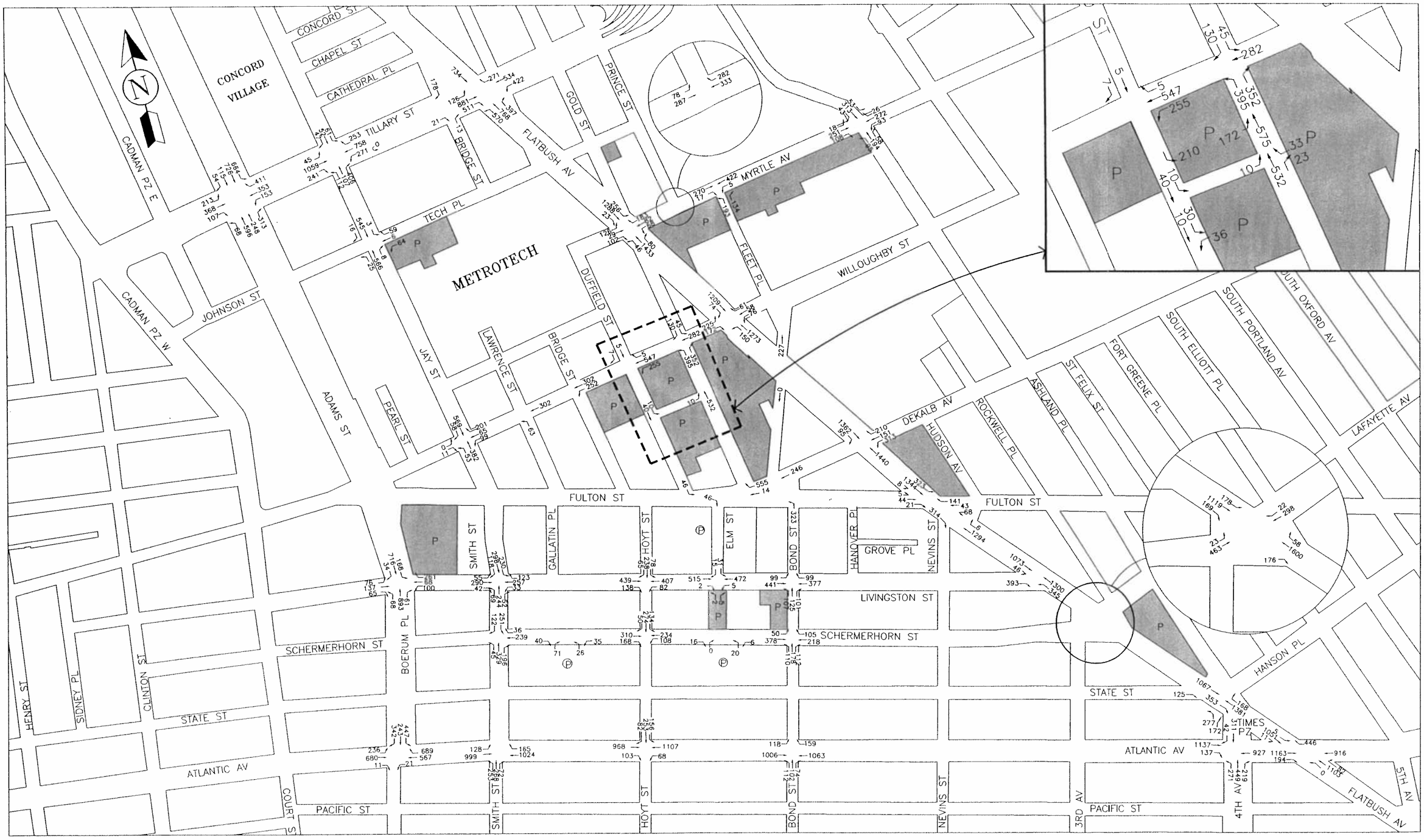

CONCORD VILLAGE
CONCORD ST
CHAPEL ST
CATHEDRAL PL
TILLARY ST
CADMAN PZ E
CADMAN PZ W
JOHNSON ST
BRIDGE ST
FLATBUSH AV
GOLD ST
PRINCE ST
MYRTLE AV
TECH PL
METROTECH
DUFFIELD ST
FLEET PL
WILLOUGHBY ST
JAY ST
LAWRENCE ST
BRIDGE ST
ADAMS ST
PEARL ST
DEKALB AV
HUDSON AV
ROCKWELL PL
ASHLAND PL
ST FELIX ST
FORT GREENE PL
SOUTH ELLIOTT PL
SOUTH PORTLAND AV
SOUTH OXFORD AV
LAFAYETTE AV
FULTON ST
SMITH ST
GALLATIN PL
HOYT ST
ELM ST
BOND ST
HANOVER PL
GROVE PL
NEVINS ST
BOERUM PL
SCHERMERHORN ST
LIVINGSTON ST
HENRY ST
SIDNEY PL
CLINTON ST
STATE ST
HANSON PL
ATLANTIC AV
COURT ST
PACIFIC ST
3RD AV
4TH AV
5TH AV
FLATBUSH AV
TIMES PZ
P
Future Parking Facility
Existing Parking Facility
Projected Development Site

# 2013 Future with the Proposed Actions Traffic Volumes- AM Peak Hour

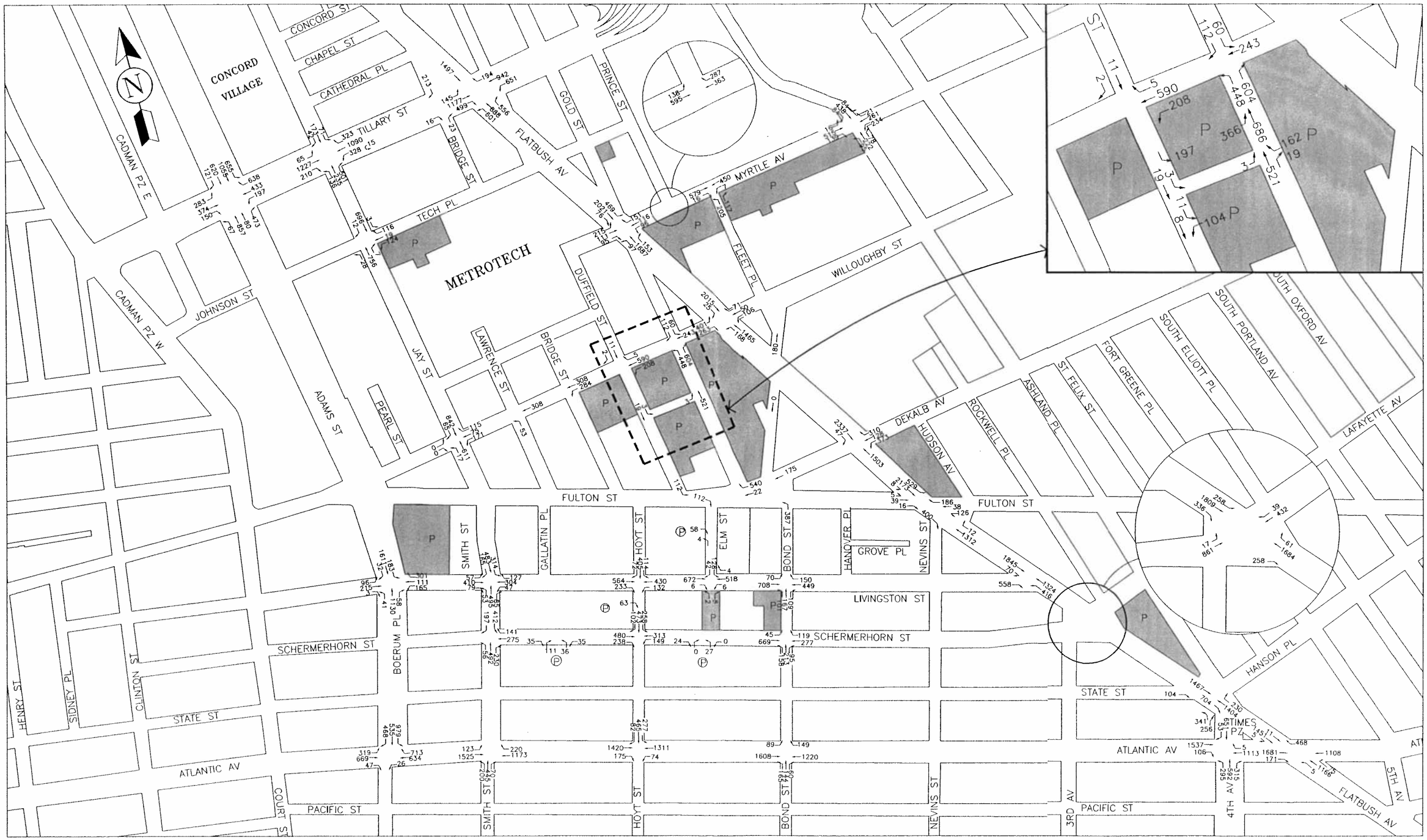
**Figure 14-14**



# 2013 Future with the Proposed Actions Traffic Volumes- Midday Peak Hour
## Figure 14-15



# 2013 Future with the Proposed Actions Traffic Volumes- PM Peak Hour
## Figure 14-16



## A. INTRODUCTION

This chapter of the EIS describes the transit and pedestrian travel characteristics and potential impacts associated with the proposed rezoning of an approximately 60-block area in Downtown Brooklyn roughly bounded by Tillary Street to the north, Schermerhorn Street/Pacific Street to the south, Adams Street to the west, and Ashland Place to the east (see Figure 1-1 in Chapter 1). As described in detail in earlier chapters of this EIS, the proposed rezoning would provide for the development of sites for a mixture of commercial office, academic, residential, and retail uses. The transportation analyses in this EIS address a development program that could reasonably be constructed by 2013. The analyses in this chapter focus on the subway and local bus modes, as well as pedestrian trips related to these "projected" development sites. Qualitative discussions of commuter rail and ferry service are also included. The locations of these projected sites are shown in Figure 1-1 and their anticipated uses are listed in Table 1-3 in Chapter 1, Project Description.

This chapter describes in detail the existing conditions at transit and pedestrian facilities expected to be used by the majority of new demand from projected development sites. The analyses focus on the weekday 8-9 AM and 5-6 PM peak hours, the periods when demand from these predominantly office and residential development sites would be heaviest and the transit system is most heavily utilized. Future conditions in the year 2013 without the proposed actions (the No Build condition) are then determined, including additional transit and pedestrian demand and any changes in transit facilities and services expected by the year 2013. The increase in travel demand resulting from the proposed actions is then projected and added to the No Build condition to develop the 2013 future with the proposed actions (the Build condition). Significant impacts from project generated trips are then identified.

## B. EXISTING CONDITIONS

### DATA COLLECTION

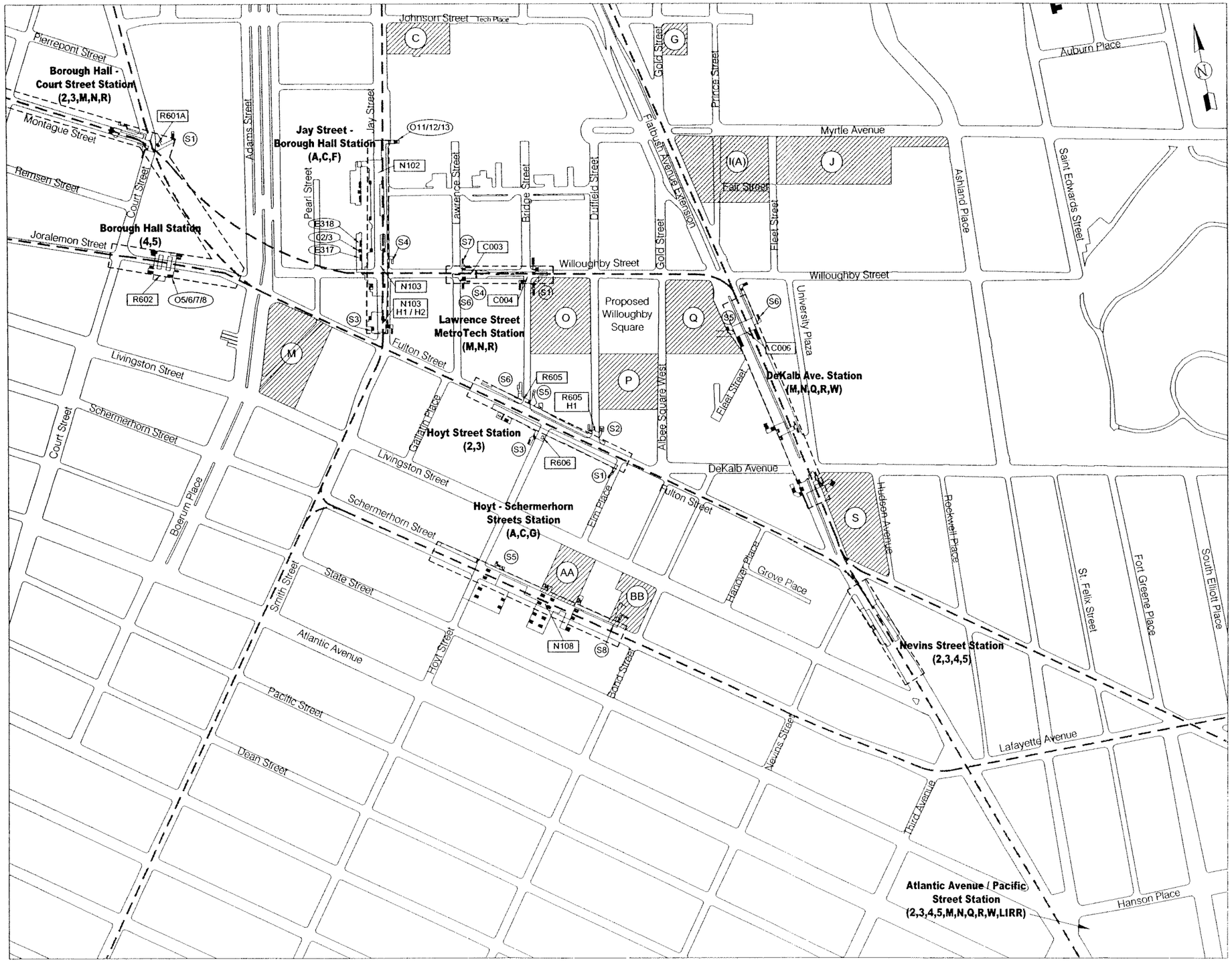
Counts at key subway station stairways and fare arrays were conducted during the AM and PM peak periods in October 2002 at the Borough Hall/Court Street, DeKalb Avenue, Hoyt Street, Hoyt-Schermerhorn Streets, Jay Street-Borough Hall, and Lawrence Street-MetroTech stations. AM, and PM peak period pedestrian counts were also conducted at this time along the Willoughby Street corridor and along Red Hook Lane and Boerum Place. Data on local bus ridership at the maximum load points along each route were obtained from NYC Transit.

### SUBWAY SERVICE

Downtown Brooklyn is served by one of the densest concentration of subway lines and stations in New York City. In 2002, service to the Downtown area's twelve stations was provided by 2, 3, 4, 5, A, C, F, G, M, N, Q, R and W trains, with five subway tunnels and the Manhattan Bridge

# Study Area Subway Stations

Figure 15-1




LEGEND

- (S4) ANALYZED STAIRWAY/ ESCALATOR
- N 108 ANALYZED FARE ARRAY
- (Q) PROJECTED DEVELOPMENT SITE
- SUBWAY LINE

It should be noted that the 2001 data reflect two events that affected subway service during the year. The first were a series of service changes implemented in July, including introduction of W train service, to accommodate the final phase of NYCDOT's rehabilitation of the Manhattan Bridge. The second was the September 11, 2001 terrorist attack on the World Trade Center which resulted in significant service disruptions and changes in passenger travel patterns for the remainder of the year.

As shown in Table 15-1, based on 2002 data, the Borough Hall/Court Street station complex is the most heavily used of the stations at which project trips would occur. It ranked 21st out of 424 based on an average of 34,805 persons entering on a typical weekday. Demand at this station complex increased by two percent from 2000 to 2001, but decreased by 1.3 percent from 2001 to 2002. The next most heavily used is the Jay-Street-Borough Hall station with a rank of 26th and an average of 30,939 persons entering on a typical weekday. Demand at this station increased by 7.2 percent from 2000 to 2001, and by 6.2 percent from 2001 to 2002. The Hoyt Street station is the most lightly used station of the group, ranking 183rd with an average of 6,931 persons entering on a typical weekday. Ridership at this station increased by 1.3 percent from 2000 to 2001 and by a further 4.4 percent from 2001 to 2002.

The Lawrence Street-MetroTech station, the closest station to the projected development sites along Willoughby Street and a gateway station to MetroTech, ranked 175th in 2002, with an average of 7,329 riders entering on a typical weekday. Demand at this station decreased by 3.9 percent from 2000 to 2001, and by a further 0.2 percent during the 2001 to 2002 period. It is important to note that, prior to September 11, 2001, a transfer to N and R trains at the Cortlandt Street (World Trade Center) station provided the most convenient connection for New Jersey commuters en route to Downtown Brooklyn via Port Authority Trans-Hudson (PATH) rail service. The elimination of this connection due to the cessation of PATH service to Lower Manhattan is likely a key factor in the drop in ridership observed at the Lawrence Street-MetroTech station. It is also likely a factor in some of the increase in ridership at the Jay Street-Borough Hall station, as many New Jersey commuters now transfer from the 9th Street PATH station to A, C and F trains at the West 4th Street subway station in Manhattan. It is anticipated that once PATH service to Lower Manhattan is restored (scheduled for November 2003), PATH commuters will once again make use of the connection to N and R trains at Cortlandt Street to reach Brooklyn. Peak hour demand at the Lawrence Street-MetroTech station in Downtown Brooklyn is therefore expected to increase at that time.

A threshold of 200 peak hour trips entering or exiting a station has been established under *CEQR* criteria to determine whether new subway demand from a proposed project warrants a detailed analysis at a particular station. As discussed later in this chapter, the travel demand forecast and subway trip assignment for the projected development sites indicate that new demand would exceed this threshold at five stations or station complexes in Downtown Brooklyn. These include the Borough Hall/Court Street station complex and the DeKalb Avenue, Hoyt Street, Jay Street-Borough Hall and Lawrence Street stations. As project-generated demand would remain below the *CEQR* threshold at the Nevins Street station and the Atlantic Avenue/Pacific Street station complex, these stations are not analyzed quantitatively in this EIS. However, the evaluation of future subway conditions with the proposed actions includes an assessment of the potential for the proposed actions to generate transfer activity at the Atlantic Avenue/Pacific Street station complex. Although new peak hour demand at the

Hoyt-Schermerhorn Streets station would also fall below the *CEQR* threshold, this station is included in the analyses as two projected development sites would be located directly above it.

The examination of conditions at analyzed stations focuses on those station elements (street stairways and fare arrays) with the potential to be affected in the future with the proposed project. The analyses were prepared using the design capacities for stairs, escalators, turnstiles, and high-wheel exits specified in *NYCTA Station Planning and Design Guidelines*, as well as procedures set forth in *Pedestrian Planning and Design* by John J. Fruin. All analyses reflect peak 15-minute conditions in the AM and PM peak hours. The 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. Based on the calculated values of pedestrian volumes per foot width of stairway per minute, Fruin defines six levels of service with letters A through F, as shown in Table 15-2. Level of service A is representative of free flow conditions without pedestrian conflicts and LOS F depicts significant capacity limitations and inconvenience.

**Table 15-2**
**Stairway Level of Service Definitions**

| Level of Service | Pedestrians/Foot/ Minute(PFM) | Comments |
|---|---|---|
| A | Up to 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 restriction in speed and difficulties in reverse flows. |
| E | 13 - 17 | Reductions of speeds, serious reverse traffic conflicts, and intermittent stoppages. |
| F | More than 17 | Complete breakdown in traffic flow. |

Practical capacities were calculated for each stairway analyzed by multiplying service volumes at LOS C/D, which is 10 persons per foot width per minute (PFM), by the effective stair width and an adjustment factor to account for two-directional friction (where applicable). Peak 15-minute volumes were then compared with the capacities to obtain a 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. LOS D, E, and F represent demand levels that exceed capacity, and hence, the v/c ratios are greater than 1.0.

Levels of service for turnstiles and high-wheel exits are also described in terms of volume-to-capacity ratios, with LOS A being less than 0.2, LOS B from 0.2 to 0.4, LOS C from 0.4 to 0.6, LOS D from 0.6 to 0.8, LOS E from 0.8 to 1.0 and LOS F over 1.0. Any volume-to-capacity ratio greater than 1.0 signifies volumes beyond capacity and extended queues.

Following are descriptions of the physical characteristics and the services provided at each analyzed station, and the results of the analyses of Existing conditions at each analyzed station element during the weekday 8-9 AM and 5-6 PM peak hours. Also provided is an analysis of line haul conditions on each of the subway routes connecting Downtown Brooklyn with Manhattan.

*BOROUGH HALL/COURT STREET STATION (2,3,4,5,M,N,R,W)*

The Borough Hall/Court Street station complex consists of three distinct but interconnected stations (see Figure 15-1). The Borough Hall IRT 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 IRT 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 adjacent to Borough Hall, and a second on the south (Brooklyn-bound) side adjacent to the Municipal Building. The two mezzanines are connected by a series of three bridges; one which connects the free zones and two connecting the paid zones. A third mezzanine is located at Court Street at the west end of the station. The Court Street BMT station, served by M, N and R trains (and W trains nights/weekends until Spring 2004), 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 IRT 2,3 station.

Project generated trips en route to and from the Borough Hall IRT 2,3 and Court Street stations are expected to use stair S1 in Columbus Park (see Figure 15-1). All of these trips would likely use the seven entry/exit turnstiles of fare array R-601A. Trips en route to and from the Borough Hall IRT 4,5 station would use stair O5/6/7/8 on the south side of Joralemon Street. This stair is under the portico of the Municipal Building and is not maintained by NYC Transit. Trips using stair O5/6/7/8 would most likely use the five entry-exit turnstiles of fare array R-602 adjacent to the Municipal Building.

As shown in Table 15-3, all of these station processors currently operate at LOS B or better in both peak hours under Existing conditions.

*DEKALB AVENUE STATION (M,N,Q,R)*

The DeKalb Avenue station is located beneath Flatbush Avenue Extension between Fleet Street and DeKalb Avenue (see Figure 15-1). The station has a double island platform configuration with two mezzanines; one south of DeKalb Avenue and a second immediately north of Fleet Street. A third mezzanine formerly served the center of the station from an in-building entrance on the west side of Flatbush Avenue, but sections of this facility have been permanently closed and it now functions only as an exit and as a crossover between the platforms. The station hosts M, N, Q, R and W trains and it serves as a major transfer point between them.

It is anticipated that project-generated trips en route to and from this station would be concentrated at two stairways; S5 at the northwest corner of Flatbush Avenue and Fleet Street, and S6 at the northeast corner of Flatbush Avenue and Fleet Street. During the October 2002 counts, the station was undergoing a full rehabilitation. Both active mezzanines were under reconstruction and stair S6 and another stair at the southeast corner of Flatbush and DeKalb

## Table 15-3
## Existing Subway Station Analysis
## Borough Hall IRT/Court Street BMT Station Complex

### BOROUGH HALL IRT 2,3/COURT STREET BMT 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 |
|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ Columbus Park | AM | 7.20 | 1,080 | 173 | 1.60 | 0.16 | A |
| | | PM | 7.20 | 1,080 | 161 | 1.49 | 0.15 | 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 |
|---|---|---|---|---|---|---|
| R-601A | Court Street Fare Array<br>Court Street/Montague Street<br>7 entry/exit turnstiles | AM | 3,360 | 867 | 0.26 | B |
| | | PM | 3,360 | 717 | 0.21 | B |

### BOROUGH HALL IRT 4,5 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 |
|---|---|---|---|---|---|---|---|---|
| O5/6/7/8 | East Stairway @ Municipal Bldg.<br>Joralemon Street | AM | 7.47 | 1,121 | 230 | 2.05 | 0.21 | A |
| | | PM | 7.47 | 1,121 | 251 | 2.24 | 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 |
|---|---|---|---|---|---|---|
| R-602 | Municipal Bldg. Fare Array<br>5 entry/exit turnstiles | AM | 2,400 | 443 | 0.18 | A |
| | | PM | 2,400 | 453 | 0.19 | A |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 October 2002 field counts.

(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.

Avenues were temporarily closed. Upon completion of the rehabilitation work, the pattern of pedestrian flows at stairways within this station will therefore be somewhat different from those observed during the October 2002 count program. The configuration of the fare arrays in each mezzanine will also likely be different from October 2002 conditions (seven turnstiles at fare array C-008 in the south mezzanine and two turnstiles and one high-revolving exit gate at fare array C-006 in the north mezzanine).

As shown in Table 15-4, stairway S5 and fare array C-006 were found to be operating at an acceptable LOS A in both peak periods under Existing conditions.

*HOYT STREET STATION (2,3)*

The Hoyt Street station lies beneath Fulton Street between Elm Place and Bridge Street (see Figure 15-1). The station, a stop for Nos. 2 and 3 trains, has two side platforms with adjacent mezzanines located at platform level. The south (Brooklyn-bound) platform has a single mezzanine with five turnstiles at Hoyt Street (fare array R-606). Access to this mezzanine is provided by stair S3. There is also an exit-only stair (S1) from this platform controlled by a high-revolving exit gate at Elm Place. In the past, access was available from the south platform directly into the former Abraham & Straus department store (now Macy's). However, this entrance as well as a sub-passageway between the two platforms have long been closed to public use.

The north (Manhattan-bound) platform has two mezzanines, one at Duffield Street and a second at Bridge Street. The Duffield Street mezzanine, reached via stair S2, is unmanned and is controlled by one high entry/exit turnstile and a high-revolving exit gate. This entrance is only open from 6:30 AM to 7 PM. The mezzanine at Bridge Street is reached via stairs S5 and S6 and is controlled by fare array R-605 with five turnstiles. Space within this mezzanine is very constricted, with little clearance between the token booth and the fare array.

Project subway trips using this station would be distributed among all five active stairways based upon the location of the development site and the direction of travel. As shown in Table 15-5, all stairs and fare arrays at this station currently operate at an acceptable LOS B or better in both the AM and PM peak hours.

*HOYT-SCHERMERHORN STREETS STATION (A,C,G)*

The Hoyt-Schermerhorn Streets station is located beneath Schermerhorn Street between Hoyt Street and Bond Street (see Figure 15-1). It is served by A and C trains operating to and from Manhattan, and G trains operating to and from Queens on the Crosstown Line. The station has four island platforms, only two of which are currently in active service. A large mezzanine area with five turnstiles (fare array N-108) spans all four platforms at roughly the station's midpoint. Two stairways provide access to this mezzanine from the street; one located near Hoyt Street (S5) and a second near Bond Street (S8). Plans of the station indicate that seven other entrances were originally built. Of these, only three are believed to still exist; two within the building line midblock along the north side of Schermerhorn Street and a third on Livingston Street at Bond Street connected to the station by a long passageway. None of these facilities is open to the public.

As shown in Table 15-6, stairs S5 and S8 and the station's fare array are currently uncongested in both the AM and PM peak hours, operating at LOS B or better in both periods.

## Table 15-4
## Existing Subway Station Analysis
## DeKalb Avenue BMT 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 |
|---|---|---|---|---|---|---|---|---|
| S5 | Stairway @ NW Corner | AM | 6.40 | 960 | 252 | 2.63 | 0.26 | A |
| | Flatbush Avenue/Fleet Street | PM | 6.40 | 960 | 174 | 1.81 | 0.18 | A |
| S6 | Stairway @ NE Corner | AM | 4.00 | 600 | (7) | n/a | n/a | n/a |
| | Flatbush Avenue/Fleet Street | PM | 4.00 | 600 | (7) | n/a | n/a | n/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-006 | North Fare Array | | | | | |
| | Flatbush Avenue/Fleet Street | | | | | |
| | 2 entry/exit turnstiles | AM | 1,410 | 252 | 0.18 | A |
| | 1 high-revolving exit gate | PM | 1,410 | 174 | 0.12 | A |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 October 2002 field counts.

(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.

(7) Stair S6 closed for reconstruction in existing condition.

n/a - data not available.

## Table 15-5
## Existing Subway Station Analysis
## Hoyt Street IRT 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 |
|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ NW Corner | AM | 3.50 | 525 | 8 | 0.15 | 0.02 | A |
| | Elm Place/Fulton Mall | PM | 3.50 | 525 | 3 | 0.06 | 0.01 | A |
| S2 | Stairway @ NE Corner | AM | 2.80 | 420 | 57 | 1.36 | 0.14 | A |
| | Duffield Street/Fulton Mall | PM | 2.80 | 420 | 23 | 0.55 | 0.05 | A |
| S3 | Stairway @ SW Corner | AM | 3.67 | 551 | 75 | 1.36 | 0.14 | A |
| | Hoyt Street/Fulton Mall | PM | 3.67 | 551 | 349 | 6.34 | 0.63 | B |
| S5 | Stairway @ NE Corner | AM | 3.73 | 560 | 166 | 2.97 | 0.30 | A |
| | Bridge Street @ Fulton Mall | PM | 3.73 | 560 | 70 | 1.25 | 0.13 | A |
| S6 | Stairway @ NW Corner | AM | 3.60 | 540 | 288 | 5.33 | 0.53 | B |
| | Bridge Street @ Fulton Mall | PM | 3.60 | 540 | 83 | 1.54 | 0.15 | 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 |
|---|---|---|---|---|---|---|
| R-605 | Bridge Street Fare Array<br>Bridge Street/Fulton Mall | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 454 | 0.19 | A |
| | | PM | 2,400 | 153 | 0.06 | A |
| R-605 (H1) | Duffield Street Fare Array<br>Duffield Street/Fulton Mall | | | | | |
| | 1 high entry/exit turnstile | AM | 470 | 57 | 0.12 | A |
| | 1 high-revolving exit gate | PM | 470 | 23 | 0.05 | A |
| R-606 | Hoyt Street Fare Array<br>Hoyt Street/Fulton Mall | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 75 | 0.03 | A |
| | | PM | 2,400 | 349 | 0.15 | A |
| --- | Elm Place Fare Array<br>Elm Place/Fulton Mall | | | | | |
| | 1 high-revolving exit gate | AM | 450 | 8 | 0.02 | A |
| | | PM | 450 | 3 | 0.01 | A |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 October 2002 field counts.

(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
## Existing Subway Station Analysis
## Hoyt-Schermerhorn Streets IND 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 |
|---|---|---|---|---|---|---|---|---|
| S5 | Stairway @ NE Corner | AM | 4.00 | 600 | 312 | 5.20 | 0.52 | B |
| | Schermerhorn Street/Hoyt Street | PM | 4.00 | 600 | 230 | 3.83 | 0.38 | A |
| S8 | Stairway @ NW Corner | AM | 5.40 | 810 | 559 | 6.90 | 0.69 | B |
| | Schermerhorn Street/Bond Street | PM | 5.40 | 810 | 422 | 5.21 | 0.52 | B |

**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–108 | Schermerhorn Street Fare Array Midblock Bond Street/Hoyt Street | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 871 | 0.36 | B |
| | | PM | 2,400 | 652 | 0.27 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 October 2002 field counts.

(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.

*JAY STREET-BOROUGH HALL STATION (A,C,F)*

The Jay Street-Borough Hall station is located beneath Jay Street, extending from Fulton Street north to MetroTech (See Figure 15-1). The station, served by A, C and F trains, has two island platforms below a large mezzanine level that extends from building line to building line. The mezzanine level contains three fare control areas. Fare array N-102 at the station's north end consists of eight turnstiles and two high entry/exit turnstiles. Much of the demand at this array is en route to and from MetroTech via stair O11/12/13 on the east side of Jay Street adjacent to One MetroTech Center. (This is a private stairway and is not maintained by New York City Transit.) Street access to the north end of the station is also afforded by an entrance with two escalators on the west side of Jay Street, one of two such entrances located within the portico of 370 Jay Street, the headquarters of New York City Transit.

A second fare array (N-103) is located in the central portion of the station near Willoughby Street. This array is comprised of eight turnstiles and one high-revolving exit gate. Two additional high-revolving exit gates immediately to the south control access from two isolated platform stairs. Street access in this central portion of the station is provided by a stairway on the northeast corner of Jay and Willoughby Streets (S4) and by the second of two entrances located within the portico of 370 Jay Street. Access at this portico entrance is provided by north facing stair O4/5 and south facing stair O2/3 (which share a common landing) and two escalators, E317 which typically operates in the up (exiting) direction, and E318 which typically operates in the down (entering) direction.

The southern-most fare array at the Jay Street-Borough Hall station (N-103, H1/H2) is located immediately north of Fulton Street. It consists of two high entry/exit turnstiles and two high-revolving exit gates. There is no token booth at this location, however, a passageway in the unpaid zone connects this area of the station to the other two fare control areas. Street access is provided by two stairways, one at the northeast corner of Jay and Fulton Streets (S2) and a second at the northwest corner (S3).

It is anticipated that project generated trips at this station would be concentrated at stairs O11/12/13, S3, S4, and O2/3; escalators E317 and E318; and all three fare control areas. As shown in Table 15-7, all of these facilities currently operate at an acceptable LOS C or better during both the AM and PM peak hours with the exception of up escalator E317 which operates at LOS D (64 percent of capacity) in the AM.

*LAWRENCE STREET-METROTECH STATION (M,N,R,W)*

The Lawrence Street station, located beneath Willoughby Street between Lawrence and Bridge Streets, would serve as a gateway station to the projected commercial development sites along Willoughby Street (see Figure 15-1). Its single island platform is served by M, N and R trains (along with W trains nights/weekends until Spring 2004). The station has two mezzanines connected by a block-long corridor within the paid zone. The western-most mezzanine, located at Lawrence Street, contains five turnstiles and a 24-hour token booth (fare array C-003). Street access is provided by four stairways, two each on the northeast and southeast corners of Willoughby and Lawrence Streets. The second mezzanine is located at the east end of the station beneath Bridge Street. Access to the street is provided by three stairways, one each on the northeast, southeast and southwest corners of the Willoughby Street/Bridge Street intersection. During the October 2002 count program, the fare array within this mezzanine included three turnstiles, two high entry/exit turnstiles and two high-revolving exit gates. A part-time token

## Table 15-7
## Existing Subway Station Analysis
## Jay Street-Borough Hall IND 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 |
|---|---|---|---|---|---|---|---|---|
| O2/3 | South Facing Stairway @ | AM | 3.60 | 540 | 46 | 0.85 | 0.09 | A |
| | 370 Jay Street South Portico | PM | 3.60 | 540 | 154 | 2.85 | 0.29 | A |
| O11/12/13 | Stairway @ Keyspan Building | AM | 9.60 | 1,440 | 702 | 4.88 | 0.49 | A |
| | East side of Jay Street | PM | 9.60 | 1,440 | 628 | 4.36 | 0.44 | A |
| S3 | Stairway @ NW Corner | AM | 3.20 | 480 | 312 | 6.50 | 0.65 | B |
| | Jay Street/Fulton Street | PM | 3.20 | 480 | 361 | 7.52 | 0.75 | C |
| S4 | Stairway @ NE Corner | AM | 3.20 | 480 | 398 | 8.29 | 0.83 | C |
| | Jay Street/Willoughby Street | PM | 3.20 | 480 | 384 | 8.00 | 0.80 | C |
| E317 | Up Escalator @ | AM | 4.00 | 1,050 | 668 | n/a | 0.64 | D |
| | 370 Jay Street South Portico | PM | 4.00 | 1,050 | 261 | n/a | 0.25 | B |
| E318 | Down Escalator @ | AM | 4.00 | 1,050 | 12 | n/a | 0.01 | A |
| | 370 Jay Street South Portico | PM | 4.00 | 1,050 | 63 | n/a | 0.06 | 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–102 | North Fare Array | | | | | |
| | Jay Street/MetroTech | | | | | |
| | 8 entry/exit turnstiles | AM | 4,440 | 1,159 | 0.26 | B |
| | 2 high entry/exit turnstiles | PM | 4,440 | 1,175 | 0.26 | B |
| N-103 | Central Fare Array | | | | | |
| | Jay Street/Willoughby Street | | | | | |
| | 8 entry/exit turnstiles | AM | 4,290 | 616 | 0.14 | A |
| | 1 high-revolving exit gate | PM | 4,290 | 801 | 0.19 | A |
| | 2 high-revolving exit gates | AM | 900 | 306 | 0.34 | B |
| | | PM | 900 | 131 | 0.15 | A |
| N–103 (H1&H2) | South Fare Array | | | | | |
| | Jay Street/Fulton Street | | | | | |
| | 2 high entry/exit turnstiles | AM | 1,950 | 592 | 0.3 | B |
| | 3 high-revolving exit gates | PM | 1,950 | 583 | 0.3 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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). Escalator capacity based on 70 person per minute.

(4) Source: PHA October 2002 field counts.

(5) Persons per foot width of stairway per minute (not applicable to escalators).

(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.

booth was open 4-6:30 PM on weekdays to accommodate peak period demand from MetroTech. During hours when the booth was not in operation, the three turnstiles were gated-off, and the entire mezzanine was closed during the overnight hours. As discussed later in this chapter, this token booth was subsequently closed by NYC Transit in August 2003.

New subway trips generated by the projected development sites along Willoughby Street would be concentrated at stair S1 at the southeast corner of Willoughby and Bridge Streets as this would be the closest stair to these sites. New project-generated trips are also expected to occur at stairs S4 and S6 at the southeast corner of Willoughby and Lawrence Streets, and at stair S7 at the northeast corner of this intersection. As shown in Table 15-8, these stairs and the station's two fare arrays are currently uncongested, with LOS B conditions or better in both the AM and PM peak hours.

*LINE HAUL*

Line haul is the volume of subway riders passing a defined point on a given subway route. The line haul capacity of a given subway route is a factor of the number of trains scheduled, the number of cars per train, and the per-car capacity. For subway routes in New York City, line haul is typically measured either at East River bridge and tunnel crossings and at 60th Street which together form the cordon of the Manhattan Central Business District (CBD), or at the actual peak load point on each subway route (the point where the trains carry the greatest number of passengers during the peak hour). As peak load point ridership data for 2002 was unavailable, data from the East River cordon has been used for the analysis of 2002 Existing line haul conditions. (As discussed later in this chapter, the analyses of 2013 No Build and Build line haul conditions are based on NYC Transit peak load point ridership projections with the completion of the Manhattan Bridge reconstruction project, and are therefore not directly comparable to the 2002 Existing conditions line haul analysis.)

All of the subway lines serving Downtown Brooklyn stations cross the East River cordon line with the exception of the G train which does not serve Manhattan. In 2002, cordon crossings into Downtown Brooklyn included, from south to north, the Joralemon Street Tunnel (4,5), Montague Street Tunnel (M,N,R), Clark Street Tunnel (2,3), Cranberry Street Tunnel (A,C), the Manhattan Bridge (Q,W) and the Rutgers Tunnel (F). The peak direction of travel through these crossings is Manhattan-bound in the AM peak period and Brooklyn-bound in the PM. Historically, the Manhattan Bridge has had the greatest amount of service as well as the highest demand. Upwards of 700 trains carrying an average of 270,000 riders used this bridge crossing (both directions combined) on a typical weekday in 2000. The Rutgers Tunnel, used by F trains, has typically had the least amount of service and the lowest level of demand, with fewer than 400 trains carrying an average of 126,000 riders per weekday in 2000. Since July 2001 (and continuing until 2004), service patterns on several of the crossings into Downtown Brooklyn have been altered to accommodate the final stage of the Manhattan Bridge rehabilitation.

An analysis of 2002 Existing subway line haul conditions at the East River cordon in the AM and PM peak hours is provided in Table 15-9. The analysis focuses on the peak direction of travel in each hour—Manhattan-bound in the AM and Brooklyn-bound in the PM. Existing conditions by subway route were analyzed by determining a volume-to-capacity (v/c) ratio. The number of peak direction trains and passengers crossing the cordon in each peak hour on a typical fall weekday served as the basis for the analysis. The v/c ratio for each route was determined by dividing the number of peak hour passengers crossing the cordon by the line haul capacity provided. Line haul capacity is determined by multiplying the capacity per subway car

## Table 15-8
## Existing Subway Station Analysis
## Lawrence Street-MetroTech BMT 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 |
|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ SE Corner | AM | 3.20 | 480 | 32 | 0.67 | 0.07 | A |
| | Bridge Street/Willoughby Street | PM | 3.20 | 480 | 29 | 0.60 | 0.06 | A |
| S4 | Stairway @ SE Corner | AM | 3.20 | 480 | 58 | 1.21 | 0.12 | A |
| | Willoughby Street/Lawrence Street | PM | 3.20 | 480 | 42 | 0.88 | 0.09 | A |
| S6 | Stairway @ SE Corner | AM | 3.13 | 470 | 225 | 4.79 | 0.48 | A |
| | Lawrence Street/Willoughby Street | PM | 3.13 | 470 | 162 | 3.45 | 0.34 | A |
| S7 | Stairway @ NE Corner | AM | 3.33 | 500 | 268 | 5.37 | 0.54 | B |
| | Lawrence Street/Willoughby Street | PM | 3.33 | 500 | 332 | 6.65 | 0.66 | B |

**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-003 | West Fare Array | | | | | |
| | Lawrence Street/Willoughby Street | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 593 | 0.25 | B |
| | | PM | 2,400 | 573 | 0.24 | B |
| C-004 | East Fare Array | | | | | |
| | Bridge Street/Willoughby Street | | | | | |
| | 3 entry/exit turnstiles (7) | AM | 1,500 | 113 | 0.08 | A |
| | 2 high entry/exit turnstiles (7) | PM | 2,940 | 118 | 0.04 | A |
| | 2 high-revolving exit gates (7) | | | | | |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 October 2002 field counts.

(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.

(7) Token booth C-004 and 3 entry/exit turnstiles open only in PM peak period. Two high entry/exit turnstiles and 2 exit gates open in both AM and PM.

# Table 15-9
# 2002 Existing Subway Line Haul Analysis

| Route | Peak Hour | Peak Direction | Trains per Hour (1) | Cars per Hour (1) | Available Capacity (2,3) | Passengers per Hour (1) | V/C Ratio (4) |
|---|---|---|---|---|---|---|---|
| 2 | AM | Manhattan-Bound | 9 | 90 | 10,800 | 6,216 | 0.58 |
| | PM | Brooklyn-Bound | 8 | 80 | 9,600 | 4,650 | 0.48 |
| 3 | AM | Manhattan-Bound | 9 | 90 | 10,800 | 5,904 | 0.55 |
| | PM | Brooklyn-Bound | 8 | 80 | 9,600 | 6,271 | 0.65 |
| 4 | AM | Manhattan-Bound | 12 | 120 | 14,400 | 10,127 | 0.70 |
| | PM | Brooklyn-Bound | 14 | 140 | 16,800 | 8,539 | 0.51 |
| 5 | AM | Manhattan-Bound | 9 | 90 | 10,800 | 9,230 | 0.85 |
| | PM | Brooklyn-Bound | 4 | 40 | 4,800 | 2,838 | 0.59 |
| A | AM | Manhattan-Bound | 16 | 140 | 28,400 | 22,606 | 0.80 |
| | PM | Brooklyn-Bound | 16 | 146 | 28,520 | 14,624 | 0.51 |
| C | AM | Manhattan-Bound | 8 | 64 | 11,520 | 5,940 | 0.52 |
| | PM | Brooklyn-Bound | 7 | 56 | 10,080 | 3,515 | 0.35 |
| F | AM | Manhattan-Bound | 14 | 114 | 24,680 | 11,297 | 0.46 |
| | PM | Brooklyn-Bound | 11 | 88 | 19,360 | 13,266 | 0.69 |
| M | AM | Manhattan-Bound | 7 | 56 | 10,080 | 2,268 | 0.23 |
| | PM | Brooklyn-Bound | 5 | 40 | 7,200 | 1,541 | 0.21 |
| N | AM | Manhattan-Bound | 7 | 62 | 12,440 | 3,894 | 0.31 |
| | PM | Brooklyn-Bound | 5 | 48 | 8,960 | 2,923 | 0.33 |
| Q | AM | Manhattan-Bound | 16 | 144 | 28,480 | 18,980 | 0.67 |
| | PM | Brooklyn-Bound | 15 | 136 | 26,720 | 18,390 | 0.69 |
| R | AM | Manhattan-Bound | 6 | 48 | 10,560 | 3,324 | 0.31 |
| | PM | Brooklyn-Bound | 6 | 50 | 10,600 | 4,448 | 0.42 |
| W | AM | Manhattan-Bound | 9 | 72 | 15,840 | 11,079 | 0.70 |
| | PM | Brooklyn-Bound | 8 | 64 | 14,080 | 8,045 | 0.57 |

**Notes:**

(1) Source: 2002 NYC Transit Cordon Counts. Data reflect a typical fall weekday in 2002.

(2) Capacity based on 120 passengers/car for 51' cars, 180 passengers/car for 60' cars and 220 passengers/car for 75' cars as per CEQR criteria.

(3) Trains typically operate with ten 51'-cars, ten 60'-cars, or eight 75'-cars except for the M and C routes which utilize trains with eight 60'-cars.

(4) Volume-to-capacity ratio.

by the number of cars crossing the cordon in the peak hour. As shown in Table 15-9, in both the AM and PM peak hours, no subway routes are currently operating at or above capacity (a v/c ratio equal to or greater than 1.00) in either peak hour. In the AM peak hour, Manhattan-bound A trains carry the highest number of passengers per hour, with 22,606, followed by Q trains with 18,980. F and W trains each carry over 11,000 passengers Manhattan-bound in the AM. The most crowded route in the AM is the No. 5, with a v/c ratio of 0.85, followed by the A train which operates at a v/c ratio of 0.80. In the PM peak hour, Brooklyn-bound Q trains carry the highest number of passengers with 18,390, followed by A trains with 14,624, and F trains with 13,266. The most crowded trains are found on the F and Q routes which each operate at a v/c ratio of 0.69, followed by No. 3 trains which operate at a v/c ratio of 0.65.

## BUS SERVICE

*NEW YORK CITY TRANSIT LOCAL BUS SERVICE*

Downtown Brooklyn is well served by NYC Transit local bus services. A total of 15 routes operate within the study area, connecting Downtown with other parts of the borough as well as Queens and Manhattan. As shown in Figure 15-2, major bus corridors in the study area include the transit mall along Fulton Street, which hosts four local bus routes. Eight bus routes can be found along segments of Livingston Street, where the north (westbound) curb lane is an exclusive bus lane during the 7 to 10 AM peak period and the south (eastbound) curb lane is similarly restricted to buses during the 4 to 7 PM period. Cadman Plaza West and Adams, Jay and Tillary Streets are also important bus corridors. Five routes terminate on Cadman Plaza West or nearby on Tillary Street. Atlantic Avenue, on the southern boundary of the study area, hosts two bus routes that connect Downtown Brooklyn with Long Island City in Queens and with Bay Ridge and Fort Hamilton.

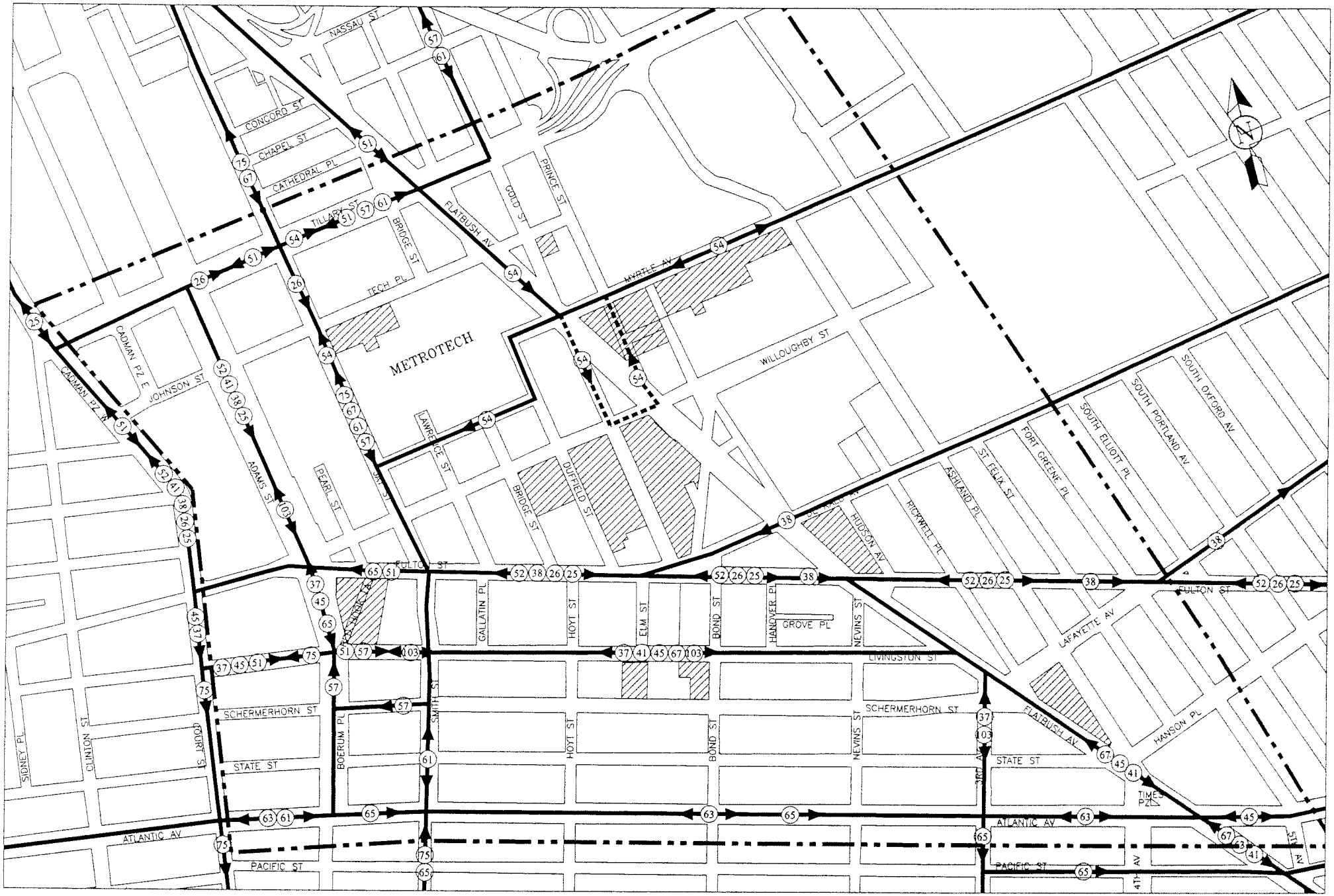
Intermodal connections between buses and other transit modes are an important aspect of the transit system serving Downtown Brooklyn. Key intermodal connections include transfers between the bus, subway and commuter rail modes at the Atlantic Avenue/Pacific Street subway station complex (which includes the Long Island Rail Road's Flatbush Avenue terminal), and between the bus and subway modes at the Borough Hall and Jay Street-Borough Hall stations, among others.

Table 15-10 presents a summary of peak hour, peak direction ridership at the maximum load point of each of the NYC Transit bus routes serving the study 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 AM peak hour, the maximum load point in the peak westbound direction occurs at Fulton Street/Nostrand Avenue, with an average of 51 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction also occurs at Fulton Street/Nostrand Avenue, with an average of 52 passengers per bus.

*B26*. The B26 provides local service in Brooklyn from a Downtown terminus at Cadman Plaza West and Tillary Street to Wyckoff Avenue/Palmetto Street in Ridgewood. Within the study area, B26 buses can be found operating on Cadman Plaza West and Tillary, Jay and Fulton Streets. During the AM peak hour, the maximum load point in the peak westbound direction occurs at Halsey Street/Nostrand Avenue, with an average of 53 passengers per bus. During the

## Downtown Brooklyn Local Bus Routes
## Figure 15-2




Study Area | (75) Bus Route Number | Direction of Service | Projected Development Site | Temporary Change in B54 Route

## Table 15-10
## Existing Local Bus Conditions

| Peak Hour (1) | Route | Peak Direction | Maximum Load Point | Peak Hour Buses (2) | Peak Hour Passengers (2) | Average Passengers Per Bus | Available Capacity (3) | Notes |
|---|---|---|---|---|---|---|---|---|
| | B25 | WB | Fulton St./Nostrand Ave. | 7 | 356 | 51 | 134 | |
| | B26 | WB | Halsey St./Nostrand Ave. | 11 | 582 | 53 | 188 | |
| | B37 | NB | Third Ave./39th St. | 5 | 194 | 39 | 156 | (4) |
| | B38 | WB | DeKalb Ave./Vanderbilt Ave. | 23 | 1,227 | 53 | 383 | |
| | B41 | NB | Flatbush Ave./Church Ave. | 25 | 1,210 | 48 | 540 | (5) |
| | B45 | WB | St. Johns Pl./Nostrand Ave. | 8 | 358 | 45 | 202 | |
| | B51 | WB | Tillary St./Bridge St. | 4 | 106 | 27 | 174 | |
| AM | B52 | WB | Nostrand Ave./Gates Ave. | 11 | 587 | 53 | 183 | |
| | B54 | WB | Vanderbilt Ave./Myrtle Ave. | 10 | 511 | 51 | 189 | |
| | B57 | WB | Flushing Ave./Nostrand Ave. | 5 | 190 | 38 | 160 | |
| | B61 | NB | Atlantic Ave./Hicks St. | 7 | 328 | 47 | 162 | |
| | B63 | NB | Fifth Ave./36th St. | 6 | 312 | 52 | 108 | (4) |
| | B65 | WB | Bergen St./Washington St. | 6 | 239 | 40 | 181 | |
| | B67 | NB | Seventh Ave./Union St. | 6 | 253 | 42 | 167 | (4) |
| | B75 | NB | 9th St./Smith Street | 6 | 180 | 30 | 240 | |
| | B25 | EB | Fulton St./Nostrand Ave. | 8 | 419 | 52 | 141 | |
| | B26 | EB | Halsey St./Nostrand Ave. | 10 | 474 | 47 | 226 | |
| | B37 | SB | Third Ave./9th Street | 5 | 182 | 36 | 168 | |
| | B38 | EB | Fulton St./DeKalb Ave. | 16 | 769 | 48 | 351 | |
| | B41 | SB | Flatbush Ave./Church Ave. | 24 | 1,150 | 48 | 530 | |
| | B45 | EB | Nostrand Ave./St. Johns Pl. | 7 | 346 | 49 | 144 | |
| | B51 | EB | Canal St./Bowery | 4 | 138 | 35 | 142 | |
| PM | B52 | EB | Fulton St./Green Ave. | 10 | 430 | 43 | 270 | |
| | B54 | EB | Vanderbilt Ave./Myrtle Ave. | 8 | 386 | 48 | 174 | |
| | B57 | EB | Flushing Ave./Nostrand Ave. | 6 | 240 | 40 | 180 | |
| | B61 | SB | Smith St./Livingston St. | 6 | 216 | 36 | 204 | |
| | B63 | SB | Fifth Ave./50th St. | 6 | 282 | 47 | 138 | |
| | B65 | EB | Dean St./Franklin Ave. | 6 | 184 | 31 | 236 | |
| | B67 | SB | Seventh Ave./Union St. | 6 | 256 | 43 | 164 | (4) |
| | B75 | SB | Smith St./Livingston St. | 5 | 177 | 35 | 173 | |

**Notes:**

(1) Peak Hours: weekday 8-9 AM and 5-6 PM.

(2) Based on most currently available NYC Transit ridership summaries unless otherwise noted.

(3) Available capacity based on a maximum of 70 passengers for a standard 40-seat bus as per CEQR criteria.

(4) Source: Atlantic Terminal Office Development FEIS, June 21, 2002.

(5) Combined local and limited service.

PM peak hour, the maximum load point in the peak eastbound direction also occurs at Halsey Street/Nostrand Avenue, with an average of 47 passengers per bus.

*B37*. The B37 travels between Shore Road/Fourth Avenue in Bay Ridge and Jay/High Streets in Downtown Brooklyn. Within Downtown Brooklyn, B37 buses operate primarily along Livingston Street. During the AM peak hour, the maximum load point in the peak northbound direction occurs at Third Avenue/39th Street, with an average of 39 passengers per bus. During the PM peak hour, the maximum load point in the peak southbound direction occurs at Third Avenue/9th Street, with an average of 36 passengers per bus.

*B38*. The B38 travels between Cadman Plaza West/Tillary Street in Downtown Brooklyn and Catalpa/Seneca Avenues in Ridgewood, Queens. Its primary routes within the study area are Cadman Plaza West and Tillary, Adams and Fulton Streets. During all but the late night hours, a branch also operates to Starr Street/Metropolitan Avenue in Ridgewood. During the AM peak hour, the maximum load point in the peak westbound direction occurs at DeKalb/Vanderbilt Avenues, with an average of 53 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction occurs at Fulton Street/DeKalb Avenue, with an average of 48 passengers per bus.

*B41*. The B41, which provides local and limited-stop service in Brooklyn, operates to Downtown Brooklyn from two southern terminals, one at Kings Plaza in Mill Basin and a second at Veterans Avenue and East 71 st Street in Bergen Beach. Within the study area, the B41 traverses Flatbush Avenue, Livingston Street, Joralemon Street and Cadman Plaza West. During the AM peak hour, the maximum load point in the peak northbound direction occurs at Flatbush/Church Avenues, with an average of 48 passengers per bus. During the PM peak hour, the maximum load point in the peak southbound direction also occurs at Flatbush/Church Avenues, with an average of 48 passengers per bus.

*B45*. The B45 operates between Ralph Avenue/St. John's Place in Ocean Hill and Court/ Livingston Streets in Downtown Brooklyn. Within the study area, B45 buses primarily utilize Livingston Street. During the AM peak hour, the maximum load point in the peak westbound direction occurs at St. Johns Place/Nostrand Avenue, with an average of 45 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction occurs at Nostrand Avenue/St. John's Place, with an average of 49 passengers per bus.

*B51*. The B51 operates between Smith/Fulton Streets in Downtown Brooklyn, and City Hall/Park Row in Manhattan via the Manhattan Bridge. Within the study area, it can be found operating along Tillary Street, Cadman Plaza West, and segments of Fulton and Livingston Streets. The B51 essentially serves to connect Downtown Brooklyn with the Chinatown and Civic Center areas of Lower Manhattan. During the AM peak hour, the maximum load point in the peak westbound direction occurs at Tillary/Bridge Streets, with an average of 27 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction occurs at Canal Street/Bowery, with an average of 35 passengers per bus.

*B52*. The B52 operates from Cadman Plaza West in Downtown Brooklyn to Palmetto Street/St. Nicholas Avenue in Bushwick. The B52 traverses Cadman Plaza West, Tillary Street, Adams Street (Court Street northbound), and Fulton Street within the study area. During the AM peak hour, the maximum load point in the peak westbound direction occurs at Nostrand/Gates Avenues, with an average of 53 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction occurs at Fulton Street/Green Avenue, with an average of 43 passengers per bus.

*B54*. B54 service operates between Jay Street/Myrtle Avenue at MetroTech and either Palmetto Street/Wycoff Avenue in Ridgewood or Myrtle Avenue/Broadway in Bushwick. Within the study area, the B54 originally utilized Flatbush Court and the MetroTech Service Road to reach Jay Street from Myrtle Avenue, and then returned to Myrtle Avenue via Tillary Street and Flatbush Avenue. Due to security concerns with respect to the MetroTech Service Road, beginning in 2001 B54 buses terminated their runs at Flatbush Court and returned to eastbound Myrtle Avenue via Gold, Willoughby and Prince Streets. Under this temporary route change, the B54 no longer served Jay Street nor provided a direct connection to the Jay Street-Borough Hall subway station. As discussed below in the section on the future without the proposed actions, the B54 route was revised in September 2003 so that these buses once again serve Jay Street.

During the AM peak hour, the maximum load point in the peak westbound direction occurs at Vanderbilt/Myrtle Avenues, with an average of 51 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction also occurs at Vanderbilt/Myrtle Avenues, with an average of 48 passengers per bus.

*B57*. B57 service operates between Boerum Place/Livingston Street in Downtown Brooklyn and Fresh Pond Road/Flushing Avenue in Queens. Within the study area, B57 buses primarily operate along Tillary and Jay Streets. During the AM peak hour, the maximum load point in the peak westbound direction occurs at Flushing/Nostrand Avenues, with an average of 38 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction also occurs at Flushing/Nostrand Avenues, with an average of 40 passengers per bus.

*B61*. B61 service operates between Van Brunt Street/Beard Street in Red Hook and Jackson Avenue/Queens Plaza South in Long Island City, Queens. Within the study area, B61 buses travel primarily along Atlantic Avenue and Tillary, Jay and Smith Streets. During the AM peak hour, the maximum load point in the peak northbound direction occurs at Atlantic Avenue/Hicks Street, with an average of 47 passengers per bus. During the PM peak hour, the maximum load point in the peak southbound direction occurs at Smith/Livingston Streets, with an average of 36 passengers per bus.

*B63*. The B63 operates between its southern terminal at Shore Road/Fourth Avenue in Bay Ridge to 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 AM peak hour, the maximum load point in the peak northbound direction occurs at Fifth Avenue/36th Street, with an average of 52 passengers per bus. 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.

*B65*. The B65 operates between its western terminal at Smith/Fulton Streets in Downtown Brooklyn and its eastern terminal at Ralph Avenue/St. John's Place in Brownsville. Within the study area, B65 buses can be found operating along portions of Smith and Fulton Streets, Boerum Place and Atlantic Avenue. During the AM peak hour, the maximum load point in the peak westbound direction occurs at Bergen/Washington Streets, with an average of 40 passengers per bus. During the PM peak hour, the maximum load point in the peak eastbound direction occurs at Dean Street/Franklin Avenue, with an average of 31 passengers per bus.

*B67*. The B67 operates between its southern terminal at MacDonald Avenue/Cortelyou Road in Borough Park and its northern terminal at Jay/High Streets (High Street subway station) in Downtown Brooklyn. Within the study area, B67 buses operate along Jay and Livingston Streets

and Flatbush Avenue. During the AM peak hour, the maximum load point in the peak northbound direction occurs at Seventh Avenue/Union Street, with an average of 42 passengers per bus. During the PM peak hour, the maximum load point in the peak southbound direction also occurs at Seventh Avenue/Union Street, with an average of 43 passengers per bus.

*B75*. The B75 operates from Sands/Jay Streets near the Brooklyn Bridge to 20th Street/Prospect Park West in Windsor Terrace. Streets traversed within the study area include Jay, Smith, Court and Livingston Streets. During the AM peak hour, the maximum load point in the peak northbound direction occurs at 9th/Smith Streets, with an average of 30 passengers per bus. During the PM peak hour, the maximum load point in the peak southbound direction occurs at Smith/Livingston Streets, with an average of 35 passengers per bus.

*NYCDOT FRANCHISED BUS SERVICES*

Command Bus Company operates a single route through the study area under a franchise from the New York City Department of Transportation. This service, the B103 Limited, operates between Tillary/Adams Streets in Downtown Brooklyn and East 94th Street/Flatlands Avenue in Canarsie. The buses run express through Windsor Terrace and Park Slope en route to and from Downtown Brooklyn. During the PM peak, service is available on request beyond East 94th Street/Flatlands Avenue to Cozine Avenue/Ashford Street. Within the study area, B103 buses traverse Livingston and Adams Streets.

## COMMUTER VAN SERVICES

Another element of the transit network providing access to the study area is commuter van service. Privately-operated commuter vans, each with a typical capacity of 14 to 15 passengers, connect outlying areas of the borough to Downtown Brooklyn. These vans typically charge $1 or $1.50 and operate along commercial corridors. Field observations indicate that the majority of vans approach Downtown Brooklyn on northbound Flatbush Avenue and then loop through the study area on westbound Schermerhorn Street, northbound Smith Street and eastbound Livingston Street. As the northbound left-turn from Flatbush Avenue to Schermerhorn Street is prohibited, northbound Ashland Place and westbound Lafayette Avenue are typically used to reach Schermerhorn Street. To facilitate these van services, NYCDOT has designated seven locations as commuter van stops. These locations, indicated by curbside regulatory signage, include northbound Ashland Place at Hanson Place, westbound Schermerhorn Street between Third Avenue and Nevins Street, eastbound Schermerhorn Street farside of Smith Street and farside of Bond Street, Nevins Street approaching Schermerhorn Street, northbound Bond Street approaching Fulton Street, and Hoyt Street approaching State Street. Field observations indicate that, while some of these stops are utilized, much of the pick-up and drop-off activity occurs at non-designated locations, especially along westbound Schermerhorn Street between Hoyt and Smith Streets, and along northbound Smith Street between Schermerhorn and Livingston Streets. In the PM peak period, vans often queue at this latter location waiting for passengers. Eastbound Livingston Street at Hoyt Street is also notable as a pick-up location in the PM peak period. In addition to the commuter vans serving Downtown Brooklyn, commuter vans operating between Brooklyn and Manhattan traverse the study area on Flatbush Avenue en route to and from the Manhattan Bridge.

## LONG ISLAND RAIL ROAD COMMUTER RAIL SERVICE

In addition to subway and bus transit, Downtown Brooklyn is served by commuter rail, with the Long Island Rail Road (LIRR) operating out of a terminal at Flatbush and Atlantic Avenues that is connected to the Atlantic Avenue/Pacific Street subway station complex. From this terminal, trains operate to Jamaica and points east, with connections available to all LIRR branches with the exception of the Port Washington Branch. Upwards of nine trains arrive or depart the Flatbush Avenue terminal during the weekday AM and PM peak hours. In addition to serving Downtown Brooklyn, the terminal is a major transfer point between the LIRR and the subway, especially for trips en route to and from Lower Manhattan. It is estimated that the commuter rail mode accounts for approximately twelve percent of commuter trips to and from Downtown Brooklyn. These trips typically walk or transfer to and from the subway to travel between their place of work and the Flatbush Avenue terminal. As discussed below in the section on the future without the proposed actions, the Atlantic Avenue/Pacific Street station complex, including the LIRR's Flatbush Avenue terminal, is presently undergoing a major reconstruction that will provide improved facilities for LIRR passengers. This reconstruction is expected to be completed in 2005.

## FERRY SERVICES

At present, the only ferry service operating in proximity to Downtown Brooklyn is a water taxi commuter service provided by New York Water Taxi, Inc. (NYWT) between Fulton Landing at the foot of Cadman Plaza West (north of Downtown) and Pier 11, Pier A and North Cove in Lower Manhattan. During weekday middays and weekends, this service is extended to West 23rd Street and West 44th Street to serve tourist and leisure markets. The boats currently operated by NYWT have a maximum capacity of 74 passengers and operate on a 40-minute headway during the AM and PM peak periods. At Fulton Landing, a connection is available to NYC Transit's B25 local bus service to East New York via Fulton Street. B25 buses typically operate on an eight to nine minute headway during peak periods.

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 DUMBO neighborhoods with workplaces in Manhattan. To date, the service has not attracted a substantial number of riders en route from Manhattan to work places in Downtown Brooklyn, likely due in part to the location of the ferry landing outside of the downtown core (e.g., approximately 3/4 of a mile from MetroTech). Approximately five percent of commuter trips to Downtown Brooklyn do, however, use either the Staten Island Ferry or one of several privately-operated services from New Jersey to Manhattan for one leg of their trip. The subway mode is typically used for access between Downtown Brooklyn and ferry landings in Manhattan.

## PEDESTRIANS

The analysis of pedestrian conditions focuses on pedestrian elements where substantial numbers of new trips would be generated by projected developments. These elements—sidewalks, corner areas and crosswalks—are primarily located along the Willoughby Street corridor from Jay Street to Flatbush Avenue Extension. It is along this corridor that much of the anticipated pedestrian demand would travel en route between subway stations and the projected commercial developments along Willoughby Street. Conditions along the east sidewalk along Boerum Place between Livingston and Fulton Streets are also analyzed, as in addition to demand from the

adjacent commercial development site (Site M), this sidewalk would also service demand displaced from the proposed elimination of Red Hook Lane. Figure 15-3 shows the locations of analyzed sidewalks, corner areas and crosswalks. Sidewalks along the Willoughby Street corridor typically range from ten to 15 feet in width, while crosswalks typically range from ten to 14 feet in width. The east sidewalk along Boerum Place between Livingston and Fulton Streets has an irregular width, measuring 13 feet wide at its narrowest point. The east and west sidewalks along Red Hook Lane (which would be eliminated with the proposed actions) are approximately nine feet and seven feet in width, respectively.

Existing pedestrian volumes at analyzed facilities are typically highest at the western end of the Willoughby Street corridor near Jay Street, due in part to the presence of an entrance stair to the Jay Street-Borough Hall subway station (on the northeast corner) and stops for a number of bus routes. Two-way peak 15-minute volumes along the north sidewalk on Willoughby Street between Lawrence and Jay Streets total 508 and 453 in the AM and PM peak hours, respectively. Two-way peak 15-minute volumes on the south sidewalk along this block total 203 and 349, respectively. By contrast, pedestrian volumes near Flatbush Avenue Extension at the eastern end of the corridor are substantially lower. Two-way peak 15-minute volumes along the south sidewalk on Willoughby Street between Albee Square West and Flatbush Avenue Extension (adjacent to projected development site Q) currently total 99 and 130 in the AM and PM peak hours, respectively. AM and PM peak 15-minute volumes on Red Hook Lane between Boerum Place and Fulton Street currently total five and ten on the west sidewalk, and 148 and 105 on the east sidewalk. During field surveys, much of the west sidewalk was observed to be blocked by parked vehicles, likely accounting for the negligible volumes along this facility.

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

Level of service standards are based on the average area available per pedestrian during the analysis period, typically expressed as a 15-minute peak period. Level of service (LOS) grades from A to F are assigned, with LOS A representative of free flow conditions without pedestrian conflicts and LOS F depicting significant capacity limitations and inconvenience. Table 15-11 defines the LOS criteria for pedestrian crosswalk/corner area and sidewalk conditions, as based on 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.




Not to Scale
(9) Analyzed Location
Subway Stair
Signalized Intersection
Projected Development Site

## Table 15-11
## 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 |

**Note:**
* Based on average conditions for 15 minutes.

**Source:** *Highway Capacity Manual.*

Tables 15-12 through 15-13 show the results of the analyses of existing sidewalk, corner area and crosswalk conditions for the AM and PM peak hours. As shown in Table 15-12, all analyzed sidewalks currently operate at an acceptable LOS C or better under platoon conditions in both peak periods. As shown in Table 15-13, all analyzed corner areas operate at LOS C or better in both peak periods, as do all analyzed crosswalks with the exception of the north crosswalk at the intersection of Willoughby and Jay Streets which operates at LOS D in the AM peak hour and at LOS E in the PM peak hour.

**Table 15-12**
**Existing Pedestrian Conditions**
**Sidewalks**

| 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 | | Persons per Foot per Min. (PFM) | | Level of Service | |
| | | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| 1 | **Willoughby Street** Flatbush Avenue to Albee Square West | South | 6.0 | 99 | 130 | 1.1 | 1.4 | A | A | 5.1 | 5.4 | B | B |
| 2 | **Albee Square West** Willoughby Street to Fulton Street | East | 7.0 | 23 | 74 | 0.2 | 0.7 | A | A | 4.2 | 4.7 | A | A |
| 3 | **Albee Square West** Willougby Street to Fulton Street | West | 3.0 | 79 | 78 | 1.8 | 1.7 | A | A | 5.8 | 5.7 | B | B |
| 4 | **Willoughby Street** Albee Square West to Duffield Street | South | 6.0 | 97 | 150 | 1.1 | 1.7 | A | A | 5.1 | 5.7 | B | B |
| 5 | **Duffield Street** Willoughby Street to Fulton Street | East | 4.5 | 123 | 126 | 1.8 | 1.9 | A | A | 5.8 | 5.9 | B | B |
| 6 | **Duffield Street** Willoughby Street to Fulton Street | West | 7.5 | 53 | 54 | 1.5 | 1.5 | A | A | 5.5 | 5.5 | A | A |
| 7 | **Willoughby Street** Duffield Street to Bridge Street | South | 7.0 | 232 | 179 | 2.2 | 1.7 | A | A | 6.2 | 5.7 | B | B |
| 8 | **Willoughby Street** Bridge Street to Lawrence Street | South | 7.0 | 260 | 289 | 2.5 | 2.8 | A | A | 6.5 | 6.8 | B | B |
| 9 | **Willoughby Street** Lawrence Street to Jay Street | South | 7.5 | 203 | 349 | 1.8 | 3.1 | A | A | 5.8 | 7.1 | B | C |
| 10 | **Willoughby Street** Lawrence Street to Jay Street | North | 6.5 | 508 | 453 | 5.2 | 4.7 | B | A | 9.2 | 8.7 | C | C |
| 11 | **Willoughby Street** Bridge Street to Lawrence Street | North | 5.0 | 244 | 262 | 3.1 | 3.5 | A | A | 7.1 | 7.5 | C | C |
| 12 | **Willoughby Street** Duffield Street to Bridge Street | North | 6.5 | 288 | 326 | 2.5 | 3.3 | A | A | 6.5 | 7.3 | B | C |
| 23 | **Boerum Place** Fulton Street to Livingston Street | East | 10.0 | 85 | 78 | 0.6 | 0.5 | A | A | 4.6 | 4.5 | A | A |

**Table 15-13**
**Existing Pedestrian Conditions**
**Corner Areas and Crosswalks**

**CORNER ANALYSIS**

| Map No. | Intersection | Corner | Curb Radii (Feet) | Peak 15 Min. Volumes | | Average Ped. Space (SF/Ped) | | Level of Service | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AM | PM | AM | PM | AM | PM |
| 13 | Willoughby Street & Flatbush Avenue | Southwest | 12 | 75 | 83 | 157 | 150 | A | A |
| 14 | Willoughby Street & Albee Square West | Southeast | 12 | 7 | 7 | 196 | 126 | A | A |
| 15 | Willoughby Street & Albee Square West | Southwest | 12 | 34 | 55 | 164 | 108 | A | A |
| 16 | Willoughby Street & Bridge Street | Southeast | 12 | 94 | 32 | 105 | 125 | A | A |
| 17 | Willoughby Street & Bridge Street | Southwest | 12 | 120 | 117 | 113 | 101 | A | A |
| 18 | Willoughby Street & Jay Street | Northeast | 12 | 308 | 273 | 35 | 27 | C | C |

**CROSSWALK ANALYSIS**

| Map No. | Intersection | Crosswalk | Curb to Curb Street Width (Ft.) | Crosswalk Width (Ft.) | Peak 15 Min. Volumes | | Conflicting Vehicle Volume with Pedestrians (Veh/15min) | | With Vehicles | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Average Ped. Space (SF/Ped) | | Level of Service | |
| | | | | | AM | PM | AM | PM | AM | PM | AM | PM |
| 19 | Flatbush Avenue & Willoughby Street | South | 60.0 | 13.0 | 63 | 71 | 56 | 70 | 83 | 68 | A | A |
| | | West | 33.0 | 17.0 | 144 | 152 | 11 | 4 | 134 | 129 | A | A |
| 20 | Willoughby Street & Albee Square West | South | 36.0 | 10.3 | 80 | 132 | 14 | 8 | 104 | 60 | A | B |
| | | East | 33.0 | 11.8 | 15 | 25 | 33 | 80 | 743 | 364 | A | A |
| | | West | 33.0 | 11.3 | 46 | 40 | 25 | 33 | 227 | 257 | A | A |
| 21 | Willoughby Street & Bridge Street | South | 29.5 | 13.5 | 125 | 180 | 39 | 40 | 239 | 165 | A | A |
| | | East | 28.6 | 13.5 | 167 | 117 | 0 | 0 | 87 | 127 | A | A |
| | | West | 28.6 | 11.5 | 81 | 69 | 0 | 0 | 158 | 187 | A | A |
| 22 | Willoughby Street & Jay Street | North | 51.5 | 11.5 | 346 | 407 | 25 | 23 | 18 | 15 | D | E |
| | | East | 31.0 | 12.5 | 261 | 380 | 0 | 0 | 48 | 30 | B | C |

# C. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Between 2002 and 2013, it is expected that the demand at analyzed transit and pedestrian facilities will increase due to development projects in the area as well as background growth. In order to forecast those future demands without the proposed actions (the No Build condition), the principal development projects listed Table 2-1 and shown in Figure 2-5 in Chapter 2 were considered. The largest of these projects is the Atlantic Yards Arena and Redevelopment project, which is proposed for an approximately 24-acre site bounded by Flatbush, Atlantic, and Vanderbilt Avenues and Dean Street at the southeastern edge of Downtown Brooklyn. The principal components of this project include an arena with an approximate capacity of 18,000 to 20,000 seats and approximately 52,000 square feet (sf) of publicly accessible rooftop recreational space, 1.8 million sf of Class A commercial office space, approximately 5,500 mixed-income residential units, approximately 400,000 sf of retail space, 3,500 parking spaces and six acres of public space. In addition to demand from No Build developments, an annual background growth rate of 0.5 percent per year was applied to existing transit and pedestrian demand for the 2002 through 2013 period. This background growth rate, recommended in the *CEQR Technical Manual* for projects in Downtown Brooklyn, is applied to account for smaller projects and general increases in travel demand not attributable to specific development projects. An additional four percent of growth was applied to existing demand at the Lawrence Street station to account for the anticipated increase in demand that will result from the restoration of the connection to between N and R trains and PATH service in Lower Manhattan in late-2003.

During the 2002 through 2013 period, it is anticipated that there will be several changes to subway, bus and commuter rail facilities and services in Downtown Brooklyn, including completion of reconstruction/rehabilitation work at the Atlantic Avenue/Pacific Street station complex and DeKalb Avenue station, the rehabilitation of the Lawrence Street and Jay Street-Borough Hall stations, the replacement of a high-revolving exit gate with a high entry/exit turnstile at stair S1 at the Hoyt Street station, and changes in the routing of B54, B61 and B63 buses within Downtown Brooklyn. Also during this period, it is anticipated that NYCDOT will implement pedestrian improvement measures developed as part of the Downtown Brooklyn Traffic Calming Project (DBTCP). With the exception of the November 2003 conversion of Smith Street to one-way northbound operation from Atlantic Avenue to Schermerhorn Street, no specific measures in the DBTCP have been identified for implementation within the study area at this time, however all measures remain candidates for implementation. Therefore the analyses of future pedestrian conditions conservatively assumes no improvements to analyzed pedestrian facilities. (The Downtown Brooklyn Traffic Calming Project is further discussed below.) No other substantive changes to analyzed transit or pedestrian facilities are expected during the 2002 through 2013 period. The following sections describe how these changes, and the growth in travel demand in Downtown Brooklyn, are expected to affect transit and pedestrian facilities in the future without the proposed actions.

## SUBWAY SERVICE

During the 2002 through 2013 period, there will be a number of changes to subway facilities in Downtown Brooklyn. These will include:

- The completion in 2005 of the reconstruction of the Atlantic Terminal complex, which includes the Long Island Rail Road's Flatbush Avenue terminal and the Atlantic

Avenue/Pacific Street subway station complex. This project includes an enlarged concourse and air conditioned waiting room for the LIRR, new stairs, a widened central connector corridor and a major new entrance to the facility at the corner of Hanson Place and Flatbush Avenue. In addition, as part of the proposed Atlantic Yards Arena and Redevelopment project, it is anticipated that several currently unused pedestrian entrances and connecting corridors at the south ends of the Atlantic Avenue BMT and IRT stations will be reconstructed and reopened. Completion of this work, anticipated for 2007, would provide direct access between the Arena development and the subway and LIRR. No subway trips from the Downtown Brooklyn Development project are expected to use these rebuilt facilities.

- The closure in August 2003 of the part-time (weekdays, 4-6:30 PM) token booth in the east mezzanine at the Lawrence Street subway station. Under existing conditions, the fare array within this mezzanine included three turnstiles: two high entry/exit turnstiles and two high-revolving exit gates, all of which were in operation in the PM peak period. During hours when the booth was not in operation, including the AM peak period, the three turnstiles were gated shut. With the closure of the part-time token booth, the three turnstiles at this fare array were permanently closed, leaving only the two high entry/exit turnstiles and the two high-revolving exit gates to service all demand entering and exiting the station via this mezzanine. NYC Transit plans to rehabilitate the Lawrence Street station prior to 2013, and it is likely that in the future without the proposed actions, one or more additional high entry/exit turnstiles will be installed in the east mezzanine to replace the capacity lost from the closure of the three existing turnstiles. As plans for this rehabilitation are not yet fully developed, the analysis of conditions at this fare array in the future without the proposed actions conservatively assumes that only the two high entry/exit turnstiles and the two high-revolving exit gates will be available to service all demand entering and exiting the station via this mezzanine.

- The rehabilitation of the Jay Street-Borough Hall station. Detailed plans for this rehabilitation have not yet been fully developed by NYC Transit, but will likely include the construction of a new passageway connecting the Jay Street-Borough Hall station to the Lawrence Street station. As the planned improvements have not yet been finalized, the analysis of conditions at this station in the future without the proposed actions conservatively assumes no changes to the configurations of the existing street stairs and fare arrays.

- The completion by late 2003 of the rehabilitation of the DeKalb Avenue station including the reopening of stair S6 providing access to the north mezzanine from the east side of Flatbush Avenue at Fleet Street (see Figure 15-1). It is anticipated that demand at stair S5 providing access to the north mezzanine from the west side of Flatbush Avenue will likely decline as trips en route to and from the east return to stair S6. The fare array at this mezzanine (C-006) will also have been expanded from the existing two turnstiles and one high-revolving exit gate to a total of four high entry/exit turnstiles and two high-revolving exit gates. This fare array will be unstaffed. At the south mezzanine, stair S2 will have reopened with two eight-foot-wide sections bisected by a new elevator providing access between the mezzanine and street level. The fare array at this mezzanine (C-008), which will be staffed full-time, will have been expanded from the existing seven turnstiles to nine.

- The replacement in early 2003 of the single high-revolving exit gate serving stair S1 (Elm Street) at the Hoyt Street station with a single high entry/exit turnstile. As a result of this

change, stair S1 will serve as a second entry point to the station's Brooklyn-bound platform, and some entering trips will divert from stair S3.

- The completion of rehabilitation work on the Manhattan Bridge in February 2004 has allowed for the restoration of full subway service across the bridge. In Downtown Brooklyn, B trains replace Q-express trains, D trains replace W trains, and N trains run express and travel over the bridge. R service between Brooklyn and Manhattan has also increased. During peak periods, service at the DeKalb Avenue station is provided by B, M, Q and R trains (D and N trains bypass the station), while service at the Lawrence Street and Court Street stations is provided by M and R trains. As a result of these service changes it is anticipated that there will be some shifting of demand between stations in Downtown Brooklyn, including an increase in usage at the DeKalb Avenue.

Tables 15-14 through 15-19 show the expected peak 15 minute volumes as well as v/c ratios and levels of service at analyzed subway station stairs and fare arrays in the 2013 future without the proposed actions. As shown in Tables 15-14 through 15-19, in the future without the proposed actions, all analyzed stairways and fare arrays at subway stations in Downtown Brooklyn will continue to operate at LOS C or better in both the AM and PM peak hours with the exception of escalator E317 at the Jay Street-Borough Hall station. This escalator, which typically operates in the exiting (up) direction, will operate at LOS D (67 percent of capacity) in the AM peak hour, and LOS B in the PM peak hour in the No Build condition.

As discussed above, in February 2004 the rehabilitation of the Manhattan Bridge was completed, allowing the full restoration of local and express service on this East River crossing, and resulting in changes to B, D, M, N, Q, R and W services in Downtown Brooklyn. In addition, new developments combined with general background growth will increase line haul demand on all subway routes serving Downtown Brooklyn. Table 15-20 shows the anticipated line haul conditions on subway routes serving Downtown Brooklyn in the 2013 future without the proposed actions. It is important to note that data in Table 15-20 reflect conditions at the peak load point of each route, which is the point at which the greatest number of passengers are carried in the peak direction during each peak hour. In the peak direction, the peak load points for each route generally occur within Downtown Brooklyn (as opposed to the East River cordon). The peak load points for the routes serving Downtown Brooklyn occur at the following locations:

- West of the Atlantic Avenue IRT station (Nos. 2, 3, 4, 5 trains)
- West of the Jay Street-Borough Hall station (A,C)
- East of the Atlantic Avenue BMT station (B,Q)
- East of the Pacific Street station (D,N)
- West of the Bergen Street station (F)
- West of the DeKalb Avenue station (M,R)

The data in Table 15-20 are based on NYC Transit peak load point ridership projections for Fall 2004, and the anticipated service plan with both the restoration of full service across the Manhattan Bridge and the completion of the Stillwell Avenue terminal reconstruction. The 2004 ridership data has been increased by a 0.5 percent per year background growth rate and the addition of demand from No Build sites in order to reflect conditions in the 2013 future without the proposed actions.

## Table 15-14
## 2013 No Build Subway Station Analysis
## Borough Hall IRT/Court Street BMT Station Complex

### BOROUGH HALL IRT 2,3/COURT STREET BMT 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 |
|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ Columbus Park | AM | 7.20 | 1,080 | 546 | 5.06 | 0.51 | B |
| | | PM | 7.20 | 1,080 | 604 | 5.59 | 0.56 | B |

**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-601A | Court Street Fare Array<br>Court Street/Montague Street | | | | | |
| | 7 entry/exit turnstiles | AM | 3,360 | 1,297 | 0.39 | B |
| | | PM | 3,360 | 1,217 | 0.36 | B |

### BOROUGH HALL IRT 4,5 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 |
|---|---|---|---|---|---|---|---|---|
| O5/6/7/8 | East Stairway @ Municipal Bldg. | AM | 7.47 | 1,121 | 292 | 2.61 | 0.26 | A |
| | Joralemon Street | PM | 7.47 | 1,121 | 326 | 2.91 | 0.29 | 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 |
|---|---|---|---|---|---|---|
| R-602 | Municipal Bldg. Fare Array | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 536 | 0.22 | B |
| | | PM | 2,400 | 572 | 0.24 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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) Assumes 0.5 percent per year background growth for 2002 through 2013 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 15-15
## 2013 No Build Subway Station Analysis
## DeKalb Avenue BMT 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 |
|---|---|---|---|---|---|---|---|---|
| S5 | Stairway @ NW Corner | AM | 6.40 | 960 | 198 | 2.06 | 0.21 | A |
| | Flatbush Avenue/Fleet Street | PM | 6.40 | 960 | 141 | 1.47 | 0.15 | A |
| S6 | Stairway @ NE Corner | AM | 4.00 | 600 | 96 | 1.60 | 0.16 | A |
| | Flatbush Avenue/Fleet Street | PM | 4.00 | 600 | 68 | 1.13 | 0.11 | 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-006 | North Fare Array<br>Flatbush Avenue/Fleet Street | | | | | |
| | 4 high entry/exit turnstiles | AM | 2,100 | 307 | 0.15 | A |
| | 2 high-revolving exit gates | PM | 2,100 | 231 | 0.11 | A |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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) Assumes 0.5 percent per year background growth for 2002 through 2013 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 15-16
## 2013 No Build Subway Station Analysis
## Hoyt Street IRT 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 |
|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ NW Corner | AM | 3.50 | 525 | 15 | 0.29 | 0.03 | A |
| | Elm Place/Fulton Mall | PM | 3.50 | 525 | 88 | 1.68 | 0.17 | A |
| S2 | Stairway @ NE Corner | AM | 2.80 | 420 | 60 | 1.43 | 0.14 | A |
| | Duffield Street/Fulton Mall | PM | 2.80 | 420 | 24 | 0.57 | 0.06 | A |
| S3 | Stairway @ SW Corner | AM | 3.67 | 551 | 78 | 1.42 | 0.14 | A |
| | Hoyt Street/Fulton Mall | PM | 3.67 | 551 | 297 | 5.40 | 0.54 | B |
| S5 | Stairway @ NE Corner | AM | 3.73 | 560 | 187 | 3.34 | 0.33 | A |
| | Bridge Street @ Fulton Mall | PM | 3.73 | 560 | 85 | 1.52 | 0.15 | A |
| S6 | Stairway @ NW Corner | AM | 3.60 | 540 | 304 | 5.63 | 0.56 | B |
| | Bridge Street @ Fulton Mall | PM | 3.60 | 540 | 88 | 1.63 | 0.16 | 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 |
|---|---|---|---|---|---|---|
| R-605 | Bridge Street Fare Array | | | | | |
| | Bridge Street/Fulton Mall | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 491 | 0.20 | A |
| | | PM | 2,400 | 173 | 0.07 | A |
| R-605 (H1) | Duffield Street Fare Array | | | | | |
| | Duffield Street/Fulton Mall | | | | | |
| | 1 high entry/exit turnstile | AM | 470 | 60 | 0.13 | A |
| | 1 high-revolving exit gate | PM | 470 | 24 | 0.05 | A |
| R-606 | Hoyt Street Fare Array | | | | | |
| | Hoyt Street/Fulton Mall | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 78 | 0.03 | A |
| | | PM | 2,400 | 297 | 0.12 | A |
| --- | Elm Place Fare Array | | | | | |
| | Elm Place/Fulton Mall | | | | | |
| | 1 high entry/exit turnstile (7) | AM | 300 | 15 | 0.05 | A |
| | | PM | 300 | 88 | 0.29 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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) Assumes 0.5 percent per year background growth for 2002 through 2013 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.

(7) High-revolving exit gate replaced with single high entry/exit turnstile in 2003.

## Table 15-17
## 2013 No Build Subway Station Analysis
## Hoyt-Schermerhorn Streets IND 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 |
|---|---|---|---|---|---|---|---|---|
| S5 | Stairway @ NE Corner | AM | 4.00 | 600 | 405 | 6.75 | 0.68 | B |
| | Schermerhorn Street/Hoyt Street | PM | 4.00 | 600 | 350 | 5.83 | 0.58 | B |
| S8 | Stairway @ NW Corner | AM | 5.40 | 810 | 591 | 7.30 | 0.73 | C |
| | Schermerhorn Street/Bond Street | PM | 5.40 | 810 | 446 | 5.51 | 0.55 | B |

**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–108 | Schermerhorn Street Fare Array Midblock Bond Street/Hoyt Street | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 996 | 0.42 | C |
| | | PM | 2,400 | 796 | 0.33 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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) Assumes 0.5 percent per year background growth for 2002 through 2013 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 15-18
## 2013 No Build Subway Station Analysis
## Jay Street-Borough Hall IND 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 |
|---|---|---|---|---|---|---|---|---|
| O2/3 | South Facing Stairway @ | AM | 3.60 | 540 | 54 | 1.00 | 0.10 | A |
| | 370 Jay Street South Portico | PM | 3.60 | 540 | 165 | 3.06 | 0.31 | A |
| O11/12/13 | Stairway @ Keyspan Building | AM | 9.60 | 1,440 | 888 | 6.17 | 0.62 | B |
| | East side of Jay Street | PM | 9.60 | 1,440 | 834 | 5.79 | 0.58 | B |
| S3 | Stairway @ NW Corner | AM | 3.20 | 480 | 346 | 7.21 | 0.72 | C |
| | Jay Street/Fulton Street | PM | 3.20 | 480 | 401 | 8.35 | 0.84 | C |
| S4 | Stairway @ NE Corner | AM | 3.20 | 480 | 420 | 8.75 | 0.88 | C |
| | Jay Street/Willoughby Street | PM | 3.20 | 480 | 406 | 8.46 | 0.85 | C |
| E317 | Up Escalator @ | AM | 4.00 | 1,050 | 707 | n/a | 0.67 | D |
| | 370 Jay Street South Portico | PM | 4.00 | 1,050 | 282 | n/a | 0.27 | B |
| E318 | Down Escalator @ | AM | 4.00 | 1,050 | 14 | n/a | 0.01 | A |
| | 370 Jay Street South Portico | PM | 4.00 | 1,050 | 67 | n/a | 0.06 | 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-102 | North Fare Array | | | | | |
| | Jay Street/MetroTech | | | | | |
| | 8 entry/exit turnstiles | AM | 4,440 | 1,744 | 0.39 | B |
| | 2 high entry/exit turnstiles | PM | 4,440 | 1,831 | 0.41 | C |
| N-103 | Central Fare Array | | | | | |
| | Jay Street/Willoughby Street | | | | | |
| | 8 entry/exit turnstiles | AM | 4,290 | 658 | 0.15 | A |
| | 1 high-revolving exit gate | PM | 4,290 | 855 | 0.20 | A |
| | 2 high-revolving exit gates | AM | 900 | 323 | 0.36 | B |
| | | PM | 900 | 138 | 0.15 | A |
| N–103 (H1&H2) | South Fare Array | | | | | |
| | Jay Street/Fulton Street | | | | | |
| | 2 high entry/exit turnstiles | AM | 1,950 | 643 | 0.33 | B |
| | 3 high-revolving exit gates | PM | 1,950 | 637 | 0.33 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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). Escalator capacity based on 70 person per minute.

(4) Assumes 0.5 percent per year background growth rate for 2002 through 2013 period.

(5) Persons per foot width of stairway per minute (not applicable to escalators).

(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
## 2013 No Build Subway Station Analysis
## Lawrence Street-MetroTech BMT 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 |
|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ SE Corner | AM | 3.20 | 480 | 35 | 0.73 | 0.07 | A |
| | Bridge Street/Willoughby Street | PM | 3.20 | 480 | 32 | 0.67 | 0.07 | A |
| S4 | Stairway @ SE Corner | AM | 3.20 | 480 | 64 | 1.33 | 0.13 | A |
| | Willoughby Street/Lawrence Street | PM | 3.20 | 480 | 46 | 0.96 | 0.10 | A |
| S6 | Stairway @ SE Corner | AM | 3.13 | 470 | 247 | 5.26 | 0.53 | B |
| | Lawrence Street/Willoughby Street | PM | 3.13 | 470 | 178 | 3.79 | 0.38 | A |
| S7 | Stairway @ NE Corner | AM | 3.33 | 500 | 294 | 5.89 | 0.59 | B |
| | Lawrence Street/Willoughby Street | PM | 3.33 | 500 | 364 | 7.29 | 0.73 | C |

**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-003 | West Fare Array | | | | | |
| | Lawrence Street/Willoughby Street | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 778 | 0.32 | B |
| | | PM | 2,400 | 789 | 0.33 | B |
| C-004 | East Fare Array | | | | | |
| | Bridge Street/Willoughby Street | | | | | |
| | 2 high entry/exit turnstiles (7) | AM | 1,500 | 166 | 0.11 | A |
| | 2 high-revolving exit gates (7) | PM | 1,500 | 162 | 0.11 | A |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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) Assumes 0.5 percent per year background growth rate for 2002 through 2013 period, plus an additional 4 percent growth to account for the restoration of the connection to PATH at Cortlandt Street in late 2003.

(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.

(7) Token booth C-004 and 3 entry/exit turnstiles closed in August 2003. Two high entry/exit turnstiles and 2 exit gates open at all times.

# Table 15-20
# 2013 No Build Subway Line Haul Analysis

| Route | Peak Hour | Peak Direction | Trains per Hour (1) | Cars per Hour (1) | Available Capacity (2) | Passengers per Hour (3) | V/C Ratio (4) |
|---|---|---|---|---|---|---|---|
| 2 | AM | Manhattan-Bound | 10 | 100 | 12,000 | 8,817 | 0.73 |
| | PM | Brooklyn-Bound | 9 | 90 | 10,800 | 6,691 | 0.62 |
| 3 | AM | Manhattan-Bound | 9 | 90 | 10,800 | 8,534 | 0.79 |
| | PM | Brooklyn-Bound | 8 | 80 | 9,600 | 9,139 | 0.95 |
| 4 | AM | Manhattan-Bound | 15 | 150 | 18,000 | 12,363 | 0.69 |
| | PM | Brooklyn-Bound | 13 | 130 | 15,600 | 10,735 | 0.69 |
| 5 | AM | Manhattan-Bound | 11 | 110 | 13,200 | 11,426 | 0.87 |
| | PM | Brooklyn-Bound | 10 | 100 | 12,000 | 10,014 | 0.83 |
| A | AM | Manhattan-Bound | 18 | 144 | 31,680 | 20,026 | 0.63 |
| | PM | Brooklyn-Bound | 16 | 128 | 28,160 | 12,954 | 0.46 |
| B | AM | Manhattan-Bound | 10 | 80 | 17,600 | 12,877 | 0.73 |
| | PM | Brooklyn-Bound | 9 | 72 | 15,840 | 10,615 | 0.67 |
| C | AM | Manhattan-Bound | 8 | 64 | 11,520 | 5,385 | 0.47 |
| | PM | Brooklyn-Bound | 7 | 56 | 10,080 | 3,215 | 0.32 |
| D | AM | Manhattan-Bound | 10 | 80 | 17,600 | 19,062 | 1.08 |
| | PM | Brooklyn-Bound | 9 | 72 | 15,840 | 20,154 | 1.27 |
| F | AM | Manhattan-Bound | 15 | 120 | 26,400 | 17,551 | 0.66 |
| | PM | Brooklyn-Bound | 12 | 96 | 21,120 | 18,692 | 0.89 |
| M | AM | Manhattan-Bound | 6 | 48 | 8,640 | 4,216 | 0.49 |
| | PM | Brooklyn-Bound | 6 | 48 | 8,640 | 5,413 | 0.63 |
| N | AM | Manhattan-Bound | 10 | 100 | 18,000 | 6,750 | 0.38 |
| | PM | Brooklyn-Bound | 9 | 90 | 16,200 | 6,801 | 0.42 |
| Q | AM | Manhattan-Bound | 10 | 100 | 18,000 | 12,877 | 0.72 |
| | PM | Brooklyn-Bound | 9 | 90 | 16,200 | 10,615 | 0.66 |
| R | AM | Manhattan-Bound | 10 | 80 | 17,600 | 6,030 | 0.34 |
| | PM | Brooklyn-Bound | 10 | 80 | 17,600 | 6,899 | 0.39 |

**Notes:**

(1) Based on NYC Transit Fall 2004 service plan after restoration of full service across the Manhattan Bridge and completion of the Stillwell Avenue terminal reconstruction. Service changes include:
Q-express service replaced by B trains in Brooklyn and N trains in Manhattan.
D trains replace W service in Brooklyn.
N trains routed over Manhattan Bridge; bypass DeKalb Avenue.

(2) Capacity based on 120 passengers/car for 51' cars, 180 passengers/car for 60' cars and 220 passengers/car for 75' cars as per CEQR criteria.

(3) 2013 No Build demand based on NYC Transit projections for Fall 2004 at the Downtown Brooklyn **peak load points** increased by 0.5 percent/year background growth and demand from No Build sites.

(4) Volume-to-capacity ratio.

**As the 2013 No Build analysis is based on peak load point data and reflects changes due to the Manhattan Bridge and Stillwell Avenue terminal projects, the 2013 No Build analysis is not directly comparable to the analysis of 2002 Existing conditions.**

As shown in Table 15-20,in the AM peak hour, Manhattan-bound A trains are expected to carry the highest number of passengers per hour at their peak load point with 20,026, followed by D trains with 19,062. F trains are expected to carry 17,551 passengers Manhattan-bound in the AM. Among the IRT lines, No. 4 trains are expected to carry the highest number of riders with 12,363 and No. 5 trains with 11,426. Nos. 2 and 3 trains are each expected to carry between 8,500 and 9,000 Manhattan-bound riders through their peak load points in the AM peak hour.

In the 2013 future without the proposed actions, Manhattan-bound D trains will be operating over capacity in the AM peak hour, with a v/c ratio of 1.08, while No. 5 trains will operate with at a v/c ratio of 0.87. All other routes will operate at v/c ratios below 0.80 (eighty percent of capacity) at their peak load points in the AM.

In the PM peak hour, Brooklyn-bound D trains are expected to carry the highest number of passengers at their peak load point with an estimated 20,154, followed by F trains with 18,692 passengers, and A trains with 12,954. The B, Q and Nos. 4 and 5 trains are each expected to carry from 10,000 to 11,000 peak direction passengers in the PM. As in the AM peak hour, D trains will be operating over capacity with a v/c ratio of 1.27. Brooklyn-bound No. 3 trains will operate close to capacity with a v/c ratio of 0.95, while F trains will operate at a v/c ratio of 0.89 and No. 5 trains will operate at 0.83. All other routes will operate at v/c ratios below 0.80 at their peak load points in the PM peak hour.

**BUS SERVICE**

During the 2002 through 2013 period, demand on NYC Transit local bus routes serving Downtown Brooklyn is expected to increase as a result of new developments and general background growth. In September 2003, the B54 route, which was temporarily truncated at Flatbush Court in 2001 due to security concerns at MetroTech, was once again extended to Jay Street. From Myrtle Avenue, westbound B54 buses travel south on Flatbush Avenue Extension, west on DeKalb Avenue and Fulton Street, and north on Jay Street where they again provide a convenient connection to the Jay Street-Borough Hall subway station. Eastbound buses return to Myrtle Avenue via eastbound Tillary Street and southbound Flatbush Avenue Extension. In November 2003, the conversion of Smith Street from two-way to one-way northbound operation from Atlantic Avenue to Schermerhorn Street necessitated the diversion of southbound B61 buses. From southbound Smith Street, B61 buses now turn west onto Livingston Street and south onto Boerum Place to reach westbound Atlantic Avenue. At the southern end of the study area, development of the first phase of the Atlantic Yards Arena and Redevelopment project will likely result in the closure of Fifth Avenue between Flatbush Avenue and Atlantic Avenue by 2007. This will necessitate a minor diversion of the B63 buses that currently utilize this short street segment.

Table 15-21 shows the estimated peak hour, peak direction ridership at the maximum load point of each of the NYC Transit local bus routes serving Downtown Brooklyn in the 2013 future without the proposed actions. As shown in Table 15-21, all analyzed local bus routes are expected to operate with available capacity at their maximum load points in both peak periods in the future without the proposed actions.

## Table 15-21
## 2013 No Build Local Bus Conditions

| Peak Hour (1) | Route | Peak Direction | Maximum Load Point | Peak Hour Buses | Peak Hour Passengers (2) | Average Passengers Per Bus | Available Capacity (3) | Notes |
|---|---|---|---|---|---|---|---|---|
| | B25 | WB | Fulton St./Nostrand Ave. | 7 | 428 | 61 | 62 | |
| | B26 | WB | Halsey St./Nostrand Ave. | 11 | 693 | 63 | 77 | |
| | B37 | NB | Third Ave./39th St. | 5 | 224 | 45 | 126 | |
| | B38 | WB | DeKalb Ave./Vanderbilt Ave. | 23 | 1,461 | 64 | 149 | |
| | B41 | NB | Flatbush Ave./Church Ave. | 25 | 1,469 | 59 | 281 | (4) |
| | B45 | WB | St. Johns Pl./Nostrand Ave. | 8 | 409 | 51 | 151 | |
| | B51 | WB | Tillary St./Bridge St. | 4 | 124 | 31 | 156 | |
| AM | B52 | WB | Nostrand Ave./Gates Ave. | 11 | 705 | 64 | 65 | |
| | B54 | WB | Vanderbilt Ave./Myrtle Ave. | 10 | 593 | 59 | 107 | |
| | B57 | WB | Flushing Ave./Nostrand Ave. | 5 | 232 | 46 | 118 | |
| | B61 | NB | Atlantic Ave./Hicks St. | 7 | 401 | 57 | 89 | |
| | B63 | NB | Fifth Ave./36th St. | 6 | 357 | 60 | 63 | |
| | B65 | WB | Bergen St./Washington St. | 6 | 271 | 45 | 149 | |
| | B67 | NB | Seventh Ave./Union St. | 6 | 320 | 53 | 100 | |
| | B75 | NB | 9th St./Smith Street | 6 | 223 | 37 | 197 | |
| | B25 | EB | Fulton St./Nostrand Ave. | 8 | 539 | 67 | 21 | |
| | B26 | EB | Halsey St./Nostrand Ave. | 10 | 611 | 61 | 89 | |
| | B37 | SB | Third Ave./9th Street | 5 | 243 | 49 | 107 | |
| | B38 | EB | Fulton St./DeKalb Ave. | 16 | 971 | 61 | 149 | |
| | B41 | SB | Flatbush Ave./Church Ave. | 24 | 1,504 | 63 | 176 | |
| | B45 | EB | Nostrand Ave./St. Johns Pl. | 7 | 435 | 62 | 55 | |
| | B51 | EB | Canal St./Bowery | 4 | 166 | 42 | 114 | |
| PM | B52 | EB | Fulton St./Green Ave. | 10 | 556 | 56 | 144 | |
| | B54 | EB | Vanderbilt Ave./Myrtle Ave. | 8 | 463 | 58 | 97 | |
| | B57 | EB | Flushing Ave./Nostrand Ave. | 6 | 298 | 50 | 122 | |
| | B61 | SB | Smith St./Livingston St. | 6 | 272 | 45 | 148 | |
| | B63 | SB | Fifth Ave./50th St. | 6 | 358 | 60 | 62 | |
| | B65 | EB | Dean St./Franklin Ave. | 6 | 235 | 39 | 185 | |
| | B67 | SB | Seventh Ave./Union St. | 6 | 344 | 57 | 76 | |
| | B75 | SB | Smith St./Livingston St. | 5 | 224 | 45 | 126 | |

**Notes:**

(1) Peak Hours: weekday 8-9 AM and 5-6 PM.

(2) Assumes 0.5% per year background growth plus demand from No Build sites.

(3) Available capacity based on a maximum of 70 passengers for a standard 40-seat bus as per CEQR criteria.

(4) Combined local and limited service.

## COMMUTER VAN SERVICES

During the 2002 through 2013 period, demand for commuter van services in Downtown Brooklyn will likely increase as a result of new developments and general background growth. It is anticipated that Flatbush Avenue will continue to function as the primary access route to and from Downtown Brooklyn for these vans, and that westbound Schermerhorn Street and eastbound Livingston Street will continue to be used for local circulation.

## LONG ISLAND RAIL ROAD COMMUTER RAIL SERVICE

As discussed above, it is expected that the reconstruction of the Atlantic Terminal complex, which includes the Long Island Rail Road's Flatbush Avenue terminal, will be complete by 2005. This project will provide an enlarged concourse and air conditioned waiting room for the LIRR, new stairs, a widened central connector corridor and a major new entrance to the facility at the corner of Hanson Place and Flatbush Avenue. By 2007, development of the Atlantic Yards Arena and Redevelopment Project will have resulted in new access points to the terminal complex from the south. It is also anticipated that in 2004, access between Downtown Brooklyn and JFK International Airport will be enhanced by the start of JFK AirTrain service which will provide a direct rail connection between the LIRR's Jamaica station and all airport terminals.

## FERRY SERVICES

By late 2003, PATH rail service to Lower Manhattan will be restored, and some New Jersey commuters now using private ferries will instead utilize PATH for the trans-Hudson segment of their trips to and from Downtown Brooklyn. These commuters will continue to transfer to subways in Manhattan to reach Downtown Brooklyn. It is anticipated that New York Water Taxi will continue to serve Fulton Landing, adjusting service as demand warrants.

## PEDESTRIANS

Pedestrian flow conditions at analyzed sidewalks, corners, and crosswalks were analyzed for the 2013 future without the proposed actions, incorporating anticipated demand from new development and a background growth of 0.5 percent per year for the 2002 to 2013 period. During this period, it is anticipated that the New York City Department of Transportation will implement traffic calming measures developed as part of the Downtown Brooklyn Traffic Calming Project (DBTCP). Under this project, which was initiated by 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. 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 candidate traffic calming measures. Measures implemented within the study area for the Downtown Brooklyn Development 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 within the study area 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. Therefore, those measures most likely to be implemented in the near term would not affect any pedestrian facility analyzed for the Downtown Brooklyn Development project. The analysis of future pedestrian conditions therefore conservatively assumes that no additional improvements are implemented at analyzed pedestrian facilities in the future without the proposed actions.

Tables 15-22 and 15-23 show the results of the analyses of sidewalk, corner area and crosswalk conditions for the AM and PM peak hours in the future without the proposed actions. As shown in Table 15-22, all analyzed sidewalks will continue to operate at acceptable LOS C or better under platoon conditions in both peak periods. As shown in Table 15-23, all analyzed corner areas will also continue to operate at LOS C or better in both peak periods in the future without the proposed actions. All analyzed crosswalks will operate at LOS C or better in all periods with the exception of the north crosswalk at the intersection of Willoughby and Jay Streets which will operate at LOS D in the AM peak hour and LOS E in the PM peak hour, unchanged from the Existing condition.

## D. THE FUTURE WITH THE PROPOSED ACTIONS

This section provides an analysis of transit and pedestrian conditions in the future with the proposed actions. As discussed in Chapter 1, "Project Description," the proposed actions are projected to stimulate approximately 6.7 million square feet of new development, including office, residential, retail, and community facility/cultural space. These new developments, located on 12 sites within the study area, would displace existing uses on these sites. The analyses in this section examine future subway, local bus and pedestrian conditions in the year 2013 with the full build-out of this projected development scenario.

As shown in Table 14-11, person-trips by subway would total 6,013 inbound and 691 outbound in the AM peak hour and 1,163 inbound and 7,408 outbound in the PM peak hour. Person-trips by local bus would total 546 inbound and 83 outbound in the AM peak hour and 211 inbound and 782 outbound in the PM. Trips by walking only, bicycle or other non-vehicular modes would total 1,360 inbound and 623 outbound in the AM peak hour, and 1,780 inbound and 2,753 outbound in the PM. Trips by commuter rail are expected to account for approximately 12 percent of commuter trips during the AM and PM peak periods. However, most if not all of these commuters either walk to and from their place of business from the Long Island Rail Road's Flatbush Avenue Terminal, or complete their journeys via a transfer to and from the subway at the Atlantic Avenue/Pacific Street station complex. For the purposes of the transit and pedestrian analyses, these commuter rail trips have therefore been included in the totals for subway and walk trips.

### SUBWAY SERVICE

As discussed above, the proposed actions would generate a net total of 6,013 inbound and 691 outbound trips by subway in the AM peak hour, and 1,163 inbound and 7,408 outbound in the

**Table 15-22**
**2013 No Build Pedestrian Conditions**
**Sidewalks**

| 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 | | Persons per Foot per Min. (PFM) | | Level of Service | |
| | | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| 1 | **Willoughby Street** Flatbush Avenue to Albee Square West | South | 6.0 | 104 | 137 | 1.2 | 1.5 | A | A | 5.2 | 5.5 | B | B |
| 2 | **Albee Square West** Willoughby Street to Fulton Street | East | 7.0 | 24 | 78 | 0.2 | 0.7 | A | A | 4.2 | 4.7 | A | A |
| 3 | **Albee Square West** Willougby Street to Fulton Street | West | 3.0 | 83 | 82 | 1.8 | 1.8 | A | A | 5.8 | 5.8 | B | B |
| 4 | **Willoughby Street** Albee Square West to Duffield Street | South | 6.0 | 101 | 158 | 1.1 | 1.8 | A | A | 5.1 | 5.8 | B | B |
| 5 | **Duffield Street** Willoughby Street to Fulton Street | East | 4.5 | 129 | 132 | 1.9 | 2.0 | A | A | 5.9 | 6.0 | B | B |
| 6 | **Duffield Street** Willoughby Street to Fulton Street | West | 7.5 | 55 | 54 | 0.5 | 0.5 | A | A | 4.5 | 4.5 | A | A |
| 7 | **Willoughby Street** Duffield Street to Bridge Street | South | 7.0 | 243 | 188 | 2.3 | 1.8 | A | A | 6.3 | 5.8 | B | B |
| 8 | **Willoughby Street** Bridge Street to Lawrence Street | South | 7.0 | 272 | 304 | 2.6 | 2.9 | A | A | 6.6 | 6.9 | B | B |
| 9 | **Willoughby Street** Lawrence Street to Jay Street | South | 7.5 | 212 | 367 | 1.9 | 3.3 | A | A | 5.9 | 7.3 | B | C |
| 10 | **Willoughby Street** Lawrence Street to Jay Street | North | 6.5 | 531 | 476 | 5.5 | 4.9 | B | A | 9.5 | 8.9 | C | C |
| 11 | **Willoughby Street** Bridge Street to Lawrence Street | North | 5.0 | 255 | 275 | 3.4 | 3.7 | A | A | 7.4 | 7.7 | C | C |
| 12 | **Willoughby Street** Duffield Street to Bridge Street | North | 6.5 | 301 | 343 | 3.1 | 3.5 | A | A | 7.1 | 7.5 | C | C |
| 23 | **Boerum Place** Fulton Street to Livingston Street | East | 10.0 | 89 | 82 | 0.6 | 0.6 | A | A | 4.6 | 4.6 | A | A |

**Table 15-23**
**2013 No Build Pedestrian Conditions**
**Corner Areas and Crosswalks**

**CORNER ANALYSIS**

| Map No. | Intersection | Corner | Curb Radii (Feet) | Peak 15 Min. Volumes | | Average Ped. Space (SF/Ped) | | Level of Service | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AM | PM | AM | PM | AM | PM |
| 13 | Willoughby Street & Flatbush Avenue | Southwest | 12 | 79 | 88 | 136 | 129 | A | A |
| 14 | Willoughby Street & Albee Square West | Southeast | 12 | 7 | 7 | 185 | 119 | A | A |
| 15 | Willoughby Street & Albee Square West | Southwest | 12 | 36 | 58 | 156 | 102 | A | A |
| 16 | Willoughby Street & Bridge Street | Southeast | 12 | 99 | 34 | 99 | 118 | A | A |
| 17 | Willoughby Street & Bridge Street | Southwest | 12 | 127 | 124 | 107 | 95 | A | A |
| 18 | Willoughby Street & Jay Street | Northeast | 12 | 325 | 288 | 33 | 25 | C | C |

**CROSSWALK ANALYSIS**

| Map No. | Intersection | Crosswalk | Curb to Curb Street Width (Ft.) | Crosswalk Width (Ft.) | Peak 15 Min. Volumes | | Conflicting Vehicle Volume with Pedestrians (Veh/15min) | | With Vehicles | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Average Ped. Space (SF/Ped) | | Level of Service | |
| | | | | | AM | PM | AM | PM | AM | PM | AM | PM |
| 19 | Flatbush Avenue & Willoughby Street | South | 60.0 | 13.0 | 67 | 75 | 59 | 74 | 76 | 63 | A | A |
| | | West | 33.0 | 17.0 | 176 | 180 | 12 | 4 | 107 | 107 | A | A |
| 20 | Willoughby Street & Albee Square West | South | 36.0 | 10.3 | 84 | 139 | 15 | 8 | 98 | 56 | A | B |
| | | East | 33.0 | 11.8 | 16 | 27 | 34 | 84 | 694 | 330 | A | A |
| | | West | 33.0 | 11.3 | 49 | 42 | 27 | 36 | 211 | 241 | A | A |
| 21 | Willoughby Street & Bridge Street | South | 29.5 | 13.5 | 132 | 191 | 41 | 44 | 225 | 155 | A | A |
| | | East | 28.6 | 13.5 | 176 | 123 | 0 | 0 | 82 | 120 | A | A |
| | | West | 28.6 | 11.5 | 85 | 73 | 0 | 0 | 150 | 176 | A | A |
| 22 | Willoughby Street & Jay Street | North | 51.5 | 11.5 | 365 | 430 | 29 | 25 | 17 | 14 | D | E |
| | | East | 31.0 | 12.5 | 276 | 401 | 0 | 0 | 45 | 28 | B | C |

PM peak hour. The estimated numbers of these trips that would occur at individual subway stations in Downtown Brooklyn are shown in Table 15-24. These estimates were based on the proximity of projected development sites to individual stations, the travel patterns of existing journey-to-work trips to Downtown Brooklyn, and census data.

As shown in Table 15 -24, the greatest numbers of trips would occur at the Jay Street-Borough Hall station which would experience 2,802 new trips in the AM peak hour and 3,481 new trips in the PM peak hour (entering and exiting combined). This would be followed by the DeKalb Avenue station with an estimated 1,282 and 1,659 new trips in the AM and PM peak hours, respectively, and the Hoyt Street station with an estimated 1,147 and 1,386 new trips in the AM and PM peak hours, respectively. The Lawrence Street station, a gateway station to the projected commercial development along Willoughby Street, would experience an estimated 848 trips in the AM peak hour and 1,023 trips in the PM. The Borough Hall/Court Street station complex would experience 356 and 425 new trips in the AM and PM. As shown in Table 15-24, both the Nevins Street station and the Atlantic Avenue/Pacific Street station complex would each experience fewer than 150 trips from projected development sites in any peak hour. As this level of demand would be below the 200-trip *CEQR* threshold for an impact analysis, conditions at these stations are not analyzed quantitatively in this EIS. However, an assessment of the potential for the proposed actions to generate transfer activity at the Atlantic Avenue/Pacific Street station complex is provided. Although new peak hour demand at the Hoyt-Schermerhorn Streets station would also fall below the *CEQR* threshold, with 142 trips in the AM peak hour and 196 trips in the PM, this station is included in the analyses as two projected residential development sites (AA and BB) would be located directly above it.

The proposed action's zoning text would include a subway stair relocation requirement for development sites of more than 50,000 square feet at entrances to the DeKalb Avenue, Hoyt Street, Hoyt-Schermerhorn Streets, Jay Street-Borough Hall, Lawrence Street, and Nevins Street stations. However, the design for such improvements would not be undertaken until proposals for development of specific sites are advanced. The analyses therefore conservatively assume no improvements to the existing street stairs at these stations in the future with the proposed actions. Urban renewal changes for the project would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets. This public space—Jay Street Plaza— would potentially include a new subway entrance/exit to the Jay Street-Borough Hall subway station. As this plaza is considered a potential development site that is unlikely to be developed by 2013, the analysis of Future Action conditions does not assume any improvement in access to the Jay Street station at this site.

# Table 15-24
## Total Subway Demand From Projected Development Sites

| Station | Peak Hour | Hourly Total Enter | Hourly Total Exit |
|---|---|---|---|
| Atlantic Avenue/Pacific Street | AM | 5 | 9 |
| | PM | 64 | 33 |
| Borough Hall/Court Street | AM | 19 | 337 |
| | PM | 391 | 34 |
| DeKalb Avenue | AM | 204 | 1,078 |
| | PM | 1,350 | 309 |
| Hoyt Street | AM | 76 | 1,071 |
| | PM | 1,259 | 127 |
| Hoyt-Schermerhorn Streets | AM | 109 | 33 |
| | PM | 75 | 121 |
| Jay Street-Borough Hall | AM | 219 | 2,583 |
| | PM | 3,101 | 380 |
| Lawrence Street | AM | 38 | 810 |
| | PM | 949 | 74 |
| Nevins Street | AM | 12 | 79 |
| | PM | 114 | 33 |
| Other Stations | AM | 9 | 13 |
| | PM | 105 | 52 |
| Totals | AM | 691 | 6,013 |
| | PM | 7,408 | 1,163 |

**Notes:**

Numbers shown are entering and exiting each subway station.

Trips at Atlantic Avenue/Pacific Street reflect trips entering or exiting the station from development sites and do not include internal transfers.

The *CEQR Technical Manual* identifies a significant 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 Action LOS D condition, a WIT of six inches or more is considered significant; for a Future Action LOS E condition, three to six inches is considered significant; and for Future Action LOS F, a WIT of one- to three-inches is considered significant. For turnstiles, escalators and high-wheel exit gates, the *CEQR Technical Manual* defines a significant 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 is also considered significant.

The following sections discuss the effects of trips from projected development sites at each analyzed subway station in Downtown Brooklyn. A discussion of the potential for transfer activity at the Atlantic Avenue/Pacific Street station complex is also provided.

*BOROUGH HALL/COURT STREET STATION (2,3,4,5,M,R)*

Project generated trips en route to and from the Borough Hall IRT 2,3 and Court Street station complex would be concentrated at stair S1 and fare array R-601A. Trips en route to and from the Borough Hall IRT 4,5 station would use stair O5/6/7/8 on the south side of Joralemon Street beneath the portico of the Municipal Building, and fare array R-602. As shown in Table 15-25, all of these station processors would continue to operate at acceptable LOS C or better in both peak hours in the future with the proposed actions, and no significant impacts are expected.

*DEKALB AVENUE STATION (B,M,Q,R)*

It is anticipated that project generated trips en route to and from this station would be concentrated at two stairways; S5 at the northwest corner of Flatbush Avenue Extension and Fleet Street (for trips to/from development sites west of Flatbush Avenue Extension), and S6 at the northeast corner of Flatbush Avenue Extension and Fleet Street (for trips to/from development sites east of Flatbush Avenue Extension). Both of these stairs serve fare array C-006 which will consist of four high entry/exit turnstiles and two high-revolving exit gate in the future with the proposed actions. As shown in Table 15-26, both analyzed stairways and fare array C-006 would operate at acceptable LOS B or better in both peak periods in the future with the proposed actions. No significant impacts are therefore expected at the DeKalb Avenue station.

*HOYT STREET STATION (2,3)*

Subway trips using the Hoyt Street station en route to and from projected development sites would be distributed among all five of the station's active stairways based upon the location of the development site and the direction of travel. These trips would be most concentrated at stair S1 at the northwest corner of Elm Place and Fulton Street (primarily in the PM), and at stair S2 at the northeast corner of Duffield and Fulton streets (in both the AM and PM). As shown in Table 15-27, in the future with the proposed actions, all stairways and fare arrays at this station would operate at acceptable LOS C or better in both peak periods with the exception of the

**Table 15-25**
**2013 Future With the Proposed Actions Subway Station Analysis**
**Borough Hall IRT/Court Street BMT Station Complex**

## BOROUGH HALL IRT 2,3/COURT STREET BMT 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ Columbus Park | AM | 7.20 | 1,080 | 546 | 60 | 606 | 5.06 | 0.51 | B | 5.61 | 0.56 | B | |
| | | PM | 7.20 | 1,080 | 604 | 67 | 671 | 5.59 | 0.56 | B | 6.21 | 0.62 | B | |

### 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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| R-601A | Court Street Fare Array<br>Court Street/Montague Street | | | | | | | | | |
| | 7 entry/exit turnstiles | AM | 3,360 | 1,297 | 60 | 1357 | 0.39 | B | 0.40 | C |
| | | PM | 3,360 | 1,217 | 67 | 1284 | 0.36 | B | 0.38 | B |

## BOROUGH HALL IRT 4,5 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O5/6/7/8 | East Stairway @ Municipal Bldg.<br>Joralemon Street | AM | 7.47 | 1,121 | 292 | 51 | 343 | 2.61 | 0.26 | A | 3.06 | 0.31 | A | |
| | | PM | 7.47 | 1,121 | 326 | 66 | 392 | 2.91 | 0.29 | A | 3.50 | 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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| R-602 | Municipal Bldg. Fare Array | | | | | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 536 | 51 | 587 | 0.22 | B | 0.24 | B |
| | | PM | 2,400 | 572 | 66 | 638 | 0.24 | B | 0.27 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 action conditions.
(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 NYC Transit guidelines.
* denotes a significant impact based on CEQR criteria.

## Table 15-26

## 2013 Future With the Proposed Actions Subway Station Analysis
## DeKalb Avenue BMT 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S5 | Stairway @ NW Corner | AM | 6.40 | 960 | 198 | 332 | 530 | 2.06 | 0.21 | A | 5.52 | 0.55 | B | |
| | Flatbush Avenue/Fleet Street | PM | 6.40 | 960 | 141 | 395 | 536 | 1.47 | 0.15 | A | 5.58 | 0.56 | B | |
| S6 | Stairway @ NE Corner | AM | 4.00 | 600 | 96 | 68 | 164 | 1.60 | 0.16 | A | 2.73 | 0.27 | A | |
| | Flatbush Avenue/Fleet Street | PM | 4.00 | 600 | 68 | 118 | 186 | 1.13 | 0.11 | A | 3.10 | 0.31 | 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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| C-006 | North Fare Array | | | | | | | | | |
| | Flatbush Avenue/Fleet Street | | | | | | | | | |
| | 4 high entry/exit turnstiles | AM | 2,100 | 307 | 400 | 707 | 0.15 | A | 0.34 | B |
| | 2 high-revolving exit gates | PM | 2,100 | 231 | 513 | 744 | 0.11 | A | 0.35 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 action conditions.

(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 NYC Transit guidelines.

* denotes a significant impact based on CEQR criteria.

**Table 15-27**

**2013 Future With the Proposed Actions Subway Station Analysis**

**Hoyt Street IRT 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ NW Corner | AM | 3.50 | 525 | 15 | 95 | 110 | 0.29 | 0.03 | A | 2.10 | 0.21 | A | |
| | Elm Place/Fulton Mall | PM | 3.50 | 525 | 88 | 172 | 260 | 1.68 | 0.17 | A | 4.95 | 0.50 | A | |
| S2 | Stairway @ NE Corner | AM | 2.80 | 420 | 60 | 172 | 232 | 1.43 | 0.14 | A | 5.52 | 0.55 | B | |
| | Duffield Street/Fulton Mall | PM | 2.80 | 420 | 24 | 167 | 191 | 0.57 | 0.06 | A | 4.55 | 0.45 | A | |
| S3 | Stairway @ SW Corner | AM | 3.67 | 551 | 78 | 53 | 131 | 1.42 | 0.14 | A | 2.38 | 0.24 | A | |
| | Hoyt Street/Fulton Mall | PM | 3.67 | 551 | 297 | 78 | 375 | 5.40 | 0.54 | B | 6.81 | 0.68 | B | |
| S5 | Stairway @ NE Corner | AM | 3.73 | 560 | 187 | 11 | 198 | 3.34 | 0.33 | A | 3.54 | 0.35 | A | |
| | Bridge Street @ Fulton Mall | PM | 3.73 | 560 | 85 | 12 | 97 | 1.52 | 0.15 | A | 1.73 | 0.17 | A | |
| S6 | Stairway @ NW Corner | AM | 3.60 | 540 | 304 | 28 | 332 | 5.63 | 0.56 | B | 6.15 | 0.61 | B | |
| | Bridge Street @ Fulton Mall | PM | 3.60 | 540 | 88 | 4 | 92 | 1.63 | 0.16 | A | 1.70 | 0.17 | 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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| R-605 | Bridge Street Fare Array<br>Bridge Street/Fulton Mall | | | | | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 491 | 39 | 530 | 0.20 | A | 0.22 | B |
| | | PM | 2,400 | 173 | 16 | 189 | 0.07 | A | 0.08 | A |
| R-605 (H1) | Duffield Street Fare Array<br>Duffield Street/Fulton Mall | | | | | | | | | |
| | 1 high entry/exit turnstile | AM | 470 | 60 | 172 | 232 | 0.13 | A | 0.49 | C |
| | 1 high-revolving exit gate | PM | 470 | 24 | 167 | 191 | 0.05 | A | 0.41 | C |
| R-606 | Hoyt Street Fare Array<br>Hoyt Street/Fulton Mall | | | | | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 78 | 53 | 131 | 0.03 | A | 0.05 | A |
| | | PM | 2,400 | 297 | 78 | 375 | 0.12 | A | 0.16 | A |
| --- | Elm Place Fare Array<br>Elm Place/Fulton Mall | | | | | | | | | |
| | 1 high entry/exit turnstile (7) | AM | 300 | 15 | 95 | 110 | 0.05 | A | 0.37 | B |
| | | PM | 300 | 88 | 172 | 260 | 0.29 | B | 0.87 | E |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 action conditions.

(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 NYC Transit guidelines.

(7) High-revolving exit gate replaced with single high entry/exit turnstile in 2003.

* denotes a significant impact based on CEQR criteria.

single high-revolving entry/exit turnstile at Elm Place and Fulton Street. This fare array would operate at LOS E in the PM peak hour with a v/c ratio of 0.87 compared to LOS B and a v/c ratio of 0.29 in the No Build condition. However, as this array would continue to operate below capacity (i.e., a v/c ratio of 1.00), it would not be considered significantly impacted under *CEQR* criteria. Therefore, no significant impacts are expected at the Hoyt Street station with the proposed actions.

*HOYT-SCHERMERHORN STREETS STATION (A,C,G)*

The Hoyt-Schermerhorn Streets station is located beneath Schermerhorn Street between Hoyt Street and Bond Street. Two residential development sites—AA and BB—would be located immediately above portions of the station. Both of the street stairs providing access to this station are located within the building lines of the block on the north side of the street, and one of the two stairs (S8) is located within projected development site BB. As no design for the buildings that would occupy either site have been prepared pending a specific development proposal, the potential for future improvements to stair S8 remains uncertain. The analyses therefore conservatively assume no improvements to this street stair (nor the potential reopening of other stairs presently closed to the public) in the future with the proposed actions.

As shown in Table 15-28, the two street stairs serving this station as well as fare array N-108 would continue to operate at an acceptable LOS C or better in both peak periods in the future with the proposed actions. No significant impacts under *CEQR* criteria are therefore expected at the Hoyt-Schermerhorn Streets station.

*JAY STREET-BOROUGH HALL STATION (A,C,F)*

As discussed above, the Jay Street-Borough Hall station would handle the greatest number of subway trips from projected development sites of any station in Downtown Brooklyn. These trips would be distributed among six stairs or escalators at the station, but would be most concentrated at stair O11/12/13 on the east side of Jay Street at MetroTech, stair S3 at the northwest corner of Jay and Fulton streets, and stair S4 on the northeast corner of Jay and Willoughby streets (see Figure 15-1). As shown in Table 15-29, in the future with the proposed actions, stairway S3 would deteriorate to LOS D in the PM peak hour from LOS C in the No Build condition, with a width increment threshold (WIT) of 17.81 inches. As this would exceed the *CEQR* impact threshold of six inches at LOS D, this stair would be significantly impacted in the PM under *CEQR* criteria.

As also shown in Table 15-29, in the future with the proposed actions, stair S4 would deteriorate to LOS F in both peak hours compared to LOS C in both periods in the No Build condition. With v/c ratios of 1.86 in the AM peak hour and 2.03 in the PM, demand at this stair would be essentially double its capacity. The WIT required to restore this stair to the No Build condition would total 43.15 inches in the AM and 53.63 in the PM, exceeding the *CEQR* impact threshold of one inch at LOS F. This stair would therefore be significantly impacted in both peak hours in the future with the proposed actions. All other analyzed stairways would remain at an acceptable LOS C or better in both peak periods, and all analyzed escalators and fare arrays would continue to operate below capacity. These elements would therefore not be impacted by the proposed actions in either peak period under *CEQR* criteria.

## Table 15-28
## 2013 Future With the Proposed Actions Subway Station Analysis
## Hoyt-Schermerhorn Streets IND 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S5 | Stairway @ NE Corner | AM | 4.00 | 600 | 405 | 12 | 417 | 6.75 | 0.68 | B | 6.95 | 0.70 | B | |
| | Schermerhorn Street/Hoyt Street | PM | 4.00 | 600 | 350 | 20 | 370 | 5.83 | 0.58 | B | 6.17 | 0.62 | B | |
| S8 | Stairway @ NW Corner | AM | 5.40 | 810 | 591 | 32 | 623 | 7.30 | 0.73 | C | 7.69 | 0.77 | C | |
| | Schermerhorn Street/Bond Street | PM | 5.40 | 810 | 446 | 41 | 487 | 5.51 | 0.55 | B | 6.01 | 0.60 | B | |

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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| N-108 | Schermerhorn Street Fare Array Midblock Bond Street/Hoyt Street | | | | | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 996 | 44 | 1,040 | 0.42 | C | 0.43 | C |
| | | PM | 2,400 | 796 | 61 | 857 | 0.33 | B | 0.36 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 action conditions.

(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 NYC Transit guidelines.

* denotes a significant impact based on CEQR criteria.

## Table 15-29
## 2013 Future With the Proposed Actions Subway Station Analysis
## Jay Street-Borough Hall IND 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O2/3 | South Facing Stairway @ | AM | 3.60 | 540 | 54 | 1 | 55 | 1.00 | 0.10 | A | 1.02 | 0.10 | A | |
| | 370 Jay Street South Portico | PM | 3.60 | 540 | 165 | 15 | 180 | 3.06 | 0.31 | A | 3.33 | 0.33 | A | |
| O11/12/13 | Stairway @ Keyspan Building | AM | 9.60 | 1,440 | 888 | 239 | 1,127 | 6.17 | 0.62 | B | 7.83 | 0.78 | C | |
| | East side of Jay Street | PM | 9.60 | 1,440 | 834 | 308 | 1,142 | 5.79 | 0.58 | B | 7.93 | 0.79 | C | |
| S3 | Stairway @ NW Corner | AM | 3.20 | 480 | 346 | 112 | 458 | 7.21 | 0.72 | C | 9.54 | 0.95 | C | |
| | Jay Street/Fulton Street | PM | 3.20 | 480 | 401 | 186 | 587 | 8.35 | 0.84 | C | 12.23 | 1.22 | D | 17.81 ≥ 6.00 * |
| S4 | Stairway @ NE Corner | AM | 3.20 | 480 | 420 | 472 | 892 | 8.75 | 0.88 | C | 18.58 | 1.86 | F | 43.15 ≥ 1.00 * |
| | Jay Street/Willoughby Street | PM | 3.20 | 480 | 406 | 567 | 973 | 8.46 | 0.85 | C | 20.27 | 2.03 | F | 53.63 ≥ 1.00 * |
| E317 | Up Escalator @ | AM | 4.00 | 1,050 | 707 | 51 | 758 | n/a | 0.67 | D | n/a | 0.72 | D | |
| | 370 Jay Street South Portico | PM | 4.00 | 1,050 | 282 | 8 | 290 | n/a | 0.27 | B | n/a | 0.28 | B | |
| E318 | Down Escalator @ | AM | 4.00 | 1,050 | 14 | 0 | 14 | n/a | 0.01 | A | n/a | 0.01 | A | |
| | 370 Jay Street South Portico | PM | 4.00 | 1,050 | 67 | 4 | 71 | n/a | 0.06 | A | n/a | 0.07 | 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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| N-102 | North Fare Array | | | | | | | | | |
| | Jay Street/MetroTech | | | | | | | | | |
| | 8 entry/exit turnstiles | AM | 4,440 | 1,744 | 239 | 1,983 | 0.39 | B | 0.45 | C |
| | 2 high entry/exit turnstiles | PM | 4,440 | 1,831 | 308 | 2,139 | 0.41 | C | 0.48 | C |
| N-103 | Central Fare Array | | | | | | | | | |
| | Jay Street/Willoughby Street | | | | | | | | | |
| | 8 entry/exit turnstiles | AM | 4,290 | 658 | 352 | 1,010 | 0.15 | A | 0.24 | B |
| | 1 high-revolving exit gate | PM | 4,290 | 855 | 587 | 1,442 | 0.20 | A | 0.34 | B |
| | 2 high-revolving exit gates | AM | 900 | 323 | 172 | 495 | 0.36 | B | 0.55 | C |
| | | PM | 900 | 138 | 7 | 145 | 0.15 | A | 0.16 | A |
| N–103 (H1&H2) | South Fare Array | | | | | | | | | |
| | Jay Street/Fulton Street | | | | | | | | | |
| | 2 high entry/exit turnstiles | AM | 1,950 | 643 | 112 | 755 | 0.33 | B | 0.39 | B |
| | 3 high-revolving exit gates | PM | 1,950 | 637 | 186 | 823 | 0.33 | B | 0.42 | C |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 4). Escalator capacity based on 70 person per minute.

(4) Persons per foot width of stairway per minute (not applicable to escalators).

(5) Width increment threshold needed to restore stairway to future no action conditions.

(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 NYC Transit guidelines.

* denotes a significant impact based on CEQR criteria.

*LAWRENCE STREET-METROTECH STATION (M,R)*

Subway trips using the Lawrence Street-MetroTech station en route to and from projected development sites would be distributed among four of the station's street stairs based upon the location of the development site and the direction of travel. These trips would be most concentrated at stair S1 at the southeast corner of Bridge and Willoughby streets which would be the closest stair to the projected commercial developments along Willoughby Street. As shown in Table 15-30, in the future with the proposed actions, all four analyzed stairways and both fare arrays at this station would operate at acceptable LOS C or better in both peak periods. Therefore, no significant impacts are expected at the Lawrence Street station with the proposed actions.

*ASSESSMENT OF TRANSFER ACTIVITY AT THE ATLANTIC AVENUE/PACIFIC STREET STATION COMPLEX*

As shown in Table 15-24, the proposed actions would generate 14 and 97 new subway trips entering and exiting the Atlantic Avenue/Pacific Street station complex in the AM and PM peak hours, respectively, fewer than the 200-trip *CEQR* threshold for a subway station impact analysis. The proposed actions would also, however, increase the potential for both subway-to-subway and commuter rail-to-subway transfer activity within the station complex (the complex also serves as the LIRR's Flatbush Avenue terminal). An evaluation of the potential for transfer activity at the Atlantic Avenue/Pacific Street station complex is therefore provided.

The Atlantic Avenue/Pacific Street station complex experiences subway-to-subway transfer activity between the complex's three subway stations, the Atlantic Avenue IRT station (2, 3, 4 and 5 trains), the Atlantic Avenue BMT station ( B and Q trains), and the Pacific Street BMT station (D, M, N, and R trains). However, given the relatively close proximity of many of the development sites to both IRT and BMT stations, it is anticipated that few if any subway trips generated by the proposed actions would involve subway-to-subway transfers at the Atlantic Avenue/Pacific Street complex. For example, the three projected commercial development sites along Willoughby Street (sites O, P and Q), are all within relatively close proximity of two stations served by BMT trains (DeKalb Avenue and Lawrence Street), as well as the Hoyt Street IRT station. Any transfer activity between BMT trains (such as from B or Q service to M or R service) would be more conveniently achieved via an across the platform transfer at DeKalb Avenue than by transferring between stations at Atlantic Avenue/Pacific Street. Similarly, the Nevins Street station offers a more convenient alternative for transfers between IRT trains than is available at Atlantic Avenue. Therefore, the proposed actions are not expected to generate a substantial number of transfers between the three subway stations within the Atlantic Avenue/Pacific Street station complex.

As discussed previously, it is estimated that trips via the LIRR would account for approximately 12 percent of all commuter trips to and from projected commercial development sites. These trips would total approximately 1,019 in the AM peak hour and 1,183 in the PM peak hour. These LIRR riders would typically walk, or transfer to and from the subway, for travel between the rail terminal and projected development sites. Based on existing travel patterns and the proximity of each respective site to the terminal, it is estimated that transfers between the LIRR

**Table 15-30**

**2013 Future With the Proposed Actions Subway Station Analysis**
**Lawrence Street-MetroTech BMT 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | Width Increment Threshold in Inches (5) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S1 | Stairway @ SE Corner | AM | 3.20 | 480 | 35 | 128 | 163 | 0.73 | 0.07 | A | 3.40 | 0.34 | A | |
| | Bridge Street/Willoughby Street | PM | 3.20 | 480 | 32 | 154 | 186 | 0.67 | 0.07 | A | 3.88 | 0.39 | A | |
| S4 | Stairway @ SE Corner | AM | 3.20 | 480 | 64 | 24 | 88 | 1.33 | 0.13 | A | 1.83 | 0.18 | A | |
| | Willoughby Street/Lawrence Street | PM | 3.20 | 480 | 46 | 30 | 76 | 0.96 | 0.10 | A | 1.58 | 0.16 | A | |
| S6 | Stairway @ SE Corner | AM | 3.13 | 470 | 247 | 24 | 271 | 5.26 | 0.53 | B | 5.77 | 0.58 | B | |
| | Lawrence Street/Willoughby Street | PM | 3.13 | 470 | 178 | 30 | 208 | 3.79 | 0.38 | A | 4.43 | 0.44 | A | |
| S7 | Stairway @ NE Corner | AM | 3.33 | 500 | 294 | 89 | 383 | 5.89 | 0.59 | B | 7.67 | 0.77 | C | |
| | Lawrence Street/Willoughby Street | PM | 3.33 | 500 | 364 | 106 | 470 | 7.29 | 0.73 | C | 9.41 | 0.94 | C | |

**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 | 2013 No Build V/C Ratio | 2013 No Build LOS | 2013 Build V/C Ratio | 2013 Build LOS |
|---|---|---|---|---|---|---|---|---|---|---|
| C-003 | West Fare Array | | | | | | | | | |
| | Lawrence Street/Willoughby Street | | | | | | | | | |
| | 5 entry/exit turnstiles | AM | 2,400 | 778 | 138 | 916 | 0.32 | B | 0.38 | B |
| | | PM | 2,400 | 789 | 166 | 955 | 0.33 | B | 0.40 | B |
| C-004 | East Fare Array | | | | | | | | | |
| | Bridge Street/Willoughby Street | | | | | | | | | |
| | 2 high entry/exit turnstiles (7) | AM | 1,500 | 166 | 127 | 293 | 0.11 | A | 0.20 | A |
| | 2 high-revolving exit gates (7) | PM | 1,500 | 162 | 154 | 316 | 0.11 | A | 0.21 | B |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 action conditions.

(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 NYC Transit guidelines.

(7) Token booth C-004 and 3 entry/exit turnstiles closed in August 2003. Two high entry/exit turnstiles and 2 exit gates open at all times.

* denotes a significant impact based on CEQR criteria.

and the subway would total approximately 545 trips in the AM peak hour and 659 in the PM peak hour. These trips would be distributed among the various fare arrays serving the three subway stations that comprise this complex, and would add to demand along the central corridor that connects the stations to the LIRR concourse. As previously discussed, by 2005 a major reconstruction of the complex will have been completed, including the renovation and expansion of the LIRR concourse, reconfigured and expanded fare arrays, and widening of the central connecting corridor. For example, the fare array providing access directly from the LIRR concourse to the Atlantic Avenue IRT station would be reconfigured and expanded to include ten turnstiles. Even assuming that all LIRR-subway transfer trips used this single fare array, during any peak 15-minutes these trips would still amount to only five percent of this one array's capacity in either the AM or PM. (Trips entering or exiting the subway complex directly from a projected development site without transferring to/from the LIRR would total 0.6 percent.) Given that LIRR-subway transfer trips would be distributed at fare arrays throughout the station complex and would not utilize any street stair, it is unlikely that these trips, in combination with the relatively small number of new subway-only trips entering and exiting the complex directly, would result in significant adverse impacts to these newly renovated and expanded facilities.

*LINE HAUL*

As discussed above, the proposed actions would generate a net total of 6,013 inbound and 691 outbound trips by subway in the AM peak hour, and 1,163 inbound and 7,408 outbound in the PM peak hour. These trips would be distributed among the numerous subway lines serving Downtown Brooklyn both to and from Brooklyn and to and from Manhattan. An analysis of subway line haul conditions at the peak load point on each route with the addition of these trips in the future with the proposed actions is shown in Table 15-31.

Given the study area's location outside of the Manhattan Central Business District (CBD) and the predominant directions of travel for project-generated trips in each peak period (inbound to Downtown Brooklyn in the AM and outbound in the PM), it is anticipated that much of this new demand would not occur at the peak load points in the peak direction of travel. For example, AM peak hour trips traveling on A and C trains en route to the project's commercial components from outlying areas of Brooklyn and southeastern Queens would exit the subway system in Downtown Brooklyn before reaching the peak load point on these lines (located west of the Jay Street-Borough Hall station). By contrast, AM peak hour project-generated trips originating in Downtown Brooklyn (i.e., from the project's residential components) en route to Manhattan and the Bronx via A and C trains would pass through the peak load point on these routes as the trains headed west from the Jay Street-Borough Hall station.

In addition, the predominant direction of travel for project demand en route to and from the Bronx, Manhattan, Staten Island, and the northern and western suburbs would be eastbound to Brooklyn in the AM and westbound towards Manhattan in the PM, opposite the direction of peak subway ridership during these periods. Overall, it is estimated that approximately 27 percent of peak direction subway trips generated by the proposed actions would occur at the peak load points in Downtown Brooklyn in the AM and PM peak periods.

## Table 15-31
## 2013 Future With the Proposed Actions Subway Line Haul Analysis

| Route | Peak Hour | Peak Direction | Trains per Hour (1) | Cars per Hour (1) | Available Capacity (2) | 2013 No Build Passengers per Hour (3) | 2013 No Build V/C Ratio (4) | 2013 Future With the Proposed Actions Passengers per Hour | 2013 Future With the Proposed Actions V/C Ratio (4) | 2013 Future With the Proposed Actions Avg. Added Passengers per Car |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | AM | Manhattan-Bound | 10 | 100 | 12000 | 8,817 | 0.73 | 9,149 | 0.76 | 3.3 |
| | PM | Brooklyn-Bound | 9 | 90 | 10800 | 6,691 | 0.62 | 7,071 | 0.65 | 4.2 |
| 3 | AM | Manhattan-Bound | 9 | 90 | 10800 | 8,534 | 0.79 | 8,864 | 0.82 | 3.7 |
| | PM | Brooklyn-Bound | 8 | 80 | 9600 | 9,139 | 0.95 | 9,518 | 0.99 | 4.7 |
| 4 | AM | Manhattan-Bound | 15 | 150 | 18000 | 12,363 | 0.69 | 12,412 | 0.69 | 0.3 |
| | PM | Brooklyn-Bound | 13 | 130 | 15600 | 10,735 | 0.69 | 10,804 | 0.69 | 0.5 |
| 5 | AM | Manhattan-Bound | 11 | 110 | 13200 | 11,426 | 0.87 | 11,474 | 0.87 | 0.4 |
| | PM | Brooklyn-Bound | 10 | 100 | 12000 | 10,014 | 0.83 | 10,084 | 0.84 | 0.7 |
| A | AM | Manhattan-Bound | 18 | 144 | 31680 | 20,026 | 0.63 | 20,162 | 0.64 | 0.9 |
| | PM | Brooklyn-Bound | 16 | 128 | 28160 | 12,954 | 0.46 | 13,166 | 0.47 | 1.7 |
| B | AM | Manhattan-Bound | 10 | 80 | 17600 | 12,877 | 0.73 | 13,004 | 0.74 | 1.6 |
| | PM | Brooklyn-Bound | 9 | 72 | 15840 | 10,615 | 0.67 | 10,773 | 0.68 | 2.2 |
| C | AM | Manhattan-Bound | 8 | 64 | 11520 | 5,385 | 0.47 | 5,443 | 0.47 | 0.9 |
| | PM | Brooklyn-Bound | 7 | 56 | 10080 | 3,215 | 0.32 | 3,355 | 0.33 | 2.5 |
| D | AM | Manhattan-Bound | 10 | 80 | 17600 | 19,062 | 1.08 | 19,184 | 1.09 | 1.5 |
| | PM | Brooklyn-Bound | 9 | 72 | 15840 | 20,154 | 1.27 | 20,301 | 1.28 | 2.0 |
| F | AM | Manhattan-Bound | 15 | 120 | 26400 | 17,551 | 0.66 | 17,780 | 0.67 | 1.9 |
| | PM | Brooklyn-Bound | 12 | 96 | 21120 | 18,692 | 0.89 | 18,963 | 0.90 | 2.8 |
| M | AM | Manhattan-Bound | 6 | 48 | 8640 | 4,216 | 0.49 | 4,289 | 0.50 | 1.5 |
| | PM | Brooklyn-Bound | 6 | 48 | 8640 | 5,413 | 0.63 | 5,498 | 0.64 | 1.8 |
| N | AM | Manhattan-Bound | 10 | 100 | 18000 | 6,750 | 0.38 | 6,882 | 0.38 | 1.3 |
| | PM | Brooklyn-Bound | 9 | 90 | 16200 | 6,801 | 0.42 | 6,954 | 0.43 | 1.7 |
| Q | AM | Manhattan-Bound | 10 | 100 | 18000 | 12,877 | 0.72 | 12,960 | 0.72 | 0.8 |
| | PM | Brooklyn-Bound | 9 | 90 | 16200 | 10,615 | 0.66 | 10,713 | 0.66 | 1.1 |
| R | AM | Manhattan-Bound | 10 | 80 | 17600 | 6,030 | 0.34 | 6,157 | 0.35 | 1.6 |
| | PM | Brooklyn-Bound | 10 | 80 | 17600 | 6,899 | 0.39 | 7,081 | 0.40 | 2.3 |

**Notes:**

(1) Based on NYC Transit Fall 2004 service plan after restoration of full service across the Manhattan Bridge and completion of the Stillwell Avenue terminal reconstruction. Service changes include:
Q-express service replaced by B trains in Brooklyn and N trains in Manhattan.
D trains replace W service in Brooklyn.
N trains routed over Manhattan Bridge; bypass DeKalb Avenue.

(2) Capacity based on 120 passengers/car for 51' cars, 180 passengers/car for 60' cars and 220 passengers/car for 75' cars as per CEQR criteria.

(3) 2013 No Build demand based on NYC Transit projections for Fall 2004 at the Downtown Brooklyn peak load points increased by 0.5 percent/year background growth and demand from No Build sites.

(4) Volume-to-capacity ratio.

**As the 2013 No Build and Build analyses are based on peak load point data and reflect changes due to the Manhattan Bridge and Stillwell Avenue terminal projects, the 2013 No Build and Build analyses are not directly comparable to the analysis of 2002 Existing conditions.**

As shown in Table 15-31, in the future with the proposed actions, D trains would continue to operate over capacity in the peak direction at their peak load point in both the AM and PM peak hours, with v/c ratios of 1.09 and 1.28, respectively, compared to 1.08 and 1.27, respectively in the No Build condition. Brooklyn-bound No. 3 trains would operate essentially at capacity in the PM peak hour with a v/c ratio of 0.99 compared to 0.95 in the No Build. In the AM, these trains would operate at a v/c ratio of 0.82 through the peak load point in the peak Manhattan-bound direction. Brooklyn-bound F trains would operate with a v/c ratio of 0.90 in the PM peak hour compared to 0.89 in the No Build condition. In the AM, these trains would operate at a v/c ratio of 0.67 in the peak Manhattan-bound direction. No. 5 trains would operate at a v/c ratio of 0.87 in the peak Manhattan-bound direction in the AM peak hour and 0.84 in the peak Brooklyn-bound direction in the PM. All other routes would continue to operate at a v/c ratio of less than 0.80 in the peak direction in each peak hour in the future with the proposed actions.

Under CEQR criteria, any increases in load levels that remain within practical capacity limits are generally not considered significant impacts. Projected increases from a No Build condition to a Build condition that exceed practical capacity may be considered significant impacts if the proposed action generates five or more additional passengers per car. As demonstrated by the analysis shown in Table 15-31, all subway routes through Downtown Brooklyn are expected to operate below their practical capacity in the peak direction in each peak hour with the exception of the D route. As the proposed actions would add an average of 1.5 peak direction passengers per car in the AM and 2.0 in the PM to trains on this route, less than the five passengers per car CEQR impact threshold, D trains would not be impacted under CEQR criteria. Brooklyn-bound No. 3 trains would operate close to their practical capacity in the PM peak hour with a v/c ratio of 0.99. The proposed actions would increase demand on this route by an average of 4.7 passengers per car, also less than the 5.0 passengers per car CEQR impact threshold. As all other routes would continue to operate below capacity through their peak load points in each peak hour, the proposed actions are not expected to result in significant adverse impacts to subway line haul conditions in Downtown Brooklyn under CEQR criteria.

## BUS SERVICE

As shown in Table 14-11, the projected development that is expected to occur with the proposed actions would generate an estimated 546 inbound and 83 outbound local bus trips in the AM peak hour, and 211 inbound and 782 outbound local bus trips in the PM peak hour. These trips were assigned to the 15 NYC Transit local bus routes serving the Downtown Brooklyn study area based on existing demand patterns and the proximity of each route to individual development sites. Table 15-32 shows the conditions on these local bus routes in the future with the proposed actions. As shown in Table 15-32, all analyzed local bus routes would continue to operate with available capacity in both peak hours at their maximum load points with the exception of eastbound B25 service. In the PM peak hour, eastbound B25 buses would experience a capacity shortfall of 43 spaces at their maximum load point at Fulton Street and Nostrand Avenue. This compares to a capacity surplus of 21 spaces in the future without the proposed actions. According to current NYC Transit guidelines, increases in bus load levels to above their maximum capacity at any load point is considered a significant impact as it would necessitate the addition of more bus service along that route. Therefore, based on this criteria, the B25 route would be significantly impacted by new demand generated by the proposed actions in the PM peak hour.

## Table 15-32
## 2013 Future With the Proposed Actions Local Bus Conditions

| Peak Hour (1) | Route | Peak Direction | Maximum Load Point | Peak Hour Buses | No Build Available Capacity (2) | Project Increment | Build Available Capacity (2) | Notes |
|---|---|---|---|---|---|---|---|---|
| AM | B25 | WB | Fulton St./Nostrand Ave. | 7 | 62 | 32 | 30 | |
| | B26 | WB | Halsey St./Nostrand Ave. | 11 | 77 | 53 | 24 | |
| | B37 | NB | Third Ave./39th St. | 5 | 126 | 13 | 113 | |
| | B38 | WB | DeKalb Ave./Vanderbilt Ave. | 23 | 149 | 111 | 38 | |
| | B41 | NB | Flatbush Ave./Church Ave. | 25 | 281 | 107 | 174 | (3) |
| | B45 | WB | St. Johns Pl./Nostrand Ave. | 8 | 151 | 25 | 126 | |
| | B51 | WB | Tillary St./Bridge St. | 4 | 156 | 7 | 149 | |
| | B52 | WB | Nostrand Ave./Gates Ave. | 11 | 65 | 51 | 14 | |
| | B54 | WB | Vanderbilt Ave./Myrtle Ave. | 10 | 107 | 50 | 57 | |
| | B57 | WB | Flushing Ave./Nostrand Ave. | 5 | 118 | 18 | 100 | |
| | B61 | NB | Atlantic Ave./Hicks St. | 7 | 89 | 32 | 57 | |
| | B63 | NB | Fifth Ave./36th St. | 6 | 63 | 4 | 59 | |
| | B65 | WB | Bergen St./Washington St. | 6 | 149 | 3 | 146 | |
| | B67 | NB | Seventh Ave./Union St. | 6 | 100 | 22 | 78 | |
| | B75 | NB | 9th St./Smith Street | 6 | 197 | 15 | 182 | |
| PM | B25 | EB | Fulton St./Nostrand Ave. | 8 | 21 | 64 | -43 | |
| | B26 | EB | Halsey St./Nostrand Ave. | 10 | 89 | 73 | 16 | |
| | B37 | SB | Third Ave./9th Street | 5 | 107 | 21 | 86 | |
| | B38 | EB | Fulton St./DeKalb Ave. | 16 | 149 | 118 | 31 | |
| | B41 | SB | Flatbush Ave./Church Ave. | 24 | 176 | 166 | 10 | |
| | B45 | EB | Nostrand Ave./St. Johns Pl. | 7 | 55 | 43 | 12 | |
| | B51 | EB | Canal St./Bowery | 4 | 114 | 17 | 97 | |
| | B52 | EB | Fulton St./Green Ave. | 10 | 144 | 63 | 81 | |
| | B54 | EB | Vanderbilt Ave./Myrtle Ave. | 8 | 97 | 61 | 36 | |
| | B57 | EB | Flushing Ave./Nostrand Ave. | 6 | 122 | 39 | 83 | |
| | B61 | SB | Smith St./Livingston St. | 6 | 148 | 36 | 112 | |
| | B63 | SB | Fifth Ave./50th St. | 6 | 62 | 11 | 51 | |
| | B65 | EB | Dean St./Franklin Ave. | 6 | 185 | 6 | 179 | |
| | B67 | SB | Seventh Ave./Union St. | 6 | 76 | 41 | 35 | |
| | B75 | SB | Smith St./Livingston St. | 5 | 126 | 23 | 103 | |

Notes:

(1) Peak Hours: weekday 8-9 AM and 5-6 PM.

(2) Available capacity based on a maximum of 70 passengers for a standard 40-seat bus as per CEQR criteria.

(3) Combined local and limited service.

## COMMUTER VAN SERVICE

As discussed previously, commuter van services within Downtown Brooklyn generally operate along the Schermerhorn Street and Livingston Street corridors. Street closures and other changes to the study area traffic network associated with the proposed actions are not expected to adversely affect the operation of these van services. While the development that is expected to occur with the proposed actions would likely increase demand for commuter vans, the overall numbers of new trips are expected to be very small relative to other modes.

## LONG ISLAND RAIL ROAD COMMUTER RAIL SERVICE

It is estimated that the commuter rail mode would account for approximately 12 percent of commuter trips to and from projected development sites. These trips would therefore total approximately 1,019 in the AM peak hour and 1,183 in the PM peak hour. Depending on the location of each site with respect to the Long Island Rail Road's Flatbush Avenue terminal, LIRR riders would typically walk or transfer to and from the subway for travel between the rail terminal and projected development sites. These commuter rail trips have therefore been assigned to either the subway or walk modes for the purposes of the impact analyses.

## FERRY SERVICES

It is anticipated that approximately five percent of new trips en route to and from projected development sites (529 in the AM peak hour and 792 in the PM) would utilize either the Staten Island Ferry or one of several privately-operated services from New Jersey for one leg of their trips to and from Downtown Brooklyn. These trips would typically include the subway mode (primarily M and R trains) for access between Downtown Brooklyn and ferry landings in Manhattan. The proposed actions may generate some additional demand for New York Water Taxi's service at Fulton Landing, however the distance between this ferry terminal and the majority of projected development sites may limit its potential utility to this new market.

## PEDESTRIANS

Implementation of the proposed actions would result in physical and operational changes to analyzed pedestrian facilities and traffic conditions along the Willoughby Street corridor and Red Hook Lane. As shown in Figure 15-4, Willoughby Street would be widened (from 60 feet to 95 feet) between Flatbush Avenue Extension and Albee Square West/Gold Street, providing for a new median and 30 feet of roadway width in each direction. Willoughby Street would be converted to one-way westbound operation from Albee Square West/Gold Street to Duffield Street. Duffield Street would be converted from northbound to southbound operation south of Willoughby Street. A new public space—Willoughby Square—would be created on Site P bounded on the north by Willoughby Street and on the south by a new eastbound private drive connecting Duffield Street to Albee Square West. The proposed actions would include a requirement for five-foot sidewalk extensions within the building lines (i.e., setbacks) for sidewalks on the south side of Willoughby Street between Adams Street and Flatbush Avenue Extension, except between Duffield Street and Albee Square West/Gold Street adjacent to the new public space. The analyses assume the implementation of these extensions between Flatbush Avenue Extension and Albee Square West (location 1 in Figure 15-4), and between Duffield and Bridge Streets (location 7 in Figure 15-4), adjacent to the two projected commercial development sites that would front Willoughby Street (sites O and Q). All other

sidewalks were conservatively assumed to remain at their existing widths in the future with the proposed actions.

The proposed actions would also include the demapping and closure of Red Hook Lane from Boerum Place to Fulton Street. The closure of the two sidewalks flanking Red Hook Lane would result in the diversion of approximately 187 pedestrians in the AM peak hour and 152 in the PM to the east sidewalk along Boerum Place.

It should be noted that the proposed development of the Willoughby Square public space would provide additional pathways for pedestrians, potentially reducing demand on nearby sidewalks. However, the analyses of pedestrian conditions in the future with the proposed actions conservatively assigned all pedestrian demand to sidewalks and crosswalks.

In addition to physical and operational changes to pedestrian facilities, the proposed actions would also generate new pedestrian demand on analyzed sidewalks, corner areas and crosswalks. This 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. New pedestrian demand along the Willoughby Street corridor would be generated primarily by the projected commercial developments on sites O, P and Q. It is expected that these new buildings would have their primary entrances at midblock locations facing Willoughby Square on Duffield Street (Site O), the new private drive on the south side of the square (Site P) and Albee Square West (Site Q). As shown in Table 14-11, these three developments would generate a combined net total of 5,236 walk, subway and bus trips in the AM peak hour, 8,796 in the midday, and 6,787 in the PM peak hour. The projected commercial development on Site M, which would encompass the former right-of-way of Red Hook Lane, would generate a combined net total of 1,354 walk, subway and bus trips in the AM peak hour, 3,194 in the midday, and 2,110 in the PM. It is expected that the pedestrian entrance to this building would be located at the corner of Fulton Street and Boerum Place. Tables 15-33 and 15-34 show conditions on analyzed sidewalks, corner areas and crosswalks with the addition of this new demand and the physical and operational changes to pedestrian facilities discussed above.

According to *CEQR* criteria, a significant impact to a sidewalk in Downtown Brooklyn occurs when the flow rate increases by two or more pedestrians per foot per minute (PFM) over No Build conditions characterized by flow rates over 15 PFM (the threshold of LOS D/E). Platoon flow rates are used for assessing impacts. As shown in Table 15-33, all analyzed sidewalks would continue to operate at LOS D or better under platoon conditions in both peak periods in the future with the proposed actions. As flow rates would remain below 14 PFM in all cases, no analyzed sidewalk would be impacted by project trips under CEQR criteria.




Not To Scale

(9) Analyzed Location  Subway Stair  Signalized Intersection  Projected Development Site

**Table 15-33**
**2013 Future Action Pedestrian Conditions**
**Sidewalks**

| 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 | | Persons per Foot per Min. (PFM) | | Level of Service | |
| | | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| 1 | **Willoughby Street** Flatbush Avenue to Albee Square West | South | 11.0 | 494 | 636 | 3.0 | 3.9 | A | A | 7.0 | 7.9 | B | C |
| 2 | **Albee Square West** Willoughby Street to Fulton Street | East | 6.5 | 588 | 762 | 6.0 | 7.8 | B | C | 10.0 | 11.8 | D | D |
| 3 | **Albee Square West** Willougby Street to Fulton Street | West | 5.5 | 152 | 175 | 1.8 | 2.1 | A | A | 5.8 | 6.1 | B | B |
| 4 | **Willoughby Street** Albee Square West to Duffield Street | South | 10.0 | 334 | 465 | 2.2 | 3.0 | A | A | 6.2 | 7.0 | B | C |
| 5 | **Duffield Street** Willoughby Street to Fulton Street | East | 5.0 | 245 | 282 | 3.3 | 3.8 | A | A | 7.3 | 7.8 | C | C |
| 6 | **Duffield Street** Willoughby Street to Fulton Street | West | 10.0 | 412 | 534 | 2.8 | 3.6 | A | A | 6.8 | 7.6 | B | C |
| 7 | **Willoughby Street** Duffield Street to Bridge Street | South | 12.0 | 833 | 914 | 4.6 | 5.1 | A | B | 8.6 | 9.1 | C | C |
| 8 | **Willoughby Street** Bridge Street to Lawrence Street | South | 7.0 | 598 | 719 | 5.7 | 6.9 | B | B | 9.7 | 10.9 | C | D |
| 9 | **Willoughby Street** Lawrence Street to Jay Street | South | 7.5 | 396 | 616 | 3.5 | 5.5 | A | B | 7.5 | 9.5 | C | C |
| 10 | **Willoughby Street** Lawrence Street to Jay Street | North | 6.5 | 898 | 929 | 9.2 | 9.5 | C | C | 13.2 | 13.5 | D | D |
| 11 | **Willoughby Street** Bridge Street to Lawrence Street | North | 5.0 | 477 | 561 | 6.4 | 7.5 | B | C | 10.4 | 11.5 | D | D |
| 12 | **Willoughby Street** Duffield Street to Bridge Street | North | 6.5 | 381 | 462 | 3.9 | 4.7 | A | A | 7.9 | 8.7 | C | C |
| 23 | **Boerum Place** Fulton Street to Livingston Street | East | 10.0 | 311 | 314 | 2.1 | 2.1 | A | A | 6.1 | 6.1 | B | B |

* Denotes a significant impact.

**Table 15-34**
**2013 Future Action Pedestrian Conditions**
**Corner Areas and Crosswalks**

**CORNER ANALYSIS**

| Map No. | Intersection | Corner | Curb Radii (Feet) | Peak 15 Min. Volumes | | Average Ped. Space (SF/Ped) | | Level of Service | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AM | PM | AM | PM | AM | PM |
| 13 | Willoughby Street & Flatbush Avenue | Southwest | 12 | 410 | 477 | 102 | 84 | A | A |
| 14 | Willoughby Street & Albee Square West | Southeast | 12 | 323 | 394 | 39 | 25 | C | C |
| 15 | Willoughby Street & Albee Square West | Southwest | 12 | 36 | 58 | 40 | 31 | B | C |
| 16 | Willoughby Street & Bridge Street | Southeast | 12 | 221 | 178 | 57 | 50 | B | B |
| 17 | Willoughby Street & Bridge Street | Southwest | 12 | 127 | 124 | 36 | 45 | C | B |
| 18 | Willoughby Street & Jay Street | Northeast | 12 | 653 | 672 | 20 | 15 | D | D |

**CROSSWALK ANALYSIS**

| Map No. | Intersection | Crosswalk | Curb to Curb Street Width (Ft.) | Crosswalk Width (Ft.) | Peak 15 Min. Volumes | | Conflicting Vehicle Volume with Pedestrians (Veh/15min) | | With Vehicles: Average Ped. Space (SF/Ped) | | With Vehicles: Level of Service | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | AM | PM | AM | PM | AM | PM | AM | PM |
| 19 | Flatbush Avenue & Willoughby Street | South | 60.0 | 13.0 | 126 | 184 | 28 | 92 | 45 | 21 | B | D |
| | | West | 65.0 | 17.0 | 179 | 184 | 30 | 6 | 81 | 82 | A | A |
| 20 | Willoughby Street & Albee Square West | South | 36.0 | 10.3 | 384 | 520 | 0 | 0 | 15 | 10 | *E | *E |
| | | East | 65.0 | 11.8 | 41 | 59 | 71 | 166 | 284 | 157 | A | A |
| | | West | 33.0 | 11.3 | 80 | 86 | 121 | 140 | 80 | 66 | A | A |
| 21 | Willoughby Street & Bridge Street | South | 29.5 | 13.5 | 593 | 612 | 79 | 71 | 47 | 46 | B | B |
| | | East | 28.6 | 13.5 | 181 | 282 | 0 | 0 | 79 | 48 | A | B |
| | | West | 28.6 | 11.5 | 223 | 81 | 0 | 0 | 53 | 158 | B | A |
| 22 | Willoughby Street & Jay Street | North | 51.5 | 11.5 | 392 | 483 | 30 | 29 | 15 | 12 | D | *E |
| | | East | 31.0 | 12.5 | 428 | 599 | 0 | 0 | 26 | 17 | D | D |

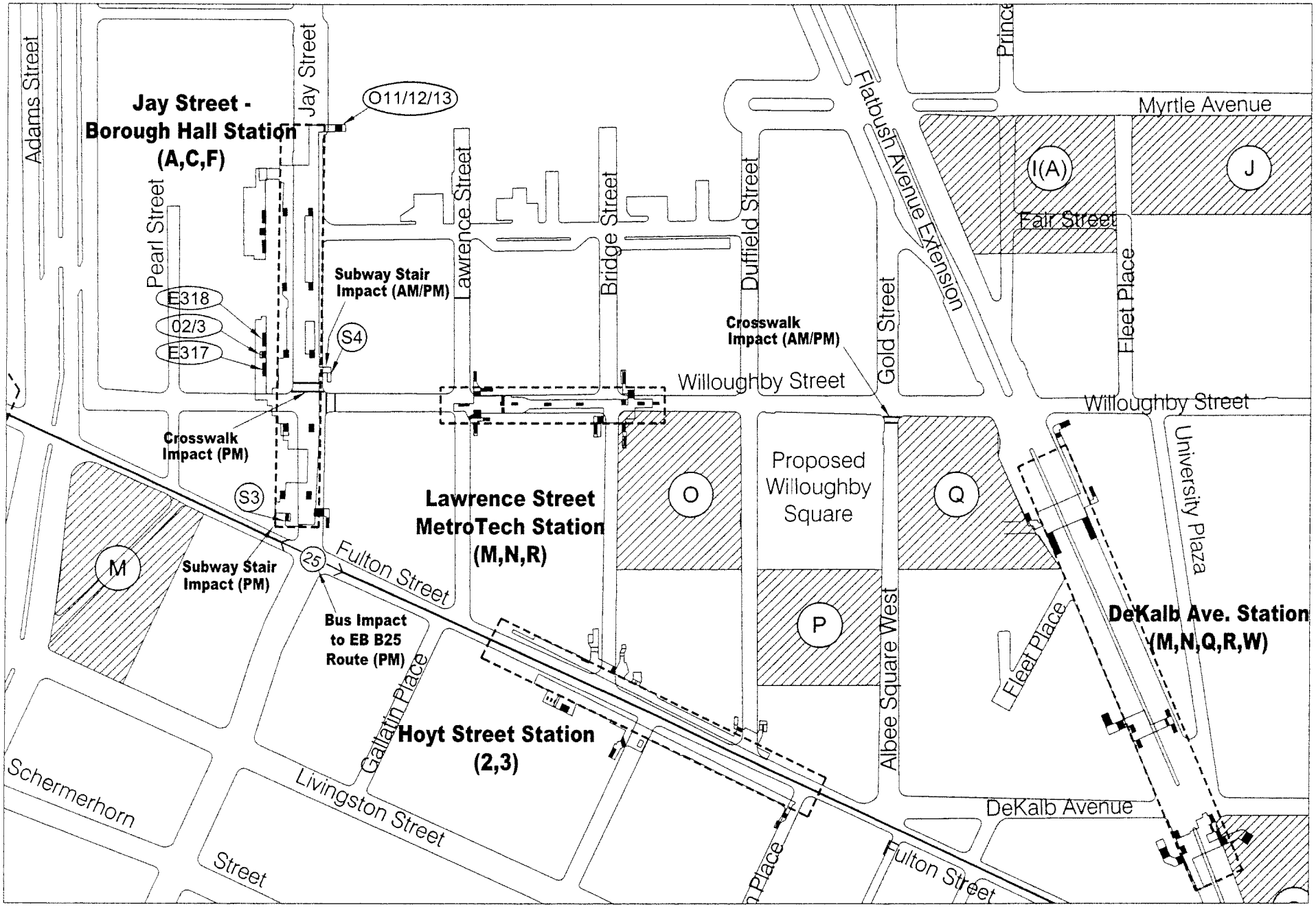
* Denotes a significant impact.

For crosswalk and corner areas within Downtown Brooklyn, *CEQR* criteria define a significant impact as a decrease in pedestrian space of one or more square feet per pedestrian (SF/ped) when the No Build condition has an average occupancy of 15 SF/ped (the LOS D/E threshold) or less. A deterioration from LOS C or better to LOS E or F would also be considered a significant impact. As shown in Table 15-34, under these criteria, two crosswalks would be impacted by demand from projected developments in one or both peak hours. At the intersection of Willoughby and Jay Streets, the north crosswalk on Jay Street would be impacted in the PM peak hour with LOS E conditions (12 SF/ped) compared to LOS E (14 SF/ped) in the No Build. Further east, the south crosswalk on Albee Square West at Willoughby Street would be impacted by new demand in both peak hours, deteriorating from LOS A to LOS E in the AM and from LOS B to LOS E in the PM. All other analyzed crosswalks and corner areas would continue to operate at LOS D or better with 15 SF/ped or greater in both peak hours in the future with the proposed actions.

Although more pedestrian trips would be generated by sites M, O, P and Q in the midday than in either the AM or PM, midday trips would be more dispersed and less concentrated on the analyzed sidewalks, corner areas and crosswalks connecting these sites to subway station entrances and bus stops. Midday impacts over and above those identified for the AM and PM peak hours are therefore considered unlikely.

## E. CONCLUSIONS

This chapter analyzes the effects of added travel demand from projected development sites on subway stations, local bus services and pedestrian facilities within Downtown Brooklyn during the AM and PM peak hours. The results of the analyses show that demand from projected development sites would significantly impact two street stairs at the Jay Street-Borough Hall subway station in one or both peak periods. As shown in Figure 15-5, stair S3 at the northwest corner of Jay and Fulton streets would be impacted in the PM peak hour, while stair S4 at the northeast corner of Jay and Willoughby streets would be impacted in both the AM and the PM. In addition, bus trips generated by the projected development sites would result in a significant PM peak hour impact to NYC Transit's B25 bus route in the peak eastbound direction. Lastly, as shown in Figure 15-5, pedestrian trips en route to and from projected development sites would impact the north crosswalk at the intersection of Willoughby and Jay Streets, along with the south crosswalk on Albee Square West at Willoughby Street. Chapter 20, "Mitigation," provides a description of measures to be developed to mitigate the transit and pedestrian impacts identified in this chapter. ❖


Jay Street - Borough Hall Station (A,C,F)
O11/12/13
Jay Street
Adams Street
Pearl Street
E318
02/3
E317
Subway Stair Impact (AM/PM)
S4
Lawrence Street
Bridge Street
Duffield Street
Flatbush Avenue Extension
Prince
Myrtle Avenue
I(A)
J
Fair Street
Fleet Place
Gold Street
Crosswalk Impact (AM/PM)
Willoughby Street
Willoughby Street
Crosswalk Impact (PM)
S3
Lawrence Street MetroTech Station (M,N,R)
O
Proposed Willoughby Square
Q
University Plaza
M
Subway Stair Impact (PM)
25
Fulton Street
Bus Impact to EB B25 Route (PM)
P
Albee Square West
Fleet Place
DeKalb Ave. Station (M,N,Q,R,W)
Gallatin Place
Hoyt Street Station (2,3)
Schermerhorn
Livingston Street
Street
DeKalb Avenue
Fulton Street
S4 Analyzed Stairway/ Escalator
P Projected Development Site

## A. INTRODUCTION

This section identifies and quantifies all the significant direct and indirect air quality impacts of the proposed actions in Downtown Brooklyn. As described in detail in Chapter 1, "Project Description," the Downtown Brooklyn Development calls for the rezoning and other land use actions to stimulate the development of mixed-use, academic, cultural, residential, and retail uses. Direct effects stem from emissions generated by stationary sources, such as emissions from fuel burned at the projected development sites for heating, ventilation, and air conditioning (HVAC) systems. Indirect effects are caused by emissions from motor vehicles traveling to and from the projected development sites (mobile sources) after completion. In addition, potential effects of stationary source emissions from existing industrial facilities on nearby proposed residential uses are assessed.

The results discussed below show that the maximum predicted carbon monoxide (CO), and particulate matter ($PM_{10}$ and $PM_{2.5}$) concentrations from mobile sources would be less than the corresponding ambient air standards, with the development of the projected development sites under the proposed actions. The cumulative parking garage analysis also determined that the project's public parking facilities would not result in any significant adverse air quality impacts. Thus, the proposed actions would not have significant adverse impacts from mobile source emissions.

A stationary source screening analysis and subsequent detailed dispersion modeling determined that there would be no potential significant adverse air quality impacts from emission of nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$) and $PM_{10}$, from the proposed HVAC systems of the projected development sites. With respect to $PM_{2.5}$,an (E) designation has been placed on projected development site BB (Block 165, Lot 29), which stipulates that any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilating, and air conditioning stack(s) is located at least 115 feet from the lot line facing Hoyt Street and parallel with Schermerhorn Street, to avoid any potential significant air quality impacts. In addition, there would be no significant adverse air quality impacts from industrial facilities on the proposed developments sites.

## B. POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Typically, ambient concentrations of CO and lead are predominantly influenced by mobile source emissions. Emissions of nitrogen oxides (NO and $NO_2$, collectively referred to as $NO_x$) come from both mobile and stationary sources. Emissions of sulfur dioxide ($SO_2$) are associated mainly with stationary sources, but diesel-powered vehicles, primarily heavy-duty trucks and buses, also contribute. Particulate matter (PM) is emitted from both stationary and mobile sources. Fine

particulate matter is also formed when emissions of $NO_x$, sulfur oxides ($SO_x$), ammonia, organic compounds, and other gases react in the atmosphere. Ozone is formed in the atmosphere by a complex photochemical processes that include $NO_x$ and volatile organic compounds (VOCs), emitted mainly from industrial processes and mobile sources.

## CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In New York City, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near crowded intersections along heavily traveled and congested roadways. Consequently, CO concentrations must be predicted on a localized or microscale basis. The proposed actions would increase traffic volumes on streets within and surrounding the rezoning area and could result in localized increases in CO levels. Therefore, a mobile source analysis was conducted to evaluate future CO concentrations with and without the proposed actions.

## NITROGEN OXIDES AND VOLATILE ORGANIC COMPOUNDS

Nitrogen oxides and volatile organic compounds are of principal concern because of their role as precursors in the formation of ozone. The standard for average annual $NO_2$ concentrations is normally applied only for fossil fuel energy sources. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are diffusing downwind, ozone concentrations are often increased many miles from the sources of the precursor pollutants. The effects of $NO_x$ emissions from mobile sources are therefore generally examined on a regional basis. The change in regional mobile source emissions of these pollutants is related to the total number of vehicle trips and the vehicle miles traveled throughout the New York metropolitan area. The proposed actions would not have a significant effect on the overall volume of vehicular travel in the metropolitan area; therefore, it would not have any measurable impact on regional $NO_x$ emissions or on ozone levels. An analysis of project-related impacts from mobile sources for these pollutants was therefore not warranted. Potential impacts from fuel to be burned for the proposed actions' HVAC systems were evaluated.

## LEAD

Lead emissions are principally associated with industrial sources and motor vehicles that use gasoline-containing lead additives. Most U.S. vehicles produced since 1975, and all vehicles produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced older ones, motor-vehicle-related lead emissions have decreased. As a result, ambient concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one quarter the level in 1975.

In 1985, the EPA announced new rules drastically reducing the amount of lead permitted in leaded gasoline. Monitored concentrations of lead indicate that this action has been effective in significantly reducing atmospheric lead levels. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the national standard of 1.5 micrograms per cubic meter (3-month average). No significant sources of lead are associated with the proposed actions. Therefore, no analysis for this pollutant was warranted.

### RESPIRABLE PARTICULATE MATTER—$PM_{10}$ AND $PM_{2.5}$

Particulate matter is emitted into the atmosphere from a variety of sources: industrial facilities, power plants, construction activity, and other smaller sources, as well as some natural sources. Gasoline-powered vehicles emit relatively small quantities of particles. Exhaust emitted from diesel-powered vehicles, especially heavy trucks and buses, contain large quantities of particles, and therefore respirable particulate matter concentrations may be locally elevated near roadways with high volumes of such vehicles (e.g., in the vicinity of bus depots or truck marshaling yards). Particulate matter less than 10 μm in diameter (both $PM_{10}$ and $PM_{2.5}$) has become of primary concern because it is respirable.

An analysis was conducted to assess the worst-case $PM_{10}$ impacts due to the increased traffic associated with the proposed project. $PM_{10}$ impacts associated with the project's potential HVAC emissions were also analyzed. In addition, the potential effects of $PM_{2.5}$ emissions from the project-generated incremental diesel trucks on ambient levels in the project study area was assessed at the locations where the greatest potential for project-related increases in concentrations could occur.

### SULFUR DIOXIDE—$SO_2$

$SO_2$ emissions are primarily associated with the combustion of sulfur-containing fuels: oil and coal. No significant quantities are emitted from mobile sources. Monitored $SO_2$ concentrations in New York City are below the national standards. Vehicular sources of $SO_2$ are not significant and therefore, an analysis of this pollutant from mobile sources was not warranted. As part of the proposed project, both natural gas and fuel could be burned. Therefore, potential future levels of $SO_2$ from HVAC systems were examined.

## C. AIR QUALITY STANDARDS

### NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act and its amendments, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, $NO_2$, ozone, particulate matter (both $PM_{2.5}$ and $PM_{10}$), $SO_2$, and lead. Hydrocarbon standards have been rescinded because these pollutants are primarily of concern in their role as ozone precursors. In addition to retaining the $PM_{10}$ standards, the U.S. Environmental Protection Agency (EPA) adopted 24-hour and annual standards for $PM_{2.5}$, which became effective September 16, 1997. It is expected to be several years before EPA releases recommended methods to assess $PM_{2.5}$ concentrations.

Table 16-1 shows the standards for these pollutants. These standards have also been adopted as the ambient air quality standards for the State of New York. The primary standards protect public health, and represent levels at which there are no known significant effects on human health. The secondary standards are intended to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. For $NO_2$, ozone, and particulate matter, the primary and secondary standards are the same.

**Table 16-1**
**National and New York State Ambient Air Quality Standards**

| Pollutant | Primary | | Secondary | |
|---|---|---|---|---|
| | ppm | µg/m³ | ppm | µg/m³ |
| **Carbon Monoxide (CO)** | | | | |
| Maximum 8-Hour Concentration[1] | 9 | (10,000) | None | |
| Maximum 1-Hour Concentration[1] | 35 | (40,000) | | |
| **Lead** | | | | |
| Maximum Arithmetic Mean Averaged Over 3 Consecutive Months | NA | 1.5 | None | |
| **Nitrogen Dioxide ($NO_2$)** | | | | |
| Annual Arithmetic Average | 0.053 | (100) | 0.053 | (100) |
| **Ozone** | | | | |
| 1-Hour Average[2] | 0.12 | (235) | 0.12 | (235) |
| 8-Hour Average[3] | 0.08 | (157) | 0.08 | (157) |
| **Total Suspended Particles (TSP)[4]** | | | | |
| Annual Mean | NA | 75 | NA | |
| Maximum 24-Hour Concentration | NA | 250 | | |
| **Respirable Particulate Matter ($PM_{10}$)** | | | | |
| Annual Arithmetic Mean | NA | 50 | NA | 50 |
| Maximum 24-Hour Concentration[1] | NA | 150 | NA | 150 |
| **Fine Respirable Particulate Matter ($PM_{2.5}$)** | | | | |
| Most Recent 3-Year Arithmetic Mean | NA | 15 | NA | 15 |
| Maximum 24-Hour Concentration[5] | NA | 65 | NA | 65 |
| **Sulfur Dioxide ($SO_2$)** | | | | |
| Annual Arithmetic Mean | 0.030 | (80) | NA | NA |
| Maximum 24-Hour Concentration[1] | 0.14 | (365) | NA | NA |
| Maximum 3-Hour Concentration[1] | NA | NA | 0.50 | (1,300) |

**Notes:**
[1] Not to be exceeded more than once a year.
[2] Applies only to areas designated as non-attainment.
[3] Three-year average of the annual fourth highest daily maximum 8-hr average concentration.
[4] TSP levels are regulated by a New York State Standard only.
[5] Not to be exceeded by the 98th percentile of 24-hour $PM_{2.5}$ concentrations in a year (averaged over 3 years).

Parenthetical values are approximately equivalent concentrations.
ppm – parts per million; µg/m³ – micrograms per cubic meter; NA – not applicable
**Sources:** 40 CFR Part 50—National Primary and Secondary Ambient Air Quality Standards, 6 NYCRR Part 257—Air Quality Standards.

## STATE IMPLEMENTATION PLAN (SIP)

The Clean Air Act requires each state to submit to EPA a State Implementation Plan (SIP) for attainment of the NAAQS. The 1977 and 1990 amendments require comprehensive plan revisions for areas where one or more of the standards have yet to be attained. All of New York City is designated non-attainment for ozone. Nassau, Rockland, Suffolk, Westchester and the five counties of New York City have been designated as severe non-attainment for ozone 1-hour standard. In November 1998, New York State submitted its Phase II Alternative Attainment Demonstration for Ozone, which addressed attainment of the one-hour ozone NAAQS by 2007,

and has recently submitted revisions to the SIP. These SIP revisions included additional emission reductions that EPA requested to demonstrate attainment of the standard and to update the SIP estimates using a new EPA model to predict mobile source emissions—MOBILE6. On April 15, 2004 EPA designated these same counties as moderate non-attainment for the new 8-hour ozone standard (effective June 15, 2004). EPA will revoke the 1-hour standard in June, 2005, however the very specific control measures for the 1-hour standard included in the SIP will be required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. A new SIP for ozone will be adopted by the state no later than June 15, 2007, with a target attainment deadline of June 15, 2010.

EPA has recently re-designated New York City from non-attainment to attainment for CO. The Clean Air Act Amendments require a maintenance plan for former non-attainment areas to ensure continued compliance of the CO NAAQS. New York City is also committed to implementing area-wide and site-specific control measures to reduce CO levels, should unanticipated localized growth result in elevated CO levels in the maintenance period.

EPA has designated New York County (Manhattan) non-attainment for respirable particulate matter ($PM_{10}$). In 1995, a SIP revision and Attainment Demonstration was submitted to EPA for the control of $PM_{10}$ concentrations in New York County. Kings County has been designated as attainment for $PM_{10}$. On February 13, 2004 New York State formally recommended that EPA designate the five counties of New York City Metropolitan Area as non-attainment for $PM_{2.5}$; by December 31, 2004, EPA will finalize the designations. Once non-attainment designations take effect, the state and local governments have three years to develop implementation plans designed to meet the standards.

## CITY ENVIRONMENTAL QUALITY REVIEW (CEQR) IMPACT CRITERIA

For all pollutants, exceeding the NAAQS generally constitutes a significant impact. In addition to the NAAQS, New York City has developed *de minimis* criteria to assess the significance of impacts on air quality that would result from a proposed development. These criteria, as detailed in the *City Environmental Quality Review* (CEQR) *Technical Manual*, set the minimum change in CO concentration that defines a significant environmental impact. Significant increases with respect to CO concentrations in New York City are defined as: (1) an increase of 0.5 parts per million (ppm) or more in the maximum 8-hour average CO concentration at a location where the predicted No Build 8-hour concentration is equal to or between 8 and 9 ppm; or (2) an increase of more than half the difference between baseline concentrations and the 8-hour standard, when no build concentrations are below 8 ppm. The *CEQR Technical Manual* guidelines indicate that an impact analysis for CO is not required if the peak number of project-generated vehicles is less than 50 per hour for the study area.

## $PM_{2.5}$ INTERIM GUIDANCE CRITERIA

At this time, EPA has not yet formally determined if the measured $PM_{2.5}$ levels in New York City indicate whether the City (or counties within the City) will be designated as either attainment or non-attainment with respect to the $PM_{2.5}$ ambient air quality standards.

The New York City Department of Environmental Protection (DEP) is currently employing interim guidance criteria for evaluating the potential $PM_{2.5}$ impacts from projects under CEQR. The interim guidance criteria for determining the potential for significant adverse impacts from $PM_{2.5}$ are as follows:

- Predicted incremental impacts of $PM_{2.5}$ greater than 5 $\mu g/m^3$ averaged over a 24-hour (daily) period at a discrete location of public access, either at ground or elevated levels (microscale analysis); and
- Predicted incremental ground-level impacts of $PM_{2.5}$ greater than 0.1 $\mu g/m^3$ on an annual average neighborhood-scale basis (A neighborhood scale concentration represents the average concentration over an area of approximately one square kilometer centered on the location where the maximum impact is predicted, or in the case of mobile sources, concentrations at a distance from the roadway similar to that used for the placement of neighborhood-scale ambient monitoring stations.)

NYSDEC has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts.[1] This policy would apply to facilities applying for permits or major permit modifications under the State Environmental Quality Review Act (SEQRA) that emit 15 tons of $PM_{10}$ or more annually. The policy states that such a project will be deemed to have a potentially significant adverse impact if the project's maximum predicted impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 $\mu g/m^3$ averaged annually or more than 5 $\mu g/m^3$ on a 24-hour basis. Projects that exceed either the annual or 24-hour threshold will be required to prepare an Environmental Impact Statement (EIS) to assess the severity of the impacts, to evaluate alternatives, and to employ reasonable and necessary mitigation measures to minimize the $PM_{2.5}$ impacts of the source to the maximum extent practicable.

The projected developments' maximum potential to emit for $PM_{2.5}$ is well below 15 tons per year. In addition, the policy is intended for evaluating NYSDEC air permit applications for projects subject to SEQRA; nevertheless, it was also used as guidance criteria for the purpose of evaluating stationary source $PM_{2.5}$ impacts.

Actions that would result in predicted incremental $PM_{2.5}$ impacts greater than the interim guidance criteria above are considered to result in potential significant adverse impacts. Actions subject to CEQR that fail such criteria (until they are modified) would require the preparation of an examination of potential measures to reduce or eliminate such potential significant adverse impacts.

## D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

### MOBILE SOURCES

*CO AND $PM_{10}$*

The prediction of motor-vehicle-generated CO and $PM_{10}$ concentrations in an urban environment is characterized by meteorological phenomena, traffic conditions, and physical configurations. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and geometry combine to affect pollutant concentrations. The mathematical expressions and formulations contained in the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all models contain simplifications and approximations of actual conditions and interactions and it is necessary to predict the reasonable

[1] *Assessing and Mitigating Impacts of Fine Particulate Matter Emissions* (NYSDEC, December 2003).

worst-case condition, most of these dispersion models predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

The CO and $PM_{10}$ analyses for the proposed actions employs a modeling approach approved by EPA that has been widely used for evaluating air quality impacts of projects in New York City, New York State and throughout the country. The modeling approach includes a series of conservative assumptions relating to meteorology, traffic, and background concentration levels resulting in a conservatively high estimate of expected CO and $PM_{10}$ concentrations that could ensue from the proposed actions.

*Dispersion Model for Microscale Analyses*

To determine motor-vehicle-generated CO concentrations adjacent to streets near the proposed project sites, the CAL3QHC model was applied. Maximum 1- and 8-hour CO concentrations were determined using EPA's CAL3QHC model Version 2.0[1]. The CAL3QHC model is based on the CALINE3 line source dispersion model, with an additional algorithm for estimating vehicular queue lengths at signalized intersections. The CALINE3 model employs a Gaussian (normal distribution) dispersion assumption. CAL3QHC predicts the dispersion of CO emissions from idling vehicles and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay calculations (from the 2000 *Highway Capacity Manual* traffic forecasting model), saturation flow rate, vehicle arrival type and signal actuation (i.e., pre-timed or actuated signal) characteristics to accurately predict the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QHCR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters. This refined version of the model, CAL3QHCR, is employed if maximum predicted future CO concentrations are greater than the applicable ambient air quality standards or when *de minimis* thresholds are exceeded using the first-level CAL3QHC modeling. CAL3QHCR was used for modeling $PM_{10}$ since the impacts are assessed on a 24-hour and annual basis.

*Meteorology*

CAL3QHC. In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction influences the accumulation of pollutants at a particular receptor location. Wind direction was chosen to maximize pollutant concentrations at each of the prediction sites. In applying the CAL3QHC model, the wind angle was varied to determine the worst-case wind direction resulting in the maximum concentrations.

Following the recommendations of EPA in the *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*[2], CO computations were performed using a wind speed of 1 meter per second, and stability class D. A neutral stability class was employed, and a persistence factor of 0.70 for the 8-hour period was selected. A surface roughness of 3.21 meters was chosen, and, in addition, a 43° Fahrenheit ambient temperature was assumed for the emissions computations. At

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[1] *User's Guide to CAL3QHC, A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*, Office of Air Quality, Planning Standards, EPA, Research Triangle Park, North Carolina, Publication EPA-454/R-92-006.

[2] *Guidelines for Modeling Carbon Monoxide From Roadway Intersections*, EPA Office of Air Quality Planning and Standards, Publication EPA-454/R-92-005.

each receptor location, the wind angle that maximized the pollutant concentrations was used in the analysis regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

CAL3QHCR. The CAL3QHCR uses hourly meteorological data. A 5-year meteorological data set for the dispersion modeling was used. The data consists of surface data collected at LaGuardia Airport and upper air data collected at Brookhaven, New York for the period 1997-2001. This meteorological data provides hour-by-hour wind speeds, directions, and atmospheric stability.

*Analysis Year*

The CO and $PM_{10}$ microscale analyses were performed for 2013, the year by which the proposed future projected sites are likely to be completed. The future analysis was performed both without the proposed actions (the No Build condition) and with the proposed actions (the Build condition).

*Vehicle Emissions Data*

To predict ambient concentrations of pollutants generated by vehicular traffic, emissions from vehicle exhaust systems must be estimated accurately. Vehicular CO and $PM_{10}$ emissions were computed using the EPA-developed mobile source emissions model, MOBILE6.2. This is the most current, recently released emissions model capable of calculating engine emission factors for various vehicle types, based on the fuel (gas, diesel, or alternative technologies), meteorological conditions, vehicle speeds, roadway types, number of starts per day and engine soak time, and various other factors that influence emissions, such as inspection maintenance programs.

Vehicle classification data were based on field studies and data obtained from other traffic studies. Emission estimates were based on guidance from NYSDEC on the appropriate credits to be used in the MOBILE6.2 model to accurately reflect the inspection and maintenance program. The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from the vehicles' exhaust systems are below emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

Based on the latest guidance from NYSDEC, sport utility vehicles (SUVs) were classified as light-duty gasoline powered trucks, with operating conditions (starts per day and soak time) and registration characteristics (age of vehicles and mileage accumulation) set to be the same as for light-duty vehicles (LDV), in order to properly model their emissions. Taxis are assumed to all be in hot stabilized mode (excluding any start emissions). The general categories of vehicle types for specific roadways were further categorized into subcategories based on their relative fleet-wide breakdown[1].

An ambient temperature of 52.5° Fahrenheit was used. This temperature, calculated based on the latest guidance from EPA and NYSDEC, represents the average temperature measured at the

[1] The MOBILE6.2 emissions model utilizes 28 vehicle categories by size and fuel. Traffic counts and predictions are based on broader size categories, and then broken down according to the fleet-wide distribution of subcategories and fuel types (diesel, gasoline, or alternative).

Central Park meteorological station during the 10 highest 8-hour CO events measured at the East 34th Street NYSDEC monitoring station in 2000 through 2002.

Since the contribution of re-entrained road dust to $PM_{10}$ concentrations as presented in the $PM_{10}$ SIP is considered to be significant, the $PM_{10}$ estimates include both exhaust and road dust. Road dust emission factors were calculated according to the latest procedure delineated by EPA[1].

*Traffic Data*

Traffic data for the air quality analysis were derived from existing traffic counts, projected future growth in traffic, *NYSDOT's Highway Sufficiency Ratings 1999,* and other information developed as part of the traffic analysis for the proposed actions. Traffic data for the future without and with the proposed actions were employed in the respective air quality modeling scenarios. The weekday AM (8 to 9 AM) and PM (5 to 6 PM) peak periods were subjected to microscale analysis. These time periods were selected for the mobile source analysis because they produce the maximum anticipated project-generated traffic and therefore have the greatest potential for significant air quality impacts.

For $PM_{10}$, the peak AM and PM period traffic volumes were used as a baseline; traffic volumes for other hours due to No Build traffic and the project were determined by adjusting the peak period volumes by the 24-hour distributions of actual vehicle counts collected for the project. 24-hour $PM_{10}$ impacts were determined by using the 24-hour distribution associated with the highest total daily vehicle count; for annual impacts, average weekday and weekend 24-hour distributions were used to more accurately simulate traffic patterns over longer periods.

*Background Concentrations*

Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis, which directly accounts for vehicle-generated emissions on the streets within 1,000 feet and line-of-sight of the receptor location. Background concentrations must be added to modeling results to obtain total pollutant concentrations at a study site.

The 8-hour average background concentration used in this analysis was 2.3 ppm for the 2013 predictions. This value, obtained from DEP, is based on CO concentrations measured at NYSDEC monitoring stations and is adjusted to reflect the reduced vehicular emissions expected in the analysis year. For purposes of this adjustment, based on EPA guidance, it was assumed that 20 percent of the background value is caused by stationary source emissions that have remained relatively unchanged with time and that 80 percent of the background value is caused by mobile sources that decrease with time. This decrease reflects the increasing numbers of federally-mandated lower-emission vehicles that are projected to enter the vehicle fleet as older, higher-polluting vehicles are retired (i.e., vehicle turnover), and the continuing benefits of the New York State inspection and maintenance program.

The $PM_{10}$ annual and 24-hour background concentrations are based on the highest and highest second-highest concentrations, respectively measured over the most recent three year period at the nearest NYSDEC monitoring site. For the project, the background concentrations for the annual and 24-hour periods are 22 $\mu g/m^3$ and 49 $\mu g/m^3$, respectively.

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[1] EPA, "Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources", Draft Ch. 13.2.1, NC, http://www.epa.gov/ttn/chief/ap42/, August 2003.

*Mobile Source Receptor Locations*

Five receptor locations were selected for CO microscale analysis (see Table 16-2 and Figure 16-1). The receptor sites are computer simulations of sidewalk or roadside locations near intersections with continuous public access. Multiple receptor sites were modeled at each of these intersections (i.e., receptors were placed along the approach and departure links at spaced intervals). These receptor locations were selected because they are the locations in the study area where the largest levels of project-generated traffic are expected, and therefore where the greatest air quality impacts and maximum changes in the CO concentrations would be expected.

**Table 16-2**
**Mobile Source Receptor Locations**

| Receptor Site | Location |
|---|---|
| 1 | Tillary Street and Flatbush Avenue |
| 2 | Myrtle Avenue and Flatbush Avenue |
| 3 | Willoughby Street and Gold Street |
| 4 | Livingston Street and Hoyt Street |
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. |

For the $PM_{10}$ analysis, a single intersection was chosen. Based on review of existing traffic volumes and estimated project-generated traffic, the intersection at Atlantic Avenue/Flatbush Avenue/4th Avenue was selected since it has the highest Build traffic volumes and would therefore result in the highest predicted $PM_{10}$ impacts.

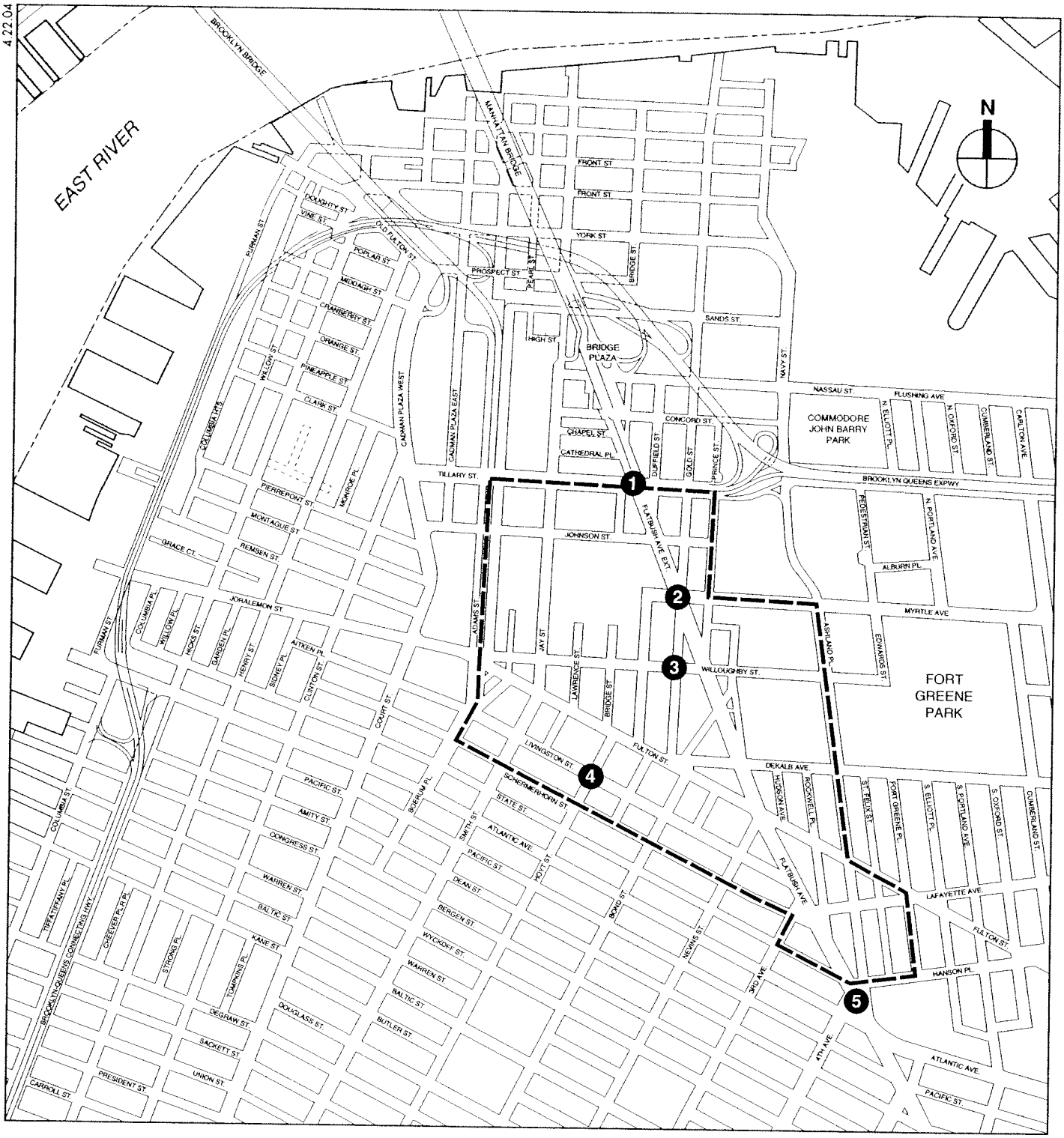
*$PM_{2.5}$*

The assessment of potential on-street $PM_{2.5}$ impacts from mobile sources followed the general methodology for assessing $PM_{10}$ impacts. Analysis of the anticipated $PM_{2.5}$ mobile source air quality impacts associated with the proposed actions was performed for the year 2013. Although there is currently no official guidance for modeling $PM_{2.5}$ impacts from mobile sources, the methodology described below was developed based on existing EPA approved methods for other mobile source modeling that are discussed in the *CEQR Technical Manual*, EPA documents regarding $PM_{2.5}$ (including EPA $PM_{2.5}$ monitoring station location guidance[1]) and the working guidance currently still under development by NYSDEC. The general approach is to determine the maximum predicted concentrations that would represent both local maximum and neighborhood-scale increases in $PM_{2.5}$ concentrations (as would be measured by monitoring stations—the same levels that were used to determine the health based NAAQS for $PM_{2.5}$). A summary of the $PM_{2.5}$ mobile sources impact assessment methodology is provided below.

*Dispersion Models for Microscale Analysis*

The CAL3QHCR model was used to predict the dispersion of $PM_{2.5}$ emitted at the chosen site. Analyses were performed using hourly traffic and meteorological data in order to estimate maximum 24-hour and annual average concentrations, following the general methodology recommended for localized mobile source modeling of $PM_{10}$, as described in the *CEQR Technical Manual* (see Section B, "Methodology for Predicting Pollutant Concentrations from

[1] *Guidance for Network Design and Optimum Site Exposure for $PM_{2.5}$ and $PM_{10}$*, EPA-454/R-99-022.




DOWNTOWN**BROOKLYN**DEVELOPMENT

## Air Quality Receptor Locations

Figure 16-1

Mobile Sources," above). Hourly meteorological data measured at the LaGuardia Airport station during the years 1997 through 2001 were employed in this analysis.

*Mobile Source Receptor Locations*

One site was chosen for the $PM_{2.5}$ mobile source impact analyses: the intersection of Willoughby Street/Gold Street (Site 3). This site was the location where the greatest potential for project-generated increases in incremental and diverted diesel trucks were projected to occur. Impacts were modeled at this location based on the predicted traffic volumes and patterns forecast for the year 2013.

Receptors for the annual neighborhood-scale analysis were placed at a distance from the roadway similar to the distances defined for the placement of neighborhood scale monitoring stations in the above-mentioned EPA guidance. Receptors were located at a distance of 15 meters (49 feet) from the curb in all modeled roadways and at 7.6 meter (25 feet) intervals along all roadways. For the localized $PM_{2.5}$ analysis, the 24-hour average microscale model was run with the same receptor placement adjacent to roadways that were used in the CO mobile source modeling analysis.

*Vehicle Emissions Data*

Estimates of on-street traffic are employed with emission factors to yield the total emissions used as input for the $PM_{2.5}$ on-street mobile source dispersion modeling. Emission estimates for $PM_{2.5}$ were determined using MOBILE6.2, and reflected the latest guidance from NYSDEC on the appropriate inspection and maintenance program credits and fuels programs. Hourly traffic data for the analyses were derived from traffic information developed as part of the 2013 CO impact analysis.

In accordance with the DEP $PM_{2.5}$ interim guidance criteria, emission rates were determined with fugitive road dust to account for their impacts on receptors near roadways (i.e., CO analysis receptor locations.) Fugitive road dust may not be included in future microscale analyses based on EPA's recent proposed rule-making for assessing impacts of $PM_{2.5}$. However, to be conservative, fugitive road dust was included in the localized $PM_{2.5}$ microscale analysis.

## PARKING

The proposed actions would include parking facilities to account for the new parking demand and supply. Emissions from vehicles using the parking areas could potentially affect ambient levels of CO at the project intersections analyzed in the future Build conditions. Of the parking associated with the projected development sites, the prototypical parking garage proposed for the south side of Willoughby Street, between Albee Square West/Gold Street and Duffield Street was modeled. The modeled garage represents the potential worst case impacts based on its capacity and location adjacent to the Willoughby Street and Gold Street intersection. With a parking capacity of approximately 694 spaces, this proposed garage would accommodate the parking demand from the proposed development sites O, P, and Q (as described in Chapter 1, "Project Description"). Other parking garages associated with the proposed actions were not analyzed, since the size of these parking facilities and the traffic levels associated with them would be comparable or significantly smaller than with the parking garage being analyzed.

The exhaust from the garages' ventilation systems would contain elevated levels of CO due to emissions from vehicles using the garages. The exhaust could potentially affect ambient levels of CO at receptors near the proposed exhaust vents. An analysis was performed using the

methodology set forth in the *CEQR Technical Manual*, applying modeling techniques to the vent structures and calculating pollutant levels at various distances from the vents.

Emissions from vehicles entering, parking, and exiting the garage were estimated using the EPA-developed MOBILE6.2 mobile source emission model and an ambient temperature of 52.5°F. Other details regarding the model were described above. For all arriving and departing vehicles, an average speed of 5 miles per hour was conservatively assumed for travel within the parking garages. In addition, all departing vehicles were assumed to idle for 1 minute before proceeding to the exit. The concentration of CO within the garage was calculated assuming a minimum ventilation rate, based on New York City Building Code requirements, of 1 cubic foot per minute of fresh air per gross square foot of garage area. To determine compliance with the NAAQS, CO concentrations were determined for the maximum 8-hour average period. (No exceedances of the 1-hour standard would occur and the 8-hour values are the most critical for impact assessment.)

To determine pollutant levels in the vicinity of the vents, the exhaust from the garage was analyzed as a "virtual point source" using the methodology in EPA's Workbook of Atmospheric Dispersion Estimates, AP-26. This methodology estimates CO concentrations at various distances from the vents by assuming that the concentration in the garage is equal to the concentration leaving the exhaust, and determining the appropriate initial horizontal and vertical dispersion coefficients at the vent faces. Background concentrations are then added to the modeling results to obtain the total ambient levels. Cumulative impacts from on-street sources (from the nearest, modeled intersection–Site 3, Willoughby Street and Gold Street) and the garage exhaust were also analyzed.

## STATIONARY SOURCES

A stationary source analysis was conducted to evaluate potential impacts from the proposed actions' HVAC systems. In addition, an assessment was conducted to determine the potential for impacts due to industrial activities within the re-zoning area.

The *CEQR Technical Manual* also requires an assessment of any actions that could result in the location of residential developments within 1,000 feet of a large emission source (e.g., a power plant) or within 400 feet of commercial, institutional, or large-scale residential developments where the proposed structure would be of a height similar to or greater than the height of an existing emission stack. To assess the potential effects of these existing sources on the proposed actions, a review of existing permitted facilities was conducted. Within the 1,000 foot area around the rezoning area, "major" combustion-related facilities as well as proposed electrical generating facilities were considered. This included all existing facilities subject to federal Prevention of Significant Deterioration (PSD) regulations, existing electrical generating facilities, and proposed major electrical generating facilities and peaking facilities. Within the 400 foot study area boundary, other sources such as those permitted under NYSDEC's Title V program were considered. Sources of information reviewed included the following:

- Combustion permits provided by DEP;
- Emissions source databases provided by NYSDEC for all sources located within the study impact areas. The data was compiled by NYSDEC from the NYSDEC Source Management System (SMS) and Air Facility System (AFS) inventories;

- The EPA's Envirofacts[1] database; and
- The NYSDEC Title V permit Web site.

No existing or proposed major electrical generating facilities with a potential to impact air quality in and around the proposed actions were identified. One source was identified within the study areas defined above (111 Livingston Street) which has a Title V permit, however, its exhaust stacks are well above the maximum height of the projected residential developments. Therefore, impacts on the proposed actions from stationary sources are not a concern.

*HVAC ANALYSIS*

*$NO_2$, $PM_{10}$, and $SO_2$ Impacts*

Screening

To compare $NO_2$, $PM_{10}$, and $SO_2$ concentrations from the proposed actions with the national and state air quality standards, estimates of the maximum estimated concentrations must be prepared. Since the projected developments would not result in any major sources of stationary source emissions, a screening analysis was conducted. This procedure evaluates whether or not a detailed analysis using dispersion modeling is necessary.

To assess air quality impacts associated with emissions from heating and hot water systems, the methodology described in the *CEQR Technical Manual* was followed, which involves determining impacts from the project at the nearest building of equal or greater height. However, due to the number of proposed developments associated with the proposed actions, and their proximity to potential receptor sites as well as each other, cumulative effects also need to be considered.

Air Quality Appendix 8 of the *CEQR Technical Manual* outlines a procedure for determining potential cumulative impacts on a proposed project. It can also be used to determine cumulative impacts *from* a proposed action. The procedure involves identifying all sources with a potential impact on nearby elevated receptors; determining each projected development's emission rates; using the Industrial Source Complex model (ISC3) screening database for each averaging period of concern, to find the concentration based on the distance between each development and the existing receptor site (Table 3Q-3 of the *CEQR Technical Manual*); multiplying the emission rates from the values found in the table to calculate concentrations; and adding the concentrations to determine the maximum predicted cumulative impact. Emission rates were determined using the procedures in Air Quality Appendix 7 of the *CEQR Technical Manual*, which considers the building's development size, type of development and fuel(s) burned. The analysis considered both impacts on existing residential developments as well as on the proposed action's own projected development sites. To estimate the maximum expected total pollutant concentrations at a given receptor, the predicted levels were added to corresponding background concentrations.

[1] Website: http://oaspub.epa.gov/enviro/ef_home2.air.

Dispersion Modeling

*$NO_2$, $PM_{10}$, and $SO_2$ Impacts*

The screening analysis indicated that dispersion modeling would be required to assess the potential air quality impacts of stationary source emissions from the projected development site J on receptors at the proposed development site I(A), and from projected development site BB on receptors at the proposed development site AA (Project-on-Project analyses). These potential impacts were evaluated using the Industrial Source Complex Short Term (ISCST3) dispersion model developed by EPA, and described in *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models* (EPA-454/B-95-003a). The ISCST3 model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on hourly meteorological data, and has the capability of calculating pollutant concentrations at locations when the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. Computations with the ISCST3 model to determine impacts from exhaust stacks were made assuming stack tip downwash, buoyancy-induced dispersion, gradual plume rise, urban dispersion coefficients and wind profile exponents, no collapsing of stable stability classes, and elimination of calms. ISCST3 was run with and without the building downwash algorithms enabled. The meteorological data set consisted of the latest 5 years of concurrent meteorological data that are available: surface data collected at La Guardia Airport (1997-2001) and upper air data collected at Brookhaven, New York (1997-2001).

*Receptor Locations*. Discrete receptors (i.e., locations with operable windows) on the projected development sites were developed for the stationary source modeling analysis. The receptor network consisted of receptors located along the sides and roof of the two proposed development sites being analyzed. Rows of receptors were placed at spaced intervals on the buildings at multiple elevations. The modeling analysis was based upon bulk configurations that illustrate the development that could be created on the project sites that have been identified as part of the worst-case development scenario. Accordingly, receptors were located assuming the proposed building envelopes shown in Figures 1-9 through 1-12 of Chapter 1, "Project Description."

*Emission Estimates and Stack Parameters*. Fuel estimates for the modeled development sites were estimated based on procedures outlined in the *CEQR Technical Manual* as discussed above. Using worst-case assumptions, potential fuel usage was estimated assuming No. 6 fuel oil for $SO_2$ and PM, and natural gas for $NO_2$.

Emission factors from the fuel oil and natural gas Combustion sections of EPA's AP-42 were utilized to determine emission rates for the proposed development site's heating and hot water systems (see Table 16-3). The annual average $NO_2$ impacts from the proposed actions conservatively assumed all of the nitrogen oxides emitted by these operations were $NO_2$.

*Background Concentrations*. To estimate the maximum expected total pollutant concentrations at a given receptor, the predicted levels were added to corresponding background concentrations. The background levels were based on concentrations monitored at the nearest NYSDEC ambient air monitoring station. The measured background concentration was added to the predicted contribution from the modeled source to determine the maximum predicted total pollutant concentration. This analysis assumes that the maximum background concentrations occur on all days.

**Table 16-3**
**Stack Parameter and Emission Rate Data for Proposed Development Sites**

| Parameter | Value | |
|---|---|---|
| | Site J | Site BB |
| Stack Height | 114 feet* | 193 feet* |
| Stack Diameter | 0 feet** | 0 feet** |
| Stack Exit Velocity | 0.00328 feet/second** | 0.00328 feet/second** |
| Stack Exit Temperature | 68 °F** | 68 °F** |
| $SO_2$ Emission Rate (Short-term/Annual) | 2.57 lbs per hr / 0.71 lbs per hr | 1.55 lbs per hr / 0.42 lbs per hr |
| $NO_x$ Emission Rate | 0.21 lbs/hr | 0.13 lbs/hr |
| $PM_{10}$ Emission Rate (Short-term/Annual) | 0.55 lbs/hr / 0.15 lbs per hr | 0.33 lbs/hr / 0.087 lbs per hr |

**Notes:**
* Assumes a 3-foot stack above the building roof as per *CEQR Technical Manual* Guidance.
** Worst-case assumptions per *CEQR Technical Manual* Guidance.

*$PM_{2.5}$ Impacts*

Dispersion modeling was performed to assess the impacts of the particulate matter emitted from the proposed action on ambient $PM_{2.5}$ concentrations in the defined study areas. The methodology follows the general approaches that were performed for the $PM_{10}$ impacts from the sources analyzed in the refined dispersion modeling analysis presented above. The assessment of $PM_{2.5}$ impacts from the projected developments of most concern (i.e., BB and J) is reasonable since that analysis considered the sources which resulted in the worst-case $PM_{10}$ impacts, and are therefore appropriate indicators for assessing overall $PM_{2.5}$ impacts from the proposed action. However, since the interim guidance criteria for $PM_{2.5}$ are based on incremental changes for both localized and neighborhood scale assessments, the modeling was performed to estimate the maximum predicted changes in $PM_{2.5}$ concentrations so the results could be compared to these criteria.

The $PM_{2.5}$ modeling impact assessment employed the same EPA dispersion model that was employed in the modeling of the other criteria pollutants, i.e., the ISCST3 model. Hourly meteorological data measured at the LaGuardia Airport station during the years 1997 through 2001 were also employed in this analysis.

The $PM_{10}$ emission factors described in Table 16-3 were used. However, if the initial modeling results exceeded the 24-hour interim guidance criteria, more realistic stack parameters were used in lieu of *CEQR Technical Manual* defaults since these are very conservative and may yield very high concentrations in situations where the receptors are in close proximity to the source.

The same network of receptors on each of the development sites was utilized for the "local" impact analyses (i.e., 24-hour $PM_{2.5}$ impacts). In the event that the maximum predicted incremental impacts of $PM_{2.5}$ exceeded 0.1 $\mu g/m^3$ on an annual average basis, an analysis to determine impacts on a neighborhood-scale basis was conducted. In accordance with the DEP interim guidance criteria for $PM_{2.5}$, a neighborhood scale concentration represents the average concentration over an area of approximately one square kilometer centered on the location where the maximum impact is predicted.

*INDUSTRIAL SOURCES*

*Screening*

To assess and estimate the potential effects on the proposed actions from existing industrial operations in the surrounding area, an investigation was conducted. A study area was established within 400 feet of the property boundary of each sensitive projected development site.

A request was made to DEP's Bureau of Environmental Compliance (BEC) to obtain all the available certificates of operation for sources of manufacturing or industrial emissions within the entire study area. In addition, a search of Federal- and State-permitted facilities within the study area was conducted using the EPA's Envirofacts database. Facilities which appeared in the Envirofacts database were cross-referenced against the DEP permits and the NYSDEC Air Guide-1 software emissions database, which presents a state-wide compilation of permit data for toxic air pollutants.

An air quality dispersion model screening database, ISC3, was used to estimate maximum potential impacts from different sources at various distances. Impact distances selected for each source were the minimum distances between the property boundary of the development sites and the source sites. Predicted worst-case impacts on the proposed development sites were compared with the short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs) recommended in the NYSDEC's DAR-1 AGC/SGC tables. These guideline concentrations present the airborne concentrations, which are applied as a screening threshold to determine if the future residents of the projected development sites could be significantly impacted from nearby sources of air pollution.

To assess the effects of multiple sources emitting the same pollutants, cumulative source impacts were determined. For each projected development, impacts of the same pollutant from industrial sources that were within 400 feet were combined and compared to the guideline concentrations discussed above.

*Dispersion Modeling*

The screening analysis indicated that dispersion modeling would be required to assess the potential air quality impacts of industrial source emissions from one of the businesses in the study area, a dry cleaning operation located near the proposed development sites I(A), G and J. These potential impacts were evaluated using the Industrial Source Complex Short Term (ISCST3) dispersion model, using the same modeling assumptions described above for the HVAC dispersion modeling analysis.

Discrete receptors (i.e., locations with operable windows) were placed on the potentially affected projected development sites for the stationary source modeling analysis. The receptor network consisted of receptors located along the sides of the buildings from the ground floor to the upper level. Receptors were placed at spaced intervals around the buildings at each floor level.

Emission estimates of the pollutants of concern were input into the ISCST3 dispersion model to estimate the impact on the projected development sites from the existing industrial source. Emission rates and stack parameters were obtained from the DEP permits.

# E. EXISTING CONDITIONS

## EXISTING MONITORED AIR QUALITY CONDITIONS

Monitored concentrations of CO, $SO_2$, particulate matter, $NO_2$, lead, and ozone ambient air quality data for the area are shown in Table 16-4.

**Table 16-4**
**Representative Monitored Ambient Air Quality Data**

| Pollutants | Location | Units | Period | Concentrations | | | Number of Exceedances of Federal Standard | |
|---|---|---|---|---|---|---|---|---|
| | | | | Mean | Highest | Second Highest | Primary | Secondary |
| CO | Canal Street | ppm | 8-hour | - | 3.7 | 3.0 | 0 | - |
| | | | 1-hour | - | 4.8 | 4.4 | 0 | - |
| $SO_2$ | Mabel Dean | ppm | Annual | 0.014 | - | - | 0 | - |
| | | | 24-hour | - | 0.046 | 0.045 | 0 | - |
| | | | 3-hour | - | 0.064 | 0.064 | - | 0 |
| Respirable Particulates ($PM_{10}$) | Mabel Dean | $\mu g/m^3$ | Annual | 19 | - | - | 0 | 0 |
| | | | 24-hour | - | 31 | 30 | 0 | 0 |
| $NO_2$ | Mabel Dean | ppm | Annual | 0.038 | - | - | 0 | 0 |
| Lead | Susan Wagner | $\mu g/m^3$ | 3-month | - | 0.02 | 0.02 | 0 | - |
| $O_3$ | Mabel Dean | ppm | 1-hour | - | 0.083 | 0.075 | 0 | 0 |

**Source:** 2001 Annual New York State Air Quality Report, NYSDEC July 2002.

These values are the most recent (2001) monitored data available that have been published by NYSDEC for these locations. There were no monitored violations of the NAAQS for the pollutants at these sites.

## PREDICTED EXISTING POLLUTANT CONCENTRATIONS IN THE PROJECT AREA

As noted previously, receptors were placed at multiple sidewalk locations next to the five intersections under analysis. The receptor with the highest predicted CO concentrations was used to represent these intersection sites for the existing conditions. CO concentrations were calculated for each receptor location, at each intersection, for each peak period specified above.

Table 16-5 shows the maximum predicted existing (2003) CO 8-hour average concentrations at these intersections. (No 1-hour values are shown since predicted values are much lower than the standard.) The values shown are the highest predicted concentrations for each receptor location for any time period analyzed. At all receptor sites, the maximum predicted 8-hour average concentrations do not exceed the national standard of 9 ppm.

**Table 16-5**
**Maximum Predicted Existing 8-Hour Average Carbon Monoxide Concentrations for 2003 (parts per million)**

| Receptor Site | Location | Time Period | 8-Hour Concentration* (ppm) |
|---|---|---|---|
| 1 | Tillary Street and Flatbush Avenue | AM | 6.0 |
| 2 | Myrtle Avenue and Flatbush Avenue | PM | 4.9 |
| 3 | Willoughby Street and Gold Street | PM | 3.8 |
| 4 | Livingston Street and Hoyt Street | PM | 3.4 |
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. | PM | 6.0 |

**Notes:** * CAL3QHCR Results
8-Hour NAAQS for CO is 9 ppm.

# F. THE FUTURE WITHOUT THE PROPOSED ACTIONS

## MOBILE SOURCES

*CO*

CO concentrations without the proposed actions were determined for the 2013 analysis year using the methodology previously described. Table 16-6 presents the future maximum predicted 8-hour average CO concentrations at the analysis intersections without the proposed actions (i.e., 2013 No Build values). The values shown are the highest predicted concentrations for the receptor locations for any of the time periods analyzed.

**Table 16-6**
**Maximum Future No Build Predicted 8-Hour Average Carbon Monoxide Concentrations for 2013 (parts per million)**

| Receptor Site | Location | Time Period | 8-Hour Concentration* (ppm) |
|---|---|---|---|
| 1 | Tillary Street and Flatbush Avenue | PM | 4.3 |
| 2 | Myrtle Avenue and Flatbush Avenue | PM | 3.6 |
| 3 | Willoughby Street and Gold Street | PM | 3.0 |
| 4 | Livingston Street and Hoyt Street | PM | 3.1 |
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. | PM | 4.7 |

**Notes:** * CAL3QHCR Results
8-Hour NAAQS for CO is 9 ppm.

Compared to the values shown in Table 16-5, predicted No Build values are lower than Existing Conditions. The decrease in CO concentrations primarily reflects the increasing proportion of newer vehicles with more effective pollution controls, as well as the continuing benefits of the New York State inspection and maintenance program.

*$PM_{10}$*

$PM_{10}$ concentrations without the proposed actions were determined for the 2013 analysis year using the methodology previously described. Table 16-7, presents the future maximum predicted 24-hour and annual average $PM_{10}$ concentrations at the analysis intersection without the proposed actions (i.e., 2013 No Build values). The values shown are the highest predicted concentrations for the receptor locations for any of the time periods analyzed. The No Build concentration includes existing $PM_{10}$ background levels, since future $PM_{10}$ background levels are generally considered to be the same as existing levels.

**Table 16-7**
**Maximum Future No Build Predicted 24-Hour and Annual Average $PM_{10}$ Concentrations for 2013 ($\mu g/m^3$)**

| Receptor Site | Location | 24-Hour Concentration* ($\mu g/m^3$) | Annual Average Concentration* ($\mu g/m^3$) |
|---|---|---|---|
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. | 117.8 | 44.6 |

**Notes:** * CAL3QHCR Results
24-Hour NAAQS for $PM_{10}$ is 150 $\mu g/m^3$.
Annual Average NAAQS for $PM_{10}$ is 50 $\mu g/m^3$.

$PM_{2.5}$ concentrations without the proposed actions are not presented since predicted future $PM_{2.5}$ background levels are generally considered to be the same as existing levels.

## G. THE FUTURE WITH THE PROPOSED ACTIONS

The proposed actions would result in increased mobile source emissions on streets within and surrounding the rezoning area. The proposed actions could also affect the surrounding community by emissions from HVAC equipment. The following sections describe the results of the studies performed to analyze the potential impacts on the surrounding community from these sources. In addition, existing industrial facilities were assessed for potential adverse impacts on the future occupants of the proposed development sites. The areas of concern are discussed below.

### MOBILE SOURCES

*CO*

CO concentrations with the proposed actions were determined for the 2013 analysis year using the methodology previously described. Table 16-8 shows the future maximum predicted 8-hour average CO concentration with the proposed actions at the five intersections studied. (No 1-hour values are shown since no exceedances of the standard would occur and the *de minimis* criteria are only applicable to 8-hour concentrations. Therefore, the 8-hour values are the most critical for impact assessment.) The values shown are the highest predicted concentrations for any of time periods analyzed. The results indicate that the proposed actions would not result in any violations of the CO standard or any significant impacts at the receptor locations.

**Table 16-8**
**Maximum Future Build Predicted 8-Hour Average Carbon Monoxide Concentrations for 2013 (parts per million)**

| Receptor Site | Location | Time Period | 8-Hour Concentration (ppm)* | |
|---|---|---|---|---|
| | | | No Build | Build |
| 1 | Tillary Street and Flatbush Avenue | PM | 4.3 | 4.5 |
| 2 | Myrtle Avenue and Flatbush Avenue | PM | 3.6 | 3.6 |
| 3 | Willoughby Street and Gold Street | PM | 3.0 | 3.5 |
| 4 | Livingston Street and Hoyt Street | PM | 3.1 | 3.2 |
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. | PM | 4.7 | 4.8 |

**Notes:** * CAL3QHCR Results
8-Hour NAAQS for CO is 9 ppm.

*$PM_{10}$*

$PM_{10}$ concentrations with the proposed actions were determined for the 2013 analysis year using the methodology previously described. Tables 16-9 and 16-10 show the future maximum predicted 24-hour and annual average $PM_{10}$ concentrations with the proposed actions at the intersection studied. The values shown are the highest predicted concentrations for any of time periods analyzed. The results indicate that the proposed actions would not result in any violations of the $PM_{10}$ standard or any significant impacts at the receptor locations.

**Table 16-9**
**Maximum Future Build Predicted 24-Hour Average $PM_{10}$ Concentrations for 2013 ($\mu g/m^3$)**

| Receptor Site | Location | 24-Hour Concentration ($\mu g/m^3$)* | |
|---|---|---|---|
| | | No Build | Build |
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. | 117.8 | 121.1 |

**Notes:** * CAL3QHCR Results
24-Hour NAAQS for $PM_{10}$ is 150 $\mu g/m^3$.

**Table 16-10**
**Maximum Future Build Predicted Annual Average $PM_{10}$ Concentrations for 2013 ($\mu g/m^3$)**

| Receptor Site | Location | Annual Average Concentration ($\mu g/m^3$)* | |
|---|---|---|---|
| | | No Build | Build |
| 5 | Atlantic Ave./Flatbush Ave./4th Ave. | 44.6 | 45.6 |

**Notes:** * CAL3QHCR Results
Annual Average NAAQS for $PM_{10}$ is 50 $\mu g/m^3$.

*$PM_{2.5}$*

As mentioned above, the primary focus of the mobile source $PM_{2.5}$ analysis was to determine the maximum predicted incremental impacts, so that they could be compared to the interim guidance criteria that would determine the potential significance of the project's impacts.

The maximum predicted neighborhood-scale annual average and localized 24-hour average $PM_{2.5}$ incremental concentrations, are presented in Table 16-11. The results show that the

predicted annual and daily (24-hour) $PM_{2.5}$ increments are below the interim guidance criteria, and therefore the proposed actions would not result in significant $PM_{2.5}$ impacts at the analyzed receptor location.

**Table 16-11**
**Maximum Predicted Incremental 24-Hour and Annual Average $PM_{2.5}$ Concentrations for 2013 ($\mu g/m^3$)**

| Receptor Site | Location | Neighborhood-Scale Analysis | Localized Analysis |
|---|---|---|---|
| | | Annual Increase | 24-Hour Increase |
| 3 | Willoughby Street and Gold Street | 0.03 | 0.72 |

Notes: $PM_{2.5}$ Interim Guidance Criteria:
Annual Average (Neighborhood-Scale)—0.1$\mu g/m^3$
24-Hour (Localized)—5.0 $\mu g/m^3$

## PARKING

As previously discussed, an analysis was performed to assess the potential effects on ambient CO concentrations from emissions from parking garages at the proposed development sites. The prototypical parking garage proposed for the south side of Willoughby Street, between Albee Square West/Gold Street and Duffield Street was modeled as a worst-case parking facility for this analysis. The garage was modeled as a mechanically ventilated, below-grade garage with a parking space capacity of approximately 694 spaces. The average 8-hour concentrations were determined using the weekday 8-hour time period when overall garage usage would be the greatest, which would typically be when the greatest number of vehicles would exit the facility over an 8-hour period. Maximum emissions would result in the highest CO levels and the greatest potential impacts. Since the EIS analyzes a worst-case development scenario and not specific development proposals, there are no specific garage designs upon which the modeling of emissions can be based. Therefore, worst-case assumptions were made regarding the design of the garages' mechanical ventilation systems. An 8-hour persistence factor of 0.81 was used to account for meteorological variability over the average 8-hour period.

Based on the methodology previously discussed, the maximum predicted future CO concentrations, with ambient background levels, at sidewalk receptor locations would be 11.0 ppm and 4.8 ppm for the 1- and 8-hour periods, respectively. The maximum 1- and 8-hour contributions from the parking garage would be 5.0 ppm and 2.5 ppm, respectively. The values are the highest predicted concentrations for any time period analyzed. These maximum predicted CO levels would be below the applicable CO standard.

In addition, the maximum total cumulative CO levels at Receptor Site 3, including parking garage emissions and on-street emissions, were evaluated. Cumulative emissions were assessed at this receptor sites because the parking garage modeled is closest to this intersection, and is, therefore, the worst case. For 2013, the maximum cumulative 8-hour average concentrations at Site 3 would be 4.8 ppm with ambient background levels included, for the PM time period. This resulting cumulative CO concentration is less than the 8-hour ambient air quality standard, and is not predicted to be over the *de minimis* criteria.

## STATIONARY SOURCES

The proposed development sites were evaluated for their potential effects on the surrounding community due to the emissions from the developments' HVAC systems. Existing industrial facilities were assessed for potential adverse impacts on the future developments sites' residents. Potential impacts were analyzed for emissions from existing or planned nearby sources. The areas of concern are discussed below.

### *HVAC ANALYSIS*

The primary stationary source of air pollutants associated with the proposed actions would be the emissions from the natural gas or oil-fired HVAC systems. The primary pollutant of concern when burning natural gas is nitrogen dioxide, and when burning oil, sulfur dioxide. Based on the methodologies in the *CEQR Technical Manual*, an estimate of the emissions from each development's HVAC system was made based on the development size, type of fuel used and type of construction.

The proposed actions would result in the development of commercial, cultural and mixed-use residential uses that are typically found throughout the City. Currently, the project consists only of zoning envelopes, not discrete design programs.

#### *Screening*

*Impacts from Projected Development Sites on Existing Sensitive Uses.* Impacts were determined using the ISC3 screening database found in Table 3Q-3 of the *CEQR Technical Manual.* If multiple sources within 400 feet of a receptor site were found of a similar or greater height than the source, the maximum predicted impacts were combined.

The maximum predicted concentrations from the modeling were added to the background concentrations to estimate the ambient air quality at potential elevated receptor locations near the projected development sites. The results of this analysis are presented in Table 16-12. The table summarizes the maximum total concentrations at receptor locations that are within 400 feet of the projected development sites and of a similar or greater height (as determined by number of boiling stories). As shown in the table, the maximum total pollutant concentrations for all of the pollutant time averaging periods are less than their respective standards. The results of this analysis show that there would be no significant air quality impacts from the projected development sites' HVAC systems on existing sensitive uses in the project area.

*Impacts from Projected Development Sites on Other Projected Development Sites.* A separate analysis was conducted to determine the potential impacts on the proposed action from one or more development sites to another development site. The same procedure for determining impacts on the surrounding area was used. The estimated concentrations from the modeling were added to the background concentrations to estimate total air quality concentrations at each proposed projected development site. The analysis showed that emissions from the projected development site J (186-136 Myrtle Avenue) would have the potential to result in impacts on the adjacent projected development site I (158-180 Myrtle Avenue). In addition, the emissions from the projected development site BB (258-272 Livingston Street) would have the potential to result in impacts on projected development site AA (230-238 Livingston Street). Therefore, ISCST3 analysis was conducted to assess the potential for impacts from the projected development sites. The results of this analysis are discussed and presented below.

**Table 16-12**
**Summary of HVAC Screening Pollutant Concentrations—Impacts from Projected Development Sites on Existing Sensitive Uses ($\mu g/m^3$)**

| Pollutant | Averaging Period | Background Concentration ($\mu g/m^3$) | Predicted Concentration ($\mu g/m^3$) | Total Concentration ($\mu g/m^3$) | Ambient Standard ($\mu g/m^3$) |
|---|---|---|---|---|---|
| **Receptor R1 (175 Willoughby Street), Source J** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 1.2 | 72.2 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 851.5 | 1,063.5 | 1,300 |
| | 24-hour | 118 | 144.9 | 262.9 | 365 |
| | Annual | 37 | 4.1 | 41.1 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 30.8 | 79.8 | 150 |
| | Annual | 22 | 0.9 | 22.9 | 50 |
| **Receptor R2 (191 Willoughby Street), Source J** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 1.0 | 72.0 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 646.5 | 858.5 | 1,300 |
| | 24-hour | 118 | 113.0 | 231.0 | 365 |
| | Annual | 37 | 3.3 | 40.3 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 23.0 | 72.0 | 150 |
| | Annual | 22 | 0.7 | 22.7 | 50 |
| **Receptor R3 (22 Ashland Place), Source J** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 1.12 | 71.12 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 765.0 | 977.0 | 1,300 |
| | 24-hour | 118 | 132.0 | 250.0 | 365 |
| | Annual | 37 | 3.78 | 40.78 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 28.0 | 77.0 | 150 |
| | Annual | 22 | 0.80 | 22.80 | 50 |
| **Receptor I1 (6 Nevins Street), Source J** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 0.52 | 71.52 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 345.7 | 557.7 | 1,300 |
| | 24-hour | 118 | 61.4 | 179.4 | 365 |
| | Annual | 37 | 1.8 | 38.8 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 13.0 | 62.0 | 150 |
| | Annual | 22 | 0.4 | 22.4 | 50 |
| **Receptor I2 (38 Lafayette Avenue), Source EE** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 1.1 | 72.1 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 708.0 | 920.0 | 1,300 |
| | 24-hour | 118 | 123.7 | 241.7 | 365 |
| | Annual | 37 | 3.6 | 40.6 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 26.3 | 75.3 | 150 |
| | Annual | 22 | 0.8 | 22.8 | 50 |

*Dispersion Modeling*

$NO_2$, $PM_{10}$, and $SO_2$ Impacts

Potential stationary source impacts from the HVAC systems of the projected development site J on the adjacent projected development site I, and projected development site BB on projected development site AA, were analyzed using ISCST3 modeling, based on the methodology previously described. The estimated concentrations from the modeling were added to the

background concentration to estimate ambient air quality at the projected development sites. The results of this analysis are presented in Table 16-13. As shown in the table, the maximum predicted concentrations for the pollutants analyzed are below the respective standards. Therefore, no significant adverse air quality impacts would occur from the HVAC systems of the projected development sites for these pollutants.

**Table 16-13**
**HVAC Dispersion Modeling Analysis**
**Maximum Predicted Pollutant Concentrations**

| Pollutants | Averaging Period | Background Concentration ($ug/m^3$) | Predicted Concentration ($ug/m^3$) | Total Predicted Concentration ($ug/m^3$) | Ambient Standard ($ug/m^3$) |
|---|---|---|---|---|---|
| **Receptor I, Source J** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 0.2 | 71.2 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 148.1 | 360.1 | 1,300 |
| | 24-hour | 118 | 39.9 | 157.9 | 365 |
| | Annual | 37 | 0.8 | 37.8 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 8.5 | 57.5 | 150 |
| | Annual | 22 | 0.2 | 22.2 | 50 |
| **Receptor AA, Source BB** | | | | | |
| Nitrogen Dioxide ($NO_2$) | Annual | 71 | 0.9 | 71.9 | 100 |
| Sulfur Dioxide ($SO_2$) | 3-hour | 212 | 659.2 | 871.2 | 1,300 |
| | 24-hour | 118 | 121.7 | 239.7 | 365 |
| | Annual | 37 | 2.9 | 39.9 | 80 |
| Inhalable Particulates ($PM_{10}$) | 24-hour | 49 | 25.6 | 74.6 | 150 |
| | Annual | 22 | 0.6 | 22.6 | 50 |

$PM_{2.5}$ Impacts

*Maximum Local $PM_{2.5}$ Incremental Impacts*

The air quality modeling analysis determined the highest predicted increase in 24-hour and annual average $PM_{2.5}$ concentrations from the two development sites. Table 16-14 summarizes the results of the impacts compared to the appropriate interim guidance criteria.

**Table 16-14**
**Maximum Predicted Stationary Source**
**$PM_{2.5}$ Incremental Concentrations**

| Receptor, Source | Averaging Period | Maximum Increment($\mu g/m^3$) | Significant Impact Threshold ($\mu g/m^3$) |
|---|---|---|---|
| Receptor I, Source J | 24-hour | 4.83 | 5.0 |
| | Annual | 0.15 | 0.3 |
| Receptor AA, Source BB | 24-hour | < 5.0 | 5.0 |
| | Annual | 0.09 | 0.3 |

**Note:** [1] Annual results represent the maximum impacts at individual receptor locations.

As shown in the table, for projected development site J, the maximum 24-hour incremental impacts would be less than the applicable interim guidance criterion of 5 $\mu g/m^3$. On an annual basis, impacts the projected $PM_{2.5}$ impacts would be less than the NYSDEC policy threshold of 0.3 $\mu g/m^3$. For projected development site BB, the maximum predicted incremental $PM_{2.5}$ impact was predicted to be slightly higher than the 5 $\mu g/m^3$ interim guidance criterion. On an annual basis, the maximum predicted impact would not exceed the 0.3 $\mu g/m^3$ threshold. Therefore, to ensure that impacts do not exceed the 24-hour $PM_{2.5}$ interim guidance criterion of 5 $\mu g/m^3$, the minimum distance from the HVAC stack(s) to the receptors at projected development site AA must be located at least 115 feet from the lot line facing Hoyt Street and parallel with Schermerhorn Street. An (E) designation would be incorporated into the zoning proposal which would preclude the potential for air quality impacts at this projected development site.

The text of the (E) designation is as follows:

> Block 165, Lot 29 (site BB)
>
> Any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilating and air conditioning stack(s) is located at least 115 feet from the lot line facing Hoyt Street and parallel with Schermerhorn Street.

Neighborhood-Scale Annual Average Impact Assessment

As shown in Table 16-14, the maximum annual impact from projected development site J on projected development site I is 0.15 $\mu g/m^3$.This concentration slightly exceeds the DEP interim guidance criterion of 0.1$\mu g/m^3$. Therefore, an analysis was conducted to determine the neighborhood-scale annual $PM_{2.5}$ increment to allow a direct comparison with this threshold concentration. The resulting neighborhood-scale annual average impact was 0.02 $\mu g/m^3$, which is well below the interim guidance criteria. Consequently, no significant adverse air quality impacts are predicted to occur on neighborhood-scale receptors from this site.

For projected development site BB, the maximum predicted local impact was 0.09 $\mu g/m^3$, which is less than the interim guidance threshold of 0.1 $\mu g/m^3$. Therefore, a neighborhood-scale analysis was not required for this site.

*INDUSTRIAL SOURCES*

*Screening*

As discussed above, a study was conducted to identify manufacturing and industrial uses within 400 feet of the projected development sites. DEP-BEC and EPA permit databases were used to identify existing sources of industrial emissions. A total of five permitted facilities were identified within 400 feet of the projected residential development sites. Figure 16-2 shows the locations of each identified source. Table 16-15 shows the businesses' name and address and a description of each permitted industrial sources.

**Table 16-15**
**Business with Industrial Source Permits**

| Source Reference No. | Facility Name | Address | Description of Permitted Sources |
|---|---|---|---|
| 1 | Medtech Motors Inc. | 329 Gold Street | Exhaust System |
| 2 | R&P Cleaners | 167 Myrtle Avenue | Dry Cleaning |
| 3 | Bridge Cleaners | 384 Bridge Street | Dry Cleaning |
| 4 | Abraham and Straus Department Store | 420 Fulton Street | Paint Spray Booth |
| 5 | Action Press | 170 Tillary Street | Printing |

The screening procedure used to estimate the emissions from these businesses is based on information contained in the operational permits obtained from BEC and NYSDEC. The permits issued by BEC describe potential contaminants emitted by the permitted processes, hours per day and days per year in which there may be emissions (which is related to the hours of business operation), and the characteristics of the emission exhaust systems (temperature, exhaust velocity, height, and dimensions of exhaust.) The Air Guide-1 software program contains information on sources permitted by NYSDEC. It summarizes short-term and annual emissions by pollutant and facility.

This screening analysis identified one business that could potentially have significant impacts on one of the projected residential development sites. This business is R&P Cleaners, a dry cleaning establishment at 167 Myrtle Avenue, located near the projected development sites I(A), G, and J.

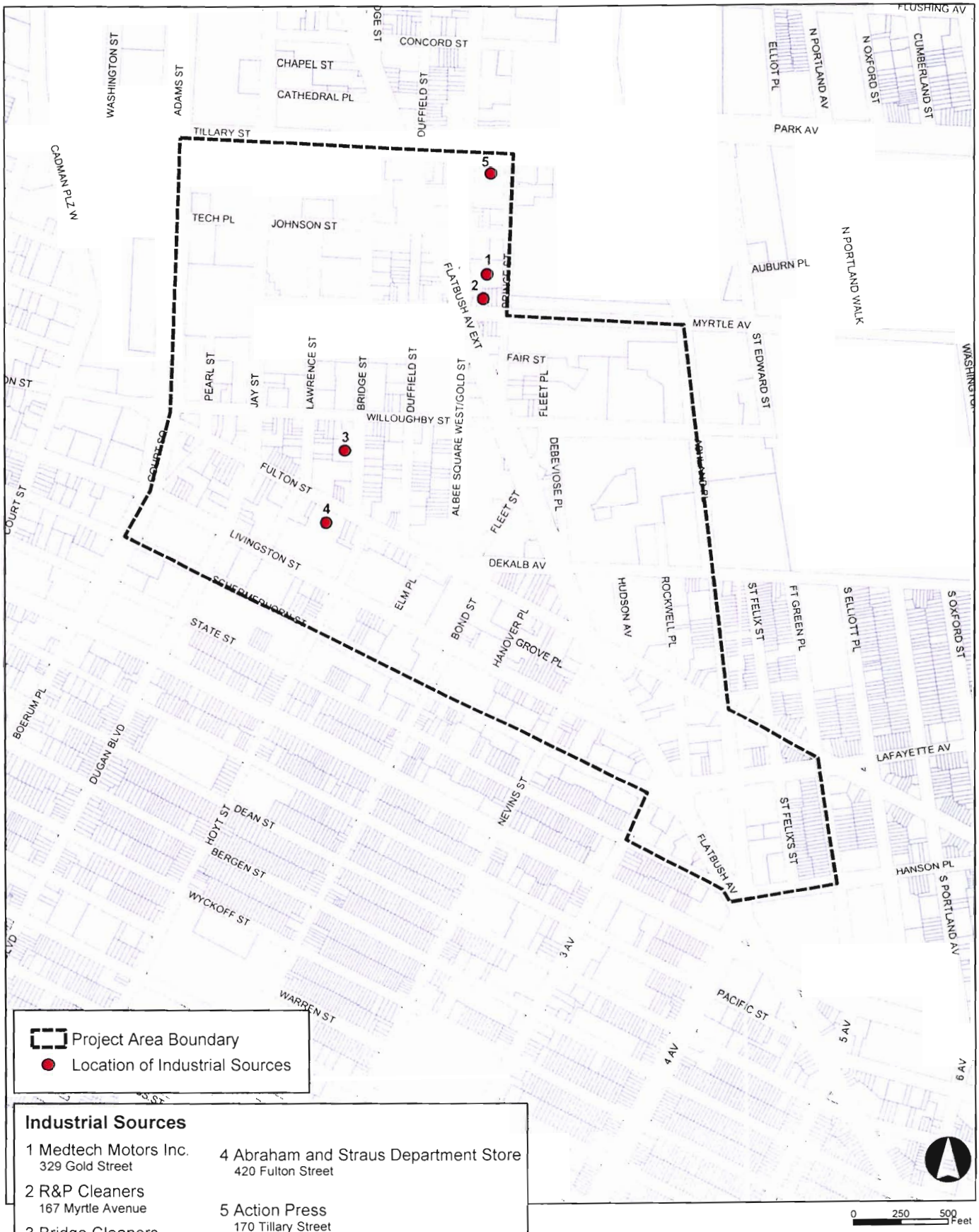
*Dispersion Modeling*

As a result of the potential impacts predicted from the initial industrial source screening analysis, a detailed analysis of industrial source impacts was undertaken to analyze potential impacts on the proposed development sites, following the methodology previously described.

Table 16-16 presents the potential impacts from the industrial screening and detailed modeling, at the projected developments most affected by industrial sources. The table lists the highest calculated SGC and AGC calculated for each toxic air pollutant. The conservative screening procedure and detailed analyses used to estimate maximum potential impacts from these businesses showed their operations would not result in any predicted violations of the NAAQS or any exceedances of the recommended SGC or AGC. Therefore, based on the data available on the surrounding industrial uses, the proposed developments would not experience significant air quality impacts from these facilities.

## CONSISTENCY WITH NEW YORK STATE AIR QUALITY IMPLEMENTATION PLAN

Maximum predicted pollutant concentrations with the proposed actions would be less than the corresponding ambient air standards. Therefore, the proposed actions would be consistent with the New York State Implementation Plan for the control of ozone and CO.




**Industrial Sources**

1 Medtech Motors Inc.
329 Gold Street

2 R&P Cleaners
167 Myrtle Avenue

3 Bridge Cleaners
384 Bridge Street

4 Abraham and Straus Department Store
420 Fulton Street

5 Action Press
170 Tillary Street

DOWNTOWN**BROOKLYN**DEVELOPMENT

**Industrial Sources**
Figure 16-2

**Table 16-16**
**Industrial Source Analysis**

| Number | Name of Business | Address | Type of Business | Pollutant | Hours of Operation | | Estimated Short-term Impact (ug/m3) | SGC (ug/m3) | Estimated Long-term Impact (ug/m3) | AGC (ug/m3) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | hrs/day | days/yr | | | | | |
| **Site G** | | | | | | | | | | | |
| 1 | MEDTECH MOTORS,INC. | 329 Gold St. | Automobile | CARBON MONOXIDE | 7.5 | 300 | 16946 | 40,000.0 | 63.33 | -- | a |
| | | | | HYDROCARBONS C1-3 | 7.5 | 300 | 9901.0 | -- | 36.96 | -- | b |
| | | | | OXIDES OF NITROGEN | 7.5 | 300 | 151114.0 | -- | 8.72 | -- | b |
| 2 | R&P CLEANERS | 167 Myrtle Ave. | Dry Cleaner | PERCHLOROETHYLENE | 5.0 | 300 | 216.7 | 1,000.0 | 0.45 | 1.0 | b,c |
| 5 | ACTION PRESS | 170 Tillary St. | Printing | ISOPROPYL ALCOHOL | 8.0 | 240 | 2.8 | 120,000.0 | 0.01 | 7,000.0 | b |
| | | | | ETHYLENE GLYCOL | 8.0 | 240 | 1.0 | 10,000.0 | 0.004 | 400.0 | b |
| | | | | ETHYLENGLYCOLMONBUTY | 8.0 | 240 | 3.0 | 14,000.0 | 0.01 | 230.0 | b |
| | | | | OIL MIST | 8.0 | 240 | 5.7 | -- | 0.02 | -- | b |
| **Site I** | | | | | | | | | | | |
| 1 | MEDTECH MOTORS,INC. | 329 Gold St. | Automobile | CARBON MONOXIDE | 7.5 | 300 | 597 | 40,000.0 | 2.23 | -- | a |
| | | | | HYDROCARBONS C1-3 | 7.5 | 300 | 349.0 | -- | 1.30 | -- | b |
| | | | | OXIDES OF NITROGEN | 7.5 | 300 | 81.9 | -- | 0.31 | -- | b |
| 2 | R&P CLEANERS | 167 Myrtle Ave. | Dry Cleaner | PERCHLOROETHYLENE | 5.0 | 300 | 685.96 | 1,000.0 | 0.92 | 1.0 | b,c |
| **Site J** | | | | | | | | | | | |
| 1 | MEDTECH MOTORS,INC. | 329 Gold St. | Automobile | CARBON MONOXIDE | 7.5 | 300 | 213 | 40,000.0 | 0.92 | -- | a |
| | | | | HYDROCARBONS C1-3 | 7.5 | 300 | 124.4 | -- | 0.54 | -- | b |
| | | | | OXIDES OF NITROGEN | 7.5 | 300 | 29.2 | -- | 0.13 | -- | b |
| 2 | R&P CLEANERS | 167 Myrtle Ave. | Dry Cleaner | PERCHLOROETHYLENE | 5.0 | 300 | 137.9 | 1,000.0 | 0.40 | 1.0 | b,c |

**Table 16-16 (cont'd)**
**Industrial Source Analysis**

| Number | Name of Business | Address | Type of Business | Pollutant | Hours of Operation | | Estimated Short-term Impact (ug/m3) | SGC (ug/m3) | Estimated Long-term Impact (ug/m3) | AGC (ug/m3) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | hrs/day | days/yr | | | | | |
| **Site P** | | | | | | | | | | | |
| 3 | BRIDGE CLEANERS | 384 Bridge St. | Dry Cleaner | PERCHLOROETHYLENE | 8.0 | 253 | 201.5 | 1,000.0 | 0.72 | 1.0 | b |
| **Flatbush Triangle** | | | | | | | | | | | |
| 5 | ACTION PRESS | 170 Tillary St. | Printing | ISOPROPYL ALCOHOL | 8.0 | 240 | 2.8 | 120,000.0 | 0.01 | 7,000.0 | b |
| | | | | ETHYLENE GLYCOL | 8.0 | 240 | 1.0 | 10,000.0 | 0.00 | 400.0 | b |
| | | | | ETHYLENGLYCOLMONBUTY | 8.0 | 240 | 3.0 | 14,000.0 | 0.01 | 230.0 | b |
| | | | | OIL MIST | 8.0 | 240 | 5.6 | -- | 0.02 | -- | b |
| **Open Space on Jay Street** | | | | | | | | | | | |
| 4 | ABRAHAM AND STRAUS DEPT STORE | 420 Fulton St. | Display Repair Shop | ISOBUTYL ALCOHOL | 1.0 | 200 | 191.6 | -- | 0.08 | 360.0 | b |
| | | | | PARTICULATE | 1.0 | 200 | 1.8 | 380.0 | 0.00 | 50.0 | b |

**Notes:** a) 1-hour NAAQS
b) NYS DAR-1 (Air Guide-1) AGC/SGC Tables
c) Impacts extracted form detailed modeling analysis.

Site numbers correspond to Figure 16-2

## H. CONCLUSIONS

The results discussed below show that the maximum predicted carbon monoxide (CO), and particulate matter ($PM_{10}$ and $PM_{2.5}$) concentrations from mobile sources would be less than the corresponding ambient air standards, with the development of the projected development sites under the proposed actions. The cumulative parking garage analysis also determined that the project's public parking facilities would not result in any significant adverse air quality impacts.

A stationary source screening analysis and subsequent detailed dispersion modeling determined that there would be no potential significant adverse air quality impacts from emission of nitrogen dioxide ($NO_2$), sulfur dioxide ($SO_2$) and $PM_{10}$, from the proposed HVAC systems of the projected development sites. With respect to $PM_{2.5}$,an E-designation has been placed on projected development site BB (Block 165, Lot 29), which stipulates that any new residential development and/or commercial development on the above-referenced and air conditioning stack(s) is located at least 115 feet from the lot line facing Hoyt Street and parallel with Schermerhorn Street, to avoid any potential significant air quality impacts. In addition, there would be no significant adverse air quality impacts from industrial facilities on the proposed developments sites. ✷

## A. INTRODUCTION

Noise pollution in an urban area comes from many sources. Some of these are activities essential to the health, safety, and welfare of a city's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, stem from the movement of people and goods, activities that are essential to the viability of the city as a place to live and do business. Although these and other noise-producing activities are necessary to a city, the noise they produce is undesirable. Urban noise detracts from the quality of the living environment, and there is increasing evidence that excessive noise represents a threat to public health. The principal effect of the proposed actions on ambient noise levels would result from project-generated automobile and truck traffic.

The proposed actions would provide for the development of sites for a mix of office, academic, cultural, residential, and retail uses. The noise analysis concentrated on locations where there was the potential for significant increases in noise due to project-generated traffic, and quantified those increases in noise levels. In addition, the noise analysis also examined the level of attenuation necessary to achieve interior noise levels that do not exceed City Environmental Quality Review (CEQR) standards.

## B. NOISE FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may adversely affect people in several ways. For example, noise may interfere with human activities, such as sleep, speech communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. Although it is possible to study these effects on people on an average or statistical basis, it must be remembered that all the stated effects of noise on people vary greatly with the individual. Several noise scales and rating methods are used to quantify the effects of noise on people. These scales and methods consider such factors as loudness, duration, time of occurrence, and changes in noise level with time.

### "A"-WEIGHTED SOUND LEVEL (DBA)

Noise is typically measured in units called decibels (dB), which are ten times the logarithm of the ratio of the sound pressure squared to a standard reference pressure squared. Because loudness is important in the assessment of the effects of noise on people, the dependence of loudness on frequency must be taken into account in the noise scale used in environmental assessments. Frequency is the rate at which sound pressures fluctuate in a cycle over a given quantity of time, and is measured in Hertz (Hz), where 1 Hz equals 1 cycle per second. Frequency defines sound in terms of pitch components. In the measurement system, one of the simplified scales that accounts for the dependence of perceived loudness on frequency is the use of a weighting network—known as A-weighting—that simulates response of the human ear. For

most noise assessments the A-weighted sound pressure level in units of dBA is used in view of its widespread recognition and its close correlation with perception. In this analysis, all measured noise levels are reported in dBA or A-weighted decibels. Common noise levels in dBA are shown in Table 17-1.

**Table 17-1**
**Common Noise Levels**

| Sound Source | (dBA) |
|---|---|
| Military jet, air raid siren | 130 |
| Amplified rock music | 110 |
| Jet takeoff at 500 meters | 100 |
| Freight train at 30 meters | 95 |
| Train horn at 30 meters | 90 |
| Heavy truck at 15 meters | |
| Busy city street, loud shout | 80 |
| Busy traffic intersection | |
| Highway traffic at 15 meters, train | 70 |
| Predominantly industrial area | 60 |
| Light car traffic at 15 meters, city or commercial areas or residential areas close to industry | |
| Background noise in an office | 50 |
| Suburban areas with medium density transportation | |
| Public library | 40 |
| Soft whisper at 5 meters | 30 |
| Threshold of hearing | 0 |

**Note:** A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.

**Sources:** Cowan, James P. *Handbook of Environmental Acoustics*. Van Nostrand Reinhold, New York, 1994.
Egan, M. David, *Architectural Acoustics*. McGraw-Hill Book Company, 1988.

## COMMUNITY RESPONSE TO CHANGES IN NOISE LEVELS

The average ability of an individual to perceive changes in noise levels is well documented (see Table 17-2). Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, whereas 10 dBA changes are normally perceived as doublings (or halvings) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

**Table 17-2**
**Average Ability to Perceive Changes in Noise Levels**

| Change (dBA) | Human Perception of Sound |
|---|---|
| 2-3 | Barely perceptible |
| 5 | Readily noticeable |
| 10 | A doubling or halving of the loudness of sound |
| 20 | A dramatic change |
| 40 | Difference between a faintly audible sound and a very loud sound |

**Source:** Bolt Beranek and Neuman, Inc., *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.

It is also possible to characterize the effects of noise on people by studying the aggregate response of people in communities. The rating method used for this purpose is based on a statistical analysis of the fluctuations in noise levels in a community, and integrates the fluctuating sound energy during a known period of time, most typically during 1 hour or 24 hours. Various government and research institutions have proposed criteria that attempt to relate changes in noise levels to community response. One commonly applied criterion for estimating this response is incorporated into the community response scale proposed by the International Standards Organization (ISO) of the United Nations (see Table 17-3). This scale relates changes in noise level to the degree of community response and permits direct estimation of the probable response of a community to a predicted change in noise level.

**Table 17-3**
**Community Response to Increases in Noise Levels**

| Change (dBA) | Category | Description |
|---|---|---|
| 0 | None | No observed reaction |
| 5 | Little | Sporadic complaints |
| 10 | Medium | Widespread complaints |
| 15 | Strong | Threats of community action |
| 20 | Very strong | Vigorous community action |

**Source:** International Standards Organization, Noise Assessment with Respect to Community Responses, ISO/TC 43 (New York: United Nations, November 1969).

## NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level unit of dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," $L_{eq}$, can be computed. $L_{eq}$ is the constant sound level that, in a given situation and time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as $L_1$, $L_{10}$, $L_{50}$, and $L_{90}$ are sometimes used to indicate noise levels that are exceeded 1, 10, 50, and 90 percent of the time, respectively. Discrete event peak levels

are given as $L_1$ levels. $L_{eq}$ is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between $L_{eq}$ and levels of exceedance is worth noting. Because $L_{eq}$ is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, $L_{eq}$ will approximate $L_{50}$ or the median level. If the noise fluctuates broadly, the $L_{eq}$ will be approximately equal to the $L_{10}$ value. If extreme fluctuations are present, the $L_{eq}$ will exceed $L_{90}$ or the background level by 10 or more decibels. Thus the relationship between $L_{eq}$ and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the $L_{eq}$ is generally between $L_{10}$ and $L_{50}$. The relationship between $L_{eq}$ and exceedance levels has been used in this analysis to characterize the noise sources and to determine the nature and extent of their impact at all receptor locations.

For the purposes of this project, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in the noise impact evaluation. $L_{eq(1)}$ is the noise descriptor used in the *CEQR Technical Manual* for noise impact evaluation, and is used to provide an indication of highest expected sound levels. $L_{10(1)}$ is the noise descriptor used in the 2001 *CEQR Technical Manual* for building attenuation. Hourly statistical noise levels (particularly $L_{10}$ and $L_{eq}$ levels) were used to characterize the relevant noise sources and their relative importance at each receptor location.

## C. NOISE STANDARDS AND CRITERIA

### NEW YORK CITY NOISE CODE

The New York City Noise Control Code promulgates sound-level standards for motor vehicles, air compressors, and paving breakers; requires that all exhausts be muffled; and prohibits all unnecessary noise adjacent to schools, hospitals, or courts. The Code further limits construction activities to weekdays between 7 AM and 6 PM.

This Code contains ambient noise quality criteria and standards based on existing land use zoning designations. Table 17-4 summarizes the ambient noise quality criteria contained in the Noise Control Code. Conformance with the noise level values contained in the Code is determined by considering noise emitted directly from stationary activities within the boundaries of a project. Construction activities and noise sources outside the boundaries of a project are not included within the provisions of this law.

**Table 17-4**
**City of New York**
**Ambient Noise Quality Zone Criteria (in dBA)**

| Ambient Noise Quality Zone (ANQZ) | Daytime Standards* (7 AM-10PM) | Nighttime Standards* (10 PM-7AM) |
|---|---|---|
| Noise quality zone N-1 (Low density residential $R_L$; land-use zones R-1 to R-3) | 60 | 50 |
| Noise quality zone N-2 (High density residential $R_H$; land-use zones R-4 to R-10) | 65 | 55 |
| Noise quality zone N-3 (All commercial and manufacturing land-use zones) | 70 | 70 |

**Note:** * Leq(1 hour).
**Source:** City of New York Local Law No. 64.

*NEW YORK CEQR NOISE STANDARDS*

The New York City Department of Environmental Protection (DEP) has set external noise exposure standards. These standards are shown in Table 17-5 and 17-6. Noise Exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The standards shown are based on maintaining an interior noise level for the worst-case hour $L_{10}$ less than or equal to 45 dBA. Attenuation requirements are shown in Table 17-6.

In addition, the 2001 *CEQR Technical Manual* uses the following criteria to determine whether a proposed project development would result in a significant adverse noise impact. The impact assessments compare the proposed action's $L_{eq(1)}$ noise levels with those calculated for the future noise levels without the proposed action (Future No Build) for receptors potentially affected by the project development.

If the future No Build noise levels are less than 60 dBA and the analysis period is not a nighttime period, the threshold for a significant impact would be an increase of at least 5 dBA $L_{eq(1)}$. For the 5 dBA threshold to be valid, the resultant proposed action condition noise level would have to be equal to or less than 65 dBA. If the future No Build noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEPO-CEQR standards as being between 10 PM and 7 AM), the incremental significant impact threshold would be 3 dBA $L_{eq(1)}$. (If the future No Build noise level is 61 dBA $L_{eq(1)}$, the maximum incremental increase would be 4 dBA, since an increase higher than this would result in a noise level higher than the 65 dBA threshold.)

*PERFORMANCE STANDARDS FOR MANUFACTURING DISTRICTS*

Section 42-213 of the New York City Zoning Resolution contains noise performance standards for uses in manufacturing districts. Noise levels from any activity, whether open or enclosed, cannot exceed the sound pressure levels shown in Table 17-7, on or beyond the lot line. Operation of motor vehicles or other transportation facilities are not included in the maximum levels specified in the performance standards. When a manufacturing district adjoins a residential district, the maximum permitted levels are reduced by 6 decibels. A small portion of the rezoning area (the northwestern portion of the rezoning area) is located in an M1-1 zoned district. That area is proposed to be rezoned to C6-4. With the proposed rezoning, new manufacturing uses would not be introduced into the area

**Table 17-5**
**CEQR Noise Exposure Guidelines**
**For Use in City Environmental Impact Review**

| Receptor Type | Time Period | Acceptable General External Exposure | Airport[3] | Marginally Acceptable General External Exposure | Airport[3] | Marginally Unacceptable General External Exposure | Airport[3] | Clearly Unacceptable General External Exposure | Airport[3] Exposure |
|---|---|---|---|---|---|---|---|---|---|
| 1. Outdoor area requiring serenity and quiet[2] | | $L_{10} \leq 55$ dBA | ---------- $L_{dn} \leq 60$ dBA ---------- | | ---------- $60 < L_{dn} \leq 65$ dBA ---------- | | (1) $65 < L_{dn} \leq 70$ dBA, (II) $70 \leq L_{dn}$ | | ---------- $L_{dn} \leq 75$ dBA ---------- |
| 2. Hospital, Nursing Home | | $L_{10} \leq 55$ dBA | | $55 < L_{10} \leq 65$ dBA | | $65 < L_{10} \leq 80$ dBA | | $L_{10} > 80$ dBA | |
| 3. Residence, residential hotel or motel | 7 AM to 10 PM | $L_{10} \leq 65$ dBA | | $65 < L_{10} \leq 70$ dBA | | $70 < L_{10} \leq 80$ dBA | | $L_{10} > 80$ dBA | |
| | 10 PM to 7 AM | $L_{10} \leq 55$ dBA | | $55 < L_{10} \leq 70$ dBA | | $70 < L_{10} \leq 80$ dBA | | $L_{10} > 80$ dBA | |
| 4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility | | Same as Residential Day (7 AM-10 PM) | | Same as Residential Day (7 AM-10 PM) | | Same as Residential Day (7 AM-10 PM) | | Same as Residential Day (7 AM-10 PM) | |
| 5. Commercial or office | | Same as Residential Day (7 AM-10 PM) | | Same as Residential Day (7 AM-10 PM) | | Same as Residential Day (7 AM-10 PM) | | Same as Residential Day (7 AM-10 PM) | |
| 6. Industrial, public areas only[4] | Note 4 | Note 4 | | Note 4 | | Note 4 | | Note 4 | |

**Notes:** (i)In addition, any new activity shall not increase the ambient noise level by 3 dBA or more.

[1] Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.

[2] Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.

[3] One may use the FAA-approved $L_{dn}$ contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.

[4] External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

**Source:** New York City Department of Environmental Protection (adopted policy 1983).

**Table 17-6**
**Required Attenuation Values to Achieve Acceptable Interior Noise Levels**

| | Marginally Acceptable | Marginally Unacceptable | | Clearly Unacceptable | | |
|---|---|---|---|---|---|---|
| Noise Level With Proposed Action | $65 < L_{10} \leq 70$ | $70 < L_{10} \leq 75$ | $75 < L_{10} \leq 80$ | $80 < L_{10} \leq 85$ | $85 < L_{10} \leq 90$ | $90 < L_{10} \leq 95$ |
| Attenuation* | 25 dB(A) | (I) 30 dB(A) | (II) 35 dB(A) | (I) 40 dB(A) | (II) 45 dB(A) | (III) 50 dB(A) |
| **Source:** New York City Department of Environmental Protection | | | | | | |

**Table 17-7**
**City of New York Noise Performance Standards for Manufacturing Districts**
**Maximum Permitted Sound Pressure Levels (in dB)**

| Octave Band (Hz) | M1 District | M2 District | M3 District |
|---|---|---|---|
| 20 to 75 | 79 | 79 | 80 |
| 75 to 150 | 74 | 75 | 75 |
| 150 to 300 | 66 | 68 | 70 |
| 300 to 600 | 59 | 62 | 64 |
| 600 to 1200 | 53 | 56 | 58 |
| 1200 to 2400 | 47 | 51 | 53 |
| 2400 to 4800 | 41 | 47 | 49 |
| Above 4800 | 39 | 44 | 46 |
| **Source:** City of New York Performance Standards for Manufacturing Districts. | | | |

## D. NOISE PREDICTION METHODOLOGY

### PROPORTIONAL MODELING TECHNIQUE

A proportional modeling technique was used as a screening mechanism to determine locations which had the potential for having significant noise impacts based on a calculation using measured existing noise levels and predicted changes in traffic volumes. The proportional model is consistent with the methodology described in the 2001 *CEQR Technical Manual* for mobile source analysis.

Using this technique, the prediction of future traffic noise levels is based on a calculation using measured existing noise levels and predicted changes in traffic volumes to determine future No Build and Build noise levels. Future No Build traffic volumes were based on applying a growth factor to the existing traffic volumes. Future Build traffic volumes were obtained by adding project-generated traffic values to No Build conditions. The vehicular traffic volumes were converted into passenger car equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars; one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars; and one bus (vehicles designed to carry more than nine

passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$

where:

F NL = Future Noise Level

E NL = Existing Noise Level

F PCE = Future PCEs

E PCE = Existing PCEs

Sound levels are measured in decibels and therefore increase logarithmically with sound source strength. In this case, the sound source is traffic volumes measured in PCEs. For example, assume that traffic is the dominant noise source at a particular location. If the existing traffic volume on a street is 100 PCEs and if the future traffic volume were increased by 50 PCEs to a total of 150 PCEs, the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 PCEs, or doubled to a total of 200 PCEs, the noise level would increase by 3.0 dBA.

This procedure was used to identify whether there were any locations in the vicinity of the rezoning area where project-generated PCE values would have the potential to result in an increase of 3 dBA or more in vehicle-related noise levels from No Build to Build conditions. (i.e., locations where there was a doubling of PCEs) and, consequently, where there is the potential for significant noise impacts. This analysis examined the weekday AM, midday, and PM peak periods. These are the time periods when the projected development under the proposed actions would have its maximum traffic generation and, therefore, the hours when the noise levels are most likely to have a significant impact. At locations where there was the potential for significant increases in noise levels based upon the development that would occur due to the proposed actions, future noise levels were determined either using the proportional modeling technique described above, or, in cases where existing volumes were very low and/or traffic on nearby streets or other sources were major noise contributors, the TNM model, which is described below.

## TNM MODEL

The *Traffic Noise Model* version 2.1 (TNM) is a computerized model developed for the Federal Highway Administration (FHWA) that takes into account various factors due to traffic flow, including traffic volumes, vehicle mix (i.e., percentage of autos, light duty trucks, heavy duty trucks, buses, etc.), sources/receptor geometry, and shielding (including barriers and terrain, ground attenuation, etc.) It is the current state-of-the-art model for traffic noise analysis.

At locations where there was the potential for significant increases in noise levels, and where existing volumes were very low and/or traffic on nearby streets or other sources were major noise contributors, the TNM model was used for analysis, and the following four step procedure was followed: first, measurements were made of ambient noise levels; second, the TNM model was used to calculate the traffic component of the existing noise levels based on traffic on the immediately adjacent street; third, the noise component of the measured ambient noise levels traffic on nearby area streets or other sources was determined by subtracting the TNM calculated traffic component (based on traffic on the immediately adjacent street) from the measured ambient noise levels; and fourth, future noise levels were calculated by adding this non-adjacent

street noise component to TNM model calculated traffic components based on traffic on the adjacent street, both with and without the proposed actions.

## E. EXISTING CONDITIONS

### STUDY AREA GENERAL DESCRIPTION

The proposed area for rezoning is located in Downtown Brooklyn and is roughly bounded by Tillary Street to the north, Schermerhorn Street to the south, Adams Street to the west, and Ashland Place to the east. The area is very heavily trafficked and contains commercial and retail uses, in addition to residential and other noise sensitive uses. The majority of development area is zoned commercial (C6), with a small area that is zoned R6 and a small area that is zoned M1. The commercial and manufacturing zoned areas are within an N3 Ambient Noise Quality Zone (ANQZ). $L_{eq(1)}$ noise level limits for this type of zone are 70 dBA for both daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) hours. The residential zoned areas are within an N2 Ambient Noise Quality Zone (ANQZ). $L_{eq(1)}$ noise level limits for this type of zone are 65 dBA for daytime (7 AM to 10 PM) and 55 dBA for nighttime (10 PM to 7 AM) hours.

### SELECTION OF NOISE RECEPTOR LOCATIONS

Based on the screening analysis, 16 locations were identified as areas where project-generated traffic would have the potential to cause significant increases in noise levels or noise impacts. In addition, these 16 receptors were also selected to determine the levels of attenuation that would be necessary to comply with CEQR interior noise standards. See Figure 17-1 for receptor site locations. Site 1 was located on Bridge Street between Willoughby and Fulton Streets; Site 2 was located on Duffield Street between Willoughby and Fulton Streets; Site 3 was located on Albee Square West/Gold Street between Willoughby Street and DeKalb Avenue; Site 4 was located on Gallatin Place between Fulton and Livingston Streets; Site 5 was located on Fulton Street between Hanover Place and Bond Street; Site 6 was located on Fleet Street between DeKalb Avenue and Flatbush Avenue Extension; Site 7 was located at the intersection of Flatbush Avenue Extension and Prince Street; Site 8 was located on Livingston Street between Bond and Hoyt Streets; Site 9 was located on Willoughby Street between Bridge and Duffield Streets; Site 10 was located on Flatbush Avenue between Lafayette Avenue and Hanson Place; Site 11 was located at the southwest corner of the Ashland Place and Myrtle Avenue intersection; Site 12 was located on Myrtle Avenue between Prince Street and Ashland Place; Site 13 was located on Gold Street between Johnson Street and Flatbush Avenue Extension; Site 14 was located on Tillary Street between Jay and Bridge Streets; Site 15 was located on Adams Street between Tillary and Johnson Streets; and Site 16 was located on Fulton Street between Adams and Jay Streets.

### NOISE MONITORING

Noise monitoring at the receptor locations was performed in year 2003 on May 29 and June 3, 12 and 17. At each of these sites, 20-minute measurements were made during the AM (7:30–10:00 AM), midday (MD) (11:00 AM–3:00 PM), and PM (4:30–6:30 PM) weekday peak periods. Weather conditions were noted to ensure a true reading as follows: wind speed under 12 mph; relative humidity under 90 percent; and temperature above 14°F and below 122°F. Consistent with CEQR practice and to maximize possible project impacts, noise from aircraft activity in the project area was excluded from the noise measurements.

## EQUIPMENT USED DURING NOISE MONITORING

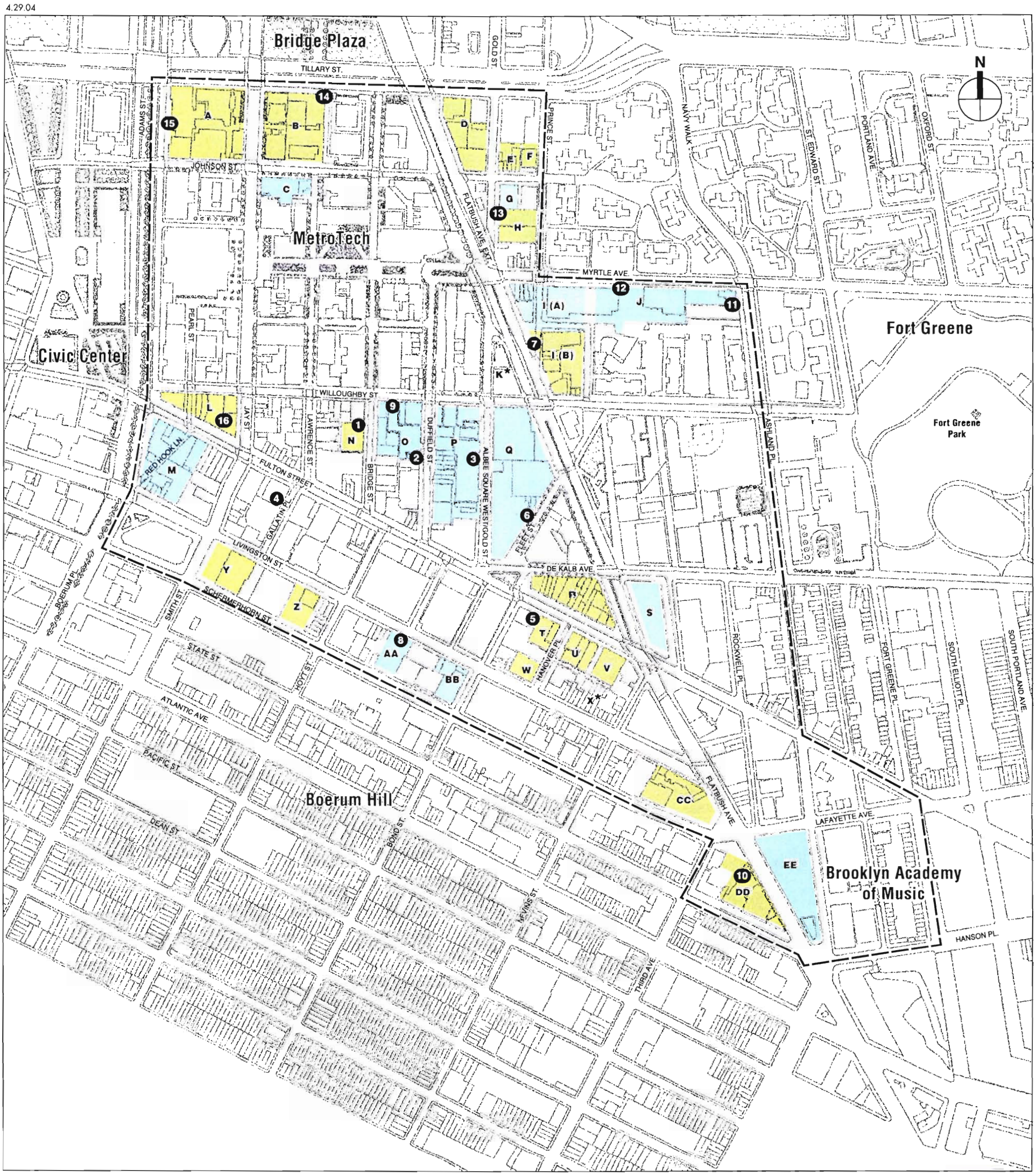
The instrumentation used for the 20-minute measurements of mobile source noise was a Brüel & Kjær Type 4176 ½-inch microphone connected to a Larson Davis Laboratories (LDL) preamplifier attached to an LDL Model 700 Type 1 (according to ANSI Standard S1.4-1983) sound level meter. This assembly was mounted at a height of 5 feet above the ground surface on a tripod and at least 6 feet away from any large sound-reflecting surface to avoid major interference with sound propagation. The meter was calibrated before and after readings with a Brüel & Kjær Type 4231 sound-level calibrator using the appropriate adaptor. Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included $L_{eq}$, $L_1$, $L_{10}$, $L_{50}$, and $L_{90}$. A windscreen was used during all sound measurements except for calibration. Only traffic related noise was measured; noise from other sources (e.g. emergency sirens, aircraft flyovers, etc.) was excluded from the measured noise levels. All measurement procedures conformed with the requirements of ANSI Standard S1.13-1971 (R1976).

## RESULTS OF BASELINE MEASUREMENTS

Noise monitoring results of the 16 receptor sites are shown in Table 17-8. Noise levels at all 16 sites are relatively high and reflect the heavy traffic volumes. In terms of CEQR standards, existing noise levels at all sites with the exception of Sites 1, 3, and 6 are in the "marginally unacceptable" category. The existing noise levels at Sites 1, 3, and 6 are in the "marginally acceptable" category.

**Table 17-8**
**Existing Noise Levels (in dBA)**

| Site | Location | Time | Measured Values | | | | |
|---|---|---|---|---|---|---|---|
| | | | $L_{eq(1)}$ | $L_1$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| 1 | Bridge Street between Willoughby and Fulton Streets | AM | 64.4 | 71.7 | 67.2 | 62.7 | 60.2 |
| | | MD | 66.6 | 76.5 | 69.0 | 63.0 | 61.0 |
| | | PM | 63.3 | 72.7 | 65.7 | 60.2 | 58.2 |
| 2 | Duffield Street between Willoughby and Fulton Streets | AM | 64.9 | 75.2 | 67.7 | 61.7 | 57.7 |
| | | MD | 69.4 | 76.0 | 72.5 | 67.5 | 63.5 |
| | | PM | 66.2 | 74.0 | 68.4 | 64.2 | 62.4 |
| 3 | Albee Square West/Gold Street between Willoughby Street and DeKalb Avenue | AM | 65.1 | 75.2 | 67.7 | 62.2 | 58.7 |
| | | MD | 66.1 | 75.0 | 69.0 | 63.5 | 60.0 |
| | | PM | 67.6 | 75.2 | 69.7 | 66.2 | 63.7 |
| 4 | Gallatin Place between Fulton and Livingston Streets | AM | 70.8 | 80.2 | 74.7 | 66.2 | 62.7 |
| | | MD | 76.6 | 85.5 | 80.0 | 73.0 | 68.5 |
| | | PM | 65.0 | 72.2 | 67.2 | 63.2 | 61.2 |
| 5 | Fulton Street between Hanover Place and Bond Street | AM | 71.3 | 82.7 | 75.2 | 64.7 | 60.2 |
| | | MD | 71.1 | 80.0 | 74.5 | 68.5 | 64.5 |
| | | PM | 72.5 | 81.2 | 75.7 | 70.7 | 66.2 |
| 6 | Fleet Street between DeKalb Avenue and Flatbush Avenue Extension | AM | 63.6 | 70.0 | 66.0 | 62.2 | 59.6 |
| | | MD | 65.8 | 71.5 | 67.5 | 64.5 | 63.5 |
| | | PM | 64.7 | 69.8 | 66.0 | 63.6 | 62.6 |
| 7 | Intersection of Flatbush Avenue Extension and Prince Street | AM | 71.3 | 79.2 | 72.8 | 69.0 | 65.0 |
| | | MD | 74.3 | 82.0 | 77.0 | 72.5 | 66.5 |
| | | PM | 69.5 | 77.4 | 71.6 | 67.8 | 63.4 |




Project Area Boundary

Projected Development Site

Potential Development Site

❶ Noise Receptor Site

* Since the issuance of the DEIS/DSEIS, Sites K and X have been removed from the proposed development plan

0 500 FEET
SCALE

DOWNTOWN**BROOKLYN**DEVELOPMENT

**Noise Receptor Locations**
Figure 17-1

**Table 17-8**
**Existing Noise Levels (in dBA) (cont'd)**

| Site | Location | Time | Measured Values | | | | |
|---|---|---|---|---|---|---|---|
| | | | $L_{eq(1)}$ | $L_1$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
| 8 | Livingston Street between Bond and Hoyt Streets | AM | 71.3 | 81.0 | 74.2 | 67.2 | 63.4 |
| | | MD | 68.2 | 77.2 | 71.2 | 65.0 | 62.2 |
| | | PM | 70.5 | 80.6 | 73.2 | 67.4 | 63.6 |
| 9 | Willoughby Street between Bridge and Duffield Streets | AM | 66.4 | 75.4 | 68.0 | 63.8 | 61.6 |
| | | MD | 69.4 | 76.8 | 71.4 | 68.0 | 65.2 |
| | | PM | 67.5 | 75.8 | 70.2 | 65.2 | 62.6 |
| 10 | Flatbush Avenue Between Lafayette Avenue and Hanson Place | AM | 72.7 | 81.0 | 75.8 | 70.6 | 65.6 |
| | | MD | 72.5 | 79.4 | 76.0 | 70.4 | 62.8 |
| | | PM | 72.1 | 79.0 | 75.4 | 70.0 | 65.2 |
| 11 | Southwest corner of Ashland Place and Myrtle Avenue | AM | 67.7 | 78.0 | 69.5 | 64.0 | 60.0 |
| | | MD | 69.7 | 79.0 | 70.0 | 64.5 | 59.5 |
| | | PM | 69.6 | 79.5 | 72.5 | 66.0 | 61.0 |
| 12 | Myrtle Avenue between Prince Street and Ashland Place | AM | 66.5 | 75.0 | 69.0 | 63.5 | 59.0 |
| | | MD | 66.8 | 76.0 | 70.0 | 64.0 | 59.5 |
| | | PM | 68.8 | 80.5 | 71.0 | 65.5 | 60.5 |
| 13 | Gold Street between Johnson Street and Flatbush Avenue Extension | AM | 68.4 | 76.5 | 71.0 | 66.5 | 63.5 |
| | | MD | 68.7 | 73.5 | 70.5 | 68.5 | 63.0 |
| | | PM | 67.9 | 78.5 | 69.5 | 65.5 | 62.0 |
| 14 | Tillary Street between Jay and Bridge Streets | AM | 73.3 | 81.5 | 75.5 | 70.5 | 67.0 |
| | | MD | 74.8 | 83.0 | 76.0 | 70.0 | 65.0 |
| | | PM | 73.1 | 85.5 | 74.0 | 68.5 | 64.5 |
| 15 | Adams Street between Tillary and Johnson Streets | AM | 68.2 | 75.8 | 70.4 | 66.6 | 63.2 |
| | | MD | 70.4 | 80.4 | 73.0 | 67.4 | 64.8 |
| | | PM | 68.1 | 74.2 | 71.4 | 65.8 | 62.6 |
| 16 | Fulton Street between Adams and Jay Streets | AM | 72.0 | 81.6 | 75.0 | 68.4 | 64.2 |
| | | MD | 73.3 | 81.6 | 76.0 | 70.4 | 66.0 |
| | | PM | 74.6 | 82.6 | 77.6 | 72.4 | 68.2 |

**Note:** Measurements performed by AKRF, Inc. on May 29, 2003 and June 3, 12 and 17, 2003.

## F. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Table 17-9 shows noise levels for future year 2013 conditions without the proposed actions (based on No Build traffic conditions) at the 16 receptor locations for the three analysis periods. These values were calculated using the methodology described above. With the exception of Sites 1 and 2, future noise levels were calculated using proportional modeling techniques. Future noise levels at Sites 1 and 2 were calculated using the TNM model.

Future No Build noise levels without the project are not expected to be significantly higher than existing levels. Traffic is the dominant noise source, and future traffic without the proposed actions will not be significantly increased when compared with existing volumes. At each of the 16 receptor sites, noise levels in the year 2013 will increase by less then 1.6 dBA. Change of this magnitude would be imperceptible and insignificant.

**Table 17-9**
**Future No Build Noise Levels (in dBA)**

| Site | Time | Existing Leq(1) | 2013 No Build Leq(1) | Change |
|---|---|---|---|---|
| 1 | AM | 64.4 | 64.6 | 0.2 |
| | MD | 66.6 | 66.9 | 0.3 |
| | PM | 63.3 | 63.7 | 0.4 |
| 2 | AM | 64.9 | 65.1 | 0.2 |
| | MD | 69.4 | 69.6 | 0.2 |
| | PM | 66.2 | 66.4 | 0.2 |
| 3 | AM | 65.1 | 65.3 | 0.2 |
| | MD | 66.1 | 66.3 | 0.2 |
| | PM | 67.6 | 67.8 | 0.2 |
| 4 | AM | 70.8 | 71.0 | 0.2 |
| | MD | 76.6 | 76.8 | 0.2 |
| | PM | 65.0 | 65.2 | 0.2 |
| 5 | AM | 71.3 | 72.0 | 0.7 |
| | MD | 71.1 | 71.7 | 0.6 |
| | PM | 72.5 | 73.2 | 0.7 |
| 6 | AM | 63.6 | 64.8 | 1.2 |
| | MD | 65.8 | 66.8 | 1.0 |
| | PM | 64.7 | 65.9 | 1.2 |
| 7 | AM | 71.3 | 71.4 | 0.1 |
| | MD | 74.3 | 74.4 | 0.1 |
| | PM | 69.5 | 69.6 | 0.1 |
| 8 | AM | 71.3 | 72.5 | 1.2 |
| | MD | 68.2 | 69.1 | 0.9 |
| | PM | 70.5 | 71.5 | 1.0 |
| 9 | AM | 66.4 | 66.9 | 0.5 |
| | MD | 69.4 | 69.8 | 0.4 |
| | PM | 67.5 | 68.0 | 0.5 |
| 10 | AM | 72.7 | 73.5 | 0.8 |
| | MD | 72.5 | 73.4 | 0.9 |
| | PM | 72.1 | 73.0 | 0.9 |
| 11 | AM | 67.7 | 68.1 | 0.4 |
| | MD | 69.7 | 70.2 | 0.5 |
| | PM | 69.6 | 70.1 | 0.5 |
| 12 | AM | 66.5 | 67.0 | 0.5 |
| | MD | 66.8 | 67.4 | 0.6 |
| | PM | 68.8 | 69.3 | 0.5 |
| 13 | AM | 68.4 | 68.6 | 0.2 |
| | MD | 68.7 | 68.9 | 0.2 |
| | PM | 67.9 | 68.1 | 0.2 |
| 14 | AM | 73.3 | 74.2 | 0.9 |
| | MD | 74.8 | 75.7 | 0.9 |
| | PM | 73.1 | 73.8 | 0.7 |
| 15 | AM | 68.2 | 69.3 | 1.1 |
| | MD | 70.4 | 71.5 | 1.1 |
| | PM | 68.1 | 69.2 | 1.1 |
| 16 | AM | 72.0 | 73.5 | 1.5 |
| | MD | 73.3 | 74.3 | 1.0 |
| | PM | 74.6 | 76.0 | 1.4 |

In terms of CEQR standards, the future No Build noise levels at all sites, with the exception of Sites 1, 3, 4, and 6, would remain in the "marginally unacceptable" category. Future No Build noise levels at Sites 1, 3, and 6 would remain in the "marginally acceptable" category. At Site 4,

future No Build noise levels would change from the "marginally unacceptable" category to the "clearly unacceptable" category.

## G. THE FUTURE WITH THE PROPOSED ACTIONS

Table 17-10 presents future 2013 noise levels at the 16 receptor sites with the development of the projected development sites. Noise levels were calculated using the methodology described above. With the exception of Sites 1 and 2, future noise levels were calculated using proportional modeling techniques. Future noise levels at Sites 1 and 2 were calculated using the TNM model.

**Table 17-10**
**Future Build Noise Levels (in dBA)**

| Site | Time | 2013 No Build Leq(1) | 2013 Build Leq(1) | Change |
|---|---|---|---|---|
| 1 | AM | 64.6 | 66.2* | 1.6 |
| | MD | 66.9 | 68.8 | 1.9 |
| | PM | 63.7 | 65.6 | 1.9 |
| 2 | AM | 65.1 | 68.5* | 3.4 |
| | MD | 69.6 | 70.4* | 0.8 |
| | PM | 66.4 | 67.3 | 0.9 |
| 3 | AM | 65.3 | 67.4 | 2.1 |
| | MD | 66.3 | 68.1 | 1.8 |
| | PM | 67.8 | 69.2 | 1.4 |
| 4 | AM | 71.0 | 71.0 | 0.0 |
| | MD | 76.8 | 76.8 | 0.0 |
| | PM | 65.2 | 65.2 | 0.0 |
| 5 | AM | 72.0 | 72.0 | 0.0 |
| | MD | 71.7 | 71.7 | 0.0 |
| | PM | 73.2 | 73.2 | 0.0 |
| 6 | AM | 64.8 | 65.0 | 0.2 |
| | MD | 66.8 | 67.0 | 0.2 |
| | PM | 65.9 | 66.0 | 0.1 |
| 7 | AM | 71.4 | 71.4 | 0.0 |
| | MD | 74.4 | 74.4 | 0.0 |
| | PM | 69.6 | 69.6 | 0.0 |
| 8 | AM | 72.5 | 73.1 | 0.6 |
| | MD | 69.1 | 69.8 | 0.7 |
| | PM | 71.5 | 71.9 | 0.4 |
| 9 | AM | 66.9 | 69.2 | 2.3 |
| | MD | 69.8 | 71.8 | 2.0 |
| | PM | 68.0 | 70.0 | 2.0 |
| 10 | AM | 73.5 | 73.6 | 0.1 |
| | MD | 73.4 | 73.5 | 0.1 |
| | PM | 73.0 | 73.1 | 0.1 |
| 11 | AM | 68.1 | 68.5 | 0.4 |
| | MD | 70.2 | 70.5 | 0.3 |
| | PM | 70.1 | 70.2 | 0.1 |

**Table 17-10**
**Future Build Noise Levels (in dBA) (cont'd)**

| Site | Time | 2013 No Build Leq(1) | 2013 Build Leq(1) | Change |
|---|---|---|---|---|
| 12 | AM | 67.0 | 67.3 | 0.3 |
| | MD | 67.4 | 67.7 | 0.3 |
| | PM | 69.3 | 69.5 | 0.2 |
| 13 | AM | 68.6 | 68.7 | 0.1 |
| | MD | 68.9 | 69.0 | 0.1 |
| | PM | 68.1 | 68.4 | 0.3 |
| 14 | AM | 74.2 | 74.5 | 0.3 |
| | MD | 75.7 | 76.0 | 0.3 |
| | PM | 73.8 | 74.0 | 0.2 |
| 15 | AM | 69.3 | 69.4 | 0.1 |
| | MD | 71.5 | 71.6 | 0.1 |
| | PM | 69.2 | 69.4 | 0.2 |
| 16 | AM | 73.5 | 73.6 | 0.2 |
| | MD | 74.3 | 74.5 | 0.3 |
| | PM | 76.0 | 76.4 | 0.4 |

**Note:**
* Values calculated using TNM Modeling.

In terms of CEQR standards, with the exception of Sites 1 and 3, future noise levels with the proposed actions at all sites would remain the same, such that Sites 2, 5, and 7 through 16 would remain in the "marginally unacceptable" category. Site 6 would remain in the "marginally acceptable" category, and Site 4 would remain in the "clearly unacceptable" category. Sites 1 and 3 would change from the "marginally acceptable" category to the "marginally unacceptable" category.

With the exception of Site 2, future noise levels with the proposed actions at all of the analysis sites would increase by less than 3 dBA during all of the analysis periods compared to future noise levels without the proposed actions. (Noise levels at Sites 1, 4 through 8, and 10 through 16 would increase by less than 2 dBA, an imperceptible and insignificant increase. Noise levels at Sites 3 and 9 would increase by less than 3 dBA, a barely perceptible and insignificant increase.) Consequently, with the exception of Site 2, the development of the projected development sites would not result in any significant increases in noise levels.

At Site 2, during the MD and PM peak periods, future noise levels with the proposed actions would increase by less than 2 dBA compared to future noise levels without the proposed actions, an imperceptible and insignificant increase. However, during the AM peak period, future noise levels with the proposed actions would increase by up to 3.4 dBA compared to future noise levels without the proposed actions. Increases of this magnitude would be perceptible and, based upon CEQR noise impact criteria, would constitute a significant noise impact. This impact occurs because of the relatively low volumes at this location without the proposed actions, and the number of vehicles (particularly trucks) generated by the development expected on this street and in the surrounding area. While there are a few residences currently on Duffield Street between Willoughby and Fulton Streets, with the proposed actions these residences would be

replaced with commercial/office/retail buildings (projected development sites O and P). While no residences would be impacted with the proposed actions, the increase in noise levels at Site 2, during the AM peak period would exceed the CEQR impact criteria and thus, the project would have a significant noise impacts at this location. There is no feasible mitigation to eliminate this impact at this site during this time period, and thus it constitutes an unmitigated project impact.

In addition, as part of the development that would occur with the proposed actions, a 1.15-acre public space, Willoughby Square, is proposed to be built over the below-grade public parking facility at Site 2. Based upon the Site 2 analysis results, $L_{10}$ noise levels of approximately 69 to 73 dBA would be expected at this new public space. These noise levels would be higher than those generally recommended for outdoor activities (i.e., they would exceed the CEQR Exposures Guideline value of 55 dBA $L_{10}$ for this use, shown in Table 17-5), but would be comparable to levels in existing parks in New York City which are adjacent to moderately to heavily trafficked streets and roadways. This exceedance of the CEQR Exposure Guideline value would result in elevated noise levels on future public space users. There are no feasible mitigation measures to reduce noise levels within an urban public space such as this to within recommended levels for this type of use.

## ATTENUATION REQUIREMENTS

As shown in Table 17-6, the 2001 *CEQR Technical Manual* has set noise attenuation values for buildings, based on exterior noise levels. Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower, and are determined based on exterior $L_{10(1)}$ noise levels.

Based on the measured $L_{10}$ noise levels, levels of building attenuation needed to achieve interior noise levels of 45 dBA or lower are shown in Table 17-11. In general, 20 to 25 dBA of building attenuation can be achieve with double glazed windows and alternative means of ventilation, such as window-sleeve air conditioning units; 30 dBA of building attenuation can be achieved with double glazed windows with good sealing properties and alternative means of ventilation such as well-sealed through-the-wall air conditioning, or central air conditioning; and 35 to 40 dBA of building attenuation can be achieve with double glazed windows with good sealing properties and alternative means of ventilation such as central air conditioning. Based upon the $L_{10(1)}$ values measured at the analysis sites, a maximum of 40 dBA of building attenuation would be required. The provision for providing sufficient building attenuation would be mandated by placing an E designation on the projected and potential development sites (see Table 17-11 or Tables 1-3 and 1-4 in Chapter 1 for a list of the affected blocks and lots). The text of the E designation would state that in order to ensure an acceptable interior noise environment at the projected and potential development sites, future uses on the sites must provide a minimum window/wall attenuation of either 25, 30, 35, or 40 dBA (depending on the site). Noise attenuation measures could include the installation of double- or triple-glazed windows, central air conditioning, air conditioning sleeves containing air conditioners, or HUD-approved fans. Prior to development on these sites, the New York City Department of Buildings would be furnished with a report from DEP stating that the environmental requirements related to the E designation have been met.

In addition, mechanical equipment such as heating, ventilation, and air conditioning (HVAC), and elevator motors would utilize sufficient noise reduction devices to comply with applicable noise regulations and standards.

Overall, with the specified attenuation measures, the proposed actions would not have any significant interior noise impacts, and would comply with all CEQR requirements.

**Table 17-11**
**Minimum Building Attenuation to Comply With CEQR Requirements***

| Site | Location | Time | $L_{10}$ (dBA) | Building Attenuation (dBA) | Affected Blocks and Lots |
|---|---|---|---|---|---|
| 1 | Bridge Street between Willoughby and Fulton Streets | MD | 71.2 | 30 | B 152, L 37; B 145, L 8, 10, 13-15 |
| 2 | Duffield Street between Willoughby and Fulton Streets | MD | 73.7 | 30 | B 145, L 26, 32; B 146, L 2, 7, 11-18 |
| 3 | Albee Square West/Gold Street between Willoughby Street and DeKalb Avenue | PM | 71.3 | 30 | B 146, L 23, 29, 34-37, 41-43, 46-52 |
| 4 | Gallatin Place between Fulton and Livingston Streets | MD | 80.2 | 40 | B 164, L 1, 13, 29, 31, 42-44 |
| 5 | Fulton Street between Hanover Place and Bond Street | PM | 76.4 | 35 | B 160, L 18, 29; B 149, L 14, 15, 17, 19, 22, 26, 28, 30-34, 50; B 161, L, 27, 30, 33, B 2093, L1 |
| 6 | Fleet Street between DeKalb Avenue and Flatbush Avenue Extension | MD | 68.7 | 25 | B 149, L 1, 49 |
| 7 | Intersection of Flatbush Avenue Extension and Prince Street | MD | 77.1 | 35 | B 2060, L 22-27, 32, 122; B 2062; L 1, 5, 6, 17-19, 21, 23, 24, 103 |
| 8 | Livingston Street between Bond and Hoyt Streets | AM | 76.0 | 35 | B 165, L 17-19, 29, 58 |
| 9 | Willoughby Street between Bridge and Duffield Streets | MD | 73.8 | 30 | B 145, L 16, 18-22 |
| 10 | Flatbush Avenue between Lafayette Avenue and Hanson Place | MD | 77.0 | 35 | B 174, L 9, 13, 18, 23, 24; B 2110, L 3; B 167, L 15, 16, 26, 28, 36, 42 |
| 11 | Southwest corner of Ashland Place and Myrtle Avenue | PM | 73.1 | 30 | B 2061, L1 |
| 12 | Myrtle Avenue between Prince Street and Ashland Place | PM | 71.7 | 30 | B2061, L1 |

**Table 17-11**
**Minimum Building Attenuation to Comply With CEQR Requirements* (cont'd)**

| Site | Location | Time | $L_{10}$ (dBA) | Building Attenuation (dBA) | Affected Blocks and Lots |
|---|---|---|---|---|---|
| 13 | Gold Street between Johnson Street and Flatbush Avenue Extension | AM | 71.3 | 30 | B 2049, L 2, 8; B 133, L 1, 5, 13, 15; B 134, L 1, 5, 30, 38, 41 |
| 14 | Tillary Street between Jay and Bridge Streets | MD | 77.2 | 35 | B 131, L 1; B 142, L 1 |
| 15 | Adams Street between Tillary and Johnson Streets | MD | 74.2 | 30 | B 128, L 1, 26 |
| 16 | Fulton Street between Adams and Jay Streets | PM | 79.4 | 35 | B 144, L 1; B 150, L 1, 6, 10, 11, 19; B 153, L 3, 14, 15; B 154, L 1, 5, 11, 12, 36-40 |

**Note:** * The provision for providing sufficient building attenuation to comply with CEQR requirements will be mandated by placing an E designation on these lots.

## A. INTRODUCTION

This chapter analyzes the potential impacts of the construction of buildings expected to result from the zoning changes and other land use actions on sites in the Downtown Brooklyn rezoning area. The following sections discuss the potential impacts resulting from the construction of the projected development sites as described in the development framework presented in Chapter 1, "Project Description." Construction of the projected development sites would be phased, and it is assumed that all construction would be completed by 2013.

The assessment will focus on the construction activities expected at sites O, P, and Q. These clustered sites, located along Willoughby Street west of Flatbush Avenue Extension, contain a substantial amount of the total projected development program and would be constructed within an overlapping timeframe. As proposed, these sites would include approximately 2.8 million square feet of commercial office space, over 500,000 square feet of retail, an underground public parking facility, and one public space: the 1.15-acre Willoughby Square. Sites C, M, and S would also entail the construction of commercial office and retail space; however, these sites are not clustered and the building programs for sites C and S are smaller.

Construction of the mixed-use residential developments proposed on sites G, I(A), J, AA, and BB are likely to proceed in a fashion similar to the office buildings, but would be smaller and thus would have fewer impacts. Site EE, located at the southern end of the rezoning area at Flatbush and DeKalb Avenues, would be developed with a visual and performing arts public library and theater, and would also include public parking and a nominal amount of retail use. In addition to the construction of buildings, the development of this site would entail the construction of streetscape improvements.

The assessment concludes that, for the most part, construction impacts of the development associated with the proposed actions would be temporary and similar to those experienced elsewhere in the City's business districts. Impacts specific to conditions in the study area would relate mainly to the potential physical effects to historic resources and potential effects on traffic conditions, particularly on Flatbush Avenue and Adams Street where currently congestion exists.

## B. CONSTRUCTION SCHEDULE AND ACTIVITIES

The development framework presented in Chapter 1, "Project Description," does not describe which of the sites would be developed first or assume a particular sequence of development. However, it is assumed that construction of all the projected development sites would be completed by 2013. While market considerations will determine the demand for new office and residential development, it is a reasonable worst-case scenario to assume that a number of the projected development sites may be under construction at the same time. This is particularly relevant for the sites clustered along Willoughby Street west of Flatbush Avenue Extension. It is expected that construction for the commercial office buildings and the underground public

garage would most likely last up to two years at each site, while the mixed-use residential buildings would be completed in a shorter period.

In general, construction activities would normally take place Monday through Friday, although the delivery and installation of certain critical pieces of equipment could occur on weekend days. Construction staging would most likely occur within the project sites themselves and may, in some cases, extend into adjacent streets by one lane. Efforts would be made to maintain traffic flow—particularly on Flatbush Avenue and Adams Street, which are main traffic routes—and to minimize adverse effects from potential lane/sidewalk closures on pedestrian and vehicular circulation along the Fulton Street retail corridor.

Builders would be required to plan and carry out noise and dust control measures during construction. In addition, there would be requirements for street crossing and entrance barriers, protective scaffolding, and strict compliance with all applicable construction safety measures.

The duration and extent of specific activities would vary based on which site is being developed. As currently contemplated, construction of the Willoughby Square public space and the public parking facility beneath it would occur from 2006 through 2008. During this time, the construction of new commercial office buildings on sites O, P, and Q also would take place. Construction of site M and the public parking facility and mixed-use residential developments on sites I(A) and J would begin in 2009 and would be complete by the end of 2010.

The following is a general outline of construction scheduling for the projected office, retail, public space, and public parking facility development on sites M, O, P, and Q.

- Months 1-4: Site clearance, excavation, and foundation. The first four months of construction would entail site clearance; digging, pile-driving, pile capping, and excavation for the foundation; dewatering (to the extent required); and reinforcing and pouring of the foundation. Typical equipment used for these activities would include excavators, backhoes, tractors, pile-drivers, hammers, and cranes. Trucks would arrive at the site with pre-mixed concrete and other building materials, and would remove any excavated material and construction debris.
- Months 5-10: Erection of the steel superstructure and (on site P) underground parking foundation. Once the foundations have been completed, the construction of the buildings' steel framework would take place, including the ramp and decking for the parking facility on site P. This process involves the installation of beams, columns, and decking, and would require the use of cranes, derricks, hoists, and welding equipment.
- Months 11-24: Façade and roof construction, mechanical installation, interior and finishing work. This would include the assembly of exterior walls and cladding; installation of heating, ventilation, and air conditioning (HVAC) equipment and ductwork; installation and checking of elevator, utility, and life safety systems; and work on interior walls and finishes. During these activities, hoists and cranes would continue to be used, and trucks would remain in use for material supply and construction waste removal.

Development of the mixed-use residential and cultural sites would proceed in a similar fashion but at a quicker pace and at a smaller scale than outlined above.

# C. POTENTIAL IMPACTS DURING CONSTRUCTION

## HAZARDOUS MATERIALS

As described in Chapter 10, "Hazardous Materials," each projected and potential development site has some potential for the presence of hazardous materials. A list of the affected lots, the proximity of the recognized environmental condition (i.e., environmental conditions identified on-site, on adjacent sites, or on sites within 400 feet) and the potential classes of chemicals that may have impacted soil and/or groundwater conditions on the lot is provided in Table 10-2.

Further investigation and/or remediation will be performed on all sites prior to and/or during redevelopment. Investigative and/or remedial activities would be performed in accordance with applicable federal, state and local regulations and with approval from the New York City Department of Environmental Protection (DEP). All activities would be governed by site-specific health and safety plans.

For lots that are not City-owned nor intended for City ownership, a mechanism (an E-designation pursuant to Section 11-15 of the Zoning Resolution—Environmental Requirements) would be used to ensure that the further investigation (and, where necessary, remediation) would be performed.

For City-owned sites or sites that are proposed for city ownership, E-designations will not be placed on development lots. Instead, since development of these sites would occur through disposition to a private entity, a similar mechanism to ensure that further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during construction would be required under the City's contract of sale with the private entity selected to develop the site. Table 10-4 lists development sites that are either City-owned or intended for City ownership. This mechanism and the E-designation mechanism will reduce or avoid the potential that significant adverse impacts would result from the proposed action on all development sites.

## HISTORIC RESOURCES

Three potential architectural resources would be directly affected by the development of projected development sites pursuant to the proposed actions. These are the Joseph J. Jacobs Building of Polytechnic University, located at 305-315 Jay Street; the Board of Education Building at 131 Livingston Street; and 233 Duffield Street on site P. In addition, two potential architectural resources—565-571 Fulton Street, and 423 Fulton Street—would be directly affected by the development of a potential development site. The removal of these buildings during construction would constitute a significant adverse impact on historic resources. Mitigation measures under consideration for this adverse impact are discussed in Chapter 20, "Mitigation."

In addition to these direct effects, several of the projected and potential development sites are located less than 90 feet from known and potential architectural resources, and therefore these resources could be potentially physically affected during construction by groundborne vibrations or other potential construction-related issues. (See Table 7-3 in Chapter 7, "Historic Resources," for the list of potentially affected resources.) In order to avoid adverse physical impacts on these historic resources, construction protection plans would be developed for the projects on the relevant development sites.

Guidance documents that will be consulted for the construction protection plans include "New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark," "Protection Programs for Landmark Buildings," and "Technical Policy and Procedures Notice No. 10/88, Procedures for the Avoidance of Damage to Historic Structures Resulting from Adjacent Construction." Elements of the construction protection plans could include: borings and soil reports of the water table; existing foundation and structural condition information and documentation for the historic resources; formulation of maximum vibration tolerances; dewatering procedures; protection from falling objects and party wall exposure; and monitoring during construction using tell-tales, seismographic equipment, and horizontal and lateral movement scales. With these procedures in place, no significant adverse impacts to these historic resources are expected to occur as a result of construction activities.

## TRAFFIC

Construction of the office buildings and other proposed developments would generate trips resulting from arriving and departing construction workers, movement of materials and equipment, and removal of construction waste. Construction would probably occur between 7 AM and 4 PM. Workers would typically arrive before the AM peak period and depart before the PM peak hour. Since the various development/construction sites are well located with respect to an extensive network of public transportation services, use of autos by construction workers is expected to be low. Truck movements would typically be spread throughout the day on weekdays, and would generally occur between the hours of 6:00 AM and 4:30 PM. Wherever possible, the scheduling of deliveries and other construction activities would take place during off-peak travel hours.

As discussed in Chapter 14, "Traffic and Parking," existing traffic conditions in the study area are prone to congestion along the major arterial routes into the area and through the area en route to and from Manhattan (e.g., Flatbush Avenue). The effects of construction activity on the street network would be related to the number of developments that might be built concurrently, the timing and potential overlap of construction on multiple sites, and the plan by which construction activities can be staged, including the availability of low volume streets for construction-related vehicles to use. It is likely that maintenance and protection of traffic measures will be needed at most development sites during construction. As a public safety measure and to accommodate the delivery of supplies, the staging of equipment, and the removal of construction debris, portions of the sidewalk and parking lanes surrounding the sites would be closed during certain periods of construction. Whenever possible, sidewalks and parking lanes along high pedestrian and/or vehicular traffic streets, such as Flatbush Avenue Extension, Fulton Street, Adams Street, Willoughby Street, and Myrtle Avenue, would not be closed. In most cases, these construction sites would be able to use parking lanes and/or sidewalks on local streets, with lower traffic and pedestrian volumes. For example, during construction of site Q, located on the south side of Willoughby Street between Albee Square West and Flatbush Avenue Extension, use of the curb lane on Albee Square West would be utilized for staging and deliveries to minimize disruption to heavily traveled Flatbush Avenue Extension. In the development of sites I(A) and J along Myrtle Avenue, the proposed extension of Fleet Place would be available for staging and site deliveries (see Figure 1-7). It is important to note that, prior to construction on any of the projected development sites, the New York City Department of Transportation's Office of Construction Mitigation and Coordination (OCMC) would review all measures contained in the construction logistics plan before issuing any construction permits. Approvals for all temporary sidewalk and curb lane closures during construction will be worked

out in coordination with OCMC, as well as with the Downtown Brooklyn Transportation Coordinator, to minimize potential impacts to pedestrian and vehicular circulation surrounding the site.

## PARKING

Construction activities that entail using curb parking lanes, such as equipment staging and deliveries, would potentially reduce the amount of on-street parking spaces available for use. At most construction sites, this would not be a sizable number of lost spaces, although the area currently has very few unoccupied spaces.

In addition to the potential loss of on-street parking spaces during construction, the proposed actions would result in the potential displacement of approximately 1,181 public parking spaces currently found on the projected development sites, broken down as follows—site I(A): 200 spaces; site O: 125 spaces; site P: 292 spaces; site Q: 454 spaces; and site EE: 110 spaces. As noted in Table 14-4 of Chapter 14, "Traffic and Parking," all of these parking facilities currently have high utilization rates. The greatest displacement of existing public parking capacity would occur as construction is undertaken at sites O, P, and Q. While a portion of the displaced capacity would be offset by the concurrent elimination of demand from existing land uses on each site, most of the displaced parkers would need to find alternative parking facilities with available capacity. Although off-street public parking utilization is relatively high in this area, there are some facilities with available capacity in proximity. One likely alternative would be the garage at 1-31 Hoyt Street, located approximately two blocks south on Hoyt and Livingston Streets. As shown in Table 14-4 and as No. 26 on Figure 14-5, this garage, with a 1,000-space capacity, is currently operating at approximately 40 percent utilization during the peak midday demand period. Another likely alternative is the Livingston & Bond Municipal Garage at 300 Livingston Street, approximately two to three blocks from sites O, P, and Q (No. 27 on Figure 14-5). This 606-space facility is currently operating at 80 percent utilization in the midday. The facility is currently proposed for sale but would still function as public parking under the proposed sale agreement.

While some localized shortfalls in parking capacity in the vicinity of sites O, P and Q may occur, dependent in part on the phasing of construction, any such shortfall would be temporary in nature. As discussed in Chapter 14, "Traffic and Parking," the projected office developments on sites O, P, and Q would each include a 225-space accessory parking facility as well as the construction of a 694-space public garage beneath Willoughby Square. This would be sufficient to accommodate all of the new demand from these sites along with a portion of the displaced existing demand.

Construction of the mixed-use residential development on site I(A) would replace a 200-space parking lot with a 457-space public garage that would also accommodate residential accessory demand, while construction on site EE would replace a 110-space parking lot with a 466-space garage that would accommodate both public parking demand and accessory demand from the BAM library and cultural facilities. As at sites O, P, and Q, construction on sites I(A) and EE may result in a temporary localized shortfall in public off-street parking capacity in their vicinity. However, upon completion of construction, these developments would yield an overall increase in parking capacity.

As noted above, some localized shortfalls in parking capacity in the vicinity of sites O, P, and Q may occur, dependent in part on the phasing of construction. Construction on sites I(A) and EE may also result in temporary localized shortfalls in public off-street parking capacity in their

vicinity. While a portion of the displaced capacity would be offset by the concurrent elimination of demand from existing land uses on each site, most of the displaced parkers would need to find alternative parking facilities with available capacity. However, upon completion of construction, these developments would yield an overall increase in parking capacity in the study area. Thus, this parking displacement during construction would not result in a permanent significant adverse impact on parking conditions.

## AIR QUALITY

Possible impacts on local air quality during construction of the projected development sites include:

- Fugitive dust (particulate) emissions from land clearing operations; and
- Mobile source emissions, including hydrocarbons, nitrogen oxide, and carbon monoxide.

### *FUGITIVE EMISSIONS*

Fugitive dust emissions can occur from land clearing, excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. Actual quantities of emissions depend on the extent and nature of the land clearing operations, the type of equipment employed, the physical characteristics of the underlying soil, the speed at which construction vehicles are operated, and the type of fugitive dust control methods employed. The U.S. Environmental Protection Agency (EPA) has suggested, in general, an overall emission rate of about 1.2 tons of particulate matter per acre per month of active construction from all phases of land clearing operations with no fugitive dust control measures. However, this is a national estimate and actual emissions would vary widely depending on many factors, including the intensity and type of land clearing operations. Much of the fugitive dust generated by construction activities consists of relatively large-size particles, which are expected to settle within a short distance from the construction site and to not significantly impact nearby buildings or people. All appropriate fugitive dust control measures—including watering of exposed areas and dust covers for trucks—would be employed during construction of the projected development sites.

### *MOBILE SOURCE EMISSIONS*

Mobile source emissions may result from the operation of construction equipment, trucks delivering materials and removing debris, workers' private vehicles, or occasional disruptions in traffic near the construction site. Localized increases in mobile source emissions would be minimized by incorporating the following traffic maintenance requirements into the construction contract documents:

- Construction requiring temporary street closings would be performed during off-peak hours wherever possible;
- The existing number of traffic lanes would be maintained to the maximum extent possible; and
- Idling of delivery trucks or other equipment would not be permitted during unloading or other inactive times.

## NOISE

Impacts on noise levels during construction of the projected development sites would include noise and vibration from the operation of construction equipment. The severity of impacts from these noise sources would depend on the noise characteristics of the equipment and activities involved, the construction schedule, and the distance to potentially sensitive noise receptors. Noise and vibration levels at a given location are dependent on the kind and number of pieces of construction equipment being operated, as well as the distance from the construction site (see Table 18-1). Noise caused by construction activities would vary widely, depending on the phase of construction—land clearing and excavations, foundation and capping, erection of structural steel, construction of exterior walls, etc.—and the specific task being undertaken.

Increased noise levels caused by construction activities can be expected to be most significant during the early phases of construction. The most significant noise source associated with the construction equipment will be the use of pile-drivers. This noise will be intrusive and would be heard by the employees at surrounding businesses and the few residents that live within several blocks of the project site. Increases in noise levels caused by delivery trucks and other construction vehicles would not be significant. Small increases in noise levels are expected to be found near a few defined truck routes and the streets in the immediate vicinity of the project site.

Construction noise is regulated by the New York City Noise Control Code and by EPA noise emission standards for construction equipment. These local and federal requirements mandate that certain classifications of construction equipment and motor vehicles meet specified noise emissions standards; that, except under exceptional circumstances, construction activities be limited to weekdays between the hours of 7 AM and 6 PM; and that construction material be handled and transported in such a manner as not to create unnecessary noise. These regulations would be carefully followed. In addition, appropriate low-noise emission level equipment and operational procedures would be used. Compliance with noise control measures would be ensured by including them in the contract documents as material specification and by directives to the construction contractor.

## Table 18-1
## Typical Noise Emission Levels for Construction Equipment

| Equipment Item | Noise Level at 50 ft. (dBA) |
|---|---|
| Air Compressor | 81 |
| Asphalt Spreader (paver) | 89 |
| Asphalt Truck | 88 |
| Backhoe | 85 |
| Bulldozer | 87 |
| Compactor | 80 |
| Concrete Plant | 83[1] |
| Concrete Spreader | 89 |
| Concrete Mixer | 85 |
| Concrete Vibrator | 76 |
| Crane (derrick) | 88 |
| Delivery Truck | 88 |
| Diamond Saw | 90[2] |
| Dredge | 88 |
| Dump Truck | 88 |
| Front End Loader | 84 |
| Gas-driven Vibro-compactor | 76 |
| Hoist | 76 |
| Jackhammer (Paving Breaker) | 88 |
| Line Drill | 98 |
| Motor Crane | 83 |
| Extractor | 101 |
| Pump | 76 |
| Roller | 80 |
| Shovel | 82 |
| Truck | 88 |

**Notes:**

1 Wood, E.W. and A.R. Thompson, *Sound Level Survey, Concrete Batch Plant: Limerick Generating Station,* Bolt Beranek and Newman, Inc., Report 2825, Cambridge, MA, May 1974.

2 New York State Department of Environmental Conservation, *Construction Noise Survey,* Report No. NC-P2, Albany, NY, April 1974.

**Sources:** Patterson, W.N., R.A. Ely, and S.M. Swanson, *Regulation of Construction Activity Noise,* Bolt Beranek and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974. Except for footnoted items.

# Chapter 19: Public Health

The 2001 *City Environmental Quality Review (CEQR) Technical Manual* states that a public health assessment may not be necessary for many proposed actions but a thorough consideration of health issues should be documented. In determining whether a public health assessment is appropriate, the following has been considered:

- Whether increased vehicular traffic or emissions from stationary sources results in significant air quality impacts. The potential for these impacts was examined in Chapter 16, "Air Quality." The results show that the development of the projected sites would not result in any significant adverse air quality impacts from mobile sources for carbon monoxide (CO) and $PM_{2.5}$. The analysis also determined that the project's public parking facilities would not result in significant adverse impacts; however, a cumulative analysis of parking emissions and on-street mobile emissions predicted an exceedance of the *de minimis* criteria. Since final plans and designs of the ventilation systems for the proposed parking garages are not available, the analysis employed worst-case assumptions. It is expected that the final designs of the garages will include the appropriate number of exhaust vents, placed at elevated locations to avoid the potential for significant adverse impacts.

  With respect to stationary sources, a screening analysis and subsequent detailed dispersion modeling determined that there would be no potential significant adverse air quality impacts from the proposed heating and cooling systems of the projected development sites. In addition, there would be no significant adverse air quality impacts from industrial facilities on the projected development sites.

- If there is an increased potential for exposure to contaminants in soil or dust. The proposed project has this potential, although the magnitude of the impact is not expected to be substantially beyond what occurs at most urban sites. Prior to construction, further investigation would be performed on each development site to determine the presence and nature of contaminants of concern and the proper remedial and/or health and safety measures that would be employed during redevelopment. Mechanisms to ensure that these actions occur include the placement of an E-designation on lots that are neither City-owned nor intended for future City ownership. For City-owned sites or sites that are proposed for City ownership, E-designations will not be placed on development lots. Instead, since development of these sites would occur through disposition to a private entity, a similar mechanism to ensure that further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during construction would be required under the City's contract of sale with the private entity selected to develop the site. Table 10-4 lists development sites that are either City-owned or intended for City ownership. This mechanism and the E-designation mechanism will reduce or avoid the potential that significant adverse impacts would result from the proposed action on all development sites.

  This mechanism and the E-designation mechanism would reduce or avoid the potential that significant adverse impacts would result from the proposed action on all development sites. If areas are found to be contaminated, remediation will be performed in accordance with all

City, state, and federal regulations and protocols. As a result, there should not be any impact on construction workers or the general public from the implementation of this mitigation. Moreover, if there are any hazardous materials at the site, their removal would be a post-construction environmental benefit for the area.

- No solid waste management practices are proposed beyond what occurs at most residential and commercial uses found in the City. These practices would include all contemporary solid waste collection and containment practices and conformance with the laws of the New York City Board of Health.
- No new odor sources would be created.
- The proposed actions would create mixed-use development in an area with high ambient noise levels. As stated in Chapter 17, "Noise" and Chapter 20, "Mitigation," E-designations would be placed on the projected sites that would require attenuation measures to ensure that interior noise levels are acceptable for the new users. No new significant sources of noise would be generated by the proposed actions.
- No activities are proposed that would exceed accepted City, state, or federal standards with respect to public health.

For the reasons stated above, a full assessment of potential impacts on public health is not necessary and no significant adverse impacts are expected as a result of the proposed actions. ✷

# A. INTRODUCTION

The preceding chapters of the EIS discuss the potential for significant adverse impacts to result from the proposed actions. Where such potential impacts have been identified—in the areas of historic resources, traffic and parking, transit and pedestrians, and noise—measures are examined to minimize or eliminate the anticipated impacts. These mitigation measures are discussed below. In addition, the effect of the proposed traffic mitigation measures on air quality is also discussed.

# B. HISTORIC RESOURCES

## ARCHITECTURAL RESOURCES

As described in Chapter 7, "Historic Resources," three potential architectural resources would be directly affected by the development of projected development sites pursuant to the proposed actions. These are the Joseph J. Jacobs Building of Polytechnic University (site C), located at 305-315 Jay Street, which LPC deems eligible for listing on the State and National Registers of Historic Places (S/NR listing); the Board of Education Building at 131 Livingston Street (site M), which LPC deems eligible for designation as a New York City Landmark and S/NR listing; and 233 Duffield Street (site P), which LPC deems eligible for designation as a New York City Landmark and S/NR listing. In addition, two other potential architectural resources would be directly affected by the development of potential development sites: 565-571 Fulton Street (site R), which LPC deems eligible for New York City Landmark designation and S/NR listing; and 423 Fulton Street (site L), which LPC deems eligible for S/NR listing. The removal of the buildings for these developments would constitute a significant adverse impact on architectural resources.

Measures to mitigate the impact on these buildings have been developed in consultation with the New York City Landmarks Preservation Commission (LPC). Per the guidelines of the 2001 *CEQR Technical Manual*, possible mitigation measures for significant adverse effects on architectural resources include redesign (i.e., relocating the action or contextual redesign), adaptive reuse, construction protection plan, data recovery, or relocation. LPC has indicated that data recovery (i.e., recordation to the standards of the Historic American Building Survey [HABS]) will be sufficient mitigation for the Joseph J. Jacobs Building and the 423 Fulton Street building. The scopes of work for all HABS-level documentation will be provided to LPC for review and approval prior to the start of demolition of these buildings. Under the revised Brooklyn Center Urban Renewal Plan, each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as HABS-level documentation, prior to issuance of a certificate of occupancy. HABS-level documentation will also be provided for the 565-571 Fulton Street, Board of Education (131 Livingston Street), and 233 Duffield Street buildings; however, these buildings are considered to be rarer resources, and therefore further

consideration was given of possible measures to mitigate this impact. For the Joseph J. Jacobs Building, which is not located within the revised BCURP, Polytechnic University (the property owner) will execute a restrictive declaration requiring that HABS-level documentation will be prepared prior to demolition of the building.

It is unlikely that the projected development of sites M and P and the potential development of site R could be relocated to other sites within the project area. The screening criteria for commercial development, which were developed in consultation with DCP, were considered for all of the parcels affected by the proposed actions in order to determine a site's attractiveness for commercial use, its bulk, and its development timeframe. Sites M, P, and R met all of the criteria for commercial development, where other blocks and lots within the project area did not. Therefore, it is reasonable to assume that the development projected to occur on these sites could not occur on other sites within the project area. Further, it is not considered feasible to include the 131 Livingston Street, 233 Duffield Street, and 565-571 Fulton Street buildings within the developments projected for sites M, P, and R. Site R was previously designated as an urban renewal site in 1970 as part of the Brooklyn Center Urban Renewal Plan (BCURP). The proposed actions would not alter the status of the site in the BCURP. It is possible that the façades of the 575-571 Fulton Street and 131 Livingston Street buildings could be preserved in place and incorporated into the façade of a modern office building; however, this would affect the structure and character of the resources.

Commitment for mitigation beyond the HABS-standard recordation of the buildings is not possible given that neither the development program nor the project developers are known. However, for 131 Livingston Street and 575-571 Fulton Street, it is possible that once a developer has been identified, there may be the potential to preserve architectural elements of the buildings' façades as part of the proposed developments. As described above, LPC has determined that 131 Livingston Street, 233 Duffield Street, and 565-571 Fulton Street appear to be eligible for designation as New York City Landmarks and for listing on the State and National Registers. Should the future development of these sites involve city, state, or federal discretionary actions, environmental review that takes into consideration these architectural resources may be required, according to the applicable statutory requirements. In addition, if the buildings are calendared for designation or designated as NYCLs, application to the LPC Preservation Department will be required prior to the start of any construction work involving these buildings.

## ARCHAEOLOGICAL RESOURCES

LPC has determined that there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that are considered to be potentially sensitive for 19th century archaeological resources. Individual Stage 1A Archaeological Assessments will be prepared for those lots which are currently City-owned or are acquired by the City, as directed by LPC, before development of these sites would commence. If determined necessary by LPC, as a result of the Stage 1A Archaeological Assessment, Stage 1B field testing—for which a protocol will be submitted to and approved by LPC—and further testing, if needed, will be undertaken prior to development of these sites. In the event that Stage 1B field testing confirms that there are significant archaeological resources on the lots which cannot be recovered during the testing phase, full archaeological excavation will occur, or the development will be redesigned to leave the resources protected in place. All archaeological work will be completed under LPC review and will adhere to the standards set forth in the 2001 *CEQR Technical*

*Manual* and the Archaeological Guidelines for work in New York City. Under the revised Brooklyn Center Urban Renewal Plan (BCURP), each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not result in any significant adverse impacts on archaeological resources on these lots.

For the lots which are not now and would not become City-owned (Block 165, Lot 58 and Block 164, Lots 1 and 29), a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, archaeological field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources on these lots pursuant to their development is considered a potential unmitigated, significant adverse impact.

## UNDERGROUND RAILROAD

During the public comment period for the DEIS/DSEIS, several property owners came forward to claim that their buildings were utilized for Underground Railroad activities. Specifically, the three buildings are 227 Duffield Street (Block 146, Lot 15); 233 Duffield Street (Block 146, Lot 12); and 436 Gold Street, aka 436 Albee Square West (Block 146, Lot 51). A thorough documentation study has not uncovered an association with the Underground Railroad for the buildings, and there is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad. The owner of 233 Duffield Street has asserted that there were shafts in the 227 and 233 Duffield Street buildings, as well as other buildings on Duffield Street, that linked the buildings' sub-basements to the surface and to tunnels under the street buildings, but he has also reported that the sub-basements and shafts have been filled and lost. However, the potential existence of these tunnels, without corroborating artifacts, would not necessarily demonstrate a connection to the Underground Railroad.

The potential existence of tunnels under the street buildings and any corroborating artifacts cannot be ascertained without further testing. Therefore, additional work, first in the form of a visual inspection of the interiors of the buildings after condemnation to ascertain the existence of other artifacts and, second, in the form of new continuous soil borings, would need to be undertaken at the sites. Soil borings will be conducted to determine subsurface conditions, such as fill layers, with the locations of borings to be approved by an archaeologist prior to their execution. This testing would be impracticable prior to demolition of these structures and while they are still occupied, and would therefore have to be conducted at the time of site redevelopment. If the soil borings indicate a potential for archeologically sensitive areas, Stage 1B testing will be undertaken in the potentially sensitive areas. The testing phase will first include the preparation of a testing protocol by a professional archaeologist, to be reviewed and approved by LPC prior to implementation. Testing will be conducted by a professional archaeologist, and appropriate research issues will be formulated in the event of a discovery.

Should the Stage 1B testing establish an association of one or all of these buildings with the Underground Railroad, and the National Park Service criteria for eligibility of Underground Railroad properties for National Historic Landmark designation or for listing in the National Register of Historic Places are met, the redevelopment of these sites pursuant to the proposed actions would constitute a significant adverse impact to archaeological resources. As required under the revised BCURP, measures to partially mitigate the elimination of these resources will, if required, be developed in consultation with LPC and performed prior to issuance of a certificate of occupancy to the redeveloper. Partial mitigation measures would involve HABS-

level documentation and/or an exhibit in an appropriate location. As described above under "Architectural Resources," 233 Duffield Street also has been identified by LPC as a potential architectural resource, and therefore HABS-level documentation will be provided to mitigate its loss.

## C. TRAFFIC AND PARKING

As discussed in Chapter 14, "Traffic and Parking" and shown in Table 14-13, demand from projected development sites and the effects of street system changes related to the proposed actions would combine to result in significant adverse traffic impacts at 29 signalized intersections in one or more peak periods. To address these impacts, a mitigation plan was developed for the Downtown Brooklyn street network. Earlier studies were reviewed to identify measures that were considered but never implemented, and new concepts were developed based on the findings of this EIS and discussions with NYCDOT and other agencies. The development of the mitigation plan followed a two-tier approach. First to be evaluated were physical and operational changes to the street network to improve traffic flow. Some of these measures would potentially benefit multiple intersections or entire corridors. Where further mitigation was found to be needed, a second tier of more traditional site-specific measures were evaluated, including modifications to intersection signalization and channelization, and curbside parking regulations.

### MITIGATION PLAN STREET NETWORK MODIFICATIONS

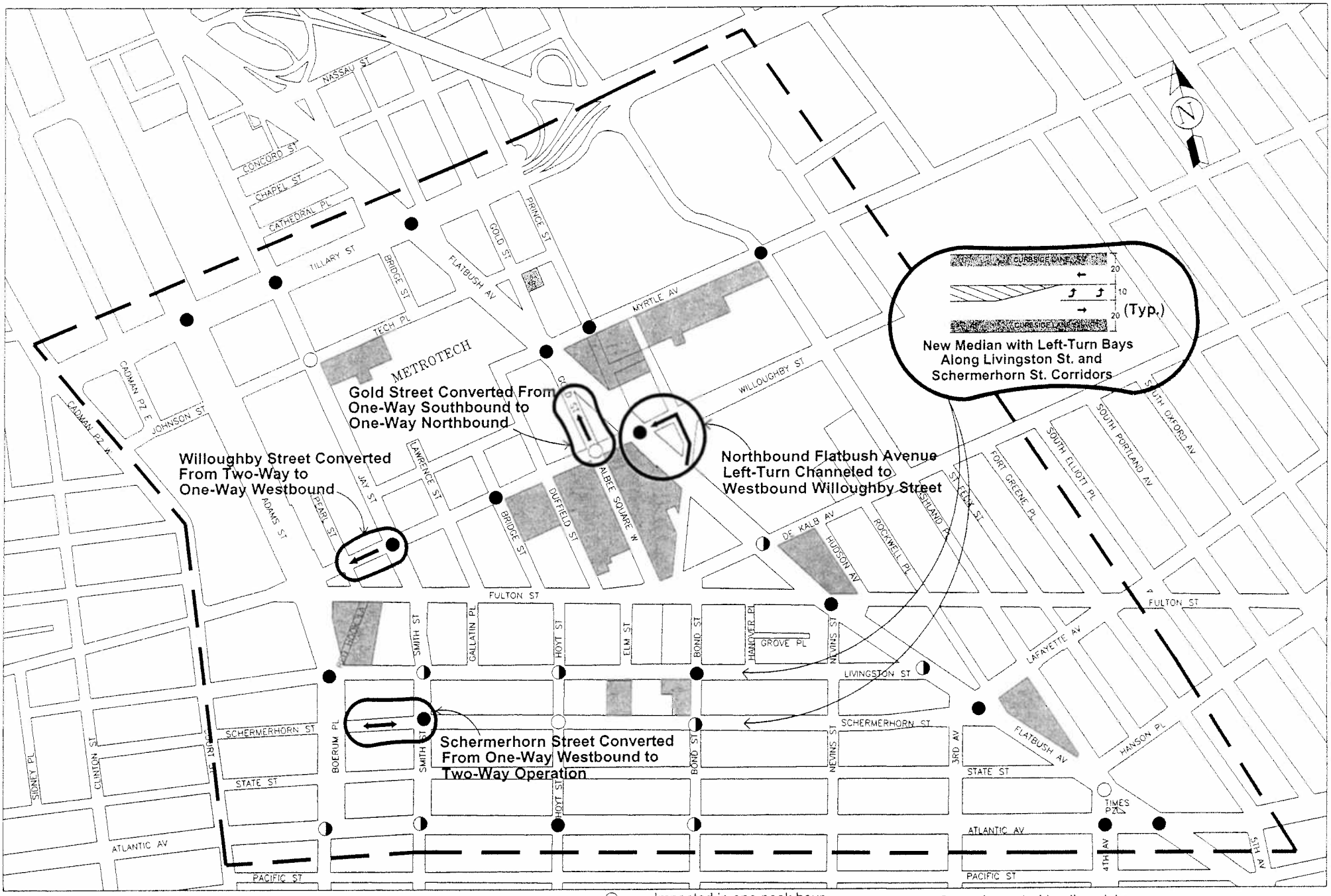
Modifications to the Downtown Brooklyn street network that are recommended as part of the project's traffic mitigation plan are shown in Figure 20-1 and described below. Traffic diversions that would result from these modifications during the AM, midday and PM peak hours are shown in Figures 20-2 through 20-4.

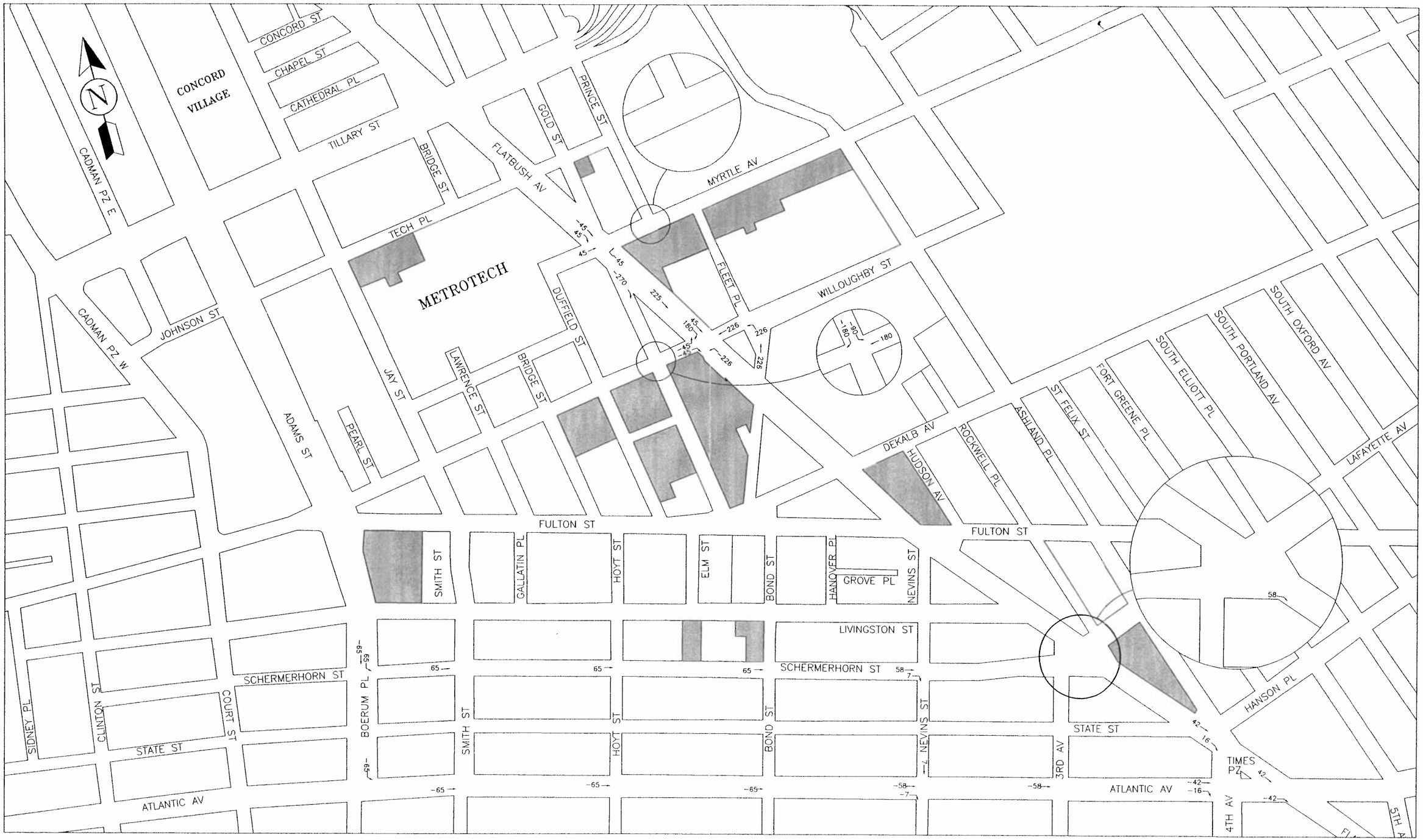
*ELIMINATION OF THE NORTHBOUND LEFT-TURN FROM FLATBUSH AVENUE EXTENSION TO WILLOUGHBY STREET*

It is proposed that the northbound left-turn from Flatbush Avenue Extension onto westbound Willoughby Street be eliminated. As shown in Figure 20-1, all traffic making this movement would instead be directed onto northbound Fleet Place and from there onto westbound Willoughby Street. The northbound Fleet Place approach to Willoughby Street would be reconfigured with new curbs and striping to facilitate the additional traffic. This measure would allow for the elimination of the left-turn phase and the provision of additional green time to both northbound and southbound Flatbush Avenue Extension and the eastbound and westbound Willoughby Street approaches. It would also enhance pedestrian safety by eliminating a vehicular turning movement that conflicts with pedestrians on the west crosswalk, as well as provide additional time for pedestrians to cross Flatbush Avenue Extension. As discussed in Chapter 14, "Traffic and Parking," an average of seven pedestrians or bicyclists were killed or injured annually at this intersection during the 2000 through 2002 period, the highest average for any intersection in the study area.

*CONVERSION OF GOLD STREET TO ONE-WAY NORTHBOUND OPERATION BETWEEN WILLOUGHBY STREET AND FLATBUSH AVENUE EXTENSION*

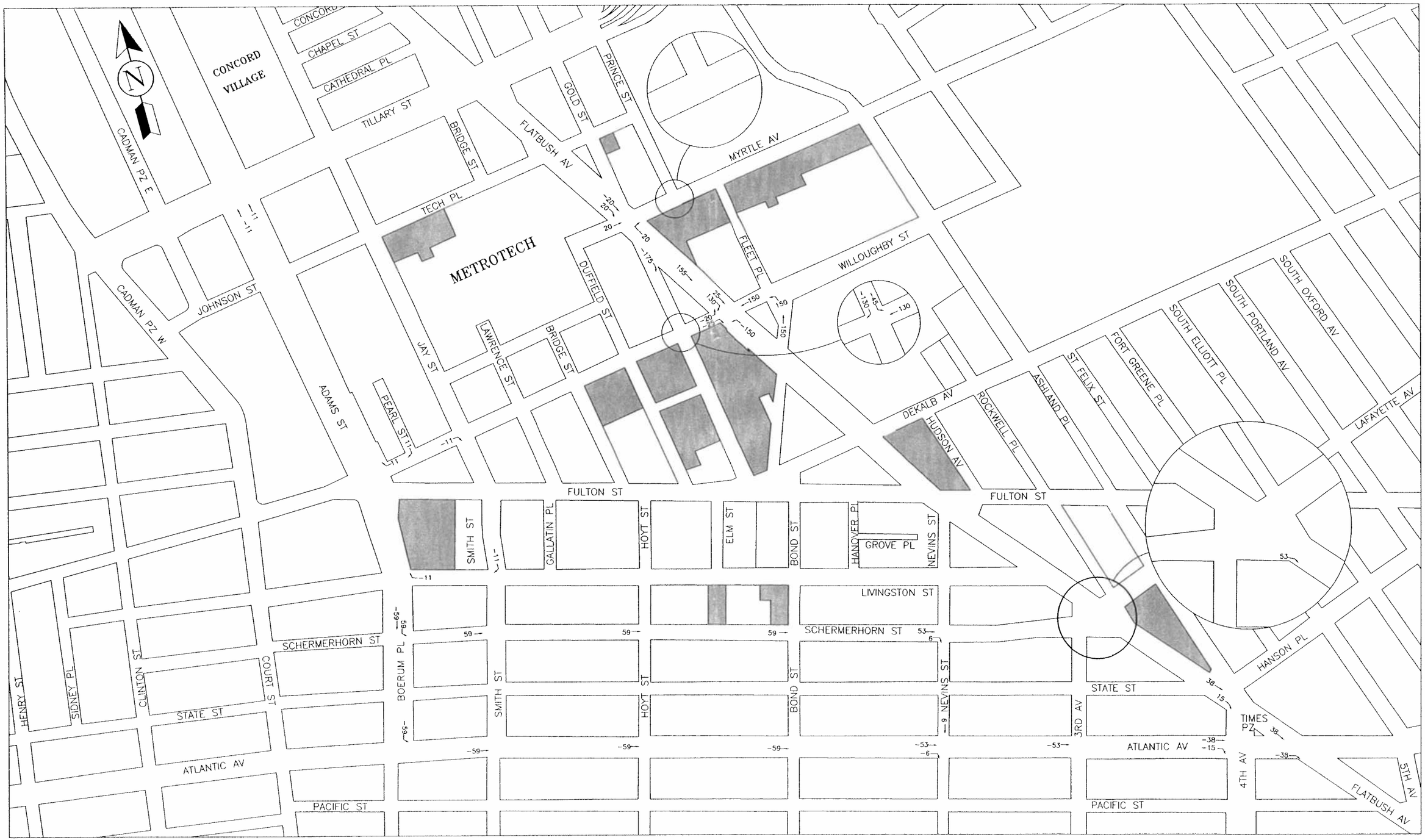
It is proposed to convert the single block of Gold Street between Willoughby Street and Flatbush Avenue Extension from one-way southbound to one-way northbound operation. With this change, vehicles would enter the block from Willoughby Street or Albee Square West and exit


Gold Street Converted From One-Way Southbound to One-Way Northbound
Willoughby Street Converted From Two-Way to One-Way Westbound
Northbound Flatbush Avenue Left-Turn Channeled to Westbound Willoughby Street
New Median with Left-Turn Bays Along Livingston St. and Schermerhorn St. Corridors
Schermerhorn Street Converted From One-Way Westbound to Two-Way Operation
CURBSIDE LANE
20
10
20
(Typ.)
METROTECH
NASSAU ST
CONCORD ST
CHAPEL ST
CATHEDRAL PL
TILLARY ST
BRIDGE ST
FLATBUSH AV
GOLD ST
PRINCE ST
MYRTLE AV
TECH PL
WILLOUGHBY ST
CADMAN PZ E
CADMAN PZ W
JOHNSON ST
JAY ST
PEARL ST
ADAMS ST
LAWRENCE ST
BRIDGE ST
DUFFIELD ST
ALBEE SQUARE W
DE KALB AV
HUDSON AV
ROCKWELL PL
ASHLAND PL
ST FELIX ST
FORT GREENE PL
SOUTH ELLIOTT PL
SOUTH PORTLAND AV
SOUTH OXFORD AV
FULTON ST
SMITH ST
GALLATIN PL
HOYT ST
ELM ST
BOND ST
HANOVER PL
GROVE PL
NEVINS ST
LAFAYETTE AV
LIVINGSTON ST
SCHERMERHORN ST
BOERUM PL
SIDNEY PL
CLINTON ST
COURT ST
STATE ST
3RD AV
FLATBUSH AV
HANSON PL
TIMES PZ
ATLANTIC AV
4TH AV
PACIFIC ST
Study Area Boundary
Projected Development Site
Impacted in one peak hour
Impacted in two peak hours
Impacted in all peak hours

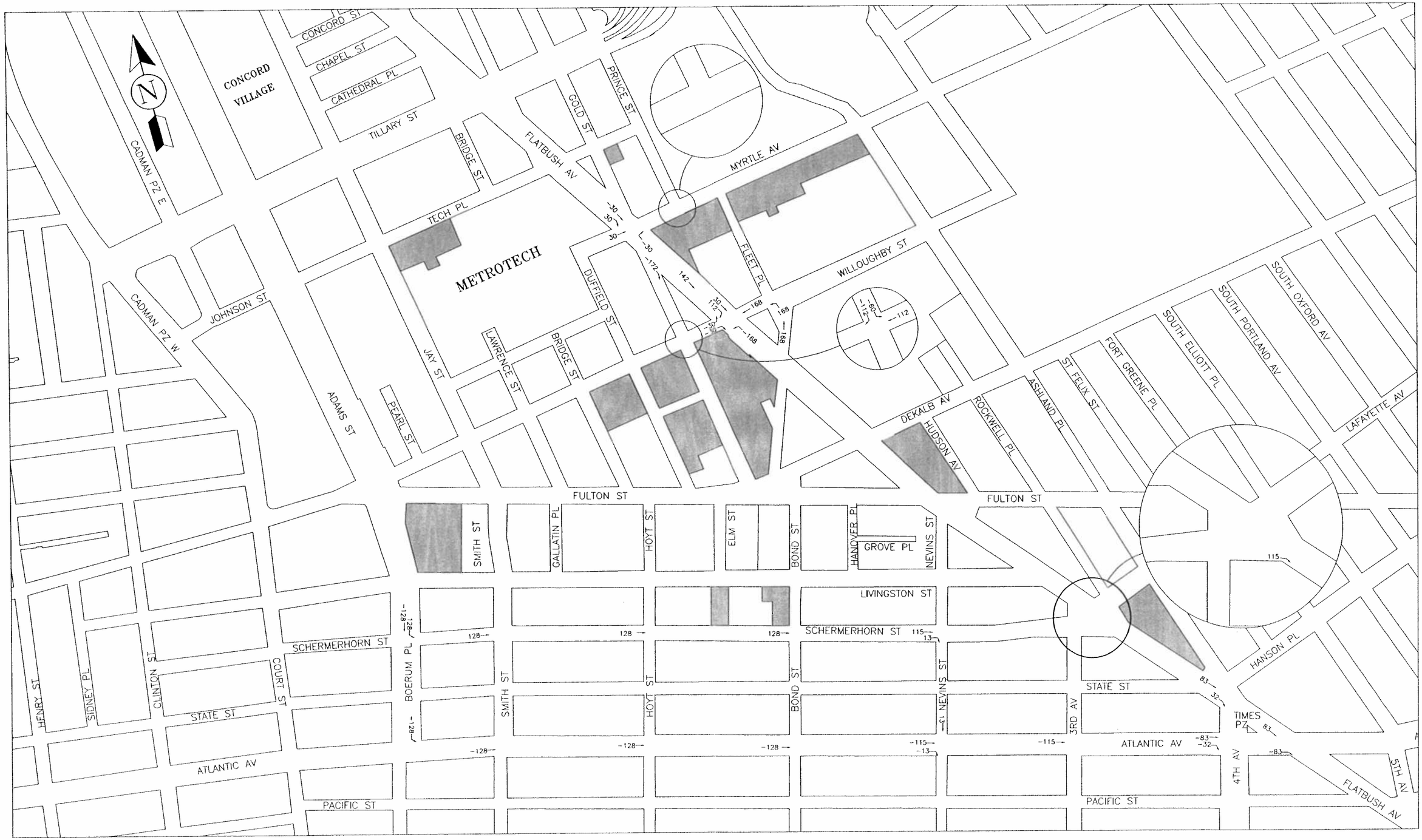



Projected Development Site

**Mitigation Traffic Diversion Increment- MD Peak Hour**
**Figure 20-3**



# Mitigation Traffic Diversion Increment- PM Peak Hour
## Figure 20-4




Projected Development Site

onto southbound Flatbush Avenue Extension. The block would essentially function as a service street for adjacent land uses such as Four MetroTech, which has its service entrance on the block. The primary benefit of this measure is that it would eliminate the southbound left- and right-turns at Willoughby Street that would otherwise conflict with northbound traffic flow on Albee Square West. The elimination of these turning movements would also reduce the potential for conflicts with pedestrians crossing Willoughby Street.

*CONVERSION OF WILLOUGHBY STREET FROM TWO-WAY TO ONE-WAY WESTBOUND OPERATION BETWEEN JAY AND PEARL STREETS*

Under the proposed actions, Willoughby Street would operate one-way westbound from Albee Square West/Gold Street to Adams Street with the exception of the single block between Pearl and Jay Streets. This block is currently bi-directional to accommodate the movement of revenue collection vehicles that use a service entrance to the New York City Transit (NYCT) building at 370 Jay Street. As NYCT has indicated that this activity is being relocated, bi-directional operation will no longer be needed, and it is proposed to convert this block to one-way westbound operation, consistent with the Willoughby Street blocks to the east and west.

As discussed in Chapter 14, "Traffic and Parking," the intersection of Willoughby and Jay Streets averaged five injuries or fatalities annually among pedestrians and bicyclists between 2000 and 2002, among the highest rates for intersections in Downtown Brooklyn. Turning vehicles (especially those turning from Willoughby Street) were involved in more than half of these accidents. Conversion to one-way westbound operation would rationalize the intersection, enhance safety by reducing the potential for confusion among drivers and pedestrians, and eliminate eastbound turning movements that conflict with both pedestrians and much heavier westbound traffic flows.

*CONVERSION OF SCHERMERHORN STREET FROM ONE-WAY WESTBOUND TO TWO-WAY OPERATION BETWEEN SMITH STREET AND BOERUM PLACE*

As discussed in Chapter 14, "Traffic and Parking," Schermerhorn Street would function as a local east-west distributor for traffic generated by projected development. However, its function in this regard is limited by the fact that west of Smith Street, Schermerhorn Street operates one-way westbound. As part of the project's traffic mitigation plan, it is therefore proposed to convert the block of Schermerhorn Street between Smith Street and Boerum Place to bi-directional operation, consistent with the rest of the Schermerhorn Street corridor from Smith Street to Flatbush Avenue. This block, which is approximately 38 feet in width (compared to 50 feet in width east of Smith Street), would operate with one moving lane in each direction plus curbside parking. By providing an alternative eastbound outlet from Boerum Place, it is anticipated that this measure would divert from 50 to 130 vehicles per hour from eastbound Atlantic Avenue, improving conditions along that heavily congested corridor without adversely affecting Schermerhorn Street.

*RECONFIGURATION OF THE LIVINGSTON STREET AND SCHERMERHORN STREET CORRIDORS*

Livingston Street, like Schermerhorn Street one block to the south, would function as a local east-west distributor for traffic generated by projected development. Given the distribution of project impacts at multiple intersections along both streets, a corridor-wide approach was used in developing measures to improve traffic flow. Two potential options for reconfiguring these 50-

foot-wide streets were considered. At present, both streets typically operate with a 25-foot-wide travelway with one large (15- to 17-foot-wide) travel lane in each direction plus curbside parking. (An exception to this is the 38-foot-wide block of Schermerhorn Street between Smith Street and Boerum Place.) Along Livingston Street, both curb lanes are striped as exclusive bus lanes, with the north (westbound) curb lane restricted to buses during the 7 to 10 AM peak period and the south (eastbound) curb lane similarly restricted during the 4 to 7 PM peak period.

Under the first reconfiguration option (the Bi-directional Couplet option), the two corridors would operate as a couplet, with eastbound flow favored on Schermerhorn Street and westbound flow favored on Livingston Street. As illustrated in the typical section shown in Figure 20-5, Schermerhorn Street from Smith Street to Third Avenue, and Livingston Street from Boerum Place to Flatbush Avenue, would be reconfigured to provide a 30-foot-wide travelway with two travel lanes and a parking lane in the favored direction and a 20-foot-wide travelway with one travel lane and a parking lane in the reverse direction. The signal plan for intersections along each corridor would be modified to enhance progression in the favored direction.

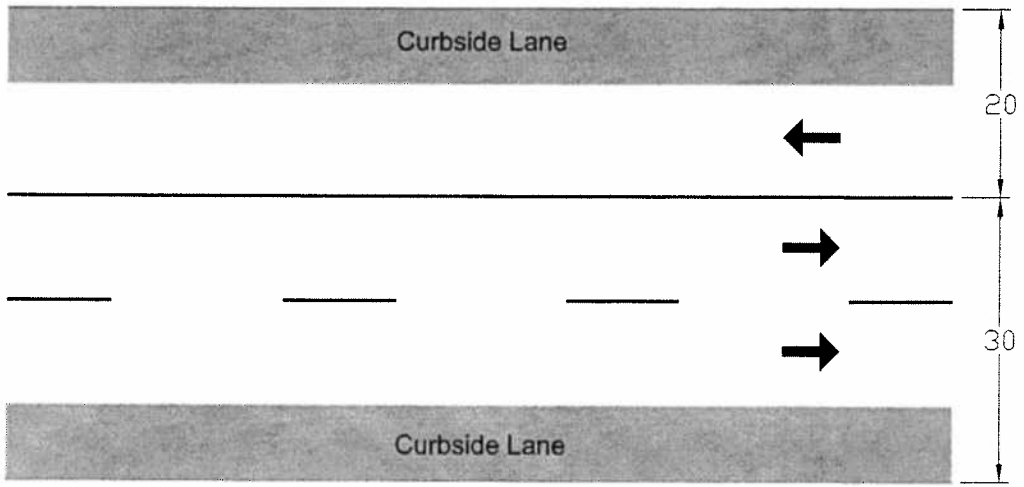
Under the second option, (the Median option) both streets would be reconfigured to provide a 20-foot-wide travelway with one moving lane and a curbside lane in each direction. The curbside lanes would be used for parking and, in the case of Livingston Street, as exclusive bus lanes during peak periods. A ten-foot-wide median would be installed on both streets, with dedicated left-turn bays at intersections. Due to its greater flexibility with respect to balancing east-west traffic flow, the Median option was selected for incorporation in the mitigation plan for the Livingston Street and Schermerhorn Street corridors. This option would also more readily accommodate the continued operation of the existing exclusive bus lanes along Livingston Street.

In addition to the physical changes discussed above, it is also proposed to increase signal cycle lengths from 60 seconds to 90 seconds along both corridors at the intersections with Hoyt Street and with Bond Street. Increasing cycle length at these locations would provide additional capacity on all approaches as well as allow a substantial increase in pedestrian crossing times, especially on the wider streets. These modifications to signalization are discussed in more detail in the following section on site-specific mitigation.

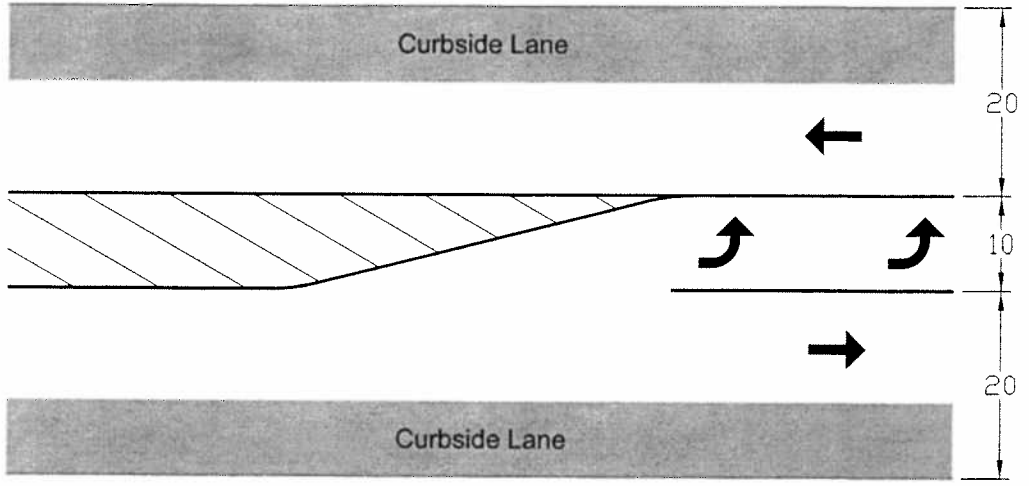
## SITE-SPECIFIC MITIGATION

The paragraphs below discuss the site-specific measures that would be included in the proposed mitigation plan, and the effects of these measures and the street network changes on each of the impacted intersections. Table 20-1 summarizes all of the measures contained in the mitigation plan.

According to the 2001 *CEQR Technical Manual*, a significant traffic impact is considered mitigated if measures implemented return projected future conditions to what they would be if a proposed action were not in place, or to acceptable levels. For a Future No Build LOS D, E or F, mitigating back to the No Build condition is required; for No Build Level of Service (LOS) A, B or C, mitigating to mid-LOS D is required (45 seconds of delay for signalized intersections, and 30 seconds of delay for unsignalized intersections). Tables 20-2 through 20-4 show the effectiveness of the proposed traffic mitigation measures during the weekday AM, midday and PM peak periods based on these criteria.




BI-DIRECTIONAL COUPLET OPTION




MEDIAN OPTION

# Table 20-1
# Proposed Traffic Mitigation Measures

| Intersection | Approach | Current Signal Timing (Seconds) (1) | Proposed Mitigation | |
|---|---|---|---|---|
| | | | Mitigation Signal Timing (Seconds) (1) | Description of Mitigation |
| Atlantic Avenue (EB/WB) @ Flatbush Avenue (NB/SB) | NB/SB<br>EB/WB<br>Ped | 72/67/63<br>40/45/49<br>8/8/8 | 68/65/60<br>44/47/52<br>8/8/8 | Divert traffic to EB Schermerhorn St. at Boerum Place. Transfer 4 sec. of green time from NB/SB approach to EB/WB approach in AM, 2 sec. in MD, and 3 sec. in PM. |
| Atlantic Avenue (EB/WB) @ Fourth Avenue (NB/SB) | NB/SB<br>SB<br>EB/WB | 41/30/36<br>20/48/27<br>59/42/57 | 43/31/37<br>17/45/24<br>60/44/59 | Divert traffic to EB Schermerhorn St. at Boerum Place. Transfer 3 sec. of green time from SB to NB/SB (2 sec.) and EB/WB (1 sec.) in AM. Transfer 3 sec. from SB to NB/SB (1 sec.) and EB/WB (2 sec.) in MD and PM. |
| Atlantic Avenue (EB/WB) @ Bond Street (NB) | NB<br>EB/WB | 48/30/45<br>72/60/75 | 45/27/45<br>75/63/75 | Divert traffic to EB Schermerhorn St. at Boerum Pl. Implement a no standing 7-10 AM regulation for 100' along north curb on WB approach. Transfer 3 sec. from NB to EB/WB in AM and MD. |
| Atlantic Avenue (EB/WB) @ Hoyt Street (SB) | SB<br>EB/WB | 48/30/45<br>72/60/75 | 46/30/45<br>74/60/75 | Divert traffic to EB Schermerhorn St. at Boerum Place. Implement no standing anytime regulation for 100' along west curb on SB approach. Transfer 2 sec. of green time from SB to EB/WB phase in AM. |
| Atlantic Avenue (EB/WB) @ Smith Street (NB/SB) | NB/SB<br>EB/WB | 48/40/45<br>72/50/75 | 48/40/44<br>72/50/76 | Divert traffic to EB Schermerhorn St. at Boerum Place. Transfer 1 sec. of green time from NB/SB to EB/WB phase in PM. |
| Atlantic Avenue (EB/WB) @ Boerum Place (NB/SB) | SB<br>EB/WB<br>EB | 52/45/60<br>42/32/42<br>26/13/18 | 50/45/57<br>43/32/44<br>27/13/19 | Divert traffic to EB Schermerhorn St. at Boerum Pl. Transfer 2 sec. of green time from SB phase to EB/WB (1 sec.) and EB/WB-R (1 sec.) in AM, and 3 sec. from SB to EB/WB (2 sec.) and EB/WB-R (1 sec.) in PM. Implement no standing 4-7 PM for 100' along west curb of SB approach. |
| Flatbush Avenue (NB/SB) @ Tillary Street (EB/WB) | NB/SB<br>NB<br>EB/WB<br>EB-LT/WB-LT | 41/41/41<br>17/17/17<br>38/38/38<br>24/24/24 | 38/38/41<br>17/17/16<br>41/40/39<br>24/25/24 | Transfer 3 sec. of green time from NB/SB to EB/WB in AM, 3 sec. from NB/SB to EB/WB (2 sec.) and EB-LT/WB-LT (1 sec.) in MD, and 1 sec. from NB to EB/WB in PM. |
| Flatbush Avenue (NB/SB) @ Myrtle Avenue (EB/WB) | NB/SB<br>EB/WB<br>SB-LT | 66/66/66<br>38/38/38<br>16/16/16 | 66/64/66<br>38/37/38<br>16/19/16 | Implement a no standing anytime regulation for 100' along east curb on NB approach. Transfer 3 sec. of green time from NB/SB to SB-LT in MD. |
| Flatbush Avenue (NB/SB) @ Willoughby Street (EB/WB) | NB/SB<br>EB/WB<br>NB-LT/EB-R | 70/66/70<br>35/37/35<br>15/17/15 | 67/71/73<br>53/49/47<br>---/---/--- | Channel NB left-turns onto Fleet Place and WB Willoughby Street. Eliminate the NB left-turn phase and implement two-phase signalization for the intersection. |
| Flatbush Avenue (NB/SB) @ DeKalb Avenue (EB/WB) | NB/SB<br>WB<br>Ped | 70/70/70<br>40/40/40<br>10/10/10 | 72/70/72<br>38/40/38<br>10/10/10 | Implement no standing anytime regulation along south curb of WB approach and restripe to 4 lanes. Transfer 2 sec. of green time from WB to NB/SB phase in AM & PM. |
| Flatbush Avenue (NB/SB) @ Fulton Street (EB/WB) | NB/SB<br>Ped.<br>EB/WB<br>SB-LT | 54/48/50<br>7/7/7<br>35/36/34<br>24/29/29 | 56/50/50<br>7/7/7<br>33/34/34<br>24/29/29 | Transfer 2 sec. of green time from EB/WB to NB/SB phase in AM and MD.<br>Implement no standing 7-10 AM regulation for 100' along west curb on SB approach |
| Flatbush Avenue (NB/SB) @ Livingston Street (EB/WB) | NB/SB<br>EB/NB-LT | 75/75/75<br>45/45/45 | 72/75/73<br>48/45/47 | Transfer 3 sec. of green time from NB/SB to EB/NB-LT in AM, and 2 sec. in the PM. |
| Flatbush Avenue (NB/SB) @ SchermerhornStreet/ Lafayette Avenue (EB/WB) | NB/SB<br>SB<br>EB/WB<br>EB | 53/53/53<br>15/15/15<br>24/24/24<br>28/28/28 | 55/55/53<br>16/17/15<br>24/24/24<br>25/24/28 | Transfer 3 sec. of green time from EB to NB/SB (2 sec.) and SB (1 sec.) in AM; and 4 sec. from EB to NB/SB (2 sec.) and SB (2 sec.) in MD. |
| Flatbush Avenue (NB/SB) @ 4th Avenue/Hanson Pl. (EB) | NB/SB<br>EB<br>Ped. | 72/67/72<br>40/45/40<br>8/8/8 | n/c<br>n/c<br>n/c | No mitigation proposed. |
| Jay Street (NB/SB) @ Tech Place (WB) | NB/SB<br>WB | 54/54/54<br>36/36/36 | n/c<br>n/c | Implement no standing 4-7 PM regulation for 100' along east curb on NB approach to provide two moving lanes. |

**Notes:**

(1) Signal timings shown indicate green plus yellow (including all-red) for each phase. AM/midday/PM.

n/c - no change.

(cl) - clearance phase.

# Table 20-1 (Continued)
# Proposed Traffic Mitigation Measures

| Intersection | Approach | Current Signal Timing (Seconds) (1) | Proposed Mitigation: Mitigation Signal Timing (Seconds) (1) | Proposed Mitigation: Description of Mitigation |
|---|---|---|---|---|
| Livingston Street (EB/WB) @<br>Bond Street (NB) | NB<br>EB/WB | 24/24/24<br>36/36/36 | 38/35/38<br>52/55/52 | Implement new median with left-turn bays along Livingston St. corridor. Implement no standing 7-10 AM regulation along west curb on NB approach from Schermerhorn St. to Livingston Street. Increase signal cycle length from 60 sec. to 90 sec. |
| Livingston Street (EB/WB) @<br>Hoyt Street (SB) | SB<br>EB/WB | 24/24/24<br>36/36/36 | 37/37/37<br>53/53/53 | Implement new median w/left-turn bays along Livingston St. corridor. Increase signal cycle length from 60 to 90 sec. Implement no standing anytime regulation for 100' along the south curb of the EB approach. |
| Livingston Street (EB/WB) @<br>Smith Street (NB/SB) | NB/SB<br>EB/WB<br>NB/SB<br>EB/WB | 45/45/45<br>45/45/45<br>---/35/35<br>---/55/55 | 45/45/52<br>45/45/38<br>---/---/---<br>---/---/--- | Implement new median w/left-turn bays along Livingston St. corridor. Decrease signal cycle length from 180 to 90 seconds in MD and PM. |
| Livingston Street (EB/WB) @<br>Boerum Place (NB/SB) | NB/SB<br>EB/WB<br>SB<br>NB/SB<br>EB/WB<br>SB | 62/60/60<br>40/50/50<br>18/15/15<br>---/55/55<br>---/42/42<br>---/18/18 | 61/62/58<br>40/40/44<br>19/18/18<br>---/---/---<br>---/---/---<br>---/---/--- | Implement new median with left-turn bays along Livingston St. corridor. Rephase signal cycle length to 120 seconds in MD and PM, and transfer 1 sec. of green time from NB/SB to SB in AM peak period. |
| Myrtle Avenue (EB/WB) @<br>Prince Street (NB) | NB<br>Ped.<br>EB/WB | 55/55/55<br>---/---/---<br>65/65/65 | ---/---/---<br>35/35/35<br>85/85/85 | Implement 35-second all-pedestrian phase in place of the existing NB phase; transfer 20-seconds of green time from NB phase to EB/WB phase. |
| Myrtle Avenue (EB/WB) @<br>Ashland Place (NB/SB) | NB/SB<br>EB/WB | 27/27/27<br>63/63/63 | n/c<br>n/c | Reconfigure NB & SB approaches to provide left-turn bays; Implement a no standing 7-10 AM regulation for 100' along north curb of WB approach and no standing anytime for 200' on the east curb of the NB approach. |
| Schermerhorn Street (EB/WB) @<br>Bond Street (NB) | EB/WB<br>NB | 32/32/32<br>28/28/28 | 49/47/54<br>41/43/36 | Implement new median w/left-turn bays along Schermerhorn St. corridor. Implement no standing 7-10 AM, 4-7 PM regulation along west curb of NB approach from State Street to Schermerhorn Street, and no standing 4-7 PM along east curb. Increase signal cycle length from 60 to 90 sec. |
| Schermerhorn Street (EB/WB) @<br>Hoyt Street (SB) | SB<br>EB/WB | 24/24/24<br>36/36/36 | 40/40/40<br>50/50/50 | Implement new median with left-turn bays along Schermerhorn Street corridor. Increase signal cycle length from 60 to 90 sec; and implement no standing,4-7 PM regulation for 100 feet along south curb of the EB approach. |
| SchermerhornStreet (EB/WB) @<br>Smith Street (NB/SB) | NB<br>SB<br>EB/WB<br>NB/SB<br>NB<br>SB<br>EB/WB | 34/34/34<br>22/22/22<br>34/34/34<br>---/---/---<br>---/28/28<br>---/28/28<br>---/34/34 | ---/---/---<br>18/23/23<br>30/33/32<br>42/34/35<br>---/---/---<br>---/---/---<br>---/---/--- | Decrease cycle length from 180 to 90 sec. in MD & PM with NB/SB phase in place of NB phase. |
| Tillary Street (EB/WB) @<br>Adams Street (NB/SB) | NB/SB<br>SB/WB-RT<br>EB<br>EB/WB<br>NB | 34/34/34<br>24/24/24<br>20/20/20<br>25/25/25<br>17/17/17 | n/c<br>n/c<br>n/c<br>n/c<br>n/c | No mitigation proposed. |
| Tillary Street (EB/WB) @<br>Jay Street (NB/SB) | NB/SB<br>EB/WB<br>WB<br>EB-LT/WB-LT | 48/48/48<br>56/56/56<br>16/16/16<br>---/---/--- | 44/45/46<br>54/56/56<br>---/---/---<br>22/19/18 | Restripe NB approach to inlcude an exclusive right-turn lane; replace lagging WB phase with EB-LT//WB-LT/NB-RT phase. Transfer 16 sec. from WB phase in all periods to new EB/WB left-turn; 4 sec. from NB/SB and 2 sec. from EB/WB in AM, 3 sec. from NB/SB in MD, and 2 sec. from NB/SB in PM. |
| Willoughby Street (WB) @<br>Gold Street/Albee Sq. W. (NB/SB) | NB/SB<br>EB/WB<br>WB | 60/60/60<br>42/42/42<br>18/18/18 | (NB) 65/65/65<br>---/---/---<br>55/55/55 | Convert Gold Street from SB to NB between Willoughby Street & Flatbush Ave. Extension. Transfer 5 sec. of green time to the NB phase in all periods. |
| Willoughby Street (WB) @<br>Bridge Street (SB) | SB<br>WB | 24/24/24<br>36/36/36 | (Ped.) 24/24/24<br>36/36/36 | Convert SB phase to an all-pedestrian phase and prohibit pedestrians during WB phase. |
| Willoughby Street (EB/WB) @<br>Jay Street (NB/SB) | NB/SB<br>EB/WB | 54/54/54<br>36/36/36 | 51/50/48<br>(WB) 39/40/42 | Convert Willoughby St. from two-way to one-way WB between Jay & Pearl Streets. Transfer 3 sec. from NB/SB to WB in AM, 4 sec. in MD and 6 sec. in PM. |

**Notes:**

(1) Signal timings shown indicate green plus yellow (including all-red) for each phase. AM/midday/PM.

n/c - no change.

Ped. - all pedestrian phase.

**Table 20-2**

## 2013 Future with the Mitigation Traffic Conditions- AM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NoBuild | | | Future Action | | | | Mitigation | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay LOS |
| Tillary Street (E-W) @ | EB-L | 0.66 | 56.9 | E | 0.67 | 57.7 | E | | 0.67 | 57.7 | E | |
| Flatbush Avenue (N-S) | EB-TR | 0.88 | 48.5 | D | 0.92 | 51.6 | D | | 0.86 | 44.3 | D | |
| | EB-R | 0.93 | 75.3 | E | 1.06 | 107.1 | F | * | 0.93 | 70.9 | E | |
| | WB-L | 1.32 | >150 | F | 1.58 | >150 | F | * | 1.58 | >150 | F | ** |
| | WB-T | 0.94 | 58.4 | E | 1.01 | 73.7 | F | * | 0.93 | 55.0 | D | |
| | WB-R | 1.06 | 106.2 | F | 1.07 | 107.0 | F | | 0.97 | 78.3 | E | |
| | NB-L | 0.84 | 51.6 | D | 0.84 | 51.4 | D | | 0.83 | 51.7 | D | |
| | NB-T | 0.60 | 25.0 | C | 0.61 | 25.1 | C | | 0.64 | 27.6 | C | |
| | SB-T | 0.56 | 34.8 | C | 0.57 | 35.1 | D | | 0.62 | 38.1 | D | |
| | SB-R | 0.35 | 35.0 | C | 0.37 | 35.4 | D | | 0.40 | 38.4 | D | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.30 | >150 | F | 1.45 | >150 | F | * | 1.45 | >150 | F | ** |
| Flatbush Avenue (N-S) | EB-TR | 0.96 | 82.5 | F | 0.47 | 40.5 | D | | 0.57 | 43.5 | D | |
| | WB-LTR | 1.01 | 83.8 | F | 1.02 | 86.8 | F | * | 1.05 | 94.2 | F | ** |
| | NB-L | 1.65 | >150 | F | 1.65 | >150 | F | | 1.65 | >150 | F | |
| | NB-TR | 1.10 | 76.7 | E | 1.15 | 94.9 | F | * | 1.15 | 83.2 | F | ** |
| | SB-L | 1.05 | 118.1 | F | 1.10 | 134.2 | F | * | 1.10 | 134.4 | F | ** |
| | SB-TR | 0.75 | 9.2 | A | 0.83 | 11.1 | B | | 0.83 | 11.3 | B | |
| Willoughby Street (E-W) @ | EB-L | 1.02 | 119.7 | F | EB-L 1.18 | >150 | F | * | EB-L | 0.36 | 32.9 | C |
| Flatbush Avenue (N-S) | | | | | | | | | EB-LR | 0.30 | 31.7 | C |
| | EB-R | 0.26 | 27.8 | C | EB-R 0.20 | 26.1 | C | | EB-R | 0.17 | 27.8 | C |
| | WB-LT | 0.73 | 54.0 | D | 0.75 | 55.4 | E | | WB-LT | 0.91 | 57.8 | E |
| | WB-R | 0.29 | 38.6 | D | 0.32 | 39.4 | D | | WB-R | 0.21 | 28.1 | C |
| | NB-L | 1.01 | 95.9 | F | 1.39 | >150 | F | * | | | | |
| | NB-T | 0.84 | 18.5 | B | 0.79 | 16.6 | B | | NB-T | 0.94 | 33.2 | C |
| | SB-TR | 0.80 | 25.5 | C | 0.88 | 30.0 | C | | SB-T | 0.99 | 44.7 | D |
| DeKalb Avenue (E-W) @ | WB-L | 0.45 | 38.3 | D | 0.64 | 44.7 | D | | 0.47 | 38.6 | D | |
| Flatbush Avenue (N-S) | WB-LT | 0.49 | 39.1 | D | 0.34 | 35.7 | D | | 0.52 | 42.2 | D | |
| | WB-R | 1.11 | 124.8 | F | 1.12 | 127.8 | F | * | 0.93 | 77.3 | F | |
| | NB-T | 1.03 | 55.4 | E | 1.06 | 67.1 | E | * | 1.03 | 55.0 | E | |
| | SB-TR | 0.82 | 26.4 | C | 0.84 | 27.5 | C | | 0.82 | 25.1 | C | |
| Livingston Street (E-W) @ | EB-R | 0.43 | 33.0 | C | 0.45 | 33.5 | C | | 0.42 | 30.8 | C | |
| Flatbush Avenue (N-S) | NB-L | 0.96 | 59.1 | E | 1.06 | 87.9 | F | * | 1.02 | 75.0 | E | ** |
| | NB-T | 0.49 | 0.7 | A | 0.50 | 0.7 | A | | 0.86 | 27.4 | C | |
| | SB-TR | 0.52 | 15.8 | B | 0.59 | 17.0 | B | | 0.62 | 19.2 | B | |
| Lafayette Avenue/ | EB-LT | 0.64 | 32.6 | C | 0.67 | 33.5 | C | | 0.72 | 37.2 | D | |
| Schermerhorn Street (E-W) @ | WB-TR | 0.80 | 61.2 | E | 0.82 | 62.4 | E | | 0.82 | 62.4 | E | |
| Flatbush Avenue (N-S) | NB-TR | 1.23 | 139.9 | F | 1.28 | >150 | F | * | 1.23 | 137.0 | F | |
| | SB-L | 0.93 | 93.3 | F | 0.95 | 96.9 | F | * | 0.90 | 85.9 | F | |
| | SB-T | 0.55 | 15.0 | B | 0.57 | 15.2 | B | | 0.54 | 12.8 | B | |
| Fourth Ave/Hanson Pl. (E-W) @ | EB-LT | 0.77 | 43.3 | D | 0.79 | 44.1 | D | | | | | |
| Flatbush Avenue (N-S) | NB-T | 0.87 | 19.9 | B | 0.90 | 21.9 | C | | | | | |
| | NB-R | 0.60 | 16.3 | B | 0.61 | 16.6 | B | | | | | |
| | SB-TR | 0.64 | 14.3 | B | 0.65 | 14.5 | B | | | | | |
| | SB-R | 0.53 | 19.8 | B | 0.55 | 20.4 | C | | | | | |

**Table 20-2 (Continued)**

## 2013 Future with the Mitigation Traffic Conditions- AM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NoBuild | | | Future Action | | | Mitigation | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Atlantic Avenue (E-W) @ Flatbush Avenue (N-S) | EB-T | 0.94 | 57.6 | E | 0.98 | 64.2 | E * | | 0.87 | 45.8 | D | | |
| | EB-R | 0.52 | 42.2 | D | 0.53 | 42.5 | D | | 0.31 | 32.7 | C | | |
| | WB-TR | 1.31 | >150 | F | 1.47 | >150 | F * | | 1.31 | >150 | F | | |
| | WB-R | 0.75 | 47.7 | D | 0.78 | 49.7 | D | | 0.68 | 40.6 | D | | |
| | NB-LTR | 0.70 | 20.6 | C | 0.72 | 21.2 | C | | 0.77 | 25.3 | C | | |
| | SB-LTR | 0.49 | 17.0 | B | 0.50 | 17.1 | B | | 0.56 | 20.7 | C | | |
| Jay Street (N-S) @ Tillary Street (E-W) | EB-L | 0.61 | 48.0 | D | 0.62 | 49.4 | D | | 0.19 | 25.0 | C | | |
| | EB-TR | 0.84 | 34.6 | C | 0.90 | 38.7 | D | | 0.94 | 43.9 | D | | |
| | WB-L | 1.71 | >150 | F | 2.02 | >150 | F * | | 1.67 | >150 | F | | |
| | WB-TR | 0.54 | 16.7 | B | 0.55 | 16.8 | B | | 0.74 | 31.8 | C | | |
| | NB-L | 0.20 | 26.4 | C | 0.21 | 26.6 | C | NB-L | 0.23 | 29.7 | C | | |
| | NB-TR | 0.83 | 42.4 | D | 0.84 | 43.0 | D | NB-T | 0.63 | 39.6 | D | | |
| | | | | | | | | NB-R | 0.75 | 32.1 | C | | |
| | SB-L | 0.50 | 43.0 | D | 0.50 | 43.3 | D | | 0.28 | 31.9 | C | | |
| | SB-TR | 0.11 | 24.7 | C | 0.11 | 24.7 | C | | 0.13 | 27.5 | C | | |
| Adams Street (N-S) (Service)@ Tillary Street (E-W) | EB-L | 1.02 | 106.0 | F | 1.01 | 105.1 | F | | 1.01 | 105.1 | F | | |
| | EB-TR | 0.61 | 35.0 | C | 0.65 | 36.1 | D | | 0.65 | 36.1 | D | | |
| | WB-L | 1.16 | >150 | F | 1.20 | >150 | F * | | 1.20 | >150 | F ** | | |
| | WB-T | 0.62 | 50.0 | D | 0.63 | 50.4 | D | | 0.63 | 50.4 | D | | |
| | WB-R | 1.12 | 125.6 | F | 1.13 | 129.4 | F * | | 1.13 | 129.4 | F ** | | |
| | NB-TR | 0.41 | 27.5 | C | 0.41 | 27.6 | C | | 0.41 | 27.6 | C | | |
| | SB-TR | 0.28 | 21.7 | C | 0.28 | 21.7 | C | | 0.28 | 21.7 | C | | |
| Adams Street (N-S) (Main) | NB-L | 0.50 | 59.7 | E | 0.49 | 59.5 | E | | 0.49 | 59.5 | E | | |
| | NB-T | 0.83 | 38.6 | D | 0.84 | 39.6 | D | | 0.84 | 39.6 | D | | |
| | SB-L | 1.21 | >150 | F | 1.30 | >150 | F * | | 1.30 | >150 | F ** | | |
| | SB-T | 1.13 | 107.2 | F | 1.14 | 112.1 | F * | | 1.14 | 112.1 | F ** | | |
| Ashland Place (N-S) @ Myrtle Avenue (E-W) | EB-LT | 0.36 | 8.5 | A | 0.38 | 8.6 | A | | 0.37 | 8.6 | A | | |
| | EB-R | 0.14 | 6.7 | A | 0.14 | 6.7 | A | | 0.14 | 6.6 | A | | |
| | | | | | | | | WB-LT | 0.99 | 47.5 | D | | |
| | WB-LTR | 0.98 | 42.8 | D | 1.06 | 64.9 | E * | WB-R | 0.09 | 6.2 | A | 44.2 | D |
| | NB-LTR | 1.14 | 119.8 | F | 1.19 | 139.3 | F * | NB-L | 0.70 | 53.0 | D | 37.4 | D |
| | | | | | | | | NB-TR | 0.56 | 33.0 | C | | |
| | SB-LTR | 0.99 | 74.4 | E | 1.01 | 78.6 | E * | SB-L | 0.82 | 82.7 | F | 40.7 | D |
| | | | | | | | | SB-TR | 0.50 | 31.6 | C | | |
| Prince Street (NB) @ Myrtle Avenue (E-W) | EB-LT | 0.73 | 32.9 | C | 1.28 | >150 | F * | EB-LT | 0.61 | 15.3 | B | | |
| | WB-TR | 1.02 | 71.9 | E | 1.51 | >150 | F * | WB-TR | 0.98 | 45.7 | D | | |
| | NB-LTR | 0.75 | 39.7 | D | | | | | | | | | |
| Gold St/Albee Square West (N-S) @ Willoughby Street (E-W) | EB-TR | 0.10 | 30.8 | C | | | | | | | | | |
| | WB-LT | 0.52 | 26.6 | C | 0.52 | 36.9 | D | | | | | | |
| | NB-L | 0.19 | 20.9 | C | 0.50 | 26.2 | C | | | | | | |
| | NB-R | 0.25 | 21.6 | C | 0.36 | 23.4 | C | | | | | | |
| | SB-L | 0.17 | 20.4 | C | 0.16 | 20.0 | B | | | | | | |
| | SB-TR | 0.13 | 19.9 | B | 0.40 | 24.7 | C | | | | | | |
| Bridge Street (SB) @ Willoughby Street (E-W) | WB-LT | 0.70 | 17.5 | B | 1.48 | >150 | F * | | 0.89 | 28.2 | C | | |

**Table 20-2 (Continued)**
**2013 Future with the Mitigation Traffic Conditions- AM Peak Hour**

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour NoBuild V/C Ratio | NoBuild Delay (sec.) | NoBuild LOS | Future Action V/C Ratio | Future Action Delay (sec.) | Future Action LOS | | Mitigation V/C Ratio | Mitigation Delay (sec.) | Mitigation LOS | | Approach Delay | Approach LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jay Street (N-S) @ | EB-LR | 0.05 | 20.2 | C | 0.00 | 19.6 | B | | | | | | | |
| Willoughby Street (E-W) | WB-LTR | 0.76 | 40.3 | D | 0.91 | 59.1 | E | * | WB-LTR | 0.82 | 42.8 | D | | |
| | NB-LT | 0.74 | 19.7 | B | 0.83 | 23.8 | C | | NB-LT | 0.92 | 33.6 | C | | |
| | SB-TR | 0.40 | 13.0 | B | 0.44 | 13.5 | B | | SB-TR | 0.49 | 15.9 | B | | |
| Bond Street (NB) @ | EB-LT | 0.62 | 13.4 | B | 0.97 | 44.4 | D | | EB-L | 0.45 | 20.1 | C | 18.6 | B |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.60 | 18.3 | B | | |
| | WB-TR | 0.89 | 27.8 | C | 1.11 | 81.0 | F | * | WB-T | 0.83 | 28.0 | C | 26.0 | C |
| | | | | | | | | | WB-R | 0.19 | 12.3 | B | | |
| | NB-LTR | 0.81 | 32.6 | C | 1.35 | >150 | F | * | | 0.72 | 29.3 | C | | |
| Hoyt Street (SB) @ | EB-TR | 0.80 | 19.0 | B | 0.87 | 23.6 | C | | EB-T | 0.75 | 22.6 | C | 20.8 | C |
| Livingston Street (E-W) | | | | | | | | | EB-R | 0.23 | 12.2 | B | | |
| | WB-LT | 0.64 | 14.3 | B | 0.83 | 23.2 | C | | WB-L | 0.33 | 15.7 | B | 17.5 | B |
| | | | | | | | | | WB-T | 0.59 | 17.3 | B | | |
| | SB-LTR | 0.23 | 15.5 | B | 0.30 | 16.1 | B | | | 0.27 | 21.6 | C | | |
| Smith Street (N-S) @ | EB-LTR | 0.64 | 22.6 | C | 0.81 | 30.3 | C | | | | | | | |
| Livingston Street (E-W) | WB-LTR | 0.40 | 18.3 | B | 0.50 | 19.9 | B | | | | | | | |
| | NB-DfL | 0.82 | 28.5 | C | 0.94 | 39.7 | D | | | | | | | |
| | NB-TR | 0.87 | 64.4 | E | 0.82 | 56.4 | E | | | | | | | |
| | SB-LTR | 0.71 | 28.0 | C | 0.86 | 38.8 | D | | | | | | | |
| Boerum Place (N-S) @ | EB-LT | 0.82 | 60.2 | E | 0.93 | 76.4 | E | * | EB-L | 0.30 | 36.4 | D | 37.6 | D |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.49 | 38.9 | D | | |
| | EB-R | 0.16 | 32.9 | C | 0.16 | 32.9 | C | | EB-R | 0.16 | 32.9 | C | | |
| | WB-LTR | 0.77 | 49.5 | D | 0.89 | 62.5 | E | * | WB-L | 0.39 | 39.3 | D | 40.5 | D |
| | | | | | | | | | WB-T | 0.35 | 35.9 | D | | |
| | | | | | | | | | WB-R | 0.60 | 44.3 | D | | |
| | NB-L | 0.35 | 24.4 | C | 0.35 | 24.4 | C | | | 0.36 | 25.6 | C | | |
| | NB-TR | 0.91 | 37.2 | D | 0.93 | 39.3 | D | | | 0.95 | 42.3 | D | | |
| | SB-L | 1.00 | 100.3 | F | 1.05 | 114.8 | F | * | | 1.00 | 99.0 | F | | |
| | SB-TR | 0.38 | 11.5 | B | 0.38 | 11.5 | B | | | 0.38 | 11.5 | B | | |
| Bond Street (NB) @ | EB-LT | 0.43 | 12.6 | B | 0.48 | 13.3 | B | | EB-L | 0.13 | 13.5 | B | 17.8 | B |
| Schermerhorn Street (E-W) | | | | | | | | | EB-T | 0.52 | 18.2 | B | | |
| | WB-TR | 0.53 | 14.2 | B | 0.54 | 14.3 | B | | | 0.56 | 19.3 | B | | |
| | NB-LTR | 1.18 | 115.8 | F | 1.57 | >150 | F | * | | 0.89 | 37.3 | D | | |
| Hoyt Street (SB) @ | EB-TR | 0.51 | 11.3 | B | 0.54 | 11.9 | B | | | 0.70 | 23.0 | C | | |
| Schermerhorn Street (E-W) | | | | | | | | | | | | | | |
| | WB-LT | 0.84 | 25.5 | C | 0.87 | 28.3 | C | | WB-L | 0.41 | 19.4 | B | 21.5 | C |
| | | | | | | | | | WB-T | 0.65 | 21.9 | C | | |
| | SB-LTR | 0.34 | 16.5 | B | 0.44 | 17.7 | B | | | 0.37 | 20.8 | C | | |
| Fourth Ave (N-S) @ | EB-TR | 0.65 | 27.7 | C | 0.68 | 28.5 | C | | | 0.66 | 27.1 | C | | |
| Atlantic Avenue (E-W) | WB-TR | 1.08 | 82.5 | F | 1.21 | 134.2 | F | * | | 1.19 | 124.5 | F | ** | |
| | NB-L | 1.22 | >150 | F | 1.29 | >150 | F | * | | 1.21 | >150 | F | | |
| | NB-T | 0.68 | 40.0 | D | 0.70 | 40.5 | D | | | 0.66 | 38.1 | D | | |
| | NB-R | 0.66 | 48.8 | D | 0.66 | 48.8 | D | | | 0.62 | 44.7 | D | | |
| | SB-T | 0.18 | 17.3 | B | 0.19 | 17.4 | B | | | 0.21 | 18.2 | B | | |
| | SB-R | 0.13 | 17.0 | B | 0.13 | 17.0 | B | | | 0.13 | 17.6 | B | | |

## Table 20-2 (Continued)
## 2013 Future with the Mitigation Traffic Conditions- AM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour NoBuild V/C Ratio | NoBuild Delay (sec.) | NoBuild LOS | Future Action V/C Ratio | Future Action Delay (sec.) | Future Action LOS | Mitigation V/C Ratio | Mitigation Delay (sec.) | Mitigation LOS | Approach Delay | Approach LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bond Street (NB) @ Atlantic Avenue (E-W) | EB-LT | 1.41 | >150 | F | 1.53 | >150 | F * | 1.37 | >150 | F | | |
| | WB-TR | 1.18 | 114.0 | F | 1.32 | >150 | F * | 0.95 | 36.7 | D | 33.4 | C |
| | | | | | | | | 0.61 | 20.4 | C | | |
| | NB-LTR | 0.72 | 38.2 | D | 0.73 | 38.7 | D | 0.80 | 44.9 | D | | |
| Hoyt Street (SB) @ Atlantic Avenue (E-W) | EB-TR | 0.72 | 22.6 | C | 0.78 | 24.9 | C | 0.71 | 21.1 | C | | |
| | WB-LT | 1.25 | 144.9 | F | 1.28 | >150 | F * | 1.24 | 139.5 | F | | |
| | SB-LTR | 0.57 | 35.4 | D | 0.72 | 41.8 | D | 0.43 | 32.0 | C | | |
| Smith Street (N-S) @ Atlantic Avenue (E-W) | EB-DfL | 1.44 | >150 | F | 1.82 | >150 | F * | 1.82 | >150 | F ** | | |
| | EB-T | 0.73 | 23.2 | C | 0.79 | 25.8 | C | 0.74 | 23.6 | C | | |
| | WB-T | 0.94 | 36.3 | D | 0.94 | 37.1 | D | 0.94 | 37.1 | D | | |
| | WB-R | 0.46 | 18.2 | B | 0.52 | 19.7 | B | 0.52 | 19.7 | B | | |
| | NB-L | 1.12 | 120.0 | F | 1.12 | 120.0 | F | 1.12 | 120.0 | F | | |
| | NB-TR | 0.73 | 38.6 | D | 0.80 | 42.4 | D | 0.80 | 42.4 | D | | |
| Boerum Place (N-S) @ Atlantic Avenue (E-W) | EB-DfL | 1.14 | 133.8 | F | 1.20 | >150 | F * | 1.15 | 133.5 | F | | |
| | EB-TR | 0.53 | 19.9 | B | 0.62 | 22.1 | C | 0.60 | 20.3 | C | | |
| | WB-LT | 1.00 | 74.7 | E | 1.03 | 81.9 | F * | 1.00 | 73.6 | E | | |
| | WB-R | 0.45 | 1.3 | A | 0.45 | 1.3 | A | 0.45 | 1.3 | A | | |
| | SB-L | 0.45 | 28.3 | C | 0.48 | 28.4 | C | 0.41 | 28.9 | C | | |
| | SB-TR | 0.61 | 32.2 | C | 0.64 | 32.9 | C | 0.67 | 35.2 | D | | |
| Jay Street (N-S) @ Tech Place (E-W) | WB-LTR | 0.12 | 21.0 | C | 0.12 | 21.0 | C | | | | | |
| | NB-TR | 0.76 | 20.7 | C | 0.86 | 26.7 | C | | | | | |
| | SB-LT | 0.56 | 15.3 | B | 0.79 | 22.2 | C | | | | | |
| Smith Street (N-S) @ Schermerhorn (E-W) | | | | | | | | EB-LT | 0.19 | 26.0 | C | |
| | WB-T | 0.56 | 29.6 | C | WB-T | 0.56 | 29.8 | C | WB-T | 0.65 | 36.1 | D |
| | WB-R | 0.22 | 23.5 | C | WB-R | 0.22 | 23.6 | C | WB-R | 0.26 | 27.2 | C |
| | NB-LTR | 1.14 | 104.6 | F | | 1.27 | >150 | F * | | 0.99 | 49.8 | D |
| | SB-L | 0.72 | 49.8 | D | | 0.74 | 51.5 | D | | 0.55 | 34.2 | C |
| | SB-R | 0.52 | 40.8 | D | | 0.56 | 42.5 | D | | 0.23 | 8.8 | A |
| Fulton Street (E-W) @ Flatbush Avenue (N-S) | EB-LTR | 0.19 | 36.7 | D | 0.19 | 36.7 | D | 0.20 | 38.5 | D | | |
| | WB-LT | 0.54 | 47.2 | D | 0.54 | 47.2 | D | 0.59 | 51.2 | D | | |
| | WB-R | 0.54 | 28.5 | C | 0.57 | 29.4 | C | 0.60 | 32.2 | C | | |
| | NB-TR | 1.19 | 126.2 | F | 1.23 | 143.3 | F * | 1.18 | 121.4 | F | | |
| | SB-L | 1.00 | 92.6 | F | 1.01 | 94.9 | F | 1.01 | 94.7 | F | | |
| | SB-T | 0.98 | 41.7 | D | 1.07 | 69.4 | E * | 0.70 | 16.7 | B | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections
** - Denotes Unmitigated Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

**Table 20-3**

## 2013 Future with the Mitigation Traffic Conditions- MD Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | | Future Action | | | | Mitigation | | | | | |
| | | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Tillary Street (E-W) @ | EB-L | | 0.49 | 50.8 | D | | 0.51 | 51.5 | D | | 0.51 | 51.5 | D | | |
| Flatbush Avenue (N-S) | EB-TR | | 0.91 | 51.8 | D | | 0.95 | 56.2 | E | | 0.95 | 56.2 | E | | |
| | EB-R | | 0.95 | 80.1 | F | | 1.04 | 102.9 | F * | | 1.04 | 102.9 | F ** | | |
| | WB-L | | 0.77 | 57.7 | E | | 0.91 | 70.5 | E * | | 0.91 | 70.5 | E ** | | |
| | WB-T | | 0.63 | 39.7 | D | | 0.66 | 40.5 | D | | 0.66 | 40.5 | D | | |
| | WB-R | | 0.84 | 62.0 | E | | 0.85 | 62.6 | E | | 0.85 | 62.6 | E | | |
| | NB-L | | 1.00 | 79.7 | E | | 1.05 | 93.8 | F * | | 0.98 | 72.7 | E | | |
| | NB-T | | 0.45 | 22.3 | C | | 0.45 | 22.4 | C | | 0.45 | 22.4 | C | | |
| | SB-T | | 0.58 | 35.4 | D | | 0.59 | 35.7 | D | | 0.62 | 37.7 | D | | |
| | SB-R | | 0.49 | 38.7 | D | | 0.55 | 41.3 | D | | 0.59 | 44.4 | D | | |
| Myrtle Avenue (E-W) @ | EB-DfL | EB-LTR | 0.89 | 63.9 | E | EB-LTR | 0.61 | 54.1 | D | EB-DfL | 0.79 | 68.9 | E | 64.1 | E |
| Flatbush Avenue (N-S) | EB-TR | | | | | | | | | EB-TR | 0.48 | 40.9 | D | | |
| | WB-LTR | | 0.71 | 47.5 | D | | 0.70 | 46.6 | D | | 0.70 | 46.8 | D | | |
| | NB-L | | 0.36 | 24.8 | C | | 0.41 | 28.1 | C | NB-L | 0.44 | 31.7 | C | | |
| | NB-TR | | 1.18 | 111.6 | F | | 1.29 | >150 | F * | NB-T | 1.17 | 110.6 | F | | |
| | | | | | | | | | | NB-R | 0.15 | 18.0 | B | | |
| | SB-L | | 1.00 | 105.4 | F | | 1.13 | 144.8 | F * | | 0.99 | 97.7 | F | | |
| | SB-TR | | 0.56 | 6.6 | A | | 0.59 | 6.8 | A | | 0.60 | 6.9 | A | | |
| Willoughby Street (E-W) @ | EB-L | EB-L | 0.90 | 84.1 | F | | 1.39 | >150 | F * | EB-L | 0.50 | 38.0 | D | | |
| Flatbush Avenue (N-S) | | | | | | | | | | EB-LR | 0.49 | 36.7 | D | | |
| | EB-R | EB-R | 0.43 | 29.1 | C | | 0.30 | 25.1 | C | EB-R | 0.50 | 35.1 | D | | |
| | WB-LT | | 0.30 | 37.0 | D | | 0.39 | 38.9 | D | WB-LT | 0.53 | 33.4 | C | | |
| | WB-R | | 0.18 | 35.1 | D | | 0.24 | 36.5 | D | WB-R | 0.14 | 25.9 | C | | |
| | NB-L | | 0.59 | 21.2 | C | | 0.71 | 29.0 | C | | | | | | |
| | NB-T | | 0.61 | 6.4 | A | | 0.55 | 5.8 | A | NB-T | 0.65 | 14.4 | B | | |
| | SB-TR | | 0.70 | 19.1 | B | | 0.74 | 20.1 | C | SB-TR | 0.79 | 18.1 | B | | |
| DeKalb Avenue (E-W) @ | WB-L | | 0.87 | 66.2 | E | | 0.88 | 68.6 | E | | | | | | |
| Flatbush Avenue (N-S) | WB-LT | | 0.56 | 41.4 | D | | 0.58 | 42.0 | D | | | | | | |
| | WB-R | | 0.81 | 61.0 | E | | 0.83 | 63.0 | E | | | | | | |
| | NB-T | | 0.74 | 23.5 | C | | 0.77 | 24.5 | C | | | | | | |
| | SB-TR | | 0.75 | 23.6 | C | | 0.79 | 25.0 | C | | | | | | |
| Livingston Street (E-W) @ | EB-R | | 0.56 | 35.8 | D | | 0.59 | 36.6 | D | | | | | | |
| Flatbush Avenue (N-S) | NB-L | | 0.58 | 15.7 | B | | 0.61 | 18.9 | B | | | | | | |
| | NB-T | | 0.37 | 0.4 | A | | 0.61 | 11.2 | B | | | | | | |
| | SB-TR | | 0.50 | 9.8 | A | | 0.53 | 10.1 | B | | | | | | |
| Lafayette Avenue/ | EB-LT | | 0.41 | 27.6 | C | | 0.49 | 29.0 | C | | 0.54 | 32.8 | C | | |
| Schermerhorn Street (E-W) @ | WB-TR | | 0.62 | 51.3 | D | | 0.68 | 53.3 | D | | 0.69 | 54.0 | D | | |
| Flatbush Avenue (N-S) | NB-TR | | 1.12 | 95.1 | F | | 1.17 | 113.8 | F * | | 1.12 | 92.8 | F | | |
| | SB-L | | 0.77 | 68.1 | E | | 0.83 | 75.8 | E * | | 0.76 | 64.4 | E | | |
| | SB-T | | 0.57 | 15.2 | B | | 0.60 | 15.7 | B | | 0.57 | 12.5 | B | | |
| Fourth Ave/Hanson Pl. (E-W) @ | EB-LT | | 0.34 | 30.7 | C | | 0.36 | 31.0 | C | | | | | | |
| Flatbush Avenue (N-S) | NB-T | | 0.71 | 18.6 | B | | 0.74 | 19.1 | B | | | | | | |
| | NB-R | | 0.32 | 14.1 | B | | 0.36 | 14.7 | B | | | | | | |
| | SB-TR | | 0.83 | 24.0 | C | | 0.85 | 25.1 | C | | | | | | |
| | SB-R | | 0.63 | 26.2 | C | | 0.69 | 28.7 | C | | | | | | |

## Table 20-3 (Continued)
## 2013 Future with the Mitigation Traffic Conditions- MD Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | Mitigation | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Atlantic Avenue (E-W) @ Flatbush Avenue (N-S) | EB-T | 0.89 | 46.7 | D | 0.93 | 51.6 | D | | 0.89 | 45.4 | D | | |
| | EB-R | 0.61 | 41.1 | D | 0.62 | 41.4 | D | | 0.47 | 34.5 | C | | |
| | WB-TR | 1.01 | 72.6 | E | 1.07 | 88.8 | F * | | 1.02 | 71.8 | E | | |
| | WB-R | 0.75 | 43.5 | D | 0.80 | 47.1 | D | | 0.76 | 42.6 | D | | |
| | NB-LTR | 0.47 | 19.0 | B | 0.48 | 19.2 | B | | 0.49 | 20.6 | C | | |
| | SB-LTR | 0.61 | 21.9 | C | 0.62 | 22.2 | C | | 0.67 | 24.5 | C | | |
| Jay Street (N-S) @ Tillary Street (E-W) | EB-L | 0.36 | 29.8 | C | 0.37 | 30.2 | C | | 0.14 | 20.8 | C | | |
| | EB-TR | 0.76 | 31.0 | C | 0.80 | 32.4 | C | | 0.80 | 32.4 | C | | |
| | WB-L | 1.08 | 123.8 | F | 1.20 | >150 | F * | | 1.05 | 113.2 | F | | |
| | WB-TR | 0.48 | 15.6 | B | 0.48 | 15.7 | B | | 0.63 | 27.4 | C | | |
| | NB-L | 0.27 | 27.7 | C | 0.30 | 28.3 | C | NB-L | 0.32 | 30.8 | C | | |
| | NB-TR | 0.59 | 32.9 | C | 0.62 | 33.5 | C | NB-T | 0.24 | 28.9 | C | | |
| | | | | | | | | NB-R | 0.71 | 31.4 | C | | |
| | SB-L | 0.35 | 31.8 | C | 0.36 | 32.4 | C | | 0.19 | 28.4 | C | | |
| | SB-TR | 0.13 | 24.9 | C | 0.13 | 24.9 | C | | 0.13 | 27.0 | C | | |
| Adams Street (N-S) (Service)@ Tillary Street (E-W) | EB-L | 0.75 | 64.8 | E | 0.74 | 64.2 | E | | 0.74 | 64.2 | E | | |
| | EB-TR | 0.58 | 34.2 | C | 0.60 | 34.7 | C | | 0.60 | 34.7 | C | | |
| | WB-L | 1.15 | >150 | F | 1.17 | >150 | F * | | 1.17 | >150 | F ** | | |
| | WB-T | 0.62 | 49.8 | D | 0.65 | 50.6 | D | | 0.65 | 50.6 | D | | |
| | WB-R | 0.94 | 76.9 | E | 0.96 | 80.5 | F | | 0.96 | 80.5 | F | | |
| | NB-TR | 0.59 | 31.2 | C | 0.61 | 31.6 | C | | 0.61 | 31.6 | C | | |
| | SB-TR | 0.32 | 22.3 | C | 0.32 | 22.3 | C | | 0.32 | 22.3 | C | | |
| Adams Street (N-S) (Main) | NB-L | 0.42 | 56.8 | E | 0.44 | 57.7 | E | | 0.44 | 57.7 | E | | |
| | NB-T | 0.48 | 28.3 | C | 0.51 | 28.9 | C | | 0.51 | 28.9 | C | | |
| | SB-L | 1.08 | 110.8 | F | 1.13 | 129.1 | F * | | 1.13 | 129.1 | F ** | | |
| | SB-T | 1.00 | 63.5 | E | 1.01 | 67.0 | E | | 1.01 | 67.0 | E | | |
| Ashland Place (N-S) @ Myrtle Avenue (E-W) | EB-LT | 0.26 | 7.4 | A | 0.28 | 7.6 | A | | 0.28 | 7.6 | A | | |
| | EB-R | 0.14 | 6.6 | A | 0.15 | 6.7 | A | | 0.16 | 6.8 | A | | |
| | WB-LTR | 0.42 | 9.2 | A | 0.46 | 9.6 | A | WB-LTR | 0.52 | 10.8 | B | | |
| | NB-LTR | 0.83 | 49.7 | D | 0.97 | 73.1 | E * | NB-L | 0.70 | 54.3 | D | 37.0 | D |
| | | | | | | | | NB-TR | 0.41 | 30.4 | C | | |
| | SB-LTR | 0.77 | 41.1 | D | 0.79 | 42.7 | D | SB-L | 0.60 | 53.8 | D | 34.7 | C |
| | | | | | | | | SB-TR | 0.51 | 31.8 | C | | |
| Prince Street (NB) @ Myrtle Avenue (E-W) | EB-LT | EB-LT | 0.51 | 23.2 | C | EB-LT | 1.09 | 104.5 | F * | | 0.56 | 13.7 | B | | |
| | WB-TR | WB-TR | 0.67 | 28.4 | C | WB-TR | 1.16 | 121.3 | F * | | 0.86 | 27.6 | C | | |
| | NB-LTR | NB-LTR | 0.78 | 41.9 | D | | | | | | | | |
| Gold St/Albee Square West (N-S) @ Willoughby Street (E-W) | EB-TR | | 0.17 | 31.9 | C | | | | | | | | |
| | WB-LT | | 0.35 | 22.9 | C | | 0.33 | 33.5 | C | | | | |
| | NB-L | | 0.29 | 22.7 | C | | 0.68 | 32.0 | C | | | | |
| | NB-R | | 0.50 | 27.0 | C | | 0.68 | 32.6 | C | | | | |
| | SB-L | | 0.09 | 19.2 | B | | 0.08 | 19.0 | B | | | | |
| | SB-TR | | 0.24 | 21.7 | C | | 0.29 | 22.3 | C | | | | |
| Bridge Street (SB) @ Willoughby Street (E-W) | WB-LT | | 0.82 | 24.8 | C | | 1.31 | >150 | F * | | 0.88 | 27.7 | C | | |

**Table 20-3(Continued)**

**2013 Future with the Mitigation Traffic Conditions- MD Peak Hour**

| SIGNALIZED INTERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | Mitigation | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Jay Street (N-S) @ | EB-LR | 0.09 | 19.9 | B | 0.04 | 19.1 | B | | | | | | |
| Willoughby Street (E-W) | WB-LTR | 1.10 | 108.0 | F | 1.27 | >150 | F * | WB-LTR | 1.09 | 98.8 | F | | |
| | NB-LT | 0.36 | 12.7 | B | 0.39 | 13.0 | B | NB-LT | 0.44 | 16.0 | B | | |
| | SB-TR | 0.46 | 13.8 | B | 0.49 | 14.2 | B | SB-TR | 0.53 | 17.2 | B | | |
| Bond Street (NB) @ | EB-LT | 0.86 | 24.1 | C | 1.17 | 107.6 | F * | EB-L | 0.34 | 13.7 | B | 21.8 | C |
| Livingston Street (E-W) | | | | | | | | EB-T | 0.83 | 23.6 | C | | |
| | WB-TR | 0.82 | 19.9 | B | 0.91 | 29.3 | C | WB-TR | 0.95 | 41.3 | D | | |
| | NB-LTR | 0.66 | 25.0 | C | 0.80 | 31.9 | C | | 0.79 | 40.1 | D | | |
| Hoyt Street (SB) @ | EB-TR | 0.97 | 40.8 | D | 1.10 | 78.9 | E * | EB-T | 0.69 | 16.4 | B | 15.8 | B |
| Livingston Street (E-W) | | | | | | | | EB-R | 0.34 | 14.1 | | | |
| | WB-LT | 0.92 | 32.6 | C | 1.04 | 61.0 | E * | WB-L | 0.28 | 13.6 | B | 20.5 | C |
| | | | | | | | | WB-T | 0.78 | 21.9 | C | | |
| | SB-LTR | 0.49 | 18.6 | B | 0.61 | 20.7 | C | | 0.56 | 26.2 | C | | |
| Smith Street (N-S) @ | EB-LTR | 0.36 | 25.7 | C | 0.42 | 27.1 | C | | 0.49 | 19.6 | B | | |
| Livingston Street (E-W) | WB-LTR | 0.40 | 26.5 | C | 0.43 | 27.1 | C | | 0.50 | 19.8 | B | | |
| | NB-DfL | 0.45 | 39.5 | D | 0.54 | 42.4 | D | | 0.46 | 19.3 | B | | |
| | NB-TR | 1.74 | >150 | F | 1.78 | >150 | F * | | 1.66 | >150 | F | | |
| | SB-LTR | 0.78 | 56.5 | E | 0.89 | 68.7 | E * | | 0.83 | 35.5 | D | | |
| Boerum Place (N-S) @ | EB-LT | 0.73 | 80.9 | F | 0.81 | 90.7 | F * | EB-L | 0.38 | 38.8 | D | 36.6 | D |
| Livingston Street (E-W) | | | | | | | | EB-T | 0.35 | 35.6 | D | | |
| | EB-R | 0.21 | 54.3 | D | 0.21 | 54.3 | D | EB-R | 0.30 | 36.1 | D | | |
| | WB-LTR | 0.71 | 72.4 | E | 0.82 | 81.3 | F * | WB-L | 0.50 | 42.8 | D | 58.9 | E |
| | | | | | | | | WB-T | 0.19 | 32.8 | C | | |
| | | | | | | | | WB-R | 0.90 | 72.4 | E | | |
| | NB-L | 0.40 | 52.1 | D | 0.40 | 52.1 | D | | 0.37 | 25.1 | C | | |
| | NB-TR | 0.57 | 51.8 | D | 0.57 | 51.8 | D | | 0.53 | 23.1 | C | | |
| | SB-L | 0.58 | 71.0 | E | 0.62 | 74.1 | E | | 0.56 | 33.8 | C | | |
| | SB-TR | 0.35 | 25.2 | C | 0.35 | 25.2 | C | | 0.34 | 11.1 | B | | |
| Bond Street (NB) @ | EB-LT | 0.56 | 14.7 | B | 0.63 | 16.2 | B | EB-L | 0.21 | 16.0 | B | 22.2 | C |
| Schermerhorn Street (E-W) | | | | | | | | EB-T | 0.65 | 22.9 | C | | |
| | WB-TR | 0.46 | 13.2 | B | 0.49 | 13.5 | B | | 0.54 | 20.4 | C | | |
| | NB-LTR | 0.71 | 23.6 | C | 0.85 | 32.4 | C | | 0.80 | 34.3 | C | | |
| Hoyt Street (SB) @ | EB-TR | 0.61 | 13.3 | B | 0.66 | 14.4 | B | | 0.83 | 30.1 | C | | |
| Schermerhorn Street (E-W) | | | | | | | | | | | | | |
| | WB-LT | 0.72 | 19.3 | B | 0.81 | 25.7 | C | WB-L | 0.57 | 26.2 | C | 19.3 | B |
| | | | | | | | | WB-T | 0.41 | 16.1 | B | | |
| | SB-LTR | 0.55 | 19.7 | B | 0.74 | 24.7 | C | | 0.63 | 26.0 | C | | |
| Fourth Ave (N-S) @ | EB-TR | 1.11 | 103.8 | F | 1.17 | 128.1 | F * | | 1.09 | 95.3 | F | | |
| Atlantic Avenue (E-W) | WB-TR | 1.12 | 112.1 | F | 1.18 | 135.4 | F * | | 1.12 | 109.7 | F | | |
| | NB-L | 1.30 | >150 | F | 1.34 | >150 | F * | | 1.28 | >150 | F | | |
| | NB-T | 0.49 | 43.8 | D | 0.51 | 44.3 | D | | 0.49 | 43.2 | D | | |
| | NB-R | 1.15 | >150 | F | 1.15 | >150 | F | | 1.11 | 142.2 | F | | |
| | SB-T | 0.17 | 9.3 | A | 0.19 | 9.4 | A | | 0.21 | 10.4 | B | | |
| | SB-R | 0.06 | 8.6 | A | 0.06 | 8.6 | A | | 0.07 | 9.4 | A | | |

**Table 20-3(Continued)**

**2013 Future with the Mitigation Traffic Conditions- MD Peak Hour**

| SIGNALIZED INTERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | | Future Action | | | | Mitigation | | | |
| | | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Bond Street (NB) @ Atlantic Avenue (E-W) | EB-LT | EB-LT | 1.05 | 57.6 | E | | 1.27 | 149.0 | F * | | 1.13 | 86.4 | F ** | | |
| | WB-TR | | 0.76 | 16.1 | B | | 0.81 | 17.9 | B | WB-TR | 0.77 | 14.6 | B | | |
| | NB-LTR | | 0.48 | 29.6 | C | | 0.48 | 29.6 | C | NB-LTR | 0.56 | 33.7 | C | | |
| Hoyt Street (SB) @ Atlantic Avenue (E-W) | EB-TR | | 0.68 | 13.9 | B | | 0.71 | 14.6 | B | | 0.67 | 13.6 | B | | |
| | WB-LT | | 0.78 | 16.6 | B | | 0.82 | 18.1 | B | | 0.79 | 17.0 | B | | |
| | SB-LTR | | 1.07 | 97.2 | F | | 1.38 | >150 | F * | | 0.78 | 38.4 | D | | |
| Smith Street (N-S) @ Atlantic Avenue (E-W) | EB-DfL | EB-LT | 0.92 | 32.7 | C | EB-LT | 0.88 | 41.0 | D | | | | | | |
| | EB-T | | | | | | | | | | | | | | |
| | WB-T | WB-T | 0.79 | 23.2 | C | | 0.81 | 23.8 | C | | | | | | |
| | WB-R | WB-R | 0.31 | 14.8 | B | | 0.34 | 15.3 | B | | | | | | |
| | NB-L | NB-L | 0.60 | 27.6 | C | | 0.60 | 27.6 | C | | | | | | |
| | NB-TR | NB-TR | 0.35 | 20.5 | C | | 0.40 | 21.2 | C | | | | | | |
| Boerum Place (N-S) @ Atlantic Avenue (E-W) | EB-DfL | | 0.79 | 47.9 | D | | 0.83 | 52.6 | D | | | | | | |
| | EB-TR | | 0.66 | 22.3 | C | | 0.72 | 24.0 | C | | | | | | |
| | WB-LT | | 0.83 | 39.7 | D | | 0.86 | 42.0 | D | | | | | | |
| | WB-R | | 0.35 | 0.9 | A | | 0.35 | 0.9 | A | | | | | | |
| | SB-L | | 0.38 | 17.5 | B | | 0.38 | 17.0 | B | | | | | | |
| | SB-TR | | 0.58 | 21.1 | C | | 0.62 | 21.9 | C | | | | | | |
| Jay Street (N-S) @ Tech Place (E-W) | WB-LTR | WB-LR | 0.34 | 24.7 | C | WB-LTR | 0.34 | 24.3 | C | | | | | | |
| | NB-TR | NB-LT | 0.89 | 34.1 | C | NB-LTR | 0.95 | 43.7 | D | | | | | | |
| | SB-LT | SB-LTR | 0.87 | 32.7 | C | SB-LT | 0.92 | 38.9 | D | | | | | | |
| Smith Street (N-S) @ Schermerhorn (E-W) | | | | | | | | | | EB-LT | 0.16 | 23.3 | C | | |
| | WB-T | | 0.46 | 48.2 | D | | 0.49 | 49.1 | D | WB-T | 0.55 | 30.3 | C | | |
| | WB-R | | 0.09 | 39.7 | D | | 0.09 | 39.7 | D | WB-R | 0.11 | 22.6 | C | | |
| | NB-LTR | | 0.70 | 62.0 | E | | 0.79 | 66.7 | E * | | 0.78 | 34.7 | C | | |
| | SB-L | | 0.85 | 92.0 | F | | 0.90 | 99.6 | F * | | 0.59 | 26.7 | C | | |
| | SB-R | | 0.51 | 68.9 | E | | 0.58 | 72.5 | E | | 0.32 | 11.9 | B | | |
| Fulton Street (E-W) @ Flatbush Avenue (N-S) | EB-LTR | | 0.22 | 36.5 | D | | 0.22 | 36.5 | D | | 0.24 | 38.4 | D | | |
| | WB-LT | | 0.44 | 42.3 | D | | 0.44 | 42.3 | D | | 0.48 | 45.2 | D | | |
| | WB-R | | 0.29 | 19.0 | B | | 0.31 | 19.3 | B | | 0.33 | 20.8 | C | | |
| | NB-TR | | 1.01 | 66.3 | E | | 1.06 | 79.2 | E * | | 1.01 | 63.7 | E | | |
| | SB-L | | 0.76 | 51.6 | D | | 0.78 | 52.9 | D | | 0.78 | 52.7 | D | | |
| | SB-T | | 0.95 | 35.6 | D | | 1.00 | 47.6 | D * | | 0.97 | 39.8 | D | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections
** - Denotes Unmitigated Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

**Table 20-4**

## 2013 Future with the Mitigation Traffic Conditions- PM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | | Mitigation | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Tillary Street (E-W) @ | EB-L | 0.55 | 53.1 | D | 0.58 | 54.1 | D | | 0.58 | 54.1 | D | | |
| Flatbush Avenue (N-S) | EB-TR | 1.03 | 76.2 | E | 1.10 | 100.6 | F | * | 1.08 | 91.8 | F | | ** |
| | EB-R | 1.05 | 106.5 | F | 1.16 | 142.3 | F | * | 1.09 | 117.7 | F | | ** |
| | WB-L | 1.24 | >150 | F | 1.35 | >150 | F | * | 1.35 | >150 | F | | ** |
| | WB-T | 1.12 | 109.6 | F | 1.13 | 116.0 | F | * | 1.10 | 103.6 | F | | |
| | WB-R | 0.59 | 44.5 | D | 0.59 | 44.6 | D | | 0.57 | 43.0 | D | | |
| | NB-L | 0.71 | 47.7 | D | 0.72 | 47.6 | D | | 0.74 | 49.0 | D | | |
| | NB-T | 0.48 | 22.8 | C | 0.49 | 23.0 | C | | 0.50 | 23.7 | C | | |
| | SB-T | 1.15 | 115.4 | F | 1.15 | 118.3 | F | | 1.15 | 118.3 | F | | |
| | SB-R | 0.57 | 41.1 | D | 0.57 | 41.1 | D | | 0.57 | 41.1 | D | | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.19 | >150 | F | 1.24 | >150 | F | * | 1.24 | >150 | F | | ** |
| Flatbush Avenue (N-S) | EB-TR | 0.94 | 77.9 | E | 0.58 | 43.8 | D | | 0.65 | 46.4 | D | | |
| | WB-LTR | 0.77 | 51.0 | D | 0.76 | 49.9 | D | | 0.78 | 51.3 | D | | |
| | NB-L | 1.11 | 160.5 | F | 1.11 | 160.5 | F | | 1.11 | >150 | F | | |
| | NB-TR | 0.87 | 25.2 | C | 1.01 | 45.2 | D | * | 0.99 | 40.1 | D | | |
| | SB-L | 1.15 | 131.3 | F | 1.24 | >150 | F | * | 1.24 | >150 | F | | ** |
| | SB-TR | 0.89 | 13.6 | B | 0.91 | 14.8 | B | | 0.91 | 15.0 | B | | |
| Willoughby Street (E-W) @ | EB-L | 1.07 | 122.5 | F | 1.72 | >150 | F | * | EB-L | 0.78 | 50.4 | D | |
| Flatbush Avenue (N-S) | | | | | | | | | EB-LR | 0.62 | 47.0 | D | |
| | EB-R | 0.78 | 49.7 | D | 0.54 | 33.2 | C | | EB-R | 0.76 | 50.8 | D | |
| | WB-LT | 0.27 | 38.1 | D | 0.52 | 44.7 | D | | WB-LT | 0.64 | 38.1 | D | |
| | WB-R | 0.24 | 37.6 | D | 0.26 | 38.3 | D | | WB-R | 0.17 | 27.8 | C | |
| | NB-L | 0.92 | 84.0 | F | 1.02 | 109.8 | F | * | | | | | |
| | NB-T | 0.62 | 5.4 | A | 0.58 | 5.1 | A | | NB-T | 0.68 | 13.5 | B | |
| | SB-TR | 1.00 | 37.7 | D | 1.03 | 45.6 | D | * | SB-TR | 1.03 | 44.2 | D | |
| DeKalb Avenue (E-W) @ | WB-L | 0.82 | 56.5 | E | 0.82 | 57.0 | E | | WB-L | 0.61 | 41.9 | D | |
| Flatbush Avenue (N-S) | WB-LT | 0.52 | 40.1 | D | 0.53 | 40.3 | D | | WB-LT | 0.57 | 43.7 | D | |
| | WB-R | 0.80 | 56.8 | E | 0.88 | 66.1 | E | * | WB-R | 0.75 | 54.6 | D | |
| | NB-T | 0.78 | 24.7 | C | 0.80 | 25.7 | C | | | 0.78 | 23.6 | C | |
| | SB-TR | 1.20 | 124.2 | F | 1.24 | 140.4 | F | * | | 1.20 | 123.2 | F | |
| Livingston Street (E-W) @ | EB-R | 0.66 | 38.8 | D | 0.83 | 47.1 | D | * | | 0.79 | 43.0 | D | |
| Flatbush Avenue (N-S) | NB-L | 0.84 | 50.7 | D | 0.86 | 53.5 | D | | | 0.83 | 48.7 | D | |
| | NB-T | 0.35 | 0.4 | A | 0.36 | 0.4 | A | | | 0.36 | 0.4 | A | |
| | SB-TR | 0.85 | 16.7 | B | 0.86 | 16.9 | B | | | 0.88 | 19.8 | B | |
| Lafayette Avenue/ | EB-LT | 0.77 | 37.0 | D | 0.88 | 44.4 | D | | | 0.88 | 44.4 | D | |
| Schermerhorn Street (E-W) @ | WB-TR | 0.90 | 69.9 | E | 0.96 | 79.9 | E | * | | 0.96 | 79.9 | E | ** |
| Flatbush Avenue (N-S) | NB-TR | 1.16 | 111.5 | F | 1.20 | 127.6 | F | * | | 1.22 | 135.2 | F | ** |
| | SB-L | 1.10 | 136.7 | F | 1.15 | >150 | F | * | | 1.15 | >150 | F | ** |
| | SB-T | 0.89 | 24.6 | C | 0.94 | 28.9 | C | | | 0.94 | 28.9 | C | |
| Fourth Ave/Hanson Pl. (E-W) @ | EB-LT | 0.50 | 36.8 | D | 0.52 | 37.1 | D | | EB-LT | 0.52 | 37.1 | D | |
| Flatbush Avenue (N-S) | NB-T | 0.67 | 14.0 | B | 0.68 | 14.3 | B | | | 0.68 | 14.3 | B | |
| | NB-R | 0.41 | 12.2 | B | 0.44 | 12.7 | B | | | 0.44 | 12.7 | B | |
| | SB-TR | 1.00 | 40.1 | D | 1.04 | 52.1 | D | * | SB-T | 1.04 | 52.1 | D | ** |
| | SB-R | 1.13 | 103.4 | F | 1.20 | 129.1 | F | * | SB-R | 1.20 | 129.1 | F | ** |

**Table 20-4 (Continued)**

**2013 Future with the Mitigation Traffic Conditions- PM Peak Hour**

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | | Future Action | | | | Mitigation | | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | | V/C Ratio | Delay (sec.) | LOS | | Approach Delay | LOS |
| Atlantic Avenue (E-W) @ | EB-T | 1.05 | 73.6 | E | | 1.17 | >150 | F | * | | 1.09 | 88.2 | F | ** | | |
| Flatbush Avenue (N-S) | EB-R | 0.46 | 32.7 | C | | 0.46 | 32.7 | C | | | 0.22 | 25.5 | C | | | |
| | WB-TR | 1.10 | 95.4 | F | | 1.13 | 107.2 | F | * | | 1.05 | 78.7 | E | | | |
| | WB-R | 0.68 | 37.4 | D | | 0.73 | 39.4 | D | | | 0.68 | 35.0 | C | | | |
| | NB-LTR | 0.55 | 18.1 | B | | 0.56 | 18.3 | B | | | 0.59 | 21.1 | C | | | |
| | SB-LTR | 0.84 | 26.4 | C | | 0.88 | 28.5 | C | | | 0.98 | 43.4 | D | | | |
| Jay Street (N-S) @ | EB-L | 0.99 | 135.7 | F | | 0.99 | 135.7 | F | | | 0.24 | 35.3 | D | | | |
| Tillary Street (E-W) | EB-TR | 0.80 | 32.6 | C | | 0.85 | 34.7 | C | | | 0.85 | 34.7 | C | | | |
| | WB-L | 1.37 | >150 | F | | 1.43 | >150 | F | * | | 1.30 | >150 | F | | | |
| | WB-TR | 0.65 | 18.6 | B | | 0.65 | 18.7 | B | | | 0.85 | 34.9 | C | | | |
| | NB-L | 0.32 | 29.1 | C | | 0.43 | 31.8 | C | | NB-L | 0.45 | 34.0 | C | | | |
| | NB-TR | 0.78 | 39.7 | D | | 0.85 | 44.0 | D | | NB-T | 0.51 | 34.0 | C | | | |
| | | | | | | | | | | NB-R | 0.81 | 36.3 | D | | | |
| | SB-L | 0.57 | 45.7 | D | | 0.66 | 56.5 | E | * | | 0.29 | 30.2 | C | | | |
| | SB-TR | 0.25 | 26.5 | C | | 0.25 | 26.5 | C | | | 0.26 | 28.0 | C | | | |
| Adams Street (N-S) (Service)@ | EB-L | 0.94 | 88.0 | F | | 0.94 | 83.9 | F | | | 0.94 | 83.9 | F | | | |
| Tillary Street (E-W) | EB-TR | 0.65 | 36.3 | D | | 0.67 | 36.9 | D | | | 0.67 | 36.9 | D | | | |
| | WB-L | 1.08 | 137.3 | F | | 1.08 | 137.3 | F | | | 1.08 | 137.3 | F | | | |
| | WB-T | 0.70 | 52.4 | D | | 0.77 | 55.5 | E | | | 0.77 | 55.5 | E | | | |
| | WB-R | 1.05 | 99.2 | F | | 1.05 | 100.2 | F | | | 1.05 | 100.2 | F | | | |
| | NB-TR | 0.59 | 31.3 | C | | 0.63 | 32.4 | C | | | 0.63 | 32.4 | C | | | |
| | SB-TR | 1.21 | 142.2 | F | | 1.21 | 142.2 | F | | | 1.21 | 142.2 | F | | | |
| Adams Street (N-S) (Main) | NB-L | 0.41 | 56.2 | E | | 0.41 | 56.3 | E | | | 0.41 | 56.3 | E | | | |
| | NB-T | 0.66 | 32.3 | C | | 0.71 | 34.0 | C | | | 0.71 | 34.0 | C | | | |
| | SB-L | 1.08 | 110.2 | F | | 1.12 | 123.4 | F | * | | 1.12 | 123.4 | F | ** | | |
| | SB-T | 1.31 | >150 | F | | 1.32 | >150 | F | * | | 1.32 | >150 | F | ** | | |
| Ashland Place (N-S) @ | EB-LT | 0.47 | 9.6 | A | | 0.51 | 10.1 | B | | | 0.51 | 10.1 | B | | | |
| Myrtle Avenue (E-W) | EB-R | 0.18 | 6.9 | A | | 0.19 | 7.1 | A | | | 0.16 | 6.7 | A | | | |
| | WB-LTR | 0.88 | 29.4 | C | | 0.96 | 43.3 | D | | WB-LTR | 0.94 | 39.7 | D | | | |
| | NB-LTR | 0.99 | 77.2 | E | | 1.10 | 109.3 | F | * | NB-L | 0.84 | 80.0 | E | | 42.9 | D |
| | | | | | | | | | | NB-TR | 0.47 | 31.2 | C | | | |
| | SB-LTR | 1.09 | 97.5 | F | | 1.12 | 109.3 | F | * | SB-L | 0.82 | 80.8 | F | | 41.5 | D |
| | | | | | | | | | | SB-TR | 0.67 | 35.2 | D | | | |
| Prince Street (NB) @ | EB-LT | EB-LT | 1.01 | 68.7 | E | EB-LT | 1.35 | >150 | F | * | | 0.89 | 29.0 | C | | |
| Myrtle Avenue (E-W) | WB-TR | WB-TR | 0.74 | 31.5 | C | WB-TR | 1.19 | 133.2 | F | * | | 0.90 | 31.5 | C | | |
| | NB-LTR | NB-LTR | 0.70 | 36.6 | D | | | | | | | | | | | |
| Gold St/Albee Square West (N-S) @ | EB-TR | | 0.30 | 34.1 | C | | | | | | | | | | | |
| Willoughby Street (E-W) | WB-LT | | 0.33 | 22.6 | C | | 0.27 | 32.7 | C | | WB-TR | 0.30 | 25.1 | C | | |
| | NB-L | | 0.21 | 21.1 | C | | 0.72 | 33.6 | C | | NB-L | 0.79 | 33.7 | C | | |
| | | | | | | | | | | | NB-TR | 0.69 | 30.0 | C | | |
| | NB-R | | 0.65 | 31.8 | C | | 1.09 | 97.0 | F | * | NB-R | 0.69 | 30.0 | C | | |
| | SB-L | | 0.11 | 19.5 | B | | 0.10 | 19.3 | B | | | | | | | |
| | SB-TR | | 0.19 | 20.9 | C | | 0.24 | 21.5 | C | | | | | | | |
| Bridge Street (SB) @ | WB-LT | | 0.75 | 20.6 | C | | 1.40 | >150 | F | * | | 0.92 | 31.6 | C | | |
| Willoughby Street (E-W) | | | | | | | | | | | | | | | | |

**Table 20-4 (Continued)**

**2013 Future with the Mitigation Traffic Conditions- PM Peak Hour**

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | | Mitigation | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Jay Street (N-S) @ | EB-LR | 0.07 | 19.6 | B | 0.00 | 19.6 | B | | | | | | | |
| Willoughby Street (E-W) | WB-LTR | 0.77 | 40.2 | D | 1.10 | 105.9 | F | * | WB-LTR | 0.89 | 44.3 | D | | |
| | NB-LT | 0.45 | 13.6 | B | 0.47 | 13.9 | B | | NB-LT | 0.56 | 19.1 | B | | |
| | SB-TR | 0.59 | 15.7 | B | 0.65 | 16.9 | B | | SB-TR | 0.75 | 23.5 | C | | |
| Bond Street (NB) @ | EB-LT | 0.77 | 14.9 | B | 1.04 | 52.3 | D | * | EB-L | 0.24 | 13.6 | B | 34.7 | C |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.95 | 36.8 | D | | |
| | WB-TR | 0.87 | 22.5 | C | 0.98 | 40.7 | D | | WB-T | 0.61 | 14.4 | B | 14.5 | B |
| | | | | | | | | | WB-R | 0.36 | 14.8 | B | | |
| | NB-LTR | 0.77 | 19.9 | B | 0.86 | 37.2 | D | | | 0.76 | 35.0 | C | | |
| Hoyt Street (SB) @ | EB-TR | 0.88 | 21.9 | C | 1.04 | 53.2 | D | * | EB-T | 0.74 | 17.5 | B | 17.0 | B |
| Livingston Street (E-W) | | | | | | | | | EB-R | 0.47 | 16.0 | B | | |
| | WB-LT | 0.77 | 15.8 | B | 1.08 | 71.9 | E | * | WB-L | 0.50 | 19.5 | B | 14.2 | B |
| | | | | | | | | | WB-T | 0.56 | 12.6 | B | | |
| | SB-LTR | 0.59 | 20.4 | C | 0.87 | 31.9 | C | | | 0.80 | 34.1 | C | | |
| Smith Street (N-S) @ | EB-LTR | 0.46 | 28.1 | C | 0.59 | 31.5 | C | | | 0.83 | 36.5 | D | | |
| Livingston Street (E-W) | WB-LTR | 0.46 | 28.1 | C | 0.52 | 29.6 | C | | | 0.75 | 32.0 | C | | |
| | NB-DfL | 0.77 | 51.9 | D | 0.89 | 63.6 | E | * | | 0.62 | 17.7 | B | | |
| | NB-TR | 2.00 | >150 | F | 2.17 | >150 | F | * | | 1.86 | >150 | F | | |
| | SB-LTR | 1.04 | 102.6 | F | 1.30 | >150 | F | * | | 1.02 | 61.8 | E | | |
| Boerum Place (N-S) @ | EB-LT | 1.10 | >150 | F | 1.04 | 137.2 | F | * | EB-L | 0.43 | 37.3 | D | 36.2 | D |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.48 | 35.7 | D | | |
| | EB-R | 0.01 | 49.0 | D | 0.01 | 49.0 | D | | EB-R | 0.01 | 27.5 | C | | |
| | WB-LTR | 0.89 | 92.1 | F | 1.07 | >150 | F | * | WB-L | 0.83 | 66.6 | E | 62.5 | E |
| | | | | | | | | | WB-T | 0.28 | 31.8 | C | | |
| | | | | | | | | | WB-R | 0.93 | 71.5 | E | | |
| | NB-L | 0.94 | >150 | F | 1.16 | >150 | F | * | | 0.75 | 87.0 | F | | |
| | NB-TR | 0.68 | 56.0 | E | 0.94 | 56.2 | E | | | 0.68 | 28.7 | C | | |
| | SB-L | 0.70 | 92.6 | F | 0.74 | 96.9 | F | * | | 0.70 | 51.6 | D | | |
| | SB-TR | 0.74 | 36.9 | D | 0.74 | 36.9 | D | | | 0.74 | 20.0 | B | | |
| Bond Street (NB) @ | EB-LT | 0.85 | 25.1 | C | 0.97 | 40.0 | D | | EB-L | 0.15 | 11.1 | B | 44.1 | D |
| Schermerhorn Street (E-W) | | | | | | | | | EB-T | 0.98 | 46.0 | D | | |
| | WB-TR | 0.54 | 14.5 | B | 0.57 | 14.8 | B | | | 0.53 | 15.5 | B | | |
| | NB-LTR | 0.86 | 33.0 | C | 0.95 | 46.4 | D | * | | 0.60 | 27.4 | C | | |
| Hoyt Street (SB) @ | EB-TR | 0.86 | 23.8 | C | 0.94 | 33.4 | C | | EB-T | 0.82 | 27.8 | C | 25.3 | C |
| Schermerhorn Street (E-W) | | | | | | | | | EB-R | 0.51 | 18.9 | B | | |
| | WB-LT | 1.35 | >150 | F | 1.53 | >150 | F | * | WB-L | 0.83 | 51.2 | D | 28.9 | C |
| | | | | | | | | | WB-T | 0.52 | 18.3 | B | | |
| | SB-LTR | 0.91 | 38.0 | D | 1.31 | >150 | F | * | SB-LT | 0.84 | 33.7 | C | 32.4 | C |
| | | | | | | | | | SB-R | 0.35 | 22.4 | C | | |
| Fourth Ave (N-S) @ | EB-TR | 0.90 | 39.1 | D | 1.02 | 59.8 | E | * | | 0.95 | 44.2 | D | | |
| Atlantic Avenue (E-W) | WB-TR | 0.95 | 48.4 | D | 0.98 | 53.6 | D | * | | 0.94 | 45.6 | D | | |
| | NB-L | 1.33 | >150 | F | 1.35 | >150 | F | * | | 1.30 | >150 | F | | |
| | NB-T | 0.52 | 39.8 | D | 0.54 | 40.2 | D | | | 0.52 | 39.2 | D | | |
| | NB-R | 1.21 | >150 | F | 1.21 | >150 | F | | | 1.17 | 144.8 | F | | |
| | SB-T | 0.45 | 19.7 | B | 0.47 | 20.2 | C | | | 0.51 | 22.1 | C | | |
| | SB-R | 0.10 | 15.6 | B | 0.10 | 15.6 | B | | | 0.11 | 16.7 | B | | |

## Table 20-4 (Continued)
## 2013 Future with the Mitigation Traffic Conditions- PM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | | Future Action | | | | Mitigation | | | | | |
| | | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Approach Delay | LOS |
| Bond Street (NB) @ | EB-LT | | 0.77 | 22.0 | C | | 0.83 | 24.3 | C | | | | | | |
| Atlantic Avenue (E-W) | WB-TR | | 0.86 | 26.9 | C | | 0.89 | 29.5 | C | | | | | | |
| | NB-LTR | | 0.48 | 33.7 | C | | 0.48 | 33.7 | C | | | | | | |
| Hoyt Street (SB) @ | EB-TR | | 0.69 | 19.2 | B | | 0.71 | 19.6 | B | | 0.65 | 18.2 | B | | |
| Atlantic Avenue (E-W) | WB-LT | | 0.91 | 30.8 | C | | 0.92 | 31.8 | C | | 0.92 | 31.8 | C | | |
| | SB-LTR | | 1.21 | >150 | F | | 1.79 | >150 | F | * | 1.01 | 72.8 | E | | |
| Smith Street (N-S) @ | EB-DfL | EB-LT | 1.13 | 90.7 | F | | 1.20 | 120.5 | F | * | 1.09 | 76.2 | E | | |
| Atlantic Avenue (E-W) | EB-T | | | | | | | | | | | | | | |
| | WB-T | WB-T | 0.71 | 20.4 | C | | 0.74 | 21.4 | C | | 0.73 | 20.5 | C | | |
| | WB-R | WB-R | 0.34 | 14.4 | B | | 0.36 | 14.7 | B | | 0.35 | 14.1 | B | | |
| | NB-L | NB-L | 0.49 | 36.0 | D | | 0.49 | 36.0 | D | | 0.50 | 37.2 | D | | |
| | NB-TR | NB-TR | 0.52 | 34.3 | C | | 0.55 | 35.0 | C | | 0.56 | 36.0 | D | | |
| Boerum Place (N-S) @ | EB-DfL | | 1.07 | 114.9 | F | | 1.13 | 135.0 | F | * | 1.05 | 105.4 | F | | |
| Atlantic Avenue (E-W) | EB-TR | | 0.69 | 28.7 | C | | 0.74 | 30.8 | C | | 0.69 | 27.0 | C | | |
| | WB-LT | | 0.84 | 48.8 | D | | 0.90 | 54.9 | D | * | 0.85 | 48.6 | D | | |
| | WB-R | | 0.35 | 0.9 | A | | 0.35 | 0.9 | A | | 0.35 | 0.9 | A | | |
| | SB-L | | 0.79 | 32.4 | C | | 0.79 | 32.6 | C | | SB-L 0.73 | 31.9 | C | | |
| | SB-TR | | 0.87 | 38.3 | D | | 0.97 | 51.4 | D | * | SB-TR 0.71 | 31.6 | C | | |
| | | | | | | | | | | | SB-R 0.71 | 39.0 | D | | |
| Jay Street (N-S) @ | WB-LTR | WB-LR | 0.31 | 23.9 | C | | 0.61 | 30.5 | C | | 0.59 | 30.0 | C | | |
| Tech Place (E-W) | NB-TR | NB-LT | 1.00 | 51.4 | D | | 1.07 | 73.2 | E | * | 0.54 | 14.7 | B | | |
| | SB-LT | SB-TR | 0.90 | 33.1 | C | | 0.93 | 37.0 | D | | 0.93 | 37.0 | D | | |
| Smith Street (N-S) @ | | | | | | | | | | | EB-LT 0.35 | 27.1 | C | | |
| Schermerhorn (E-W) | WB-T | | 0.54 | 50.7 | D | | 0.55 | 51.1 | D | | WB-T 0.64 | 34.0 | C | | |
| | WB-R | | 0.39 | 47.1 | D | | 0.40 | 47.3 | D | | WB-R 0.48 | 31.0 | C | | |
| | NB-LTR | | 1.11 | 131.7 | F | | 1.19 | >150 | F | * | 1.02 | 67.6 | E | | |
| | SB-L | | 1.27 | >150 | F | | 1.42 | >150 | F | * | 1.07 | 95.3 | F | | |
| | SB-R | | 0.66 | 77.4 | E | | 0.89 | 103.6 | F | * | 0.48 | 14.3 | B | | |
| Fulton Street (E-W) @ | EB-LTR | | 0.20 | 37.6 | D | | 0.20 | 37.6 | D | | 0.20 | 37.6 | D | | |
| Flatbush Avenue (N-S) | WB-LT | | 0.77 | 63.3 | E | | 0.59 | 63.3 | E | | 0.59 | 63.3 | E | | |
| | WB-R | | 0.41 | 22.6 | C | | 0.42 | 22.8 | C | | 0.42 | 22.8 | C | | |
| | NB-TR | | 0.98 | 57.6 | E | | 1.02 | 66.0 | E | * | 1.02 | 66.0 | E | | ** |
| | SB-L | | 0.96 | 66.9 | E | | 0.98 | 71.4 | E | * | 0.98 | 71.4 | E | | ** |
| | SB-T | | 0.91 | 26.5 | C | | 0.94 | 29.3 | C | | 0.94 | 29.3 | C | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections
** - Denotes Unmitigated Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

*ATLANTIC AVENUE CORRIDOR*

*Flatbush Avenue*

The proposed conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place would divert from 38 to 83 vph from the eastbound Atlantic Avenue approach at Flatbush Avenue in each peak period. It is further proposed to transfer four seconds of green time from the Flatbush Avenue phase to the Atlantic Avenue phase in the AM peak period, two seconds in the midday, and three seconds in the PM peak period. In combination, these measures would eliminate the project's impacts to the westbound through-right movement in all periods, and the eastbound through movement on Atlantic Avenue in the AM peak period. As shown in Tables 20-2 through 20-4, with the exception of the eastbound through-movement which would operate at LOS D in the AM, all of these impacted movements would continue to operate at LOS E or F with the proposed mitigation. However, delay would be reduced to below projected No Build levels in all cases. Delay on the eastbound through-movement in the PM would also be reduced by the proposed mitigation, but this movement would continue to operate at LOS F with greater delay than in the No Build. The project's PM peak hour impact to the eastbound through-movement on Atlantic Avenue would therefore remain unmitigated.

*Fourth Avenue*

The diversion of traffic associated with the proposed conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place, would divert from 53 to 115 vph from eastbound Atlantic Avenue approaching Fourth Avenue in each peak period. At this intersection, it is further proposed to transfer two seconds of green time to the northbound/southbound phase and one second to the eastbound/westbound from the southbound phase in the AM peak hour, and two seconds to the eastbound/westbound phase and one second to the northbound/southbound phase from the southbound phase in the midday and PM peak hours. These measures would eliminate the project's impacts to the northbound left-turn movement in all three peak periods, and the eastbound and westbound approaches in the midday and PM. As shown in Tables 20-2 through 20-4, all of these movements would operate at LOS D or F, but with less delay than in the No Build.

While operation of the westbound approach in the AM would be improved compared to the Future Action condition, this movement would continue to be impacted, with LOS F conditions. Additional measures were therefore evaluated to fully address this impact. However, further signal timing adjustments to return this movement to its No Build condition would be impractical as they would result in new or worsened impacts on other movements. Increasing capacity through changes to curbside regulations or modifications to lane striping was also found to be ineffective.

*Bond Street*

The diversion of traffic associated with the proposed conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place would divert from 59 to 128 vph from eastbound Atlantic Avenue approaching Bond Street in each peak period. At this intersection, it is further proposed to implement a "No Standing 7-10 AM" regulation for 100 feet along the north curb on the westbound approach to accommodate right-turning vehicles in the AM peak period. In addition, it is proposed to transfer three seconds of green time from the Bond Street phase to the Atlantic Avenue phase in the AM and midday

peak periods. These measures would eliminate the project's potential impacts to the eastbound and westbound approaches in the AM peak period. As shown in Table 20-2, with these measures, the westbound approach would operate at LOS C in the AM. The eastbound approach would operate at LOS F in the AM, with improved operation compared to the No Build. As shown in Table 20-3, in the midday, the eastbound approach would also operate at LOS F. While conditions would be improved compared to the Build condition, the operation of the eastbound approach in the midday would not be returned to No Build levels. Additional measures were therefore evaluated to address the project's impact to the eastbound approach in the midday. However, further signal timing adjustments to return this approach to its No Build condition would be impractical as they would result in new or worsened impacts on other approaches. Increasing capacity through changes to curbside regulations or modifications to lane striping was also found to be ineffective. The midday peak hour impact to the eastbound approach would therefore remain unmitigated.

*Hoyt Street*

The diversion of traffic associated with the proposed conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place would divert from 59 to 128 vph from eastbound Atlantic Avenue approaching Hoyt Street in each peak period. At this intersection, it is further proposed to implement a "No Standing Anytime" regulation for 100 feet along the west curb of the southbound Hoyt Street approach to provide for an additional lane on the approach, and to transfer two seconds of green time from the southbound phase to the eastbound/westbound phase in the AM peak period. These measures would eliminate the project's impacts to the westbound approach in the AM peak hour and the southbound approach in the midday and PM peak hours. As shown in Tables 20-2 through 20-4, although the westbound approach would continue to operate at LOS F in the AM peak hour, and the southbound approach at LOS D and E in the midday and PM, respectively, conditions would be improved compared to the No Build. All potential project impacts at this intersection would therefore be fully mitigated.

*Smith Street*

The diversion of traffic associated with the proposed conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place would divert from 59 to 128 vph from eastbound Atlantic Avenue approaching Smith Street in each peak period. At this intersection, it is further proposed to transfer one second of green time from the Smith Street phase to the Atlantic Avenue phase in the PM peak period. These measures would reduce delay on the eastbound left-turn movement to below its No Build level in the PM, fully mitigating the project's impact during this period. However, these measures would not be sufficient to address the project's potential impact to the eastbound left-turn in the AM peak hour. Additional operational measures were therefore evaluated to determine their effectiveness at returning this movement to its No Build condition. Measures such as further signal timing adjustments, changes to curbside regulations and modifications to lane striping were found to be ineffective. Prohibiting the eastbound left-turn onto northbound Smith Street was also considered but determined to be infeasible as this movement provides important truck access into the Downtown Brooklyn core. Consequently, as shown in Table 20-2, the project's impact to the eastbound left-turn in the AM would remain unmitigated.

*Boerum Place*

The diversion of traffic associated with the proposed conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place would divert from 59 to 128 vph from the southbound approach in each peak period at the intersection of Atlantic Avenue and Boerum Place. It is further proposed to transfer two seconds of green time from the southbound phase to the eastbound/westbound (one second) and eastbound/westbound-right-turn (one second) phases in the AM peak period and three seconds from the southbound phase to the eastbound/westbound (two seconds) and eastbound/westbound-right-turn (one second) phases in the PM peak period. In addition, it is proposed to implement a no standing 4-7 PM regulation for 100 feet along the west curb of the southbound Boerum Place approach. The reductions in peak period demand combined with the reallocation of green time and the change in PM curbside regulations would fully mitigate the project's potential impacts to the eastbound left-turn and the westbound left-through movement in the AM and PM peak hours, and to the southbound through-right movement in the PM. As shown in Tables 20-2 and 20-4, although the eastbound left-turn would operate at LOS F in the AM and PM peak periods, and the westbound left-through movement would operate at LOS E in the AM, these movements would be returned to their No Build levels or better in all cases.

*FLATBUSH AVENUE CORRIDOR*

*Tillary Street*

At this intersection it is proposed to transfer three seconds of green time from the northbound/southbound phase to the eastbound/westbound phase in the AM peak period, three seconds from the northbound/southbound phase to the eastbound/westbound phase (2 sec.) and eastbound/westbound exclusive left-turn phase (1 sec.) in the midday, and one second from the northbound phase to the eastbound/westbound phase in the PM. As shown in Tables 20-2 through 20-4, with this proposed mitigation, the impacts to the eastbound right-turn movement in the AM, the westbound through-movement in the AM and PM, and the northbound left-turn in the midday would be fully mitigated. Although these movements would continue to operate at LOS D, E or F in these periods, delays would be reduced to below No Build levels. Additional measures were evaluated to address the project's impacts to the eastbound through-right movement in the PM, to the eastbound right-turn in the midday and PM, and to the westbound left-turn movement in all periods. However, further signal timing adjustments to return these movements to their No Build levels would be impractical as they would result in new or worsened impacts on other approaches. Increasing capacity through changes to curbside regulations or modifications to lane striping was also found to be ineffective. These impacts would therefore remain unmitigated.

*Myrtle Avenue*

At this intersection, it is proposed to implement a "No Standing Anytime" regulation for 100 feet along the east curb of the northbound approach. In addition, three seconds of green time would be transferred from the northbound/southbound phase to the southbound left-turn phase in the midday peak period. As shown in Table 20-3, although the northbound through-right and southbound left-turn would continue to operate at LOS E or F with high delay in the midday peak period with these measures, the project's potential impacts on these movements in the midday, and on the northbound through-right in the PM, would be fully mitigated under CEQR criteria.

As shown in Tables 20-2 and 20-4, the eastbound and southbound left-turn movements at this intersection would be impacted in the AM and PM peak periods, while the westbound approach and northbound through-right movement would be impacted in the AM peak hour only. Additional signal timing adjustments to return these movements to their No Build levels would be impractical as they would result in new or worsened impacts on other approaches, and due to the need to maintain signal progression along Flatbush Avenue. Increasing capacity through further changes to curbside regulations or modifications to lane striping was also found to be ineffective. The project's AM and PM peak hour impacts to the eastbound and southbound left-turn movements and AM-only impacts to the westbound approach and northbound through-right movement would remain unmitigated.

*Willoughby Street*

Two of the changes to the Downtown Brooklyn street network discussed above would alter traffic flows at the intersection of Flatbush Avenue Extension and Willoughby Street. First, the conversion of Gold Street from southbound to northbound operation would reduce traffic on the eastbound Willoughby Street approach to the intersection, but also increase volumes on the southbound right-turn movement. Second, with the elimination of the northbound left-turn from Flatbush Avenue Extension onto westbound Willoughby Street, all traffic making this movement would instead use northbound Fleet Place to reach westbound Willoughby Street, increasing volumes on this approach. This latter measure would allow for the elimination of the northbound left-turn phase and the provision of 15 seconds of additional green time in the AM and 12 seconds in the midday and PM peak periods to the eastbound/westbound Willoughby Street phase, and five seconds and three seconds to the northbound/southbound Flatbush Avenue phase in the midday and PM, respectively. In the AM, it is also proposed to transfer three seconds from the northbound/southbound phase to the eastbound/westbound phase.

As shown in Tables 20-2 through 20-4, with these measures, all movements at this intersection would operate at with acceptable levels of delay in all periods, and all potential project impacts at this intersection would therefore be fully mitigated.

As discussed in Chapter 14, "Traffic and Parking," an average of seven pedestrians or bicyclists were killed or injured annually at this intersection during the 2000 through 2002 period, the highest average for any intersection in the study area. As noted above, the elimination of the northbound left-turn movement from Flatbush Avenue Extension onto Willoughby Street would enhance pedestrian safety at this intersection by eliminating a vehicular turning movement that conflicts with pedestrians on the west crosswalk. Further, adding green time to the Willoughby Street movements would increase the time available for pedestrians to cross Flatbush Avenue Extension.

*DeKalb Avenue*

At this intersection, it is proposed to implement a "No Standing Anytime" regulation for 100 feet along the south curb of the westbound approach, and to restripe the approach from three lanes to four. (DeKalb Avenue is 42 feet wide at this location.) It is further proposed to transfer two seconds of green time from the westbound phase to the northbound/southbound phase in the AM and PM peak periods. As shown in Tables 20-2 and 20-4, with these measures, the westbound right-turn would operate at LOS F and D in the AM and PM peak periods, respectively, with lower delay than in the No Build during both periods. The northbound approach would operate at LOS E in the AM peak period with delay comparable to the NO Build. Lastly, the southbound approach would operate at LOS F in the PM with delay

comparable to the No Build condition. Therefore, all potential impacts at this intersection would be fully mitigated.

*Fulton Street*

At this intersection, it is proposed to transfer two seconds of green time from eastbound/westbound Fulton Street to northbound/southbound Flatbush Avenue in the AM and midday peak periods, an to implement a no standing 7-10 AM regulation for 100 feet along the west curb of the southbound approach.

These changes to signal timing and curbside regulations would fully mitigate the project's potential impacts to the northbound and southbound approaches in the AM and midday peak hours. As shown in Tables 20-2 and 20-3, although in some cases these movements would continue to operate at LOS D, E or F in these periods, their delay would be returned to acceptable levels.

As shown in Table 20-4, with the proposed mitigation measures, the northbound approach would operate at LOS E with 66.0 seconds of delay in the PM compared to LOS E and 57.6 seconds of delay in the No Build. The southbound left-turn movement would continue to operate at LOS E with 71.4 seconds of delay compared to 66.9 seconds of delay in the No Build. Additional signal timing adjustments would be impractical due to the need to maintain progression along Flatbush Avenue. Increasing capacity through additional changes to curbside regulations or modifications to lane striping was also found to be ineffective. The project's PM peak hour impacts to these movements would remain unmitigated.

*Livingston Street*

At this intersection, it is proposed to transfer three seconds of green time from the northbound-southbound Flatbush Avenue phase to the eastbound and northbound left-turn phase in the AM peak period and two seconds in the PM. As shown in Table 20-4, with this measure, the eastbound right-turn would operate with less than 45 seconds of delay in the PM peak hour, fully mitigating the project's impact to this movement. However, as shown in Table 20-2, the northbound left-turn would operate at LOS E with 75.0 seconds of delay in the AM peak period. Additional signal timing adjustments to return this movement to its No Build condition (LOS E with 59.1 seconds of delay) would be impractical due to the need to maintain progression along Flatbush Avenue. Increasing capacity through changes to curbside regulations or modifications to lane striping were also found to be ineffective. The project's AM peak hour impact to the northbound left-turn movement would remain unmitigated.

*Schermerhorn Street/Lafayette Avenue*

It is proposed to transfer two seconds of green time to the northbound/southbound phase and one second to the southbound phase from the eastbound phase in the AM peak period. In the midday, it is proposed to transfer two seconds each to the northbound/southbound and southbound phases from the eastbound phase. As shown in Tables 20-2 through 20-4, with these signal timing adjustments, the project's potential impacts to the northbound approach and southbound left-turn movement in the AM and midday peak periods would be fully mitigated. Although these movements would operate at LOS E or F, conditions would be improved compared to the No Build in all cases.

As shown in Table 20-4, the westbound and northbound approaches and southbound left-turn movement at this intersection would all be impacted in the PM peak period. Additional signal

timing adjustments to return these movements to their No Build levels would be impractical as they would result in new or worsened impacts on other approaches. Increasing capacity through changes to curbside regulations or modifications to lane striping were also found to be ineffective. The project's PM peak hour impacts to the westbound and northbound approaches and southbound left-turn movement would remain unmitigated.

*Fourth Avenue/Hanson Place*

As shown in Table 20-4, the southbound through-right and right-turn movements at this intersection would be impacted in the PM peak hour. A range of mitigation measures to return these movements to acceptable levels of service were evaluated, including signal timing adjustments and increasing capacity through changes to curbside regulations or modifications to lane striping. All were found to be ineffective, or impractical as they would result in new or worsened impacts on other approaches. The project's PM peak hour impacts to the southbound through-right and right-turn movements at this intersection would remain unmitigated.

*JAY STREET CORRIDOR*

*Tech Place*

To mitigate the project's PM peak period impact to northbound Jay Street, it is proposed to implement a "No Standing 4-7 PM" regulation for 100 feet along the east curb on the northbound approach to provide for two moving lanes. As shown in Table 20-4, with this measure, northbound Jay Street would operate at LOS B in the PM peak period, and the project's potential impact on this approach would be fully mitigated.

*LIVINGSTON STREET*

*Bond Street*

As discussed above, it is proposed to reconfigure Livingston Street to provide a 20-foot-wide travelway with one moving lane and a parking (or exclusive bus lane) in each direction, along with a ten-foot-wide median with dedicated left-turn bays at intersections. It is further proposed to implement a "No Standing 7-10 AM" regulation along the length of the west curb of the northbound Bond Street approach from Schermerhorn Street to Livingston Street. This latter measure is needed to provide for additional capacity for increased northbound traffic on this narrow (24-foot-wide) street. As also discussed above, it is proposed to increase the signal cycle length from 60 seconds to 90 seconds at this intersection as part of the corridor-wide mitigation plan for Livingston Street. Increasing cycle length at this location would provide additional capacity on all approaches as well as allow substantial increases (11-19 seconds) in pedestrian crossing times, especially for pedestrians crossing 50-foot-wide Livingston Street. As shown in Tables 20-2 through 20-4, with these measures, all approaches at this intersection would operate at LOS D or better with under 45 seconds of delay in all periods, and the project's impacts to the northbound and westbound approaches in the AM peak period and the eastbound approach in the midday and PM periods would be fully mitigated.

*Hoyt Street*

As discussed above, it is proposed to reconfigure Livingston Street to provide a 20-foot-wide travelway with one moving lane and a parking (or exclusive bus lane) in each direction, along with a ten-foot-wide median with dedicated left-turn bays at intersections. It is also proposed to increase the signal cycle length from 60 seconds to 90 seconds at this intersection as part of the

corridor-wide mitigation plan for Livingston Street. Increasing cycle length at this location would provide additional capacity on all approaches as well as allow substantial increases (14-16 seconds) in pedestrian crossing times, especially for pedestrians crossing 50-foot-wide Livingston Street. In addition, it is proposed to implement a no standing anytime regulation for 100 feet along the south curb of the eastbound approach. As shown in Tables 20-2 through 20-4, with these measures, all approaches at this intersection would operate at LOS D or better with less than 45 seconds of delay in all periods, and the project's potential impacts to the eastbound and westbound approaches in the midday and PM peak periods would be fully mitigated.

*Smith Street*

As discussed above, it is proposed to reconfigure Livingston Street east of Boerum Place to provide a 20-foot-wide travelway with one moving lane and a parking (or exclusive bus lane) in each direction, along with a ten-foot-wide median with dedicated left-turn bays at intersections. To mitigate the project's midday and PM peak hour impacts to northbound and southbound Smith Street, it is further proposed to decrease the signal cycle length from 180 seconds to 90 seconds in the midday and PM peak periods. As shown in Tables 20-3 and 20-4, with these measures, the southbound Smith Street approach would operate at LOS D in the midday and LOS E in the PM with lower delay than in the No Build. The northbound through-right movement would continue to operate at LOS F during these periods, but conditions would also be improved compared to the No Build. The northbound left-turn would improve to LOS B in the PM compared to LOS D in the No Build. Consequently, all project impacts at this intersection would be fully mitigated with these measures.

*Boerum Place*

As discussed above, it is proposed to reconfigure Livingston Street east of Boerum Place to provide a 20-foot-wide travelway with one moving lane and a parking lane (or exclusive bus lane) in each direction, along with a ten-foot-wide median with dedicated left-turn bays at intersections. It is further proposed to re-phase the signal cycle length in the midday and PM from 240 seconds to 120 seconds, comparable to the existing 120-second cycle length in the AM. In addition, one second of green time would be transferred from the northbound/southbound phase to the southbound phase in the AM peak period. As shown in Tables 20-2 through 20-4, with these measures, all impacted movements would be fully mitigated in all periods. The eastbound left and through movements would operate at LOS D or better with less than 45 seconds of delay in all periods; the westbound approach would operate at LOS D in the AM and LOS E in the midday and PM, with less delay than in the No Build condition. The northbound left-turn movement would operate at LOS F in the PM, but with lower delay than in the No Build, as would the southbound left-turn in the AM. In the PM, the southbound left-turn movement would operate at LOS D compared to LOS F in the No Build.

*MYRTLE AVENUE*

*Prince Street*

To mitigate the project's potential impacts to eastbound and westbound Myrtle Avenue in all peak periods, it is proposed to implement a 35-second all-pedestrian signal phase in place of the existing 55-second northbound phase, and to allocate the remaining 20 seconds of green time to the eastbound/westbound phase. (As discussed in Chapter 14, "Traffic and Parking," the northbound Prince Street approach to this intersection would be eliminated with the proposed actions.) As shown in Tables 20-2 through 20-4, with this measure, both eastbound and

westbound Myrtle Avenue would operate at LOS D or better in all periods with lower delay than in the No Build. All of the project's potential impacts at this intersection would therefore be fully mitigated.

*Ashland Street*

To mitigate the project's potential impacts to westbound Myrtle Avenue and northbound and southbound Ashland Place, it is proposed to make full use of the 56-foot roadway width of Ashland Place by providing two lanes in each direction plus left-turn bays. This would require implementing a "No Standing Anytime" regulation for approximately 200 feet along the east curb on the northbound approach to the intersection. It is also proposed to implement a no standing 7-10 AM regulation for 100 feet along the north curb of the westbound approach. As shown in Tables 20-2 through 20-4, with these measures the westbound, northbound, and southbound approaches would all operate at LOS D or better with less than 45 seconds of delay in all periods. All potential project impacts at this intersection would therefore be fully mitigated.

*SCHERMERHORN STREET*

*Bond Street*

To mitigate the project's potential impacts to the northbound approach in the AM and PM peak periods, it is proposed to implement a "No Standing 7-10 AM and 4-7 PM" regulation along the west curb of the northbound approach from State Street to Schermerhorn Street, and a "No Standing 4-7 PM" regulation along the east curb. It is also proposed to increase the signal cycle length from 60 seconds to 90 seconds at this intersection as part of the corridor-wide mitigation plan for Schermerhorn Street. Increasing cycle length at this location would provide additional capacity on all approaches as well as allow substantial increases (13 to 22 seconds) in pedestrian crossing times, especially for pedestrians crossing 50-foot-wide Schermerhorn Street. As shown in Tables 20-2 through 20-4, combined with the new median and left-turn bay that would be implemented on Schermerhorn Street as part of the corridor-wide mitigation plan, these measures would fully mitigate the project's AM and PM peak period impacts to the northbound approach. All approaches at this intersection would operate at LOS D or better with less than 45 seconds of delay in all periods.

*Hoyt Street*

To mitigate the project's potential impacts to the westbound and southbound approaches in the PM peak period, it is proposed to increase the signal cycle length from 60 seconds to 90 seconds at this intersection as part of the corridor-wide mitigation plan for Schermerhorn Street. Increasing cycle length at this location would provide additional capacity on all approaches as well as allow substantial increases (14-16 seconds) in pedestrian crossing times, especially for pedestrians crossing 50-foot-wide Schermerhorn Street. It is also proposed to implement a "No Standing, 4-7 PM" regulation for 100 feet along the south curb of the eastbound approach. As shown in Table 20-4, combined with the new median and left-turn bay that would be implemented on Schermerhorn Street as part of the corridor-wide mitigation plan, these measures would fully mitigate the project's PM peak hour impacts to the southbound and westbound approaches. All approaches at this intersection would operate at LOS C or better with less than 45 seconds of delay in all periods.

*Smith Street*

As discussed above, as part of the mitigation plan's street network changes, it is proposed to convert the block of Schermerhorn Street between Smith Street and Boerum Place from one-way westbound to bi-directional operation, consistent with the rest of the Schermerhorn Street corridor from Smith Street to Flatbush Avenue. In addition, it is proposed to reduce the cycle length from 180 seconds to 90 seconds in the midday and PM (comparable to the AM) and convert the northbound-only phase to a northbound-southbound phase. As shown in Tables 20-2 through 20-4, combined with the new median and left-turn bay that would be implemented on Schermerhorn Street as part of the corridor-wide mitigation plan, these measures would fully mitigate the project's potential impacts to the northbound and southbound approaches in all periods. Although the northbound approach and southbound left-turn would continue to operate at LOS E or F in the PM peak period, the delay for these movements would be below No Build levels..

*TILLARY STREET*

*Adams Street*

As discussed in Chapter 14, "Traffic and Parking," the westbound left-turn movement from Tillary Street at Adams Street would be impacted in the AM and midday, while the westbound right-turn would be impacted in the AM peak period only. Both of these movements would operate at LOS F at these times, unchanged from the No Build. The southbound through-movement on the Adams Street mainline would be impacted in the AM and PM, while the southbound left-turn movement would be impacted in all periods. Both of these movements would continue to operate at their No Build LOS F at these times.

With heavy traffic flows to and from the Brooklyn Bridge, the intersection of Tillary and Adams Streets has long suffered from heavy congestion. All of the movements impacted by project traffic operate at LOS F under Existing conditions. Potential measures to mitigate project impacts at this intersection were evaluated, but few feasible options were identified. Improving the operation of this problematic intersection has been examined in a number of previous studies including the *1987 Downtown Brooklyn Master Planning and Improvement Study*, which identified this intersection as requiring significant capital and operational improvements to operate at an acceptable level of service. That study considered several flyover options as well as a two-way underpass from Adams Street to the Brooklyn Bridge under Tillary Street. The underpass option was recommended but never implemented. More recently, measures to improve pedestrian and bicycle movement and safety at this intersection were studied as part of NYCDOT's *Downtown Brooklyn Traffic Calming Project.*

New trips generated by the proposed actions would only amount to an increase of approximately three percent of the total peak period demand at this intersection. These trips would develop over the long term and would be dispersed among all four approaches. Given the magnitude of the measures that would be required to reduce congestion at this location, no mitigation is being proposed to address the impacts from the relatively small incremental increase in demand that would result from the proposed actions. The project's potential impacts at this intersection would therefore remain unmitigated.

*Jay Street*

To mitigate the project's potential impacts to the southbound left-turn in the PM peak period and the westbound left-turn movement in all periods, it is proposed to restripe the northbound Jay Street approach to include an exclusive right-turn lane and to replace the lagging westbound phase with a phase for eastbound/westbound left-turns and northbound right-turns. The 16 seconds of green time from the westbound phase would be transferred to the new eastbound/westbound left-turn phase in all periods, along with four seconds from the northbound/southbound phase and two seconds from the eastbound/westbound phase in the AM peak period, and three seconds and two seconds from the northbound/southbound phase in the midday and PM periods, respectively. As shown in Tables 20-2 through 20-4, although the westbound left-turn would continue to operate at LOS F in all periods, its operation would be improved compared to No Build conditions, and the project's impacts would be fully mitigated based on CEQR criteria. The impact to the southbound left-turn in the PM peak period would also be fully mitigated with LOS C conditions during this period.

*WILLOUGHBY STREET CORRIDOR*

*Albee Square West/Gold Street*

To mitigate the project's PM peak period impact to the northbound right-turn movement, it is proposed to convert Gold Street from one-way southbound to one-way northbound between Willoughby Street and Flatbush Avenue Extension. As discussed above, this measure would eliminate conflicting northbound and southbound turning movements at the Willoughby Street intersection. Concurrent with this street network change, it is proposed to transfer five seconds of green time from the westbound phase to the northbound phase in all periods (the eastbound movement at this intersection would be eliminated with the proposed actions). As shown in Table 20-4, with these measures, the northbound right-turn movement would operate at LOS C in the PM peak period, and the project's impact to this movement would therefore be fully mitigated.

As discussed in Chapter 14, "Traffic and Parking," although not identified as a high accident location based on 2000 through 2002 data, the signalized intersection of Willoughby Street with Albee Square West/Gold Street is expected to see substantial new pedestrian and vehicular demand with implementation of the proposed actions. The combination of increased pedestrian and vehicular traffic would likely increase the potential for vehicle/pedestrian conflicts at this intersection. However, the elimination of southbound traffic flow under the project's mitigation plan, combined with the conversion of Albee Square West from two-way to one-way northbound operation as part of the proposed actions, would enhance pedestrian safety at this intersection by eliminating vehicular turning movements that conflict with pedestrians, especially on the south, east and west crosswalks.

*Bridge Street*

As discussed in Chapter 14, "Traffic and Parking," the southbound Bridge Street approach to this intersection is closed to traffic and is expected to remain so in the future with the proposed actions. Consequently, to mitigate the project's impacts to westbound Willoughby Street in all three peak periods, it is proposed to convert the 24-second southbound phase into an all-pedestrian phase, and to prohibit pedestrians from crossing during the westbound phase. As demonstrated in Tables 20-2 through 20-4, with this measure, westbound Willoughby Street

would operate at LOS C in all periods, and the project's potential impacts at this intersection would be fully mitigated.

*Jay Street*

As discussed above, to mitigate the impacts to westbound Willoughby Street in the midday and PM peak periods as well as enhance pedestrian safety, it is proposed to convert the block of Willoughby Street between Pearl and Jay Streets from bi-directional to one-way westbound operation, consistent with the Willoughby Street blocks to the east and west. It is further proposed to transfer three seconds of green time from Jay Street to Willoughby Street in the AM peak period, four seconds in the midday and six seconds in the PM peak period. In addition, as discussed below in the sections on subway and pedestrian mitigation, it is proposed to install eight-foot-wide sidewalk extensions or "neckdowns" within the curb lane along the east sidewalk on Jay Street both to the north and to the south of the intersection. Adjacent to these neckdowns, Jay Street would be reduced to 44 feet in width, with the northbound Jay Street approach operating with 20 feet of width and the southbound Jay Street approach operating with 24 feet of width. As the neckdowns taper back to the original sidewalk width to the north and south of the intersection, northbound and southbound Jay Street would transition back to 26 feet of width in each direction. To accommodate the installation of the neckdown on the north leg of the intersection, an existing bus stop along the east curb would need to be relocated approximately 50 feet northward.

As shown in Tables 20-2 through 20-4, with these measures westbound Willoughby Street would operate at LOS D with less than 45 seconds of delay in the AM and PM peak periods. In the midday, this approach would operate at LOS F with less delay than in the No Build condition. The project's potential impacts to the westbound approach would therefore be fully mitigated.

*CONCLUSION*

In summary, as shown in Tables 20-5 and 20-6, the proposed traffic mitigation plan would fully address all impacts at 17 intersections in the AM peak period, 16 in the midday and 21 in the PM peak period. Eighteen out of 29 intersections impacted by the proposed actions would no longer be impacted with implementation of the proposed mitigation plan. However, unmitigable impacts would remain in one or more peak periods at a total of eleven intersections. The intersection of Adams Street and Tillary Street would have four unmitigated impacts in the AM peak period and two each in the midday and PM peak periods. The intersection of Atlantic Avenue and Bond Street would have one unmitigated impact in the midday peak period, while the intersection of Atlantic and Flatbush Avenues would have one unmitigated impact in the PM. The intersection of Atlantic and Fourth Avenues would have one unmitigated impact in the AM peak period, as would the intersection of Atlantic Avenue and Smith Street.

**Table 20-5**
**Summary of Mitigated Traffic Impacts**

| Intersections | | AM | MD | PM |
|---|---|---|---|---|
| **Atlantic Avenue and** | Flatbush Avenue | X | X | U |
| | Fourth Avenue | U | X | X |
| | Bond Street | X | U | |
| | Hoyt Street | X | X | X |
| | Smith Street | U | | X |
| | Boerum Place | X | | X |
| **Flatbush Avenue and** | Tillary Street | U | U | U |
| | Myrtle Avenue | U | X | U |
| | Willoughby Street | X | X | X |
| | DeKalb Avenue | X | | X |
| | Fulton Street | X | X | U |
| | Livingston Street | U | | X |
| | Schermerhorn Street/Lafayette | X | X | U |
| | Fourth Avenue/Hanson Place | | | U |
| **Jay Street and** | Tech Place | | | X |
| **Livingston Street and** | Bond Street | X | X | X |
| | Hoyt Street | | X | X |
| | Smith Street | | X | X |
| | Boerum Place | X | X | X |
| **Myrtle Avenue and** | Prince Street | X | X | X |
| | Ashland Place | X | X | X |
| **Schermerhorn Street and** | Bond Street | X | | X |
| | Hoyt Street | | | X |
| | Smith Street | X | X | X |
| **Tillary Street and** | Adams Street | U | U | U |
| | Jay Street | X | X | X |
| **Willoughby Street and** | Albee Square West/Gold Street | | | X |
| | Bridge Street | X | X | X |
| | Jay Street | X | X | X |

**Notes:**
**X:** All impacts fully mitigated.
**U:** One or more unmitigated impacts in the peak period.

**Table 20-6**
**Intersections With Unmitigable Impacts**

| Intersections | Number of Unmitigated Impacts | | |
|---|---|---|---|
| | AM | Midday | PM |
| Adams Street @ Tillary Street | 4 | 2 | 2 |
| Atlantic Avenue @ Bond Street | 0 | 1 | 0 |
| Atlantic Avenue @ Flatbush Avenue | 0 | 0 | 1 |
| Atlantic Avenue @ Fourth Avenue | 1 | 0 | 0 |
| Atlantic Avenue @ Smith Street | 1 | 0 | 0 |
| Flatbush Avenue @ Fulton Street | 0 | 0 | 2 |
| Flatbush Avenue @ Hanson Place/Fourth Avenue | 0 | 0 | 2 |
| Flatbush Avenue @ Livingston Street | 1 | 0 | 0 |
| Flatbush Avenue @ Myrtle Avenue | 4 | 0 | 2 |
| Flatbush Avenue @ Schermerhorn Street/Lafayette Avenue | 0 | 0 | 3 |
| Flatbush Avenue @ Tillary Street | 1 | 2 | 3 |

The intersection of Flatbush Avenue and Fulton Street would have two unmitigated impacts in the PM, as would the intersection of Flatbush Avenue/Hanson Place/Fourth Avenue. The Flatbush Avenue and Livingston Street intersection would have one unmitigated impact in the AM, and the intersection of Flatbush and Myrtle Avenues would have four unmitigated impacts in the AM and two in the PM. The intersection of Flatbush Avenue and Tillary Street would have one unmitigated impact in the AM, two in the midday and three in the PM peak hour. Lastly, the intersection of Flatbush Avenue with Schermerhorn Street and Lafayette Avenue would have three unmitigated impacts in the PM peak period.

Additional measures will be explored in coordination with NYCDOT to reduce or eliminate these unmitigated significant adverse impacts. The City recognizes the historic and on-going traffic issues in the Downtown Brooklyn area, whose congested conditions would continue to exist regardless of the proposed actions. The City is committed to seeking remedies to these significant congested conditions.

## PARKING

As discussed in Chapter 14, "Traffic and Parking," the proposed actions would accommodate all of the anticipated off-street parking demand generated by the projected development sites, would increase the surplus of study area parking spaces in the AM period by 552, and would reduce the No Build midday parking deficit by 181 spaces. As sufficient off-street parking capacity would be provided to accommodate all parking demand resulting from the proposed actions, and as delivery and service vehicles would be accommodated in off-street loading facilities, the proposed actions are not expected to adversely affect either off-street or on-street parking conditions in the study area.

As discussed above in the section on traffic mitigation, changes to curbside regulations are proposed at approximately twelve locations in the study area as part of the project's traffic mitigation plan. These changes typically involve the implementation of a no standing regulation along a curb for 100 feet approaching an intersection effective throughout the day or during one

or more peak periods. As shown in Table 20-7, approximately 25 metered curbside parking spaces and 22 non-metered spaces for public or authorized-vehicle parking are expected to be affected by the proposed parking regulation changes recommended in the project's traffic mitigation plan. These spaces would be dispersed throughout the study area. Of the 25 metered spaces, only 11 would be affected throughout the day, while seven would be affected during each of the AM and PM peak periods.

## D. TRANSIT AND PEDESTRIANS

As discussed in Chapter 15, "Transit and Pedestrians," transit demand from projected development sites would significantly impact two street stairs at the Jay Street-Borough Hall subway station in one or both peak periods, and NYCT's B25 bus route in the PM peak period in the peak eastbound direction. Pedestrian trips en route to and from projected development sites would result in significant adverse pedestrian impacts to one crosswalk on Jay Street at Willoughby Street and one crosswalk on Albee Square West/Gold Street at Willoughby Street. The following sections discuss potential mitigation for these transit and pedestrian impacts.

### SUBWAY SERVICE

The results of the analyses of conditions at study area subway stations in the future with the proposed actions show that demand from projected development sites would significantly impact two street stairs at the Jay Street-Borough Hall subway station in one or both peak periods. As shown in Table 15-29, in the 2013 future with the proposed actions, stair S3 at the northwest corner of Jay and Fulton Streets would deteriorate from LOS C to LOS D in the PM peak period, with 17.8 inches of theoretical widening required to return this stair to its No Build operating condition. Stair S4 at the northeast corner of Jay and Willoughby streets would deteriorate from LOS C to LOS F in both the AM and PM peak periods. This stair would require upwards of 54 inches (4.5 feet) of theoretical widening to return it to its No Build condition.

Mitigation measures to address subway station stairway impacts typically involve physically widening an affected stairway in order to increase its capacity, or implementing measures that would decrease demand, typically by providing new and/or more convenient access points. At Stair S3, at the northwest corner of Jay and Fulton Streets, a one-foot widening would restore this stair to LOS C in the PM peak period, comparable to the No Build condition and below NYC Transit's minimum standard of 10 persons per foot-width per minute (PFM). However, while such mitigation is feasible, it would not be practical to undertake for this moderate level of impact given the cost and disruption involved in widening the stair. (Stair S3 would operate at a functional LOS D in the PM peak period). In addition, urban renewal changes proposed as part of this project would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets. This public space—Jay Street Plaza—would potentially include a new subway entrance/exit to the Jay Street-Borough Hall station. A new subway entrance/exit located within this plaza would fully address the PM peak period impact to Stair S3. Therefore, pending the implementation of a new transit plaza, the proposed actions' impact to Stair S3 would remain unmitigated.

## Table 20-7
## Curbside Parking Affected by Proposed Traffic Mitigation

| Intersection | Approach | Curb | Existing Weekday Curbside Regulations | Proposed Weekday Parking Regulations (1) | Affected Metered Spaces | | Affected Non-Metered Spaces | | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. | Time Period | No. | Time Period | |
| Atlantic Avenue/Bond Street | WB | North | No Parking Anytime (for 60' from intersection)<br>2 Hour Parking 9AM-7PM | No Standing Anytime (for 60' from intersection)<br>No Standing 7-10AM (for 60' - 100' from intersection)<br>2 Hour Parking 10AM-7PM (for 60' - 100' from intersection) | 2 | 7-10AM | --- | ------ | |
| Atlantic Avenue/Hoyt Street | SB | West | No Parking 8-9AM, No Standing 4-7PM<br>1 Hour Parking 9AM-4PM | No Standing Anytime | 4 | 9AM-4PM | --- | ------ | |
| Atlantic Avenue/Boerum Place | SB | West | 1 Hour Parking 9AM-7PM | No Standing 4-7PM<br>1 Hour Parking 9AM-4PM | 2 | 4-7PM | --- | ------ | |
| Flatbush Avenue/Myrtle Avenue | NB | East | No Standing 7-10AM<br>2 Hour Parking 10AM-7PM | No Standing Anytime | 5 | 10AM-7PM | --- | ------ | |
| Flatbush Avenue/DeKalb Avenue | WB | South | (Curb lane closed for construction under)<br>existing conditions) | No Standing Anytime | --- | ------ | --- | ------ | |
| Flatbush Avenue/Fulton Street | SB | West | No Standing 4-7PM<br>1 Hour Parking 9AM-4PM, 7-10PM | No Standing 7-10AM, 4-7PM<br>1 Hour Parking 10AM-4PM, 7-10PM | 5 | 9-10AM | --- | ------ | |
| Jay Street/Tech Place | NB | East | No regulations posted | No Standing 4-7PM | --- | ------ | 5 | 4-7PM | |
| Livingston Street/Bond Street | NB | West | No Parking 8AM-7PM<br>Except Authorized Vehicles (NYPD Transit) | No Standing 7-10AM, No Parking 10AM-7PM<br>Except Authorized Vehicles (NYPD Transit) | --- | ------ | 8 | 7-10AM | |
| Livingston Street/Hoyt Street | EB | South | No Standing 4-7PM (Bus Lane)<br>1 Hour Parking 9AM-4PM | No Standing Anytime | 2 | All Times | --- | ------ | |
| Myrtle Avenue/Ashland Place | NB | East | No Parking 8:30-10AM, Tues. & Fri. | No Standing Anytime (for 200' from intersection) | --- | ------ | 7 | All Times | |
| | WB | North | No Parking 8AM-6PM | No Standing 7-10AM, No Parking 10AM-6PM | --- | ------ | --- | ------ | |
| Schermerhorn Street/Bond Street | NB | West | No Standing 8AM-7PM | No Standing 7-10AM, 4-7PM (along entire length of block) | --- | ------ | --- | ------ | (2) |
| | NB | East | No Standing 7-10AM<br>1 Hour Parking 10AM-7PM | No Standing 7-10AM, 4-7PM (along entire length of block)<br>1 Hour Parking 10AM-4PM | 5 | 4-7PM | --- | ------ | |
| Schermerhorn Street/Hoyt Street | EB | South | No Standing 7AM-7PM<br>Except Authorized Vehicles | No Standing Except Authorized Vehicles 7AM-4PM<br>No Standing 4-7PM | --- | ------ | 2 | 4-7PM | |
| | | | | **Total Spaces Affected:** | 25 | | 22 | | |

**Notes:**

(1) Proposed regulations apply for 100' from the intersection unless otherwise noted.
(2) Parking by vehicles with NYPD permits observed along this curb during field surveys.

To mitigate the AM and PM peak period impacts to Stair S4 on the northeast corner of Jay and Willoughby Streets, it is proposed to double the width of this stair from its current five feet to ten feet in width. To accommodate this widened stairway and provide sufficient sidewalk space for pedestrians, an eight-foot-wide sidewalk extension or "neckdown" would be installed within the curb lane along the east sidewalk on Jay Street adjacent to the stair. This neckdown would extend for approximately 33 feet north from the intersection with Willoughby Street before tapering back to the original 14-foot sidewalk width. As shown in Figure 20-6, the neckdown would provide a total of 10.5 feet of sidewalk width adjacent to the newly widened stair, three feet more than is presently available adjacent to the existing stair. As previously discussed in the section on traffic and parking mitigation, this proposed neckdown, along with a similar installation along the east sidewalk on Jay Street south of Willoughby Street (to channel traffic), would not adversely impact traffic flow conditions.

As shown in Table 20-8, with its width increased from five feet to ten feet, Stair S4 would operate at LOS C (8.26 PFM) in the AM peak period, comparable to the No Build condition and below NYC Transit's minimum standard of 10 PFM. In the PM peak period, this stair would also operate at an acceptable LOS C (9.01 PFM). The proposed five-foot widening would therefore return this stair to a functional level of operation in both peak periods, fully mitigating the project's impacts.

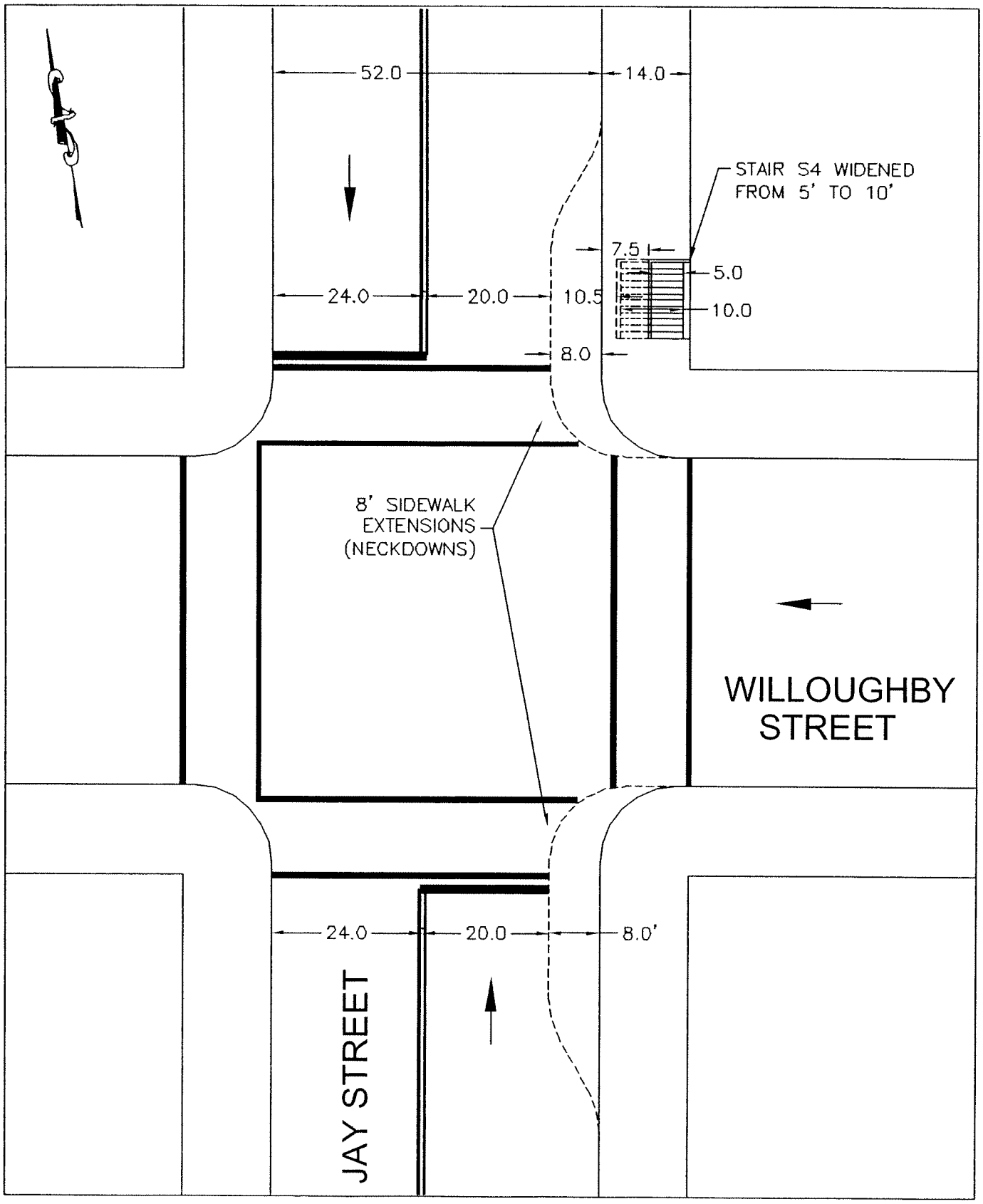
If, after further detailed engineering, widening of Stair S4 proves to be impractical due to the presence of utilities or other physical constraints, an alternative mitigation scheme would be explored. Under this alternative, a second five-foot-wide stair would be constructed adjacent to the building line immediately to the north of Stair S4. This stair would face northward and share a common landing with Stair S4 in a "T"-shaped configuration. The two five-foot-wide stairs would function as a combined system with a capacity similar to that achieved by widening Stair S4 to ten feet. Consequently, this alternative mitigation measure would similarly address the project's AM and PM peak hour impacts to Stair S4. Construction of this new stair would likely not require extension of the adjacent sidewalk, but such an extension (or neckdown) may still be considered for implementation for the purposes of enhancing pedestrian safety at this intersection.

## BUS SERVICE

The results of the analysis of local bus conditions in the future with the proposed actions show that demand from projected development sites would significantly impact eastbound B25 service in the PM peak period. As shown in Table 15-32, in the PM peak period eastbound B25 buses would experience a capacity shortfall of 43 spaces at their maximum load point at Fulton Street and Nostrand Avenue. This compares to a capacity surplus of 21 spaces in the future without the proposed actions. According to current NYC Transit guidelines, increases in bus load levels to above their maximum capacity at any load point is considered a significant impact as it would necessitate the addition of more bus service along that route. As standard practice, New York City Transit routinely conducts ridership counts and adjusts bus service frequency to meet its service criteria, within fiscal and operating constraints. Therefore, no mitigation is proposed for the potential impact to eastbound B25 service.

**Proposed Mitigation for Stair S4 at Jay Street - Borough Hall Station**

**Figure 20-6**



## Table 20-8
## 2013 Future With Mitigation Subway Station Analysis
## Jay Street-Borough Hall IND Station

**2013 BUILD CONDITION**

| 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 | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build PFM (4) | 2013 Build V/C | 2013 Build LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3 | Stairway @ NW Corner | AM | 3.20 | 480 | 346 | 112 | 458 | 7.21 | 0.72 | C | 9.54 | 0.95 | C | |
| | Jay Street/Fulton Street | PM | 3.20 | 480 | 401 | 186 | 587 | 8.35 | 0.84 | C | 12.23 | 1.22 | D | * |
| S4 | Stairway @ NE Corner | AM | 3.20 | 480 | 420 | 472 | 892 | 8.75 | 0.88 | C | 18.58 | 1.86 | F | * |
| | Jay Street/Willoughby Street | PM | 3.20 | 480 | 406 | 567 | 973 | 8.46 | 0.85 | C | 20.27 | 2.03 | F | * |

**2013 BUILD WITH MITIGATION**

| No. | Station Element/Location | Peak Period (1) | Effective Width in Feet (2,5) | Maximum 15 Minute Capacity (3) | No Build Pk 15 Min Volume | Pk 15 Min Project Increment | Build Pk 15 Min Volume | 2013 No Build PFM (4) | 2013 No Build V/C | 2013 No Build LOS | 2013 Build w/Mitigation PFM (4) | 2013 Build w/Mitigation V/C | 2013 Build w/Mitigation LOS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S3 | Stairway @ NW Corner | AM | 3.20 | 480 | 346 | 112 | 458 | 7.21 | 0.72 | C | 9.54 | 0.95 | C | |
| | Jay Street/Fulton Street | PM | 3.20 | 480 | 401 | 186 | 587 | 8.35 | 0.84 | C | 12.23 | 1.22 | D | * |
| S4 | Stairway @ NE Corner | AM | 7.20 | 1,080 | 420 | 472 | 892 | 8.75 | 0.88 | C | 8.26 | 0.83 | C | |
| | Jay Street/Willoughby Street | PM | 7.20 | 1,080 | 406 | 567 | 973 | 8.46 | 0.85 | C | 9.01 | 0.90 | C | |

**Notes:**

(1) Peak Hours: 8-9 am and 5-6 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 4).

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

(5) Stair S4 widened from 5 feet to 10 feet in mitigated condition.

* denotes a significant impact based on CEQR criteria.

## PEDESTRIANS

The results of the analyses of pedestrian conditions in the future with the proposed actions show that demand from projected development sites would significantly impact two crosswalks along the Willoughby Street corridor in one or more peak periods. As shown Table 15-34, new demand would significantly impact the north crosswalk on Jay Street at Willoughby Street in the PM peak period, and the south crosswalk on Albee Square West/Gold Street at Willoughby Street in both peak periods.

A significant pedestrian impact is considered mitigated if measures implemented return projected future conditions to what they would be if a proposed action were not in place, or to acceptable levels. For a No Build LOS D, E or F, mitigation back to the No Build condition is required; for No Build LOS A, B or C, mitigation to the LOS D/E threshold is required (15 square feet per pedestrian for corners and crosswalks, and 15 pedestrians per foot per minute for sidewalks and midblock locations).

The following paragraphs discuss potential mitigation measures for the pedestrian impacts identified in Chapter 15, "Transit and Pedestrians." Table 20-9 shows the effectiveness of the proposed measures on impacted crosswalks during the weekday AM and PM peak periods. In addition to reflecting the effects of the proposed pedestrian mitigation measures, the analyses summarized in Table 20-9 also reflect the effects of the traffic mitigation measures discussed above on the impacted pedestrian facilities. With the exception of the east crosswalk on Willoughby Street at Jay Street, no additional impacts to any pedestrian facilities (impacted or otherwise) are projected to occur as a result of the traffic mitigation measures. As discussed below, a minor widening of the east crosswalk at the intersection of Willoughby and Jay Streets is proposed to address the potential effects of traffic mitigation measures at this intersection.

### *NORTH CROSSWALK ON JAY STREET AT WILLOUGHBY STREET*

Pedestrian demand and increased traffic generated by the proposed actions would impact the north crosswalk on Jay Street at Willoughby Street in the PM peak period. The level of service would remain at LOS E, however, the amount of space per pedestrian would fall from 14 square feet in the No Build to 12 square feet. To address this impact, it is therefore proposed to widen this crosswalk to 13 feet in width from the existing 11.5 feet. As shown in Table 20-9, with this widening, the north crosswalk would operate at LOS D in the PM peak period, with an average 17 square feet per pedestrian. The potential impact to this crosswalk resulting from the proposed actions would therefore be fully mitigated.

### *EAST CROSSWALK ON JAY STREET AT WILLOUGHBY STREET*

Although not significantly impacted by new travel from the proposed project, signal timing changes proposed as part of the traffic mitigation plan at the intersection of Jay and Willoughby Streets would potentially impact the east crosswalk on Willoughby Street in the PM peak hour. As demonstrated in Table 20-9, a minor widening of this crosswalk to a total of 13 feet in width (from the existing 12.5 feet) would return this crosswalk to an acceptable LOS D (15 square feet per pedestrian), fully mitigating the effects of the project's traffic mitigation plan.

# Table 20-9
# 2013 Future With Mitigation Pedestrian Conditions
# Corners and Crosswalks

## Future Action Crosswalk Conditions

| Map No. | Intersection | Crosswalk | Curb to Curb Street Width (Ft.) | Crosswalk Width (Ft.) | Peak 15 Min. Volumes | | Conflicting Vehicle Volume with Pedestrians (Veh/15min) | | With Vehicles: Average Ped. Space (SF/Ped) | | With Vehicles: Level of Service | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | AM | PM | AM | PM | AM | PM | AM | PM |
| 20 | Willoughby Street & Albee Square West | South | 36.0 | 10.3 | 384 | 520 | 0 | 0 | 15 | 10 | *E | *E |
| | | East | 65.0 | 11.8 | 41 | 59 | 71 | 166 | 284 | 157 | A | A |
| | | West | 33.0 | 11.3 | 80 | 86 | 121 | 140 | 80 | 66 | A | A |
| 22 | Willoughby Street & Jay Street | North | 51.5 | 11.5 | 392 | 483 | 30 | 29 | 15 | 12 | D | *E |
| | | East | 31.0 | 12.5 | 428 | 599 | 0 | 0 | 26 | 17 | D | D |

## Future Action with Mitigation Crosswalk Conditions

| Map No. | Intersection | Crosswalk | Curb to Curb Street Width (Ft.) | Crosswalk Width (Ft.) | Peak 15 Min. Volumes | | Conflicting Vehicle Volume with Pedestrians (Veh/15min) | | With Vehicles: Average Ped. Space (SF/Ped) | | With Vehicles: Level of Service | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | AM | PM | AM | PM | AM | PM | AM | PM |
| 20 | Willoughby Street & Albee Square West | South | 36.0 | 14.0 | 384 | 520 | 0 | 0 | 24 | 16 | C | D |
| | | East | 65.0 | 11.8 | 41 | 59 | 71 | 166 | 333 | 187 | A | A |
| | | West | 33.0 | 11.3 | 80 | 86 | 121 | 140 | 114 | 90 | A | A |
| 22 | Willoughby Street & Jay Street | North | 44.0 | 13.0 | 392 | 483 | 30 | 29 | 20 | 17 | D | D |
| | | East | 31.0 | 13.0 | 428 | 599 | 0 | 0 | 26 | 15 | C | D |

* Denotes a significant impact.

*SOUTH CROSSWALK ON ALBEE SQUARE WEST/GOLD STREET AT WILLOUGHBY STREET*

The combination of increased pedestrian and vehicular traffic at the intersection of Willoughby Street and Albee Square West/Gold Street would adversely impact the south crosswalk on Albee Square West/Gold Street in both peak periods. This facility would deteriorate from LOS A to LOS E in the AM peak period, and from LOS B to LOS E in the PM peak period. To address this impact, it is therefore proposed to widen the south crosswalk to 14 feet in width from the existing 10.3 feet. As shown in Table 20-9, with this widening, the south crosswalk would operate at LOS C (24 square feet per pedestrian) in the AM peak period and LOS D (16 square feet per pedestrian) in the PM peak period. As this crosswalk would be operating above the CEQR threshold of 15 square feet per pedestrian in both peak periods, the potential impacts to this crosswalk resulting from the proposed actions would be fully mitigated.

### AIR QUALITY

Chapter 16, "Air Quality," showed that under the 2013 build condition, with the development of the projected sites, impacts on carbon monoxide (CO) would be well below ambient air quality standards and the City's *de minimis* criteria. The proposed traffic mitigation measures, which include new roadway configurations and volume diversions, were evaluated to determine the potential effects on air quality in the study area. Because the proposed mitigation measures seek to avoid or reduce the levels of congestion and delays at an intersection, an overall improvement in traffic conditions would occur for the study area as compared to the Build condition. Based on the traffic mitigation analysis presented above, the proposed changes in volume, levels of service, and delays through the network would result in similar, if not lower, predicted CO concentrations under the build with mitigation condition. Similarly, the build with mitigation scenario would not alter the conclusions of no significant impact on inhalable particulate ($PM_{10}$ and $PM_{2.5}$) levels.

The proposed traffic mitigation measures would not affect the stationary or industrial source analyses provided in Chapter 16, which determined that there would be no significant air quality impacts resulting from the proposed actions.

## E. NOISE

As discussed in Chapter 17, "Noise," at noise receptor located at Site 2 (Duffield Street between Willoughby and Fulton Streets), during the AM peak period, future noise levels with the development of the proposed sites would increase by up to 3.4 dBA compared to future noise levels without the proposed actions. Increases of this magnitude would be perceptible and, based upon CEQR noise impact criteria, would constitute a significant noise impact. This impact occurs because of the relatively low volumes at this location without the proposed actions, and the number of vehicles (particularly trucks) generated by the development expected on this street and in the surrounding area. While no residences would be impacted with the proposed actions, the increase in noise levels at Site 2, during the AM peak period would exceed the CEQR impact criteria and thus, the project would have a significant adverse noise impact at this location. There is no feasible mitigation to eliminate this impact at this site during this time period, and thus it would constitute an unmitigated project impact.

In addition, as part of the development that would occur with the proposed actions, a 1.15-acre public space, Willoughby Square, is proposed to be built near Site 2. Based upon the Site 2

analysis results, $L_{10}$ noise levels of approximately 69 to 73 dBA would be expected at this new public space. These noise levels would be higher than those generally recommended for outdoor activities (i.e., they would exceed the CEQR Exposures Guideline value of 55 dBA $L_{10}$ for this use) but would be comparable to levels in existing parks in New York City which are adjacent to moderately to heavily trafficked streets and roadways. This exceedance of the CEQR Exposure Guideline value would result in elevated noise levels on future public space users. There are no feasible mitigation measures to reduce noise levels within an urban public space such as this to within recommended levels for this type of use; however, the design of this new public space will consider layout or design features to minimize potential adverse effects on its viability.

## ATTENUATION REQUIREMENTS

The 2001 *CEQR Technical Manual* has set noise attenuation values for buildings, based on exterior noise levels. Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower, and are determined based on exterior $L_{10(1)}$ noise levels.

Based on the measured $L_{10}$ noise levels, levels of building attenuation needed to achieve interior noise levels of 45 dBA or lower are shown in Table 20-10. In general, 20 to 25 dBA of building attenuation can be achieve with double glazed windows and alternative means of ventilation, such as window-sleeve air conditioning units; 30 dBA of building attenuation can be achieved with double glazed windows with good sealing properties and alternative means of ventilation such as well-sealed through-the-wall air conditioning, or central air conditioning; and 35 to 40 dBA of building attenuation can be achieve with double glazed windows with good sealing properties and alternative means of ventilation such as central air conditioning. Based upon the $L_{10(1)}$ values measured at the analysis sites, a maximum of 40 dBA of building attenuation would be required. The provision for providing sufficient building attenuation will be mandated by placing an E-designation on the projected and potential development sites (see Table 20-9, or Tables 1-3 and 1-4 in Chapter 1, for a list of the affected blocks and lots). The text of the E-designation would state that in order to ensure an acceptable interior noise environment at the projected and potential development sites, future uses on these sites must provide a minimum window/wall attenuation of either 25, 30, 35, or 40 dB(A) (depending on the site). Noise attenuation measures could include the installation of double- or triple-glazed windows, central air conditioning, air conditioning sleeves containing air conditioners, or HUD-approved fans. Prior to development on these sites, the New York City Department of Buildings would be furnished with a report from NYCDEP stating that the environmental requirements related to the E-designation have been met.

Overall, with the specified E-designations, the proposed actions would not have any significant interior noise impacts, and would comply with all CEQR requirements.

**Table 20-10**
**Minimum Building Attenuation to Comply With CEQR Requirements***

| Site | Location | Time | $L_{10}$ (dBA) | Building Attenuation (dBA) | Affected Blocks and Lots |
|---|---|---|---|---|---|
| 1 | Bridge Street between Willoughby and Fulton Streets | MD | 71.2 | 30 | B 152, L 37; B 145, L 8, 10, 13-15 |
| 2 | Duffield Street between Willoughby and Fulton Streets | MD | 73.7 | 30 | B 145, L 26, 32; B 146, L 2, 7, 11-18 |
| 3 | Albee Square West/Gold Street between Willoughby Street and DeKalb Avenue | PM | 71.3 | 30 | B 146, L 23, 29, 34-37, 41-43, 46-52 |
| 4 | Gallatin Place between Fulton and Livingston Streets | MD | 80.2 | 40 | B 164, L 1, 13, 29, 31, 42-44 |
| 5 | Fulton Street between Hanover Place and Bond Street | PM | 76.4 | 35 | B 160, L 18, 29; B 149, L 14, 15, 17, 19, 22, 26, 28, 30-34, 50; B 161, L 27, 30, 33, B 2093, L1 |
| 6 | Fleet Street between DeKalb Avenue and Flatbush Avenue Extension | MD | 68.2 | 25 | B 149, L 1, 49 |
| 7 | Intersection of Flatbush Avenue Extension and Prince Street | MD | 77.2 | 35 | B 2060, L 22-27, 32, 122; B 2062; L 1, 5, 6, 17-19, 21, 23, 24, 103 |
| 8 | Livingston Street between Bond and Hoyt Streets | AM | 75.0 | 30 | B 165, L 17-19, 29, 58 |
| 9 | Willoughby Street between Bridge and Duffield Streets | MD | 73.8 | 30 | B 145, L 16, 18-22 |
| 10 | Flatbush Avenue between Lafayette Avenue and Hanson Place | MD | 76.6 | 35 | B 174, L 9, 13, 18, 23, 24; B 2110, L 3; B 167, L 15, 16, 26, 28, 36, 42 |
| 11 | Southwest corner of Ashland Place and Myrtle Avenue | PM | 73.1 | 30 | B 2061, L1 |
| 12 | Myrtle Avenue between Prince Street and Ashland Place | PM | 71.8 | 30 | B 2061, L1 |
| 13 | Gold Street between Johnson Street and Flatbush Avenue Extension | AM | 71.3 | 30 | B 2049, L 2, 8; B 133, L 1, 5, 13, 15; B 134, L 1, 5, 30, 38, 41 |

**Table 20-10 (cont'd)**
**Minimum Building Attenuation to Comply With CEQR Requirements***

| Site | Location | Time | $L_{10}$ (dBA) | Building Attenuation (dBA) | Affected Blocks and Lots |
|---|---|---|---|---|---|
| 14 | Tillary Street between Jay and Bridge Streets | MD | 77.2 | 35 | B 131, L 1; B 142, L 1 |
| 15 | Adams Street between Tillary and Johnson Streets | MD | 74.0 | 30 | B 128, L 1, 26 |
| 16 | Fulton Street between Adams and Jay Streets | PM | 78.1 | 35 | B 144, L 1; B 150, L 1, 6, 10, 11, 19; B 153, L 3, 14, 15; B 154, L 1, 5, 11, 12, 36-40 |

**Note:** * The provision for providing sufficient building attenuation to comply with CEQR requirements will be mandated by placing an "E" designation on these lots.

# A. INTRODUCTION

This chapter considers a range of alternatives to the proposed rezoning and other related land use actions for the Downtown Brooklyn Development project. The purpose of this alternatives analysis is to examine reasonable and practicable options that avoid or reduce project-related, significant adverse impacts and may still allow for the achievement of the stated goals and objectives of the proposed actions. The analysis first considers the No Action Alternative, in which the proposed rezoning and other actions are not undertaken. It then assesses a No Unmitigated Impacts Alternative, in which there is a change in density or program design in order to avoid the potential unmitigated impacts associated with the projected development sites. The third alternative omits from the proposed amendments to the Brooklyn Center Urban Renewal Plan (BCURP) the extension of the Urban Renewal area boundary by 9 blocks and the designation of 57 lots within five proposed development sites. Lastly, the BQE Ramp Alternative considers future 2013 traffic conditions assuming that the Brooklyn-Queens Expressway (BQE) off-ramp to Navy Street is constructed.

For each of the technical areas presented in this environmental impact statement, the anticipated effects of the proposed actions are compared to those that would result from each of the alternatives. The purpose of this analysis, as set forth by the 2001 *City Environmental Quality Review (CEQR) Technical Manual*, is to provide decision makers with the opportunity to consider practicable alternatives that are consistent with the project's purpose and that could potentially reduce or eliminate significant adverse impacts identified in the EIS.

# B. NO ACTION ALTERNATIVE

The No Action Alternative assumes that the proposed zoning changes and other land use actions would not be implemented. This alternative is discussed and analyzed as "Future Without the Proposed Actions" in each of the technical areas of Chapters 2 through 19. This analysis compares conditions under the No Action Alternative with conditions with the proposed actions. The No Action condition assumes no amendments to the zoning map and zoning text for the Special Downtown Brooklyn District; no changes to the City map; no amendments to the Brooklyn Center Urban Renewal Plan, MetroTech Urban Renewal Plan, and Atlantic Terminal Urban Renewal Area Plan; no modification of the MetroTech General Large-Scale Development Special Permit; no disposition of the City's interest in real property; no site selection for a visual and performing arts public library on Block 2110, Lot 3; and no special permits for the proposed parking facilities. The No Action Alternative would not require any discretionary actions. The effects of this alternative are summarized below as it compares to the proposed actions.

## LAND USE, ZONING, AND PUBLIC POLICY

Under the No Action Alternative, the rezoning area would continue to contain a mix of civic, office, residential, community facility, and retail uses. The existing trend of residential

development and conversions would continue in the area; however, the developments associated with the proposed actions would not take place with this alternative. Unlike the proposed actions, the No Action Alternative would not involve acquisition of proposed urban renewal sites by the City or potential direct displacement of residential, commercial, or institutional uses currently occupying the proposed new designated properties. Under this alternative, no actions would be undertaken to map or demap certain streets in the project area, and therefore the accessibility of new and existing developments would not increase. Unlike the proposed actions, the No Action Alternative would preclude the ability to provide viable development sites sized to accommodate large floorplates to encourage downtown expansion.

In this alternative, zoning changes and new development would be expected to occur on a site-by-site basis as a continuation of the existing redevelopment trends in the area. However, this growth would be far short of the development expected under the proposed actions. Moreover, unlike the proposed actions, the No Action Alternative would not provide the zoning and map changes and text amendments necessary to support a comprehensive planning effort for development that integrates the commercial, academic, institutional, and residential elements of the downtown area.

The considerable benefits expected to result from the proposed actions—a strengthened and expanded central business district, the creation of transition zones between the downtown commercial core and surrounding residential neighborhoods, and a more unified downtown area—would not be fully realized under the No Action Alternative. In addition, the No Action Alternative would not create public amenities such as Willoughby Square and Jay Street Plaza, or streetscape improvements. Thus, this No Action Alternative would not meet the goals of the Downtown Brooklyn Development project.

Overall, no adverse effects to land use, zoning, or public policy would result from the No Action Alternative or the proposed actions.

## SOCIOECONOMIC CONDITIONS

Under the No Action Alternative, it is generally anticipated that existing economic activities on the projected development sites will remain. Absent the proposed actions, the only anticipated development on the projected development sites is the conversion of the existing building on site G at Tech Place and Gold Street for 60 new residential units. These new residential units will displace a 60,000-square-foot existing industrial operation. It is also anticipated that 11 projects unrelated to the proposed actions could be completed in the area by 2013. These projects could total approximately 4.6 million square feet of development, including 730 residential units, 1.3 million square feet of cultural and community facility space, 780,000 square feet of court-related space, 1.3 million square feet of office/commercial space, 512,685 square feet of retail space, and 887 public parking spaces.

Unlike the proposed actions, the No Action Alternative would not result in the direct displacement of an estimated 130 residential units and approximately 100 small commercial and municipal uses. It should be noted that most of the municipal uses will relocate from their current space under both the No Action and proposed actions scenarios. Further, under the proposed actions, those residents and businesses to be directly displaced will be offered relocation assistance.

The No Action Alternative would not result in significant benefits to the area's business and residential communities through economic growth and job retention or through the introduction

of new integrated land uses to the area. The No Action Alternative would not beneficially impact existing businesses by increasing residential and worker populations (by approximately 1,670 and 19,124 respectively) and thereby creating a substantial new customer base. The No Action Alternative also would not realize benefits from creating or retaining a significant number of jobs in New York City and State during construction and ongoing operations of the projected development sites.

Neither the No Action Alternative nor development under the proposed actions are expected to exert indirect displacement pressures on residents or businesses in the project area or study area; in addition, neither scenario would directly displace anchor establishments or uses that form a customer base, or introduce a use that would lower property values. However, the No Action Alternative would not further the City's goals of reinforcing Downtown Brooklyn's role as a regional central business district; providing viable development sites for future market cycles; capturing regional employment growth and strengthening New York City's economic base by attracting new businesses and retaining businesses considering relocation outside Manhattan; increasing opportunities for commercial, residential, and academic growth in Downtown Brooklyn; and promoting connections between the area's commercial core and surrounding academic, cultural, and residential neighborhoods.

## COMMUNITY FACILITIES

Like the proposed actions, no significant impacts to community facilities would result from the No Action Alternative. The New York City Police and Fire Departments would continue to allocate their resources to ensure that the project area is adequately served. Area schools would continue to operate below capacity, and libraries and day care centers would continue to meet existing demand.

## OPEN SPACE AND RECREATIONAL FACILITIES

Under the No Action Alternative, fewer new workers and residents would be introduced to the project area. The ½-mile study area would continue to experience a deficiency of passive open space resources, with the weighted average ratio for passive open space remaining at 0.26 acres per 1,000 workers and residents. The study area also would continue to experience a deficiency in active open space; the active open space ratio would decrease from 0.49 to 0.48 per 1,000 residents. Neither the No Action Alternative nor the proposed actions would result in any significant adverse impacts on open space in the study area. However, the proposed actions would add approximately 1.15 acres of passive open space and streetscape improvements that would not occur under the No Action Alternative.

## SHADOWS

Without the development of the projected development sites under the proposed actions, no new project shadows would be cast; thus, there would be no potential for shadow impacts under the No Action Alternative. The shadows that would fall on new public spaces and existing open spaces under the proposed actions, while not considered to be a significant adverse impact, would not occur with this alternative.

## HISTORIC RESOURCES

*ARCHITECTURAL RESOURCES*

Unlike with the proposed actions, under the No Action Alternative, the Joseph J. Jacobs Building of Polytechnic University (site C), located at 305-315 Jay Street, the Board of Education Building at 131 Livingston Street (site M), 222 Duffield Street (site P), and 423 Fulton Street (site L), all of which LPC deems eligible for designation as New York City Landmarks and/or listing on the State and National Registers of Historic Places (S\NR), would not be demolished and thus no significant adverse impacts would occur on these four potential architectural resources.

The cast-iron buildings at 565-571 Fulton Street (site R) have been deemed eligible for NYCL designation and S\NR listing by LPC, and their demolition would be considered to be a significant adverse impact. However, this site was previously included in 1970 as part of the Brooklyn Center Urban Renewal Plan (BCURP), and thus the demolition of these buildings would be considered a significant adverse impact under both the proposed actions and the No Action Alternative.

*ARCHEOLOGICAL RESOURCES*

LPC has determined that there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that are considered to be potentially sensitive for 19th century archaeological resources. Under the No Action Alternative, no development would take place on these lots, and thus no subsurface disturbance would occur on these sites. Therefore, there would be no impacts to any potential archaeological resources that might be present on the projected or potential development sites.

## URBAN DESIGN AND VISUAL RESOURCES

Under the No Action Alternative, the urban design and existing view corridors and views to visual resources in the project area will not substantially change. Without the impetus of the increase in allowable density and the change in permitted uses that would result from the proposed actions, substantial new construction is unlikely to occur in the project area. While the urban design of the area could improve with improvements in the exterior façades of surrounding buildings by owners looking to attract new tenants, the overall urban design of the area, in terms of the type and bulk of buildings, would most likely be maintained to a great extent under this alternative.

In addition, the No Action Alternative would not provide for new public spaces, sidewalk widenings, or ground-floor retail use and glazing requirements for new construction, all of which would enliven the street-level environment in the project area and would be expected in the proposed actions scenario. This alternative would not meet the proposed actions' goals to transform the appearance of the project area through streetscape enhancements and new public plazas that would unify urban design features and bridge gaps in the urban fabric, and to create new developments that would enhance the vitality of the area and foster connections between MetroTech and Fulton Mall and the Boerum Hill and Fort Greene neighborhoods to the south and east.

## NEIGHBORHOOD CHARACTER

Under the No Action Alternative, the uses currently on the projected development sites would remain, with the exception of site G, which would be redeveloped for residential use independent of the proposed actions. In addition, a number of office, residential, institutional, and retail projects are planned within the project area and the surrounding study area. While these developments could result in changes to the character of the areas immediately surrounding the project locations, under the No Action Alternative, the overall neighborhood character of the project area would remain substantially the same as it is today.

With the proposed actions, while there would be the potential for significant adverse impacts on traffic, pedestrian circulation, subway stair levels of service, and noise, these potential effects would not cause a significant adverse impact on neighborhood character. Furthermore, the proposed actions would result in significant beneficial changes to neighborhood character, such as improved streetscapes and better circulation. Overall, the more cohesive Downtown Brooklyn neighborhood expected to result from the proposed actions would not occur with the No Action Alternative.

## HAZARDOUS MATERIALS

Generally, developments that may occur within the project area under the No Action Alternative could result in the exposure of construction workers and nearby residents to hazardous materials, if development were to occur on any lot in the project area that has the potential for hazardous material contamination. However, it is assumed that all construction and required removal or handling of hazardous materials would be conducted in accordance with applicable state and federal requirements, thereby minimizing the potential for exposure. Under the No Action Alternative, regular maintenance of existing buildings on the project sites would minimize potential adverse effects associated with the presence of hazardous materials. The presence of these materials would not present a significant exposure risk if the buildings are properly maintained.

A greater potential for significant adverse hazardous materials impacts exists under the proposed actions compared with the No Action Alternative since more in-ground disturbance is expected to occur with the proposed actions. However, development under the proposed actions would include subsurface investigations, tank removals, remediation, asbestos abatement, and construction in accordance with applicable state and federal requirements and under site-specific Sampling and Remediation Work Plans and Health and Safety Plans. Mechanisms to ensure that these actions occur with the proposed actions include the placement of an E-designation on lots that are neither City-owned nor intended for future City ownership.

For City-owned sites or sites that are proposed for city ownership, E-designations will not be placed on development lots. Instead, since development of these sites will occur through disposition to a private entity, a similar mechanism to ensure that further investigative and/or remedial activities, as well as health and safety measures, prior to and/or during construction will be required under the City's contract of sale with the private entity selected to develop the site. This mechanism and the E-designation mechanism would reduce or avoid the potential that significant adverse impacts on all development sites.

## INFRASTRUCTURE AND ENERGY

Demands on local utility systems, including water supply, solid waste and recycling, and energy would remain generally the same as existing conditions. As with the proposed actions, no significant adverse infrastructure and energy impacts would occur under the No Action Alternative.

## TRAFFIC AND PARKING

In the No Action Alternative, traffic and parking demand levels in the study area would increase as a result of general background growth and future developments in the area. A smaller surplus of off-street public parking spaces would exist in the AM peak period as compared to existing conditions; during the midday peak period, a shortage would occur. On-street parking demand would continue to exceed supply throughout much of the day in this alternative.

Unlike the No Action Alternative, the proposed actions would result in significant adverse traffic impacts at 29 signalized intersections in one or more peak periods. The implementation of the proposed mitigation plan would eliminate impacts at 18 of these intersections. However, one or more movements at 11 intersections would remain impacted in one or more peak periods; no feasible mitigation measure have been identified. No significant adverse impacts to on- or off-street parking conditions would result from the proposed actions.

## TRANSIT AND PEDESTRIANS

Under the No Action Alternative, transit and pedestrian facilities in the project area would experience an increase in demand as a result of background growth and future developments anticipated throughout the project area. However, levels of service (LOS) at stairways and fare arrays at subway stations, local bus routes, sidewalks, corner areas, and crosswalks would remain largely the same compared with existing conditions.

Compared to the No Action Alternative, the proposed actions would introduce more new pedestrians to the project area and could allow for the creation of Jay Street Plaza, a transit plaza at Jay Street between Willoughby and Fulton Streets. This public space would potentially include a new subway entrance/exit to the Jay Street-Borough Hall subway station. With the proposed actions, there would be significant adverse impacts at two street stairs at the Jay Street-Borough Hall subway station in one or both peak periods, and New York City Transit's B25 bus route in the eastbound direction in the PM peak period. Pedestrian trips to and from projected development sites would result in significant pedestrian impacts to one crosswalk on Jay Street at Willoughby Street and one crosswalk on Albee Square West at Willoughby Street. As discussed in Chapter 20, "Mitigation," some of these impacts would be mitigated by widening the respective stairways and crosswalks and creating a new subway entrance/exit.

## AIR QUALITY

No violations of the National Ambient Air Quality Standards (NAAQS) are predicted to occur either under the No Action Alternative or with the proposed actions, and both scenarios would be consistent with the New York State Implementation Plan (SIP).

## NOISE

Noise levels under the No Action Alternative would not be expected to be significantly higher than existing levels, and no significant adverse noise impacts would occur at the 16 noise

receptor locations in the project area. In comparison, a significant adverse noise impact could occur along Duffield Street between Willoughby and Fulton Streets under the proposed actions. However, this impact would primarily affect Willoughby Square, a new public space that would only be developed as part of the proposed actions, and no residences would be affected.

### CONSTRUCTION IMPACTS

The No Action Alternative would not generate the temporary construction impacts attributable to the proposed actions. Construction activities under the proposed actions would cause a significant adverse impact on historic resources, which would not occur with this alternative. However, under the proposed actions, all construction would be governed by applicable city, state, and federal regulations regarding construction activities, avoiding significant adverse impacts in other areas. The No Action Alternative would avoid the increase in truck traffic and construction-related noise projected to occur with the proposed actions, but would not provide the economic benefits associated with the construction of the projected development sites.

### CONCLUSION

No significant adverse impacts would occur in the project area under the No Action Alternative. However, the benefits expected from the proposed actions on land use, economics, urban design, and neighborhood character would not be realized under this alternative. In addition, the No Action Alternative would fall far short of the objectives of the proposed actions in facilitating opportunities for new commercial developments with the size and large floorplates required of modern corporate tenants; attracting new businesses and retain businesses considering relocation outside of the City; encouraging new residential, cultural and retail opportunities to meet the needs of workers, residents and visitors; fostering connections between the commercial and retail cores of MetroTech and Fulton Mall, and the Boerum Hill and Fort Greene residential neighborhoods; and enhancing the public environment, ground-floor uses, and streetscapes to make the project area an appealing place to live, work, and visit.

## C. NO UNMITIGATED IMPACTS ALTERNATIVE

This No Unmitigated Impacts Alternative assesses a change in density or program design in order to avoid the potential unmitigated impacts associated with the projected development sites. To avoid the potential unmitigated impacts, this alternative would require that the overall program size for the projected development sites be reduced by approximately 95 percent. Unlike the approximately 6.7 million-square-foot development potential assumed on the projected development sites under the proposed actions, this alternative would limit development on the projected sites to approximately 335,000 square feet. This would represent less than 10 percent of the floor area currently allowed "as-of-right" under the existing allowable zoning and land use regulations.

As presented in Chapter 20, "Mitigation," the development of the projected development sites under the proposed actions would result in significant unmitigated adverse impacts to one or more movements at 11 intersections during one or more peak periods. This No Unmitigated Impacts Alternative considers that a 95 percent reduction of the program size of the projected development sites would be required to reduce the amount of new traffic demand to a level sufficient to eliminate the project's unavoidable significant traffic impacts. With this reduction in traffic demand, many of the measures incorporated in the project's traffic mitigation plan would no longer be necessary.

Additionally, the No Unmitigated Impacts Alternative program would need to avoid the potential unmitigated impacts on historic resources and noise quality. With a 95 percent reduction in the size of the project program, most of the projected development sites would not be developed. Therefore, it is assumed that under this alternative, projected development site AA would not be developed and the potential archaeological resources on a portion of that site (i.e. Block 165, Lot 58) would not be disturbed. However, an unmitigated impact could remain for the other lots which have the potential to contain archaeological resources and are not now and would not become City-owned (Block 164, Lots 1 and 29), as these lots are located on a potential development site and this alternative does not consider a reduction in the scale of development assumed to occur post-2013. Possible actions under the No Unmitigated Impacts Alternative that could serve to avoid potential impacts to architectural resources could include transfer of development rights off the projected development sites containing architectural resources, or contextual downzoning to reduce potential visual impacts on architectural resources. However, downzoning of the project area would not achieve the objectives of the project, which include rezoning to create higher allowable FARs for the creation of buildings with the larger floorplates and square footages required of modern offices. It is also considered unlikely that development rights could be transferred off the projected development sites, as it is reasonable to assume that the development projected to occur on these sites could not occur on other sites within the project area that did not meet the criteria for commercial or residential development.

The reduction in the size of the project program would avoid the unmitigated noise impact at the Site 2 receptor (Duffield Street between Willoughby and Fulton Streets), as no large-scale commercial development would occur on adjacent projected development sites O and P, and no public space or public parking facility would be created on Block 146 that could result in elevated traffic volumes on this street.

## CONCLUSION

As described above, the No Unmitigated Impacts Alternative would limit development on the projected sites to approximately 335,000 square feet, which represents less than 10 percent of the floor area currently allowed "as-of-right" under the existing allowable zoning and land use regulations. Additionally, although the No Unmitigated Impacts Alternative would avoid most of the project's potential unmitigated impacts, it would not avoid all unmitigated impacts to archaeological resources. This No Unmitigated Impacts Alternative is not an acceptable alternative to the proposed Downtown Brooklyn Development Project. By significantly reducing the number of sites to be developed, this alternative would fail to meet the objectives of the project, which include: capturing future economic growth and new jobs by creating opportunities for new office development, by allowing for the creation of buildings with large floorplates and square footages required of modern offices by corporate tenants; encouraging opportunities for residential growth and enhancing vitality through the development of higher-density, mixed-income apartment houses within Downtown Brooklyn; fostering new and varied retail opportunities to meet the needs of workers, residents and visitors and make Downtown Brooklyn an entertainment/leisure destination; and creating a vibrant, multi-use urban environment that serves the residents, businesses, and academic institutions of Downtown Brooklyn and its surrounding communities.

## D. MODIFIED BCURP ALTERNATIVE

The Modified BCURP Alternative considers that the amendments to the BCURP omit the proposed extension of the Urban Renewal area boundary by 9 blocks and the designation of 57 lots within the five proposed development sites: sites I(A), L, M, O, and P (see Figure 21-1). This alternative would preclude the ability to form viable development sites on these blocks that are sufficiently large to accommodate the floorplates and square footages required of modern corporate offices, and would preclude the growth of the overall business district. In addition, without the ability to form viable development sites, none of the proposed mapping actions would be required; the project area's block pattern would remain as it is in current conditions, hindering the accessibility of existing and new development. None of the proposed actions' public spaces would be created under this alternative since these spaces would occupy parcels that would not be newly designated.

Projected development sites not affected by the omissions from the BCURP and other sites previously designated under the BCURP could still be developed; however, unlike the approximately 6.7 million-square-foot development potential assumed on the projected development sites under the proposed actions, this alternative would reduce the overall development potential by 43 percent, to approximately 3.8 million square feet. The viability of the projected commercial development on site Q would be considerably lessened in the absence of the projected commercial developments on sites O and P and the new Willoughby Square public space; if this site could not be developed, the development potential under this alternative would be reduced to 2.2 million square feet, a decrease of 67 percent from the development potential with the proposed actions. In addition, the development under this alternative would primarily increase the institutional and residential presence in Downtown Brooklyn, rather than extend and reinforce the downtown commercial office core. Unlike the proposed actions, this alternative would not result in the direct displacement of an estimated 130 residential units and approximately 100 small commercial and municipal uses. However, development of the previously designated BCURP sites would result in the potential for direct displacement of an estimated 3 residential units and 10 non-residential uses. As with both the proposed actions and this alternative, no significant adverse impacts would occur and as part of the City's site acquisition process, those directly displaced would receive relocation assistance from the City.

With respect to this alternative's effects on potential architectural resources, it would be unlikely that sites L, M, or P would be redeveloped under a single development program. However, it is possible that under this alternative the City could dispose of the Board of Education Building at 131 Livingston Street for redevelopment. Similar to the proposed actions, any plans that include the demolition of 131 Livingston Street, 233 Duffield Street, or 423 Fulton Street would constitute a significant adverse impact on this potential architectural resource. The cast-iron buildings at 565-571 Fulton Street, which are located on a site that was previously designated and approved for acquisition and redevelopment in 1970 as part of the BCURP, could still be removed under this alternative.

Similar to development under the proposed actions, it is possible that the façades of the 131 Livingston Street, 423 Fulton Street, or 565-571 Fulton Street buildings could be preserved in place and incorporated into the façades of modern office buildings; however, this would affect the structure and character of the resources. As partial mitigation, the 131 Livingston Street, 233 Duffield Street, 423 Fulton Street, and 565-571 Fulton Street buildings could be recorded to HABS standards; however, similar to the proposed actions, commitment for mitigation beyond the HABS standards is not possible given that a development program and project developer are

not known. With respect to archaeological resources, in this alternative there would be no subsurface disturbance of the potential archaeological resources on sites I(A), O, and P, as these sites would not be developed. In all other respects, the potential impacts to archaeological resources would remain the same as with the proposed actions.

Without the new developments on sites Q and I(A) bridging the area around Flatbush and Myrtle Avenues, the proposed streetscape improvements on these streets would be less beneficial than with the proposed actions. In addition, there would be fewer changes to the density of the project area or to its view corridors with this alternative. It is possible that new development on a site-by-site basis could occur on sites I(A) or M, as a continuation of existing redevelopment trends in the area; however, such new development is not expected to be of a size to warrant the demapping of Red Hook Lane or Prince Street.

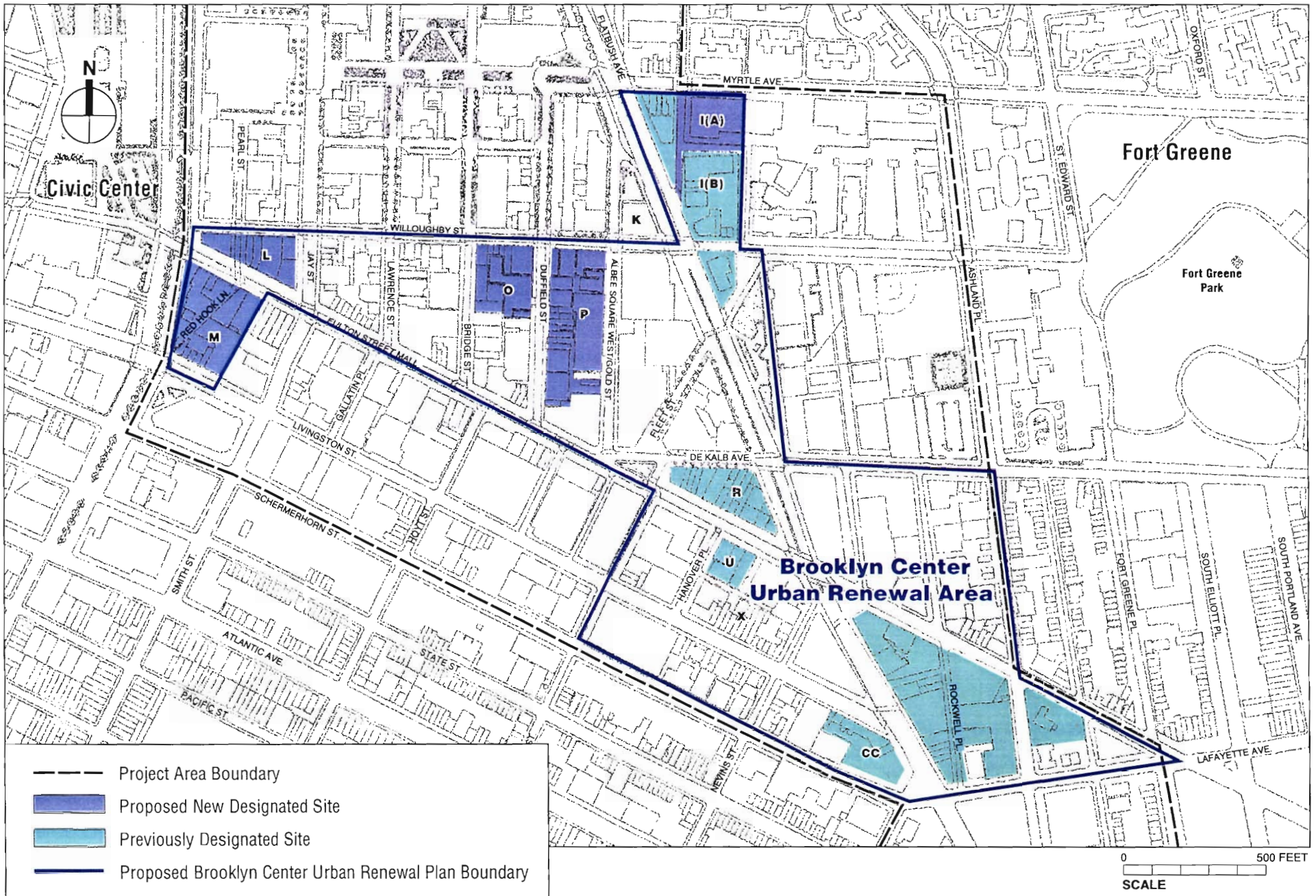
Under this alternative, traffic and parking demands in the study area would be less than under the proposed actions, particularly along Willoughby Street and adjacent streets, since there would be considerably less commercial office and retail development (1.3 to 2.9 million square feet, versus 5.5 million square feet with the proposed actions). However, there would still be significant traffic impacts with this alternative, as the traffic demand would be above the level sufficient to eliminate unavoidable significant traffic impacts (see the "No Unmitigated Impacts Alternative," above). On-street parking demand would continue to exceed supply throughout much of the day. Similarly, although transit and pedestrian facilities in the project area would experience less demand than with the proposed actions, it is expected that significant adverse impacts on pedestrian conditions and subway stair levels of service would still occur. Without the development of the commercial office towers and public parking facility on projected development sites O and P, the predicted unmitigated significant noise impacts resulting from the proposed actions would not occur.

### CONCLUSION

Overall, the Modified BCURP Alternative would allow for less new development and would not allow for the creation of new public spaces. By significantly reducing the ability to provide viable development sites in the Downtown Brooklyn area, this alternative would fail to meet the objectives of the project, which include: capturing future economic growth and new jobs by creating opportunities for new office development, by allowing for the creation of buildings with large floorplates and square footages required of modern offices by corporate tenants; encouraging opportunities for residential growth and enhancing vitality through the development of higher-density, mixed-income apartment houses within Downtown Brooklyn; fostering new and varied retail opportunities to meet the needs of workers, residents and visitors and make Downtown Brooklyn an entertainment/leisure destination; and creating a vibrant, multi-use urban environment that serves the residents, businesses, and academic institutions of Downtown Brooklyn and its surrounding communities.

## E. BQE RAMP ALTERNATIVE

As discussed in Chapter 20, "Mitigation," 18 out of 29 intersections impacted by the proposed actions would no longer be impacted with implementation of the proposed traffic mitigation plan. However, unmitigable impacts would remain in one or more peak periods at a total of 11 intersections, including seven along Flatbush Avenue. Under the BQE Ramp Alternative, a new exit ramp from the westbound Brooklyn-Queens Expressway (BQE) to the BQE service road between North Elliott Place and Navy Street/Ashland Place would be constructed (see Figure




**Proposed Brooklyn Center Urban Renewal Area**

Figure 21-1

21-2). The existing substandard loop-ramp to Navy Street would be eliminated. With this measure, first recommended in NYCDOT's *1987 Downtown Brooklyn Master Planning Improvements Study*, vehicles en route from the westbound BQE to destinations in the Downtown Brooklyn core such as MetroTech, Atlantic Center and the projected commercial developments along Willoughby Street, would have the option of utilizing the new ramp to reach southbound Ashland Place. From Ashland Place, this traffic would then enter the Downtown Brooklyn core via westbound Myrtle Avenue, Willoughby Street and DeKalb Avenue. By allowing Ashland Place to function as a southbound distributor roadway for traffic from the westbound BQE, this measure would reduce southbound demand along the congested Flatbush Avenue corridor. As shown in Figures 21-3 through 21-5, approximately 407 vehicles per hour (vph) would be diverted to southbound Ashland Place from Flatbush Avenue Extension in the AM peak period, 226 in the midday and 347 in the PM peak period.

As discussed in Chapter 14, "Traffic and Parking," the Brooklyn-Queens Expressway is under the jurisdiction of the New York State Department of Transportation (NYSDOT). Planning and implementation of a new off-ramp would therefore require close consultation with NYSDOT. NYSDOT is currently advancing plans to construct a replacement deck for the BQE from Flushing/Classon Avenues to Sands Street beginning in 2004, and is also undertaking a long range study to identify potential intermediate (15 to 20 years) and long range (20+ years) alternatives for improvements to the Brooklyn-Queens Expressway (BQE). Coordination with these ongoing efforts would also be necessary.

In addition to a proposed new BQE off-ramp, the street network modifications recommended as part of the project's traffic mitigation plan (see Chapter 20, "Mitigation") would also be implemented under this alternative. These include:

- the elimination of the northbound left-turn from Flatbush Avenue Extension to Willoughby Street;
- the conversion of Gold Street from one-way northbound to one-way southbound operation between Willoughby Street and Flatbush Avenue Extension;
- conversion of Willoughby Street from two-way to one-way westbound operation between Jay and Pearl Streets;
- conversion of Schermerhorn Street from one-way westbound to two-way operation between Smith Street and Boerum Place; and
- the reconfiguration of the Livingston Street and Schermerhorn Street corridors.

As traffic flows within the study area would be altered by a proposed new off-ramp, especially along the Flatbush Avenue and Ashland Place corridors, some site specific improvement measures (e.g., modifications to signalization, lane configurations and parking regulations) under this alternative would be different than those proposed as part of the project's traffic mitigation plan discussed in Chapter 20. The site-specific measures and their effects at those impacted intersections where a new BQE off-ramp would alter traffic flows compared to the project's traffic mitigation plan are discussed below. These intersections include seven along the Flatbush Avenue corridor (Tillary, Willoughby, Fulton, and Livingston Streets; Myrtle and DeKalb Avenues; and Schermerhorn Street/Lafayette Avenue) along with the intersection of Myrtle Avenue with Ashland Place. At all other impacted intersections, the improvement measures recommended under the BQE Ramp Alternative would be the same as for the proposed actions. Traffic conditions at these locations with these measures would also be the same as for the proposed actions (see Chapter 20, "Mitigation").

Table 21-1 summarizes all of the measures that would be implemented under the BQE Ramp Alternative, while Tables 21-2 through 21-4 show the effectiveness of the proposed traffic improvement measures during the weekday AM, midday and PM peak periods. Table 21-5 provides a comparison of the effectiveness of the mitigation measures with the proposed actions versus those improvement measures under this alternative. Overall, as shown in Table 21-5, a total of nine intersections would have unmitigated significant adverse impacts in one or more peak hours under this alternative, compared to eleven intersections with the proposed actions (described in Chapter 20, "Mitigation"). There would be eight movements with unmitigated impacts in the AM peak hour, three in the midday and six in the PM with this alternative. This compares to 12 movements with unmitigated impacts in the AM peak hour, five in the midday and 15 in the PM with the proposed project's traffic mitigation plan.

## *FLATBUSH AVENUE CORRIDOR*

### *Tillary Street*

The diversion of traffic to Ashland Place via a new BQE off-ramp would reduce demand for the westbound left-turn movement from Tillary Street onto southbound Flatbush Avenue Extension by from 226 to 407 trips in each peak hour (see Figures 21-3 through 21-5). It is also proposed to reorganize the signalization at this intersection as shown in Table 21-1. As shown in Tables 21-2 through 21-4, with these measures, all of the project's impacts at this intersection would be fully mitigated under this alternative.

### *Myrtle Avenue*

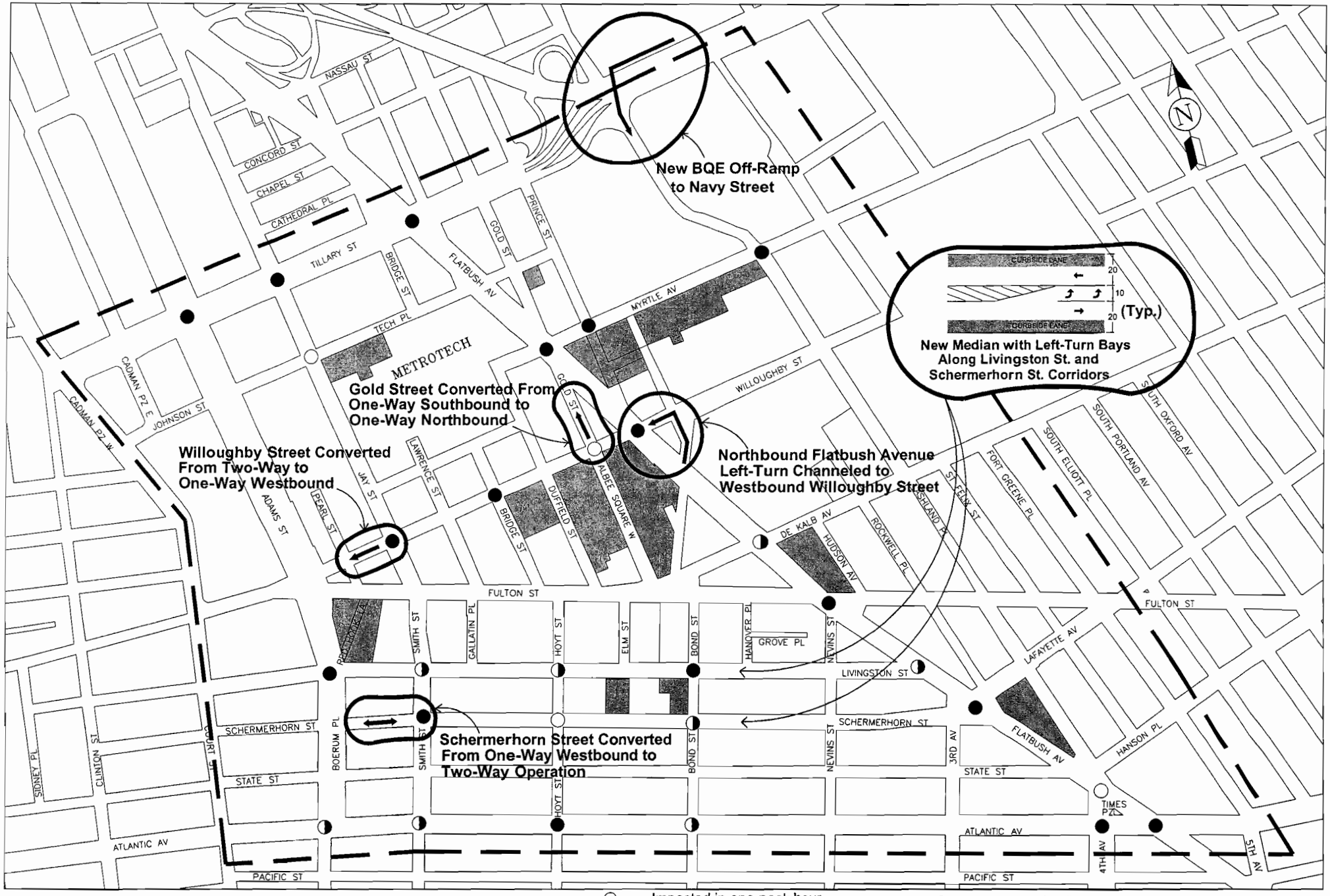
The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp would reduce traffic on the southbound Flatbush Avenue Extension approach to Myrtle Avenue by from 226 to 407 vehicles in each peak period. It is further proposed to implement a "No Standing Anytime" regulation for 100 feet along the east curb of the northbound approach and to transfer green time from the southbound signal phase to the northbound/southbound and the eastbound/westbound phases in one or more peak periods. As shown in Tables 21-2 through 21-4, although many movements at this intersection would continue to operate at LOS E or F with high delay in one or more peak periods, these measures, combined with traffic diversions from a new BQE off-ramp, would address all of the project's significant impacts at this intersection with the exception of the AM peak hour impact to the eastbound left-turn movement. Delay for this movement, while lower than under the proposed project's mitigated condition, would still be higher than in the No Build condition.

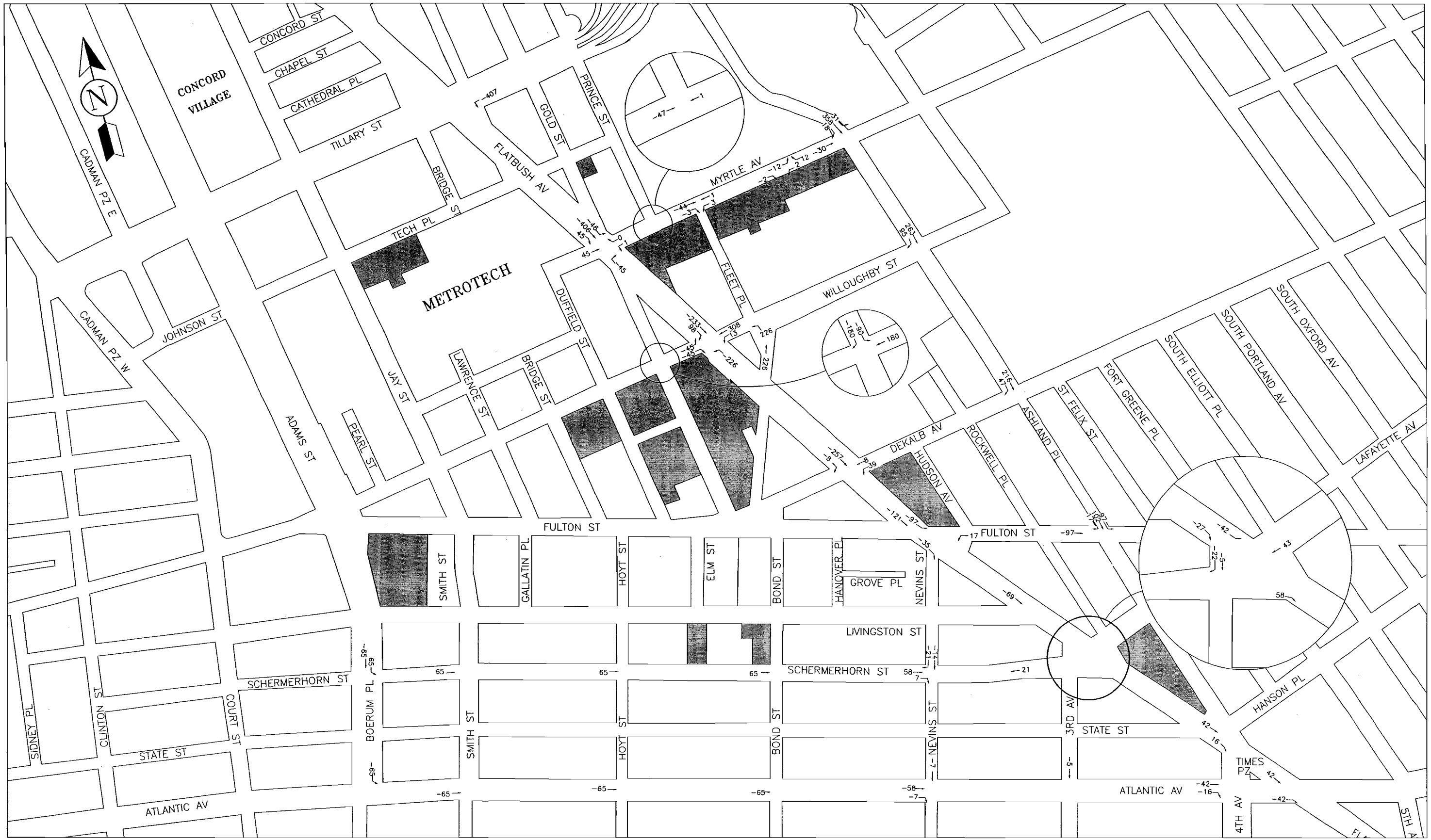
### *Willoughby Street*

The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp under this alternative would reduce through traffic on southbound Flatbush Avenue Extension approaching Willoughby Street. Two additional street network changes that would be implemented under both the project's mitigation plan and this alternative would also alter traffic flows at this intersection. The conversion of Gold Street from southbound to northbound operation would reduce traffic on the eastbound Willoughby Street approach to the intersection, but also increase volumes on the southbound right-turn movement. In addition, with the elimination of the northbound left-turn from Flatbush Avenue Extension onto westbound Willoughby Street, all traffic making this movement would instead use northbound Fleet Place to reach westbound Willoughby Street, increasing volumes on this approach. This latter measure would allow for the elimination of the northbound left-turn phase and the provision of a

# Street Network Modifications With The BQE Ramp Alternative

**Figure 21-2**





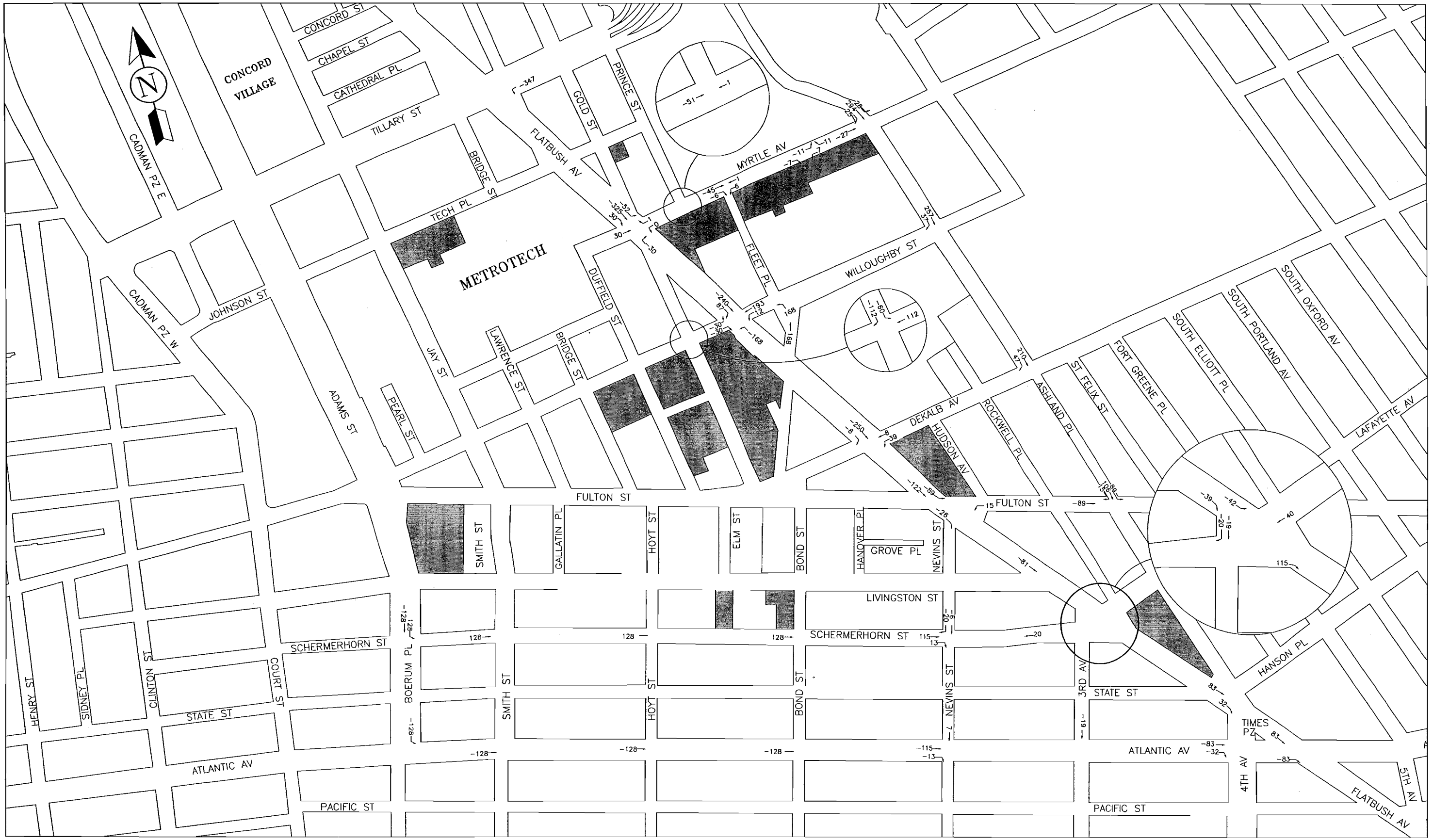

Projected Development Site

BQE Ramp Alternative Traffic Diversion Increment- MD Peak Hour

Figure 21- 4




Projected Development Site




Projected Development Site

as potential architectural resources. Should these buildings be designated by LPC as New York City Landmarks, or listed on the State and National Registers of Historic Places, they would be provided with varying levels of regulatory control over their future alteration and would be eligible for commercial rehabilitation tax credits and other mechanisms to support their preservation and continued use. The designation of individual buildings as landmarks and the designation of an historic district along Fulton Street would be at the discretion of LPC and City Council following comprehensive research and consultation with the community, and is outside the scope of the proposed actions. In addition, through the Fulton Mall Improvement Association's master planning effort, strategies will be addressed to restore the façades of historic buildings along Fulton Street. It is possible that in the future, the Fulton Mall Improvement Association or other local economic development organizations may also work with property and business owners to encourage upper-story use of the buildings on Fulton Street.

**Comment 46:** 227 Duffield Street was part of the Duffield Street Estates and part of the Underground Railroad. Artifacts, medicine bottles, and boxes of wood were found in my backyard. (23)

I will give documentation of the Underground Railroad history of my building located at 233 Duffield Street. (32)

The buildings on Duffield Street that are tied to the Underground Railroad should not be disturbed. (3, 12)

**Response:** In response to this comment, research was conducted to determine whether any evidence of an association with Underground Railroad activities could be established for these sites (227 Duffield Street, 233 Duffield Street, and 436 Gold Street/Albee Square West). The research effort focused on documenting the construction date of the buildings, as well as their owners and residents during the most active period of the Underground Railroad, roughly between 1827 and 1865. Based on this research, no documentable association with the Underground Railroad could be established for the 227 Duffield Street, 233 Duffield Street, and 436 Gold Street buildings. Documentation of the Underground Railroad history of 233 Duffield Street was not provided by the property owner as of the date of the FEIS. There is no evidence to support a determination that these properties are eligible for either National Historic Landmark status or for listing on the National Register of Historic Places in relation to the Underground Railroad. However, additional work, first in the form of a visual inspection of the interiors of the buildings after condemnation to ascertain the existence of other artifacts and, second, in the form of new continuous soil borings, will be undertaken at the sites, in order to ascertain the potential existence of tunnels under the street buildings and any corroborating artifacts. This testing would be impracticable prior to demolition of these

**Response:** 81 Willoughby Street, 101 Willoughby Street, and 105 Johnson Street (aka 122 Tillary Street) were previously determined eligible for listing on the State and National Registers of Historic Places (S/NR listing) by the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), and were deemed eligible for New York City Landmark (NYCL) designation by the New York City Landmarks Preservation Commission (LPC) as part of the Downtown Brooklyn project. These buildings were considered in Chapter 7, "Historic Resources" as known architectural resources.

As part of the Downtown Brooklyn project, LPC has deemed 15 Willoughby Street (aka 345 Adams Street and 11-17 Willoughby Street), 456 Fulton Street (aka 450 Fulton Street), 505 Fulton Street (aka 248 Duffield Street), 131 Livingston Street, 308-310 Livingston Street, 375 Fulton Street (better known as 376 Fulton Street), 418-434 Fulton Street, and 233 Duffield Street eligible for NYCL designation and S/NR listing; 567-571 Fulton Street eligible for NYCL designation; and 446 Fulton Street and 25 Elm Place eligible for S/NR listing. These buildings were considered in Chapter 7, "Historic Resources" as potential architectural resources.

370 Jay Street, 532-540 Fulton Street, and 2-6 Flatbush Avenue (aka 2-12 Nevins Street) were deemed not eligible for NYCL designation or S/NR listing by LPC as part of the Downtown Brooklyn project. Therefore, they were not considered in the historic resources analysis.

**Comment 45:** The plan should create a historic district along Fulton Street – an Old Brooklyn Commercial/Downtown Historic District. It should promote the conservation, adaptive reuse of buildings and upper-story residential use, selective downzoning, and restoration. (14, 19, 37, 59)

Find ways to emphasize the worth of historic buildings in Downtown Brooklyn, though designation or a special zoning area. This might spur funding opportunities to rehabilitate downtown rather than tearing it down. (6)

The City should encourage developers to preserve and protect historic facades in the Downtown Brooklyn plan. (4)

The City should explore the creation of a special Transfer of Development Rights district to discourage the warehousing of historic properties and encourage their rehabilitation and full use. (59)

The City should designate the most significant buildings as individual NYC landmarks to provide regulatory control over their alteration and provide incentives through private and public programs to encourage property owners to restore their buildings. (59)

**Response:** A number of buildings in the Downtown Brooklyn project area, particularly along Fulton Street, were identified through the environmental review process

throughout the year. It is expected that the landscaping of the Square would consist largely of shade-tolerant plants, thereby reducing or avoiding impacts to vegetation. Without the proposed actions, this new public space would not exist.

**Comment 42:** The City should maximize open space development and rehabilitate downtown area parks and open space such as Cadman Plaza Park, Walt Whitman Park, and McLoughlin Park. (7, 4, 20, 54, 56)

The City should: 1) fund the maintenance and upkeep of existing parks in Community District 2; 2) explore the establishment of an endowment; 3) fund the development of the planned South Oxford Park and recreation center; 4) fund the park and open space projects listed in Community Board 2's register of capital budget priorities; 5) plant trees wherever possible, in containers and in the ground, throughout the community district. (8)

The City should use the money to be used for acquiring the IDC site for improving existing parks instead. (16)

The open space in the plan is not adequate. (60)

The plan must create more open space around the State Street corridor and Boerum Hill. (20, 65)

**Response:** In response to comments in support of the Institute of Design and Construction, based on its importance to the area, the privately-owned portion of site K (Block 2060, Lots 1 and 4) has been removed from the proposed development plan. The open space to be provided with the proposed actions would address the needs of new workers and residents. Any commitment to upgrade existing parks in the Downtown Brooklyn area is outside the scope of the proposed actions.

**Comment 43:** Lower Manhattan is getting, three times as much open space as Downtown Brooklyn. (20)

**Response:** A similar comment was made during the public review of the draft scoping document for the DSEIS. This comment refers to capital spending and does not pertain to this EIS.

## HISTORIC RESOURCES

**Comment 44:** The following buildings should be reviewed as possible landmarks: 375 Fulton Street, 418-34 Fulton Street, 446 Fulton Street, 456 Fulton Street, 505 Fulton Street, 532-540 Fulton Street (aka 2-12 Nevins Street and 2/4/6 Flatbush Avenue), 567-571 Fulton Street, 233 Duffield Street, 25 Elm Place, 370 Jay Street, 105 Johnson Street, 131 Livingston Street, 308-310 Livingston Street, 15 Willoughby Street (aka 345 Adams Street), 81 Willoughby Street, 101 Willoughby Street. (8, 36, 37)

**Response:** Market studies to determine the type of retail use that should occupy a space based on market demand is outside the scope of this EIS. As defined in the *2001 CEQR Technical* Manual, the purpose of the economic study presented in the EIS is to determine the potential for significant adverse impacts on neighborhood character due to changes in land use and, direct and indirect displacement resulting from the proposed actions.

**Comment 40:** There must be careful planning and consideration for the inclusion of women and minority-owned entrepreneurs and professionals in every phase of development from design, professional services, construction to post-construction, and retail opportunities. (5, 6)

The plan should maximize participation of minority and women contractors and consultants, and Brooklyn material suppliers. (4)

The project needs to provide job training. (18, 23)

There needs to be an equitable distribution of economic development opportunities. The implementation of the plan should be responsible and equitable. There should be a registry of employment seekers. (47)

**Response:** The City, through the Department of Small Business Services (DSBS), will provide outreach to small businesses and minority- and women-owned business enterprises (MWBEs) to create opportunities. The DSBS office will be opening up an office in Downtown Brooklyn, which will have approximately 24 staff members to serve the Downtown Brooklyn small businesses.

Additionally, the Downtown Brooklyn Council is partnering with the City and the Downtown Brooklyn Advisory and Oversight Committee to identify contracting opportunities for local, minority- and women-owned businesses. The Downtown Brooklyn Workforce Development Committee, which was established in November 2003, will identify processes to connect local residents, job training and placement organizations, and downtown businesses. Its goal is to ensure that local residents benefit from over 19,000 permanent jobs that will result from the plan.

**OPEN SPACE**

**Comment 41:** The amount of open space contemplated by the proposed plan is relatively modest, and will also need to meet the highest standards of design. It is important that planned open spaces be located in sites that will not be in shadow during peak hours of their use. (59)

**Response:** As described in Chapter 6, "Shadows", the development anticipated as a result of the proposed actions on sites O, P, and Q would surround Willoughby Square, the public space to be created by the proposed actions, and shadows from these developments would cover portions of Willoughby Square

**Response:** The approximately 100 businesses that potentially could be displaced by the proposed actions, as disclosed in the EIS were determined based on a lot by lot survey of the existing uses. Displaced commercial tenants are entitled to relocation benefits by HPD.

**Comment 37:** TrackData, located at 95 Rockwell Place, would be subject to condemnation and relocation with the project. We've been in business for 22 years as a software developer; we employ a couple of hundred people, operate 24 hours a day, 7 days a week, and have a payroll of $10 million. To be relocated would be distressing and expensive, costing many millions of dollars; it would be a tremendous burden. We would have to reinstall expensive high-tech/high-speed data lines to the markets. We would require at least 45,000 square feet at another location. Don't take resources away from our people. We would consider moving to New Jersey if it's cheaper, although many of their employees live in Brooklyn. (42)

**Response:** This business is located on a previously designated site (Site 7) under the Brooklyn Center Urban Renewal Plan (BCURP). Site 7 is neither a projected nor potential development site under the Downtown Brooklyn Development plan. Site acquisition and relocation of uses could move forward absent the approvals of the proposed actions. Nonetheless, should the site be acquired by the City acquisition under the current BCURP or as part of the Downtown Brooklyn project, the affected property owner(s) and businesses would be justly compensated. Further, the relocation benefits would be developed to address an individual business' needs with the goal of keeping as many as possible within the project area.

**Comment 38:** We did a more accurate census of the housing units. There is an average of 6 people in each apartment right now. (32)

**Response:** The commentator did not provide data to support this rather high occupancy rate such as location and number and type of units surveyed. Chapter 3, "Socioeconomic Conditions" of the EIS presents an average occupancy rate of 2.1 residents per unit for the project sites and study area, compared with 2.8 residents per unit for the borough of Brooklyn. The occupancy rates used in the EIS are based on the 2000 Census, which is a widely accepted source and is in conformance with the approach to impact assessment as outlined in the 2001 *CEQR Technical Manual.*

**Comment 39:** The project should enhance the commercial district that exists without displacing those Brooklynites who already shop there. Market studies should be conducted to identify the needs of the Fulton Street's current and future potential shoppers to help the Fulton Mall Association and community groups "grow" the kinds of retail that are most needed and desirable. (59)

efforts that have retained and attracted companies in New York. Retention of jobs within New York City is certainly one of the principal goals of the plan but so is the need for job growth in the borough. While the initial jobs may be transfers, over time, employment growth could be realized through the expansion of those companies, job turnover, and/or the establishment of new businesses in the area to service the relocated companies.

**Comment 35:** There are approximately 20 Korean-American businesses in Downtown Brooklyn. They were given no notice of their possible eviction; most owners have not heard of this plan. There should be proper notification, full compensation for the value of their businesses, and relocation assistance should be a guarantee. (62)

There are approximately 20 Chinese-American business owners in Downtown Brooklyn. There needs to be greater assurance on compensation (more than nominal compensation), more communications in Chinese and Korean, and preferential treatment in relocation. The increased rents at new buildings would not be affordable for existing businesses. (41)

**Response:** As a follow-up to this comment made at the public hearing, the submitted list of Asian-American businesses were compared with those occupying previously designated or newly proposed sites in the BCURP to assess which businesses would be potentially affected. Of the 32 businesses owners on the list, 18 would be affected: 13 businesses are located on sites newly proposed for designation and four businesses are located on previously designated sites. There are 4 businesses located on BCURP Site 4 and one business on BCURP Site 3B. However, because the proposed actions have been revised to de-designate Site 3B, this business is no longer at risk.. All affected property owners were noticed three times by certified mail and notices were posted at affected properties for tenant notification. It should be noted that City-acquisition and relocation, owners and tenants affected by this action will receive compensation. The property owner will receive market value for his or her property and commercial or residential tenants will receive relocation benefits. Businesses that would be displaced would be provided with relocation and compensation assistance, based on individual needs, by a variety of agencies, including the Department of Small Business Services, EDC, and the Cornerstone Group, which has been hired specifically for the Downtown Brooklyn plan.

**Comment 36:** The disclosure that approximately 100 businesses would require compensation and relocation is misleading. This project would confiscate 300 businesses with a combined market value of between $130 million and $200 million. There's no compensation provided for the value of these businesses. There are no local leases in Atlantic Center or MetroTech. These independent retailers are being removed, not relocated. (69)

## SOCIOECONOMIC CONDITIONS

**Comment 31:** Consult with the Borough President's Workforce Development Task Force and the Downtown Brooklyn Council in order to coordinate job training and counseling initiatives as a means to maximize local hiring. (4)

**Response:** As part of the public/private effort on this project, the City and the Downtown Brooklyn Council are committed to providing initiatives to encourage local job training and hiring. Additionally, the Downtown Brooklyn Workforce Development Committee, which was established in November 2003, will identify processes to connect local residents, job training and placement organizations, and downtown businesses. Its goal is to ensure that local residents benefit from the approximately 19,124 permanent jobs that will result from the plan.

**Comment 32:** Small business needs are not being considered. (14)

**Response:** The City, through the Department of Small Business Services (DSBS), will provide outreach to small businesses and minority- and women-owned business enterprises (MWBEs) and to help create job opportunities. The DSBS office in Downtown Brooklyn will have approximately 24 staff members and will serve the Downtown Brooklyn small businesses. Additionally, the Downtown Brooklyn Council is partnering with the City and the Downtown Brooklyn Advisory and Oversight Committee to identify contracting opportunities for local, minority-, and women-owned businesses. In addition, approximately 19,124 net new jobs would be created in Downtown Brooklyn as a result of the proposed actions.

**Comment 33:** The Training and Employment Council of Brooklyn, which began as the Downtown Brooklyn Training and Employment Council, supports the plan. Existing businesses should be encouraged to and supported in occupying new space when it becomes available. (11)

**Response:** Comment noted.

**Comment 34:** There will be no new jobs, just relocated jobs. (12, 14, 35)

The talk of job training for the community is just talk. (12)

The project needs to get actual numbers from developers and supporters that show real job creation, not relocation. Look at MetroTech and Atlantic Center Mall in terms of how successful they have been for Brooklyn and New York City. (53)

**Response:** The proposed actions would reinforce Downtown Brooklyn's role as a regional central business district and build on the success of previous development

Do not upzone, do not demap, do not build big box and skyscrapers, do not build so big. (9, 34)

**Response:** The portion of the project area proposed for a rezoning to C6-4.5 would fulfill a major project goal of facilitating as-of-right development of appropriate higher-density, mixed-use developments within an integrated, comprehensive plan. The Special Downtown Brooklyn District (SDBD) and the urban renewal plans provide height, setback, streetwall, and other urban design controls intended to produce building designs of superior quality. The density provided by the proposed zoning is necessary for the development of new, modern, and efficient office space.

**Comment 29:** The proposed plan should not include an extension of the urban renewal plans for another 40 years. There should be a sunset period. The urban renewal plans can be blight itself. (7, 30)

Do not extend the urban renewal plans. This would adversely affect neighborhood investment as sites wait for condemnation. They reduce community participation in the planning and implementation of development (6, 9, 14, 16, 34)

**Response:** The proposed plan amendments encompasses a large area containing previously designated and newly designated properties, properties to be acquired, and City-owned properties. The Downtown Brooklyn Development project seeks approval of a number of land use actions that would facilitate long-term, forward-looking planning. As part of this long-term planning, the extension of the urban renewal plans would allow flexibility to implement the proposed plan to respond to market cycles. The impacts of the proposed urban renewal actions are discussed in the appropriate chapters of the FEIS.

**Comment 30:** The original EIS indicated that the extent of the first planned taking of property would be up to Lot 18 on Block 146, but upon entry of the Duffield Street Block Association in opposition to the plan, the plan suddenly changed to include all the activists who own property on the block. The plan increased 50 percent on Block 146, from ¼ of the block to almost ½ of the block. (50)

**Response:** This comment is inaccurate. Under the Downtown Brooklyn Development plan, site P has always comprised Block 146: Lots 2, 7, 11-18, 23, 29, 34-37, 41-43, and 46-52. There have been no changes to the lot designations on site P since this project's initial proposal.

planning for this area. In addition, the Downtown Brooklyn Council, an association of business, institutional and academic entities, plans to assess and possibly undertake the creation of a Transportation Management Association (TMA), parking patterns in residential neighborhoods, and a wide range of strategies to improve mass transit and alternative transit access. The New York City Department of Small Business Services has very recently opened an office in Downtown Brooklyn, on Elm Place, in order to assist local businesses and expand opportunities for minorities and women-owned businesses in the area. In addition, the Fulton Street Business Improvement District (BID) is working with Fulton Street merchants to restore the buildings along this street, and with the City to create incentives for historic building restoration. Although social issues, such as high unemployment or high crime, cannot be rectified through the land use process, approximately 19,124 net new jobs would be created in Downtown Brooklyn as a result of the proposed actions.

## LAND USE, ZONING, AND PUBLIC POLICY

**Comment 27:** There should be an overall height limit of 250 feet, and no flexibility on tower regulations. (3)

Establish a building height limit of 250 feet, unless otherwise set lower, for the area bounded by Boerum Place, Fulton Street, Flatbush Avenue, and Livingston Street. (8)

There must be a height limit. There's no reason to have tall buildings; you can develop without them. (43)

**Response:** Imposing a building height limit of 250 feet within the Downtown Brooklyn area would unduly inhibit building design flexibility. Development sites in Downtown Brooklyn are already constrained in size for modern, efficient office building construction. The proposed new height and setback regulations address this deficiency with the option of either a standard building envelope with the height limit of 250 feet, or a tower building with the maximum base height and no height limit. The tower option allows buildings to have a shorter base with a slender tower and transfer floor area from adjacent buildings. Furthermore, there are already a number of tall office towers in the surrounding area. In addition, the proposed actions do include height limits adjacent to the surrounding residential neighborhoods. Chapter 9, "Neighborhood Character" and Chapter 6, "Shadows," of the EIS discuss the potential impacts of the proposed actions.

**Comment 28:** The proposed C6-4.5 zoning district should be C6-4. (3)

The C6 zoning of the project area should remain. (16)

Many upzonings are planned in Brooklyn; upzoning would be bad here. There's already a glut of unused space in Downtown Brooklyn. (43)

**Response:** As noted on page 1-21 of the "Project Description," CEQR assessments of large area-wide zoning proposals not associated with specific development projects are based upon the likely development scenarios within a 10-year build period. This is the time frame that can be reasonably predicted without engaging in highly speculative projections. The analysis of a 10-year build timeframe is a widely accepted and appropriate practice. The rate of development projected to occur within that period is based on conservative market projections.

**Comment 25:** Throughout the DEIS, analytical methods are described in such general ways that it is virtually impossible for even the most diligent reviewer to reconstruct the process to verify the results. (44)

**Response:** The DEIS/DSEIS was prepared and submitted to all interested City agencies for their technical review including relevant supporting data addressing the analysis approach, methodology, assumptions, and results. The methodologies utilized for the analyses presented in the DEIS/DSEIS were in conformance with the 2001 *CEQR Technical Manual.* The discussions presented in the EIS need to balance the technical intricacies of the impact analysis and its associated volume of data with the need to present information that can be understood by the general public.

**Comment 26:** The DSEIS leaves many problems unaddressed, such as the high unemployment rate, inadequacy of participation by local businesses and contractors, shortage of affordable housing, destruction of historic buildings, need for more schools and recreational facilities, traffic congestion, and noise and air pollution. (6)

**Response:** As noted previously, the EIS has been prepared in conformance with the 2001 *CEQR Technical Manual* to provide the decision-makers with the results of the impact analyses for the relevant environmental areas such as land use, open space, community facilities (i.e., schools), economics, historic resources, traffic, parking, air quality and noise. This disclosure document, along with the recommendations made by elected officials, community board, civic organizations, and the interested public, will be used by the decision-makers to determine the approvals for the proposed actions. In response to comments received throughout the project's public review and outreach process, the plan has been modified and expanded to consider a number of the issues listed above. The FEIS reflects these modifications as summarized in the Foreword and updated throughout the FEIS chapters.

There are a number of independent but interrelated initiatives being undertaken to support and enhance the redevelopment of Downtown Brooklyn, which are outside the scope of the CEQR analysis. NYCDOT and EDC have announced their intention to commence a comprehensive transportation analysis, or "transportation blueprint" study, of Downtown Brooklyn. NYCDOT also has recently hired a Downtown Brooklyn Traffic Coordinator to facilitate traffic

**Response:** The proposed Atlantic Yards Arena and Redevelopment project has been considered in the assessment of potential environmental impacts as part of the DSEIS, issued on March 8, 2004, for the Downtown Brooklyn Development project. Although the Downtown Brooklyn Development project is not linked to the approval of the Arena project or any of its components, the overall Arena project was included as part of the future baseline condition in the same way that other unbuilt projects were accounted for in the EIS. Table 1-7 of the EIS presents the all the future baseline projects, including Atlantic Terminal, BAM and the Arena proposal, that were included in the EIS assessment.

**Comment 22:** The EIS has many fatal flaws. It seems like Robert Moses is behind this, it is moving forward so quickly. (32)

The EIS is flawed; it uses outdated data and assumptions and is in need of serious reworking. (51)

**Response:** The data, assumptions, and analytical methods used in the EIS are in conformance with the 2001 *CEQR Technical Manual*, and were subject to public review during the scoping sessions. Relevant comments were responded to in the Final Scope of Analysis, which formed the framework for the DEIS/DSEIS.

**Comment 23:** Many comments about the proper study area and issues to be addressed in the scope of the DEIS were made by thoughtful, knowledgeable community activists. Not one was heeded. (44)

**Response:** The comments made on the Draft Scope of Analysis for the DEIS and the Draft Scope of Analysis for the DSEIS were considered and responded to as part of the Final Scope of Analysis for the DEIS and Final Scope of Analysis for the DSEIS. Where relevant to the EIS scope of work, the comments were incorporated into the Final Scopes, which formed the framework for the DEIS/DSEIS impact analysis.

**Comment 24:** The DEIS, even with its recent supplement, is a completely invalid basis for making a judgment. The EIS only addresses 6.7 million square feet of development, not 14 million square feet (the full build out), which is obligated under CEQR. Despite CEQR guidelines that require assessing the full build-out of multi-year projects, the second 7 million square feet of what will become as-of-right development has not been considered at all in the DSEIS. The argument that further growth is too speculative to project and, if it occurs, is subject to additional environmental review are specious. (44)

The EIS should study the traffic and transportation impacts of full build-out on every site identified in the Downtown Brooklyn Plan and project assumptions for a period of 25 years. (8)

actions have to be balanced and considered against the benefits that would be derived from the development to be created, including more customers coming to the area, and more residential and commercial opportunities. Businesses and residents that would be displaced by such development would be provided with relocation and compensation assistance by a variety of agencies, on an individual-by-individual basis and as fairly as possible.

**Comment 19:** Deal with eminent domain fairly and sensitively. Compensate appropriately and relocate businesses/residents within the study area. (71)

Treat those subject to displacement and/or acquisition in the urban renewal process with dignity and respect. (4)

**Response:** The power of eminent domain will be used only as necessary, as specific projects are ready for development. The businesses that would be displaced would be provided with relocation assistance and compensation, based on individual needs, by a variety of agencies, including the Department of Small Business Services, EDC, and the Cornerstone Group, which has been hired specifically for the Downtown Brooklyn plan. HPD will work with those residents who would be directly displaced to find appropriate housing, whether in new, local 80/20 or 50/30/20 housing units or elsewhere. Such residents would be given priority status with HPD and the New York City Housing Authority for any available units. All persons subject to displacement would be treated with dignity and respect.

**Comment 20:** Mandate phased relocation from the plan area only when a specific development plan is in place. (36)

**Response:** Redevelopment would proceed as market demand emerges to ensure that tenants and developers are committed before a site acquisition takes place.

**EIS FRAMEWORK AND ANALYSIS**

**Comment 21:** The Arena complex could jeopardize the success of the Downtown Brooklyn plan. Its impact must be considered as well. The proposed development plan for Downtown Brooklyn, which would include the Arena complex, the Atlantic Terminal complex, and the BAM LDC complex, has the potential to radically and permanently change every aspect of our borough forever. The plan will transform downtown into a miniature metropolis within the central confines of our traditional neighborhoods. (6)

The Downtown Brooklyn plan should be redone to consider the proposed Arena project. To talk about the plan and the proposed Arena project separately is beyond absurd. (31)

**Response:** The New York City Department of Housing Preservation and Development (HPD) has identified a menu of various resources of housing opportunities that serve families and individuals in every income group. HPD staff will work will all relocatees to provide appropriate housing in newly created or existing units that become available in Downtown Brooklyn and surrounding areas. Residential relocatees will receive a priority to rent or purchase units in HPD programs as well as in the New York City Housing Authority.

**Comment 18:** This plan is not in keeping with the original intent of the use of eminent domain. Eminent domain should be avoided. (14, 16, 34, 45, 53, 64, 69)

Eminent domain is extortion. There's no such thing as fair compensation when you're forced to sell. (31)

Eminent domain is the most powerful tool government has. It should be used judiciously and only for specific programs. (30, 46)

There needs to be a more creative compensation package; currently, only the owners get compensation, and lessors only get compensation for fixtures and relocation assistance. Consider the market value (vs. appraised value) of buildings and businesses with leases. (3)

Fair market value should be compensated in terms of highest and best use. Compensation under eminent domain should be based on the free market. (12, 69)

Compensation at fair market value is not enough. Eminent domain is a violent and blatant violation of homeowner's rights. (70)

Compensation of $15,000 for tenants is nothing. People never recover from relocation. (23)

BNN Fulton Flushing LLC strenuously objects the potential taking of their property at 423 Fulton Street. The threat of condemnation inhibits the ability to finance and make planned improvements. (63)

Brooklyn USA employs 50 people and occupies 3 floors; it would be displaced by the project. (15)

**Response:** The rationale for condemnation is to implement the goals of the urban renewal plan, which includes removal of blight and the elimination of vacancies and substandard conditions in the urban renewal area. The use of eminent domain is necessary for the proposed development plan in order to create the larger, more viable development sites necessary for modern office construction. The power of eminent domain will be used only as necessary, as specific projects are ready for development. The proposed actions' impacts on socioeconomic conditions, including the potential for direct and indirect displacement of residents and businesses, will be considered by the decision-makers in their decision to approve or disapprove the proposed actions. The impacts of the proposed

actions would facilitate the development of Atlantic Yards Arena and Redevelopment Project.

**Comment 16:** For any sites developed in the Brooklyn Center Urban Renewal Plan with residential use or mixed-use projects that include residential uses, no less than 20 percent of the units per development should be affordable. Give priority to residents of Community District 2 to 50 percent of all affordable units in all City-funded projects within the plan. (4)

Affordable housing programs should be part of the plan. Underutilized upper stories of the buildings on Fulton Street are excellent candidates for conversion to residential or live-work spaces, including some at lower and middle-income rents. We would strongly support affordable housing programs on the blocks between Livingston and Schermerhorn Streets. (59)

Affordable housing needs to be included in the plan. (18, 53, 60)

The plan should incorporate the 50/30/20 affordable housing ratio into all future housing and require developers' participation in the Quality Housing Program for residential construction. (8, 36)

Implementation of the 80/20 affordable housing program should be on-site, not located off-site at the fringe of the district. (73)

**Response:** The proposed actions do not preclude the development of affordable housing. Public initiatives for the provision of mixed-income housing are currently available to private developers. The New York City Housing Development Corporation (HDC) provides tax-exempt bond financing that has been successful in encouraging private development of mixed-income housing throughout the City.

In addition, the proposed actions include the mapping of an underlying C6-4 district in portions of the rezoning area. In C6-4 districts, the Inclusionary Housing program is available, but not required. The Inclusionary Housing program allows a bonus of 2 FAR provided that new development complies with the requirements set forth in Sections 23-90 through 23-94 of the Zoning Resolution. Such housing may be provided on-site, within the same community district or within an adjacent community district within a one-half mile radius of the development. At this time, it is not contemplated that the proposed actions would include a requirement for on-site, affordable housing other than what the Inclusionary Housing regulations already prescribe. For the purposes of analyzing the potential socioeconomic impacts of the proposed actions, it is more conservative to analyze the development of market rate rather than affordable housing.

**Comment 17:** The 50/30/20 affordable housing ratio will not meet the needs of families, who with no credit, will not qualify for this program. (23)

**Response:** The privately-owned portion of site K (Block 2060, Lots 1, 4), currently occupied by the Institute of Design and Construction has been removed from the proposed project's development plans. Its withdrawal from the plan is in response to comments in support of the existing school, based on its importance to area. All corresponding land use actions related to that portion of the site—including rezoning, changes to allowable use, acquisition/disposition of those lots, and modifications to ground-floor retail requirements, streetwall continuity and curb cut restrictions—have been withdrawn from the EIS and ULURP applications. All relevant sections of the FEIS have been revised to reflect the removal of this site from the plan.

**Comment 14:** The potential taking of Site 3 is disturbing. There is an educational institution based in Downtown Brooklyn that is scheduled to expand into the building at 522 Fulton Street. I and the other owners of this building plan to spend millions of dollars of new construction to accommodate this educational institution. However, the project cannot go forward if our building is not removed from the plan. (24)

**Response:** In response to this comment, several urban renewal sites previously designated but never acquired have been removed from the BCURP. This would facilitate the development of Long Island University's expansion and minimize further site acquisition as part of the proposed actions. Because this institutional expansion would be in keeping with the goals of both the BCURP and the proposed actions, the removal of these sites was deemed appropriate.

**Comment 15:** The project should remove Site 6A from the Downtown Brooklyn plan and decouple the Downtown Brooklyn and Arena projects. (3)

The sites around the Brooklyn Academy of Music (BAM) should be used for the creation of a cultural district, not as bargaining chips in the debate over the Nets arena program. (30)

Site 6[A] is going through ULURP. Why won't the rest of the Arena project go through ULURP? (31)

**Response:** In order to minimize confusion between the Downtown Brooklyn Development project and the proposed Arena project, all land use actions proposed as part of the Downtown Brooklyn plan for Site 6A (Block 1118) of the Atlantic Terminal Urban Renewal Plan (ATURP) have been withdrawn. This site, located at the southeast corner of Atlantic and Flatbush Avenues, was neither a projected nor potential development site; however, a number of land use actions were being sought for the site including rezoning, modification of allowable use, and acquisition/disposition of that property under the ATURP. These proposed actions affecting this block have been removed from the EIS and ULURP applications in response to concerns raised during the public review that these

## PROPOSED PROJECT AND DISCRETIONARY ACTIONS

**Comment 10:** On what figures do you base the projected occupation of buildings, since so much back-office work is being outsourced to other countries? Do you have any commitments from actual corporations? (64)

The DSEIS discloses 6.7 million square feet of office space and says that it is primarily for back-office space, but the appeal for this is limited. (3)

Back office space is being exported to other countries. (14)

Where are the studies showing the need for new office development? (31)

**Response:** Current economic projections show an overall increase in all office-using employment over the next 25 years, and growth in sectors such as business services will drive regional demand for new office space to over 110 million square feet. In order for the City to be able to compete effectively in the region and ensure that it maintains its current market share, a breadth of office space options must be made available.

**Comment 11:** The below-grade garage will probably have six levels, with half below the water table. (32)

**Response:** The proposed 694-space below-grade public parking facility at Willoughby Street is currently designed to have 4 below-grade parking levels. The proposed garage would be approximately 40 feet below street grade; there are no flooding issues anticipated with this parking facility.

**Comment 12:** The project should consider additional design guidelines for streetscapes. (6)

There should be design guidelines for streetscapes. (60)

**Response:** The development plan proposes numerous urban design controls in the proposed zoning regulations and urban renewal plans. These controls include additional streets where street trees, streetwalls, and ground floor retail stores are proposed, new standardized storefront regulations, sidewalk widenings, building design restrictions and new parks and open spaces. Furthermore, the Brooklyn Center Urban Renewal Plan will include design controls for the buildings surrounding the new Willoughby Square public space.

**Comment 13:** The plan should reconsider the designation of the Institute of Design and Construction site for acquisition. The City should, instead, redirect the funds that would otherwise have been used to acquire, demolish, and pay for moving and other expenses associated with the Institute of Design and Construction to improving neighborhood parks and open spaces. (4, 16)

towers going up at once but this is not very likely as the plan will take years to fulfill. (38)

The Municipal Arts Society agrees with the goals of many specifics in the plan, as well as its emphasis on economic development. (59)

KeySpan supports the plan, which offers a comprehensive vision for Downtown Brooklyn. It will strengthen the economic center of America's fourth largest city. By providing nearly one million square feet of retail space, the plan will strengthen and diversify the available retail options. The plan will provide new job opportunities, housing units, cultural facilities, tax revenue, and construction opportunities. (75)

**Response:** Comment noted.

**Comment 9:** The plan will help the New York City College of Technology meet the needs of our students. It will replace deteriorating buildings and will serve as a model of the first higher education public-private partnership in the state, and perhaps the nation. The plan should be approved—to not do so and to delay could mean great missed opportunities for Brooklyn. (17)

The Brooklyn Public Library strongly supports the plan. It will allow the library to use City-owned property to construct a spectacular new visual and performing arts library. (25)

BAM LDC supports the Downtown Brooklyn plan because it addresses many of the City's needs for more office space, jobs, housing, educational facilities, improved transportation networks, and new cultural facilities, right here in Brooklyn. (29)

BAM LDC supports the Downtown Brooklyn plan because it would create many important syngergies between the cultural district and an expanded business district. Applications in the Downtown Brooklyn plan enable the BAM LDC development to go forward. (48)

Polytechnic University strongly supports the plan. Development of a vigorous 24/7 community in the areas affected by the plan is important for the school's future and its ability to serve our students. Implementation of the plan would be a giant step in this direction. (67)

Brooklyn Law School endorses the plan's efforts to fortify the area's commercial core, to develop mixed income housing, and to strengthen Downtown Brooklyn's academic institutions. This plan signals that Downtown Brooklyn is on the brink of another new and greater era. (72)

**Response:** Comment noted.

There are a number of independent but interrelated initiatives being undertaken to support and enhance the redevelopment of Downtown Brooklyn which are outside the scope of the CEQR analysis. NYCDOT and EDC have announced their intention to commence a comprehensive transportation analysis, or "transportation blueprint" study, of Downtown Brooklyn. NYCDOT also has recently hired a Downtown Brooklyn Traffic Coordinator to facilitate traffic planning for this area. In addition, the Downtown Brooklyn Council, an association of business, institutional and academic entities, plans to assess and possibly undertake the creation of a Transportation Management Association (TMA), parking patterns in residential neighborhoods, and a wide range of strategies to improve mass transit and alternative transit access. The New York City Department of Small Business Services has very recently opened an office in Downtown Brooklyn, on Elm Place, in order to assist local businesses and expand opportunities for minorities and women-owned businesses in the area. In addition, the Fulton Mall Improvement Association has begun a master planning effort focused on streetscape improvements, façade restorations of historic buildings, and an improved retail mix.

**Comment 7:** This is civic leadership in action. The City needs to be competitive in capturing new development, new jobs, and new opportunities. The revised zoning envelope for Downtown Brooklyn can help us do that. (30)

**Response:** Comment noted.

**Comment 8:** The Downtown Brooklyn plan will strengthen Downtown Brooklyn's economic base and will provide over 24,000 jobs over the next ten years. The plan takes an innovative approach to economic development and revitalization, the need for a commercial core, and the need for space for our academic and cultural centers to flourish. (40)

The Downtown Brooklyn plan will create a vibrant economic center. The new plan provides a sensible transition from commercial to residential areas. It will capture regional employment growth, serve arts organizations, and bring in tax revenue. (46)

The plan is a well thought out proposal that can be the catalyst to many wonderful projects that will not only ensure the long-term survival of Brooklyn as a viable borough for living, working and recreating, but will also put Brooklyn in a very competitive position in these areas as it relates to Manhattan. (24)

Multiple siting options are necessary in order to attract business tenants. This plan will improve of Downtown Brooklyn. Fear of massive traffic, pedestrian congestion, and multiple large construction sites are based on the idea of several

**Response:** Comment noted.

**Comment 5:** The area is already in the midst of an organic vitalization; focus on this organic growth. It is not the plan or nothing; lots of this plan is purely speculative, short-sighted and not sustainable. (73)

**Response:** The Downtown Brooklyn Development project is a public planning effort that will facilitate future mixed-use development in a thoughtful, comprehensive manner. The Downtown Brooklyn Development project is a long-term plan that anticipates gradual development based on market demand; however, it is vital that the necessary approvals and overall guidelines be in place in order to react nimbly to the needs of future market cycles and trends.

**Comment 6:** The Downtown Brooklyn plan is much needed because of its City- and region-wide importance. However, a process is needed for the future refinement of the plan, phasing of development, a comprehensive traffic study, a parking plan, and a design strategy for individual projects to prevent insensitive architecture. (74)

The core of the plan is positive, and with some improvements, it would merit the enthusiastic support of the community I represent. A full and complete plan must address the impact on the surrounding residential neighborhoods in terms of traffic congestion, parking, and open space. (7)

Steps must be taken to address traffic calming, parking solutions, improved recreation spaces, jobs, and opportunities for the arts and culture. (4)

The City's plan deserves to create sustainable economic development in Brooklyn deserves support but the City should go much further by truly investing in Brooklyn's infrastructure. It must create a comprehensive traffic mitigation and mass transit improvement proposal, promote open space and historic preservation, and encourage the development of affordable housing and opportunities for minorities and women-owned businesses. The City must make serious investments in appropriate school infrastructure for the increased population. (5)

**Response:** The FEIS has been prepared in conformance with the 2001 *CEQR Technical Manual* to provide the decision-makers with the results of the impact analyses for the relevant environmental areas such as land use, open space, community facilities, economics, historic resources, traffic, and parking. This disclosure document, along with the recommendations made by elected officials, community board, civic organizations, and the interested public, will be used by the decision-makers to determine the approvals for the proposed actions. In response to comments received throughout the project's public review and outreach process, the plan has been modified and expanded to consider many of the issues listed above.

In addition, the project sponsors have undertaken and will continue their outreach to the community on the progress of the project. The plan continues to be fine-tuned in response to discussions with elected officials and community leaders. Numerous meetings have been held with the local community boards, tenants associations, arts groups, churches, and neighborhood groups. A number of proposed actions have been withdrawn from the FEIS and ULURP applications in response to public comments. Further opportunities for public comment will be available during the City Council review period.

**Comment 2:** There were only 15 days to review the DEIS instead of the minimum 30 days prescribed by City Environmental Quality Review (CEQR). (44)

**Response:** This comment is incorrect. The project is in conformance with CEQR regulations. The DSEIS was issued on March 8, 2004, and the public review and comment period extended through April 7, 2004.

**PROJECT DESCRIPTION/PROPOSED ACTIONS**

**Comment 3:** The scale of development proposed is not appropriate for Brooklyn. The existing infrastructure cannot support this kind of development. (12, 16, 64)

Development should fit within the context of Brooklyn, its brownstone neighborhoods, and small neighborhoods. (33, 35, 45, 53)

**Response:** The Downtown Brooklyn Development project is a comprehensive, public planning effort whose stated goals include: 1) to increase opportunities for integrating commercial, residential, and academic growth in Downtown Brooklyn; 2) to promote connections between the area's commercial core and surrounding academic, cultural, and residential neighborhoods; and 3) to reinforce the positive character of surrounding neighborhoods. The potential development of large-scale commercial uses is balanced with mixed-use residential, retail, and academic facilities, as well as an improved streetscape and the creation of open space. The sponsors believe that this plan would create appropriate massing and design guidelines to respond to the context of the surrounding buildings and uses and to create an attractive area that is an appealing place to live, work, and visit and transitions easily into neighboring residential areas. In general, the proposed actions are expected to transform the appearance of the project area, through streetscape enhancements that would unify the urban design of the area and bridge gaps in the urban fabric, and through the creation of new developments that would enhance the vitality of the area and foster connections between MetroTech and Fulton Mall and the Boerum Hill and Fort Greene neighborhoods to the south and east.

**Comment 4:** PlaceMatters supports revitalization without gentrification. Downtown Brooklyn should remain a welcoming commercial center for its current constituents. (57)

71. Michael Weiss, Executive Director, Fulton Mall Improvement Association and MetroTech BID, oral comments
72. Joan Wexler, Brooklyn Law School, oral comments
73. Zafra Whitcomb, oral comments
74. Kim Williams, AIA New York Chapter, oral comments
75. Albert Wiltshire, KeySpan, written submission dated March 24, 2004

# C. RESPONSE TO COMMENTS

## GENERAL / PUBLIC REVIEW PROCESS

**Comment 1:** The community was not informed in a timely fashion. (50)

The community should have been involved. Urban renewal should be a partnership. There's a rush to push this plan through. (51)

This project does not respect the efforts of the community. The community should be engaged in this process. (27)

The decisionmaking process should be kept at a local level with input from the City Planning Commission, the City Council, community boards, and residents and business owners. Control should not be given over entirely to developers and others who have an agenda that does not reflect the needs of the community. (18, 20, 26)

There should have been more inclusive planning from the start of the process. (44)

There has not been a public planning process. (14)

There has been a lack of community outreach. The only communication was a notice on my door, no registered letter. (32)

There has been a lack of input from property owners. (70)

**Response:** The CEQR process has provided multiple opportunities for community input into the plan. A public scoping meeting on the project's Draft Scope of Analysis was held on May 20, 2003 to accept oral comments, and oral comments and written submissions received through May 30, 2003 were considered in the preparation of the Final Scope. The Notice of Completion for the DEIS, issued November 28, 2003, also solicited comments. A public scoping meeting on the Draft Scope of Analysis for the Supplemental EIS was held on February 23, 2004 to accept oral comments, and oral comments and written submissions received through March 4, 2004 were considered in the preparation of the Final Scope. The Notice of Completion for the DSEIS, issued March 8, 2004 also solicited comments. A public hearing on the DEIS/DSEIS was held on March 24, 2004. Oral comments and written submissions received through April 7, 2004 were considered in the preparation of the FEIS.

39. Scott P. Heyl, President, Preservation League of New York State, written submission dated April 2, 2004
40. Bill Howell, Howell Industries, oral comments and written submission dated March 24, 2004
41. Francis Kwan-Yu Hsueh, oral comments
42. Martin Kaye, Chief Operating Officer and Chief Financial Officer, Track Data Corporation, oral comments
43. Irma Kennedy, State Street Block Association, oral comments
44. Carolyn Konheim, Chair, Community Consulting Services, oral comments and written submissions dated March 24, 2004 and April 7, 2004
45. Lucy Koteen, Fort Greene Association, oral comments
46. Paul Kursner, ConEd, Renaissance Housing Program, oral comments
47. Maria Lewis, Brooklyn United for Innovative Development, oral comments
48. Jeanne Lutfy, President, Brooklyn Academy of Music LDC, oral comments
49. Frank J. Macchiarola, St. Francis College, undated written submission
50. George Mays, Duffield Street Block Association, oral comments and undated written submission
51. Daniel McCalla, Brooklyn Coalition Against Urban Removal, oral comments and undated written submission
52. Jane McGroarty, Brooklyn Heights Association and Downtown Brooklyn Coalition, oral comments
53. Margaret McNabb, oral comments and written submission dated April 5, 2004
54. Paul Nuccio, President, Concord Village Owners, Inc., written submission dated March 31, 2004
55. Randolph Peers, Brooklyn Chamber of Commerce, oral comments and written submission dated March 24, 2004
56. Howard Pitch, Fort Greene Association, oral comments
57. Marci Reaven, Director, PlaceMatters, written submission dated March 23, 2004
58. Thomas Rooney, Prospect Heights Action Coalition, oral comments
59. Frank Sanchis, Municipal Art Society, oral comments and written submissions dated January 15, 2004 and March 24, 2004
60. JoAnne Simon, Downtown Brooklyn Coalition, oral comments and written submission dated March 29, 2004
61. Joseph Sitt, Chairman of Fulton Street Business Improvement District (BID) and affected property owner, oral comments
62. Austin So, Korean American League for Civic Action, oral comments
63. Robert A. Spiegelman, written submission dated March 22, 2004
64. Monica Abels Stabin, oral comments
65. Julia Stanton, Executive Director, Brooklyn Heights Association, written submission dated March 30, 2004
66. Carlecia Taylor, Downtown Brooklyn Council, oral comments and written submission dated March 24, 2004
67. Richard Thorsen, Vice President-Development and University Relations, Polytechnic University, written submission dated March 24, 2004
68. Carol Trezza, Vice President for Urban Planning, Real Estate Board of New York, Inc., undated written submission
69. Philip Truscott, Brooklyn Vision, oral comments
70. Dave Walker, affected property owner at 436 Albee Square West, oral comments

6. Velmanette Montgomery, State Senator, oral comments presented by Arthur Haywoode with written submission dated March 24, 2004
7. David Yassky, City Council, 33rd District, oral comments

**COMMUNITY BOARDS, CIVIC ORGANIZATIONS AND INTERESTED PUBLIC**

8. Brooklyn Community Board 2, oral comments presented by William Vinicombe with written submission dated February 18, 2004
9. Brooklyn Community Board 2, Landmarks Committee, oral comments presented by Cathy Wassylenko
10. Brooklyn Community Board 6, oral comments presented by Jerry Armer
11. Edwin Alcea, Training and Employment Council of Brooklyn, oral comments
12. John Anselmo, Institue for Design and Construction, oral comments
13. Victoria Aviles, President, MetroTech Business Improvement District, undated written submission
14. Sandy Balboza, Atlantic Avenue Betterment Association, oral comments and written submission dated March 24, 2004
15. Joseph Batesh, Brooklyn USA, affected business and property owner, oral comments
16. Vincent Battista, Institute for Design and Construction, oral comments
17. Fred Beaufait, President, New York City College of Technology, oral comments and undated written submission
18. Samantha Bernadino, oral comments
19. Charla Bolton, Society for the Preservation of Long Island Antiquities, written submission dated March 30, 2004
20. Nancy Bowe, Brooklyn Heights Association, oral comments
21. Noah Budnick, Projects Director, Transportation Alternatives, written submission dated March 24, 2004
22. Michael Burke, President, Downtown Brooklyn Council, oral comments
23. Joy Chatel, Duffield Street Block Association and affected property owner at 227 Duffield Street, oral comments
24. Isaac Chera, Crown Acquisitions, written submission dated March 24, 2004
25. Ginnie Cooper, Brooklyn Public Library, oral comments
26. J. Allison Crockett, Prospect Heights Action Coalition, written submission dated March 26, 2004
27. John Crow, Brooklyn Bear's Community Garden, oral comments and written submission dated March 26, 2004
28. Gary Curry, President, Cornerstone Group, oral comments
29. Peter Gee, Chief Financial Officer, Brooklyn Academy of Music, oral comments
30. Marilyn Gelber, Executive Director, Independence Community Foundation, oral comments and written submission dated March 24, 2004
31. Daniel Goldstein, oral comments
32. Lewis Greenstein, affected property owner at 233 Duffield Street, oral comments and undated written submission
33. Heloise Gruneberg, President, Brooklyn Vision, oral comments
34. Patti Hagan, Prospect Heights Action Coalition, oral comments
35. Schellie Hagan, Prospect Heights Action Coalition, oral comments
36. Ursula Hahn, written submission dated March 30, 2004
37. Meredith Hamilton, Brooklyn Heights Association, oral comments
38. Chris Havens, Two Trees Management, oral comments

## A. INTRODUCTION

This chapter summarizes and responds to substantive comments received during the public comment period on the Draft Environmental Impact Statement (DEIS) and the Draft Supplemental Environmental Impact Statement (DSEIS) for the Downtown Brooklyn Development project. Public review of the DEIS/DSEIS began on March 8, 2004 with the issuance of the notice of completion and publication of the DSEIS. A public hearing was held on March 24, 2004 at Klitgord Auditorium at the New York City College of Technology to accept oral comments. The oral comments and written submissions on the DEIS/DSEIS received through April 7, 2004, the close of the public comment period, were considered in the preparation of the Final Environmental Impact Statement (FEIS).

Section B identifies the agencies, organizations, and individuals who commented on the DEIS/DSEIS. Section C summarizes and responds to each substantive comment. The comments are organized by subject area. Because of the number of comments, where multiple comments were made on the same subject matter, a single comment has been selected to summarize the essence of those individual comments on the same subject. Following each comment is the list of people who made the comment identified by number as listed in Section B. Responses then follow each comment.

Where relevant, these changes have been incorporated into the FEIS. Revisions to the DEIS/DSEIS are indicated by double-underlining.

## B. AGENCIES, ORGANIZATIONS AND INDIVIDUALS WHO COMMENTED ON THE DEIS/DSEIS

### AGENCIES

1. New York City Department of Housing Preservation and Development, oral comments from Assistant Commissioner for the Division of Neighborhood Planning, Christopher Cirillo
2. New York City Department of Small Business Services, oral comments from Commissioner Robert W. Walsh

### ELECTED OFFICIALS

3. Letitia James, City Council, 35th District, oral comments and written submission dated March 24, 2004
4. Marty Markowitz, Brooklyn Borough President, oral comments presented by Gregory Atkins, Chief of Staff and undated written submission
5. Joan L. Millman, Member of Assembly, 52nd Assembly District, written submission dated March 24, 2004

## E. NOISE

As discussed in Chapter 17, "Noise" and Chapter 20, "Mitigation", at the Site 2 noise receptor, located at Duffield Street between Willoughby and Fulton Streets, future noise levels with the proposed actions would increase by up to 3.4 dBA compared to future noise levels without the proposed actions during the AM peak period. Increases of this magnitude would be perceptible and, based upon CEQR noise impact criteria, would constitute a significant noise impact. This impact would occur because of the relatively low volumes at this location without the proposed actions, and the number of vehicles (particularly trucks) generated by the development expected on this street and in the surrounding area. While no residences would be impacted with the proposed actions, the increase in noise levels at Site 2, during the AM peak period would exceed the CEQR impact criteria and thus, the project would have a significant noise impacts at this location. There is no feasible mitigation to eliminate this impact at this site during this time period, and thus it would constitute an unmitigated project impact. ✷

## C. TRAFFIC AND PARKING

As detailed in Chapter 20, "Mitigation," the development of the projected sites under the proposed actions would result in significant adverse traffic impacts at 29 signalized intersections in one or more peak periods. Eighteen out of the 29 intersections impacted by the development of the projected sites would no longer be impacted with the implementation of proposed traffic mitigation plan. However, as shown in Table 22-1, one or more movements at eleven intersections would remain impacted in one or more peak periods. No feasible mitigation measures have been identified; additional measures will be explored in coordination with New York City Department of Transportation to reduce or eliminate these unmitigated significant adverse impacts.

**Table 22-1**

**Intersections With Unmitigable Impacts**

| Intersections | Number of Unmitigated Impacts | | |
|---|---|---|---|
| | AM | Midday | PM |
| Adams Street @ Tillary Street | 4 | 2 | 2 |
| Atlantic Avenue @ Bond Street | 0 | 1 | 0 |
| Atlantic Avenue @ Flatbush Avenue | 0 | 0 | 1 |
| Atlantic Avenue @ Fourth Avenue | 1 | 0 | 0 |
| Atlantic Avenue @ Smith Street | 1 | 0 | 0 |
| Flatbush Avenue @ Fulton Street | 0 | 0 | 2 |
| Flatbush Avenue @ Hanson Place/Fourth Avenue | 0 | 0 | 2 |
| Flatbush Avenue @ Livingston Street | 1 | 0 | 0 |
| Flatbush Avenue @ Myrtle Avenue | 4 | 0 | 2 |
| Flatbush Avenue @ Schermerhorn Street/Lafayette Avenue | 0 | 0 | 3 |
| Flatbush Avenue @ Tillary Street | 1 | 2 | 3 |

## D. TRANSIT AND PEDESTRIANS

Mitigation measures to address subway station stairway impacts typically involve physically widening an affected stairway in order to increase its capacity, or implementing measures that would decrease demand, typically by providing new and/or more convenient access points. At Stair S3, at the northwest corner of Jay and Fulton Streets, a one-foot widening would restore this stair to LOS C in the PM peak period, comparable the No Build condition and below NYC Transit's minimum standard of 10 persons per foot-width per minute (PFM). However, while such mitigation is feasible, it would not be practical to undertake for this moderate level of impact. (Stair S3 would operate at a functional LOS D in the PM peak period). In addition, urban renewal changes proposed as part of this project would also allow for the creation of a transit plaza at Jay Street between Willoughby and Fulton Streets. This public space—Jay Street Plaza—would potentially include a new subway entrance/exit to the Jay Street-Borough Hall station. A new subway entrance/exit located within this plaza would fully address the PM peak period impact to Stair S3. Therefore, pending the implementation of a new transit plaza, the proposed actions' impact to Stair S3 would remain unmitigated.

# Chapter 22: Unavoidable Significant Adverse Impacts

## A. INTRODUCTION

Unavoidable significant adverse impacts are defined as those that meet the following two criteria:

- There are no reasonably practicable mitigation measures to eliminate the impacts; and
- There are no reasonable alternatives to the proposed project that would meet the purpose and need of the action, eliminate the impact, and not cause other or similar significant adverse impacts.

## B. HISTORIC RESOURCES

### ARCHAEOLOGICAL RESOURCES

As discussed in Chapter 7, "Historic Resources" and Chapter 20, "Mitigation," the New York City Landmarks Preservation Commission (LPC) has determined that there are 31 lots—21 lots on four projected development sites and 10 lots on six potential development sites—that are considered to be potentially sensitive for 19th century archaeological resources. Individual Stage 1A Archaeological Assessments will be prepared for those lots that are currently City-owned or are acquired by the City, as directed by LPC, before development of these sites would commence. If determined necessary by LPC as a result of the Stage 1A Archaeological Assessment, Stage 1B field testing—for which a protocol would be submitted to and approved by LPC—and further testing, if needed, will be undertaken prior to development of these sites. In the event that Stage 1B field testing confirms that there are significant archaeological resources on the lots which cannot be recovered during the testing phase, full archaeological excavation will occur or the development will be redesigned to leave the resources protected in place. All archaeological work will be completed under LPC review and adhere to the standards set forth in the 2001 *City Environmental Quality Review (CEQR) Technical Manual* and the Archaeological Guidelines for work in New York City. Under the revised Brooklyn Center Urban Renewal Plan (BCURP), each redeveloper would be required to perform all mitigation measures identified in the FEIS, such as future archaeological work, prior to issuance of a certificate of occupancy. With these measures, the proposed actions would not result in any significant adverse impacts on archaeological resources on these City-owned or would be acquired lots.

For the lots which are not now and would not become City-owned (Block 165, Lot 58 and Block 164, Lots 1 and 29), a mechanism does not exist to ensure that Stage 1A Archaeological Assessments (and, if necessary, archaeological field testing) would be undertaken prior to development. Therefore, the potential loss of archaeological resources on these lots pursuant to their development would be considered a potential unmitigated, significant adverse impact.

*MYRTLE AVENUE CORRIDOR*

*Ashland Place (Navy Street)*

The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp would increase traffic on the southbound Ashland Place (Navy Street) approach to Myrtle Avenue by from 226 to 406 vehicles in each peak period. To accommodate this increase in traffic, it is proposed to make full use of the 56-foot roadway width of Ashland Place by providing two lanes in each direction plus left-turn bays. This would require implementing a "No Standing Anytime" regulation for approximately 200 feet along the east curb on the northbound approach to the intersection. It is also proposed to implement a no standing 7-10 AM and 4-7 PM regulation for 100 feet along the north curb of the westbound approach. As shown in Tables 21-2 through 21-4, with these measures all approaches at this intersection would operate with lower delay under the BQE Ramp Alternative than in the No Build condition

## CONCLUSION

A total of nine intersections would have unmitigated significant adverse impacts in one or more peak hours under this BQE Ramp Alternative, compared to eleven intersections with the proposed actions. Overall, this BQE Ramp Alternative would improve traffic conditions in the study area. As was noted in Chapter 20, "Mitigation," the City recognizes the historic and continued traffic issues in the Downtown Brooklyn area, whose congested conditions would continue to exist regardless of the proposed actions. The City is committed to seeking remedies to these significant congested conditions and the City has initiated discussions with NYSDOT and this consultation is on-going.

✷

**Table 21-5**

**Summary of Traffic Impacts with the BQE Ramp Alternative**

| Intersections | | Proposed Actions | | | BQE Ramp Alternative | | |
|---|---|---|---|---|---|---|---|
| | | AM | MD | PM | AM | MD | PM |
| Atlantic Avenue and | Flatbush Avenue | X | X | U | X | X | U |
| | Fourth Avenue | U | X | X | U | X | X |
| | Bond Street | X | U | | X | U | |
| | Hoyt Street | X | X | X | X | X | X |
| | Smith Street | U | | X | U | | X |
| | Boerum Place | X | | X | X | | X |
| Flatbush Avenue and | Tillary Street | U | U | U | X | X | X |
| | Myrtle Avenue | U | X | U | U | X | X |
| | Willoughby Street | X | X | X | X | X | X |
| | DeKalb Avenue | X | | X | X | | X |
| | Fulton Street | X | X | U | X | X | X |
| | Livingston Street | U | | X | U | | X |
| | Schermerhorn Street/Lafayette Street | X | X | U | X | X | U |
| | Fourth Avenue/Hanson Place | | | U | | | U |
| Jay Street and | Tech Place | | | X | | | X |
| Livingston Street and | Bond Street | X | X | X | X | X | X |
| | Hoyt Street | | X | X | | X | X |
| | Smith Street | | X | X | | X | X |
| | Boerum Place | X | X | X | X | X | X |
| Myrtle Avenue and | Prince Street | X | X | X | X | X | X |
| | Ashland Place | X | X | X | X | X | X |
| Schermerhorn Street and | Bond Street | X | | X | X | | X |
| | Hoyt Street | | | X | | | X |
| | Smith Street | X | X | X | X | X | X |
| Tillary Street and | Adams Street | U | U | U | U | U | U |
| | Jay Street | X | X | X | X | X | X |
| Willoughby Street and | Albee Square West/Gold Street | | | X | | | X |
| | Bridge Street | X | X | X | X | X | X |
| | Jay Street | X | X | X | X | X | X |

**Notes:** X–All impacts fully eliminated. U–One or more unmitigated impacts in the peak hour.

*Schermerhorn Street/Lafayette Avenue*

The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp would reduce traffic on the southbound Flatbush Avenue approach to Schermerhorn Street/Lafayette Avenue by from 51 to 81 vehicles in each peak period. In combination with adjustments to signal timing (see Table 21-1), the project's potential impacts to the westbound approach in the PM, the northbound approach in the AM and midday, and the southbound left-turn movement in all three peak periods would be fully mitigated under this alternative. Although delay to the northbound approach in the PM peak hour would be reduced compared to the future action with mitigation condition, this movement would remain impacted under the BQE Ramp Alternative.

## Table 21-4 (Continued)
## BQE Ramp Alternative Traffic Conditions- PM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | | Mitigation | | | | | BQE Off-ramp Alternative | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay LOS |
| Bond Street (NB) @ Atlantic Avenue (E-W) | EB-LT | 0.77 | 22.0 | C | 0.83 | 24.3 | C | | | | | | | | | | |
| | WB-TR | 0.86 | 26.9 | C | 0.89 | 29.5 | C | | | | | | | | | | |
| | NB-LTR | 0.48 | 33.7 | C | 0.48 | 33.7 | C | | | | | | | | | | |
| Hoyt Street (SB) @ Atlantic Avenue (E-W) | EB-TR | 0.69 | 19.2 | B | 0.71 | 19.6 | B | | 0.65 | 18.2 | B | | | 0.65 | 18.2 | B | |
| | WB-LT | 0.91 | 30.8 | C | 0.92 | 31.8 | C | | 0.92 | 31.8 | C | | | 0.92 | 31.8 | C | |
| | SB-LTR | 1.21 | >150 | F | 1.79 | >150 | F | * | 1.01 | 72.8 | E | | | 1.01 | 72.8 | E | |
| Smith Street (N-S) @ Atlantic Avenue (E-W) | NB-L | EB-LT | 1.13 | 90.7 | F | 1.20 | 120.5 | F | * | 1.09 | 76.2 | E | | | 1.09 | 76.2 | E | |
| | NB-T | | | | | | | | | | | | | | | | |
| | NB-R | WB-T | 0.71 | 20.4 | C | 0.74 | 21.4 | C | | 0.73 | 20.5 | C | | | 0.73 | 20.5 | C | |
| | SB-T | WB-R | 0.34 | 14.4 | B | 0.36 | 14.7 | B | | 0.35 | 14.1 | B | | | 0.35 | 14.1 | B | |
| | SB-R | NB-L | 0.49 | 36.0 | D | 0.49 | 36.0 | D | | 0.50 | 37.2 | D | | | 0.50 | 37.2 | D | |
| | | NB-TR | 0.52 | 34.3 | C | 0.55 | 35.0 | C | | 0.56 | 36.0 | D | | | 0.56 | 36.0 | D | |
| Boerum Place (N-S) @ Atlantic Avenue (E-W) | EB-DfL | | 1.07 | 114.9 | F | 1.13 | 135.0 | F | * | 1.05 | 105.4 | F | | | 1.05 | 105.4 | F | |
| | EB-TR | | 0.69 | 28.7 | C | 0.74 | 30.8 | C | | 0.69 | 27.0 | C | | | 0.69 | 27.0 | C | |
| | WB-LT | | 0.84 | 48.8 | D | 0.90 | 54.9 | D | * | 0.85 | 48.6 | D | | | 0.85 | 48.6 | D | |
| | WB-R | | 0.35 | 0.9 | A | 0.35 | 0.9 | A | | 0.35 | 0.9 | A | | | 0.35 | 0.9 | A | |
| | SB-L | | 0.79 | 32.4 | C | 0.79 | 32.6 | C | | SB-L 0.73 | 31.9 | C | | SB-L | 0.73 | 31.9 | C | |
| | SB-TR | | 0.87 | 38.3 | D | 0.97 | 51.4 | D | * | SB-TR 0.71 | 31.6 | C | | SB-TR | 0.71 | 31.6 | C | |
| | | | | | | | | | | SB-R 0.71 | 39.0 | D | | SB-R | 0.71 | 39.0 | D | |
| Jay Street (N-S) @ Tech Place (E-W) | WB-LTR | WB-LR | 0.31 | 23.9 | C | 0.61 | 30.5 | C | | 0.59 | 30.0 | C | | | 0.59 | 30.0 | C | |
| | NB-TR | NB-LT | 1.00 | 51.4 | D | 1.07 | 73.2 | E | * | 0.54 | 14.7 | B | | | 0.54 | 14.7 | B | |
| | SB-LT | SB-TR | 0.90 | 33.1 | C | 0.93 | 37.0 | D | | 0.93 | 37.0 | D | | | 0.93 | 37.0 | D | |
| Smith Street (N-S) @ Schermerhorn (E-W) | | | | | | | | | | EB-LT 0.35 | 27.1 | C | | EB-LT | 0.35 | 27.1 | C | |
| | WB-T | | 0.54 | 50.7 | D | 0.55 | 51.1 | D | | WB-T 0.64 | 34.0 | C | | WB-T | 0.64 | 34.0 | C | |
| | WB-R | | 0.39 | 47.1 | D | 0.40 | 47.3 | D | | WB-R 0.48 | 31.0 | C | | WB-R | 0.48 | 31.0 | C | |
| | NB-LTR | | 1.11 | 131.7 | F | 1.19 | >150 | F | * | 1.02 | 67.6 | E | | | 1.02 | 67.6 | E | |
| | SB-L | | 1.27 | >150 | F | 1.42 | >150 | F | * | 1.07 | 95.3 | F | | | 1.07 | 95.3 | F | |
| | SB-R | | 0.66 | 77.4 | E | 0.89 | 103.6 | F | * | 0.48 | 14.3 | B | | | 0.48 | 14.3 | B | |
| Fulton Street (E-W) @ Flatbush Avenue (N-S) | EB-LTR | | 0.20 | 37.6 | D | 0.20 | 37.6 | D | | 0.20 | 37.6 | D | | | 0.19 | 36.3 | D | |
| | WB-LT | | 0.77 | 63.3 | E | 0.59 | 63.3 | E | | 0.59 | 63.3 | E | | | 0.80 | 64.8 | E | |
| | WB-R | | 0.41 | 22.6 | C | 0.42 | 22.8 | C | | 0.42 | 22.8 | C | | | 0.43 | 23.8 | C | |
| | NB-TR | | 0.98 | 57.6 | E | 1.02 | 66.0 | E | * | 1.02 | 66.0 | E | ** | | 0.99 | 56.5 | E | |
| | SB-L | | 0.96 | 66.9 | E | 0.98 | 71.4 | E | * | 0.98 | 71.4 | E | ** | | 0.87 | 53.2 | D | |
| | SB-T | | 0.91 | 26.5 | C | 0.94 | 29.3 | C | | 0.94 | 29.3 | C | | | 0.90 | 26.7 | C | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections
** - Denotes Unmitigated Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | Mitigation | | | | | BQE Off-ramp Alternative | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay |
| Jay Street (N-S) @ | EB-LR | 0.07 | 19.6 | B | 0.00 | 19.6 | B | | | | | | | | | | | |
| Willoughby Street (E-W) | WB-LTR | 0.77 | 40.2 | D | 1.10 | 105.9 | F | * | WB-LTR | 0.89 | 44.3 | D | | | WB-LTR | 0.89 | 44.3 | D | |
| | NB-LT | 0.45 | 13.6 | B | 0.47 | 13.9 | B | | NB-LT | 0.56 | 19.1 | B | | | NB-LT | 0.56 | 19.1 | B | |
| | SB-TR | 0.59 | 15.7 | B | 0.65 | 16.9 | B | | SB-TR | 0.75 | 23.5 | C | | | SB-TR | 0.75 | 23.5 | C | |
| Bond Street (NB) @ | EB-LT | 0.77 | 14.9 | B | 1.04 | 52.3 | D | * | EB-L | 0.24 | 13.6 | B | 34.7 | C | EB-L | 0.24 | 13.6 | B | 34.7 |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.95 | 36.8 | D | | | EB-T | 0.95 | 36.8 | D | |
| | WB-TR | 0.87 | 22.5 | C | 0.98 | 40.7 | D | | WB-T | 0.61 | 14.4 | B | 14.5 | B | WB-T | 0.61 | 14.4 | B | 14.5 |
| | | | | | | | | | WB-R | 0.36 | 14.8 | B | | | WB-R | 0.36 | 14.8 | B | |
| | NB-LTR | 0.77 | 19.9 | B | 0.86 | 37.2 | D | | | 0.76 | 35.0 | C | | | | 0.76 | 35.0 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.88 | 21.9 | C | 1.04 | 53.2 | D | * | EB-T | 0.74 | 17.5 | B | 17.0 | B | EB-T | 0.74 | 17.5 | B | 17.0 |
| Livingston Street (E-W) | | | | | | | | | EB-R | 0.47 | 16.0 | B | | | EB-R | 0.47 | 16.0 | B | |
| | WB-LT | 0.77 | 15.8 | B | 1.08 | 71.9 | E | * | WB-L | 0.50 | 19.5 | B | 14.2 | B | WB-L | 0.50 | 19.5 | B | 14.2 |
| | | | | | | | | | WB-T | 0.56 | 12.6 | B | | | WB-T | 0.56 | 12.6 | B | |
| | SB-LTR | 0.59 | 20.4 | C | 0.87 | 31.9 | C | | | 0.80 | 34.1 | C | | | | 0.80 | 34.1 | C | |
| Smith Street (N-S) @ | EB-LTR | 0.46 | 28.1 | C | 0.59 | 31.5 | C | | | 0.83 | 36.5 | D | | | | 0.83 | 36.5 | D | |
| Livingston Street (E-W) | WB-LTR | 0.46 | 28.1 | C | 0.52 | 29.6 | C | | | 0.75 | 32.0 | C | | | | 0.75 | 32.0 | C | |
| | NB-DfL | 0.77 | 51.9 | D | 0.89 | 63.6 | E | * | | 0.62 | 17.7 | B | | | | 0.62 | 17.7 | B | |
| | NB-TR | 2.00 | >150 | F | 2.17 | >150 | F | * | | 1.86 | >150 | F | | | | 1.86 | >150 | F | |
| | SB-LTR | 1.04 | 102.6 | F | 1.30 | >150 | F | * | | 1.02 | 61.8 | E | | | | 1.02 | 61.8 | E | |
| Boerum Place (N-S) @ | EB-LT | 1.10 | >150 | F | 1.04 | 137.2 | F | * | EB-L | 0.43 | 37.3 | D | 36.2 | D | EB-L | 0.43 | 37.3 | D | 36.2 |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.48 | 35.7 | D | | | EB-T | 0.48 | 35.7 | D | |
| | EB-R | 0.01 | 49.0 | D | 0.01 | 49.0 | D | | EB-R | 0.01 | 27.5 | C | | | EB-R | 0.01 | 27.5 | C | |
| | WB-LTR | 0.89 | 92.1 | F | 1.07 | >150 | F | * | WB-L | 0.83 | 66.6 | E | 62.5 | E | WB-L | 0.83 | 66.6 | E | 62.5 |
| | | | | | | | | | WB-T | 0.28 | 31.8 | C | | | WB-T | 0.28 | 31.8 | C | |
| | | | | | | | | | WB-R | 0.93 | 71.5 | E | | | WB-R | 0.93 | 71.5 | E | |
| | NB-L | 0.94 | >150 | F | 1.16 | >150 | F | * | | 0.75 | 87.0 | F | | | | 0.75 | 87.0 | F | |
| | NB-TR | 0.68 | 56.0 | E | 0.94 | 56.2 | E | | | 0.68 | 28.7 | C | | | | 0.68 | 28.7 | C | |
| | SB-L | 0.70 | 92.6 | F | 0.74 | 96.9 | F | * | | 0.70 | 51.6 | D | | | | 0.70 | 51.6 | D | |
| | SB-TR | 0.74 | 36.9 | D | 0.74 | 36.9 | D | | | 0.74 | 20.0 | B | | | | 0.74 | 20.0 | B | |
| Bond Street (NB) @ | EB-LT | 0.85 | 25.1 | C | 0.97 | 40.0 | D | | EB-L | 0.15 | 11.1 | B | 44.1 | D | EB-L | 0.15 | 11.1 | B | 44.1 |
| Schermerhorn Street (E-W) | | | | | | | | | EB-T | 0.98 | 46.0 | D | | | EB-T | 0.98 | 46.0 | D | |
| | WB-TR | 0.54 | 14.5 | B | 0.57 | 14.8 | B | | | 0.53 | 15.5 | B | | | | 0.53 | 15.5 | B | |
| | NB-LTR | 0.86 | 33.0 | C | 0.95 | 46.4 | D | * | | 0.60 | 27.4 | C | | | | 0.60 | 27.4 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.86 | 23.8 | C | 0.94 | 33.4 | C | | EB-T | 0.82 | 27.8 | C | 25.3 | C | EB-T | 0.82 | 27.8 | C | 25.3 |
| Schermerhorn Street (E-W) | | | | | | | | | EB-R | 0.51 | 18.9 | B | | | EB-R | 0.51 | 18.9 | B | |
| | WB-LT | 1.35 | >150 | F | 1.53 | >150 | F | * | WB-L | 0.83 | 51.2 | D | 28.9 | C | WB-L | 0.83 | 51.2 | D | 28.9 |
| | | | | | | | | | WB-T | 0.52 | 18.3 | B | | | WB-T | 0.52 | 18.3 | B | |
| | SB-LTR | 0.91 | 38.0 | D | 1.31 | >150 | F | * | SB-LT | 0.84 | 33.7 | C | 32.4 | C | SB-LT | 0.84 | 33.7 | C | 32.4 |
| | | | | | | | | | SB-R | 0.35 | 22.4 | C | | | SB-R | 0.35 | 22.4 | C | |
| Fourth Ave (N-S) @ | EB-TR | 0.90 | 39.1 | D | 1.02 | 59.8 | E | * | | 0.95 | 44.2 | D | | | | 0.95 | 44.2 | D | |
| Atlantic Avenue (E-W) | WB-TR | 0.95 | 48.4 | D | 0.98 | 53.6 | D | * | | 0.94 | 45.6 | D | | | | 0.94 | 45.6 | D | |
| | NB-L | 1.33 | >150 | F | 1.35 | >150 | F | * | | 1.30 | >150 | F | | | | 1.30 | >150 | F | |
| | NB-T | 0.52 | 39.8 | D | 0.54 | 40.2 | D | | | 0.52 | 39.2 | D | | | | 0.52 | 39.2 | D | |
| | NB-R | 1.21 | >150 | F | 1.21 | >150 | F | | | 1.17 | 144.8 | F | | | | 1.17 | 144.8 | F | |
| | SB-T | 0.45 | 19.7 | B | 0.47 | 20.2 | C | | | 0.51 | 22.1 | C | | | | 0.51 | 22.1 | C | |
| | SB-R | 0.10 | 15.6 | B | 0.10 | 15.6 | B | | | 0.11 | 16.7 | B | | | | 0.11 | 16.7 | B | |

## Table 21-4 (Continued)
## BQE Ramp Alternative Traffic Conditions- PM Peak Hour

| ıALIZED :RSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | Mitigation | | | | BQE Off-ramp Alternative | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS |
| ıtic Avenue (E-W) @ ɔush Avenue (N-S) | EB-T | 1.05 | 73.6 | E | 1.17 | >150 | F * | 1.09 | 88.2 | F ** | | | 1.09 | 88.2 | F ** | | |
| | EB-R | 0.46 | 32.7 | C | 0.46 | 32.7 | C | 0.22 | 25.5 | C | | | 0.22 | 25.5 | C | | |
| | WB-TR | 1.10 | 95.4 | F | 1.13 | 107.2 | F * | 1.05 | 78.7 | E | | | 1.05 | 78.7 | E | | |
| | WB-R | 0.68 | 37.4 | D | 0.73 | 39.4 | D | 0.68 | 35.0 | C | | | 0.68 | 35.0 | C | | |
| | NB-LTR | 0.55 | 18.1 | B | 0.56 | 18.3 | B | 0.59 | 21.1 | C | | | 0.59 | 21.1 | C | | |
| | SB-LTR | 0.84 | 26.4 | C | 0.88 | 28.5 | C | 0.98 | 43.4 | D | | | 0.98 | 43.4 | D | | |
| ' Street (N-S) @ ary Street (E-W) | EB-L | 0.99 | 135.7 | F | 0.99 | 135.7 | F | 0.24 | 35.3 | D | | | 0.24 | 35.3 | D | | |
| | EB-TR | 0.80 | 32.6 | C | 0.85 | 34.7 | C | 0.85 | 34.7 | C | | | 0.85 | 34.7 | C | | |
| | WB-L | 1.37 | >150 | F | 1.43 | >150 | F * | 1.30 | >150 | F | | | 1.30 | >150 | F | | |
| | WB-TR | 0.65 | 18.6 | B | 0.65 | 18.7 | B | 0.85 | 34.9 | C | | | 0.85 | 34.9 | C | | |
| | NB-L | 0.32 | 29.1 | C | 0.43 | 31.8 | C | NB-L | 0.45 | 34.0 | C | | NB-L | 0.45 | 34.0 | C | |
| | NB-TR | 0.78 | 39.7 | D | 0.85 | 44.0 | D | NB-T | 0.51 | 34.0 | C | | NB-T | 0.51 | 34.0 | C | |
| | | | | | | | | NB-R | 0.81 | 36.3 | D | | NB-R | 0.81 | 36.3 | D | |
| | SB-L | 0.57 | 45.7 | D | 0.66 | 56.5 | E * | | 0.29 | 30.2 | C | | | 0.29 | 30.2 | C | |
| | SB-TR | 0.25 | 26.5 | C | 0.25 | 26.5 | C | | 0.26 | 28.0 | C | | | 0.26 | 28.0 | C | |
| dams Street (N-S) (Service)@ ilary Street (E-W) | EB-L | 0.94 | 88.0 | F | 0.94 | 83.9 | F | 0.94 | 83.9 | F | | | 0.94 | 83.9 | F | | |
| | EB-TR | 0.65 | 36.3 | D | 0.67 | 36.9 | D | 0.67 | 36.9 | D | | | 0.67 | 36.9 | D | | |
| | WB-L | 1.08 | 137.3 | F | 1.08 | 137.3 | F | 1.08 | 137.3 | F | | | 1.08 | 137.3 | F | | |
| | WB-T | 0.70 | 52.4 | D | 0.77 | 55.5 | E | 0.77 | 55.5 | E | | | 0.77 | 55.5 | E | | |
| | WB-R | 1.05 | 99.2 | F | 1.05 | 100.2 | F | 1.05 | 100.2 | F | | | 1.05 | 100.2 | F | | |
| | NB-TR | 0.59 | 31.3 | C | 0.63 | 32.4 | C | 0.63 | 32.4 | C | | | 0.63 | 32.4 | C | | |
| | SB-TR | 1.21 | 142.2 | F | 1.21 | 142.2 | F | 1.21 | 142.2 | F | | | 1.21 | 142.2 | F | | |
| Adams Street (N-S) (Main) | NB-L | 0.41 | 56.2 | E | 0.41 | 56.3 | E | 0.41 | 56.3 | E | | | 0.41 | 56.3 | E | | |
| | NB-T | 0.66 | 32.3 | C | 0.71 | 34.0 | C | 0.71 | 34.0 | C | | | 0.71 | 34.0 | C | | |
| | SB-L | 1.08 | 110.2 | F | 1.12 | 123.4 | F * | 1.12 | 123.4 | F ** | | | 1.12 | 123.4 | F ** | | |
| | SB-T | 1.31 | >150 | F | 1.32 | >150 | F * | 1.32 | >150 | F ** | | | 1.32 | >150 | F ** | | |
| Ashland Place (N-S) @ Myrtle Avenue (E-W) | EB-LT | 0.47 | 9.6 | A | 0.51 | 10.1 | B | 0.51 | 10.1 | B | | | 0.50 | 11.0 | B | | |
| | EB-R | 0.18 | 6.9 | A | 0.19 | 7.1 | A | 0.16 | 6.7 | A | | | 0.17 | 7.6 | A | | |
| | | | | | | | | | | | | | WB-LT | 0.94 | 40.3 | D | |
| | WB-LTR | 0.88 | 29.4 | C | 0.96 | 43.3 | D | WB-LTR | 0.94 | 39.7 | D | | WB-R | 0.03 | 6.6 | A | |
| | NB-LTR | 0.99 | 77.2 | E | 1.10 | 109.3 | F * | NB-L | 0.84 | 80.0 | E | 42.9 D | NB-L | 1.29 | >150 | F | 77.0 E |
| | | | | | | | | NB-TR | 0.47 | 31.2 | C | | NB-TR | 0.43 | 29.0 | C | |
| | SB-LTR | 1.09 | 97.5 | F | 1.12 | 109.3 | F * | SB-L | 0.82 | 80.8 | F | 41.5 D | SB-L | 0.97 | 110.2 | F | 63.6 E |
| | | | | | | | | SB-TR | 0.67 | 35.2 | D | | SB-TR | 0.97 | 57.5 | E | |
| Prince Street (NB) @ Myrtle Avenue (E-W) | EB-LT | EB-LT | 1.01 | 68.7 | E | EB-LT | 1.35 | >150 | F * | | 0.89 | 29.0 | C | | 0.89 | 29.0 | C |
| | WB-TR | WB-TR | 0.74 | 31.5 | C | WB-TR | 1.19 | 133.2 | F * | | 0.90 | 31.5 | C | | 0.90 | 31.5 | C |
| | NB-LTR | NB-LTR | 0.70 | 36.6 | D | | | | | | | | | | | | |
| Gold St/Albee Square West (N-S) @ Willoughby Street (E-W) | EB-TR | | 0.30 | 34.1 | C | | | WB-TR | 0.30 | 25.1 | C | | WB-TR | 0.30 | 25.1 | C | |
| | WB-LT | | 0.33 | 22.6 | C | 0.27 | 32.7 | C | NB-L | 0.79 | 33.7 | C | | NB-L | 0.79 | 33.7 | C |
| | NB-L | | 0.21 | 21.1 | C | 0.72 | 33.6 | C | NB-TR | 0.69 | 30.0 | C | | NB-TR | 0.69 | 30.0 | C |
| | | | | | | | | | NB-R | 0.69 | 30.0 | C | | NB-R | 0.69 | 30.0 | C |
| | NB-R | | 0.65 | 31.8 | C | 1.09 | 97.0 | F * | | | | | | | | | |
| | SB-L | | 0.11 | 19.5 | B | 0.10 | 19.3 | B | | | | | | | | | |
| | SB-TR | | 0.19 | 20.9 | C | 0.24 | 21.5 | C | | | | | | | | | |
| Bridge Street (SB) @ Willoughby Street (E-W) | WB-LT | | 0.75 | 20.6 | C | 1.40 | >150 | F * | | 0.92 | 31.6 | C | | | 0.92 | 31.6 | C |

**Table 21**

**BQE Ramp Alternative Traffic Conditions- PM Peak Hou**

| SIGNALIZED INTERSECTION | Lane Group | PM Peak Hour | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | | Mitigation | | | | | BQE Off-ramp Alternative | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay |
| Tillary Street (E-W) @ | EB-L | 0.55 | 53.1 | D | 0.58 | 54.1 | D | | 0.58 | 54.1 | D | | | 0.61 | 56.5 | E | |
| Flatbush Avenue (N-S) | EB-TR | 1.03 | 76.2 | E | 1.10 | 100.6 | F | * | 1.08 | 91.8 | F | | ** | 1.03 | 71.5 | E | |
| | EB-R | 1.05 | 106.5 | F | 1.16 | 142.3 | F | * | 1.09 | 117.7 | F | | ** | 1.02 | 95.1 | F | |
| | WB-L | 1.24 | >150 | F | 1.35 | >150 | F | * | 1.35 | >150 | F | | ** | 0.66 | 53.6 | D | |
| | WB-T | 1.12 | 109.6 | F | 1.13 | 116.0 | F | * | 1.10 | 103.6 | F | | | 1.05 | 82.0 | F | |
| | WB-R | 0.59 | 44.5 | D | 0.59 | 44.6 | D | | 0.57 | 43.0 | D | | | 0.54 | 40.2 | D | |
| | NB-L | 0.71 | 47.7 | D | 0.72 | 47.6 | D | | 0.74 | 49.0 | D | | | 0.77 | 52.0 | D | |
| | NB-T | 0.48 | 22.8 | C | 0.49 | 23.0 | C | | 0.50 | 23.7 | C | | | 0.51 | 24.5 | C | |
| | SB-T | 1.15 | 115.4 | F | 1.15 | 118.3 | F | | 1.15 | 118.3 | F | | | 1.13 | 105.9 | F | |
| | SB-R | 0.57 | 41.1 | D | 0.57 | 41.1 | D | | 0.57 | 41.1 | D | | | 0.55 | 39.8 | D | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.19 | 170.0 | F | 1.24 | 191.9 | F | * | 1.24 | >150 | F | | ** | 1.19 | >150 | F | |
| Flatbush Avenue (N-S) | EB-TR | 0.94 | 77.9 | E | 0.58 | 43.8 | D | | 0.65 | 46.4 | D | | | 0.63 | 44.6 | D | |
| | WB-LTR | 0.77 | 51.0 | D | 0.76 | 49.9 | D | | 0.78 | 51.3 | D | | | 0.75 | 48.6 | D | |
| | NB-L | 1.11 | 160.5 | F | 1.11 | 160.5 | F | | 1.11 | >150 | F | | | 1.11 | >150 | F | |
| | NB-TR | 0.87 | 25.2 | C | 1.01 | 45.2 | D | * | 0.99 | 40.1 | D | | | 0.99 | 40.1 | D | |
| | SB-L | 1.15 | 131.3 | F | 1.24 | >150 | F | * | 1.24 | >150 | F | | ** | 1.14 | 129.8 | F | |
| | SB-TR | 0.89 | 13.6 | B | 0.91 | 14.8 | B | | 0.91 | 15.0 | B | | | 0.80 | 10.7 | B | |
| Willoughby Street (E-W) @ | EB-L | 1.07 | 122.5 | F | 1.72 | >150 | F | * | EB-L | 0.78 | 50.4 | D | | EB-L | 0.69 | 42.4 | D |
| Flatbush Avenue (N-S) | | | | | | | | | EB-LR | 0.62 | 47.0 | D | | EB-LR | 0.61 | 44.1 | D |
| | EB-R | 0.78 | 49.7 | D | 0.54 | 33.2 | C | | EB-R | 0.76 | 50.8 | D | | EB-R | 0.44 | 32.9 | C |
| | WB-LT | 0.27 | 38.1 | D | 0.52 | 44.7 | D | | WB-LT | 0.64 | 38.1 | D | | WB-LTR | 0.44 | 30.0 | C |
| | WB-R | 0.24 | 37.6 | D | 0.26 | 38.3 | D | | WB-R | 0.17 | 27.8 | C | | | | | |
| | NB-L | 0.92 | 84.0 | F | 1.02 | 109.8 | F | * | | | | | | | | | |
| | NB-T | 0.62 | 5.4 | A | 0.58 | 5.1 | A | | NB-T | 0.68 | 13.5 | B | | NB-T | 0.70 | 15.3 | B |
| | SB-TR | 1.00 | 37.7 | D | 1.03 | 45.6 | D | * | | 1.03 | 44.2 | D | | | 0.91 | 23.1 | C |
| DeKalb Avenue (E-W) @ | WB-L | 0.82 | 56.5 | E | 0.82 | 57.0 | E | | WB-L | 0.61 | 41.9 | D | | WB-L | 0.67 | 44.0 | D |
| Flatbush Avenue (N-S) | WB-LT | 0.52 | 40.1 | D | 0.53 | 40.3 | D | | WB-LT | 0.57 | 43.7 | D | | WB-TR | 0.59 | 44.5 | D |
| | WB-R | 0.80 | 56.8 | E | 0.88 | 66.1 | E | * | WB-R | 0.75 | 54.6 | D | | WB-R | 0.75 | 54.6 | D |
| | NB-T | 0.78 | 24.7 | C | 0.80 | 25.7 | C | | | 0.78 | 23.6 | C | | | 0.78 | 23.6 | C |
| | SB-TR | 1.20 | 124.2 | F | 1.24 | 140.4 | F | * | | 1.20 | 123.2 | F | | | 1.07 | 69.0 | E |
| Livingston Street (E-W) @ | EB-R | 0.66 | 38.8 | D | 0.83 | 47.1 | D | * | | 0.79 | 43.0 | D | | | 0.79 | 43.0 | D |
| Flatbush Avenue (N-S) | NB-L | 0.84 | 50.7 | D | 0.86 | 53.5 | D | | | 0.83 | 48.7 | D | | | 0.83 | 47.8 | D |
| | NB-T | 0.35 | 0.4 | A | 0.36 | 0.4 | A | | | 0.36 | 0.4 | A | | | 0.36 | 0.4 | A |
| | SB-TR | 0.85 | 16.7 | B | 0.86 | 16.9 | B | | | 0.88 | 19.8 | B | | | 0.84 | 17.8 | B |
| Lafayette Avenue/ | EB-LT | 0.77 | 37.0 | D | 0.88 | 44.4 | D | | | 0.88 | 44.4 | D | | | 0.88 | 44.3 | D |
| Schermerhorn Street (E-W) @ | WB-TR | 0.90 | 69.9 | E | 0.96 | 79.9 | E | * | | 0.96 | 79.9 | E | ** | | 0.91 | 67.1 | E |
| Flatbush Avenue (N-S) | NB-TR | 1.16 | 111.5 | F | 1.20 | 127.6 | F | * | | 1.22 | 135.2 | F | ** | | 1.17 | 112.7 | F ** |
| | SB-L | 1.10 | 136.7 | F | 1.15 | >150 | F | * | | 1.15 | >150 | F | ** | | 1.08 | 134.1 | F |
| | SB-T | 0.89 | 24.6 | C | 0.94 | 28.9 | C | | | 0.94 | 28.9 | C | | | 0.94 | 28.9 | C |
| Fourth Ave/Hanson Pl. (E-W) @ | EB-LT | 0.50 | 36.8 | D | 0.52 | 37.1 | D | | EB-LT | 0.52 | 37.1 | D | | EB-LT | 0.52 | 37.1 | D |
| Flatbush Avenue (N-S) | NB-T | 0.67 | 14.0 | B | 0.68 | 14.3 | B | | | 0.68 | 14.3 | B | | | 0.68 | 14.3 | B |
| | NB-R | 0.41 | 12.2 | B | 0.44 | 12.7 | B | | | 0.44 | 12.7 | B | | | 0.44 | 12.7 | B |
| | SB-TR | 1.00 | 40.1 | D | 1.04 | 52.1 | D | * | SB-T | 1.04 | 52.1 | D | ** | SB-T | 1.04 | 52.1 | D ** |
| | SB-R | 1.13 | 103.4 | F | 1.20 | 129.1 | F | * | SB-R | 1.20 | 129.1 | F | ** | SB-R | 1.20 | 129.1 | F ** |

## Table 21-3 (Continued)
## BQE Ramp Alternative Traffic Conditions- MD Peak Hour

| IGNALIZED ITERSECTION | Lane Group | No Action V/C Ratio | No Action Delay (sec.) | No Action LOS | Future Action V/C Ratio | Future Action Delay (sec.) | Future Action LOS | MD Peak Hour Mitigation V/C Ratio | Mitigation Delay (sec.) | Mitigation LOS | Mitigation Appr. Delay | Mitigation Appr. LOS | BQE Off-ramp Alternative V/C Ratio | BQE Off-ramp Alternative Delay (sec.) | BQE Off-ramp Alternative LOS | BQE Off-ramp Alternative Appr. Delay | BQE Off-ramp Alternative Appr. LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ond Street (NB) @ | EB-LT | EB-LT 1.05 | 57.6 | E | 1.27 | 149.0 | F * | 1.13 | 86.4 | F ** | | | 1.13 | 86.4 | F ** | | |
| lantic Avenue (E-W) | WB-TR | 0.76 | 16.1 | B | 0.81 | 17.9 | B | WB-TR 0.77 | 14.6 | B | | | WB-TR 0.77 | 14.6 | B | | |
| | NB-LTR | 0.48 | 29.6 | C | 0.48 | 29.6 | C | NB-LTR 0.56 | 33.7 | C | | | NB-LTR 0.56 | 33.7 | C | | |
| Hoyt Street (SB) @ | EB-TR | 0.68 | 13.9 | B | 0.71 | 14.6 | B | 0.67 | 13.6 | B | | | 0.67 | 13.6 | B | | |
| Atlantic Avenue (E-W) | WB-LT | 0.78 | 16.6 | B | 0.82 | 18.1 | B | 0.79 | 17.0 | B | | | 0.79 | 17.0 | B | | |
| | SB-LTR | 1.07 | 97.2 | F | 1.38 | >150 | F * | 0.78 | 38.4 | D | | | 0.78 | 38.4 | D | | |
| Smith Street (N-S) @ | NB-L | EB-LT 0.92 | 32.7 | C | EB-LT 0.88 | 41.0 | D | | | | | | | | | | |
| Atlantic Avenue (E-W) | NB-T | | | | | | | | | | | | | | | | |
| | NB-R | WB-T 0.79 | 23.2 | C | 0.81 | 23.8 | C | | | | | | | | | | |
| | SB-T | WB-R 0.31 | 14.8 | B | 0.34 | 15.3 | B | | | | | | | | | | |
| | SB-R | NB-L 0.60 | 27.6 | C | 0.60 | 27.6 | C | | | | | | | | | | |
| | | NB-TR 0.35 | 20.5 | C | 0.40 | 21.2 | C | | | | | | | | | | |
| Boerum Place (N-S) @ | EB-DfL | 0.79 | 47.9 | D | 0.83 | 52.6 | D | | | | | | | | | | |
| Atlantic Avenue (E-W) | EB-TR | 0.66 | 22.3 | C | 0.72 | 24.0 | C | | | | | | | | | | |
| | WB-LT | 0.83 | 39.7 | D | 0.86 | 42.0 | D | | | | | | | | | | |
| | WB-R | 0.35 | 0.9 | A | 0.35 | 0.9 | A | | | | | | | | | | |
| | SB-L | 0.38 | 17.5 | B | 0.38 | 17.0 | B | | | | | | | | | | |
| | SB-TR | 0.58 | 21.1 | C | 0.62 | 21.9 | C | | | | | | | | | | |
| Jay Street (N-S) @ | WB-LTR | WB-LR 0.34 | 24.7 | C | WB-LTR 0.34 | 24.3 | C | | | | | | | | | | |
| Tech Place (E-W) | NB-TR | NB-LT 0.89 | 34.1 | C | NB-LTR 0.95 | 43.7 | D | | | | | | | | | | |
| | SB-LT | SB-LTR 0.87 | 32.7 | C | SB-LT 0.92 | 38.9 | D | | | | | | | | | | |
| Smith Street (N-S) @ | | | | | | | | EB-LT 0.16 | 23.3 | C | | | EB-LT 0.16 | 23.3 | C | | |
| Schermerhorn (E-W) | WB-T | 0.46 | 48.2 | D | 0.49 | 49.1 | D | WB-T 0.55 | 30.3 | C | | | WB-T 0.55 | 30.3 | C | | |
| | WB-R | 0.09 | 39.7 | D | 0.09 | 39.7 | D | WB-R 0.11 | 22.6 | C | | | WB-R 0.11 | 22.6 | C | | |
| | NB-LTR | 0.70 | 62.0 | E | 0.79 | 66.7 | E * | 0.78 | 34.7 | C | | | 0.78 | 34.7 | C | | |
| | SB-L | 0.85 | 92.0 | F | 0.90 | 99.6 | F * | 0.59 | 26.7 | C | | | 0.59 | 26.7 | C | | |
| | SB-R | 0.51 | 68.9 | E | 0.58 | 72.5 | E | 0.32 | 11.9 | B | | | 0.32 | 11.9 | B | | |
| Fulton Street (E-W) @ | EB-LTR | 0.22 | 36.5 | D | 0.22 | 36.5 | D | 0.24 | 38.4 | D | | | 0.24 | 38.4 | D | | |
| Flatbush Avenue (N-S) | WB-LT | 0.44 | 42.3 | D | 0.44 | 42.3 | D | 0.48 | 45.2 | D | | | 0.53 | 47.2 | D | | |
| | WB-R | 0.29 | 19.0 | B | 0.31 | 19.3 | B | 0.33 | 20.8 | C | | | 0.33 | 20.8 | C | | |
| | NB-TR | 1.01 | 66.3 | E | 1.06 | 79.2 | E * | 1.01 | 63.7 | E | | | 1.01 | 63.7 | E | | |
| | SB-L | 0.76 | 51.6 | D | 0.78 | 52.9 | D | 0.78 | 52.7 | D | | | 0.66 | 45.4 | D | | |
| | SB-T | 0.95 | 35.6 | D | 1.00 | 47.6 | D * | 0.97 | 39.8 | D | | | 0.92 | 30.3 | C | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections
** - Denotes Unmitigated Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

## Table 21-3 (Continue
## BQE Ramp Alternative Traffic Conditions- MD Peak Ho

| SIGNALIZED INTERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | Mitigation | | | | | BQE Off-ramp Alternative | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay |
| Jay Street (N-S) @ | EB-LR | 0.09 | 19.9 | B | 0.04 | 19.1 | B | | | | | | | | | | |
| Willoughby Street (E-W) | WB-LTR | 1.10 | 108.0 | F | 1.27 | >150 | F * | WB-LTR | 1.09 | 98.8 | F | | | WB-LTR | 1.09 | 98.8 | F | |
| | NB-LT | 0.36 | 12.7 | B | 0.39 | 13.0 | B | NB-LT | 0.44 | 16.0 | B | | | NB-LT | 0.44 | 16.0 | B | |
| | SB-TR | 0.46 | 13.8 | B | 0.49 | 14.2 | B | SB-TR | 0.53 | 17.2 | B | | | SB-TR | 0.53 | 17.2 | B | |
| Bond Street (NB) @ | EB-LT | 0.86 | 24.1 | C | 1.17 | 107.6 | F * | EB-L | 0.34 | 13.7 | B | 21.8 | C | EB-L | 0.34 | 13.7 | B | 21.8 |
| Livingston Street (E-W) | | | | | | | | EB-T | 0.83 | 23.6 | C | | | EB-T | 0.83 | 23.6 | C | |
| | WB-TR | 0.82 | 19.9 | B | 0.91 | 29.3 | C | WB-TR | 0.95 | 41.3 | D | | | WB-TR | 0.95 | 41.3 | D | |
| | NB-LTR | 0.66 | 25.0 | C | 0.80 | 31.9 | C | | 0.79 | 40.1 | D | | | | 0.79 | 40.1 | D | |
| Hoyt Street (SB) @ | EB-TR | 0.97 | 40.8 | D | 1.10 | 78.9 | E * | EB-T | 0.69 | 16.4 | B | 15.8 | B | EB-T | 0.69 | 16.4 | B | 15.8 |
| Livingston Street (E-W) | | | | | | | | EB-R | 0.34 | 14.1 | | | | EB-R | 0.34 | 14.1 | | |
| | WB-LT | 0.92 | 32.6 | C | 1.04 | 61.0 | E * | WB-L | 0.28 | 13.6 | B | 20.5 | C | WB-L | 0.28 | 13.6 | B | 20.5 |
| | | | | | | | | WB-T | 0.78 | 21.9 | C | | | WB-T | 0.78 | 21.9 | C | |
| | SB-LTR | 0.49 | 18.6 | B | 0.61 | 20.7 | C | | 0.56 | 26.2 | C | | | | 0.56 | 26.2 | C | |
| Smith Street (N-S) @ | EB-LTR | 0.36 | 25.7 | C | 0.42 | 27.1 | C | | 0.49 | 19.6 | B | | | | 0.49 | 19.6 | B | |
| Livingston Street (E-W) | WB-LTR | 0.40 | 26.5 | C | 0.43 | 27.1 | C | | 0.50 | 19.8 | B | | | | 0.50 | 19.8 | B | |
| | NB-DfL | 0.45 | 39.5 | D | 0.54 | 42.4 | D | | 0.46 | 19.3 | B | | | | 0.46 | 19.3 | B | |
| | NB-TR | 1.74 | >150 | F | 1.78 | >150 | F * | | 1.66 | >150 | F | | | | 1.66 | >150 | F | |
| | SB-LTR | 0.78 | 56.5 | E | 0.89 | 68.7 | E * | | 0.83 | 35.5 | D | | | | 0.83 | 35.5 | D | |
| Boerum Place (N-S) @ | EB-LT | 0.73 | 80.9 | F | 0.81 | 90.7 | F * | EB-L | 0.38 | 38.8 | D | 36.6 | D | EB-L | 0.38 | 38.8 | D | 36.6 |
| Livingston Street (E-W) | | | | | | | | EB-T | 0.35 | 35.6 | D | | | EB-T | 0.35 | 35.6 | D | |
| | EB-R | 0.21 | 54.3 | D | 0.21 | 54.3 | D | EB-R | 0.30 | 36.1 | D | | | EB-R | 0.30 | 36.1 | D | |
| | WB-LTR | 0.71 | 72.4 | E | 0.82 | 81.3 | F * | WB-L | 0.50 | 42.8 | D | 58.9 | E | WB-L | 0.50 | 42.8 | D | 58.9 |
| | | | | | | | | WB-T | 0.19 | 32.8 | C | | | WB-T | 0.19 | 32.8 | C | |
| | | | | | | | | WB-R | 0.90 | 72.4 | E | | | WB-R | 0.90 | 72.4 | E | |
| | NB-L | 0.40 | 52.1 | D | 0.40 | 52.1 | D | | 0.37 | 25.1 | C | | | | 0.37 | 25.1 | C | |
| | NB-TR | 0.57 | 51.8 | D | 0.57 | 51.8 | D | | 0.53 | 23.1 | C | | | | 0.53 | 23.1 | C | |
| | SB-L | 0.58 | 71.0 | E | 0.62 | 74.1 | E | | 0.56 | 33.8 | C | | | | 0.56 | 33.8 | C | |
| | SB-TR | 0.35 | 25.2 | C | 0.35 | 25.2 | C | | 0.34 | 11.1 | B | | | | 0.34 | 11.1 | B | |
| Bond Street (NB) @ | EB-LT | 0.56 | 14.7 | B | 0.63 | 16.2 | B | EB-L | 0.21 | 16.0 | B | 22.2 | C | EB-L | 0.21 | 16.0 | B | 22.2 |
| Schermerhorn Street (E-W) | | | | | | | | EB-T | 0.65 | 22.9 | C | | | EB-T | 0.65 | 22.9 | C | |
| | WB-TR | 0.46 | 13.2 | B | 0.49 | 13.5 | B | | 0.54 | 20.4 | C | | | | 0.54 | 20.4 | C | |
| | NB-LTR | 0.71 | 23.6 | C | 0.85 | 32.4 | C | | 0.80 | 34.3 | C | | | | 0.80 | 34.3 | C | |
| Hoyt Street (SB) @ | EB-TR | 0.61 | 13.3 | B | 0.66 | 14.4 | B | | 0.83 | 30.1 | C | | | | 0.83 | 30.1 | C | |
| Schermerhorn Street (E-W) | | | | | | | | | | | | | | | | | | |
| | WB-LT | 0.72 | 19.3 | B | 0.81 | 25.7 | C | WB-L | 0.57 | 26.2 | C | 19.3 | B | WB-L | 0.57 | 26.2 | C | 19.3 |
| | | | | | | | | WB-T | 0.41 | 16.1 | B | | | WB-T | 0.41 | 16.1 | B | |
| | SB-LTR | 0.55 | 19.7 | B | 0.74 | 24.7 | C | | 0.63 | 26.0 | C | | | | 0.63 | 26.0 | C | |
| Fourth Ave (N-S) @ | EB-TR | 1.11 | 103.8 | F | 1.17 | 128.1 | F * | | 1.09 | 95.3 | F | | | | 1.09 | 95.3 | F | |
| Atlantic Avenue (E-W) | WB-TR | 1.12 | 112.1 | F | 1.18 | 135.4 | F * | | 1.12 | 109.7 | F | | | | 1.12 | 109.7 | F | |
| | NB-L | 1.30 | >150 | F | 1.34 | >150 | F * | | 1.28 | >150 | F | | | | 1.28 | >150 | F | |
| | NB-T | 0.49 | 43.8 | D | 0.51 | 44.3 | D | | 0.49 | 43.2 | D | | | | 0.49 | 43.2 | D | |
| | NB-R | 1.15 | >150 | F | 1.15 | >150 | F | | 1.11 | 142.2 | F | | | | 1.11 | 142.2 | F | |
| | SB-T | 0.17 | 9.3 | A | 0.19 | 9.4 | A | | 0.21 | 10.4 | B | | | | 0.21 | 10.4 | B | |
| | SB-R | 0.06 | 8.6 | A | 0.06 | 8.6 | A | | 0.07 | 9.4 | A | | | | 0.07 | 9.4 | A | |

## Table 21-3 (Continued)
## BQE Ramp Alternative Traffic Conditions- MD Peak Hour

| NALIZED ERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | Future Action | | | Mitigation | | | | | BQE Off-ramp Alternative | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS |
| ıntic Avenue (E-W) @ | EB-T | 0.89 | 46.7 | D | 0.93 | 51.6 | D | 0.89 | 45.4 | D | | | 0.89 | 45.4 | D | | |
| bush Avenue (N-S) | EB-R | 0.61 | 41.1 | D | 0.62 | 41.4 | D | 0.47 | 34.5 | C | | | 0.47 | 34.5 | C | | |
| | WB-TR | 1.01 | 72.6 | E | 1.07 | 88.8 | F * | 1.02 | 71.8 | E | | | 1.02 | 71.8 | E | | |
| | WB-R | 0.75 | 43.5 | D | 0.80 | 47.1 | D | 0.76 | 42.6 | D | | | 0.76 | 42.6 | D | | |
| | NB-LTR | 0.47 | 19.0 | B | 0.48 | 19.2 | B | 0.49 | 20.6 | C | | | 0.49 | 20.6 | C | | |
| | SB-LTR | 0.61 | 21.9 | C | 0.62 | 22.2 | C | 0.67 | 24.5 | C | | | 0.67 | 24.5 | C | | |
| y Street (N-S) @ | EB-L | 0.36 | 29.8 | C | 0.37 | 30.2 | C | 0.14 | 20.8 | C | | | 0.14 | 20.8 | C | | |
| lary Street (E-W) | EB-TR | 0.76 | 31.0 | C | 0.80 | 32.4 | C | 0.80 | 32.4 | C | | | 0.80 | 32.4 | C | | |
| | WB-L | 1.08 | 123.8 | F | 1.20 | >150 | F * | 1.05 | 113.2 | F | | | 1.05 | 113.2 | F | | |
| | WB-TR | 0.48 | 15.6 | B | 0.48 | 15.7 | B | 0.63 | 27.4 | C | | | 0.63 | 27.4 | C | | |
| | NB-L | 0.27 | 27.7 | C | 0.30 | 28.3 | C | NB-L 0.32 | 30.8 | C | | | NB-L 0.32 | 30.8 | C | | |
| | NB-TR | 0.59 | 32.9 | C | 0.62 | 33.5 | C | NB-T 0.24 | 28.9 | C | | | NB-T 0.24 | 28.9 | C | | |
| | | | | | | | | NB-R 0.71 | 31.4 | C | | | NB-R 0.71 | 31.4 | C | | |
| | SB-L | 0.35 | 31.8 | C | 0.36 | 32.4 | C | 0.19 | 28.4 | C | | | 0.19 | 28.4 | C | | |
| | SB-TR | 0.13 | 24.9 | C | 0.13 | 24.9 | C | 0.13 | 27.0 | C | | | 0.13 | 27.0 | C | | |
| dams Street (N-S) (Service)@ | EB-L | 0.75 | 64.8 | E | 0.74 | 64.2 | E | 0.74 | 64.2 | E | | | 0.74 | 64.2 | E | | |
| illary Street (E-W) | EB-TR | 0.58 | 34.2 | C | 0.60 | 34.7 | C | 0.60 | 34.7 | C | | | 0.60 | 34.7 | C | | |
| | WB-L | 1.15 | >150 | F | 1.17 | >150 | F * | 1.17 | >150 | F ** | | | 1.17 | >150 | F ** | | |
| | WB-T | 0.62 | 49.8 | D | 0.65 | 50.6 | D | 0.65 | 50.6 | D | | | 0.65 | 50.6 | D | | |
| | WB-R | 0.94 | 76.9 | E | 0.96 | 80.5 | F | 0.96 | 80.5 | F | | | 0.96 | 80.5 | F | | |
| | NB-TR | 0.59 | 31.2 | C | 0.61 | 31.6 | C | 0.61 | 31.6 | C | | | 0.61 | 31.6 | C | | |
| | SB-TR | 0.32 | 22.3 | C | 0.32 | 22.3 | C | 0.32 | 22.3 | C | | | 0.32 | 22.3 | C | | |
| Adams Street (N-S) (Main) | NB-L | 0.42 | 56.8 | E | 0.44 | 57.7 | E | 0.44 | 57.7 | E | | | 0.44 | 57.7 | E | | |
| | NB-T | 0.48 | 28.3 | C | 0.51 | 28.9 | C | 0.51 | 28.9 | C | | | 0.51 | 28.9 | C | | |
| | SB-L | 1.08 | 110.8 | F | 1.13 | 129.1 | F * | 1.13 | 129.1 | F ** | | | 1.13 | 129.1 | F ** | | |
| | SB-T | 1.00 | 63.5 | E | 1.01 | 67.0 | E | 1.01 | 67.0 | E | | | 1.01 | 67.0 | E | | |
| Ashland Place (N-S) @ | EB-LT | 0.26 | 7.4 | A | 0.28 | 7.6 | A | 0.28 | 7.6 | A | | | 0.28 | 9.3 | A | | |
| Myrtle Avenue (E-W) | EB-R | 0.14 | 6.6 | A | 0.15 | 6.7 | A | 0.16 | 6.8 | A | | | 0.17 | 8.5 | A | | |
| | WB-LTR | 0.42 | 9.2 | A | 0.46 | 9.6 | A | WB-LTR 0.52 | 10.8 | B | | | WB-LTR 0.56 | 13.6 | B | | |
| | NB-LTR | 0.83 | 49.7 | D | 0.97 | 73.1 | E * | NB-L 0.70 | 54.3 | D | 37.0 | D | NB-L 0.91 | 91.5 | F | 44.4 | D |
| | | | | | | | | NB-TR 0.41 | 30.4 | C | | | NB-TR 0.34 | 26.4 | C | | |
| | SB-LTR | 0.77 | 41.1 | D | 0.79 | 42.7 | D | SB-L 0.60 | 53.8 | D | 34.7 | C | SB-L 0.65 | 52.2 | D | 34.6 | C |
| | | | | | | | | SB-TR 0.51 | 31.8 | C | | | SB-TR 0.68 | 32.4 | C | | |
| Prince Street (NB) @ | EB-LT | EB-LT 0.51 | 23.2 | C | EB-LT 1.09 | 104.5 | F * | 0.56 | 13.7 | B | | | 0.56 | 13.7 | B | | |
| Myrtle Avenue (E-W) | WB-TR | WB-TR 0.67 | 28.4 | C | WB-TR 1.16 | 121.3 | F * | 0.86 | 27.6 | C | | | 0.86 | 27.6 | C | | |
| | NB-LTR | NB-LTR 0.78 | 41.9 | D | | | | | | | | | | | | | |
| Gold St/Albee Square West (N-S) @ | EB-TR | 0.17 | 31.9 | C | | | | | | | | | | | | | |
| Willoughby Street (E-W) | WB-LT | 0.35 | 22.9 | C | 0.33 | 33.5 | C | | | | | | | | | | |
| | NB-L | 0.29 | 22.7 | C | 0.68 | 32.0 | C | | | | | | | | | | |
| | NB-R | 0.50 | 27.0 | C | 0.68 | 32.6 | C | | | | | | | | | | |
| | SB-L | 0.09 | 19.2 | B | 0.08 | 19.0 | B | | | | | | | | | | |
| | SB-TR | 0.24 | 21.7 | C | 0.29 | 22.3 | C | | | | | | | | | | |
| Bridge Street (SB) @ | WB-LT | 0.82 | 24.8 | C | 1.31 | >150 | F * | 0.88 | 27.7 | C | | | 0.88 | 27.7 | C | | |
| Willoughby Street (E-W) | | | | | | | | | | | | | | | | | |

**Table 2**

**BQE Ramp Alternative Traffic Conditions- MD Peak H**

| SIGNALIZED INTERSECTION | Lane Group | MD Peak Hour | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No Action | | | | Future Action | | | | Mitigation | | | | | | BQE Off-ramp Alternative | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | | Appr Delay | |
| Tillary Street (E-W) @ | EB-L | | 0.49 | 50.8 | D | | 0.51 | 51.5 | D | | 0.51 | 51.5 | D | | | | 0.56 | 55.7 | E | | |
| Flatbush Avenue (N-S) | EB-TR | | 0.91 | 51.8 | D | | 0.95 | 56.2 | E | | 0.95 | 56.2 | E | | | | 0.88 | 47.2 | D | | |
| | EB-R | | 0.95 | 80.1 | F | | 1.04 | 102.9 | F | * | 1.04 | 102.9 | F | ** | | | 0.96 | 79.0 | E | | |
| | WB-L | | 0.77 | 57.7 | E | | 0.91 | 70.5 | E | * | 0.91 | 70.5 | E | ** | | | 0.47 | 49.2 | D | | |
| | WB-T | | 0.63 | 39.7 | D | | 0.66 | 40.5 | D | | 0.66 | 40.5 | D | | | | 0.62 | 37.6 | D | | |
| | WB-R | | 0.84 | 62.0 | E | | 0.85 | 62.6 | E | | 0.85 | 62.6 | E | | | | 0.79 | 53.7 | D | | |
| | NB-L | | 1.00 | 79.7 | E | | 1.05 | 93.8 | F | * | 0.98 | 72.7 | E | | | | 0.99 | 77.2 | E | | |
| | NB-T | | 0.45 | 22.3 | C | | 0.45 | 22.4 | C | | 0.45 | 22.4 | C | | | | 0.46 | 22.8 | C | | |
| | SB-T | | 0.58 | 35.4 | D | | 0.59 | 35.7 | D | | 0.62 | 37.7 | D | | | | 0.62 | 37.7 | D | | |
| | SB-R | | 0.49 | 38.7 | D | | 0.55 | 41.3 | D | | 0.59 | 44.4 | D | | | | 0.59 | 44.4 | D | | |
| Myrtle Avenue (E-W) @ | EB-DfL | EB-LTR | 0.89 | 63.9 | E | EB-LTR | 0.61 | 54.1 | D | | EB-DfL | 0.79 | 68.9 | E | 64.1 | E | EB-DfL | 0.79 | 68.9 | E | 53.7 |
| Flatbush Avenue (N-S) | EB-TR | | | | | | | | | | EB-TR | 0.48 | 40.9 | D | | | EB-TR | 0.48 | 40.9 | D | |
| | WB-LTR | | 0.71 | 47.5 | D | | 0.70 | 46.6 | D | | | 0.70 | 46.8 | D | | | | 0.70 | 46.8 | D | |
| | NB-L | | 0.36 | 24.8 | C | | 0.41 | 28.1 | C | | NB-L | 0.44 | 31.7 | C | | | NB-L | 0.32 | 22.5 | C | |
| | NB-TR | | 1.18 | 111.6 | F | | 1.29 | >150 | F | * | NB-T | 1.17 | 110.6 | F | | | NB-T | 1.12 | 84.4 | F | |
| | | | | | | | | | | | NB-R | 0.15 | 18.0 | B | | | NB-R | 0.15 | 16.3 | B | |
| | SB-L | | 1.00 | 105.4 | F | | 1.13 | 144.8 | F | * | | 0.99 | 97.7 | F | | | | 0.99 | 103.6 | F | |
| | SB-TR | | 0.56 | 6.6 | A | | 0.59 | 6.8 | A | | | 0.60 | 6.9 | A | | | | 0.51 | 6.1 | A | |
| Willoughby Street (E-W) @ | EB-L | EB-L | 0.90 | 84.1 | F | | 1.39 | >150 | F | * | EB-L | 0.50 | 38.0 | D | | | EB-L | 0.45 | 35.2 | D | |
| Flatbush Avenue (N-S) | | | | | | | | | | | EB-LR | 0.49 | 36.7 | D | | | EB-LR | 0.48 | 36.5 | D | |
| | EB-R | EB-R | 0.43 | 29.1 | C | | 0.30 | 25.1 | C | | EB-R | 0.50 | 35.1 | D | | | EB-R | 0.50 | 35.1 | D | |
| | WB-LT | | 0.30 | 37.0 | D | | 0.39 | 38.9 | D | | WB-LT | 0.53 | 33.4 | C | | | WB-LTR | 0.38 | 29.0 | C | |
| | WB-R | | 0.18 | 35.1 | D | | 0.24 | 36.5 | D | | WB-R | 0.14 | 25.9 | C | | | | | | | |
| | NB-L | | 0.59 | 21.2 | C | | 0.71 | 29.0 | C | | | | | | | | | | | | |
| | NB-T | | 0.61 | 6.4 | A | | 0.55 | 5.8 | A | | NB-T | 0.65 | 14.4 | B | | | NB-T | 0.65 | 14.4 | B | |
| | SB-TR | | 0.70 | 19.1 | B | | 0.74 | 20.1 | C | | SB-TR | 0.79 | 18.1 | B | | | SB-TR | 0.69 | 15.3 | B | |
| DeKalb Avenue (E-W) @ | WB-L | | 0.87 | 66.2 | E | | 0.88 | 68.6 | E | | | | | | | | | | | | |
| Flatbush Avenue (N-S) | WB-LT | | 0.56 | 41.4 | D | | 0.58 | 42.0 | D | | | | | | | | | | | | |
| | WB-R | | 0.81 | 61.0 | E | | 0.83 | 63.0 | E | | | | | | | | | | | | |
| | NB-T | | 0.74 | 23.5 | C | | 0.77 | 24.5 | C | | | | | | | | | | | | |
| | SB-TR | | 0.75 | 23.6 | C | | 0.79 | 25.0 | C | | | | | | | | | | | | |
| Livingston Street (E-W) @ | EB-R | | 0.56 | 35.8 | D | | 0.59 | 36.6 | D | | | | | | | | | | | | |
| Flatbush Avenue (N-S) | NB-L | | 0.58 | 15.7 | B | | 0.61 | 18.9 | B | | | | | | | | | | | | |
| | NB-T | | 0.37 | 0.4 | A | | 0.61 | 11.2 | B | | | | | | | | | | | | |
| | SB-TR | | 0.50 | 9.8 | A | | 0.53 | 10.1 | B | | | | | | | | | | | | |
| Lafayette Avenue/ | EB-LT | | 0.41 | 27.6 | C | | 0.49 | 29.0 | C | | | 0.54 | 32.8 | C | | | | 0.51 | 30.1 | C | |
| Schermerhorn Street (E-W) @ | WB-TR | | 0.62 | 51.3 | D | | 0.68 | 53.3 | D | | | 0.69 | 54.0 | D | | | | 0.71 | 53.7 | D | |
| Flatbush Avenue (N-S) | NB-TR | | 1.12 | 95.1 | F | | 1.17 | 113.8 | F | * | | 1.12 | 92.8 | F | | | | 1.12 | 92.8 | F | |
| | SB-L | | 0.77 | 68.1 | E | | 0.83 | 75.8 | E | * | | 0.76 | 64.4 | E | | | | 0.71 | 64.4 | E | |
| | SB-T | | 0.57 | 15.2 | B | | 0.60 | 15.7 | B | | | 0.57 | 12.5 | B | | | | 0.59 | 14.8 | B | |
| Fourth Ave/Hanson Pl. (E-W) @ | EB-LT | | 0.34 | 30.7 | C | | 0.36 | 31.0 | C | | | | | | | | | | | | |
| Flatbush Avenue (N-S) | NB-T | | 0.71 | 18.6 | B | | 0.74 | 19.1 | B | | | | | | | | | | | | |
| | NB-R | | 0.32 | 14.1 | B | | 0.36 | 14.7 | B | | | | | | | | | | | | |
| | SB-TR | | 0.83 | 24.0 | C | | 0.85 | 25.1 | C | | | | | | | | | | | | |
| | SB-R | | 0.63 | 26.2 | C | | 0.69 | 28.7 | C | | | | | | | | | | | | |

## Table 21-2 (Continued)
## BQE Ramp Alternative Traffic Conditions- AM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour NoBuild V/C Ratio | NoBuild Delay (sec.) | NoBuild LOS | Future Action V/C Ratio | Future Action Delay (sec.) | Future Action LOS | Mitigation V/C Ratio | Mitigation Delay (sec.) | Mitigation LOS | Mitigation Appr. Delay | Mitigation Appr. LOS | BQE Off-ramp Alternative V/C Ratio | BQE Off-ramp Alternative Delay (sec.) | BQE Off-ramp Alternative LOS | BQE Off-ramp Alternative Appr. Delay | BQE Off-ramp Alternative Appr. LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bond Street (NB) @ Atlantic Avenue (E-W) | EB-LT | 1.41 | >150 | F | 1.53 | >150 | F * | 1.37 | >150 | F | | | 1.37 | >150 | F | | |
| | WB-TR | 1.18 | 114.0 | F | 1.32 | >150 | F * | WB-T 0.95 | 36.7 | D | 33.4 | C | WB-T 0.95 | 36.7 | D | 33.4 | C |
| | | | | | | | | WB-R 0.61 | 20.4 | C | | | WB-R 0.61 | 20.4 | C | | |
| | NB-LTR | 0.72 | 38.2 | D | 0.73 | 38.7 | D | NB-LTR 0.80 | 44.9 | D | | | NB-LTR 0.80 | 44.9 | D | | |
| Hoyt Street (SB) @ Atlantic Avenue (E-W) | EB-TR | 0.72 | 22.6 | C | 0.78 | 24.9 | C | 0.71 | 21.1 | C | | | 0.71 | 21.1 | C | | |
| | WB-LT | 1.25 | 144.9 | F | 1.28 | >150 | F * | 1.24 | 139.5 | F | | | 1.24 | 139.5 | F | | |
| | SB-LTR | 0.57 | 35.4 | D | 0.72 | 41.8 | D | 0.43 | 32.0 | C | | | 0.43 | 32.0 | C | | |
| Smith Street (N-S) @ Atlantic Avenue (E-W) | NB-L | 1.44 | >150 | F | 1.82 | >150 | F * | 1.82 | >150 | F ** | | | 1.82 | >150 | F ** | | |
| | NB-T | 0.73 | 23.2 | C | 0.79 | 25.8 | C | 0.74 | 23.6 | C | | | 0.74 | 23.6 | C | | |
| | NB-R | 0.94 | 36.3 | D | 0.94 | 37.1 | D | 0.94 | 37.1 | D | | | 0.94 | 37.1 | D | | |
| | SB-T | 0.46 | 18.2 | B | 0.52 | 19.7 | B | 0.52 | 19.7 | B | | | 0.52 | 19.7 | B | | |
| | SB-R | 1.12 | 120.0 | F | 1.12 | 120.0 | F | 1.12 | 120.0 | F | | | 1.12 | 120.0 | F | | |
| | | 0.73 | 38.6 | D | 0.80 | 42.4 | D | 0.80 | 42.4 | D | | | 0.80 | 42.4 | D | | |
| Boerum Place (N-S) @ Atlantic Avenue (E-W) | EB-DfL | 1.14 | 133.8 | F | 1.20 | >150 | F * | 1.15 | 133.5 | F | | | 1.15 | 133.5 | F | | |
| | EB-TR | 0.53 | 19.9 | B | 0.62 | 22.1 | C | 0.60 | 20.3 | C | | | 0.60 | 20.3 | C | | |
| | WB-LT | 1.00 | 74.7 | E | 1.03 | 81.9 | F * | 1.00 | 73.6 | E | | | 1.00 | 73.6 | E | | |
| | WB-R | 0.45 | 1.3 | A | 0.45 | 1.3 | A | 0.45 | 1.3 | A | | | 0.45 | 1.3 | A | | |
| | SB-L | 0.45 | 28.3 | C | 0.48 | 28.4 | C | 0.41 | 28.9 | C | | | 0.41 | 28.9 | C | | |
| | SB-TR | 0.61 | 32.2 | C | 0.64 | 32.9 | C | 0.67 | 35.2 | D | | | 0.67 | 35.2 | D | | |
| Jay Street (N-S) @ Tech Place (E-W) | WB-LTR | 0.12 | 21.0 | C | 0.12 | 21.0 | C | | | | | | | | | | |
| | NB-TR | 0.76 | 20.7 | C | 0.86 | 26.7 | C | | | | | | | | | | |
| | SB-LT | 0.56 | 15.3 | B | 0.79 | 22.2 | C | | | | | | | | | | |
| Smith Street (N-S) @ Schermerhorn (E-W) | | | | | | | | EB-LT 0.19 | 26.0 | C | | | EB-LT 0.19 | 26.0 | C | | |
| | WB-T | 0.56 | 29.6 | C | WB-T 0.56 | 29.8 | C | WB-T 0.65 | 36.1 | D | | | WB-T 0.65 | 36.1 | D | | |
| | WB-R | 0.22 | 23.5 | C | WB-R 0.22 | 23.6 | C | WB-R 0.26 | 27.2 | C | | | WB-R 0.26 | 27.2 | C | | |
| | NB-LTR | 1.14 | 104.6 | F | 1.27 | >150 | F * | 0.99 | 49.8 | D | | | 0.99 | 49.8 | D | | |
| | SB-L | 0.72 | 49.8 | D | 0.74 | 51.5 | D | 0.55 | 34.2 | C | | | 0.55 | 34.2 | C | | |
| | SB-R | 0.52 | 40.8 | D | 0.56 | 42.5 | D | 0.23 | 8.8 | A | | | 0.23 | 8.8 | A | | |
| Fulton Street (E-W) @ Flatbush Avenue (N-S) | EB-LTR | 0.19 | 36.7 | D | 0.19 | 36.7 | D | 0.20 | 38.5 | D | | | 0.19 | 36.7 | D | | |
| | WB-LT | 0.54 | 47.2 | D | 0.54 | 47.2 | D | 0.59 | 51.2 | D | | | 0.63 | 51.4 | D | | |
| | WB-R | 0.54 | 28.5 | C | 0.57 | 29.4 | C | 0.60 | 32.2 | C | | | 0.59 | 31.6 | C | | |
| | NB-TR | 1.19 | 126.2 | F | 1.23 | 143.3 | F * | 1.18 | 121.4 | F | | | 1.18 | 121.4 | F | | |
| | SB-L | 1.00 | 92.6 | F | 1.01 | 94.9 | F | 1.01 | 94.7 | F | | | 0.79 | 60.9 | E | | |
| | SB-T | 0.98 | 41.7 | D | 1.07 | 69.4 | E * | 0.70 | 16.7 | B | | | 0.64 | 16.8 | B | | |

NOTES:
EB-Eastbound, WB-Westbound, NB-Northbound, SB-Southbound
L-Left, T-Through, R-Right, DfL-Analysis considers a Defactor Left Lane on this approach .
V/C Ratio - Volume to Capacity Ratio, SEC/VEH - Seconds per vehicle
LOS - Level of service
* - Denotes Impacted Intersections
** - Denotes Unmitigated Intersections

Analysis is based on the 2000 Highway Capacity Manual Methodology (HCS 2000).

## Table 21-2 (Continued)
## BQE Ramp Alternative Traffic Conditions- AM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NoBuild | | | Future Action | | | | Mitigation | | | | | BQE Off-ramp Alternative | | | | | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS |
| Jay Street (N-S) @ | EB-LR | 0.05 | 20.2 | C | 0.00 | 19.6 | B | | | | | | | | | | | | | | |
| Willoughby Street (E-W) | WB-LTR | 0.76 | 40.3 | D | 0.91 | 59.1 | E | * | WB-LTR | 0.82 | 42.8 | D | | | WB-LTR | 0.82 | 42.8 | D | | |
| | NB-LT | 0.74 | 19.7 | B | 0.83 | 23.8 | C | | NB-LT | 0.92 | 33.6 | C | | | NB-LT | 0.92 | 33.6 | C | | |
| | SB-TR | 0.40 | 13.0 | B | 0.44 | 13.5 | B | | SB-TR | 0.49 | 15.9 | B | | | SB-TR | 0.49 | 15.9 | B | | |
| Bond Street (NB) @ | EB-LT | 0.62 | 13.4 | B | 0.97 | 44.4 | D | | EB-L | 0.45 | 20.1 | C | 18.6 | B | EB-L | 0.45 | 20.1 | C | 18.6 | B |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.60 | 18.3 | B | | | EB-T | 0.60 | 18.3 | B | | |
| | WB-TR | 0.89 | 27.8 | C | 1.11 | 81.0 | F | * | WB-T | 0.83 | 28.0 | C | 26.0 | C | WB-T | 0.83 | 28.0 | C | 26.0 | C |
| | | | | | | | | | WB-R | 0.19 | 12.3 | B | | | WB-R | 0.19 | 12.3 | B | | |
| | NB-LTR | 0.81 | 32.6 | C | 1.35 | >150 | F | * | | 0.72 | 29.3 | C | | | | 0.72 | 29.3 | C | | |
| Hoyt Street (SB) @ | EB-TR | 0.80 | 19.0 | B | 0.87 | 23.6 | C | | EB-T | 0.75 | 22.6 | C | 20.8 | C | EB-T | 0.75 | 22.6 | C | 20.8 | C |
| Livingston Street (E-W) | | | | | | | | | EB-R | 0.23 | 12.2 | B | | | EB-R | 0.23 | 12.2 | B | | |
| | WB-LT | 0.64 | 14.3 | B | 0.83 | 23.2 | C | | WB-L | 0.33 | 15.7 | B | 17.5 | B | WB-L | 0.33 | 15.7 | B | 17.5 | B |
| | | | | | | | | | WB-T | 0.59 | 17.3 | B | | | WB-T | 0.59 | 17.3 | B | | |
| | SB-LTR | 0.23 | 15.5 | B | 0.30 | 16.1 | B | | | 0.27 | 21.6 | C | | | | 0.27 | 21.6 | C | | |
| Smith Street (N-S) @ | EB-LTR | 0.64 | 22.6 | C | 0.81 | 30.3 | C | | | | | | | | | | | | | |
| Livingston Street (E-W) | WB-LTR | 0.40 | 18.3 | B | 0.50 | 19.9 | B | | | | | | | | | | | | | |
| | NB-DfL | 0.82 | 28.5 | C | 0.94 | 39.7 | D | | | | | | | | | | | | | |
| | NB-TR | 0.87 | 64.4 | E | 0.82 | 56.4 | E | | | | | | | | | | | | | |
| | SB-LTR | 0.71 | 28.0 | C | 0.86 | 38.8 | D | | | | | | | | | | | | | |
| Boerum Place (N-S) @ | EB-LT | 0.82 | 60.2 | E | 0.93 | 76.4 | E | * | EB-L | 0.30 | 36.4 | D | 37.6 | D | EB-L | 0.30 | 36.4 | D | 37.6 | D |
| Livingston Street (E-W) | | | | | | | | | EB-T | 0.49 | 38.9 | D | | | EB-T | 0.49 | 38.9 | D | | |
| | EB-R | 0.16 | 32.9 | C | 0.16 | 32.9 | C | | EB-R | 0.16 | 32.9 | C | | | EB-R | 0.16 | 32.9 | C | | |
| | WB-LTR | 0.77 | 49.5 | D | 0.89 | 62.5 | E | * | WB-L | 0.39 | 39.3 | D | 40.5 | D | WB-L | 0.39 | 39.3 | D | 40.5 | D |
| | | | | | | | | | WB-T | 0.35 | 35.9 | D | | | WB-T | 0.35 | 35.9 | D | | |
| | | | | | | | | | WB-R | 0.60 | 44.3 | D | | | WB-R | 0.60 | 44.3 | D | | |
| | NB-L | 0.35 | 24.4 | C | 0.35 | 24.4 | C | | | 0.36 | 25.6 | C | | | | 0.36 | 25.6 | C | | |
| | NB-TR | 0.91 | 37.2 | D | 0.93 | 39.3 | D | | | 0.95 | 42.3 | D | | | | 0.95 | 42.3 | D | | |
| | SB-L | 1.00 | 100.3 | F | 1.05 | 114.8 | F | * | | 1.00 | 99.0 | F | | | | 1.00 | 99.0 | F | | |
| | SB-TR | 0.38 | 11.5 | B | 0.38 | 11.5 | B | | | 0.38 | 11.5 | B | | | | 0.38 | 11.5 | B | | |
| Bond Street (NB) @ | EB-LT | 0.43 | 12.6 | B | 0.48 | 13.3 | B | | EB-L | 0.13 | 13.5 | B | 17.8 | B | EB-L | 0.13 | 13.5 | B | 17.8 | B |
| Schermerhorn Street (E-W) | | | | | | | | | EB-T | 0.52 | 18.2 | B | | | EB-T | 0.52 | 18.2 | B | | |
| | WB-TR | 0.53 | 14.2 | B | 0.54 | 14.3 | B | | | 0.56 | 19.3 | B | | | | 0.56 | 19.3 | B | | |
| | NB-LTR | 1.18 | 115.8 | F | 1.57 | >150 | F | * | | 0.89 | 37.3 | D | | | | 0.89 | 37.3 | D | | |
| Hoyt Street (SB) @ | EB-TR | 0.51 | 11.3 | B | 0.54 | 11.9 | B | | | 0.70 | 23.0 | C | | | | 0.70 | 23.0 | C | | |
| Schermerhorn Street (E-W) | | | | | | | | | | | | | | | | | | | | |
| | WB-LT | 0.84 | 25.5 | C | 0.87 | 28.3 | C | | WB-L | 0.41 | 19.4 | B | 21.5 | C | WB-L | 0.41 | 19.4 | B | 21.5 | C |
| | | | | | | | | | WB-T | 0.65 | 21.9 | C | | | WB-T | 0.65 | 21.9 | C | | |
| | SB-LTR | 0.34 | 16.5 | B | 0.44 | 17.7 | B | | | 0.37 | 20.8 | C | | | | 0.37 | 20.8 | C | | |
| Fourth Ave (N-S) @ | EB-TR | 0.65 | 27.7 | C | 0.68 | 28.5 | C | | | 0.66 | 27.1 | C | | | | 0.66 | 27.1 | C | | |
| Atlantic Avenue (E-W) | WB-TR | 1.08 | 82.5 | F | 1.21 | 134.2 | F | * | | 1.19 | 124.5 | F | ** | | | 1.19 | 124.5 | F | ** | |
| | NB-L | 1.22 | >150 | F | 1.29 | >150 | F | * | | 1.21 | >150 | F | | | | 1.21 | >150 | F | | |
| | NB-T | 0.68 | 40.0 | D | 0.70 | 40.5 | D | | | 0.66 | 38.1 | D | | | | 0.66 | 38.1 | D | | |
| | NB-R | 0.66 | 48.8 | D | 0.66 | 48.8 | D | | | 0.62 | 44.7 | D | | | | 0.62 | 44.7 | D | | |
| | SB-T | 0.18 | 17.3 | B | 0.19 | 17.4 | B | | | 0.21 | 18.2 | B | | | | 0.21 | 18.2 | B | | |
| | SB-R | 0.13 | 17.0 | B | 0.13 | 17.0 | B | | | 0.13 | 17.6 | B | | | | 0.13 | 17.6 | B | | |

## Table 21-2 (Continued)
## BQE Ramp Alternative Traffic Conditions- AM Peak Hour

| GNALIZED TERSECTION | Lane Group | AM Peak Hour NoBuild V/C Ratio | NoBuild Delay (sec.) | NoBuild LOS | Future Action V/C Ratio | Future Action Delay (sec.) | Future Action LOS | Mitigation V/C Ratio | Mitigation Delay (sec.) | Mitigation LOS | Mitigation Appr. Delay | Mitigation Appr. LOS | BQE Off-ramp Alternative V/C Ratio | BQE Off-ramp Alternative Delay (sec.) | BQE Off-ramp Alternative LOS | BQE Off-ramp Alternative Appr. Delay | BQE Off-ramp Alternative Appr. LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| tlantic Avenue (E-W) @ | EB-T | 0.94 | 57.6 | E | 0.98 | 64.2 | E * | 0.87 | 45.8 | D | | | 0.87 | 45.8 | D | | |
| latbush Avenue (N-S) | EB-R | 0.52 | 42.2 | D | 0.53 | 42.5 | D | 0.31 | 32.7 | C | | | 0.31 | 32.7 | C | | |
| | WB-TR | 1.31 | >150 | F | 1.47 | >150 | F * | 1.31 | >150 | F | | | 1.31 | >150 | F | | |
| | WB-R | 0.75 | 47.7 | D | 0.78 | 49.7 | D | 0.68 | 40.6 | D | | | 0.68 | 40.6 | D | | |
| | NB-LTR | 0.70 | 20.6 | C | 0.72 | 21.2 | C | 0.77 | 25.3 | C | | | 0.77 | 25.3 | C | | |
| | SB-LTR | 0.49 | 17.0 | B | 0.50 | 17.1 | B | 0.56 | 20.7 | C | | | 0.56 | 20.7 | C | | |
| Jay Street (N-S) @ | EB-L | 0.61 | 48.0 | D | 0.62 | 49.4 | D | 0.19 | 25.0 | C | | | 0.19 | 25.0 | C | | |
| Tillary Street (E-W) | EB-TR | 0.84 | 34.6 | C | 0.90 | 38.7 | D | 0.94 | 43.9 | D | | | 0.94 | 43.9 | D | | |
| | WB-L | 1.71 | >150 | F | 2.02 | >150 | F * | 1.67 | >150 | F | | | 1.67 | >150 | F | | |
| | WB-TR | 0.54 | 16.7 | B | 0.55 | 16.8 | B | 0.74 | 31.8 | C | | | 0.74 | 31.8 | C | | |
| | NB-L | 0.20 | 26.4 | C | 0.21 | 26.6 | C | 0.23 | 29.7 | C | NB-L | | 0.23 | 29.7 | C | NB-L | |
| | NB-TR | 0.83 | 42.4 | D | 0.84 | 43.0 | D | 0.63 | 39.6 | D | NB-T | | 0.63 | 39.6 | D | NB-T | |
| | | | | | | | | 0.75 | 32.1 | C | NB-R | | 0.75 | 32.1 | C | NB-R | |
| | SB-L | 0.50 | 43.0 | D | 0.50 | 43.3 | D | 0.28 | 31.9 | C | | | 0.28 | 31.9 | C | | |
| | SB-TR | 0.11 | 24.7 | C | 0.11 | 24.7 | C | 0.13 | 27.5 | C | | | 0.13 | 27.5 | C | | |
| Adams Street (N-S) (Service)@ | EB-L | 1.02 | 106.0 | F | 1.01 | 105.1 | F | 1.01 | 105.1 | F | | | 1.01 | 105.1 | F | | |
| Tillary Street (E-W) | EB-TR | 0.61 | 35.0 | C | 0.65 | 36.1 | D | 0.65 | 36.1 | D | | | 0.65 | 36.1 | D | | |
| | WB-L | 1.16 | >150 | F | 1.20 | >150 | F * | 1.20 | >150 | F ** | | | 1.20 | >150 | F ** | | |
| | WB-T | 0.62 | 50.0 | D | 0.63 | 50.4 | D | 0.63 | 50.4 | D | | | 0.63 | 50.4 | D | | |
| | WB-R | 1.12 | 125.6 | F | 1.13 | 129.4 | F * | 1.13 | 129.4 | F ** | | | 1.13 | 129.4 | F ** | | |
| | NB-TR | 0.41 | 27.5 | C | 0.41 | 27.6 | C | 0.41 | 27.6 | C | | | 0.41 | 27.6 | C | | |
| | SB-TR | 0.28 | 21.7 | C | 0.28 | 21.7 | C | 0.28 | 21.7 | C | | | 0.28 | 21.7 | C | | |
| Adams Street (N-S) (Main) | NB-L | 0.50 | 59.7 | E | 0.49 | 59.5 | E | 0.49 | 59.5 | E | | | 0.49 | 59.5 | E | | |
| | NB-T | 0.83 | 38.6 | D | 0.84 | 39.6 | D | 0.84 | 39.6 | D | | | 0.84 | 39.6 | D | | |
| | SB-L | 1.21 | >150 | F | 1.30 | >150 | F * | 1.30 | >150 | F ** | | | 1.30 | >150 | F ** | | |
| | SB-T | 1.13 | 107.2 | F | 1.14 | 112.1 | F * | 1.14 | 112.1 | F ** | | | 1.14 | 112.1 | F ** | | |
| Ashland Place (N-S) @ | EB-LT | 0.36 | 8.5 | A | 0.38 | 8.6 | A | 0.37 | 8.6 | A | | | 0.35 | 8.8 | A | | |
| Myrtle Avenue (E-W) | EB-R | 0.14 | 6.7 | A | 0.14 | 6.7 | A | 0.14 | 6.6 | A | | | 0.14 | 7.0 | A | | |
| | | | | | | | | WB-LT | 0.99 | 47.5 | D | | WB-LT | 0.99 | 46.9 | D | |
| | WB-LTR | 0.98 | 42.8 | D | 1.06 | 64.9 | E * | WB-R | 0.09 | 6.2 | A | 44.2 D | WB-R | 0.09 | 6.6 | A | 43.7 D |
| | NB-LTR | 1.14 | 119.8 | F | 1.19 | 139.3 | F * | NB-L | 0.70 | 53.0 | D | 37.4 D | NB-L | 1.40 | >150 | F | 84.2 D |
| | | | | | | | | NB-TR | 0.56 | 33.0 | C | | NB-TR | 0.54 | 31.7 | C | |
| | SB-LTR | 0.99 | 74.4 | E | 1.01 | 78.6 | E * | SB-L | 0.82 | 82.7 | F | 40.7 D | SB-L | 1.09 | 146.3 | F | 73.5 D |
| | | | | | | | | SB-TR | 0.50 | 31.6 | C | | SB-TR | 0.99 | 62.9 | E | |
| Prince Street (NB) @ | EB-LT | 0.73 | 32.9 | C | 1.28 | >150 | F * | EB-LT | 0.61 | 15.3 | B | | EB-LT | 0.61 | 15.3 | B | |
| Myrtle Avenue (E-W) | WB-TR | 1.02 | 71.9 | E | 1.51 | >150 | F * | WB-TR | 0.98 | 45.7 | D | | WB-TR | 0.98 | 45.7 | D | |
| | NB-LTR | 0.75 | 39.7 | D | | | | | | | | | | | | | |
| Gold St/Albee Square West (N-S) @ | EB-TR | 0.10 | 30.8 | C | | | | | | | | | | | | | |
| Willoughby Street (E-W) | WB-LT | 0.52 | 26.6 | C | 0.52 | 36.9 | D | | | | | | | | | | |
| | NB-L | 0.19 | 20.9 | C | 0.50 | 26.2 | C | | | | | | | | | | |
| | NB-R | 0.25 | 21.6 | C | 0.36 | 23.4 | C | | | | | | | | | | |
| | SB-L | 0.17 | 20.4 | C | 0.16 | 20.0 | B | | | | | | | | | | |
| | SB-TR | 0.13 | 19.9 | B | 0.40 | 24.7 | C | | | | | | | | | | |
| Bridge Street (SB) @ | WB-LT | 0.70 | 17.5 | B | 1.48 | >150 | F * | 0.89 | 28.2 | C | | | 0.89 | 28.2 | C | | |
| Willoughby Street (E-W) | | | | | | | | | | | | | | | | | |

**Table 21-2**

## BQE Ramp Alternative Traffic Conditions- AM Peak Hour

| SIGNALIZED INTERSECTION | Lane Group | AM Peak Hour | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NoBuild | | | Future Action | | | | Mitigation | | | | | BQE Off-ramp Alternative | | | |
| | | V/C Ratio | Delay (sec.) | LOS | V/C Ratio | Delay (sec.) | LOS | | V/C Ratio | Delay (sec.) | LOS | Appr. Delay | LOS | V/C Ratio | Delay (sec.) | LOS | Appr. Delay LOS |
| Tillary Street (E-W) @ | EB-L | 0.66 | 56.9 | E | 0.67 | 57.7 | E | | 0.67 | 57.7 | E | | | 0.67 | 57.7 | E | |
| Flatbush Avenue (N-S) | EB-TR | 0.88 | 48.5 | D | 0.92 | 51.6 | D | | 0.86 | 44.3 | D | | | 0.86 | 44.3 | D | |
| | EB-R | 0.93 | 75.3 | E | 1.06 | 107.1 | F | * | 0.93 | 70.9 | E | | | 0.93 | 70.9 | E | |
| | WB-L | 1.32 | >150 | F | 1.58 | >150 | F | * | 1.58 | >150 | F | | ** | 0.79 | 58.0 | E | |
| | WB-T | 0.94 | 58.4 | E | 1.01 | 73.7 | F | * | 0.93 | 55.0 | D | | | 0.93 | 55.0 | D | |
| | WB-R | 1.06 | 106.2 | F | 1.07 | 107.0 | F | | 0.97 | 78.3 | E | | | 0.97 | 78.3 | E | |
| | NB-L | 0.84 | 51.6 | D | 0.84 | 51.4 | D | | 0.83 | 51.7 | D | | | 0.83 | 51.7 | D | |
| | NB-T | 0.60 | 25.0 | C | 0.61 | 25.1 | C | | 0.64 | 27.6 | C | | | 0.64 | 27.6 | C | |
| | SB-T | 0.56 | 34.8 | C | 0.57 | 35.1 | D | | 0.62 | 38.1 | D | | | 0.62 | 38.1 | D | |
| | SB-R | 0.35 | 35.0 | C | 0.37 | 35.4 | D | | 0.40 | 38.4 | D | | | 0.40 | 38.4 | D | |
| Myrtle Avenue (E-W) @ | EB-DfL | 1.30 | >150 | F | 1.45 | >150 | F | * | 1.45 | >150 | F | | ** | 1.37 | >150 | F | ** |
| Flatbush Avenue (N-S) | EB-TR | 0.96 | 82.5 | F | 0.47 | 40.5 | D | | 0.57 | 43.5 | D | | | 0.55 | 42.0 | D | |
| | WB-LTR | 1.01 | 83.8 | F | 1.02 | 86.8 | F | * | 1.05 | 94.2 | F | | ** | 1.01 | 83.8 | F | |
| | NB-L | 1.65 | >150 | F | 1.65 | >150 | F | | 1.65 | >150 | F | | | 1.63 | >150 | F | |
| | NB-TR | 1.10 | 76.7 | E | 1.15 | 94.9 | F | * | 1.15 | 83.2 | F | | ** | 1.10 | 75.1 | E | |
| | SB-L | 1.05 | 118.1 | F | 1.10 | 134.2 | F | * | 1.10 | 134.4 | F | | ** | 1.01 | 112.1 | F | |
| | SB-TR | 0.75 | 9.2 | A | 0.83 | 11.1 | B | | 0.83 | 11.3 | B | | | 0.67 | 8.5 | A | |
| Willoughby Street (E-W) @ | EB-L | 1.02 | 119.7 | F | EB-L | 1.18 | >150 | F | * | EB-L | 0.36 | 32.9 | C | | EB-L | 0.35 | 31.3 | C |
| Flatbush Avenue (N-S) | | | | | | | | | | EB-LR | 0.30 | 31.7 | C | | EB-LR | 0.29 | 30.4 | C |
| | EB-R | 0.26 | 27.8 | C | EB-R | 0.20 | 26.1 | C | | EB-R | 0.17 | 27.8 | C | | EB-R | 0.16 | 26.7 | C |
| | WB-LT | 0.73 | 54.0 | D | 0.75 | 55.4 | E | | | WB-LT | 0.91 | 57.8 | E | | WB-LTR | 0.67 | 35.2 | D |
| | WB-R | 0.29 | 38.6 | D | 0.32 | 39.4 | D | | | WB-R | 0.21 | 28.1 | C | | | | | |
| | NB-L | 1.01 | 95.9 | F | 1.39 | >150 | F | * | | | | | | | | | | |
| | NB-T | 0.84 | 18.5 | B | 0.79 | 16.6 | B | | | NB-T | 0.94 | 33.2 | C | | NB-T | 0.96 | 37.1 | D |
| | SB-TR | 0.80 | 25.5 | C | 0.88 | 30.0 | C | | | SB-T | 0.99 | 44.7 | D | | SB-T | 0.80 | 25.5 | C |
| DeKalb Avenue (E-W) @ | WB-L | 0.45 | 38.3 | D | 0.64 | 44.7 | D | | 0.47 | 38.6 | D | | | WB-L | 0.54 | 40.1 | D | |
| Flatbush Avenue (N-S) | WB-LT | 0.49 | 39.1 | D | 0.34 | 35.7 | D | | 0.52 | 42.2 | D | | | WB-TR | 0.52 | 42.9 | D | |
| | WB-R | 1.11 | 124.8 | F | 1.12 | 127.8 | F | * | 0.93 | 77.3 | F | | | WB-R | 0.93 | 77.3 | E | |
| | NB-T | 1.03 | 55.4 | E | 1.06 | 67.1 | E | * | 1.03 | 55.0 | E | | | | 1.03 | 55.0 | D | |
| | SB-TR | 0.82 | 26.4 | C | 0.84 | 27.5 | C | | 0.82 | 25.1 | C | | | | 0.69 | 20.8 | C | |
| Livingston Street (E-W) @ | EB-R | 0.43 | 33.0 | C | 0.45 | 33.5 | C | | 0.42 | 30.8 | C | | | | 0.42 | 30.8 | C | |
| Flatbush Avenue (N-S) | NB-L | 0.96 | 59.1 | E | 1.06 | 87.9 | F | * | 1.02 | 75.0 | E | | ** | | 1.00 | 69.1 | E | ** |
| | NB-T | 0.49 | 0.7 | A | 0.50 | 0.7 | A | | 0.86 | 27.4 | C | | | | 0.86 | 27.4 | C | |
| | SB-TR | 0.52 | 15.8 | B | 0.59 | 17.0 | B | | 0.62 | 19.2 | B | | | | 0.58 | 18.5 | B | |
| Lafayette Avenue/ | EB-LT | 0.64 | 32.6 | C | 0.67 | 33.5 | C | | 0.72 | 37.2 | D | | | | 0.68 | 33.8 | C | |
| Schermerhorn Street (E-W) @ | WB-TR | 0.80 | 61.2 | E | 0.82 | 62.4 | E | | 0.82 | 62.4 | E | | | | 0.83 | 60.6 | E | |
| Flatbush Avenue (N-S) | NB-TR | 1.23 | 139.9 | F | 1.28 | >150 | F | * | 1.23 | 137.0 | F | | | | 1.23 | 137.0 | F | |
| | SB-L | 0.93 | 93.3 | F | 0.95 | 96.9 | F | * | 0.90 | 85.9 | F | | | | 0.84 | 81.4 | F | |
| | SB-T | 0.55 | 15.0 | B | 0.57 | 15.2 | B | | 0.54 | 12.8 | B | | | | 0.57 | 12.8 | B | |
| Fourth Ave/Hanson Pl. (E-W) @ | EB-LT | 0.77 | 43.3 | D | 0.79 | 44.1 | D | | | | | | | | | | | |
| Flatbush Avenue (N-S) | NB-T | 0.87 | 19.9 | B | 0.90 | 21.9 | C | | | | | | | | | | | |
| | NB-R | 0.60 | 16.3 | B | 0.61 | 16.6 | B | | | | | | | | | | | |
| | SB-TR | 0.64 | 14.3 | B | 0.65 | 14.5 | B | | | | | | | | | | | |
| | SB-R | 0.53 | 19.8 | B | 0.55 | 20.4 | C | | | | | | | | | | | |

## Table 21-1 (cont'd)
## Proposed Traffic Improvement Measures With BQE Ramp Alternative

| Intersection | Approach | Current Signal Timing (Seconds) (1) | Proposed Mitigation | |
|---|---|---|---|---|
| | | | Mitigation Signal Timing (Seconds) (1) | Description of Mitigation |
| Livingston Street (EB/WB) @ Bond Street (NB) | NB<br>EB/WB | 24/24/24<br>36/36/36 | 38/35/38<br>52/55/52 | Implement new median with left-turn bays along Livingston St. corridor. Implement no standing 7-10 AM regulation along west curb on NB approach from Schermerhorn St. to Livingston Street. Increase signal cycle length from 60 sec. to 90 sec. |
| Livingston Street (EB/WB) @ Hoyt Street (SB) | SB<br>EB/WB | 24/24/24<br>36/36/36 | 37/37/37<br>53/53/53 | Implement new median w/left-turn bays along Livingston St. corridor. Increase signal cycle length from 60 to 90 sec. Implement no standing anytime regulation for 100' along the south curb of the EB approach. |
| Livingston Street (EB/WB) @ Smith Street (NB/SB) | NB/SB<br>EB/WB<br>NB/SB<br>EB/WB | 45/45/45<br>45/45/45<br>---/35/35<br>---/55/55 | 45/45/52<br>45/45/38 | Implement new median w/left-turn bays along Livingston St. corridor. Decrease signal cycle length from 180 to 90 seconds in MD and PM. |
| Livingston Street (EB/WB) @ Boerum Place (NB/SB) | NB/SB<br>EB/WB<br>SB<br>NB/SB<br>EB/WB<br>SB | 62/60/60<br>40/50/50<br>18/15/15<br>---/55/55<br>---/42/42<br>---/18/18 | 61/62/58<br>40/40/44<br>19/18/18<br>---/---/---<br>---/---/---<br>---/---/--- | Implement new median with left-turn bays along Livingston St. corridor. Rephase signal cycle length to 120 seconds in MD and PM, and transfer 1 sec. of green time from NB/SB to SB in AM peak period. |
| Myrtle Avenue (EB/WB) @ Prince Street (NB) | NB<br>Ped.<br>EB/WB | 55/55/55<br>---/---/---<br>65/65/65 | ---/---/---<br>35/35/35<br>85/85/85 | Implement 35-second all-pedestrian phase in place of the existing NB phase; transfer 20-seconds of green time from NB phase to EB/WB phase. |
| * Myrtle Avenue (EB/WB) @ Ashland Place (NB/SB) | NB/SB<br>EB/WB | 27/27/27<br>63/63/63 | 28/31/29<br>62/59/61 | Divert traffic to Ashland Pl. via new BQE off-ramp. Reconfigure NB & SB approaches to provide left-turn bays; implement a no standing 7-10 AM & 4-7 PM regulation for 100' along north curb of WB approach and no standing anytime for 200' on the east curb of the NB approach. Transfer 1 sec. of green time from the EB/WB phase to NB/SB in AM, 4 sec. in MD and 2 sec. in PM. |
| Schermerhorn Street (EB/WB) @ Bond Street (NB) | EB/WB<br>NB | 32/32/32<br>28/28/28 | 49/47/54<br>41/43/36 | Implement new median w/left-turn bays along Schermerhorn St. corridor. Implement no standing 7-10 AM, 4-7 PM regulation along west curb of NB approach from State Street to Schermerhorn Street, and no standing 4-7 PM along east curb. Increase signal cycle length from 60 to 90 sec. |
| Schermerhorn Street (EB/WB) @ Hoyt Street (SB) | SB<br>EB/WB | 24/24/24<br>36/36/36 | 40/40/40<br>50/50/50 | Implement new median with left-turn bays along Schermerhorn Street corridor. Increase signal cycle length from 60 to 90 sec; and implement no standing,4-7 PM regulation for 100 feet along south curb of the EB approach. |
| SchermerhornStreet (EB/WB) @ Smith Street (NB/SB) | NB<br>SB<br>EB/WB<br>NB/SB<br>NB<br>SB<br>EB/WB | 34/34/34<br>22/22/22<br>34/34/34<br>---/---/---<br>---/28/28<br>---/28/28<br>---/34/34 | ---/---/---<br>18/23/23<br>30/33/32<br>42/34/35<br>---/---/---<br>---/---/---<br>---/---/--- | Decrease cycle length from 180 to 90 sec. in MD & PM with NB/SB phase in place of NB phase. |
| Tillary Street (EB/WB) @ Adams Street (NB/SB) | NB/SB<br>SB/WB-RT<br>EB<br>EB/WB<br>NB | 34/34/34<br>24/24/24<br>20/20/20<br>25/25/25<br>17/17/17 | n/c<br>n/c<br>n/c<br>n/c<br>n/c | No mitigation proposed. |
| Tillary Street (EB/WB) @ Jay Street (NB/SB) | NB/SB<br>EB/WB<br>WB<br>EB-LT/WB-LT | 48/48/48<br>56/56/56<br>16/16/16<br>---/---/--- | 44/45/46<br>54/56/56<br>---/---/---<br>22/19/18 | Restripe NB approach to inlcude an exclusive right-turn lane; replace lagging WB phase with EB-LT//WB-LT/NB-RT phase. Transfer 16 sec. from WB phase in all periods to new EB/WB left-turn; 4 sec. from NB/SB and 2 sec. from EB/WB in AM, 3 sec. from NB/SB in MD, and 2 sec. from NB/SB in PM. |
| Willoughby Street (WB) @ Gold Street/Albee Sq. W. (NB/SB) | NB/SB<br>EB/WB<br>WB | 60/60/60<br>42/42/42<br>18/18/18 | (NB) 65/65/65<br>---/---/---<br>55/55/55 | Convert Gold Street from SB to NB between Willoughby Street & Flatbush Ave. Extension. Transfer 5 sec. of green time to the NB phase in all periods. |
| Willoughby Street (WB) @ Bridge Street (SB) | SB<br>WB | 24/24/24<br>36/36/36 | (Ped.) 24/24/24<br>36/36/36 | Convert SB phase to an all-pedestrian phase and prohibit pedestrians during WB phase. |
| Willoughby Street (EB/WB) @ Jay Street (NB/SB) | NB/SB<br>EB/WB | 54/54/54<br>36/36/36 | 51/50/48<br>(WB) 39/40/42 | Convert Willoughby St. from two-way to one-way WB between Jay & Pearl Streets. Transfer 3 sec. from NB/SB to WB in AM, 4 sec. in MD and 6 sec. in PM. |

**Notes:**

(1) Signal timings shown indicate green plus yellow (including all-red) for each phase. AM/midday/PM.

n/c - no change.

Ped. - all pedestrian phase.

* denotes mitigation different from that recommended under the proposed project's traffic mitigation plan.

# Table 21-1
## Proposed Traffic Improvement Measures With BQE Ramp Alternative

| Intersection | Approach | Current Signal Timing (Seconds) (1) | Proposed Mitigation | |
|---|---|---|---|---|
| | | | Mitigation Signal Timing (Seconds) (1) | Description of Mitigation |
| Atlantic Avenue (EB/WB) @ Flatbush Avenue (NB/SB) | NB/SB<br>EB/WB<br>Ped | 72/67/63<br>40/45/49<br>8/8/8 | 68/65/60<br>44/47/52<br>8/8/8 | Divert traffic to EB Schermerhorn St. at Boerum Place. Transfer 4 sec. of green time from NB/SB approach to EB/WB approach in AM, 2 sec. in MD, and 3 sec. in PM. |
| Atlantic Avenue (EB/WB) @ Fourth Avenue (NB/SB) | NB/SB<br>SB<br>EB/WB | 41/30/36<br>20/48/27<br>59/42/57 | 43/31/37<br>17/45/24<br>60/44/59 | Divert traffic to EB Schermerhorn St. at Boerum Place. Transfer 3 sec. of green time from SB to NB/SB (2 sec.) and EB/WB (1 sec.) in AM. Transfer 3 sec. from SB to NB/SB (1 sec.) and EB/WB (2 sec.) in MD and PM. |
| Atlantic Avenue (EB/WB) @ Bond Street (NB) | NB<br>EB/WB | 48/30/45<br>72/60/75 | 45/27/45<br>75/63/75 | Divert traffic to EB Schermerhorn St. at Boerum Pl. Implement a no standing 7-10 AM regulation for 100' along north curb on WB approach. Transfer 3 sec. from NB to EB/WB in AM and MD. |
| Atlantic Avenue (EB/WB) @ Hoyt Street (SB) | SB<br>EB/WB | 48/30/45<br>72/60/75 | 46/30/45<br>74/60/75 | Divert traffic to EB Schermerhorn St. at Boerum Place. Implement no standing anytime regulation for 100' along west curb on SB approach. Transfer 2 sec. of green time from SB to EB/WB phase in AM. |
| Atlantic Avenue (EB/WB) @ Smith Street (NB/SB) | NB/SB<br>EB/WB | 48/40/45<br>72/50/75 | 48/40/44<br>72/50/76 | Divert traffic to EB Schermerhorn St. at Boerum Place. Transfer 1 sec. of green time from NB/SB to EB/WB phase in PM. |
| Atlantic Avenue (EB/WB) @ Boerum Place (NB/SB) | SB<br>EB/WB<br>EB | 52/45/60<br>42/32/42<br>26/13/18 | 50/45/57<br>43/32/44<br>27/13/19 | Divert traffic to EB Schermerhorn St. at Boerum Pl. Transfer 2 sec. of green time from SB phase to EB/WB (1 sec.) and EB/WB-R (1 sec.) in AM, and 3 sec. from SB to EB/WB (2 sec.) and EB/WB-R (1 sec.) in PM. Implement no standing 4-7 PM for 100' along west curb of SB approach. |
| * Flatbush Avenue (NB/SB) @ Tillary Street (EB/WB) | NB/SB<br>NB<br>EB/WB<br>EB-LT/WB-LT | 41/41/41<br>17/17/17<br>38/38/38<br>24/24/24 | 38/39/42<br>17/18/14<br>41/41/41<br>24/22/23 | Divert traffic to Ashland Pl. via new BQE off-ramp. Transfer 3 sec. of green time from NB/SB to EB/WB in AM, 2 sec from NB/SB and 2 sec. from EB-LT/WB-LT to NB (1 sec.) and EB/WB (3 sec.) in MD; and 3 sec. from NB and 1 sec. from EB-LT/WB-LT to EB/WB (3 sec.) and NB/SB (1 sec.) in PM. |
| * Flatbush Avenue (NB/SB) @ Myrtle Avenue (EB/WB) | NB/SB<br>EB/WB<br>SB | 66/66/66<br>38/38/38<br>16/16/16 | 67/66/66<br>39/38/39<br>14/16/15 | Divert traffic to Ashland Pl. via new BQE off-ramp. Implement a no standing anytime regulation for 100' along east curb on NB approach; transfer 2 sec. of green time from SB to NB/SB (1 sec.) and EB/WB (1 sec.) in AM, and 1 sec. from SB to EB/WB in PM. |
| * Flatbush Avenue (NB/SB) @ Willoughby Street (EB/WB) | NB/SB<br>EB/WB<br>NB-LT/EB-R | 70/66/70<br>35/37/35<br>15/17/15 | 67/71/73<br>53/49/47<br>---/---/--- | Divert traffic to Ashland Pl. via new BQE off-ramp. Channel NB left-turns onto Fleet Place and WB Willoughby Street; eliminate NB left-turn phase and implement two-phase signalization for the intersection. |
| * Flatbush Avenue (NB/SB) @ DeKalb Avenue (EB/WB) | NB/SB<br>WB<br>Ped | 70/70/70<br>40/40/40<br>10/10/10 | 72/70/72<br>38/40/38<br>10/10/10 | Divert traffic to Ashland Pl. via new BQE off-ramp. Implement no standing 7-10 AM and 4-7 PM regulation along south curb of WB approach and restripe to 4 lanes. Transfer 2 sec. of green time from WB to NB/SB phase in AM and PM. |
| * Flatbush Avenue (NB/SB) @ Fulton Street (EB/WB) | NB/SB<br>Ped.<br>EB/WB<br>SB | 54/48/50<br>7/7/7<br>35/36/34<br>24/29/29 | 56/50/52<br>7/7/7<br>35/34/35<br>22/29/26 | Divert traffic to Ashland Pl. via new BQE off-ramp. Transfer 2 sec. of green time from SB phase to NB/SB in AM, 2 sec. from EB/WB to NB/SB in MD, and 3 sec. from SB to EB/WB (1 sec.) and NB/SB (2 sec.) in PM. |
| Flatbush Avenue (NB/SB) @ Livingston Street (EB/WB) | NB/SB<br>EB/NB-LT | 75/75/75<br>45/45/45 | 72/75/73<br>48/45/47 | Divert traffic to Ashland Pl. via new BQE off-ramp. Transfer 3 sec. of green time from NB/SB to EB/NB-LT in AM and 2 sec. in PM. |
| * Flatbush Avenue (NB/SB) @ SchermerhornStreet/ Lafayette Avenue (EB/WB) | NB/SB<br>SB<br>EB/WB<br>EB | 53/53/53<br>15/15/15<br>24/24/24<br>28/28/28 | 55/55/55<br>13/14/13<br>26/25/27<br>26/26/25 | Divert traffic to Ashland Pl. via new BQE off-ramp. Transfer 2 sec. of green time from SB to NB/SB in AM and PM, and 1 sec. to EB/WB in MD; transfer 2 sec. from EB to EB/WB in AM and 3 sec. in PM; transfer 2 sec. from EB to NB/SB in MD. |
| Flatbush Avenue (NB/SB) @ 4th Avenue/Hanson Pl. (EB) | NB/SB<br>EB<br>Ped. | 72/67/72<br>40/45/40<br>8/8/8 | n/c<br>n/c<br>n/c | No mitigation proposed. |
| Jay Street (NB/SB) @ Tech Place (WB) | NB/SB<br>WB | 54/54/54<br>36/36/36 | n/c<br>n/c | Implement no standing 4-7 PM regulation for 100' along east curb on NB approach to provide two moving lanes. |

**Notes:**

(1) Signal timings shown indicate green plus yellow (including all-red) for each phase. AM/midday/PM.

n/c - no change.

(cl) - clearance phase.

* denotes mitigation different from that recommended under the proposed project's traffic mitigation plan.

two-phase signal cycle with increased green time to the northbound/southbound and eastbound/ westbound phases.

As shown in Tables 21-2 through 21-4, with a new BQE off-ramp and these additional measures, all impacted movements would operate at LOS D or better in all periods with delays lower than under No Build conditions. All potential significant impacts at this intersection would therefore be fully eliminated under the BQE Ramp Alternative.

*DeKalb Avenue*

The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp would reduce traffic on the southbound Flatbush Avenue Extension approach to DeKalb Avenue by from 160 to 265 vehicles in each peak hour. Peak hour traffic on the westbound DeKalb Avenue approach would increase by from 31 to 47 vph due to this diversion. It is further proposed to implement a "No Standing 7-10 AM and 4-7 PM" regulation for 100 feet along the south curb of the westbound approach, and to restripe the approach from three lanes to four. (DeKalb Avenue is 42 feet wide at this location.) It is further proposed to transfer additional green time from the westbound phase to the northbound/southbound phase in the AM and PM peak periods. As shown in Tables 21-2 through 21-4, with these measures, all potential impacts at this intersection would be fully addressed under the BQE Ramp Alternative.

*Fulton Street*

The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp would reduce traffic on the southbound Flatbush Avenue Extension approach to Fulton Street by from 129 to 218 vehicles in each peak period. In combination with adjustments to signal timing (see Table 21-1), all of the project's potential impacts at this intersection would be fully addressed under the BQE Ramp Alternative.

*Livingston Street*

The diversion of southbound Flatbush Avenue traffic to Ashland Place via a new BQE off-ramp would reduce traffic on the southbound Flatbush Avenue approach to Livingston Street by 51 to 81 vehicles in each peak period. In combination with adjustments to signal timing (see Table 21-1), the project's potential impact to the eastbound right-turn movement in the PM peak hour would be fully addressed under this alternative. Although delay to the northbound left-turn movement in the AM peak hour would be reduced compared to the future action with mitigation condition, this movement would remain impacted under the BQE Ramp Alternative.

structures and while they are still occupied, and would therefore have to be conducted at the time of site redevelopment. If the soil borings indicate a potential for archeologically sensitive areas, Stage 1B testing would be undertaken in the potentially sensitive areas. Should the Stage 1B testing indicate that an association of one or all of these buildings with the Underground Railroad is established, and the National Park Service criteria for eligibility of Underground Railroad properties for National Historic Landmark designation or for listing in the National Register of Historic Places are met, the redevelopment of these sites pursuant to the proposed actions would constitute a significant adverse impact to archaeological resources. As required under the revised Brooklyn Center Urban Renewal Plan, measures to partially mitigate the elimination of these resources would be developed in consultation with LPC and performed prior to issuance of a certificate of occupancy to the redeveloper.

**Comment 47:** Best efforts should be made to relocate 227, 231, 233, and 235 Duffield Street and 436 Albee Square West onto nearby properties. Another alternative for 233 Duffield Street would be to incorporate the structure into the redevelopment site, or to site the building in the Willoughby Square open space for use as a public amenity. (4)

**Response:** 227, 231, and 235 Duffield Street and 436 Gold Street/Albee Square West were not identified as potential architectural resources in the historic resources analysis, and therefore would not require preservation through relocation or other means. 227 and 233 Duffield Street and 436 Gold Street have been claimed by their owners to have been utilized for Underground Railroad activities; however, as described above, no documentable association with the Underground Railroad could be established for these sites. Documentation of the Underground Railroad history of 233 Duffield Street was not provided by the property owner as of the date of the FEIS. Under the conservative assumption that in the future, evidence of an association of one or all of these buildings with the Underground Railroad could possibly be established, to move these structures onto nearby properties would impair their integrity of location and setting so as to eliminate their eligibility for listing on the National Register of Historic Places in relation to the Underground Railroad. It is not considered feasible to incorporate the structure of the 233 Duffield Street building into the development projected for site P. Mitigation for the loss of this potential architectural resource has been developed in consultation with LPC and is presented in Chapter 20, "Mitigation."

## URBAN DESIGN AND VISUAL RESOURCES

**Comment 48:** Excellence in design for the new buildings this plan contemplates is critical to creating a thriving commercial core. The streetscape design must address the

needs of office workers and Brooklyn residents for a comfortable and coherent pedestrian experience. (59)

**Response:** With the proposed actions, Flatbush Avenue would have a wider, landscaped median similar to that on Adams Street; continuous sidewalks that are wider at street crossings; and signalized and delineated pedestrian crossings, all of which would improve the pedestrian and visual experience of this avenue. The proposed text changes to the Special Downtown Brooklyn District, specifically the ground-floor retail use, subway stair relocation, street wall continuity, ground-floor retail use, fenestration, security gate transparency, and street tree requirements also would be expected to create a comfortable and coherent pedestrian experience in Downtown Brooklyn.

**Comment 49:** Flatbush Avenue will have more loading docks. It will not be a grand boulevard (12)

**Response:** With the proposed actions, Flatbush Avenue would have a wider, landscaped median similar to that on Adams Street; continuous sidewalks that are wider at street crossings; and signalized and delineated pedestrian crossings, all of which would improve the pedestrian and visual experience of this avenue. The new commercial and residential development expected on the avenue pursuant to the proposed actions, as well as new streetwall continuity and ground-floor retail use requirements on the east side of Flatbush Avenue, also are expected to revitalize the avenue's appearance.

## TRAFFIC AND PARKING

A number of comments relating to traffic, parking, and travel by bicycle focused on the need to study specific issues or specific improvements that were outside of the scope of the proposed actions. However, separate from this project, NYCDOT and the New York City Economic Development Corporation have announced that they plan to initiate a comprehensive transportation analysis, or "transportation blueprint" study, of Downtown Brooklyn. In addition, the Downtown Brooklyn Council, an association of business, institutional and academic entities, plans to undertake a multi-tiered program that will allow for the assessment and possible design of a wide range of strategies to improve mass transit and alternative transit access. The Council's studies are expected to include an assessment of parking patterns in residential neighborhoods near Downtown Brooklyn, the preparation of an intermodal transit plan, and a feasibility study of the creation of a Transportation Management Association (TMA). Many of the comments and recommendations regarding issues outside of the scope of the proposed actions will be addressed in the context of one or more of these studies.

**Comment 50:** A new City public/private partnership, the Downtown Brooklyn Transportation Management Agency (TMA) should be created to address current and future traffic, parking and mass transportation issues; prepare and implement a traffic/transportation management strategy; and to facilitate community-based involvement. Among the tasks for this agency would be undertaking a

comprehensive area-wide traffic analysis, establishing a jitney/bus loop, expediting implementation of the Downtown Brooklyn Traffic Calming Study, implementing permit parking programs and other parking management strategies, examining measures to better manage truck traffic, and enhancing traffic enforcement. (4)

**Response:** The Downtown Brooklyn Council will commence a study that will consider the creation of such a Transportation Management Agency for Downtown Brooklyn. This exploratory study will have the full support of NYCDOT and EDC, and will seek to include the MTA among other key stakeholders.

**Comment 51:** The traffic calming measures recommended in the Downtown Brooklyn Traffic Calming Project should be implemented on an accelerated schedule. (4, 21)

**Response:** NYCDOT has announced that $4 million in funding for capital improvements associated with the Downtown Brooklyn Traffic Calming Project has been advanced from Fiscal Year 2009 to Fiscal Year 2006. This will enable DOT to install median extensions, neckdowns and other traffic-calming initiatives in Downtown Brooklyn. By advancing these projects, NYCDOT hopes to facilitate the Downtown Brooklyn Development Plan.

**Comment 52:** The City should study and implement tolls on the East River bridges. (21)

**Response:** An examination of the tolling policy on bridges and tunnels in Brooklyn is not directly relevant to the assessment of impacts from the proposed actions, and is beyond the scope of what is required under CEQR. Any implementation of new tolls would be subject to an independent environmental review.

**Comment 53:** The City should negotiate to make parking spaces at MetroTech available to City agencies to reduce curbside parking by these agencies, and should identify the specific spaces that will be relinquished by these agencies. (4)

There should be the abolition of special permit parking permits and their rampant abuse by federal, state, and City personnel. (54)

Extend the "no authorized permit" zone to the limits of the Primary Study Area of the Downtown Brooklyn Traffic Calming Project, provide off-street parking for agency personnel, and eliminate all on-street designated spaces for agency personnel parking. (8)

**Response:** In order to strengthen and enhance the Downtown Brooklyn Development Plan, the City has committed to a number of initiatives to address Downtown Brooklyn's parking issues. These include a reduction in the number of reserved City agency curbside parking spaces of 30 percent (approximately 80 spaces), a reduction in the number of official parking permits issued to agency staff within Downtown Brooklyn, and increased NYPD enforcement of parking regulations,

including abuse and misuse of government parking permits. The potential for parking agency vehicles in one or more garages at MetroTech is currently being explored. The City will also consider setting aside parking spaces in the new garage under the new open space at Willoughby Square for use by official City agency vehicles and, if supported by the community, will expand the Downtown Brooklyn no-permit zone to include both sides of Atlantic Avenue from Third Avenue to Henry Street.

**Comment 54:** The City should commit to a schedule to replace parking meters with muni-meters in Downtown Brooklyn and surrounding communities, remove afternoon parking restrictions along both sides of Atlantic Avenue from Fourth Avenue to Hicks Street, and provide funding commitments in a timely manner for the public parking garages beneath the BAM LDC sites and the "north" site. (4)

Install muni-meters with provision for longer (two to four hour) parking. (8)

**Response:** The proposed actions are a major rezoning in Downtown Brooklyn and include sufficient new off-street parking capacity to accommodate all project-generated parking demand. The installation of muni-meters and the implementation of changes to parking restrictions along Atlantic Avenue (with the exception of changes needed for traffic mitigation purposes) are not within the scope of the proposed actions. However, these issues may be examined in one or more of the independent studies planned by NYCDOT and the Downtown Brooklyn Council.

The BAM Cultural District is a City priority. Some funding to advance its development is in place, and it is expected that design for one of the BAM garages will begin this summer. The City is committed to completion of the overall project, including the two on-site garages, in a timely fashion. The City is similarly committed to the timely development of the proposed garage on the "North" site (Site IA).

**Comment 55:** A residential parking permit program should be instituted in adjacent residential communities. (8)

**Response:** The Downtown Brooklyn Council, an association of business, institutional and academic entities, plans to undertake a thorough assessment of parking patterns in the residential neighborhoods surrounding Downtown Brooklyn. Upon completion of this study, the City will re-examine the feasibility of introducing a residential parking permit program.

**Comment 56:** Vigorously enforce parking regulations in the Downtown core by means of a separate, designated NYPD precinct. (8)

The City should undertake measures to stop the constant parking in the Adams Street bike lane. (21)

**Response:** In order to strengthen and enhance the Downtown Brooklyn Development Plan, the City has committed to a number of initiatives to address Downtown Brooklyn's parking issues. Among these initiatives is increased NYPD enforcement of parking regulations.

**Comment 57:** Institute a net reduction in parking spaces as more parking, either on-street, in garages, under new residential and commercial developments or at retail centers, will create more traffic. (21)

Reconsider the proposed massive additions to garage spaces; they appear counterproductive to the plan's effort to demap several streets so that traffic has fewer options to disperse. (6, 8)

**Response:** By facilitating development in an area with one of the densest concentrations of transit services in the City, the proposed actions would support travel by mass transit. However, even development in such a transit-rich environment as Downtown Brooklyn will generate trips by motor vehicle. As discussed in the EIS, demand for off-street public parking in Downtown Brooklyn is expected to exceed supply by approximately 1,179 spaces in the midday in the future without the proposed actions as new developments increase demand and displace existing parking supply. The projected development of 6.7 million square feet of new commercial, residential and community/cultural space under the proposed actions would further increase parking demand within Downtown Brooklyn. In the absence of new parking supply, the EIS projects a midday deficit of over 4,000 off-street parking spaces in Downtown Brooklyn in the future with the proposed actions. Instituting a net reduction in parking spaces in Downtown Brooklyn would considerably worsen both on-street and off-street parking conditions. Traffic conditions would correspondingly worsen as drivers would be forced to circulate through the street network looking for parking, and as instances of double and illegal parking increased. Area businesses would be adversely affected as access by delivery and service vehicles would be hindered, as would access by those needing to drive. In addition to providing sufficient new off-street parking capacity to accommodate all project-generated parking demand, the proposed actions would facilitate travel by the transit and walk modes by improving the pedestrian streetscape and subway entrances.

**Comment 58:** Enclosed, accessible and secure bike parking should be made a requirement in new commercial developments as is required in Long Island City under NYCDCP's Indoor Bike Parking Zoning Regulations for Long Island City, Queens Special Zoning District. It should also be required within the new parking garage under Willoughby Square and at transit stations. (21)

**Response:** To facilitate bicycle commuting to and from Downtown Brooklyn, the proposed zoning text would include a requirement that new commercial developments in C6-1, C6-5, and C6-4 districts provide up to 400 feet of enclosed storage space

for bicycles. The operators of the proposed Willoughby Square garage and the other garages that would be developed as a result of the proposed actions would be encouraged to accommodate secure bicycle parking in their facilities. Requiring enclosed and secure bicycle parking at transit stations is an issue that is under the jurisdiction of New York City Transit and not part of the proposed actions.

**Comment 59:** The City should work with colleges and universities in Downtown Brooklyn to create bike parking and encourage bike commuting by students. (21)

Safe and convenient bicycle and pedestrian access to the Brooklyn and Manhattan Bridges, and between Downtown Brooklyn and surrounding neighborhoods, should be created. (4, 21)

**Response:** The proposed project seeks to foster connections between Downtown Brooklyn and surrounding residential neighborhoods, and to enhance streetscapes and the overall pedestrian environment along key corridors through a number of zoning and mapping actions. Included in the new zoning text would be a requirement that new commercial developments in C6-1, C6-5, and C6-4 districts provide up to 400 feet of enclosed storage space for bicycles. However, specific measures to facilitate bicycle use at existing educational facilities or to provide new or improved bicycle connections within Downtown Brooklyn are not within the scope of this project. NYCDOT and the New York City Economic Development Corporation have announced that they plan to initiate a comprehensive transportation analysis, or "blueprint" study, of Downtown Brooklyn. Such measures to promote and enhance bicycle usage in Downtown Brooklyn would be more appropriately addressed in the context of this study.

## TRANSIT AND PEDESTRIAN

A number of comments relating to transit focused on the need to obtain funding in the 2005-09 MTA Capital Plan for transit improvements in Downtown Brooklyn, as well as recommendations for specific projects. Among the projects recommended were expanding the subway car fleet and the number of trains serving Downtown Brooklyn, optimizing bus circulation and intermodal transfers in Downtown Brooklyn, increasing express or limited-stop bus service, implementing a new jitney bus service, constructing a new East River tunnel for the subway and/or Long Island Rail Road, extending existing and planned subway routes to Downtown Brooklyn, expediting repairs and planned modernization work at subway stations, studying new subsurface connections between subway stations, facilitating free MetroCard transfers between stations and soliciting interest in expanding ferry routes to Downtown Brooklyn. While potentially beneficial to Downtown Brooklyn, many of these recommended projects are not directly related to the proposed actions or to the transit impact analyses in the EIS, and are therefore not specifically addressed below. Comprehensive capital improvements and operational changes to subway and bus services are generally under the jurisdiction of the MTA and New York City Transit and are not within the scope of this project.

**Comment 60:** The DSEIS subtracts more than 1,500 AM peak hour subway trip arrivals attributable to existing floor area based on a higher rate per square foot than was used for new floor area. The buildings that are to be replaced are generally under-utilized or less job productive than proposed structures. (44)

**Response:** Developments projected to occur as a result of the proposed actions would displace approximately 1.5 million square feet of existing land uses on 13 sites in Downtown Brooklyn. The existing uses on these sites were determined based on extensive field surveys and other sources, and were found to include approximately 622,000 sf of commercial/office space, 574,000 square feet of retail space, 130 dwelling units, 108,000 square feet of community facility space and 69,000 square feet of miscellaneous industrial space. While it is possible that some of the buildings on these sites are currently underutilized, it is reasonable to assume that over the ten-year analysis period, the intensity of use at any currently underutilized site would increase to a level appropriate for the size of the buildings on that site. As stated in the EIS, the trip generation and modal split assumptions utilized for forecasting travel demand from projected developments were also utilized in forecasting the demand eliminated due to the displacement of existing uses.

**Comment 61:** A 20-year horizon is needed for projecting transit demands. (44)

**Response:** As discussed in the EIS, CEQR assessments of large area-wide zoning proposals not associated with specific development projects are based upon a 10-year time frame. This is the time frame that can be reasonably predicted without engaging in highly speculative projections.

**Comment 62:** The analyses in the DSEIS assume that the proportion of work trips originating in Brooklyn is only 50 percent whereas Census county-to-county data indicate that it is 65 percent. The DSEIS assertion that 12 percent of subway/train arrivals are actually on the LIRR is based on unavailable surveys. (44)

**Response:** As discussed in the EIS, the travel demand and mode choice assumptions used for the transportation analyses are based on accepted CEQR criteria, standard professional references, and studies that have been done for similar uses in Downtown Brooklyn. These sources were supplemented by 1990 and 2000 Census data, Employee Commute Options (ECO) survey data from firms and governmental/educational institutions in Downtown Brooklyn, as well as recent data for Downtown Brooklyn from other sources. These data are more reflective of conditions in Downtown Brooklyn than the county-wide Census data cited in the comment. The 12 percent LIRR mode share assumption cited is based on NYCDOT-approved ECO survey data from workers in Downtown Brooklyn. These data likely reflect the convenient LIRR access to the study area (via the railroad's Flatbush Avenue terminal) compared to other parts of Brooklyn.

**Comment 63:** Investigate the physical feasibility of constructing a new Brooklyn-bound platform at the Lawrence Street station to increase capacity and circulation. (4)

Rebuild the narrow stairways and platform of the Lawrence Street station as part of the planned connection with the Jay Street station. (8)

**Response:** Plans for the renovation of the Jay Street-Borough Hall and Lawrence Street subway stations, and for a potential connection between the two stations, are currently being developed by NYC Transit. Comprehensive capital improvements such as these, as well as operational changes to subway services are generally under the jurisdiction of the MTA and New York City Transit and are not within the scope of this project.

**Comment 64:** Build a transit hub at the base of the building at Willoughby, Adams and Fulton streets, with bus platforms and subsurface connections between the Jay Street-Borough Hall IND and Borough Hall IRT stations. (8)

**Response:** Construction of a transit hub at the base of the projected commercial development at Willoughby, Adams and Fulton Streets (Site M) is not under consideration. However, urban renewal changes for the project would allow for the creation of a transit plaza across Fulton Street from Site M on a triangular site bounded by Fulton, Jay and Willoughby Streets. This public space–Jay Street Plaza–would potentially include a new subway entrance/exit to the Jay Street-Borough Hall station, and would facilitate connections between the subway and the bus services operating along the Jay Street and Fulton Street corridors.

**Comment 65:** Renovate and re-open the Myrtle Avenue subway station, south of the Manhattan Bridge. (8)

**Response:** Comprehensive capital improvements such as the reconstruction and re-opening of the former Myrtle Avenue subway station beneath Flatbush Avenue Extension are generally under the jurisdiction of the MTA and New York City Transit and are not within the scope of this project. It should be noted that the closure of this station was due, in-part, to its close proximity to the DeKalb Avenue station, and much of its infrastructure was removed prior to the construction of MetroTech.

**Comment 66:** Instead of using NYC Transit's model of link-by-link ridership, the line haul analysis in the DSEIS used a short-cut method that compares all added trips in 2013 to annual passenger counts at the "cordon" entering Manhattan, as a surrogate for a cordon in Downtown Brooklyn. By omitting a Brooklyn cordon, the analyses in the DSEIS left out the 9,000 trips destined for Downtown Brooklyn. (44)

During the AM peak hour, ridership on trains approaching Downtown from Brooklyn will increase by 20 percent by 2013, of which eight percent will be from the proposed actions. The conclusion of the subway line haul analysis in the DSEIS that no additional service is needed is incorrect. There will be a need for 8 added peak hour trains in 2013 and 11 in 2023 to serve riders on the A/C and 4/5 lines. (44)

**Response:** The No Build and Build subway line haul analyses in the FEIS have been revised to reflect conditions at the peak load points within Downtown Brooklyn on each of the routes serving the study area. (The peak load point is the location where the largest number of riders are present on the trains on a given route.) As peak load point data were not available at the time of publication of the DSEIS, the line haul analyses in that document utilized data from the East River cordon.) The forecast of 2013 future baseline conditions for the FEIS analyses also incorporate updated NYC Transit schedule and peak load point ridership data reflecting the February 2004 changes in service across the Manhattan Bridge and the reopening of the Stillwell Avenue terminus in late 2004. The analysis of 2013 Build line haul conditions accounts for all peak direction project-generated subway trips that would pass through the peak load point on each route. As discussed in the FEIS, based on this updated data, the analyses show that peak direction demand for D train service will exceed capacity in both the AM and PM peak hours by 2013, and that peak direction No. 3 trains will be operating essentially at capacity in the PM peak hour. All other routes within Downtown Brooklyn will continue to operate with available capacity in the peak direction in both peak periods. As demonstrated in the FEIS, based on CEQR criteria, the proposed actions would not result in any significant impacts to subway line haul service.

**Comment 67:** A one percent per year annual growth rate should have been used for the subway line haul analysis. Growth in line haul is largely related to work trips to Manhattan, and one percent annual growth is what would be needed for Brooklyn to maintain a 16 percent share of the 114,000 Manhattan jobs forecast by 2015 based on New York Metropolitan Transportation Council (NYMTC) projections. (44)

**Response:** In addition to accounting for discrete development projects within Downtown Brooklyn, the analyses of future No Build and Build subway line haul conditions assume a 0.5 percent per year background growth rate for subway demand during the 2002 through 2013 period. This is the growth rate recommended in the 2001 *CEQR Technical Manual* to account for background increases in transit demand for both Downtown Brooklyn and Manhattan.

**Comment 68:** An inexplicably high number of project-generated subway trips in the line haul analysis were assigned to the historically lowest ridership lines, doubling the

percent of new trips on the 2, 3 and R. The No. 5 line went from getting 10 percent of the trips added by the No Build to carrying only one percent of project trips. The two largest rezoning sites (M and Q) are adjacent to No. 5 stations at Borough Hall and Nevins Street. (44)

**Response:** The No Build and Build subway line haul analyses in the FEIS have been revised to reflect conditions at the peak load points within Downtown Brooklyn on each route serving the study area. Updated schedule and ridership data provided by NYC Transit were also utilized to develop the FEIS forecast of 2013 future baseline conditions. The assignment of project-generated subway trips to routes serving Downtown Brooklyn has been revised to incorporate this new data as well as to reflect conditions at the peak load points. The numbers of trips projected to occur on 2, 3 and R trains in the line haul analysis reflect both general ridership patterns through Downtown Brooklyn and the fact that stations served by these trains–Hoyt Street (2, 3), Lawrence Street (M, R) and DeKalb Avenue (B, M, Q, R)–are located immediately adjacent or in close proximity to the bulk of the projected commercial development which would occur along Willoughby Street. The smaller number of trips projected to occur on No. 5 trains in part reflects the fact that the two stations in the area served by No. 5 trains–Nevins Street (2, 3, 4, 5) and Borough Hall (2, 3, 4, 5)–are not in as close proximity to these projected development sites. For riders on the IRT subway lines (2, 3, 4, 5), the Hoyt Street station served by Nos. 2 and 3 trains would provide the most convenient access to the projected commercial development along the Willoughby Street corridor. Riders on the IRT lines en route to and from Site M are expected to be distributed among Nos. 2 and 3 trains (via Hoyt Street) and Nos. 4 and 5 trains (via Borough Hall).

**Comment 69:** Future conditions on the No. 5 line are understated because the cordon counts for the base year were an anomalous low 19,000 peak rider, whereas, they have ranged from 22,000 to 26,000 every year since 1998. (44)

**Response:** The forecast of 2013 future baseline conditions for the FEIS has been revised to incorporate updated NYC Transit schedule and peak load point ridership data for the Nos. 4 and 5 routes.

**Comment 70:** Pedestrian space needs to be preserved and enlarged, streetscape improvements made to increase pedestrian safety and comfort, and leading pedestrian intervals maintained and expanded. (21)

**Response:** As discussed in the EIS, enhancing streetscapes and the creation of new public spaces, are central goals of the Downtown Brooklyn Development project. Along Flatbush Avenue for example, streetscape enhancements would include a wider, landscaped center median along the avenue, continuous sidewalks that are wider at street crossings, and signalized and delineated pedestrian crossings. The streetscape of Willoughby Street would be similarly improved with

widened sidewalks and improved subway entrances that are included in new buildings and/or plazas. The proposed project's traffic mitigation plan would preserve all existing pedestrian intervals, and would introduce a new all-pedestrian phase at the intersection of Myrtle Avenue and Prince Street.

**Comment 71:** Improving the Flatbush Avenue median should not come at the expense of narrowing its sidewalks. (21)

**Response:** The proposed improvements to the Flatbush Avenue median would not entail the narrowing of sidewalks along the avenue.

**Comment 72:** Build out the sidewalk at the intersection of Tillary and Flatbush where the NYPD has barricaded off part of the roadbed. (21)

**Response:** The west curb lane of Flatbush Avenue south of Tillary Street has been closed to traffic by the NYPD as a security measure for an adjacent building. As the long-term continuation of this closure remains uncertain, permanent physical changes at this location were not contemplated as part of the proposed project.

**MITIGATION**

**Comment 73:** The City Planning Commission should lay over the ULURP actions until there is a comprehensive plan with mitigation acceptable to the community fully committed. (44)

**Response:** The proposed Downtown Brooklyn plan has included extensive community outreach and provides comprehensive mitigation, including numerous physical and operational changes to the study area street network and widening of a subway stair at the Jay Street-Borough Hall subway station. The ULURP clock cannot be stopped once a project has been certified.

**Comment 74:** As the EIS proposes no substantial mitigation measures, the funding for traffic mitigation should be used for traffic calming. (21)

**Response:** A comprehensive mitigation plan, including numerous physical and operational changes to the study area street network and widening of a sidewalk stair at the Jay Street-Borough Hall subway station, is presented in Chapter 20 of the EIS. As these measures are needed to address specific project-related traffic and transit impacts, funding for these measures cannot be shifted to other programs such as the Downtown Brooklyn Traffic Calming Project. However, it should be noted that NYCDOT has announced that $4 million in funding for capital improvements associated with the Downtown Brooklyn Traffic Calming Project has been advanced from Fiscal Year 2009 to Fiscal Year 2006.

## ALTERNATIVES

**Comment 75:** This is the Manhattanization of Brooklyn, planned homogenization–vote the No Action Alternative. There should be a moratorium on development so we can stop and think. (34)

**Response:** Comment noted. ✷

# Appendix A

# Downtown Brooklyn Development
# No Build Parking Supply And Demand

## DOWNTOWN BROOKLYN DEVELOPMENT
# NO BUILD PARKING SUPPLY AND DEMAND

05-Mar-04

| No. | Site | Estimated New Demand at Public Parking Facilities AM | Midday | Public Spaces Displaced | Public Spaces Provided | Accessory Spaces Provided | Notes |
|---|---|---|---|---|---|---|---|
| 1 | 9 MetroTech South | 201 | 305 | 0 | 337 | 0 | (8),(9) |
| 2 | 60-82 Washington Street | See note (2) | See note (2) | 0 | 0 | 0 | |
| 3 | 110 Livingston Street | 119 | 117 | 0 | 225 | 0 | (3) |
| 4 | 223 Atlantic Avenue/Court Street | 164 | 169 | 515 | 700 | 0 | |
| 5 | 330 Jay Street | 271 | 410 | 0 | 0 | 150 | (4),(9) |
| 6 | Atlantic Avenue/Smith Street | See note (5) | See note (5) | 0 | 130 | 0 | |
| 7 | Atlantic Terminal | 212 | 389 | 0 | 0 | 0 | (1) |
| 8 | BAM LDC East | 110 | 120 | See Note (7) | 0 | 0 | |
| 9 | BAM LDC North | 200 | 251 | 322 | 466 | 0 | |
| 10 | Atlantic Ave. Pharmacy | See note (5) | See note (5) | 0 | 0 | 0 | |
| 11 | Bond Street Garage | See note (5) | See note (5) | 0 | 0 | 0 | |
| 12 | Bridge Plaza Rezoning | See note (5) | See note (5) | 0 | 0 | 74 | |
| 13 | Bridgefront Condos | See note (2) | See note (2) | 0 | 0 | 0 | |
| 14 | Brooklyn Bridge State Park | See note (5) | See note (5) | 0 | 0 | 0 | |
| 15 | Brooklyn Law School Dorm | 0 | 0 | 0 | 212 | 0 | (10) |
| 16 | CUNY Site A | 110 | 186 | 0 | 0 | 0 | |
| 17 | CUNY Site B | 48 | 82 | 0 | 0 | 0 | |
| 18 | Hoyt-Schermerhorn Streets | 0 | 0 | 650 | 0 | 225 | (6) |
| 19 | Federal Courthouse | 132 | 132 | 0 | 0 | 120 | (12) |
| 20 | Ingersoll Community Center | See note (5) | See note (5) | 0 | 0 | 0 | |
| 21 | Light Bridges | See note (2) | See note (2) | 0 | 0 | 0 | |
| 22 | LIU Wellness Center | See note (5) | See note (5) | 0 | 0 | 0 | |
| 23 | Marriott Expansion | 154 | 84 | 0 | 0 | 0 | (13) |
| 24 | 53 Boerum Place | 0 | 0 | 0 | 0 | 85 | (6) |
| 25 | St. Francis College | See note (5) | See note (5) | 0 | 0 | 0 | |
| 26 | Schermerhorn Block 171 | 0 | 0 | 424 | 0 | 140 | (6) |
| 27 | South Portland Street | See note (5) | See note (5) | 0 | 0 | 0 | (5) |
| 28 | Sweeney Building | See note (2) | See note (2) | 0 | 0 | 0 | (2) |
| 29 | Thor Equities | See note (5) | See note (5) | 0 | 0 | 0 | (5) |
| ---- | Heights LLC Garage | 0 | 0 | 150 | 0 | 0 | (11) |
| ---- | Atlantic Center | 378 | 439 | 0 | 0 | 0 | (14) |
| ---- | Site 5 | 0 | 0 | 0 | 0 | 123 | (15) ,(16) |
| ---- | New Lot on Site O | 0 | 0 | 0 | 30 | 123 | (17) |
| ---- | Arena Project | See note (18) | See note (18) | See note (18) | See note (18) | See note (18) | |
| | | **2,099** | **2,684** | **2,061** | **2,100** | **1,040** | |

**Notes:**

(1) Includes demand from retail/movie and office development projects.
(2) Demand would occur at facilities located outside of the study area.
(3) Demand assumptions from 110 Livingston Street EAS which assumes 300 D.U.
(4) AM/MD demand shown for 330 Jay Street is total demand minus the capacity of the accessory garage (150 sapces).
(5) Project demand assumed to be included in background growth.
(6) Project demand assumed to be accommodated in accessory facilities.
(7) Existing parking supply on BAM East site included in total for BAM North site.
(8) The special permit for the MetroTech 9 South garage is for 337 spaces. The operator currently plans for 272.
(9) AM demand assumed at 66% of midday demand based on office parking patterns.
(10) Bklyn Law demand already in the system under existing conditions and would be diverted to new public spaces from other facilities.
(11) Parking garage at 199 State Street suffered a structural collapse in Oct. 2002 and was demolished.
(12) Court opens @ 10 AM with little activity in afternoon. Assumes 50% of peak demand in AM and midday.
(13) 280-room annex at 0.55 spaces/room in AM and 0.30 spaces/room in midday.
(14) Demand accommodated in existing on-site garage and other area facilities.
(15) Assumes 0.4 accessory spaces per D.U. (308 D.U. assumed) as specified for C6-2 zoning.
(16) New retail assumed to be equivalent to existing on-site retail. Parking demand therefore assumed to already be in the system.
(17) New Albee Square Public Parking, LLC, 30-space public lot (license No. 1131833) opened at 209-211 Duffield Street 9/03.
(18) Arena project will not displace any existing parking supply within the study area, and all new demand during the AM and midday will be accommodated in on-site facilities located outside of the study area.